CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

March 12, 1993 / Vol. 42 / No. 9

MMWR
MORBIDITY AND MORTALITY WEEKLY REPORT

Current Trends

Infant Mortality — United States, 1990

The infant mortality rate for the United States for 1990—9.2 infant deaths per 1000 live births—was the lowest rate ever recorded and represented a decrease of 6% from the rate of 9.8 for 1989. This report summarizes 1990 infant mortality data based on information from birth and death certificates compiled by CDC's National Center for Health Statistics' (NCHS) Vital Statistics System (*1*) and compares findings with those for 1989.

In this report, cause-of-death statistics are based on the underlying cause of death* reported on the death certificate by the attending physician, medical examiner, or coroner in a manner specified by the World Health Organization. Race for infant deaths is tabulated by race of decedent; race for live births (which comprise the denominator of infant mortality rates) is by race of mother. Race differences are given only for black and white infants because the Linked Birth/Infant Death Data Set—used to more accurately estimate infant mortality rates for other racial groups—was not yet available for 1989 and 1990.

A total of 38,351 infants died during 1990, compared with 39,655 during 1989. The mortality rate for black† infants in 1990 (18.0 per 1000) decreased 3% from the rate in 1989 (18.6 per 1000); for white† infants, the rate decreased 6% (from 8.1 in 1989 to 7.6 in 1990). From 1989 through 1990, the neonatal (infants aged <28 days) mortality rate decreased 6% (6.2 and 5.8 per 1000, respectively). For black infants, the rate decreased 3% (11.9 to 11.6); for white infants, the rate decreased 6% (5.1 to 4.8). The postneonatal (infants aged 28 days–11 months) mortality rate decreased 6%, from 3.6 in 1989 to 3.4 in 1990. For black infants, the postneonatal mortality rate decreased 4% (from 6.7 to 6.4), and for white infants, 3% (from 2.9 to 2.8).

From 1989 through 1990, the infant mortality rate decreased for eight of the 10 leading causes of infant death. The largest decreases were for respiratory distress syndrome (24%), accidents§ and adverse effects (9%), and sudden infant death syn-

*Defined by the World Health Organization's *International Classification of Diseases, Ninth Revision* as "(a) the disease or injury which initiated the train of morbid events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury."
†Includes Hispanic and non-Hispanic infants.
§When a death occurs under "accidental" circumstances, the preferred term within the public health community is "unintentional injury."

Infant Mortality — Continued

drome (SIDS) (7%). The two increases were for the categories of newborn affected by maternal complications of pregnancy (5%) and intrauterine hypoxia and birth asphyxia (2%).

The rank order of the 10 leading causes of infant death differed by race (Table 1). The first four leading causes of death were the same for black and white infants, although their rank order differed. These same four causes accounted for 49% of all deaths among black infants and for 56% of all deaths among white infants; the remaining six of the 10 leading causes accounted for 16% and 15% of the total deaths for black and white infants, respectively. For black infants, the leading cause of death was disorders relating to short gestation and unspecified low birthweight (LBW) (<2500 g at birth) (279.4 deaths per 100,000 live births), accounting for 16% of all deaths among black infants. For white infants, the leading cause of death was congenital anomalies (195.1 deaths per 100,000 live births), accounting for 26% of all deaths among white infants.

In 1990, the risk of dying within the first year of life was 2.4 times greater for black than for white infants. For each of the leading causes of death, the risk of death was higher for black than for white infants, although there were large variations in the magnitude of the excess by cause. The highest black-to-white rate ratios were associated with disorders relating to short gestation and unspecified LBW (4.6:1), pneumonia and influenza (3.0:1), respiratory distress syndrome and newborn affected by maternal complications of pregnancy (2.6:1 each), and infections specific to the perinatal period (2.5:1). The lowest ratios were associated with congenital anomalies (1.1:1) and SIDS and newborn affected by complications of placenta, cord, and membranes (2.1:1 each).

Three of the 10 leading causes of infant death accounted for 41% of the difference in infant mortality between black and white infants: disorders relating to short gestation and unspecified LBW (21%), SIDS (12%), and respiratory distress syndrome (8%).

Reported by: Div of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Vital Statistics, National Center for Health Statistics, CDC.

Editorial Note: Infant mortality is one of the most widely used general indices of health in the United States and other countries. The infant mortality rate in the United States remains higher than that in many other developed countries. In 1988 (the most recent year for which these data are available), the infant mortality rate in the United States ranked 23rd (*2*), a decline in rank from 1980 (20th) (*3*).

During the 1970s, the U.S. infant mortality rate decreased by 5% per year. However, the rate of decrease slowed to an annual average of 3% during 1980–1989. The decrease of 6% for 1989–1990 predominantly reflects the rapid decrease in mortality from respiratory distress syndrome (accounting for 36% of the decrease from 1989 to 1990)—possibly because of improvements in medical management of this condition (*4*).

Differences in infant mortality rates by race may reflect differences in factors such as socioeconomic status, access to medical care, and the prevalence of specific risks. For example, infants of mothers of low socioeconomic status are at increased risk of death (*5*). In 1990, nearly three times as many black as white infants (56% versus 20%) were members of families with incomes below the poverty level (Bureau of the Census, unpublished data, 1992). In addition, because of income differentials, black

Infant Mortality — Continued

TABLE 1. Number of infant deaths, mortality rate,* and percentage of deaths attributed to each cause, by race† — United States, 1990

Race/ Rank order§	Cause of death (ICD-9¶ code)	No.	Rate	% Distribution
BLACK				
1	Disorders relating to short gestation and unspecified low birthweight (765)	1,912	279.4	15.6
2	Sudden infant death syndrome (798.0)	1,578	230.6	12.8
3	Congenital anomalies (740–759)	1,530	223.6	12.4
4	Respiratory distress syndrome (769)	984	143.8	8.0
5	Newborn affected by maternal complications of pregnancy (761)	571	83.4	4.6
6	Infections specific to the perinatal period (771)	291	42.5	2.4
7	Newborn affected by complications of placenta, cord, and membranes (762)	291	42.5	2.4
8	Accidents** and adverse effects (E800–E949)	289	42.2	2.4
9	Pneumonia and influenza (480–487)	235	34.3	1.9
10	Intrauterine hypoxia and birth asphyxia (768)	231	33.8	1.9
	All other causes (residual)	4,378	639.7	35.6
All causes		**12,290**	**1,795.9**	**100.0**
WHITE				
1	Congenital anomalies (740–759)	6,418	195.1	25.8
2	Sudden infant death syndrome (798.0)	3,643	110.7	14.6
3	Disorders relating to short gestation and unspecified low birthweight (765)	2,004	60.9	8.1
4	Respiratory distress syndrome (769)	1,798	54.6	7.2
5	Newborn affected by maternal complications of pregnancy (761)	1,044	31.7	4.2
6	Newborn affected by complications of placenta, cord, and membranes (762)	657	20.0	2.6
7	Accidents** and adverse effects (E800–E949)	609	18.5	2.4
8	Infections specific to the perinatal period (771)	569	17.3	2.3
9	Intrauterine hypoxia and birth asphyxia (768)	505	15.3	2.0
10	Pneumonia and influenza (480–487)	375	11.4	1.5
	All other causes (residual)	7,261	220.7	29.2
All causes		**24,883**	**756.3**	**100.0**
TOTAL††				
1	Congenital anomalies (740–759)	8,239	198.1	21.5
2	Sudden infant death syndrome (798.0)	5,417	130.3	14.1
3	Disorders relating to short gestation and unspecified low birthweight (765)	4,013	96.5	10.5
4	Respiratory distress syndrome (769)	2,850	68.5	7.4
5	Newborn affected by maternal complications of pregnancy (761)	1,655	39.8	4.3
6	Newborn affected by complications of placenta, cord, and membranes (762)	975	23.4	2.5
7	Accidents** and adverse effects (E800–E949)	930	22.4	2.4
8	Infections specific to the perinatal period (771)	875	21.0	2.3
9	Intrauterine hypoxia and birth asphyxia (768)	762	18.3	2.0
10	Pneumonia and influenza (480–487)	634	15.2	1.7
	All other causes (residual)	12,001	288.6	31.3
All causes		**38,351**	**922.3**	**100.0**

