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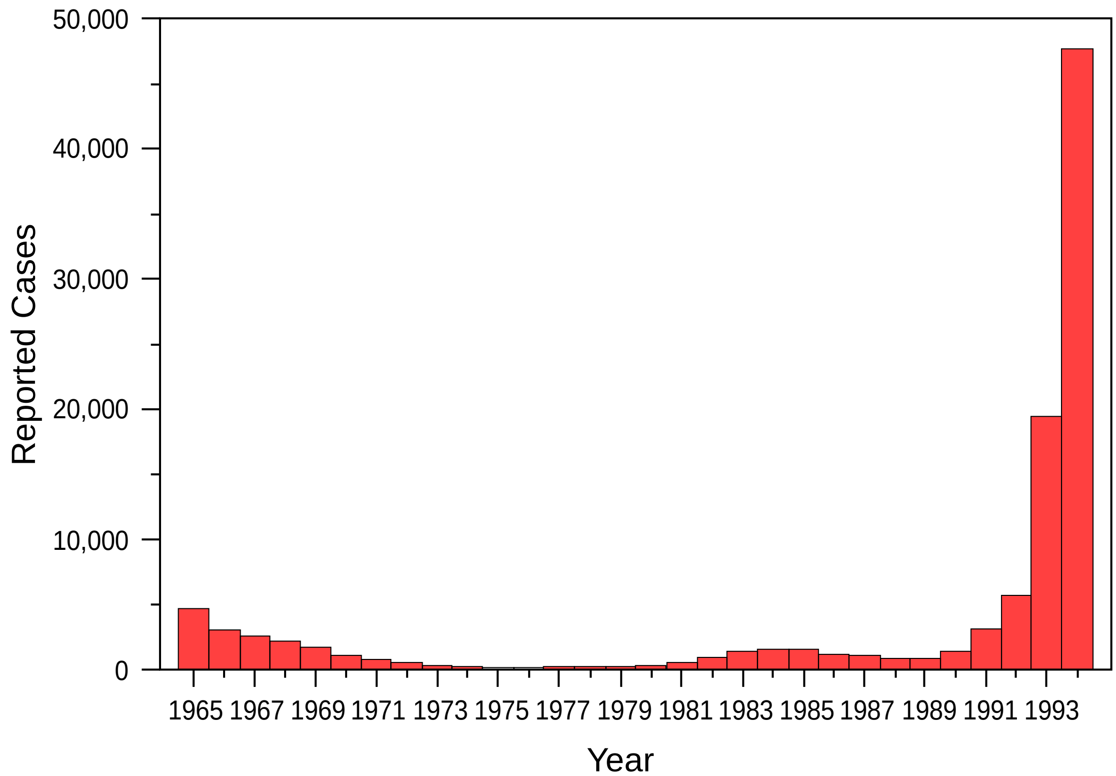
Diphtheria Epidemic — New Independent States of the Former Soviet Union, 1990–1994

Although diphtheria was controlled for approximately 30 years after the institution of childhood vaccination with diphtheria toxoid in the late 1950s, epidemic diphtheria has reemerged in the New Independent States (NIS) of the former Soviet Union (*1,2*) (Figures 1 and 2). The epidemic began in 1990 in the Russian Federation and spread to

FIGURE 1. Reported number of diphtheria cases — New Independent States of the former Soviet Union, 1965–1994*

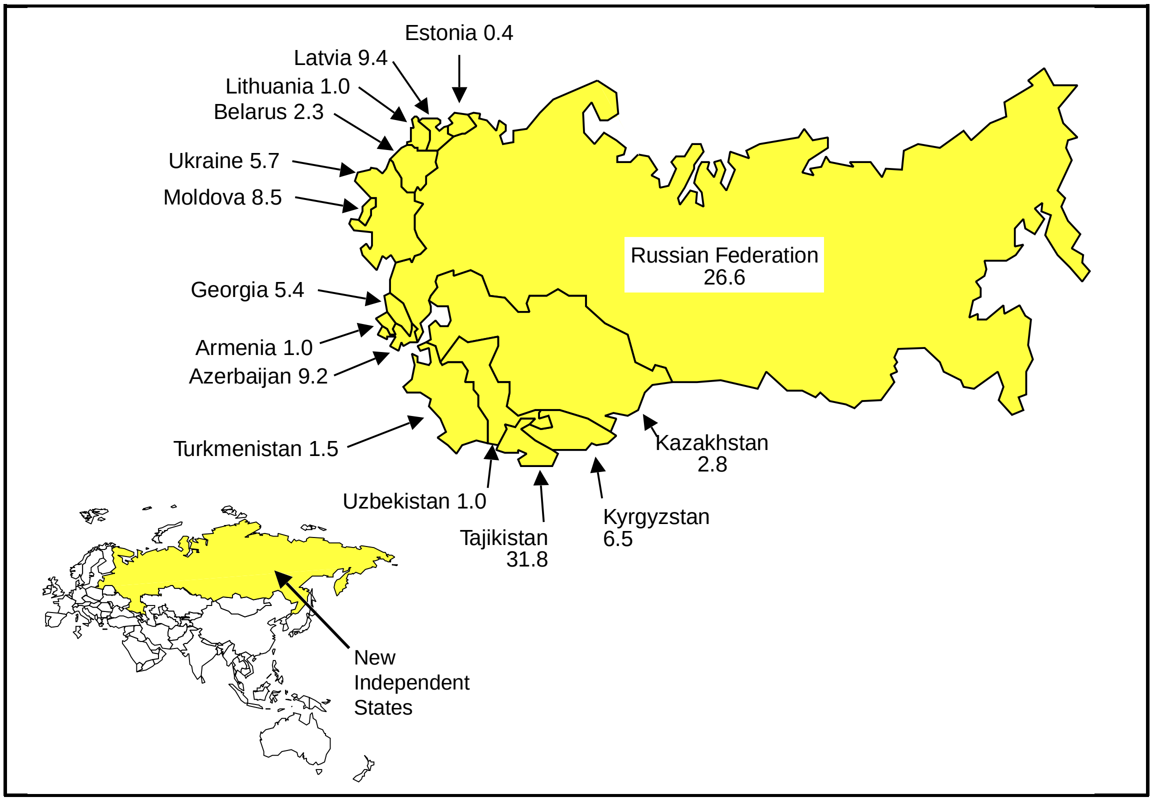


*Data for 1994 are provisional.

Source: World Health Organization.

Diphtheria Epidemic — Continued

FIGURE 2. Reported incidence rate* of diphtheria — New Independent States of the former Soviet Union, 1994



*Per 100,000 population.

Ukraine in 1991 and, during 1993–1994, to 12 of the 13 remaining NIS. In most affected countries, the incidence rate of reported diphtheria has increased twofold to 10-fold each year. This report summarizes data provided to the World Health Organization (WHO) about diphtheria in the NIS during 1989–1994.*

Overall, reported cases of diphtheria in the NIS increased from 839 in 1989 to 47,802 in 1994 (Figure 1). In 1994, a total of 1746 persons died; case-fatality rates ranged from 2.8% (Russian Federation) to 23.0% (Lithuania and Turkmenistan).

In the Russian Federation, reported diphtheria cases increased from 603 in 1989 (0.4 per 100,000 population) to 15,229 (10.3) in 1993, then increased 161% to 39,703 (26.6) in 1994; a total of 1104 (2.8%) persons died. The epidemic has progressively spread to involve all 89 administrative regions. Throughout the epidemic, approximately 70% of cases have been reported among persons aged ≥15 years. The highest age-specific incidence rates were among persons aged 4–10 years, 15–17 years, and 40–49 years. Reported nationwide coverage with a primary series (three doses) of diphtheria toxoid among children aged 12–23 months increased from 72.6% in 1992 to 79.2% in 1993, but coverage remains low (<60%) in some regions. During 1992–1993, at least 90% of children aged ≤5 years had received a primary series with diphtheria and tetanus toxoids and pertussis vaccine (DTP) or pediatric (DT) or adult (Td) formulation diphtheria and tetanus toxoids, and approximately 80% had

*Data for 1994 are provisional.

