Data Quality Documentation, Discharge Abstract Database 2008–2009 Executive Summary

October 2009

Canadian Institute for Health Information
Institut canadien d'information sur la santé

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ISBN 978-1-55465-628-8 (PDF)

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How to cite this document:
Canadian Institute for Health Information, *Data Quality Documentation, Discharge Abstract Database, 2008–2009—Executive Summary* (Ottawa, Ont.: CIHI, 2009).

Cette publication est aussi disponible en français sous le titre *Document sur la qualité des données, Base de données sur les congés des patients, 2008-2009 — Sommaire*.
ISBN 978-1-55465-629-5 (PDF)

Data Quality Documentation, Discharge Abstract Database, 2008–2009—Executive Summary

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1. Introduction

1.1 An Overview of the Discharge Abstract Database

The Discharge Abstract Database (DAD) is a national database for information on all separations from acute care institutions, including discharges, deaths, sign-outs and transfers within a fiscal year (April 1 to March 31). Over time, the DAD has also been used to capture day surgery procedures, long-term care, rehabilitation and other data. More than 3.2 million abstracts were submitted to the DAD in 2008–2009, representing approximately 75% of all acute inpatient separations in Canada (Quebec does not submit data to the DAD). Quebec's acute inpatient separations are reported to the Hospital Morbidity Database (HMDB) and usually account for 25% of the total inpatient separations in Canada.

Following its inception in 1963, when it was developed to collect data on separations from institutions in Ontario, it has expanded to provide coverage in all provinces except Quebec. DAD data is available for all fiscal years since 1979–1980, but the comprehensiveness and format of submissions have varied significantly. Data since 1990 is most readily available for use.

In addition to the collection and processing of data on institution separations, CIHI also provides electronic Hospital Specific Reports (eHSRs), value-added information (calculated Case Mix Groups, expected length of stay and Resource Intensity Weights) and national comparative reporting based on peer groups (eCHAP) to data suppliers. These facilitate management decision-making at the institutional, regional and provincial/territorial levels.

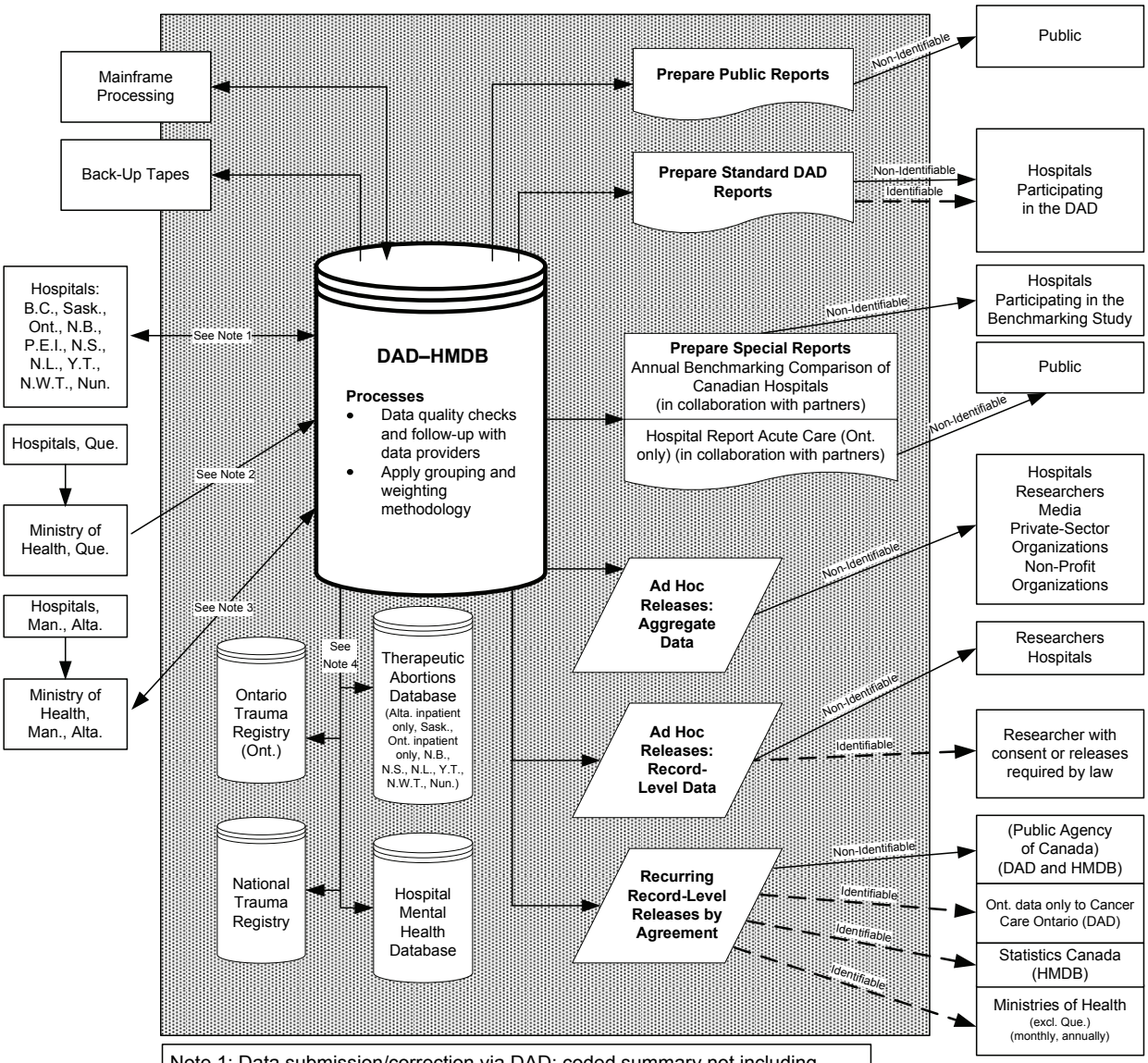
As a core database at CIHI, the DAD feeds other databases, including the HMDB, the Hospital Mental Health Database (HMHDB), the National Trauma Registry (NTR), the Ontario Trauma Registry (OTR) and the Therapeutic Abortions Database (TADB).

Information from the DAD is used by institutions, governments and academic institutions. Institutions use DAD data to support utilization management decisions and for administrative research. Governments use DAD data for funding, system planning and evaluation. Academic and other institutions use the DAD for a wide variety of research purposes.

Data from the DAD and the HMDB was merged in 2001 and is now housed in the same physical database. The Quebec Ministry of Health and Social Services submits a data file to CIHI on an annual basis. This data file is then merged with the DAD to create the national DAD–HMDB data file, though the two databases have different populations of reference and include different data elements. For example, the HMDB includes data from Quebec, whereas the DAD does not contain any discharges from this province. For a detailed description of the HMDB and to see how it resembles and differs from the DAD, please refer to the data quality documentation for the HMDB on the CIHI website.

The following diagram depicts data flow from institutions to the DAD and the HMDB.

Discharge Abstract Database–Hospital Morbidity Database (DAD–HMDB) 2008–2009 Data Flow Diagram



Note 1: Data submission/correction via DAD: coded summary not including name or street address.
Note 2: Data submission via HMDB: coded summary not including name or street address.
Note 3: Data submission/correction via DAD (Man., Alta.): coded summary not including name or street address.
Note 4: Registry-database-specific subset of data.

= CIHI

2. Coverage

2.1 Population Covered by the DAD

The original function of the DAD was to collect acute inpatient data. Its uses have expanded over the years to include the collection of information on day surgery, long-term care and rehabilitation. Over time, provinces and territories have begun to submit chronic, rehabilitation and other types of level-of-care data to specialized databases at CIHI, including the Continuing Care Reporting System (CCRS), the National Rehabilitation Reporting System (NRS) and the Ontario Mental Health Reporting System (OMHRS), which has captured information on new admissions for adult inpatient mental health beds in Ontario since October 1, 2005. The data in the DAD for these other care types is therefore incomplete.

Table 1 shows some of the uses across the provinces and territories in 2008–2009.

Table 1 Summary of 2008–2009 DAD Participation, by Province/Territory and Institution Type

Institution Type	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	N.W.T.	Nun.	Y.T.
Acute Care	√	√	√	√	N/A	√	√	√	√	√	√	√	X*
Day Surgery	√	√	X†	√	N/A	N/A‡	√	√	N/A‡	√	√	√	√
Rehab	N/A	N/A	X	X	N/A	N/A	NA§	N/A	X	X	N/A	N/A	N/A
Special Rehab	N/A	N/A	X	N/A	N/A	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chronic Care	X	N/A	N/A	X	N/A	X	X	X	N/A	X	X	N/A	N/A
Psychiatric	N/A	N/A	X	X	N/A	N/A	X	N/A	X	N/A	N/A	N/A	N/A
Home for the Aged	N/A	N/A	N/A	N/A	N/A	N/A	X	N/A	N/A	N/A	N/A	N/A	N/A

Notes

√: all valid institutions reporting.
X: partial reporting.
N/A: no reporting.

* One acute care institution in the Yukon, Watson Lake Hospital, fits the criteria of an institution that should report to the DAD. However, it has not submitted data to the DAD in any fiscal year due to resource shortages and is not anticipated to submit data in coming years. On average, this institution has approximately 400 separations per year. This institution number is not on the DAD frame because Yukon Health and Social Services does not require it to submit data; therefore, it is not reported in this document as a data quality issue of under-coverage.

† Three institutions in Nova Scotia submitted day surgery data to the National Ambulatory Care Reporting System (NACRS) in 2008–2009. Two of these institutions started submitting data to NACRS in 2003, and one started submitting data to NACRS in 2005.

‡ Ontario submits all of its day surgery abstracts to NACRS; Alberta submits day surgery abstracts to CIHI but the data is not stored in the DAD.

§ As of April 2008, all institutions in Manitoba report rehab abstracts to the National Rehabilitation Reporting System (NRS); the DAD database contains only the acute care portion of the patient stay.

Source

Discharge Abstract Database, 2008–2009, Canadian Institute for Health Information.

A valid submitting institution number is one that has been designated by a ministry or department of health in a province or territory for an institution that is required to report data on separations to the DAD. There were 859 of these institutions in 2008–2009, including 637 acute care institution numbers (74.16%) and 174 day surgery institution numbers (20.26%). Table 2 delineates these institutions by province/territory and Institution Type.

Table 2 Number of Valid Submitting Institution Numbers in the DAD, 2008–2009, by Province/Territory and Institution Type

Institution Type	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	N.W.T.	Nun.	Y.T.	Total
Acute Care	34	7	34	22	N/A	176	97	70	109	82	4	1	1	**637**
Day Surgery	14	2	16	22	N/A	0	28	24	0	62	4	1	1	**174**
Rehab	0	0	4	4	N/A	0	0	0	1	3	0	0	0	**12**
Special Rehab	0	0	1	0	N/A	1	0	0	0	0	0	0	0	**2**
Chronic Care	1	0	0	14	N/A	1	2	1	0	3	4	0	0	**26**
Home for the Aged	0	0	1	2	N/A	0	1	0	3	0	0	0	0	**7**
Psychiatric	0	0	0	0	N/A	0	1	0	0	0	0	0	0	**1**
Total	**49**	**9**	**56**	**64**	**N/A**	**178**	**129**	**95**	**113**	**150**	**12**	**2**	**2**	**859**

Note
N/A: not applicable (Quebec data is not part of the DAD frame).

