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Alcohol-Related Mortality and Years of Potential Life Lost — United States, 1987

Public health problems associated with alcohol use and misuse include mortality from injuries (an outcome of acute exposure to alcohol) and mortality from chronic diseases (an outcome of long-term misuse of alcohol). In 1985, alcohol-related mortality (ARM) for the United States was estimated at 94,768 deaths (University of California–San Francisco [UCSF], unpublished data), accounting for 4.5% of deaths from all causes. A study of ARM in 1980 estimated 69,180 such deaths in the United States for that year (*1*); however, that estimate was computed using a smaller number of alcohol-related diagnoses. This report presents estimates of ARM and years of potential life lost (YPLL) for the United States for 1987. These estimates are based on a comprehensive assessment of mortality associated with alcohol use and misuse that employs a structured data-base approach (*2*).

Alcohol-Related Mortality

A comprehensive set of diagnoses that are causally linked to alcohol use and misuse was determined by a literature review, then ranked by *International Classification of Diseases, Ninth Revision, Clinical Modification*, rubric. Alcohol-attributable fractions (AAFs) were then estimated for each diagnosis. AAFs are estimates of the proportions of deaths from disease or injury diagnoses that are causally linked to alcohol use and misuse. For chronic diseases, AAFs were estimated from clinical case series studies and analytical epidemiologic studies; for injuries, AAFs were estimated from injury surveillance studies that reported alcohol involvement.

For each of these diagnoses, gender- and 5-year-age-group–specific mortality data for 1987 were obtained from CDC's National Center for Health Statistics. For each diagnosis, ARM was calculated as deaths × AAF for each gender and 5-year age group (Table 1). For alcohol-*defined* diagnoses (e.g., alcoholism, alcohol dependence syndrome, and alcoholic cardiomyopathy), all deaths were ascribed to alcohol use and misuse, and the AAF was set to unity (1.0).

In 1987, an estimated 105,095 persons died from alcohol-related causes (4.9% of total national mortality). Deaths among males predominated (66.8%) (Table 2). Gender disparity was most marked for mental disorders (alcohol dependence and alcohol abuse deaths: male/female ratio = 3.7:1) and deaths from intentional injuries

Alcohol-Related Death — Continued

TABLE 1. Alcohol-attributable fractions (AAFs), total estimated mortality, and estimated alcohol-related mortality (ARM), by sex and diagnosis — United States, 1987

Diagnosis (ICD-9-CM rubric)	AAFs	Age (yrs)*	Male		Female	
			No. deaths	ARM	No. deaths	ARM
Malignant neoplasms						
Cancer of the lip/oral cavity/ pharynx (140–149)	0.50†	≥35	5,259	2,630	2,622	1,049
Cancer of the esophagus (150)	0.75	≥35	6,705	5,029	2,365	1,774
Cancer of the stomach (151)	0.20	≥35	8,178	1,636	5,428	1,086
Cancer of the liver/intrahepatic bile ducts (155)	0.15	≥35	4,215	632	2,831	425
Cancer of the larynx (161)	0.50†	≥35	2,968	1,484	690	276
Mental disorders						
Alcoholic psychoses (291)	1.00	≥15	302	302	80	80
Alcohol dependence syndrome (303)	1.00	≥15	3,353	3,353	908	908
Alcohol abuse (305.0)	1.00	≥15	537	537	136	136
Cardiovascular diseases						
Essential hypertension (401)	0.08	≥35	1,663	126	2,368	180
Alcoholic cardiomyopathy (425.5)	1.00	≥15	688	688	109	109
Cerebrovascular disease (430–438)	0.07	≥35	58,302	3,790	90,068	5,854
Respiratory diseases						
Respiratory tuberculosis (011–012)	0.25	≥35	911	228	396	99
Pneumonia and influenza (480–487)	0.05	≥35	32,379	1,619	34,852	1,743
Digestive diseases						
Diseases of esophagus/stomach/ duodenum (530–537)	0.10	≥35	4545	455	4,520	452
Alcoholic gastritis (535.3)	1.00	≥15	60	60	13	13
Alcoholic fatty liver (571.0)	1.00	≥15	672	672	242	242
Acute alcoholic hepatitis (571.1)	1.00	≥15	518	518	276	276
Alcoholic cirrhosis of the liver (571.2)	1.00	≥15	5,517	5,517	1,991	1,991
Alcoholic liver damage, unspecified (571.3)	1.00	≥15	1,514	1,514	535	535
Other cirrhosis of the liver (571.5, 571.6)	0.50	≥35	7,508	3,754	5,097	2,549
Acute pancreatitis (577.0)	0.42	≥35	1,117	469	1,005	422
Chronic pancreatitis (577.1)	0.60	≥35	121	73	74	44
Unintentional injuries§						
Motor vehicle accidents (E810–E825)	0.42	>0	33,904	14,240	14,386	6,042
Other road vehicle accidents (E826.9)	0.20	>0	159	32	72	14
Water transport accidents (E830–E838)	0.20	>0	853	171	95	19
Air/space transport accidents (E840–E845)	0.16	>0	1,032	165	231	37
Alcohol poisonings (E860, E860.1)	1.00	≥15	151	151	37	37
Accidental falls (E880–E888)	0.35	≥15	6,091	2,132	5,485	1920
Accidents caused by fires (E890–E899)	0.45	>0	2,863	1,288	1,847	831
Accidental drownings (E910)	0.38	>0	3,529	1,341	831	316
Other injuries	0.25	≥15	4,469	1,117	1,410	353
Intentional injuries						
Suicide (E950–E959)	0.28	≥15	24,073	6,740	6,472	1812
Homicide (E960–E969)	0.46	≥15	15,007	6,903	4,792	2,204
Metabolic disorder						
Diabetes mellitus (250)	0.05	≥35	15,795	790	21,959	1098
Other alcohol-related diagnoses						
Alcoholic polyneuropathy (357.5)	1.00	≥15	4	4	0	0
Excess blood alcohol level (790.3)	1.00	≥15	9	9	2	2
Total				**70,168**		**34,927**

*Deaths occurring before this age were not included in the calculations.
†AAF is 0.40 for females.
§When a death occurs under "accidental" circumstances, the preferred term within the public health community for the cause of death is "unintentional injury."

Alcohol-Related Death — Continued

attributable to alcohol use (male/female ratio = 3.4:1). ARM accounted for 6.3% of deaths among males and 3.4% of deaths among females in 1987.

Certain specific diagnoses were major contributors to ARM: motor vehicle crashes (19.3%), homicide (8.7%), suicide (8.1%), alcoholic cirrhosis of the liver (7.1%), and esophageal cancer (6.5%).

Alcohol-Related YPLL

YPLL were calculated to age 65 and to full life expectancy (Table 3) using previously described methods (*3*). For the calculation of alcohol-related YPLL based on life expectancy, age-specific life expectancy data were U.S. all-races data for 1985 (*4*). For each diagnosis, alcohol-related YPLL were calculated as deaths × AAF × YPLL by sex and 5-year age group.

In 1987, ARM accounted for more than 1.5 million YPLL before age 65 and more than 2.7 million YPLL before life expectancy (Table 3). Although unintentional injuries caused 28.7% of all ARM, they accounted for 50.8% and 40.8% of YPLL before age 65 and life expectancy, respectively. Intentional injuries (suicide and homicide), which represented 16.8% of all deaths, accounted for 29.1% and 23.7% of YPLL before age 65 and life expectancy, respectively.

On average, each alcohol-related death was associated with 14.6 YPLL before age 65 and 25.9 YPLL before life expectancy (Table 4). For both YPLL measures, deaths caused by intentional and unintentional injuries were associated with the greatest number of YPLL per death.