Diphtheria Epidemic — Continued

received at least one booster. Up to 50% of infants in some areas may have received a primary series with Td rather than DTP or DT.

In Ukraine, reported cases increased 27-fold, from 109 in 1990 to 2990 (5.7 per 100,000) in 1994; 111 (3.7%) persons died. In 1994, 80% of cases occurred among persons aged ≥15 years. In Belarus, reported cases increased 97%, from 120 in 1993 to 236 (2.3) in 1994. In Moldova, reported cases increased 10-fold, from 35 in 1993 to 372 (8.5) in 1994; 19 (5.1%) persons died. In Latvia, reported cases increased 21-fold, from 12 in 1993 to 250 (9.4) in 1994 and, in Lithuania, from eight in 1993 to 39 (1.0) in 1994. In Estonia, seven cases (0.4) were reported in 1994.

In Tajikistan, reported cases increased 180%, from 680 in 1993 to 1907 (31.8 per 100,000) in 1994. Most cases were reported from the southern region of Kurgan Tyube, which borders Afghanistan. For other central Asian republics, case counts for 1994 were Kazakhstan, 489 (2.8); Kyrgyzstan, 303 (6.5); Turkmenistan, 61 (1.5); and Uzbekistan, 232 (1.0). These totals represent increases of twofold to 20-fold over 1993. Approximately 50% of cases in these countries have occurred among persons aged ≤14 years.

In Georgia, 294 cases (5.4 per 100,000) were reported in 1994, a 10-fold increase over 1993. Forty-two (14%) persons died, and 43% of cases occurred among persons aged ≥15 years. In Azerbaijan, 685 cases (9.2) were reported in 1994, compared with 141 in 1993. Armenia reported no cases during 1991–1993 but 36 (1.0) cases in 1994.

Reported by: Regional Office for Europe, World Health Organization, Copenhagen. Global Program on Vaccines and Immunization, World Health Organization, Geneva. Regional Office for Eastern Europe and Central Asia, United Nations Children's Fund, New York and Geneva. Child Survival Unit, United Nations Children's Fund, New York. Childhood and Respiratory Diseases Br, Div of Bacterial and Mycotic Diseases, National Center for Infectious Diseases; International Health Program Office; Child Vaccine Preventable Disease Br, Div of Epidemiology and Surveillance, National Immunization Program, CDC.

Editorial Note: WHO considers the rapidly expanding diphtheria epidemic in the NIS an international public health emergency. In the Russian Federation, the epidemic has intensified each successive year. In the central Asian and Transcaucasian republics, epidemic diphtheria is established in all eight countries; in some of these countries, many cases have occurred among refugees or persons displaced by internal conflict. Previous reports of diphtheria epidemics underscore the potential for further increase in the magnitude of this epidemic (*3*).

Although the reasons for the diphtheria epidemic in the NIS are not fully understood, one important factor is the presence of a large number of susceptible children and adults—which enabled introduction or reemergence of toxigenic strains of *Corynebacterium diphtheriae*. Spread of the organism may have been facilitated by crowding and population migration resulting from the dissolution of the Soviet Union. In addition, adequate control measures (particularly aggressive mass vaccination in affected areas) were not implemented during the early phase of the epidemic. Increases in the number of susceptible children in the NIS probably resulted from a combination of low vaccination coverage in many areas and inappropriate primary vaccination of substantial numbers of infants with Td, a formulation for adults containing decreased amounts of diphtheria toxoid. The existence of large numbers of susceptible adults is a new phenomenon in the vaccine era. In the prevaccine era, most persons acquired immunity to diphtheria naturally before adulthood through exposure to *C. diphtheriae*. Following the introduction of childhood vaccination with

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diphtheria toxoid, circulation of toxigenic *C. diphtheriae* decreased substantially. In addition, vaccine-induced immunity wanes over time unless periodic boosters are administered. Serologic studies in the NIS, Western Europe, and the United States indicate that 20%–60% of adults aged ≥20 years are susceptible to diphtheria (*4–7*).

Lack of effectiveness of diphtheria toxoid is not considered to be an important contributing factor for this epidemic. Recent assessments of vaccine effectiveness in children conducted in the Russian Federation and Ukraine have documented high clinical effectiveness of diphtheria toxoid produced in the Russian Federation.

A plan formulated jointly by WHO and the United Nations Children's Fund (UNICEF), in collaboration with CDC, the U.S. Agency for International Development, and the International Federation of Red Cross and Red Crescent Societies, has outlined the strategies necessary to control the diphtheria epidemic in the NIS. This plan was approved in January and February 1995 by representatives of the affected countries. Key elements of the plan are to achieve and maintain high levels of routine childhood vaccination with diphtheria toxoid (i.e., ≥95% coverage with four doses of DTP by age 2 years in all districts and the same levels for booster doses according to national vaccination schedules) and to rapidly vaccinate ≥90% of adolescents and adults with Td (*8,9*) in all areas of the NIS affected by the epidemic. Because of widespread transmission among the entire population of the NIS, attempts to control the epidemic through vaccination of targeted subgroups (e.g., adults in selected occupations and children) have not been effective.

In 1994, at least 20 imported cases of diphtheria were reported in countries in Europe, including Bulgaria, Finland, Germany, Norway, and Poland. This demonstrates the potential for the diphtheria epidemic in the NIS to spread to neighboring countries in Europe, the Middle East, and Asia. Although no cases have been directly imported into the United States, CDC has received reports of two cases of diphtheria among U.S. citizens who reside in or who traveled to the NIS, and considers the epidemic to pose a risk for importation into the United States.

This report underscores the importance of maintaining high levels of diphtheria immunity among the total populations of the United States and other countries, regardless of whether international travel is planned. The Advisory Committee on Immunization Practices recommends that all children receive a routine series of five doses of DTP (or DT if pertussis vaccine is contraindicated) with doses at ages 2, 4, 6, and 12–15 months and 4–6 years; Td boosters should then be administered every 10 years (*10*). For persons aged ≥7 years who have not been previously vaccinated against diphtheria, the primary series consists of three doses of Td, with intervals of 1–2 months between the first two doses and 6–12 months between the second and third doses. Persons traveling to areas with diphtheria activity should have completed the primary series and should have received the most recent dose of vaccine (either primary series or booster) within the previous 10 years.

Control of the epidemic in the NIS requires immediate efforts to raise levels of immunity through extensive mass vaccination of adolescents and adults. Shortages of vaccine, antitoxin, and antibiotics exist in the NIS (except the Russian Federation); these needs should immediately be addressed through coordinated efforts of international public health and donor agencies. An Interagency Immunization Coordinating Committee was convened in 1994 and is scheduled to meet again in April 1995 to

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coordinate donor activities in support of disease control and primary vaccination of children in the NIS.

References

1. Expanded Program on Immunization, World Health Organization. Outbreak of diphtheria, update. Wkly Epidemiol Rec 1993;19:134–7.
2. CDC. Diphtheria outbreak—Russian Federation, 1990–1993. MMWR 1993;42:840–1,847.
3. Stuart G. A note on diphtheria incidence in certain European countries. Br Med J 1945;2:613–5.
4. Crossley K, Irvine P, Warren JB, Lee BK, Mead K. Tetanus and diphtheria immunity in urban Minnesota adults. JAMA 1979;242:2298–3000.
5. Christenson B, Bottiger M. Serological immunity to diphtheria in Sweden in 1978 and 1984. Scand J Infect Dis 1986;18:227–33.
6. Rix BA, Zhobakas A, Wachmann CH, Bakasenas B, Ronne T. Immunity from diphtheria, tetanus, poliomyelitis, measles, mumps, and rubella among adults in Lithuania. Scand J Infect Dis 1994;26:459–67.
7. Ad Hoc Working Group. Susceptibility to diphtheria. Lancet 1978;1:428–30.
8. Expanded Program on Immunization, Pan American Health Organization. Diphtheria epidemic in Ecuador. EPI Newsletter 1994;16:5–6,8.
9. Youwang Y, Jianming D, Yong X, Pong Z. Epidemiological features of an outbreak of diphtheria and its control with diphtheria toxoid immunization. Int J Epidemiol 1992;21:807–11.
10. ACIP. Diphtheria, tetanus, and pertussis: recommendations for vaccine use and other preventive measures—recommendations of the Immunization Practices Advisory Committee (ACIP). MMWR 1991;40(no. RR-10).

