CENTERS FOR DISEASE CONTROL

March 18, 1988 / Vol. 37 / No. 10

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

153 Mercury Exposure in a High School Laboratory — Connecticut
155 Premature Mortality by Income Level — Multnomah County, Oregon, 1976-1984
158 Self-Reported Hearing Loss Among Workers Potentially Exposed to Industrial Noise — United States

Mercury Exposure in a High School Laboratory — Connecticut

On December 8, 1986, 22 students and a teacher in a Connecticut high school chemistry laboratory were exposed to mercury vapor. The class was conducting an oxidation reduction experiment that called for silver oxide. However, mercuric oxide had been used because silver oxide was not available.

The experiment was performed at eleven work stations; exhaust hoods in the classroom were not turned on. Each experiment used 1.75 g of mercuric oxide to obtain a theoretical yield of 1.62 g of elemental mercury. The mercuric oxide was placed in a crucible and heated over a burner flame for 15 minutes to drive off the oxygen. The teacher stopped the experiment when he learned that the yields were lower than expected, and, therefore, mercury was being vaporized. He turned on the hoods and had the students clean out the crucibles. The experiment had started at approximately 8:15 a.m.; the students had left the room by 9:00 a.m. The school then called the local fire department and the Toxic Hazards Section of the Connecticut Department of Health Services for assistance in determining the extent of the possible mercury exposure.

The maximum concentration of mercury in the air was estimated at 50 mg/m^3 (10.9 g total mercury lost ÷ 219 m^3 air volume of room).* The mercury saturation point in air at 20 °C (68 °F) is 15 mg/m^3 (*1*). The excess 35 mg/m^3 of mercury that appears to have been lost may have condensed on surfaces in the room. The maximum dose, or body burden, to each student was estimated at 9.3 mg.†

Air measurements for mercury were taken in the laboratory after it had been ventilated for several hours. The mercury level was 0.008 mg/m^3 with the windows open and hoods on. However, when the laboratory was closed and the hoods were turned off for 25 minutes, the level rose to 0.04 mg/m^3 (the American Conference of Government Industrial Hygienists time-weighted average is 0.05 mg/m^3). This five-fold increase may have been due to vaporization of the condensed mercury from surfaces in the room. Mercury levels were measured again the day after the incident (December 9), and school personnel were given instructions for cleanup. On

*This concentration is based on an assumption that the lost mercury had completely vaporized and had thoroughly mixed with the air in the room.
†Body burden was estimated using the value of the mercury saturation point in air and assuming 100% absorption of mercury in the lungs and a breathing rate of 20 m^3 per 24 hours for a period of 3/4 of an hour.

Mercury Exposure — Continued

December 12, mercury levels in the air in the room ranged from 0.002 to 0.003 mg/m^3. School officials were told they could resume use of the classroom.

On December 11, urine samples were obtained from the 23 persons who were in the classroom during the experiment. Eight persons had urine levels of mercury at or above 30 µg/L, the maximum level considered acceptable (*2*). On January 20, 1987, repeat tests showed that six of the eight students still had urine mercury levels above 30 µg/L. School officials decided to have follow-up testing performed on the remaining 15 persons in the class. The urine mercury level for all but one of these 15 persons had increased from the original value, and some had risen to 30 µg/L or above. The highest level was 72 µg/L. Testing of a control group to determine the normal average urine mercury level for unexposed students at the school was also requested. However, school officials did not allow control samples to be obtained. Additional follow-up testing was conducted on February 24, 1987, and again on March 31, 1987. On February 24, 1987, everyone in the class, including the teacher, had a mercury level either at or below 30 µg/L. On March 31, 1987, one student had a mercury level of 37 µg/L; all others remained at or below 30 µg/L.

Reported by: M Shelnitz, H Rao, PhD, CJ Dupuy, MS, SM, B Toal, MSPH, M Cartter, MD, JL Hadler, MD, MPH, State Epidemiologist, State of Connecticut Dept of Health Svcs. Div of Environmental Hazards and Health Effects, Center for Environmental Health and Injury Control, CDC.

Editorial Note: The biologic half-life for mercury vapor ranges from 35 to 90 days (*3*). Immediately after exposure, fecal excretion of mercury is predominant; renal excretion increases with time (*3*). Careful behavioral and neurological monitoring is recommended when urine levels are 100 µg/L or greater (*4*). Seventy-eight days passed between the students' exposure on December 8, 1986, and the test on February 24, 1987, in which all urine mercury levels were at or below 30 µg/L. The fact that one to two biologic half-lives had passed during this time probably explains the decrease in urine mercury concentrations.

Organic mercury, which is predominantly methyl mercury, and elemental mercury pose different risks. These differences result from the greater intake of organic mercury, which is obtained through the diet, and from the intrinsic toxicities of both forms of mercury (*5*). High doses of methyl mercury can produce irreversible destruction of neurons in the visual cortex and cerebellum and lead to a permanent narrowing of the visual field and signs of ataxia (*5*). The effects of inhaled mercury vapor on the nervous system are usually reversible, particularly if they are mild (*5*).

Much of the information on elemental mercury vapor is qualitative rather than quantitative, but good quantitative dose-response data are available for methyl mercury. Since methylated mercury poses greater risk than vaporized mercury, it was considered feasible to use these data in analyzing the possible risk of adverse effects in the Connecticut incident. Methyl mercury exposure has been shown to cause neurological effects at body-burden levels of between 25 and 50 mg (*3*). The students' estimated body burden of 9.3 mg was well below these values; therefore, neurotoxic effects were not anticipated. Acute renal effects were not anticipated either because they are generally caused by inorganic mercury salts (*3*).

The appropriate method for determining risks associated with toxic chemical exposures is to measure and compare ambient concentrations and body burdens. Such analysis allows for the examination of factors that can affect absorption at different exposure levels. However, as in the incident reported here, such data are not

Mercury Exposure — Continued

always available. In the absence of good monitoring data, estimated body burden must be used to assess risk.

The problem that occurred at this high school could occur at other schools. Consequently, it is recommended that mercuric oxide not be substituted for silver oxide. In the event of mercury exposure, workers assigned to cleanup should be warned of the danger involved and instructed in safety precautions. Also, students should be trained in the proper use of laboratory safety equipment such as exhaust hoods, goggles, gloves, aprons, and fire extinguishers as well as in the proper disposal of toxic chemicals that are used in classroom experiments.

References

1. Dreisbach RH. Handbook of poisoning: prevention, diagnosis, & treatment. 10th ed. Los Altos, California: Lange Medical Publications, 1980:234.
2. Nobel S. Mercury in urine. In: Seligson D, ed. Standard methods of clinical chemistry. Vol 3. New York: Academic Press, 1969:180.
3. Goyer RA. Toxic effects of metals. In: Doull J, Klaassen CD, Amdur MO, eds. Casarett and Doull's toxicology: the basic science of poisons. 3rd ed. New York: Macmillan Publishing, 1986:605-9.
4. Adams CR, Ziegler DK, Lin JT. Mercury intoxication simulating amyotrophic lateral sclerosis. JAMA 1983;250:642-3.
5. Environmental Protection Agency. Mercury health effects update: health issue assessment, final report. Washington, DC: US Environmental Protection Agency, Office of Health and Environmental Assessment, 1984:2.1-2.9.

