

# APPENDIX C: MORTALITY

## COMPARISON BETWEEN ICD-9 AND ICD-10

Mortality statistics are compiled under guidelines of the World Health Organization (WHO). The procedures for coding and classifying mortality statistics are known collectively as the International Classification of Diseases (ICD). The ICD provides guidelines for coding death certificates, gives the disease (injury/poisoning) categories, the procedures for selecting the underlying cause of death, and provides definitions such as 'live birth', 'maternal death', or 'underlying cause of death'. The ICD also provides the tabulation lists for classifying mortality and the format of the medical certificate of death. Periodically the ICD is revised to allow for advances in medicine and changes in diagnostic terminology. The last revision was in 1999, when the tenth revision (ICD-10) replaced the ninth revision (ICD-9). Since 1999, causes of death have been classified using the tenth revision of this classification (ICD-10).

The ICD structure comprises cause of death categories that are identified by codes. The ninth revision of the ICD had more than 4000 categories and used all numeric codes (001–999) to identify the categories. ICD-10 has approximately twice the clinical detail of ICD-9, with more than 8000 categories identified by alphanumeric codes (A00–Z99). Both revisions provide for greater detail with a decimal numeric subdivision at the four-character level. Tabulation lists, which provide the cause-of-death groupings to present mortality statistics, have also changed. In ICD-9, 72 selected causes of death were used to rank the leading causes of death. This list has been expanded to 113 causes in ICD-10. Sixty-one selected causes were used to rank infant mortality statistics in ICD-9; this list has been expanded to 130 selected causes in ICD-10.

ICD-10 also has more chapters than ICD-9. Diseases of the nervous system and sense organs was split into three chapters in ICD-10: diseases of the nervous system, diseases of the eye and adnexa, and diseases of the ear and mastoid process. Other chapters have been rearranged; in ICD-10 diseases of the immune system are now included with diseases of the blood and blood-forming organs. They were included in the chapter endocrine, nutritional, and metabolic diseases in ICD-9. External causes of injury and poisoning (E codes) and factors influencing health status and contact with health services (V codes) were supplementary chapters in ICD-9; in ICD-10 they are part

of the core classification. Additionally, some cause-of-death titles have changed (e.g. Suicide, ICD-9; Intentional Self-Harm, ICD-10) and some titles have shifted from one section to another. Arguably the change that will have the biggest impact on mortality statistics is the change in cause-of-death coding rules.

Cause-of-death coding rules determine how the underlying cause of death is assigned from the medical information on the death certificate. Changes in these coding rules can produce serious breaks in cause-of-death trends. For example, in 1979 the eleventh leading cause of death (nephritis, nephritic syndrome, and nephrosis) had a rate that was 70% higher than the rate in 1978. The underlying cause of death in 1978 was assigned using ICD-8 coding rules, while mortality statistics in 1979 were coded using ICD-9 rules. Almost all of this increase was due to changes in the coding rules. In this example, the ICD-9 coding rules had a much greater assignment of deaths to this particular cause. Of course, an increase in assignments to one or more causes of death must come at the expense of assignments of death to other causes.

To help measure the impact of changing cause-of-death coding rules, comparability ratios are used. Comparability ratios are calculated by double coding all deaths in a particular year. That is, each death in a given year is assigned a cause of death using both ICD-9 coding rules and ICD-10 coding rules. The comparability ratio is calculated by counting the number of deaths for a selected cause in the new revision (ICD-10) and dividing by the number of deaths for the selected cause in the old revision (ICD-9). The National Center for Health Statistics (NCHS) used the national 1996 death file to derive the comparability ratios.

A comparability ratio that is equal to 1.0 shows that either revision will produce the same number of deaths. It does not, however, suggest that the cause of death was unaffected by the revision change. It is possible that any changes to the assignment of death could have balanced out, leaving the same number of deaths. For example, an increase in assignment of deaths could be counterbalanced by a narrower cause of death title (i.e. fewer cause of death codes).

A comparability ratio that is greater than 1.0 usually suggests an increase in the assignments of death under ICD-10 or that the cause-of-death title is broader under ICD-10. Conversely, a comparability ratio less than 1.0 usually suggests a decrease in the assignments of death under ICD-10 or the cause of death title is narrower under ICD-10.

Leading causes of death are based on the 113 selected causes-of-death list developed by the National Center for Health Statistics (NCHS). This list replaces the 72 selected causes-of-death list used in ICD-9. Since comparability ratios are used to measure the impact of changing coding rules, it is important to remove the effects of changing tabulation lists. For that reason, the ICD-9 codes used for some causes of death in this report differ from the codes used in the ICD-9 tabulation list. For example, accidents and adverse effects (E800–E949) was a cause-of-death category in the ICD-9 tabulation list. In the ICD-10 tabulation list, however, adverse effects are listed separately from accidents. For that reason, adverse effects (E870–E879, E930–E949) are not included in the ICD-9 codes for unintentional injury (accidents) in this report. For the same reasons, ICD-9 code 435 is not included in the cause-of-death category cerebrovascular diseases.

#### AGE-ADJUSTED RATES

The crude death rate is commonly used to measure mortality. However, the age composition of the population can greatly influence the crude death rate. For example, since most deaths occur to persons over 70 years of age, a population that is aging will naturally see an increase in the crude death rate. Therefore, using the crude death rate to measure trends can be misleading if the age distribution of the population has changed over time. To help overcome this and other limitations of the crude death rate, age adjustment is used in mortality statistics. Age adjustment needs a standard age distribution, usually called a standard population. In the past, the most frequently used standard in the United States was based on the 1940 U.S. population. Beginning with 1999 mortality statistics, however, the U.S. and the Bureau of Vital Statistics began using the year 2000 standard population for age adjustment. **One impact of changing the standard population is that comparisons with previously published age-adjusted death rates will be meaningless, since age-adjusted death rates using different standard populations are not directly comparable.** Generally, the year 2000 standard will give age-adjusted death rates that are much higher than those based on the 1940 standard.

