
Technical Notes — Methodology

"That, sir, is the good of counting; it brings everything to a certainty, which before floated in the mind indefinitely."

—Samuel Johnson

MORTALITY

Comparability Between ICD-9 and ICD-10 Codes

The *International Classification of Diseases* (ICD) codes are periodically revised to reflect progress in the identification of diseases.¹ This practice began in 1900 and occurs every 10 to 20 years. Each of these revisions has produced some breaks in the comparability of cause of death statistics.

ICD-10 has many changes from ICD-9, including: considerably greater detail for some causes (and less detail for others); shifts of inclusion in terms and titles from one category, section, or chapter to another; regrouping of diseases; new titles and sections; and modifications in coding rules. As a result, serious breaks occur in comparability for a number of causes of death. Measures of this discontinuity are essential to the interpretation of mortality trends. Comparability ratios between ICD-9 and ICD-10 have been computed for this purpose (please see the table at the end of Appendix B).

Studies of the comparability between revisions of the ICD have been carried out and published since at least the fifth revision. Comparability studies, also called bridge-coding studies, involve the dual classification of a single year of mortality data, that is classifying the underlying cause of death on mortality records by the new revision and the previous revision. The key element of the comparability study is the comparability ratio, which is derived from the dual classification. It is calculated by dividing the number of deaths for a selected cause of death classified by the new revision by the number of deaths classified to the most nearly comparable cause of death using the previous revision (in this case the number of deaths identified as being attributable to a particular cause using ICD-10 codes and rules divided by the number of deaths attributed to the same cause using ICD-9 codes and rules). The resulting ratio represents the net effect of the new revision on statistics for this cause and can be used as a factor to adjust previously calculated mortality statistics.

A comparability ratio of 1.00 indicates that the same number of deaths was assigned to a particular cause or combination of causes, regardless of the revision used. A ratio showing perfect correspondence (1.00) between the two revisions does not necessarily indicate that the cause was unaffected by changes in classification and coding procedures but merely that there was no net change.

A ratio less than 1.00 results from a decrease in assignments of death to a cause in ICD-10 compared with ICD-9. A ratio of more than 1.00 results from an increase in assignments of deaths to a cause in ICD-10 compared to the corresponding ICD-9 cause.

In regard to the magnitude of coding effects produced by rule changes, that of Rule 3 is among the most prominent. This rule is used to determine the direct sequels of causes. It states "If the conditions selected by the general principle or by Rule I or by Rule 2 is obviously a direct consequence of another reported condition, whether in Part I or Part II [of the medical certification portion of the death certificate], select this primary condition." The cause of death most affected by Rule 3 is pneumonia, which is often the consequence of another condition or injury. In ICD-10 the applicability of Rule 3 to pneumonia is broader than in ICD-9, so pneumonia is considered a consequence of a much wider range of conditions. As a result, pneumonia is much less likely to be selected as the underlying cause of death under ICD-10 than under ICD-9.

Comparability ratios have been applied to Tables 6-3 and 6-50. The following describes selected leading causes of death affected by changes in classification and underlying cause of death rules.

Heart Disease. The comparability ratio (CR) for this cause is 0.9852, indicating a net decrease of nearly 1.5 percent in the allocation of heart disease as the underlying cause of death when using the ICD-10 classification scheme. This net decrease is a result primarily of shifts away from heart disease to other causes of death due to Rule A; under this rule, certain disorders are considered ill-defined and not reflecting the true underlying cause of death. Cardiac arrest is one such disorder. Thus, it is ignored in the selection of underlying cause of death if another more specific cause is listed on the death certificate.

Malignant Neoplasms. The CR for cancer is 1.0093, indicating considerable comparability in numbers and rates between revisions. Nevertheless, a substantial number of deaths are classified under malignant neoplasms in ICD-10 that were not classified as such under ICD-9. Most of these were classified as pneumonia in ICD-9 and were affected by the change in Rule 3 (described above). In ICD-10, the applicability of Rule 3 to pneumonia is broader than in ICD-9; that is, pneumonia is considered a consequence of a much wider range of conditions. As a result, pneumonia is much less likely to be selected as the underlying cause of death under ICD-10 than under ICD-9. In addition, some deaths shifted out of the malignant neoplasm category due to the revision. Most of these are classified in ICD-10 as HIV or, *in situ* neoplasms, benign neoplasms, and neoplasms of uncertain or unknown behavior.

