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Persistent Lack of Detectable HIV-1 Antibody In a Person With HIV Infection — Utah, 1995

Infection with human immunodeficiency virus (HIV) is diagnosed routinely by the enzyme immunoassay (EIA) for HIV-1 antibody; a nonreactive blood sample is designated as negative without further testing. However, one limitation of this screening algorithm is that a blood sample may be obtained from a patient with recent HIV infection before detectable HIV antibody is present ("window period"). This report describes a patient with confirmed HIV infection in whom EIAs for HIV antibody (HIV-EIAs) were persistently negative beyond the expected "window period."*

Case Investigation

In October 1995, the Utah Department of Health referred to CDC blood samples obtained from a man who had had onset of persistent fatigue and malaise during January 1995. During January–June 1995, he had sought medical care at several clinics. When he was admitted to a hospital in June because of respiratory illness and recent weight loss of 27 lbs, HIV-EIA was negative. In August, he was admitted with lung-biopsy–confirmed *Pneumocystis carinii* pneumonia (PCP) and a CD4+ count of 129 cells/μL; an HIV-EIA again was negative. The patient reported frequently donating plasma at a plasmapheresis center from August 1990 through April 1994. Review of records at the plasmapheresis center identified 33 donations by the patient. At the time of each donation, testing on an aliquot of the donated plasma was negative by HIV-EIA (Table 1).

The patient was married and reported sexual contact without condom use with his wife during 1989–1993; the couple separated in 1993 and had no further sexual contact. The wife was interviewed and reported sexual contact during 1985–1989 with a bisexual man who had died of acquired immunodeficiency syndrome (AIDS) in 1994. In January 1994, she was diagnosed with PCP and HIV infection (HIV-EIA positive). When the patient became aware of his wife's HIV infection in May 1994, he was tested and was HIV-EIA negative (Table 1). The patient denied male-to-male sexual contact or receipt of a transfusion. He had used multiple nonparenteral illicit drugs, but denied injecting-drug use.

*Single copies of this report will be available until March 8, 1997, from the CDC National AIDS Clearinghouse, P.O. Box 6003, Rockville, MD 20849-6003; telephone (800) 458-5231 or (301) 217-0023.

TABLE 1. Laboratory results for a patient with HIV infection — Utah, 1990–1995

Date(s)	HIV-EIA* (Manufacturer)	Western blot	PCR†	RT-PCR§	HIV-1 antigen signal/cutoff ratio¶ (Manufacturer)	Antigen test comments	Test location
June 1990–April 1994	33 Samples, all negative (A)	ND**	ND	ND	ND		Plasma center
May 1994	Negative (B)	ND	ND	ND	ND		UDH††
June 1995	Negative (A)	ND	ND	ND	ND		UVAMC§§
September 1995	Negative (A)	ND	ND	ND	ND		UVAMC
September 1995	Negative (C)	Negative	ND	ND	ND		UDH
October 1995	Negative (B)	Weak *gag* bands	IND¶¶	Positive	3.75 (D)	Not neutralizable	CDC
					7.48 (D)	Following immune complex disruption	CDC
					3.47 (E)	Neutralization ND	FDA***
					10.52 (F)	Neutralization ND	FDA
	Positive (A)						FDA
	Negative (C)						FDA
	Negative (B)						FDA
December 1995	Negative (B)	Weak *gag* bands	Positive	ND	1.96 (D)	Not neutralizable	CDC
					9.84 (D)	Following immune complex disruption	CDC
					2.77 (F)	Neutralization ND	FDA
					3.03 (E)	Positive neutralization	FDA
	Positive (A)						FDA
	Negative (C)						FDA
	Negative (B)						FDA

* Enzyme immunoassay for HIV-1 antibody.
† Polymerase chain reaction.
§ Reverse-transcriptase PCR.
¶ Ratio of sample optical density (OD) to minimum OD required for a positive test.
** Not done.
†† Utah Department of Health.
§§ Utah Veterans Affairs Medical Center.
¶¶ Indeterminate results.
*** Food and Drug Administration.

HIV Infection — Continued

Laboratory Investigation

Two blood samples obtained in October and in December 1995 were analyzed by CDC and the Food and Drug Administration (FDA). Both samples were weakly reactive for antibody (signal/cutoff ratio <2.2) when tested by the HIV-EIA kit from manufacturer A, but were negative by kits from manufacturers B and C.

Because antibody detection assays were negative or weakly positive, additional assays were conducted. Assays for HIV-1 p24 antigen using the kit from manufacturer D on both samples were so weakly reactive that neutralization assays were invalid; however, after the samples were subjected to base dissociation to disrupt immune complexes, the p24-antigen results became strongly reactive and neutralizable. Antigen results also were positive using EIA kits from manufacturers E and F without immune complex disruption, including a positive neutralization test (kit E). HIV infection was diagnosed based on the positive p24-antigen test results.

Testing also was conducted to evaluate whether the persistent seronegativity was attributable to infection with an atypical virus or to lack of immune competence. HIV proviral DNA present in the peripheral blood mononuclear cells from the patient and his wife was amplified by a nested polymerase chain reaction (PCR) and sequenced directly. The results indicated that the HIV sequences from the patient and his wife were closely related[†], and that these HIV strains were subtype B viruses, the HIV subtype predominant in the United States. Immunologic evaluation of specimens obtained from the patient in August 1995 detected normal levels of serum immunoglobulin G, immunoglobulin M, and immunoglobulin A and a positive immunoglobulin G titer to Epstein-Barr virus and cytomegalovirus.

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Editorial Note: This report documents persistently negative HIV test results from an HIV-infected man. HIV-infected blood may test EIA negative for HIV antibody for at least three reasons. First, infectious blood may be tested during the "window period." Second, infections with divergent HIV strains (e.g., group O viruses) may not be detected by EIAs designed to detect antibody to HIV-1 and HIV-2 (*1*). However, a recently completed retrospective study in the United States did not document any serum samples with peptide reactivity consistent with HIV-1 group O infection (*2*). In the case described in this report, genetic analysis indicated that the husband and wife were infected with similar subtype B strains, typical of HIV-1 strains found in the United States. Third, although HIV-infected patients who are initially HIV seropositive have been reported to become seronegative (serorevert) (*3*), this phenomenon is rare when current HIV-EIAs are used (*4*).

The persistently seronegative status of the patient described in this report was not associated with one of the previously recognized reasons. Based on the similarity of the genetic sequences between the patient and his wife and results of the epidemiologic investigation, the most likely mode of HIV transmission to the

[†]DNA sequence analysis determined that sequences from the patient and his wife differed by 7.4% over 345 nucleotides of the C2V3 region of the *env* gene, and 3.1% over 393 nucleotides of the p17 region of *gag*. Phylogenetic tree constructions demonstrated the close relation between the HIV sequences from the patient and his wife, with a bootstrap support of 98% and 100%, respectively, for each gene region.

HIV Infection — Continued

case-patient was by heterosexual contact with his HIV-infected wife; the persistent seronegativity probably resulted from an atypical host response and not from infection with an atypical viral strain. A small number of such patients have been reported previously (*5,6*); in these cases, disease progression has been rapid, and diagnostic specimens were collected and analyzed only after the patient became ill.

Plasma obtained by plasmapheresis (source plasma) is either heat-treated or treated by a solvent/detergent process to inactivate HIV. Because the products derived from pools containing these donations were treated, no recall of plasma derivatives was initiated. CDC has not received reports of instances of HIV transmission by plasma products processed according to recommended procedures to inactivate HIV. In comparison, whole-blood donations are not treated, and failure to detect HIV antibody in an infected person is a safety concern for whole-blood donations. The blood supply in the United States is screened through predonation donor deferral based on history of exposure risks and postdonation laboratory testing (*7*). Of the 12 million units of blood donated in the United States annually, an estimated 32–49 blood components are potentially infectious for HIV and available for distribution by blood banks for infusion into patients—primarily because of "window period" donations (*8*). Since screening of donated blood began in 1985, a total of 35 cases of AIDS have been associated with receipt of "window period" donations; the sensitivity of the screening test has improved during this period.

FDA recently issued guidelines to blood and plasma establishments (e.g., plasmapheresis centers) and recommends that all blood and plasma donations be screened for HIV-1 p24 antigen beginning within 3 months of the licensing of a test kit for screening use (*9*). Although this recommendation was promulgated primarily to decrease the number of "window period" HIV-seronegative blood donations, p24-antigen testing may have an additional benefit of identifying blood from the rare HIV-infected donor with persistently undetectable HIV antibody. Kits to detect HIV-1 p24 antigen have not yet been licensed for screening purposes by FDA, but one or more such tests are expected to be licensed soon. The Public Health Service has issued guidelines for testing and counseling blood and plasma donors with HIV-1 p24 antigen (*10*).

Although the conditions characterizing the case described in this report are rare, such cases must be diagnosed correctly. Physicians who treat patients with AIDS-defining conditions—but for whom EIAs fail to detect HIV antibody—should seek specialized laboratory assistance from their state or local health departments. Laboratory procedures such as antigen testing, antigen testing after immune complex disruption, DNA-PCR, and reverse-transcriptase PCR can assist in defining the HIV-infection status of such persons.

References

1. Schable C, Zekeng L, Pau CP, et al. Sensitivity of United States HIV antibody tests for detection of HIV-1 group O infections. Lancet 1994;344:1333–4.
2. Pau CP, Hu DJ, Spurill C, et al. Surveillance for HIV-1 group O infections in the United States. Transfusion 1996 (in press).
3. Farzadegan H, Polis MA, Wolinsky SM, et al. Loss of human immunodeficiency virus type 1 (HIV-1) antibodies with evidence of viral infection in asymptomatic homosexual men: a report from the Multicenter AIDS Cohort Study. Ann Intern Med 1988;108:785–90.
4. Roy MJ, Damato JJ, Burke DS. Absence of true seroreversion of HIV-1 antibody in seroreactive individuals. JAMA 1993;269:2786–9.

