



National Rehabilitation Reporting System,  
Data Quality Documentation, 2011–2012



## Our Vision

Better data. Better decisions.  
Healthier Canadians.

## Our Mandate

To lead the development and maintenance of comprehensive and integrated health information that enables sound policy and effective health system management that improve health and health care.

## Our Values

Respect, Integrity, Collaboration,  
Excellence, Innovation

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# 1 Introduction

The purpose of this data quality document is to provide information regarding interpretation of the data reported to the National Rehabilitation Reporting System (NRS) by facilities with designated rehabilitation beds in Canada, for rehabilitation activity between April 1, 2011, and March 31, 2012 (fiscal year 2011–2012). More specifically, this document highlights the content, coverage and potential limitations of the 2011–2012 data reported by all facilities that submit data to the NRS. Additionally, this document provides information about the extent of non-response, at both the facility and data element levels, which will enable users to identify further potential limitations of the data and provide additional context regarding the use of information.

This report is intended to be a companion document for use by individuals and organizations who received an NRS data file for 2011–2012. In addition, the report can be used by NRS-participating facilities and other organizations or individuals to identify the content, coverage and potential limitations of the NRS data for 2011–2012. If there are any questions regarding the NRS data or the data quality assessment of 2011–2012 data, please contact the Rehabilitation program area at the Canadian Institute for Health Information (CIHI) by email ([nrs@cihi.ca](mailto:nrs@cihi.ca)). Questions of this nature may also be submitted to CIHI's eQuery tool, which can be accessed from the website ([www.cihi.ca](http://www.cihi.ca)). Please refer to Section 8 for information about eQuery or to learn of additional data quality documentation published by CIHI regarding the NRS.

As with data releases for previous fiscal years, the 2011–2012 release contains client identifiers, socio-demographic characteristics, administrative elements, health characteristics, and activities and participation elements. This data is provided for each rehabilitation client who was admitted to, discharged from or had a follow-up NRS assessment in a Canadian facility that participated in the NRS, including facilities with specialty rehabilitation beds or programs and those with general rehabilitation beds or programs. Only those assessments submitted successfully by the error correction deadline (May 15, 2012) are included in this data release. Specifications for submitting to the NRS during 2011–2012 are available in the *Rehabilitation Minimum Data Set Manual, February 2011*.

## 2 Concepts and Definitions

### 2.1 Mandate/Purpose

The mandate of the NRS is to collect information and report on adult inpatient rehabilitation episodes that occur in Canada. The purpose is to provide accurate and timely information to support health policies, quality improvement activities and decision-making in the inpatient rehabilitation sector.

### 2.2 Population of Reference

The population of reference for the NRS 2011–2012 data file is all inpatient rehabilitation episodes that occurred in participating NRS facilities between April 1, 2011, and March 31, 2012, and for which data was successfully submitted to the NRS on or before May 15, 2012.

As of May 2012, 103 inpatient rehabilitation facilities in Newfoundland and Labrador, Prince Edward Island, Nova Scotia, New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia had submitted 2011–2012 data to the NRS. In Ontario, the Ministry of Health and Long-Term Care has mandated submission of NRS data from all facilities with designated adult inpatient rehabilitation beds. Although participation in the NRS is primarily voluntary in all other provinces and territories, a number of regional health authorities or facilities choose to submit data to the NRS for all inpatient rehabilitation activity.

Of the total number of episodes that had an admission, discharge or follow-up date occurring in 2011–2012, 78.1% (32,275 out of 41,334) were submitted from facilities in Ontario. As of May 15, 2012, a large proportion—82.4% (293,411 out of 355,971)—of all the episodes in the NRS database dating back to 2000–2001, complete or incomplete, were submitted from facilities in Ontario.

For historical comparisons, Table 1 shows the number of facilities that submitted data between 2000–2001 and 2011–2012, by province. Due to the Ontario mandate regarding data submission, the number of submitting facilities increased by 137% (from 27 to 64) in 2002–2003. It should be noted that the Ontario facilities were mandated beginning in the third quarter (Q3) of 2002–2003, so data reported prior to that quarter may not be comparable with data reported afterward. As can be seen from the table, the number of submitting facilities in Ontario dropped between fiscal years 2008–2009 and 2011–2012. This drop reflects reorganizations at the facility level of NRS-reporting facilities, such as the merger of two reporting units into one.

**Table 1: Number of Submitting Facilities, by Province and Fiscal Year**

Fiscal Year	B.C.	Alta.	Sask.	Man.	Ont.	N.B.	N.S.	P.E.I.	N.L.	Total
2000–2001	3	—	1	—	20	—	1	—	1	26
2001–2002	3	4	2	—	27	—	1	—	1	38
2002–2003	3	5	2	—	64	—	1	—	1	76
2003–2004	2	5	3	—	67	1	1	—	1	80
2004–2005	2	6	3	—	70	1	2	—	1	85
2005–2006	5	8	3	—	72	1	2	—	1	92
2006–2007	5	8	3	—	72	2	2	—	1	93
2007–2008	5	9	3	5	71	2	2	1	1	99
2008–2009	5	8	2	6	73	2	2	—	1	99
2009–2010	7	11	2	7	69	2	2	—	1	101
2010–2011	7	11	2	7	68	2	2	1	1	101
2011–2012	7	11	2	7	70	2	2	1	1	103

**Note**

— Not applicable.

**Source**

National Rehabilitation Reporting System, 2000–2001 to 2011–2012, Canadian Institute for Health Information.

Tables 2 and 3 show the number of submitting facilities, by facility type (specialty or general, respectively) and fiscal year. The NRS definitions of *general* and *specialty* may not necessarily align with the designation of each facility as general or specialty by the health ministries or regions of each province; thus the two types should be compared cautiously. For the NRS, facilities self-designate their facility type:

- A *general* rehabilitation facility is typically a rehabilitation unit or collection of beds designated for rehabilitation purposes that is part of a general hospital offering multiple levels or types of care.
- A *specialty* rehabilitation facility is typically one that provides more extensive and specialized inpatient rehabilitation services and is commonly a free-standing facility or a specialized unit within a hospital.

The data in tables 2 and 3 reflects these NRS definitions.

**Table 2: Number of Submitting Specialty Facilities, by Province and Fiscal Year**

Fiscal Year	B.C.	Alta.	Sask.	Man.	Ont.	N.B.	N.S.	P.E.I.	N.L.	Total
2000–2001	2	—	1	—	6	—	1	—	1	11
2001–2002	2	4	1	—	9	—	1	—	1	18
2002–2003	2	5	1	—	15	—	1	—	1	25
2003–2004	1	5	1	—	15	1	1	—	1	25
2004–2005	1	6	1	—	15	1	1	—	1	26
2005–2006	2	6	1	—	15	1	1	—	1	27
2006–2007	2	6	1	—	15	1	1	—	1	27
2007–2008	2	7	1	2	15	2	1	—	1	31
2008–2009	2	4	1	5	18	2	1	—	—	33
2009–2010	2	7	1	5	16	2	—	—	—	33
2010–2011	2	7	1	5	14	2	—	—	—	31
2011–2012	2	7	1	5	15	2	—	—	—	32

**Note**

— Not applicable.

**Source**

National Rehabilitation Reporting System, 2000–2001 to 2011–2012, Canadian Institute for Health Information.

