

ICD-10/ICD-9 Comparability Ratios for 113 Selected Causes of Death

How to Use This Table

To compare deaths coded with ICD-10 (used for deaths that occurred in 1999 and later) to deaths coded with ICD-9 (used for deaths that occurred between 1979 and 1998), multiply the number of deaths from earlier years by the comparability ratio for the specific cause of death.

For example, the ratio for Septicemia is 1.19, indicating that 19 percent more deaths were coded to this cause in ICD-10 than in ICD-9 solely because of the revision in the ICD. To analyze the trend in Septicemia deaths, multiply the number of Septicemia deaths in 1998 (317) by 1.19 to make it comparable to the 1999 Septicemia number. Comparing the 1998 number (modified to make it comparable = 379) to the 1999 number (376), we see that the number of deaths from this cause did not change appreciably from 1998 to 1999.

The standard error can be used to obtain a more definitive estimate of whether the numbers for ICD-10 years are different from those for ICD-9 years. The following example (again, for Septicemia) demonstrates how to use the standard error.

1. Multiply:

$$\begin{array}{ccccccc} \text{Comparability ratio} & \times & \text{standard error} & \times & 1.96 & \times & \text{the comparability-modified 1998 number.} \\ 1.19 & & 0.0042 & & & & 379 \\ = & & & & & & \\ = & & & & & & 3.7127 \end{array}$$

2. Add and subtract this number to/from the comparability-modified 1998 number:

$$\begin{array}{l} 379 - 3.7127 = 375.2873 \text{ (low point of the range);} \\ 379 + 3.7127 = 382.7127 \text{ (high point of the range).} \end{array}$$

When these two numbers are rounded, the range (or confidence interval) is 375.3 to 382.7. The actual number of Septicemia deaths for 1999 (376) falls within this range. Therefore, there is a 95% probability that mortality due to Septicemia in 1999 was not substantially different from mortality due to Septicemia in 1998.

The National Center for Health Statistics (NCHS) provided the comparability ratios and standard errors used in the table.

CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999	1998		Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	Actual Number	Comparability Modified	Actual Number				
Salmonella infections	0	+	1	0.81	A01-A02	002-003	0.0644
Shigellosis and amebiasis	0	+	0	*	A03,A06	004,006	*
Certain other intestinal infections	20	+	24	0.60	A04,A07-A09	007-009	0.0248
Tuberculosis	3	+	15	0.85	A16-A19	010-018	0.0172
Respiratory tuberculosis	2	+	9	0.91	A16	010-012	0.0201
Other tuberculosis	1	+	6	0.70	A17-A19	013-018	0.0407
Whooping cough	0	+	0	*	A37	033	*
Scarlet fever and erysipelas	0	+	0	*	A38,A46	034.1-035	*
Meningococcal infection	3	+	5	1.00	A39	036	0.0149
Septicemia	376	379	317	1.19	A40-A41	038	0.0042
Syphilis	0	+	1	0.64	A50-A53	090-097	0.1184
Acute poliomyelitis	0	+	0	*	A80	045	*
Arthropod-borne viral encephalitis	0	+	0	*	A83-A84,A85.2	062-064	*
Measles	0	+	0	*	B05	055	*
Viral hepatitis	15	+	34	0.83	B15-B19	070	0.0120
Human immunodeficiency virus (HIV) disease	62	+	60	1.06	B20-B24	042-044	0.0018
Malaria	0	+	0	*	B50-B54	084	*
Other and unspecified infectious and parasitic diseases and their sequelae	141	122	111	1.10	A00,A05,A20-A36,A42-A44, A48-A49,A54-A79, A81-A82,A85.0-A85.1, A85.8,A86-B04,B06-B09, B25-B49,B55-B99	001,005,020-032, 037, 039-041,046-054, 056-061, 065-066,071-083, 085-088,098-134, 136-139,771.3	0.0154
Malignant neoplasms	10,731	10,960	10,886	1.01	C00-C97	140-208	0.0002
Malignant neoplasms of lip, oral cavity and pharynx	142	169	176	0.96	C00-C14	140-149	0.0040
Malignant neoplasm of esophagus	266	273	273	1.00	C15	150	0.0020

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* Figure does not meet standards of reliability or precision.