HIV Infection — Continued

5. Martin-Rico P, Pedersen C, Skinhoj P, Nielsen C, Lindhardt B. Rapid development of AIDS in an HIV-1-antibody-negative homosexual man. AIDS 1995;9:95–6.
6. Soriano V, Dronda F, Gonzalex-Lopez A, Chaves F, Bravo R, Gutierrez M. HIV-1 causing AIDS and death in a seronegative individual. Vox Sang 1994;67:410–1.
7. Food and Drug Administration. Revised recommendations for the prevention of human immunodeficiency virus transmission blood and blood products [Memorandum to all registered blood and plasma establishments]. Rockville, Maryland: US Department of Health and Human Services, Public Health Service, Food and Drug Administration, Center for Biologics Evaluation and Research, 1992.
8. Lackritz EM, Satten GA, Aberle-Grasse J, et al. Estimated risk of transmission of the human immunodeficiency virus by screened blood in the United States. N Engl J Med 1995; 333:1721–5.
9. Food and Drug Administration. Recommendations for donor screening with a licensed test for HIV-1 antigen [Memorandum to all registered blood and plasma establishments]. Rockville, Maryland: US Department of Health and Human Services, Public Health Service, Food and Drug Administration, Center for Biologics Evaluation and Research, 1995.
10. CDC. U.S. Public Health Service guidelines for testing and counseling blood and plasma donors for human immunodeficiency virus type 1 antigen. MMWR 1996;45(no. RR-2).

Prevalence of Physical Inactivity During Leisure Time Among Overweight Persons — Behavioral Risk Factor Surveillance System, 1994

During 1988–1991, approximately one third of adults in the United States were overweight* (*2*)—an important risk factor for heart disease, diabetes, and some cancers (*3*). In addition to diet modification, initiating and maintaining regular physical activity is an important component of an effective weight-control strategy (*4*). To determine the prevalence of physical inactivity during leisure time among adults who are overweight, CDC analyzed data from the 1994 Behavioral Risk Factor Surveillance System (BRFSS). This report summarizes the results of that analysis, which indicate that more than one third (37%) of overweight persons report no physical activity during their leisure time.

The BRFSS is a population-based, random-digit–dialed telephone survey of the noninstitutionalized U.S. population aged ≥18 years. During 1994, a total of 103,690 persons were surveyed in 50 states and the District of Columbia; 11% were not eligible for this analysis because of pregnancy (1%) or missing information (10%). Of those remaining, 28% of men and 27% of women were overweight and were included in this analysis (n=25,164). Overweight persons were classified as attempting to control their weight if they reported trying to lose or maintain weight. Participants were asked about the type, duration, and frequency of the two leisure-time physical activities they had participated in most frequently during the preceding month. Those participating in no leisure-time physical activity during the preceding month were classified as inactive. Prevalence estimates and confidence intervals were calculated by using SUDAAN.

Overall, 33% of overweight men and 41% of overweight women were inactive during their leisure time (Table 1). The proportion of overweight persons reporting no

*Overweight is defined as a body mass index (BMI=weight [kg]/height [m]^2) ≥27.8 for men and ≥27.3 for women. This classification was based on the 85th percentile value for BMI among persons aged 20–29 years in the Second National Health and Nutrition Examination Survey (*1*).

TABLE 1. Weighted prevalence of inactivity* during leisure time among overweight persons†, by sex and weight-control status — United States, Behavioral Risk Factor Surveillance System, 1994§

	Men							Women						
		Attempting to control weight		Not attempting to control weight		Total			Attempting to control weight		Not attempting to control weight		Total	
Category	Sample size	%	(95% CI¶)	%	(95% CI)	%	(95% CI)	Sample size	%	(95% CI)	%	(95% CI)	%	(95% CI)
Age (yrs)														
18–29	1586	21%	(±3.6%)	34%	(± 7.9%)	**23%**	**(±3.3%)**	1579	26%	(±3.5%)	51%	(±14.4%)	**28%**	**(±3.4%)**
30–39	2633	27%	(±3.0%)	38%	(± 6.3%)	**28%**	**(±2.7%)**	2886	31%	(±2.7%)	53%	(± 9.3%)	**33%**	**(±2.6%)**
40–49	2710	29%	(±2.9%)	53%	(± 6.4%)	**33%**	**(±2.7%)**	2935	36%	(±2.9%)	64%	(± 7.4%)	**39%**	**(±2.8%)**
50–59	1810	36%	(±3.8%)	57%	(± 8.2%)	**40%**	**(±3.5%)**	2328	41%	(±3.2%)	66%	(± 7.3%)	**43%**	**(±3.0%)**
60–69	1431	34%	(±4.2%)	62%	(± 8.9%)	**39%**	**(±3.9%)**	2195	45%	(±3.6%)	71%	(± 6.1%)	**49%**	**(±3.3%)**
≥70	844	37%	(±6.0%)	67%	(±10.0%)	**45%**	**(±5.6%)**	2227	51%	(±3.7%)	76%	(± 5.4%)	**57%**	**(±3.3%)**
Education														
Less than high school diploma	1636	47%	(±4.3%)	68%	(± 7.5%)	**52%**	**(±3.8%)**	2941	53%	(±3.2%)	79%	(± 4.4%)	**58%**	**(±2.8%)**
High school graduate	3653	34%	(±2.7%)	54%	(± 5.1%)	**38%**	**(±2.4%)**	5214	40%	(±2.1%)	68%	(± 4.8%)	**43%**	**(±2.0%)**
Some college	2914	23%	(±2.7%)	36%	(± 6.1%)	**25%**	**(±2.5%)**	3746	31%	(±2.5%)	53%	(± 7.2%)	**32%**	**(±2.4%)**
College graduate	2811	18%	(±2.2%)	34%	(± 7.6%)	**20%**	**(±2.2%)**	2249	24%	(±2.9%)	45%	(±10.2%)	**26%**	**(±2.8%)**
Level of overweight														
Moderate**	7130	26%	(±1.8%)	46%	(± 3.9%)	**30%**	**(±1.7%)**	9564	35%	(±1.6%)	64%	(± 3.9%)	**39%**	**(±1.5%)**
Severe††	3884	34%	(±2.6%)	58%	(± 5.9%)	**38%**	**(±2.4%)**	4586	42%	(±2.4%)	71%	(± 5.4%)	**46%**	**(±2.2%)**
Total	**11,014**	**29%**	**(±1.5%)**	**49%**	**(± 3.3%)**	**33%**	**(±1.4%)**	**14,150**	**37%**	**(±1.3%)**	**66%**	**(± 3.2%)**	**41%**	**(±1.2%)**

*No reported leisure-time activity during the preceding month.
†Body mass index (BMI) ≥27.8 for men and ≥27.3 for women.
§n=25,164.
¶Confidence interval.
**BMI ≥27.8 and <31.1 for men and ≥27.3 and <32.3 for women.
††BMI ≥31.1 for men and ≥32.3 for women.

Physical Inactivity — Continued

physical activity during leisure time increased with age and level of overweight and decreased with level of educational achievement. Among overweight persons, 85% were attempting to control their weight (82% of men and 88% of women). Among men and women, overweight persons not attempting to control their weight were approximately 1.7 times more likely to be inactive during leisure time than those attempting to control their weight (49% and 29%, respectively and 66% and 37%, respectively). Among persons attempting to control their weight, those trying to only maintain weight were more likely to be inactive than those trying to lose weight (34% and 27% for men and 49% and 34% for women).

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Editorial Note: Based on the BRFSS findings, physical inactivity during leisure time was reported among a substantial proportion of overweight men (33%) and women (41%) in the United States. Demographic characteristics of persons who are less likely to be active—both among overweight persons and the total population—are similar. Factors related to differences in levels of physical activity may include knowledge and attitudes about physical activity, access to equipment and facilities, time, safety, and illness or disability (*5*). In this report, persons attempting to control their weight were more likely to be active during leisure time than those who were not. However, one third of those attempting to control their weight were inactive, indicating that some overweight persons either do not recognize the importance of physical activity in controlling weight or do not act on this knowledge.

The findings in this report may overestimate inactivity because of at least two limitations. First, because weight was self-reported and overweight persons tend to underreport their weight (*6*), those classified as overweight in this analysis probably represent a heavier subset of all overweight persons. Because leisure-time physical activity declines with increasing levels of weight, these prevalences of inactivity among overweight persons probably are overestimated. Second, prevalences of physical inactivity were estimated only for leisure time. The exclusion of other types of physical activity also could result in overestimates of inactivity because persons who reported inactivity during leisure time may have been physically active at other times (e.g., during work or household chores).

CDC and the American College of Sports Medicine have recommended that every U.S. adult should accumulate ≥30 minutes of moderate-to-intense physical activity on most, preferably all, days (*7*). Most persons should be able to engage in moderately intense activities such as walking. Before engaging in strenuous activity, persons with chronic diseases or risk factors for chronic diseases should consult their health-care provider.

Regular physical activity provides health benefits for most persons. Because of the increased risk for chronic diseases among overweight persons (*3*), regular physical activity is especially important for overweight persons. Physical activity facilitates weight control by increasing energy expenditure and by preventing the loss of lean body mass that occurs with dieting (*8*). In addition, participation in physical activity by overweight persons can positively influence metabolic status through improved insulin sensitivity and decreased levels of blood lipids (*9*).

Physical Inactivity — Continued

In the United States, the prevalence of overweight is increasing (*2*). Because of the increased health risks among overweight persons, health-care providers should routinely assess physical activity levels in their overweight patients and should counsel them to initiate or maintain regular physical activity to assist with weight control and to improve overall health (*10*). Although activities appropriate for overweight persons vary based on health status and other factors, walking is encouraged for most overweight persons—particularly those who are initiating an activity program.

