CENTERS FOR DISEASE CONTROL

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Health Objectives for the Nation

Introduction

This issue of the MMWR *introduces a new series, "Health Objectives for the Nation." Future articles will address efforts by health agencies at all levels to meet national objectives and by the public and private sectors to develop and implement comparable prevention and health promotion objectives. This first article provides background to the origin of national health objectives, outlines the process used to develop the objectives, lists the broad categories of objectives, and describes an approach to implementing the objectives.*

Year 2000 National Health Objectives

In July 1979, the publication *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention* described for the first time a national public health agenda. This report established five quantifiable goals for improving the health of all Americans and documented the importance of disease prevention and health promotion in achieving these goals (*1*). In 1980, a companion piece—*Promoting Health/Preventing Disease: Objectives for the Nation*—set forth 226 specific, measurable health objectives in a plan of action for reaching these goals (*2*). These objectives, referred to as "the 1990 health objectives," called for improvements in health status, risk reduction, public and professional awareness, health services and protective measures, and surveillance and evaluation.

Successes in attaining these objectives have been documented in areas such as hypertension, childhood infectious diseases, and injury prevention (*3–5*). However, many of the objectives will not be met by 1990, and new public health problems and challenges have arisen. Therefore, in 1987, the Public Health Service (PHS) began developing the Year 2000 Objectives for the Nation.

The planning process for these new objectives has taken into account the need to 1) involve as many groups as possible in early stages, 2) set objectives addressing high-risk minority populations and specific age groups when appropriate, and 3) emphasize the roles for citizens, the private sector, and the public sector in meeting the objectives.

National Health Objectives — Continued

Process

To ensure a broad base of input, PHS and the Institute of Medicine invited more than 300 national organizations and the state and territorial health departments to join a consortium to develop the year 2000 objectives. Regular mailings and meetings are used to sustain the participation of these organizations. Twenty-five public hearings provided a forum for persons and organizations in different areas of the country to participate in the process and make recommendations; PHS narrowed the list of recommendations to 21 priority areas (Table 1). Specific PHS agencies then drafted objectives in each priority area using work groups made up of subject-area experts from federal, state, and local agencies and from academia. Each work group used the testimony from the public hearings in writing the objectives.

In January 1989, a draft of the objectives developed by the work groups was sent to other experts, both within and outside the federal government, for critical review. The revised objectives were then sent to the Office of Disease Prevention and Health Promotion, Office of the Assistant Secretary for Health (which is coordinating the process), for incorporation into the draft publication *Promoting Health/Preventing Disease: Year 2000 Objectives for the Nation* (*6*). More than 7000 persons and organizations have participated in developing the draft now available for review.

On September 18, PHS solicited public review of and comment on the objectives, with a November 15 deadline (*7*). A national conference is planned for July 1990 to release the final *Year 2000 Objectives for the Nation* and to begin the decade-long implementation effort.

Goals and Objectives

The draft *Year 2000 Objectives* proposes five specific, measurable goals—similar to those set forth in *Healthy People* in 1979—that the comprehensive set of objectives in the 21 priority areas is designed to achieve by the year 2000 (*6*):

- Reduce infant mortality to no more than seven deaths per 1000 live births (baseline: 10.4 per 1000 in 1986).
- Increase life expectancy to at least 78 years (baseline: 74.9 years in 1987).
- Reduce disability caused by chronic conditions to a prevalence of no more than 6% of all persons (age-adjusted baseline: 8.9%).
- Increase years of healthy life to at least 65 years (baseline: an estimated 60 years in 1987).
- Decrease disparity in life expectancy between white and minority populations to no more than 4 years (baseline: 5.8 years in 1987).

The 21 priority areas have served as a framework for drafting the year 2000 objectives. These priority areas include many of the 15 areas established for 1990 and extend into additional areas, such as human immunodeficiency virus (HIV) infection, cancer, and the vitality and functional independence of older people (Table 1). The priority areas and the specific objectives under each are grouped into four major sections in the publication: Health Promotion, Health Protection, Preventive Services, and System Improvement Priorities.

The year 2000 draft contains 339 objectives (compared with the 226 objectives established for 1990) characterized by 1) an increased emphasis on prevention of disability and morbidity, 2) greater attention to improvements in the health status of specific groups at highest risk for premature death, disease, and disability, and 3) inclusion of more screening interventions to detect asymptomatic diseases and conditions early enough to prevent early death or disability.

National Health Objectives — Continued

Specific targets for special populations were developed for groups demonstrating higher risk than the general population for a particular disease or condition. These groups start at a lower baseline for the health condition and thus are at a disadvantage in attaining the same target level as the general population. For example, the draft objective on the initiation of smoking aims to reduce the proportion of youth who start to smoke from 29.5% in 1987 to no more than 15%. However, a special-

TABLE 1. Year 2000 national health objectives, priority areas, and Public Health Service lead agencies

Priority areas	Lead agencies
HEALTH PROMOTION	
1. Nutrition	Food and Drug Administration National Institutes of Health
2. Physical Activity and Fitness	President's Council on Physical Fitness and Sports
3. Tobacco	Centers for Disease Control
4. Alcohol and Other Drugs	Alcohol, Drug Abuse, and Mental Health Administration
5. Sexual Behavior	Office of Population Affairs
6. Violent and Abusive Behavior	Centers for Disease Control
7. Vitality and Functional Independence of Older People	National Institutes of Health
HEALTH PROTECTION	
8. Environmental Health	National Institutes of Health Centers for Disease Control
9. Occupational Safety and Health	Centers for Disease Control
10. Unintentional Injuries	Centers for Disease Control
PREVENTIVE SERVICES	
11. Maternal and Infant Health	Health Resources and Services Administration
12. Immunization and Infectious Diseases	Centers for Disease Control
13. Human Immunodeficiency Virus Infection	National AIDS Program Office
14. Sexually Transmitted Diseases	Centers for Disease Control
15. High Blood Cholesterol and High Blood Pressure	National Institutes of Health
16. Cancer	National Institutes of Health
17. Other Chronic Disorders	National Institutes of Health Centers for Disease Control
18. Oral Health	National Institutes of Health Centers for Disease Control
19. Mental and Behavioral Disorders	Alcohol, Drug Abuse, and Mental Health Administration
SYSTEM IMPROVEMENT PRIORITIES	
20. Health Education and Preventive Services	Health Resources and Services Administration Centers for Disease Control
21. Surveillance and Data Systems	Centers for Disease Control

National Health Objectives — Continued

population target of 20% is set for youth of low socioeconomic status whose baseline rate was 40% in 1987.

Implementing the Objectives

Because many states and communities may wish to develop and attain their own health objectives relating to the year 2000, PHS is working with the Model Standards Project through the American Public Health Association to develop a community implementation workbook. The workbook will integrate the national health objectives with the approaches of the publication *Model Standards: A Guide for Community Preventive Health Services* (*8*) to enable state and local health agencies to tailor the national objectives to their specific local health and demographic needs. The workbook is scheduled for release in the fall of 1990, as a companion to the *Year 2000 Objectives for the Nation.*

Reported by: Office of Disease Prevention and Health Promotion, Office of the Assistant Secretary for Health, US Dept of Health and Human Svcs. Office of Program Planning and Evaluation, Office of the Director, CDC.

