NLCHI Mortality System
2021 v.1.0 Master Methodology
October 2022

Newfoundland & Labrador
Centre for
Health Information

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Newfoundland and Labrador Centre for Health Information
70 O'Leary Avenue
St. John's NL, A1B 2C7

Phone: 709-752-6000
www.nlchi.nl.ca

Mortality Master Methodology Document
Document Control Record

Version	Author	Date	Change(s) Made
2011 v.1.0	Rosalie Haire and Michele Bishop	March 30, 2012	Annual Review and Updates Add: Storage and Retrieval Updates: Changes are minor e.g., grammar. Deletion: No sections or significant text were deleted.
2012 v.1.0	Michele Bishop	June 12, 2013	Annual Review Added: Item 4.2: Data Quality Results Table Updates: Data Dictionary Appendix 6 – revised/updated Deletion: No sections or significant text were deleted
2013 V.1.0	Rosalie Haire	March 22, 2014	Annual Updates
2016 V.1.0	Beatrice Pittman	August 14, 2017	Annual Updates
2017 V.1.0	Trevor Greeley	October 1, 2018	Annual Revision and Normalization Added the results of the incomplete data fields (item non-response)
2020 V.1.0	Trevor Greeley and Kaylah Mercer	January 11, 2021	Annual Revision (2020)
2021 V.1.0	Kaylah Mercer/Kerry Critch	October 12, 2022	Annual Revision (2021)

Table of Contents

1. Mortality System

1.1 Introduction

This internal document is considered the primary reference for Centre staff working with the NLCHI Mortality System. It is intended to provide staff with information related to the collection, processing, storage, use and disclosure of information contained within this key provincial health information system.

The contents of this document provide detailed guidance for staff in the day-to-day data management tasks of the NLCHI Mortality System, fulfilling the role of a procedure manual.

This document is reviewed annually and revised as needed to ensure it remains current and useful. Feedback from readers is welcomed. Suggestions for future updates can be sent to:

Manager, Clinical and Administrative Standards
Newfoundland and Labrador Centre for Health Information
70 O'Leary Avenue
St. John's, NL A1B 2C7
Phone 709 752-6000

1.2 Description of Dataset

This longitudinal dataset has 106 data elements that contain demographic, administrative and clinical data related to all deaths that occur in the province, both resident and non-resident. Some of these fields have become inactive over the years; for 2021, there are 92 active fields (see Appendix 6 for field list).

The Registration of Death form contains multiple sections. Responsibility for completion of the sections varies as noted in the table below:

Section	**Responsibility for Completion**
Registration	Vital Statistics
Information on Deceased	Health Care Professional/Funeral Home
Parental Information	Health Care Professional/Funeral Home
Informant	Health Care Professional/Funeral Home
Place of Death	Health Care Professional
Medical Certification	Health Care Professional
Disposition	Funeral Home
Office Use	Vital Statistics

Data in the NLCHI Mortality System are retained in a longitudinal file to facilitate efficient retrieval and creation of statistical data and research reports. The longitudinal file is updated annually to include the previous year's data.

1.3 Purpose of Dataset

This dataset is used primarily for analytical information regarding deaths which occur within the province of Newfoundland & Labrador and to provide aggregate statistical information. It is also used to cross reference other datasets for quality assurance and verification purposes.

The Data and Information Services (DaIS) department at the Newfoundland and Labrador Centre for Health Information (the Centre) provides mortality statistical information and reports to government agencies, health care managers, clinicians, etc. to assist in making evidence-based decisions.

1.4 Population Reference Coverage

Under the Vital Statistics Act (2009) all deaths occurring within the province of Newfoundland and Labrador must be reported to Vital Statistics, by the funeral home, within a 5 day period. All funeral homes in Newfoundland and Labrador submit Registration of Death (RD) forms to Vital Statistics in compliance with the Act.

1.5 Reporting Period

The reporting period for deaths is the calendar year, January 1st to December 31st.

1.6 Years Available

Data is available for the years 1991-2021.

1.7 Live Birth/Mortality Advisory Committee

The Live Birth/Mortality Systems Advisory Committee is comprised of internal and external stakeholders. This committee's mandate is to advise the Manager, Clinical Standards and Information on stakeholder information needs, data collection, and other relevant issues. One of this committee's responsibilities is to perform an annual review of the RD form and make recommendations regarding data collection requirements.

The Live Birth/Mortality Advisory Committee members are responsible for bringing forward issues or concerns from their respective organizations, providing key expertise, seeking input and circulating decisions made by the committee.

The following organizations, facilities or agencies have representatives on the Live Birth/Mortality Advisory Committee:

- Vital Statistics, Service NL
- Newfoundland and Labrador Provincial Perinatal Program
- Women's Health Program, Eastern Health
- Department of Health and Community Services
- Newfoundland and Labrador Funeral Services Association
- Newfoundland and Labrador Centre for Health Information
- Regional Health Authorities

Appendix 1 contains the terms of reference for the NLCHI Live Birth/Mortality Systems Advisory Committee.

2. Data Source(s)

2.1 Origin of Data

Data is collected at the funeral home responsible for the disposition of the remains.

Origin of death data can vary:

- If death occurs in a health care facility, the data originates from the facility.
- If the death is suspicious or undergoes an autopsy the data originates from a medical examiner.
- If an expected death occurs at home, the data originates from the last attending health care provider.

No matter where the data originates, the funeral home director is responsible for obtaining the Registration of Death (RD) form prior to accepting the remains for disposal.

2.2 Flow of Data

The RD forms are initiated by the medical professional responsible for certifying the death. When remains are accepted by the funeral home, staff obtain both the Vital Statistics and the Centre's copy of the form, funeral home staff complete demographic and disposition data, and forward both completed copies to Vital Statistics.

Vital Statistics adds administrative data before forwarding a copy to the Centre's DaIS department.

Prior to 2020, RD forms were received from Vital Statistics, via courier, on a weekly basis. Accompanying the forms was a Records Transfer Sheet, on which Vital Statistics indicated which type of form was enclosed (Live Birth, Registration of Death, Registration of Stillbirth, Revisions, etc.) as well as the registration numbers. Upon receipt of the documents, the HIM analyst or Data Entry Operator checked each batch of forms to ensure all registration numbers recorded on the transfer sheet had been received. Once verified, the transfer sheet was dated and signed by the Health Information Management (HIM) analyst and emailed to Vital Statistics as confirmation of receipt of the documents. Beginning in 2020, the RD forms are scanned monthly to the Centre via Secure File Transfer. The Data Entry Operator ensures all forms are scanned and follows up with Vital Statistics for missing forms.