Nearly all of the specified malignant neoplasm categories show some shifts of deaths into and out of the specified category. For example, because of changes in the rule governing the selection of the primary site, deaths involving cancer of the trachea, bronchus, and lung are a little less likely to be attributed to this

cause. (The comparability ratio is 0.9844.) This occurred because ICD-10, in contrast to ICD-9, classifies malignant neoplasms of the lung as secondary to many other cancers. Further, when classifying deaths according to ICD-10, unlike ICD-9, selection of the primary site is not determined by order of entry on the death certificate. Thus, when two primary sites from different organ systems are listed, the deaths are classified to C97, the category for independent (primary) multiple sites.

Alzheimer's Disease. The CR published in the previously described NCHS publication should not be applied to Oregon data. Unlike the nation, deaths assigned to this category have included both Alzheimer's disease (ICD-9 331.0) and presenile dementia (ICD-9 290.1). A study of deaths coded to ICD-9 290.1 showed that 99 out of 100 were attributable to Alzheimer's dementia and that physicians were using the terms "Alzheimer's disease" and "Alzheimer's dementia" essentially interchangeably. To provide a more realistic measure of the impact of Alzheimer's disease, both diseases were included in Oregon's "Alzheimer's Disease" category. ICD-10 eliminated the separate category for "Alzheimer's dementia"; just one code (G30) is present in the current revision.

Unintentional Injuries. With a comparability ratio of 1.0251, deaths were slightly more likely to be attributed to unintentional injuries than previously. Virtually all of this increase involves shifts from natural causes in ICD-9 to unintentional injuries in ICD-10. Most of these deaths were classified as pneumonia or cardiac arrest in ICD-9 but were coded to unintentional injuries as a consequence of the changes in Rule 3 and Rule A, respectively. The CR for the largest subset in this group, motor vehicles, is 0.9527, but the specific category with the largest difference (CR = 0.7720) is falls. This 23 percent decrease is the result of the change in the classification of unspecified fractures. In ICD-9, if the term "fracture" was listed on the death certificate without mention of an external cause, the death was classified to "Fracture, cause unspecified" (E887) within the greater "Accidental Falls" (E880-888) category. In ICD-10, a fall is not assumed to be responsible for an unspecified fracture, and the death is classified to "Exposure to Unspecified Factor," (X59), which is classified as an unintentional injury, but in a residual category, not a fall.

Intentional Self-Harm. This category has a comparability ratio of 1.0022, indicating little change in the overall number of deaths attributed to suicide. Some changes in coding categories have resulted in less specific data. For example, the type of firearm used in suicide (and all other external cause categories) is no longer distinguished other than handgun vs. long gun; previously, rifles, shotguns, and military (assault) weapons were categorized individually. Further, suffocation suicides involving plastic bags are no longer identified (The number of deaths in this category was typically about the same as the number resulting from cutting and piercing injuries).