Editorial Note: The 1979 publication *Healthy People* is a landmark in the history of public health. At the time, the Secretary of Health, Education, and Welfare characterized this report as a document "to encourage a second public health revolution" (*1*) and suggested that it reflected an emerging consensus among the health community that the nation's health strategy must emphasize the prevention of disease.

Public health efforts at the local, state, and national levels have resulted in documented progress toward meeting many objectives, but improvement is still needed in others. For example, by 1987, considerable progress had been made toward the objectives related to childhood vaccines even though the goal of immunizing children by the earliest appropriate year (age 2) had not been reached. Five of the eight objectives addressing morbidity reduction from childhood vaccine-preventable diseases appeared to have been attained, including those for diphtheria (1990 target, 50 cases; 1987 level, three cases), poliomyelitis (target, 10; level, no cases), and tetanus, rubella, and congenital rubella syndrome (all of which fell below the 1990 target in 1987). In contrast, immunization targets for adults were not likely to be achieved. The 1990 objective for influenza vaccination targeted immunization of at least 60% of high-risk populations annually. However, the 1985 U.S. Immunization Survey showed that only about 20% of high-risk persons had received the vaccine during the preceding year (*4*).

The draft *Year 2000 Objectives* affirms the commitment to addressing public health problems that persist, as well as problems that have appeared or intensified since the inception of the national health objectives in the late 1970s. For example, the current document contains a section on HIV, which was unknown when the 1990 objectives were developed.

The extensive participation by representatives of state and local governments, academic institutions, business and labor, and community and professional organizations at each step in the process is helping to establish the broad network needed for successful implementation of programs. This network is vital to the efforts to meet the objectives, as well as to achieve the goal of the World Health Organization of "Health for All by the Year 2000."

National Health Objectives — Continued

PHS welcomes comments on the draft objectives. The draft is available for public review from ODPHP National Health Information Center, P.O. Box 1133, Washington, DC 20013-1133; telephone (301) 565-4167 or (800) 336-4797. Comments should be sent by November 15, 1989, to:

Deputy Assistant Secretary for Health
(Disease Prevention and Health Promotion)
U.S. Department of Health and Human Services
330 C Street, S.W., Room 2132
Washington, DC 20201

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Current Trends

Contribution of Birth Defects to Infant Mortality — United States, 1986

As infant mortality in the United States has declined during the 20th century, the proportion of infant deaths attributed to birth defects has increased steadily (*1*) (Figure 1). Birth defects also contribute substantially to years of potential life lost before age 65 (*2*).

To evaluate the contribution of birth defects to infant mortality in the United States, mortality data for 1986 from CDC's National Center for Health Statistics were analyzed. Birth defects were defined as conditions coded within Congenital Anomalies (740.0–759.9) of the *International Classification of Diseases, Ninth Revision* (ICD-9). Excluded from this group were 460 babies with lung hypoplasia (748.5),

Birth Defects — Continued

patent ductus arteriosus (747.0), or hydrocephalus (742.3) secondary to intraventricular hemorrhage (772.1) who also had ICD-9 codes 764 or 765 (disorders relating to low birthweight and short gestation).

Of 38,957 reported infant deaths in 1986, 8005 (20.5%) had birth defects listed as the underlying cause of death; birth defects were the leading cause of infant mortality (Figure 2). Birth defects were listed as a contributing cause of death for an additional 1088 infants. Thus, in 1986 birth defects were an underlying or contributing cause of death for 9093 (23.3%) infants.

Cardiovascular defects, the most frequent type of birth defect, were present in 3057 (38.2%) of the 8005 babies. Central nervous system defects (including anencephalus

FIGURE 1. Percentage of infant deaths attributed to birth defects — United States, 1916–1986

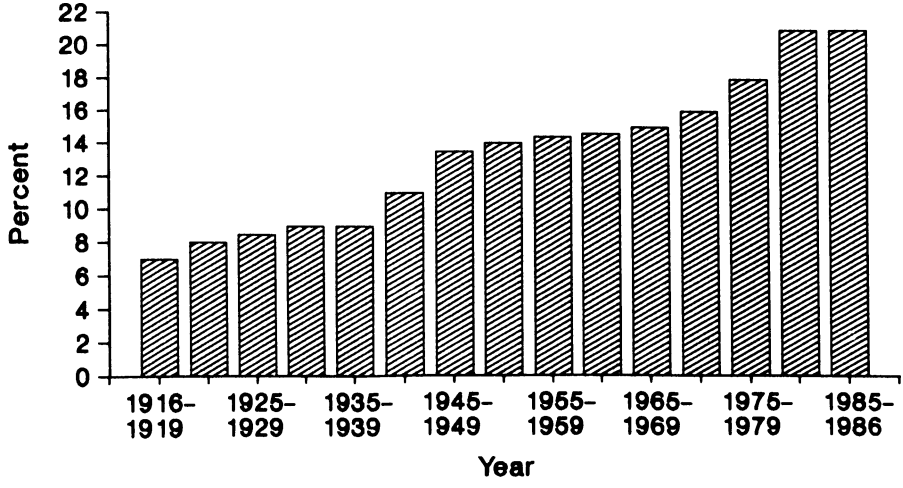
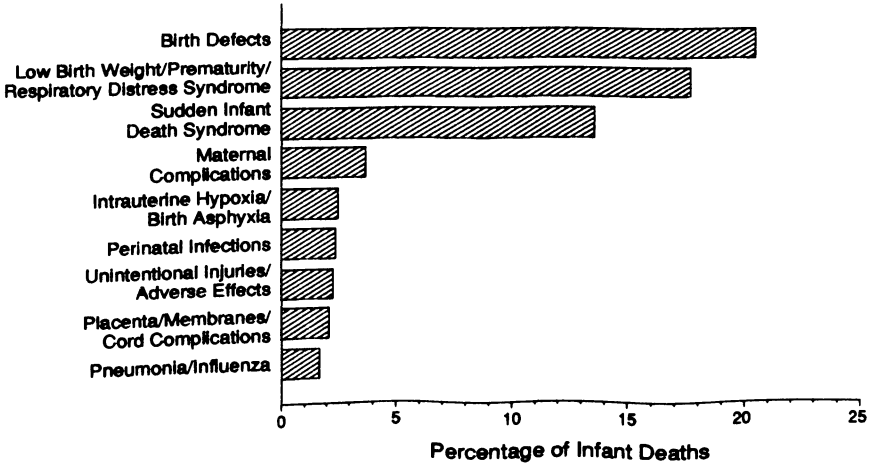


FIGURE 2. Leading causes of infant mortality — United States, 1986



Birth Defects — Continued

and similar anomalies, spina bifida, and other congenital anomalies of the central nervous system and eye) were the second largest group, occurring in 1191 (14.9%). Birth defects of the respiratory system comprised the third largest group (870 [10.9%]).

