CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

January 31, 1997 / Vol. 46 / No. 4

MMWR™
MORBIDITY AND MORTALITY WEEKLY REPORT

As part of its commemoration of CDC's 50th anniversary, MMWR *is reprinting selected* MMWR *articles of historical interest to public health, accompanied by a current editorial note.*

Reprinted below is the report published April 24, 1992, which first described the need for information on the economic and social impact of disease- and injury-prevention strategies, followed by a contemporary editorial note.

Effectiveness in Disease and Injury Prevention

Public Health Focus: Effectiveness of Disease and Injury Prevention

Public health practice is based on scientifically sound strategies for improving the quality of life and reducing morbidity and premature mortality. To maximize the health benefits of available resources, public health decision-makers require information on the effectiveness, as well as the economic and social impact, of disease and injury prevention strategies (*1*). This report introduces a monthly series of articles to be published in *MMWR* (weekly) that highlight prevention effectiveness.

The development of prevention technology begins with researchers in the basic public health and biomedical sciences identifying potentially effective technologies that can be used to reduce unnecessary morbidity and premature mortality. Applied research under carefully controlled conditions may then determine whether such techniques are efficacious (e.g., the effect of smoking cessation on lung cancer). As these techniques are applied at the community level, their impact and cost can be assessed first in demonstration settings and then in routine community settings, and improvements in techniques can then be incorporated into prevention strategies.

Important considerations in the assessment of disease and injury prevention strategies (i.e., the scientific method for evaluating the effectiveness of prevention strategies) include

- identification of efficacious and effective strategies to reduce morbidity and premature mortality and improve the quality of life;
- characterization of the social, legal, and ethical impact of these strategies;
- estimation of the economic impact of prevention strategies;

Prevention — Continued

- determination of optimal methods for implementing those strategies; and
- evaluation of the health impact of prevention programs.

Each report in the monthly series will highlight the knowledge base regarding a specific prevention strategy and will address related considerations, including efficacy, effectiveness, safety, and economic factors. Topics have been selected based on their inclusion in the national health objectives for the year 2000 (*2*), CDC and other public health program efforts, and the availability of data. In particular, the reports will present specific examples of disease and injury prevention strategies and illustrate approaches to evaluating the effectiveness of such strategies.

Reported by: Office of Program Planning and Evaluation, Office of the Director; Office of the Director, Epidemiology Program Office, CDC.

Editorial Note: Public health officials and policy-makers at all levels require a scientific framework for assessing the effectiveness of disease and injury prevention as a basis for establishing priorities, selecting prevention strategies, and allocating resources. The success of prevention activities can be defined by whether they delay or avert morbidity and mortality. However, the ability to evaluate objectively many prevention techniques with randomized controlled trials is often limited by fiscal, ethical, or other constraints. The *MMWR Recommendations and Reports* issue, "A Framework for Assessing the Effectiveness of Disease and Injury Prevention" (*1*), focuses on the challenges of assessment that arise as a consequence of these constraints. Reports in the *MMWR* (weekly) series will describe examples of how prevention effectiveness can be assessed.

Because public health programs sometimes may begin to implement preventive measures before appropriate assessments are completed, gaps may exist in knowledge of the efficacy, effectiveness, safety, or economic impact of specific prevention strategies. The series of reports in *MMWR* (weekly) will characterize many of these gaps and describe how they have been addressed. In addition, the reports in this series are intended to 1) provide decision-makers with information about the potential impact of these interventions on the health of their communities; 2) suggest approaches suitable for adaptation to public health practice; and 3) encourage further examination of these topics and stimulate additional systematic efforts by public health professionals to assess and enhance the effectiveness of public health programs.

References

1. CDC. A framework for assessing the effectiveness of disease and injury prevention. MMWR 1992;41(no. RR-3).
2. Public Health Service. Healthy people 2000: national health promotion and disease prevention objectives—full report, with commentary. Washington, DC: US Department of Health and Human Services, Public Health Service, 1991; DHHS publication no. (PHS)91-50212.