Beginning in 2017, demographic and administrative data elements that are captured electronically at Vital Statistics from the paper forms are transmitted to the Centre via the Office of the Chief Information Officer (OCIO), into the Centre's Cloverleaf interface. The files are received business-daily and are stored in NIMS. Once received, the Data Entry Operator loads the files into the Centre's Vital Events 3M HDM platform. Once loaded, the data is verified against the paper forms, and any missing or incorrect information is updated.

The Centre's Health Information Management (HIM) analyst assigns the medical codes. As of January 1, 2003, medical codes are based upon the ICD-10-CA classifications; prior to 2003, ICD-9 classification system was used. The data entry operator completes demographic coding and data entry. The demographic coding includes Standard Geographical Code (SGC) and institution code for location of death.

An edit and correction process is completed by DaIS staff after all known RD forms have been received, coded and entered into the database. Once closed, the file is appended to the longitudinal dataset and is ready for use by stakeholders.

2.3 Data Collection and Processing Timelines

- Daily: funeral homes are legally required to report deaths to Vital Statistics within 5 days after death.
- Weekly: Vital Statistics completes the administrative section of the form and forwards a copy to the Centre.
- Monthly: Forms requiring revisions and/or coding queries are completed.
- Annually: all RD forms are received at the Centre by mid-April for the previous calendar year.
- April 30, YYYY: the annual cycle of demographic and medical coding, data entry and corrections for the previous data year is scheduled for completion.
- May 31, YYYY: the mortality longitudinal file is scheduled to be uploaded with the previous calendar edited year data.

3. Data Dictionary/Elements

Data elements on the RD form are those identified by the Live Birth/Mortality Systems Advisory Committee as required data by one or more stakeholders. Of the total elements on the RD form, a select number of fields is entered into the system. The Mortality System Data Dictionary (Appendix 2) contains the list of data elements, element details and the reference year.

NOTE: Estimated Date of Death Data Element: When a range of dates is documented, the last date listed in the range is entered as the estimated date of death.

4. Data Quality Processes

4.1 Edit and Correction Process

The NLCHI Mortality System contains a series of edit checks which have been designed to automatically flag data elements that are incomplete, illegible or contain incorrect data.

All NLCHI Mortality edits are conducted internally and are performed in mid-April. The edit process consists of logic and classification edits. These include edits such as: date of death must be greater than the date of birth, postal code edits, and sorting files within the applicable

regional health authority. After all edits and corrections are completed a validation of MCP numbers is performed. Appendix 3 lists the edits performed on mortality data.

The data extraction process is scheduled to be completed by May 31, YYYY for the previous year's data. If Vital Statistics indicates that all deaths have not been reported in a timely manner, there may be a delay in meeting the May 31, YYYY target.

4.2 Data Quality Results

The table below displays the annual results of data quality measures for the NLCHI Mortality database (based on total number of errors):

Results of Data Quality Measures for the NLCHI Mortality System							
Year	Total # Records Edited**	Total # Errors Identified	Total # Corrections Using Internal Resources	Total # Corrections Using External Resources***	Total # Outstanding Errors After Corrections	Outstanding Error Rate	Number of Records with one or more outstanding errors
2010	4481	601	372	N/A	229	38%	N/A****
2011	4521	308	238	N/A	70	22%	70
2012	4623	224	198	N/A	26	11%	26
2013	4859	205	152	N/A	53	26%	53
2014	4987	260	218	N/A	42	16%	42
2015	5224	438	402	N/A	36	8%	36
2016	5003	420	389	N/A	31	7%	31
2017	5148	127	127	N/A	0	0%	0
2018	5246	96	96	N/A	0	0%	0
2019	5266	42	42	N/A	0	0%	0
2020*	5421	1210	1209	N/A	1	0.02%	1
2021	5854	335	334	N/A	1	0.02%	1

*In 2020, additional errors were noted with incorrect facility numbers being entered.
**The total number of records edited may not always reflect the total number of records received each year due to late receipt of records after the file has been closed.
***Currently, edits to the Mortality database are performed on an internal basis only.
****Capture of the number of records containing errors began in 2011.

4.3 Maintenance Process

The Live Birth/Mortality Advisory Committee members are responsible for bringing forward issues or concerns from their respective organizations, providing key expertise, seeking input and circulating decisions made by the committee.

This is a dynamic dataset; therefore, users should be aware of past data element changes and the fact that changes are likely to occur in the future. Due to these ongoing changes data elements have been added, revised or classified as inactive. Data elements that are deemed inactive are no longer entered into the dataset. However, for historical purposes these data elements and their values remain in the dataset (for the applicable years).

Whenever it is discovered that Vital Statistics inadvertently omitted a form or a funeral home failed to report a death, these revisions are retrospectively added to the longitudinal file.

When corrections are required after the year-end file is closed, the revisions are made and the changes are documented, including the rationale for the changes. The revised dataset is updated following the NLCHI Dataset Naming Convention (see Appendix 5).

For example, in 2008 data entry screens were redesigned and standardized to assist with data quality on input; the date format validation as MM/DD/YYYY was implemented.

End users of mortality data may identify data quality issues. When an issue is reported to DaIS staff, corrective and/or preventative action is taken.

Process Schedule for Coding, Keying, Editing and Importing of Vital Statistics Data				
Registration of Death				
Process	**Position Responsible**	**Start Timeframe**	**Start Date**	**Completion Date**
Medical Coding	HIM Analyst	Within 10 days after receiving from Vital Statistics **Minimum Target 150 a week**		
Social Coding	Data Entry Operator	Within 5 days after receiving from HIM Analyst **Minimum Target 150 a week**		
Keying	Data Entry Operator	Within 10 days after social coding **Minimum Target 150 a week**	January to December	**End of Month** February to January
Edit Process	HIM Analyst/Data Entry Operator	Within 10 days after keying completed for year	April	April
MCP Verification and Annual Database Import	Database Analyst	Within 15 days after Edit Process	May	May

5. Uses of Data

The Data and Information Services (DaIS) Department at the Centre provides mortality statistical information and reports to government agencies, health care managers, clinicians, etc. to assist in planning and evidence-based decision making. Stakeholders include the following organizations and agencies:

- Department of Health and Community Services

- Department of Education
- Newfoundland and Labrador Statistical Agency–Community Accounts
- Regional Health Authorities
- Researchers
- Vital Statistics

Data may be disclosed to researchers in accordance with the Centre's security policies upon request and approval by the Secondary Uses Committee.