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Editorial Note: The estimates in this analysis were produced using a structured applications software package (Alcohol-Related Disease Impact [ARDI]) (*2*) that operates as a set of linked spreadsheets retrieved in response to menu choices. This software adapts epidemiologic and cost-of-illness methodologies developed for U.S. estimates of alcohol-attributable disease impact (UCSF, unpublished data) for use by state and local health departments (*5*). This approach is time- and cost-efficient; after

TABLE 2. Estimated alcohol-related mortality and male-to-female ratio, by sex and diagnostic category — United States, 1987

Diagnostic category	Male No. deaths	Male (%)	Female No. deaths	Female (%)	Total No. deaths	Total (%)	Male: female ratio
Malignant neoplasms	11,410	(16.3)	4,609	(13.2)	16,019	(15.2)	2.5
Mental disorders	4,192	(6.0)	1,124	(3.2)	5,316	(5.1)	3.7
Cardiovascular diseases	4,604	(6.6)	6,143	(17.6)	10,747	(10.2)	0.8
Respiratory diseases*	1,847	(2.6)	1,842	(5.3)	3,688	(3.5)	1.0
Digestive diseases	13,032	(18.6)	6,524	(18.7)	19,556	(18.7)	2.0
Unintentional injuries	20,637	(29.4)	9,569	(27.4)	30,205	(28.7)	2.2
Intentional injuries	13,644	(19.4)	4,016	(11.5)	17,660	(16.8)	3.4
Other alcohol-related diagnoses	803	(1.1)	1,100	(3.1)	1,903	(1.8)	0.7
Total	**70,168**	**(100.0)**	**34,927**	**(100.0)**	**105,095**	**(100.0)**	

*Includes mortality from respiratory tuberculosis.

Alcohol-Related Death — Continued

collection of standard mortality and population data, all analytic procedures (i.e., data entry, disease-impact calculations, table printing, and graph plotting) can be completed in 1 workday.

The development of ARDI software follows the successful use of Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC) software (*6,7*) that produced both national (*8*) and state-level (*9,10*) estimates of the disease impact of cigarette smoking. ARDI software can assist state and local health professionals and policy makers in better characterizing the public health impact of alcohol use and misuse, as well as stimulating collaborative research and improvement of alcohol-related research methodologies and health data.

Further epidemiologic studies are needed to allow direct computation of AAFs for most diagnoses. AAFs require a consistent definition of alcohol exposure prevalence and robust, diagnosis-specific relative risk measures. For most alcohol-related diseases and injuries, such measures have not yet been determined by rigorous epidemiologic investigation; quantity, volume, and frequency measures of alcohol consumption vary among studies of alcohol-related chronic diseases. In addition, injury surveillance data are constrained by a lack of standardized units for measuring blood-alcohol concentration and disparities in defining measurement thresholds for

TABLE 3. Alcohol-related years of potential life lost (YPLL), by sex and diagnostic category — United States, 1987

	Male		Female		Total	
Diagnostic category	**YPLL***	**(%)**	**YPLL***	**(%)**	**YPLL***	**(%)**
YPLL to age 65						
Malignant neoplasms	37.5	(3.3)	10.8	(2.8)	48.3	(3.2)
Mental disorders	52.3	(4.6)	14.2	(3.7)	66.5	(4.3)
Cardiovascular diseases	13.0	(1.1)	6.4	(1.6)	19.3	(1.3)
Respiratory diseases†	3.3	(0.3)	1.4	(0.4)	4.7	(0.3)
Digestive diseases	116.3	(10.2)	46.8	(12.1)	163.1	(10.7)
Unintentional injuries	571.0	(49.8)	207.6	(53.9)	778.6	(50.8)
Intentional injuries	350.0	(30.5)	96.2	(25.0)	446.1	(29.1)
Other alcohol-related diagnoses	2.6	(0.2)	1.9	(0.5)	4.5	(0.3)
Total	**1145.9**	**(100.0)**	**385.3**	**(100.0)**	**1531.2**	**(100.0)**
	(74.8)		**(25.2)**		**(100.0)**	
YPLL to life expectancy						
Malignant neoplasms	164.8	(8.8)	71.9	(8.5)	236.7	(8.7)
Mental disorders	100.7	(5.4)	32.5	(3.8)	133.3	(4.9)
Cardiovascular diseases	55.3	(2.9)	66.6	(7.9)	122.0	(4.5)
Respiratory diseases†	18.6	(1.0)	18.1	(2.1)	36.6	(1.3)
Digestive diseases	267.3	(14.3)	145.3	(17.1)	412.5	(15.2)
Unintentional injuries	769.5	(41.1)	339.7	(40.1)	1109.2	(40.8)
Intentional injuries	486.9	(26.0)	158.6	(18.7)	645.4	(23.7)
Other alcohol-related diagnoses	10.7	(0.6)	15.1	(1.8)	25.8	(0.9)
Total	**1873.8**	**(100.0)**	**847.8**	**(100.0)**	**2721.6**	**(100.0)**
	(68.9)		**(31.1)**		**(100.0)**	

*Thousands.
†Includes YPLL from respiratory tuberculosis.

Alcohol-Related Death — Continued

intoxication. Finally, consensus must be developed regarding the appropriate comparison population for relative risk calculations—specifically, whether abstinence or moderate drinking provide an optimal baseline.

Despite methodologic concerns, a standardized, structured approach to the analysis of the public health impact of alcohol use and misuse can provide an evaluation tool for monitoring alcohol-intervention efforts.

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TABLE 4. Mean years of potential life lost (YPLL) for alcohol-related deaths, by sex and diagnostic category — United States, 1987

Diagnostic category	Mean YPLL per death		
	Male	Female	Total
YPLL to age 65			
Malignant neoplasms	3.3	2.3	3.0
Mental disorders	12.5	12.6	12.5
Cardiovascular diseases	2.8	1.0	1.8
Respiratory diseases*	1.8	0.8	1.3
Digestive diseases	8.9	7.2	8.3
Unintentional injuries	27.7	21.7	25.8
Intentional injuries	25.7	23.9	25.3
Other alcohol-related diagnoses	3.2	1.7	2.3
Mean YPLL per death	16.3	11.0	14.6
YPLL to life expectancy			
Malignant neoplasms	14.4	15.6	14.8
Mental disorders	24.0	28.9	25.1
Cardiovascular diseases	12.0	10.8	11.3
Respiratory diseases*	10.1	9.8	9.9
Digestive diseases	20.5	22.3	21.1
Unintentional injuries	37.3	35.5	36.7
Intentional injuries	35.7	39.5	36.5
Other alcohol-related diagnoses	13.4	13.7	13.6
Mean YPLL per death	26.7	24.3	25.9

*Includes YPLL from respiratory tuberculosis.

Alcohol-Related Death — Continued

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Alcohol-Related Disease Impact — Wisconsin, 1988

Based on CDC's Behavioral Risk Factor Surveillance System, Wisconsin is among the leading states nationally in estimates of alcohol-related risk factors: in 1988, 25.3% of the adult population reported binge drinking (consuming five or more drinks on one occasion during the last month), 8.6% reported heavier drinking (consuming ≥60 drinks per month), and 6.2% reported drinking and driving (driving after having "too much to drink" at least once in the last month). Alcohol sales data for 1984 indicate that Wisconsin ranked sixth among all states in per capita sales of ethanol (3.2 gallons of ethanol sold per Wisconsin resident aged ≥14 years). To characterize the public health impact of alcohol use and misuse in Wisconsin, the Wisconsin Department of Health and Social Services used 1988 mortality data and population estimates and a structured data-base approach to estimate alcohol-related mortality (ARM),* years of potential life lost (YPLL),† and economic costs (*1,2*).