*Deaths at <1 year of age per 100,000 live births in specified group.
†Race differences are given only for black and white infants because the Linked Birth/Infant Death Data Set—used to more accurately estimate infant mortality rates for other racial groups—was not yet available for 1990.
§Based on number of deaths.
¶*International Classification of Diseases, Ninth Revision*.
**When a death occurs under "accidental" circumstances, the preferred term within the public health community is "unintentional injury."
†† Includes races other than black and white.

Infant Mortality — Continued

women may be less likely to have health insurance that covers the costs of care for pregnancy and childbirth (*6*) and therefore unable to obtain adequate care (*7*).

LBW is an important intermediate variable between some risk factors and infant mortality. In 1987 (the latest year for which data are available), 6.9% of infants were born with LBW; however, 61% of all infant deaths occurred among these infants. In 1990, 13.3% of black infants were born with LBW, in comparison with 5.7% of white infants (*7*). Although race differentials in mortality from predominantly postneonatal causes of infant death (e.g., SIDS, accidents and adverse effects, and pneumonia and influenza) are important (*8*), most of the causes of death for which black infants are at substantially elevated risk of death are closely associated with LBW. For three of the four causes of infant death with the highest mortality rate ratios (i.e., disorders relating to short gestation and unspecified LBW, respiratory distress syndrome, and newborn affected by maternal complications of pregnancy), more than 95% of the 1987 deaths occurred among LBW infants (CDC, unpublished data, 1992).

One of the 1990 national health objectives was to reduce the overall infant mortality rate to 9.0 deaths per 1000 live births (*9*); the recorded rate of 9.2 for 1990 nearly reached that goal. A year 2000 national health objective is to reduce the overall infant mortality rate to no more than 7 per 1000 live births (objective 14.1) (*10*). If the average annual decrease of 3% for the total population during the 1980s continues, the overall infant mortality objective for the year 2000 will be achieved.

Strategies to achieve the national health objective for reducing infant mortality should consider the heterogeneity of factors accounting for infant mortality in the United States. For example, reducing mortality from disorders related to short gestation and unspecified LBW will require improved understanding of etiologic risk factors for preterm delivery. Reduction of deaths related to maternal complications of pregnancy and intrauterine hypoxia and asphyxia will require both expansion of access to prenatal care and assessment of the adequacy of the content of care (*11*). Continued high mortality rates from pneumonia and influenza and injury suggest that prevention programs should be universally available to assure vaccinations and to encourage the use of car seats and home-based prevention measures (*12*).

While total infant mortality declined in 1990, the gap in infant mortality between black and white infants increased—this pattern underscores the need to distinguish those factors associated with the decline from those factors that account for the disparity (*13*). Differences in socioeconomic status and access to care do not entirely explain the disparity (*14*), and suggest that other factors, which may not be available in routinely collected data, need to be examined.

References

1. NCHS. Advance report of final mortality statistics, 1990.Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1993.(Monthly vital statistics report; vol 41, no. 7, suppl).
2. NCHS. Health, United States, 1991. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1992; DHHS publication no. (PHS)92-1232.
3. NCHS. Health, United States, 1988. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1989; DHHS publication no. (PHS)89-1232.
4. Long W, Corbet A, Cotton R, et al. A controlled trial of synthetic surfactant in infants weighing 1250 g or more with respiratory distress syndrome. N Engl J Med 1991;325:1696–1703.
5. Gould JB, Davey B, LeRoy S. Socioeconomic differentials and neonatal mortality: racial comparison of California singletons. Pediatrics 1989;83:181–6.

Infant Mortality — Continued

6. Alan Guttmacher Institute. Blessed events and the bottom line: financing maternity care in the United States. New York: Alan Guttmacher Institute, 1987.
7. NCHS. Advance report of final natality statistics, 1990. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1993.(Monthly vital statistics report; vol 41, no. 9, suppl).
8. MacDorman MF, Rosenberg HM. Trends in infant mortality by cause of death and other characteristics, 1960–88. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1993. (Vital and health statistics; series 20, no. 20).
9. Public Health Service. The 1990 health objectives for the nation: a midcourse review. Washington, DC: US Department of Health and Human Services, Public Health Service, 1986.
10. Public Health Service. Healthy people2000: national health promotion and disease prevention objectives—full report, with commentary. Washington, DC: US Department of Health and Human Services, Public Health Service, 1991; DHHS publication no. (PHS)91-50212.
11. Public Health Service. Caring for our future: thecontent of prenatal care—a report of the Public Health Service Expert Panel on the Content of Prenatal Care. Washington, DC: US Department of Health and Human Services, Public Health Service, 1989.
12. Hinman AR. Immunizations in the United States. Pediatrics 1990;86:1064–6(suppl).
13. Wise P. The social context of race and infant mortality: history and public policy. Am J Prev Med (in press).
14. Schoendorf KC, Hogue CJR, Kleinman JC, Rowley D. Mortality among infants of black as compared with white college-educated parents. N Engl J Med 1992;326:1522–6.