Reported by: Birth Defects and Genetics Br, Div of Birth Defects and Developmental Disabilities, Center for Environmental Health and Injury Control, CDC.

Editorial Note: The rapid decline of infant mortality rates in the 1970s has been attributed largely to the advent of medical technology in the care of premature and other critically ill newborns. In the 1980s, this decline has slowed considerably—partly because of a lack of progress in primary prevention of conditions which lead to infant death. As a consequence, the 1990 health objective of nine infant deaths per 1000 live births is unlikely to be met (*3*). Additionally, to meet the year 2000 objectives, health agencies will have to make substantial efforts to prevent the leading causes of infant mortality.

Birth defects, prematurity, and sudden infant death syndrome account for 52% of all infant deaths. Epidemiologic and basic research are integral to the development of prevention programs for infant mortality. The federal government and 22 states maintain surveillance systems for birth defects. These systems can assist in assessing the effectiveness of intervention programs in preventing defects whose etiology is known (e.g., fetal alcohol syndrome) and in serving as a basis for the epidemiologic research needed to understand the causes of birth defects.

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3. 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.

Epidemiologic Notes and Reports

Varicella Outbreak in a Women's Prison — Kentucky

During January and February 1989, three cases of varicella (chickenpox) occurred among inmates at the Federal Correctional Institution in Lexington, Kentucky. This all-women prison is a 1200-bed facility with an onsite hospital. At the time of the outbreak, 1276 inmates were housed in the facility; approximately one fourth were Hispanic (primarily from Central and South America); 36 (3%) were pregnant. Thirty-two (3%) inmates were seropositive by enzyme-linked immunosorbent assay (EIA) and Western blot for human immunodeficiency virus (HIV) infection, including six persons with acquired immunodeficiency syndrome (AIDS).

The first case of varicella developed on January 8 in a 25-year-old U.S.-born black woman who had been on furlough in New Jersey with her 8-year-old daughter who had chickenpox. The second case occurred on February 1 in a 23-year-old Central American woman; she had given a hair permanent to the first case-patient within 24 hours before the first patient developed a rash. The third case was identified on

Varicella Outbreak — Continued

February 19 in a 19-year-old U.S.-born Hispanic woman who also has severe juvenile rheumatoid arthritis. The latter two women attended the same class during late January.

The third case-patient lived in the chronic-care unit of the prison hospital with 17 other women, including two with AIDS and one receiving low-dose steroids for treatment of systemic lupus erythematosis. She potentially exposed two groups of contacts. The first group comprised other inmates in the chronic-care unit, the unit's medical staff, and inmate workers. To prevent further transmission, persons with uncertain histories of previous chickenpox infection were not permitted to enter the unit. Three nurses who were uncertain of their histories were excluded from the unit pending results of their varicella-zoster (VZ) antibody titer tests. In addition, 12 patients and four inmate workers from the chronic-care unit were identified from histories as possibly not immune.

(Continued on page 641)

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

Disease	37th Week Ending			Cumulative, 37th Week Ending		
	Sep. 16, 1989	Sep. 17, 1988	Median 1984-1988	Sep. 16, 1989	Sep. 17, 1988	Median 1984-1988
Acquired Immunodeficiency Syndrome (AIDS)	325	U*	279	24,369	22,001	8,900
Aseptic meningitis	533	253	413	5,612	4,287	6,020
Encephalitis: Primary (arthropod-borne & unspec)	32	23	39	536	585	767
Post-infectious	1	2	2	64	93	86
Gonorrhea: Civilian	9,539	14,727	16,441	464,577	486,703	585,230
Military	230	168	281	7,558	8,547	11,869
Hepatitis: Type A	601	522	437	24,113	17,632	15,574
Type B	352	402	450	15,919	15,974	18,093
Non A, Non B	39	30	49	1,676	1,875	2,553
Unspecified	25	29	84	1,649	1,494	3,195
Legionellosis	22	21	20	710	702	512
Leprosy	3	-	4	115	115	162
Malaria	37	23	22	877	681	681
Measles: Total†	95	33	39	10,602	2,237	2,456
Indigenous	87	29	29	10,116	2,004	2,048
Imported	8	4	8	484	233	280
Meningococcal infections	31	32	25	1,980	2,146	2,048
Mumps	43	33	35	4,048	3,505	3,505
Pertussis	41	44	86	2,187	1,919	1,919
Rubella (German measles)	1	1	5	300	160	431
Syphilis (Primary & Secondary): Civilian	620	552	545	27,966	28,486	19,619
Military	8	2	1	177	114	123
Toxic Shock syndrome	3	9	9	260	254	254
Tuberculosis	372	408	425	14,700	14,772	14,997
Tularemia	4	4	4	116	149	148
Typhoid Fever	11	13	11	342	260	240
Typhus fever, tick-borne (RMSF)	17	6	23	477	477	530
Rabies, animal	65	94	107	3,424	3,070	3,820

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1989		Cum. 1989
Anthrax	-	Leptospirosis	68
Botulism: Foodborne	18	Plague	3
Infant	9	Poliomyelitis, Paralytic	-
Other	4	Psittacosis (Fla. 1)	76
Brucellosis	59	Rabies, human	1
Cholera	-	Tetanus	31
Congenital rubella syndrome (Ala. 1)	3	Trichinosis	13
Congenital syphilis, ages < 1 year	158		
Diphtheria (Calif. 1)	3		