TABLE C.1 ICD CAUSE OF DEATH CODES

CAUSE OF DEATH	ICD-10 CODES	ICD-9 CODES
INFECTIOUS AND PARASITIC DISEASE	A00-B99	001-139
TUBERCULOSIS	A16-A19	101-018
MENINGOCOCCAL INFECTION	A39	036
SEPTICEMIA	A40-A41	038
VIRAL HEPATITIS	B15-B19	070
HUMAN IMMUNODEFICIENCY VIRUS (HIV) DISEASE	B20-B24	042-044
MALIGNANT NEOPLASMS	C00-C97	140-208
ESOPHAGUS	C15	150
STOMACH	C16	151
COLON, RECTUM AND ANUS	C18-C21	153-154
LIVER AND INTRAHEPATIC BILE DUCTS	C22	155
PANCREAS	C25	157
BRONCHUS AND LUNG	C33-C34	162
SKIN	C43	172
BREAST	C50	174-175
CERVICAL	C53	180
UTERINE	C53	179,182
OVARIAN	C56	183
PROSTATE	C61	185
KIDNEY AND RENAL PELVIS	C64-C65	189.0,189.1
BLADDER	C67	188
BRAIN	C70-C72	191-192
LYMPHOID AND HEMATOPOIETIC	C81-C96	201
HODGKIN'S DISEASE	C81	201
NON-HODGKIN'S LYMPHOMA	C82-C85	200,202
LEUKEMIA	C91-C95	204-208
MULTIPLE MYELOMA	C88	203
BENIGN AND UNCERTAIN NEOPLASMS	D00-D48	210-239
DIABETES MELLITUS	E10-E14	250
PARKINSON'S DISEASE	G20-G21	332
ALZHEIMER'S DISEASE	G30	331
MAJOR CARDIOVASCULAR DISEASES	I00-I78	390-434,436-448
DISEASES OF THE HEART	I00-I09,I11,I13,I20-I51	390-398,402,404,410-429
RHEUMATIC HEART DISEASES	I00-I09	390-398
HYPERTENSIVE HEART AND RENAL DISEASE	I13	404
ISCHEMIC HEART DISEASES	I20-I25	410-414,429.2
ACUTE MYCARDIAL INFARCTION	I21-I22	410
OTHER ACUTE ISCHEMIC HEART DISEASES	I24	411
ATHEROSCLEROTIC CARDIOVASCULAR DISEASE	I25.0	429.2
OTHER HEART DISEASES	I26-I51	415-429.1,429.3-429.9
HEART FAILURE	I50	428
CEREBROVASCULAR DISEASES	I60-I69	430-434,436-438
INFLUENZA AND PNEUMONIA	J10-J18	480-487
INFLUENZA	J10-J11	487
PNEUMONIA	J12-J18	480-486
CHRONIC LOWER RESPIRATORY DISEASES	J40-J47	490-494,496
EMPHYSEMA	J43	492
ASTHMA	J45-J46	493
CHRONIC LIVER DISEASE AND CIRRHOSIS	K70,K73-K74	571
ALCOHOLIC LIVER DISEASE	K70	571.0-571.3
OTHER CHRONIC LIVER DISEASE AND CIRRHOSIS	K73-K74	571.4-571.9
NEPHRITIS, NEPHROTIC SYNDROME AND NEPHROSIS	N00-N07,N17-N19,N25-N27	580-589
RENAL FAILURE	N17-N19	584-586
CONDITIONS ORIGINATING IN THE PERINATAL PERIOD	P00-P96	760-771.2,771.4-779
CONGENITAL MALFORMATIONS	Q00-Q99	740-759
UNINTENTIONAL INJURY	V01-X59,Y85-Y86	E800-E869,E880-E929
TRANSPORT ACCIDENTS	V01-V99,Y85	E800-E848,E929.0,E929.1
MOTOR VEHICLE ACCIDENTS	V02-V04,V090,V092,V12-V14,V19.0-V19.2,V19.4-V19.6,V20-V79,V80.3-V80.5,V81.0-V81.1,V82.0-V82.1,V83-V86,V87.0-V87.8,V88.0-V88.8,V89.0,V89.2	E810-E825
WATER TRANSPORT	V90-V94	E830-E838
AIR TRANSPORT	V95-V97	E840-E845
NONTRANSPORT ACCIDENTS	W00-X59,Y86	E850-E869,E880-E928,E929.2-E929.9
FALLS	W00-W19	E880-E888
DISCHARGE OF FIREARMS	W32-W34	E922
DROWNING AND SUBMERSION	W65-W74	E910
SMOKE, FIRE AND FLAME	X00-X09	E890-E899
POISONING	X40-X49	E850-E869,E924.1
INTENTIONAL SELF-HARM (SUICIDE)	X60-X84,Y87.0	E950-E959
BY DISCHARGE OF FIREARMS	X72-X74	E955.0-E955.4
ASSAULT (HOMICIDE)	X85-Y09,Y87.1	E960-E969