Premature Mortality by Income Level — Multnomah County, Oregon, 1976-1984

Health status is difficult to assess because of the heterogeneous nature of populations. To alleviate this problem, officials in Oregon analyzed premature mortality in relation to median household income by census tracts and focused on one racial group. Multnomah County was chosen as the study area because it contains 21% of the state's population and includes Portland, Oregon's largest city. During the study period, 1976-1984, a total of 48,012 white residents of Multnomah County died. These deaths resulted in 303,084 years of potential life lost (YPLL) before 70 years of age.*

Comparative mortality figures (CMF), years of potential life lost indices (YPLLI), and YPLL were calculated for census tracts grouped by median income quintile. The CMF is the ratio of the age-adjusted mortality rate for an income group to the rate for all groups combined. The YPLLI is the ratio of the age-adjusted YPLL rate for an income group to that for all groups. The age adjustment for CMF was calculated by a direct method, and that for YPLLI, by an indirect method (*1*). In the poorest quintile (Group I) median household income was less than $12,100, and, in the wealthiest quintile (Group V), it was greater than $19,300.

An inverse relationship existed between income levels and the measures of mortality (CMF and YPLLI) due to all causes of death[†] (Figure 1). For the causes of deaths listed in Table 1, residents of the poorest census tracts (Group I) consistently had the highest mortality, and the wealthiest (Group V) had the lowest. YPLLI differed

*Seventy years of age was used as the base for YPLL calculations in conformance with recommendations of the National Center for Health Statistics (*1*).

[†]The International Classification of Diseases (ICD), Eighth Revision Adapted, was used to classify the underlying causes of death during the period 1976-1978 (*2*). The ICD, Ninth Revision, was used for the period 1979-1984 (*3*).

Premature Mortality — Continued

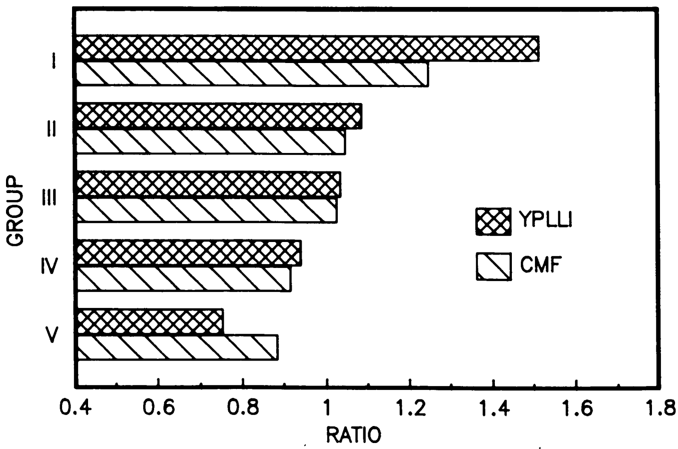
more between income levels than did CMF. The YPLLI exceeded the CMF by the greatest amount in the lowest income quintile; thus, the greatest excess in premature mortality occurred in this group.

Among the leading causes of death listed in Table 1, the disparity in mortality among income groups is greatest for alcoholism. The YPLLI and CMF decreased in each successive income quintile from Group I to Group V. The YPLLI for alcoholism was 11.7 times higher for Group I than for Group V. Previous studies have shown increased levels of alcohol abuse among persons with low income (*4*). Others have suggested that alcohol-related diseases are less likely to be reported on the death certificates of persons with higher incomes. The Oregon Center for Health Statistics queries certifying physicians regarding the deaths of any persons for whom the cause of death was suggestive of alcohol abuse (e.g., liver cirrhosis) (*5*). In 1984, Oregon's mortality rate for all liver disease and cirrhosis (ICD-9 571.0–571.9) was slightly higher (12.0/100,000 population) than that for the United States as a whole (11.6/100,000), but the mortality rate for alcoholic liver disease and cirrhosis (ICD-9 571.0–571.3) was twice as high (9.8 compared with 4.8). In 1984, 82% of all liver disease and deaths from cirrhosis in Oregon were reported to be alcohol-related; this was the highest percentage for any state.

Chronic obstructive pulmonary disease (COPD), the fifth leading cause of death and the ninth leading cause of YPLL, caused the second greatest disparity in mortality among income groups. The YPLLI for COPD was highest for Group I and lowest for Group V; the difference between the two groups was fourfold.

For unintentional injuries, Group I had the highest YPLLI, 1.2 times that of Group V. However, this finding masked a substantial difference in YPLLI for nonmotor vehicle-related unintentional injury (ICD-9 E826–E949); the YPLLI for the poorest quintile was 1.7 times that for the wealthiest. Both groups had similar YPLLI for motor vehicle-related unintentional injuries.

FIGURE 1. Comparative mortality figures (CMF) and years of potential life lost indices (YPLLI) for all causes of death, by income groups*—Multnomah County, Oregon, 1976-1984



*Group I is the lowest income quintile; Group V is the highest.

Premature Mortality — Continued

Reported by: DD Hopkins, MS, JA Grant-Worley, MS, KL Stebbins, LN Wright, MD, JE Gordon, PhD, LR Foster, MD, State Epidemiologist, Oregon Health Div. Div of Surveillance and Epidemiologic Studies, Epidemiology Program Office, CDC.

Editorial Note: Years of potential life lost is a measure of mortality that emphasizes causes of death that are important at ages under an arbitrary cut-off, 70 years in this study. A recent study in West Virginia (*6*) found that crude YPLL rates were higher in counties with low per capita income. The Multnomah County data demonstrate a large variation in premature mortality by economic status in a major metropolitan area. Census tracts are often more homogeneous than counties, and studies based on them may yield a more definitive picture of the relationship between mortality and income. The high rates of premature mortality found in low income areas, in particular, provide direction for public health prevention efforts.

TABLE 1. Years of potential life lost (YPLL), years of potential life lost index (YPLLI), number of deaths, and comparative mortality figures (CMF) for selected causes of death, by lowest and highest income quintiles* — Multnomah County, Oregon, 1976-1984

Cause of Death	YPLL	YPLLI		No. of Deaths	CMF	
		Group I	Group V		Group I	Group V
Total for All Causes	303,084	1.5†	0.8†	48,012	1.3†	0.9†
Unintentional Injuries	56,398	1.1	0.9†	2,163	1.2†	0.9†
Malignant Neoplasms	56,067	1.2†	0.8†	10,142	1.1†	0.9†
Heart Disease	44,261	1.6†	0.7†	17,288	1.2†	0.9†
Early Infancy	23,310	1.4	0.8	336	1.4	0.8
Suicide	21,000	1.6†	0.8†	817	1.6†	0.8†
Congenital Anomalies	14,652	1.2	0.9	269	1.1	0.9
Alcoholism§	13,180	3.5†	0.3†	1,185	3.1†	0.4†
Cerebrovascular Disease	6,848	1.2	0.7†	4,700	1.1†	1.0
Chronic Obstructive Pulmonary Disease	5,305	2.4†	0.6†	1,761	1.5†	0.8†

*Group I is the lowest income quintile; Group V is the highest.
†95% confidence interval excludes 1.00 ($p<0.05$).
§Alcoholism includes alcoholic psychosis, alcohol dependence syndrome, alcoholic gastritis, alcoholic cardiomyopathy, alcoholic polyneuropathy, and alcoholic liver disease.