**Table 3: Number of Submitting General Facilities, by Province and Fiscal Year**

Fiscal Year	B.C.	Alta.	Sask.	Man.	Ont.	N.B.	N.S.	P.E.I.	N.L.	Total
2000–2001	1	—	—	—	14	—	—	—	—	15
2001–2002	1	—	1	—	18	—	—	—	—	20
2002–2003	1	—	1	—	49	—	—	—	—	51
2003–2004	1	—	2	—	52	—	—	—	—	55
2004–2005	1	—	2	—	55	—	1	—	—	59
2005–2006	3	2	2	—	57	—	1	—	—	65
2006–2007	3	2	2	—	57	1	1	—	—	66
2007–2008	3	2	2	3	56	—	1	1	—	68
2008–2009	3	4	1	1	55	—	1	—	1	66
2009–2010	5	4	1	2	53	—	2	—	1	68
2010–2011	5	4	1	2	54	—	2	1	1	70
2011–2012	5	4	1	2	55	—	2	1	1	71

**Note**

— Not applicable.

**Source**

National Rehabilitation Reporting System, 2000–2001 to 2011–2012, Canadian Institute for Health Information.



Rehabilitation clinicians in hospitals complete assessments when a client is admitted to and discharged from the inpatient rehabilitation program. Hospitals can choose to collect additional clinical information in an optional follow-up assessment, which is conducted between 80 and 180 days after clients complete their inpatient rehabilitation stays. Collection of this follow-up information provides an opportunity for hospitals to assess sustainability of functional outcomes that were gained during rehabilitation. There were 37,955 admission assessments, 37,142 discharge assessments and 1,013 follow-up assessments successfully submitted for 2011–2012 from the 103 submitting facilities.

Table 4 shows the number of admission assessments submitted for each fiscal year by participating facilities in each province. Facilities have the option either to submit the admission and discharge assessments during the quarters in which they occur, or to submit admission assessments only when the corresponding discharge assessment has been completed, thereby submitting both in the quarter in which the discharge occurred. Consequently, total admission numbers for any given fiscal year may differ slightly from admission counts in previous years. In addition, numbers of submitted assessments could vary between fiscal years due to changes in practice that might impact volumes of admissions during a given year. Please see Section 7 for more details on this topic.

**Table 4: Number of Admission Assessments, by Province and Fiscal Year**

Fiscal Year	B.C.	Alta.	Sask.	Man.	Ont.	N.B.	N.S.	P.E.I.	N.L.	Total
2000–2001	265	—	81	—	1,212	—	62	—	36	1,656
2001–2002	509	959	65	—	4,265	—	335	—	66	6,199
2002–2003	714	2,021	390	—	17,454	—	354	—	58	20,991
2003–2004	367	2,224	457	—	26,338	106	333	—	58	29,883
2004–2005	441	2,314	480	—	29,908	115	472	—	66	33,796
2005–2006	1,121	2,452	462	—	32,625	87	537	—	315	37,599
2006–2007	1,413	2,798	480	—	31,965	210	573	35	206	37,680
2007–2008	1,374	2,399	457	1,677	30,140	187	572	104	136	37,046
2008–2009	1,332	1,960	428	2,197	29,952	195	560	—	175	36,799
2009–2010	1,568	2,871	463	2,387	29,763	192	544	—	287	38,075
2010–2011	1,621	2,858	522	2,294	29,710	198	479	317	293	38,292
2011–2012	1,571	2,665	446	1,930	30,079	211	520	291	242	37,955
<b>Total</b>	<b>12,296</b>	<b>25,521</b>	<b>4,731</b>	<b>10,485</b>	<b>293,411</b>	<b>1,501</b>	<b>5,341</b>	<b>747</b>	<b>1,938</b>	<b>355,971</b>

**Note**

— Not applicable.

**Source**

National Rehabilitation Reporting System, 2000–2001 to 2011–2012, Canadian Institute for Health Information.

Table 5 shows the number of discharges that occurred in participating facilities for which assessments were successfully submitted to the NRS, by province and fiscal year.

**Table 5: Number of Discharge Assessments, by Province and Fiscal Year**

Fiscal Year	B.C.	Alta.	Sask.	Man.	Ont.	N.B.	N.S.	P.E.I.	N.L.	Total
2000–2001	159	—	44	—	896	—	14	—	24	1,137
2001–2002	499	747	37	—	3,845	—	244	—	60	5,432
2002–2003	671	1,903	300	—	14,999	—	272	—	57	18,202
2003–2004	338	2,151	437	—	24,071	88	237	—	62	27,384
2004–2005	349	2,253	438	—	27,514	104	347	—	56	31,061
2005–2006	992	2,410	455	—	29,193	83	487	—	292	33,912
2006–2007	1,358	2,753	472	—	29,351	195	511	22	167	34,829
2007–2008	1,317	2,384	444	1,420	27,926	170	553	105	152	34,471
2008–2009	1,277	1,751	426	2,148	27,770	185	516	—	137	34,210
2009–2010	1,466	2,677	455	2,371	27,821	176	543	—	247	35,756
2010–2011	1,513	2,717	516	2,271	28,261	193	437	297	273	36,478
2011–2012	1,529	2,574	469	2,177	29,072	207	546	286	282	37,142
<b>Total</b>	<b>11,468</b>	<b>24,320</b>	<b>4,493</b>	<b>10,387</b>	<b>270,719</b>	<b>1,401</b>	<b>4,707</b>	<b>710</b>	<b>1,809</b>	<b>330,014</b>

**Note**

— Not applicable.

**Source**

National Rehabilitation Reporting System, 2000–2001 to 2011–2012, Canadian Institute for Health Information.

Table 6 shows the number of follow-up assessments successfully submitted by participating facilities, by province and fiscal year. The table shows that facilities from only four provinces—New Brunswick, Ontario, Alberta and British Columbia—submitted 2011–2012 follow-up data, with Alberta facilities submitting 64% of the total follow-up records for that year. Since the submission of follow-up assessments is optional, it is expected that the number of submissions of follow-up assessments will vary from year to year, due in part to the additional processes required by facilities to collect this information.

**Table 6: Number of Follow-Up Assessments, by Province and Fiscal Year**

Fiscal Year	B.C.	Alta.	Sask.	Man.	Ont.	N.B.	N.S.	P.E.I.	N.L.	Total
2000–2001	—	—	—	—	—	—	—	—	—	0
2001–2002	46	—	—	—	361	—	—	—	—	407
2002–2003	57	146	5	—	341	—	—	—	—	549
2003–2004	22	280	21	—	399	—	—	—	—	722
2004–2005	17	304	13	—	569	—	10	—	—	913
2005–2006	49	532	—	—	270	—	6	—	—	857
2006–2007	31	866	—	—	339	—	—	—	—	1,236
2007–2008	65	856	—	—	191	—	—	—	—	1,112
2008–2009	27	459	—	—	357	19	—	—	—	862
2009–2010	29	381	—	—	179	21	—	—	—	610
2010–2011	22	672	—	—	295	27	—	—	—	1,016
2011–2012	13	645	—	—	336	19	—	—	—	1,013
<b>Total</b>	<b>378</b>	<b>5,141</b>	<b>39</b>	<b>—</b>	<b>3,637</b>	<b>86</b>	<b>16</b>	<b>—</b>	<b>—</b>	<b>9,297</b>

**Note**

— Not applicable.