References

1. Najjar MF, Rowland M. Anthropometric reference data and prevalence of overweight, United States, 1976–1980. Washington, DC: US Department of Health and Human Services, Public Health Services, National Center for Health Statistics, 1987; DHHS publication no. (PHS)87-1688. (Vital and health statistics; series 11, no. 238).
2. Kuczmarski RJ, Flegal KM, Campbell SM, Johnson CL. Increasing prevalence of overweight among U.S. adults: the National Health and Nutrition Examination Surveys, 1960–1991. JAMA 1994;272:205–11.
3. Pi-Sunyer FX. Health implications of obesity. Am J Clin Nutr 1991;53(suppl):1595S–603S.
4. Council on Scientific Affairs. Treatment of obesity in adults. JAMA 1988;260: 2547–51.
5. Dishman RK. Determinants of participation in physical activity. In: Bouchard C, Shepard RJ, Stephens T, Sutton JR, McPherson BD, eds. Exercise, fitness, and health: a consensus of current knowledge. Champaign, Illinois: Human Kinetics Publishers, Inc., 1990:75–101.
6. Rowland ML. Self-reported weight and height. Am J Clin Nutr 1990;52:1125–33.
7. Pate RR, Pratt M, Blair SN, et al. Physical activity and public health—a recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. JAMA 1995;273:402–7.
8. Garfinkel PE, Coscina DV. Discussion: exercise and obesity. In: Bouchard C, Shepard RJ, Stephens T, Sutton JR, McPherson BD, eds. Exercise, fitness, and health: a consensus of current knowledge. Champaign, Illinois: Human Kinetics Publishers, Inc., 1990:511–5.
9. Björntorp P. Physical exercise in the treatment of obesity. In: Björntorp P, Brodoff BN, eds. Obesity. Philadelphia: J.B. Lippincott Company, 1992:708–11.
10. Patrick K, Sallis JF, Long B, et al. A new tool for encouraging activity: Project PACE. The Physician and Sportsmedicine 1994;22:45–55.

Use of a Data-Based Approach by a Health Maintenance Organization to Identify and Address Physician Barriers to Pediatric Vaccination — California, 1995

Based on a vaccination coverage assessment during January–May 1994, 44% of 2-year-olds enrolled in the southern California health plan of a national health maintenance organization (HMO) were up-to-date at their second birthday for the complete series of recommended vaccinations (4:3:1:1 series*). This coverage level was low compared with the levels for some other health plans in the HMO (range: 39%–85% for the 41 other health plans). The assessment had been recommended by the National Committee for Quality Assurance (a national accreditation body for HMOs), and data had been obtained for analysis from the 1993 Health Plan Employer Data and Information Set (HEDIS), which is a standardized set of health-plan performance measurements including selected preventive services (e.g., mammography, cervical

*Four doses of diphtheria and tetanus toxoids and pertussis vaccine (DTP), three doses of oral poliovirus vaccine (OPV), one dose of measles-mumps-rubella vaccine (MMR), and one dose of *Haemophilus influenzae* type b vaccine (Hib) (after age 12 months).

Barriers to Pediatric Vaccination — Continued

cancer screening, eye examinations for persons with diabetes, cholesterol screening, and pediatric vaccination) (*1*). To assist the southern California health plan in developing interventions for increasing coverage, in May 1995, the HMO's national research center conducted a study to determine possible causes for the low pediatric vaccination coverage level. This report summarizes the findings of the analysis and illustrates the use of a data-based approach to assist in solving problems related to low vaccination coverage in a managed-care setting.

The setting is a non-Medicaid, independent practice association (IPA) model health plan with approximately 150,000 members and 4300 affiliated primary-care physicians in southern California. To verify the 44% vaccination rate, investigators at the research center reviewed the full texts of medical charts of a subset of children that had been previously identified in the 1993 HEDIS sample as members of the health plan. In 1993, a total of 1396 children aged 2 years were enrolled in the plan; of these, 255 (18%) met the HEDIS eligibility criteria of continuous enrollment since age 42 days. A simple random sample of 137 children was then selected from the 255 eligible children to comprise the 1993 HEDIS sample; of these, medical charts were available for 107 children at the time of the reassessment in 1995. Charts were unavailable for 30 children: 12 children were no longer enrolled in the plan, and the primary-care physicians for 18 enrolled children refused to release their charts. The 107 children were born in 1991 and had been continuously enrolled in the health plan from at least age 42 days to 24 months.

Vaccination dates were abstracted from charts and entered into the Clinical Assessment Software Application developed by CDC (*2*). To assess physician knowledge, attitudes, and practices regarding pediatric vaccination, a survey was mailed to the 97 physicians providing care for the children in the sample. The survey contained items adapted from instruments previously used to identify physician barriers to pediatric vaccination (*3,4*). Standard reports produced by CASA were used to calculate vaccination rates and estimate missed opportunities for simultaneous vaccinations.

Assessment of Pediatric Vaccination Coverage

Based on the medical chart review of the 107 children, 47 (44%) were up-to-date with all recommended vaccinations by age 24 months (Table 1). An estimated 23% of vaccination visits involved a missed opportunity to administer more than one vaccine. Eliminating these missed opportunities would have increased the overall vaccination coverage level to 55%.

TABLE 1. Number of children* enrolled in an HMO† health plan who were up-to-date for recommended vaccinations, by vaccination status and age — California, 1995

	By age 24 months	
Vaccination status	**No.**	**(%)**
4:3:1:1 series§	47	(44%)
Four DTP	65	(61%)
Three OPV	71	(66%)
One MMR	76	(71%)
One Hib	66	(62%)

*n=107.
†Health maintenance organization.
§Four doses of diphtheria and tetanus toxoids and pertussis vaccine (DTP), three doses of oral poliovirus vaccine (OPV), one dose of measles-mumps-rubella vaccine (MMR), and one dose of *Haemophilus influenzae* type b vaccine (Hib) (after age 12 months).

Barriers to Pediatric Vaccination — Continued

Of the 76 (71%) children who had received their first vaccine by age 3 months, 54 (71%) were up-to-date with the 4:3:1 vaccination series[†] by age 24 months. In contrast, of the 31 children who did not receive their first vaccine by age 3 months, two (6%) were up-to-date by age 24 months.

Physician Knowledge, Attitudes, and Practices

Of the 97 physicians surveyed, four were excluded because they did not provide well-child care; 71 (76%) of the remaining 93 physicians returned a questionnaire. Respondents reported their practices to include vaccinating children during acute-care visits (85%) and follow-up visits (97%); simultaneously administering four vaccines[§] to an eligible 18-month-old child (94%); and referring some children to other physicians/facilities for vaccinations (15%) (Table 2). Invalid contraindications also were assessed, and 61% of respondents reported not administering diphtheria and tetanus toxoids and pertussis vaccine when a child has a low-grade fever (<102.2 F [<39.0 C]) or when a child has afebrile bronchiolitis[¶]. Reported barriers to vaccinations included lack of a system to track undervaccinated children (37%) and temporary interruptions in the supply of some vaccines during the 12 months preceding the survey (18%). In addition, 39% of respondents offered no suggestion for improving vaccination rates in their practices.

Follow-Up

These findings were presented to the southern California health plan's management during a workshop to facilitate the design and implementation of data-based interventions. Participants worked in groups to examine the importance of each barrier and address options for the health plan to reduce or eliminate the barrier. After priorities were established, participants specified the behaviors, interventions, and methods to eliminate the barriers. Following the workshop, the health plan's management 1) disseminated CDC's *Guide to Contraindications to Childhood Vaccinations* to all pediatricians affiliated with the health plan, 2) conducted sessions to educate physicians about valid contraindications to vaccination, and 3) developed a plan to capture updated member addresses and telephone numbers to enhance vaccination-reminder and recall efforts. The results of the 1995 HEDIS assessment will assist the research center and the health plan in determining whether these interventions increased the previously documented vaccination coverage level.

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Editorial Note: The population-based and data-based approaches described in this report are common features of public health programs and, as illustrated in this report, can be implemented in managed-care delivery systems. In particular, the HEDIS health-plan performance measures that prompted the southern California health plan to review its vaccination activities underscore the capacity of managed-care organizations to collect and use data for improving prevention efforts. Physician behavior to

[†] Four doses of DTP, three doses of OPV, and one dose of MMR.
[§] DTP, OPV, MMR, and Hib.
[¶] Low-grade fever and afebrile bronchiolitis are not intrinsic contraindications; however, the clinical condition of the patient must be considered by the health-care professional when administering vaccine and occasionally may warrant withholding vaccine.

Barriers to Pediatric Vaccination — Continued

TABLE 2. Number and percentage of physicians* in an HMO† health plan, by selected characteristics — California, 1995

Physician characteristic	No.	(%)
Would vaccinate during visit(s) for:		
Acute care	60	(85)
Follow-up care	69	(97)
Had mechanism to identify undervaccinated children		
No specific system	26	(37)
Computer tracking system	6	(8)
"Tickler system" (i.e., index cards)	7	(10)
Systematic chart reviews	29	(41)
Other	10	(14)
Would give DTP, OPV, MMR, and Hib§ at a single preventive-care visit	67	(94)
Reported vaccines unavailable during preceding year	13	(18)
Ever referred patients elsewhere for vaccination(s)	11	(15)
Would not administer DTP to an 18-month-old child with the following invalid contraindications:		
Gastroenteritis (no dehydration)	27	(38)
Otitis media (afebrile)	22	(31)
Upper respiratory infection (afebrile)	7	(10)
Bronchiolitis¶ (afebrile)	43	(61)
Fever¶ (<102.2 F [<39.0 C])	43	(61)
Would not administer MMR to an 18-month-old child with the following invalid contraindications:		
Gastroenteritis (no dehydration)	24	(34)
Otitis media (afebrile)	19	(27)
Upper respiratory infection (afebrile)	6	(8)
Bronchiolitis¶ (afebrile)	41	(58)
Fever¶ (<102.2 F [<39.0 C])	42	(59)

*n=71.
†Health maintenance organization.
§Diphtheria and tetanus toxoids and pertussis vaccine, oral poliovirus vaccine, measles-mumps-rubella vaccine, and *Haemophilus influenzae* type b vaccine.
¶These conditions are not intrinsic contraindications; however, the clinical condition of the patient must be considered by the health-care professional when administering vaccine and occasionally may warrant withholding vaccine.

improve vaccination coverage may be influenced more readily in HMOs with centralized facilities and unique providers (e.g., group- or staff-model HMOs) than in IPA models, which comprise a network of independent physicians who serve a small proportion of the patient population in a particular HMO (*5*).

