

# 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,V190-V192,V194-V196,V20-V79,V803-V805,V810-V811,V820-V821,V83-V86,V870-V878,V880-V888,V890,V892	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
BY DISCHARGE OF FIREARMS	X93-X95	E965.0-E965.4

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

List number	Cause of death <sup>1</sup>	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95 percent confidence limits	
		ICD-10 <sup>2</sup>	ICD-9 <sup>2</sup>				Lower	Upper
001	Salmonella infections . . . . .	30	37	0.8108	0.0644	7.9	0.6846	0.9370
002	Shigellosis and amebiasis . . . . .	*	*	*	*	*	*	*
003	Certain other intestinal infections . . . . .	*	*	*	*	*	*	*
004	Tuberculosis . . . . .	653	764	0.8547	0.0172	2	0.8209	0.8885
005	Respiratory tuberculosis . . . . .	518	572	0.9056	0.0201	2.2	0.8662	0.9450
006	Other tuberculosis . . . . .	135	192	0.7031	0.0407	5.8	0.6233	0.7830
007	Whooping cough . . . . .	*	*	*	*	*	*	*
008	Scarlet fever and erysipelas . . . . .	*	*	*	*	*	*	*
009	Meningococcal infection . . . . .	221	222	0.9955	0.0149	1.5	0.9663	1.0247
010	Septicemia . . . . .	21,258	17,791	1.1949	0.0042	0.3	1.1867	1.2030
011	Syphilis . . . . .	21	33	0.6364	0.1184	18.6	0.4043	0.8685
012	Acute poliomyelitis . . . . .	*	*	*	*	*	*	*
013	Arthropod-borne viral encephalitis . . . . .	*	*	*	*	*	*	*
014	Measles . . . . .	*	*	*	*	*	*	*
015	Viral hepatitis . . . . .	1,123	1,346	0.8343	0.0120	1.4	0.8109	0.8578
016	Human immunodeficiency virus (HIV) disease . . . . .	25,089	23,586	1.0637	0.0018	0.2	1.0601	1.0673
017	Malaria . . . . .	*	*	*	*	*	*	*
018	Other and unspecified infectious and parasitic diseases and their sequelae . . . . .	2,865	2,607	1.0990	0.0154	1.4	1.0688	1.1291
019	Malignant neoplasms . . . . .	464,688	461,544	1.0068	0.0002	0.0	1.0064	1.0072
020	Malignant neoplasms of lip, oral cavity and pharynx . . . . .	5,927	6,172	0.9603	0.0040	0.4	0.9525	0.9681
021	Malignant neoplasm of esophagus . . . . .	9,596	9,630	0.9965	0.0020	0.2	0.9926	1.0003
022	Malignant neoplasm of stomach . . . . .	11,480	11,408	1.0063	0.0019	0.2	1.0025	1.0101
023	Malignant neoplasms of colon, rectum and anus . . . . .	48,583	48,619	0.9993	0.0009	0.1	0.9975	1.0010
024	Malignant neoplasms of liver and intrahepatic bile ducts . . . . .	9,732	10,102	0.9634	0.0023	0.2	0.9588	0.9679
025	Malignant neoplasm of pancreas . . . . .	24,313	24,361	0.9980	0.0009	0.1	0.9963	0.9997
026	Malignant neoplasm of larynx . . . . .	3,209	3,194	1.0047	0.0053	0.5	0.9943	1.0150
027	Malignant neoplasms of trachea, bronchus and lung . . . . .	131,750	133,936	0.9837	0.0005	0.1	0.9827	0.9846
028	Malignant melanoma of skin . . . . .	5,941	6,139	0.9677	0.0032	0.3	0.9614	0.9741
029	Malignant neoplasm of breast . . . . .	38,102	37,891	1.0056	0.0010	0.1	1.0036	1.0075
030	Malignant neoplasm of cervix uteri . . . . .	3,753	3,802	0.9871	0.0034	0.3	0.9805	0.9938