Editorial Note—1997: Since the initiation of the series of articles (*1–7*) and publication of the *MMWR Recommendations and Reports* (*8*) on prevention effectiveness, the concepts have been institutionalized as a public health science at CDC and many other organizations in the public health community. Public health programs traditionally have been accountable for their effectiveness and have had to exist within resource constraints. Choices among competing priorities and intervention strategies have been and will continue to be made regardless of the information available. Prevention effectiveness integrates the best available information into the value of those choices.

Prevention — Continued

The prevention-effectiveness initiative has helped to catalyze the integration of the principles of evidence-based medicine (*9*) into public health. A central feature of this approach is the focus on health outcomes. By examining the links between interventions, intermediate impacts, and health outcomes, synthetic analyses can be developed as tools to assist in selecting the best intervention strategies. These tools assist in clarifying the objectives, the strategies available to achieve those objectives, the logic of the causal pathways, and the evidence that supports the links in those pathways. In addition to facilitating understanding of problems and potential solutions, these tools provide a basis for developing practice guidelines (*10*) and, in the future, adapting those guidelines to communities with differing demographics, risk profiles, and health concerns (*11*).

Public health uses clinical interventions as well as behavioral, environmental, and social approaches. Many of the prevention-effectiveness methods that have been applied in the clinical arena (e.g., decision analyses and economic evaluations as applied to technology assessments, outcomes research, and health services research) needed to be adapted to public health. Recommendations for comparable methods for decision modeling and analysis and economic evaluation in public health are now available (*12,13*). These standards for analysis assure policymakers that studies conducted in accordance with these principles are reliable and comparable.

The need to spend limited health-care resources more efficiently is generally accepted. Managed-care and public health partners now routinely explore the broadest range of community-based intervention strategies to improve the health of the populations they serve. The tools of prevention effectiveness provide decision-makers with critical information necessary for improving decision-making to weigh along with ethics, feasibility, and the distribution of costs and benefits to different populations. For example, policy discussions on the fortification of food with folic acid to reduce neural tube defects used economic evaluations to compare the costs, benefits, and hazards associated with fortifying foods with different levels of folic acid, with diet supplementation, or with no intervention (*14*).

Since 1992, CDC has increased substantially its capability in prevention effectiveness through courses, postdoctoral fellowships, routine use of economic evaluations (cost-effectiveness and cost-benefit and cost-utility analyses), and the development of comparable methodologies (*11*). For example, a recent study of the cost-effectiveness of antibiotics for the treatment of chlamydia cervicitis (*15*) led to a negotiated public health price for a single-dose formulation of azithromycin suitable for administration in clinics. Prevention effectiveness has become a core science for public health, but additional efforts are required to clarify understanding of how prevention-effectiveness studies can be better used by decision-makers. Methods for measuring outcomes (such as quality-adjusted life-years and benefits estimation for cost-benefit analyses) and resource allocation need to be refined. Finally, improved, more complete, and comparable information on cost-effectiveness needs to be available to users.

1997 Editorial Note by Steven M Teutsch, MD, MPH, Office of the Director, Division of Prevention Research and Analytic Methods (proposed), Epidemiology Program Office, CDC.