**TABLE C.2 ESTIMATED COMPARABILITY RATIOS FOR 113 SELECTED CAUSES OF DEATH**

List number	Cause of death	Number of deaths allocated according to		Final comparability ratio	Standard error of ratio	Relative standard error of ratio	Preliminary comparability ratio, as published	Percent difference preliminary vs. final
		ICD-10	ICD-9					
001	Salmonella infections	52	58	0.8966	0.06927	7.7	0.8108	10.6
002	Shigellosis and amebiasis	7	8	*	*	*	*	*
003	Certain other intestinal infections	704	819	0.8596	0.02789	3.2	*	*
004	Tuberculosis	1,058	1,201	0.8809	0.01493	1.7	0.8547	3.1
005	Respiratory tuberculosis	857	912	0.9397	0.01724	1.8	0.9056	3.8
006	Other tuberculosis	201	289	0.6955	0.03558	5.1	0.7031	-1.1
007	Whooping cough	6	4	*	*	*	*	*
008	Scarlet fever and erysipelas	1	3	*	*	*	*	*
009	Meningococcal infection	285	288	0.9896	0.01984	2.0	0.9955	-0.6
010	Septicemia	25,390	21,336	1.1900	0.00415	0.3	1.1949	-0.4
011	Syphilis	57	73	0.7808	0.08729	11.2	0.6364	22.7
012	Acute poliomyelitis	1	-	*	*	*	*	*
013	Arthropod-borne viral encephalitis	2	3	*	*	*	*	*
014	Measles	1	1	*	*	*	*	*
015	Viral hepatitis	2,693	3,769	0.7145	0.00817	1.1	0.8343	-14.4
016	Human immunodeficiency virus (HIV) disease	33,441	30,904	1.0821	0.00187	0.2	1.0637	1.7
017	Malaria	5	5	*	*	*	*	*
018	Other and unspecified infectious and parasitic diseases and their sequelae	5,716	6,278	0.9105	0.01095	1.2	1.099	-17.2
019	Malignant neoplasms	542,914	537,906	1.0093	0.00021	0.0	1.0068	0.2
020	Malignant neoplasms of lip, oral cavity and pharynx	7,519	7,835	0.9597	0.00395	0.4	0.9603	-0.1
021	Malignant neoplasm of esophagus	11,139	11,199	0.9946	0.00201	0.2	0.9965	-0.2
022	Malignant neoplasm of stomach	13,385	13,292	1.0070	0.00201	0.2	1.0063	0.1
023	Malignant neoplasms of colon, rectum and anus	56,221	56,291	0.9988	0.00095	0.1	0.9993	-0.1
024	Malignant neoplasms of trachea, bronchus and lung	11,126	11,542	0.9640	0.00247	0.3	0.9634	0.1
025	Malignant neoplasm of pancreas	27,089	27,168	0.9971	0.00098	0.1	0.998	-0.1
026	Malignant neoplasm of larynx	3,927	3,907	1.0051	0.00527	0.5	1.0047	0.0
027	Malignant neoplasms of trachea, bronchus and lung	149,206	151,573	0.9844	0.00053	0.1	0.9837	0.1
028	Malignant melanoma of skin	6,892	7,259	0.9494	0.00352	0.4	0.9677	-1.9
029	Malignant neoplasm of breast	43,644	43,327	1.0073	0.00104	0.1	1.0056	0.2
030	Malignant neoplasm of cervix uteri	4,517	4,534	0.9963	0.00357	0.4	0.9871	0.9
031	Malignant neoplasms of corpus uteri and uterus, part unspecified	6,444	6,292	1.0242	0.00403	0.4	1.026	-0.2
032	Malignant neoplasm of ovary	13,043	13,125	0.9938	0.00173	0.2	0.9954	-0.2
033	Malignant neoplasm of prostate	34,497	34,008	1.0144	0.00146	0.1	1.0134	0.1
034	Malignant neoplasms of kidney and renal pelvis	11,028	11,068	0.9964	0.00231	0.2	1	-0.4
035	Malignant neoplasm of bladder	11,350	11,406	0.9951	0.00263	0.3	0.9968	-0.2
	Malignant neoplasms of meninges, brain and other parts of central nervous system	12,052	12,331	0.9774	0.00260	0.3	0.9691	0.9
037	Malignant neoplasms of lymphoid, hematopoietic and related tissue	55,029	54,788	1.0044	0.00115	0.1	1.0042	0.0
038	Hodgkin's disease	1,408	1,404	1.0028	0.00994	1.0	0.9855	1.8
039	Non-Hodgkin's lymphoma	22,377	22,865	0.9787	0.00183	0.2	0.9781	0.1
040	Leukemia	20,507	20,296	1.0104	0.00189	0.2	1.0119	-0.1
041	Multiple myeloma and immunoproliferative neoplasms	10,665	10,223	1.0432	0.00309	0.3	1.0383	0.5
	Other and unspecified malignant neoplasms of lymphoid, hematopoietic and related tissue	72	-	*	*	*	*	*
043	All other and unspecified malignant neoplasms	64,806	56,961	1.1377	0.00208	0.2	1.1251	1.1
	In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior	12,411	7,607	1.6315	0.01403	0.9	1.6744	-2.6
045	Anemias	4,071	4,317	0.9430	0.00792	0.8	0.9559	-1.3
046	Diabetes mellitus	62,673	61,485	1.0193	0.00114	0.1	1.0082	1.1
047	Nutritional deficiencies	3,839	3,678	1.0438	0.01288	1.2	1.1636	-10.3
048	Malnutrition	3,535	3,507	1.0080	0.01299	1.3	0.9782	3.0
049	Other nutritional deficiencies	304	171	1.7778	0.12104	6.8	6.2041	-71.3
050	Meningitis	754	745	1.0121	0.01580	1.6	1.0137	-0.2
051	Parkinson's disease	11,916	11,797	1.0101	0.00293	0.3	1.0012	0.9
052	Alzheimer's disease	33,667	21,292	1.5812	0.00693	0.4	1.5536	1.8
053	Major cardiovascular diseases	942,439	945,945	0.9963	0.00021	0.0	0.9981	-0.2
054	Diseases of heart	719,631	730,444	0.9852	0.00023	0.0	0.9858	-0.1
055	Acute rheumatic fever and chronic rheumatic heart diseases	4,387	4,976	0.8816	0.00741	0.8	0.8208	7.4
056	Hypertensive heart disease	20,739	25,973	0.7985	0.00264	0.3	0.8028	-0.5
057	Hypertensive heart and renal disease	2,806	2,490	1.1269	0.01515	1.3	1.0705	5.3
058	Ischemic heart diseases	543,063	542,728	1.0006	0.00026	0.0	0.999	0.2
059	Acute myocardial infarction	209,916	212,992	0.9856	0.00039	0.0	0.9887	-0.3
060	Other acute ischemic heart diseases	3,084	2,876	1.0723	0.01299	1.2	1.011	6.1
061	Other forms of chronic ischemic heart disease	330,063	326,860	1.0098	0.00044	0.0	1.0054	0.4