In 1988, a total of 1949 alcohol-related deaths occurred in Wisconsin, accounting for 4.5% of all deaths (Table 1). Intentional (suicide and homicide) and unintentional injuries accounted for 857 (44%) of these. The contribution of injury deaths to ARM varied inversely with age: injuries accounted for 97% of ARM among persons aged <35 years, 38% among persons aged 35–64 years, and 24% among persons aged ≥65 years (Figure 1, page 185). ARM due to digestive diseases and mental disorders was more prevalent in the 35–64-year age group; ARM from neoplasms and cardiovascular diseases in persons aged ≥65 years was substantial. The absolute number of alcohol-associated deaths increased with age. In contrast, ARM as a proportion of total mortality peaked at ages 15–24 years and declined with age thereafter (Figure 2, page 185).

Males accounted for nearly twice as many alcohol-associated deaths as females (1263, compared with 686); the greatest differential (3:1) occurred in the <35-year age group. Sixty-one percent (417/686) of alcohol-related deaths in females occurred in the ≥65-year age group, compared with 41% (521/1263) in males. Of the 857 alcohol-related deaths due to injury, 604 (70%) occurred in males, 311 (51%) of whom were <35 years of age. For males <35 years of age, 159 deaths (50% of ARM in this group) were from motor-vehicle injuries.

*ARM was calculated by multiplying the number of deaths by the fraction determined to be alcohol-related for each *International Classification of Diseases, Ninth Revision, Clinical Modification*, rubric.

†YPLL were calculated by adding YPLL (age-adjusted life expectancy minus age at death) for each of the alcohol-related deaths.

Alcohol-Related Disease Impact — Continued

TABLE 1. Estimated alcohol-related mortality, by diagnosis — Wisconsin, 1988

Diagnosis (ICD-9-CM rubric)	No. deaths	Alcohol-attributable fraction	No. alcohol-attributable deaths*
Malignant neoplasms			
Cancer of the lip/oral cavity/pharynx (140–149)	150	0.50†	70
Cancer of the esophagus (150)	186	0.75	140
Cancer of the stomach (151)	296	0.20	59
Cancer of the liver/intrahepatic bile ducts (155)	150	0.15	22
Cancer of the larynx (161)	51	0.50†	24
Subtotal	**833**		**315**
Mental disorders			
Alcoholic psychoses (291)	5	1.00	5
Alcohol dependence syndrome (303)	72	1.00	72
Alcohol abuse (305.0)	10	1.00	10
Subtotal	**87**		**87**
Cardiovascular diseases			
Essential hypertension (401)	74	0.08	6
Alcoholic cardiomyopathy (425.5)	19	1.00	19
Cerebrovascular disease (430–438)	3,383§	0.07	219
Subtotal	**3,476**		**244**
Respiratory diseases			
Respiratory tuberculosis (011–012)	0	0.25	0
Pneumonia and influenza (480–487)	1,797	0.05	88
Subtotal	**1,797**		**88**
Digestive diseases			
Diseases of esophagus/stomach/duodenum (530–537)	194	0.10	20
Alcoholic gastritis (535.3)	5	1.00	5
Alcoholic fatty liver (571.0)	4	1.00	4
Acute alcoholic hepatitis (571.1)	15	1.00	15
Alcoholic cirrhosis of the liver (571.2)	141	1.00	141
Alcoholic liver damage, unspecified (571.3)	31	1.00	31
Other cirrhosis of the liver (571.5, 571.6)	181	0.50	90
Acute pancreatitis (577.0)	26	0.42	11
Chronic pancreatitis (577.1)	6§	0.60	3
Subtotal	**603**		**320**
Unintentional injuries¶			
Motor vehicle accidents (E810–E825)	817	0.42	346
Other road vehicle accidents (E826.9)	4	0.20	1
Water transport accidents (E830–E838)	20	0.20	4
Air/space transport accidents (E840–E845)	12	0.16	2
Alcohol poisonings (E860, E860.1)	0	1.00	0
Accidental falls (E880–E888)	307§	0.35	105
Accidents caused by fires (E890–E899)	74	0.45	33
Accidental drownings (E910)	64	0.38	24
Other injuries	410§	0.25	93
Subtotal	**1,708**		**608**
Intentional injuries			
Suicide (E950–E959)	652	0.28	181
Homicide (E960–E969)	166§	0.46	68
Subtotal	**818**		**249**
Metabolic disorder			
Diabetes mellitis (250)	786	0.05	39
Other alcohol-related diagnoses			
Alcoholic polyneuropathy (357.5)	0	1.00	0
Excess blood alcohol level (790.3)	0	1.00	0
Subtotal	**0**		**0**
All other deaths	**33,203**	**0.0**	**0**
Total	**43,311**	**0.045**	**1,949**

*Alcohol-attributable deaths = total deaths × alcohol-attributable fraction.
†Alcohol-attributable fraction is 0.40 for females.
§Includes deaths below the specified age range used to calculate number of alcohol-attributable deaths (*2*).
¶When a death occurs under "accidental" circumstances, the preferred term within the public health community for the cause of death is "unintentional injury."

Alcohol-Related Disease Impact — Continued

The 1949 deaths related to alcohol use and misuse accounted for an estimated 46,052 YPLL to full life expectancy (23.6 YPLL per death). Injuries accounted for 30,023 (65%) YPLL; 14,458 of these YPLL were due to motor-vehicle injuries. Males <35 years of age accounted for 16,011 YPLL, more than one third the total.

Alcohol-related economic costs were prorated from national figures (national per capita alcohol-related costs multiplied by Wisconsin population), except for indirect mortality costs, which were calculated using expected lifetime earnings and Wisconsin mortality data (*1*). In 1988, alcohol-related economic costs in Wisconsin were estimated to be $1.47 billion (Table 2, page 186). Direct costs (i.e., those for which actual expenditures are made) were estimated at $344 million. Direct health-care costs for the detection, treatment, and rehabilitation of alcohol-related diseases

(Continued on page 185)

TABLE I. Summary — cases of specified notifiable diseases, United States

Disease	11th Week Ending			Cumulative, 11th Week Ending		
	Mar. 17, 1990	Mar. 18, 1989	Median 1985-1989	Mar. 17, 1990	Mar. 18, 1989	Median 1985-1989
Acquired Immunodeficiency Syndrome (AIDS)	732	U*	353	9,174	6,590	4,182
Aseptic meningitis	93	68	87	908	895	895
Encephalitis: Primary (arthropod-borne & unspec)	17	17	21	129	126	169
Post-infectious	2	3	3	23	20	17
Gonorrhea: Civilian	11,122	14,163	14,293	139,434	144,607	172,037
Military	145	265	365	2,188	2,280	3,363
Hepatitis: Type A	466	665	590	5,623	7,223	5,173
Type B	401	385	508	3,924	4,220	4,956
Non A, Non B	25	47	66	374	515	620
Unspecified	43	44	70	360	545	701
Legionellosis	38	20	20	240	197	163
Leprosy	4	7	5	28	32	45
Malaria	18	17	12	208	210	145
Measles: Total†	284	528	73	3,029	1,726	519
Indigenous	277	474	64	2,750	1,620	431
Imported	7	54	9	279	107	61
Meningococcal infections	58	102	82	663	750	750
Mumps	110	134	104	1,130	1,215	1,091
Pertussis	33	37	48	537	418	418
Rubella (German measles)	16	2	11	106	49	59
Syphilis (Primary & Secondary): Civilian	800	691	639	9,816	8,337	7,182
Military	5	6	5	67	69	50
Toxic Shock syndrome	8	11	11	82	68	67
Tuberculosis	429	485	449	3,793	3,802	3,792
Tularemia	-	-	1	8	10	17
Typhoid Fever	7	11	10	72	82	50
Typhus fever, tick-borne (RMSF)	1	1	-	16	19	10
Rabies, animal	63	95	95	612	836	845