*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.
†There were no international imported measles cases for this week.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending September 16, 1989 and September 17, 1988 (37th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989
UNITED STATES	24,369	5,612	536	64	464,577	486,703	24,113	15,919	1,676	1,649	710	115
NEW ENGLAND	1,044	299	19	2	14,154	15,131	515	763	56	62	48	8
Maine	46	13	5	-	182	300	16	42	5	1	5	-
N.H.	35	27	-	-	116	191	50	44	8	4	1	-
Vt.	11	31	3	-	44	91	28	64	5	-	1	-
Mass.	584	101	6	2	5,510	5,151	152	439	23	46	32	6
R.I.	57	53	-	-	1,021	1,349	28	50	4	4	9	1
Conn.	311	74	5	-	7,281	8,049	241	124	11	7	-	1
MID. ATLANTIC	6,836	597	52	5	57,963	78,171	2,788	2,320	157	195	178	18
Upstate N.Y.	948	203	19	4	10,859	9,366	574	422	55	6	52	3
N.Y. City	3,440	93	2	1	25,023	35,464	277	840	30	164	24	13
N.J.	1,618	-	31	-	10,868	11,020	309	456	24	5	35	1
Pa.	830	301	-	-	11,213	22,321	1,628	602	48	20	67	1
E.N. CENTRAL	1,907	1,011	177	6	87,852	81,283	1,390	1,944	191	73	197	3
Ohio	341	287	63	2	23,365	18,085	298	360	32	18	93	-
Ind.	251	153	32	3	6,386	6,259	161	326	23	27	40	1
Ill.	871	185	33	1	28,436	23,873	626	514	74	18	14	2
Mich.	351	321	35	-	22,871	25,984	199	474	40	10	32	-
Wis.	93	65	14	-	6,794	7,082	106	270	22	-	18	-
W.N. CENTRAL	616	265	24	3	22,044	20,463	887	701	76	24	28	1
Minn.	134	11	-	1	2,498	2,768	99	79	16	4	2	-
Iowa	43	43	8	-	1,963	1,528	75	26	12	5	5	-
Mo.	305	119	2	-	13,525	11,608	499	490	26	9	11	-
N. Dak.	6	12	1	-	92	126	4	19	4	2	1	-
S. Dak.	4	7	4	-	182	370	10	7	5	-	2	-
Nebr.	26	8	5	-	930	1,140	64	18	2	2	2	1
Kans.	98	65	4	2	2,854	2,923	136	62	11	2	5	-
S. ATLANTIC	4,944	1,137	109	23	132,376	137,459	2,332	3,091	258	258	89	1
Del.	70	55	1	-	2,266	2,092	34	109	5	8	8	-
Md.	476	143	14	2	15,459	14,022	636	543	23	25	23	-
D.C.	383	8	-	-	8,287	10,309	4	19	2	-	-	-
Va.	329	227	30	3	11,150	9,880	223	228	57	146	6	-
W. Va.	34	55	52	-	1,026	962	18	78	9	7	-	-
N.C.	353	128	7	2	19,984	19,183	313	752	65	-	24	1
S.C.	242	26	-	-	12,243	10,612	54	428	3	10	5	-
Ga.	817	86	1	1	25,459	26,502	257	292	10	8	14	-
Fla.	2,240	409	4	15	36,502	43,897	793	642	84	54	9	-
E.S. CENTRAL	506	480	23	2	38,398	38,288	292	1,160	114	6	38	-
Ky.	78	141	8	1	3,751	3,860	85	300	36	4	9	-
Tenn.	158	86	1	-	12,823	12,720	115	618	23	-	20	-
Ala.	160	177	13	-	12,096	11,972	63	163	49	1	9	-
Miss.	110	76	1	1	9,728	9,736	29	79	6	1	-	-
W.S. CENTRAL	2,125	668	48	4	51,411	53,015	2,710	1,597	112	380	35	17
Ark.	57	29	6	-	5,998	5,304	177	55	12	6	1	-
La.	344	53	10	-	10,852	10,746	198	277	14	1	5	-
Okla.	101	57	11	2	4,410	5,004	319	148	24	27	20	-
Tex.	1,623	529	21	2	30,151	31,961	2,016	1,117	62	346	9	17
MOUNTAIN	729	210	8	3	10,242	10,496	3,584	1,067	158	113	38	3
Mont.	13	5	-	-	138	328	64	39	6	2	2	1
Idaho	18	1	-	1	136	270	124	93	12	3	-	-
Wyo.	14	4	-	-	71	151	38	4	2	-	-	-
Colo.	227	108	1	1	2,090	2,271	397	130	43	49	3	-
N. Mex.	67	9	1	-	961	1,017	472	158	28	2	3	1
Ariz.	212	60	3	-	4,031	3,788	1,826	388	36	48	19	1
Utah	48	15	1	1	327	398	383	85	21	4	7	-
Nev.	130	8	2	-	2,488	2,273	280	170	10	5	4	-
PACIFIC	5,662	945	76	16	50,137	52,397	9,615	3,276	554	538	59	64
Wash.	401	-	2	1	4,643	5,066	2,318	727	152	42	22	6
Oreg.	175	-	-	-	2,239	2,251	1,693	362	58	10	2	1
Calif.	4,945	865	62	15	42,166	43,882	4,939	2,080	331	472	32	53
Alaska	11	18	9	-	706	744	521	45	5	4	1	-
Hawaii	130	62	3	-	383	454	144	62	8	10	2	4
Guam	1	-	-	-	-	108	-	-	-	-	-	-
P.R.	1,069	65	2	1	739	962	143	171	16	18	-	8
V.I.	26	-	-	-	491	328	-	6	-	-	-	-
Amer. Samoa	-	-	-	-	-	65	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	34	-	-	-	-	-	-

