

The implementation of ICD-10 for Cause of Death Coding

Change from ICD-9 to ICD-10

The Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) was approved by the World Health Organization in 1990 and has been available for implementation since 1993. The General Register Office for Northern Ireland introduced ICD-10 to replace ICD-9 for classifying deaths from 1 January 2001.

The International Classification of Diseases (ICD) is used to code and classify mortality data from death certificates. ICD-10 is copyrighted by the World Health Organization (WHO), which owns and publishes the classification.

ICD-10 was developed following a thorough evaluation by a Technical Advisory Panel and extensive additional consultation with physician groups, clinical coders, and others to assure clinical accuracy and utility.

The main changes between ICD-10 compare to ICD-9

The primary intent of developing new revisions is to incorporate advances in medical knowledge. Each successive revision has a similar core to the previous revision. Compared with ICD-9, ICD-10 has:

- used alphanumeric codes instead of numeric codes (e.g. the code for diabetes mellitus was 250 in ICD-9 and is E10-E14 in ICD-10);
- moved some conditions around the classification (e.g., hemorrhage has been moved from the circulatory chapter in ICD-9 to the symptoms and signs chapter in ICD-10);
- expanded details of many conditions (e.g., viral hepatitis has been expanded from ICD-9 070, a single 3-digit category, to ICD-10 B15-B19, five 3-digit categories);
- modified coding rules (e.g., the ICD-9 "Old pneumonia, influenza, and maternal conditions" and "Error and accidents in medical care" coding rules have been eliminated); and
- ICD-10 uses a total of some 8,000 unique codes, over 3,000 more than ICD-9.

In total ICD-10 has 21 chapters with alphanumeric categories and subcategories compared with 17 chapters in ICD-9. ICD-10 has an expanded scope, compared to ICD-9 including conditions and situations which are not diseases but represent risk factors to health, such as occupational and environmental factors, lifestyle and psycho-social circumstances.

New areas covered

New areas covered include recently identified conditions such as AIDS/HIV and any chromosomal abnormalities. Additionally, there is

much greater detail for certain important conditions, for example acute myocardial infarction. There is also a substantial increase in the number of codes covering perinatal conditions.

Selection and modification rules

The selection and modification rules have been changed significantly for ICD-10. The most important change is to selection Rule 3, which covers the circumstances where particular conditions can be assumed to be a direct consequence of another condition, reported on the death certificate. In ICD-10 the wording of Rule 3 is similar to that in ICD-9. However, there are further explanatory notes in ICD-10 that substantially widen its scope. Of most significance is a note referring to pneumonia and bronchopneumonia. Another important change to the application of the rules concerns the way in which the primary site of malignant neoplasms is selected, and in particular the creation of a new code (C97) covering 'malignant neoplasms of independent (primary) multiple sites'.

Bridge-coding exercise

It was hoped that following the introduction of ICD-10 in 2001, the General Register Office would bridge-code all or part of the year 2000 so comparisons could be made between ICD-9 and ICD-10. Due to competing work pressures, for example the new marriage law, it was not possible to complete the work in time for this report so the bridge-coding exercise will be included in the 2003 Registrar General's Report. Instead this year's report presents results from relevant bridge-coding exercises in England and Wales and Scotland.

England and Wales and Scotland carried out a bridge-coding exercise on the year 1999. For England and Wales this involved comparing over 550,000 deaths and in Scotland the exercise was carried out on just over 60,000 deaths.

Comparability Ratios

The following tables show how the change in classification has affected the broad groups of causes of death in England and Wales and Scotland. These are simply the ratios of the numbers of deaths classified to comparable causes under the two classifications. The comparability ratios reflect the net effect and therefore a ratio of 1.00 does not necessarily mean 100 per cent correspondence between the two classifications; it may merely reflect compensating gains and losses. A comparability ratio of less than 1.00 indicates that fewer deaths were classified to a particular cause under ICD-10 than had been classified to the comparable cause under ICD-9, whereas a ratio greater than 1.00 indicates that more deaths were classified to the cause under ICD-10 than under ICD-9.