--- Category not applicable

(Continued)

CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999	1998		Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	Actual Number	Comparability Modified	Actual Number				
Malignant neoplasm of stomach	203	219	218	1.01	C16	151	0.0019
Malignant neoplasms of colon, rectum and anus	1,169	1,128	1,128	1.00	C18-C21	153-154	0.0009
Malignant neoplasms of liver and intrahepatic bile ducts	214	222	230	0.96	C22	155	0.0023
Malignant neoplasm of pancreas	576	576	576	1.00	C25	157	0.0009
Malignant neoplasm of larynx	69	+	63	1.00	C32	161	0.0053
Malignant neoplasms of trachea, bronchus and lung	2,642	2,753	2,799	0.98	C33-C34	162	0.0005
Malignant melanoma of skin	142	138	143	0.97	C43	172	0.0032
Malignant neoplasm of breast	834	869	864	1.01	C50	174-175	0.0010
Malignant neoplasm of cervix uteri	67	125	127	0.99	C53	180	0.0034
Malignant neoplasms of corpus uteri and uterus, part unspecified	141	+	59	1.03	C54-C55	179,182	0.0040
Malignant neoplasm of ovary	250	288	288	1.00	C56	183.0	0.0016
Malignant neoplasm of prostate	681	761	751	1.01	C61	185	0.0015
Malignant neoplasms of kidney and renal pelvis	246	227	227	1.00	C64-C65	189.0,189.1	0.0022
Malignant neoplasm of bladder	241	242	242	1.00	C67	188	0.0026
Malignant neoplasms of meninges, brain and other parts of central nervous system	252	277	286	0.97	C70-C72	191-192	0.0025
Malignant neoplasms of lymphoid, hematopoietic and related tissue	1,243	1,253	1,253	1.00	C81-C96	200-208	0.0012
Hodgkin's disease	22	+	40	0.99	C81	201	0.0089
Non-Hodgkin's lymphoma	519	519	531	0.98	C82-C85	200,202	0.0018
Leukemia	469	473	467	1.01	C91-C95	204-208	0.0019
Multiple myeloma and immunoproliferative neoplasms	231	223	215	1.04	C88,C90	203	0.0030

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(Continued)

CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999	1998		Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	Actual Number	Comparability Modified	Actual Number				
Other and unspecified malignant neoplasms of lymphoid, hematopoietic and related tissue	2	+	0	*	C96	---	*
All other and unspecified malignant neoplasms	1,353	1,331	1,183	1.13	C17,C23-C24,C26-C31, C37-C41,C44-C49, C51-C52, C57-C60, C62-C63, C66, C68-C69,C73-C80,C97	152,156,158-160, 163-171,173,181, 183.2-184,186-187, 189.2-190,193-199	0.0021
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior	321	352	210	1.67	D00-D48	210-239	0.0164
Anemias	83	+	97	0.96	D50-D64	280-285	0.0077
Diabetes mellitus	1,273	1,284	1,274	1.01	E10-E14	250	0.0011
Nutritional deficiencies	81	144	124	1.16	E40-E64	260-269	0.0165
Malnutrition	57	118	121	0.98	E40-E46	260-263	0.0151
Other nutritional deficiencies	24	+	3	6.20	E50-E64	264-269	0.5961
Meningitis	17	+	9	1.01	G00,G03	320-322	0.0136
Parkinson's disease	340	311	311	1.00	G20-G21	332	0.0028
Alzheimer's disease	1,169	797	513	1.55	G30	331.0	0.0071
Major cardiovascular diseases	18,745	18,416	18,416	1.00	I00-I78	390-434,436-448	0.0002
Diseases of heart	13,802	13,479	13,673	0.99	I00-I09,I11,I13,I20-I51	390-398,402,404,410-429	0.0002
Acute rheumatic fever and chronic rheumatic heart diseases	78	97	118	0.82	I00-I09	390-398	0.0089
Hypertensive heart disease	434	315	392	0.80	I11	402	0.0028
Hypertensive heart and renal disease	47	+	32	1.07	I13	404	0.0160
Ischemic heart diseases	9,615	9,602	9,602	1.00	I20-I25	410-414,429.2	0.0002
Acute myocardial infarction	4,388	4,406	4,457	0.99	I21-I22	410	0.0003

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(Continued)

CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999	1998		Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	Actual Number	Comparability Modified	Actual Number				
Other acute ischemic heart diseases	27	+	11	1.01	I24	411	0.0117
Other forms of chronic ischemic heart disease	5,200	5,162	5,134	1.01	I20,I25	412-414,429.2	0.0004
Atherosclerotic cardiovascular disease, so described	693	703	670	1.05	I25.0	429.2	0.0016
All other forms of chronic ischemic heart disease	4,507	4,435	4,464	0.99	I20,I25.1-I25.9	412-414	0.0004
Other heart diseases	3,628	3,429	3,529	0.97	I26-I51	415-429.1,429.3-429.9	0.0010
Acute and subacute endocarditis	20	+	14	1.00	I33	421	0.0137
Diseases of pericardium and acute myocarditis	14	+	7	1.03	I30-I31,I40	420,422-423	0.0160
Heart failure	1,333	1,430	1,374	1.04	I50	428	0.0013
All other forms of heart disease	2,261	2,000	2,134	0.94	I26-I28,I34-I38,I42-I49,I51	415-417,424-427, 429.0-429.1,429.3-429.9	0.0014
Essential (primary) hypertension and hypertensive renal disease	246	223	199	1.12	I10,I12	401,403	0.0050
Cerebrovascular diseases	3,849	3,851	3,637	1.06	I60-I69	430-434,436-438	0.0008
Atherosclerosis	243	252	262	0.96	I70	440	0.0025
Other diseases of circulatory system	605	610	645	0.95	I71-I78	441-448	0.0021
Aortic aneurysm and dissection	366	399	399	1.00	I71	441	0.0010
Other diseases of arteries, arterioles and capillaries	239	209	246	0.85	I72-I78	442-448	0.0053
Other disorders of circulatory system	77	+	88	1.03	I80-I99	451-459	0.0172
Influenza and pneumonia	1,423	1,333	1,909	0.70	J10-J18	480-487	0.0018
Influenza	117	104	103	1.01	J10-J11	487	0.0073
Pneumonia	1,306	1,256	1,806	0.70	J12-J18	480-486	0.0018
Other acute lower respiratory infections	13	+	19	0.97	J20-J22	466	0.0392

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CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999	1998		Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	Actual Number	Comparability Modified	Actual Number				
Acute bronchitis and bronchiolitis	7	+	19	0.75	J20-J21	466	0.0264
Unspecified acute lower respiratory infection	6	+	0	*	J22	---	*
Chronic lower respiratory diseases	2,266		2,153 2,055	1.05	J40-J47	490-494,496	0.0009
Bronchitis, chronic and unspecified	19	+	45	0.39	J40-J42	490-491	0.0107
Emphysema	329		304 313	0.97	J43	492	0.0031
Asthma	85	+	93	0.89	J45-J46	493	0.0061
Other chronic lower respiratory diseases	1,833		1,760 1,604	1.10	J44,J47	494,496	0.0014
Pneumoconioses and chemical effects	13	+	12	1.02	J60-J66,J68	500-506	0.0099
Pneumonitis due to solids and liquids	359		267 239	1.12	J69	507	0.0048
Other diseases of respiratory system	411		437 374	1.17	J00-J06,J30-J39,J67,J70-J98	034.0,460-465, 470-478, 495,508-519	0.0052
Peptic ulcer	100	+	83	0.97	K25-K28	531-534	0.0045
Diseases of appendix	8	+	7	1.03	K35-K38	540-543	0.0242
Hernia	35	+	31	1.04	K40-K46	550-553	0.0154
Chronic liver disease and cirrhosis	402		402 388	1.04	K70,K73-K74	571	0.0027
Alcoholic liver disease	199		198 194	1.02	K70	571.0-571.3	0.0050
Other chronic liver disease and cirrhosis	203		204 194	1.05	K73-K74	571.4-571.9	0.0041
Cholelithiasis and other disorders of gallbladder	71	+	53	0.96	K80-K82	574-575	0.0060
Nephritis, nephrotic syndrome and nephrosis	677		710 576	1.23	N00-N07,N17-N19,N25-N27	580-589	0.0044
Acute and rapidly progressive nephritic and nephrotic syndrome	8	+	3	0.65	N00-N01,N04	580-581	0.0342
Chronic glomerulonephritis, nephritis and nephritis not specified as acute or chronic, and renal sclerosis unspecified	7	+	28	0.39	N02-N03,N05-N07,N26	582-583,587	0.0144

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(Continued)

CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999	1998		Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	Actual Number	Comparability Modified	Actual Number				
Renal failure	661	704	544	1.29	N17-N19	584-586	0.0050
Other disorders of kidney	1	+	1	0.91	N25,N27	588-589	0.0867
Infections of kidney	21	+	15	1.01	N10-N12,N13.6,N15.1	590	0.0144
Hyperplasia of prostate	12	+	12	1.00	N40	600	0.0159
Inflammatory diseases of female pelvic organs	5	+	2	0.98	N70-N76	614-616	0.0410
Pregnancy, childbirth and the puerperium	4	+	6	*	O00-099	630-676	*
Certain conditions originating in the perinatal period	213	234	220	1.07	P00-P96	760-771.2,771.4-779	0.0033
Congenital malformations, deformations and chromosomal abnormalities	201	202	238	0.85	Q00-Q99	740-759	0.0055
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	198	154	161	0.96	R00-R99	780-799	0.0034
Sudden infant death syndrome	55	+	45	1.04	R95	798.0	0.0040
All other diseases (Residual)	3,838	3,812	4,237	0.90	Residual	Residual	0.0015
Accidents	1,943	1,927	1,870	1.03	V01-X59,Y85-Y86	E800-E869,E880-E929	0.0014
Transport accidents	824	813	813	1.00	V01-V99,Y85	E800-E848, E929.0,E929.1	0.0006
Motor vehicle accidents	761	642	753	0.85	V02-V04, V09.0, V09.2, 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	0.0027