031	Malignant neoplasms of corpus uteri and uterus, part unspecified . . . . .	5,318	5,183	1.0260	0.0040	0.4	1.0182	1.0339
032	Malignant neoplasm of ovary . . . . .	11,292	11,344	0.9954	0.0016	0.2	0.9923	0.9985
033	Malignant neoplasm of prostate . . . . .	30,672	30,267	1.0134	0.0015	0.1	1.0105	1.0162
034	Malignant neoplasms of kidney and renal pelvis . . . . .	9,521	9,521	1.0000	0.0022	0.2	0.9957	1.0043
035	Malignant neoplasm of bladder . . . . .	9,563	9,594	0.9968	0.0026	0.3	0.9916	1.0019
036	Malignant neoplasms of meninges, brain and other parts of central nervous system . . . . .	10,039	10,359	0.9691	0.0025	0.3	0.9642	0.9740
037	Malignant neoplasms of lymphoid, hematopoietic and related tissue . . . . .	44,715	44,530	1.0042	0.0012	0.1	1.0019	1.0064
038	Hodgkin's disease . . . . .	1,021	1,036	0.9855	0.0089	0.9	0.9680	1.0030
039	Non-Hodgkin's lymphoma . . . . .	17,924	18,326	0.9781	0.0018	0.2	0.9745	0.9817
040	Leukemia . . . . .	16,600	16,405	1.0119	0.0019	0.2	1.0083	1.0155
041	Multiple myeloma and immunoproliferative neoplasms . . . . .	9,099	8,763	1.0383	0.0030	0.3	1.0324	1.0443
042	Other and unspecified malignant neoplasms of lymphoid, hematopoietic and related tissue . . . . .	*	*	*	*	*	*	*
043	All other and unspecified malignant neoplasms . . . . .	51,182	45,492	1.1251	0.0021	0.2	1.1210	1.1292
044	In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior . . . . .	9,263	5,532	1.6744	0.0164	1.0	1.6422	1.7067
045	Anemias . . . . .	3,059	3,200	0.9559	0.0077	0.8	0.9409	0.9710
046	Diabetes mellitus . . . . .	48,636	48,242	1.0082	0.0011	0.1	1.0060	1.0103
047	Nutritional deficiencies . . . . .	3,215	2,763	1.1636	0.0165	1.4	1.1312	1.1960
048	Malnutrition . . . . .	2,607	2,665	0.9782	0.0151	1.5	0.9487	1.0078
049	Other nutritional deficiencies . . . . .	608	98	6.2041	0.5961	9.6	5.0358	7.3724
050	Meningitis . . . . .	592	584	1.0137	0.0136	1.3	0.9871	1.0403
051	Parkinson's disease . . . . .	10,404	10,392	1.0012	0.0028	0.3	0.9956	1.0067
052	Alzheimer's disease . . . . .	29,707	19,121	1.5536	0.0071	0.5	1.5398	1.5675
053	Major cardiovascular diseases . . . . .	796,919	798,435	0.9981	0.0002	0.0	0.9977	0.9985
054	Diseases of heart . . . . .	615,564	624,405	0.9858	0.0002	0.0	0.9854	0.9863
055	Acute rheumatic fever and chronic rheumatic heart diseases . . . . .	2,446	2,980	0.8208	0.0089	1.1	0.8034	0.8382
056	Hypertensive heart disease . . . . .	17,322	21,577	0.8028	0.0028	0.3	0.7973	0.8083
057	Hypertensive heart and renal disease . . . . .	2,170	2,027	1.0705	0.0160	1.5	1.0392	1.1019
058	Ischemic heart diseases . . . . .	466,459	466,935	0.9990	0.0002	0.0	0.9985	0.9994
059	Acute myocardial infarction . . . . .	178,125	180,169	0.9887	0.0003	0.0	0.9880	0.9893
060	Other acute ischemic heart diseases . . . . .	2,667	2,638	1.0110	0.0117	1.2	0.9880	1.0340
061	Other forms of chronic ischemic heart disease . . . . .	285,667	284,128	1.0054	0.0004	0.0	1.0046	1.0062