An important barrier to pediatric vaccination for many physicians in the health plan in southern California is the lack of systems to identify and track undervaccinated children. Provider-based tracking systems are well suited to both group- and IPA-model HMOs, and previous studies document their effectiveness in increasing vaccination coverage (*6*).

Barriers to Pediatric Vaccination — Continued

The findings in this report are subject to at least two limitations. First, the HEDIS measures used by HMOs—and consequently the measures used in this survey—require that children be continuously enrolled in the HMO since age 42 days to be eligible for inclusion in the HEDIS sample. In 20 of the health plans in the national HMO, the percentage of children who meet this criterion ranges from 16% to 87%; however, in the health plan described in this report, the criterion limited eligibility to only 18% of enrolled children. Consequently, these findings may not be generalizable to the total population of 2-year-olds enrolled in the health plan. For example, children continuously enrolled since age 42 days probably had more health-care visits and consequently more opportunities to be vaccinated than those enrolled for less time, and vaccination coverage for the continuously enrolled children may overestimate the coverage in the total population of 2-year-olds enrolled in the plan. In contrast, because some children may have received vaccinations from providers outside the health plan, and such information is not included in the plan's database, coverage for the children in this sample may underestimate true coverage. Second, these data included children born during January–December 1991 who were aged 24–35 months during the 1993 HEDIS report period for which data were collected in 1994 and were reexamined in 1995 for this report. Recently released national estimates for children who were born during May 1991–August 1993 documented series-complete coverage of 72% (*7*). Because of interventions initiated during 1991–1996 to increase coverage nationwide, current rates in this health plan may be >44% for children who were born after 1991 (*7*). Moreover, the mean HEDIS vaccination rate for all the health plans in the national HMO was 66% in 1994, even before the interventions described in this report were initiated in southern California.

The efforts of approximately 300 HMOs nationally are part of the Childhood Immunization Program led by the American Association of Health Plans (formerly Group Health Association of America and the American Managed Care and Review Association) to increase vaccination coverage levels and reach the national target of 90% vaccination coverage. Several managed-care organizations, including an IPA model, have successfully increased vaccination coverage at least 30 percentage points using data-based approaches as part of their quality-improvement activities (*8*); similar efforts in the public sector have improved vaccination levels in Georgia (*8*) and are being implemented in other states. More widespread adoption of these population-based and data-based techniques in both the public and private sectors can assist in accelerating the achievement of national vaccination coverage goals.

References

1. National Committee for Quality Assurance. Health Plan Employer Data and Information Set (HEDIS) (version 2.0). Washington, DC: National Committee for Quality Assurance, 1993.
2. CDC. Clinic Assessment Software Application (CASA) user's guide, version 3.0. Atlanta, Georgia: US Department of Health and Human Services, Public Health Service, CDC, 1994.
3. Szilagyi PG, Rodewald LE, Humiston SG, et al. Immunization practices of pediatricians and family physicians in the United States. Pediatrics 1994;94:517–23.
4. Lieu TA, Black SB, Ray P, et al. Risk factors for delayed immunization among children in an HMO. Am J Public Health 1994;84:1621–5.
5. Shenkin BN. The independent practice associated in theory and practice. JAMA 1995;273: 1937–42.

Barriers to Pediatric Vaccination — Continued

6. Abramson JS, O'Shea TM, Ratledge DL, Lawless MR, Givner LB. Development of a vaccine tracking system to improve the rate of age appropriate primary immunization in children of lower socioeconomic status. J Pediatr 1995;126:583–6.
7. CDC. National, state, and urban area vaccination coverage levels among children aged 19–35 months—United States, April 1994–March 1995. MMWR 1996;45:145–50.
8. CDC. Evaluation of vaccination strategies in public clinics—Georgia, 1985–1993. MMWR 1995; 44:323–5.

Clinical Laboratory Performance on Proficiency Testing Samples — United States, 1994

Regulation of laboratory testing for human health is mandated by law in the United States; the most recently enacted regulatory law is the Clinical Laboratory Improvement Amendments of 1988 (CLIA)*. In accordance with this law, as of August 1995, a total of 154,721 laboratories† had registered with the Health Care Financing Administration (HCFA), which is responsible for implementing the CLIA regulations. Of these laboratories, only 11% were subject to the federal laboratory practice regulations that existed before the enactment of CLIA. Under CLIA regulations, all laboratories were required to begin participation in a U.S. Department of Health and Human Services (DHHS)-approved proficiency testing (PT) program by January 1, 1994, for a prescribed group of tests (e.g., hematocrit), analytes (e.g., glucose), and testing specialties (e.g., bacteriology) if performed routinely. This report summarizes an assessment of the performance of laboratories participating in PT programs with a certificate of registration from HCFA§ in 1994 (n=40,711) and indicates that physician office laboratories (POLs) and other newly regulated testing sites (OTSs) had higher rates of unsatisfactory PT performance than previously regulated hospital and independent laboratories (HIs).

Laboratories participating in PT receive simulated patient specimens, test the specimens, and report their results back to the PT program. Participants receive notification of the accuracy of their test results from the PT program after results from all participant laboratories are evaluated. Three times a year, CLIA-regulated laboratories that perform certain moderate- or high-complexity assays for regulated tests, analytes, and testing specialties submit results from PT challenges to either HCFA or their accrediting organizations. For this analysis, data are presented for the 17,058 laboratories enrolled in the seven largest DHHS-approved PT programs¶ and whose PT results were reported to HCFA in compliance with their certificates of registration. These laboratories represent 42% of all laboratories whose PT performance is monitored by

*Public Law 100-578 (42 USC 201 note).
†Data were obtained in August 1995 from the Health Care Financing Administration Online Survey, Certification, and Reporting (OSCAR) database.
§CLIA regulations allow laboratories and testing sites to select monitoring of their PT performance by either HCFA or a DHHS-approved accrediting body. Those laboratories and testing sites that choose to have HCFA monitor their PT performance are issued a certificate of registration. Those laboratories and testing sites that choose to have an approved accrediting body monitor their PT performance are issued a certificate of accreditation from HCFA.
¶The American Academy of Family Physicians, the American Academy of Pediatrics, the American Association of Bioanalysts, the American Osteopathic Association, the College of American Pathologists, the External Comparative Evaluation, and the Medical Laboratory Evaluation program sponsored by the American Society for Internal Medicine.

Clinical Laboratory Performance — Continued

HCFA. PT scores were merged with the HCFA Online Survey, Certification, and Reporting (OSCAR) administrative data set to create three groups by laboratory type: HIs, POLs, and OTSs. Satisfactory and unsatisfactory PT performance ratings were calculated for the three study groups according to CLIA criteria.** Chi-square test statistics and logit odds ratios were calculated for each analyte using SAS statistical software.

In 1994, of the 154,721 laboratories in the United States, 57% were POLs, and 10% were HIs; the 33% OTSs were a combination of 20 other types (e.g., ambulatory surgery centers, community clinics, comprehensive outpatient rehabilitation facilities, ancillary testing sites in a health-care facility, end-stage renal disease dialysis facilities, and health fairs). In this analysis, the OTS group is considered as a unit because these laboratories previously had not been subject to federal regulatory oversight.††

In 1994, the 17,058 laboratories in this sample reported to HCFA approximately 1.2 million PT scores. The distribution of the reporting laboratories among the HI, POL, and OTS study groups was 43%, 36%, and 21%, respectively. Rates of overall satisfactory event performance for all regulated tests, analytes, and specialties for the three groups were 97% for the HIs; 89% for the POLs; and 94% for the OTSs. Data were analyzed for the 10 most common tests, analytes, or testing specialties performed by POLs. PT failure rates ranged from 1.2%–5.3% for the HIs, 4.1%–15.9% for the POLs, and 2.1%–11.6% for the OTSs (Figure 1).

Compared with HIs, logit odds ratios of unsatisfactory PT performance for the 10 most common tests, analytes, and specialties ranged from 2.4 to 6.0 for the POLs and from 1.4 to 3.6 for the OTSs (Table 1). In addition, odds ratios were calculated for the next 10 tests, analytes, and specialties most commonly performed in POLs (creatinine, potassium, white blood cell count, aspartate aminotransferase, alanine aminotransferase, white blood cell differential, total bilirubin, platelet count, alkaline phosphatase, and prothrombin time). All odds ratios were >1.0, and the odds ratios for POLs were consistently higher than for OTSs.

Reported by: Laboratory Practice Assessment Br, Div of Laboratory Systems, Public Health Practice Program Office, CDC.