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

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending September 16, 1989 and September 17, 1988 (37th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1989	1989	Cum. 1989	1989	Cum. 1989	Cum. 1988	Cum. 1989	1989	Cum. 1989	1989	Cum. 1989	Cum. 1988	1989	Cum. 1989	Cum. 1988
UNITED STATES	877	87	10,116	8	484	2,237	1,980	43	4,048	41	2,187	1,919	1	300	160
NEW ENGLAND	56	-	286	-	35	108	142	-	72	11	281	216	-	6	6
Maine	-	-	-	-	1	7	13	-	-	7	16	11	-	-	-
N.H.	2	-	11	-	4	87	15	-	13	-	5	34	-	4	3
Vt.	2	-	1	-	2	-	6	-	3	-	6	3	-	1	-
Mass.	32	-	28	-	21	3	76	-	48	4	228	141	-	1	2
R.I.	10	-	38	-	3	-	1	-	-	-	11	10	-	-	1
Conn.	10	-	208	-	4	11	31	-	8	-	15	17	-	-	-
MID. ATLANTIC	156	1	645	-	170	861	267	-	368	2	127	109	-	25	12
Upstate N.Y.	22	-	42	-	98	37	90	-	135	-	45	68	-	10	2
N.Y. City	56	1	82	-	14	46	33	-	18	-	3	4	-	15	7
N.J.	43	-	318	-	-	241	58	-	160	-	21	4	-	-	1
Pa.	35	-	203	-	58	537	86	-	55	2	58	33	-	-	2
E.N. CENTRAL	68	77	2,690	-	66	180	249	2	437	2	206	213	-	24	26
Ohio	12	77	979	-	35	25	92	-	118	-	45	25	-	3	1
Ind.	9	-	78	-	-	57	28	-	40	-	19	58	-	-	-
Ill.	28	-	1,149	-	-	71	66	-	139	-	81	39	-	19	21
Mich.	12	-	302	-	15	23	47	2	109	2	35	32	-	1	4
Wis.	7	-	182	-	16	4	16	-	31	-	26	59	-	1	-
W.N. CENTRAL	27	-	634	-	11	13	72	6	376	-	151	107	-	6	2
Minn.	8	-	17	-	-	11	13	-	2	-	35	48	-	-	-
Iowa	3	-	8	-	1	-	2	1	34	-	13	21	-	1	-
Mo.	9	-	369	-	-	2	22	-	54	-	92	16	-	4	-
N. Dak.	1	-	-	-	-	-	-	-	-	-	2	11	-	-	-
S. Dak.	1	-	-	-	-	-	7	-	-	-	1	5	-	-	-
Nebr.	2	-	108	-	2	-	17	-	5	-	5	-	-	-	-
Kans.	3	-	132	-	8	-	11	5	281	-	3	6	-	1	2
S. ATLANTIC	153	1	535	-	50	324	345	8	697	5	214	200	-	9	17
Del.	6	-	66	-	1	-	2	-	1	-	1	7	-	-	-
Md.	25	1	49	-	33	14	60	3	361	-	36	32	-	2	1
D.C.	8	-	32	-	4	-	15	-	118	-	-	1	-	-	-
Va.	28	-	20	-	3	143	40	-	98	-	25	21	-	-	11
W. Va.	2	-	51	-	-	6	12	-	11	2	24	8	-	-	-
N.C.	19	-	168	-	-	4	48	-	27	-	40	57	-	1	-
S.C.	7	-	3	-	-	-	22	3	23	-	-	1	-	-	-
Ga.	9	-	1	-	1	-	59	-	27	3	31	31	-	-	2
Fla.	49	-	145	-	8	157	87	2	31	-	57	42	-	6	3
E.S. CENTRAL	10	8	233	-	3	69	63	2	186	6	103	76	1	3	2
Ky.	-	2	37	-	3	35	36	-	9	-	1	12	-	-	-
Tenn.	3	2	146	-	-	-	5	1	51	6	42	20	-	2	2
Ala.	5	3	49	-	-	-	18	1	20	-	57	40	1	1	-
Miss.	2	1	1	-	-	34	4	N	N	-	3	4	-	-	-
W.S. CENTRAL	48	-	3,097	7	55	14	142	25	1,322	5	245	96	-	36	6
Ark.	-	-	-	7§	15	1	9	-	128	1	21	11	-	-	2
La.	2	-	11	-	-	-	37	17	568	1	15	16	-	5	-
Okla.	6	-	122	-	-	8	22	-	187	3	46	42	-	1	1
Tex.	40	-	2,964	-	40	5	74	8	439	-	163	27	-	30	3
MOUNTAIN	22	-	352	1	36	140	61	-	159	3	503	553	-	35	6
Mont.	1	-	12	-	1	24	1	-	2	2	33	2	-	1	-
Idaho	2	-	-	-	2	1	2	-	15	-	57	296	-	32	-
Wyo.	1	-	-	-	-	-	-	-	8	-	-	1	-	1	-
Colo.	5	-	64	-	15	115	19	-	26	-	33	15	-	-	2
N. Mex.	3	-	16	-	15	-	2	N	N	1	24	45	-	-	-
Ariz.	7	-	141	-	-	-	24	-	92	-	341	171	-	-	-
Utah	-	-	118	-	-	-	5	-	10	-	14	22	-	-	3
Nev.	3	-	1	1§	3	-	8	-	6	-	1	1	-	1	1
PACIFIC	337	-	1,644	-	58	528	639	-	431	7	357	349	-	156	83
Wash.	26	-	28	-	13	2	67	-	36	6	147	82	-	-	-
Oreg.	18	-	9	-	19	4	43	N	N	-	7	27	-	3	-
Calif.	283	-	1,588	-	17	510	522	-	379	1	186	178	-	130	57
Alaska	4	-	1	-	-	-	5	-	2	-	1	7	-	-	-
Hawaii	6	-	18	-	9	12	2	-	14	-	16	55	-	23	26
Guam	-	U	-	U	-	1	-	U	-	U	-	-	U	-	1
P.R.	1	U	490	U	-	190	4	U	8	U	4	13	U	8	2
V.I.	-	U	4	U	-	-	-	U	15	U	-	-	U	-	-
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