Source
Discharge Abstract Database, 2008–2009, Canadian Institute for Health Information.

Table 3 lists the number of institution numbers reporting separations in 2008–2009, by Institution Type and submitting province/territory. The total figures are smaller than in Table 2 because they are based on actual discharges reported during 2008–2009. Seven facilities sent data files to CIHI each indicating that the total number of separations from their facility was equal to zero; therefore, they do not constitute an issue of data coverage in the DAD.

Table 3 Number of Valid Institution Numbers Reporting Separations in the DAD, 2008–2009, by Province/Territory and Institution Type*

Institution Type	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	N.W.T.	Nun.	Y.T.	Total
Acute Care	33	7	34	22	N/A	175	97	68	109	82	4	1	1	**633**
Day Surgery	13	2	16	20	N/A	0	28	24	0	62	4	1	1	**171**
Rehab	0	0	4	4	N/A	0	0	0	1	3	0	0	0	**12**
Special Rehab	0	0	1	0	N/A	1	0	0	0	0	0	0	0	**2**
Chronic Care	1	0	0	14	N/A	1	2	1	0	3	4	0	0	**26**
Home for the Aged	0	0	0	0	N/A	0	1	0	0	0	0	0	0	**1**
Psychiatric	0	0	1	2	N/A	0	1	0	3	0	0	0	0	**7**
Total	**47**	**9**	**56**	**62**	**N/A**	**177**	**129**	**93**	**113**	**150**	**12**	**2**	**2**	**852**†

Notes

* Institution Type refers to the level of care associated with each institution number as defined by the provincial/territorial ministries/departments of health.

† There were 852 institution numbers with separations to report to the DAD in 2008–2009, although there were 859 valid institution numbers in the DAD frame. This is because seven valid institution numbers had no separations to report in 2008–2009.

N/A: not applicable (Quebec data is not part of the DAD frame).

Source

Discharge Abstract Database, 2008–2009, Canadian Institute for Health Information.

In 2008–2009, 3,232,396 abstracts were submitted to DAD, including 2,401,434 acute care abstracts (74.30%) and 821,186 day surgery abstracts (25.43%). A detailed breakdown of all abstracts submitted, by province/territory and Institution Type, is provided in Table 4.

Table 4 Number of Abstracts Submitted to the DAD, 2008–2009, by Province/ Territory and Institution Type

Submitting Province	Acute Care	Day Surgery	Rehab	Special Rehab	Chronic Care	Psychiatric	Home for the Aged	Total
N.L.	56,559	72,309	0	0	51	0	0	**128,919**
P.E.I.	15,917	11,829	0	0	0	0	0	**27,746**
N.S.	92,568	104,430	390	111	0	165	0	**197,664**
N.B.	93,212	52,265	568	0	1,571	262	0	**147,878**
Que.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**
Ont.	1,086,811	0	0	205	457	0	0	**1,087,473**
Man.	137,130	99,354	0	0	184	41	52	**236,761**
Sask.	137,344	110,293	0	0	25	0	0	**247,662**
Alta.	360,796	0	1,464	0	0	2,703	0	**364,963**
B.C.	409,952	364,957	1,435	0	31	0	0	**776,375**
N.W.T.	5,635	3,296	0	0	61	0	0	**8,992**
Nun.	2,151	599	0	0	0	0	0	**2,750**
Y.T.	3,359	1,854	0	0	0	0	0	**5,213**
Total	**2,401,434**	**821,186**	**3,857**	**316**	**2,380**	**3,171**	**52**	**3,232,396**

Note

N/A: not applicable (Quebec data is not part of the DAD frame).

Source

Discharge Abstract Database, 2008–2009, Canadian Institute for Health Information.

Table 5 summarizes the percentage change in DAD submissions from 2007–2008 to 2008–2009, by province/territory and Institution Type. Overall, there was a 0.86% decrease in the total number of submissions for 2008–2009. This included a decrease of 0.09% in acute care submissions and an increase of 4.02% in day surgery submissions. The overall decrease is mostly due to the following: as of April 2008, Manitoba reports rehab abstracts to the NRS, not to the DAD; in addition, in 2008–2009, Manitoba submitted only 52 abstracts with Institution Type *home for the aged* to the DAD, compared to 84 the year before.

Table 5 Percentage Change in the Number of Abstracts Submitted to the DAD Between 2007–2008 and 2008–2009, by Province/Territory and Institution Type

Submitting Province	Acute Care	Day Surgery	Rehab	Special Rehab	Chronic Care	Psychiatric	Home for the Aged	Total
N.L.	-1.88	1.87	-	-	0.00	-	-	**-0.19**
P.E.I.	-1.62	9.01	-	-	-	-	-	**-2.65**
N.S.	0.73	3.44	-14.85	-27.92	-	-21.80	-	**-2.06**
N.B.	-1.86	3.98	4.41	-	-13.01	16.44	-	**-0.04**
Que.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**
Ont.	-0.30	-	-	7.33	5.79	-	-	**0.29**
Man.	0.34	4.54	-100.00*	-	15.72	-8.89	-38.10	**-1.56**
Sask.	-0.30	4.43	-	-	-13.79	-	-	**-1.75**
Alta.	0.09	-	3.46	-	-	-10.94	-	**-0.01**
B.C.	0.67	4.30	-7.95	-	-52.31	-	-	**-2.33**
N.W.T.	-2.78	-4.71	-	-	-18.67	-	-	**3.62**
Nun.	13.51	3.28	-	-	-	-	-	**-11.11**
Y.T.	5.63	2.32	-	-	-	-	-	**-4.43**
Total	**-0.09**	**4.02**	**-24.43**	**-8.41**	**-9.06**	**-9.81**	**-38.10**	**-0.86**

Notes

A hyphen (-) indicates that there were no abstracts submitted in 2008–2009.

* As of April 2008, Manitoba reports rehab abstracts to the NRS, and the DAD contains only the acute care portion of the patient stay.

N/A: not applicable (Quebec data is not part of the DAD frame).

Sources

Discharge Abstract Database, 2007–2008 and 2008–2009, Canadian Institute for Health Information.

Over time, provinces and territories have begun to submit chronic, rehabilitation and other types of level-of-care data to specialized databases at CIHI, including the CCRS, the NRS and OMHRS, which has captured information on new admissions for adult inpatient mental health beds in Ontario since October 1, 2005. The data in the DAD for these other care types is therefore incomplete.

2.2 Population of Reference for the DAD

The population of reference for 2008–2009 includes all separations (excluding stillbirths and cadaveric donors) from acute inpatient and day surgery institutions, as defined by the Analytical Institution Type Code, in all provinces and territories except Quebec, between April 1, 2008, and March 31, 2009. The Analytical Institution Type Code was a new data element introduced to the DAD in 2004–2005 to minimize the impact of the differences between level-of-care definitions across provinces/territories and to facilitate comparative reporting across Canada. It is a CIHI-defined data element that is assigned when the Institution Type assigned to an institution number is known to differ from the type of care provided. CIHI consults and confirms the level of care with the institutions and the provincial/territorial ministries or departments of health before assigning this value. The provincially/territorially assigned Institution Type remains in the database under the Institution Type Code field. Of the institutions that reported data, 55 were assigned an Analytical Institution Type that differed from the Institution Type assigned by the ministry or department of health, including 50 that were changed from an acute Institution Type to a non-acute Analytical Institution Type, 1 that was changed from a psychiatric Institution Type to a chronic Analytical Institution Type and 4 that were changed from a day surgery Institution Type to an organized outpatient Analytical Institution Type.

The introduction of the Analytical Institution Type Code does not alter CIHI's eHSRs and eCHAP reports, as these and all other reports produced from the DAD Production System have always been based on the Institution Type assigned by provinces and territories. **Users are advised to use Analytical Institution Type Codes to identify acute inpatient separations.**

Table 6 shows the number of acute care and day surgery institution numbers in the DAD as defined by the provincial/territorial Institution Type Code and the number defined by CIHI under the Analytical Institution Type Code in 2008–2009. There were fewer institutions defined as acute care and day surgery by the Analytical Institution Type Code than by the Institution Type Code.

Table 6 Comparison of Acute Care and Day Surgery Institution Numbers Reporting Separations to the DAD, 2008–2009, by Institution Type Code and Analytical Institution Type, by Province/Territory*

	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	N.W.T.	Nun.	Y.T.	Total
Acute Care Defined by **Institution Type**	33	7	34	22	N/A	175	97	68	109	82	4	1	1	**633**
Acute Care Defined by **Analytical Institution Type**	33	7	33	22	N/A	169	73	64	96	81	4	1	1	**584**
Day Surgery Defined by **Institution Type**	13	2	16	20	N/A	0	28	24	0	62	4	1	1	**171**
Day Surgery Defined by **Analytical Institution Type**	13	2	16	17	N/A	0	28	24	0	62	4	1	1	**168**

Notes

* The level of care of an institution, as defined by the Analytical Institution Type Code, may change over time due to hospital mergers, closures or when CIHI validation processes or analyses determine that it was incorrectly assigned. The totals reported in this table reflect the level of care recorded in the DAD at the time of closure.

N/A: not applicable (Quebec data is not part of the DAD frame).

Source

Discharge Abstract Database, 2008–2009, Canadian Institute for Health Information.

Table 7 shows the total number of abstracts submitted to the DAD for 2008–2009 within the population of reference. Abstracts (excluding stillbirths and cadaveric donors) are categorized by Analytical Institution Type Code. There were 2,386,292 acute care abstracts (74.55% of the population of reference) and 814,414 day surgery abstracts (25.45% of the population of reference) as defined by the Analytical Institution Type Code.

Table 7 Number of Abstracts Submitted to the DAD, 2008–2009, by Province/ Territory and Analytical Institution Type Code* for Population of Reference†

Submitting Province	Acute Care	Day Surgery	Total
N.L.	55,446	72,309	**127,755**
P.E.I.	15,914	11,829	**27,743**
N.S.	91,789	104,430	**196,219**
N.B.	93,173	45,493	**138,666**
Que.	N/A	N/A	**N/A**
Ont.	1,085,025	0	**1,085,025**
Man.	133,191	99,354	**232,545**
Sask.	135,710	110,293	**246,003**
Alta.	355,773	0	**355,773**
B.C.	409,143	364,957	**774,100**
N.W.T.	5,628	3,296	**8,924**
Nun.	2,147	599	**2,746**
Y.T.	3,353	1,854	**5,207**
Total	**2,386,292**	**814,414**	**3,200,706**

Notes

* The level of care of an institution, as defined by the Analytical Institution Type Code, may change over time due to hospital mergers, closures or when CIHI validation processes or analyses determine that it was incorrectly assigned. The totals reported in this table reflect the level of care recorded in the DAD at the time of closure.

