CANADIAN VITAL STATISTICS DEATH DATABASE

DATA DICTIONARY AND USER GUIDE

2016

The complete and accurate registration of all events in Canada continues to be the main objective of the collaborative effort among the provinces, the territories and Statistics Canada.

Health Statistics Division

Last updated: June 28, 2018

Years of data capture : 1974-2016

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INTRODUCTION

The Canadian Vital Statistics: Death database (CVSD) data dictionary and user guide is a reference manual for data users. It contains information on the background of vital statistics in Canada, including information on data collection, processing and dissemination, variables contained in the database as well as a description of edits that were applied to the data and any relevant information or provincial/territorial differences.

HISTORY OF VITAL STATISTICS IN CANADA

The Dominion Bureau of Statistics (now Statistics Canada) was created in 1918 by the Statistics Act. The Dominion and provinces collaborated in the creation of a Canadian vital statistics system. The Dominion Bureau of Statistics was to provide a standard registration form for live births, stillbirths and deaths. The provinces would then return the transcripts of completed forms to the Dominion. The first annual report comprised of data from eight provinces was released in 1921[1]. Quebec began to participate in 1926, Newfoundland and Labrador in 1949, Yukon and Northwest Territories in 1950, and Nunavut in 1999.

Provincial and territorial Vital Statistics Acts render compulsory the registration of all live births, deaths and stillbirths occurring within their jurisdiction. These Acts are based on a Model Vital Statistics Act (1949). The Canadian system of vital statistics operates under an agreement between the provincial and territorial vital statistics offices and the Government of Canada. Under this agreement, all registrars collect a standard set of data elements, although they may choose to collect additional variables. The

[1] For a complete history on the development of a Canadian Vital Statistics system in Canada, please refer to *Health Reports* 1994, vol. 6 no. 3 Catalogue number 82-003.

system is overseen by the Vital Statistics Council for Canada, which is an advisory committee composed of a representative from each jurisdiction and Statistics Canada.

CANADIAN VITAL STATISTICS: DEATH DATABASE

The CVSD is an administrative database containing a collection of annual demographic and cause of death information in Canada. Vital statistics death data are received from the provincial and territorial vital statistics offices where deaths occurring in those jurisdictions are registered. As of 2010, deaths of Canadians occurring in the United States are no longer included in the database.

The data are used to calculate basic indicators (such as counts, rates) on deaths of residents of Canada. Information from this database is also used for population health surveillance. Each provincial and territorial vital statistics agency is governed by specific legislation.

DATA DISSEMINATION

Death data are received from the province or territory of occurrence of the death event. However, death data are published according to the place of residence of the decedent. This may account for the discrepancies found between numbers published by Statistics Canada and those published by the provinces and territories. Some differences may also be accounted for by the different timing of when a data year is closed.

To calculate mortality rates, Statistics Canada uses the most up-to-date population available at the time of release. Rates are not revised with updates to the population file.

Historical data have been reformatted to match the current record layout in order to facilitate analysis over time.

When consulting the Statistics Canada website on published death data, differences may be found between data released by the Vital Statistics section (actual counts of deaths from January to December with a breakdown by characteristics) and Demography Division (estimations of deaths from July 1 to June 30). Tables containing estimations are clearly noted.

Definitions used in the production of statistical tables of Canadian vital statistics data are based on those recommended by the World Health Organisation[1] and the United Nations[2]. Please refer to the following page for the definitions:

http://unstats.un.org/unsd/demographic/meetings/egm/CRVS2011/final_report.pdf

For more information regarding the description of the database, data sources and methodology, data accuracy and quality, please refer to the following webpage:

http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3233&Item

DATA PROCESSING

The data processing system applies edits to uncover inconsistent or questionable data, makes corrections, and applies imputations for certain key variables.

DATA VALIDATION

During processing, a series of edits is applied to the data from each province and territory. Records failing these edits are validated against images of the death registration forms when available.

Edits have different severity levels with accompanying rules for resolution. The severity levels and resolution rules are as follows:

Severity level	Resolution
0	No action required, edit passed
1	Warning, update or imputation applied
2	Warning, manual correction optional
3	Failed edit, manual correction required

[1] World Health Organisation (WHO). **International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Volumes 1 and 2** (ICD-10). Geneva, 1992.

[2] United Nations. **Principles and Recommendations for a Vital Statistics System**. Statistical Papers, Series M, No.19, Rev.3. New York, 2013.

Severity level	Resolution
4	Critical failure, send back to province/territory

Once all system edits have been applied and corrections to the file have been made, a duplicate check is run on the data in order to eliminate any duplicate records at the provincial/territorial, and national level.

IMPUTATION

As of 2010, if values for the following fields are unknown, they are imputed within the death database: province or territory of usual residence, sex, age, and date of birth of decedent.

For deaths where the province/territory of usual residence of decedent is unknown, but the residence was known to be in Canada, the province/territory is imputed based on the province/territory of occurrence.

If the sex of the decedent is unknown, the sex is imputed deterministically in cases where there was a sex-specific cause of death. For all other cases where the sex of the decedent is unknown, sex is imputed based on a logistic regression model.

If the birth year is known and the age of the decedent is unknown, age is derived from the birth year and date of death. If the birth year is unknown, the age of the decedent is imputed based on the provincial/territorial median age at death over the last ten years.

When the date of birth of the decedent is either fully or partially missing, the complete date of birth is imputed based on the decedent's age and date of the death.

DATA FILES AND RECORD LAYOUTS

Two files are produced annually: a nominal (INDEX) file and a non-nominal file (STATS). Most analysts and researchers have access only to the latter. Both files follow the same record layout. There are two record layouts: one for the data for reference year 2010 and earlier and another for reference year 2011 onward. Additional information on the differences between the two is provided in the descriptions of data elements.

RECORD LAYOUT UP TO THE YEAR 2010				
Field	**Field name**	**Length**	**Position**	**Item name**
1	EVENT_TYPE	1	1	Event (3. Death)
2	RECORD_STATUS	1	2	Type of record
3	EVENT_YEAR	4	3-6	Year of event (YYYY)
4	PLACEOFDEATH_PROVINCE	3	7-9	Place of occurrence: province/territory code (PPP)
5	REGISTRATION_NUMBER	6	10-15	Death registration number
6	PLACEOFDEATH_CITY	15	16-30	Place of occurrence: city, town, or village name
7	PLACEOFDEATH_CENSUSDIVISION	2	31-32	Place of occurrence: census division (CD)
	PLACEOFDEATH_CENSUSSUBDIVISION	3	33-35	Place of occurrence: census subdivision (CSD)
8	DEATH_MONTH	2	36-37	Date of death month (MM)
	DEATH_DAY	2	38-39	Date of death day (DD)
	DEATH_YEAR	4	40-43	Date of death year (YYYY)
9	NAME	35	44-78	Surname and given name(s) of the deceased
10	SEX	1	79	Sex of the deceased
11	BIRTH_MONTH	2	80-81	Deceased date of birth month (MM)
	BIRTH_DAY	2	82-83	Deceased date of birth day (DD)
	BIRTH_YEAR	4	84-87	Deceased date of birth year (YYYY)
12	AGE_CODE	1	88	Age of the deceased : code

RECORD LAYOUT UP TO THE YEAR 2010				
Field	**Field name**	**Length**	**Position**	**Item name**
13	AGE_VALUE	3	89-91	Age of deceased: value
14	BIRTHPLACE_3DIGIT	3	92-94	Birthplace of deceased: province / territory / country code (PPP)
15	RESIDENCE_PROVINCE_3DIGIT	3	95-97	Usual residence of deceased: province/territory/country code (PPP)
	RESIDENCE_CENSUSDIVISION	2	98-99	Usual residence of deceased: census division code (CD)
	RESIDENCE_CENSUSSUBDIVISION	3	100-102	Usual residence of deceased: census subdivision code (CSD)
16	RESIDENCE_POSTALCODE	6	103-108	Usual residence of deceased: postal code (ANANAN)
17	MARITAL_STATUS	1	109	Marital status of deceased
18	SPOUSE_SURNAME	17	110-126	Name of spouse: surname or maiden name
19	SPOUSE_INITIALS	3	127-129	Name of spouse: initials
20	FATHER_SURNAME	17	130-146	Name of father : surname
21	FATHER_INITIALS	3	147-149	Name of father: initials
22	FATHER_BIRTHPLACE_3DIGIT	3	150-152	Birthplace of father: province / territory / country code (PPP)
23	MOTHER_SURNAME	17	153-169	Maiden name of mother: surname
24	MOTHER_INITIALS	3	170-172	Name of mother: initials
25	MOTHER_BIRTHPLACE_3DIGIT	3	173-175	Birthplace of mother: province / territory / country code (PPP)
26	CERTIFICATION_MONTH	2	176-177	Date of certification month (MM)

RECORD LAYOUT UP TO THE YEAR 2010				
Field	**Field name**	**Length**	**Position**	**Item name**
	CERTIFICATION_DAY	2	178-179	Date of certification day (DD)
	CERTIFICATION_YEAR	4	180-183	Date of certification year (YYYY)
27	DEATH_CAUSE_4DIGITS	4	184-187	Underlying cause of death
28	PLACEOFDEATH_LOCALITY	1	188	Locality of death
29	AUTOPSY_PERFORMED	1	189	Autopsy performed
30	AUTOPSY_FINDINGS_USED	1	190	Autopsy findings used in stated underlying cause of death
31	AUTOPSY_FURTHER_INFORMATION	1	191	Further information expected on cause of death
32	INJURY_NATURE_ICD	4	192-195	Nature of injury: (variable cancelled in 2000. Filled with blanks)
33	INJURY_LOCALITY	1	196	Locality of injury
34	DESIGNATION_ATTENDANT	1	197	Designation of certifier
35	DISPOSITION_BODY	1	198	Disposition
36	ID	9	199-207	Record identification
37	PCODE	6	208-213	Postal code
38	RESFLG	1	214	Residence flag on postal codes (PCODE)
39	PR	2	215-216	Province code
40	CD	2	217-218	Census division code
41	CSD	3	219-221	Census subdivision code
42	CMA	3	222-224	CMA or CA code

RECORD LAYOUT UP TO THE YEAR 2010				
Field	**Field name**	**Length**	**Position**	**Item name**
43	CT	7	225-231	Census Tract – urban CT's only (No PCT)
44	DA	4	232-235	Dissemination area
45	BLK	2	236-237	Block
46	INSTFLG	1	238	Institutional flag
47	LAT	8	239-246	Latitude degrees(2)+decimals(6)
48	LONG	9	247-255	Longitude degrees(3)+decimals(6)
49	DPL	3	256-258	Designated place
50	DMTDIFF	1	259	Previous or alternate DMT if different
51	DMT	1	260	Delivery mode type
52	LINK	1	261	Link type (increasing confidence)
53	SOURCE	1	262	Source of geographic codes
54	NCSD	1	263	Number CSD possible at this postal code
55	NCD	1	264	Number CD possible at this postal code
56	RPF	1	265	Representative point (centroid) flag for latitude and longitude
57	SERV	1	266	Service type
58	PREC	1	267	Precision of latitude/longitude
59	NADR	1	268	Number of address ranges for this postal code