References

1. CDC. Public health focus: fluoridation of community water systems. MMWR 1992;41: 372–5,381.

Prevention — Continued

2. CDC. Public health focus: mammography. MMWR 1992;41:454–9.
3. CDC. Public health focus: effectiveness of smoking-control strategies—United States. MMWR 1992;41:645–7,653.
4. CDC. Public health focus: surveillance, prevention, and control of nosocomial infections. MMWR 1992;41:783–7.
5. CDC. Public health focus: effectiveness of rollover protective structures for preventing injuries associated with agricultural tractors. MMWR 1993;42:57–9.
6. CDC. Public health focus: prevention of blindness associated with diabetic retinopathy. MMWR 1993;42:191–5.
7. CDC. Public health focus: physical activity and the prevention of coronary heart disease. MMWR 1993;42:669–72.
8. Teutsch SM. A framework for assessing the effectiveness of disease and injury prevention. MMWR 1992;41(no. RR-3).
9. Field MJ, Lohr KN, eds. Clinical practice guidelines: directions for a new program. Washington, DC: National Academy Press, 1990.
10. CDC. CDC guidelines: improving the quality. Atlanta, Georgia: US Department of Health and Human Services, Public Health Service, CDC, 1996.
11. Gold MR, McKay KI, Teutsch SM, Haddix AC. Assessing outcomes in population health: moving the field forward. Am J Prev Med 1997 (in press).
12. Haddix AC, Teutsch SM, Shaffer PA, Duñet DO, eds. Prevention effectiveness: a guide to decision analysis and economic evaluation. New York, New York: Oxford University Press, 1996.
13. Gold MR, Siegel JE, Russell LB, Weinstein M. Cost effectiveness in health and medicine. New York, New York: Oxford University Press, 1996.
14. Kelly AE, Haddix AC, Scanlon KS, Helmick CG, Mulinare J. Cost-effectiveness of strategies to prevent neural tube defects. In: Gold MR, Siegel JE, Russell LB, Weinstein MC, eds. Cost-effectiveness in health and medicine. New York, New York: Oxford University Press, 1996: 313–48.
15. Haddix AC, Hillis SD, Kassler WJ. The cost-effectiveness of azithromycin for *Chlamydia trachomatis* infections in women. Sex Transm Dis 1995;22:274–80.

Update: Influenza Activity — United States, 1996–97 Season

Influenza activity in the United States increased from mid-November through December 1996, peaked during December 22, 1996–January 4, 1997, and began to decline during January 5–18. Laboratory-confirmed influenza type A and/or type B has been reported in all states this season. This report summarizes influenza surveillance data from September 29, 1996, through January 18, 1997.

As of January 18, World Health Organization collaborating laboratories in the United States had tested 20,754 specimens for respiratory viruses, and 4063 (20%) were positive for influenza. Of these isolates, 3959 (97%) were influenza type A, and 104 (3%) were influenza type B. The number of influenza isolates and percentage of specimens positive for influenza increased steadily during November and December. During the weeks ending December 28 and January 4, 31% of specimens tested were positive for influenza; however, the percentage positive for influenza declined to 25% during the week ending January 11 and to 18% during the week ending January 18. The number of influenza type B isolates increased each week during December and accounted for 68 (5%) of 1376 isolates reported during December 29–January 18. Although influenza type B viruses have been isolated in all nine regions of the United States, 51 (49%) of the 104 influenza type B isolates reported this season were from the Pacific region.

Influenza Activity — Continued

State and territorial epidemiologists first reported regional influenza activity* for the week ending October 19, 1996. During each of the subsequent 4 weeks, one or two states reported regional activity. Widespread activity was first reported during the week ending November 23 (week 47) from two states (Colorado and Pennsylvania), and the number of states reporting regional activity during week 47 increased to seven. The number of states reporting regional or widespread activity increased during December and peaked at 38 during the week ending January 4, then declined to 31 during the week ending January 18. Most laboratory-confirmed influenza outbreaks reported by states to CDC have occurred among elderly nursing-home residents, although some reported outbreaks have been among children and young adults.

During the week ending December 7, the percentage of visits to U.S. sentinel physicians for influenza-like illness (ILI) increased above baseline levels (0–3%) for the first time this season and ranged from 5% to 7% through the week ending January 4. The percentage of patient visits for ILI returned to baseline levels (3%) during the week ending January 11 and remained at baseline levels (2%) during the week ending January 18. The percentage of deaths attributed to pneumonia and influenza (P&I) exceeded the epidemic threshold† for the first time this season during the week ending December 14 and has continued to increase each week through the week ending January 18. During the week ending January 18, 8.6% of deaths were attributed to P&I, which is above the epidemic threshold of 7.2% for the week.