Effectiveness in Disease and Injury Prevention

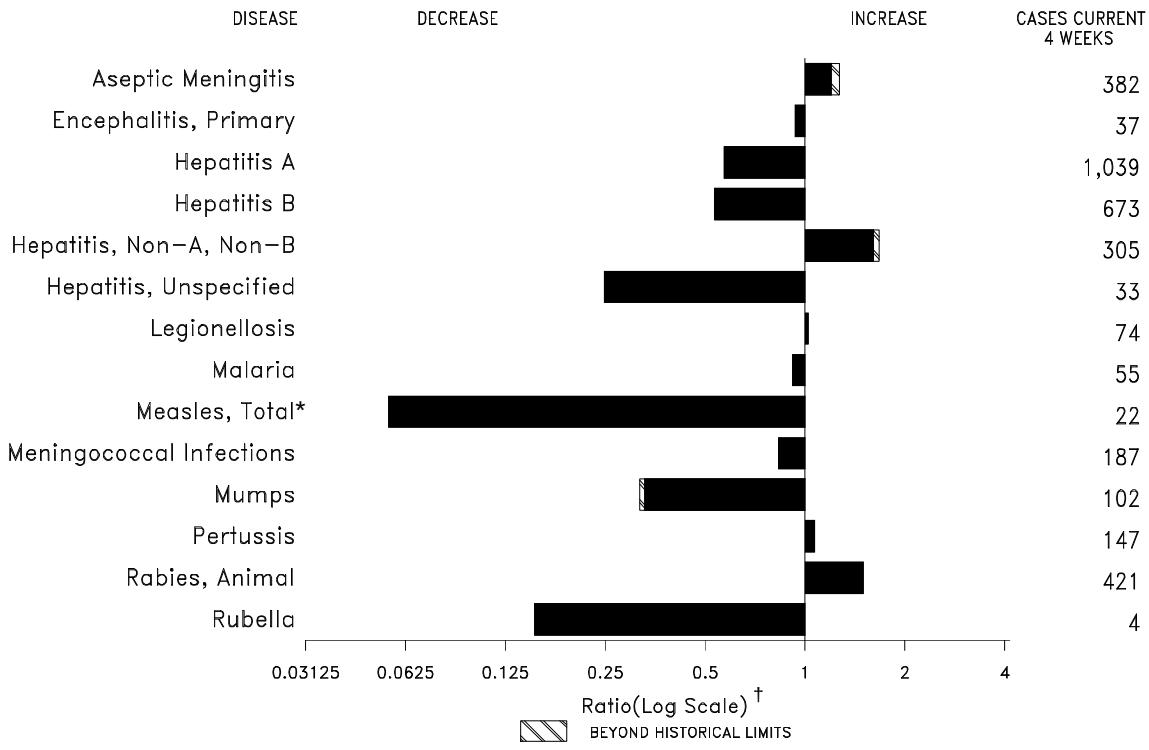
State Activities for Prevention of Lead Poisoning Among Children — United States, 1992

In 1990, an estimated 3 million children aged <6 years had blood lead levels (BLLs) >10 μg/dL (*1*)—levels associated with decreased intellectual performance and other adverse health events (*2,3*). During October 1991, CDC revised its childhood lead poisoning prevention policy statement (*4*); the recommendations included lowering the BLL of concern from 25 μg/dL to 10 μg/dL. To characterize efforts of state health agencies in lead-poisoning prevention and to assess the extent of implementation of the recommendations in the 1991 lead statement, in June 1992, the Lead Task Force of the Association of State and Territorial Health Officials (ASTHO) conducted a questionnaire survey of directors of public health in each of the 50 states. This report summarizes findings of the survey regarding screening issues, funding mechanisms, and follow-up of children with elevated BLLs.

In addition to lowering the BLL of concern, CDC's 1991 revised lead statement introduced a multitiered approach for environmental management (i.e., investigation of lead exposure and reduction of lead hazards) and medical follow-up based on an affected child's BLL; recommended a phase in of "virtually universal" screening (i.e., screening of all young children except those in communities where large numbers of children were previously screened and found not to have lead poisoning); and emphasized the importance of primary prevention (i.e., identification and remediation of lead hazards before children's BLLs increase). Because the erythrocyte protoporphyrin (EP) test that had been previously recommended for screening is not sufficiently sensitive for BLLs <25 μg/dL, measurement of blood lead was identified as the screening test of choice.

(Continued on page 171)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending March 6, 1993, with historical data — United States



*The large apparent decrease in 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 thehatched 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 6, 1993 (9th Week)

	Cum. 1993		Cum. 1993
AIDS*	10,300	Measles: imported	3
Anthrax	-	indigenous	38
Botulism: Foodborne	-	Plague	-
Infant	7	Poliomyelitis, Paralytic§	-
Other	1	Psittacosis	12
Brucellosis	8	Rabies, human	-
Cholera	2	Syphilis, primary & secondary	4,808
Congenital rubella syndrome	1	Syphilis, congenital, age < 1 year	-
Diphtheria	-	Tetanus	3
Encephalitis, post-infectious	24	Toxic shock syndrome	45
Gonorrhea	62,761	Trichinosis	5
Haemophilus influenzae (invasive disease)†	204	Tuberculosis	2,255
Hansen Disease	16	Tularemia	11
Leptospirosis	9	Typhoid fever	54
Lyme Disease	382	Typhus fever, tickborne (RMSF)	19

*Updated monthly; last update February 27, 1993.
†Of 186 cases of known age, 69 (37%) were reported among children less than 5 years of age.
§No cases of suspected poliomyelitis have been reported in 1993; 4 cases of suspected poliomyelitis were reported in 1992; 6 of the 9 suspected cases with onset in 1991 were confirmed; all were vaccine associated.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending March 6, 1993, and February 29, 1992 (9th Week)