RECORD LAYOUT UP TO THE YEAR 2010				
Field	**Field name**	**Length**	**Position**	**Item name**
60	CODER	3	269-271	CODER: 'R5E'=GEORES5E MAR 2008 PCCF
61	CPCCODE	4	272-275	Canada Post community code (sequential). Warning: This code changes with each vintage of PCCF, so must only be used with CPCNAMES files associated with above coder
62	HR	2	276-277	Health regions code (unique within PR)
63	SUB	3	278-280	Health district code (unique in PR or PR+HR QC)
64	CSIZE	1	281	Analytical variables (5): community size code (based on CMA-CA POP06)
65	QAIPPE	1	282	Income quintile (IPPE, quintiles within CMA-CA)
66	SACTYPE	1	283	Statistical area type
67	CSIZEMIZ	1	284	CMACA SIZE + MIZ
68	NSREL	1	285	North-south relationship
69	AIRLIFT	1	286	Canada Post air stage community (6+ months/year)
70	BLKURB	1	287	Urban block
71	FED	3	288-290	Federal electoral district for 2006 Census
72	ER	2	291-292	Economic region (unique within PR)

RECORD LAYOUT UP TO THE YEAR 2010				
Field	**Field name**	**Length**	**Position**	**Item name**
73	AR	2	293-294	Census agricultural region (CROP DIST)
74	CCS	3	295-297	Census consolidated subdivision
75	POINSTAL	1	298	Postal installation geography flag
76	QILEVEL	3	299-301	Quality of links to community, street, and address
77	GMETHOD	1	302	Geocoding method used to build regular PCCF record
78	EA81UID	8	303-310	1981 enumeration area: PR(2)+FED(3)+EA(3)
79	EA86UID	8	311-318	1986 enumeration area: PR(2)+FED(3)+EA(3)
80	EA91UID	8	319-326	1991 enumeration area: PR(2)+FED(3)+EA(3)
81	EA96UID	8	327-334	1996 enumeration area: PR(2)+FED(3)+EA(3)
82	DA01UID	8	335-342	2001 dissemination area: PR(2)+CD(2)+DA(4)
83	DA06UID	8	343-350	2006 dissemination area: PR(2)+CD(2)+DA(4)
84	AHR	2	351-352	Alternate health region of Ontario PHU
85	ASUB	3	353-355	Alternate health district for Toronto PHU

RECORD LAYOUT UP TO THE YEAR 2010				
Field	**Field name**	**Length**	**Position**	**Item name**
86	DB11UID	10	356-365	2011 dissemination block identifier correspondance: PR(2)+CD(2)+DA(4)+BLK
87	PCCFFLAG	1	400	Flag indicating if original RESIDENCE_POSTALCODE was changed to match the PCODE by HSD
88	PCCFVER	3	401-403	Version of PCCF used to obtain PCCF results

RECORD LAYOUT FOR 2011 ONWARD				
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1	EVENT_TYPE	1	1	Event (3. Death)
2	RECORD_STATUS	1	2	Type of record
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34	DESIGNATION_ATTENDANT	1	197	Designation of certifier
35	DISPOSITION_BODY	1	198	Disposition
36	IMP090R	1	199	Imputation flag for sex
37	IMP100R	1	200	Imputation flag for date of birth
38	IMP110R	1	201	Imputation flag for age code
39	IMP120	1	202	Imputation flag for age value
40	IMP140	1	203	Imputation flag for RESIDENCE_PROVINCE_3DIGIT

DESCRIPTION OF DATA ELEMENTS

This section provides a description of the data elements in the same order as they appear in each of the two record layouts: (1) reference years up to 2010 and (2) reference years from 2011 onward. The valid values are listed for each field. A processing history informs the user of any changes that may affect the data, while the provincial/territorial information section indicates any provincial/territorial changes to the standard. In both record layouts, Fields 1 through 35 are obtained from the provincial and territorial vital statistics registries.

For reference years 2000 to 2010, Fields 36 to 88 are generated from the postal code of residence using the PCCF+, an automated geographic coding system based on the Statistics Canada Postal Code Conversion Files. For reference years 2011 onward, Fields 36 to 40 are imputation flags depicting whether the data elements for sex, date of birth, age code, age value and province/territory of residence have been imputed; the geographic information from PCCF+ is kept on a separate file.

The following table provides the version of PCCF+ used for each data year.

Year(s)	PCCF+ version
2000-2008	5E
2009	5J3
2010	5K0
2011-2016	6D

For more details about PCCF+, please refer to the document at http://www5.statcan.gc.ca/bsolc/olc-cel/olc-cel?lang=eng&catno=82F0086X.

Multiple causes of death and related information are obtained from the automated cause of death coding software and are described here to provide a complete overview of the information available from the CVSD. These data elements are, however, kept in a separate file, with its own record layout.

FIELD 1	EVENT

FIELD NAME: EVENT_TYPE

POSITION: 1

LENGTH: 1

DESCRIPTION: Code representing the type of vital statistics event: birth, death, or stillbirth.

VALID VALUES:

Value	Meaning
3	Death event

BLANKS ALLOWED: No

COMMENTS: This field is used as a data quality indicator. The completion rate for this field must be 100%.

PROCESSING HISTORY: N/A

P/T INFORMATION: N/A

FIELD 2	TYPE OF RECORD

FIELD NAME: RECORD_STATUS

POSITION: 2

LENGTH: 1

DESCRIPTION: Code describing whether the death record submitted by the province/territory represents a new death registration, an amendment to (replacement of) a death record already submitted, or the cancellation of a death registration.

VALID VALUES:

Value	Meaning
1	New registration
2	Amendment
3	Cancellation
4	New registration captured at STC
5	Cancelled registration captured at STC

BLANKS ALLOWED: No

COMMENTS: Only death records where the record type is “1”, “2”, or “4 should be included on the STATS file which is used for analysis. The STATS file does not contain any cancelled records. Therefore, there may be gaps in registrations numbers. The INDEX file contains all records, regardless of record type. Fields 6 and higher in the cancelled record are blank. These fields may have contained data prior to processing.

This field is used as a data quality indicator. The completion rate for this field must be 100%.

PROCESSING HISTORY: N/A

P/T INFORMATION: N/A

FIELD 3	YEAR OF EVENT

FIELD NAME: EVENT_YEAR

POSITION: 3-6

LENGTH: 4

DESCRIPTION: The year in which the death occurred.

VALID VALUES:

Value	Meaning
YYYY	1974 to most recent year

BLANKS ALLOWED: No

COMMENTS: This variable along with the province/territory of occurrence (place of death) and registration number is part of a unique death record identifier of each record, which is used to reference it.

This field is used as a data quality indicator. The completion rate for this field must be 100%.

PROCESSING HISTORY: N/A

P/T INFORMATION: N/A

FIELD 4	PLACE OF OCCURRENCE: PROVINCE/TERRITORY CODE

FIELD NAME: PLACEOFDEATH_PROVINCE

POSITION: 7-9

LENGTH: 3

DESCRIPTION: Code (PPP) representing the province/territory in which the death occurred.

VALID VALUES:

Value	Meaning
840	United States (until 2009)
910	Newfoundland and Labrador
911	Prince Edward Island
912	Nova Scotia
913	New Brunswick
924	Quebec
935	Ontario
946	Manitoba
947	Saskatchewan
948	Alberta
959	British Columbia
960	Yukon
961	Northwest Territories
962	Nunavut

BLANKS ALLOWED: No

COMMENTS: This variable along with the year of death and registration number is part of a unique death record identifier of each record, which is used to reference it.

	This field is used as a data quality indicator. The completion rate for this field must be 100%.
PROCESSING HISTORY:	As of the 2010 reference year, Statistics Canada is only including information on deaths occurring in Canada due to poor coverage for deaths occurring in the United States.
P/T INFORMATION:	N/A

FIELD 5	DEATH REGISTRATION NUMBER
FIELD NAME:	REGISTRATION_NUMBER
POSITION:	10-15
LENGTH:	6
DESCRIPTION:	A number unique to each death registration (in combination with the province/territory of occurrence and year of death) assigned by the provincial or territorial vital statistics registrar.
VALID VALUES:	000001-999999
BLANKS ALLOWED:	No
COMMENTS:	This variable along with the province/territory of occurrence (place of death) and year of death is part of a unique death record identifier of each record, which is used to reference it. This field is used as a data quality indicator. The completion rate for this field must be 100%.
PROCESSING HISTORY:	N/A
P/T INFORMATION:	N/A

FIELD 6	PLACE OF OCCURRENCE: CITY, TOWN OR VILLAGE NAME
FIELD NAME:	PLACEOFDEATH_CITY
POSITION:	16-30
LENGTH:	15
DESCRIPTION:	Name of city, town or village where the death occurred.
VALID VALUES:	Unedited
BLANKS ALLOWED:	Yes
COMMENTS:	N/A
PROCESSING HISTORY:	N/A
P/T INFORMATION:	There were many unknown values for place of death in 2004/2005 (a new coding system adopted by Ontario in 2004; British Columbia had problems with coding and reporting in 2005).

FIELD 7	PLACE OF OCCURRENCE: CENSUS DIVISION, CENSUS SUBDIVISION CODES
FIELD NAME:	PLACEOFDEATH_CENSUSDIVISION PLACEOFDEATH_CENSUSSUBDIVISION
POSITION:	31-35
LENGTH:	5
DESCRIPTION:	Geographical code representing the Census Division (CD) and Census Subdivision (CSD) of the city, town, or village in which the death occurred.
VALID VALUES:	Refer to Standard Geographical Classification (2011) Catalogue no.12-575-X available on Statistics Canada website. http://www.statcan.gc.ca/pub/12-571-x/12-571-x2011001-eng.pdf Format: CDCSD CD: Census Division (county) (Canada only) CSD: Census Subdivision (municipality) (Canada only) CDCSD: "00000" if death occurred in the USA
BLANKS ALLOWED:	No
COMMENTS:	N/A
PROCESSING HISTORY:	This field used to be provided by the province/territory. From 2003 to 2007, the quality of this variable was poor, and as of the 2008 reference year, this field is no longer validated if it is received from the province/territory.
P/T INFORMATION:	There were many unknown values for place of death in 2004/2005 (a new coding system adopted by Ontario in 2004; British Columbia had problems with coding and reporting in 2005).

FIELD 8	DATE OF DEATH

FIELD NAME: DEATH_MONTH (36-37)
DEATH_DAY (38-39)
DEATH_YEAR (40-43)

POSITION: 36-43

LENGTH: 8

DESCRIPTION: Code representing the month (MM), day (DD), and year (YYYY) when the death occurred.