The trivalent vaccine prepared for the 1996–97 influenza season contains A/Texas/36/91-like (H1N1), A/Wuhan/359/95-like (H3N2), and B/Beijing/184/93-like viral antigens. U.S. manufacturers used A/Nanchang/933/95(H3N2) and B/Harbin/07/94 viruses for the A/Wuhan/359/95-like and B/Beijing/184/93-like antigens, respectively, because of their growth properties. All 105 influenza A(H3N2) isolates antigenically characterized by CDC were closely related to A/Wuhan/359/95 and A/Nanchang/933/95 (Table 1). The five antigenically characterized influenza B isolates were B/Beijing/184/93-like.

Reported by: Participating state and territorial epidemiologists and state public health laboratory directors. World Health Organization collaborating laboratories. Sentinel Physicians Influenza Surveillance System. Influenza Br, and WHO Collaborating Center for Surveillance, Epidemiology, and Control of Influenza, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases, CDC.

Editorial Note: The pattern of influenza activity during mid-November 1996–January 18, 1997, has been consistent with previous influenza seasons dominated by influenza A(H3N2) viruses. Since the emergence of influenza A(H3N2) viruses in 1968, seasons during which these viruses predominate have been associated with higher morbidity and mortality, particularly among the elderly, than have seasons during which influenza A(H1N1) or influenza type B viruses predominated (*1,2*). When influenza strains included in vaccines are closely matched with circulating strains, influenza vaccine is approximately 70% effective in preventing ILI in healthy adults aged <65 years.

*Levels of activity are 1) *no activity*; 2) *sporadic*—sporadically occurring influenza-like illness (ILI) or culture-confirmed influenza, with no outbreaks detected; 3) *regional*—outbreaks of ILI or culture-confirmed influenza in counties with a combined population of <50% of the state's total population; and 4) *widespread*—outbreaks of ILI or culture-confirmed influenza in counties with a combined population of ≥50% of the state's total population.

†The epidemic threshold is 1.645 standard deviations above the seasonal baseline. The expected seasonal baseline is projected using a robust regression procedure in which a periodic regression model is applied to observed percentages of deaths from P&I since 1983.

Influenza Activity — Continued

TABLE 1. Hemagglutination-inhibition titers of influenza type A(H3N2) viruses with serum specimens from infected ferrets*

	Ferret antiserum		
Viral antigen	**A/Johannesburg/33/94**	**A/Wuhan/359/95**	**A/Nanchang/933/95**
Reference antigens			
A/Johannesburg/33/94	**640**	40	40
A/Wuhan/359/95	80	**1280**	1280
A/Nanchang/933/95	80	1280	**1280**
Recent isolates			
A/New York/37/96	160	1280	1280
A/Minnesota/01/96	80	640	1280
A/Texas/09/96	80	640	1280
A/Indiana/02/96	160	1280	1280
A/Washington/07/96	40	640	1280
A/California/11/96	80	1280	1280

*A fourfold difference in hemagglutination-inhibition titers between two viruses is usually indicative of antigenic variation between viruses.

Because of decreased immunologic response among persons aged ≥65 years, influenza vaccine may be only 30%–40% effective in preventing ILI among nursing-home residents; however, among such groups, influenza vaccine may be 50%–60% effective in preventing pneumonia and hospitalization and 80% effective in preventing death (*3*).

Despite the close match between influenza vaccine strains and strains circulating during the current season, the potential remains for influenza outbreaks among vaccinated groups. Nursing homes and other facilities providing care for persons at risk for influenza-associated complications should consider using the antiviral agents amantadine hydrochloride or rimantadine hydrochloride for prophylaxis and/or treatment during institutional outbreaks of influenza type A (*3*).

The increase in the proportion of influenza type B viruses in recent weeks emphasizes the importance of continued surveillance to detect changes in the relative proportions of circulating influenza virus types or subtypes. Influenza virus types or subtypes that were not predominant during the early part of the season often increase in number toward the end of the season. Current surveillance data indicate circulation of both influenza type A and influenza type B viruses. Because amantadine and rimantadine are effective only against influenza type A viruses, the use of rapid diagnostic testing for influenza type A can be useful in guiding decisions regarding management of cases of influenza and responses to outbreaks.