Reporting Area	AIDS*	Aseptic Meningitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionellosis	Lyme Disease
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993
UNITED STATES	10,300	1,065	91	24	62,761	83,998	3,291	1,642	689	99	189	382
NEW ENGLAND	679	23	4	-	1,526	1,890	125	79	1	1	7	43
Maine	8	3	1	-	11	19	3	-	-	-	1	-
N.H.	47	1	-	-	9	31	2	11	-	-	-	5
Vt.	3	2	-	-	9	1	3	1	-	-	-	-
Mass.	403	15	3	-	573	697	73	59	1	1	5	14
R.I.	29	2	-	-	80	143	31	8	-	-	1	10
Conn.	189	-	-	-	844	999	13	-	-	-	-	14
MID. ATLANTIC	2,506	96	3	3	5,693	7,459	162	184	38	3	38	265
Upstate N.Y.	236	49	-	1	542	223	60	51	15	1	5	164
N.Y. City	1,841	5	-	-	1,541	3,969	10	1	-	-	-	-
N.J.	195	-	-	-	1,301	1,141	63	61	16	-	7	12
Pa.	234	42	3	2	2,309	2,126	29	71	7	2	26	89
E.N. CENTRAL	787	160	25	5	12,830	16,709	429	190	141	1	62	4
Ohio	137	64	10	-	4,503	5,031	80	50	14	-	34	4
Ind.	277	22	2	1	1,385	1,613	253	39	2	-	14	-
Ill.	106	22	2	-	3,892	4,916	54	16	2	-	-	-
Mich.	224	48	10	4	2,371	4,498	40	84	121	1	14	-
Wis.	43	4	1	-	679	651	2	1	2	-	-	-
W.N. CENTRAL	377	52	2	-	2,885	5,477	576	132	27	2	11	10
Minn.	209	4	2	-	320	503	67	8	1	1	-	1
Iowa	40	16	-	-	276	274	5	4	2	1	-	1
Mo.	40	14	-	-	1,536	3,664	392	105	17	-	3	-
N. Dak.	-	1	-	-	5	17	10	-	-	-	-	-
S. Dak.	17	2	-	-	30	39	8	-	-	-	-	-
Nebr.	26	1	-	-	-	8	68	2	6	-	6	-
Kans.	45	14	-	-	718	972	26	13	1	-	2	8
S. ATLANTIC	2,357	279	15	11	17,817	29,615	209	272	99	22	24	42
Del.	120	2	-	-	247	296	1	25	30	-	5	27
Md.	222	23	5	-	2,883	2,920	32	59	3	1	13	6
D.C.	176	7	-	-	1,152	1,428	1	5	-	-	3	1
Va.	20	38	5	3	1,139	3,786	30	22	4	11	-	3
W. Va.	3	4	4	-	119	163	-	4	2	3	-	1
N.C.	57	18	1	-	4,857	3,023	9	24	11	-	1	3
S.C.	54	1	-	-	1,178	1,899	2	7	-	-	-	-
Ga.	268	19	-	-	2,512	11,299	27	24	19	-	2	-
Fla.	1,437	167	-	8	3,730	4,801	107	102	30	7	-	1
E.S. CENTRAL	613	71	6	-	7,428	8,081	45	187	180	-	13	2
Ky.	53	35	2	-	842	881	24	19	3	-	2	-
Tenn.	196	16	4	-	2,231	2,489	10	147	174	-	9	1
Ala.	230	17	-	-	2,634	2,899	9	19	3	-	-	1
Miss.	134	3	-	-	1,721	1,812	2	2	-	-	2	-
W.S. CENTRAL	950	31	5	-	8,560	8,003	168	116	19	12	6	2
Ark.	127	6	-	-	1,043	1,654	9	10	1	-	-	1
La.	172	1	-	-	1,884	1,289	10	14	10	-	1	-
Okla.	108	-	3	-	448	890	13	20	7	1	5	1
Tex.	543	24	2	-	5,185	4,170	136	72	1	11	-	-
MOUNTAIN	695	52	5	3	1,740	2,007	651	99	51	22	17	1
Mont.	3	-	-	1	13	13	15	2	-	-	-	-
Idaho	20	2	-	-	19	22	52	6	-	1	1	-
Wyo.	18	-	-	-	10	6	3	3	15	-	2	1
Colo.	303	16	2	-	576	816	207	13	10	16	1	-
N. Mex.	78	11	1	2	184	143	50	42	16	-	-	-
Ariz.	31	14	2	-	579	655	191	22	5	3	5	-
Utah	77	1	-	-	45	30	123	3	4	2	1	-
Nev.	165	8	-	-	314	322	10	8	1	-	7	-
PACIFIC	1,336	301	26	2	4,282	4,757	926	383	133	36	11	13
Wash.	85	-	-	-	649	683	82	23	19	2	2	-
Oreg.	88	-	-	-	236	266	30	12	3	-	-	-
Calif.	1,149	285	23	2	3,236	3,593	661	341	109	33	8	13
Alaska	4	3	2	-	94	120	134	3	-	-	-	-
Hawaii	10	13	1	-	67	95	19	4	2	1	1	-
Guam	-	-	-	-	11	20	-	-	-	-	-	-
P.R.	522	15	-	-	73	15	6	44	3	-	-	-
V.I.	33	-	-	-	18	13	-	1	-	-	-	-
Amer. Samoa	-	-	-	-	5	5	3	-	-	-	-	-
C.N.M.I.	-	2	-	-	9	5	-	-	-	-	-	-

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

*Updated monthly; last update February 27, 1993.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending March 6, 1993, and February 29, 1992 (9th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1993	1993	Cum. 1993	1993	Cum. 1993	Cum. 1992	Cum. 1993	1993	Cum. 1993	1993	Cum. 1993	Cum. 1992	1993	Cum. 1993	Cum. 1992
UNITED STATES	119	4	38	1	3	253	393	29	248	43	378	183	1	16	26
NEW ENGLAND	20	-	21	1	1	4	25	1	2	10	80	13	-	1	4
Maine	-	-	-	-	-	-	2	-	-	-	3	1	-	1	-
N.H.	2	-	-	-	-	-	4	-	-	-	51	4	-	-	-
Vt.	-	-	18	1†	1	-	2	-	-	2	12	-	-	-	-
Mass.	9	-	-	-	-	2	16	1	1	8	11	8	-	-	-
R.I.	1	-	-	-	-	-	-	-	1	-	1	-	-	-	4
Conn.	8	-	3	-	-	2	1	-	-	-	2	-	-	-	-
MID. ATLANTIC	17	-	-	-	-	49	49	4	31	2	75	37	-	2	3
Upstate N.Y.	9	-	-	-	-	10	20	2	11	-	26	14	-	-	2
N.Y. City	2	-	-	-	-	17	3	-	-	-	-	2	-	-	-
N.J.	3	-	-	-	-	22	7	-	1	-	11	15	-	1	1
Pa.	3	-	-	-	-	-	19	2	19	2	38	6	-	1	-
E.N. CENTRAL	10	-	-	-	-	4	61	4	49	9	61	20	-	-	5
Ohio	3	-	-	-	-	3	19	1	24	9	48	2	-	-	-
Ind.	2	-	-	-	-	-	13	-	-	-	7	5	-	-	-
Ill.	3	-	-	-	-	-	18	-	6	-	-	5	-	-	5
Mich.	2	-	-	-	-	-	10	3	19	-	5	1	-	-	-
Wis.	-	-	-	-	-	1	1	-	-	-	1	7	-	-	-
W.N. CENTRAL	1	-	-	-	-	1	20	2	10	2	18	16	-	1	1
Minn.	-	-	-	-	-	1	2	-	-	-	-	2	-	-	-
Iowa	1	-	-	-	-	-	2	-	2	-	-	1	-	-	-
Mo.	-	-	-	-	-	-	7	2	5	-	8	8	-	1	-
N. Dak.	-	-	-	-	-	-	-	-	3	-	1	2	-	-	-
S. Dak.	-	-	-	-	-	-	1	-	-	-	1	1	-	-	-
Nebr.	-	-	-	-	-	-	-	-	-	-	3	2	-	-	-
Kans.	-	-	-	-	-	-	8	-	-	2	5	-	-	-	1
S. ATLANTIC	27	4	8	-	2	26	81	11	37	6	21	21	-	1	3
Del.	1	-	-	-	-	-	1	1	1	-	-	-	-	-	-
Md.	5	-	-	-	1	1	6	8	16	6	14	7	-	-	-
D.C.	5	-	-	-	-	-	3	-	-	-	-	-	-	-	1
Va.	1	-	-	-	1	4	7	-	9	-	1	2	-	-	-
W. Va.	-	-	-	-	-	-	2	-	2	-	1	-	-	-	-
N.C.	9	-	-	-	-	-	13	-	-	-	-	4	-	-	-
S.C.	-	-	-	-	-	-	7	-	1	-	-	6	-	-	-
Ga.	2	-	-	-	-	-	29	-	-	-	3	-	-	-	-
Fla.	4	4	8	-	-	21	13	2	8	-	2	2	-	1	2
E.S. CENTRAL	2	-	-	-	-	79	28	1	9	5	13	1	-	-	-
Ky.	-	-	-	-	-	63	6	-	-	-	3	-	-	-	-
Tenn.	-	-	-	-	-	-	9	1	4	4	5	-	-	-	-
Ala.	1	-	-	-	-	-	10	-	5	1	5	1	-	-	-
Miss.	1	-	-	-	-	16	3	-	-	-	-	-	-	-	-
W.S. CENTRAL	3	-	1	-	-	62	23	3	37	-	7	8	-	1	-
Ark.	1	-	-	-	-	-	2	-	2	-	-	3	-	-	-
La.	-	-	1	-	-	-	4	1	5	-	-	-	-	-	-
Okla.	1	-	-	-	-	-	3	-	2	-	7	5	-	1	-
Tex.	1	-	-	-	-	62	14	2	28	-	-	-	-	-	-
MOUNTAIN	5	-	3	-	-	-	32	1	24	3	29	19	-	2	-
Mont.	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
Idaho	-	-	-	-	-	-	1	-	3	1	4	4	-	1	-
Wyo.	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-
Colo.	3	-	2	-	-	-	5	-	4	-	11	6	-	-	-
N. Mex.	2	-	-	-	-	-	2	N	N	2	11	7	-	-	-
Ariz.	-	-	1	-	-	-	19	-	11	-	2	-	-	-	-
Utah	-	-	-	-	-	-	1	-	3	-	-	2	-	1	-
Nev.	-	-	-	-	-	-	-	1	3	-	-	-	-	-	-
PACIFIC	34	-	5	-	-	28	74	2	49	6	74	48	1	8	10
Wash.	2	-	-	-	-	7	6	-	6	3	5	7	-	-	-
Oreg.	1	-	-	-	-	-	9	N	N	-	-	4	-	1	-
Calif.	30	-	1	-	-	12	54	-	36	3	64	35	-	4	10
Alaska	-	-	-	-	-	9	4	-	2	-	1	-	-	1	-
Hawaii	1	-	4	-	-	-	1	2	5	-	4	2	1	2	-
Guam	-	U	-	U	-	4	-	U	2	U	-	-	U	-	-
P.R.	-	-	37	-	-	21	3	-	-	-	-	2	-	-	-
V.I.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Amer. Samoa	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	4	U	-	-	U	-	-