† The population of reference includes acute inpatient and day surgery abstracts (identified using the Analytical Institution Type Code), excluding stillbirths and cadaveric donors.

N/A: not applicable (Quebec data is not part of the DAD frame).

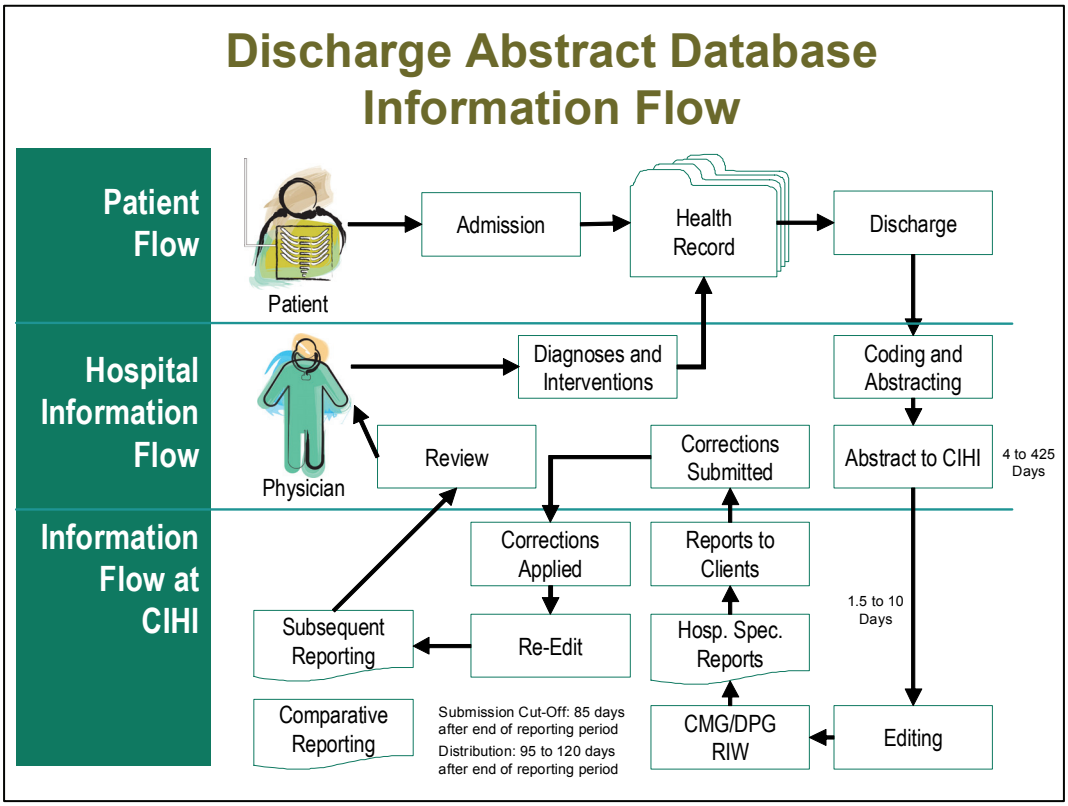
Source

Discharge Abstract Database, 2008–2009, Canadian Institute for Health Information.

3. Collection and Response

3.1 Data Collection

The following diagram summarizes the three stages of information flow in the DAD. Patient flow (stage one) into a health care facility leads to information flow at the institution level (stage two). Information at the institution level then feeds into information flow at CIHI (stage three).



Abstracting and Data Submission

The DAD abstract is a record of hospital activity that is completed for each instance of a hospital separation (discharge, death, sign-out or transfer of the patient to another facility). The data collected on each abstract includes coded diagnostic, intervention and patient demographic and administrative information. The format of the DAD abstract was changed in 2001–2002 to accommodate the adoption of the ICD-10-CA/CCI classification systems in some provinces and territories. ICD-10-CA is an enhanced version of ICD-10 developed by CIHI for morbidity classification in Canada. The Canadian Classification of Health Interventions (CCI) is the Canadian standard for classifying health care interventions. Since 2004–2005, all provinces and territories have submitted data to the DAD using the ICD-10 abstract. In 2007, the DAD abstract and the standard suite of reports were modified to support the new Case Mix Group methodology, CMG+. This methodology is designed to aggregate acute care inpatient cases with shared clinical and resource-utilization characteristics and was designed to take advantage of the increased clinical specificity of ICD-10-CA and CCI. Section 4.1 describes these classification systems in detail.

The *DAD Abstracting Manual*[1] (available in PDF version on the CIHI website) provides data element definitions, data collection guidelines, data validation rules, error message descriptions and valid code values. It is made available to clients prior to the beginning of each fiscal year. The core section of the manual provides the data collection requirements that are applicable at a national level for acute and day surgery abstracts. A section on provincial variations identifies province-/territory-specific guidelines for abstracting certain data elements. Appendix C shows the format and coding classifications used for the DAD from 1994–1995 to 2008–2009.

Ministries of health mandate the submission of data to CIHI databases from institutions in all provinces and territories except Ontario, where institutions purchase services directly from CIHI. Data collection is facilitated through the service package called the Core Plan (CIHI's products and services contract). Under this plan, institutions may access CIHI's national data holdings and services related to data quality and processing, client education and support, data access, national health information standards and select publications and reports. When clients submit data files to the DAD, the DAD Submission Reports and eHSR reports are made available to them immediately after the records are processed. Clients may also take advantage of electronic Comparison of Hospital Activity Program (eCHAP) and eManagement reports and the CIHI eQuery tool for client support.

All hospitals that submit data to the DAD must use abstracting software that meets CIHI's specifications. CIHI outsources the development of abstracting software to vendors in the private sector. These vendors incorporate CIHI submission specifications into proprietary software systems, which also provide data quality control measures, such as data capture edit checks, cross-data element logic checks and interactive warning messages, to be presented to clients as data is collected. Data files are submitted to CIHI electronically through a secure, web-based application.

Completeness of Data Submission

The CIHI Management Report, produced after each data processing session and distributed monthly to provincial and territorial ministries of health, shows the number of abstracts in the database for institutions in each province and territory for each of the 12 report periods (13 in British Columbia) and the total number of abstracts in the database. This report is used to monitor data submission throughout the year. The DAD team at CIHI monitors the Management Reports regularly and follows up with facilities or provincial/territorial representatives when an unusually high or low number of abstracts is submitted for any period.

Data Submission Timeline

All data must be submitted to the DAD prior to the year-end deadline. The published submission deadline for 2008–2009 was July 31, 2009.

3.2 Data Quality Control

Extensive quality control measures support the collection of high-quality data in the DAD. These include processes for requiring software vendors to test their abstracting software before data is submitted for each fiscal year, the CIHI education program, CIHI's production system edits and correction process, client support and special data quality studies. These are described below.

Abstracting Software Development and Testing

CIHI maintains data capture quality control measures through the Vendor Relations and Production Systems sections of its Information Technology department. These areas offer vendor support, coordinate the annual release of vendor system specifications and assist with vendor system testing. CIHI requires vendors to test their software annually. They must submit a specified number and type of test abstracts, which are then processed in a testing environment to ensure that the format and content of the files meet the submission requirements for the fiscal year. Facilities are also required to submit test submissions after their vendor has passed an annual test.

CIHI Education Program

Through the CIHI education program, instructional sessions are provided to clients on coding and abstracting, how to manage submission errors and corrections, Case Mix Group methodology and other related topics. These sessions are one mechanism to ensure standardized data collection coding practices and adherence to CIHI's data submission and collection requirements.

CIHI's eQuery application allows clients to submit questions to a variety of program areas from a single place. With this shared knowledge base, clients can view answers to questions that have previously been asked about DAD abstracting, data quality, report interpretation and other topics. Clients can also submit new questions that are not already resolved in the knowledge base.

CIHI Production System Edits and Correction Process

More than 800 data element edits are applied to each abstract as it is processed at CIHI, to ensure that the data in each field is in the expected format, within a specific range of values and has a logical relationship to other data elements. For most data elements, when errors are detected a standard default value of "Z" is substituted into the data field (for hard errors) or the field is flagged with a warning message. For some data elements, blanks or numeric values are used to represent missing or invalid data. The client receives an electronic report and is asked to submit corrections for abstracts and fields that have been defaulted to "Z" or flagged as an error. The correction and editing steps are repeated until either the client successfully corrects the abstracts or the database closes at the year-end deadline. Before the end of the fiscal year, clients can submit previously missing abstracts or delete duplicate abstracts. Any uncorrected hard errors that remain in the database can be identified by the standard default value of "Z."

In addition to verifying individual data elements, the editing process checks a number of inter-relationships. Clients may receive an error message in a field when the reported value is valid but violates certain logical relationships with the data in other fields.

To ensure relevance and consistency, edits are reviewed and updated each year as new data elements are added and changes are made to the database. Test cases and specifications are created according to internal guidelines so that new edits will function correctly.

Client Services Representatives

CIHI assigns specific client services representatives to provide support for data collectors in each of the provinces and territories. The client services representatives answer questions related to DAD products, assist in the development and delivery of education programs, provide data quality expertise and build relationships with provincial/territorial data consultants, health organizations and data users.

Special Studies

CIHI's Data Quality department evaluates coding and abstracting accuracy in the DAD via reabstraction studies. Reabstraction involves returning to the original source of information (a patient chart) and comparing it with information in the DAD database. The studies focus on data used to calculate specific health indicators, select administrative clinical data and diagnosis and intervention coding. Four reabstraction studies have been completed and released to date and are all available on the CIHI website. The first study is *Discharge Abstract Database Data Quality Re-Abstraction Study—Combined Findings for Fiscal Years 1999/2000 and 2000/2001.*[2] Building upon this two-year study, CIHI also produced the *Discharge Abstract Database CMG/Plx Data Quality Re-Abstraction Study*,[3] which measured the accuracy of data elements used in the CMG assignment methodology and complexity overlay process. The third study is *Data Quality of the Discharge Abstract Database Following the First-Year Implementation of ICD-10-CA/CCI.*[4] The fourth study, *Reabstraction Study of the Ontario Case-Costing Facilities for 2002–2003 and 2003–2004,*[5] includes the double reabstraction of approximately 800 discharges to specifically measure the inter-rater reliability of the health information professionals who participated in the study.

The Data Quality department at CIHI has implemented a five-year plan for ongoing reabstraction studies, starting with a study of the 2005–2006 DAD. The first part (year 1) of the study, *CIHI Data Quality Study of the 2005–2006 Discharge Abstract Database,*[6] evaluated the quality of clinical and non-clinical information in the 2005–2006 DAD for all of the provinces and territories across Canada; it also identified issues associated with coding variations. Results for the 2005–2006 study were released in winter 2008 to all institutions and provinces that participated in the study. As of August 2009, a summary report is available on CIHI's website.