References

1. Kleinman JC. Mortality. In: National Center for Health Statistics. Statistical notes for health planners. No. 3. Rockville, Maryland: US Department of Health, Education, and Welfare, Public Health Service, 1977; PHS publication no. (HRA)77-1237.
2. National Center for Health Statistics. International classification of diseases, adapted for use in the United States. Eighth revision. Washington, DC: US Department of Health, Education, and Welfare, Public Health Service, 1968; PHS publication no. 1693.
3. World Health Organization. Manual of the international statistical classification of diseases, injuries, and causes of death. Ninth revision. Geneva: World Health Organization, 1977.
4. Millar WJ. Sex differentials in mortality by income level in urban Canada. Can J Public Health 1983;74:329-34.
5. Hopkins DD. Questioning the physician: a survey of the cause of death query criteria used by centers for health statistics in the United States and the efficacy of the criteria used by the Oregon Center for Health Statistics. Portland, Oregon: Oregon Department of Human Resources, 1987.
6. Centers for Disease Control. Premature mortality in West Virginia, 1978-1982. MMWR 1987; 36:29-33.

Self-Reported Hearing Loss Among Workers Potentially Exposed to Industrial Noise — United States

Noise-induced loss of hearing has been recognized as an occupational health problem since the 18th century (*1*). Occupational deafness is an irreversible, sensorineural condition that results from damage to the nerve cells of the inner ear. Recent estimates from surveys indicate that between 7.4 and 10.2 million people work at sites where the level of noise presents an increased risk of hearing loss (85 decibels [dBA] or higher) (*2*). During the period 1978-1987, an estimated $835 million was paid in workers' compensation claims for occupationally induced hearing impairment (*3*).

To assess the prevalence of hearing-loss symptoms among adult workers in the United States, investigators from the National Institute for Occupational Safety and Health (NIOSH) recently analyzed data collected during the 1971 and 1977 National Health Interview Surveys (NHIS) conducted by the National Center for Health Statistics (NCHS) (*4,5*). NHIS is a continuing household survey of a stratified

(Continued on page 164)

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

Disease	10th Week Ending			Cumulative, 10th Week Ending		
	March 12, 1988	March 7, 1987	Median 1983-1987	March 12, 1988	March 7, 1987	Median 1983-1987
Acquired Immunodeficiency Syndrome (AIDS)	989	869	107	5,608	3,790	1,076
Aseptic meningitis	88	92	70	726	861	829
Encephalitis: Primary (arthropod-borne & unspec)	14	12	13	118	144	158
Post-infectious	-	1	1	10	11	13
Gonorrhea: Civilian	11,607	15,317	15,398	131,524	162,586	157,834
Military	161	358	398	2,331	3,295	3,743
Hepatitis: Type A	480	648	456	4,587	4,626	4,407
Type B	409	549	530	3,521	4,525	4,525
Non A, Non B	47	79	74	404	553	592
Unspecified	58	55	110	418	630	865
Legionellosis	12	9	10	111	127	110
Leprosy	7	3	6	24	42	45
Malaria	10	14	14	117	135	127
Measles: Total*	26	138	71	340	446	443
Indigenous	24	132	57	321	367	367
Imported	2	6	6	19	79	52
Meningococcal infections	70	133	84	668	812	638
Mumps	153	398	98	773	3,277	696
Pertussis	93	39	35	372	346	331
Rubella (German measles)	3	8	14	28	44	84
Syphilis (Primary & Secondary): Civilian	775	629	535	6,817	6,545	5,477
Military	14	3	3	47	46	46
Toxic Shock syndrome	4	3	7	48	52	78
Tuberculosis	371	460	460	3,144	3,483	3,483
Tularemia	1	2	2	19	15	15
Typhoid Fever	7	6	6	61	38	45
Typhus fever, tick-borne (RMSF)	1	1	1	14	8	10
Rabies, animal	63	94	94	549	730	757

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1988		Cum. 1988
Anthrax	-	Leptospirosis (Hawaii 2)	6
Botulism: Foodborne	4	Plague	-
Infant (Hawaii 1)	6	Poliomyelitis, Paralytic	-
Other	2	Psittacosis (Upstate NY 1, Minn. 1)	17
Brucellosis	7	Rabies, human	-
Cholera	-	Tetanus	4
Congenital rubella syndrome	-	Trichinosis	4
Congenital syphilis, ages < 1 year			-
Diphtheria	-		