ICD Codes		Cause of Death (ICD - 10 Titles)	England and Wales Deaths			Scotland Deaths		
ICD - 9 List	ICD - 10 List		ICD - 9	ICD - 10	Comparability Ratio	ICD - 9	ICD - 10	Comparability Ratio
		All causes	551,093	551,093	1	60,281	60,281	1
001-139	A00-B99	I. Certain infectious and parasitic diseases	3,611	3,902	1.08	498	601	1.21
140-239	C00-D48	II. Neoplasms	135,791	140,281	1.03	14,966	15,327	1.02
280-289	D50-89	III. Diseases of the blood and blood forming organs and certain disorders involving the immune mechanism	1,855	1,076	0.58	204	129	0.63
240-279	E00-90	IV. Endocrine, nutritional and metabolic diseases	7,537	7,816	1.04	870	911	1.05
290-319	F00-99	V. Mental and behavioural disorders	11,145	13,461	1.21	1,901	2,330	1.23
320-389	G00-H95	VI-VIII. Diseases of the nervous system and the sense organs	10,164	14,796	1.46	971	1,393	1.43
390-459	I00-99	IX. Diseases of the circulatory system	218,062	226,438	1.04	24,787	25,284	1.02
460-519	J00-99	X. Diseases of the respiratory system	96,453	74,831	0.78	8,870	6,881	0.78
520-579	K00-93	XI. Diseases of the digestive system	21,606	21,998	1.02	2,787	2,829	1.02
680-709	L00-99	XII. Diseases of the skin and subcutaneous tissue	1,146	1,142	1.00	90	94	1.04
710-739	M00-99	XIII. Diseases of the musculoskeletal system and connective system	3,567	4,969	1.39	295	398	1.35
580-629	N00-99	XIV. Diseases of the genitourinary system	7,279	7,255	1.00	936	961	1.03
630-676	O00-99	XV. Pregnancy, childbirth and the puerperium	31	34	1.10	7	8	1.14
760-779	P00-96	XVI. Certain conditions originating in the perinatal period	115	137	1.19	137	129	0.94
740-759	Q00-99	XVII. Congenital malformations, deformations and chromosomal abnormalities	1,175	1,327	1.13	157	163	1.04
780-799	R00-99	XVIII. Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	14,651	14,692	1.00	355	365	1.03
E800-999	V01-Y98	XX. External causes of morbidity and mortality	16,905	16,938	1.00	2,450	2,478	1.01

The table of deaths for England and Wales and Scotland shows that the vast majority of deaths (over 90 per cent) remained in the same Chapter in ICD-9 and ICD-10.

In absolute terms the largest difference in numbers of deaths is from ICD-10 Chapter X (Diseases of the respiratory system) reflecting the application of rule 3 in relation to pneumonia. In England and Wales just under 21,700 deaths previously coded as diseases of the respiratory system in ICD-9 were coded into a different chapter using ICD-10, the majority were reassigned to Chapter IX (Diseases of the circulatory system), including stroke, heart failure, and chronic ischaemic heart disease. In Scotland just under 2,000 deaths that were coded as diseases of the respiratory system in ICD-9 changed to a different chapter under ICD-10.

In relative terms, the chapter that shows the largest change in both England and Wales and Scotland is Chapter III in ICD-10 (Diseases of the blood and blood forming organs). More than half the deaths in England and Wales coded here in ICD-9 have moved to Chapter II in ICD-10 (Neoplasms).

The ratios for England and Scotland are similar for most of the chapters and where the large differences do lie (for example in Chapter XVI Certain conditions originating in the perinatal period) this corresponds to small numbers of deaths in both England, Wales and Scotland.

References

Detailed analysis of the bridge-coding exercises carried out in England and Wales and Scotland can be found at:

1. Rooney C, Griffiths C and Cook L. The implementation of ICD-10 for cause of death coding - some preliminary results from the bridge coding study. Health Statistics Quarterly 13. Office for National Statistics, London. This article may be found on the ONS website - http://www.statistics.gov.uk/downloads/theme_health/HSQ13_v4.pdf
2. 2000 Annual report of the Registrar General for Scotland. Appendix 2. This article may be found on the GROS website - <http://www.gros.gov.uk/grosweb/grosweb.nsf/pages/00app2>