CIHI has continued implementing its five-year plan by conducting a second reabstraction study on 2006–2007 data. This study (year 2) focused on interventions and included the provinces of British Columbia, Alberta and Ontario. The data collection for the year 2 study was completed from March 31 to May 9, 2008. The year 2 study focused on case mix variables. Results were distributed to those institutions and provinces that participated in the study in summer and fall 2009; in November 2009, a summary report will be available on CIHI's website.

3.3 Data Element Changes

Requests for refinements and suggested enhancements to data elements in the DAD are communicated to CIHI in several ways, including

- Input from advisory committees;
- Routine communication from clients to DAD support services representatives; and
- Formal submissions for data element additions or deletions from stakeholders.

The National Clinical Administrative Databases (NCAD) Steering Committee provides input to CIHI about these suggestions and advice about whether a proposed data element is appropriate for inclusion in the database as a mandatory (to ensure national comparability) or optional data element. Please refer to Appendix A for the collection status of various data elements in the 2008–2009 DAD.

4. Major Changes to the DAD

4.1 Historical Changes

Classifications Systems

Classifications systems in health care provide a standard mechanism for the capture and coding of diagnoses and interventions. ICD-10-CA, the enhanced Canadian version of the 10th revision of the International Statistical Classification of Diseases and Related Health Problems, replaced the earlier ICD-9 and ICD-9-CM classifications. CCI, the Canadian Classification of Health Interventions, was developed and is maintained by CIHI. It contains a comprehensive list of diagnostic, therapeutic and support interventions and replaced the CCP and ICD-9-CM intervention codes.

The ICD-10-CA and CCI classification systems were first implemented in 2001–2002 in British Columbia, Newfoundland and Labrador, Nova Scotia, Prince Edward Island, the Yukon and parts of Saskatchewan. The systems were implemented in all jurisdictions except Quebec in 2004–2005, when Manitoba made the transition from ICD-9-CM. Appendix C shows when each province and territory adopted ICD-10-CA and CCI.

ICD-10-CA and CCI codes are reviewed regularly. Codes may be added or deactivated as requirements in the field dictate. In March 2009, a new version of ICD-10-CA/CCI was introduced, including a large number of new diagnosis and intervention codes. Further information, including a description of these changes and an indication of when the changes occurred, may be found in the CIHI publication *Evolution Tables for ICD-10-CA and CCI*.

The ICD-10-CA and CCI coding standards are also reviewed, amended and enhanced annually by a pan-Canadian committee representing the provinces and territories. The *Canadian Coding Standards for ICD-10-CA and CCI*[7] for 2004 through 2009 are available on the CIHI website and may be downloaded free of charge.

Data Quality of the Discharge Abstract Database Following the First-Year Implementation of ICD-10-CA/CCI[4] was published to provide users of the data with accurate and timely information on the implementation of the system and the accuracy of the data. It offered an initial assessment of the quality of coded diagnostic and intervention data from the first-year implementation of the new ICD-10-CA and CCI classification system. The complete document is available on the CIHI website.

The Data Quality department at CIHI has implemented a five-year plan for ongoing reabstraction studies, starting with a study of the 2005–2006 DAD. The first part (year 1) of the study, *CIHI Data Quality Study of the 2005–2006 Discharge Abstract Database,*[6] evaluated the quality of clinical and non-clinical information in the 2005–2006 DAD for all of the provinces and territories across Canada; it also identified issues associated with coding variations. Results for the 2005–2006 study were released in winter 2008 to all institutions and provinces that participated in the study. As of August 2009, a summary report is available on CIHI's website.

CIHI has continued implementing its five-year plan by conducting a second reabstraction study on 2006–2007 data. This study (year 2) focused on interventions and included the provinces of British Columbia, Alberta and Ontario. The data collection for the year 2 study was completed from March 31 to May 9, 2008. The year 2 study focused on case mix variables. Results were distributed to those institutions and provinces that participated in the study in summer and fall 2009; in November 2009, a summary report will be available on CIHI's website.

Case Mix Grouping

The CIHI Case Mix Group uses the data to derive Case Mix Groups (CMGs) and Day Procedure Groups (DPGs), expected length of stay (ELOS) and Resource Intensity Weights (RIWs). CMGs categorize patients into statistically and clinically homogeneous groups based on clinical characteristics and resource use. Adjustments for patients of different levels of acuity form the basis for comparisons between health care organizations and Case Mix–adjusted resource utilization. Over the years, these grouping methodologies and their accompanying indicators have been used by health care facilities to plan, monitor and manage the services they provide.

All acute care inpatient data in the DAD for 2008–2009 has been grouped to the CMG+. Formerly named CMG/PIx, the CMG+ methodology is designed to aggregate acute care inpatient cases with similar clinical and resource-utilization characteristics and to take advantage of the increased clinical specificity of ICD-10-CA and CCI. Redevelopment of the CMG/PIx and relative cost weighting methodologies included an extensive review of the CMG/PIx grouper logic, complexity methodology and age groupings. More information on CMG+ can be found on the CIHI website.

4.2 Historical References

The following products are useful references for users of DAD data. Users should consider both the fiscal year and classification scheme when referring to DAD documentation.

- *DAD Abstracting Core Manual*[8] (see Appendix C for format and coding classifications over time)
- *DAD Abstracting Manual Provincial/Territorial Variations*[9]
- *Quality Assurance Processes Applied to the Discharge Abstract and Hospital Morbidity Databases*[10]
- *CMG+ Directory* (ICD-10-CA and ICD-9-CM available)[11]
- *DAD Resource Intensity Weights and Expected Length of Stay*[12]

5. Comparability

Comparability refers to the extent to which databases are consistent over time and use standard conventions (such as data elements or reporting periods), which make them similar to other databases.

5.1 Geography

Postal Code is a common variable in almost all CIHI databases. If it is used along with the Postal Code Conversion File (PCCF) from Statistics Canada, any standard geographical classification can be located, and the information in databases can be compared. The forward sortation area—that is, the first three digits of a postal code—is typically the lowest level of aggregation available to external users under CIHI's Privacy and Confidentiality Policy. The release of information for small geographical areas may also be restricted to ensure confidentiality. Special requests must be approved by the CIHI Privacy and Legal Services (PLS) Secretariat. Note that for rural areas that use post office box numbers, postal code data does not necessarily provide an accurate picture of patient residence. This is because box numbers can be located in a region different from the place of residence. In addition, when rural postal codes include more than one enumeration area, it becomes difficult to determine a specific place of residence.

5.2 Institution

A standard code assigned by provinces and territories is used for the unique identification of institutions in the DAD and other CIHI databases, with some minor alterations. In the DAD, a province/territory prefix is added to the Institution Code to make it unique. Institution-identifying information is not released externally without approval from the CIHI PLS Secretariat.

5.3 Time

DAD data is grouped by fiscal year (April 1 to March 31), based on the discharge date on the abstract. Admission dates collected on each abstract enable data users to group data within and across fiscal years, depending on the need of the study.

5.4 Person

Patient names and street addresses are not part of the DAD. Health care numbers (HCNs) are assigned to individuals by provincial ministries of health and territorial governments. CIHI receives a complete HCN on the DAD abstract and applies a standard algorithm to scramble this number. Because the numbers are only unique within each province and territory, DAD captures a variable representing the province or territory that issued the HCN. Combining the HCN and the Province/Territory Issuing Health Care Number with other relevant person fields, such as Birthdate, Gender and Postal Code, unique individuals can be identified within the DAD, while they remain anonymous.

The HCN, Birthdate and full Postal Code of persons are not normally made available to external users. Access to these and other restricted data elements and the use of DAD data for data linkage studies require prior approval by the CIHI PLS Secretariat.

6. General Data Limitations

Data limitations are detected and investigated through data processing and editing, as well as through data quality activities within the DAD program area. The CIHI Data Quality Framework,[13] implemented in 2000–2001 and revised in 2009, provides a common strategy for assessing data quality across CIHI databases and registries. It is built upon five dimensions of quality:

- Accuracy;
- Comparability;
- Timeliness;
- Usability; and
- Relevance.

The data limitations discussed below focus on accuracy (coverage, non-response, measurement error and response bias) and comparability (equivalency, linkage, standardization and historical comparability). Analyses were conducted using the Analytical Institution Type Code unless otherwise specified. For further information on the CIHI Data Quality Framework, please refer to the CIHI website.[13]

6.1 Accuracy

Accuracy refers to how well information in or derived from the database or registry reflects the reality it was designed to measure.

Coverage

The DAD frame is effectively validated by the provinces and territories, since they determine in advance which institutions must submit data to the DAD. Data submissions are monitored continually, and CIHI staff follow up with facilities or with ministries/departments of health when there are gaps in submissions or if there is a significant change in the total volume of abstracts received.

Over-coverage occurs when units that are not part of the population of reference are included in the frame, potentially skewing the result of analyses performed on the population of reference. The population of reference in the DAD is acute inpatient and day surgery abstracts. In addition, however, institutions have occasionally used the DAD to abstract data from other levels of care, including chronic care, rehabilitation and psychiatry. Any such non-acute data that appears in the DAD does not constitute over-coverage since the reference population can still be studied if these records are isolated. **Users are advised to use Analytical Institution Type Codes to identify acute care and day surgery abstracts.**

Under-coverage occurs when part of the population of reference is not included in the frame. This, too, can affect analyses of the population of reference. There was no source of under-coverage in the DAD in 2008–2009, since acute care institutions are mandated by their provincial/territorial ministry/department of health to submit to the DAD. Submission of day surgery data is also mandated in all provinces except Ontario and

Alberta. One acute care institution in the Yukon, Watson Lake Hospital, fits the criteria of an institution that should report to the DAD. However, it has not submitted data to the DAD in any fiscal year due to resource shortages and is not anticipated to submit data in coming years, as Yukon Health and Social Services has not mandated it to do so. On average, this institution has approximately 400 separations per year. At the national level, the missing data from this institution has a very minimal impact.