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1990		Cum. 1990
Anthrax	-	Leptospirosis (Colo. 1)	7
Botulism: Foodborne	1	Plague	-
Infant (Md. 1, Tex. 2)	10	Poliomyelitis, Paralytic,§	-
Other	1	Psittacosis (N.C. 1, Colo. 2)	36
Brucellosis (Mass. 1)	9	Rabies, human	-
Cholera	-	Tetanus (Tex. 1)	11
Congenital rubella syndrome	-	Trichinosis	10
Congenital syphilis, ages < 1 year	-		
Diphtheria	1		

*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.
†Four of the 284 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.
§One case of suspected poliomyelitis has been reported in 1990; none of 13 suspected cases in 1989 have been confirmed to date. Nine of 14 suspected cases in 1988 were confirmed and all were vaccine-associated.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending March 17, 1990 and March 18, 1989 (11th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	9,174	908	129	23	139,434	144,607	5,623	3,924	374	360	240	28
NEW ENGLAND	411	51	5	-	4,254	4,051	114	227	9	21	10	-
Maine	15	1	-	-	55	66	1	15	2	1	1	-
N.H.	26	4	-	-	36	50	3	10	-	1	-	-
Vt.	3	5	-	-	15	20	1	10	2	-	3	-
Mass.	241	17	1	-	1,599	1,681	80	152	5	18	4	-
R.I.	13	17	-	-	224	323	15	13	-	1	2	-
Conn.	113	7	4	-	2,325	1,911	14	27	-	-	-	-
MID. ATLANTIC	3,120	166	9	-	16,910	24,596	849	593	51	29	63	8
Upstate N.Y.	485	70	8	-	2,886	3,372	224	147	7	7	26	1
N.Y. City	1,810	23	1	-	8,743	11,350	86	190	8	12	8	4
N.J.	554	-	-	-	2,861	2,957	111	108	17	-	7	2
Pa.	271	73	-	-	2,420	6,917	428	148	19	10	22	1
E.N. CENTRAL	532	152	26	5	28,225	24,905	359	564	21	33	70	-
Ohio	133	47	8	2	8,774	6,694	54	121	7	4	28	-
Ind.	53	27	2	2	2,621	1,510	44	183	3	10	16	-
Ill.	217	20	7	1	8,731	7,382	104	31	3	10	-	-
Mich.	85	53	9	-	6,805	7,153	112	144	7	9	18	-
Wis.	44	5	-	-	1,294	2,166	45	85	1	-	8	-
W.N. CENTRAL	217	36	9	1	7,835	6,015	278	169	20	7	11	-
Minn.	43	3	4	1	925	583	37	13	5	-	-	-
Iowa	11	2	1	-	572	529	70	25	1	2	1	-
Mo.	124	17	-	-	4,490	3,625	128	112	6	3	8	-
N. Dak.	-	1	-	-	24	34	2	1	2	1	-	-
S. Dak.	1	1	2	-	44	56	10	3	1	-	-	-
Nebr.	16	8	2	-	377	310	19	11	2	-	1	-
Kans.	22	4	-	-	1,403	878	12	4	3	1	1	-
S. ATLANTIC	1,669	207	37	5	38,574	39,086	640	757	61	43	35	1
Del.	27	6	1	-	531	564	30	22	2	-	1	-
Md.	256	44	5	-	4,517	4,018	318	114	8	3	8	1
D.C.	53	1	-	-	858	2,546	6	6	3	-	-	-
Va.	221	42	14	-	3,856	3,428	40	47	6	31	5	-
W. Va.	13	3	3	-	270	306	6	25	1	-	-	-
N.C.	156	20	9	-	6,458	5,785	115	218	29	-	9	-
S.C.	75	3	-	-	3,548	3,586	12	151	5	5	5	-
Ga.	263	9	2	1	8,565	7,394	47	81	2	3	5	-
Fla.	605	79	3	4	9,971	11,459	66	93	5	1	2	-
E.S. CENTRAL	164	59	10	-	11,769	11,883	74	305	27	2	19	-
Ky.	30	17	2	-	1,258	1,039	19	80	12	2	6	-
Tenn.	29	10	6	-	3,589	3,909	25	178	10	-	7	-
Ala.	49	25	2	-	4,153	3,859	30	47	5	-	6	-
Miss.	56	7	-	-	2,769	3,076	-	-	-	-	-	-
W.S. CENTRAL	968	37	4	2	13,311	15,369	450	222	25	33	12	9
Ark.	31	1	-	-	1,991	1,522	108	15	2	2	2	-
La.	158	8	2	-	2,625	3,251	23	57	-	1	2	-
Okla.	41	7	-	2	1,270	1,411	112	35	6	4	8	-
Tex.	738	21	2	-	7,425	9,185	207	115	17	26	-	9
MOUNTAIN	242	40	3	-	2,787	2,860	929	300	28	35	16	-
Mont.	3	1	-	-	26	46	21	22	2	1	-	-
Idaho	6	-	-	-	20	47	12	19	5	-	1	-
Wyo.	-	1	1	-	33	30	15	5	-	-	-	-
Colo.	64	14	-	-	723	572	67	60	8	15	2	-
N. Mex.	12	3	-	-	218	289	126	28	-	-	1	-
Ariz.	113	11	2	-	1,252	1,077	555	92	11	12	7	-
Utah	22	5	-	-	90	110	52	13	1	2	1	-
Nev.	22	5	-	-	425	689	81	61	1	5	4	-
PACIFIC	1,851	160	26	10	15,769	15,842	1,930	787	132	157	4	10
Wash.	130	-	1	1	1,258	1,424	313	120	25	7	1	1
Oreg.	65	-	-	-	557	621	222	86	9	6	-	-
Calif.	1,621	143	24	8	13,661	13,501	1,319	549	95	143	2	5
Alaska	9	2	-	-	226	198	42	16	3	-	-	-
Hawaii	26	15	1	1	67	98	34	16	-	1	1	4
Guam	1	-	-	-	28	32	2	1	-	4	-	-
P.R.	349	24	4	-	278	210	26	24	-	18	-	-
V.I.	4	-	-	-	103	126	-	2	-	-	-	-
Amer. Samoa	-	-	-	-	16	11	3	-	-	-	-	2
C.N.M.I.	-	-	-	-	40	20	2	1	-	-	-	1