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

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending September 16, 1989 and September 17, 1988 (37th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989
UNITED STATES	27,966	28,486	260	14,700	14,772	116	342	477	3,424
NEW ENGLAND	1,210	793	13	406	370	2	27	7	8
Maine	8	12	3	12	17	-	-	-	2
N.H.	10	6	1	19	8	-	-	-	1
Vt.	-	3	-	7	3	-	-	-	-
Mass.	369	301	4	208	211	2	17	4	2
R.I.	23	26	2	47	32	-	5	1	-
Conn.	800	445	3	113	99	-	5	2	3
MID. ATLANTIC	5,050	7,173	40	2,885	2,915	2	107	54	563
Upstate N.Y.	615	379	7	233	387	1	25	11	44
N.Y. City	2,630	5,217	2	1,588	1,573	-	49	3	-
N.J.	991	652	9	577	486	-	25	21	17
Pa.	814	925	22	487	469	1	8	19	502
E.N. CENTRAL	1,255	796	41	1,547	1,618	3	36	56	93
Ohio	105	74	12	268	306	-	7	29	9
Ind.	46	40	6	114	164	1	2	19	2
Ill.	556	365	9	708	694	-	19	6	23
Mich.	444	277	14	370	381	1	6	2	18
Wis.	104	40	-	87	73	1	2	-	41
W.N. CENTRAL	241	171	31	372	384	46	5	71	442
Minn.	37	16	7	72	62	-	1	-	98
Iowa	29	17	5	28	41	-	2	2	110
Mo.	123	105	7	176	192	33	1	55	40
N. Dak.	2	2	-	12	13	-	-	1	44
S. Dak.	1	-	4	18	26	6	-	3	71
Nebr.	21	25	5	18	10	3	-	-	39
Kans.	28	6	3	48	40	4	1	10	40
S. ATLANTIC	10,173	9,917	23	3,153	3,169	6	30	162	1,040
Del.	135	77	1	25	29	-	2	1	26
Md.	558	537	1	263	300	2	7	11	287
D.C.	608	478	1	138	136	-	2	-	2
Va.	383	285	4	252	291	4	5	11	196
W. Va.	13	34	-	54	54	-	-	2	44
N.C.	742	565	6	400	314	-	2	93	7
S.C.	601	509	4	354	356	-	2	26	162
Ga.	1,955	1,700	3	477	519	-	3	15	176
Fla.	5,178	5,732	3	1,190	1,170	-	7	3	140
E.S. CENTRAL	1,972	1,377	5	1,149	1,200	6	2	48	280
Ky.	40	46	1	287	283	1	1	12	114
Tenn.	824	583	3	321	326	4	-	27	72
Ala.	626	415	1	337	376	-	1	5	91
Miss.	482	333	-	204	215	1	-	4	3
W.S. CENTRAL	4,146	3,009	22	1,789	1,848	34	14	54	469
Ark.	264	170	1	185	202	24	-	15	62
La.	996	578	-	249	209	-	1	-	7
Okla.	69	111	12	155	174	10	2	32	76
Tex.	2,817	2,150	9	1,200	1,263	-	11	7	324
MOUNTAIN	552	543	38	311	426	11	6	21	203
Mont.	1	3	-	11	12	1	-	14	66
Idaho	1	2	3	22	16	-	-	2	6
Wyo.	6	1	2	-	5	2	-	2	64
Colo.	55	79	6	19	69	2	2	3	21
N. Mex.	21	39	5	60	79	2	-	-	18
Ariz.	186	117	9	139	181	-	3	-	21
Utah	13	13	9	26	18	3	1	-	2
Nev.	269	289	4	34	46	1	-	-	5
PACIFIC	3,367	4,707	47	3,088	2,842	6	115	4	326
Wash.	252	164	3	170	156	-	7	-	-
Oreg.	178	202	-	102	110	4	5	1	-
Calif.	2,923	4,307	43	2,653	2,441	2	94	3	262
Alaska	5	10	-	37	27	-	-	-	64
Hawaii	9	24	1	126	108	-	9	-	-
Guam	-	3	-	-	20	-	-	-	-
P.R.	385	447	-	210	175	-	4	-	50
V.I.	8	1	-	4	6	-	-	-	-
Amer. Samoa	-	-	-	-	3	-	-	-	-
C.N.M.I.	-	1	-	-	17	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending September 16, 1989 (37th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	605	420	96	61	12	16	56
Boston, Mass.	172	105	37	19	6	5	13
Bridgeport, Conn.	44	32	8	3	-	1	5
Cambridge, Mass.	27	22	1	4	-	-	8
Fall River, Mass.	22	19	3	-	-	-	1
Hartford, Conn.	42	27	11	2	1	1	2
Lowell, Mass.	14	12	2	-	-	-	1
Lynn, Mass.	14	9	4	-	-	1	-
New Bedford, Mass.	28	22	5	1	-	-	1
New Haven, Conn.	41	30	3	4	1	3	6
Providence, R.I.	45	32	-	12	-	1	4
Somerville, Mass.	8	7	1	-	-	-	1
Springfield, Mass.	48	27	9	5	4	3	6
Waterbury, Conn.	37	29	3	5	-	-	2
Worcester, Mass.	63	47	9	6	-	1	6
MID. ATLANTIC	2,506	1,568	509	276	80	73	143
Albany, N.Y.	50	33	9	6	1	1	3
Allentown, Pa.	20	14	4	1	1	-	-
Buffalo, N.Y.	101	68	22	7	2	2	8
Camden, N.J.	49	32	6	6	2	3	-
Elizabeth, N.J.	13	6	4	-	1	2	2
Erie, Pa.†	35	28	5	2	-	-	4
Jersey City, N.J.	47	31	9	4	2	1	2
N.Y. City, N.Y.	1,352	817	274	185	40	36	65
Newark, N.J.	66	33	13	12	4	4	2
Paterson, N.J.	26	12	8	6	-	-	3
Philadelphia, Pa.	293	191	57	19	16	10	24
Pittsburgh, Pa.†	75	50	16	-	1	8	8
Reading, Pa.	32	29	3	-	-	-	4
Rochester, N.Y.	125	81	28	9	6	1	5
Schenectady, N.Y.	30	18	6	3	2	1	-
Scranton, Pa.†	29	19	9	1	-	-	2
Syracuse, N.Y.	86	57	20	6	-	3	6
Trenton, N.J.	30	16	7	4	2	1	2
Utica, N.Y.	18	12	3	3	-	-	1
Yonkers, N.Y.	29	21	6	2	-	-	2
E.N. CENTRAL	2,326	1,522	481	187	54	82	102
Akron, Ohio	47	39	5	1	1	1	-
Canton, Ohio	35	31	4	-	-	-	1
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	130	87	27	6	3	7	14
Cleveland, Ohio	168	109	37	11	4	7	9
Columbus, Ohio	199	121	49	15	7	7	1
Dayton, Ohio	95	66	15	10	1	3	5
Detroit, Mich.	258	130	68	42	10	8	6
Evansville, Ind.	52	35	12	1	2	2	3
Fort Wayne, Ind.	55	38	8	3	1	5	5
Gary, Ind.§	16	8	6	2	-	-	1
Grand Rapids, Mich.	69	49	13	5	1	1	4
Indianapolis, Ind.	169	119	25	13	8	4	5
Madison, Wis.§	33	23	7	3	-	-	3
Milwaukee, Wis.	145	99	25	15	1	5	3
Peoria, Ill.	47	32	8	2	-	5	7
Rockford, Ill.	35	24	4	5	2	-	3
South Bend, Ind.	46	33	10	1	1	1	3
Toledo, Ohio	109	76	23	5	2	3	10
Youngstown, Ohio	54	41	10	2	-	1	3
W.N. CENTRAL	782	554	129	56	17	26	37
Des Moines, Iowa	75	53	12	4	4	2	2
Duluth, Minn.	32	22	8	2	-	-	-
Kansas City, Kans.§	65	50	10	4	1	-	2
Kansas City, Mo.	103	72	21	9	-	1	6
Lincoln, Nebr.	38	30	6	1	-	1	6
Minneapolis, Minn.	139	96	19	13	4	7	9
Omaha, Nebr.	77	51	11	8	2	5	7
St. Louis, Mo.	137	94	26	7	3	7	3
St. Paul, Minn.	73	54	10	3	3	3	2
Wichita, Kans.	43	32	6	5	-	-	-
S. ATLANTIC	1,345	814	294	154	40	42	57
Atlanta, Ga.	129	69	38	13	7	2	3
Baltimore, Md.	344	213	73	38	11	9	16
Charlotte, N.C.	75	48	18	7	-	2	6
Jacksonville, Fla.	130	86	24	11	2	7	11
Miami, Fla.	116	56	32	19	3	5	2
Norfolk, Va.	55	26	20	6	-	3	4
Richmond, Va.	93	55	21	11	5	1	6
Savannah, Ga.	48	36	8	2	1	1	3
St. Petersburg, Fla.	70	57	6	2	1	4	-
Tampa, Fla.	64	42	11	8	2	1	4
Washington, D.C.	199	109	38	37	8	7	2
Wilmington, Del.	22	17	5	-	-	-	-
E.S. CENTRAL	770	473	176	60	25	35	43
Birmingham, Ala.	124	79	27	8	5	5	5
Chattanooga, Tenn.	59	38	11	4	3	3	6
Knoxville, Tenn.	69	39	16	10	3	1	4
Louisville, Ky.	115	80	21	4	2	7	5
Memphis, Tenn.	173	108	40	10	8	7	13
Mobile, Ala.	37	18	10	3	2	4	1
Montgomery, Ala.	69	40	17	8	1	3	2
Nashville, Tenn.	124	71	34	13	1	5	7
W.S. CENTRAL	1,801	1,102	385	198	64	52	79
Austin, Tex.	78	52	12	9	1	4	5
Baton Rouge, La.	51	37	8	1	3	2	-
Corpus Christi, Tex.	44	34	4	2	2	2	-
Dallas, Tex.	210	109	40	33	14	14	6
El Paso, Tex.	58	42	11	3	1	1	3
Fort Worth, Tex	90	56	17	10	4	3	2
Houston, Tex.§	734	436	169	89	24	16	18
Little Rock, Ark.	80	50	17	8	3	2	4
New Orleans, La.	90	58	15	13	2	2	-
San Antonio, Tex.	193	120	48	17	5	3	25
Shreveport, La.	51	26	11	9	3	2	4
Tulsa, Okla.	122	82	33	4	2	1	12
MOUNTAIN	720	451	144	74	28	23	29
Albuquerque, N. Mex.	93	62	10	7	12	2	7
Colo. Springs, Colo.	47	31	7	6	-	3	6
Denver, Colo.	111	67	25	11	3	5	3
Las Vegas, Nev.	99	55	31	9	2	2	3
Ogden, Utah	16	10	2	1	1	2	2
Phoenix, Ariz.	183	115	35	26	4	3	3
Pueblo, Colo.	15	10	3	1	1	-	-
Salt Lake City, Utah	48	30	10	4	3	1	-
Tucson, Ariz.	108	71	21	9	2	5	5
PACIFIC	2,113	1,328	376	253	79	69	109
Berkeley, Calif.	16	12	2	-	-	2	-
Fresno, Calif.	87	66	10	4	3	4	6
Glendale, Calif.	23	16	3	3	1	-	-
Honolulu, Hawaii	77	52	15	5	3	2	9
Long Beach, Calif.	94	60	16	11	2	5	12
Los Angeles Calif.	522	307	100	75	26	9	16
Oakland, Calif.	144	80	34	17	7	6	7
Pasadena, Calif.	34	22	5	3	-	4	2
Portland, Oreg.	160	104	31	14	6	5	3
Sacramento, Calif.	154	100	27	16	3	8	14
San Diego, Calif.	208	128	39	26	6	9	14
San Francisco, Calif.	153	80	28	35	1	6	6
San Jose, Calif.	161	108	27	17	8	1	10
Seattle, Wash.	164	112	18	20	11	3	3
Spokane, Wash.	57	39	12	2	-	4	4
Tacoma, Wash.	59	42	9	5	2	1	3
TOTAL	12,968††	8,232	2,590	1,319	399	418	655