See footnotes at end of table.

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

List number	Cause of death <sup>1</sup>	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95 percent confidence limits	
		ICD-10 <sup>2</sup>	ICD-9 <sup>2</sup>				Lower	Upper
062	Atherosclerotic cardiovascular disease, so described . . . . .	64,354	61,362	1.0488	0.0016	0.2	1.0456	1.0519
063	All other forms of chronic ischemic heart disease . . . . .	221,313	222,766	0.9935	0.0004	0.0	0.9927	0.9942
064	Other heart diseases . . . . .	127,167	130,886	0.9716	0.0010	0.1	0.9696	0.9736
065	Acute and subacute endocarditis . . . . .	552	554	0.9964	0.0137	1.4	0.9695	1.0233
066	Diseases of pericardium and acute myocarditis . . . . .	489	475	1.0295	0.0160	1.6	0.9981	1.0608
067	Heart failure . . . . .	44,297	42,554	1.0410	0.0013	0.1	1.0384	1.0435
068	All other forms of heart disease . . . . .	81,829	87,303	0.9373	0.0014	0.2	0.9345	0.9401
069	Essential (primary) hypertension and hypertensive renal disease . . . . .	11,958	10,684	1.1192	0.0050	0.4	1.1094	1.1291
070	Cerebrovascular diseases . . . . .	137,264	129,640	1.0588	0.0008	0.1	1.0572	1.0604
071	Atherosclerosis . . . . .	13,894	14,417	0.9637	0.0025	0.3	0.9588	0.9686
072	Other diseases of circulatory system . . . . .	18,239	19,289	0.9456	0.0021	0.2	0.9414	0.9498
073	Aortic aneurysm and dissection . . . . .	12,216	12,201	1.0012	0.0010	0.1	0.9992	1.0032
074	Other diseases of arteries, arterioles and capillaries . . . . .	6,023	7,088	0.8497	0.0053	0.6	0.8394	0.8601
075	Other disorders of circulatory system . . . . .	2,984	2,899	1.0293	0.0172	1.7	0.9956	1.0631
076	Influenza and pneumonia . . . . .	50,526	72,371	0.6982	0.0018	0.3	0.6947	0.7016
077	Influenza . . . . .	572	567	1.0088	0.0073	0.7	0.9945	1.0231
078	Pneumonia . . . . .	49,954	71,804	0.6957	0.0018	0.3	0.6922	0.6992
079	Other acute lower respiratory infections . . . . .	346	355	0.9746	0.0392	4.0	0.8978	1.0515
080	Acute bronchitis and bronchiolitis . . . . .	265	355	0.7465	0.0264	3.5	0.6947	0.7983
081	Unspecified acute lower respiratory infection . . . . .	*	*	*	*	*	*	*
082	Chronic lower respiratory diseases . . . . .	94,326	90,022	1.0478	0.0009	0.1	1.0460	1.0496
083	Bronchitis, chronic and unspeci ed . . . . .	913	2,320	0.3935	0.0107	2.7	0.3726	0.4145
084	Emphysema . . . . .	14,369	14,774	0.9726	0.0031	0.3	0.9666	0.9786
085	Asthma . . . . .	4,217	4,718	0.8938	0.0061	0.7	0.8819	0.9057
086	Other chronic lower respiratory diseases . . . . .	74,827	68,210	1.0970	0.0014	0.1	1.0943	1.0998
087	Pneumoconioses and chemical effects . . . . .	860	845	1.0178	0.0099	1.0	0.9983	1.0372
088	Pneumonitis due to solids and liquids . . . . .	10,183	9,104	1.1185	0.0048	0.4	1.1092	1.1279
089	Other diseases of respiratory system . . . . .	16,656	14,269	1.1673	0.0052	0.4	1.1572	1.1774
090	Peptic ulcer . . . . .	3,574	3,686	0.9696	0.0045	0.5	0.9608	0.9784
091	Diseases of appendix . . . . .	209	202	1.0347	0.0242	2.3	0.9873	1.0820
092	Hernia . . . . .	658	633	1.0395	0.0154	1.5	1.0094	1.0696