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CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999	1998		Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	Actual Number	Comparability Modified	Actual Number				
Other land transport accidents	32	+	9	14.13	V01,V05-V06, V09.1, V09.3-V09.9, V10-V11, V15-V18, V19.3, V19.8- V19.9, V80.0-V80.2, V80.6-V80.9,V81.2-V81.9, V82.2-V82.9, V87.9, V88.9,V89.1,V89.3,V89.9	E800-E807,E826-E829	0.9952
Water, air and space, and other and unspecified transport accidents and their sequelae	31	0	51	1.01	V90-V99,Y85	E830-E848, E929.0,E929.1	0.0209
Nontransport accidents	1,119	1,138	1,057	1.08	W00-X59,Y86	E850-E869,E880- E928,E929.2-E929.9	0.0035
Falls	595	437	520	0.84	W00-W19	E880-E888	0.0049
Accidental discharge of firearms	14	+	65	1.06	W32-W34	E922	0.0127
Accidental drowning and submersion	65	+	67	1.00	W65-W74	E910	0.0127
Accidental exposure to smoke, fire and flames	52	+	65	0.97	X00-X09	E890-E899	0.0089
Accidental poisoning and exposure to noxious Substances	139	127	143	0.89	X40-X49	E850-E869,E924.1	0.0191
Other and unspecified nontransport accidents and their sequelae	254	349	246	1.42	W20-W31, W35-W64, W75-W99,X10-X39, X50-X59,Y86	E900-E909, E911-E921, E923-E924.0, E924.8- E928, E929.2-E929.9	0.0123
Intentional self-harm (suicide)	598	593	593	1.00	X60-X84,Y87.0	E950-E959	0.0005
Intentional self-harm (suicide) by discharge of Firearms	301	312	312	1.00	X72-X74	E955.0-E955.4	0.0007
Intentional self-harm (suicide) by other and unspecified means and their sequelae	297	281	281	1.00	X60-X71,X75-X84,Y87.0	E950-E954, E955.5-E959	0.0023
Assault (homicide)	203	188	188	1.00	X85-Y09,Y87.1	E960-E969	0.0006
Assault (homicide) by discharge of firearms	129	114	114	1.00	X93-X95	E965.0-E965.4	0.0008

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--- Category not applicable

(Continued)

CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999	1998		Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	Actual Number	Comparability Modified	Actual Number				
Assault (homicide) by other and unspecified means and their sequelae	74	+	74	1.00	X85-X92,X96-Y09,Y87.1	E960-E964, E965.5-E969	0.0024
Legal intervention	4	+	5	*	Y35,Y89.0	E970-E978	*
Events of undetermined intent	48	+	49	*	Y10-Y34,Y87.2,Y89.9	E980-E989	*
Discharge of firearms, undetermined intent	3	+	3	*	Y22-Y24	E985.0-E985.4	*
Other and unspecified events of undetermined intent and their sequelae	45	+	46	*	Y10-Y21,Y25-Y34,Y87.2,Y89.9	E980-E984, E985.5-E989	*
Operations of war and their sequelae	0	+	0	*	Y36,Y89.1	E990-E999	*
Complications of medical and surgical care	48	+	52	*	Y40-Y84,Y88	E870-E879,E930-E949	*
Injury by firearms	451	450	450	1.00	W32-W34,X72-X74, X93-X95, Y22-Y24,Y35.0	E922, E955.0-E955.4, E965.0-E965.4, E970, E985.0-E985.4	0.0006
Drug-induced deaths	239	272	228	1.20	F11.0-F11.5,F11.7-F11.9, F12.0-F12.5,F12.7-F12.9, F13.0-F13.5, F13.7-F13.9, F14.0-F14.5, F14.7-F14.9, F15.0-F15.5, F15.7-F15.9, F16.0-F16.5, F16.7-F16.9, F17.0, F17.3-F17.5, F17.7-F17.9, F18.0-F18.5, F18.7-F18.9, F19.0-F19.5, F19.7-F19.9, X40-X44, X60-X64, X85, Y10-Y14	292,304, 305.2-305.9, E850-E858, E950.0-E950.5,E962.0, E980.0-E980.5	0.0225
Alcohol-induced deaths	348	370	382	0.97	F10,G31.2,G62.1,I42.6, K29.2,K70,R78.0,X45,X65, Y15	291,303,305.0,357.5, 425.5,535.3,571.0- 571.3,790.3,E860	0.0025

Source: Bureau of Health Information, Division of Health Care Financing, Department of Health and Family Services. The comparability ratio for each cause of death is from the National Center for Health Statistics, December 5, 2000.

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