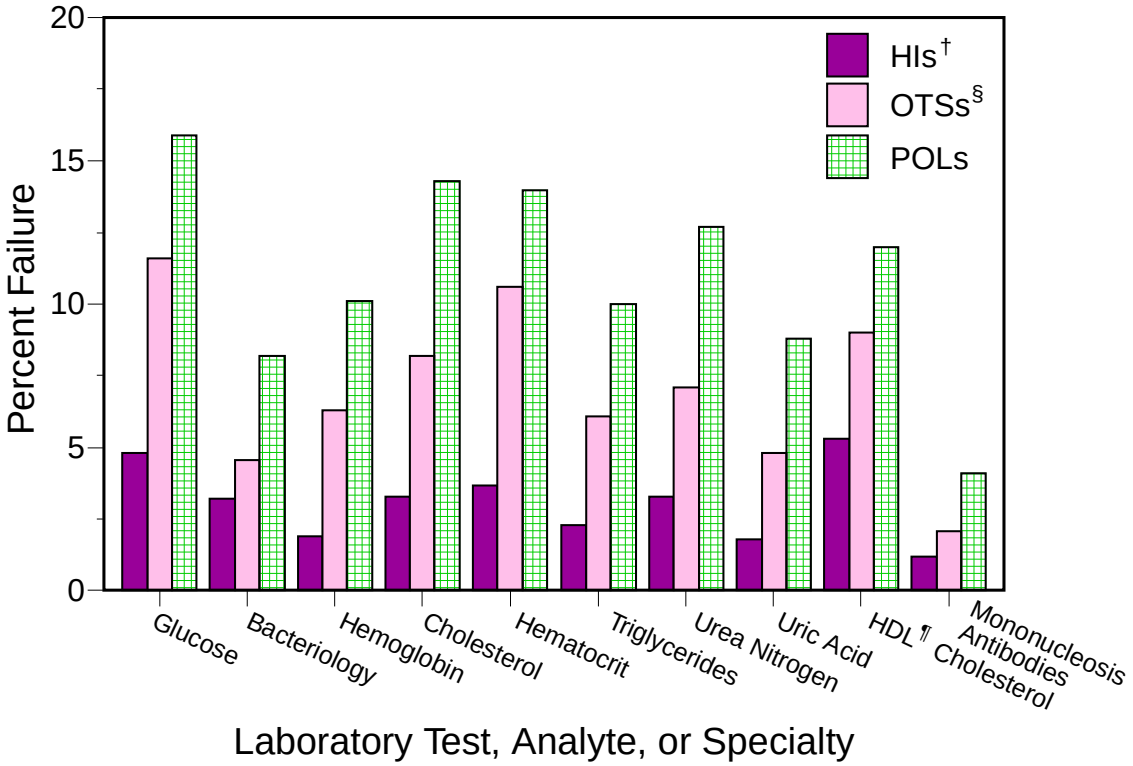
Editorial Note: Personnel, quality-control and quality-assurance standards, and PT comprise the basis for the CLIA regulatory model, with PT serving as the surrogate laboratory-performance measure. PT performance is a useful indicator of the quality of a laboratory's analytic performance on patient samples and may reflect the quality of routine testing (*1*). Previous assessments have established the usefulness of PT for identifying laboratories with performance deficiencies and specific analytic testing problems and for providing standards for laboratory improvement in test performance (*2*). Performance levels have been directly related to experience with PT (*3–5*), and satisfactory laboratory performance has been associated with the number of patient samples routinely tested, daily quality control, and participation in a PT program (*6*). In this report, PT failure rates for the POL and OTS groups were higher than those

** Failure to attain an overall testing event score of at least 80% is considered unsatisfactory performance for all specialties and subspecialties with the following exceptions: gynecologic cytology (90%), ABO group and D (Rho) typing (100%), and compatibility testing (100%).

†† Before passage of the CLIA legislation in 1988, some states (California, Florida, Idaho, Maryland, Massachusetts, Michigan, Nevada, New Jersey, Oregon, Pennsylvania, West Virginia, Wisconsin, and Wyoming) enacted regulatory legislation that encompassed some alternative testing sites; requirements varied by state. Most of these laws (except in California, Idaho, and Pennsylvania) exempted most POLs from regulation.

Clinical Laboratory Performance — Continued

FIGURE 1. Percentage of proficiency testing (PT)-challenge failures for the 10 most common laboratory tests, analytes, or testing specialties performed by physician office laboratories (POLs), by type of laboratory — United States, 1994*



*Approximately 1.2 million PT scores were obtained from the Health Care Financing Administration for 17,058 laboratories participating in the seven largest U.S. Department of Health and Human Services-approved PT programs.
†Hospital and independent laboratories.
§All other testing sites.
¶High-density lipoprotein.

TABLE 1. Odds ratios of unsatisfactory proficiency testing performance for POLs* and OTSs† compared with HIs§ for the 10 most common tests, analytes, or testing specialties performed by POLs — United States, 1994

	POLs		OTSs	
Test, analyte, or specialty	Odds ratio	(95% CI¶)	Odds ratio	(95% CI)
Glucose	3.8	(3.4–4.1)	2.6	(2.3–2.9)
Bacteriology	2.7	(2.4–3.0)	1.4	(1.2–1.7)
Hemoglobin	6.0	(5.3–6.8)	3.6	(3.1–4.2)
Cholesterol	4.9	(4.4–5.5)	2.6	(2.3–3.1)
Hematocrit	4.2	(3.9–4.7)	3.1	(2.7–3.4)
Triglycerides	4.8	(4.2–5.5)	2.8	(2.3–3.4)
Urea nitrogen	4.2	(3.8–4.7)	2.2	(1.9–2.6)
Uric acid	5.3	(4.6–6.1)	2.8	(2.2–3.5)
High-density lipoprotein cholesterol	2.4	(2.2–2.7)	1.8	(1.5–2.1)
Mononucleosis antibodies	3.7	(3.0–4.6)	1.8	(1.3–2.4)

*Physician office laboratories.
†All other testing sites.
§Hospital and independent laboratories.
¶Confidence interval.

Clinical Laboratory Performance — Continued

for the HI group, possibly reflecting lack of laboratory practice expertise or experience with PT. For example, some OTS laboratories may perform complex tests more consistent with the functions of a traditional, previously regulated laboratory, while others perform tests more consistent with those of a previously unregulated POL.

The findings in this report are subject to at least three limitations. First, although this assessment included results from the two largest DHHS-approved PT programs (the American Association of Bioanalysts and the College of American Pathologists), the findings may not be representative because scores from all DHHS-approved PT programs were not available for analysis. Second, because processing of PT samples differs from the routine processing of patient samples, PT performance cannot directly assess the reliability of some important preanalytic and postanalytic steps. Finally, the relation between PT performance and overall daily laboratory performance is complex. Although PT is sensitive to poor daily laboratory performance, some false positives occur. Therefore, poor PT performance may be attributable to human errors in processing PT samples or in reporting the results rather than poor analytic technique.

Most deficiencies in PT are the result of methodologic or technical problems (*7*). Participation in PT can assist in alerting laboratories to potential problems in testing and provides opportunities for corrective action. Monitoring and disseminating information about trends in PT performance during the ongoing implementation of the CLIA regulations can assist individual laboratories in assessing their performance relative to other laboratories. In addition, PT performance trends can be used by public and private laboratory professional organizations to plan training and educational programs for improving the quality of clinical laboratory testing.

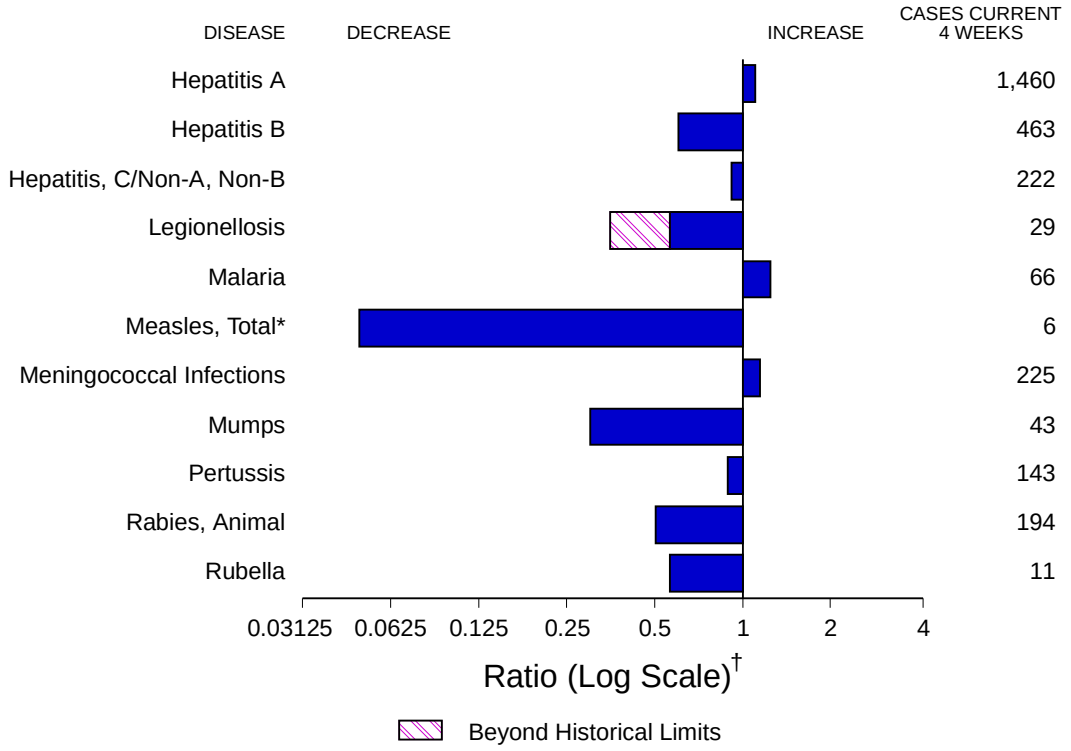
References

1. Jenny RW, Jackson KY. Proficiency test performance as a predictor of accuracy of routine patient testing for theophylline. Clin Chem 1993;39:76–81.
2. Boone DJ. Literature review of research related to the Clinical Laboratory Improvement Amendments of 1988. Arch Pathol Lab Med 1992;116:681–93.
3. Tholen D, Lawson NS, Cohen T, Gilmore B. Proficiency test performance and experience with College of American Pathologists' programs. Arch Pathol Lab Med 1995;119:307–11.
4. Rickman WJ, Monical C, Waxdal MJ. Improved precision in the enumeration of absolute numbers of lymphocyte immunophenotypes with long-term monthly proficiency testing. Ann N Y Acad Sci 1993;677:53–8.
5. Ehrmeyer SS, Burmeister BJ, Laessig RH, Hassemer DJ. Laboratory performance in a state proficiency testing program: what can a laboratorian take home? J Clin Immunol 1994;17: 223–30.
6. Erickson R, Driscoll C, Dvorak L, et al. Factors related to accuracy in office cholesterol testing: Iowa Academy of Family Physicians Network. J Fam Pract 1991;33:457–61.
7. Steindel SJ, Howanitz PJ, Renner SW, Sarewitz SJ. Short-term studies of the laboratory's role in quality care laboratory proficiency testing: data analysis and critique. Northfield, Illinois: College of American Pathologists, 1995.

Erratum: Vol. 45, No. 7

In the report, "National, State, and Urban Area Vaccination Coverage Levels Among Children Aged 19–35 Months—United States, April 1994–March 1995," on page 149 in Table 3 in the column for 4:3:1:3 series coverage, the percentage coverage for Chicago should be 55.