**Source**

National Rehabilitation Reporting System, 2000–2001 to 2011–2012, Canadian Institute for Health Information.

For the NRS, a *complete episode* is defined as an admission assessment that has a corresponding discharge assessment. Table 7 shows that, as of May 15, 2012, there were 330,014 complete episodes in the NRS database. This represents the total number of complete episodes in the NRS since its inception in 2000–2001. There were 34,117 admission assessments submitted with corresponding discharge assessments for inpatient rehabilitation stays in 2011–2012. By comparison, there were 3,838 admission assessments submitted for 2011–2012 that, as of May 15, 2012, did not have a corresponding discharge assessment. It is valid for an unplanned discharge—reflecting an inpatient rehabilitation stay lasting three days or fewer—to have no corresponding discharge assessment.

Of the admission assessments submitted for 2011–2012 without a corresponding discharge assessment, 798 were coded as unplanned discharges. Although these records are considered complete, they are not included as complete episodes for comparison purposes, as they do not contain any discharge functional-status information. Discounting these unplanned discharges, there were 3,040 admission assessments in the database for 2011–2012 that did not have corresponding discharges submitted by the May 15, 2012, submission deadline. These records most likely represent open episodes of care from admissions in 2011–2012, in which the client was or will be discharged in 2012–2013.

**Table 7: Number of Complete Episodes as of May 15, 2012**

B.C.	Alta.	Sask.	Man.	Ont.	N.B.	N.S.	P.E.I.	N.L.	Total
11,468	24,320	4,493	10,387	270,719	1,401	4,707	710	1,809	<b>330,014</b>

**Source**

National Rehabilitation Reporting System, 2000–2001 to 2011–2012, Canadian Institute for Health Information.

## 2.3 Data Elements

Data elements collected for the NRS are grouped into one of the following categories: client identifiers, socio-demographic characteristics, administrative elements, health characteristics, and activities and participation. A list of all data elements is available in the *Rehabilitation Minimum Data Set Manual*.

# 3 Data Limitations

Due to the primarily voluntary nature of the NRS in provinces other than Ontario, the information presented or reported cannot necessarily be generalized to all rehabilitation episodes that occurred throughout the country during this reporting period. CIHI continues to work toward expanding the implementation of the NRS across Canada in order to increase national representation and coverage, particularly for general rehabilitation facilities outside of Ontario.

Under the mandate of the Ontario Ministry of Health and Long-Term Care, it is assumed that the data received from Ontario facilities includes all inpatient rehabilitation episodes that occurred in designated beds within these facilities. At this time, there is no absolute mechanism in place for verifying this assumption. However, various initiatives of the Ontario ministry and CIHI are expected to provide additional confirmation by comparing NRS data with that of other available sources.

In addition, follow-up assessments are optional to record in the NRS. Facilities can choose to submit follow-up data on some, all or none of their clients. A total of 11 facilities submitted 2011–2012 follow-up data. Consequently, only limited follow-up information is available in the NRS.

# 4 Coverage

## 4.1 NRS Frame

The *NRS frame* is defined as all facilities that are licensed to participate in the NRS and have submitted data at least once since the implementation of the NRS in 2000–2001. Excluded from this definition are facilities that have permanently closed or that have merged to form one facility. In 2011–2012, 104 facilities from Newfoundland and Labrador, Nova Scotia, P.E.I., New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta and B.C. were expected to submit data to the NRS at some point during the year. As of the end of the fourth-quarter submission period (May 15, 2012), 104 facilities remained on the NRS facilities frame.

As stated in Section 2.2, about 78% of the 2011–2012 data submitted to the NRS was received from participating facilities in Ontario. The remaining data (22%) was submitted by facilities in other provinces that participate on a primarily voluntary basis. These facilities can choose to submit information on some or all of their rehabilitation episodes. Hence, it is not known whether data on all rehabilitation episodes from these voluntary facilities is being captured.

## 4.2 Frame Maintenance Procedures

The NRS frame is periodically updated to reflect the addition of new facilities, temporary or permanent closures of facilities or rehabilitation units, and/or hospital mergers.

At the end of 2010–2011, there were 100 facilities on the frame.

At the beginning of 2011–2012, North Bay General Hospital started submitting under a new facility number (changing from 53413 to 54733).

In Q3 of 2011–2012, the Sudbury Outpatient Centre (54741) was added to the frame.

In Q3 of 2011–2012, Woodstock General Hospital (54740) was added to the frame.

In 2012–2013, the following Ontario facilities will begin submitting under new facility names and numbers:

- The Credit Valley Hospital (53288) will become the Credit Valley Hospital Site (54750) of the Credit Valley Hospital and Trillium Health Centre.
- The Trillium Health Centre (54150) will split to become the Trillium Health Centre—Mississauga Site (54755) and the Trillium Health Centre—West Toronto Site (54758), both part of the Credit Valley Hospital and Trillium Health Centre.
- The Toronto Rehabilitation Institute—Hillcrest Hospital/University Centre Site (53950) will become the University Health Network—Hillcrest Hospital/University Centre Site (54744).
- The Toronto Rehabilitation Institute—Lyndhurst Hospital Site (53951) will become the University Health Network—Lyndhurst Hospital Site (54743).

## 4.3 Impact of Frame Maintenance

Changes in the NRS facility frame can occur from quarter to quarter for reasons such as facility transfers, facility closures and/or new facilities submitting data for the first time. These changes in recent fiscal years are not considered to be major, but they may impact the comparability of data between quarters. Table 8 shows frame changes for the 2011–2012 fiscal year. As can be seen, the number of facilities on the frame changed slightly as a result of the above-mentioned additions and deletions. As stated in Section 4.1, there were 102 facilities on the frame at some point in the fiscal year.

**Table 8: Number of Facilities on the NRS Frame, by Fiscal Quarter**

Fiscal Year	Quarter			
	1	2	3	4
<b>2011–2012</b>	100	100	102	102

**Source**

National Rehabilitation Reporting System, 2011–2012, Canadian Institute for Health Information.

## 5 Non-Response

The following sections describe the rate of non-response in terms of unit (facility) and item (data element) non-response. These rates are calculated for all admission, discharge and follow-up assessments from all facilities and relate to activity between April 1, 2011, and March 31, 2012.

There are several reasons why some participating facilities may not report in any particular quarter, including temporary closures, temporary challenges in their technical capacity to submit data, labour disruptions, mergers or failure to meet the submission deadline. Therefore, when interpreting the data for non-response, users should be aware that such factors may have influenced the reported data.

### 5.1 Unit Non-Response/Over-Response

Unit non-response occurs when a participating facility on the NRS facility frame does not submit data for the reporting period. For the purpose of comparison, CIHI uses the unit response rate to derive the unit non-response rate. (It should be noted that unit non-response can occur not only at the facility level but also at the assessment level. However, due to the fact that the total number of expected assessments from each facility is not known, it makes it impossible to determine a unit non-response rate at the assessment level. To calculate this, one would ideally need to know the number of expected assessments prior to each quarterly submission.)

In 2011–2012, there was one Ontario facility that was on the NRS frame but did not submit any data, yielding a national *unit non-response rate* of 1%.

Conversely, unit over-response occurs when data is received from a facility that is not on the frame during the corresponding time period—that is, data is not expected for a facility at that time. In 2011–2012, due to facility restructuring issues, two facilities in Ontario submitted data prior to officially joining the frame and being expected to submit, yielding a national *unit over-response rate* of 2%.