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending March 17, 1990 and March 18, 1989 (11th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	1990	Cum. 1990	Cum. 1989
UNITED STATES	208	277	2,750	7	279	1,726	663	110	1,130	33	537	418	16	106	49
NEW ENGLAND	23	2	46	-	10	50	43	-	12	2	78	12	1	2	1
Maine	-	-	-	-	-	-	5	-	-	-	1	4	-	-	-
N.H.	2	-	-	-	7	-	1	-	4	-	7	5	-	-	-
Vt.	3	-	-	-	1	1	4	-	1	-	2	1	-	-	1
Mass.	12	2	2	-	-	10	23	-	4	2	63	-	-	-	-
R.I.	2	-	14	-	2	19	1	-	3	-	-	2	-	1	-
Conn.	4	-	30	-	-	20	9	-	-	-	5	-	1	1	-
MID. ATLANTIC	45	68	285	-	70	141	100	4	71	-	143	37	-	2	2
Upstate N.Y.	9	14	126	-	60	15	36	4	28	-	117	15	-	1	1
N.Y. City	19	12	26	-	4	22	9	-	-	-	-	1	-	-	1
N.J.	5	-	8	-	-	95	18	-	19	-	7	17	-	-	-
Pa.	12	42	125	-	6	9	37	-	24	-	19	4	-	1	-
E.N. CENTRAL	11	67	1,095	3	119	151	88	12	107	12	119	53	-	5	4
Ohio	3	-	139	-	-	97	30	-	29	-	30	1	-	-	-
Ind.	-	52	100	-	-	-	10	-	5	-	31	3	-	-	-
Ill.	2	1	412	-	-	53	24	-	19	-	17	21	-	5	3
Mich.	4	14	136	3§	119	-	15	11	39	12	28	5	-	-	-
Wis.	2	-	308	-	-	1	9	1	15	-	13	23	-	-	1
W.N. CENTRAL	2	-	75	-	1	216	25	3	42	-	6	14	-	-	1
Minn.	-	-	27	-	1	-	5	-	-	-	-	-	-	-	-
Iowa	-	-	21	-	-	-	1	-	6	-	1	6	-	-	-
Mo.	2	-	27	-	-	206	10	3	21	-	2	7	-	-	1
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Dak.	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-
Nebr.	-	-	-	-	-	-	3	-	1	-	1	-	-	-	-
Kans.	-	-	-	-	-	10	4	-	14	-	1	1	-	-	-
S. ATLANTIC	52	11	170	4	42	94	124	45	405	2	52	30	1	8	-
Del.	1	-	2	-	-	-	1	-	-	-	1	-	-	-	-
Md.	12	5	16	-	11	10	13	33	231	-	18	3	-	-	-
D.C.	5	-	-	-	1	2	2	-	5	-	1	-	-	-	-
Va.	13	-	9	-	2	-	17	3	12	-	4	3	-	-	-
W. Va.	1	-	6	-	-	-	4	2	30	-	5	4	-	-	-
N.C.	5	-	3	-	-	81	22	-	27	2	8	10	-	-	-
S.C.	-	-	1	-	-	-	9	-	10	-	3	-	-	-	-
Ga.	5	1	2	4†	8	-	24	-	25	-	8	4	-	-	-
Fla.	10	5	131	-	20	1	32	7	65	-	4	6	1	8	-
E.S. CENTRAL	4	6	32	-	-	2	35	3	33	2	18	24	1	1	-
Ky.	1	-	-	-	-	1	12	-	-	-	-	-	-	-	-
Tenn.	2	2	18	-	-	-	11	2	14	1	6	11	1	1	-
Ala.	1	4	4	-	-	1	12	-	3	1	11	10	-	-	-
Miss.	-	-	10	-	-	-	-	1	16	-	1	3	-	-	-
W.S. CENTRAL	2	99	240	-	9	820	46	25	236	-	9	5	-	-	5
Ark.	-	-	-	-	-	-	3	8	60	-	-	2	-	-	-
La.	-	-	-	-	-	1	11	3	46	-	1	-	-	-	-
Okla.	2	-	38	-	-	15	7	-	63	-	8	3	-	-	-
Tex.	-	99	202	-	9	804	25	14	67	-	-	-	-	-	5
MOUNTAIN	5	19	85	-	13	16	16	3	66	1	52	179	1	1	1
Mont.	-	-	-	-	-	13	4	-	-	-	-	-	-	-	-
Idaho	2	-	-	-	-	1	-	-	31	-	2	12	1	1	-
Wyo.	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Colo.	-	4	10	-	2	1	7	-	6	-	37	16	-	-	-
N. Mex.	-	9	23	-	-	-	-	N	N	-	1	3	-	-	-
Ariz.	3	-	37	-	8	1	2	-	21	-	6	142	-	-	-
Utah	-	-	-	-	-	-	1	-	2	1	3	5	-	-	-
Nev.	-	6	15	-	3	-	2	3	4	-	3	1	-	-	1
PACIFIC	64	5	722	-	15	236	186	15	158	14	60	64	12	87	35
Wash.	3	-	6	-	11	1	20	1	16	4	16	12	-	-	-
Oreg.	2	-	-	-	-	-	20	N	N	-	3	1	-	-	-
Calif.	58	-	679	-	3	231	142	13	139	10	37	49	12	83	29
Alaska	-	5	36	-	-	-	4	-	-	-	-	-	-	-	-
Hawaii	1	-	1	-	1	4	-	1	3	-	4	2	-	4	6
Guam	1	U	-	U	-	-	-	U	-	U	-	1	U	-	-
P.R.	-	3	47	-	-	149	4	-	3	-	4	2	-	-	2
V.I.	-	-	-	-	-	-	-	1	3	-	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	2	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending March 17, 1990 and March 18, 1989 (11th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	9,816	8,337	82	3,793	3,802	8	72	16	612
NEW ENGLAND	412	332	4	71	80	-	4	-	-
Maine	3	-	-	-	1	-	-	-	-
N.H.	26	-	1	1	4	-	-	-	-
Vt.	-	-	-	2	1	-	-	-	-
Mass.	145	116	2	29	37	-	3	-	-
R.I.	1	9	-	15	14	-	-	-	-
Conn.	237	207	1	24	23	-	1	-	-
MID. ATLANTIC	1,625	1,631	9	970	803	1	19	2	159
Upstate N.Y.	118	133	4	17	74	-	7	-	3
N.Y. City	1,115	649	2	676	519	-	4	-	-
N.J.	343	284	-	136	92	1	7	2	52
Pa.	49	565	3	141	118	-	1	-	104
E.N. CENTRAL	594	312	24	417	422	-	9	1	11
Ohio	110	23	9	51	79	-	3	-	2
Ind.	6	12	2	17	27	-	-	-	-
Ill.	240	145	-	189	185	-	3	-	4
Mich.	164	119	13	139	116	-	3	1	-
Wis.	74	13	-	21	15	-	-	-	5
W.N. CENTRAL	65	68	8	90	112	4	-	2	73
Minn.	23	6	-	17	24	-	-	-	35
Iowa	6	11	1	10	19	-	-	-	7
Mo.	30	32	4	38	38	3	-	2	2
N. Dak.	1	1	-	4	4	-	-	-	8
S. Dak.	-	-	-	4	7	-	-	-	13
Nebr.	2	10	2	7	6	1	-	-	-
Kans.	3	8	1	10	14	-	-	-	8
S. ATLANTIC	3,791	3,133	2	689	776	2	6	5	201
Del.	48	40	-	6	6	-	-	-	2
Md.	277	169	-	67	61	-	4	-	62
D.C.	915	181	-	18	42	-	-	-	-
Va.	125	123	-	61	71	-	-	-	42
W. Va.	3	4	-	13	19	-	-	-	4
N.C.	366	178	1	90	66	1	-	3	2
S.C.	202	146	-	104	80	1	-	2	24
Ga.	765	682	-	74	106	-	1	-	50
Fla.	1,090	1,610	1	256	325	-	1	-	15
E.S. CENTRAL	732	522	5	241	334	-	-	1	25
Ky.	18	14	-	83	82	-	-	-	9
Tenn.	259	166	3	44	94	-	-	1	1
Ala.	223	215	2	86	105	-	-	-	15
Miss.	232	127	-	28	53	-	-	-	-
W.S. CENTRAL	1,462	1,101	3	451	402	-	2	4	78
Ark.	101	88	-	56	51	-	-	-	4
La.	456	230	-	43	61	-	-	-	-
Okla.	48	15	3	39	21	-	-	4	15
Tex.	857	768	-	313	269	-	2	-	59
MOUNTAIN	167	178	12	70	111	1	6	-	16
Mont.	-	-	-	4	4	-	-	-	6
Idaho	4	-	1	1	3	-	-	-	-
Wyo.	-	-	1	-	-	-	-	-	8
Colo.	11	31	4	-	2	-	-	-	-
N. Mex.	11	4	4	20	17	1	-	-	1
Ariz.	112	40	2	30	47	-	4	-	-
Utah	1	5	-	-	21	-	-	-	-
Nev.	28	98	-	15	17	-	2	-	1
PACIFIC	968	1,060	15	794	762	-	26	1	49
Wash.	62	72	1	59	40	-	-	-	-
Oreg.	24	51	-	18	23	-	-	-	-
Calif.	873	930	13	684	655	-	25	1	37
Alaska	3	2	-	11	10	-	-	-	12
Hawaii	6	5	1	22	34	-	1	-	-
Guam	-	3	-	8	13	-	-	-	-
P.R.	228	98	-	29	37	-	-	-	7
V.I.	-	1	-	1	1	-	-	-	-
Amer. Samoa	-	-	-	3	1	-	-	-	-
C.N.M.I.	-	1	-	6	1	-	4	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending March 17, 1990 (11th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	588	424	93	39	15	17	61
Boston, Mass.	146	96	26	16	4	4	24
Bridgeport, Conn.	43	33	5	3	1	1	1
Cambridge, Mass.	28	19	8	1	-	-	3
Fall River, Mass.	29	23	3	-	1	2	2
Hartford, Conn.§	65	49	9	6	1	-	7
Lowell, Mass.	22	15	5	1	-	1	2
Lynn, Mass.	21	17	3	1	-	-	2
New Bedford, Mass.	35	28	6	1	-	-	2
New Haven, Conn.	44	26	9	3	3	3	1
Providence, R.I.	27	23	2	1	1	-	2
Somerville, Mass.	4	3	1	-	-	-	-
Springfield, Mass.	46	33	6	2	3	2	2
Waterbury, Conn.	31	24	5	2	-	-	5
Worcester, Mass.	47	35	5	2	1	4	8
MID. ATLANTIC	2,911	1,889	536	331	72	82	165
Albany, N.Y.	46	36	8	2	-	-	2
Allentown, Pa.	22	19	2	1	-	-	1
Buffalo, N.Y.	103	47	28	24	2	2	7
Camden, N.J.	33	18	8	1	4	2	-
Elizabeth, N.J.	19	14	3	1	-	1	-
Erie, Pa.†	41	26	7	3	3	2	5
Jersey City, N.J.	79	39	15	11	3	11	2
N.Y. City, N.Y.	1,532	1,000	266	194	36	36	73
Newark, N.J.	53	18	13	20	2	-	4
Paterson, N.J.	30	14	8	4	1	3	-
Philadelphia, Pa.	422	279	84	35	15	8	26
Pittsburgh, Pa.†	107	79	16	7	-	5	12
Reading, Pa.	36	30	3	2	-	1	6
Rochester, N.Y.	131	100	17	5	2	7	13
Schenectady, N.Y.	32	26	3	1	2	-	1
Scranton, Pa.†	24	16	8	-	-	-	2
Syracuse, N.Y.	105	63	29	8	2	3	3
Trenton, N.J.	44	25	11	8	-	-	-
Utica, N.Y.	19	16	2	-	-	1	1
Yonkers, N.Y.	33	24	5	4	-	-	7
E.N. CENTRAL	2,471	1,650	462	187	58	113	160
Akron, Ohio	61	50	7	2	-	2	-
Canton, Ohio	35	27	6	2	-	-	2
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	158	104	30	15	6	3	25
Cleveland, Ohio	177	113	33	21	3	7	14
Columbus, Ohio	153	99	29	10	7	8	18
Dayton, Ohio	153	111	26	6	3	7	17
Detroit, Mich.	276	154	52	32	9	28	6
Evansville, Ind.	37	28	6	1	-	2	1
Fort Wayne, Ind.	61	46	10	3	1	1	3
Gary, Ind.§	17	11	3	3	-	-	1
Grand Rapids, Mich.	70	46	16	5	1	2	9
Indianapolis, Ind.	173	109	32	15	8	9	12
Madison, Wis.§	34	26	5	3	-	-	1
Milwaukee, Wis.	165	113	29	8	1	14	5
Peoria, Ill.§	49	35	11	2	-	1	5
Rockford, Ill.	58	43	10	1	3	1	5
South Bend, Ind.	62	47	8	4	2	1	8
Toledo, Ohio	110	81	17	6	3	3	4
Youngstown, Ohio	58	45	7	3	1	2	8
W.N. CENTRAL	874	659	134	44	16	20	63
Des Moines, Iowa	76	60	8	5	-	3	12
Duluth, Minn.	28	23	3	1	-	1	-
Kansas City, Kans.	29	22	5	2	-	-	1
Kansas City, Mo.	120	86	27	3	2	2	9
Lincoln, Nebr.	62	49	7	3	2	1	8
Minneapolis, Minn.	193	149	26	11	5	2	17
Omaha, Nebr.	104	80	17	4	2	1	6
St. Louis, Mo.§	158	114	23	10	4	7	8
St. Paul, Minn.	71	52	13	3	1	2	1
Wichita, Kans.	33	24	5	2	-	1	1