FIGURE I. Selected notifiable disease reports, comparison of 4-week totals ending March 2, 1996, with historical data — United States



*The large apparent decrease in the number of reported cases of measles (total) reflects dramatic fluctuations in the historical baseline.

†Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of selected notifiable diseases, United States, cumulative, week ending March 2, 1996 (9th Week)

	Cum. 1996		Cum. 1996
Anthrax	-	HIV infection, pediatric*§	49
Brucellosis	7	Plague	-
Cholera	-	Poliomyelitis, paralytic¶	-
Congenital rubella syndrome	-	Psittacosis	3
Cryptosporidiosis*	194	Rabies, human	-
Diphtheria	1	Rocky Mountain spotted fever (RMSF)	10
Encephalitis: California*	-	Streptococcal toxic-shock syndrome*	7
eastern equine*	1	Syphilis, congenital**	-
St. Louis*	-	Tetanus	2
western equine*	-	Toxic-shock syndrome	21
Hansen Disease	17	Trichinosis	4
Hantavirus pulmonary syndrome*†	-	Typhoid fever	24

*Not notifiable in all states.
†Updated weekly from reports to the Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases (NCID).
§Updated monthly to the Division of HIV/AIDS Prevention, National Center for Prevention Services (NCPS), last update February 27, 1996.
¶No suspected cases of polio reported for 1996.
**Updated quarterly from reports to the Division of STD Prevention, NCPS. First quarter 1996 is not yet available.
-: no reported cases

TABLE II. Cases of selected notifiable diseases, United States, weeks ending March 2, 1996, and March 4, 1995 (9th Week)

Reporting Area	AIDS*		Chlamydia	*Escherichia coli* O157:H7		Gonorrhea		Hepatitis C/NA,NB		Legionellosis	
				NETSS†	PHLIS§						
	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995
UNITED STATES	10,058	11,041	27,287	97	33	44,296	67,917	553	667	102	184
NEW ENGLAND	454	509	1,668	13	3	1,020	1,012	7	11	4	2
Maine	8	15	-	2	-	4	10	-	-	1	-
N.H.	14	11	109	1	1	24	19	-	1	-	-
Vt.	5	1	-	3	2	16	5	3	-	-	-
Mass.	250	285	1,153	4	-	396	570	4	10	2	1
R.I.	17	28	406	2	-	103	104	-	-	1	1
Conn.	160	169	-	1	-	477	304	-	-	N	N
MID. ATLANTIC	2,863	2,932	1,128	13	9	3,417	7,954	63	59	16	21
Upstate N.Y.	324	250	N	8	6	349	1,898	42	22	5	4
N.Y. City	1,615	1,572	-	-	-	713	2,422	1	1	-	1
N.J.	554	665	1,128	2	-	506	741	16	29	2	6
Pa.	370	445	-	N	3	1,849	2,893	4	7	9	10
E.N. CENTRAL	822	1,121	6,966	12	2	7,748	14,051	59	57	39	66
Ohio	250	236	1,046	9	-	599	4,627	2	2	18	26
Ind.	91	80	1,675	2	-	1,375	1,401	2	-	8	12
Ill.	315	532	-	1	1	2,783	3,422	2	20	1	12
Mich.	108	215	3,745	-	1	2,644	3,391	53	35	12	7
Wis.	58	58	500	N	-	347	1,210	-	-	-	9
W.N. CENTRAL	254	234	2,557	12	10	2,037	3,738	69	15	7	18
Minn.	56	64	-	1	8	-	546	-	-	-	-
Iowa	23	14	183	3	1	83	283	46	2	1	2
Mo.	93	97	1,795	1	-	1,476	2,101	23	9	1	16
N. Dak.	-	-	-	1	1	-	6	-	-	-	-
S. Dak.	3	-	191	-	-	25	34	-	1	1	-
Nebr.	22	20	388	1	-	57	183	-	1	4	-
Kans.	57	39	-	5	-	396	585	-	2	-	-
S. ATLANTIC	2,485	2,665	8,031	9	1	18,515	20,204	20	51	11	37
Del.	72	69	-	-	-	281	355	-	-	-	-
Md.	198	348	880	N	-	2,366	2,631	-	2	2	8
D.C.	125	140	N	-	-	753	1,115	-	-	1	2
Va.	129	233	1,631	N	1	1,192	1,965	1	-	2	1
W. Va.	19	13	-	N	-	99	106	4	14	1	3
N.C.	34	160	-	4	-	3,633	4,563	7	13	3	7
S.C.	93	165	-	1	-	2,189	2,114	1	1	1	5
Ga.	446	383	1,839	1	-	4,765	3,614	-	7	-	5
Fla.	1,369	1,154	3,681	-	-	3,237	3,741	7	14	1	6
E.S. CENTRAL	360	381	1,134	4	1	4,406	8,087	73	266	10	7
Ky.	66	38	-	-	-	729	917	4	5	2	2
Tenn.	141	167	1,101	N	1	1,201	2,104	69	260	4	3
Ala.	90	103	-	-	-	2,329	3,474	-	1	-	1
Miss.	63	73	33	2	-	147	1,592	-	-	4	1
W.S. CENTRAL	956	904	993	5	1	2,680	5,478	51	18	-	3
Ark.	45	45	-	3	-	522	616	-	-	-	-
La.	225	168	-	N	1	1,481	2,214	8	7	-	1
Okla.	28	57	993	1	-	677	58	33	9	-	2
Tex.	658	634	-	1	-	-	2,590	10	2	-	-
MOUNTAIN	254	434	2,923	9	2	1,163	1,661	128	79	5	20
Mont.	3	7	-	-	-	3	23	4	3	-	2
Idaho	4	16	229	2	-	12	26	47	10	-	1
Wyo.	-	4	120	-	-	8	10	34	32	-	-
Colo.	85	187	-	3	2	348	530	4	18	4	11
N. Mex.	20	34	-	-	-	169	218	22	9	-	1
Ariz.	96	88	1,949	N	-	464	545	13	4	-	1
Utah	39	30	254	3	-	49	34	4	3	-	2
Nev.	7	68	371	1	-	110	275	-	-	1	2
PACIFIC	1,610	1,861	1,887	20	4	3,310	5,732	83	111	10	10
Wash.	141	147	1,672	4	4	438	477	14	25	-	-
Oreg.	103	74	-	7	-	46	77	2	6	-	-
Calif.	1,340	1,549	-	7	-	2,679	4,892	36	72	10	7
Alaska	3	29	N	-	-	79	174	2	-	-	-
Hawaii	23	62	215	N	-	68	112	29	8	-	3
Guam	3	-	-	N	-	-	13	-	-	-	-
P.R.	255	586	N	N	U	59	100	15	17	-	-
V.I.	1	-	N	N	U	-	7	-	-	-	-
Amer. Samoa	-	-	-	N	U	-	6	-	-	-	-
C.N.M.I.	-	-	N	N	U	-	4	-	-	-	-

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

*Updated monthly to the Division of HIV/AIDS Prevention, National Center for Prevention Services, last update February 27, 1996.
†National Electronic Telecommunications System for Surveillance.
§Public Health Laboratory Information System.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending March 2, 1996, and March 4, 1995 (9th Week)

Reporting Area	Lyme Disease		Malaria		Meningococcal Disease		Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal	
	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995
UNITED STATES	469	673	140	162	643	577	1,599	2,808	1,989	2,144	495	920
NEW ENGLAND	28	27	4	7	23	37	26	38	50	39	66	248
Maine	-	1	1	-	6	2	-	-	4	-	-	-
N.H.	-	2	-	1	1	7	-	1	2	1	7	38
Vt.	-	1	1	-	1	5	-	-	-	-	16	31
Mass.	7	3	2	-	7	11	14	14	20	16	19	119
R.I.	16	-	-	2	-	-	-	-	8	7	8	-
Conn.	5	20	-	4	8	12	12	23	16	15	16	60
MID. ATLANTIC	393	531	38	35	43	56	52	190	289	381	82	225
Upstate N.Y.	141	202	10	3	12	17	-	22	30	31	30	140
N.Y. City	128	27	19	16	5	8	18	105	152	209	-	-
N.J.	-	86	6	12	14	22	16	32	77	74	23	40
Pa.	124	216	3	4	12	9	18	31	30	67	29	45
E.N. CENTRAL	6	6	16	23	80	87	335	475	350	258	5	1
Ohio	4	4	3	1	39	22	141	166	55	38	2	1
Ind.	2	1	1	1	6	14	44	44	26	8	-	-
Ill.	-	1	3	17	22	30	83	163	228	149	-	-
Mich.	-	-	7	2	5	11	39	63	34	59	-	-
Wis.	-	-	2	2	8	10	28	39	7	4	3	-
W.N. CENTRAL	16	12	3	5	57	27	63	154	50	60	43	46
Minn.	-	-	-	3	3	1	-	6	13	11	3	4
Iowa	9	-	1	-	15	7	4	11	5	15	26	12
Mo.	-	5	1	2	19	12	56	133	18	22	3	7
N. Dak.	-	-	-	-	1	-	-	-	1	-	4	5
S. Dak.	-	-	-	-	2	-	-	-	5	-	7	11
Nebr.	-	-	-	-	8	2	3	4	-	-	-	-
Kans.	7	7	1	-	9	5	-	-	8	12	-	7
S. ATLANTIC	20	72	24	38	99	98	548	738	235	356	246	274
Del.	1	9	2	1	1	1	10	4	-	9	10	13
Md.	14	52	10	10	12	1	84	72	34	71	78	68
D.C.	-	-	1	3	2	1	20	30	12	18	-	1
Va.	-	1	5	7	5	11	56	117	1	6	52	50
W. Va.	2	5	-	-	4	-	1	-	12	13	8	15
N.C.	3	3	4	4	16	13	183	201	40	18	49	56
S.C.	-	2	-	-	17	11	80	110	38	50	6	16
Ga.	-	-	2	3	33	31	60	126	-	55	38	46
Fla.	-	-	-	10	9	29	54	78	98	116	5	9
E.S. CENTRAL	-	6	-	1	47	29	412	646	190	158	8	37
Ky.	-	1	-	-	8	10	32	44	36	31	-	3
Tenn.	-	3	-	-	3	6	84	132	31	62	-	19
Ala.	-	-	-	1	18	8	119	117	68	65	8	15
Miss.	-	2	-	-	18	5	177	353	55	-	-	-
W.S. CENTRAL	-	6	1	2	79	66	141	388	84	167	3	26
Ark.	-	-	-	1	9	6	41	84	12	29	-	14
La.	-	-	-	-	16	8	78	186	-	-	-	9
Okla.	-	6	-	-	4	8	22	32	9	32	3	3
Tex.	-	-	1	1	50	44	-	86	63	106	-	-
MOUNTAIN	-	1	12	11	47	43	21	56	74	66	7	7
Mont.	-	-	-	1	1	1	-	2	-	-	-	3
Idaho	-	-	1	-	6	2	1	-	2	2	-	-
Wyo.	-	-	1	-	4	1	1	-	-	-	4	-
Colo.	-	-	5	6	4	11	9	27	12	3	-	-
N. Mex.	-	-	1	2	10	8	-	9	5	17	1	-
Ariz.	-	-	1	1	15	18	7	10	42	40	1	4
Utah	-	-	2	1	3	1	-	2	-	3	-	-
Nev.	-	1	1	-	4	1	3	6	13	1	1	-
PACIFIC	6	12	42	40	168	134	1	123	667	659	35	56
Wash.	-	-	-	5	15	11	-	1	39	38	-	-
Oreg.	4	-	4	4	31	31	1	3	15	4	-	-
Calif.	2	12	35	29	118	91	-	119	574	573	32	54
Alaska	-	-	-	1	2	-	-	-	12	14	3	2
Hawaii	-	-	3	1	2	1	-	-	27	30	-	-
Guam	-	-	-	-	-	1	-	1	-	4	-	-
P.R.	-	-	-	-	-	9	29	55	-	-	6	11
V.I.	-	-	-	-	-	-	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	2	-	-
C.N.M.I.	-	-	-	-	-	-	-	-	-	5	-	-