*Two of the 26 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.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending March 12, 1988 and March 7, 1987 (10th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988
UNITED STATES	5,608	726	118	10	131,524	162,586	4,587	3,521	404	418	111	24
NEW ENGLAND	278	36	6	-	3,965	5,792	176	276	53	31	3	3
Maine	10	2	1	-	96	192	10	12	1	1	1	-
N.H.	4	7	-	-	69	80	11	6	3	1	-	-
Vt.	3	1	2	-	36	38	3	8	3	-	-	-
Mass.	161	16	3	-	1,334	2,154	109	185	39	24	2	3
R.I.	13	8	-	-	335	436	22	25	5	-	-	-
Conn.	87	2	-	-	2,095	2,892	21	40	2	5	-	-
MID. ATLANTIC	1,715	89	13	-	18,128	26,467	247	383	22	32	19	1
Upstate N.Y.	251	43	10	-	2,105	3,082	158	100	11	2	17	-
N.Y. City	833	15	2	-	7,400	14,805	29	170	1	22	-	1
N.J.	490	31	1	-	3,108	3,108	60	113	10	8	-	-
Pa.	141	-	-	-	5,515	5,472	-	-	-	-	2	-
E.N. CENTRAL	466	100	16	-	21,705	22,405	449	365	20	27	37	-
Ohio	111	43	9	-	5,122	4,690	301	120	7	2	13	-
Ind.	39	13	2	-	1,978	1,859	20	37	1	9	3	-
Ill.	206	-	-	-	6,256	6,725	15	22	-	1	-	-
Mich.	89	39	3	-	7,019	7,125	100	164	10	15	17	-
Wis.	21	5	2	-	1,330	2,006	13	22	2	-	4	-
W.N. CENTRAL	117	40	10	2	5,134	6,574	292	181	17	4	11	-
Minn.	28	12	1	-	685	1,054	11	23	1	1	-	-
Iowa	7	9	5	-	372	669	17	20	4	-	4	-
Mo.	40	5	-	-	2,910	3,369	122	92	6	1	1	-
N. Dak.	-	-	-	-	29	80	1	2	1	-	-	-
S. Dak.	3	5	-	1	110	134	-	1	1	-	3	-
Nebr.	13	1	1	1	316	364	26	17	1	-	2	-
Kans.	26	8	3	-	712	904	115	26	3	2	1	-
S. ATLANTIC	851	161	12	3	36,489	41,909	263	716	47	65	18	-
Del.	14	4	1	-	540	591	1	19	1	1	2	-
Md.	95	15	1	-	3,685	4,063	36	117	3	2	3	-
D.C.	81	5	-	-	2,348	2,594	3	4	2	1	-	-
Va.	105	14	6	1	2,643	3,366	56	38	13	43	1	-
W. Va.	3	4	1	-	298	336	1	11	1	3	-	-
N.C.	65	33	2	-	5,944	5,990	34	121	9	5	8	-
S.C.	28	3	-	-	2,803	3,887	8	124	2	1	2	-
Ga.	118	17	1	-	6,908	7,193	34	118	1	1	1	-
Fla.	342	66	-	2	11,320	13,889	90	164	15	8	1	-
E.S. CENTRAL	156	47	10	2	10,087	11,727	99	189	27	4	6	1
Ky.	24	22	3	1	873	1,200	82	27	9	2	3	-
Tenn.	72	5	3	-	3,133	4,048	11	85	12	-	1	-
Ala.	44	17	4	1	3,592	3,781	3	73	6	2	2	1
Miss.	16	3	-	-	2,489	2,698	3	4	-	-	-	-
W.S. CENTRAL	573	52	4	-	15,613	17,379	427	208	25	89	2	-
Ark.	22	2	1	-	1,328	1,806	43	13	-	2	-	-
La.	79	7	-	-	3,759	3,692	18	48	3	3	1	-
Okla.	20	6	1	-	1,310	1,904	150	37	4	9	1	-
Tex.	452	37	2	-	9,216	9,977	216	110	18	75	-	-
MOUNTAIN	194	29	12	1	2,790	4,226	660	307	39	47	8	-
Mont.	4	1	-	-	76	102	14	12	2	2	-	-
Idaho	2	-	-	-	72	147	28	18	1	-	-	-
Wyo.	1	-	-	-	41	66	1	1	3	-	1	-
Colo.	63	9	2	-	721	879	30	43	3	18	4	-
N. Mex.	11	-	-	-	282	446	126	36	3	1	-	-
Ariz.	72	9	5	-	890	1,482	349	137	15	17	1	-
Utah	14	6	3	1	131	177	78	22	9	8	2	-
Nev.	27	4	2	-	577	927	34	38	3	1	-	-
PACIFIC	1,258	172	35	2	17,613	26,107	1,974	896	154	119	7	19
Wash.	71	-	1	1	1,136	1,731	319	79	16	10	4	-
Oreg.	44	-	-	-	600	883	422	140	20	4	-	-
Calif.	1,107	146	33	1	15,446	22,825	1,159	655	115	103	1	19
Alaska	7	6	-	-	241	430	74	14	2	2	-	-
Hawaii	29	20	1	-	190	238	-	8	1	-	2	-
Guam	-	-	-	-	30	47	1	2	-	2	-	2
P.R.	100	7	1	-	321	460	4	53	7	9	-	-
V.I.	1	-	-	-	70	44	-	2	-	-	-	-
Amer. Samoa	-	-	-	-	-	85	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	9	24	-	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 12, 1988 and March 7, 1987 (10th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1988	1988	Cum. 1988	1988	Cum. 1988	Cum. 1987	Cum. 1988	1988	Cum. 1988	1988	Cum. 1988	Cum. 1987	1988	Cum. 1988	Cum. 1987
UNITED STATES	117	24	321	2	19	446	668	153	773	93	372	346	3	28	44
NEW ENGLAND	14	-	1	-	-	6	61	-	3	-	49	7	-	-	-
Maine	2	-	-	-	-	-	1	-	-	-	10	-	-	-	-
N.H.	-	-	-	-	-	-	7	-	2	-	16	1	-	-	-
Vt.	-	-	-	-	-	6	3	-	-	-	-	2	-	-	-
Mass.	9	-	1	-	-	-	26	-	1	-	16	3	-	-	-
R.I.	2	-	-	-	-	-	10	-	-	-	-	-	-	-	-
Conn.	1	-	-	-	-	-	14	-	-	-	7	1	-	-	-
MID. ATLANTIC	13	11	78	-	-	76	52	3	40	2	13	36	-	1	-
Upstate N.Y.	8	-	-	-	-	12	30	2	15	1	6	24	-	-	-
N.Y. City	3	-	4	-	-	48	6	-	-	-	-	-	-	-	-
N.J.	2	-	-	-	-	1	16	-	11	-	1	1	-	1	-
Pa.	-	11	74	-	-	15	-	1	14	1	6	11	-	-	-
E.N. CENTRAL	4	-	10	-	-	40	68	10	183	12	33	56	1	4	7
Ohio	-	-	-	-	-	4	28	3	36	5	8	19	-	-	-
Ind.	-	-	-	-	-	-	6	-	14	7	15	-	-	-	-
Ill.	-	-	1	-	-	13	2	2	12	-	-	3	-	-	6
Mich.	4	-	9	-	-	23	23	5	85	-	7	13	1	4	1
Wis.	-	-	-	-	-	-	9	-	36	-	3	21	-	-	-
W.N. CENTRAL	3	-	-	-	-	2	33	4	51	6	29	23	-	-	-
Minn.	1	-	-	-	-	-	7	-	-	-	3	3	-	-	-
Iowa	-	-	-	-	-	-	-	-	20	4	13	2	-	-	-
Mo.	1	-	-	-	-	2	12	-	10	1	3	10	-	-	-
N. Dak.	-	-	-	-	-	-	-	-	-	-	6	1	-	-	-
S. Dak.	-	-	-	-	-	-	1	-	-	-	2	1	-	-	-
Nebr.	-	-	-	-	-	-	5	-	2	-	-	-	-	-	-
Kans.	1	-	-	-	-	-	8	4	19	1	2	6	-	-	-
S. ATLANTIC	15	2	48	-	4	3	124	4	46	-	34	81	-	-	5
Del.	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Md.	2	-	-	-	2	-	14	-	2	-	6	-	-	-	1
D.C.	4	-	-	-	-	-	4	4	17	-	-	-	-	-	-
Va.	3	-	-	-	-	-	16	-	4	-	2	27	-	-	-
W. Va.	-	-	-	-	-	-	-	-	2	-	-	11	-	-	-
N.C.	1	-	-	-	1	-	21	-	7	-	16	37	-	-	-
S.C.	3	-	-	-	-	-	13	-	3	-	-	-	-	-	-
Ga.	-	-	-	-	-	-	15	-	4	-	7	5	-	-	-
Fla.	2	2	48	-	1	3	41	-	7	-	1	1	-	-	4
E.S. CENTRAL	2	-	-	-	-	-	52	81	166	-	7	6	-	-	2
Ky.	-	-	-	-	-	-	6	25	35	-	-	1	-	-	2
Tenn.	-	-	-	-	-	-	31	54	127	-	6	-	-	-	-
Ala.	2	-	-	-	-	-	14	2	3	-	-	3	-	-	-
Miss.	-	-	-	-	-	-	1	N	N	-	1	2	-	-	-
W.S. CENTRAL	11	1	8	-	-	6	40	35	115	7	11	23	-	1	-
Ark.	-	-	-	-	-	-	6	-	1	-	2	2	-	1	-
La.	1	-	-	-	-	-	8	12	50	-	2	2	-	-	-
Okla.	4	1	8	-	-	1	2	10	19	7	7	19	-	-	-
Tex.	6	-	-	-	-	5	24	13	45	-	-	-	-	-	-
MOUNTAIN	6	5	113	-	-	81	28	7	46	58	126	31	1	2	1
Mont.	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Idaho	-	-	-	-	-	-	2	-	-	58	114	16	-	-	-
Wyo.	-	-	-	-	-	-	-	1	2	-	1	2	-	-	-
Colo.	3	5	113	-	-	-	8	1	12	-	2	11	1	1	-
N. Mex.	-	-	-	-	-	79	7	N	N	-	-	1	-	-	-
Ariz.	1	-	-	-	-	1	4	5	28	-	1	-	-	-	-
Utah	1	-	-	-	-	-	6	-	1	-	7	1	-	-	1
Nev.	1	-	-	-	-	-	1	-	3	-	1	-	-	1	-
PACIFIC	49	5	63	2	15	232	210	9	123	8	70	83	1	20	29
Wash.	2	-	-	-	-	-	11	1	6	1	11	14	-	-	-
Oreg.	4	-	-	-	-	21	11	N	N	-	2	9	-	-	1
Calif.	42	5	63	2†	14	210	178	8	114	5	37	40	1	18	26
Alaska	1	-	-	-	-	-	1	-	3	1	2	3	-	-	-
Hawaii	-	-	-	-	1	1	9	-	-	1	18	17	-	2	2
Guam	-	-	-	-	1	1	-	-	1	-	-	-	-	1	-
P.R.	2	-	23	-	-	137	4	-	2	1	1	8	-	-	1
V.I.	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*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 12, 1988 and March 7, 1987 (10th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988
UNITED STATES	6,817	6,545	48	3,144	3,483	19	61	14	549
NEW ENGLAND	206	93	4	55	83	-	6	-	3
Maine	2	-	1	2	10	-	-	-	1
N.H.	2	1	2	-	5	-	-	-	2
Vt.	-	1	-	-	1	-	-	-	-
Mass.	76	51	1	31	21	-	4	-	-
R.I.	7	-	-	7	7	-	-	-	-
Conn.	119	40	-	15	39	-	2	-	-