VALID VALUES:

Value	Meaning
Month (MM)	Month death occurred
01	January
02	February
03	March
04	April
05	May
06	June
07	July
08	August
09	September
10	October
11	November
12	December
Day (DD)	
01-31	Day of the month death occurred
Year (YYYY)	Year death occurred

BLANKS ALLOWED: No

COMMENTS:	This field is used as a data quality indicator. The completion rate for this field must be 100%. In the absence of the date of death, the date when the body was found is used as the date of death.
PROCESSING HISTORY:	N/A
P/T INFORMATION:	N/A

FIELD 9	SURNAME AND GIVEN NAME(S) OF THE DECEASED
FIELD NAME:	NAME
POSITION:	44-78
LENGTH:	35
DESCRIPTION:	Surname and given name(s) of deceased.
VALID VALUES:	The first non-blank character in the name must be alphabetic. Valid characters are: alphabetic, apostrophe, hyphen, comma, period, numeric.
BLANKS ALLOWED:	No
COMMENTS:	Names are suppressed on the STATS file.
PROCESSING HISTORY:	N/A
P/T INFORMATION:	N/A

FIELD 10 SEX OF THE DECEASED

FIELD NAME: SEX

POSITION: 79

LENGTH: 1

DESCRIPTION: Identifies the sex of the deceased.

VALID VALUES:

Values	Meaning
1	Male
2	Female
9	Unknown

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: Prior to 2010, sex was imputed based on a review of characteristics (name, cause of death) to make a determination. If none could be made, sex was coded to 9=Unknown. In the published CANSIM tables on deaths, where unknown, the sex of the deceased is imputed based on the registration number: where the registration number is odd, sex is male, and where it is even sex is female.

As of 2010, sex was imputed based on the cause of death, if applicable, or using logistic regression.

P/T INFORMATION: Ontario collects male, female and undetermined which is coded to unknown to align with valid values used at Statistics Canada.

FIELD 11	DATE OF BIRTH OF THE DECEASED

FIELD NAME: BIRTH_MONTH (80-81)
BIRTH_DAY (82-83)
BIRTH_YEAR (84-87)

POSITION: 80-87

LENGTH: 8

DESCRIPTION: Code representing the month (MM), day (DD), and year (YYYY) the decedent was born.

VALID VALUES:

Value	Meaning
Month (MM)	Month the decedent was born
01	January
02	February
03	March
04	April
05	May
06	June
07	July
08	August
09	September
10	October
11	November
12	December
Day (DD)	
01-31	Day of the month the decedent was born
Year (YYYY)	Year the decedent was born

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: Starting with the 2010 data year, if the date of birth is missing or partially missing, it is imputed. The imputation is done by using the age of the deceased and the date of death.

P/T INFORMATION: N/A

FIELD 12	AGE OF DECEASED: CODE

FIELD NAME: AGE_CODE

POSITION: 88

LENGTH: 1

DESCRIPTION: Code indicating the unit of time measurement used to report the Age of Deceased: Value (Field 13). The unit used should be appropriate for the age. Age is expressed in the number of *completed* time units at the last birthday preceding the death.

VALID VALUES:

Value	Meaning	Restrictions
1	Minutes	For ages between 1 and 59 minutes. If age is 60 minutes, it will be coded as 1 hour.
2	Hours	For ages between 1 and 23 hours. If age is 24 hours, it will be coded as 1 day.
3	Days	For ages between 1 and 27 days accordingly. If age unit is equal to 28 days or more, it will be coded as 1 month.
4	Months	For ages greater than or equal to 1 month, but less than 12 months. As of 2016, if age is given as 12 months, it will be coded as 1 year.
5	Years	For ages between 1 and 130 years.
9	Unknown	

BLANKS ALLOWED: No

COMMENTS:	Early neonatal deaths are deaths to a child under one week of age (0 to 6 days). Perinatal deaths are deaths to a child under one week of age (0 to 6 days) or a stillbirth of 28 weeks or more of gestation. Neonatal deaths are deaths of a child under four weeks of age (0 to 27 days). Post-neonatal deaths are deaths of a child under one year of age but at least 28 days old (28 to 364 days). Infant deaths are deaths of a child under one year of age.
PROCESSING HISTORY:	N/A
P/T INFORMATION:	N/A

FIELD 13	AGE OF DECEASED: VALUE

FIELD NAME: AGE_VALUE

POSITION: 89-91

LENGTH: 3

DESCRIPTION: Actual age of deceased reported in time units of either minutes, hours, days, months, or years (as appropriate for the age code specified in Field 12). Age is expressed as the number of *completed* time units (i.e., age as of last birthday preceding the death).

VALID VALUES:

Value	Meaning
001-115	Number of time units
999	Unknown

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: Age value can be derived from the birth year since the date of death is always available. If the birth year is not known, then it will be imputed by the median value of age in domains defined by the cause of death along with their proper lower and upper age limits which are found in the ICD10 reference file. The previous ten years of data are used to compute medians per domain. Minutes are never used for imputation, the minimum is 12 hours.

P/T INFORMATION: N/A

FIELD 14	BIRTHPLACE OF DECEASED: PROVINCE/TERRITORY/COUNTRY CODE

FIELD NAME: BIRTHPLACE_3DIGIT

POSITION: 92-94

LENGTH: 3

DESCRIPTION: Geographical code (PPP) representing the province/territory of birth if the deceased was born in Canada, or the country of birth if the deceased was born outside of Canada.

Place of birth may be reported according to the boundaries in effect at the time of birth (for instance in situations where boundaries of countries have changed or countries have split up). In the present file they are coded according to what is indicated on the registration form and can be categorized using the codes listed in the table below.

VALID VALUES: The following link provides the current country codes. http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=366466.

Please see also document *CountryCode2013.xlsx* that accompanies the data and the following table.

Value	Meaning
909	Canada (Province/territory unknown)
910	Newfoundland and Labrador
911	Prince Edward Island
912	Nova Scotia
913	New Brunswick
924	Quebec
935	Ontario
946	Manitoba
947	Saskatchewan
948	Alberta
959	British Columbia
960	Yukon

Value	Meaning
961	Northwest Territories
962	Nunavut
970	Soviet Union (Former USSR) (STC Code)
971	Czechoslovakia (Former) (STC Code)
972	Africa (STC Code)
973	Asia (STC Code)
974	Europe (STC Code)
975	South America (STC code)
976	Central America (STC Code)
977	West Indies/Caribbean (STC Code)
978	Yugoslavia (Former) (STC Code)
979	Oceania (STC Code)
899	At sea
999	Unknown
000	Unknown

BLANKS ALLOWED: No

COMMENTS: For decedents reportedly born in Nunavut prior to 1999, their birthplace is updated from Nunavut to the Northwest Territories. Data remains unchanged if the image of the death registration was not available.

PROCESSING HISTORY: N/A

P/T HISTORY: N/A

FIELD 15	USUAL RESIDENCE OF DECEASED: GEOGRAPHICAL CODE

FIELD NAME: RESIDENCE_PROVINCE_3DIGIT (95-97)
RESIDENCE_CENSUSDIVISION (98-99)
RESIDENCE_CENSUSSUBDIVISION (100-102)

POSITION: 95-102

LENGTH: 8

DESCRIPTION: Geographical code representing the province/territory or country (PPP), and, if applicable, Census Division (CD) and Census Subdivision (CSD) of the usual residence of the deceased at the time the death occurred. The usual residence of the deceased may be outside Canada. The usual residence of newborns dying in the hospital is the usual residence of the mother. Until 2008, this information was provided by the provinces and territories. As of 2008, this information is generated using the PCCF+ (Postal Code Conversion File Plus).

VALID VALUES:

Values	Meaning
PPPCDCSD	PPP = Province/Territory/Country Code CD = Census Division Code (in Canada) or 00 (outside Canada or unknown) CSD = Census Subdivision Code (in Canada)
9PPCDCSD	9PPCDCSD known and in Canada
9PPCD000	9PPCD known and in Canada, CSD unknown
9PP00000	9PP known and in Canada, CDCSD unknown
90900000	Canada, unknown province/territory
PPP00000	PPP known and outside Canada
00000000	Geographical location unknown

Refer to Standard Geographical Classification (2011) Catalogue no.12-575-X available on Statistics Canada website.
http://www.statcan.gc.ca/pub/12-571-x/12-571-x2011001-eng.pdf

The following link provides the current country codes.
http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=366466.

Please see also document *CountryCode2013.xlsx* that accompanies the data and the following table.

Value	Meaning
909	Canada (province/territory unknown)
910	Newfoundland and Labrador
911	Prince Edward Island
912	Nova Scotia
913	New Brunswick
924	Quebec
935	Ontario
946	Manitoba
947	Saskatchewan
948	Alberta
959	British Columbia
960	Yukon
961	Northwest Territories
962	Nunavut
970	Soviet Union (Former USSR) (STC Code)
971	Czechoslovakia (Former) (STC Code)
972	Africa (STC Code)
973	Asia (STC Code)
974	Europe (STC Code)
975	South America (STC Code)
976	Central America (STC Code)
977	West Indies/Caribbean (STC Code)
978	Yugoslavia (Former) (STC Code)
979	Oceania (STC Code) (STC Code)
899	At sea
999	Unknown
000	Unknown

BLANKS ALLOWED: No

COMMENTS: These fields are still populated by some provinces and territories, however, users should use the CD and CSD which were produced using the Postal Code Conversion File + (PCCF+) which are available in the PCCF+ section of the record layout.

PROCESSING HISTORY: As of the 2008 reference year, the CD and CSD of usual residence of the deceased is generated using the PCCF+ which provides a link between six-character postal codes[OM] and standard census geographic areas (e.g., dissemination areas, census subdivisions, census tracts). If the province/territory provided the information, it will appear in this field (15), positions 98-102.

In 2008 and 2009, the CD/CSD code generated by PCCF+ overwrote the CD/CSD codes provided by the provinces and territories. If a postal code was not available and a CD/CSD code was provided by the province or territory, it was kept on the file.

Starting in 2010, the data submitted by the province or territory for this field is left on the file unedited. This information can be used if there was no postal code available. Also, where the province or territory of residence of the deceased is missing, the value is imputed. The value for the province or territory of occurrence is used.

P/T INFORMATION: N/A

FIELD 16	USUAL RESIDENCE OF DECEASED: POSTAL CODE
FIELD NAME:	RESIDENCE_POSTALCODE
POSITION:	103-108
LENGTH:	6
DESCRIPTION:	Canadian postal code, for which the format is ANANAN, where A is a letter, and N is a number. If residence of deceased is not in Canada or is unknown, the field is left blank.
VALID VALUES:	Refer to system edits.
BLANKS ALLOWED:	Yes
COMMENTS:	The postal code must correspond to the province or territory in which the deceased usually resided. There are a few exceptions: The city of Flin Flon, which straddles Manitoba and Saskatchewan, The city of Lloydminster, which straddle Saskatchewan and Alberta, and Onion Lake Cree Nation, which straddles Saskatchewan and Alberta. In these instances, the province or residence generated by PCCF+ may be inconsistent with the province stated in RESIDENCE_PROVINCE_3DIGIT.
PROCESSING HISTORY:	As of the 2008 reference year, all sub-provincial geography is generated using the PCCF+ which provides a link between six-character postal codes[OM] and standard census geographic areas (e.g., dissemination areas, census subdivisions, census tracts). Invalid or missing postal codes are manually verified using the postal code tool available from the Canada Post website. As of 2014, the mailing address postal code was used when there was no postal code for usual residence.
P/T INFORMATION:	N/A

FIELD 17	MARITAL STATUS OF DECEASED

FIELD NAME: MARITAL_STATUS

POSITION: 109

LENGTH: 1

DESCRIPTION: Identifies the *legal conjugal status* of the deceased at the time of death. Persons in common-law relationships are assigned to their legal marital status category.