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

TABLE III. Cases of selected notifiable diseases preventable by vaccination, United States, weeks ending March 2, 1996, and March 4, 1995 (9th Week)

Reporting Area	*H. influenzae*, invasive		Hepatitis (viral), by type				Measles (Rubeola)			
			A		B		Indigenous		Imported†	
	Cum. 1996*	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	1996	Cum. 1996	1996	Cum. 1996
UNITED STATES	216	244	3,706	4,016	1,036	1,342	4	10	-	1
NEW ENGLAND	7	10	36	27	2	46	-	3	-	-
Maine	-	-	5	6	-	1	-	-	-	-
N.H.	5	1	3	1	-	3	-	-	-	-
Vt.	-	1	-	-	1	1	-	-	-	-
Mass.	2	2	19	6	-	9	-	3	-	-
R.I.	-	-	2	7	1	6	-	-	-	-
Conn.	-	6	7	7	-	26	-	-	-	-
MID. ATLANTIC	26	25	217	187	179	154	-	1	-	-
Upstate N.Y.	9	8	50	31	48	41	-	-	-	-
N.Y. City	2	4	147	85	117	27	-	1	-	-
N.J.	8	5	-	40	-	58	-	-	-	-
Pa.	7	8	20	31	14	28	-	-	-	-
E.N. CENTRAL	29	51	346	647	121	207	-	-	-	-
Ohio	18	28	195	366	21	14	-	-	-	-
Ind.	1	3	69	29	15	43	-	-	-	-
Ill.	9	17	16	136	10	62	-	-	-	-
Mich.	-	3	51	71	71	75	-	-	-	-
Wis.	1	-	15	45	4	13	-	-	-	-
W.N. CENTRAL	10	7	312	179	99	107	-	-	-	-
Minn.	-	1	7	11	2	4	-	-	-	-
Iowa	6	1	91	9	40	13	-	-	-	-
Mo.	4	4	141	137	40	80	-	-	-	-
N. Dak.	-	-	4	1	-	1	-	-	-	-
S. Dak.	-	-	11	-	-	-	-	-	-	-
Nebr.	-	-	30	10	3	5	-	-	-	-
Kans.	-	1	28	11	14	4	-	-	-	-
S. ATLANTIC	49	62	118	166	155	175	-	1	-	-
Del.	-	-	1	3	-	1	-	-	-	-
Md.	13	22	37	35	53	40	-	1	-	-
D.C.	-	-	3	1	3	7	-	-	-	-
Va.	2	8	10	34	17	14	-	-	-	-
W. Va.	-	1	4	6	6	12	-	-	-	-
N.C.	5	10	20	17	57	45	-	-	-	-
S.C.	2	-	16	4	6	6	-	-	-	-
Ga.	27	7	-	8	-	12	-	-	-	-
Fla.	-	14	27	58	13	38	-	-	-	-
E.S. CENTRAL	6	3	110	229	25	168	-	-	-	-
Ky.	2	1	5	17	8	19	-	-	-	-
Tenn.	-	-	19	173	6	127	-	-	-	-
Ala.	3	2	29	23	11	22	-	-	-	-
Miss.	1	-	57	16	-	-	-	-	-	-
W.S. CENTRAL	7	9	618	269	71	57	-	-	-	-
Ark.	-	1	104	12	8	1	-	-	-	-
La.	-	-	10	10	6	5	-	-	-	-
Okla.	7	6	322	91	19	11	-	-	-	-
Tex.	-	2	182	156	38	40	-	-	-	-
MOUNTAIN	23	22	575	756	145	103	-	-	-	-
Mont.	-	-	12	11	-	4	-	-	-	-
Idaho	1	1	79	85	20	15	-	-	-	-
Wyo.	9	1	5	27	5	2	-	-	-	-
Colo.	1	3	24	100	9	20	-	-	-	-
N. Mex.	5	4	99	153	70	36	-	-	-	-
Ariz.	4	6	153	164	14	13	-	-	-	-
Utah	2	2	167	193	20	8	-	-	-	-
Nev.	1	5	36	23	7	5	-	-	-	-
PACIFIC	59	55	1,374	1,556	239	325	4	5	-	1
Wash.	-	3	94	67	15	14	3	4	-	-
Oreg.	7	6	206	298	15	20	-	-	-	-
Calif.	50	44	1,035	1,164	206	286	-	-	-	-
Alaska	-	-	19	14	2	1	1	1	-	-
Hawaii	2	2	20	13	1	4	-	-	-	1
Guam	-	-	-	-	-	-	U	-	U	-
P.R.	-	3	13	4	40	27	-	-	-	-
V.I.	-	-	-	-	-	1	U	-	U	-
Amer. Samoa	-	-	-	4	-	-	U	-	U	-
C.N.M.I.	-	-	-	5	-	-	U	-	U	-

*Of 48 cases among children aged <5 years, serotype was reported for 13 and of those, 1 was type B.
†For imported measles, cases include only those resulting from importation from other countries.
N: Not notifiable U: Unavailable -: no reported cases

TABLE III. (Cont'd.) Cases of selected notifiable diseases preventable by vaccination, United States, weeks ending March 2, 1996, and March 4, 1995 (9th Week)

Reporting Area	Measles (Rubeola), cont'd. Total		Mumps			Pertussis			Rubella		
	Cum. 1996	Cum. 1995	1996	Cum. 1996	Cum. 1995	1996	Cum. 1996	Cum. 1995	1996	Cum. 1996	Cum. 1995
UNITED STATES	11	59	9	96	131	46	276	470	4	24	11
NEW ENGLAND	3	3	-	-	2	12	48	77	-	2	2
Maine	-	-	-	-	2	-	2	6	-	-	-
N.H.	-	-	-	-	-	-	6	5	-	-	1
Vt.	-	-	-	-	-	-	5	2	-	-	-
Mass.	3	1	-	-	-	12	35	61	-	-	1
R.I.	-	2	-	-	-	-	-	-	-	-	-
Conn.	-	-	-	-	-	-	-	3	-	2	-
MID. ATLANTIC	1	1	-	12	19	2	38	37	2	3	-
Upstate N.Y.	-	-	-	5	4	1	28	21	2	2	-
N.Y. City	1	-	-	2	2	1	8	9	-	1	-
N.J.	-	1	-	-	3	-	-	3	-	-	-
Pa.	-	-	-	5	10	-	2	4	-	-	-
E.N. CENTRAL	-	-	3	26	18	6	47	54	-	-	-
Ohio	-	-	-	13	7	4	35	24	-	-	-
Ind.	-	-	3	4	4	-	3	6	-	-	-
Ill.	-	-	-	-	-	-	-	-	-	-	-
Mich.	-	-	-	9	7	2	7	22	-	-	-
Wis.	-	-	-	-	-	-	2	2	-	-	-
W.N. CENTRAL	-	1	-	2	10	1	2	18	-	-	-
Minn.	-	-	-	-	-	-	1	-	-	-	-
Iowa	-	-	-	-	1	1	1	1	-	-	-
Mo.	-	1	-	-	8	-	-	7	-	-	-
N. Dak.	-	-	-	2	-	-	-	1	-	-	-
S. Dak.	-	-	-	-	-	-	-	2	-	-	-
Nebr.	-	-	-	-	1	-	-	1	-	-	-
Kans.	-	-	-	-	-	-	-	6	-	-	-
S. ATLANTIC	1	-	2	10	23	-	19	42	-	-	1
Del.	-	-	-	-	-	-	-	2	-	-	-
Md.	1	-	2	4	5	-	14	-	-	-	-
D.C.	-	-	-	-	-	-	-	1	-	-	-
Va.	-	-	-	2	4	-	-	-	-	-	-
W. Va.	-	-	-	-	-	-	-	-	-	-	-
N.C.	-	-	-	-	10	-	-	30	-	-	-
S.C.	-	-	-	3	1	-	2	7	-	-	-
Ga.	-	-	-	1	-	-	1	-	-	-	-
Fla.	-	-	-	-	3	-	2	2	-	-	1
E.S. CENTRAL	-	-	-	3	4	-	6	9	-	-	-
Ky.	-	-	-	-	-	-	4	-	-	-	-
Tenn.	-	-	-	-	-	-	-	-	-	-	-
Ala.	-	-	-	3	2	-	1	9	-	-	-
Miss.	-	-	-	-	2	-	1	-	N	N	N
W.S. CENTRAL	-	-	-	3	7	-	3	9	-	-	-
Ark.	-	-	-	-	2	-	2	-	-	-	-
La.	-	-	-	3	1	-	1	-	-	-	-
Okla.	-	-	-	-	-	-	-	-	-	-	-
Tex.	-	-	-	-	4	-	-	9	-	-	-
MOUNTAIN	-	47	-	8	4	12	36	153	-	-	2
Mont.	-	-	-	-	-	-	2	2	-	-	-
Idaho	-	-	-	-	-	9	11	47	-	-	-
Wyo.	-	-	-	-	-	-	-	-	-	-	-
Colo.	-	17	-	-	-	-	-	30	-	-	-
N. Mex.	-	23	N	N	N	3	12	4	-	-	-
Ariz.	-	7	-	-	-	-	2	68	-	-	2
Utah	-	-	-	-	1	-	1	1	-	-	-
Nev.	-	-	-	8	3	-	8	1	-	-	-
PACIFIC	6	7	4	32	44	13	77	71	2	19	6
Wash.	4	-	-	2	1	4	10	9	1	1	-
Oreg.	-	-	N	N	N	2	15	1	-	-	-
Calif.	-	7	4	22	37	6	48	59	-	17	6
Alaska	1	-	-	1	5	-	-	-	-	-	-
Hawaii	1	-	-	7	1	1	4	2	1	1	-
Guam	-	-	U	-	-	U	-	-	U	-	-
P.R.	-	-	-	-	-	-	-	2	-	-	-
V.I.	-	-	U	-	1	U	-	-	U	-	-
Amer. Samoa	-	-	U	-	-	U	-	-	U	-	-
C.N.M.I.	-	-	U	-	-	U	-	-	U	-	-