MID. ATLANTIC	1,241	987	9	609	624	-	8	1	71
Upstate N.Y.	64	32	4	120	120	-	1	-	-
N.Y. City	826	675	2	241	284	-	1	1	-
N.J.	145	112	2	113	108	-	6	-	-
Pa.	206	168	1	135	112	-	-	-	71
E.N. CENTRAL	215	190	4	406	428	1	7	1	9
Ohio	18	16	3	79	89	-	1	-	-
Ind.	17	14	-	32	32	-	1	-	-
Ill.	110	121	-	163	166	-	4	-	2
Mich.	66	24	1	110	129	1	1	1	2
Wis.	4	15	-	22	12	-	-	-	5
W.N. CENTRAL	33	31	10	82	99	9	1	-	81
Minn.	3	4	-	16	21	-	1	-	35
Iowa	3	5	2	6	8	-	-	-	13
Mo.	17	17	4	35	55	7	-	-	3
N. Dak.	1	-	-	1	1	-	-	-	9
S. Dak.	1	2	-	11	3	-	-	-	16
Nebr.	4	2	2	4	3	1	-	-	1
Kans.	4	1	2	9	8	1	-	-	4
S. ATLANTIC	2,420	2,173	5	693	684	2	11	9	184
Del.	34	19	-	3	11	1	-	-	-
Md.	116	121	1	57	57	-	-	-	62
D.C.	108	65	-	34	23	-	-	-	-
Va.	76	47	-	87	70	-	5	-	59
W. Va.	1	1	-	17	25	-	-	-	11
N.C.	164	130	3	40	75	-	1	9	-
S.C.	112	129	-	79	69	-	-	-	10
Ga.	376	335	-	100	69	1	2	-	35
Fla.	1,433	1,326	1	276	285	-	3	-	7
E.S. CENTRAL	406	420	6	249	359	4	-	2	37
Ky.	12	3	2	84	85	3	-	-	24
Tenn.	162	205	3	48	108	-	-	1	-
Ala.	131	98	1	86	113	-	-	1	13
Miss.	101	114	-	31	53	1	-	-	-
W.S. CENTRAL	738	882	3	341	347	1	1	-	70
Ark.	22	37	-	33	26	-	-	-	16
La.	127	143	-	50	63	-	1	-	-
Okla.	34	27	2	39	41	1	-	-	5
Tex.	555	675	1	219	217	-	-	-	49
MOUNTAIN	129	128	4	48	101	2	3	1	46
Mont.	2	7	-	-	6	-	1	-	35
Idaho	-	1	1	-	10	-	-	1	-
Wyo.	-	-	-	-	-	-	-	-	4
Colo.	24	22	1	5	16	2	2	-	-
N. Mex.	13	11	-	14	18	-	-	-	3
Ariz.	28	65	1	18	43	-	-	-	4
Utah	6	2	1	-	1	-	-	-	-
Nev.	56	20	-	11	7	-	-	-	-
PACIFIC	1,429	1,641	3	661	758	-	24	-	48
Wash.	29	27	-	35	29	-	2	-	-
Oreg.	51	35	-	25	19	-	3	-	-
Calif.	1,342	1,576	3	560	653	-	17	-	46
Alaska	1	2	-	8	16	-	-	-	2
Hawaii	6	1	-	33	41	-	2	-	-
Guam	-	1	-	-	2	-	-	-	-
P.R.	106	207	-	33	46	-	2	-	16
V.I.	1	2	-	1	1	-	-	-	-
Amer. Samoa	-	53	-	-	21	-	-	-	-
C.N.M.I.	-	2	-	-	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending March 12, 1988 (10th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	754	540	127	54	15	18	69
Boston, Mass.	197	127	39	21	5	5	26
Bridgeport, Conn.	60	46	9	3	1	1	3
Cambridge, Mass.	27	21	1	1	2	2	9
Fall River, Mass.	38	32	5	1	-	-	1
Hartford, Conn.	59	35	17	5	-	2	1
Lowell, Mass.	34	26	6	1	-	1	3
Lynn, Mass.	19	17	2	-	-	-	2
New Bedford, Mass.	36	29	5	2	-	-	2
New Haven, Conn.	46	35	5	2	3	1	3
Providence, R.I.	69	52	12	3	2	-	6
Somerville, Mass.	6	5	-	1	-	-	-
Springfield, Mass.	50	35	9	4	-	2	3
Waterbury, Conn.	38	32	4	1	-	1	4
Worcester, Mass.	75	48	13	9	2	3	6
MID. ATLANTIC	2,979	2,008	573	284	53	60	178
Albany, N.Y.	55	41	10	1	1	2	3
Allentown, Pa.	15	14	1	-	-	-	-
Buffalo, N.Y.	121	83	25	8	1	3	13
Camden, N.J.	47	28	15	3	-	1	-
Elizabeth, N.J.	26	20	5	-	1	-	4
Erie, Pa.†	49	39	5	3	1	1	5
Jersey City, N.J.	58	41	7	10	-	-	3
N.Y. City, N.Y.	1,650	1,078	301	211	31	29	77
Newark, N.J.	47	12	17	7	2	9	3
Paterson, N.J.	36	26	5	3	2	-	1
Philadelphia, Pa.	391	260	102	20	5	4	29
Pittsburgh, Pa.†	48	35	9	1	-	3	2
Reading, Pa.	30	21	6	1	1	1	2
Rochester, N.Y.	143	103	26	6	5	3	17
Schenectady, N.Y.	37	29	6	1	1	-	2
Scranton, Pa.†	29	21	5	2	1	-	3
Syracuse, N.Y.	92	71	16	3	1	1	9
Trenton, N.J.	33	23	6	2	-	2	1
Utica, N.Y.	36	34	2	-	-	-	3
Yonkers, N.Y.	36	29	4	2	-	1	1
E.N. CENTRAL	2,530	1,717	517	156	63	77	113
Akron, Ohio	76	54	19	1	-	2	-
Canton, Ohio	44	34	8	-	2	-	4
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	148	105	32	7	3	1	22
Cleveland, Ohio	179	127	33	7	6	6	2
Columbus, Ohio	177	123	36	9	3	6	2
Dayton, Ohio	153	105	30	10	6	2	3
Detroit, Mich.	312	185	73	34	4	16	10
Evansville, Ind.	58	46	10	1	1	-	4
Fort Wayne, Ind.	59	35	13	6	1	4	4
Gary, Ind.	16	13	1	1	1	-	1
Grand Rapids, Mich.	52	37	9	4	2	-	4
Indianapolis, Ind.	192	127	37	10	11	7	2
Madison, Wis.	32	20	8	3	1	-	1
Milwaukee, Wis.	124	94	20	3	4	3	13
Peoria, Ill.	47	34	11	1	1	-	6
Rockford, Ill.	41	31	5	4	-	1	6
South Bend, Ind.	82	61	14	1	1	5	6
Toledo, Ohio	120	81	26	8	4	1	4
Youngstown, Ohio	54	43	7	1	2	1	3
W.N. CENTRAL	918	643	175	55	21	24	55
Des Moines, Iowa	95	69	17	7	-	2	11
Duluth, Minn.	27	23	2	1	-	1	-
Kansas City, Kans.	36	25	3	5	2	1	1
Kansas City, Mo.	118	75	30	9	4	-	5
Lincoln, Nebr.	37	30	2	5	-	-	4
Minneapolis, Minn.	192	139	41	6	1	5	6
Omaha, Nebr.	95	69	15	4	3	4	7
St. Louis, Mo.	155	93	34	15	7	6	6
St. Paul, Minn.	77	57	13	2	2	3	2
Wichita, Kans.	86	63	18	1	2	2	13
S. ATLANTIC	1,519	937	313	167	49	48	84
Atlanta, Ga.	184	110	44	21	5	4	9
Baltimore, Md.	198	127	46	16	4	5	11
Charlotte, N.C.	97	60	21	10	3	2	8
Jacksonville, Fla.	159	101	33	14	8	2	11
Miami, Fla.	155	72	38	29	11	5	-
Norfolk, Va.	82	53	13	7	5	4	9
Richmond, Va.	91	64	18	4	2	3	5
Savannah, Ga.	73	50	10	7	4	2	8
St. Petersburg, Fla.	106	81	19	4	-	2	4
Tampa, Fla.	75	52	12	7	1	3	9
Washington, D.C.	263	139	55	44	6	16	9
Wilmington, Del.	36	28	4	4	-	-	1
E.S. CENTRAL	967	652	206	67	19	19	68
Birmingham, Ala.	178	113	45	9	6	5	7
Chattanooga, Tenn.	72	55	10	4	2	1	9
Knoxville, Tenn.	111	85	13	9	-	4	13
Louisville, Ky.	116	81	24	8	1	2	9
Memphis, Tenn.	165	104	37	18	5	1	10
Mobile, Ala.	98	64	29	4	1	-	9
Montgomery, Ala.	52	38	11	1	1	1	2
Nashville, Tenn.	175	112	37	14	3	5	9
W.S. CENTRAL	1,437	956	275	123	50	32	94
Austin, Tex.	87	67	8	6	3	3	9
Baton Rouge, La.	28	21	3	3	1	-	2
Corpus Christi, Tex.	46	34	11	1	-	-	1
Dallas, Tex.	218	131	43	28	11	5	10
El Paso, Tex.	62	40	15	2	2	3	3
Fort Worth, Tex	104	75	17	7	5	-	4
Houston, Tex.§	308	176	74	34	13	11	7
Little Rock, Ark.	107	80	14	9	2	1	15
New Orleans, La.	115	82	22	8	2	1	-
San Antonio, Tex.	174	115	36	11	8	4	24
Shreveport, La.	72	58	9	3	-	2	9
Tulsa, Okla.	116	77	23	11	3	2	10
MOUNTAIN	687	452	142	53	16	24	57
Albuquerque, N. Mex.	101	63	21	10	5	2	9
Colo. Springs, Colo.	42	28	10	3	1	-	10
Denver, Colo.	123	76	29	9	2	7	12
Las Vegas, Nev.	100	60	26	9	3	2	9
Ogden, Utah	21	18	3	-	-	-	5
Phoenix, Ariz.	106	72	19	10	1	4	4
Pueblo, Colo.	34	23	8	3	-	-	1
Salt Lake City, Utah	44	24	8	4	2	6	3
Tucson, Ariz.	116	88	18	5	2	3	4
PACIFIC	2,429	1,681	419	188	69	62	211
Berkeley, Calif.	24	16	5	1	1	1	3
Fresno, Calif.	90	65	9	7	5	4	11
Glendale, Calif.	41	31	7	2	-	1	1
Honolulu, Hawaii	70	43	19	5	1	2	9
Long Beach, Calif.	211	142	40	13	5	11	37
Los Angeles Calif.	730	520	105	68	21	6	45
Oakland, Calif.	70	52	8	5	4	1	11
Pasadena, Calif.	48	29	9	4	1	5	2
Portland, Oreg.	137	105	19	7	4	2	15
Sacramento, Calif.	181	118	36	11	8	8	14
San Diego, Calif.	183	133	28	13	3	6	23
San Francisco, Calif.	181	109	38	27	4	3	9
San Jose, Calif.	186	127	38	11	7	3	19
Seattle, Wash.	160	109	32	10	4	5	2
Spokane, Wash.	70	46	16	4	1	3	7
Tacoma, Wash.	47	36	10	-	-	1	3
TOTAL	14,220	9,586††	2,747	1,147	355	364	929