There are a number of coverage issues to be aware of when using 2008–2009 data:

- **The 2008–2009 DAD does not include Quebec data:** The population of reference for the 2008–2009 DAD includes all separations (discharges, deaths, sign-outs and transfers of patients) from acute inpatient and day surgery institutions in all provinces and territories except Quebec between April 1, 2008, and March 31, 2009.
- **The 2008–2009 DAD does not contain complete day surgery data:** Day surgery data from facilities in Ontario is not submitted to the DAD but to the National Ambulatory Care Reporting System (NACRS). Alberta submits day surgery abstracts to CIHI, but the data is not stored in the DAD. Three institutions in Nova Scotia submit day surgery data to NACRS. Two of these institutions have been submitting data to NACRS since 2003 and one since 2005.
- **Changes in institutions submitting to the DAD:** Throughout the fiscal year there are openings, closures and mergers of institutions. Of the institution numbers reported in 2007–2008, 13 were no longer valid in 2008–2009. Some facilities closed, some changed status (changed names, merged with other institutions or submitted data under a different level of care) and others were no longer part of the frame at some point during the year. Two were from Nova Scotia, five were from New Brunswick, one was from Ontario, two were from Manitoba and three were from British Columbia. There were also nine new institution numbers in 2008–2009 that did not exist in 2007–2008, because a facility either opened or changed status (changed names, merged with other institutions or submitted data under a different level of care) at some point during the year. Of the new institution numbers in 2008–2009, two were from New Brunswick, one was from Manitoba, two were from Ontario, two were from Saskatchewan and two were from British Columbia.
- **Potential extra abstracts:** In order to identify potential extra abstracts in the DAD, CIHI looks for abstracts with identical values within a combination of select data elements, including Province Code, Institution Code, Health Care Number, Birthdate, Gender, Postal Code, Admission Date/Time, Discharge Date/Time, MRDx, Principal Intervention Code and Weight. CIHI is unable to identify true extra abstracts definitively without confirmation by agencies of the provincial and territorial governments. In 2008–2009, there were 71 potential extra abstracts submitted to the DAD for the population of interest; 63 of these abstracts were for the population of reference.

Non-Response

Item Non-Response

Item non-response (or partial non-response, as it is sometimes known) occurs when a record is received with some data missing. The item response rate for the DAD depends largely on whether the data element is mandatory or optional. No missing data is allowed for mandatory variables. For most mandatory data elements, if data is missing or contains invalid values, it is converted to "Z." For non-mandatory fields, missing values are left blank but in some cases may trigger a warning message on the Submission Detailed Error File.

Table 8 lists the number of acute and day surgery abstracts with missing or invalid values in selected data fields and shows this number as a percentage of total acute and day surgery records.

Table 8 Number of Acute Care and Day Surgery Abstracts* Submitted to the DAD, 2008–2009, With Missing or Invalid Values in Selected Mandatory Data Elements for the Population of Reference†

Data Element	Number of Acute and Day Surgery Abstracts With Missing/Invalid Values	Percentage of Acute and Day Surgery Abstracts With Missing/Invalid Values
Gender Code	1	0%
Postal Code	72	0.0022%
Birth Date	2	0.0001%
Admission Date	2	0.0001%
Admission Time	0	0%
Discharge Date	24	0.0007%
Discharge Time	9	0.0003%
Discharge Disposition	0	0%
Admission Category	0	0%
Entry Code	4	0.0001%
Most Responsible Diagnosis	117	0.0037%
Principal Intervention	5	0.0002%

Notes

* Acute and day surgery abstracts are identified using the Analytical Institution Type Code variable.

† The population of reference includes acute inpatient and day surgery abstracts, excluding stillbirths and cadaveric donors.

Source

Discharge Abstract Database, 2008–2009, Canadian Institute for Health Information.

To protect patient anonymity in the analytical environment, CIHI removes the original HCN from the analytic (SAS) data sets and replaces it with a scrambled HCN. Since the scrambling process is done consistently, the scrambled HCN can be used to link records across fiscal years within the DAD and across CIHI data holdings. Access to the unscrambled HCN has always been restricted from external data users and is now restricted from internal CIHI data users as well.

As a result of this process, HCNs with valid values (including the valid values "0" and "1," which are used to indicate that the patient has an HCN but it is unavailable at the time of data collection) can no longer be distinguished from those with invalid values (such as "Z"), as they are now all reassigned to the same value of "000000000000." From the point of view of data quality, invalidly formatted HCNs differ from those with "0" and "1" values, even though neither value can be used to link records for analysis. In the 2008–2009 DAD, only 65 abstracts of the 31,424 that scrambled to "000000000000" were related to HCNs with an invalid value of "Z."

Table 9 Number of Acute Care and Day Surgery Abstracts* Submitted to the DAD, 2008–2009, With Scrambled Health Care Number Equal to "000000000000," for the Population of Reference†

Scrambled Health Care Number	Number and Percent of Acute and Day Surgery Abstracts
000000000000	31,424 (0.98%)

Notes

* Acute and day surgery abstracts are identified using the Analytical Institution Type Code.

† The population of reference includes acute inpatient and day surgery abstracts, excluding stillbirths and cadaveric donors.

Source

Discharge Abstract Database, 2008–2009, Canadian Institute for Health Information.

Unit Non-Response

Unit non-response can occur at either the institution level (the frame unit) or the record level (the unit of analysis).

Record-level unit non-response occurs when an entire record is missing. The unit response rate, which is the complement of the unit non-response rate, is usually computed by CIHI rather than the unit non-response rate.

Institution-level unit non-response occurs when an entire fiscal period of data is missing. Although every institution is required to submit 12 full periods of data (13 in British Columbia), some may have no separations (discharges) for one or more periods. They are required to submit data files indicating zero separations for each such period so that they are not recorded as a failure to report. CIHI received data files indicating 0 discharges from seven institutions that had no separations to report on some/all fiscal periods for 2008–2009. These do not constitute missing data. One acute institution from Alberta, Queen Elizabeth II Hospital, had two missing periods of data in the 2008–2009 DAD. On average, this institution has approximately 800 separations per fiscal period.

Measurement Error

Measurement error assesses the degree to which the values reported match the values that should have been reported.

- **Underestimated or overestimated wait time in the emergency department (ED)**: Starting with 2007–2008, the Decision to Admit Date/Time data element was no longer captured. The data element captured is Date/Time Patient Left the Emergency Department, but this data element is not mandatory in all provinces/territories. Wait Time in the Emergency Department is a derived field calculated as the time between the Admit Date/Time and the Date/Time Patient Left the ED. A wait time in the ED that is greater than 168 hours is considered excessive. However, this is not necessarily a data quality error because there are patients that spend their entire stay in the ED, although they are admitted as inpatients. In the 2008–2009 DAD, there were 421 abstracts with a Wait Time in the ED value greater than 168 hours. The majority of cases (210) came from British Columbia.
- **Intervention date repeated for multiple interventions undertaken in one operative episode:** According to the guideline provided in the *DAD Abstracting Manual,*[1] when more than one CCI code is required to capture the interventions performed in a single operative episode, the Intervention Date should be recorded only with the first CCI code; the dates for the other CCI codes in the same episode should be blank. This is important for processing the abstract on the DAD mainframe, as the episode sequence ID is incremented for each date entered. Repeated capture of the Intervention Date for multiple interventions undertaken during the same episode results in the Episode Sequence ID being erroneously incremented for each code. This means that the number of operative episodes identified may be inflated.

  Note: When processing the abstract, after the sequence ID is added, the blank date fields for the other intervention codes in an episode are populated with the date that was captured for the first intervention code in the episode. Users are advised to exercise judgment as to whether this issue will affect their analyses.
- **Multiple Out-of-Hospital (OOH) interventions recorded in the same date in one abstract**: The OOH field is a flag used to indicate that an intervention episode was performed in the ambulatory care setting of another facility during the current inpatient stay in the reporting facility. Sometimes, the code was not added to each intervention in the same episode, which could lead to under-counting the number of OOH interventions. In most cases, due to medical, administration or traffic reasons, only one episode of OOH procedures is performed within one day. There were 916 abstracts with multiple episodes of OOH procedures within one day. This number indicates that the coders may over-assign the Intervention Date for the OOH procedures.
- **Most Responsible Diagnosis (ICD-10 code) when Entry Code is *newborn*:** An Entry Code of N (newborn) is used to indicate live births that occur within the reporting institution. Other Entry Code values are used to indicate births that occur in other settings, such as in the home or on the way to hospital. These codes are separate from the diagnosis codes that also specify births in hospital and those outside the hospital. There were 80 abstracts that had an Entry Code of N (newborn) and a Most

Responsible Diagnosis that denoted birth outside the hospital. As of 2009–2010, a new edit will prevent incorrect recording of Entry Code N and Most Responsible Diagnosis as described above.

- **Readmission Codes when Admission Category is *elective*:** The Readmission Code identifies all new admissions and subsequent visits to the same health care facility by the same patient. The Admission Category is the patient classification on admission to a health care facility. Both data elements can capture whether the admission was planned/elective or unplanned. However, for 278 abstracts, the Readmission Code and the Admission Category did not consistently indicate whether the admission was planned or unplanned. The Admission Category was *elective*, but the Readmission Codes indicated an *unplanned admission*. These records generated a warning message, but these combinations can be entered into the abstracting system. These findings reflect a variation in the usage and interpretation of the Readmission Code data element across facilities in Canada. CIHI will be investigating this issue to better understand the conditions under which the terms "elective" and "unplanned" are combined, and will clarify the data element definitions.
- **Inconsistency in Discharge Disposition when Institution To field is acute care**: If the Discharge Disposition on an abstract indicates that the patient was discharged to another acute care facility (Discharge Disposition = 01), then there should be an acute care institution number in the Institution To field, and vice versa. There is an edit that defaults the Institution To field to "Z" if the Discharge Disposition is "01" and the Institution To number is not an acute care institution number. There were 41 abstracts for the population of reference with the Institution To field defaulted to "Z." However, for 2008–2009, there was no reverse edit that required that no acute care numbers be found in the Institution To field if the Discharge Disposition was not equal to 01—transferred to acute care. In 2008–2009, all abstracts with an acute care number in the Institution To field indicated a transfer to acute care in the Discharge Disposition field. This represents a significant improvement compared to previous fiscal years. Additional, clearer instructions were implemented in 2009–2010 to improve the consistency in these two fields. Provincial-/territorial-specific DAD abstracting manuals (except for P.E.I.) were updated to include Discharge Disposition tables that indicate which specific types of institutions in each province/territory would be associated with each specific Discharge Disposition code.
- **Change in rehab data abstracting practice:** Between 2006–2007 and 2007–2008, three large acute care institutions in Manitoba that have designated rehabilitation beds began capturing all patient days in these beds under Patient Service 99 (ALC) rather than Patient Service 76 (Rehab), as had been the practice in the past. These records included service transfers to the rehab service during a single admission and admissions directly to the rehab units. As of April 2008, Manitoba reports all rehab abstracts to the NRS; the DAD contains only the acute care portion of the patient stay. Users are advised that acute and ALC length-of-stay data from Manitoba starting with 2008–2009 may not be comparable to data from other jurisdictions, and may not be comparable to data from Manitoba in fiscal years prior to 2008–2009.

- **Change in Alternate Level of Care (ALC) data reported to CIHI**: Since April 2008, Whitehorse General Hospital in the Yukon is once again collecting and reporting ALC data to CIHI. This institution did not collect ALC data between 2004–2005 and 2007–2008. Users are advised that ALC data for this institution in 2008–2009 may not be comparable to the ALC data between 2004–2005 and 2007–2008.