Influenza surveillance data are updated weekly and are available through the CDC voice information system, telephone (404) 332-4551, or the fax information system, telephone (404) 332-4565, by requesting document no. 361100.

References

1. Lui KL, Kendal AP. Impact of influenza epidemics on mortality in the United States from October 1972 to May 1985. Am J Public Health 1987;77:712–6.
2. Noble GR. Epidemiological and clinical aspects of influenza. In: Beare AS, ed. Basic and applied research. Boca Raton, Florida: CRC Press, 1982:11–50.
3. ACIP. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1996;45(no. RR-5).

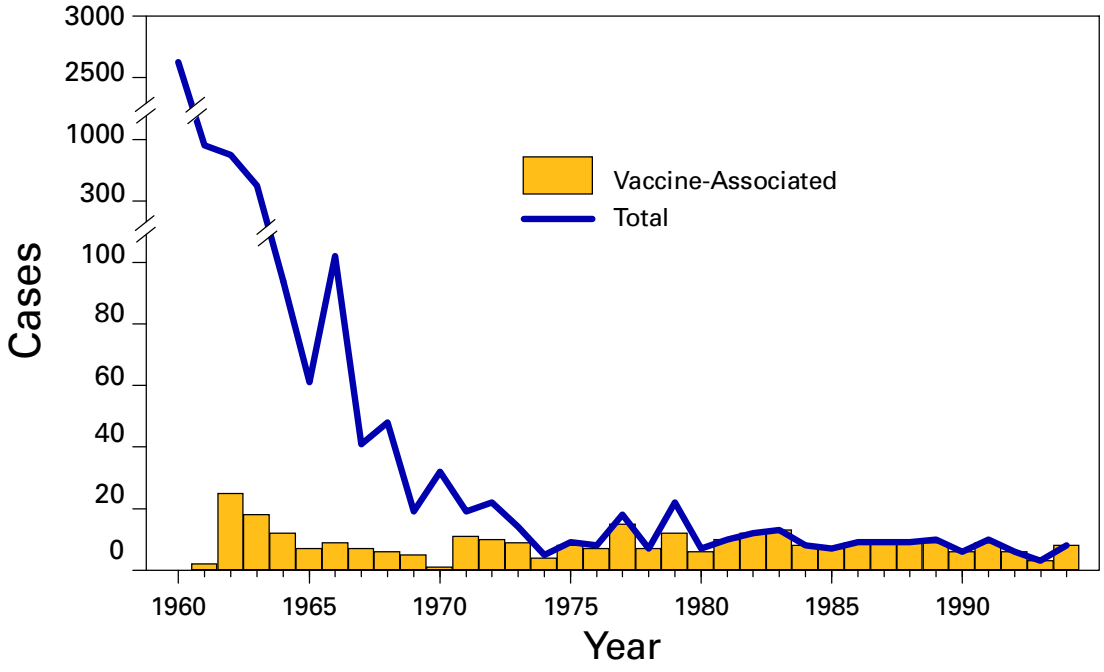
Paralytic Poliomyelitis — United States, 1980–1994

The Advisory Committee on Immunization Practices (ACIP) recently recommended a sequential vaccination schedule of two doses of inactivated poliovirus vaccine (IPV) followed by two doses of oral poliovirus vaccine (OPV) for routine vaccination of children in the United States (*1*). ACIP revised its recommendation for routine poliovirus vaccination for three reasons: 1) paralytic poliomyelitis attributable to indigenously acquired wild poliovirus has not occurred in the United States since 1979 (*2*), 2) progress toward global eradication of poliomyelitis has reduced the risk for importation of wild poliovirus into the United States (*3*), and 3) vaccine-associated paralytic poliomyelitis (VAPP) continues to occur. ACIP has recommended that implementation of this new vaccination schedule begin in early 1997. This report summarizes both the epidemiology of paralytic poliomyelitis in the United States reported during 1980–1994 and provisional reports for 1995–1996 and updates the estimated risk for VAPP. These findings indicate that the overall estimated risk for VAPP has remained constant.