093	Chronic liver disease and cirrhosis . . . . .	21,688	20,920	1.0367	0.0027	0.3	1.0314	1.0420
094	Alcoholic liver disease . . . . .	10,147	9,965	1.0183	0.0050	0.5	1.0085	1.0281
095	Other chronic liver disease and cirrhosis . . . . .	11,541	10,955	1.0535	0.0041	0.4	1.0454	1.0615
096	Cholelithiasis and other disorders of gallbladder . . . . .	1,725	1,803	0.9567	0.0060	0.6	0.9450	0.9685
097	Nephritis, nephrotic syndrome and nephrosis . . . . .	24,939	20,242	1.2320	0.0044	0.4	1.2234	1.2407
098	Acute and rapidly progressive nephritic and nephrotic syndrome . . . . .	161	249	0.6466	0.0342	5.3	0.5796	0.7136
099	Chronic glomerulonephritis, nephritis and nephropathy not specified as acute or chronic, and renal sclerosis unspecified . . . . .	468	1,213	0.3858	0.0144	3.7	0.3575	0.4141
100	Renal failure . . . . .	24,290	18,758	1.2949	0.0050	0.4	1.2852	1.3047
101	Other disorders of kidney . . . . .	20	22	0.9091	0.0867	9.5	0.7392	1.0790
102	Infections of kidney . . . . .	731	726	1.0069	0.0144	1.4	0.9786	1.0352
103	Hyperplasia of prostate . . . . .	326	327	0.9969	0.0159	1.6	0.9658	1.0280
104	Inflammatory diseases of female pelvic organs . . . . .	63	64	0.9844	0.0410	4.2	0.9040	1.0648
105	Pregnancy, childbirth and the puerperium . . . . .	*	*	*	*	*	*	*
106	Pregnancy with abortive outcome . . . . .	*	*	*	*	*	*	*
107	Other complications of pregnancy, childbirth and the puerperium . . . . .	*	*	*	*	*	*	*
108	Certain conditions originating in the perinatal period . . . . .	10,184	9,555	1.0658	0.0033	0.3	1.0593	1.0724
109	Congenital malformations, deformations and chromosomal abnormalities . . . . .	5,950	7,025	0.8470	0.0055	0.6	0.8362	0.8577
110	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified . . . . .	16,940	17,732	0.9553	0.0034	0.4	0.9487	0.9620
111	All other diseases (Residual) . . . . .	109,853	122,107	0.8996	0.0015	0.2	0.8968	0.9025
112	Accidents (unintentional injuries) . . . . .	31,084	30,163	1.0305	0.0014	0.1	1.0278	1.0333
113	Transport accidents . . . . .	17,547	17,586	0.9978	0.0006	0.1	0.9966	0.9990
114	Motor vehicle accidents . . . . .	14,539	17,051	0.8527	0.0027	0.3	0.8473	0.8581
115	Other land transport accidents . . . . .	*	*	*	*	*	*	*
116	Water, air and space, and other and unspecified transport accidents and their sequelae . . . . .	351	347	1.0115	0.0209	2.1	0.9706	1.0525
117	Nontransport accidents . . . . .	13,537	12,577	1.0763	0.0035	0.3	1.0696	1.0831
118	Falls . . . . .	5,173	6,152	0.8409	0.0049	0.6	0.8313	0.8505
119	Accidental discharge of firearms . . . . .	493	466	1.0579	0.0127	1.2	1.0331	1.0828
120	Accidental drowning and submersion . . . . .	283	284	0.9965	0.0127	1.3	0.9716	1.0213
121	Accidental exposure to smoke, fire and flames . . . . .	493	506	0.9743	0.0089	0.9	0.9568	0.9918
122	Accidental poisoning and exposure to noxious substances . . . . .	*	*	*	*	*	*	*
123	Other and unspecified nontransport accidents and their sequelae . . . . .	6,698	4,721	1.4188	0.0123	0.9	1.3947	1.4428