- **J09 code used to identify H1N1 influenza**: After the H1N1 influenza outbreak in early 2009, CIHI, the World Health Organization (WHO) and the International Update and Revision Committee of the ICD-10 (URC) decided to use the code J09 (Influenza due to identified avian influenza virus) to identify H1N1 influenza until a unique code could be developed, as there had been no confirmed cases of avian flu in Canada. The J09 code was a new ICD-10-CA code for 2006–2007. A data quality audit performed by CIHI in May 2009 to confirm if the J09 code had been used in the DAD for 2006–2007, 2007–2008 and 2008–2009 revealed that the J09 code had been used by some facilities. The DAD program area followed up with these facilities and all cases submitted prior to the new coding directive were confirmed as coding errors. As the closed years of DAD data (2006–2007 and 2007–2008) cannot be corrected, the DAD program area will record this data quality issue in the DAD data quality documentation of these previous years. In the 2008–2009 DAD, all the errors were corrected; there were 16 cases of actual H1N1 reported using the J09 code.

- **Discharge Disposition *died* (07) recorded twice for the same HCN**: The DAD program area identified two instances where a Discharge Disposition of *died* (07) was captured on two distinct records for the same HCN in the 2008–2009 DAD. This issue of duplicate deaths has also been identified for previous fiscal years of the DAD. The issue of duplication of death records for the same HCN has been found when linking records across the DAD and NACRS databases. Nineteen abstracts have Discharge Disposition (Visit Disposition in NACRS) of *died* in both the DAD and NACRS for the same HCN. CIHI will update the *DAD Abstracting Manual*,[1] where necessary, to ensure that the collection guidelines are clearer in order to prevent this in the future.

- **Variations on the use of Discharge Disposition for patients who do not return from a pass**: In the 2008–2009 DAD, a new value of 12 (*patients who did not return from a pass*) was added to the Discharge Disposition data element. The DAD program area identified instances where facilities are using Discharge Disposition 05 (*discharge home*), 06 (*signed out*), 07 (*died*) or 12 (*patients who did not return from a pass*) if the patient did not return from a pass. For example, some facilities use the value 12 if a patient died while out on pass while other facilities use the value 07.
  It was determined that more clarity in the *DAD Abstracting Manual*[1] is needed for 2009–2010 about how/when to use the new value, as facilities were inconsistently coding Discharge Disposition in 2008–2009. CIHI will update the *DAD Abstracting Manual*[1] to ensure the collection guidelines are clearer.

Response Bias

While measurement error occurs when a data element is coded incorrectly, response bias occurs when the errors occur in a systematic way. The CIHI report *Coding Variations in the Discharge Abstract Database (DAD) Data*[14] found that coding variations result from differences in the interpretation of coding/reporting guidelines and varying documentation practices in institutions. While reabstraction of 2001–2002 and 2002–2003 DAD data showed that the problem with diagnosis typing had not been eliminated, preliminary analysis of the 2003–2004 and 2004–2005 DAD data suggested a reduction in coding variations.

CIHI has implemented a five-year plan for ongoing reabstraction studies, starting with a study on the 2005–2006 DAD. The results for the first part (year 1) of the study, the *CIHI Data Quality Study of the 2005–2006 Discharge Abstract Database,*[6] were released in winter 2008 to all institutions and provinces that participated in the study. As of August 2009, a summary report is available on CIHI's website. The study found some level of bias in the data. These are two examples:

- The Case Mix Group complexity: When reported using the original data, complexity tended to be higher than the complexity assigned when using DAD data.
- The reliability of diagnosis typing for those conditions that were reported to the DAD as a significant condition: The original DAD data tended to report more significant conditions than data based on chart review.

The data collection for the year 2 study was completed from March 31 to May 9, 2008. The year 2 study focused on case mix variables. Results were distributed to those institutions and provinces that participated in the study in summer and fall 2009; in November 2009, a summary report will be available on CIHI's website.

6.2 Comparability

Comparability is defined as the extent to which databases are consistent over time and use standard conventions (such as data elements or reporting periods, which make them similar to other databases).

Equivalency

Fiscal year 2004–2005 marked the first year of full adoption of the ICD-10-CA and CCI classification system for provinces and territories that submitted data to the DAD. The classification scheme change since 2001–2002 resulted in a number of challenges for users wishing to trend data over time. For details, see *Coping With the Introduction of ICD-10-CA and CCI: Impact of New Classification Systems on the Assignment of Case Mix Groups/Day Procedure Groups*,[15] based on 2001–2002 and 2002–2003 data, on the CIHI website. Appendix C shows the coding classifications used by provinces and territories in different fiscal years. **Users are strongly advised to analyze data using the classification scheme in which the data was collected.**

Linkage

- **Health Care Number (HCN) systems are evolving:** Provincial standards, edits and procedures regarding HCNs have changed over the years. British Columbia, Alberta, Ontario, Saskatchewan and the Northwest Territories have revised their health care numbering systems (for example, from family to individual based) and have issued new HCNs. Because CIHI information does not link the old and the new numbering systems, users must exercise caution when using HCNs for linkage purposes. Note that, under its Privacy and Confidentiality Policy, CIHI releases only scrambled HCNs to external users.
- **Version codes on Ontario HCNs:** Some HCNs in Ontario may include a version code. Where present (in HCNs of more than 10 bytes), it appears after the 10-digit HCN. Version codes were introduced to uniquely identify a health card and to verify the status of the health card. Some cards do not have a version code, and version codes are not always recorded on DAD abstracts. When new Ontario health cards are issued or a replacement card is issued, the 10-digit numeric portion of the HCN remains the same but the version code changes. Linkage over time therefore can only be accomplished by using the first 10 digits of either the HCN or the scrambled HCN.
- **Scrambled Health Care Number:** CIHI's use of consistently scrambled HCNs makes it possible to link data within and across years. One caveat is that invalid and missing HCNs are converted to "000000000000" and so should be excluded before data is linked.
- **Patient postal codes do not necessarily provide an accurate picture of patient residence:** The post office box numbers used by some rural residents may point to a region different from the place of residence. In addition, when rural postal codes map to more than one enumeration area, it becomes difficult to determine a specific place of residence. The forward sortation area (first three digits of the postal code) is typically the lowest level of aggregation available to external users under CIHI's Privacy and Confidentiality Policy. The release of information for small geographical areas may also be restricted to ensure patient privacy and confidentiality of patient information.
- **Discrepancy in patient residence as identified by the Postal Code and Health Care Number:** Among the acute care abstracts in the 2008–2009 DAD, approximately 22.46% of out-of-province records (abstracts where the Province Issuing Health Care Number code did not match the Submitting Province code) had a postal code from the reporting province or territory. This may be for a variety of reasons—for example, a patient who has relocated may have sought care using the HCN issued by the original province and territory and the postal code in the current province or territory. Users need to exercise judgment as to which data element is best suited to identify patient residence. For data elements like Postal Code, Health Care Number and Provider Number, CIHI's edit system can only check for format, not actual values. Therefore, incorrect HCNs or retired Postal Codes may be included in the database as long as they have the valid formats. DAD analysts conduct testing during the open year to assess and address these cases.

- **Incomplete linkage between mothers and babies:** The ICD-10-CA abstract allows for the capture of information for linking mothers and babies (via the Chart Number and the Maternal/Newborn Chart Number). A mother's Chart Number is placed on the baby's abstract in the Maternal/Newborn Chart Number field, and the baby's Chart Number is placed on the mother's abstract in the Maternal/Newborn Chart Number field. Users should be aware that mother-and-baby linkages may be incomplete because some institutions have not adhered to CIHI's guidelines for coding these fields.
- **Multiple linkages of newborn chart numbers to a mother's chart number:** The Maternal/Newborn Chart Number on the ICD-10 abstract captures the baby's Chart Number on the mother's abstract and the mother's Chart Number on the baby's abstract. This facilitates linkage of mothers to their babies and vice versa. Newborn abstracts may appear to link to more than one mother, as CIHI has found examples of the same newborn's Chart Number on more than one mother's abstract. CIHI monitors for these cases during the open year and contacts institutions to have these abstracts corrected and resubmitted to the DAD.
- **Incomplete HCNs for newborns:** The provinces and territories have different guidelines for coding HCNs for newborns. Some systematically code "0," "1" or the mother's HCN on the newborn abstract. In other jurisdictions, newborns receive a valid HCN before leaving the institution. When a newborn has not been assigned a valid HCN before leaving the institution, the HCN is defaulted to "000000000000" in the DAD. This prevents future linkages to the newborn's record.

Standardization

- **Provincial/territorial variation in DAD data collection:** The collection of a DAD data element within a province or territory can be mandatory, optional or vary in definition, depending on the decisions made by the provincial/territorial ministries of health. Response rates are typically low for non-mandatory fields. Users should be aware of these variations when conducting data analyses. Appendix A lists the key provincial abstracting differences for the 2008–2009 DAD. Please refer to the *DAD Abstracting Manual 2008–2009*[1] for details.
- **Incomplete non-acute care data in the DAD:** Comprehensiveness of non-acute care data (such as rehab or chronic care) collected in the DAD varies by province/territory. Users of the data should be aware that comprehensiveness and requirements for data collection from non-acute institutions via the DAD vary over time, and that institution types also change over the years. For specific details of these changes, contact CIHI.
- **Lack of standardized definitions for levels of care across Canada:** Currently there are no standardized definitions for levels of care. To minimize the differences between definitions for levels of care across all jurisdictions and to facilitate national comparison, the Analytical Institution Type Code was introduced in the DAD in 2004–2005. It is a CIHI-defined data element that is assigned when the Institution Type assigned to an institution number is known to differ from the type of care that is provided. Before assigning this value, CIHI consults and confirms the level of care with the institutions and provincial/territorial health agencies. The provincially/territorially assigned Institution Type remains in the database under the Institution Type Code field. Users are advised to use the Analytical Institution Type Code when performing analysis on acute care data.

Historical Comparability

- **Health Care Number (HCN) systems are evolving:** Provincial standards, edits and procedures regarding HCNs have changed over the years. British Columbia, Alberta, Ontario, Saskatchewan and the Northwest Territories have revised their HCN systems (for example, from family to individual based) and have issued new HCNs. Because CIHI information does not link the old and the new numbering systems, users must exercise caution when using HCNs for linkage purposes. Note that CIHI releases only scrambled HCNs to external users under its Privacy and Confidentiality Policy.
- **Version codes on Ontario HCNs:** HCNs in Ontario may include a version code. Where present (in HCNs of more than 10 bytes), it appears after the 10-digit HCN. Version codes were introduced to uniquely identify a health card and for verifying the status of the health card. Some health cards do not have a version code, and version codes are not always recorded on DAD abstracts. When new Ontario health cards are issued or a replacement card is issued, the 10-digit numeric portion of the HCN remains the same but the version code changes. Linkage over time therefore can only be accomplished by using the first 10 digits of either the HCN or scrambled HCN.
- **Scrambled Health Care Number:** CIHI's use of consistently scrambled HCNs makes it possible to link data within and across years. One caveat is that the invalid and missing HCNs are converted to "000000000000" and so should be excluded before data is linked.
- **Institution number is not standardized over time:** Institution numbers are assigned by provincial and territorial ministries or departments of health. One facility can be assigned different numbers as facilities merge or close or as the type of care provided in the facility changes. Longitudinal records of institution number changes are well maintained in most provinces and territories; however, linkages by institution number over time can be challenging, especially in Ontario.