Table 1. Final and preliminary 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	0.897	0.069	7.7	0.811	10.6
002	Shigellosis and amebiasis.....	7	8	*	*	*	*	*
003	Certain other intestinal infections.....	704	819	0.860	0.028	3.2	*	*
004	Tuberculosis.....	1,058	1,201	0.881	0.015	1.7	0.855	3.1
005	Respiratory tuberculosis.....	857	912	0.940	0.017	1.8	0.906	3.8
006	Other tuberculosis.....	201	289	0.696	0.036	5.1	0.703	-1.1
007	Whooping cough.....	6	4	*	*	*	*	*
008	Scarlet fever and erysipelas.....	1	3	*	*	*	*	*
009	Meningococcal infection.....	285	288	0.990	0.020	2.0	0.996	-0.6
010	Septicemia.....	25,390	21,336	1.190	0.004	0.3	1.195	-0.4
011	Syphilis.....	57	73	0.781	0.087	11.2	0.636	22.7
012	Acute poliomyelitis.....	1	-	*	*	*	*	*
013	Arthropod-borne viral encephalitis.....	2	3	*	*	*	*	*
014	Measles.....	1	1	*	*	*	*	*
015	Viral hepatitis.....	2,693	3,769	0.715	0.008	1.1	0.834	-14.4
016	Human immunodeficiency virus (HIV) disease.....	33,441	30,904	1.082	0.002	0.2	1.064	1.7
017	Malaria.....	5	5	*	*	*	*	*
018	Other and unspecified infectious and parasitic diseases and their sequelae.....	5,716	6,278	0.910	0.011	1.2	1.099	-17.2
019	Malignant neoplasms.....	542,914	537,906	1.009	0.000	0.0	1.007	0.2
020	Malignant neoplasms of lip, oral cavity and pharynx.....	7,519	7,835	0.960	0.004	0.4	0.960	-0.1
021	Malignant neoplasm of esophagus.....	11,139	11,199	0.995	0.002	0.2	0.997	-0.2
022	Malignant neoplasm of stomach.....	13,385	13,292	1.007	0.002	0.2	1.006	0.1
023	Malignant neoplasms of colon, rectum and anus.....	56,221	56,291	0.999	0.001	0.1	0.999	-0.1
024	Malignant neoplasms of liver and intrahepatic bile ducts.....	11,126	11,542	0.964	0.002	0.3	0.963	0.1
025	Malignant neoplasm of pancreas.....	27,089	27,168	0.997	0.001	0.1	0.998	-0.1
026	Malignant neoplasm of larynx.....	3,927	3,907	1.005	0.005	0.5	1.005	0.0
027	Malignant neoplasms of trachea, bronchus and lung.....	149,206	151,573	0.984	0.001	0.1	0.984	0.1
028	Malignant melanoma of skin.....	6,892	7,259	0.949	0.004	0.4	0.968	-1.9
029	Malignant neoplasm of breast.....	43,644	43,327	1.007	0.001	0.1	1.006	0.2
030	Malignant neoplasm of cervix uteri.....	4,517	4,534	0.996	0.004	0.4	0.987	0.9
031	Malignant neoplasms of corpus uteri and uterus, part unspecified.....	6,444	6,292	1.024	0.004	0.4	1.026	-0.2
032	Malignant neoplasm of ovary.....	13,043	13,125	0.994	0.002	0.2	0.995	-0.2
033	Malignant neoplasm of prostate.....	34,497	34,008	1.014	0.001	0.1	1.013	0.1
034	Malignant neoplasms of kidney and renal pelvis.....	11,028	11,068	0.996	0.002	0.2	1	-0.4
035	Malignant neoplasm of bladder.....	11,350	11,406	0.995	0.003	0.3	0.997	-0.2
036	Malignant neoplasms of meninges, brain and other parts of central nervous system.....	12,052	12,331	0.977	0.003	0.3	0.969	0.9
037	Malignant neoplasms of lymphoid, hematopoietic and related tissue.....	55,029	54,788	1.004	0.001	0.1	1.004	0.0
038	Hodgkin's disease.....	1,408	1,404	1.003	0.010	1.0	0.986	1.8
039	Non-Hodgkin's lymphoma.....	22,377	22,865	0.979	0.002	0.2	0.978	0.1
040	Leukemia.....	20,507	20,296	1.010	0.002	0.2	1.012	-0.1
041	Multiple myeloma and immunoproliferative neoplasms.....	10,665	10,223	1.043	0.003	0.3	1.038	0.5
042	Other and unspecified malignant neoplasms of lymphoid, hematopoietic and related tissue.....	72	-	*	*	*	*	*
043	All other and unspecified malignant neoplasms.....	64,806	56,961	1.138	0.002	0.2	1.125	1.1
044	In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior.....	12,411	7,607	1.632	0.014	0.9	1.674	-2.6
045	Anemias.....	4,071	4,317	0.943	0.008	0.8	0.956	-1.3
046	Diabetes mellitus.....	62,673	61,485	1.019	0.001	0.1	1.008	1.1
047	Nutritional deficiencies.....	3,839	3,678	1.044	0.013	1.2	1.164	-10.3
048	Malnutrition.....	3,535	3,507	1.008	0.013	1.3	0.978	3.0
049	Other nutritional deficiencies.....	304	171	1.778	0.121	6.8	6.204	-71.3
050	Meningitis.....	754	745	1.012	0.016	1.6	1.014	-0.2