The Centre also uses this data to cross reference with other datasets for quality assurance and verification purposes.

6. Comparisons to Other Holdings

6.1 NLCHI Holdings

Comparability across years in the Mortality System and with other Centre datasets is possible using variables such as the deceased's Health Care Number (HCN).

6.2 Other Holdings

Comparison between Statistics Canada and Vital Statistics mortality databases is possible using the death registration number.

7. Changes to Dataset

7.1 Methodological/Revision History

There have been no significant changes to the dataset structure since its inception in 1991.

From 1991 to 1999 Vital Statistics began their registration numbers with 1001. Since 2000 the numbering system was changed to begin with number 1.

Prior to 1990 Newfoundland and Labrador was assigned code 12 by Statistics Canada, in June 1990 the code was changed to 10.

In 2003, the RD form underwent changes to the format and data elements collected. Documentation related to changes and general information on the Mortality System prior to 2003 is minimal.

The following versions of Statistics Canada SGC codes were used for social coding:

1991 to 2007 SGC version 1991 was used.
2007 to 2009 SGC version 2001 was used.
2007 to 2011 SGC version 2006 was used.
2012 to 2016 SGC version 2011 was used.
2017 to 2021 SGC version 2016 was used.

Appendix 6 lists all active fields for the de-identified data file.

7.2 Other Significant Changes

In 2008, the responsibility of the Mortality System was transferred from the Centre's R&E Department to the Data Quality and Standards Department. Both departments merged to become HAES in 2017. After the Shared Services Organization was created in 2019, the department became, and is now known as, Data and Information Services (DaIS).

In 2017, the process of data entering information solely from the paper forms transitioned to a new process where electronic information in transferred from Vital Statistics via the OCIO to the Centre. The information is then loaded into the Centre's Vital Events 3M HDM platform, where missing or incorrect information is updated, and medical coding is completed.

Beginning in 2020, during the Global Coronavirus Pandemic, the paper forms were scanned, and transferred to NLCHI via a Secure File Transfer Process; and paper copies were no longer received. The original paper copies are held at Vital Statistics as per their scheduled retention period.

7.3 Reference Materials

Reference materials available from the DaIS include:

- Copy of RD form(s), 1989-2021.
- The Guide to the Completion of Registration of Death and Registration of Stillbirth. This document is produced by Vital Statistics as a reference document for those responsible for completing the registration form.
- Mortality System edit information.

8. Data Quality Limitations

8.1 Contributors Impact on Data Quality

Historically, the only reference source available to assist with quality assurance activities was the Vital Statistics paper form, which is also the source of origin. Since 2009, DaIS staff has been authorized to access the provincial Client Registry and the MCP Beneficiary Registration Database to cross reference key administrative and demographic data elements to improve data quality.

Rarely will a funeral home refuse to comply with submission of RD forms; however, it is not uncommon for a late response thus delaying the completion timeframe of March 31st.

Due to significant investments in quality assurance processes in recent years, the file years 2003-current are more accurate than those of previous years.

9. Access

9.1 Access to Dataset

Internally, access by Centre staff to this database is granted when DaIS directors or managers grant permission on an individual basis, based on job responsibilities. Authorized users will be required to use a unique username and password in order to access the file, which is housed in the NLCHI Information Management Solution (NIMS) secure environment.

Positions that have access to the dataset:

- Manager, Clinical and Administrative Standards
- Health Information Management Analyst
- Data Entry Operator
- Database Analyst
- Manager, Analytics
- Data Management Consultant
- Epidemiologists
- Research/Business Analysts

9.2 Storage/Retrieval

Source documents used to create the dataset are kept for 5 years and then securely shredded.

The electronic dataset is maintained indefinitely and is stored on a secure server at the Centre.

Only the Infrastructure Department's staff has access to the backup files. The Centre uses the Grandfather-Father-Son (GFS) method to backup data. The backups are organized into Daily, Weekly, and Monthly files. The Daily tapes are retained for 1 week. Weekly tapes are retained for 5 weeks, and Monthly tapes are retained for 1 year. The Centre also performs an annual backup with no specified retention period. The annual tapes are archived and are not reused.

The Mortality System data has a standardized naming convention to provide easy identification and prompt retrieval of data. The naming convention rules can be found in Appendix 5.

9.3 Privacy and Confidentiality Responsibilities

The Centre's Secondary Uses Committee reviews applications for the use of record level death data for research and data quality purposes. A strong component of this committee is adherence to privacy and confidentiality legislation.

It is the responsibility of all users of death data to ensure complete confidentiality of the information. It is expected that all users adhere to polices outlined by the Centre.

Researchers will be granted access to de-identified data only unless their research specifically requires identifiable data.

9.4 Authority to Access

Access to the mortality dataset is by authorization from the DaIS manager/directors.

9.5 Privileges Permitted for Each Type of User

Authorized users will be allowed privileges as required to perform their duties as authorized by their director/manager.

DaIS, Database Analyst	unlimited access
Manager CAS	unlimited access to the 3M system
DaIS HIM Analyst	unlimited access to the 3M system
DaIS, Data Entry Operator	unlimited access to the 3M system
DaIS Analytics Staff	read only access to the longitudinal file

9.6 Audit Trail

An audit trial is maintained on NLCHI's Mortality System for DaIS staff with access; a record of each user's access and the additions, revisions or deletions performed are logged. Additional audit requirements for all datasets managed in NIMS are outlined in the *Audit Plan NIMS-DL* guidance document.

10. De-identification Process

The mortality data is de-identified post editing before it is made available for use. Access to identifiable information is only provided when absolutely necessary.

Once the data is ready for use, the Database Analyst or designate performs the de-identification process. Each record with a valid Health Care Number (HCN) will have a unique de-identification identifier (DID) assigned and the file will be stripped of identifiable data, such as name and HCN. In the event that re-identification of a record is required, the Database Analyst or designate will be responsible to re-identify records (only possible to provide HCN). In some cases, records may not be re-identifiable e.g., the original data did not have a valid HCN so they are assigned a generic DID.

11. Education

When the need for education related to the Mortality dataset is identified the Centre will develop and deliver appropriate education. Where applicable, this will be done in conjunction with Vital Statistics.