See footnotes at end of table.

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

List number	Cause of death <sup>1</sup>	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95 percent confidence limits	
		ICD-10 <sup>2</sup>	ICD-9 <sup>2</sup>				Lower	Upper
124	Intentional self-harm (suicide) . . . . .	18,352	18,422	0.9962	0.0005	0.0	0.9952	0.9972
125	Intentional self-harm (suicide) by discharge of firearms . . . . .	14,157	14,183	0.9982	0.0007	0.1	0.9968	0.9996
126	Intentional self-harm (suicide) by other and unspecified means and their sequelae. . . . .	4,195	4,239	0.9896	0.0023	0.2	0.9850	0.9942
127	Assault (homicide) . . . . .	12,287	12,308	0.9983	0.0006	0.1	0.9972	0.9994
128	Assault (homicide) by discharge of firearms . . . . .	8,718	8,745	0.9969	0.0008	0.1	0.9953	0.9985
	Assault (homicide) by other and unspecified means and their sequelae. . . . .	3,569	3,563	1.0017	0.0024	0.2	0.9969	1.0064
129	Legal intervention. . . . .	*	*	*	*	*	*	*
130	Events of undetermined intent . . . . .	*	*	*	*	*	*	*
131	Discharge of firearms, undetermined intent . . . . .	*	*	*	*	*	*	*
132	Other and unspecified events of undetermined intent and their sequelae. . . . .	*	*	*	*	*	*	*
133	Operations of war and their sequelae . . . . .	*	*	*	*	*	*	*
134	Complications of medical and surgical care. . . . .	*	*	*	*	*	*	*
135								

\* Figure does not meet standards of reliability or precision.

0.0 Quantity more than zero but less than 0.05.

<sup>1</sup>Based on the Ninth and Tenth Revision categories.

<sup>2</sup>ICD-10 is International Classification of Diseases, Tenth Revision, and ICD-9 is International Classification of Diseases, Ninth Revision.

