HMHDB

Hospital Mental Health Database, 2017–2018

User Documentation

Canadian Institute for Health Information
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1 Introduction

This document provides users of the Hospital Mental Health Database (HMHDB) with information on its composition, its data quality and the fitness of the data for various uses.

The HMHDB is an annual (fiscal year), pan-Canadian, event-based database that contains information on inpatient discharges for mental illness or addiction from both general and psychiatric hospitals. Statistics based on the HMHDB are available through the Quick Stats reports on CIHI's website. The current database contains information on admission and discharge dates, as well as diagnosis and demographic information. Since the HMHDB is event-based rather than person-based, a client who had more than one hospital discharge for a mental illness or addiction in the fiscal year will appear in the database multiple times. Some clients who are hospitalized in a given fiscal year are not discharged until a subsequent fiscal year; in these cases, records are included in the database in the year of discharge, not the year of admission to hospital.

The HMHDB has 2 primary components:

- General hospital data based on discharges for mental illness or addiction, which is extracted as a subset of the Discharge Abstract Database (DAD)/Hospital Morbidity Database (HMDB)[i] and the Ontario Mental Health Reporting System (OMHRS); and
- Psychiatric hospital data, which is extracted from the DAD/HMDB, the Hospital Mental Health Survey (HMHS) and OMHRS. HMHS data is not collected by questionnaire; facilities submit an annual text file to CIHI containing sufficient administrative and diagnosis data for the facilities to be included in the HMHDB.

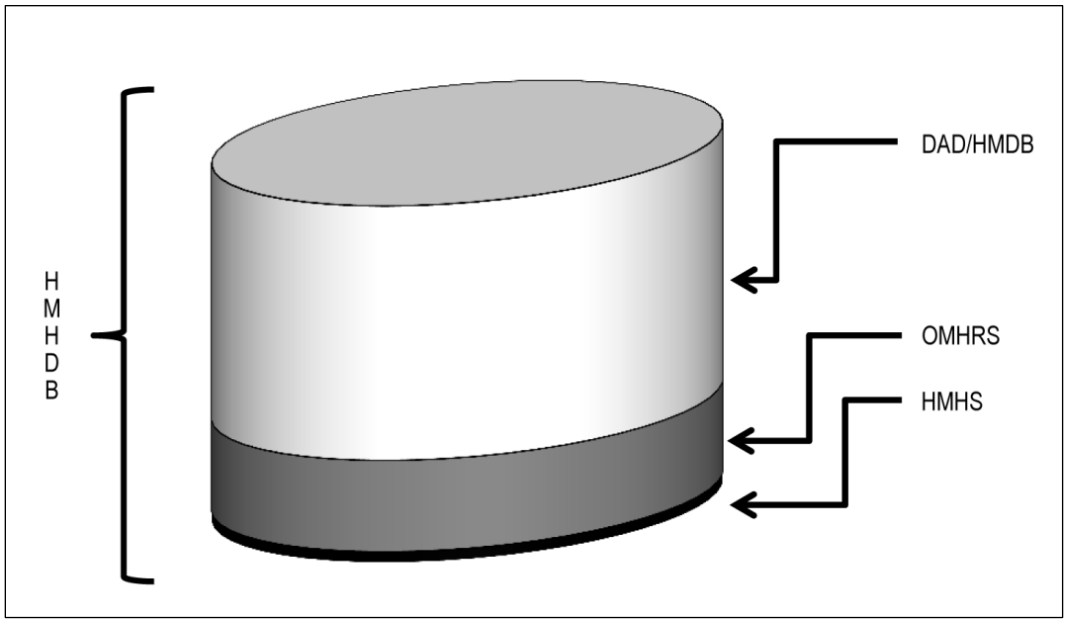
i. The DAD receives data directly from acute care facilities or from their respective health/regional authority or ministry/department of health. Facilities in all provinces and territories except Quebec are required to report. Data from Quebec is submitted to CIHI directly by the ministère de la Santé et des Services sociaux du Québec. This data is appended to the DAD to create the HMDB.