*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 4 weeks.

TABLE V. Estimated years of potential life lost (YPLL) before age 65* and cause-specific mortality, by cause of death — United States, 1986

Cause of mortality (ICD, 9th Revision)	YPLL for Persons Dying in 1986*	Cause-Specific Mortality, 1986† (Rate/100,000)
All Causes (Total)	12,054,242	870.8
Unintentional Injuries§ (E800-E949)	2,371,024	39.7
Malignant Neoplasms (140-208)	1,821,682	193.3
Diseases of the Heart (390-398,402,404-429)	1,534,607	318.7
Suicide/Homicide (E950-E978)	1,342,693	22.0
Congenital Anomalies (740-759)	651,523	5.1
Prematurity¶ (765-769)	438,351	2.8
Sudden Infant Death Syndrome (798)	313,555	2.0
Acquired Immunodeficiency Syndrome**	246,823	3.6
Cerebrovascular Disease (430-438)	232,583	61.3
Chronic Liver Diseases and Cirrhosis (571)	225,028	10.9
Pneumonia and Influenza (480-487)	166,389	29.2
Chronic Obstructive Pulmonary Diseases (490-496)	127,889	31.3
Diabetes Mellitus (250)	126,652	15.1

*For details of calculation, see footnotes to Table V, *MMWR* 1988;37:45.
†Cause-specific mortality rates as reported in the National Center for Health Statistics' *Monthly Vital Statistics Report* are compiled from a 10% sample of all deaths.
§Equivalent to accidents and adverse effects.
¶Category derived from disorders relating to short gestation and respiratory distress syndrome.
**Reflects CDC surveillance data.