Source: Anderson RN, Minino AM, Hoyert DL, Rosenberg HM. Comparability of Cause of Death Between ICD-9 and ICD-10; Preliminary Estimates. National Vital Statistics Reports; Vol. 49, Number 2. Hyattsville, MD: National Center for Health Statistics. 2001

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

List number	Cause of death <sup>1</sup>	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95 percent confidence limits	
		ICD-10 <sup>2</sup>	ICD-9 <sup>2</sup>				Lower	Upper
001	Certain infectious and parasitic diseases . . . . .	284	387	0.7339	0.0339	4.6	0.6673	0.8004
002	Certain intestinal infectious diseases . . . . .	*	*	*	*	*	*	*
003	Diarrhea and gastroenteritis of infectious origin . . . . .	—	144	—	—	—	—	—
004	Tuberculosis . . . . .	*	*	*	*	*	*	*
005	Tetanus . . . . .	*	*	*	*	*	*	*
006	Diphtheria . . . . .	*	*	*	*	*	*	*
007	Whooping cough . . . . .	*	*	*	*	*	*	*
008	Meningococcal infection . . . . .	25	26	0.9615	0.0377	3.9	0.8876	1.0355
009	Septicemia . . . . .	167	121	1.3802	0.0713	5.2	1.2403	1.5200
010	Congenital syphilis . . . . .	*	*	*	*	*	*	*
011	Gonococcal infection . . . . .	*	*	*	*	*	*	*
012	Viral diseases . . . . .	62	62	1.0000	0.0757	7.6	0.8517	1.1483
013	Acute poliomyelitis . . . . .	*	*	*	*	*	*	*
014	Varicella (chickenpox) . . . . .	*	*	*	*	*	*	*
015	Measles . . . . .	*	*	*	*	*	*	*
016	Human immunodeficiency virus (HIV) disease . . . . .	23	22	1.0455	0.0465	4.4	0.9544	1.1365
017	Mumps . . . . .	*	*	*	*	*	*	*
018	Other and unspecified viral diseases . . . . .	35	36	0.9722	0.1255	12.9	0.7262	1.2182
019	Candidiasis . . . . .	*	*	*	*	*	*	*
020	Malaria . . . . .	*	*	*	*	*	*	*
021	Pneumocystosis . . . . .	*	*	*	*	*	*	*
022	All other and unspecified infectious and parasitic diseases . . . . .	*	*	*	*	*	*	*
023	Neoplasms . . . . .	73	72	1.0139	0.0420	4.1	0.9317	1.0961
024	Malignant neoplasms . . . . .	48	46	1.0435	0.0544	5.2	0.9369	1.1501
025	Hodgkin's disease and non-Hodgkin's lymphomas . . . . .	*	*	*	*	*	*	*
026	Leukemia . . . . .	*	*	*	*	*	*	*
027	Other and unspecified malignant neoplasms . . . . .	30	28	1.0714	0.0906	8.5	0.8939	1.2489
028	In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior . . . . .	25	26	0.9615	0.1131	11.8	0.7398	1.1833
029	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism . . . . .	35	50	0.7000	0.0803	11.5	0.5427	0.8573
030	Anemias . . . . .	*	*	*	*	*	*	*
031	Other diseases of blood and blood-forming organs . . . . .	*	*	*	*	*	*	*
032	Certain disorders involving the immune mechanism . . . . .	*	*	*	*	*	*	*
033	Endocrine, nutritional and metabolic diseases . . . . .	112	129	0.8682	0.0555	6.4	0.7595	0.9770
034	Short stature, not elsewhere classified . . . . .	*	*	*	*	*	*	*
035	Malnutrition and other nutritional deficiencies . . . . .	*	*	*	*	*	*	*
036	Cystic fibrosis . . . . .	*	*	*	*	*	*	*
037	Volume depletion, disorders of fluid, electrolyte and acid-base balance . . . . .	40	53	0.7547	0.0852	11.3	0.5878	0.9217
038	All other endocrine, nutritional and metabolic diseases . . . . .	64	55	1.1636	0.0809	6.9	1.0051	1.3221
039	Diseases of the nervous system . . . . .	305	286	1.0664	0.0263	2.5	1.0149	1.1180
040	Meningitis . . . . .	70	70	1.0000	0.0404	4.0	0.9208	1.0792
041	Infantile spinal muscular atrophy, type I (Werdnig-Hoffman) . . . . .	47	47	1.0000	0.0521	5.2	0.8978	1.1022
042	Infantile cerebral palsy . . . . .	*	*	*	*	*	*	*
043	Anoxic brain damage, not elsewhere classified . . . . .	29	30	0.9667	0.1269	13.1	0.7179	1.2155
044	Other diseases of nervous system . . . . .	145	126	1.1508	0.0532	4.6	1.0466	1.2550
045	Diseases of the ear and mastoid process . . . . .	*	*	*	*	*	*	*
046	Diseases of the circulatory system . . . . .	419	587	0.7138	0.0244	3.4	0.6659	0.7617
047	Pulmonary heart disease and diseases of pulmonary circulation . . . . .	138	123	1.1220	0.0447	4.0	1.0342	1.2097
048	Pericarditis, endocarditis and myocarditis . . . . .	*	*	*	*	*	*	*
049	Cardiomyopathy . . . . .	82	84	0.9762	0.0166	1.7	0.9436	1.0088
050	Cardiac arrest . . . . .	25	87	0.2874	0.0508	17.7	0.1878	0.3869
051	Cerebrovascular diseases . . . . .	77	163	0.4724	0.0510	10.8	0.3725	0.5723
052	All other diseases of circulatory system . . . . .	88	123	0.7154	0.0519	7.3	0.6137	0.8172
053	Diseases of the respiratory system . . . . .	420	516	0.8140	0.0220	2.7	0.7709	0.8570
054	Acute upper respiratory infections . . . . .	*	*	*	*	*	*	*
055	Influenza and pneumonia . . . . .	231	303	0.7624	0.0261	3.4	0.7112	0.8135
056	Influenza . . . . .	*	*	*	*	*	*	*
057	Pneumonia . . . . .	224	295	0.7593	0.0266	3.5	0.7072	0.8114
058	Acute bronchitis and acute bronchiolitis . . . . .	33	41	0.8049	0.0758	9.4	0.6563	0.9534
059	Bronchitis, chronic and unspecified . . . . .	*	*	*	*	*	*	*
060	Asthma . . . . .	*	*	*	*	*	*	*
061	Pneumonitis due to solids and liquids . . . . .	*	*	*	*	*	*	*
062	Other and unspecified diseases of respiratory system . . . . .	117	127	0.9213	0.0632	6.9	0.7973	1.0452
063	Diseases of the digestive system . . . . .	278	167	1.6647	0.1084	6.5	1.4521	1.8772