Table 9 displays the unit (facility) response rate by province for 2011–2012. Calculations are based on the number of facilities in a province that submitted data divided by the number expected to submit data for 2011–2012 (that is, those that were on the NRS frame at some point during the year). Note that Ontario has a rate of 101%; this is a result of one facility failing to submit data and two others submitting data when they were not expected to.

**Table 9: Facility Response Rate, by Province, 2011–2012**

B.C.	Alta.	Sask.	Man.	Ont.	N.B.	N.S.	P.E.I.	N.L.
100%	100%	100%	100%	101%	100%	100%	100%	100%

**Source**

National Rehabilitation Reporting System, 2011–2012, Canadian Institute for Health Information.

## 5.2 Item Non-Response

In contrast to unit non-response, which reflects the number of facilities on the frame that did not submit data, item non-response occurs, strictly speaking, when an assessment is received that contains blank values for data elements that should not be left blank. In practice, data submission software and database edits prevent facilities from submitting blank values in mandatory data fields. As such, item non-response must be estimated by looking instead at the prevalence of non-response codes used for mandatory data elements. For these data elements, facilities can use options such as *asked*, *unknown* or *not available, temporarily*. These codes are used for situations in which assessors are not able to submit information either because it is not available or because they are not able to obtain it. Table 10 summarizes the data elements for which these coding responses can be used.

**Table 10: Data Elements and Coding Options Used to Identify Item Non-Response, 2011–2012**

Data Element	Codes Used to Identify Non-Response	
	Code	Description
<b>Health Care Number</b>	-50	Not available, temporarily
	-70	Asked, unknown
<b>Province Issuing Health Care Number</b>	-50	Not available, temporarily
	-70	Asked, unknown
<b>Estimated Birthdate</b>	1	Yes
<b>Primary Language</b>	und	Language not known
<b>Postal Code of Residence</b>	-50	Not available, temporarily
	-70	Asked, unknown
<b>Province of Residence</b>	-50	Not available, temporarily
	-70	Asked, unknown
<b>Living Arrangement</b>	-50	Not available, temporarily
	-70	Asked, unknown
<b>Living Setting</b>	-50	Not available, temporarily
	-70	Asked, unknown

**Table 10: Data Elements and Coding Options Used to Identify Item Non-Response, 2011–2012 (cont'd)**

Data Element	Codes Used to Identify Non-Response	
	Code	Description
<b>Vocational Status</b>	-50	Not available, temporarily
	-70	Asked, unknown
<b>Responsibility for Payment</b>	-50	Not available, temporarily
	-70	Asked, unknown
<b>Height</b>	999.999	Height unknown
<b>Weight</b>	999.999	Weight unknown
<b>Date Ready for Admission Known</b>	0	No
<b>Referral Source/Referred To</b>	-50	Not available, temporarily
	-70	Asked, unknown
<b>Referral Source/Referred To Province</b>	-50	Not available, temporarily
	-70	Asked, unknown
<b>Referral Source/Referred To Facility Number</b>	99999	Facility number unknown
<b>Hospitalization Since Discharge</b>	-50	Not available, temporarily
	-70	Asked, unknown
<b>General Health Status</b>	8	Not able to test

**Source**

National Rehabilitation Reporting System, 2011–2012, Canadian Institute for Health Information.

From a clinical perspective, options such as *not applicable*, *not able to test* and *client unable to answer* may be valid responses. Although *asked, unknown* and *not available, temporarily* may be noted as valid responses, the proportion of cases in which these options are coded may provide an estimate of item non-response. As such, the item non-response rates for 2011–2012 were estimated using those data elements for which facilities used *asked, unknown* (-70), *not available, temporarily* (-50) or any of the other coding options presented in Table 10. As these codes may be clinically valid, the actual non-response rates may be lower than is suggested by the present report (see Table 11). In the current NRS context, item non-response in data elements is measured only when hospitals are actually expected to submit information on clients for that data element.

Given the coding options available in Table 10, facilities are not always providing information about these data elements that would be useful for analysis. As such, records containing these values are sometimes excluded from certain analyses performed on these data elements. Consequently, the clients included in a given analysis involving a particular data element or indicator may be different from the clients that are included in other indicators for the same reporting period. Hence, a calculation of the proportion of cases in which information is identified as *not available* may provide an understanding of the degree to which a given indicator is representative of the population sample. This information, referred to here as the *estimated item non-response rate*, is summarized in Table 11. Note that, because the completion of follow-up assessments is optional, the number of assessments from which item non-response is estimated for follow-up assessment is generally less than for admission and discharge assessments.



**Table 11: Estimated Non-Response Rates of Data Elements, by Assessment Type, All Participating Facilities, 2011–2012**

Data Element	Admission		Discharge		Follow-Up	
	%	#	%	#	%	#
Health Care Number	1.8	37,955	—	—	—	—
Province Issuing Health Care Number	1.7	37,955	—	—	—	—
Estimated Birthdate	0.4	37,955	—	—	—	—
Primary Language	2.4	37,157 <sup>*</sup>	—	—	—	—
Postal Code of Residence	0.2	37,157 <sup>*</sup>	—	—	—	—
Province of Residence	0.0	37,157 <sup>*</sup>	—	—	—	—
Living Arrangement	0.2	37,157 <sup>*</sup>	0.6	33,366 <sup>†</sup>	0.3	1,013
Living Setting	0.2	37,157 <sup>*</sup>	0.4	33,366 <sup>†</sup>	0.3	1,013
Vocational Status	0.8	37,157 <sup>*</sup>	2.3	33,366 <sup>†</sup>	13.8	1,013
Responsibility for Payment	0.1	37,157 <sup>*</sup>	0.0	33,366 <sup>†</sup>	—	—
Height	15.3	37,157 <sup>*</sup>	15.4	11,543 <sup>§</sup>	—	—
Weight	13.1	37,157 <sup>*</sup>	14.7	11,543 <sup>§</sup>	—	—
Date Ready for Admission Known	12.8	37,157 <sup>*</sup>	—	—	—	—
Referral Source	0.1	37,157 <sup>*</sup>	—	—	—	—
Referral Source Province/Territory	0.0	37,157 <sup>*</sup>	—	—	—	—
Referral Source Facility Number	0.4	35,971 <sup>‡</sup>	—	—	—	—
Referred To	—	—	0.6	36,685 <sup>**</sup>	—	—
Referred To Province/Territory	—	—	0.1	34,258 <sup>††</sup>	—	—
Referred To Facility Number	—	—	7.6	12,406 <sup>‡‡</sup>	—	—
Hospitalization Since Discharge	—	—	—	—	0.0	1,013
General Health Status	3.6	37,157 <sup>*</sup>	4.0	33,366 <sup>†</sup>	0.9	1,013

**Notes**

% The percentage of assessments for which one of the values presented in Table 11 was coded for the data element in question.

# The number of assessments for which the data element should have been reported. This number is used as the denominator to calculate the percentage.

\* These elements are mandatory if Admission Class ≠ 4.

† These elements are mandatory if Reason for Discharge = 1 or 2.

‡ Referral Source Facility Number is mandatory for collection only when Referral Source = 02 to 06 or 10.

§ These elements are mandatory if Reason for Discharge = 1 or 2 and the difference between the discharge and admission dates is greater than 30 days.