Hearing Loss — Continued

probability sample of the civilian, noninstitutionalized U.S. population. Members of some 42,000 households, comprising approximately 120,000 persons, are interviewed each year to obtain information about health status. Thus, NHIS serves as a database for national estimates of prevalence of various health conditions in the U.S. population. The survey is also useful for following health trends in this population. For this study, the prevalence of self-reported hearing loss was obtained for all persons over 17 years of age who were in the labor force at the time of interview. The Gallaudet Scale, a well-validated, self-rating hearing scale consisting of seven questions, was used to evaluate the degree of hearing impairment (*6*). Unilateral hearing loss, which was involved in about half of the cases, was excluded.

Data from the 1972-1974 National Occupational Hazard Survey (NOHS) were used to classify worksites by noise level (*7*). NOHS was conducted by NIOSH from 1972 to 1974 on a probability sample of approximately 5,000 workplaces across the United States (*7*). The survey provides information on potential exposures of workers to chemical and physical agents. These data identified industries and occupations in which employees are exposed to continuous noise.*

Some degree of hearing loss was reported by 3.2% of all NHIS respondents. Self-reported hearing loss was higher among adults working in industries with potential exposure to industrial noise than among those working in industries without such potential exposures. NHIS data were then analyzed with the data collected independently during NOHS. Stratifying NHIS data on self-reported hearing loss by the noise levels reported in NOHS shows that self-reported hearing loss increases with age, and that, within age groups, it is consistently greater for noisy industries.

The percentage and number of workers exposed to noise and the percentage of self-reported hearing loss in 31 broad industrial categories were estimated from the NOHS and the NHIS (Table 1). Industries in the manufacturing sector had the highest prevalence of noise exposure (overall exposure rate, 37%).

Results of the NHIS on self-reported hearing loss among workers 17 years of age or older were divided into three groups: 1) persons with light exposure, or those working in industries where <10% of the employees were estimated by NOHS to be exposed to noise at ≥85 dBA; 2) persons with moderate exposure, or those employed in industries where 10%–24% of the workers receive such exposure; and 3) persons with heavy exposure, or those employed in industries where ≥25% of the workers receive such exposure. These data were further stratified into three age groups: 17-44 years, 45-54 years, and ≥55 years. A comparison of these groups showed that the prevalence of self-reported hearing loss among white males† increased with both age and increasing exposure to industrial noise (Figure 1).

Reported by: Surveillance Br, Div of Surveillance, Hazard Evaluations and Field Studies, National Institute for Occupational Safety and Health; Div of Health Interview Statistics, National Center for Health Statistics, CDC.

Editorial Note: Current findings indicate that occupational exposure to noise is a widespread problem that has a substantial impact on the prevalence of hearing loss

*Occupational exposure to noise was assessed by an industrial hygienist who determined the effect of noise on employees in the workplaces surveyed by NOHS. Workers were considered to be exposed if the noise level was measured or estimated to be ≥85 dBA, irrespective of the number of hours of daily exposure.

†Results for other races are not shown because there were too few nonwhite males in the NHIS samples to provide reliable estimates after stratification of the data. No effect was seen for women, possibly because of the small number of women employed in industries with high noise levels.

Hearing Loss — Continued

among the working population. Exposure to intense noise causes hearing loss that may be temporary or permanent. Temporary hearing loss, also called auditory fatigue, may occur after only a few minutes of exposure to intense noise and is reversible after a period of time away from the noise. However, when exposure to excessive noise occurs over a period of months or years, only partial recovery of hearing may be possible.

TABLE 1. Estimated percentage of workers exposed to noise and prevalence of self-reported hearing loss, by industry — United States, 1970s

Industry	Estimated Percentage Exposure*	Estimated Number Employed (Thousands)†	Estimated Number Exposed (Thousands)§	Estimated Percentage Self-Reported Hearing Loss†
Manufacturing				
Food	32.7	1,765	577.2	3.5
Textiles	38.0	965	366.7	3.7
Apparel	19.3	1,448	279.5	1.8
Lumber and wood	54.2	688	372.9	7.4
Furniture	36.1	545	196.7	3.1
Printing	16.6	1,427	236.9	4.1
Chemicals	13.5	1,147	154.8	2.7
Stone, clay, glass	28.3	681	192.7	3.6
Primary metal	46.4	1,240	575.4	4.8
Fabricated metal	43.0	1,448	622.6	3.9
Machinery, excluding elec.	23.8	2,304	548.4	4.3
Electrical machinery	13.5	2,029	273.9	3.0
Transport equipment	37.1	2,545	944.2	4.3
Other	30.7	3,427	1,052.1	3.1
Trade				
Wholesale	8.9	3,147	280.1	3.2
Retail—food	1.9	3,453	65.6	2.0
Retail—other	4.2	10,789	453.1	2.4
Services				
Personal	2.6	1,526	39.7	2.9
Miscellaneous business	2.6	2,027	52.7	2.6
Repair	24.1	1,294	311.9	4.6
Amusement and recreation	5.2	965	50.2	1.5
Health	1.2	5,635	67.6	1.8
Education	1.2	7,144	85.7	2.5
Other	1.9	4,318	82.0	2.7
Other industries				
Forestry, fishing	9.5	132	12.5	3.3
Mining	38.0	728	276.6	4.7
Construction	29.1	5,636	1,640.1	4.9
Transport, excluding rail	12.9	2,628	339.0	2.9
Communications	2.2	1,282	28.2	1.7
Utilities	16.2	1,213	196.5	4.4
Finance, insurance	1.3	4,714	61.3	2.5
Total	**13.3**	**78,290**	**10,436.8**	**3.2**

*Estimated using data from the National Occupational Hazard Survey, 1972-1974.
†Estimated using data from the National Health Interview Survey, 1971 and 1977.
§Derived by multiplying column 1 by column 2.

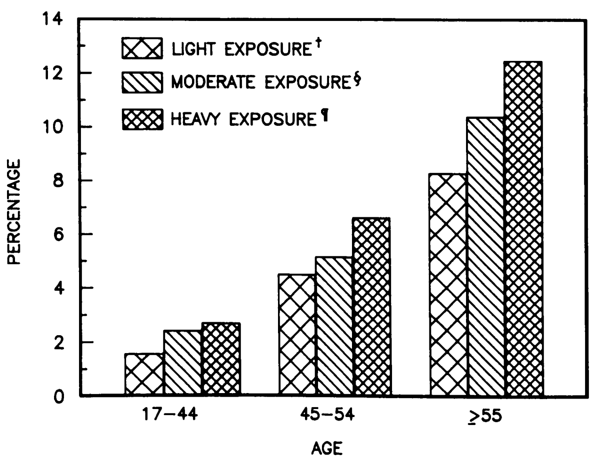
Hearing Loss — Continued

NIOSH has identified noise-induced hearing loss as one of ten leading work-related diseases and injuries (*8*). A national strategy for the prevention of such hearing loss will be included in a NIOSH publication entitled *Proposed National Strategies for the Prevention of Leading Work-Related Diseases and Injuries, Part II,* which is to be published soon. The three main recommendations for preventing hearing loss among workers are 1) developing technology that will substitute quiet processes for noisy ones; 2) controlling the noise of existing processes; and 3) developing hearing conservation programs, including proper use of personal protective equipment.