Epidemiology

During 1980–1994, state and territorial health departments reported to CDC 133 confirmed cases of paralytic poliomyelitis. Of these, 125 (94%) cases were associated with administration of OPV (annual mean: eight VAPP cases) (Figure 1); six cases (only one of which occurred after 1986) were classified as imported; and two were classified as indeterminate (no poliovirus was isolated from samples obtained from the patients, and these persons had no history of recent vaccination or direct contact with a vaccine recipient). Of the 125 VAPP cases, 49 (39%) occurred among

FIGURE 1. Total number of reported paralytic poliomyelitis cases* and number of reported vaccine-associated cases — United States, 1960–1994



*Excluding imported cases.

Paralytic Poliomyelitis — Continued

immunologically normal recipients of OPV, 46 (37%) among immunologically normal contacts of OPV recipients (including six cases among persons from whom vaccine-like poliovirus was isolated but who had no history of direct contact with vaccinees), and 30 (24%) among immunologically compromised OPV recipients or contacts of OPV recipients. Provisional reports include an additional six confirmed cases for 1995 and one confirmed case for 1996.

During 1980–1994, of the 125 VAPP cases, 97 (78%) were associated with administration of the first or second dose of OPV. Of the 49 cases among immunologically normal OPV recipients (Table 1), 45 (92%) were associated with administration of the first or second dose of OPV, and 41 (91%) of these were among persons aged <1 year. Of the 46 cases among immunologically normal contacts, 32 (70%) were associated with the first or second dose of OPV, and 26 (81%) of these occurred among persons aged ≥20 years. Of the 23 cases among immunologically compromised vaccine recipients, 15 (65%) were associated with administration of the first or second dose of OPV, and 12 (80%) of these were among persons aged <1 year. Of the seven cases among immunologically compromised contacts, five (71%) were associated with administration of the first or second dose, and four (80%) of these occurred among persons aged ≥20 years. Of the immunologically compromised vaccine recipients with VAPP, none had immunodeficiency diagnosed before onset of paralysis. Of the seven persons with cases of VAPP during 1995–1996, five were OPV recipients, and all of these were aged <1 year.

To analyze temporal trends, cases of VAPP among OPV recipients and contacts were grouped by 3-year intervals from 1980 through 1994. The number of cases among all vaccine recipients occurring during each 3-year period remained relatively constant (range: 13–16, p=0.71), and there were no substantial temporal changes in the number of cases among immunologically normal recipients (p=0.18). However, from 1980–1982 to 1992–1994, the number of cases among contacts declined significantly, from 15 to four (p=0.01) (Table 1).

TABLE 1. Number of cases of vaccine-associated paralytic poliomyelitis (VAPP) among recipients of oral poliovirus vaccine (OPV) and contacts of OPV recipients, by 3-year groupings — United States, 1980–1994

	VAPP cases					
Category	**1980–1982**	**1983–1985**	**1986–1988**	**1989–1991**	**1992–1994***	**Total**
Recipients						
Immunologically normal	10	12	11	8	8	**49**
Immunologically compromised	3	2	5	8	5	**23**
Total	**13**	**14**	**16**	**16**	**13**	**72**
Contacts						
Immunologically normal	14	12	9	7	4	**46**
Immunologically compromised	1	2	2	2	0	**7**
Total	**15**	**14**	**11**	**9**	**4**	**53**
Total	**28**	**28**	**27**	**25**	**17**	**125**

*Because of late reporting, the number of cases during this period may be incomplete.

Paralytic Poliomyelitis — Continued

Estimated Risks for VAPP

Based on the distribution of an estimated 303 million total doses of OPV during 1980–1994, the overall risk (as measured by a ratio) for VAPP during this period was one case to the 2.4 million doses distributed; for children receiving their first doses of OPV, the ratio was one case to the 750,000 children. Assuming that all 57.8 million children born during 1980–1994 received a first dose of OPV, the ratio for immunologically normal first-dose recipients was one case to the 1.4 million first doses distributed. For all first-dose recipients (immunologically normal or compromised), the ratio was one case to the 1.2 million first doses distributed. Based on all doses distributed, the ratio for recipients was one case to the 6.2 million doses distributed.