**TABLE C.2 ESTIMATED COMPARABILITY RATIOS FOR 113 SELECTED CAUSES OF DEATH** (Continued)

List number	Cause of death	Number of deaths allocated according to		Final comparability ratio	Standard error of ratio	Relative standard error of ratio	Preliminary comparability ratio, as published	Percent difference preliminary vs. final
		ICD-10	ICD-9					
062	Atherosclerotic cardiovascular disease, so described	72,231	68,150	1.0599	0.00163	0.2	1.0488	1.1
063	All other forms of chronic ischemic heart disease	257,832	258,710	0.9966	0.00044	0.0	0.9935	0.3
064	Other heart diseases	148,636	154,277	0.9634	0.00104	0.1	0.9716	-0.8
065	Acute and subacute endocarditis	864	838	1.0310	0.01846	1.8	0.9964	3.5
066	Diseases of pericardium and acute myocarditis	750	714	1.0504	0.01838	1.8	1.0295	2.0
067	Heart failure	48,876	47,052	1.0388	0.00142	0.1	1.041	-0.2
068	All other forms of heart disease	98,146	105,673	0.9288	0.00143	0.2	0.9373	-0.9
069	Essential (primary) hypertension and hypertensive renal disease	14,381	12,884	1.1162	0.00495	0.4	1.1192	-0.3
070	Cerebrovascular diseases	166,837	158,855	1.0502	0.00083	0.1	1.0588	-0.8
071	Atherosclerosis	16,086	16,655	0.9658	0.00265	0.3	0.9637	0.2
072	Other diseases of circulatory system	25,504	27,107	0.9409	0.00231	0.2	0.9456	-0.5
073	Aortic aneurysm and dissection	16,371	16,361	1.0006	0.00163	0.2	1.0012	-0.1
074	Other diseases of arteries, arterioles and capillaries	9,133	10,746	0.8499	0.00518	0.6	0.8497	0.0
075	Other disorders of circulatory system	4,105	4,207	0.9758	0.01400	1.4	1.0293	-5.2
076	Influenza and pneumonia	57,915	83,045	0.6974	0.00169	0.2	0.6982	-0.1
077	Influenza	743	743	1.0000	0.01060	1.1	1.0088	-0.9
078	Pneumonia	57,172	82,302	0.6947	0.00170	0.2	0.6957	-0.1
079	Other acute lower respiratory infections	461	474	0.9726	0.03785	3.9	0.9746	-0.2
080	Acute bronchitis and bronchiolitis	342	474	0.7215	0.02609	3.6	0.7465	-3.3
081	Unspecified acute lower respiratory infection	119	-	*	*	*	*	*
082	Chronic lower respiratory diseases	109,746	105,411	1.0411	0.00095	0.1	1.0478	-0.6
083	Bronchitis, chronic and unspecified	1,207	3,127	0.3860	0.00932	2.4	0.3935	-1.9
084	Emphysema	16,521	17,179	0.9617	0.00301	0.3	0.9726	-1.1
085	Asthma	4,971	5,614	0.8855	0.00583	0.7	0.8938	-0.9
086	Other chronic lower respiratory diseases	87,047	79,491	1.0951	0.00142	0.1	1.097	-0.2
087	Pneumoconioses and chemical effects	1,154	1,135	1.0167	0.01055	1.0	1.0178	-0.1
088	Pneumonitis due to solids and liquids	11,338	10,264	1.1046	0.00484	0.4	1.1185	-1.2
089	Other diseases of respiratory system	20,676	18,621	1.1104	0.00464	0.4	1.1673	-4.9
090	Peptic ulcer	4,979	5,127	0.9711	0.00475	0.5	0.9696	0.2
091	Diseases of appendix	410	421	0.9739	0.02309	2.4	1.0347	-5.9
092	Hernia	1,408	1,391	1.0122	0.01221	1.2	1.0395	-2.6
093	Chronic liver disease and cirrhosis	25,659	24,861	1.0321	0.00262	0.3	1.0367	-0.4
094	Alcoholic liver disease	11,971	11,962	1.0008	0.00465	0.5	1.0183	-1.7
095	Other chronic liver disease and cirrhosis	13,688	12,899	1.0612	0.00411	0.4	1.0535	0.7
096	Cholelithiasis and other disorders of gallbladder	2,706	2,816	0.9609	0.00689	0.7	0.9567	0.4
097	Nephritis, nephrotic syndrome and nephrosis	30,401	24,215	1.2555	0.00438	0.3	1.232	1.9
098	Acute and rapidly progressive nephritic and nephrotic syndrome	208	320	0.6500	0.03226	5.0	0.6466	0.5
099	Chronic glomerulonephritis, nephritis and nephrosis not specified as acute or chronic and renal sclerosis unspecified	670	1,629	0.4113	0.01302	3.2	0.3858	6.6
100	Renal failure	29,487	22,224	1.3268	0.00497	0.4	1.2949	2.5
101	Other disorders of kidney	36	42	0.8571	0.09859	11.5	0.9091	-5.7
102	Infections of kidney	905	885	1.0226	0.01608	1.6	1.0069	1.6
103	Hyperplasia of prostate	462	455	1.0154	0.01729	1.7	0.9969	1.9
104	Inflammatory diseases of female pelvic organs	100	112	0.8929	0.04622	5.2	0.9844	-9.3
105	Pregnancy, childbirth and the puerperium	325	285	1.1404	0.03747	3.3	*	*
106	Pregnancy with abortive outcome	41	39	1.0513	0.10516	10.0	*	*
107	Other complications of pregnancy, childbirth and the puerperium	284	246	1.1545	0.04411	3.8	*	*
108	Certain conditions originating in the perinatal period	13,892	12,916	1.0756	0.00331	0.3	1.0658	0.9
109	Congenital malformations, deformations and chromosomal abnormalities	10,514	11,740	0.8956	0.00456	0.5	0.847	5.7
110	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	24,877	25,506	0.9753	0.00284	0.3	0.9553	2.1
111	All other diseases (Residual)	146,846	160,672	0.9139	0.00134	0.1	0.8996	1.6
112	Accidents (unintentional injuries)	88,815	86,639	1.0251	0.00055	0.1	1.0305	-0.5
113	Transport accidents	45,786	46,053	0.9942	0.00079	0.1	0.9978	-0.4
114	Motor vehicle accidents	41,001	43,037	0.9527	0.00124	0.1	0.8527	11.7
115	Other land transport accidents	2,610	729	3.5802	0.11559	3.2	*	*
116	Water, air and space, and other and unspecified transport accidents and their sequelae	2,175	2,287	0.9510	0.00980	1.0	1.0115	-6.0
117	Nontransport accidents	43,029	40,586	1.0602	0.00142	0.1	1.0763	-1.5
118	Falls	10,743	13,916	0.7720	0.00411	0.5	0.8409	-8.2
119	Accidental discharge of firearms	1,049	1,032	1.0165	0.00526	0.5	1.0579	-3.9
120	Accidental drowning and submersion	3,542	3,440	1.0297	0.00558	0.5	0.9965	3.3
121	Accidental exposure to smoke, fire and flames	3,647	3,649	0.9995	0.00404	0.4	0.9743	2.6
122	Accidental poisoning and exposure to noxious substances	8,236	7,953	1.0356	0.00278	0.3	*	*
123	Other and unspecified nontransport accidents and their sequelae	15,812	10,596	1.4923	0.00907	0.6	1.4188	5.2