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
S. ATLANTIC	1,276	772	269	134	46	54	70
Atlanta, Ga.	156	88	33	19	7	9	10
Baltimore, Md.	205	132	41	19	9	4	12
Charlotte, N.C.	95	57	23	10	4	1	6
Jacksonville, Fla.	131	79	34	10	2	6	5
Miami, Fla.	118	66	25	19	2	6	3
Norfolk, Va.	56	36	13	4	2	1	6
Richmond, Va.	90	57	13	8	-	12	13
Savannah, Ga.	45	24	16	2	2	1	-
St. Petersburg, Fla.	67	51	4	3	6	3	4
Tampa, Fla.	78	50	14	8	2	4	3
Washington, D.C.§	222	123	50	32	9	7	8
Wilmington, Del.	13	9	3	-	1	-	-
E.S. CENTRAL	804	541	152	49	34	28	57
Birmingham, Ala.	136	92	26	9	3	6	5
Chattanooga, Tenn.	87	58	17	3	8	1	5
Knoxville, Tenn.	68	49	8	7	2	2	9
Louisville, Ky.	83	58	14	4	3	4	6
Memphis, Tenn.	190	128	44	9	6	3	18
Mobile, Ala.	77	45	14	7	9	2	4
Montgomery, Ala.	46	33	7	4	-	2	1
Nashville, Tenn.	117	78	22	6	3	8	9
W.S. CENTRAL	1,723	1,061	380	187	58	36	84
Austin, Tex.	59	40	8	10	-	1	11
Baton Rouge, La.	65	47	11	4	2	1	1
Corpus Christi, Tex.	43	30	9	3	-	1	1
Dallas, Tex.	178	96	39	31	8	4	5
El Paso, Tex.	65	40	17	3	3	2	5
Fort Worth, Tex	103	62	23	10	3	5	7
Houston, Tex.§	734	436	169	89	24	16	18
Little Rock, Ark.	74	49	16	5	1	3	3
New Orleans, La.	63	40	15	5	2	-	-
San Antonio, Tex.	158	96	37	15	8	2	14
Shreveport, La.	54	30	14	4	5	1	7
Tulsa, Okla.	127	95	22	8	2	-	12
MOUNTAIN	726	492	128	67	21	18	36
Albuquerque, N. Mex.	93	61	15	10	5	2	2
Colo. Springs, Colo.	34	30	3	1	-	-	7
Denver, Colo.	109	73	20	15	1	-	5
Las Vegas, Nev.	115	79	24	6	4	2	6
Ogden, Utah	15	11	3	-	-	1	1
Phoenix, Ariz.	169	108	33	18	2	8	3
Pueblo, Colo.	25	17	1	4	3	-	1
Salt Lake City, Utah	51	28	10	7	3	3	1
Tucson, Ariz.	115	85	19	6	3	2	10
PACIFIC	2,330	1,543	412	237	68	63	173
Berkeley, Calif.	20	13	6	-	1	-	3
Fresno, Calif.	86	62	10	9	2	3	14
Glendale, Calif.	27	24	3	-	-	-	1
Honolulu, Hawaii	83	54	18	6	1	4	8
Long Beach, Calif.	99	70	15	8	2	4	16
Los Angeles Calif.	800	525	151	80	26	11	43
Oakland, Calif.	82	55	13	11	3	-	2
Pasadena, Calif.	32	19	7	3	-	3	1
Portland, Oreg.	150	102	23	14	4	7	11
Sacramento, Calif.	183	120	29	20	9	5	20
San Diego, Calif.	209	129	40	25	6	9	22
San Francisco, Calif.	162	84	36	37	3	2	10
San Jose, Calif.	147	101	28	6	4	8	7
Seattle, Wash.	161	115	22	14	6	4	7
Spokane, Wash.	46	32	11	1	-	2	5
Tacoma, Wash.	43	38	-	3	1	1	3
TOTAL	13,703††	9,031	2,566	1,275	388	431	869