Appendix A

2008–2009 Mandatory DAD Data Elements
ICD-10-CA Submitting Provinces
Inpatient

This document is intended for use in conjunction with the* DAD Abstracting Manual *available on the CIHI website. Please refer to the* DAD Abstracting Manual[1] *for details on provincial variations.

Legend	
M	Mandatory data element
Blank	Optional data element
Shading	Not submitting in ICD-10-CA

Group and Field Number	Data Element	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	N.W.T.	Y.T.	Nun.
01 01	Institution Number	M	M	M	M		M	M	M	M	M	M	M	M
01 03	Batch Year	M	M	M	M		M	M	M	M	M	M	M	M
01 04	Batch Period	M	M	M	M		M	M	M	M	M	M	M	M
01 05	Batch Number	M	M	M	M		M	M	M	M	M	M	M	M
01 06	Abstract Number	M	M	M	M		M	M	M	M	M	M	M	M
01 08	Coder Number	M	M	M	M		M	M	M	M	M	M	M	M
01 09	Chart Number	M	M	M	M		M	M	M	M	M	M	M	M
01 10	Register Number	M		M	M		M						M	
01 11	Second Chart/Register Number													
01 12	Maternal/Newborn Chart/Register Number	M	M	M	M		M	M	M	M	M	M	M	M
03 01	Health Care Number	M	M	M	M		M	M	M	M	M	M	M	M
03 02	Postal Code	M	M	M	M		M	M	M	M	M	M	M	M
03 03	Residence Code	M		M	M		M			M		M		M
03 04	Gender	M	M	M	M		M	M	M	M	M	M	M	M
03 05	Province/Territory Issuing HCN	M	M	M	M		M	M	M	M	M	M	M	M
03 06	RFP	M	M	M	M		M	M	M	M	M	M	M	M
03 08	Birthdate	M	M	M	M		M	M	M	M	M	M	M	M
03 09	Estimated Birthdate	M	M	M	M		M	M	M	M	M	M	M	M
03 11-27	Province/Territory Ancillary Data			M					M	M	M			

Group and Field Number	Data Element	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	N.W.T.	Y.T.	Nun.
04 01	Admit Date	M	M	M	M		M	M	M	M	M	M	M	M
04 02	Admit Hour	M	M	M	M		M	M	M	M	M	M	M	M
04 04	Institution From	M	M	M	M		M	M	M	M	M	M	M	M
04 05	Admit Category	M	M	M	M		M	M	M	M	M	M	M	M
04 06	Entry Code	M	M	M	M		M	M	M	M	M	M	M	M
04 07	Admit by Ambulance	M	M	M	M		M	M	M	M	M	M	M	M
04 08	Readmission Code	M	M	M	M				M		M	M		M
04 13	Date Patient Left ER	M		M			M	M	M	M	M			
04 14	Time Patient Left ER	M		M			M	M	M	M	M			
05 01	Discharge Date	M	M	M	M		M	M	M	M	M	M	M	M
05 02	Discharge Time	M	M	M	M		M	M	M	M	M	M	M	M
05 04	Institution To	M	M	M	M		M	M	M	M	M	M	M	M
05 05	Discharge Disposition	M	M	M	M		M	M	M	M	M	M	M	M
07 01	Main Patient Service	M	M	M	M		M	M	M	M	M	M	M	M
07 02	Sub-Service			M	M					M				
07 03	Weight (0–29 Days on Admission)	M	M	M	M		M	M	M	M	M	M	M	M
07 04	Abstract Overflow													
08 01	Service Transfer (3 Occurrences)				M			M	M	M	M			
08 01	Alternate Level of Care (ALC)	M	M	M	M		M	M	M	M	M	M	M	M
08 02	Sub-Service								M	M				
08 03	Service Transfer Days (if SV Transfer Coded)	M	M	M	M		M	M	M	M	M	M	M	M
09 01	Provider Type (8 Occurrences)	M	M	M	M		M	M	M	M	M	M	M	M
09 02	Provider Number	M	M	M	M		M	M	M	M	M	M	M	M
09 03	Provider Service	M	M	M	M		M	M	M	M	M	M	M	M
10 01	Diagnosis Prefix (25 Occurrences)													
10 02	Diagnosis Code (ICD-10-CA) (25 Occurrences)	M	M	M	M		M	M	M	M	M	M	M	M

Group and Field Number	Data Element	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	N.W.T.	Y.T.	Nun.
10 04	Diagnosis Type	M	M	M	M		M	M	M	M	M	M	M	M
10 05	Cancer Staging—Clinical Tumour													
10 06	Cancer Staging—Clinical Node													
10 07	Cancer Staging—Clinical Metastasis													
10 08	Cancer Staging—Pathology Tumour													
10 09	Cancer Staging—Pathology Node													
10 10	Cancer Staging—Pathology Metastasis													
10 11	Cancer Staging—Summary Staging													
11 01	Intervention Date (20 Occurrences)	M	M	M	M		M	M	M	M	M	M	M	M
11 02	Intervention Code (CCI)	M	M	M	M		M	M	M	M	M	M	M	M
11 03	Status Attribute (if Mandatory)	M	M	M	M		M	M	M	M	M	M	M	M
11 04	Location Attribute (if Mandatory)	M	M	M	M		M	M	M	M	M	M	M	M
11 05	Extent Attribute (if Mandatory)	M	M	M	M		M	M	M	M	M	M	M	M
11 06	Intervention Provider	M		M	M			M	M		M	M	M	M
11 07	Intervention Provider Service	M		M	M			M	M		M	M	M	M
11 08	Intervention Tissue													
11 09	Intervention Time				M									
11 10	Intervention Location	M		M	M		M	M	M					
11 11	Anaesthetist	M			M		M				M	M		
11 12	Anaesthetist Technique	M	M	M	M		M	M	M	M	M	M	M	M
11 13	OOH Indicator	M	M	M	M		M	M	M	M	M	M	M	
11 14	OOH Institution Number	M	M	M	M		M	M	M	M	M	M	M	

Group and Field Number	Data Element	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	N.W.T.	Y.T.	Nun.
11 15	Unplanned Return to OR	M							M	M	M			
11 16	Died in OR	M	M	M	M		M	M	M	M	M	M	M	M
13 01	SCU Death Indicator (6 Occurrences)	M	M	M	M		M	M	M	M	M	M	M	M
13 02	SCU Unit Number	M	M	M	M		M	M	M	M	M	M	M	M
13 03	SCU Admit Date	M	M	M	M		M	M	M	M	M	M	M	M
13 04	SCU Admit Time	M	M	M	M		M	M	M	M	M	M	M	M
13 05	SCU Discharge Date	M	M	M	M		M	M	M	M	M	M	M	M
13 06	SCU Discharge Time	M	M	M	M		M	M	M	M	M	M	M	M
13 09	Glasgow Coma Scale	M	M	M	M		M	M	M	M	M	M	M	M
14 01-19	Basic Options	M												
15 02-14	Mental Health	M			M		M	M						
16 01-18	Project Information (5 Occurrences)	M		M	M		M			M	M			
17 01-07	Blood Information	M	M	M	M		M	M	M	M		M	M	M
18 01-09	Reproductive Care Information	M	M	M	M		M	M	M	M	M	M	M	M
19 01-14	Licensed Vendor Assigned Values			M	M			M						
19 15	Abstract Vendor ID Number	M	M	M	M		M	M	M	M	M	M	M	M

Note
Quebec does not submit DAD data to CIHI at this time.

Appendix B

Evolution of DAD Data Elements 1995–1996 to 2008–2009

This document must be referenced when performing trending analysis on DAD data and is intended for use in conjunction with the* DAD Abstracting Manual*. Please refer to the* DAD Abstracting Manual[1] *or contact CIHI for details behind these changes.

Legend	
*	No change to existing field
C	Change in data element definition
F	Change in data element format
D	Deleted data element
N	New data element
O	Field did not exist that year
	Modified ICD-9 abstract
	New abstract (ICD-10-CA/CCI)

		ICD-9 Abstract						ICD-10 Abstract							
Group and Field Number	Data Element	1995–1996	1996–1997	1997–1998	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
01 01	Province	*	*	*	*	*	*	D	O	O	O	O	O	O	O
01 02	Institution Number	*	*	*	*	*	*	F	*	*	*	*	*	*	*
01 03	Batch Year	*	*	*	*	F	*	*	*	*	*	*	*	*	*
01 04	Batch Period	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01 05	Batch Number	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01 06	Abstract Number	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01 08	Coder Number	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01 09	Chart Number	*	*	*	*	F	*	*	*	*	*	*	*	*	*
01 10	Register Number	*	*	*	*	*	*	F	*	*	*	*	*	*	*
01 11	Second Chart/ Register Number	*	*	*	*	F	*	*	*	*	*	*	*	*	*
01 12	Maternal/ Newborn Chart/ Register Number	O	O	O	O	O	O	N	*	*	*	C	*	*	*

		ICD-9 Abstract						ICD-10 Abstract							
Group and Field Number	Data Element	1995–1996	1996–1997	1997–1998	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
02 01	Manual Length of Stay	*	*	*	*	D	O	O	O	O	O	O	O	O	O
03 01	Health Care Number	*	*	*	*	C	*	F	*	*	*	*	*	F	C,F
03 02	Postal Code	*	*	*	*	C	*	C	*	*	*	*	*	C	*
03 03	Residence Code	*	*	*	*	F	*	*	*	*	*	*	*	*	*
03 04	Sex	*	*	*	*	D	O	O	O	O	O	O	O	O	O
03 04	Gender	*	*	*	*	N	*	C	*	*	*	*	*	*	*
03 05	Province/ Territory Issuing HCN	O	O	O	O	N	*	C	*	*	*	*	*	*	C
03 06	Responibility For Payment	O	O	O	O	N	*	C	*	*	*	*	*	*	*
03 07	Marital Status	O	O	O	O	N	*	D	O	O	O	O	O	O	O
03 08	Birthdate	*	*	*	*	F	*	*	*	*	*	*	*	*	*
03 09	Age >99 Years	*	*	*	*	D	O	O	O	O	O	O	O	O	O
03 09	Estimated Birthdate	*	*	*	*	C	*	*	*	*	*	*	*	*	*
03 10	Age Is Unknown	*	*	*	*	D	O	O	O	O	O	O	O	O	O
03 11-22	Provincial/ Territorial Ancillary Data	*	*	*	*	*	*	F	*	*	*	*	*	*	*
04 01	Admit Date	*	*	*	*	F	*	*	*	*	*	*	*	*	*
04 02	Admit Time	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04 04	Institution From	*	*	*	*	*	*	F	*	*	*	*	*	C	*
04 05	Admission Category	*	*	*	*	*	*	C	*	C	*	*	*	*	C
04 06	Entry Code	*	*	*	*	*	C	*	*	*	*	*	*	*	*
04 07	Admit by Ambulance	*	*	*	*	C	*	*	*	*	*	F	C,F	*	*
04 08	Readmission Code	*	*	*	*	*	*	C	*	*	*	C	*	*	C
04 09	Unplanned Readmission	O	O	O	O	N	C	D	O	O	O	O	O	O	O