Occupational Lead Surveillance — Taiwan, July–December 1993

Lead poisoning has been recognized as an occupational disease for centuries and has been linked with both severe and subtle health damage (*1–3*). In July 1993, the government of Taiwan initiated a compulsory system* for surveillance of elevated blood lead levels (BLLs) among workers in that country (*4*). All lead-exposed workers in lead-using factories† are identified and included in the lead surveillance system. This report summarizes findings from this program for July–December 1993.

A total of 18 categories of production processes (e.g., battery recycling or manufacturing, lead smelting, plastic stabilizer additive processing, and lead-based paint production) or occupation/job categories constitute the high-lead exposure group. Lead-exposed workers in these settings are required to have their BLLs monitored annually by one of 22 specified, certified hospital laboratories. Based on job titles and an occupation register published by the Labor Council of Taiwan, a minimum of 4500 workers in Taiwan were directly exposed to lead-contaminated work environments (at exposure levels ranging from 0.002 mg/m^3 to 3.051 mg/m^3§), and 10-fold more workers were indirectly exposed (e.g., secretaries who work at the same factories but in jobs that do not entail direct lead exposure).

Employers are required by law to report at least annually to local health bureaus and labor inspection offices the BLLs and results of health examinations (specifically designed for lead-exposed workers and performed at one of the specified hospitals). Labor Council factory inspectors are responsible for enforcing this law. To ensure

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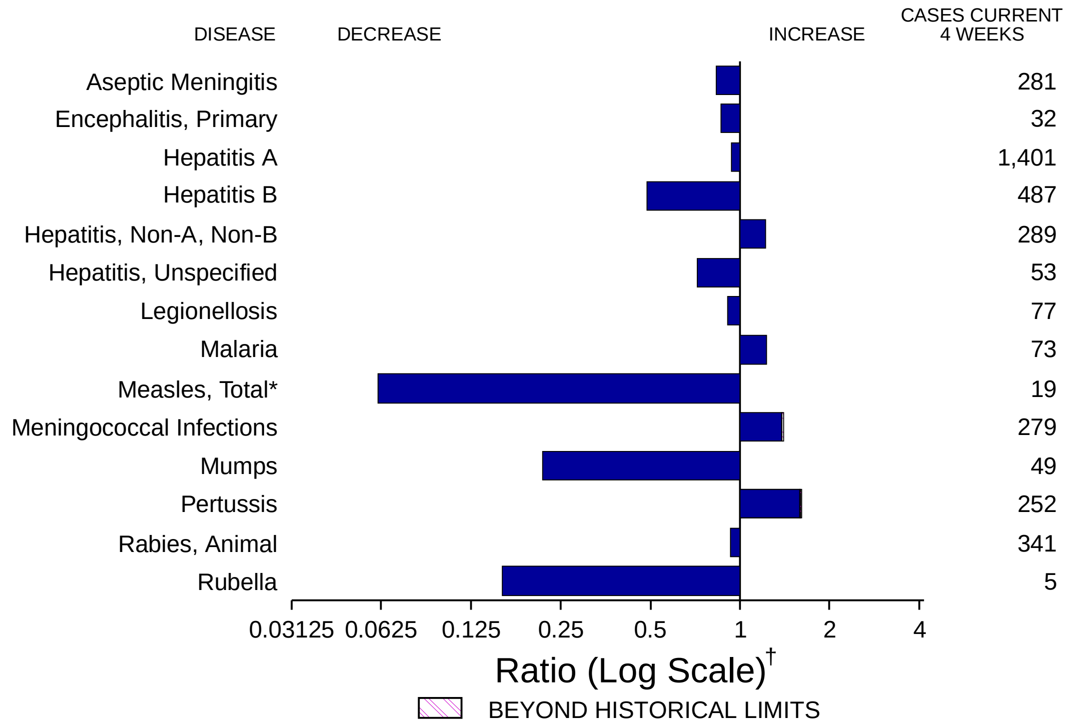
*Based on the Labor Safety and Health Law (enacted in 1974 by the Labor Council of Taiwan).
†Defined according to the worker's occupation/job category and the company's production process, which is registered on the license of every factory in Taiwan.
§Data from a Labor Council survey of working environments of lead-related workers; in the United States, the maximum allowable exposure to lead in air is 50 µg/m^3 (0.050 mg/m^3).

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending March 11, 1995, with historical data — United States



*The large apparent decrease in the number of reported cases of measles (total) reflects dramatic fluctuations in the historical baseline.
†Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending March 11, 1995 (10th Week)

	Cum. 1995		Cum. 1995
Anthrax	-	Plague	-
Aseptic Meningitis	771	Poliomyelitis, Paralytic	-
Brucellosis	12	Psittacosis	4
Cholera	-	Rabies, human	-
Congenital rubella syndrome	2	Rocky Mountain Spotted Fever	19
Diphtheria	-	Syphilis, congenital, age < 1 year†	-
Encephalitis, primary	80	Tetanus	4
Encephalitis, post-infectious	15	Toxic shock syndrome	36
*Haemophilus influenzae**	285	Trichinosis	4
Hansen Disease	20	Tularemia	3
Hepatitis, unspecified	84	Typhoid fever	48
Leptospirosis	11		

*Of 277 cases of known age, 61 (22%) were reported among children less than 5 years of age.
†Updated quarterly from reports to the Division of Sexually Transmitted Diseases and HIV Prevention, National Center for Prevention Services. First quarter data not yet available.
-: no reported cases

TABLE II. Cases of selected notifiable diseases, United States, weeks ending March 11, 1995, and March 12, 1994 (10th Week)