For DAD/HMDB facilities, hospital type is based on the Analytical Institution Type Code, a CIHI-defined data element used to identify the level of care for facilities in the DAD/HMDB. Prior to assigning this value, CIHI consults and confirms the level of care with the institutions and the provincial and territorial ministries or departments of health. For OMHRS facilities, hospital type is based on the OMHRS Peer Group. OMHRS Peer Group is based on the nature of the services, the type of hospital in which the service is located, the provincial or regional designation and/or the self-assignment of the facility. HMHS facilities are psychiatric facilities.

The data sources for the HMHDB are illustrated in the figure, with jurisdiction-specific details in Table 1. The process for creating the HMHDB is discussed in greater detail below.

Quality assessment for the 2017–2018 data, of which the present document is a summary, was conducted in January 2019.

Figure Data sources for the Hospital Mental Health Database



Notes
HMHDB: Hospital Mental Health Database.
DAD: Discharge Abstract Database.
HMDB: Hospital Morbidity Database.
OMHRS: Ontario Mental Health Reporting System.
HMHS: Hospital Mental Health Survey.

Table 1 Data sources for general and psychiatric hospitals in the Hospital Mental Health Database, 2017–2018

Province/territory	Data source
British Columbia	DAD
Alberta	DAD
Saskatchewan*	DAD HMHS
Manitoba*†	DAD HMHS OMHRS
Ontario‡	DAD OMHRS
Quebec	HMDB
New Brunswick	DAD
Nova Scotia	DAD
Prince Edward Island	DAD
Newfoundland and Labrador	DAD
Yukon	DAD
Northwest Territories	DAD
Nunavut	DAD

Notes

* A Saskatchewan psychiatric facility, Saskatchewan Hospital, and a Manitoba psychiatric facility, Eden Mental Health Centre, provided data to CIHI for the HMHS.

† A Manitoba psychiatric facility, Selkirk Mental Health Centre, reported to OMHRS.

‡ Ontario general and psychiatric hospitals reported discharges from designated adult mental health beds, as well as other selected psychiatric discharges, to OMHRS. All other discharges were reported to the DAD.

DAD: Discharge Abstract Database.

HMHS: Hospital Mental Health Survey.

OMHRS: Ontario Mental Health Reporting System.

HMDB: Hospital Morbidity Database.

2 Concepts and definitions

2.1 Purpose

The purpose of the HMHDB is to compile and provide pan-Canadian information on discharges from psychiatric and general hospitals for clients who have a primary diagnosis of mental illness or addiction.

2.2 Population

The population of reference is defined as all discharges that have a most responsible diagnosis of a mental illness or addiction from psychiatric and general hospitals in Canada that were *expected to submit* data to the DAD/HMDB, the HMHS or OMHRS, between April 1, 2016, and March 31, 2017. This definition reflects a change from years prior to 2014–2015. Previously, the population of reference was based on discharges from hospitals that *submitted* data to the DAD/HMDB, the HMHS or OMHRS in the given fiscal year.

Records from general hospitals from the DAD/HMDB were included in the HMHDB if the most responsible diagnosis was on the list of included diagnoses. The list is available in the document *Hospital Mental Health Database Data Dictionary for Fiscal Year 2017–2018*, which can be found on the HMHDB metadata web page.

All records from psychiatric facilities and OMHRS facilities are extracted for the HMHDB. Discharges with diagnosis codes not attributable to a mental illness or addiction are classified to the category non–mental health (non-MH) disorders. Statistics in this report exclude discharges for non-MH disorders.

In 2017–2018, a total of 190,611 discharges (75.25%) were extracted from the DAD/HMDB; 62,338 discharges (24.61%) were from OMHRS; and 369 discharges (0.15%) were from the HMHS.

Table 2 shows the number of facilities that reported data, the number of discharges and the total length of stay for general and psychiatric hospitals.

Table 2 Discharges and length of stay by hospital type,* Hospital Mental Health Database, 2017–2018

Type of hospital	Number of submitting facilities	Number of discharges	Length of stay (total days)
General	750	224,442	3,602,790
Psychiatric	52	28,876	2,049,138
Total	**802**	**253,318**	**5,651,928**

Note

* The generic term "hospital" is used throughout this report, while the analysis is based on reporting facilities. It is possible that a hospital may have more than one reporting facility.