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

**Pneumonia and influenza.

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

††Total includes unknown ages.

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

Varicella Outbreak — Continued

The second group of contacts comprised all other identifiable social and classroom contacts of the third case-patient and included >200 inmates who attended the same programs or classes during the 3 days before she developed symptoms. Of this group, 100 were uncertain about histories of previous varicella infection, including 40 with self-identified risk behaviors for HIV infection and one who may have been pregnant. Serum specimens were obtained from 116 of these inmates and three staff members to measure VZ antibody titers. Because of the time required to process the specimens, all potentially susceptible inmates in this second group of contacts were quarantined in a separate unit within the prison until their serologic results became available.

Overall, 115 (99%) of the 116 persons with evaluative results* were immune to VZ (immunity defined as titers ≥1:8 by immunofluorescent antibody [IFA] measurement); the one person who was confirmed susceptible to VZ after duplicate IFA testing remained asymptomatic. All pregnant women, AIDS patients, and staff were immune. In addition, all 40 persons reportedly at risk for HIV infection were negative for HIV antibody on EIA testing. No cases of varicella have occurred since the third case.

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Editorial Note: In the United States, exposure to and infection with the highly communicable VZ virus is virtually unavoidable (*1*). VZ virus causes both varicella (the manifestation of primary infection in a susceptible person) and zoster (the result of reactivation of latent virus); patients with either disease may transmit the virus to susceptible persons (*1–3*). An estimated 3.5 million cases of varicella and 300,000 cases of zoster occur in the United States annually (*2*).

Varicella can be life threatening, particularly in adults, pregnant women, neonates, and immunocompromised persons. VZ infection in pregnancy may also produce fetal infection and an array of congenital abnormalities characterized as "congenital varicella syndrome" (*4*). Zoster occurs and can be severe in HIV-infected persons (*5*). Persons from rural tropical and subtropical regions are less likely than persons from temperate zones to be infected as children, leaving them susceptible as adults (*6*). Thus, in this prison population, increased risk existed for transmission and severe health effects.

In this investigation, the estimated level of immunity for the inmate population was at least 99%. Based on this nonrandom sample from the population of 1267 inmates, at most, 13 persons were possibly susceptible to varicella before the onset of disease in the first case-patient. Nonetheless, the close confines and extensive socialization in a prison maximize the potential spread of a highly contagious disease, such as varicella, despite high levels of immunity.

Introduction and subsequent transmission of the VZ virus among patients and staff can be reduced in health-care settings such as in this prison. CDC has developed isolation precautions for hospitalized patients who either have active disease or have been exposed to varicella or zoster (*7*). CDC has also issued recommendations to minimize virus transmission to and from hospital personnel (*8*); in institutions where varicella is prevalent or where there are many high-risk patients, it may be useful to

*Three women had "interfering substances" in their serum preventing a determination of VZ antibody presence, but subsequent interviews with family members established a childhood history of chickenpox in all three cases.

Varicella Outbreak — Continued

screen those personnel who have a negative or equivocal history of varicella for the presence of serum antibodies to VZ virus to document susceptibility or immunity (persons with a positive history can be considered immune). In the absence of a licensed vaccine against VZ, efforts should be taken to maximize the effectiveness of existing recommendations for control of VZ virus infections.

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Current Trends

Surveillance for Occupational Lead Exposure — United States, 1987

Since 1981, four states (California, New Jersey, New York, and Texas) have implemented surveillance systems for occupational lead exposure. Although the details of these systems, each state requires any laboratory that performs blood-lead assays to report all elevated blood-lead levels (BLLs) to the state health department (SHD) (Table 1). The SHD then uses telephone follow-up (with either the physician who submitted the blood specimen or the patient) to obtain demographic information and identify possible occupational lead exposures.

TABLE 1. Features of state reporting systems for elevated blood-lead levels — New York, New Jersey, Texas, California

State	Starting date	Reporting level	Sources of reports	Ages covered
New York	Sept. 1981	25 μg/dL	All reporting laboratories* Physicians Health facilities	All
New Jersey	Oct. 1985	25 μg/dL	In-state laboratories	All
Texas	Oct. 1985	40 μg/dL	Physicians In-state laboratories Health facilities	≥15 years
California	Apr. 1987	25 μg/dL	In-state laboratories	All

*Requires reporting by any laboratory performing blood-lead analyses on in-state employees, regardless of whether the laboratory is in- or out-of-state.

Lead Exposure — Continued

This report summarizes 1987 surveillance data from these states on adults* with BLL ≥40 μg/dL of whole blood.† A person was counted as a case-patient only once, even though some persons may have been reported several times within the year. The highest BLL reported for each person (peak BLL) was used for this report.

For 1987, 1926 adults with elevated BLLs were reported to the four SHDs; for 524 (27.2%) persons, BLL exceeded 50 μg/dL.§ Most (93%) elevated BLLs occurred in males, and most (94% [excluding New Jersey, for which specific data were not available]) were work-related.¶ The age distribution was similar in the four states; the greatest proportions of persons with elevated BLLs were aged 25–34 and 35–44 years. In California and Texas, 44% and 40% of reported persons, respectively, were Hispanic; in contrast, Hispanics represent approximately 24% and 25%, respectively, of these states' populations (Bureau of the Census, unpublished data, 1988).