Reporting Area	AIDS*	Gonorrhea		Hepatitis (Viral), by type						Legionellosis	
				A		B		NA,NB			
	Cum. 1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	11,161	66,433	70,238	4,105	3,816	1,255	2,247	573	808	203	282
NEW ENGLAND	521	1,115	1,608	29	55	41	61	17	22	3	2
Maine	15	10	9	6	8	2	-	-	-	-	-
N.H.	12	25	13	1	2	3	4	1	4	-	-
Vt.	2	5	6	-	-	-	-	-	-	-	-
Mass.	294	640	576	8	25	11	44	16	11	2	-
R.I.	31	116	78	7	11	6	2	-	7	1	2
Conn.	167	319	926	7	9	19	11	-	-	N	N
MID. ATLANTIC	2,980	7,015	8,263	177	268	126	257	68	106	18	33
Upstate N.Y.	249	909	1,780	45	60	47	57	28	44	5	7
N.Y. City	1,592	2,196	3,383	82	118	23	54	1	1	-	-
N.J.	690	748	715	26	52	36	76	32	49	6	6
Pa.	449	3,162	2,385	24	38	20	70	7	12	7	20
E.N. CENTRAL	1,138	14,620	13,165	601	408	143	276	46	77	59	107
Ohio	238	5,104	4,679	433	108	19	38	2	2	30	38
Ind.	80	1,308	1,475	28	72	32	46	1	3	11	38
Ill.	535	3,785	2,369	49	130	10	72	6	23	3	7
Mich.	222	3,862	3,337	76	56	81	71	37	49	9	16
Wis.	63	561	1,305	15	42	1	49	-	-	6	8
W.N. CENTRAL	242	3,641	4,310	173	176	62	111	15	9	22	22
Minn.	66	592	683	12	21	5	8	-	1	-	-
Iowa	14	293	257	10	6	11	6	2	1	3	14
Mo.	99	2,101	2,245	122	99	41	87	10	2	18	3
N. Dak.	-	3	5	2	1	1	-	-	-	-	2
S. Dak.	-	38	28	1	9	-	-	1	-	-	-
Nebr.	20	-	292	7	28	4	3	-	1	-	2
Kans.	43	614	800	19	12	-	7	2	4	1	1
S. ATLANTIC	2,676	21,066	19,679	202	226	205	530	62	162	41	58
Del.	69	415	317	3	3	1	3	1	-	-	-
Md.	357	2,753	3,577	40	39	38	66	3	12	10	13
D.C.	142	1,060	1,279	1	6	8	11	-	-	2	-
Va.	238	1,965	2,688	38	25	14	20	-	8	2	2
W. Va.	13	110	153	6	3	13	5	14	7	3	1
N.C.	161	5,084	5,018	20	19	62	71	16	11	7	5
S.C.	168	2,114	2,443	4	6	7	7	-	-	6	1
Ga.	361	3,484	U	22	17	17	270	9	106	5	26
Fla.	1,167	4,081	4,204	68	108	45	77	19	18	6	10
E.S. CENTRAL	393	7,878	6,513	73	90	92	267	91	178	4	14
Ky.	38	879	870	10	51	9	26	4	5	1	2
Tenn.	172	876	2,327	25	29	56	225	86	171	1	9
Ala.	104	4,310	3,316	29	10	27	16	1	2	1	3
Miss.	79	1,813	U	9	U	-	U	-	U	1	U
W.S. CENTRAL	919	5,981	7,659	338	420	124	191	74	50	3	8
Ark.	45	457	1,333	14	8	1	5	-	1	-	1
La.	170	2,436	2,775	10	15	9	23	7	15	1	-
Okla.	59	14	728	114	46	64	71	64	32	2	7
Tex.	645	3,074	2,823	200	351	50	92	3	2	-	-
MOUNTAIN	430	1,492	1,675	861	699	122	109	88	79	30	23
Mont.	7	23	25	12	7	4	3	3	-	2	8
Idaho	16	27	13	88	62	18	17	9	29	3	-
Wyo.	3	9	23	28	3	2	5	32	16	-	1
Colo.	187	545	678	117	79	22	19	19	18	12	4
N. Mex.	34	230	195	175	197	42	38	13	4	1	1
Ariz.	86	554	351	170	262	15	16	8	4	8	1
Utah	30	1	59	242	53	14	4	3	4	2	-
Nev.	67	103	331	29	36	5	7	1	4	2	8
PACIFIC	1,862	3,625	7,366	1,651	1,474	340	445	112	125	23	15
Wash.	148	474	629	91	207	25	47	29	49	-	4
Oreg.	74	18	232	296	67	17	15	4	2	-	-
Calif.	1,549	2,863	6,190	1,232	1,141	292	365	70	71	20	10
Alaska	29	178	173	14	50	2	2	1	-	-	-
Hawaii	62	92	142	18	9	4	16	8	3	3	1
Guam	-	8	31	-	1	-	-	-	-	-	-
P.R.	596	101	111	12	7	135	43	134	12	-	-
V.I.	-	3	7	-	-	1	1	-	-	-	-
Amer. Samoa	-	8	4	4	2	-	-	-	-	-	-
C.N.M.I.	-	2	14	1	1	-	-	-	-	-	-

N: Not notifiable U: Unavailable -: no reported cases C.N.M.I.: Commonwealth of Northern Mariana Islands

*Updated monthly to the Division of HIV/AIDS, National Center for Infectious Diseases; last update February 23, 1995.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending March 11, 1995, and March 12, 1994 (10th Week)

Reporting Area	Lyme Disease		Malaria		Measles (Rubeola) Indigenous		Measles (Rubeola) Imported*		Measles (Rubeola) Total		Meningococcal Infections		Mumps	
	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	1995	Cum. 1995	1995	Cum. 1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	547	595	161	197	4	36	-	1	37	64	647	694	138	276
NEW ENGLAND	21	60	7	17	-	2	-	1	3	3	48	31	3	9
Maine	1	-	-	1	-	-	-	-	-	-	4	6	2	3
N.H.	1	4	-	2	-	-	-	-	-	-	7	1	-	3
Vt.	-	1	-	-	-	-	-	-	-	-	4	1	-	-
Mass.	19	11	1	5	-	-	-	1	1	1	18	11	-	-
R.I.	-	9	2	4	-	2	-	-	2	2	-	-	-	1
Conn.	-	35	4	5	-	-	-	-	-	-	15	12	1	2
MID. ATLANTIC	409	429	33	30	-	1	-	-	1	10	57	57	17	28
Upstate N.Y.	195	330	5	9	-	-	-	-	-	1	25	23	6	3
N.Y. City	1	10	14	5	-	1	-	-	1	1	6	-	-	-
N.J.	34	68	12	12	-	-	-	-	-	7	21	15	-	4
Pa.	179	21	2	4	-	-	-	-	-	1	5	19	11	21
E.N. CENTRAL	12	6	13	26	-	-	-	-	-	13	87	108	26	71
Ohio	11	3	1	2	-	-	-	-	-	9	27	27	11	8
Ind.	1	-	1	7	-	-	-	-	-	1	12	19	2	2
Ill.	-	3	9	9	-	-	-	-	-	-	29	34	4	48
Mich.	-	-	2	7	-	-	-	-	-	-	17	11	9	11
Wis.	-	-	-	1	-	-	-	-	-	3	2	17	-	2
W.N. CENTRAL	12	10	5	9	-	-	-	-	-	-	32	54	7	10
Minn.	-	1	3	2	-	-	-	-	-	-	6	3	-	-
Iowa	-	1	-	1	-	-	-	-	-	-	7	4	1	3
Mo.	2	7	2	4	-	-	-	-	-	-	13	34	5	6
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	-	-	1
S. Dak.	-	-	-	-	-	-	-	-	-	-	-	4	-	-
Nebr.	-	-	-	2	U	-	U	-	-	-	2	1	1	-
Kans.	10	1	-	-	-	-	-	-	-	-	4	8	-	-
S. ATLANTIC	62	64	44	47	-	-	-	-	-	4	121	112	20	47
Del.	1	5	1	2	-	-	-	-	-	-	1	-	-	-
Md.	46	7	12	13	-	-	-	-	-	-	2	7	-	10
D.C.	-	-	3	6	-	-	-	-	-	-	1	1	-	-
Va.	2	11	8	8	-	-	-	-	-	1	11	14	4	10
W. Va.	5	3	-	-	-	-	-	-	-	-	-	6	-	2
N.C.	4	16	4	1	-	-	-	-	-	-	19	19	10	15
S.C.	4	-	-	1	-	-	-	-	-	-	20	4	1	5
Ga.	-	21	6	8	-	-	-	-	-	-	35	18	-	2
Fla.	-	1	10	8	-	-	-	-	-	3	32	43	5	3
E.S. CENTRAL	3	7	1	5	-	-	-	-	-	22	32	44	3	-
Ky.	1	5	-	1	-	-	-	-	-	-	13	14	-	-
Tenn.	1	1	-	3	-	-	-	-	-	22	2	12	-	-
Ala.	-	1	1	1	-	-	-	-	-	-	12	18	2	-
Miss.	1	U	-	U	-	-	-	-	-	U	5	U	1	U
W.S. CENTRAL	9	2	3	5	-	-	-	-	-	4	70	83	7	54
Ark.	-	-	2	-	-	-	-	-	-	-	6	9	-	-
La.	-	-	-	-	-	-	-	-	-	-	8	9	2	3
Okla.	9	2	-	1	-	-	-	-	-	-	8	7	-	14
Tex.	-	-	1	4	-	-	-	-	-	4	48	58	5	37
MOUNTAIN	2	4	12	6	4	33	-	-	33	-	56	47	10	6
Mont.	-	-	1	-	-	-	-	-	-	-	2	2	-	-
Idaho	-	1	-	2	-	-	-	-	-	-	1	9	-	2
Wyo.	-	-	-	-	-	-	-	-	-	-	1	2	-	-
Colo.	1	-	6	2	-	-	-	-	-	-	13	3	1	-
N. Mex.	-	3	3	1	3	25	-	-	25	-	17	3	N	N
Ariz.	-	-	1	-	-	7	-	-	7	-	18	18	1	-
Utah	-	-	1	1	-	-	-	-	-	-	2	7	1	1
Nev.	1	-	-	-	1	1	-	-	1	-	2	3	6	3
PACIFIC	17	13	43	52	-	-	-	-	-	8	144	158	45	51
Wash.	1	-	5	2	-	-	-	-	-	-	18	24	2	4
Oreg.	1	-	4	1	-	-	-	-	-	-	33	29	N	N
Calif.	15	13	30	42	-	-	-	-	-	8	92	100	38	42
Alaska	-	-	1	-	-	-	-	-	-	-	-	1	4	2
Hawaii	-	-	3	7	-	-	-	-	-	-	1	4	1	3
Guam	-	-	-	-	U	-	U	-	-	1	-	-	-	2
P.R.	-	-	-	-	-	-	-	-	-	5	9	2	-	2
V.I.	-	-	-	-	U	-	U	-	-	-	-	-	1	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	1
C.N.M.I.	-	-	-	1	U	-	U	-	-	22	-	-	-	-