It is important to note that a hospital may have more than one reporting facility. Facilities that are represented in Table 2 may correspond to a free-standing facility, a unit within a hospital or a collection of beds within a hospital. The number of facilities included in the HMHDB may vary from one fiscal year to the next for various reasons. These include a reorganization that results in some hospitals reporting under 2 separate facility numbers, where previously they reported under only 1; the reappearance in the database of a facility that previously had discharge counts of 0; and the exclusion of facilities from the HMHDB due to data quality issues or reporting constraints.

Several facilities in Ontario report part of their discharges to the DAD and the other part to OMHRS. In this scenario, the facility is represented as 2 facilities in the HMHDB.

2.3 Data elements and concepts

The data elements in the HMHDB include a client identifier (i.e., encrypted health card number [HCN]), diagnoses, age at admission, age at discharge, sex and discharge disposition.

Table 3 provides a list of the key data elements in the HMHDB data file. Extended descriptions of these and additional data elements (e.g., primary diagnosis) are available in the document *Hospital Mental Health Database Data Dictionary for Fiscal Year 2017–2018*, which can be found on the HMHDB metadata web page.

Table 3 Main data elements, Hospital Mental Health Database

Data element	Description
PROV	Province or territory in which the reporting facility is located
BIRTHDATE	Birthdate of person
SEX	Sex of person
PATIENT_POSTALCODE	Residential postal code of person
ADMITAGE	Age of person at the time of admission
ADMITDATE	The date that the person was admitted to the facility
SEPDATE	The date the person was formally discharged (through discharge or death) from the facility
LOS	The total number of days the person was hospitalized
ENCRYPTED_HCN	Encrypted health card number (HCN)
HEALTH_CARD_PROV_CODE*	Province/territory issuing health card number
PSYCH_HOSP	Indicates whether a record is from a general or psychiatric facility
DIAGCATEGORY†	Broad mental health category based on the most responsible discharge diagnosis code
DISCHARGE_DISPOSITION	Identifies the location where the person was discharged to or the status of the person on discharge

Notes

* Not available for records from Quebec and the HMHS.

† Please refer to Table 2: Mental illness diagnosis codes and categories in the *HMHDB Data Dictionary for Fiscal Year 2017–2018*, which can be found on the HMHDB metadata web page.

3 Data limitations

Changes to the database frame occur each year for a number of reasons, as noted in Section 2.2 — Population. Frame changes result in some limits on comparability, particularly for more detailed analyses. For example, changes in the number of psychiatric hospitals in a jurisdiction (due to re-typing, closure, etc.) will have a greater impact on analyses that provide a breakdown by facility type. Large changes to length of stay or number of discharges may partly reflect changes such as mergers, closures and splits, as well as non-frame changes such as bed numbers.

HMHDB extraction criteria were modified in 2011–2012, as described in Section 6 — Revision history. The changes result in some limits on comparability with prior years, particularly for more detailed analyses.

There is a potential data quality issue in the HMHDB for 2007–2008 onward due to the issue of OMHRS open episodes of care. Open episodes are those for which an admission record was submitted to CIHI but not a subsequent record. In the case of a missing discharge assessment, clients are not included in the HMHDB (as it is based on discharges). By the end of 2015–2016, open episodes represented approximately 0.1% of the total number of episodes in the OMHRS database and no longer presented a significant data quality issue.

4 Coverage

4.1 HMHDB frame

The frame of the HMHDB includes all facilities that were expected to submit data on psychiatric discharges to the DAD/HMDB, the HMHS or OMHRS. A hospital was expected to submit data for inclusion in the HMHDB if that hospital contributed any records to the HMHDB in the 3-year period ending March 31, 2018. Data on discharges for mental illness or addiction was submitted by hospitals from all provinces and territories. The proportion of data from general hospitals as compared with psychiatric hospitals has remained relatively stable over time (Table 4).

Table 4 Proportion of discharges by hospital type, Hospital Mental Health Database, 2006–2007 to 2017–2018

Fiscal year	General	Psychiatric
2006–2007	86.9%	13.1%
2007–2008	86.7%	13.3%
2008–2009	87.1%	12.9%
2009–2010	87.1%	12.9%
2010–2011	86.4%	13.6%
2011–2012	87.7%	12.3%
2012–2013	86.1%	13.9%
2013–2014	86.9%	13.1%
2014–2015	88.1%	11.9%
2015–2016	88.0%	12.0%
2016–2017	88.6%	11.4%
2017–2018	88.6%	11.4%

All hospital discharges that were treated in designated adult mental health beds in Ontario have been captured in OMHRS as of 2006–2007. Since that time, discharges for mental illness or addiction in Ontario treated in non-OMHRS beds are reported to the DAD and extracted from there for inclusion in the HMHDB.