		ICD-9 Abstract						ICD-10 Abstract							
Group and Field Number	Data Element	1995–1996	1996–1997	1997–1998	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
04 10	Wait Time in ER (in Minutes)	O	O	O	O	N	*	D	O	O	O	O	O	O	O
04 11	ER Decision to Admit Date	O	O	O	O	O	O	N	*	*	*	*	*	D	O
04 12	ER Decision to Admit Time	O	O	O	O	O	O	N	*	*	*	*	*	D	O
04 13	Date Patient Left ER	O	O	O	O	O	O	N	*	*	*	*	*	*	*
04 14	Time Patient Left ER	O	O	O	O	O	O	N	*	*	*	F	*	*	*
05 01	Discharge Date	*	*	*	*	F	*	*	*	*	*	*	C	*	C
05 02	Discharge Time	*	*	*	*	*	*	*	*	*	*	*	C	*	C
05 04	Institution To	*	*	*	*	*	*	F	*	*	*	*	*	*	*
05 05	Date Ready for Discharge	*	*	*	*	F	*	D	O	O	O	O	O	O	O
05 05	Discharge Disposition	O	O	O	O	O	O	N	*	C	*	*	*	*	C,F
05 06	Reserved	*	*	*	*	*	*	D	O	O	O	O	O	O	O
06 01	Exit Alive	*	*	*	*	C	*	D	O	O	O	O	O	O	O
06 02	Autopsy	*	*	*	*	*	*	D	O	O	O	O	O	O	O
06 03	Coroner/ Medical Examiner	*	*	*	*	*	*	D	O	O	O	O	O	O	O
06 04-11	Death Codes	*	*	*	*	C	*	D	O	O	O	O	O	O	O
07 01	Main Patient Service	*	*	C	*	*	*	*	*	*	*	*	C	*	*
07 02	Patient Sub-Service	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07 03	Weight	*	*	*	*	*	*	C	*	*	*	*	*	*	*
07 04	Abstract Overflow	*	*	*	*	C	*	*	*	*	*	*	*	*	*
08 01	Service Transfer	*	*	C	*	*	*	*	*	*	*	*	C	*	*
08 02	Transfer Sub-Service	*	*	*	*	*	*	*	*	*	*	*	*	*	*

		ICD-9 Abstract						ICD-10 Abstract							
Group and Field Number	Data Element	1995–1996	1996–1997	1997–1998	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
08 03	Service Transfer Days	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09 01	Doctor/ Provider Type	*	*	*	*	*	*	C	C	*	*	*	*	*	C,F
09 02	Doctor/ Provider Number	*	*	*	*	*	*	F	*	*	*	*	*	*	*
09 03	Doctor/ Provider Service	*	*	C	*	*	*	F	C	*	*	F	*	C	F
10 01	Diagnosis Prefix	*	*	*	*	*	*	C	*	*	*	*	*	*	F
10 02	Diagnosis Code	*	*	*	*	*	*	C	*	*	*	C	*	*	*
10 03	Diagnosis Suffix	*	*	*	*	*	*	D	O	O	O	O	O	O	O
10 04	Diagnosis Type	*	*	*	*	*	*	C	*	C	C	F	*	C	C
10 05-11	Cancer Staging	O	O	O	O	O	O	N	*	*	*	*	*	*	*
11 01	Procedure/ Intervention Date	*	*	*	*	F	*	*	*	*	*	*	*	C	C
11 02	Procedure/ Intervention Code	*	*	*	*	*	*	C	*	*	*	*	*	*	C
11 03	Procedure Suffix	*	*	*	*	*	*	D	O	O	O	O	O	O	O
11 04	Procedure Doctor Number	*	*	*	*	*	*	D	O	O	O	O	O	O	O
11 05	Procedure Doctor Service	*	*	*	*	*	*	D	O	O	O	O	O	O	O
11 06	Tissue Code	*	*	*	*	*	*	D	O	O	O	O	O	O	O
11 07	Procedure Time	*	*	*	*	*	*	D	O	O	O	O	O	O	O
11 08	Operating Room	*	*	*	*	D	O	O	O	O	O	O	O	O	O
11 08	Intervention Location	O	O	O	O	N	*	D	O	O	O	O	O	O	O
11 09	Anaesthetist	*	*	*	*	*	*	D	O	O	O	O	O	O	O

		ICD-9 Abstract						ICD-10 Abstract							
Group and Field Number	Data Element	1995–1996	1996–1997	1997–1998	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
11 10	Anaesthetic Technique	*	*	*	*	*	*	D	O	O	O	O	O	O	O
11 11	Out-of-Hospital Institution Number	O	O	O	O	N	*	D	O	O	O	O	O	O	O
11 12	Unplanned Return to OR	O	O	O	O	N	*	D	O	O	O	O	O	O	O
11 03-05	Intervention Attributes	O	O	O	O	O	O	N	*	*	*	*	*	*	*
11 06	Intervention Provider Number	O	O	O	O	O	O	N	*	*	*	*	*	*	*
11 07	Intervention Provider Service	O	O	O	O	O	O	N	*	*	*	*	*	*	*
11 08	Intervention Tissue	O	O	O	O	O	O	N	C	*	*	*	*	*	*
11 09	Intervention Time	O	O	O	O	O	O	N	*	F	*	*	*	*	*
11 10	Intervention Location	O	O	O	O	O	O	N	*	*	*	*	*	*	C
11 11	Anaesthetist	O	O	O	O	O	O	N	*	*	*	*	C	*	*
11 12	Anaesthetic Technique	O	O	O	O	O	O	N	C	C	*	F	*	*	C
11 13	Out-of-Hospital Indicator	O	O	O	O	O	O	N	*	*	*	*	*	*	C
11 14	Out-of-Hospital Institution Number	O	O	O	O	O	O	N	*	*	*	*	*	*	*
11 15	Unplanned Return to OR	O	O	O	O	O	O	N	*	*	*	*	*	*	*
11 16	Died in OR	O	O	O	O	O	O	N	*	*	*	*	*	*	C
12 01-06	Therapies	*	*	*	*	*	*	D	O	O	O	O	O	O	O
12 07	Discharge Planning	*	*	*	*	*	*	D	O	O	O	O	O	O	O
12 08	Social Services	*	*	*	*	*	*	D	O	O	O	O	O	O	O
12 09	Preadmission Workup	*	*	*	*	*	*	D	O	O	O	O	O	O	O

		ICD-9 Abstract						ICD-10 Abstract							
Group and Field Number	Data Element	1995–1996	1996–1997	1997–1998	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
13 01	SCU Death Indicator	*	*	*	*	*	*	C	*	*	*	*	*	*	*
13 02	SCU Unit Number	*	*	*	*	*	*	C	*	*	*	*	*	*	F
13 03	SCU Days	*	*	*	*	*	*	D	O	O	O	O	O	O	O
13 03	SCU Admit Date	O	O	O	O	O	O	N	*	*	*	*	*	*	*
13 04	SCU Admit Time	O	O	O	O	O	O	N	*	*	*	*	*	*	*
13 05	SCU Discharge Date	O	O	O	O	O	O	N	*	*	*	*	*	*	*
13 06	SCU Discharge Time	O	O	O	O	O	O	N	*	*	*	*	*	*	*
13 09	Glasgow Coma Scale	O	O	O	O	O	O	N	*	*	*	*	*	*	*
14 01-19	Basic Options	*	*	*	*	*	*	C	*	*	*	*	*	F	*
14 18	Basic Option R—Ventilator Days	*	*	*	*	*	*	D	O	O	O	O	O	O	O
15 01	Reserved	*	*	*	*	D	O	O	O	O	O	O	O	O	O
15 02-14	Mental Health Information	O	O	O	O	N	*	*	*	*	*	*	*	*	C
16 01-18	Project Information	*	*	*	*	*	*	*	*	*	*	*	C	F	*
16 01-06	Blood Information #302	*	*	*	*	D	O	O	O	O	O	O	O	O	O
17 01-07	Blood Information	O	O	O	O	N	*	*	*	*	*	*	*	*	*
18 01-09	Reproductive Care—OBS/TA	O	O	O	O	O	O	N	*	*	*	*	C	*	*
18 01-05	Therapeutic Abortion Information	O	O	O	O	N	*	D	O	O	O	O	O	O	O
19 01-05	Vendor-Assigned Values	O	O	O	O	O	O	N	*	*	*	*	*	F	*

Appendix C

Format and Coding Classifications Used in the *DAD Abstracting Manual*,[1] 1994–1995 to 2008–2009

Province/ Territory	1994–1995	1995–1996	1996–1997	1997–1998	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005 to 2008–2009
N.L.	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP *(paper)*	I-9-CCP *(paper)*	I-10-CCI *(paper)*	I-10-CCI *(online)*	I-10-CCI *(online)*	I-10-CCI *(online)*
P.E.I.	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-10-CCI *(paper)*	I-10-CCI *(online)*	I-10-CCI *(online)*	I-10-CCI *(online)*
N.S.	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-10-CCI *(paper)*	I-10-CCI *(online)*	I-10-CCI *(online)*	I-10-CCI *(online)*
N.B.	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-10-CCI *(online)*	I-10-CCI *(online)*
Que.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ont.	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-10-CCI *(online)*	I-10-CCI *(online)*	I-10-CCI *(online)*
Man.	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-10-CCI *(online)*
Sask.	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CM/ I-10-CCI *(paper)*	I-10-CCI *(online)*	I-10-CCI *(online)*	I-10-CCI *(online)*
Alta.	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-10-CCI *(online)*	I-10-CCI *(online)*	I-10-CCI *(online)*
B.C.	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-9-CCP and I-9-CM *(paper)*	I-10-CCI *(paper)*	I-10-CCI *(online)*	I-10-CCI *(online)*	I-10-CCI *(online)*
Y.T.	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-10-CCI *(paper)*	I-10-CCI *(online)*	I-10-CCI *(online)*	I-10-CCI *(online)*
N.W.T.	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-10-CCI *(online)*	I-10-CCI *(online)*	I-10-CCI *(online)*
Nun.						I-9-CM *(paper)*	I-9-CM *(paper)*	I-9-CM *(paper)*	I-10-CCI *(online)*	I-10-CCI *(online)*	I-10-CCI *(online)*

Note
N/A: not applicable (Quebec data is not part of the DAD frame).

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