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza.

†Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

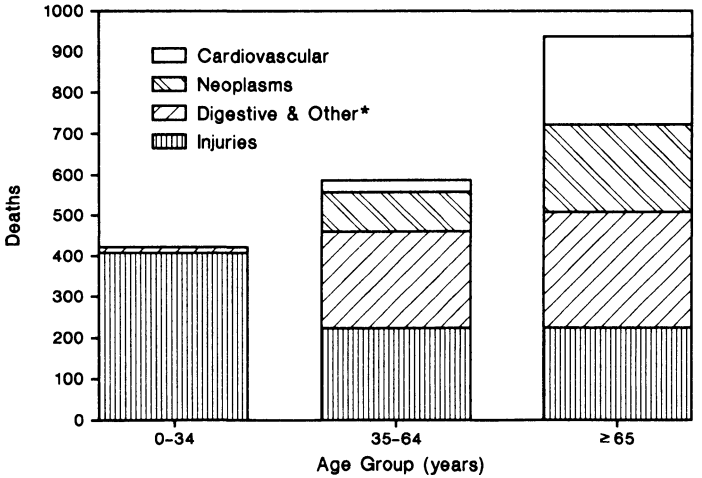
††Total includes unknown ages.

§Data not available. Figures are estimates based on average of past available 4 weeks.

Alcohol-Related Disease Impact — Continued

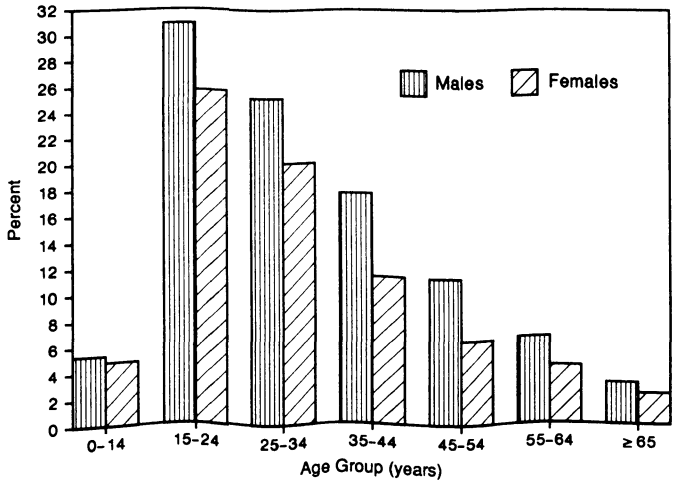
and injuries were $152 million, of which $65 million (43%) represented short-stay hospital costs. Direct costs of fetal alcohol syndrome (FAS) were estimated at $34 million; 80% of these costs were for residential care and support services for mentally retarded adults >21 years of age whose impairment was considered to be caused by FAS. Indirect costs (i.e., potential goods and services not produced because of lost or diminished productivity) were estimated at $1.13 billion. In 1988, the alcohol-related economic cost per resident in Wisconsin was $305.

FIGURE 1. Number of alcohol-related deaths, by age and diagnostic category — Wisconsin, 1988



*Mental disorders, respiratory diseases, and diabetes mellitus.

FIGURE 2. Alcohol-related deaths as a percentage of total deaths, by age and sex — Wisconsin, 1988



Alcohol-Related Disease Impact — Continued

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Editorial Note: The structured data-base analysis described in this report (*1*) can be used by state health departments to estimate the magnitude of the health and economic impact of alcohol use and misuse across many disease categories. Previous experience has shown that analyses that attribute costs and disease outcomes to specific risk factors can be used to support public-health interventions (*3*). This analysis determined that in Wisconsin in 1988, alcohol use and misuse was

TABLE 2. Summary of alcohol-related economic costs — Wisconsin, 1988

Category	Dollars (millions)
DIRECT COSTS	
Health sector	
Treatment facility	
Short-stay hospital	65.4
Specialty institution	36.3
Other treatment costs	
Office-based physician	3.0
Nursing home	19.2
Professional services	3.7
Federal provider	14.2
Support costs	
Training, research, and health insurance administration	10.6
Subtotal	*152.3*
Nonhealth sector	
Crime expenditure	90.7
Motor vehicle crash	55.2
Fire destruction	9.8
Social welfare administration	1.9
Subtotal	*157.5*
Fetal alcohol syndrome	**34.4**
Total direct costs	**344.2**
INDIRECT COSTS	
Health sector	
Mortality	485.0
Morbidity	
Noninstitutionalized	574.1
Institutionalized	4.0
Subtotal	*1063.1*
Nonhealth sector	
Victim of crime	9.9
Incarceration	57.6
Subtotal	*67.6*
Total indirect costs	**1130.7**
TOTAL	**1474.8**

Alcohol-Related Disease Impact — Continued

responsible for 4.5% of all deaths, an estimated 46,052 YPLL, and approximately $1.47 billion of direct and indirect costs. A substantial proportion of the health and economic impact was related to alcohol-attributable injuries among persons in younger age groups.

Although this assessment of alcohol-attributable disease and injury impact is based on the most current cost-of-illness methodologies, at least four restrictions apply to the interpretation of the results. First, the lack of well-established relative risks for alcohol use and misuse by age, sex, and drinking pattern limit the precision of the alcohol-attributable fractions (AAFs). All calculations of ARM, YPLL, and mortality-related economic costs depend on these AAFs. Second, indirect costs were calculated by a methodology (*4*) in which the value of human life is estimated to be the lifetime earnings of a person, with future earnings discounted to present value (a 4% discounting rate was used in this study). Although this method is commonly used to place a dollar value on human life, it may underestimate the relative economic value of women and minorities (*4*). Third, for costs other than those due to mortality, national estimates are prorated to the state's population. Although proration is necessary because state-level data are not available, this method is insensitive to possible differences between the state and the nation in patterns of alcohol use and associated costs. Finally, the psychosocial effects of alcohol use and misuse (e.g., pain and suffering) are difficult to convert into economic terms and were not included in this analysis.