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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					
051	Parkinson's disease.....	11,916	11,797	1.010	0.003	0.3	1.001	0.9
052	Alzheimer's disease.....	33,667	21,292	1.581	0.007	0.4	1.554	1.8
053	Major cardiovascular diseases	942,439	945,945	0.996	0.000	0.0	0.998	-0.2
054	Diseases of heart	719,631	730,444	0.985	0.000	0.0	0.986	-0.1
055	Acute rheumatic fever and chronic rheumatic heart diseases	4,387	4,976	0.882	0.007	0.8	0.821	7.4
056	Hypertensive heart disease.....	20,739	25,973	0.798	0.003	0.3	0.803	-0.5
057	Hypertensive heart and renal disease.....	2,806	2,490	1.127	0.015	1.3	1.071	5.3
058	Ischemic heart diseases.....	543,063	542,728	1.001	0.000	0.0	0.999	0.2
059	Acute myocardial infarction.....	209,916	212,992	0.986	0.000	0.0	0.989	-0.3
060	Other acute ischemic heart diseases	3,084	2,876	1.072	0.013	1.2	1.011	6.1
061	Other forms of chronic ischemic heart disease ...	330,063	326,860	1.010	0.000	0.0	1.005	0.4
062	Atherosclerotic cardiovascular disease, so described	72,231	68,150	1.060	0.002	0.2	1.049	1.1
063	All other forms of chronic ischemic heart disease	257,832	258,710	0.997	0.000	0.0	0.994	0.3
064	Other heart diseases.....	148,636	154,277	0.963	0.001	0.1	0.972	-0.8
065	Acute and subacute endocarditis	864	838	1.031	0.018	1.8	0.996	3.5
066	Diseases of pericardium and acute myocarditis ..	750	714	1.050	0.018	1.8	1.030	2.0
067	Heart failure.....	48,876	47,052	1.039	0.001	0.1	1.041	-0.2
068	All other forms of heart disease.....	98,146	105,673	0.929	0.001	0.2	0.937	-0.9
069	Essential (primary) hypertension and hypertensive renal disease	14,381	12,884	1.116	0.005	0.4	1.119	-0.3
070	Cerebrovascular diseases	166,837	158,855	1.050	0.001	0.1	1.059	-0.8
071	Atherosclerosis.....	16,086	16,655	0.966	0.003	0.3	0.964	0.2
072	Other diseases of circulatory system	25,504	27,107	0.941	0.002	0.2	0.946	-0.5
073	Aortic aneurysm and dissection	16,371	16,361	1.001	0.002	0.2	1.001	-0.1
074	Other diseases of arteries, arterioles and capillaries ...	9,133	10,746	0.850	0.005	0.6	0.850	0.0
075	Other disorders of circulatory system.....	4,105	4,207	0.976	0.014	1.4	1.029	-5.2
076	Influenza and pneumonia	57,915	83,045	0.697	0.002	0.2	0.698	-0.1
077	Influenza.....	743	743	1.000	0.011	1.1	1.009	-0.9
078	Pneumonia	57,172	82,302	0.695	0.002	0.2	0.696	-0.1
079	Other acute lower respiratory infections	461	474	0.973	0.038	3.9	0.975	-0.2
080	Acute bronchitis and bronchiolitis.....	342	474	0.722	0.026	3.6	0.747	-3.3
081	Unspecified acute lower respiratory infection	119	-	*	*	*	*	*
082	Chronic lower respiratory diseases	109,746	105,411	1.041	0.001	0.1	1.048	-0.6
083	Bronchitis, chronic and unspecified.....	1,207	3,127	0.386	0.009	2.4	0.394	-1.9
084	Emphysema.....	16,521	17,179	0.962	0.003	0.3	0.973	-1.1
085	Asthma	4,971	5,614	0.885	0.006	0.7	0.894	-0.9
086	Other chronic lower respiratory diseases	87,047	79,491	1.095	0.001	0.1	1.097	-0.2
087	Pneumoconioses and chemical effects	1,154	1,135	1.017	0.011	1.0	1.018	-0.1
088	Pneumonitis due to solids and liquids	11,338	10,264	1.105	0.005	0.4	1.119	-1.2
089	Other diseases of respiratory system.....	20,676	18,621	1.110	0.005	0.4	1.167	-4.9
090	Peptic ulcer.....	4,979	5,127	0.971	0.005	0.5	0.970	0.2
091	Diseases of appendix	410	421	0.974	0.023	2.4	1.035	-5.9
092	Hernia.....	1,408	1,391	1.012	0.012	1.2	1.040	-2.6
093	Chronic liver disease and cirrhosis.....	25,659	24,861	1.032	0.003	0.3	1.037	-0.4
094	Alcoholic liver disease	11,971	11,962	1.001	0.005	0.5	1.018	-1.7
095	Other chronic liver disease and cirrhosis.....	13,688	12,899	1.061	0.004	0.4	1.054	0.7
096	Cholelithiasis and other disorders of gallbladder.....	2,706	2,816	0.961	0.007	0.7	0.957	0.4
097	Nephritis, nephrotic syndrome and nephrosis	30,401	24,215	1.255	0.004	0.3	1.232	1.9
098	Acute and rapidly progressive nephritic and nephrotic syndrome.....	208	320	0.650	0.032	5.0	0.647	0.5
099	Chronic glomerulonephritis, nephritis and nephritis not specified as acute or chronic and renal sclerosis unspecified	670	1,629	0.411	0.013	3.2	0.386	6.6
100	Renal failure	29,487	22,224	1.327	0.005	0.4	1.295	2.5