4.2 Frame maintenance procedures

The DAD/HMDB and OMHRS teams at CIHI have kept all internal users of their data apprised of changes affecting those facilities that report to the DAD/HMDB and OMHRS.

4.3 Impact of the frame maintenance procedures

As changes to the HMHDB frame occur yearly, the major impact of such changes will be on the comparability of the data over time. In some jurisdictions, restructuring of health services has meant that institutions have been reclassified. Often the changes involve psychiatric facilities becoming part of a general hospital or part of a larger hospital system. As such, in addition to an impact on temporal comparisons, provincial comparisons of indices, such as average length of stay, will be affected because of variations in the amount of reclassification between psychiatric and general hospitals.

CIHI provides guidance to each ministry of health on how to manage DAD submissions when 2 acute care facilities amalgamate. CIHI recommends that a single DAD abstract be submitted when the patient is formally discharged, using the facility number that is in effect at that time. For the period of the stay when a prior facility number was in effect, CIHI recommends that a separate abstract should not be submitted.

When OMHRS Ontario facility closures, mergers and splits happen, based on current direction from the MOHLTC, OMHRS Ontario facilities should discharge patients from the old facility number and admit them under the new facility number, with the new admit date being the same as the old discharge date. As the HMHDB takes a snapshot of OMHRS and is based on discharges, this will result in false discharges in the HMHDB for the given fiscal year, followed by real discharges at the actual discharge and a splitting of the true length of stay for that episode of care.

5 Collection and non-response

5.1 Data collection/abstraction

The 4 data sources for the HMHDB are the DAD, the HMDB, the HMHS and OMHRS (see the figure). Data from the DAD/HMDB for general hospitals was included in the HMHDB when the most responsible diagnosis was a mental illness or addiction. Data from psychiatric hospitals and OMHRS facilities was included regardless of diagnosis. However, discharges for non-MH disorders are excluded from the statistics in this report.

For 2017–2018,[ii] diagnostic data was submitted to the DAD/HMDB using the ICD-10-CA coding format and to OMHRS using the DSM-5 coding format.

Extraction of the data files for the HMHDB was conducted according to the diagnostic classification system in which the data was originally coded. Discharges were then grouped into broad mental health categories[iii] based on the first-listed DSM-5 diagnosis category for OMHRS records or the primary diagnosis code for all other records. Prior to 2016–2017, OMHRS records were assigned to broad mental health categories based on the specific DSM-IV-TR code that was the primary diagnosis. As of 2016–2017, the specific primary diagnosis code for an OMHRS record may not be consistent with the assigned broad mental health category. For example, the first-listed DSM-5 diagnosis category could be “depressive disorders,” leading to assignment to the broad mental health category “mood disorders.” For the same record, the specific DSM-5 code listed first (considered primary) could be for an anxiety disorder.

The OMHRS database is longitudinal in nature — late data is accepted as long as it meets the current submission specifications. This means that later data cuts may include records from a previous quarter that were submitted after the submission deadline for that previous quarter. The HMHDB data file for 2017–2018 includes OMHRS records received as of November 15, 2018. The HMHDB will not be revised to incorporate data received after that date.

The data that comprised the HMHS was received from provincial providers in electronic format. Table 5 identifies jurisdictions and classification systems used to report their data.

ii. The DSM-III and DSM-IV-TR coding formats were used for a small amount diagnostic data submitted to the HMHS for 1 psychiatric facility in Manitoba and 1 psychiatric facility in Saskatchewan.

iii. Please refer to Table 2: Mental illness diagnosis codes and categories in the *HMHDB Data Dictionary for Fiscal Year 2017–2018*, which can be found on the HMHDB metadata web page.