VALID VALUES:

Value	Meaning	Restrictions
1	Single	A single person is one who has never married, or a person whose marriage has been annulled and who has not remarried.
2	Married	A married person is one who is legally married and not separated.
3	Widowed	A person whose spouse has died and has not remarried is widowed.
4	Divorced	A divorced person is one who has obtained a legal divorce and has not remarried.
5	Separated	A separated person is legally married but is not living with his or her spouse.
9	Unknown	

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: N/A

P/T INFORMATION:

The following table identifies (with an X) what categories are collected in each province and territory. The common-law category is mapped to unknown at Statistics Canada.

Prior to 2010, common-law in Saskatchewan was coded as 'married'. From 2010 on, common-law is coded as 'unknown' marital status.

	Single (Never married), Divorced, Widowed, Married	Common Law	Separated	Unknown	Other
Newfoundland and Labrador	X		X	X	
Prince Edward Island	X			X	
Nova Scotia	X				
New Brunswick	X	X	X		
Quebec	X		X		
Ontario	X	X			Same-sex partner
Manitoba	X		X		
Saskatchewan	X	X			
Alberta	X			X	
British Columbia	X		X		X
Yukon	X				
Northwest Territories	X	X			
Nunavut	X				

FIELD 18	NAME OF SPOUSE: SURNAME OR MAIDEN NAME
FIELD NAME:	SPOUSE_SURNAME
POSITION:	110-126
LENGTH:	17
DESCRIPTION:	The spouse's surname (if the spouse is male), or maiden name (if the spouse is female).
VALID VALUES:	The first non-blank character in the name must be alphabetic. Valid characters are: alphabetic, apostrophe, hyphen, comma, period, and numeric.
BLANKS ALLOWED:	Yes
COMMENTS:	Names are suppressed on the STATS file.
PROCESSING HISTORY:	Reporting for this variable began in 1996.
P/T INFORMATION:	As of 2003, this information is no longer available for Ontario.

FIELD 19	NAME OF SPOUSE: INITIALS
FIELD NAME:	SPOUSE_INITIALS
POSITION:	127-129
LENGTH:	3
DESCRIPTION:	The spouse's initials.
VALID VALUES:	Up to 3 initials can be indicated. There is no punctuation between or following initials. Valid characters are the following: • alphabetic • blank
BLANKS ALLOWED:	Yes
COMMENTS:	Names are suppressed on the STATS file.
PROCESSING HISTORY:	Reporting of this variable began in 1996.
P/T INFORMATION:	As of 2003, this information is no longer available for Ontario.

FIELD 20	NAME OF FATHER: SURNAME
FIELD NAME:	FATHER_SURNAME
POSITION:	130-146
LENGTH:	17
DESCRIPTION:	Surname of father.
VALID VALUES:	The first non-blank character in the name must be alphabetic. Valid characters are: alphabetic, apostrophe, hyphen, comma, period, numeric.
BLANKS ALLOWED:	Yes
COMMENTS:	Names are suppressed on the STATS file.
PROCESSING HISTORY:	N/A
P/T INFORMATION:	Depending on the year and jurisdiction, reporting for this variable is fragmented.

FIELD 21	NAME OF FATHER: INITIALS
FIELD NAME:	FATHER_INITIALS
POSITION:	147-149
LENGTH:	3
DESCRIPTION:	Names are suppressed on the STATS file.
VALID VALUES:	Up to 3 initials can be indicated. There is no punctuation between or following initials. Valid characters are the following: • alphabetic • blank
BLANKS ALLOWED:	Yes
COMMENTS:	N/A
PROCESSING HISTORY:	N/A
P/T INFORMATION:	Depending on the year and jurisdiction, reporting for this variable is fragmented.

FIELD 22	BIRTHPLACE OF FATHER: PROVINCE/TERRITORY/COUNTRY CODE

FIELD NAME: FATHER_BIRTHPLACE_3DIGIT

POSITION: 150-152

LENGTH: 3

DESCRIPTION: Geographical code (PPP) representing the province or territory of birth if the father of the deceased was born in Canada, or the country if the father was born outside of Canada.

VALID VALUES: The following link provides the current country codes. http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=366466.

Please see also document *CountryCode2013.xlsx* that accompanies the data and the following table.

Value	Meaning
909	Canada (province/territory unknown)
910	Newfoundland and Labrador
911	Prince Edward Island
912	Nova Scotia
913	New Brunswick
924	Quebec
935	Ontario
946	Manitoba
947	Saskatchewan
948	Alberta
959	British Columbia
960	Yukon
961	Northwest Territories
962	Nunavut

Value	Meaning
970	Soviet Union (Former USSR) (STC Code)
971	Czechoslovakia (Former) (STC Code)
972	Africa (STC Code)
973	Asia (STC Code)
974	Europe (STC Code)
975	South America (STC Code)
976	Central America (STC Code)
977	West Indies/Caribbean (STC Code)
978	Yugoslavia (Former) (STC Code)
979	Oceania (STC Code)
999	Unknown
000	Unknown
899	At sea

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: N/A

P/T INFORMATION: Depending on the year and jurisdiction, reporting for this variable is fragmented.

FIELD 23	MAIDEN NAME OF MOTHER: SURNAME
FIELD NAME:	MOTHER_SURNAME
POSITION:	153-169
LENGTH:	17
DESCRIPTION:	The mother's surname at birth.
VALID VALUES:	The first non-blank character in the name must be alphabetic. Valid characters are: alphabetic, apostrophe, hyphen, comma, period, and numeric.
BLANKS ALLOWED:	Yes
COMMENTS:	Names are suppressed on the STATS file.
PROCESSING HISTORY:	N/A
P/T INFORMATION:	Depending on the year and jurisdiction, reporting for this variable is fragmented.

FIELD 24	NAME OF MOTHER: INITIALS
FIELD NAME:	MOTHER_INITIALS
POSITION:	170-172
LENGTH:	3
DESCRIPTION:	Initials of mother.
VALID VALUES:	Up to 3 initials can be indicated. There is no punctuation between or following initials. Valid characters are the following: • alphabetic • blank
BLANKS ALLOWED:	Yes
COMMENTS:	Names are suppressed on the STATS file.
PROCESSING HISTORY:	N/A
P/T INFORMATION:	Depending on the year and jurisdiction, reporting for this variable is fragmented.

FIELD 25	BIRTHPLACE OF MOTHER: PROVINCE/TERRITORY/COUNTRY CODE

FIELD NAME: MOTHER_BIRTHPLACE_3DIGIT

POSITION: 173-175

LENGTH: 3

DESCRIPTION: Geographical code representing the province or territory of birth if the mother of the deceased was born in Canada or the country if the mother was born outside of Canada

VALID VALUES: The following link provides the current country codes. http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=366466.

Please see also document *CountryCode2013.xlsx* that accompanies the data and the following table.

Value	Meaning
909	Canada (province/territory unknown)
910	Newfoundland and Labrador
911	Prince Edward Island
912	Nova Scotia
913	New Brunswick
924	Quebec
935	Ontario
946	Manitoba
947	Saskatchewan
948	Alberta
959	British Columbia
960	Yukon
961	Northwest Territories
962	Nunavut

Value	Meaning
970	Soviet Union (Former USSR) (STC Code)
971	Czechoslovakia (Former) (STC Code)
972	Africa (STC Code)
973	Asia (STC Code)
974	Europe (STC Code)
975	South America (STC Code)
976	Central America (STC Code)
977	West Indies/Caribbean (STC Code)
978	Yugoslavia (Former) (STC Code)
979	Oceania (STC Code)
999	Unknown
000	Unknown
899	At sea

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: N/A

P/T INFORMATION: Depending on the year and jurisdiction, reporting for this variable is fragmented.

FIELD 26	DATE OF CERTIFICATION

FIELD NAME: CERTIFICATION_MONTH (176-177)
CERTIFICATION_DAY (178-179)
CERTIFICATION_YEAR (180-183)

POSITION: 176-183

LENGTH: 8

DESCRIPTION: Code representing the month (MM), day (DD), and year (YYYY) when the death was certified by the registrar.

VALID VALUES:

Value	Meaning
Month (MM)	Month the death was certified
01	January
02	February
03	March
04	April
05	May
06	June
07	July
08	August
09	September
10	October
11	November
12	December
99	Unknown
Day (DD)	
01-31	Day of the month the death was certified
99	Unknown
Year (YYYY)	Year the death was certified
9999	Unknown

BLANKS ALLOWED:	Yes
COMMENTS:	N/A
PROCESSING HISTORY:	N/A
P/T INFORMATION:	In Quebec, the date of certification is not collected.

FIELD 27	UNDERLYING CAUSE OF DEATH
FIELD NAME:	DEATH_CAUSE_4DIGITS
POSITION:	184-187
LENGTH:	4
DESCRIPTION:	The International Statistical Classification of Diseases and Related Health code representing the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury. Statistics Canada tabulates cause of death statistics based on the Underlying cause of death. The International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), contains approximately 12,700 codes; approximately 8,000 of these are valid for underlying cause of death. The remaining codes are used to classify injuries, poisoning, certain other consequences of external causes (S00 to T98 codes), and to classify the manifestation of conditions subject to dual classification (dagger and asterisk codes). The classification is divided into 21 chapters. Each chapter is subdivided in blocks of 3 character codes starting with a letter specific to the chapter. Precision to the 3 character code is available by looking at the fourth character which appears after a decimal point.
VALID VALUES:	The cause-of-death code reference file *ICD10_UnderlyingCauseOfDeaths.xlsx* provides information on valid values for the codes as well as information on when codes were added and deleted in annual updates to ICD-10. A similar file *ICD9_UnderlyingCauseOfDeaths.xls* provides a list of the valid codes for ICD-9. Additional information on the updates for 2013 appear in file *Summary2013_Dissemination.pdf* ; for years prior to 2013, the annual

updates are documented in the footnotes to the following CANSIM tables: http://www.statcan.gc.ca/pub/84-208-x/2012001/tbl-eng.htm

BLANKS ALLOWED: No

COMMENTS: The provincial and territorial vital statistics legislation specifies situations where the death is to be reported to the coroner or medical examiner. Coroner and medical examiner investigations are lengthy; it is possible that the final cause of death information is still outstanding when the data are released. In these situations, the underlying cause of death will be unknown (R99).

PROCESSING HISTORY: The following ICD revisions have been used over the years:

ICD revision	Years
ICD-10	2000-present
ICD-9	1979-1999
ICDA-8	1969-1978
ICD-7	1958-1968
ICD-6	1950-1957
ICD-5	1941-1949
ICD-4	1931-1940
ICD-3	1921-1930

The "Comparability of ICD-10 and ICD-09 for Mortality Statistics in Canada" presents a general description of how ICD-10 differs from ICD-9 and how the latest revision was implemented in Canada. It also presents the results of a comparability study that was done to measure the impacts of the new revision on mortality statistics in Canada. The complete report can be found under the following link: http://www.statcan.gc.ca/pub/84-548-x/84-548-x2005001-eng.htm

For external cause deaths coded to ICDA-8 and ICD-9 the underlying cause code is ALWAYS from the **E800-E999** range and the nature of injury code is ALWAYS from the **N800-N999** range, therefore the secret to deciphering an 800-999 code without an alpha prefix is where it is in

the record layout. If it's in the underlying cause of death field, it's an E code. If it's in the nature of injury field, it's an N code.