See footnotes at end of table.

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

List number	Cause of death <sup>1</sup>	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95 percent confidence limits	
		ICD-10 <sup>2</sup>	ICD-9 <sup>2</sup>				Lower	Upper
064	Gastritis, duodenitis, and noninfective enteritis and colitis . . . . .	137	47	2.9149	0.3879	13.3	2.1547	3.6751
065	Hernia of abdominal cavity and intestinal obstruction without hernia . . . . .	*	*	*	*	*	*	*
066	All other and unspecified diseases of digestive system . . . . .	84	86	0.9767	0.0708	7.3	0.8379	1.1156
067	Diseases of the genitourinary system . . . . .	117	117	1.0000	0.0567	5.7	0.8889	1.1111
068	Renal failure and other disorders of kidney . . . . .	102	98	1.0408	0.0658	6.3	0.9118	1.1699
069	Other and unspecified diseases of genitourinary system . . . . .	*	*	*	*	*	*	*
070	Certain conditions originating in the perinatal period . . . . .	10,047	9,495	1.0581	0.0032	0.3	1.0519	1.0643
071	Newborn affected by maternal factors and by complications of pregnancy, labor and delivery . . . . .	1,305	1,256	1.0390	0.0099	1.0	1.0196	1.0585
072	Newborn affected by maternal hypertensive disorders . . . . .	23	22	1.0455	0.0465	4.4	0.9544	1.1365
073	Newborn affected by other maternal conditions which may be unrelated to present pregnancy . . . . .	*	*	*	*	*	*	*
074	Newborn affected by maternal complications of pregnancy . . . . .	662	643	1.0295	0.0138	1.3	1.0024	1.0567
075	Newborn affected by incompetent cervix . . . . .	205	201	1.0199	0.0188	1.8	0.9831	1.0567
076	Newborn affected by premature rupture of membranes . . . . .	314	307	1.0228	0.0136	1.3	0.9962	1.0494
077	Newborn affected by multiple pregnancy . . . . .	104	103	1.0097	0.0507	5.0	0.9103	1.1091
078	Newborn affected by other maternal complications of pregnancy . . . . .	39	32	1.2188	0.1655	13.6	0.8945	1.5430
079	Newborn affected by complications of placenta, cord, and membranes . . . . .	579	553	1.0470	0.0128	1.2	1.0219	1.0721
080	Newborn affected by complications involving placenta . . . . .	306	285	1.0737	0.0174	1.6	1.0395	1.1079
081	Newborn affected by complications involving cord . . . . .	*	*	*	*	*	*	*
082	Newborn affected by chorioamnionitis . . . . .	258	255	1.0118	0.0163	1.6	0.9799	1.0436
083	Newborn affected by other and unspecified abnormalities of membranes . . . . .	*	*	*	*	*	*	*
084	Newborn affected by other complications of labor and delivery . . . . .	37	20	1.8500	0.3262	17.6	1.2107	2.4893
085	Newborn affected by noxious influences transmitted via placenta or breast milk . . . . .	*	*	*	*	*	*	*
086	Disorders related to length of gestation and fetal malnutrition . . . . .	3,843	3,474	1.1062	0.0064	0.6	1.0936	1.1188
087	Slow fetal growth and fetal malnutrition . . . . .	34	30	1.1333	0.1004	8.9	0.9366	1.3301
088	Disorders related to short gestation and low birth weight, not elsewhere classified . . . . .	3,809	3,444	1.1060	0.0064	0.6	1.0934	1.1186
089	Extremely low birth weight or extreme immaturity . . . . .	2,835	2,558	1.1083	0.0079	0.7	1.0927	1.1239
090	Other low birth weight or preterm . . . . .	974	886	1.0993	0.0135	1.2	1.0729	1.1258
091	Disorders related to long gestation and high birth weight . . . . .	*	*	*	*	*	*	*
092	Birth trauma . . . . .	5	113	0.0442	0.0197	44.5	0.0056	0.0829
093	Intrauterine hypoxia and birth asphyxia . . . . .	401	277	1.4477	0.0599	4.1	1.3303	1.5650
094	Intrauterine hypoxia . . . . .	57	63	0.9048	0.1227	13.6	0.6643	1.1452
095	Birth asphyxia . . . . .	344	214	1.6075	0.0763	4.7	1.4579	1.7571
096	Respiratory distress of newborn . . . . .	917	894	1.0257	0.0131	1.3	1.0001	1.0513
097	Other respiratory conditions originating in the perinatal period . . . . .	1,160	1,372	0.8455	0.0216	2.6	0.8032	0.8878
098	Congenital pneumonia . . . . .	57	15	3.8000	0.9004	23.7	2.0352	5.5648
099	Neonatal aspiration syndromes . . . . .	78	56	1.3929	0.1115	8.0	1.1743	1.6114
100	Interstitial emphysema and related conditions originating in the perinatal period . . . . .	146	121	1.2066	0.0595	4.9	1.0899	1.3233
101	Pulmonary hemorrhage originating in the perinatal period . . . . .	212	145	1.4621	0.0751	5.1	1.3150	1.6092
102	Chronic respiratory disease originating in the perinatal period . . . . .	243	214	1.1355	0.0327	2.9	1.0715	1.1995
103	Atelectasis . . . . .	382	185	2.0649	0.1144	5.5	1.8406	2.2891
104	All other respiratory conditions originating in the perinatal period . . . . .	42	636	0.0660	0.0101	15.2	0.0463	0.0858
105	Infections specific to the perinatal period . . . . .	563	552	1.0199	0.0261	2.6	0.9688	1.0710
106	Bacterial sepsis of newborn . . . . .	470	514	0.9144	0.0272	3.0	0.8611	0.9677
107	Omphalitis of newborn with or without mild hemorrhage . . . . .	*	*	*	*	*	*	*
108	All other infections specific to the perinatal period . . . . .	93	38	2.4474	0.3705	15.1	1.7211	3.1736
109	Hemorrhagic and hematological disorders of newborn . . . . .	390	274	1.4234	0.0640	4.5	1.2979	1.5488
110	Neonatal hemorrhage . . . . .	319	222	1.4369	0.0698	4.9	1.3002	1.5737
111	Hemorrhagic disease of newborn . . . . .	*	*	*	*	*	*	*
112	Hemolytic disease of newborn due to isoimmunization and other perinatal jaundice . . . . .	*	*	*	*	*	*	*
113	Hematological disorders . . . . .	*	*	*	*	*	*	*
114	Syndrome of infant of a diabetic mother and neonatal diabetes mellitus . . . . .	*	*	*	*	*	*	*
115	Necrotizing enterocolitis of newborn . . . . .	249	203	1.2266	0.0456	3.7	1.1371	1.3161
116	Hydrops fetalis not due to hemolytic disease . . . . .	120	120	1.0000	0.0264	2.6	0.9483	1.0517
117	Other perinatal conditions . . . . .	1,092	954	1.1447	0.0192	1.7	1.1070	1.1823
118	Congenital malformations, deformations and chromosomal abnormalities . . . . .	3,400	3,751	0.9064	0.0057	0.6	0.8953	0.9176

See footnotes at end of table.