Table 5 Diagnosis classification coding systems, by province/territory

Province/territory	Diagnosis classification coding system
British Columbia	ICD-10-CA
Alberta	ICD-10-CA
Saskatchewan	ICD-10-CA, DSM-IV-TR
Manitoba	ICD-10-CA, DSM-III, DSM-5
Ontario	ICD-10-CA, DSM-5
Quebec	ICD-10-CA
New Brunswick	ICD-10-CA
Nova Scotia	ICD-10-CA
Prince Edward Island	ICD-10-CA
Newfoundland and Labrador	ICD-10-CA
Yukon	ICD-10-CA
Northwest Territories	ICD-10-CA
Nunavut	ICD-10-CA

5.2 Data quality control

Controls on data quality for the HMHDB are based on protocols developed for the DAD, the HMDB, the HMHS and OMHRS.

Data from the DAD is subject to a series of data quality steps that are intended to ensure data accuracy, to maintain the frame and to identify problem areas. In 2010–2011, the most recent reabstraction study on the contents of the DAD indicated that the level of overall error was minimal. You can find information about data quality for the DAD, HMDB and OMHRS on the following web pages:

- On the page Discharge Abstract Database (DAD) Metadata, under Data Quality, look for the PDF *Current-Year Information, 2017–2018*.
- On the page Hospital Morbidity Database (HMDB) Metadata, under Data Quality, look for the PDF *Current-Year Information, 2017–2018*.
- On the page Ontario Mental Health Reporting System (OMHRS) Metadata, under Data Quality, look for the PDF *Ontario Mental Health Reporting System Data Quality Documentation, 2017–2018* (to be published spring 2019).
- On the page Discharge Abstract Database (DAD) Metadata, under Data Quality Studies, review data quality studies related to the DAD.

5.3 Non-response

Analyses in this section are based on the population of reference, as defined in Section 2.2 — Population and Section 4.1 — HMHDB frame.

Unit non-response occurs when entire records are missing from the database. The unit non-response rate at the record level was 0.0004% in 2017–2018 due to the following issue:

- Santé Manitouwadge Health in Ontario submitted partial data to the DAD, which resulted in approximately 1 discharge not being included in the HMHDB.

The unit non-response rate at the hospital level was nil in 2017–2018.

Item non-response usually occurs when a record that is received has some missing data elements that should not be missing. Item non-response differs from unit non-response in that unit non-response deals with the number of units or records that are missing, while item non-response deals with the number of data elements that are missing within a record.

Item non-response for a data element is calculated as follows and expressed as a percentage:

> (1 − (number of records for which the data element was reported ÷ number of records for which the data element should have been reported)) × 100

Within the HMHDB data, certain data elements are available for only one of the data sources. Partial reporting can also be a function of provincial practices; an example is the 2-letter postal abbreviation that is used for Quebec discharges instead of the 6-digit postal code. Item non-response rates for some of the key data elements in the HMHDB are listed in Table 6.

Table 6 Item non-response rates (percentage), Hospital Mental Health Database, 2017–2018

Data element	Psychiatric hospital discharges N = 28,876	General hospital discharges N = 224,442	All hospital discharges N = 253,318
Patient Postal Code*	1.4	0.2	0.4
Discharge Disposition	0.7	0.0	0.1
Encrypted HCN†	2.2	1.1	1.2
Patient Date of Birth	30.3	22.0	22.9
Admitted via Emergency Department	1.28	0.0	0.15

Notes

* The percentages listed reflect missing values only. Quebec provides the 2-letter postal abbreviation (QC). A method is in place to map these discharges to their appropriate health region. Additionally, jurisdictions may use a 2-letter postal (or other) abbreviation or the 3-digit forward sortation area code instead of the full postal code. For example, XX may be used in the *postal code* field in the DAD/HMDB to indicate that the patient is homeless. These instances are not counted above as true non-responses, as data has been reported.

† The percentages listed reflect blank values and specific codes used in OMHRS and the DAD/HMDB to indicate unknown or invalid values. HCN is not provided by the 2 facilities that reported via the HMHS (369 psychiatric hospital discharges [0.15% of the HMHDB or 1.28% of psychiatric hospital discharges] for 2017–2018). For details on non-response rates for source data holdings (DAD/HMDB and OMHRS), please refer to their respective user documentation (links provided in Section 5.2 — Data quality control).