From 2000 to 2012, Statistics Canada had been using an automated ICD-10 mortality classification system developed and supported by the National Center for Health Statistics (NCHS) in the United States to code its mortality data. Quebec used a different system developed and supported by Inserm-CépiDc in France.

In 2013, Canadian Vital Statistics (CVS) implemented Iris, an automated cause of death coding system to code mortality data. Previously, the Mortality Medical Data System (MMDS) system was used in all provinces and territories with the exception of Quebec, where STYX (a derivation of MMDS) was used. The implementation of Iris enabled CVS to apply a series of ICD-10 updates, something that had not been included in the most recent version of MMDS used in Canada (MMDS 2011). The implementation of Iris has made CVS data more comparable internationally. A summary of the impact of replacing MMDS with Iris as the automated mortality classification system used in Canada is provided in *Appendix 2: Iris to Mortality Medical Data System (MMDS) Comparability*.

P/T INFORMATION:

Statistics Canada does the coding for all provinces and territories except for Quebec, Ontario and British Columbia.

In Quebec, the coroner's office does the coding for deaths that are reportable to the coroner. L'Institut de la statistique du Québec (ISQ) provides the coding for all deaths that are not reportable to the coroner. The ISQ does not make any changes to the ICD-10 codes received from the coroner's office. However, Statistics Canada may make changes to those codes during the data quality review; therefore counts available from the ISQ could be different from those released by Statistics Canada.

FIELD 28	LOCALITY OF DEATH

FIELD NAME: PLACEOFDEATH_LOCALITY

POSITION: 188

LENGTH: 1

DESCRIPTION: Code indicating the site where the death occurred (which is not necessarily where the death was certified).

VALID VALUES:

Value	Meaning
1	Hospital: Licensed to operate as hospital under provincial, territorial or federal government legislation.
2	Private home.
3	Other health care facility: Includes: nursing homes, other long-term care facilities, nursing stations, other short-term care facilities and other health care facilities not licensed to operate as hospitals by provincial, territorial or federal governments such as free standing birthing centres.
4	Other specified locality.
9	Unknown locality

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: N/A

P/T INFORMATION: Quebec: Deaths in residential and long-term care centers are included under “hospital”.

As of 2011, Saskatchewan implemented a new software system that now includes the option for “3”.

As of 2014, Saskatchewan no longer reports and code 2s (private home) for locality of death. These cases are now coded as 4s (other specified locality).

New Brunswick: Prior to 2016, Hospital (emergency room/out-patient and patients (dead on arrival) were coded as either ‘Hospital’, ‘Other Health Care Facility’, or ‘Other Specified Locality’. As of 2016, these deaths are coded only as ‘Other Specified Localities’, with only Hospital (in-patient) coded as ‘Hospital’.

FIELD 29	AUTOPSY PERFORMED

FIELD NAME: AUTOPSY_PERFORMED

POSITION: 189

LENGTH: 1

DESCRIPTION: Code indicating whether an autopsy was performed or not.

VALID VALUES:

Value	Meaning
1	Yes
2	No
9	Unknown

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: N/A

P/T INFORMATION: This information is not consistently provided by British Columbia and Ontario. When possible, it is added after consulting the image of the registration. For the period 2003 to 2012, data on autopsies in Ontario reflect information captured by front-line staff, often in the absence of a medical certificate of death. This information greatly underestimates the true number of autopsies performed in Ontario.

FIELD 30	AUTOPSY FINDINGS USED IN STATED UNDERLYING CAUSE OF DEATH

FIELD NAME: AUTOPSY_FINDINGS_USED

POSITION: 190

LENGTH: 1

DESCRIPTION: Code indicating whether the stated underlying cause of death takes into account autopsy findings. A death certificate may have been completed before the results of an autopsy were available.

VALID VALUES:

Value	Meaning
1	Autopsy performed and its results taken into account in determining the stated underlying cause of death.
2	Autopsy performed but results not taken into account in determining the stated underlying cause of death.
9	Autopsy performed but it is unknown if its results were taken into account in determining the stated underlying cause of death.
Blank	No autopsy, or unknown whether an autopsy was performed.

BLANKS ALLOWED: Yes

COMMENTS: N/A

PROCESSING HISTORY: N/A

P/T INFORMATION:	This information is not consistently provided by British Columbia and Ontario. When possible, it is added after consulting the image of the registration.

FIELD 31	FURTHER INFORMATION EXPECTED ON CAUSE OF DEATH

FIELD NAME: AUTOPSY_FURTHER_INFORMATION

POSITION: 191

LENGTH: 1

DESCRIPTION: Code indicating whether, at the time of completion of the death certificate, it was expected that there would be further information forthcoming on the underlying cause of death.

VALID VALUES:

Value	Meaning
1	Yes
2	No
9	Unknown

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: N/A

P/T INFORMATION: As of 2011 in Alberta, this information is not collected, as it is not in their new system.

This information is not consistently provided by British Columbia and Ontario.

FIELD 32	NATURE OF INJURY
FIELD NAME:	INJURY_NATURE_ICD
POSITION:	192-195
LENGTH:	4
DESCRIPTION:	ICDA-8 or ICD-9 code representing the fatal injury produced by the circumstances of the accident or violence (i.e. external cause) that caused the death.
VALID VALUES:	For external cause deaths coded to ICDA-8 and ICD-9 the underlying cause code is ALWAYS from the **E800-E999** range and the nature of injury code is ALWAYS from the **N800-N999** range, therefore the secret to deciphering an 800-999 code without an alpha prefix is where it is in the record layout. If it's in the underlying cause of death field, it's an E code. If it's in the nature of injury field, it's an N code. The nature of injury code reference file *ICD9_NatureOfInjury.xls* provides information on valid values for the codes.
BLANKS ALLOWED:	Yes
COMMENTS:	This variable was cancelled with the implementation of ICD-10 in 2000.
PROCESSING HISTORY:	N/A
P/T INFORMATION:	N/A

FIELD 33	LOCALITY OF INJURY

FIELD NAME: INJURY_LOCALITY

POSITION: 196

LENGTH: 1

DESCRIPTION: Code representing the site where the accident or poisoning occurred, if the underlying cause of death indicates an accident or poisoning.

VALID VALUES:

Value	Meaning
0	Home Includes: Apartment, boarding-house, residential caravan (trailer) park, farmhouse, home premises, house (residential), non-institutional place of residence, private driveway to home, private garage, private garden or yard to home, and swimming-pool in private house or garden. Excludes: Abandoned or derelict house (category 8), home under construction but not yet occupied (category 6) and institutional place of residence (category 1).
1	Residential institution Includes: Children's home, dormitory, home for the sick, hospice, military camp, nursing home, old people's home, orphanage, pensioner's home, prison, and reform school.
2	School, other institution and public administrative area

Value	Meaning
	Includes: Building (including adjacent grounds) used by the general public or by a particular group of the public such as assembly hall, campus, church, cinema, clubhouse, college, court-house, dancehall, day nursery, gallery, hospital, institute for higher education, kindergarten, library, movie-house, museum, music-hall, opera-house, post office, public hall, school (private, public or state), theatre, university, and youth centre. Excludes: Building under construction (category 6), residential institution (category 1) and sports and athletics area (category 3).
3	Sports and athletics area Includes: Baseball field, basketball-court, cricket ground, football field, golf-course, gymnasium, hockey field, riding-school, skating-rink, squash-court, stadium, public swimming-pool, and tennis-court. Excludes: Private swimming pool in private home or garden (category 0).
4	Street and highway Includes: Freeway, motorway, pavement, road, and sidewalk.
5	Trade and service area Includes: Airport, bank, café, casino, commercial garage, gas station, hotel, market, office building, petrol station, radio or television station, restaurant, service station, commercial shop, shopping mall, station (bus or railway), store, supermarket, and warehouse.

Value	Meaning
	Excludes: Garage in private home (category 0).
6	Industrial and construction area Includes: Building (any) under construction, dockyard, dry dock, factory (building or premises), gasworks, industrial yard, mine, oil rig, and other offshore installations, pit (coal, gravel, or sand), power-station (coal, nuclear, or oil), shipyard, tunnel under construction, and workshop.
7	Farm Includes: Farm buildings, farm land under cultivation, and ranch. Excludes: farmhouse and home premises of farm (category 0).
8	Other specified locality Includes: Beach, campsite, canal, caravan site NOS, derelict house, desert, dock NOS, forest, harbour, hill, lake, marsh, military training ground, mountain, park (amusement, public), parking-lot or parking-place, pond or pool, prairie, public space NOS, railway line, river, sea, seashore, stream , swamp, water reservoir, and zoo.
9	Unknown locality
Blank	Not applicable

BLANKS ALLOWED: Yes

COMMENTS: These values are different from those used in ICD-9. For further information on examples within each category, refer to the ICD-10, Volume 1, and Chapter 20.

PROCESSING HISTORY: N/A

P/T INFORMATION: Information not available for Ontario from 2003 – 2006.

In Alberta, “Mine, quarry” is mapped to “5” while “Public building” is mapped to “2”.

FIELD 34	DESIGNATION OF CERTIFIER

FIELD NAME: DESIGNATION_ATTENDANT

POSITION: 197

LENGTH: 1

DESCRIPTION: Code describing the designation of the person who certified the death.

VALID VALUES:

Value	Meaning
1	Medical doctor
2	Registered nurse
3	Midwife
4	Coroner/medical examiner
5	Other person
9	Unknown

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: N/A

P/T INFORMATION: In Alberta, only a medical doctor or medical examiner can certify a death.

Prior to 2014, only a medical doctor or coroner could certify a death in British Columbia. As of 2014, a nurse practitioner (classified here as registered nurse) can also certify deaths in British Columbia.

As of 2016, nurse practitioners in Saskatchewan and New Brunswick, as well as registered nurses in Ontario, can be designated certifiers.

Classification of nurse practitioners as registered nurses is not consistent across provinces and territories.

In Manitoba, event registrars at a nursing station can certify a death. These are mapped to “5”.

This variable is not received consistently from Ontario.

FIELD 35	DISPOSITION

ITEM NAME: DISPOSITION_BODY

POSITION: 198

LENGTH: 1

DESCRIPTION: Code indicating the manner in which the body was disposed.

VALID VALUES:

Value	Meaning
1	Burial
2	Cremation
3	Other disposition
9	Unknown

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: N/A

P/T INFORMATION: New Brunswick allows for choice of “Burial and Cremation” which Statistics Canada puts as “2”.

Alberta allows for a choice of “Department of Anatomy” which is mapped to “3”.

FIELD 36	IMPUTATION FLAG FOR SEX

ITEM NAME: IMP090R

POSITION: 199

LENGTH: 1

DESCRIPTION: Flag indicating whether or not the value of SEX is imputed.

VALID VALUES:

Value	Meaning
0	No Imputation
2	Imputed according to DEATH_CAUSE_4DIGITS or probabilities determined using a logistic regression model

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: Available as of 2013 reference year.