*For imported measles, cases include only those resulting from importation from other countries.

N: Not notifiable U: Unavailable -: no reported cases

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending March 11, 1995, and March 12, 1994 (10th Week)

Reporting Area	Pertussis			Rubella			Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal	
	1995	Cum. 1995	Cum. 1994	1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	74	560	767	1	13	65	2,958	3,534	2,330	2,874	974	1,058
NEW ENGLAND	1	54	71	-	1	45	39	34	42	61	292	286
Maine	-	6	2	-	-	-	-	-	-	-	-	-
N.H.	-	4	16	-	-	-	1	-	1	2	40	33
Vt.	-	2	8	-	-	-	-	-	-	-	38	24
Mass.	1	39	40	-	1	45	13	10	19	24	138	121
R.I.	-	-	2	-	-	-	-	5	7	7	9	5
Conn.	-	3	3	-	-	-	25	19	15	28	67	103
MID. ATLANTIC	5	36	137	-	1	4	199	255	443	414	212	262
Upstate N.Y.	3	24	45	-	1	4	16	28	27	79	132	163
N.Y. City	-	6	8	-	-	-	117	147	251	207	-	-
N.J.	-	-	7	-	-	-	34	24	90	80	50	55
Pa.	2	6	77	-	-	-	32	56	75	48	30	44
E.N. CENTRAL	4	57	195	-	-	4	512	483	287	277	1	3
Ohio	3	27	52	-	-	-	178	196	41	43	1	-
Ind.	-	4	14	-	-	-	44	60	4	23	-	-
Ill.	-	-	74	-	-	4	193	106	171	159	-	-
Mich.	1	26	17	-	-	-	63	61	66	43	-	1
Wis.	-	-	38	-	-	-	34	60	5	9	-	2
W.N. CENTRAL	2	12	22	-	-	-	154	252	69	57	45	25
Minn.	-	-	8	-	-	-	8	10	10	7	2	-
Iowa	-	1	1	-	-	-	13	11	15	7	13	13
Mo.	-	1	6	-	-	-	133	228	30	32	7	2
N. Dak.	-	1	-	-	-	-	-	-	-	1	5	-
S. Dak.	2	4	-	-	-	-	-	-	-	6	11	2
Nebr.	U	-	1	U	-	-	-	3	-	-	-	-
Kans.	-	5	6	-	-	-	-	-	14	4	7	8
S. ATLANTIC	-	44	97	-	1	5	696	1,106	372	579	316	319
Del.	-	2	-	-	-	-	5	6	-	2	10	2
Md.	-	-	30	-	-	-	22	44	87	54	76	97
D.C.	-	1	2	-	-	-	33	51	19	26	1	1
Va.	-	-	12	-	-	-	118	127	6	66	58	69
W. Va.	-	-	1	-	-	-	-	5	15	14	17	13
N.C.	-	30	30	-	-	-	218	378	24	32	68	30
S.C.	-	7	7	-	-	-	110	132	62	78	19	28
Ga.	-	1	6	-	-	-	94	183	48	112	55	74
Fla.	-	3	9	-	1	5	96	180	111	195	12	5
E.S. CENTRAL	5	14	22	-	-	-	810	374	130	190	30	38
Ky.	-	-	3	-	-	-	50	52	36	49	3	-
Tenn.	2	2	13	-	-	-	73	188	-	62	11	16
Ala.	3	12	6	-	-	-	131	134	67	79	16	22
Miss.	-	-	U	-	-	U	556	U	27	U	-	U
W.S. CENTRAL	1	13	24	1	1	-	453	739	241	214	15	53
Ark.	-	-	-	-	-	-	128	108	31	24	3	5
La.	-	-	1	-	-	-	202	401	-	-	9	-
Okla.	-	-	20	-	-	-	20	24	1	19	3	11
Tex.	1	13	3	1	1	-	103	206	209	171	-	37
MOUNTAIN	49	246	45	-	2	-	45	60	113	93	7	15
Mont.	-	2	-	-	-	-	3	-	-	-	3	1
Idaho	2	28	15	-	-	-	-	1	2	4	-	-
Wyo.	-	-	-	-	-	-	2	-	-	1	-	4
Colo.	1	1	20	-	-	-	28	38	-	2	-	-
N. Mex.	-	4	3	-	-	-	1	1	17	15	-	-
Ariz.	45	207	5	-	2	-	11	10	51	50	4	10
Utah	1	2	2	-	-	-	-	4	7	-	-	-
Nev.	-	2	-	-	-	-	-	6	36	21	-	-
PACIFIC	7	84	154	-	7	7	50	231	633	989	56	57
Wash.	1	16	26	-	-	-	1	6	43	34	-	-
Oreg.	-	1	16	-	-	-	-	2	3	17	-	-
Calif.	6	64	109	-	7	7	49	223	547	882	55	44
Alaska	-	-	-	-	-	-	-	-	9	15	1	13
Hawaii	-	3	3	-	-	-	-	-	31	41	-	-
Guam	U	-	-	U	-	-	-	1	4	7	-	-
P.R.	1	3	-	-	-	-	43	72	-	-	8	13
V.I.	U	-	-	U	-	-	-	3	-	-	-	-
Amer. Samoa	-	-	1	-	-	-	-	-	2	-	-	-
C.N.M.I.	U	-	-	U	-	-	-	-	1	12	-	-

