

# ICD-10/ICD-9 Comparability Ratios for 130 Selected Causes of Infant Death

To compare deaths coded with ICD-10 (used for deaths that occurred in 1999-2003 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 Diseases of the Respiratory System is 0.79, indicating that 21 percent fewer 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 Diseases of the Respiratory System deaths, multiply the number of Diseases of the Respiratory System deaths in 1994-1998 (73) by 0.79 to make it comparable to the 1999-2003 Diseases of the Respiratory System number. Comparing the 1994-1998 number (modified to make it comparable = 58) to the 1999-2003 number (60), we see that the number of deaths from this cause did not change appreciably from the 1994-1998 period to the 1999-2003 period.

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 Diseases of the Respiratory System) demonstrates how to use the standard error.

1. Multiply:

Comparability Ratio	X	Standard Error	X	1.96	X	Comparability-modified 1994-1998 number	=	Confidence Interval
0.79	X	0.01928	X	1.96	X	58	=	1.7315

2. Add and subtract this number to/from the comparability-modified 1994-1998 number:

58 – 1.7315 = 56.27 (low point of the range);  
 58 + 1.7315 = 59.73 (high point of the range).

When these two numbers are rounded, the range (or confidence interval) is 56 to 60. The actual number of Diseases of the Respiratory System deaths for 1999-2003 (60) falls within this range. Therefore, there is a 95% probability that mortality due to Diseases of the Respiratory System in 1999-2003 was not substantially different from mortality due to Diseases of the Respiratory System in 1994-1998.

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

CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999-2003	1994-1998		Final Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	ICD-10 Actual Number	Comparability Modified	ICD-9 Actual Number				
Certain infectious and parasitic diseases	35	+	49	0.72	A00-B99	001-033,024.1-124,136-139,771.3	0.02609
Certain intestinal infectious diseases	1	+	2	*	A00-A08	001-008	*
Diarrhea and gastroenteritis of infectious origin	0	+	5	*	A09	009	*
Tuberculosis	0	+	0	*	A16-A19	010-018	*
Tetanus	0	+	0	*	A33,A35	037, 771.3	*
Diphtheria	0	+	0	*	A36	032	*
Whooping cough	1	+	0	*	A37	033	*
Meningococcal infection	2	+	6	0.97	A39	036	0.05961
Septicemia	16	+	14	1.21	A40-A41	038	0.05465
Congenital syphilis	0	+	0	*	A50	090	*
Gonococcal infection	0	+	0	*	A54	098	*
Viral diseases	11	+	18	1.08	A80-B34	042-079	0.07929
Acute poliomyelitis	0	+	0	*	A80	045	*
Varicella (chickenpox)	0	+	0	*	B01	052	*
Measles	0	+	0	*	B05	055	*
Human immunodeficiency virus (HIV) disease	0	+	0	0.97	B20-B24	042-044	0.08612
Mumps	0	+	0	*	B26	072	*
Other and unspecified viral diseases	11	+	18	1.13	A81-B00,B02-B04,B06-B19,B25,B27-B34	046-051,053-054,056-071,073-079	0.11681
Candidiasis	1	+	1	0.69	B37	112	0.10993
Malaria	0	+	0	*	B50-B54	084	*
Pneumocystosis	0	+	0	*	B59	136.3	*
All other and unspecified infectious and parasitic diseases	3	+	3	0.50	A20-A32,A38,A42-A49,A51-A53,A55-A79,B35-B36,B38-B49,B55-B58,B60-B99	020-031,034.1-035,039-041,080-083,085-088,091-097,099-111,114-134,136.0-136.2,136.4-139	0.07895
Neoplasms	17	+	7	1.02	C00-D48	140-239	0.03726
Malignant neoplasms	10	+	4	1.08	C00-C97	140-208	0.05799
Hodgkin's disease and non-Hodgkin's lymphomas	0	+	0	*	C81-C85	200-202	*
Leukemia	6	+	2	1.03	C91-C95	204-208	0.05495
Other and unspecified malignant neoplasms	4	+	2	1.09	C00-C80,C88-C90,C96-C97)	140-199,203	0.09045