\*\* Referred To is mandatory for collection when Reason for Discharge = 1 to 3.

†† Referred To Province/Territory is mandatory for collection only when Referred To = 02 to 13 or 97.

‡‡ Referred To Facility Number is mandatory for collection only when Referred To = 02 to 06 or 10.

— Not applicable.

**Source**

National Rehabilitation Reporting System, 2011–2012, Canadian Institute for Health Information.

The following three examples illustrate how different item non-response rates can affect data analyses. First, the Days Waiting for Admission indicator can be calculated only for those cases in which Date Ready for Admission was known. As Table 11 indicates, the Date Ready for Admission was not known for 12.8% of clients. As such, the number of days waiting for admission cannot be calculated for at least 12.8% of clients. The second noteworthy non-response rate item is the Referred To Facility Number data element. Analyses pertaining to this data element will necessarily have to omit 7.6% of episodes and should be interpreted in this context. Finally, the Body Mass Index (BMI) indicator can be calculated only for those cases in which height and weight have been recorded. At admission, height was unknown for 15.3% of clients and weight was unknown for 13.1% of clients. At discharge, height and weight were unknown for 15.4% and 14.7% of clients, respectively. As such, BMI cannot be calculated for 13% to 15% of clients.

It is worth noting that inter-facility variation is observed in the response rates for these elements. CIHI continues to implement measures to improve response rates, in particular on these four data elements. Such measures include specific initiatives in educational products aimed at assessors and trainers at participating facilities, as well as the inclusion of these data elements in the facility quarterly data quality reports (see Section 8.4).

Table 11 shows that the non-response rate is negligible for the data elements for which valid non-response coding options are available, aside from Date Ready for Admission Known, Referred To Facility Number, Height, Weight and General Health Status. However, analyses and reports produced by CIHI should be interpreted in light of the varying rates of item non-response for these data elements.

### 5.3 Adjustment for Non-Response

There are no adjustments made (that is, imputation) for non-response in the NRS since there is no clear identification of cases of true item non-response elements in the data set, given the edit and validation checks in place.

## 6 Major Methodological Changes From Previous Years

The following is a summary of changes in key data elements over time, together with some selected analyses that were conducted to assess the impact of the changes on the NRS database.

There were major revisions to the NRS database effective October 1, 2001, in order to address issues with the prototype reporting system:

- Post-Discharge Living Arrangements (data element 13)—A new response code was added (8) to indicate that the living arrangement was transitional.
- Informal Support Received (data element 16)—There was a definition change to response codes 2, 3 and 4 in order to clarify that the client required informal support services.
- Responsibility for Payment (data element 24)—A new response code was added (8—*Canadian resident, insurance pay*).
- Service Interruptions (data element 25)—A new data element (25D) was added to indicate the service interruption transfer status.

- Reason for Discharge (data element 31)—There were changes to response codes 2 and 3 (2—*service goals met and referral/transfer to other unit/facility*; 3—*service goals not met and referral/transfer to other unit/facility [change in health status] or discharged to community*).
- Referred To (data element 32)—A coding restriction was removed to allow completion of data element 32 based on the coding for data element 31 (Reason for Discharge); a new valid code of -90 (*not applicable*) was added.

Further revisions to the NRS in subsequent years included the following:

### **Prior to 2005–2006**

- Edits were changed to allow inclusion of clients younger than age 18. As of May 15, 2009, there were a total of 491 assessments for this age category in the entire database. This edit change did not result in a change to the overall age or sex distribution of clients in the database.
- The distribution of Admission Class (data element 19A) changed following the onset of the Ontario mandate (Q3 2002–2003). There was an increase in the overall number of assessments in specific admission classes. The greatest increase noted was in the short-stay admission class, which increased dramatically after the Ontario mandate.

### **For 2005–2006**

- There was a change from optional to mandatory reporting of Informal Support (data element 16); therefore, the number of responses for this data element increased. Since there may be differences in characteristics of the clients for whom this data element had historically not been collected, trends should be interpreted cautiously.
- A change was made to permit the discharge and admission dates to be the same when the Admission Class (data element 19A) is coded as 4—(*un*)*planned discharge without assessment*. Previously, discharge date was forced to be at least one day after admission date.
- A change to the short-stay admission class coding was made effective Q1 2005–2006. The 10-day upper limit validation on the short-stay category was removed. This change was implemented to address a previously identified data quality issue related to coding of this data element: cases where the length of stay on admission was expected to be less than 10 days, but the actual length of stay was greater than 10 days.

There were no methodological changes made for 2006–2007 or 2007–2008, in anticipation of significant revisions implemented in 2008–2009.

## For 2008–2009

### New Elements

- Most Responsible Health Condition ICD-10-CA (data element 80), Pre-Admit Comorbid Health Condition ICD-10-CA (data element 81), Post-Admit Comorbid Health Condition ICD-10-CA (data element 82), Transfer or Death Health Condition ICD-10-CA (data element 83), Service Interruption Reason ICD-10-CA (data element 84) and Health Condition Reason(s) for Hospitalization ICD-10-CA (data element 85)—New data elements using a pick-list of ICD-10-CA codes for validation.
- Pre-Admit Comorbid Procedure or Intervention CCI (data element 86)—New data element using CCI codes to describe the reason for service intervention.
- Glasses/Hearing Aid Flag (data element 79)—A new data element added to indicate cases in which reduced FIM® instrument<sup>i</sup> scores relating to comprehension, expression, social interaction or problem-solving are due to the presence of glasses and/or a hearing aid.

### Retired Elements

- Therapy Start Date (data element 26) and Therapy End Date (data element 27)—Retired.
- Most Responsible Health Condition (data element 35)—Retired and replaced with Most Responsible Health Condition ICD-10-CA (data element 80).
- Pre-Admit Comorbid Health Condition (data element 36a)—Retired and replaced with Pre-Admit Comorbid Health Condition ICD-10-CA (data element 81).
- Post-Admit Comorbid Health Condition (data element 36b)—Retired and replaced with Post-Admit Comorbid Health Condition ICD-10-CA (data element 82).
- Transfer or Death Health Condition (data element 37)—Retired and replaced with Transfer or Death Health Condition ICD-10-CA (data element 83).
- Service Interruption Reason (data element 25C)—Retired and replaced with Service Interruption Reason ICD-10-CA (data element 84).
- Health Condition Reason(s) for Hospitalization (data element 73C)—Retired and replaced with Health Condition Reason(s) for Hospitalization ICD-10-CA (data element 85).
- Interventions (data elements 71A and 71B)—Retired.

### Modified Elements

- Postal Code (data element 11B)—Coding of forward sortation area (FSA) is no longer valid for Ontario clients in Ontario facilities; only full postal codes or -50, -70 or -90 are valid.
- Post-Discharge Living Arrangement (data element 13)—A new response code of 9—*living in acute care* was added; 9—*living in acute care* can only be coded along with 4—*living with paid attendant* or 8—*living arrangement(s) is/are transitional or temporary*.

i. The 18-item FIM® instrument referenced herein is the property of Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities, Inc.