Appendix 1: Live Birth/Mortality Advisory Committee Terms of Reference

PURPOSE

The purpose of this committee is to ensure data is collected accurately and shared appropriately to meet federal and provincial Vital Statistics information needs; to support the Live Birth Notification, Death Registration and Stillbirth Registration for health service delivery; and to support the NLCHI Live Birth, Mortality and Stillbirth systems.

OBJECTIVES

- Perform an annual review of Live Birth Notification, Stillbirth and Death Registration forms and make recommendations regarding data collection requirements
- Revise form format as required to support accurate and efficient data collection and distribution.
- Collaborate and assist in the development and maintenance of Reference Manuals for each type of form published by Vital Statistics (death and stillbirth) and the Centre (live birth).
- Work collaboratively to ensure the requirements for Live Birth, Stillbirth and Death information for each member's organization are met.
- Ensure data is collected and provided to stakeholders in accordance with current legislation and Vital Statistics and the Centre policies regarding privacy and security of health information are met.

MEMBERSHIP

Membership is comprised of representatives from the primary stakeholders of this information: Vital Statistics Division (Government of Newfoundland and Labrador, Service NL, Department of Health and Community Services, Perinatal Program NL, Regional Health Authorities, Funeral Directors Association, NLCHI and others.

- Manager, Clinical and Administrative Standards, NLCHI, *Chair*
- Registrar, Vital Statistics Division
- Deputy Registrar, Vital Statistics Division
- Divisional Manager, Children's and Women's Health, Eastern Health
- Clinical Educator, Women's' Health Centre, Eastern Health
- Representative, Department of Health and Community Services
- President, Newfoundland and Labrador Funeral Services Association (ad hoc)
- Epidemiologist, NLCHI
- Health Records Analyst, NLCHI

Members may appoint a designate to attend a meeting on their behalf if they are unable to attend a meeting of the committee.

REPORTING

The committee members report to their respective director/manager or association.

MEETING FREQUENCY

Meetings are held approximately 7-10 times per year; monthly between March and September with additional meetings held at the call of the Chair. Action items may be circulated for review via e-mail. Meetings will take place in person or virtually (e.g., Microsoft Teams).

MINUTES

Minutes are recorded by the Chair and distributed to all members. Members are responsible for sharing the minutes and related documents with others within their respective organizations.

REVISION HISTORY

Revised: February 9, 2009
Approved: June 9, 2009

Revised: April 8, 2014
Approved June 10, 2014

Revised: May 24, 2016
Approved: May 24, 2016

Revised: September 21, 2018
Approved: September, 2018

Revised: January 11, 2021
Approved: January 11, 2021

Appendix 2: NLCHI Mortality System Data Dictionary

*__Note__: Items in grey are variables which are no longer collected and/or valid. Variable names preceded by an asterisk (*) are identifiable fields and have been removed from the de-identified dataset.

Variable Name	Label	Value/Example	Type	Length	Applicable Year(s)	Comments
W_PAT_ID	DW Unique Patient identifier		Numeric	8	1991-2021	Used in DW for linkage of patient records
DID_KEY	NIMS Unique Patient Identifier		Numeric	8	1991-2021	NIMS De-identification Key used for data linkage
regisnum	Registration Number	Year-Province - Accession Number YYYY/NL/12345… 10 = Newfoundland and Labrador	Numeric	8	1991-2021	
Year	Year of Death	Value: YYYY	Numeric	8	1991-2021	
Sex	Sex	1=Male 2=Female 98=Unknown 99=System Missing	Numeric	8	1991-2021	
*deadname	Name of Deceased (Surname, Given Names)	None	String	40	1991-2021	Removed from the DID file
*maiden_n	Maiden Name of Deceased, if applicable	None	String	35	1991-2021	Removed from the DID file
dob	Date of Birth (YYYY/MM/DD)	None	Date YYYY/MM/DD	8	1991-2021	
dob_derived	Date of Birth derived from validated MCP number (YYYY/MM/DD)	None	Date YYYY/MM/DD	8	1991-2021	
age_yrs	Age (Years)	None	Numeric	8	1991-2021	
age_yrs_derived	Age (Years) derived from derived Date of Birth	None	Numeric	8	1991-2021	
dod	Date of Death YYYY/MM/DD	None	Date	8	1991-2021	When a range of dates is documented, the last date listed in the range is entered as the estimated date of death.
est_days	Estimated Day of Death	None	Numeric	8	1991-2021	

Variable Name	Label	Value/Example	Type	Length	Applicable Year(s)	Comments
est_mths	Estimated Month of Death	None	Numeric	8	1991-2021	
est_yrs	Estimated Year of Death	None	Numeric	8	1991-2021	
age_mths	Age (Months)	For deaths under 1 year of age	Numeric	8	1991-2021	
age_days	Age (Days)	For deaths under 1 year of age	Numeric	8	1991-2021	
age_hrs	Age (Hours)	For deaths under 24 hours	Numeric	8	1991-2021	
age_mins	Age (Minutes)	For deaths under 24 hours	Numeric	8	1991-2021	
time_dth	Time of Death For deaths less than 1 year of age	For deaths ≤ 1 year of age (24 hr clock)	Numeric	8	2008-2021	To ***only*** be used for deaths ≤ 1 year of age
marsta	Current Legal Marital Status of Deceased	1=Never Married 2=Legally Married and not Separated 3=Legally Married but Separated 4=Divorced 5=Widowed 98=Unknown 99=System Missing	Numeric	8	2017-2021	
*mcp	HCN Number	None	String	12	1991-2021	This variable is kept in Master File, but not in the de-identified Longitudinal file.
*mcp_validated	Validated HCN Number	MCP # checked and verified by NLCHI	Numeric	8	1991-2021	New in 2009, but all MCP numbers in Longitudinal File validated also. Removed from the DID file.
sgc_res	SGC for Usual Residence	7-digit sgc code	Numeric	8	1991-2021	New for 2009, but all MCP numbers in Longitudinal File validated also.
sgc	SGC – Derived	Truncated to 4-5 digits (e.g., 1001519 To 1519)	Numeric	8	1991-2021	