P/T INFORMATION: N/A

FIELD 37	IMPUTATION FLAG FOR DATE OF BIRTH

ITEM NAME: IMP100R

POSITION: 200

LENGTH: 1

DESCRIPTION: Flag indicating whether or not the values of variables pertaining to the decedent's date of birth are imputed.

VALID VALUES:

Value	Meaning
0	No Imputation
1	Imputation of all date fields (BIRTH_YEAR, _MONTH, _DAY)
2	Partial imputation of date fields (BIRTH_MONTH and _DAY)
3	Partial imputation of date fields (BIRTH_DAY)

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: Available as of 2013 reference year.

P/T INFORMATION: N/A

FIELD 38	IMPUTATION FLAG FOR AGE CODE

ITEM NAME: IMP110R

POSITION: 201

LENGTH: 1

DESCRIPTION: Flag indicating whether or not the value of AGE_CODE is imputed.

VALID VALUES:

Value	Meaning
0	No imputation
1	Calculated from given dates of birth and death
2	Imputed using DEATH_CAUSE_4DIGITS and median age from prior 10 years of data

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: Available as of 2013 reference year.

P/T INFORMATION: N/A

FIELD 39	IMPUTATION FLAG FOR AGE VALUE

ITEM NAME: IMP120R

POSITION: 202

LENGTH: 1

DESCRIPTION: Flag indicating whether or not the value of AGE_VALUE is imputed.

VALID VALUES:

Value	Meaning
0	No imputation
1	Calculated from given dates of birth and death
2	Imputed using DEATH_CAUSE_4DIGITS and median age from prior 10 years of data

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: Available as of 2013 reference year.

P/T INFORMATION: N/A

FIELD 40	IMPUTATION FLAG FOR RESIDENCE_PROVINCE_3DIGIT

ITEM NAME: IMP140R

POSITION: 203

LENGTH: 1

DESCRIPTION: Flag indicating whether or not the value of RESIDENCE_PROVINCE_3DIGIT is imputed.

VALID VALUES:

Value	Meaning
0	No imputation
1	Imputed as province of occurrence

BLANKS ALLOWED: No

COMMENTS: N/A

PROCESSING HISTORY: Available as of 2013 reference year.

P/T INFORMATION: N/A

PCCF+ FIELDS

See Record Layout for information (field name, length, position, type and item name) regarding the variables produced by PCCF+ (Postal Code Conversion File Plus). For additional information, please refer to the version-specific PCCF+ user guide.

The following table provides the version of PCCF+ used for each data year.

Year(s)	PCCF+ version
2000-2008	5E
2009	5J3
2010	5K0
2011-2016	6D

MULTIPLE CAUSE CODES – ENTITY AXIS

ITEM NAME: EA_MC1 – EA_MC20

ELEMENT ID: N/A
MCOSITION: N/A

LENGTH: 6 positions each

DESCRIPTION: This information is kept in a separate file.

The 20 variables contain the other causes and conditions listed on the death certificate that led to the death.

Entity-Axis multiple cause codes are six positions each, and formats are as follows:

1st position: Part/line number of where the cause was entered on the death certificate. These codes can be understood as:

Part I. Line a	1
Part I. Line b	2
Part I. Line c	3
Part I. Line d	4
Part I. Line e	5
Part II	6

2nd position: Sequence within line with values 1-8

3rd to 6th position: ICD-10 code

See *Appendix 1: Multiple Cause of Death File* and 'Underlying Cause of Death' for more information about multiple causes of death and ICD-10 codes.

VALID VALUES:	The cause-of-death code reference files *ICD10_UnderlyingCauseOfDeaths.xlsx* and *ICD10_NatureOfInjury.xls* provide information on valid values for the codes.
BLANKS ALLOWED:	Yes
COMMENTS:	Other than normal coding activities, these variables have undergone no other validation.
PROCESSING HISTORY:	These variables are available as of reference year 2000.
P/T INFORMATION:	N/A

MULTIPLE CAUSE OF DEATH – RECORD AXIS

FIELD NAME:	RA_MC1 – RA_MC20
ELEMENT ID:	N/A
POSITION:	N/A
LENGTH:	4 positions each
DESCRIPTION:	This information is kept in a separate file. The 20 variables contain the other causes and conditions listed on the death certificate that led to the death. See *Appendix 1: Multiple Cause of Death File* and 'Underlying Cause of Death' for more information about multiple causes of death and ICD-10 codes.
VALID VALUES:	The cause-of-death code reference files *ICD10_UnderlyingCauseOfDeaths.xlsx* and *ICD10_NatureOfInjury.xls* provide information on valid values for the codes.
BLANKS ALLOWED:	Yes
COMMENTS:	Other than normal coding activities, these variables have undergone no other validation.
PROCESSING HISTORY:	These variables are available as of reference year 2000.
P/T INFORMATION:	For all provinces excluding Quebec, Ontario and British Columbia, the RECORD AXIS codes have gone through additional processing (when compared to the ENTITY AXIS codes) that link pairs of codes to remove redundancy.

APPENDIX 1 MULTIPLE CAUSE OF DEATH FILE

The following paper describes how multiple cause of death data contains additional information that is not always obvious when analysing death data by looking only at the underlying cause of death. The article provides an overview of the collection, processing, coverage, and potential uses of multiple cause data and illustrates its use for select diseases and conditions.

Multiple cause of death file

Introduction

In Canada, in accordance with international standards, deaths are classified and tabulated by a single underlying cause. (1) However, in most cases, several conditions or diseases are reported as causing the death. Accordingly, most research has relied on cause-specific mortality data to analyze disease prevalence, understand disease etiology, and examine patterns over time. Focus on a single underlying cause is useful for diseases and conditions that are isolated in nature, such as acute and infectious disease. However, chronic conditions are now the major causes of death, many of which are difficult to classify by a single cause and represent a number of coexisting conditions. (2-5) These other conditions or diseases comprise the *multiple causes of death* and contain additional information about the details of the death.

Except for specific research projects, multiple cause data have only recently become available in Canada. (6-7) Statistics Canada's multiple cause of death dataset electronically captures underlying and additional causes reported on death certificates. This article provides an overview of the collection, processing, coverage, and potential uses of multiple cause data and illustrates its use for select diseases and conditions.

What are multiple causes of death?

There were approximately 239,000 deaths per year in Canada. (8) Of the deaths registered between 2000 and 2016, only 18% reported just one cause of death. There was no information reported on multiple cause of death for about 2% of the deaths. The remaining 80% reported more than one cause of death (Table 1).

Table 1: Deaths, Percentage of Causes Reported, 2000 – 2016

Number of Causes Reported	Percentage of Total Deaths
No data	2%
Single cause only	18%
2 causes	24%
3 causes	22%
4 causes	15%
5 causes	9%
6 or more causes	10%

Source: Statistics Canada, Vital Statistics Death Database, Multiple Cause of Death File, 2000-2016

Mortality data are collected by provincial and territorial registries of vital statistics, which are responsible for the registration of deaths that occur in their jurisdictions. All causes entered on a death certificate are captured and coded.

The Data

Deaths in Canada are registered in two parts: first, the medical certificate of cause of death is completed by a certifier (usually a physician or nurse); second, a death registration form is completed by the provincial or territorial registrar. Every province and territory has a different death registration form, however a standard medical certificate of cause of death recommended internationally by the World Health Organization (WHO) is used across all jurisdictions. (9) The medical certificate of cause of death contains the immediate cause of death, the antecedent causes of death including the underlying cause, as well as other significant conditions contributing to the death.

In most official statistics and research, only the underlying cause of death is considered. This is despite only 18% of deaths having a single reported cause. Multiple cause data, on the other hand, provide information on other diseases reported on the death certificate, on associations among diseases/comorbidities, and on injuries reported when deaths result from an external cause.

The underlying cause of death (UCD) is defined by the WHO as *the disease or injury that initiated the train of events leading directly to death or the circumstances of the accident or violence that produced the fatal injury* (10). In a properly completed certificate, the cause entered alone on the lowest used line of Part 1 is selected as the underlying cause, which is what is used in tabulating cause of death. In Figure 1A, lung cancer is the underlying cause of death (as it is the cause entered alone on the lowest used line of Part 1) and represents the disease that initiated the train of events leading directly to death. For this example, lung cancer led to immuno-suppression, which caused pneumonia, which gave rise to cardio-respiratory failure.

Figure 1A: Example of a medical certificate of death

Cause of death		Approximate interval between onset and death
I Disease or condition directly leading to death*	(a) cardio-repiratory failure	
	due to (or as a consequence of)	
Antecedent causes *Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last*	(b) pneumonia	
	due to (or as a consequence of)	
	(c) immunosuppression	
	due to (or as a consequence of)	
	(d) cancer of lung	
II Other significant conditions contributing to the death, but not related to the disease or condition causing it		
**This does not mean the mode of dying, e.g. heart failure, respiratroy failure. It means the disease, injury, or complication that caused death.*		

Although the underlying cause should be entered alone on the lowest used line of Part 1, sometimes several conditions are entered on this and the other lines. When this happens, the underlying cause is selected using rules specified by WHO.

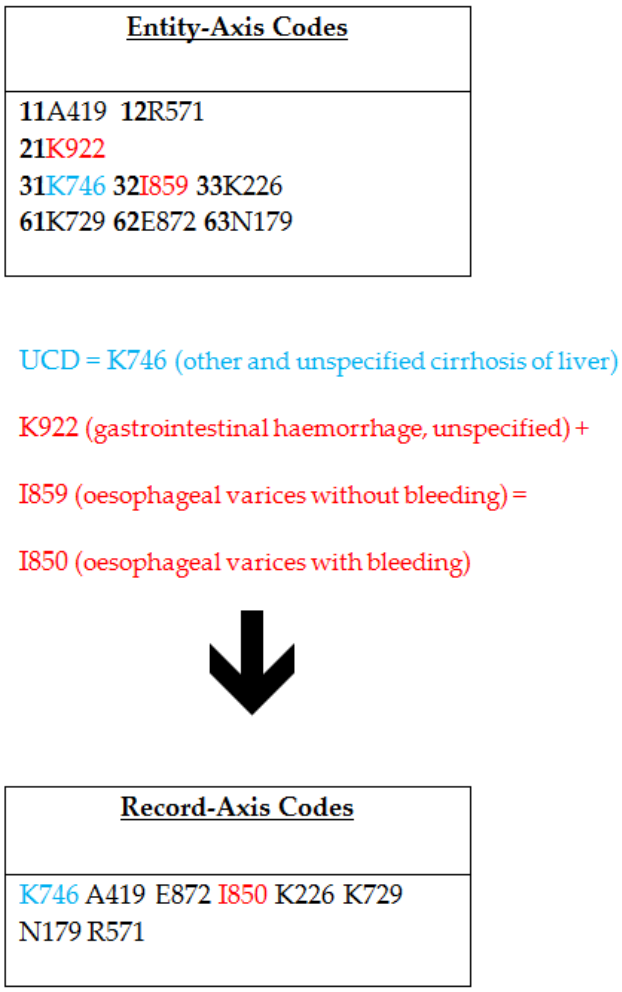
Figure 1B: Example of a medical certificate of death

Cause of death		Approximate interval between onset and death
I Disease or condition directly leading to death*	(a) **septicemia, hypovolemic shock**	
	due to (or as a consequence of)	
Antecedent causes *Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last*	(b) **GI hemorrhage**	
	due to (or as a consequence of)	
	(c) **liver cirrhosis, esophageal varices, Mallory-Weiss Syndrome**	
	due to (or as a consequence of)	
	(d)	
II Other significant conditions contributing to the death, but not related to the disease or condition causing it	**liver failure, acidosis, acute renal failure**	
**This does not mean the mode of dying, e.g. heart failure, respiratroy failure. It means the disease, injury, or complication that caused death.*		

In Figure 1B, all of the 9 causes listed, i.e. septicemia, hypovolemic shock, GI hemorrhage, liver cirrhosis, esophageal varices, Mallory Weiss syndrome, and in Part 2 liver failure, acidosis, and acute renal failure are given an ICD-10 code. ICD-10 is the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD), a statistical classification promulgated by the World Health Organization. The cause of death codes are then processed using an automated mortality classification

software[1] to select the underlying cause of death according to the WHO rules. In the example, three conditions are listed in the lowest used line of Part 1, therefore additional WHO rules are applied and the underlying cause of death is selected as "other and unspecified cirrhosis of liver" (K746).