5.4 Adjustment for invalid diagnosis codes

Invalid DSM-IV-TR diagnosis codes and invalid DSM-III diagnosis codes were sometimes submitted to the HMHS. CIHI's revision procedures, based on a complete list of valid DSM-IV-TR codes, automatically modify some invalid DSM-IV-TR codes. Invalid codes that could not be corrected remain in the database as submitted.

6 Revision history

In 2006–2007, a client identifier consisting of a person's encrypted HCN was added. Additionally, the province/territory issuing the HCN was added in 2012–2013 (and retrospectively included back to 2006–2007) to improve the accuracy of linkage of client discharges.

In 2011–2012, the following major changes were made:

- Additional mental health codes (O99.3, R41.0 and R41.3 in ICD-10-CA) were added to the extraction criteria for the DAD/HMDB.
- Extraction criteria for OMHRS records were modified to include all discharges.
- The broad mental health category diagnostic grouping table was further refined and now includes additional ICD-10-CA and DSM-IV-TR codes.
- New data elements (Homeless, Admitted via Emergency, Facility Postal Code and Discharge Disposition) were included.

The mental health codes R41.0 and R41.3 were removed from the extraction criteria as of 2014–2015.

In 2016–2017, the following changes were made:

- The number of variables for diagnosis and diagnosis type each increased from 35 to 50, to accommodate Quebec data collection changes for the HMDB.
- For records from OMHRS, diagnosis codes and DSM-5 diagnosis categories were based on the DSM-5 classification system that replaced DSM-IV-TR.
- For OMHRS records, broad mental health category in the HMHDB was assigned based on the DSM-5 diagnosis category[iv] instead of the specific diagnosis code.
- The assignment of diagnosis codes to diagnosis categories was modified. Several ICD-10-CA and DSM-IV-TR diagnosis codes were regrouped into HMHDB broad mental health categories as follows:

iv. Please refer to Table 2: Mental illness diagnosis codes and categories in the *HMHDB Data Dictionary for Fiscal Year 2017–2018*, which can be found on the HMHDB metadata web page.

Table 7 Regrouped ICD-10-CA and DSM-IV-TR codes

Coding classification system	Diagnosis code	Previous broad mental health category	Revised broad mental health category (as of 2016–2017)
DSM-IV-TR	312.31	Other mental health disorders	Substance-related disorders
	300.3, 308.3, 309.81	Anxiety disorders	Other mental health disorders
	309.21, 303.23	Other mental health disorders	Anxiety disorders
ICD-10-CA	F53.1	Organic disorders	Mood disorders
	F63.0	Other mental health disorders	Substance-related disorders
	F94.0	Other mental health disorders	Anxiety disorders
	F68.1	Personality disorders	Other mental health disorders
	F42, F43.0, F43.1, F43.8, F43.9	Anxiety disorders	Other mental health disorders

These changes were the outcome of a process undertaken by CIHI to align ICD-10-CA codes to DSM-5 diagnosis categories. This alignment process was undertaken to support comparable reporting across provinces/territories on indicators related to mental illness hospitalizations. The diagnosis code regrouping affects comparability across years for the distribution of records among broad mental health categories. Most changes involved the categories anxiety disorders and other mental health disorders.

7 Comparability

The HMHDB makes a number of comparisons possible for indicators such as hospital length of stay and number of discharges. When making comparisons over time (using previous iterations of the database) or across provinces/territories, users should be aware that certain limitations might apply. In particular, comparisons over time might be affected by changes in the frame that result in changes to the number of reporting facilities, and by changes to the extraction criteria for the HMHDB. Changes to the assignment of diagnosis codes to diagnosis categories, as described in Section 6 — Revision history, may also affect comparability.

The HMHDB synthesizes data on hospital discharges from several sources. As such, it is a unique resource for pan-Canadian information on and comparison of discharges that have a most responsible diagnosis of a mental illness or addiction. The latest mental health statistics are provided through Quick Stats reports on CIHI's website. The data set also allows for comparisons among mental health diagnosis categories, between general and psychiatric hospitals, as well as among provinces, territories and health regions.

8 Contact

For more information about the HMHDB, email the Mental Health and Addictions program area or visit CIHI's Mental Health and Addictions web page.

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