Variable Name	Label	Value/Example	Type	Length	Applicable Year(s)	Comments
pcode	Postal Code	None	String	8	1993 2001-2021	
province	Deceased Province of Residence	NEWFOUNDLAND AND LABRADOR	String	26	2017-2021	
country	Deceased Country of Residence	CANADA	String	44	2017-2021	
town	Deceased Town of Residence	DEER LAKE	String	45	2017-2021	
hth_auth	Regional Health Authority	1=Eastern 2=Central 3=Western 4=Labrador-Grenfell 9=Out of Province 98=Unknown 99=System Missing	Numeric	8	1991-2021	Derived from sgc
comm_brd	Health & Community Services Board	1=St. John's 2=Eastern 3=Central 4=Western 5=Labrador 6=Grenfell 9=Out of Province 98=Unknown 99=System Missing	Numeric	8	1991-2016	Derived from sgc
inst_brd	Institutional Health Board	1=St. John's 2=Avalon 3=Central East 4=Central West 5=Grenfell 6=Labrador 7=Peninsulas 8=Western 9=Out of Province 98=Unknown 99=System Missing	Numeric	8	1991-2016	Derived from sgc
*momname	Mother's Maiden Surname & Given Names	None	String	35	1991-2006 2008 2013	Data partially available Removed from the DID file.
hospital	Hospital Code	3 digit provincially assigned facility number	Numeric	8	1991-2021	
facility	Hospital Name	Name associated with the provincially assigned number	String	35	1998-2002 2004-2021	Derived from Hospital Code
locality		1=Hospital 2=Private Home 3=Other Health Care Facility				

Variable Name	Label	Value/Example	Type	Length	Applicable Year(s)	Comments
	Locality of Death	4=Other 98 = Unknown 99=System Missing	Numeric	8	2007-2021	
location_other	Locality of Death Other, Specify	Free text	String	255	2007-2021	
Statscan_cause_d	Statistics Canada – Underlying Cause of Death		String	4	1993-2020	Field added through linkage with Statistics Canada's Death dataset. From 1991 to 1999, ICD-9 was used. From 2000 onwards, ICD-10 is used. (StatCan uses ICD-10; NLCHI uses ICD-10-CA.)
chapter	Underlying Cause of Death ICD Chapter Number	1-20	Number	2	1996-2021	Provides the ICD chapter number associated with the Statistics Canada Underlying Cause of Death Code
chapter_desc	Underlying Cause of Death ICD Chapter Name	Example: Diseases of the Nervous System	String	78	1996-2021	Provides the ICD chapter name associated with the Statistics Canada Underlying Cause of Death Code
icd_a	Immediate Cause of Death (ICD code)	None	String	6	1991-2021	ICD-9 used in 1991-2002 ICD-10-CA used in 2003-2012
icd_atxt	Immediate Cause of Death (Text)	None	String	78	2017-2021	
icd_b icd_c icd_d icd_e		None	String	6	1991-2021	ICD-9 used in 1991-2002

Variable Name	Label	Value/Example	Type	Length	Applicable Year(s)	Comments
icd_f icd_g icd_h icd_i icd_j icd_k icd_l icd_m	Antecedent Cause of Death – Other Significant Condition)					ICD-10-CA used in 2003-2012 icd_h to icd_m added in 2017
icd_btxt icd_ctxt icd_dtxt icd_etxt icd_ftxt icd_gtxt icd_htxt icd_itxt icd_jtxt icd_ktxt icd_ltxt icd_mtxt	Antecedent Cause of Death – Other Significant Condition (Text)	None	String	78	2017 -2021	
oth_con1 oth_con2 oth_con3 oth_con4 oth_con5 oth_con6 oth_con7 oth_con8 oth_con9 oth_con10 oth_con11 oth_con12	Condition-1 (ICD code) Condition-2 (ICD code) Condition-3 (ICD code) Condition-4 (ICD code) Condition-5 (ICD code) Condition-6 (ICD code) Condition-7 (ICD code) Condition-8 (ICD code) Condition-9 (ICD code) Condition-10 (ICD code) Condition-11 (ICD code) Condition-12 (ICD code)	None	String	8	1997-2021	ICD-9 used in 1991-2002 ICD-10-CA used in 2003-2012 oth_con7-12 added in 2017
oth_con1txt oth_con2txt oth_con3txt oth_con4txt oth_con5txt oth_con6txt oth_con7txt oth_con8txt oth_con9txt oth_con10txt oth_con11txt oth_con12txt	Condition-1(ICD text) Condition-2(ICD text) Condition-3(ICD text) Condition-4(ICD text) Condition-5(ICD text) Condition-6(ICD text) Condition-71(ICD text) Condition-8(ICD text) Condition-9(ICD text) Condition-10(ICD text) Condition-11(ICD text) Condition-12(ICD text)	None	String	78	2017-2021	
dur_preg	Duration of Pregnancy (Weeks)	If deceased is a female, did the death occur: □ During Pregnancy	Numeric	8	1991-2009	
dur_preg_days	Duration of Pregnancy (Days)	□ Within 42 days thereafter Or □ If deceased is a female, did the death occur:	Numeric	8	2007-2009	

Variable Name	Label	Value/Example	Type	Length	Applicable Year(s)	Comments
		between 43 days and 365 days thereafter.				
gest_weeks	Gestational Age in Weeks if newborn death due to Prematurity	Used for NB death due to prematurity	Numeric	8	1991-2005 2008-2021	
gest_days	Gestational Age in Days if newborn death due to Prematurity	Used for NB death due to prematurity	Numeric	8	1991-2005 2008-2021	
weight	Birth Weight (grams)	None	String	4	1991-2002	
medterm	Medical Termination of Pregnancy	1= Yes 2= No 98=Unknown 99=System Missing	Numeric	8	2008-2021	
death_dueto	Was this death due to…	1=Natural Causes 2=Accident 3=Suicide 4=Homicide 5=Undetermined 97 = Other 98=Unknown 99=System Missing	Numeric	8	2003-2021	
death_duetospecify	Was this death due to…(Other specified)	None	String	100	2007-2021	
autopsy	Autopsy	1=Yes 2=No 98=Unknown 99=System Missing	Numeric	8	1993-2021	
disposit	Disposition	1=Burial 2=Cremation 3=Other 98=Unknown 99=System Missing	Numeric	8	2003-2010	
disp_oth	Disposition (Other)	None	String	50	1993-2010	
medinjury	Maternal Injury	1 = Yes 2 = No 98=Unknown 99=System Missing	Numeric	8	1991-2021	
dec_female	Female Death	1 = During pregnancy 2 = Within 42 days of pregnancy 3 = Between 43 and 365 4 = Not pregnant within the last year	Numeric	8	1991-2021	

Variable Name	Label	Value/Example	Type	Length	Applicable Year(s)	Comments
		98 = Unknown 99 = Unknown				
OOP_HCN	Out of Province Identifier	1 = OOP	Numeric	8	2017-2021	
comments	Comments	None	String	255	1991-2021	
DBA_comments	These are comments from the data base analyst and will be removed before making file available for use.	None	String	50	1991-2021	

Appendix 3: NLCHI Mortality Edits

Prior to the edit process, NLCHI staff will contact Vital Statistics to confirm receipt of all registrations for the year.