**TABLE C.2 ESTIMATED COMPARABILITY RATIOS FOR 113  
SELECTED CAUSES OF DEATH** (Continued)

List number	Cause of death	Number of deaths allocated according to		Final comparability ratio	Standard error of ratio	Relative standard error of ratio	Preliminary comparability ratio, as published	Percent difference preliminary vs. final
		ICD-10	ICD-9					
124	Intentional self-harm (suicide)	29,974	29,907	1.0022	0.00044	0.0	0.9962	0.6
125	Intentional self-harm (suicide) by discharge of firearms	17,905	17,884	1.0012	0.00080	0.1	0.9982	0.3
126	Intentional self-harm (suicide) by other and unspecified means and their sequelae	12,069	12,023	1.0038	0.00129	0.1	0.9896	1.4
127	Assault (homicide)	20,180	20,140	1.0020	0.00051	0.1	0.9983	0.4
128	Assault (homicide) by discharge of firearms	13,881	13,855	1.0019	0.00079	0.1	0.9969	0.5
129	Assault (homicide) by other and unspecified means and their sequelae	6,299	6,285	1.0022	0.00207	0.2	1.0017	0.1
130	Legal intervention	307	328	0.9360	0.01889	2.0	*	*
131	Events of undetermined intent	2,745	2,782	0.9867	0.00386	0.4	*	*
132	Discharge of firearms, undetermined intent	222	222	1.0000	0.00899	0.9	*	*
133	Other and unspecified events of undetermined intent and their sequelae	2,523	2,560	0.9855	0.00423	0.4	*	*
134	Operations of war and their sequelae	7	12	*	*	*	*	*
135	Complications of medical and surgical care	1,912	3,033	0.6304	0.01353	2.1	*	*

— Quantity zero

. . . Category not applicable

\* Figure does not meet standards of reliability or precision

Source: National Center for Health Statistics ([ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Datasets/Comparability/icd9\\_icd10/Comparability\\_Ratio\\_tables.xls](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Datasets/Comparability/icd9_icd10/Comparability_Ratio_tables.xls))