- Post-Discharge Living Setting (data element 15)—A response code of 9—*acute care* was added; if Referred To (data element 32) is coded 02—*inpatient acute unit, same facility* or 03—*inpatient acute unit, different facility*, Post-Discharge Living Setting must be coded 9—*acute care*.
- Informal Support Received (data element 16)—Invalid to code this element for clients between ages 0 and 13.
- Post-Discharge Living Arrangement (data element 13), Post-Discharge Living Setting (data element 15), Informal Support Received (data element 16), Post-Discharge Vocational Status (data element 18), Referred To Province/Territory (data element 33A), Referred To Facility Number (data element 33B)—Invalid to code these items if Reason for Discharge (data element 31) is coded 8—*person deceased*.
- Service Interruption Start Date (data element 25A), Service Interruption Return Date (data element 25B) and Service Interruption Transfer Status (data element 25D) now cross-validate with Service Interruption Reason ICD-10-CA (data element 84) instead of retired element Service Interruption Reason (data element 25C).
- Height and Weight (data elements 40A and 40B)—New validations to impose upper and lower limits on height and weight measurements.
- FIM® instrument elements (data elements 41 to 58)—A requirement to not allow the FIM® instrument to be partially coded was added.
- CIHI cognitive elements (data elements 64 to 69)—A new validation was added requiring CIHI cognitive elements to be coded if conditions from previous years were satisfied and Glasses/Hearing Aid Flag (data element 79) is coded 0—*no, FIM® instrument cognitive items score(s) of 6 is/are NOT due solely to the use of glasses and/or a hearing aid*; another requirement: if one CIHI cognitive element is coded then all must be coded.

### Modification to Submissions

- New validation to disallow an admission record to be updated to an (un)planned discharge if a discharge record exists in the database for that episode of care.

### For 2009–2010

#### New Elements

- Aboriginal Status (data element 87)—A new data element included to allow CIHI to identify clients entering adult inpatient rehabilitation who identify as First Nations, Inuit or Métis.

#### Retired Elements

- Presence of Cognitive and/or Communication Impairment(s) or Activity Limitations (data element 63)—Retired; its presence became redundant with the addition of Glasses/Hearing Aid Flag (data element 79) the previous year.

## Modified Elements

- CIHI cognitive elements (data elements 64 to 69)—Specification modified to remove references related to Presence of Cognitive and/or Communication Impairment(s) or Activity Limitations (data element 63). The edit specifications were updated for these elements to instead reference Glasses/Hearing Aid Flag (data element 79).
- Locomotion: Walk/Wheelchair–FIM® instrument–Mode (data element 52A)—Element 52A added to discharge and follow-up assessments and specifications modified to require the mode coded on the discharge and follow-up assessments to be the same as that coded on the admission assessment.

## For 2010–2011

### New Elements

- Project Field (data elements 88A/B and 89A/B)—Two new data elements were introduced to allow facilities to capture internally defined projects that are not part of the NRS common data set. Part A is the self-defined project code and Part B is the data that corresponds to the project code.

### Modified Elements

- Height and Weight (data elements 40A and 40B)—Mandatory to record on admission unless Admission Class (data element 19A) = 4. Mandatory to record on discharge unless Reason for Discharge (data element 31) = 3 to 8. On both admission and discharge, if unable to code, can code 999.999.
- Impact of Pain (data element 59A)—Ability to record 59A on discharge even if 59A on admission was coded as 5—*no*. Ability to record 59A on follow-up even if 59A on discharge was coded as 5—*no*.
- Postal Code (data element 11B)—Postal code on follow-up can now be different than that on admission.
- Health Care Number (HCN; data element 5)—If Province Issuing Health Care Number is -50 or -70, then HCN will be given the same designation.
- Date of Onset (data element 39)—Validation to ensure onset date is greater than birthdate and less than or equal to date ready for admission, or admission date if date ready for admission is not coded.
- Post-Discharge Living Arrangements (data element 13)—If *Living arrangement(s) is/are transitional or temporary* is coded as 1—*yes*, then it is mandatory to code at least one other living arrangement as 1—*yes*.
- CIHI Cognitive (data elements 64 to 69)—If one CIHI cognitive element is coded, then all must be coded. If coded on admission, then must be coded on discharge, unless discharge reason code ≠ 1 or 2. If recorded on admission and discharge, then must be recorded on follow-up.

- Aboriginal Status (data element 87)—A new response code of 8—*Did not ask/answer* was introduced.
- Province/territory codes of NF, PQ and YK have been made invalid and replaced with NL, QC and YT, respectively, affecting several data elements.

### Modification to Submissions

- New validation introduced to reject any new record that is submitted as an update record, to reduce accidental submission of overlapping, nearly identical records for the same client.

## For 2011–2012

### New Elements

- Reasons for Waiting for Discharge (elements 90A and 90B)—Two new data elements were introduced to allow facilities to capture the primary and secondary (if applicable) reasons a person waited to be discharged from a facility or agency.

### Modified Elements

- Pre-Hospital Living Arrangements (element 12), and Follow-up Living Arrangements (element 76)—if *Living arrangement* is coded as “living alone” (1—yes), then cannot also code “living in a facility” as 1—yes.
- Post-Discharge Living Arrangements (element 13)—if *Living arrangements* is coded as “living alone” (1—yes), then cannot also code “living in a facility” as 1—yes or “living in acute care” as 1—yes.
- Service Interruptions (element 25)—Start Date must be less than or equal to the Service Interruption Return Date and less than or equal to the Date Ready for Discharge or Discharge Date (if the Date Ready for Discharge is not coded).
- Service Interruptions (element 25)—Return Date must be greater than or equal to the Service Interruption Start Date and less than or equal to the Date Ready for Discharge or Discharge Date (if the Date Ready for Discharge is not coded).

## 6.1 Effects of Data Element Modifications

Aboriginal Status (data element 87) was made mandatory to record on admission in 2009–2010. At that time, coding of *Does not identify with an Aboriginal community* occurred 97.7% of the time. Introduction of the response code 8—*Did not ask/answer* in 2010–2011 caused this rate to fall to 73.0%, with *Did not ask/answer* being coded 25.6% of the time. This change highlights the potential impact of not providing non-response coding options to data submitters.

In 2009–2010, admission Height and Weight (data elements 40A/B) were coded only 20.8% and 22.6% of the time, respectively. The remaining clients had these elements left blank or coded as *unknown* (999.999). When Height and Weight became mandatory to record in 2010–2011, there was a large increase in coding, with non-response (that is, coding of *unknown*) falling to between 14% and 18%. These rates continued to drop in 2011–2012, when Height and Weight were coded as *unknown* between 13% and 15% of the time. These rates are expected to fall further as coders become more familiar with coding these data elements.

A change was also observed in the coding of Most Responsible Health Condition with the introduction of ICD-10-CA classification codes. Table 12 indicates the most commonly used diagnostic health condition (DHC) codes in 2007–2008 versus the most commonly used ICD-10-CA codes in fiscal years 2008–2009 to 2011–2012, both of which provide information about Most Responsible Health Condition. On review, the newer ICD-10-CA and former DHC codes appear to be capturing similar types of common most responsible health conditions, with orthopedic fractures, arthritis and stroke diagnoses continuing to be most prevalent over time.