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

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CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999-2003	1994-1998		Final Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	ICD-10 Actual Number	Comparability Modified	ICD-9 Actual Number				
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior	7	+	3	0.93	D00-D48	210-239	0.07889
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	6	+	7	0.89	D50-D89	135,279-289	0.07814
Anemias	2	+	0	0.53	D50-D64	280-285	0.09738
Hemorrhagic conditions and other diseases of blood and blood-forming organs	3	+	5	1.02	D65-D76	286-289	0.14430
Certain disorders involving the immune mechanism	1	+	2	1.04	D80-D89	135,279	0.14608
Endocrine, nutritional and metabolic diseases	23	+	25	0.91	E00-E88	240-278	0.04146
Short stature, not elsewhere classified	5	+	6	0.63	E34.3	259.4	0.11562
Malnutrition and other nutritional deficiencies	1	+	2	0.73	E40-E64	260-269	*
Cystic fibrosis	1	+	0	1.14	E84	277.0	*
Volume depletion, disorders of fluid, electrolyte and acid-base balance	2	+	7	0.71	E86-E87	276	0.06792
All other endocrine, nutritional and metabolic diseases	14	+	10	1.11	E00-E32,E34.0-E34.2,E34.4-E34.9,E65-E83,E85,E88	240-259.3,259.8-259.9,270-275,277.1-278	0.06671
Diseases of the nervous system	43	+	40	1.03	G00-G98	320-359,435	0.02601
Meningitis	9	+	12	1.04	G00,G03	320-322	0.04078
Infantile spinal muscular atrophy, type I (Werdnig-Hoffman)	7	+	8	1.00	G12.0	335.0	0.03890
Infantile cerebral palsy	2	+	0	*	G80	343	*
Anoxic brain damage, not elsewhere classified	2	+	4	0.85	G93.1	348.1	0.11061
Other diseases of nervous system	23	+	16	1.10	G04,G06-G11,G12.1-G12.9,G20-G 72,G81-G92,G93.0,G93.2-G93.9,G95-G98	323-334,335.1-342,344-348.0,348.2-359,435	0.04456
Diseases of the ear and mastoid process	1	+	1	*	H60-H93	380-389	*
Diseases of the circulatory system	53	46	69	0.66	I00-I99	390-434,436-459	0.01988
Pulmonary heart disease and diseases of pulmonary circulation	20	+	15	0.83	I26-I28	415-417	0.03936
Pericarditis, endocarditis and myocarditis	3	+	0	*	I30,I33,I40	420-422	*
Cardiomyopathy	8	+	10	0.94	I42	425	0.03234
Cardiac arrest	0	+	3	0.41	I46	427.5	0.05441
Cerebrovascular diseases	9	+	26	0.36	I60-I69	430-434,436-438	0.03442

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

(Continued)

CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999-2003	1994-1998		Final Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	ICD-10 Actual Number	Comparability Modified	ICD-9 Actual Number				
All other diseases of circulatory system	13	+	15	0.76	I00-I25,I31,I34-I38,I44-I45,I47-I51,I70-I99	390-414,423-424,426-427.4,427.6-429,440-459	0.04801
Diseases of the respiratory system	60	58	73	0.79	J00-J98	034.0,460-519	0.01928
Acute upper respiratory infections	2	+	1	*	J00-J06	034.0,460-465	*
Influenza and pneumonia	31	+	45	0.73	J10-J18	480-487	0.02343
Influenza	1	+	2	*	J10-J11	487	*
Pneumonia	30	+	43	0.72	J12-J18	480-486	0.02395
Acute bronchitis and acute bronchiolitis	11	+	8	0.89	J20-J21	466	0.07713
Bronchitis, chronic and unspecified	4	+	6	0.81	J40-J42	490-491	0.12053
Asthma	0	+	1	*	J45-J46	493	*
Pneumonitis due to solids and liquids	0	+	4	*	J69	507	*
Other and unspecified diseases of respiratory system	12	+	8	0.91	J22,J30-J39,J43-J44,J47-J68,J70-J98	470-479,492,494-506,508-519	0.05169
Diseases of the digestive system	36	+	41	1.41	K00-K92	520-579	0.06358
Gastritis, duodenitis, and noninfective enteritis and colitis	16	+	11	2.65	K29,K50-K55	535,555-558	0.27628
Hernia of abdominal cavity and intestinal obstruction without hernia	8	+	12	1.22	K40-K46,K56	550-553,560	0.14915
All other and unspecified diseases of digestive system	12	+	18	1.00	K00-K28,K30-K38,K57-K92	520-534,536-543,562-579	0.05085
Diseases of the genitourinary system	10	+	10	0.99	N00-N98	580-629	0.04864
Renal failure and other disorders of kidney	4	+	8	1.05	N17-N19,N25,N27	584-589	0.06030
Other and unspecified diseases of genitourinary system	6	+	2	0.75	N00-N15,N20-N23,N26,N28-N98	580-583,590-629	0.08673
Certain conditions originating in the perinatal period	1,143	1,144	1,066	1.07	P00-P96	760-771.2,771.4-779	0.00323
Newborn affected by maternal factors and by complications of pregnancy, labor and delivery	223	212	204	1.04	P00-P04	760-763	0.00893
Newborn affected by maternal hypertensive disorders	4	+	2	1.04	P00.0	760.0	0.07868
Newborn affected by other maternal conditions which may be unrelated to present pregnancy	8	+	9	0.87	P00.1-P00.9	760.1-760.6,760.8-760.9	0.12217
Newborn affected by maternal complications of pregnancy	99	118	112	1.05	P01	761	0.01267
Newborn affected by incompetent cervix	27	+	42	1.04	P01.0	761.0	0.01737
Newborn affected by premature rupture of membranes	47	+	49	1.04	P01.1	761.1	0.01255

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CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999-2003	1994-1998		Final Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	ICD-10 Actual Number	Comparability Modified	ICD-9 Actual Number				
Newborn affected by multiple pregnancy	9	+	12	0.95	P01.5	761.5	0.04299
Newborn affected by other maternal complications of pregnancy	16	+	9	1.32	P01.2-P01.4,P01.6-P01.9	761.2-761.4,761.6-761.9	0.09036
Newborn affected by complications of placenta, cord and membranes	92	67	66	1.02	P02	762	0.01301
Newborn affected by complications involving placenta	52	+	43	1.02	P02.0-P02.3	762.0-762.3	0.01808
Newborn affected by complications involving cord	6	+	6	1.12	P02.4-P02.6	762.4-762.6	0.09828
Newborn affected by chorioamnionitis	34	+	17	1.01	P02.7	762.7	0.01690
Newborn affected by other and unspecified abnormalities of membranes	0	+	0	*	P02.8-P02.9	762.8-762.9	*
Newborn affected by other complications of labor and delivery	18	+	5	1.37	P03	763.0-763.4,763.6-763.9	0.14167
Newborn affected by noxious influences transmitted via placenta or breast milk	2	+	10	0.77	P04	760.7,763.5	0.07422
Disorders related to length of gestation and fetal malnutrition	456	483	435	1.11	P05-P08	764-766	0.00671
Slow fetal growth and fetal malnutrition	7	+	4	1.32	P05	764	0.12238
Disorders related to short gestation and low birth weight, not elsewhere classified	449	478	431	1.11	P07	765	0.00668
Extremely low birth weight or extreme immaturity	298	316	286	1.10	P07.0,P07.2	765.0	0.00817
Other low birth weight or preterm	151	163	145	1.12	P07.1,P07.3	765.1	0.01531
Disorders related to long gestation and high birth weight	0	+	0	*	P08	766	*
Birth trauma	14	+	25	0.86	P10-P15	767	0.08490
Intrauterine hypoxia and birth asphyxia	50	+	41	1.32	P20-P21	768	0.04608
Intrauterine hypoxia	3	+	16	0.85	P20	768.2-768.4	0.09582
Birth asphyxia	47	+	25	1.49	P21	768.5-768.9	0.06176
Respiratory distress of newborn	67	89	96	0.92	P22	769	0.01417
Other respiratory conditions originating in the perinatal period	110	84	97	0.87	P23-P28	770	
Congenital pneumonia	7	+	0	3.88	P23	770.0	0.71968
Neonatal aspiration syndromes	13	+	5	1.43	P24	770.1	0.09553