**TABLE C.3 ESTIMATED COMPARABILITY RATIOS FOR 130 SELECTED CAUSES OF INFANT DEATH**

List number	Cause of death	Number of deaths allocated according to		Final comparability ratio	Standard error of ratio	Relative standard error of ratio	Preliminary comparability ratio, as published	Percent difference preliminary vs. final
		ICD-10	ICD-9					
001	Certain infectious and parasitic diseases	500	697	0.7174	0.02609	3.6	0.7339	-2.3
002	Certain intestinal infectious diseases	10	6	*	*	*	*	*
003	Diarrhea and gastroenteritis of infectious origin	-	202	*	*	*	*	*
004	Tuberculosis	2	2	*	*	*	*	*
005	Tetanus	-	-	*	*	*	*	*
006	Diphtheria	-	-	*	*	*	*	*
007	Whooping cough	6	4	*	*	*	*	*
008	Meningococcal infection	36	37	0.9730	0.05961	6.1	0.9615	1.2
009	Septicemia	239	198	1.2071	0.05465	4.5	1.3802	-12.5
010	Congenital syphilis	4	6	*	*	*	*	*
011	Gonococcal infection	3	-	*	*	*	*	*
012	Viral diseases	137	127	1.0787	0.07929	7.3	1	7.9
013	Acute poliomyelitis	-	-	*	*	*	*	*
014	Varicella (chickenpox)	6	6	*	*	*	*	*
015	Measles	-	-	*	*	*	*	*
	Human immunodeficiency virus (HIV) disease	37	38	0.9737	0.08612	8.8	1.0455	-6.9
017	Mumps	-	-	*	*	*	*	*
018	Other and unspecified viral diseases	94	83	1.1325	0.11681	10.3	0.9722	16.5
019	Candidiasis	22	32	0.6875	0.10993	16.0 *	*	*
020	Malaria	-	-	*	*	*	*	*
021	Pneumocystosis	3	7	*	*	*	*	*
	All other and unspecified infectious and parasitic diseases	38	76	0.5000	0.07895	15.8 *	*	*
022	Neoplasms	149	146	1.0205	0.03726	3.7	1.0139	0.7
023	Malignant neoplasms	93	86	1.0814	0.05799	5.4	1.0435	3.6
	Hodgkin's disease and non-Hodgkin's lymphomas	2	1	*	*	*	*	*
025	Leukemia	33	32	1.0313	0.05495	5.3	*	*
	Other and unspecified malignant neoplasms	58	53	1.0943	0.09045	8.3	1.0714	2.1
027	In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior	56	60	0.9333	0.07889	8.5	0.9615	-2.9
	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	93	105	0.8857	0.07814	8.8	0.7	26.5
029	Anemias	16	30	0.5333	0.09738	18.3	*	*
030	Hemorrhagic conditions and other diseases of blood and blood-forming organs	49	48	1.0208	0.14430	14.1	*	*
	Certain disorders involving the immune mechanism	28	27	1.0370	0.14608	14.1	*	*
032	Endocrine, nutritional and metabolic diseases	247	270	0.9148	0.04146	4.5	0.8682	5.4
034	Short stature, not elsewhere classified	19	30	0.6333	0.11562	18.3	*	*
035	Nutritional deficiencies	8	11	0.7273	*	*	*	*
036	Cystic fibrosis	8	7	1.1429	*	*	*	*
	Volume depletion, disorders of fluid, electrolyte and acid-base balance	62	87	0.7126	0.06792	9.5	0.7547	-5.6
	All other endocrine, nutritional and metabolic diseases	150	135	1.1111	0.06671	6.0	1.1636	-4.5
038	Diseases of the nervous system	466	453	1.0287	0.02601	2.5	1.0664	-3.5
039	Meningitis	104	100	1.0400	0.04078	3.9	1	4.0
	Infantile spinal muscular atrophy, type I (Werdnig-Hoffman)	63	63	1.0000	0.03890	3.9	1	0.0
041	Infantile cerebral palsy	15	22	*	*	*	*	*
042	Anoxic brain damage, not elsewhere classified	41	48	0.8542	0.11061	12.9	0.9667	-11.6
043	Other diseases of nervous system	243	220	1.1045	0.04456	4.0	1.1508	-4.0
044	Diseases of the ear and mastoid process	8	8	*	*	*	*	*
045	Diseases of the circulatory system	612	928	0.6595	0.01988	3.0	0.7138	-7.6
	Pulmonary heart disease and diseases of pulmonary circulation	162	196	0.8265	0.03936	4.8	1.122	-26.3
047	Pericarditis, endocarditis and myocarditis	18	17	*	*	*	*	*
048	Cardiomyopathy	119	127	0.9370	0.03234	3.5	0.9762	-4.0
049	Cardiac arrest	51	123	0.4146	0.05441	13.1	0.2874	44.3
050	Cerebrovascular diseases	83	231	0.3593	0.03442	9.6	0.4724	-23.9
051	All other diseases of circulatory system	179	234	0.7650	0.04801	6.3	0.7154	6.9
052	Diseases of the respiratory system	648	818	0.7922	0.01928	2.4	0.814	-2.7
053	Acute upper respiratory infections	12	18	*	*	*	*	*
054	Influenza and pneumonia	334	460	0.7261	0.02343	3.2	0.7624	-4.8
055	Influenza	12	15	*	*	*	*	*
056	Pneumonia	322	445	0.7236	0.02395	3.3	0.7593	-4.7
057	Acute bronchitis and acute bronchiolitis	54	61	0.8852	0.07713	8.7	0.8049	10.0
058	Bronchitis, chronic and unspecified	22	27	0.8148	0.12053	14.8 *	*	*
059	Asthma	8	8	*	*	*	*	*
060	Pneumonitis due to solids and liquids	11	16	*	*	*	*	*
061	Other and unspecified diseases of respiratory system	207	228	0.9079	0.05169	5.7	0.9213	-1.5
062								