*For measles only, imported cases include both out-of-state and international importations.
N: Not notifiable U: Unavailable † International § Out-of-state

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending March 6, 1993, and February 29, 1992 (9th Week)

Reporting Area	Syphilis (Primary & Secondary)		Toxic-Shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993
UNITED STATES	4,808	6,092	45	2,255	2,538	11	54	19	944
NEW ENGLAND	81	129	5	24	21	-	6	2	202
Maine	2	-	1	3	-	-	-	-	-
N.H.	1	9	1	-	-	-	-	-	4
Vt.	-	-	-	-	-	-	-	-	3
Mass.	43	52	3	3	18	-	4	2	57
R.I.	2	9	-	-	-	-	-	-	-
Conn.	33	59	-	18	3	-	2	-	138
MID. ATLANTIC	347	795	9	462	616	-	5	2	327
Upstate N.Y.	21	56	5	30	87	-	1	-	241
N.Y. City	249	415	-	301	347	-	2	-	-
N.J.	61	107	-	69	91	-	1	2	67
Pa.	16	217	4	62	91	-	1	-	19
E.N. CENTRAL	672	826	13	277	290	2	5	-	4
Ohio	214	100	8	35	58	-	2	-	-
Ind.	63	39	1	26	27	1	1	-	-
Ill.	215	364	-	163	129	-	1	-	-
Mich.	129	185	4	41	66	1	1	-	-
Wis.	51	138	-	12	10	-	-	-	4
W.N. CENTRAL	262	205	3	35	66	1	-	-	58
Minn.	14	13	1	-	24	-	-	-	13
Iowa	15	3	1	5	4	-	-	-	8
Mo.	208	157	-	18	27	1	-	-	1
N. Dak.	-	1	-	-	2	-	-	-	13
S. Dak.	-	-	-	3	4	-	-	-	4
Nebr.	-	1	-	2	-	-	-	-	1
Kans.	25	30	1	7	5	-	-	-	18
S. ATLANTIC	1,376	1,667	6	308	451	-	9	2	270
Del.	23	40	-	-	7	-	-	-	22
Md.	71	131	-	57	47	-	3	-	85
D.C.	152	100	-	8	23	-	-	-	3
Va.	105	102	-	-	22	-	1	-	57
W. Va.	6	1	-	10	14	-	-	-	9
N.C.	400	391	2	63	67	-	-	2	5
S.C.	148	231	-	44	48	-	-	-	19
Ga.	240	379	-	126	97	-	1	-	70
Fla.	231	292	4	-	126	-	4	-	-
E.S. CENTRAL	615	803	1	136	176	3	1	3	12
Ky.	52	26	-	50	53	-	-	2	1
Tenn.	176	182	1	-	-	2	-	-	-
Ala.	162	381	-	68	68	1	1	-	11
Miss.	225	214	-	18	55	-	-	1	-
W.S. CENTRAL	1,193	807	-	177	152	3	1	10	53
Ark.	156	102	-	16	13	1	-	-	2
La.	441	420	-	-	-	-	1	-	-
Okla.	63	50	-	9	18	1	-	10	8
Tex.	533	235	-	152	121	1	-	-	43
MOUNTAIN	33	101	2	66	57	-	1	-	10
Mont.	-	2	-	-	-	-	-	-	2
Idaho	-	1	-	-	5	-	-	-	-
Wyo.	1	-	-	-	-	-	-	-	2
Colo.	10	18	1	-	5	-	-	-	-
N. Mex.	7	11	-	-	14	-	-	-	2
Ariz.	15	40	-	44	25	-	1	-	4
Utah	-	1	1	8	-	-	-	-	-
Nev.	-	28	-	14	8	-	-	-	-
PACIFIC	229	759	6	770	709	2	26	-	8
Wash.	10	20	-	37	31	-	-	-	-
Oreg.	13	12	-	9	8	-	-	-	-
Calif.	205	724	6	675	617	2	24	-	-
Alaska	-	-	-	3	13	-	-	-	8
Hawaii	1	3	-	46	40	-	2	-	-
Guam	-	1	-	1	10	-	-	-	-
P.R.	80	21	-	-	24	-	-	-	12
V.I.	11	11	-	1	1	-	-	-	-
Amer. Samoa	-	-	-	1	-	-	-	-	-
C.N.M.I.	-	1	-	1	4	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending March 6, 1993 (9th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	664	497	95	44	12	16	78
Boston, Mass.	206	138	35	19	8	6	31
Bridgeport, Conn.	46	32	6	5	-	3	3
Cambridge, Mass.	36	32	3	1	-	-	5
Fall River, Mass.	33	29	3	1	-	-	1
Hartford, Conn.	31	21	6	2	-	2	1
Lowell, Mass.	25	22	1	-	2	-	4
Lynn, Mass.	18	13	4	1	-	-	-
New Bedford, Mass.	36	27	6	3	-	-	-
New Haven, Conn.	43	29	6	5	1	2	9
Providence, R.I.	43	34	7	2	-	-	6
Somerville, Mass.	13	11	1	-	1	-	2
Springfield, Mass.	30	26	1	1	-	2	3
Waterbury, Conn.	34	28	4	1	-	1	1
Worcester, Mass.	70	55	12	3	-	-	12
MID. ATLANTIC	3,309	2,273	589	310	63	72	205
Albany, N.Y.	62	47	8	4	1	2	4
Allentown, Pa.	24	17	7	-	-	-	-
Buffalo, N.Y.	107	77	20	5	4	1	3
Camden, N.J.	52	33	7	7	2	3	1
Elizabeth, N.J.	24	13	8	3	-	-	1
Erie, Pa.§	45	35	5	4	-	1	4
Jersey City, N.J.	55	44	6	4	-	1	4
New York City, N.Y.	1,946	1,309	349	210	32	46	117
Newark, N.J.	64	22	22	11	3	6	4
Paterson, N.J.	34	19	8	4	2	1	3
Philadelphia, Pa.	393	273	70	29	14	5	24
Pittsburgh, Pa.§	98	67	21	5	1	4	5
Reading, Pa.	18	16	1	-	1	-	1
Rochester, N.Y.	152	124	19	7	1	1	9
Schenectady, N.Y.	24	14	7	3	-	-	1
Scranton, Pa.§	36	31	2	3	-	-	4
Syracuse, N.Y.	91	64	18	8	1	-	8
Trenton, N.J.	27	17	6	3	-	1	3
Utica, N.Y.	20	18	1	-	1	-	3
Yonkers, N.Y.	37	33	4	-	-	-	6
E.N. CENTRAL	2,363	1,573	405	210	93	82	153
Akron, Ohio	80	52	18	4	4	2	4
Canton, Ohio	51	46	4	1	-	-	7
Chicago, Ill.	359	154	67	75	43	20	12
Cincinnati, Ohio	228	173	32	10	7	6	25
Cleveland, Ohio	139	96	27	10	2	4	3
Columbus, Ohio	201	140	37	11	7	6	12
Dayton, Ohio	132	103	15	7	3	4	7
Detroit, Mich.	279	167	53	37	9	13	12
Evansville, Ind.	51	34	11	1	3	2	5
Fort Wayne, Ind.	64	50	7	5	-	2	4
Gary, Ind.	14	4	4	6	-	-	1
Grand Rapids, Mich.	38	26	7	3	-	2	5
Indianapolis, Ind.	177	114	39	14	2	8	13
Madison, Wis.	44	29	9	1	2	3	2
Milwaukee, Wis.	173	126	32	8	3	4	16
Peoria, Ill.	32	25	5	-	2	-	2
Rockford, Ill.	70	51	11	5	1	2	11
South Bend, Ind.	53	45	5	2	-	1	2
Toledo, Ohio	114	82	16	10	4	2	7
Youngstown, Ohio	64	56	6	-	1	1	3
W.N. CENTRAL	872	645	134	51	20	22	57
Des Moines, Iowa	91	68	12	6	1	4	10
Duluth, Minn.	23	17	4	2	-	-	-
Kansas City, Kans.	32	18	9	3	2	-	1
Kansas City, Mo.	119	87	19	7	2	4	9
Lincoln, Nebr.	43	30	7	3	1	2	4
Minneapolis, Minn.	201	147	29	13	5	7	10
Omaha, Nebr.	91	66	15	6	1	3	8
St. Louis, Mo.	150	120	19	7	3	1	-
St. Paul, Minn.	53	40	11	1	1	-	12
Wichita, Kans.	69	52	9	3	4	1	3