Note: Mortality edits are not sent back for correction, they are resolved using internal resources.

Edits have been designed for various data elements to flag potential incomplete, inaccurate or missing data. The following describes the current edits run against the values entered into specific data fields.

All edits are run in the 3M system, additional edits may be run SAS. Many of the edits listed below are completed during data entry. The edits below are run again in SAS to ensure none were missed by the 3M system.

MCP VALIDATION

The Database Analyst (DBA) performs this step prior to the start of the edit process in order to validate the MCP number of on each record. The MCP numbers in the database are linked with the MCP Master Key in order to confirm that the number is valid. Any erroneous records are investigated and corrected, wherever possible, to at least 95% accuracy. Any fields that have Health Care numbers (HCN) that do not meet the criteria are deleted so that the field is blank for those records. This would include records with out of province HCN. This process results in the creation of a new variable entitled: mcp_validated and is used in the remaining edit process to confirm data, and to derive and confirm additional data elements such as age at time of death, etc. If the health care number is not a valid MCP number (i.e., missing, out of province, etc.) the field 'mcp_validated' will be blank. In these instances, the age and date of birth for the deceased as originally data entered will be used.

BREAKDOWN OF VALIDATED MCP

This process is performed within the 3M system to verify the gender, date of birth (DOB), check digit and length of the validated MCP. All possible corrections are performed prior to completion of remaining edits.

1) CORRECT NUMBER OF RECORDS

This edit is performed once the entire years' worth of data has been received and entered.

a) Search for duplicate registration numbers by using the "identify duplicate cases" feature of SAS.

b) Syntax will search for missing registration numbers. Gaps in the sequential record numbers are identified by the creation of a new variable entitled: 'seq'. If there are records listed in this new variable, this indicates that there are missing registration numbers.
Action Taken: The Data Entry Operator will examine file, pull forms, and confirm correct information – records missed, or entered twice. The database will be updated appropriately.

2) SEARCH FOR MISSING VALUES

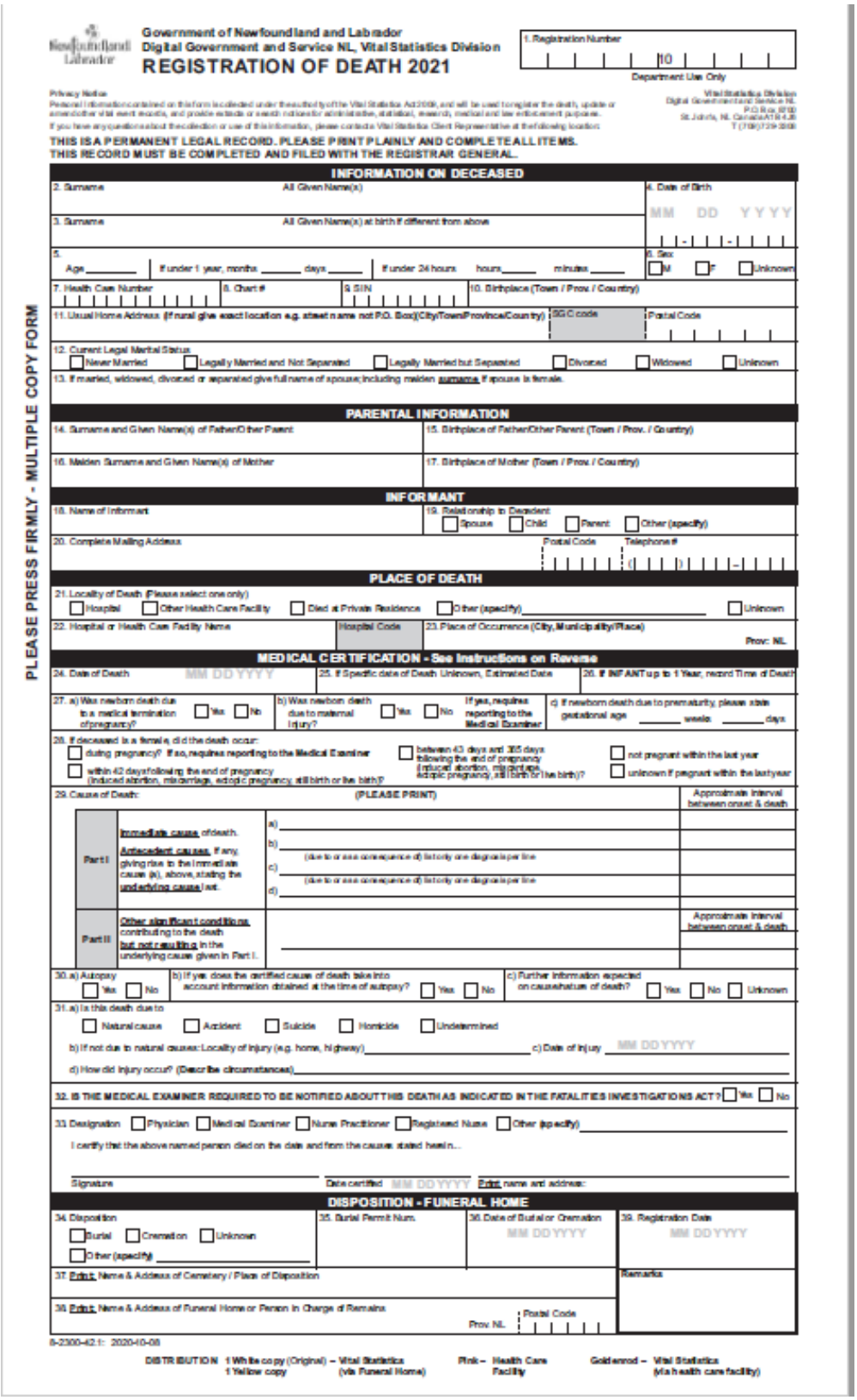
Each keyed field will be sorted ascending and descending to search for missing values.
Action Taken: The Data Entry Operator will obtain missing information by pulling the files, or by checking the CR if applicable.