**TABLE C.3 ESTIMATED COMPARABILITY RATIOS FOR 130 SELECTED CAUSES OF INFANT DEATH** (Continued)

List number	Cause of death	Number of deaths allocated according to		Final comparability ratio	Standard error of ratio	Relative standard error of ratio	Preliminary comparability ratio, as published	Percent difference preliminary vs. final
		ICD-10	ICD-9					
063	Diseases of the digestive system	491	348	1.4109	0.06358	4.5	1.6647	-15.2
	Gastritis, duodenitis, and noninfective enteritis and colitis	207	78	2.6538	0.27628	10.4	2.9149	-9.0
064	Hernia of abdominal cavity and intestinal obstruction without hernia	84	69	1.2174	0.14915	12.3 *	*	
065	All other and unspecified diseases of digestive system	200	201	0.9950	0.05085	5.1	0.9767	1.9
066	Diseases of the genitourinary system	169	171	0.9883	0.04864	4.9	1	-1.2
067	Renal failure and other disorders of kidney	142	135	1.0519	0.06030	5.7	1.0408	1.1
068	Other and unspecified diseases of genitourinary system	27	36	0.7500	0.08673	11.6 *	*	
069	Certain conditions originating in the perinatal period	13741	12804	1.0732	0.00323	0.3	1.0581	1.4
070	Newborn affected by maternal factors and by complications of pregnancy, labor and delivery	2517	2421	1.0397	0.00893	0.9	1.039	0.1
071	Newborn affected by maternal hypertensive disorders	47	45	1.0444	0.07868	7.5	1.0455	-0.1
072	Newborn affected by other maternal conditions which may be unrelated to present pregnancy	52	60	0.8667	0.12217	14.1 *	*	
073	Newborn affected by maternal complications of pregnancy	1307	1243	1.0515	0.01267	1.2	1.0295	2.1
074	Newborn affected by incompetent cervix	353	338	1.0444	0.01737	1.7	1.0199	2.4
075	Newborn affected by premature rupture of membranes	600	579	1.0363	0.01255	1.2	1.0228	1.3
076	Newborn affected by multiple pregnancy	198	208	0.9519	0.04299	4.5	1.0097	-5.7
077	Newborn affected by other maternal complications of pregnancy	156	118	1.3220	0.09036	6.8	1.2188	8.5
078	Newborn affected by complications of placenta, cord and membranes	963	942	1.0223	0.01301	1.3	1.047	-2.4
079	Newborn affected by complications involving placenta	544	533	1.0206	0.01808	1.8	1.0737	-4.9
080	Newborn affected by complications involving cord	65	58	1.1207	0.09828	8.8	*	*
081	Newborn affected by chorioamnionitis	351	347	1.0115	0.01690	1.7	1.0118	0.0
082	Newborn affected by other and unspecified abnormalities of	3	4	*	*	*	*	*
083	Newborn affected by other complications of labor and delivery	107	78	1.3718	0.14167	10.3	1.85	-25.8
084	Newborn affected by noxious influences transmitted via placenta or breast milk	41	53	0.7736	0.07422	9.6	*	*
085	Disorders related to length of gestation and fetal malnutrition	4309	3880	1.1106	0.00671	0.6	1.1062	0.4
086	Slow fetal growth and fetal malnutrition	58	44	1.3182	0.12238	9.3	1.1333	16.3
087	Disorders related to short gestation and low birth weight, not elsewhere classified	4251	3836	1.1082	0.00668	0.6	1.106	0.2
088	Extremely low birth weight or extreme immaturity	3173	2875	1.1037	0.00817	0.7	1.1083	-0.4
089	Other low birth weight or preterm	1078	961	1.1217	0.01531	1.4	1.0993	2.0
090	Disorders related to long gestation and high birth weight	-	-	*	*	*	*	*
091	Birth trauma	140	163	0.8589	0.08490	9.9	0.0442	1843.2
092	Intrauterine hypoxia and birth asphyxia	560	423	1.3239	0.04608	3.5	1.4477	-8.6
093	Intrauterine hypoxia	94	110	0.8545	0.09582	11.2	0.9048	-5.6
094	Birth asphyxia	466	313	1.4888	0.06176	4.1	1.6075	-7.4
095	Respiratory distress of newborn	2904	3144	0.9237	0.01417	1.6	1.0257	-9.9
096	Other respiratory conditions originating in the perinatal period	1176	1352	0.8698			0.8455	2.9
097	Congenital pneumonia	93	24	3.8750	0.71968	18.6	3.8	2.0
098	Neonatal aspiration syndromes	117	82	1.4268	0.09553	6.7	1.3929	2.4
099	Interstitial emphysema and related conditions originating in the perinatal period	245	163	1.5031	0.08308	5.5	1.2066	24.6
100	Pulmonary hemorrhage originating in the perinatal period	276	180	1.5333	0.07410	4.8	1.4621	4.9
101	Chronic respiratory disease originating in the perinatal period	358	316	1.1329	0.03266	2.9	1.1355	-0.2
102	Atelectasis	558	251	2.2231	0.11002	4.9	2.0649	7.7
103	All other respiratory conditions originating in the perinatal period	81	776	0.1044	0.01153	11.0	0.066	58.2
104	Infections specific to the perinatal period	860	751	1.1451	0.02662	2.3	1.0199	12.3
105	Bacterial sepsis of newborn	671	681	0.9853	0.02688	2.7	0.9144	7.8
106	Omphalitis of newborn with or without mild hemorrhage	3	3	*	*	*	*	*
107	All other infections specific to the perinatal period	186	67	2.7761	0.30354	10.9	2.4474	13.4
108	Hemorrhagic and hematological disorders of newborn	514	386	1.3316	0.05919	4.4	1.4234	-6.4
109	Neonatal hemorrhage	390	298	1.3087	0.06737	5.1	1.4369	-8.9
110	Hemorrhagic disease of newborn	1	2	*	*	*	*	*
111	Hemolytic disease of newborn due to isoimmunization and other perinatal	16	23	0.6957	0.14952	21.5	*	*
112	Hematological disorders	107	63	1.6984	0.19404	11.4	*	*
113	Syndrome of infant of a diabetic mother and neonatal diabetes mellitus	7	9	*	*	*	*	*
114	Necrotizing enterocolitis of newborn	370	310	1.1935	0.03796	3.2	1.2266	-2.7
115	Hydrops fetalis not due to hemolytic disease	157	151	1.0397	0.02865	2.8	1	4.0
116	Other perinatal conditions	1403	1166	1.2033	0.02135	1.8	1.1447	5.1