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,348	869	265	149	33	32	85
Atlanta, Ga.	190	110	39	27	8	6	5
Baltimore, Md.	162	106	28	23	2	3	17
Charlotte, N.C.	98	61	24	9	3	1	4
Jacksonville, Fla.	136	92	28	9	3	4	7
Miami, Fla.	109	74	18	12	3	2	1
Norfolk, Va.	68	46	9	7	1	5	8
Richmond, Va.	74	48	22	3	1	-	5
Savannah, Ga.	50	36	11	1	2	-	2
St. Petersburg, Fla.	61	50	7	2	1	1	1
Tampa, Fla.	177	120	32	14	3	8	23
Washington, D.C.	202	110	45	39	6	2	8
Wilmington, Del.	21	16	2	3	-	-	4
E.S. CENTRAL	832	548	175	58	27	24	62
Birmingham, Ala.	87	55	14	6	5	7	1
Chattanooga, Tenn.	82	54	19	3	5	1	6
Knoxville, Tenn.	80	54	17	6	3	-	9
Lexington, Ky.	43	31	8	2	1	1	7
Memphis, Tenn.	197	122	41	17	4	13	18
Mobile, Ala.	113	79	19	9	6	-	7
Montgomery, Ala.	56	45	9	2	-	-	2
Nashville, Tenn.	174	108	48	13	3	2	12
W.S. CENTRAL	1,455	928	274	162	57	34	93
Austin, Tex.	76	53	15	6	1	1	6
Baton Rouge, La.	30	23	4	2	1	-	2
Corpus Christi, Tex.	48	31	8	5	2	2	1
Dallas, Tex.	240	153	42	34	8	3	6
El Paso, Tex.	124	80	26	11	4	3	9
Ft. Worth, Tex.	107	75	12	12	4	4	9
Houston, Tex.	412	227	93	59	24	9	42
Little Rock, Ark.	36	22	5	4	2	3	2
New Orleans, La.	61	33	13	10	4	1	-
San Antonio, Tex.	195	142	32	11	6	4	9
Shreveport, La.	14	11	1	1	-	1	1
Tulsa, Okla.	112	78	23	7	1	3	6
MOUNTAIN	783	568	132	55	16	12	60
Albuquerque, N.M.	72	47	11	9	2	3	5
Colo. Springs, Colo.	70	48	15	6	-	1	6
Denver, Colo.	U	U	U	U	U	U	U
Las Vegas, Nev.	172	118	42	10	2	-	6
Ogden, Utah	27	22	2	1	-	2	5
Phoenix, Ariz.	165	118	25	15	3	4	14
Pueblo, Colo.	27	21	4	1	1	-	2
Salt Lake City, Utah	94	69	11	7	5	2	9
Tucson, Ariz.	156	125	22	6	3	-	13
PACIFIC	2,138	1,461	349	225	50	46	148
Berkeley, Calif.	18	12	3	3	-	-	1
Fresno, Calif.	103	69	17	10	1	6	9
Glendale, Calif.	25	22	2	1	-	-	1
Honolulu, Hawaii	106	79	18	5	1	3	6
Long Beach, Calif.	76	57	12	4	1	2	7
Los Angeles, Calif.	615	389	108	85	22	4	30
Pasadena, Calif.	38	25	5	5	1	2	3
Portland, Oreg.	128	98	15	4	5	6	4
Sacramento, Calif.	148	100	25	18	2	3	16
San Diego, Calif.	164	103	25	22	6	8	17
San Francisco, Calif.	166	104	27	29	1	5	5
San Jose, Calif.	202	144	35	19	3	1	30
Santa Cruz, Calif.	30	24	4	1	-	1	2
Seattle, Wash.	157	104	30	15	7	1	3
Spokane, Wash.	67	56	9	1	-	1	8
Tacoma, Wash.	95	75	14	3	-	3	6
TOTAL	13,764¶	9,362	2,418	1,264	371	340	941

*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.