The existing Occupational Safety and Health Administration standard for occupational exposure to noise specifies a maximum permissible exposure level of 90 dBA for 8 hours, with higher levels allowed for shorter durations (*9*). After a review of epidemiologic and laboratory data, NIOSH has proposed a limit of 85 dBA (*10*). Recommended or required levels vary depending on the number of hours of exposure during the work day (Table 2).

The study presented here demonstrates the practical value of linking information from an exposure surveillance survey (NOHS) with information from a survey that measures health status on a national level (NHIS). By identifying associations between potential environmental and occupational exposures and self-reported adverse health outcomes, it is possible to develop a better focus for research studies. When conducting large studies or assessing the impact of prevention strategies at the national level, such self-reported measures of adverse health outcomes may be more practical than actual testing.

FIGURE 1. Prevalence of self-reported hearing loss among white males with workplace exposure to ≥85 decibels (dBA) of noise, by age group and exposure levels — United States, 1971-1977*



*National Institute for Occupational Safety and Health (NIOSH) analysis of data from the National Health Interview Survey conducted by the National Center for Health Statistics. Worksites were classified by noise level using data from the 1972-1974 National Occupational Hazard Survey conducted by NIOSH.
†Workers employed in industries with <10% of employees exposed to noise at ≥85 dBA.
§Workers employed in industries with 10%–24% of employees exposed to noise at ≥85 dBA.
¶Workers employed in industries with ≥25% of employees exposed to noise at ≥85 dBA.

Hearing Loss — Continued

A comparison of the current results with future studies that use data from similar surveys will permit an evaluation of overall progress toward the prevention of work-related hearing loss. As intervention strategies are applied successfully, there should be no differential hearing loss between workers in industries with low, medium, or high noise levels. Improvement should be evident first in the younger age groups and later among older employees.

TABLE 2. National Institute for Occupational Safety and Health (NIOSH) recommendations and Occupational Safety and Health Administration (OSHA) standards for permissible noise levels at various durations of exposure

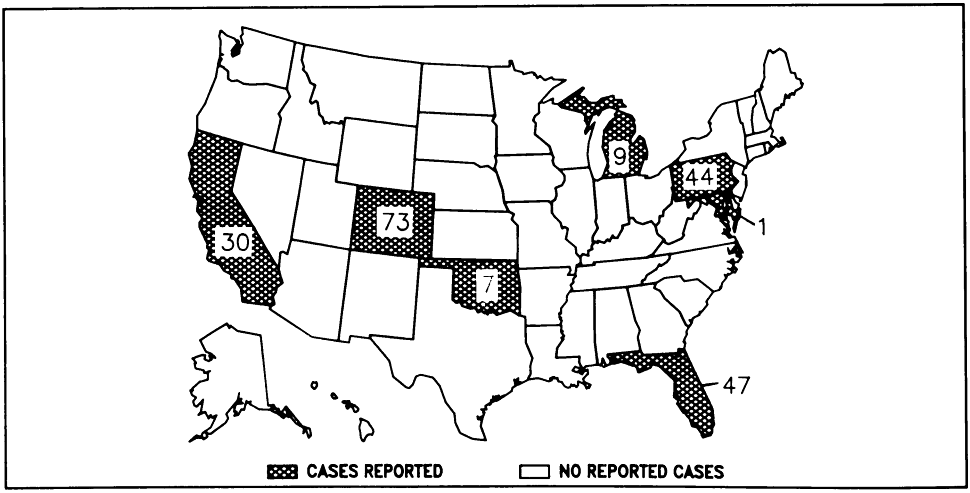
Duration of Exposure (hours per day)	Noise Level (dBA)	
	NIOSH	OSHA*
16	80	—
8	85	90
4	90	95
2	95	100
1	100	105
1/2	105	110
1/4	110	115[†]
1/8	115[†]	—

*OSHA does not allow any exposure to impact or impulse noise above a 140 dBA peak sound-pressure level.
[†]No exposure to continuous noise above 115 dBA.

References

1. Ramazzini B. Diseases of workers (De morbis artificum, 1713). Trans. Wilmer Cave Wright. New York: Hafner Publishing, 1964:231,437.
2. Simpson M, Bruce R. Noise in America: the extent of the noise problem. Washington, DC: Bolt, Beranek, and Newman, 1981; BBN report no. 3318R.
3. Ginnold RE. Occupational hearing loss. Workers' compensation under state and federal programs. Washington, DC: Environmental Protection Agency, 1979; EPA report no. 550/9-79-101.
4. Wilder CS. Prevalence of selected impairments, United States—1971. Rockville, Maryland: National Center for Health Statistics, 1975; DHEW publication no. (HRA)75-1526. (Vital and health statistics: data from the National Health Survey; series 10; no. 99).
5. Feller BA. Prevalence of selected impairments, United States—1977. Hyattsville, Maryland: National Center for Health Statistics, 1981; DHEW publication no. (HRA)81-1562. (Vital and health statistics: data from the National Health Survey; series 10; no. 134).
6. Ries PW. Hearing ability of persons by sociodemographic and health characteristics: United States. Hyattsville, Maryland: National Center for Health Statistics, 1982; DHHS publication no. (PHS)82-1568. (Vital and health statistics: data from the National Health Survey; series 10; no. 140).
7. National Institute for Occupational Safety and Health. National Occupational Hazard Survey. 3 volumes. Rockville, Maryland: National Institute for Occupational Safety and Health, 1974, 1977, 1978; DHEW publication nos. (NIOSH)74-127, 77-213, 78-114.
8. Centers for Disease Control. Leading work-related diseases and injuries—United States. MMWR 1983;32:24-6,32.
9. Office of the Federal Register. Code of federal regulations: labor. Washington, DC: Office of the Federal Register, National Archives and Records Administration, 1986. (29 CFR 1910.95).
10. National Institute for Occupational Safety and Health. Criteria for a recommended standard . . . occupational exposure to noise. Rockville, Maryland: National Institute for Occupational Safety and Health, 1972; DHEW publication no. (HSM)73-11001.

FIGURE I. Reported measles cases – United States, Weeks 6-9, 1988



The *Morbidity and Mortality Weekly Report* is prepared by the Centers for Disease Control, Atlanta, Georgia, and available on a paid subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, (202) 783-3238.

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.

☆U.S. Government Printing Office: 1988-530-111/60065 Region IV

DEPARTMENT OF
HEALTH & HUMAN SERVICES
Public Health Service
Centers for Disease Control
Atlanta, GA 30333

FIRST-CLASS MAIL
POSTAGE & FEES PAID
PHS/CDC
Permit No. G-284

Official Business
Penalty for Private Use $300

X

Z4 *HCRU9FISD22 8721
DANIEL B FISHBEIN, MD
CID, VRL
7-B44 G13