Despite these limitations, this analysis illustrates the magnitude of the health and economic costs of alcohol use and misuse across many disease and injury categories and may provide a framework for public health initiatives to reduce alcohol-related morbidity and mortality.

Revenues from excise taxes on alcohol are lower than the economic costs associated with alcohol use and misuse (*5*). Increasing state alcohol tax rates represents one potential approach for reducing alcohol consumption while simultaneously generating revenue to offset the costs associated with alcohol use and misuse. These funds could be used to support mass media campaigns, school-based health education programs, and alcohol treatment programs to reduce the burden of alcohol-related morbidity and mortality.

This report also demonstrates that injuries—particularly those caused by motor vehicle crashes—were a substantial cause of alcohol-related premature mortality in Wisconsin. State-based options for reducing the public health impact of drinking and driving include raising the minimum drinking age, lowering legal blood-alcohol concentration limits, increasing the enforcement of "drunk driving" laws, and enacting mandatory motor vehicle safety-restraint laws.

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Epidemiologic Notes and Reports

Microsporidian Keratoconjunctivitis in Patients with AIDS

From November 1989 through January 1990, five cases of ocular infections with microsporidia in patients with acquired immunodeficiency syndrome (AIDS) were reported. Three cases were identified in New York City (*1*), one in San Antonio, and one in Cleveland (*2*). All five patients were homosexual men aged 29–46 years. The most common presenting manifestations were conjunctivitis or scleritis (all patients), foreign-body sensation (four patients), blurred vision (three patients), and photophobia (three patients). Ophthalmologic examinations found conjunctival inflammation (all patients), decreased visual acuity (four patients), and diffuse punctate keratopathy (four patients). One patient had corneal inflammation, and one patient had corneal ulceration. Pathologic findings were bilateral in all patients. Concomitant, unilateral cytomegalovirus retinitis was noted in two patients. After routine bacterial and fungal cultures failed to identify plausible etiologic agents, corneal or conjunctival scrapings and/or biopsy specimens were obtained from all patients. Sections from these specimens prepared with Giemsa and other routine histologic stains contained numerous oval, dark-staining organisms consistent in morphology with microsporidian spores. Visualization of characteristic ultrastructure with transmission electron microscopy confirmed the diagnosis in all cases.

Two of the five patients have died of other AIDS-related complications. No improvement in their ocular infections was noted before death despite attempted treatment with various topical antimicrobial (tobramycin, chloramphenicol, and sulfisoxazole), lubricating, and anti-inflammatory agents (*1*). Two other patients did not respond to therapy with topical antimicrobial agents (neomycin, propamidine isethionate, amphotericin, sulfacetamide, and trimethoprim/sulfamethoxazole); however, several weeks after therapy was discontinued the symptoms resolved. The reason for these improvements is unknown, but both patients coincidentally began systemic therapy with fluconozole or itraconazole for concomitant cryptococcal meningitis. Infection in the fifth patient failed to respond to topical preparations (cefazolin, propamidine isethionate, and clotrimazole); one cornea perforated, and the patient underwent emergency corneal grafting.

One patient wore contact lenses; none had histories of ocular trauma. Use of other eye medications by patients is unknown. Two patients had histories of foreign travel. Four patients were exposed to domestic animals: one had cared for a friend's pet cat, two others kept pet birds (parrot and parakeets) in their homes, and one had both a pet cat and a pet bird. The exact source of infection in all five cases remains unknown.

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Editorial Note: Microsporidia are ubiquitous, spore-forming, intracellular protozoal parasites that cause disease in a wide range of vertebrate and invertebrate animals. Manifestations of disease in humans range from asymptomatic infections to fulminant cerebritis and/or nephritis; ocular infections are recognized infrequently (*3,4*).

Microsporidian Keratoconjunctivitis — Continued

Since 1987, microsporidia have been increasingly recognized as a human pathogen (*5,6*). From 1959 through 1989, only eight cases of microsporidiosis were documented in immunocompetent (six cases) or immunosuppressed (two cases) patients without AIDS; four of these were ocular infections. Since 1985, enteric microsporidial infections have been reported with increasing frequency in AIDS patients with chronic diarrhea; hepatic and peritoneal infections have also been documented. Through 1989, more than 50 cases of intra-abdominal infections were reported in AIDS patients (*7*). Because reliable serologic tests are unavailable, the diagnosis of microsporidiosis requires biopsy of the infected tissue. Although routine histopathologic studies can provide presumptive identification, diagnostic confirmation requires electron microscopic visualization of the organisms' characteristic ultrastructure. There is no known effective antimicrobial therapy; data on the outcome of surgical procedures, such as keratoplasty and corneal transplantation, are insufficient to permit recommendations.

The occurrence of five cases of ocular microsporidiosis within such a brief time from three diverse geographic areas suggests that this problem (like intestinal microsporidiosis) may be more widespread than previously recognized. Knowledge of the epidemiologic characteristics and clinical features of microsporidial infection is limited. Infections with microsporidia have been documented in immunocompetent and immunosuppressed patients with varied cultural and socioeconomic backgrounds from at least five continents (Africa, Asia, Europe, North America, and South America). However, common epidemiologic characteristics have not been identified (*7*) and the mode of transmission in humans is unknown. In animals, transmission occurs by ingestion of microsporidian spores shed into the environment through the skin, urine, or feces of infected hosts (*3*). Although fecal-oral transmission is the likely route of infection in humans with intestinal microsporidiosis, the source of ocular infections is not clear. The relatively superficial location of conjunctival and corneal tissues suggests that direct inoculation of the eye may occur.

To better characterize the epidemiology, public health impact, and clinical features of microsporidial infections, CDC's Parasitic Diseases Branch (PDB), Division of Parasitic Diseases, Center for Infectious Diseases, is interested in obtaining information and specimens from physicians who suspect this condition in their patients. Physicians are encouraged to report such cases to CDC through their state health departments. Consultation and information regarding specimen processing are available through PDB; telephone (404) 488-4050.

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Notice to Readers

Fifth National Conference on Chronic Disease Prevention and Control

CDC, the Association of State and Territorial Health Officials, and the Association of State and Territorial Chronic Disease Program Directors will cosponsor the Fifth National Conference on Chronic Disease Prevention and Control, "From 1990 to 2000," October 17–19, 1990, in Detroit. The conference is open to the public.

The conference will emphasize interactions among federal, state, and local health departments; voluntary health agencies; and professional organizations. It will include two plenary sessions: Demographic Trends—Implications for Chronic Disease and the Public's Health, and Tobacco Control—Science and Politics. Six concurrent sessions of invited papers will focus on: special populations—minorities, the elderly, and rural inhabitants; state highlights—Michigan; quality of life and disability—issues and impact; dietary fat/nutrition; industry and chronic disease prevention—societal roles and responsibilities; and state and community tobacco-control activities. The conference will also include oral presentations, poster sessions, and roundtable discussions on related chronic disease topics involving program development and implementation, epidemiologic studies, and social and economic issues.

Additional information is available from the Center for Chronic Disease Prevention and Health Promotion, Mailstop A37, CDC, Atlanta, GA 30333; telephone: (404) 639-1750 or FTS 236-2249; FAX (404) 639-0043.

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The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday. The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333; telephone (404) 332-4555.

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