**TABLE C.3 ESTIMATED COMPARABILITY RATIOS FOR 130 SELECTED CAUSES OF INFANT DEATH** (Continued)

List number	Cause of death	Number of deaths allocated according to		Final comparability ratio	Standard error of ratio	Relative standard error of ratio	Preliminary comparability ratio, as published	Percent difference preliminary vs. final
		ICD-10	ICD-9					
118	Congenital malformations, deformations and chromosomal abnormalities	5874	6330	0.9280	0.00506	0.5	0.9064	2.4
119	Anencephaly and similar malformations	351	350	1.0029	0.00949	0.9	1	0.3
120	Congenital hydrocephalus	96	145	0.6621	0.04988	7.5	0.6813	-2.8
121	Spina bifida	52	63	0.8254	0.06608	8.0	0.75	10.1
122	Other congenital malformations of nervous system	324	297	1.0909	0.04205	3.9	1.0791	1.1
123	Congenital malformations of heart	1936	1910	1.0136	0.00934	0.9	0.9951	1.9
124	Other congenital malformations of circulatory system	236	347	0.6801	0.03233	4.8	0.6198	9.7
125	Congenital malformations of respiratory system	640	948	0.6751	0.01863	2.8	0.6322	6.8
126	Congenital malformations of digestive system	66	79	0.8354	0.08099	9.7	*	*
127	Congenital malformations of genitourinary system	332	335	0.9910	0.02504	2.5	0.9432	5.1
128	Congenital malformations and deformations of musculoskeletal system, limbs and integument	456	476	0.9580	0.03159	3.3	0.865	10.7
129	Down's syndrome	104	106	0.9811	0.05607	5.7	0.9828	-0.2
130	Edward's syndrome	364	362	1.0055	0.01239	1.2	0.9964	0.9
131	Patau's syndrome	233	244	0.9549	0.01836	1.9	0.9827	-2.8
132	Other congenital malformations and deformations	524	535	0.9794	0.02738	2.8	0.9744	0.5
133	Other chromosomal abnormalities, not elsewhere classified	160	133	1.2030	0.06750	5.6	1.0755	11.9
134	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	3741	3663	1.0213	0.00440	0.4	1.0245	-0.3
135	Sudden infant death syndrome	3006	2844	1.0570	0.00514	0.5	1.0362	2.0
136	Other symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	735	819	0.8974	0.01309	1.5	0.9069	-1.0
137	All other diseases (Residual)	25	21	1.1905	0.24370	20.5	*	*
138	External causes of mortality	1061	1063	0.9981	0.00189	0.1	0.9932	0.5
139	Accidents (unintentional injuries)	716	700	1.0229	0.00577	0.6	1.0246	-0.2
140	Transport accidents	219	215	1.0186	0.01148	1.1	0.9167	11.1
141	Motor vehicle accidents	209	214	0.9766	0.01789	1.8	0.8673	12.6
142	Other and unspecified transport accidents	10	1	*	*	*	*	*
143	Falls	11	8	*	*	*	*	*
144	Accidental discharge of firearms	2	2	*	*	*	*	*
145	Accidental drowning and submersion	58	57	1.0175	0.03064	3.0	*	*
146	Accidental suffocation and strangulation in bed	146	130	1.1231	0.06821	6.1	*	*
147	Other accidental suffocation and strangulation	105	122	0.8607	0.06036	7.0	1.1449	-24.8
148	Accidental inhalation and ingestion of food or other objects causing obstruction	74	65	1.1385	0.05443	4.8	1.1034	3.2
149	Accidents caused by exposure to smoke, fire and flames	52	53	0.9811	0.00000	0.0	*	*
150	Accidental poisoning and exposure to noxious substances	11	11	*	*	*	*	*
151	Other and unspecified accidents	38	37	1.0270	0.09876	9.6	*	*
152	Assault (homicide)	300	300	1.0000	0.01054	1.1	0.9481	5.5
153	Assault (homicide) by hanging, strangulation and suffocation	35	30	1.1667	0.11940	10.2	*	*
154	Assault (homicide) by discharge of firearms	7	8	*	*	*	*	*
155	Neglect, abandonment and other maltreatment syndromes	107	112	0.9554	0.05309	5.6	*	*
156	Assault (homicide) by other and unspecified means	151	150	1.0067	0.04068	4.0	1.0341	-2.7
157	Complications of medical and surgical care	11	25	*	*	*	*	*
158	Other external causes	34	38	0.8947	0.06096	6.8	*	*

- Quantity zero  
\* Figure does not meet standards of reliability or precision

Source: National Center for Health Statistics ([ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Datasets/Comparability/icd9\\_icd10/Comparability\\_Ratio\\_tables.xls](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Datasets/Comparability/icd9_icd10/Comparability_Ratio_tables.xls))