Figure 2: Automated coding of multiple causes



[1] The classification software used is the Automated Coding of Medical Entities (ACME) computing software

All cause of death information is reflected in a single variable called the entity-axis codes, which is a string of text containing up to 20 multiple cause codes (see Figure 2). The codes in the entity-axis variable also contain the part, line and sequence number of where the cause was found on the medical certificate of cause of death.

Figure 2 shows an application of code linkage. In the entity-axis variable, "gastrointestinal haemorrhage, unspecified" (K922) and "oesophageal varices without bleeding" (I859) are specified. These two are linked and combined to "oesophageal varices with bleeding" (I850) in the record-axis variable. Code linkage occurs in about 12% of multiple cause records[1]. Depending on the nature of the analysis, both the entity-axis and record-axis variables are of value.

Discussion

This paper presents an example of multiple cause information being used to augment single cause mortality statistics. In the following example, deaths by drowning and non-fatal submersion are examined in greater detail using underlying and multiple causes combined. When a person drowns, drowning is reported on the death certificate as either the underlying cause of death or as one of the multiple causes. If the latter happens, without looking at the multiple cause data, the true impact of drowning as a cause of death would not be completely understood. Table 2 presents the total and percentage of underlying causes where drowning was included in the multiple cause codes.

Table 2: Total and percentage of underlying causes for deaths where drowning is listed as a multiple cause, 2000-2010, both sexes, all-ages, Canada

Underlying Cause	Total	Percentage
Accidental drowning and submersion (W65-W74)	2,815	41.9%
Intentional self-harm (X60-X84)	1,250	18.6%
Water transport accidents (V90-V94)	855	12.7%
Land transport accidents (V01-V89)	695	10.3%
Drowning and submersion, undetermined intent (Y21)	450	6.7%
Other	325	4.8%
Epilepsy (G40)	70	1.0%
Falls (W00-W19)	70	1.0%

[1] Excluding records received from Ontario

Underlying Cause	Total	Percentage
Air and space transport accidents (V95-V97)	65	1.0%
Assault (X85-Y09)	45	0.7%
Exposure to forces of nature (X30-X39)	40	0.6%
Accidental poisoning by and exposure to noxious substances (X40-X49)	25	0.4%
Inanimate mechanical forces (W20-W49)	10	0.1%

Source: Statistics Canada, Vital Statistics Death Database, Multiple Cause of Death File, 2000-2010

Note: The counts in this table have been rounded to a neighbouring multiple of 5 to meet the confidentiality requirements of the *Statistics Act*; percentages were calculated based on the rounded numbers.

Out of all the times drowning was listed in the multiple causes, 41.9% were primarily attributable to a*ccidental drowning and submersion* (W65-W74), 18.6% were attributable to i*ntentional self-harm* (X60-X84), 6.7% were attributable to *Drowning and submersion, undetermined intent* (Y21), but the remaining 32.8% were attributed to non-drowning underlying causes . Thus, the additional information on the multiple causes of death suggests that, based on underlying cause alone, drowning may be under-reported as a cause of death in official statistics.

Data coverage

The number of records missing multiple cause information is low (2.2% for years 2000 to 2013), however the degree of missingness differs by year, province, age, sex and cause of death. Using the 2000 to 2010 data, logistic regression was used to determine if missingness is evenly distributed by sex, age, manner of death, by urban or rural status, and by neighbourhood income quintile. The results indicate that missingness in the multiple cause information between 2000 and 2010 is not evenly distributed for all variables, which suggests a potential for bias. For example, missingness was higher among male decedents than female; higher among ages 1 to 24 and lower among ages 40 and older when compared to the 35 to 40 age group; it was higher among rural areas than urban; higher among

accidental deaths, suicides and homicides than natural deaths; and missingness is lower among low and high neighbourhood income quintiles when compared to the middle income quintile.[1]

References

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[1] Low neighbourhood income quintiles refer to income quintile 1 and 2, high neighbourhood income quintiles refer to income quintile 4 and 5, middle neighbourhood income quintile refer to income quintile 3.

Iris to Mortality Medical Data System (MMDS) Comparability

In 2013, the Canadian Vital Statistics (CVS) program implemented Iris, an automated cause of death coding system to code mortality data. Iris automates the application of the International Classification of Diseases 10th Revision (ICD-10) rules and guidelines to select the underlying cause of death for statistical tabulations, promulgated and updated by the World Health Organization (WHO). Language-independent, Iris can work with different input dictionaries designed to automatically assign ICD-10 codes to each cause of death reported on a certificate. Previously, the Mortality Medical Data System (MMDS) was used in all provinces and territories with the exception of Quebec, where STYX (a derivation of MMDS) was used.

The implementation of Iris enabled CVS to apply a series of ICD-10 updates, something that had not been included in the most recent version of MMDS used in Canada (MMDS 2011). The implementation of Iris has made CVS data more comparable internationally.

The following summary will assess the impact of replacing MMDS with Iris as the automated mortality classification system used in Canada. In order to do this, two methods were employed. First, the differences between Iris and MMDS were quantified on a sample of 2012 mortality data, where 47,389 death records were processed in both the MMDS and Iris systems. This sample included deaths occurring in nine of the thirteen provinces and territories with the exception of British Columbia, Ontario, Quebec and New Brunswick. Only records for which the underlying cause of death code was automatically selected by both systems (i.e. no manual coding intervention) were compared. The second method included a deeper analysis of the differences in cause of death coding between our final 2012 mortality data, coded in MMDS and our final 2013 mortality data, coded in Iris. This second method included deaths occurring in all provinces and territories for which the deceased was a resident of Canada. The results from both methods will be discussed by chapter in the results section below.

Results

Changes to cause of death coding resulting from the implementation of Iris, by chapter

Some of the results of our Iris/MMDS comparability study were different from those of our colleagues in the United Kingdom and in Australia because a more up-to-date version of MMDS (Version 2011) was in

use in Canada when the switch to Iris was made. Also, we were not able to assess the impact of Iris on some mortality trends observed in the Quebec data because, prior to implementation of Iris, Quebec was using Styx, an automated system based on MMDS, to which we do not have access.

Chapter I: Certain infectious and parasitic diseases (ICD-10 codes A00–B99)

Overall, the number of deaths assigned to this chapter decreased by 15.7% from 2012 to 2013, the biggest decrease to have occurred between consecutive years since 2000.

The chapter level decrease could be attributed to WHO updates to causal relationships, expanding the list of diseases that infectious diseases could be due to. This update, included in the Iris decision tables for assessing causal relationships, was much more expansive than the decision tables in MMDS. For this reason deaths coded to infectious diseases in MMDS were, if reported with acceptable causes, coded to the other conditions in Iris. This precipitated a:

- Decrease in A04.7 (Enterocolitis due to *Clostridium Difficile)*
- Decrease in A09.0 (Other and unspecified gastroenteritis and colitis of infectious origin)
- Decrease in B20-B24 (Human Immunodeficiency Virus [HIV] disease)

Chapter II: Neoplasms (ICD-10 codes C00–D48)

The number of deaths assigned to this chapter increased only slightly (1.1%) from 2012 to 2013. Though this change was one of the smaller ones to have occurred since 2000, a number of updates to WHO rules and guidelines implemented with Iris may have affected UCODs within the chapter.

For example, as the result of WHO updates to UCOD coding instructions implemented in Iris, the codes C77 (Secondary and unspecified malignant neoplasm of lymph nodes), C78 (Secondary malignant neoplasm of respiratory and digestive organs), C79 (Secondary malignant neoplasm of other and unspecified sites), and C97 (Malignant neoplasms of independent (primary) multiple sites) became invalid for UCOD. The termination of these codes resulted in C00-C76 (Other primary malignant neoplasms) or C80.9 (Malignant neoplasm, primary site unspecified) being chosen as UCOD instead. This change may have explained part or all of the increase in codes within C00-C76.

Another WHO update included the addition of four character subcategories to C80 (Malignant neoplasm without specification of site). Deaths previously attributed to C80 in MMDS were assigned to C80.0 (Malignant neoplasm, primary site unknown, so stated) or to C80.9 (Malignant neoplasm, primary site unspecified) in Iris.

Decreases in certain codes within C00-C96 (Malignant neoplasms) may have been the result of WHO updates to causal relationships. More specifically, reflected in Iris decision tables, J44.0-J44.9 (Chronic obstructive pulmonary disease) (COPD) could be due to a reduced list of malignant neoplasms in comparison to that included in MMDS. For this reason, MMDS coded more deaths to categories within C00-C96 when COPD was reported as due to malignant neoplasms while Iris coded some of these same deaths to COPD. This was seen to precipitate a:

- Decrease in C83.3 (Diffuse large B-cell lymphoma)
- Decrease in C88.0 (Waldenström's macroglobulinaemia)

A WHO update to the code assignment for Chronic myelomonocytic leukaemia, included in the English dictionary for Iris input, may have explained an increase in deaths from C93.1 (Chronic myelomonocytic leukaemia) and a decrease in deaths from C92.7 (Other myeloid leukaemia) .

Finally, a WHO update to the code assignment for T-cell lymphoma, included in the English dictionary for Iris input, may have explained an increase in deaths from C84.4 (Peripheral T-cell lymphoma, not elsewhere classified) and a decrease in deaths from C84.5 (Other mature T/NK-cell lymphomas) . T-cell lymphoma, previously assigned to C84.5 in MMDS, was assigned to C88.4 in Iris.

Chapter III: Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (ICD-10 codes D50–D89)

This chapter saw an increase of 3.9% from 2012 to 2013, one of the smaller changes that has occurred since 2000. The implementation of Iris had no discernible impact on the coding of causes of death to this chapter.