U: Unavailable -: no reported cases

TABLE III. Deaths in 121 U.S. cities,* week ending March 11, 1995 (10th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	634	464	102	48	10	10	64
Boston, Mass.	151	108	24	11	2	6	7
Bridgeport, Conn.	47	35	8	2	2	-	9
Cambridge, Mass.	29	18	8	3	-	-	2
Fall River, Mass.	18	18	-	-	-	-	1
Hartford, Conn.	58	42	10	6	-	-	3
Lowell, Mass.	35	27	7	1	-	-	7
Lynn, Mass.	19	15	2	2	-	-	4
New Bedford, Mass.	40	32	5	2	1	-	1
New Haven, Conn.	35	26	5	2	1	1	3
Providence, R.I.	63	50	8	3	1	1	7
Somerville, Mass.	6	4	1	1	-	-	-
Springfield, Mass.	38	22	7	7	2	-	6
Waterbury, Conn.	29	21	4	3	1	-	-
Worcester, Mass.	66	46	13	5	-	2	14
MID. ATLANTIC	2,664	1,795	474	284	57	54	164
Albany, N.Y.	44	34	7	3	-	-	6
Allentown, Pa.	18	16	1	1	-	-	-
Buffalo, N.Y.	88	71	15	-	1	1	6
Camden, N.J.	29	17	8	4	-	-	2
Elizabeth, N.J.	18	13	4	1	-	-	1
Erie, Pa.§	40	32	4	3	-	1	4
Jersey City, N.J.	61	39	10	9	-	3	-
New York City, N.Y.	1,431	908	273	182	38	30	56
Newark, N.J.	88	45	15	18	5	5	10
Paterson, N.J.	36	29	3	4	-	-	3
Philadelphia, Pa.	296	202	48	34	4	8	21
Pittsburgh, Pa.§	123	86	28	5	1	3	17
Reading, Pa.	20	16	2	2	-	-	4
Rochester, N.Y.	144	107	26	6	5	-	8
Schenectady, N.Y.	24	17	4	3	-	-	3
Scranton, Pa.§	32	26	4	2	-	-	4
Syracuse, N.Y.	105	86	13	2	3	1	11
Trenton, N.J.	26	18	3	4	-	1	5
Utica, N.Y.	19	12	5	1	-	1	1
Yonkers, N.Y.	22	21	1	-	-	-	2
E.N. CENTRAL	2,479	1,654	443	229	110	43	168
Akron, Ohio	67	54	9	2	-	2	-
Canton, Ohio	39	29	6	3	-	1	4
Chicago, Ill.	475	210	96	98	62	9	22
Cincinnati, Ohio	206	147	44	10	2	3	27
Cleveland, Ohio	170	101	40	17	7	5	1
Columbus, Ohio	195	151	32	9	1	2	19
Dayton, Ohio	129	99	17	8	5	-	8
Detroit, Mich.	269	171	53	28	9	8	10
Evansville, Ind.	33	24	7	1	1	-	4
Fort Wayne, Ind.	77	60	8	6	2	1	8
Gary, Ind.	20	8	6	3	3	-	1
Grand Rapids, Mich.	71	51	17	2	-	1	12
Indianapolis, Ind.	188	131	34	14	5	4	19
Madison, Wis.	62	46	7	7	1	1	6
Milwaukee, Wis.	131	99	21	7	3	1	12
Peoria, Ill.	56	44	7	2	2	1	2
Rockford, Ill.	51	36	9	1	3	2	5
South Bend, Ind.	52	43	4	3	2	-	3
Toledo, Ohio	115	90	15	7	1	2	4
Youngstown, Ohio	73	60	11	1	1	-	1
W.N. CENTRAL	865	610	133	60	21	21	57
Des Moines, Iowa	55	36	15	1	1	2	7
Duluth, Minn.	32	26	5	-	-	1	6
Kansas City, Kans.	31	23	4	3	1	-	-
Kansas City, Mo.	126	65	23	13	4	1	7
Lincoln, Nebr.	40	34	4	1	1	-	3
Minneapolis, Minn.	202	151	31	12	2	6	16
Omaha, Nebr.	84	63	8	5	4	4	2
St. Louis, Mo.	169	123	21	14	7	4	-
St. Paul, Minn.	65	48	9	6	1	1	11
Wichita, Kans.	61	41	13	5	-	2	5
S. ATLANTIC	1,519	973	279	186	46	33	103
Atlanta, Ga.	215	129	42	33	7	4	7
Baltimore, Md.	211	125	40	34	8	4	25
Charlotte, N.C.	146	97	26	13	4	6	17
Jacksonville, Fla.	166	123	25	15	1	2	12
Miami, Fla.	99	60	19	16	4	-	2
Norfolk, Va.	60	43	4	6	3	4	2
Richmond, Va.	75	46	19	6	3	1	7
Savannah, Ga.	52	36	11	3	1	1	5
St. Petersburg, Fla.	58	45	8	4	1	-	7
Tampa, Fla.	195	138	37	12	3	3	13
Washington, D.C.	232	126	45	42	11	8	6
Wilmington, Del.	10	5	3	2	-	-	-
E.S. CENTRAL	836	535	167	67	35	32	62
Birmingham, Ala.	128	82	23	12	6	5	5
Chattanooga, Tenn.	85	59	14	6	2	4	7
Knoxville, Tenn.	89	56	20	8	3	2	8
Lexington, Ky.	79	48	17	5	4	5	7
Memphis, Tenn.	202	122	42	14	12	12	19
Mobile, Ala.	18	11	6	1	-	-	-
Montgomery, Ala.	70	48	9	10	2	1	5
Nashville, Tenn.	165	109	36	11	6	3	11
W.S. CENTRAL	1,485	953	277	164	51	39	94
Austin, Tex.	78	57	12	6	2	1	5
Baton Rouge, La.	52	24	11	12	3	2	1
Corpus Christi, Tex.	62	46	10	3	-	2	2
Dallas, Tex.	205	117	51	21	10	6	6
El Paso, Tex.	74	51	12	7	2	2	5
Ft. Worth, Tex.	120	84	22	5	3	6	5
Houston, Tex.	340	197	75	50	10	8	37
Little Rock, Ark.	51	34	7	5	4	1	5
New Orleans, La.	140	91	17	19	8	5	-
San Antonio, Tex.	187	125	31	21	8	2	12
Shreveport, La.	78	54	15	7	1	1	6
Tulsa, Okla.	98	73	14	8	-	3	10
MOUNTAIN	973	690	156	76	28	23	75
Albuquerque, N.M.	127	97	18	8	3	1	9
Colo. Springs, Colo.	61	45	9	4	2	1	7
Denver, Colo.	145	103	18	15	4	5	19
Las Vegas, Nev.	157	108	39	3	6	1	6
Ogden, Utah	17	13	3	1	-	-	-
Phoenix, Ariz.	184	114	35	22	5	8	11
Pueblo, Colo.	35	30	1	2	2	-	3
Salt Lake City, Utah	113	81	14	10	4	4	10
Tucson, Ariz.	134	99	19	11	2	3	10
PACIFIC	2,197	1,434	377	246	90	36	173
Berkeley, Calif.	16	11	5	-	-	-	1
Fresno, Calif.	94	62	19	10	1	2	8
Glendale, Calif.	40	29	8	2	1	-	4
Honolulu, Hawaii	75	61	9	3	2	-	10
Long Beach, Calif.	81	52	14	7	3	5	11
Los Angeles, Calif.	738	440	132	115	29	8	29
Pasadena, Calif.	34	26	6	2	-	-	2
Portland, Oreg.	104	72	17	6	4	5	8
Sacramento, Calif.	173	123	33	11	1	5	12
San Diego, Calif.	178	115	34	19	3	7	28
San Francisco, Calif.	162	84	19	31	27	1	16
San Jose, Calif.	164	123	23	14	4	-	25
Santa Cruz, Calif.	22	15	4	2	1	-	4
Seattle, Wash.	145	103	22	12	8	-	7
Spokane, Wash.	61	51	7	1	1	1	3
Tacoma, Wash.	110	67	25	11	5	2	5
TOTAL	13,652¶	9,108	2,408	1,360	448	291	960

*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.

U: Unavailable -: no reported cases

Occupational Lead Surveillance — Continued

employer and worker participation, employers are subject to fines equivalent to \$1200–\$2400 U.S. for delayed reporting (i.e., beyond 3 months) or failure to report. To encourage continued reporting by local health officials, the Ministry of Health publishes a quarterly report that contains county-specific BLL results and complete rates of follow-up.

During July–December 1993, BLLs were tested in 2905 lead-exposed workers. The mean BLL in males (n=1941) was 15.0 µg/dL (standard deviation [sd]=±15.1 µg/dL) and in females (n=964), 12.5 µg/dL (sd=±12.2 µg/dL). Mean BLLs were significantly ($p<0.05$, Z test) higher than BLLs for the total population aged ≥15 years in Taiwan (9.6 µg/dL for males; 7.4 µg/dL for females) (*5*). In addition, BLLs in 287 (9.9%) workers exceeded the applicable regulatory level (40 µg/dL for males; 30 µg/dL for females).

Most monitored workers were employed in soldering/cable stripping (452) and in battery recycling/manufacturing (364) (Table 1). Mean BLLs were highest among battery workers (34.6 µg/dL) and plastic manufacturers (27.5 µg/dL), and BLLs were elevated for approximately 25% of workers in plastic-manufacturing factories and 50% in battery-producing factories. Mean BLLs and proportions of workers with elevated BLLs were lowest in the following exposure categories: electric plating and painting, railroad workers, traffic police, and soldering/cable stripping.