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

TABLE IV. Deaths in 121 U.S. cities,* week ending March 2, 1996 (9th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	597	444	94	37	15	6	27
Boston, Mass.	121	76	26	10	4	4	2
Bridgeport, Conn.	44	32	7	3	1	1	-
Cambridge, Mass.	24	19	2	1	2	-	1
Fall River, Mass.	21	21	-	-	-	-	-
Hartford, Conn.	67	40	17	9	1	-	1
Lowell, Mass.	27	25	2	-	-	-	1
Lynn, Mass.	13	7	4	2	-	-	-
New Bedford, Mass.	27	26	1	-	-	-	-
New Haven, Conn.	52	34	14	4	-	-	2
Providence, R.I.	44	31	7	2	3	1	3
Somerville, Mass.	9	8	1	-	-	-	-
Springfield, Mass.	47	39	3	5	-	-	6
Waterbury, Conn.	33	31	2	-	-	-	5
Worcester, Mass.	68	55	8	1	4	-	6
MID. ATLANTIC	2,487	1,686	452	259	40	50	137
Albany, N.Y.	46	33	10	3	-	-	4
Allentown, Pa.	23	19	2	2	-	-	-
Buffalo, N.Y.	U	U	U	U	U	U	U
Camden, N.J.	44	30	10	2	-	2	4
Elizabeth, N.J.	33	22	11	-	-	-	-
Erie, Pa.§	28	24	4	-	-	-	2
Jersey City, N.J.	54	37	10	5	1	1	2
New York City, N.Y.	1,368	890	252	179	22	25	54
Newark, N.J.	82	32	27	11	2	10	9
Paterson, N.J.	24	8	10	3	1	2	2
Philadelphia, Pa.	299	221	49	21	4	4	29
Pittsburgh, Pa.§	95	70	13	7	3	2	5
Reading, Pa.	25	23	2	-	-	-	8
Rochester, N.Y.	123	91	21	9	2	-	9
Schenectady, N.Y.	18	14	2	-	2	-	1
Scranton, Pa.§	23	22	-	-	1	-	-
Syracuse, N.Y.	108	87	9	8	1	3	3
Trenton, N.J.	48	29	11	7	1	-	-
Utica, N.Y.	16	10	4	2	-	-	-
Yonkers, N.Y.	30	24	5	-	-	1	5
E.N. CENTRAL	2,465	1,678	474	201	54	57	154
Akron, Ohio	76	61	11	3	1	-	-
Canton, Ohio	39	32	3	2	-	2	6
Chicago, Ill.	437	283	77	53	16	7	33
Cincinnati, Ohio	154	112	28	9	3	2	17
Cleveland, Ohio	156	90	41	14	7	4	4
Columbus, Ohio	225	146	47	17	6	9	14
Dayton, Ohio	132	94	28	8	-	2	13
Detroit, Mich.	258	146	65	35	7	5	8
Evansville, Ind.	37	32	3	-	-	2	1
Fort Wayne, Ind.	60	39	17	1	1	2	2
Gary, Ind.	17	11	5	-	-	1	-
Grand Rapids, Mich.	58	41	10	4	-	3	5
Indianapolis, Ind.	281	183	61	26	5	6	17
Madison, Wis.	61	38	11	3	6	3	4
Milwaukee, Wis.	140	104	20	12	-	4	3
Peoria, Ill.	30	25	4	-	-	1	2
Rockford, Ill.	49	35	9	2	-	3	7
South Bend, Ind.	48	42	5	1	-	-	6
Toledo, Ohio	136	106	21	7	1	1	10
Youngstown, Ohio	71	58	8	4	1	-	2
W.N. CENTRAL	855	636	112	60	17	17	59
Des Moines, Iowa	19	9	5	4	-	1	2
Duluth, Minn.	U	U	U	U	U	U	U
Kansas City, Kans.	45	33	8	4	-	-	2
Kansas City, Mo.	107	73	11	8	2	1	9
Lincoln, Nebr.	37	31	2	2	1	-	2
Minneapolis, Minn.	243	179	31	20	3	10	18
Omaha, Nebr.	105	70	19	8	5	3	7
St. Louis, Mo.	108	89	13	3	3	-	6
St. Paul, Minn.	75	62	7	5	1	-	10
Wichita, Kans.	116	90	16	6	2	2	3

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,418	925	297	142	27	27	77
Atlanta, Ga.	203	119	44	32	5	3	9
Baltimore, Md.	289	171	75	37	4	2	28
Charlotte, N.C.	U	U	U	U	U	U	U
Jacksonville, Fla.	164	118	28	13	2	3	7
Miami, Fla.	118	70	30	14	3	1	-
Norfolk, Va.	51	33	12	6	-	-	3
Richmond, Va.	U	U	U	U	U	U	U
Savannah, Ga.	59	36	14	6	-	3	7
St. Petersburg, Fla.	77	62	6	6	2	1	2
Tampa, Fla.	214	161	35	9	1	8	15
Washington, D.C.	217	137	45	19	10	6	6
Wilmington, Del.	26	18	8	-	-	-	-
E.S. CENTRAL	712	478	158	46	10	19	49
Birmingham, Ala.	150	92	35	11	4	7	6
Chattanooga, Tenn.	105	73	17	11	-	4	15
Knoxville, Tenn.	100	75	19	3	1	2	14
Lexington, Ky.	67	47	16	1	-	3	-
Memphis, Tenn.	U	U	U	U	U	U	U
Mobile, Ala.	58	43	11	2	1	1	-
Montgomery, Ala.	46	34	9	2	1	-	4
Nashville, Tenn.	186	114	51	16	3	2	10
W.S. CENTRAL	1,725	1,112	334	177	56	46	96
Austin, Tex.	74	43	14	8	5	4	6
Baton Rouge, La.	68	47	12	5	1	3	3
Corpus Christi, Tex.	62	44	14	2	2	-	1
Dallas, Tex.	245	149	52	27	7	10	12
El Paso, Tex.	62	36	12	9	-	5	1
Ft. Worth, Tex.	95	64	17	5	4	5	-
Houston, Tex.	374	239	79	42	6	8	27
Little Rock, Ark.	83	53	20	8	1	1	6
New Orleans, La.	134	81	28	15	9	1	-
San Antonio, Tex.	280	175	51	35	12	7	21
Shreveport, La.	107	84	13	7	3	-	10
Tulsa, Okla.	141	97	22	14	6	2	9
MOUNTAIN	950	628	171	86	40	25	94
Albuquerque, N.M.	100	68	17	9	4	2	5
Colo. Springs, Colo.	45	32	9	2	1	1	5
Denver, Colo.	103	63	17	13	4	6	10
Las Vegas, Nev.	168	108	41	16	3	-	14
Ogden, Utah	21	14	5	1	-	1	1
Phoenix, Ariz.	252	166	35	27	14	10	32
Pueblo, Colo.	33	27	4	1	1	-	4
Salt Lake City, Utah	89	55	17	5	7	5	8
Tucson, Ariz.	139	95	26	12	6	-	15
PACIFIC	2,093	1,463	352	184	52	42	167
Berkeley, Calif.	23	18	3	2	-	-	1
Fresno, Calif.	68	45	13	6	3	1	6
Glendale, Calif.	29	26	1	1	1	-	1
Honolulu, Hawaii	86	63	15	6	1	1	6
Long Beach, Calif.	87	66	10	9	1	1	14
Los Angeles, Calif.	536	366	90	52	15	13	20
Pasadena, Calif.	23	21	1	-	-	1	2
Portland, Oreg.	136	94	22	13	4	3	8
Sacramento, Calif.	192	129	36	18	5	4	21
San Diego, Calif.	172	116	33	15	6	2	20
San Francisco, Calif.	152	100	28	15	6	3	14
San Jose, Calif.	214	147	46	12	5	4	23
Santa Cruz, Calif.	31	23	1	6	-	1	6
Seattle, Wash.	172	120	25	19	2	6	6
Spokane, Wash.	61	52	5	3	-	1	10
Tacoma, Wash.	111	77	23	7	3	1	9
TOTAL	13,302¶	9,050	2,444	1,192	311	289	860

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.
†Pneumonia and influenza.
§Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.
¶Total includes unknown ages.
U: Unavailable -: no reported cases

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