3) REGIONAL HEALTH AUTHORITIES

Syntax will be run to sort all records into the appropriate Regional Health Authority (RHA), by using the SGC to derive theses variables.
Action Taken: Following this process, the Data Entry Operator will sort to identify any missing data. Any fields that identify Out of Province SGC codes, or any which are Unknown, will be entered manually.

Once all edits are performed, the Database Analyst (DBA) will extract the file and merge it with the Mortality Longitudinal File.

Appendix 4: 2021 Form



Government of Newfoundland and Labrador
Digital Government and Service NL, Vital Statistics Division

REGISTRATION OF DEATH 2021

1. Registration Number — Department Use Only

Privacy Notice
Personal information contained on this form is collected under the authority of the Vital Statistics Act 2009, and will be used to register the death, update or amend other vital event records, and provide extracts or search notices for administrative, statistical, research, medical and law enforcement purposes.
If you have any questions about the collection or use of this information, please contact a Vital Statistics Client Representative at the following location:

Vital Statistics Division
Digital Government and Service NL
P.O. Box 8700
St. John's, NL Canada A1B 4J6
T (709) 729-3508

THIS IS A PERMANENT LEGAL RECORD. PLEASE PRINT PLAINLY AND COMPLETE ALL ITEMS.
THIS RECORD MUST BE COMPLETED AND FILED WITH THE REGISTRAR GENERAL.

PLEASE PRESS FIRMLY - MULTIPLE COPY FORM

INFORMATION ON DECEASED

2. Surname — All Given Name(s)
3. Surname — All Given Name(s) at birth if different from above
4. Date of Birth (MM DD YYYY)
5. Age _____ If under 1 year, months _____ days _____ If under 24 hours hours _____ minutes _____
6. Sex ☐M ☐F ☐Unknown
7. Health Care Number
8. Chart #
9. SIN
10. Birthplace (Town / Prov. / Country)
11. Usual Home Address (If rural give exact location e.g. street name not P.O. Box)(City/Town/Province/Country) — SGC code — Postal Code
12. Current Legal Marital Status
☐Never Married ☐Legally Married and Not Separated ☐Legally Married but Separated ☐Divorced ☐Widowed ☐Unknown
13. If married, widowed, divorced or separated give full name of spouse; including maiden surname if spouse is female.

PARENTAL INFORMATION

14. Surname and Given Name(s) of Father/Other Parent
15. Birthplace of Father/Other Parent (Town / Prov. / Country)
16. Maiden Surname and Given Name(s) of Mother
17. Birthplace of Mother (Town / Prov. / Country)

INFORMANT

18. Name of Informant
19. Relationship to Deceased: ☐Spouse ☐Child ☐Parent ☐Other (specify)
20. Complete Mailing Address — Postal Code — Telephone #

PLACE OF DEATH

21. Locality of Death (Please select one only)
☐Hospital ☐Other Health Care Facility ☐Died at Private Residence ☐Other (specify) _____ ☐Unknown
22. Hospital or Health Care Facility Name — Hospital Code — 23. Place of Occurrence (City, Municipality/Place) — Prov: NL

MEDICAL CERTIFICATION - See Instructions on Reverse

24. Date of Death (MM DD YYYY)
25. If Specific date of Death Unknown, Estimated Date
26. IF INFANT up to 1 Year, record Time of Death
27. a) Was newborn death due to a medical termination of pregnancy? ☐Yes ☐No
b) Was newborn death due to maternal injury? ☐Yes ☐No If yes, requires reporting to the Medical Examiner
c) If newborn death due to prematurity, please state gestational age _____ weeks _____ days
28. If deceased is a female, did the death occur:
☐during pregnancy? If so, requires reporting to the Medical Examiner
☐within 42 days following the end of pregnancy (Induced abortion, miscarriage, ectopic pregnancy, still birth or live birth)?
☐between 43 days and 365 days following the end of pregnancy (Induced abortion, miscarriage, ectopic pregnancy, still birth or live birth)?
☐not pregnant within the last year
☐unknown if pregnant within the last year
29. Cause of Death: (PLEASE PRINT) — Approximate Interval between onset & death

Part I	Immediate cause of death. Antecedent causes. If any, giving rise to the immediate cause (a), above, stating the underlying cause last.	a)	
		b) (due to or as a consequence of)	
		c) (due to or as a consequence of)	
		d)	
Part II	Other significant conditions contributing to the death but not resulting in the underlying cause given in Part I.		

30. a) Autopsy ☐Yes ☐No
b) If yes, does the certified cause of death take into account information obtained at the time of autopsy? ☐Yes ☐No
c) Further information expected on cause/nature of death? ☐Yes ☐No ☐Unknown
31. a) Is this death due to
☐Natural cause ☐Accident ☐Suicide ☐Homicide ☐Undetermined
b) If not due to natural causes: Locality of injury (e.g. home, highway) _____ c) Date of injury (MM DD YYYY)
d) How did injury occur? (Describe circumstances) _____
32. IS THE MEDICAL EXAMINER REQUIRED TO BE NOTIFIED ABOUT THIS DEATH AS INDICATED IN THE FATALITIES INVESTIGATIONS ACT? ☐Yes ☐No
33. Designation ☐Physician ☐Medical Examiner ☐Nurse Practitioner ☐Registered Nurse ☐Other (specify) _____
I certify that the above named person died on the date and from the causes stated herein.
Signature — Date certified (MM DD YYYY) — Print name and address:

DISPOSITION - FUNERAL HOME

34. Disposition ☐Burial ☐Cremation ☐Unknown ☐Other (specify) _____
35. Burial Permit Num.
36. Date of Burial or Cremation (MM DD YYYY)
39. Registration Date (MM DD YYYY)
37. Print Name & Address of Cemetery / Place of Disposition
Remarks
38. Print Name & Address of Funeral Home or Person in Charge of Remains — Prov NL — Postal Code

6-2300-42-1: 2020-10-08

DISTRIBUTION 1 White copy (Original) – Vital Statistics; 1 Yellow copy (via Funeral Home) — Pink – Health Care Facility — Goldenrod – Vital Statistics (via health care facility)

Appendix 5: Dataset Naming Convention

To facilitate and maintain ease of identifying, accessing and retrieving data a structured and standardized naming convention has been developed.

The naming convention methodology includes:

- Clear structure of each component
- Logic that can be easily understood
- Standardized naming rules
- Document record control

The format and description of each component of the dataset naming convention is as follows:

Format:

Master Files: Dataset name/acronym, underscore, file year, underscore, file status (MASTER), underscore (if applicable), identifiable status (If applicable), underscore, version control number (if applicable), underscore, period and the file extension. Due to the file name length limits of SAS and other analytic software, working files names must be limited to 32 characters, excluding file extension.