The surveillance system in Taiwan also provides for an intervention team (including epidemiologists, industrial hygienists, and physicians) to evaluate the workplaces of workers with elevated BLLs. This response includes monitoring ambient lead exposure levels, evaluating the company's health and safety procedures, providing technical assistance to reduce lead exposure, and improving high-risk work practices and worker behaviors (including prevention of inadvertent transport of lead from the workplace to the worker's home). Through February 1995, the intervention teams had investigated the workplaces of 201 (70%) of the 287 workers with elevated BLLs. Priorities for follow-up are based on the BLLs of the workers involved.

Reported by: TN Wu, PhD, CY Shen, PhD, GY Yang, MD, SH Liou, MD, KN Ko, MPH, SL Chao, MPH, CC Hsu, MPH, JS Lai, PhD, PY Chang, MD, Disease Surveillance and Quarantine Svc,

TABLE 1. Blood lead levels (BLLs) among lead-exposed workers, by production process/occupation — Taiwan, July–December 1993

	Workers examined				Elevated BLLs*	
Production process/ Occupation	**No.**	**(%)**	**Mean BLL (µg/dL)**	**(SD†)**	**No. workers**	**(%)**
Mine smelting and foundry workers	152	(5.2)	13.1	(±14.2 µg/dL)	8	(5.3)
Electric plating and painting	134	(4.6)	7.1	(± 3.1 µg/dL)	0	
Metal working	93	(3.2)	12.9	(±11.0 µg/dL)	3	(3.2)
Plastic manufacturing	154	(5.3)	27.5	(±20.9 µg/dL)	45	(29.2)
Soldering/Cable stripping	452	(15.6)	8.6	(± 8.5 µg/dL)	6	(1.3)
Battery recycling/manufacturing	364	(12.5)	34.6	(±15.9 µg/dL)	176	(48.4)
Railroad workers	32	(1.1)	15.6	(±10.7 µg/dL)	0	
Traffic police	258	(8.9)	13.1	(± 5.8 µg/dL)	1	(0.4)
Other/Undefined	1266	(43.6)	9.7	(± 9.7 µg/dL)	48	(3.8)
Total	**2905**	**(100.0)**			**287**	**(9.9)**

*BLL ≥40 µg/dL for males; BLL ≥30 µg/dL for females.
†Standard deviation.

Occupational Lead Surveillance — Continued

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Editorial Note: The establishment of the compulsory occupational lead surveillance system described in this report is an important step in industrial hygiene and occupational disease prevention in Taiwan, and similar systems may be used in other countries and settings. In particular, the surveillance system in Taiwan indicates the usefulness of exposure information to target monitoring activities and using that information to target intervention efforts. This system should facilitate improvements in the industrial hygiene of the work environment, assist in evaluating the effects of intervention, and reduce both primary and secondary (e.g., take-home) exposures to lead.

Since the mid-1980s, occupational lead surveillance programs have been developed in both Taiwan and the United States. In both countries, these systems are laboratory-based and legally mandated; however, each system also has distinguishing features (Table 2). In particular, in Taiwan, companies subject to surveillance are predetermined based on predicted potential for exposure and are required to report to the government. In comparison, in the United States, companies are required to self-identify the existence of lead exposures and then to comply with the requirements of the Occupational Safety and Health Administration (OSHA) General Industry (*6*) and/or Construction Standards (*7*), which include provisions for environmental and medical monitoring. In Taiwan, 70% of the workers in workplaces where elevated BLLs were detected received follow-up interventions. In the United States, follow-up interventions vary according to state resources and BLLs. Seven of the 14 CDC-funded state-based surveillance programs have formal or informal agreements with OSHA for referral and follow-up of cases. However, the apparent exclusion of the nonmanufacturing sector (e.g., construction) is an important potential limitation in Taiwan and may preclude identification of new hazards or sources of lead poisoning, as well as reflect an underestimate of the magnitude of the problem outside of the manufactur-

TABLE 2. Occupational blood lead level (BLL) surveillance systems, by selected characteristics — Taiwan and United States

Characteristic	Taiwan	United States
Reporting	Compulsory	Compulsory in 32 states*
Coverage	Nationwide	State-based
Target population	Lead-exposed workers (cohort)	Adult population† (cross-sectional sample)
Frequency of surveillance	12 months	Varies (depending on BLL)
Routine evaluation of compliance reporting	Yes	Varies by state
Epidemiologic intervention	Yes (for every worker whose BLL exceeds a specified level)	Yes (for every worker whose BLL exceeds a specified level§)

*Alabama, Arizona, California, Colorado, Connecticut, Florida, Georgia, Illinois, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, Texas, Utah, Vermont, Washington, Wisconsin, and Wyoming. The national adult surveillance system currently receives reports from 22 states.

†Aged ≥16 years.

§Follow-up approach varies by state. Medical removal of workers with elevated BLLs is mandated by the Occupational Safety and Health Administration in the General Industry and/or Construction Standards.

Occupational Lead Surveillance — Continued

ing sector. Finally, the reported compliance with monitoring was relatively high in Taiwan (2950 [66%] workers monitored of an estimated 4500 exposed); in comparison, based on an assessment in California in 1986, the requirements of the OSHA standard for air and blood lead monitoring have been adhered to by only a small proportion of facilities¶ (*8*). Despite this apparently low compliance with biologic monitoring provisions of the standard, state-based surveillance programs have succeeded in identifying industries and occupations where lead hazards remain (*9*).

Although the systems in Taiwan and the United States differ, the beneficial public health effects of surveillance in each country are substantial—large numbers of workers with exposure and/or elevated BLLs have been identified (*10*), monitored, and trained to prevent future lead poisoning. The surveillance system in Taiwan reflects efforts to establish improved occupational health surveillance in conjunction with rapid growth in industrial capacity. The legal mandate in Taiwan enables the incorporation of surveillance requirements as integral parts of standard business operations, rather than only as reactive responses to a public health problem, and emphasizes that occupational health concerns are an important part of industrialization.

References

1. La Dou J. Occupational medicine. Englewood Cliffs, New Jersey: Prentice Hall, 1990:297.
2. Rempel D. The lead-exposed worker. JAMA 1989;262:532.
3. Hamilton A. Exploring the dangerous trades. Boston: Little Brown, 1943.
4. Wu TN, Shen CY, Yang GY, et al. Establishment of an occupational diseases surveillance system to monitor blood lead levels in Taiwan. Prev Med 1995 (in press).
5. Liou SH, Wu TN, Chiang HC. A nation-wide survey of blood lead level in Taiwan. Taipei, Taiwan: Taiwan Department of Health, 1992.
6. Office of the Federal Register. Code of federal regulations: occupational safety and health standards. Subpart Z: Toxic and hazardous substances—lead. Washington, DC: Office of the Federal Register, National Archives and Records Administration, 1985. (29 CFR §1910.1025).
7. Occupational Safety and Health Administration, US Department of Labor. Lead exposure in construction: interim final rule. Federal Register 1993;58:26590–649. (29 CFR §1926).
8. Rudolph L, Sharp D, Samuels S, Perkins C, Rosenberg J. Environmental and biological monitoring for lead exposure in California workplaces. Am J Public Health 1990;80:921–5.
9. Rabin R, Brooks D, Davis L. Elevated blood lead levels among construction workers in the Massachusetts Occupational Lead Registry. Am J Public Health 1994;84:1483–5.
10. CDC. Adult blood lead epidemiology and surveillance—United States, fourth quarter, 1993. MMWR 1994;43:246–7.

¶In 1986, an estimated 2.6% of facilities using lead had ever done any environmental monitoring, and 1.4% of facilities (employing 2.6% of potentially lead-exposed workers) had routine biologic monitoring programs.