Samples for poliovirus isolation were obtained from 110 (88%) of the 125 persons with VAPP; of these, poliovirus was isolated from the samples from 89 (81%) persons. Of the 109 cases for which the date of sample collection was known, poliovirus was isolated from 83 (85%) of the 98 samples obtained ≤15 days after onset of paralysis and from five (46%) of the 11 samples obtained >15 days after onset of paralysis. Cases were reported to CDC a median of 47 days (range: 1 day–13 years) after onset of paralysis.

Reported by: Child Vaccine Preventable Disease Br, Epidemiology and Surveillance Div, National Immunization Program, CDC.

Editorial Note: The new sequential IPV/OPV poliovirus vaccination schedule is expected to reduce the incidence of VAPP while maintaining individual and population immunity against polioviruses at the high levels necessary to prevent polio outbreaks if wild poliovirus is reintroduced into the United States. Use of IPV as the first two doses of the sequential vaccination schedule should induce high levels of protective antibodies among immunologically normal vaccine recipients by the time the first dose of OPV is administered at age 12–18 months, thereby eliminating 95% of VAPP cases among these children (*4*). In addition, the number of contact cases may decrease because of reduced transmission (attributed to some IPV-induced immunity of pharyngeal mucosa and, to a lesser degree, of intestinal mucosa) of vaccine virus from persons given OPV after receipt of two doses of IPV. Delaying administration of the first dose of OPV until age 12 months may allow additional time for diagnosis of immunodeficiency (which contraindicates receipt of OPV) and enable prevention of some VAPP cases among immunodeficient recipients (*4,5*).

The overall estimated risk for VAPP in the United States has remained relatively constant since 1965 (*2,6,7*); however, the findings in this report suggest that the risk for VAPP among contacts of OPV recipients has decreased since 1980. Because of reporting delays, the data for recent years may not be complete, and additional years of observation are required to confirm this trend. Although reasons for the decline have not been firmly established, enforcement of state vaccination requirements for school entry beginning in the late 1960s may have decreased the proportion of parents and adult close contacts of vaccinees without immunity to poliovirus, particularly in areas where compliance with these requirements is high (*8*). However, other reports suggest that the prevalence of poliovirus susceptibility among young adults did not change during this period: for example, data from a national serosurvey of U.S. Army recruits born during 1954–1972 indicated that 12.5%–13.0% were susceptible to poliovirus type 3, and that no statistically significant decline in the percentage susceptible occurred among recruits born after 1966 (*9*).

Paralytic Poliomyelitis — Continued

Enhanced surveillance for paralytic poliomyelitis (whether vaccine- or wild poliovirus-associated) is necessary to monitor the impact of the change in the routine poliovirus vaccination policy. The completeness of reporting for diagnosed paralytic poliomyelitis in the United States has been estimated at 81%. Misdiagnosis or failure to report diagnosed cases contributes to incomplete surveillance (*6*). Any suspected case of paralytic poliomyelitis must be reported immediately to state or local health authorities (*10*). A clinical case definition for reporting cases of paralytic poliomyelitis* was adopted by the Council of State and Territorial Epidemiologists in 1990. Confirmed cases are those that meet the clinical case definition and in which the patient has a neurologic deficit 60 days after onset of initial symptoms, has died, or has unknown follow-up status. Experts at state and local health departments and at CDC are available for consultation about patients who have suspected cases of paralytic poliomyelitis (i.e., patients with acute paralytic manifestations), and information about clinical diagnosis and reporting of cases is available from CDC's National Immunization Program, telephone (404) 639-8255.