Lead Poisoning — Continued

Although 48 states responded to the survey, not all respondents answered every question. Of 48 respondents, 21 (44%) had implemented or were planning to implement the revised guidelines within 1 year, 18 (38%) planned to phase in the guidelines over several years, and nine (19%) had no plans to implement the guidelines. Thirty-seven (80%) of 46 states are coordinating prevention activities with housing and environmental agencies. Of 47 respondents, 19 (40%) maintain a system at the state level for monitoring health and environmental follow-up of children with elevated BLLs.

Major barriers to establishing virtually universal screening were a lack of financial support for blood lead screening (67%); inadequate funding for abatement (65%); insufficient resources for environmental follow-up (40%); a lack of interest in and/or support for the CDC guidelines by the health-care community (38%); absence of a state law mandating screening (35%); and insufficient laboratory capacity for analyzing blood lead samples (29%).

Approaches for statewide screening included use of well-child clinics, community health centers, the Special Supplemental Food Program for Women, Infants, and Children (WIC), and Head Start programs. Thirty-seven (86%) of 43 states reported that the Early and Periodic Screening, Diagnostic, and Treatment program was important for providing statewide screening.

Primary screening methods reported by 44 states were blood lead testing (70%), both blood lead testing and EP (23%), and EP only (7%). Of 35 respondents, 22 (63%) reported the primary screening test used by pediatricians was blood lead tests, 12 (34%) reported that pediatricians used both blood lead testing and EP, and one (3%) reported that pediatricians used EP.

Twenty-eight (58%) of 48 states provided information on their ability to assure medical and environmental follow-up of children consistent with the multitiered approach outlined in the 1991 statement. Eighty-six percent of respondent states reported that medical and environmental management as recommended by CDC was provided for more than half of children with BLLs ≥20 μg/dL. One fourth reported that more than 50% of children with BLLs 10–19 μg/dL received follow-up activities consistent with CDC recommendations.

States used multiple financial mechanisms to fund lead poisoning prevention activities. Among 45 states reporting information on funding for blood lead screening, 91% used federal funds; 53%, state funds; and 29%, local funds. Among 40 states providing information on financial mechanisms to support environmental investigations, 70% used federal funds and 58% used state funds. Among 37 states reporting funding information on medical follow-up, 92% used federal funds; 49%, state funds; 41%, client copayment; and 35%, reimbursement from private insurance. Only 23 (48%) states provided information on sources of funding for lead abatement. The principal methods of supporting these activities were local funds and "other" resources (e.g., money spent by owners of property with lead hazards).

Reported by: DB Fischer, JD, A Boyer, Lead Poisoning Task Force, Association of State and Territorial Health Officials. Lead Poisoning Prevention Br, Div of Environmental Hazards and Health Effects, National Center for Environmental Health, CDC.

Editorial Note: The lead survey conducted by ASTHO is the first systematic assessment of lead poisoning prevention activities at state health agencies since the October 1991 lead statement. However, the survey focused on statewide programs and activi-

Lead Poisoning — Continued

ties, and the findings may not reflect prevention efforts conducted by local health departments.

The 1991 lead statement underscored the need for state and local health departments to implement virtually universal screening and to assure follow-up at BLLs lower than previously recommended. The findings in this report indicate that most states are implementing the new guidelines and identifying aspects that require strengthened efforts or resources.

When the 1991 lead statement was released, EP testing was widely used to screen children. Although most public and private health-care providers appear to be screening children with blood lead tests, the findings in this report indicate EP testing is still being performed and underscore the need for continued efforts to phase in blood lead testing.

Collection of state-level data to monitor health-care and environmental management of children with elevated BLLs was reported by only 40% of respondents. However, such data are useful for facilitating coordination and allocation of resources and assuring implementation of prevention programs. Case-management software, such as CDC-developed System for Tracking Elevated Lead Levels and Remediation (STELLAR), can facilitate data management. Additional information about STELLAR is available from CDC's Lead Poisoning Prevention Branch, Division of Environmental Hazards and Health Effects, National Center for Environmental Health, Mailstop F-42, 4770 Buford Highway, NE, Atlanta, GA 30341-3724.

CDC is providing resources to assist with the development of "balanced" programs at the state and local level; such programs integrate activities for screening, environmental inspections, health-care case-management and environmental follow-up, education, and data collection and management. Primary and secondary prevention of childhood lead poisoning relies on funding for lead-hazard reduction; during fiscal year 1992, the U.S. Department of Housing and Urban Development awarded funds to 10 state and local agencies for abatement activities.

CDC plans to revise the 1991 lead statement to incorporate new scientific data and to account for recent changes in approaches to environmental hazard reduction. The findings in this report have assisted in identifying potential barriers to the implementations of recommendations in the lead statement.

References

1. US Environmental Protection Agency. Strategy for reducing lead exposures. Washington, DC: US Environmental Protection Agency, 1992.
2. Baghurst PA, McMichael AJ, Wigg NR, et al. Environmental exposure to lead and children's intelligence at the age of seven years. N Engl J Med 1992;327:1279–84.
3. Mushak P, Davis JM, Crocetti AF, Grant LD. Prenatal and postnatal effects of low-level lead exposure: integrated summary of a report to the U.S. Congress onchildhood lead poisoning. Environ Res 1989;50:11–36.
4. CDC. Preventing lead poisoning in young children: a statement by the Centers for Disease Control, October 1991. Atlanta: US Department of Health and Human Services, Public Health Service, 1991.