Chapter IV: Endocrine, nutritional and metabolic diseases (ICD-10 codes E00–E90)

A small increase of 0.8% occurred in deaths caused by Endocrine, nutritional and metabolic diseases, from 2012 to 2013, one of the smaller changes to have occurred since 2000. Nevertheless, within chapter shifts, particularly in the Diabetes mellitus (E10-E14) block occurred from 2012 to 2013, reflecting numerous WHO updates to combinations made between diabetes and complications of diabetes. The fact that such updates were included in Iris precipitated shifts within the four characters subcategories of E10-E14 when compared to the same deaths coded in MMDS.

Chapter V: Mental and behavioural disorders (ICD-10 codes F00–F99)

The number of deaths due to mental and behavioral disorders increased by 14.4% from 2012 to 2013.

The increase in Chapter V deaths could be largely attributed to the increase in deaths due to F03 (Unspecified dementia). At least a part of this trend was explained by the WHO update to include J69.0 (Pneumonitis due to food and vomit) in the range of pneumonias that were considered to be obvious consequences of F03. Another factor contributing to this increase was the update to the code for chest infection from J98.8 in MMDS to J22 in Iris, and the obvious consequence relationship that J22 had with F03. The net result of this update was that many deaths coded to J69.0 and J98.8 in MMDS were coded to F03 in Iris.

Chapter VI: Diseases of the nervous system (ICD-10 codes G00–G99)

The increase in deaths from Diseases of the nervous system was relatively small (2.2%) from 2012 to 2013.

Still, two prominent intra-chapter shifts occurred because of WHO updates to the code assignment for two diseases. First, progressive supranuclear palsy, previously coded to G12.2 (Motor neuron disease) in MMDS was updated to be included in G23.1 (Progressive supranuclear opthamoplegia) in Iris. Second, multiple systemic (brain) (CNS) atrophy, previously coded to G31.8 (Other specified degenerative diseases of the nervous system) in MMDS was updated to be included in G90.3 (Multi-system degeneration) in Iris.

Chapter VII: Diseases of the eye and adnexa (ICD-10 codes H00–H59)

The number of deaths assigned to Chapter VII was very small and no changes were noted from 2012 to 2013. The implementation of Iris had no discernible impact on the coding of causes of death to this chapter.

Chapter VIII: Diseases of the ear and mastoid process (ICD-10 codes H60–H95)

The number of deaths assigned to Chapter VIII was very small and little change was noted from 2012 to 2013. The implementation of Iris had no discernible impact on the coding of causes of death to this chapter.

Chapter IX: Diseases of the circulatory system (ICD-10 codes I00–I99)

Diseases of the circulatory system increased by 2.2% from 2012 to 2013. Although a small absolute change, this increase was the greatest to have occurred since 2000.

The chapter level increase may be the result of a WHO update to causal relationships. More specifically, in Iris, Unspecified dementia (F03) could be due to an expanded list of Diseases of the circulatory

system, in comparison to MMDS's more reduced list. For this reason, MMDS coded more F03 deaths when F03 was reported as due to a circulatory system diseases, while Iris coded many of these same deaths to circulatory system diseases.

An update to causal relationships may also be the reason for an increase in deaths from I20-I25 (Ischaemic heart disease). In Iris, Ischaemic heart disease could be due to a reduced list of accepted causes, in comparison to MMDS where, for example, a causal relationship was present between I20-I25 and N17-19 (renal failure). For this reason, MMDS coded more N17-N19 deaths when I20-I25 was reported as due to N17-N19, while Iris coded these same deaths to I20-I25.

A WHO update that caused a shift within the Diseases of the circulatory system chapter was the expanded linkage relationship between I50 (Heart failure) and I51.4-I51.9 (Complications and ill-defined descriptions of heart disease) with I10 (Hypertension) as well as with I12 (Hypertensive renal disease). The net result of this update was that more deaths with combinations of these conditions reported were coded to subcategories in I11 and I13 and fewer to subcategories of I12 when coded with Iris as compared to MMDS. This precipitated an:

- Increase in I11.0 (Hypertensive heart disease with (congestive) heart failure)
- Increase in I11.9 ((Hypertensive heart disease without (congestive) heart failure)
- Decrease in I12.0 (Hypertensive renal disease with renal failure)
- Increase in I13.2 (Hypertensive heart and renal disease with both (congestive) heart failure and renal failure)

The implementation of WHO updates to causal relationships may be the reason for a decrease in some Diseases of the circulatory system. More specifically, only I26.9 (Pulmonary embolism without mention of acute cor pulmonale) and I27.1 (kyphoscoliotic heart disease) were acceptable causes of J43 (Emphysema) and J44- (Other chronic obstructive pulmonary disease) in Iris, in comparison to MMDS's more expansive list. For this reason, MMDS coded more circulatory system deaths when J43 or J44 were reported as due to circulatory system diseases and, while Iris coded these same deaths to J43.0-J44.9. This is thought to have precipitated a:

- Decrease in I27.9 (Pulmonary heart disease, unspecified)
- Decrease in I34.0 (Mitral (valve) insufficiency)
- Decrease in I51.7 (Cardiomegaly)
- Decrease in I51.8 (Other ill-defined hearth diseases)
- Decrease in I69.8 (Sequelae of other and unspecified cerebrovascular disease)

Finally, another WHO update included the addition of four character subcategories to I48 (Atrial fibrillation and flutter). Deaths previously attributed to I48 (unless impacted by another update) in MMDS were assigned to four character subcategories of I48 in Iris.

Chapter X: Diseases of the respiratory system (ICD-10 codes J00–J99)

Deaths due to diseases of the respiratory system increased by 4.8% from 2012 to 2013. Although not one of the highest changes witnessed over time, impact from the implementation of Iris was noticed.

The chapter level increase may be explained by a WHO update to relevant causal relationships reflected in Iris, where J44.0-J44.9 (COPD) could be due to a reduced list of accepted causes, in comparison to MMDS's more expansive list. For this reason, MMDS coded more deaths to C00-C096 and I00-I99 when COPD was certified as due to C00-C96 or I00-I99, while Iris coded these same deaths to J44.0-J44.9.

While there was an increase in deaths due to diseases of the respiratory system at the chapter level there was a decrease in the number of deaths due to J69.0 (Pneumonitis due to food and vomit) (aspiration pneumonia). This decrease was due to the WHO update adding aspiration pneumonia (J690) to the group of pneumonias considered to be an obvious consequence of many conditions. The net result of this update was that many deaths coded to J69.0 in MMDS were coded to other causes of death in Iris. This expansion of the obvious consequence relationships for J69.0 also caused some intra-chapter shifts when J69.0 was reported with other conditions of which it was considered an obvious consequence in Iris. For example, deaths due to J45 (Asthma) may have increased in part due to a WHO update making J69.0 an obvious consequence of J45.9. The net result of this update was that many deaths coded to J69.0 in MMDS were coded to J45.9 in Iris.

Also, a WHO update to add an index entry for chest infection, provisionally coded to J98.8 (Other respiratory disorders), assigning it to J22 (Unspecified lower respiratory infection). The result of this update was that many deaths previously coded to J98.8 in MMDS were coded to J22 or other causes within the chapter (depending on J22's relationships with other causes on the certificate) in Iris.

Chapter XI: Diseases of the digestive system (ICD-10 codes K00–K93)

Deaths resulting from diseases of the digestive system increased by 5.1% from 2012 to 2013, the second biggest increase since 2000, however no major updates were found to have influenced this trend.

Still, a significant within chapter shift occurred because of a WHO update to add an index entry for non-alcoholic steatohepatitis, provisionally coded to K76.0 (Fatty (change of) liver, not elsewhere classified),

assigning it to K75.8 (Other specified inflammatory liver diseases). The impact of this update was that many deaths previously coded to K76.0 in MMDS were coded to K75.8 in Iris.

Chapter XII: Diseases of the skin and subcutaneous tissue (ICD-10 codes L00–L99)

A 24.4% increase occurred in deaths caused by Diseases of the skin and subcutaneous tissue from 2012 to 2013, the second highest increase since 2000. However, it is important to analyse this trend with caution as the sample size for deaths in this chapter was small. Moreover, the implementation of Iris had no discernible impact on the coding of causes of death to this chapter.

Chapter XIII: Diseases of the musculoskeletal system and connective tissue (ICD-10 codes M00–M99)

Deaths resulting from Diseases to the musculoskeletal system and connective tissue increased by 10.9% from 2012 to 2013. The implementation of Iris had no discernible impact on the coding of causes of death to this chapter.

Chapter XIV: Diseases of the genitourinary system (ICD-10 codes N00–N99)

Deaths caused by Diseases of the genitourinary system decreased by 5.6% from 2012 to 2013.

The decrease in Genitourinary system deaths may be in part due to the implementation of the WHO update to causal relationships, namely the relationships between Ischaemic heart disease (I20-I25) and Renal failure (N17-N19) and between forms of Bronchitis (J40-42) and certain types of kidney disease (N18.5-N19) that were present in MMDS but not in Iris. For this reason, MMDS coded more deaths to N17-N19 or N18.5-N19, while Iris coded these same deaths to I20-I25 or J40-J42, respectively, precipitating a:

- Decrease in N18.9 (Chronic kidney disease, unspecified)
- Decrease in N19 (Kidney failure, unspecified)

Possibly exacerbating the impact of this update was a change to the English dictionary for Iris input. Chronic kidney disease, previously assigned to N03.9 (Unspecified chronic nephritic syndrome) in MMDS, was assigned to N18.9 (Unspecified chronic kidney disease) in Iris.

Chapter XV: Pregnancy, childbirth and the puerperium (ICD-10 codes O00–O99)

There was a 5.6% increase in deaths due to Pregnancy, childbirth and the puerperium from 2012 to 2013. The implementation of Iris had no discernible impact on the coding of causes of death to this chapter.

Chapter XVI: Certain conditions originating in the perinatal period (ICD-10 codes P00–P96)

Deaths due to Certain conditions originating in the perinatal period increased by 3.9% from 2012 to 2013. The implementation of Iris had no discernible impact on the coding of causes of death to this chapter.

Chapter XVII: Congenital malformations, deformations and chromosomal abnormalities (ICD-10 codes Q00–Q99)

Deaths resulting from congenital malformations, deformations and chromosomal abnormalities increased by 1.1% from 2012 to 2013.

The increase in deaths in this chapter could be largely attributed to the 32.4% increase in deaths due to Down syndrome (Q90.9). A WHO update where F03 (Unspecified dementia) was an obvious consequence of Down syndrome was included in Iris. The net result was that many deaths coded to F03 in MMDS were coded to Q90.9 in Iris.

Chapter XVIII: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (ICD-10 codes R00–R99)

From 2012 to 2013, deaths due to Symptoms, signs and abnormal clinical and laboratory finding, not elsewhere classified increased by 2.2%.

Within Chapter XVIII, a small shift occurred in some deaths coded to R54 (Senility) moving to R53 (Malaise and fatigue). In MMDS, age-related debility was coded as a multiple-term entity to R54 and R53, as both “age” and “debility” were taken into consideration when coding. However in Iris, age-related debility was coded as a one-term entity to R53.

Chapter XX: External causes of morbidity and mortality (ICD-10 codes U50.9, V01–Y89)

Deaths resulting from external causes of mortality showed a small increase of 1.5% from 2012 to 2013, although this is not thought to be due to the implementation of Iris as there were no major updates affecting coding in this chapter.