Elevated BLLs were most common in workers employed in industrial sectors with well-known lead hazards, such as primary and secondary lead smelting, brass foundries (both Standard Industrial Code [SIC] 33), and battery manufacturing (SIC 36) (Table 2). Less common sources included: construction (including bridge reconstruction and home rehabilitation), ceramics manufacture, plastics production, stained-glass window production, ammunition manufacture, and firing ranges (both for sport and law-enforcement training).

Case follow-up efforts vary by state, but all attempt to 1) confirm occupational lead exposure by gathering more information about work history, hobbies with possible lead exposures, symptoms, and household contacts from the affected person or the reporting source, 2) provide educational and technical information to affected workers, attending physicians, and employers, and 3) arrange onsite evaluations of the lead hazard. Follow-up procedures may entail telephone contact with all newly reported workers, telephone contact only when a threshold BLL is exceeded, or telephone contact with the initiator (physician or employer) of the blood-lead test. Educational materials may be mailed to affected workers (and their physicians) or may be distributed to all lead-exposed workers when worksite inspections are conducted.

Worksite follow-up visits, including industrial hygiene evaluations, are part of each state's program. For example, the New Jersey Department of Health conducted 54 worksite visits from October 1985 through May 1989. In New York, selected worksite industrial hygiene surveys are conducted by the SHD, which refers employers to the State Department of Labor for technical assistance. Less frequently, OSHA (either the consultation program or compliance section) may be contacted. In Texas, the SHD refers employers to either the state OSHA consultation program or to an industrial hygienist employed by the SHD.

*For this report, California and New York define adults as persons aged ≥18 years; Texas uses age 15 years as the reporting threshold, and New Jersey uses age 16 years.

†This threshold was chosen for this report to permit comparison of data among the four states because Texas collects data only at or above this level.

§An average BLL of 50 μg/dL based on three blood samples over a 6-month period or one sample >60 μg/dL requires medical removal of employee from lead exposure without loss of wages, benefits, or seniority (Occupational Safety and Health Administration [OSHA] Lead Standard) (*1*).

¶During follow-up interview, the affected person indicated that exposure to lead occurred at work.

Lead Exposure — Continued

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Editorial Note: Lead poisoning, first described by Hippocrates around 370 B.C., is the oldest recognized occupational disease. The clinical and pathophysiologic effects of higher levels of lead exposure are well known, but evidence continues to emerge concerning adverse health effects at lower BLLs (*2*). In the occupational setting, inhalation of lead dust and fume is the primary route of absorption. Data from the National Occupational Exposure Survey conducted from 1981–1983 by the National Institute for Occupational Safety and Health (NIOSH), CDC, indicate that

TABLE 2. Peak* blood-lead levels (BLLs), by industry and number of workers — United States, 1987

Industry (SIC† code)§	No. workers, by BLL				Total	
	40–49 μg/dL	50–59 μg/dL	60–69 μg/dL	≥70 μg/dL	No.	(%)
Electric and electronic equipment (36)	301	112	34	15	462	(35)
Primary metal industries (33)	327	63	28	15	433	(33)
Chemicals and allied products (28)	54	28	5	0	87	(7)
Stone, clay, and glass products (32)	63	15	3	2	83	6)
Fabricated metal products (34)	33	8	4	6	51	(4)
Auto repairs, services, and garages (75)	18	14	11	4	47	(4)
Special trade contractors (17)	17	4	7	11	39	(3)
Transportation equipment (37)	25	6	3	0	34	(3)
Federal, state, and local governments (90–98)	13	9	0	2	24	(2)
Heavy construction contractors (16)	3	4	3	13	23	(2)
Wholesale trade durable goods (50)	6	6	2	2	16	(1)
Machinery, except electrical (35)	10	3	1	1	15	(1)
Communications (48)	12	1	0	0	13	(1)
Total	**882**	**273**	**101**	**71**	**1327**	**(100)**

*Highest BLL reported for each person.
†Standard Industrial Classification.
§Industries with ≤13 workers reported with BLLs ≥40 μg/dL were not listed on the table and accounted for 36 persons. For 563 workers, the industrial classification was not known.

Lead Exposure — Continued

approximately 827,000 U.S. workers are potentially exposed** to lead on the job (*3*; CDC, unpublished data, 1989). Workplace exposure has also been described as a vector for childhood and community lead exposure through contamination of work clothing and the local environment (*4*).

In 1979, OSHA promulgated a Standard for Occupational Exposure to Lead (*1*), which requires that, in workplaces where lead is used, employers must monitor for airborne contamination. When airborne lead concentrations exceed 30 $\mu g/m^3$ of air (averaged over an 8-hour workshift), employers must provide an industrial hygiene program and medical surveillance (including the monitoring of BLLs). The OSHA permissible exposure limit (PEL) for lead is 50 $\mu g/m^3$ for an 8-hour workshift (*1*). An employee with one BLL $\geq$60 $\mu g/dL$ or three BLLs that average $\geq$50 $\mu g/dL$ over a 6-month period must be moved to a job without lead exposure until the worker's BLL declines to an acceptable level (i.e., 40 $\mu g/dL$) (*1*). Although the OSHA Lead Standard has been in effect for >10 years, the data in this report indicate that overexposures to lead continue in many industries.

Construction-related industries (SICs 16 and 17) accounted for the highest proportion (30.4%) of workers with BLLs $\geq$70 $\mu g/dL$. The OSHA Lead Standard does not apply to the construction industry, for which OSHA has established a separate PEL of 200 $\mu g/m^3$ and does not require medical monitoring (*5*). Although the construction industry has a higher PEL for lead, this level is frequently exceeded when cutting or welding torches are used on bridges coated with lead-containing paints (*6,7*). Lead overexposures in the construction industry should be given greater attention.

In California and Texas, the rates of elevated BLLs for Hispanics were higher than this group's relative proportion of population in those states. (Occupational disease and injury rates are higher for minority workers than for other groups, possibly because they may be employed disproportionately in shops with suboptimal controls and greater exposures [*8*].) Because the potential impact of occupational lead exposure as a minority health concern has not been previously addressed, in California, Spanish-language educational materials describing the hazards and control of lead in the workplace have been developed for minority workers.

Since 1987, the Wisconsin, Maryland, and Colorado SHDs have implemented similar BLL surveillance systems, and other states are considering such systems. NIOSH, in collaboration with SHDs through the Sentinel Event Notification System for Occupational Risks program, is supporting this program development effort. A key consideration for surveillance of this problem is selection of the BLL necessary for triggering a report to the SHD. Most of the states conducting surveillance of lead toxicity in adults have adopted the level recommended by CDC for nonoccupational settings (25 $\mu g/dL$) as an indicator for elevated BLLs in children (*9*).

To eliminate occupational lead poisoning (*10*), blood-lead surveillance programs, such as those described here, are crucial for identifying individual workers and workplaces with overexposure to lead. These programs enable targeting of public health, technical, and educational resources to those worksites in need of assistance.

**The survey defined potential exposure as 1) observation of the chemical in sufficient proximity to an employee such that one or more physical phases of the substance is likely to enter or contact the body of the worker and 2) meeting minimum duration of exposure guidelines (*3*).

Lead Exposure — Continued

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