**Table 12: Most Commonly Coded Diagnostic Health Condition and ICD-10-CA Codes Used to Indicate Most Responsible Health Condition**

Most Responsible Health Condition—ICD-10-CA Codes, 2008–2009 to 2011–2012 Combined	%	Most Responsible Health Condition—DHC Codes, 2007–2008	%
Primary generalized (osteo)arthritis—M15.0	5.5	Osteoarthritis and allied disorders	18.8
Gonarthrosis [arthrosis of knee]—M17	5.4	Fracture of neck of femur/hip, unilateral	9.4
Intertrochanteric fracture—S72.10	4.9	Cerebral infarction	3.9
Cerebral infarction, unspecified—I63.9	3.8	Occlusion of cerebral arteries	3.8
Fracture of neck of femur—S72.0	3.2	Other debilitating conditions; includes: malaise; chronic fatigue syndrome, deconditioned; and cachexia, excluding debility due to cardiac and vascular conditions (J) and respiratory conditions (K)	2.2
Stroke, not specified as haemorrhage or infarction Includes: Cerebrovascular accident (CVA) NOS—I64	2.9	Intracerebral haemorrhage	1.8
Cerebral infarction due to unspecified occlusion or stenosis of cerebral arteries—I63.5	2.6	Chronic obstructive pulmonary disease, unspecified	1.6
Arthritis, unspecified Includes: Arthropathy NOS—M13.9	2.3	Fracture of pelvis	1.6
Coxarthrosis [arthrosis of hip]—M16.0	2.2	Status post-joint replacement—hip, unilateral	1.5
Malaise and fatigue—R53.0	2.0	Subarachnoid, subdural and extradural hemorrhage	1.4
All other ICD-10-CA codes	65.2	All other DHC codes	54.0

**Source**

National Rehabilitation Reporting System, 2011–2012, Canadian Institute for Health Information.



## 7 Impact of Longitudinal Nature of NRS Database

The longitudinal nature of the NRS needs to be considered when interpreting data files. As noted previously, this document references the 2011–2012 NRS fiscal year, for submitted data received on or before the May 15, 2012, error correction deadline. Due to the longitudinal nature of the database, data continues to be accepted for previous fiscal years after the corresponding submission deadlines. It is important to note, therefore, that analysis of 2011–2012 data included in a later data cut (that is, after the May 15, 2012, deadline) may result in different findings due to additional data being included or changes being made to the existing data. In the following sections, specific examples of the impact of the longitudinal nature of the database are explored.

### 7.1 Impact of Data Submission Options

As noted previously, facilities have two options for NRS data submission: they can submit admission assessments in the quarter in which they occur; or they can submit admission assessments when the corresponding discharge assessment has been completed (either in the same quarter or in a subsequent quarter). Changes to the database for a particular quarter following the submission deadline for that quarter usually occur when facilities use the second option to submit data. Quarterly comparative reports or data files extracted at the end of a given quarter will reflect only records submitted by that date. Therefore, if an admission record for a Q1 admission is submitted in Q2 along with the corresponding discharge, the Q2 report or data file will include one additional admission for Q1 than would appear in a report or file extracted earlier. In 2011–2012, approximately 10.4% of complete episodes included admission assessments submitted in a subsequent quarter.

### 7.2 Impact of Late Submissions

In some cases, facilities may submit data after the submission deadline for that quarter, resulting in exclusion of this data from that quarter's NRS eReports. Similar situations may arise for a whole year of data when the submissions for one fiscal year are received in a subsequent fiscal year. This may occur, for instance, if a facility is submitting admission data at the time of discharge (that is, data submission option 2) and the discharge occurs in a different fiscal year than that of the admission. In such situations, changes in the database may arise after the data is reported to facilities in the quarterly comparative reports.

Table 13 provides a snapshot of the number of facilities that submitted data for previous fiscal years in 2011–2012.

**Table 13: Number of Facilities Submitting Data for Previous Fiscal Years in 2011–2012, by Submission Quarter**

Submission Quarter	Data Related to . . . (Fiscal Year)								
	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
<b>Q1 2011–2012</b>	—	—	—	1	1	1	2	2	44
<b>Q2 2011–2012</b>	—	—	—	1	1	—	3	4	23
<b>Q3 2011–2012</b>	—	—	—	—	—	1	2	6	18
<b>Q4 2011–2012</b>	1	1	1	1	1	5	5	3	12

**Note**

— Not applicable.

**Source**

National Rehabilitation Reporting System, 2011–2012, Canadian Institute for Health Information.

### 7.3 Impact of Corrections to Database

In rare situations, facilities may provide an update to information previously submitted and accepted into the NRS database. For example, if a data element such as Date of Onset or Discharge Date was coded incorrectly, the facility has the option of modifying this information on an assessment record that is already in the database. In 2011–2012, 3,605 update records were submitted to the NRS (see Table 14).

A facility may also delete an assessment that was previously accepted into the database. This may affect comparisons of assessments for the same fiscal period in different data cuts. In 2011–2012, 751 delete records were submitted to the NRS (see Table 14). It is important to note that, in some cases, an assessment record may be replaced with correct data after the original assessment is deleted, as this is the required method to correct an inaccurate Health Care Number, Admission Date or Chart Number.

**Table 14: Number of New, Update and Delete Records Submitted, by Submission Year**

Submission Year	New Records		Update Records		Delete Records		Total Records Received	
	#	%	#	%	#	%	#	%
2000–2001	2,452	82.8	508	17.2	2	0.1	2,962	100.0
2001–2002	11,752	93.8	764	6.1	19	0.2	12,535	100.0
2002–2003	39,989	96.1	1,589	3.8	55	0.1	41,633	100.0
2003–2004	58,314	97.4	1,336	2.2	236	0.4	59,886	100.0
2004–2005	65,970	95.7	2,890	4.2	57	0.1	68,917	100.0
2005–2006	72,589	97.4	1,894	2.5	60	0.1	74,543	100.0
2006–2007	73,878	98.2	1,316	1.7	26	0.0	75,220	100.0
2007–2008	71,669	98.8	832	1.1	41	0.1	72,542	100.0
2008–2009	71,078	97.3	1,884	2.6	56	0.1	73,018	100.0
2009–2010	75,525	96.6	2,501	3.2	132	0.2	78,158	100.0
2010–2011	76,106	95.1	3,749	4.7	186	0.2	80,041	100.0
2011–2012*	78,318	94.7	3,605	4.4	751	0.9	82,674	100.0

**Note**

\* These numbers reflect all data submitted between May 16, 2011, and May 16, 2012, regardless of the fiscal year(s) to which it pertains.

**Source**

National Rehabilitation Reporting System, 2000–2001 to 2011–2012, Canadian Institute for Health Information.

As shown above, the submission of update and delete records occurred relatively infrequently in 2011–2012, as indicated by the small proportion (5.3%) of total accepted submissions for the period.

As noted in the table above, CIHI is able to track the number of updates and deletions received, but there is currently limited capability to track which assessments were deleted or which elements of an assessment were updated. CIHI will continue to explore opportunities to enhance the database to be able to capture more details about the type of correction or modification made.

## 8 Data Quality Control

Significant quality control measures are in place to support the collection of high-quality data in the NRS. These include processes related to NRS data submission, the NRS education program, NRS client support activities and data quality documentation. Each of these is described below.

### 8.1 Data Submission

Assessments are submitted in an electronic format to CIHI through a secure web-based application. At a minimum, facilities are expected to submit data on a quarterly basis, but they may choose to submit data more frequently. In order to submit data, all facilities must use in-house or vendor software that has undergone the CIHI testing process. In the event of changes to NRS specifications, vendors and facilities must submit test assessments, 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.