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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					
101	Other disorders of kidney	11,916	11,797	0.857	0.099	11.5	0.909	-5.7
102	Infections of kidney	905	885	1.023	0.016	1.6	1.007	1.6
103	Hyperplasia of prostate	462	455	1.015	0.017	1.7	0.997	1.9
104	Inflammatory diseases of female pelvic organs.....	100	112	0.893	0.046	5.2	0.984	-9.3
105	Pregnancy, childbirth and the puerperium.....	325	285	1.140	0.037	3.3	*	*
106	Pregnancy with abortive outcome	41	39	1.051	0.105	10.0	*	*
107	Other complications of pregnancy, childbirth and the puerperium	284	246	1.154	0.044	3.8	*	*
108	Certain conditions originating in the perinatal period	13,892	12,916	1.076	0.003	0.3	1.066	0.9
109	Congenital malformations, deformations and chromosomal abnormalities	10,514	11,740	0.896	0.005	0.5	0.847	5.7
110	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	24,877	25,506	0.975	0.003	0.3	0.955	2.1
111	All other diseases (Residual).....	146,846	160,672	0.914	0.001	0.1	0.900	1.6
112	Accidents (unintentional injuries).....	88,815	86,639	1.025	0.001	0.1	1.031	-0.5
113	Transport accidents	45,786	46,053	0.994	0.001	0.1	0.998	-0.4
114	Motor vehicle accidents	41,001	43,037	0.953	0.001	0.1	0.853	11.7
115	Other land transport accidents	2,610	729	3.580	0.116	3.2	*	*
116	Water, air and space, and other and unspecified transport accidents and their sequelae	2,175	2,287	0.951	0.010	1.0	1.012	-6.0
117	Nontransport accidents	43,029	40,586	1.060	0.001	0.1	1.076	-1.5
118	Falls	10,743	13,916	0.772	0.004	0.5	0.841	-8.2
119	Accidental discharge of firearms	1,049	1,032	1.016	0.005	0.5	1.058	-3.9
120	Accidental drowning and submersion.....	3,542	3,440	1.030	0.006	0.5	0.997	3.3
121	Accidental exposure to smoke, fire and flames	3,647	3,649	0.999	0.004	0.4	0.974	2.6
122	Accidental poisoning and exposure to noxious substances	8,236	7,953	1.036	0.003	0.3	*	*
123	Other and unspecified nontransport accidents and their sequelae	15,812	10,596	1.492	0.009	0.6	1.419	5.2
124	Intentional self-harm (suicide)	29,974	29,907	1.002	0.000	0.0	0.996	0.6
125	Intentional self-harm (suicide) by discharge of firearms.....	17,905	17,884	1.001	0.001	0.1	0.998	0.3
126	Intentional self-harm (suicide) by other and unspecified means and their sequelae	12,069	12,023	1.004	0.001	0.1	0.990	1.4
127	Assault (homicide)	20,180	20,140	1.002	0.001	0.1	0.998	0.4
128	Assault (homicide) by discharge of firearms.....	13,881	13,855	1.002	0.001	0.1	0.997	0.5
129	Assault (homicide) by other and unspecified means and their sequelae	6,299	6,285	1.002	0.002	0.2	1.002	0.1
130	Legal intervention	307	328	0.936	0.019	2.0	*	*
131	Events of undetermined intent.....	2,745	2,782	0.987	0.004	0.4	*	*
132	Discharge of firearms, undetermined intent	222	222	1.000	0.009	0.9	*	*
133	Other and unspecified events of undetermined intent and their sequelae	2,523	2,560	0.986	0.004	0.4	*	*
134	Operations of war and their sequelae.....	7	12	*	*	*	*	*
135	Complications of medical and surgical care	1,912	3,033	0.630	0.014	2.1	*	*

– Quantity zero

... Category not applicable

* Figure does not meet standards of reliability or precision

From: http://ftp.cdc.gov/pub/Health_Statistics/NCHS/Datasets/Comparability/icd9_icd10/

Assault. Like suicide, this category (i.e., homicide) showed little difference between ICD-9 and ICD-10 coding; the comparability ratio was 1.0020. The reader is cautioned that this CR is applicable only to prior years’ categories based on ICD-9 codes E960-E969. Under the ICD-9 classification, legal intervention (E970-E979) deaths were included in the leading cause of death category “Homicide.” They no longer are. Further, NCHS has not published a comparability ratio for legal intervention deaths because the figure calculated did not meet standards of reliability or precision.