Update: Dracunculiasis Eradication — Ghana and Nigeria, 1994

The plan for the global eradication of dracunculiasis (i.e., Guinea worm disease) was developed in October 1980 (*1*). Since 1987–1988, Global 2000, Inc., the United Nations Children's Fund (UNICEF), and the U.S. Agency for International Development have assisted the Guinea Worm Eradication Programs in Ghana and Nigeria, countries in west Africa. In 1989, Ghana and Nigeria ranked first and second in the number of reported cases of dracunculiasis with 179,556 and 640,008 cases, respectively (*2*). This report summarizes data for the two countries during 1994 and describes efforts toward eradication of dracunculiasis.

Dracunculiasis Eradication — Continued

Ghana

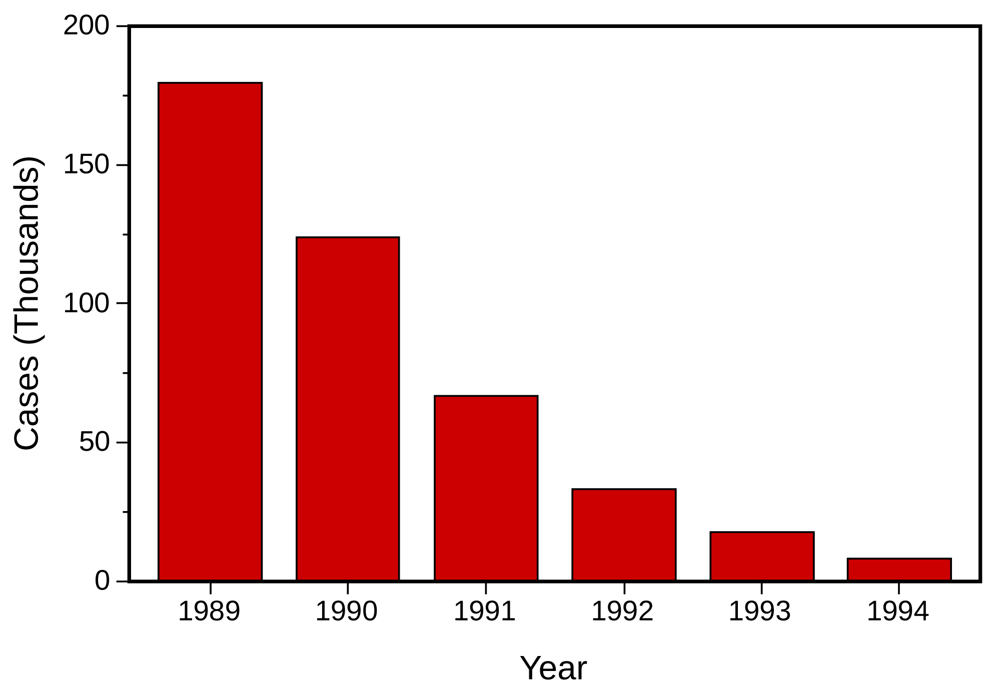
In 1994, Ghana (1991 population: 16 million) reported to the World Health Organization (WHO) 8432 cases of dracunculiasis in 1347 villages with known endemic disease, representing substantial declines in the numbers of cases (53%) and villages with known endemic disease (42%) from 1993. Since initiation of active surveillance in 1989, the numbers of cases and villages with known endemic disease have been reduced by 95% (Figure 1) and 79%, respectively.

In 1994, an average of 74% of villages with known endemic disease submitted surveillance reports on time each month; the rate of timely reporting increased from 30%–45% during January–March (when ethnic disturbances occurred in parts of the northern region, which has high rates of dracunculiasis) to 98% during October–December. During 1994, the northern region reported 69% of all cases in the country. Five of the 10 regions reported no indigenous cases for ≥3 consecutive months. Overall, 65% of the reported cases were fully contained (i.e., the case was detected within 24 hours of worm emergence, the worm extracted surgically and/or the lesions bandaged, and the affected person prevented from entering sources of drinking water to prevent transmission); the percentage of contained cases increased steadily during the year, from 30% in January to 93% in December.

Nigeria

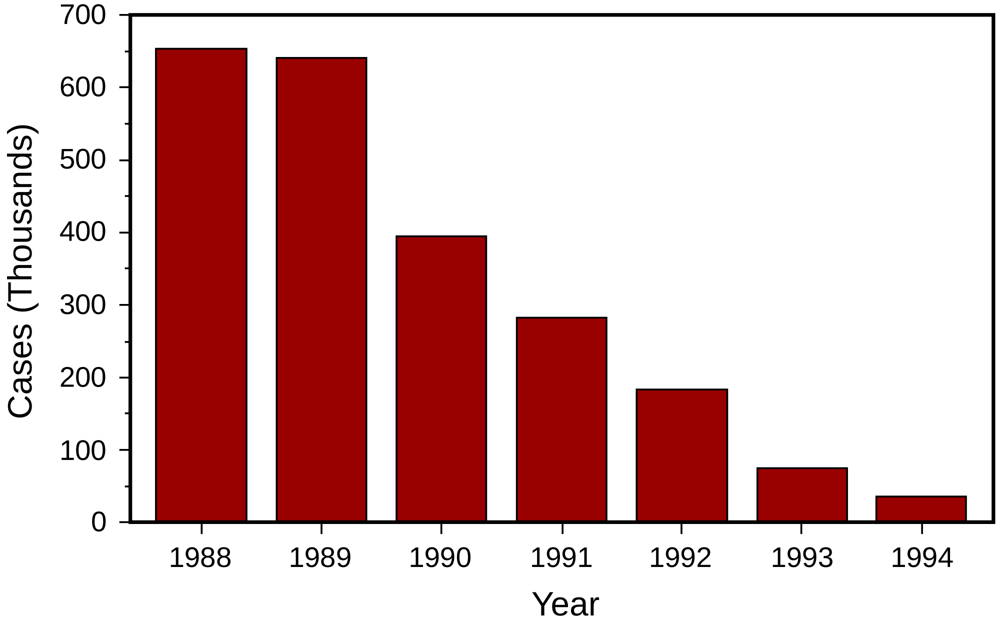
In 1994, Nigeria (1992 population: 90 million) reported to WHO 35,749 cases of dracunculiasis in 2571 villages with known endemic disease, representing substantial declines in the numbers of cases (53%) and villages with known endemic disease (29%) from 1993 (*3*). From July 1988 through December 1994, the annual numbers of cases and villages with known endemic disease declined 95% (Figure 2) and 56%, respectively.

FIGURE 1. Number of reported cases of dracunculiasis, by year — Ghana Guinea Worm Eradication Program, 1989–1994



Dracunculiasis Eradication — Continued

FIGURE 2. Number of reported cases of dracunculiasis, by year* — Nigeria Guinea Worm Eradication Program, 1988–1994



*For 1988–1992, fiscal year (i.e., July–June) totals are shown. Beginning in 1992, calendar year totals are shown. Data for July–December 1991 are not included.

In 1994, an average of 75% of villages with known endemic disease submitted surveillance reports on time. Five of the 30 states and the Federal Capital Territory reported 66% of the total number of cases; seven states reported no cases. By December 31, approximately 72% of the remaining villages with known endemic disease had begun case-containment measures designed to prevent further transmission.

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Editorial Note: This report documents continued progress in Ghana's and Nigeria's efforts to eradicate dracunculiasis. However, the civil disturbances in Nigeria and ethnic fighting in Ghana during 1994 may slow this progress. For example, during January 1995 in Ghana, 1971 cases of dracunculiasis were reported, a 136% increase over the 834 cases reported in January 1994. However, concerted efforts to rapidly reinstitute eradication efforts in Ghana as the ethnic strife subsided resulted in rapid detection and full containment of 97% of the cases. Improvements in surveillance and case containment in Ghana and Nigeria indicate that the two countries may reach the goal of eradicating dracunculiasis by the end of 1995.

References

1. Hopkins DR, Foege WH. Guinea worm disease [Letter]. Science 1981;212:495.
2. World Health Organization. Dracunculiasis: global surveillance summary, 1993. Wkly Epidemiol Rec 1994;17:121–8.
3. CDC. Update: dracunculiasis eradication—Ghana and Nigeria, 1993. MMWR 1994;43:293–5.

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