All assessments submitted to the NRS are verified according to system edits to ensure that the data in each field is in the expected format and within a specific range of values. In addition to individual data element verification, the editing process also checks a number of inter-element relationships. Facilities may receive an error message in a field when the reported value is in fact valid but violates certain logical relationships with the data in other fields. Edits are reviewed and updated each year as new data elements are added and changes to the database are made to ensure relevance and consistency. The technical specifications used for 2011–2012 are found in the *Rehabilitation Minimum Data Set Manual, February 2011* and in detailed vendor edit specifications available to licensed NRS software vendors.

As of June 2007, the NRS is one of several CIHI data holdings that offer clients the eManagement Report Tool. This tool allows facilities to regularly monitor the status of their data submissions to CIHI from one period to the next and across CIHI data holdings. Furthermore, the tool provides summary information on the facility's submissions—such as volumes of records submitted, error rates and timeliness—as required for all applicable clinical databases. Other submission-related data is also now available in the NRS eReports. These interactive reports, introduced in August 2009, are updated quarterly and permit users to view a large number of details, as desired, about their aggregated data and that of peer facilities from across the country.

### 8.2 Education Program

Through the CIHI Education program, instructional workshops are provided to facilities in order to enhance coding proficiency at a facility level. All clinicians involved in clinical coding for the NRS must demonstrate coding proficiency on a standard test. Additional educational products are also offered to facilitate NRS facility report interpretation, provide instruction on data submission procedures and allow clinicians and other data collectors at participating facilities to refresh coding skills. These sessions serve as one mechanism to facilitate standardized coding practices and adherence to CIHI's data submission and collection requirements. In addition, topical teleconferences and web conferences are offered regularly to facilities according to need or coinciding with changes to data set specifications.

CIHI also has an application called eQuery that enables facilities to submit questions to a variety of CIHI program areas, including Rehabilitation. It is a shared knowledge base that allows individuals to use extended search functionality to view previously submitted questions and answers. New questions may be submitted through a common point of entry if the user cannot locate answers to the particular question in the knowledge base. Additional information regarding this tool may be found at [www.cihi.ca](http://www.cihi.ca).

## 8.3 Client Support

In addition to the eQuery service, the Rehabilitation program area offers client support to NRS facilities and other users of the NRS via email at [nrs@cihi.ca](mailto:nrs@cihi.ca). This client resource aims to answer questions related to NRS products and coding, assist in the development and delivery of education programs and provide data quality expertise.

Additionally, the *Rehabilitation Minimum Data Set Manual* is provided to all participating NRS facilities and other requestors. As the primary information resource for the NRS, it contains data element definitions, data validation rules, submission criteria, clinical coding guidelines and complete pick-lists of valid NRS codes. Please note that due to the proprietary nature of the content, those who wish to receive the manual must first sign an end-user license agreement with the NRS. For further information on this resource, please send inquiries to the Rehabilitation team via email ([nrs@cihi.ca](mailto:nrs@cihi.ca)).

As of August 2009, the Rehabilitation program area has also made available an online NRS product, *eReports Manual: User Guide and Report Interpretation Guidelines*, via eNRS and the NRS eReports launch page. This manual is designed to provide assistance in creating and interpreting NRS eReports, and includes descriptions of available NRS indicators. This manual is available only to clients who have signed an eServices agreement. To find out more, please send an email to [nrs@cihi.ca](mailto:nrs@cihi.ca).

## 8.4 Other Data Quality Reports

### 8.4.1 Data Quality Report for Provinces/Territories

In addition to the present annual data quality document, CIHI releases the *NRS Data Quality Report for Provinces/Territories* on an annual basis to each provincial and territorial deputy minister of health. The Rehabilitation program area is one of several CIHI program areas that participate in this report annually.

The *NRS Data Quality Report for Provinces/Territories* can be used to assess and compare the quality of NRS data with a set of actionable data quality indicators, shown in Table 15. This report for provinces/territories also includes a one-page jurisdictional summary document, which highlights indicator findings and includes recommendations to enhance data quality, as well as a trending report that allows users to analyze trends in data quality over the past five years. Four of these indicators are also reported at the facility level in the *Data Quality Indicators eReport*, described further in the next subsection of this document.

**Table 15: Information and Indicators in the Data Quality Report for Provinces/Territories**

Contextual Information	Data Quality Indicators
Number of Participating Facilities	Completeness of Participation
Number of Beds in Participating Facilities	Participating Facility Non-Response Rate
Total Number of Complete Episodes	Unknown Referred To Facility Number*
Percentage of All Complete Episodes in the NRS	Records Rejected Due to Hard Edits
	Incomplete Episodes*
	Late Submissions
	Availability of Health Care Number for Linkage*
	Records Excluded From Wait Time for Admission Data Analysis*
	Facilities Submitting Follow-Up Records
	Discharge Records With a Corresponding Follow-Up Record

**Note**

\* Denotes subset of indicators found in quarterly data quality indicators eReport.

**Source**

National Rehabilitation Reporting System, 2011–2012, Canadian Institute for Health Information.

The objectives of the *NRS Data Quality Report for Provinces/Territories* are to

- Promote an enhanced awareness of CIHI's health information relating to inpatient rehabilitation in Canada;
- Highlight issues related to the quality of this information in jurisdictions that are presently submitting NRS data to CIHI;
- Identify or flag emerging or potential data quality issues;
- Increase provincial/territorial support for CIHI data quality initiatives; and
- Promote the use of NRS information in decision-making.

The annual *NRS Data Quality Report for Provinces/Territories* is released in December of each year. Details on the indicators are available by contacting CIHI at [nrs@cihi.ca](mailto:nrs@cihi.ca).

### 8.4.2 Data Quality Indicators eReport

Starting in 2008–2009, a data quality indicators report was generated on a quarterly basis and provided to all participating NRS facilities as part of their quarterly comparative reports. It contained a subset of the indicators found in the provincial/territorial report (see Table 15) and enabled facility-level analysis across the subset of indicators. As of August 2009, this report became available via the NRS eReports environment.

### 8.4.3 Internal Data Quality Framework Analysis

On an annual basis, the NRS database is assessed according to five dimensions of data quality as defined by the CIHI Data Quality Framework: accuracy, timeliness, comparability, usability and relevance. This assessment builds upon previous NRS data quality assessment reports and includes recommendations based on the criteria assessment. This document is used internally at CIHI by the Rehabilitation program area to consider data quality improvements for future years, as well as by other programs or internal research teams conducting analyses of NRS data.

## 9 Conclusion

The present report highlights the content, coverage and response rates related to the inpatient rehabilitation activity that occurred in 2011–2012 and for which data was successfully submitted to the NRS on or before May 15, 2012. This information is intended to assist users in identifying potential limitations related to item response rates and the generalizability of the data in the NRS. Identification of historical changes in NRS methodology and a discussion of the longitudinal nature of the NRS also provides additional context regarding the use of NRS information. Furthermore, activities related to improving NRS data quality are outlined and references to further NRS documentation provided.

As part of CIHI's efforts to ensure a high level of data quality within data holdings, the NRS data quality documentation will continue to be updated for each annual data file released. The goal is to promote awareness of our effort to continually improve the quality of the information that is generated by the NRS, as well as to assist users in utilizing that information appropriately, given certain limitations that may exist in the data.





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