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CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999-2003	1994-1998		Final Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	ICD-10 Actual Number	Comparability Modified	ICD-9 Actual Number				
Interstitial emphysema and related conditions originating in the perinatal period	10	+	5	1.50	P25	770.2	0.08308
Pulmonary hemorrhage originating in the perinatal period	16	+	8	1.53	P26	770.3	0.07410
Chronic respiratory disease originating in the perinatal period	24	+	17	1.13	P27	770.7	0.03266
Atelectasis	34	+	18	2.22	P28.0-28.1	770.4-770.5	0.11002
All other respiratory conditions originating in the perinatal period	6	+	44	0.10	P28.2-28.9	770.6-770.8	0.01153
Infections specific to the perinatal period	79	62	54	1.15	P35-P39	771.0-771.2,771.4-771.8	0.02662
Bacterial sepsis of newborn	66	+	47	0.99	P36	771.8	0.02688
Omphalitis of newborn with or without mild hemorrhage	0	+	0	*	P38	771.4	*
All other infections specific to the perinatal period	13	+	7	2.78	P35,P37,P39	771.0-771.2,771.5-771.7	0.30354
Hemorrhagic and hematological disorders of newborn	44	+	21	1.33	P50-P61	772-774,776	0.05919
Neonatal hemorrhage	39	+	18	1.31	P50-P52,P54	772	0.06737
Hemorrhagic disease of newborn	0	+	0	*	P53	776.0	*
Hemolytic disease of newborn due to isoimmunization and other perinatal jaundice	1	+	2	0.70	P55-P59	773-774	0.14952
Hematological disorders	4	+	1	1.70	P60-P61	776.1-776.9	0.19404
Syndrome of infant of a diabetic mother and neonatal diabetes mellitus	1	+	0	*	P70.0-P70.2	775.0-775.1	*
Necrotizing enterocolitis of newborn	16	+	25	1.19	P77	777.5	0.03796
Hydrops fetalis not due to hemolytic disease	11	+	7	1.04	P83.2	778.0	0.02865
Other perinatal conditions	72	73	61	1.20	P29,P70.3-P76,P78-P81,P83.0-P83.1,P83.3-P96	775.2-775.9,777.0-777.4,777.6-777.9,778.1-779	0.02135
Congenital malformations, deformations and chromosomal abnormalities	467	528	569	0.93	Q00-Q99	740-759	0.00506
Anencephaly and similar malformations	20	+	37	1.00	Q00	740	0.00949
Congenital hydrocephalus	5	+	8	0.66	Q03	742.3	0.04988
Spina bifida	2	+	4	0.83	Q05	741	0.06608
Other congenital malformations of nervous system	34	+	33	1.09	Q01-Q02,Q04,Q06-Q07	742.0-742.2,742.4-742.9	0.04205