Super MICAR

Beginning in 1993, the underlying cause of death was determined by using Super MICAR, software distributed by the National Center for Health Statistics. In the past, the underlying cause of death was determined by a nosologist using information provided on death certificates by physicians. Super MICAR applies a set of algorithms to all the causes listed on a death certificate to arrive at the underlying cause of death.

This software is being used because the number of deaths among Oregonians has increased substantially during recent years, but has not been accompanied by an increase in staff. Consequently, data availability became increasingly untimely.

An advantage of the Super Micar system is that all causes recorded on the death certificate are now included in the data file. We will can report, for example, not only the number of Oregonians who died from Alzheimer’s disease but the number of Oregonians who had the disease at the time of their death (provided it was mentioned on the certificate).

Age-adjusted Rates

Most of the death rates in this report are not age-adjusted. Tables 6-43, 44, 51 and 52 are exceptions to this rule. The descriptive narrative of Chapter 6 frequently makes reference to age-adjusted rates and age- or sex-specific rates in addition to mentioning crude death rates. Because age-adjusted rates should be viewed as relative indexes (rather than as actual measures of mortality risk), it is important not to compare them directly to crude rates.

Age-adjusted death rates permit the comparison of populations with disparate age structures as if the populations had similar distributions. They should be used when comparing subsets (e.g., counties and races). See the formulas section of this

Year 2000 United States standard population: Numbers and proportions (weights)					
Age	Number	Weights	Age	Number	Weights
All ages.....	1,000,000	1.000000	35-44 years.....	162,613	0.162613
Under 1 year.....	13,818	0.013818	45-54 years.....	134,834	0.134834
1-4 years.....	55,317	0.055317	55-64 years.....	87,247	0.087247
5-14 years.....	145,565	0.145565	65-74 years.....	66,037	0.066037
15-24 years.....	138,646	0.138646	75-84 years.....	44,842	0.044842
25-34 years.....	135,573	0.135573	85 years and over.....	15,508	0.015508

Minino AM, Arias E, Kochanek KD, Murphy SL, Smith BL. Deaths: Final Data for 2000. National vital statistics reports; vol 50 no 15 Hyattsville, Maryland: National Center for Health Statistics. 2002. p117.

Appendix for instructions on calculating age-adjusted rates. Rates may also be computed on-line at the federal Centers for Disease Control (CDC) site.

All of the age-adjusted rates of this report were computed by applying age-specific death rates to the U.S. standard population for the Year 2000 shown in the accompanying table:

Tobacco-linked Deaths

The number of Oregonians whose deaths were linked to tobacco use are presented in the mortality section. However, the number is artificially low. This is because the role of tobacco, if any, is not routinely noted on the death certificates of Oregonians who died out-of-state. (The footnotes in the tables describe the question on the Oregon death certificate regarding tobacco use.) The potential for undercount is greatest for Oregon residents who live in counties bordering other states. A more detailed discussion can be found in *Tobacco and Oregon: A Legacy of Illness and Death*, published in 1992.

YOUTH SUICIDE ATTEMPTS

Data in the youth suicide attempts section were compiled from teen suicide attempt reports and death certifications files with the Oregon Department of Human Services' Center for Health Statistics. Attempt rates are age-specific and are expressed per 100,000 of the population at risk per year. The Center for Population Research was the source of the population data. Methods of attempts are classified according to the International Classification of Diseases (ICD). The name of the attempter is not recorded on attempts reported to the Center for Health Statistics.

Several problems are apparent with the data. The first is that the total number of attempts reported is low. Because Oregon is the only state to require that adolescent suicide attempts be reported, when Oregon adolescents attempt suicide in another state, the event is not reported. More significantly, although required by law, the data suggest that not all hospitals are fully cooperating with the program. It is uncertain whether reporting hospitals are using the same criteria in determining whether the patient attempted suicide. Finally, a few data items are poorly reported.

ENDNOTE

1. This description is drawn from *National Vital Statistics Report*, Vol. 49, No. 2, June 26, 2001, which includes additional detail not included here. The document is available online at:
http://ftp.cdc.gov/pub/Health_Statistics/NCHS/Datasets/Comparability/icd9_icd10/