Epidemiologic Notes and Reports

False-Positive Serologic Tests for Human T-Cell Lymphotropic Virus Type I Among Blood Donors Following Influenza Vaccination, 1992

From October 31 through December 15, 1991, 10 blood donors to the American Red Cross Blood Services, Badger Region (ARCBS)*, were found to have false-positive screening enzyme-linked immunosorbent assays (ELISAs) for antibodies to two or more of the following viruses: human immunodeficiency virus type 1 (HIV-1), human T-cell lymphotrophic virus type 1 (HTLV-I), and hepatitis C virus (HCV) (*1*). An investigation by the Division of Health, Wisconsin Department of Health and Social Services (WDOH), and the ARCBS indicated that the risk for false-positive reactivity was associated with antecedent receipt of influenza vaccine formulated for the 1991–92 season (*1*). In March 1992, the ARCBS began use of newly available ELISAs for anti-HIV (HIVAB, HIV-1/HIV-2 (rDNA) EIA [Abbott Laboratories,† Abbott Park, Illinois]) and anti-HCV (HCV 2.0 ELISA [Ortho Diagnostic Systems, Raritan, New Jersey]), while continuing to test with the ELISA for anti-HTLV-I [HTLV-I ELISA (Abbott Laboratories) used in 1991. From January 1 through October 13, 1992, the ARCBS identified 19 blood donors with repeatedly reactive ELISAs for HTLV-I. However, from October 14 through November 10, 15 false-positive ELISAs for HTLV-I were reported by the ARCBS to the WDOH. As a result of this increase, the ARCBS conducted a case-control study to assess the relation between influenza vaccination and testing positive for HTLV-I. This report summarizes the results of the study.

A case-donor was defined as a donor of blood to the ARCBS during the study period who had repeatedly reactive ELISAs for HTLV-I on a single donated specimen that were unconfirmed for anti-HTLV-I on supplemental assays including Western blot (WB) assay. During the study period, there were 15 case-donors; anti-HTLV-I WB assay was negative for 11 and indeterminate for four. No case-donor had a reactive ELISA for HIV-1 or HCV. Thirty control-donors who had been randomly selected from donors of blood during the study interval were seronegative for all viral serologic tests.

During November 20 through November 23, 1992, the 15 case-donors and 30 control-donors were interviewed regarding receipt of influenza, tetanus, measles-mumps-rubella, hepatitis B, rubella (single antigen), poliomyelitus, and pneumococcal vaccines during the 12 months before their donation of blood during the study interval. Donors acknowledging receipt of a vaccine were questioned regarding date of vaccination. Twelve case-donors reported they had been vaccinated against influenza before index donation, compared with two control-donors (odds ratio=56; 95% confidence interval [CI]=6–704). Among the 12 case-donors who had received influenza vaccine, 11 had negative WB assays for HTLV-I, and the mean time between influenza vaccination and blood donation was 15 days (range: 5–26 days). The intervals for the two control-donors who received influenza vaccine were 15 and 20 days.

*An area comprising approximately 2.5 million persons residing in parts of Illinois, Iowa, Michigan, Minnesota, and Wisconsin.

† Use of trade names and commercial sources is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Serologic Tests — Continued

Review of 397 blood-donation records randomly sampled from records of the 12,221 donors of blood to the ARCBS during the study period indicated that 15 (3.8% [95% CI=2.0%–5.7%]) blood donors reported antecedent receipt of influenza vaccination during the 12 months before blood donation. Based on these findings, an estimated 244–696 persons who donated blood during the study period may have been vaccinated against influenza before blood donation. Because 12 case-donors received influenza vaccination this season before blood donation, an estimated 1.7% (12 of 696) to 4.9% (12 of 244) of blood donors who recently received influenza vaccination before blood donation will have false-positive ELISAs for HTLV-I.

Reported by: BS Zarvan, AJ Hibbard, MD, G Becker, MD, American Red Cross Blood Services, Badger Region, Madison; JP Davis, MD, State Epidemiologist, Div of Health, Wisconsin Dept of Health and Social Svcs. Epidemiology Activity, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases; Div of Field Epidemiology, Epidemiology Program Office, CDC.

Editorial Note: The findings in this report indicate that false-positive ELISA reactivity for antibody to HTLV-I among blood donors in the Badger Region was associated with antecedent receipt of 1992–93 influenza virus vaccine (IVV). When July/August was compared with October/November, the proportion of blood donors with false-positive HTLV-I antibody screening tests more than doubled (0.032% to 0.083%) (American Red Cross National Reference Laboratory for Infectious Diseases, unpublished data, 1992). Because review of blood-donation records underestimates the actual number of blood donors vaccinated against influenza, the findings in this report probably overestimate the actual incidence of false-positive ELISAs for HTLV-I among influenza vaccine recipients.

The association between recent IVV and temporary false-positive ELISAs for antibodies to multiple viruses was first described in 1991 (*1*). Because IVVs are sterile suspensions, there is no risk of contracting any viral infection from these vaccines (*2*). The false-positive reactivity for antibodies to HIV, HTLV-I, and hepatitis C in association with influenza vaccination observed in 1991 has been attributed to serum immunoglobin M (IgM) (which is not specific for these viruses) binding to and cross-reacting with test kit components (*3*).

In early 1992, ELISA test kits for HIV and hepatitis C used in blood banks were replaced by new kits that appear to reduce—and may eliminate—nonspecific IgM cross-reactivity. However, similar changes have not yet been implemented for HTLV-I test kits. Consequently, although there was no recurrence of a seasonal increase of multiple false-positive viral screening tests among blood donors in the Badger Region in the fall of 1992, the findings in this report suggest a small percentage of blood donors who were recently vaccinated against influenza had false-positive anti-HTLV-I screening tests during the 1992–93 influenza season.

In accordance with an American Red Cross directive, Red Cross blood centers in the United States notify a blood donor with a repeatedly reactive ELISA for HTLV-I antibody and an indeterminate or positive WB assay. These donors are indefinitely deferred from blood donation. Blood components from a donor who has a repeatedly reactive ELISA for HTLV-I antibody and a negative WB assay are discarded, but the donor remains eligible for future blood donation if subsequently donated blood is negative by the anti-HTLV-I ELISA. If any subsequent blood donation is ELISA-reactive for HTLV-I antibody, the blood donor is notified and indefinitely deferred from blood donation regardless of the WB assay result. Because the duration of false HTLV-I reac-

Serologic Tests — Continued

tivity following influenza vaccination is likely to be less than 4 months, the risk of false reactivity occurring during subsequent blood donations is less likely. Efforts to decrease the false HTLV-I reactivity for influenza-vaccinated donors are under way.

References

1. MacKenzie W, Davis JP, Peterson DE, Hibbard AJ, Becker G, Zarvan BS. Multiple false-positive serologic tests for HIV, HTLV-I, and hepatitis C following influenza vaccination, 1991. JAMA 1992;268:1015–7.
2. ACIP. Prevention and control of influenza. MMWR 1992;41(no. RR-9).
3. Stramer SL, Dillender MJ, Pendy LM, Holzer TJ, Abbott Laboratories. False positive EIA reactivity in multiple blood bank screening assays is due to non-specific binding of IgM [Abstract no. S111]. Transfusion 1992;32(suppl):30S.

The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available on a paid subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone (202) 783-3238.

The data in the weekly *MMWR* 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. Inquiries about the *MMWR* Series, including material to be considered for publication, should be directed to: Editor, *MMWR* Series, Mailstop C-08, Centers for Disease Control and Prevention, Atlanta, GA 30333; telephone (404) 332-4555.

☆**U.S. Government Printing Office: 1993-733-131/67066 Region IV**