Working files: At a minimum, the file must have the dataset name/acronym. Identifiable files must be identified as such; otherwise, the name/acronym will be the minimum (i.e. Identifiable - MS_ID; de-identified – MS). If a longitudinal file is provided annually, the file name will not include the years of data; however, if individual file years are provided as working files, the file year(s) must be included. Versioning will not be included in working files – if a new version is provided, the earlier version becomes transitory and can be disposed of.

For the NLCHI Mortality System, the following convention will be used.

Example:
Master Identifiable single year file
MS_2021_Master_ID_v0_1.mdb

Example and Order of Dataset Naming Components	
Component	**Example**
Name	MS
Year	2021
Dataset Status	Master
Identifiable Status	ID
Version	v0.1
Extension (database type)	mdb

Master Identifiable longitudinal file
MS_CY1991_2021_Master_ID_v0_1.sas7bdat

Example and Order of Dataset Naming Components	
Component	**Example**
Name	MS
Year	Calendar Years 1991-2021
Dataset Status	Master
Identifiable status	ID – identifiable
Version	v0.1
Extension (database type)	sas7bdat

Master De-identified longitudinal file
MS_CY1991_2021_Master_v0_1.sas7bdat

Example and Order of Dataset Naming Components	
Component	**Example**
Name	MS
Year	Calendar Years 1991-2021
Dataset Status	Master
Identifiable status	De-identified
Version	v0.1
Extension (database type)	sas7bdat

Working identifiable longitudinal file
MS_ID.sas7bdat

Example and Order of Dataset Naming Components	
Component	**Example**
Name	MS
Identifiable status	ID - identifiable
Extension (database type)	sas7bdat

Working de-identified longitudinal file
MS.sas7bdat

Example and Order of Dataset Naming Components	
Component	**Example**
Name	MS
Identifiable status	De- identified
Extension (database type)	sas7bdat

Process

When a master copy is made it will initiate a Dataset Control Record. For each dataset, there will be a document control record to indicate:

- Name of Dataset (including version)
- Requestor
- Date
- Change(s) Made
- Rationale for Change
- Database Analyst
- Pertinent Documentation

If it is necessary to update a master file the database analyst is responsible for:

- Making the changes
- Completing the Dataset Control Record
- Uploading the revised dataset with new version number
- Notifying applicable managers in DaIS of the update and copy of Dataset Control Record

Appendix 6: Active Fields for 2021 De-identified Mortality File

Variable Name	Label
W_PAT_ID	DW Unique Patient identifier
DID_KEY	NIMS Unique Patient Identifier
regisnum	Registration Number
year	Year of Death
sex	Sex
dob	Date of Birth
dob_derived	Date of Birth derived from validated MCP number
age_yrs	Age (Years)
age_yrs_derived	Age (Years) derived from derived Date of Birth
dod	Date of Death
est_days	Estimated Day of Death
est_mths	Estimated Month of Death
est_yrs	Estimated Year of Death
age_mths	Age (Months)
age_days	Age (Days)
age_hrs	Age (Hours)
age_mins	Age (Minutes)
time_dth	Time of Death For deaths less than 1 year of age
marsta	Current Legal Marital Status of Deceased
sgc_res	SGC for Usual Residence
sgc	SGC – Derived
pcode	Postal Code
province	Deceased Province of Residence
country	Deceased Country of Residence
town	Deceased Town of Residence
hth_auth	Regional Health Authority
hospital	Hospital Code
facility	Hospital Name
locality	Locality of Death
location_other	Locality of Death Other, Specify
chapter	Underlying Cause of Death ICD Chapter Number
chapter_desc	Underlying Cause of Death ICD Chapter Name

icd_a	Immediate Cause of Death
icd_atxt	Immediate Cause of Death (Text)
icd_b-m	Antecedent Cause of Death – Other Significant Condition (Code)
icd_btxt - mtxt	Antecedent Cause of Death – Other Significant Condition (Text)
oth_con1 - 12	Condition-1 (ICD code)
oth_con1txt - 12txt	Condition-1(ICD text)
gest_weeks	Gestational Age in Weeks if newborn death due to Prematurity
gest_days	Gestational Age in Days if newborn death due to Prematurity
medterm	Medical Termination of Pregnancy
death_dueto	Was this death due to…
death_duetospecify	Was this death due to…(Other specified)
autopsy	Autopsy
medinjury	Maternal Injury
dec_female	Female Death
OOP_HCN	Out of Province Identifier
comments	Comments

Appendix 7: Glossary

Client Registry
The Client Registry is maintained at the Centre and contains data including resident demographic information such as name, address, date of birth and administrative information such as date of birth registration, MCP number, etc. It is the first foundational registry of the Newfoundland and Labrador Electronic Heath Record (EHR). The Client Registry enables the accurate identification of individuals in the provincial EHR by linking person-specific information from clinical information systems to the correct person. It is currently used throughout the health care system to accurately identify clients.

Hospital Code
This code identifies a Newfoundland and Labrador health care facility. A hospital code in the Mortality System consists of a four characters, starting with an alpha followed by three numbers. This code identifies a Newfoundland and Labrador health care facility.

MCP Number
A 12 digit number issued to residents of the province by Newfoundland and Labrador Medical Care Plan.

Medical Coding
The International Statistical Classification of Diseases, Injuries, and Causes of Death, Ninth Revision (ICD-9) and the International Classification of Diseases and Related Health Problems, Tenth Revision, Canada (ICD-10-CA), this system consists of codes to classify diseases and health problems.

Office of the Chief Information Officer (OCIO)
The OCIO provides Information Technology and Information Management capability aligned to support the business of government and the citizens of Newfoundland and Labrador.

Secondary Uses Committee
This Committee provides advice to the Chief Privacy Officer, who is accountable for the approval of new uses and disclosures of personal health information. Any committee member who has requested the new uses or is a party to the request for disclosure of data/information shall state the conflict of interest at the beginning of the discussion on the request. There shall be between three and seven members. Membership shall include expertise in research, data quality, and privacy

Geographic Coding
This is a code that identifies a place of residence. The Standard Geographical Classification (SGC) is Statistics Canada's official classification of geographic areas in Canada. The SGC provides unique numeric codes for three types of geographic areas: provinces and territories, census divisions (counties, regional municipalities), and census subdivisions (municipalities).