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

List number	Cause of death <sup>1</sup>	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95 percent confidence limits	
		ICD-10 <sup>2</sup>	ICD-9 <sup>2</sup>				Lower	Upper
119	Anencephaly and similar malformations . . . . .	299	299	1.0000	0.0	0.0	1.0000	1.0000
120	Congenital hydrocephalus . . . . .	62	91	0.6813	0.0552	8.1	0.5732	0.7895
121	Spina bifida . . . . .	24	32	0.7500	0.0765	10.2	0.6000	0.9000
122	Other congenital malformations of nervous system . . . . .	191	177	1.0791	0.0477	4.4	0.9856	1.1725
123	Congenital malformations of heart . . . . .	1,022	1,027	0.9951	0.0081	0.8	0.9793	1.0109
124	Other congenital malformations of circulatory system . . . . .	75	121	0.6198	0.0504	8.1	0.5210	0.7186
125	Congenital malformations of respiratory system . . . . .	361	571	0.6322	0.0225	3.6	0.5882	0.6762
126	Congenital malformations of digestive system . . . . .	*	*	*	*	*	*	*
127	Congenital malformations of genitourinary system . . . . .	216	229	0.9432	0.0244	2.6	0.8955	0.9910
128	Congenital malformations and deformations of musculoskeletal system, limbs and integument . . . . .	269	311	0.8650	0.0319	3.7	0.8024	0.9275
129	Down's syndrome . . . . .	57	58	0.9828	0.0705	7.2	0.8446	1.1209
130	Edward's syndrome . . . . .	277	278	0.9964	0.0080	0.8	0.9807	1.0121
131	Patau's syndrome . . . . .	170	173	0.9827	0.0099	1.0	0.9632	1.0021
132	Other congenital malformations and deformations . . . . .	304	312	0.9744	0.0210	2.2	0.9332	1.0155
133	Other chromosomal abnormalities, not elsewhere classified . . . . .	57	53	1.0755	0.0783	7.3	0.9221	1.2289
134	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified . . . . .	2,799	2,732	1.0245	0.0042	0.4	1.0163	1.0327
135	Sudden infant death syndrome . . . . .	2,575	2,485	1.0362	0.0040	0.4	1.0284	1.0440
136	Other symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified . . . . .	224	247	0.9069	0.0270	3.0	0.8540	0.9598
137	All other diseases . . . . .	*	*	*	*	*	*	*
138	External causes of mortality . . . . .	441	444	0.9932	0.0098	1.0	0.9741	1.0124
139	Accidents (unintentional injuries) . . . . .	292	285	1.0246	0.0107	1.0	1.0037	1.0454
140	Transport accidents . . . . .	99	108	0.9167	0.0294	3.2	0.8590	0.9743
141	Motor vehicle accidents . . . . .	85	98	0.8673	0.0368	4.2	0.7952	0.9395
142	Other and unspecified transport accidents . . . . .	*	*	*	*	*	*	*
143	Falls . . . . .	*	*	*	*	*	*	*
144	Accidental discharge of firearms . . . . .	*	*	*	*	*	*	*
145	Accidental drowning and submersion . . . . .	*	*	*	*	*	*	*
146	Accidental suffocation and strangulation in bed . . . . .	*	*	*	*	*	*	*
147	Other accidental suffocation and strangulation . . . . .	79	69	1.1449	0.0537	4.7	1.0396	1.2502
148	Accidental inhalation and ingestion of food or other objects causing obstruction of respiratory tract . . . . .	32	29	1.1034	0.0810	7.3	0.9447	1.2622
149	Accidents caused by exposure to smoke, fire and flames . . . . .	*	*	*	*	*	*	*
150	Accidental poisoning and exposure to noxious substances . . . . .	*	*	*	*	*	*	*
151	Other and unspecified accidents . . . . .	*	*	*	*	*	*	*
152	Assault (homicide) . . . . .	146	154	0.9481	0.0179	1.9	0.9130	0.9831
153	Assault (homicide) by hanging, strangulation and suffocation . . . . .	*	*	*	*	*	*	*
154	Assault (homicide) by discharge of firearms . . . . .	*	*	*	*	*	*	*
155	Neglect, abandonment and other maltreatment syndromes . . . . .	*	*	*	*	*	*	*
156	Assault (homicide) by other and unspecified means . . . . .	91	88	1.0341	0.0417	4.0	0.9524	1.1158
157	Complications of medical and surgical care . . . . .	*	*	*	*	*	*	*
158	Other external causes . . . . .	*	*	*	*	*	*	*

\* Figure does not meet standards of reliability or precision.

- Quantity zero.

<sup>1</sup>Based on the Ninth and Tenth Revision categories.

<sup>2</sup>ICD-10 is Classification of Diseases, Tenth Revision, and ICD-9 is International Classification of Diseases, Ninth Revision.

Source: Anderson RN, Minino AM, Hoyert DL, Rosenberg HM. Comparability of Cause of Death Between ICD-9 and ICD-10; Preliminary Estimates. National Vital Statistics Reports; Vol. 49, Number 2. Hyattsville, MD: National Center for Health Statistics. 2001