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**(Continued)**

CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999-2003	1994-1998		Final Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	ICD-10 Actual Number	Comparability Modified	ICD-9 Actual Number				
Congenital malformations of heart	<b>91</b>	<b>156</b>	<b>154</b>	1.01	Q20-Q24	745-746	0.00934
Other congenital malformations of circulatory system	<b>12</b>	+	<b>28</b>	0.68	Q25-Q28	747	0.03233
Congenital malformations of respiratory system	<b>68</b>	<b>51</b>	<b>75</b>	0.68	Q30-Q34	748	0.01863
Congenital malformations of digestive system	<b>7</b>	+	<b>8</b>	0.84	Q35-Q45	749-751	0.08099
Congenital malformations of genitourinary system	<b>27</b>	+	<b>37</b>	0.99	Q50-Q64	752-753	0.02504
Congenital malformations and deformations of musculoskeletal system, limbs and integument	<b>47</b>	+	<b>44</b>	0.96	Q65-Q85	754-757	0.03159
Down's syndrome	<b>7</b>	+	<b>9</b>	0.98	Q90	758.0	0.05607
Edward's syndrome	<b>48</b>	+	<b>30</b>	1.01	Q91.0-Q91.3	758.2	0.01239
Patau's syndrome	<b>32</b>	+	<b>30</b>	0.95	Q91.4-Q91.7	758.1	0.01836
Other congenital malformations and deformations	<b>44</b>	<b>53</b>	<b>54</b>	0.98	Q10-Q18,Q86-Q89	743-744,759	0.02738
Other chromosomal abnormalities, not elsewhere classified	<b>23</b>	+	<b>18</b>	1.20	Q92-Q99	758.3-758.9	0.06750
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	<b>294</b>	<b>369</b>	<b>361</b>	1.02	R00-R99	780-799	0.00440
Sudden infant death syndrome	<b>268</b>	<b>350</b>	<b>331</b>	1.06	R95	798.0	0.00514
Other symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	<b>26</b>	+	<b>30</b>	0.90	R00-R53,R55-R94,R96-R99	780-796,798.1-799	0.01309
All other diseases (Residual)	<b>2</b>	+	<b>1</b>	1.19	F01-F99,H00-H57,L00-M99	290-319,360-379,680-739	0.24370
External causes of mortality	<b>139</b>	<b>125</b>	<b>125</b>	1.00	V01-Y84	E800-E999	0.00189
Accidents (unintentional injuries)	<b>103</b>	<b>75</b>	<b>74</b>	1.02	V01-X59	E800-E869,E880-E929	0.00577
Transport accidents	<b>16</b>	+	<b>8</b>	1.02	V01-V99	E800-E848,E920-E929.1	0.01148
Motor vehicle accidents	<b>16</b>	+	<b>8</b>	0.98	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	0.01789

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**(Continued)**

**ICD-10/ICD-9 Comparability Ratio Table for 130 Selected Causes of Infant Death**

CAUSE OF DEATH (Based on the Tenth Revision, International Classification of Diseases)	1999-2003	1994-1998		Final Comparability Ratio	ICD-10 Codes	ICD-9 Codes	Standard Error
	ICD-10 Actual Number	Comparability Modified	ICD-9 Actual Number				
Other and unspecified transport accidents	0	+	0	*	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,V90-V99	E800-E807,E826-E848,E929.1	*
Falls	2	+	2	*	W00-W19	E880-E888	*
Accidental discharge of firearms	0	+	0	*	W32-W34	E922	*
Accidental drowning and submersion	6	+	1	1.02	W65-W74	E910	0.03064
Accidental suffocation and strangulation in bed	55	+	28	1.12	W75	E913.0	0.06821
Other accidental suffocation and strangulation	12	+	14	0.86	W76-W77,W81-W84	E913.1-E913.9	0.06036
Accidental inhalation and ingestion of food or other objects causing obstruction of respiratory tract	5	+	9	1.14	W78-W80	E911-E912	0.05443
Accidents caused by exposure to smoke, fire and flames	6	+	4	0.98	X00-X09	E890-E899	0.00000
Accidental poisoning and exposure to noxious substances	1	+	1	*	X40-X49	E850-E869,E924.1	*
Other and unspecified accidents	0	+	7	1.03	W20-W31,W35-W64,W85-W99,X10-X39,X50-X59	E900-E909.E914-E921,E923-E924.0,E924.8-E929	0.09876
Assault (homicide)	31	+	40	1.00	X85-Y09	E960-E968	0.01054
Assault (homicide) by hanging, strangulation and suffocation	6	+	6	1.17	X91	E963	0.11940
Assault (homicide) by discharge of firearms	0	+	3	*	X93-X95	E965.0-E965.4	*
Neglect, abandonment and other maltreatment syndromes	19	+	21	0.96	Y06-Y07	E967,E968.4	0.05309
Assault (homicide) by other and unspecified means	6	+	10	1.01	X85-X90,X92,X96-X99,Y00-Y05,Y08-Y09	E960-E962,E964,E965.5-E966,E968.0-E968.3,E968.8-E968.9	0.04068
Complications of medical and surgical care	1	+	0	*	Y40-Y84	E870-E879,E930-E949	*
Other external causes	4	+	0	0.89	X60-X84,Y10-Y36	E970-E979	0.06096

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