Laboratory studies, especially attempted poliovirus isolation, are critical for ruling out or confirming paralytic poliomyelitis. Specimens for virus isolation (e.g., stool, throat swab, and cerebrospinal fluid) and serologic testing must be obtained in a timely manner. At least two stool specimens and two throat swabs should be obtained as early as possible in the course of illness (optimally within 15 days of onset) from patients who are suspected to have polio. Cultures for enterovirus followed by enteroviral typing should be considered for **all** patients with acute flaccid paralysis unless an alternative diagnosis is apparent. Intratypic differentiation must be performed to determine whether a poliovirus isolate is vaccine-related or wild type. The Enterovirus Laboratory of CDC's National Center for Infectious Diseases is the national reference laboratory for polioviruses in the United States and the only laboratory that performs this procedure on a routine basis. Information about collection and shipment of clinical specimens is available from this laboratory, telephone (404) 639-2749.

References

1. ACIP. Poliomyelitis prevention in the United States: introduction of a sequential vaccination schedule of inactivated poliovirus vaccine followed by oral poliovirus vaccine—recommendations of the Advisory Committee on Immunization Practices. MMWR 1997;46(no. RR-3).
2. CDC. Poliomyelitis—United States, 1975–1984. MMWR 1986;35:180–2.
3. CDC. Certification of poliomyelitis eradication—the Americas, 1994. MMWR 1994;43:720–2.
4. Miller MA, Sutter RW, Strebel PM, Hadler SC. Cost-effectiveness of incorporating inactivated poliovirus vaccine into the routine childhood immunization schedule. JAMA 1996;276:967–71.
5. Prevots DR, Sutter RW, Quick L, Izurieta H, Strebel PM. Vaccine-associated paralytic poliomyelitis in the United States, 1980–1994: current risk and potential impact of proposed sequential schedule of IPV followed by OPV [Abstract]. In: Program and abstracts of the 36th Interscience Conference on Antimicrobial Agents and Chemotherapy. New Orleans, Louisiana: American Society for Microbiology, 1996:179.
6. Prevots DR, Sutter RW, Strebel PM, Weibel RE, Cochi SL. Completeness of reporting for paralytic poliomyelitis, United States, 1980 through 1991: implications for estimating the risk of vaccine-associated disease. Arch Pediatr Adolesc Med 1994;148:479–85.
7. Strebel PM, Sutter RW, Cochi SL, et al. Epidemiology of poliomyelitis in the United States one decade after the last reported case of indigenous wild virus-associated disease. Clin Infect Dis 1992;14:568–79.

*Acute onset of flaccid paralysis in one or more limbs with decreased or absent tendon reflexes in the affected limbs without other apparent cause and without sensory or cognitive loss (as reported by a physician).

Paralytic Poliomyelitis — Continued

8. Orenstein WA, Wassilak SGF, Deforest A, et al. Seroprevalence of poliovirus antibodies among Massachusetts schoolchildren. In: Program and abstracts of the 28th Interscience Conference on Antimicrobial Agents and Chemotherapy [Abstract]. Washington, DC: American Society for Microbiology, 1988:198.
9. Kelley PW, Petruccelli BP, Stehr-Green P, Erickson RL, Mason CJ. The susceptibility of young adult Americans to vaccine-preventable infections: a national serosurvey of US Army recruits. JAMA 1991;266:2724–9.
10. CDC. Mandatory reporting of infectious diseases by clinicians. MMWR 1990;39(no. RR-9):1–17.

Legionnaires Disease Associated with a Whirlpool Spa Display — Virginia, September–October, 1996

Contaminated whirlpool spas have been reported as a source of legionellosis. This report describes the preliminary findings of an ongoing investigation by the Virginia Department of Health (VDH) and CDC of a recent outbreak of Legionnaires disease in Virginia, which implicated a whirlpool spa display at a retail store as the source of infection.

On October 15, 1996, a district health department in southwestern Virginia contacted the Office of Epidemiology, VDH, about a hospital (hospital A) report that 15 patients had been admitted during October 12–13 with unexplained pneumonia. On October 21, another hospital (hospital B), located approximately 15 miles from hospital A, reported its pneumonia census to be higher than expected for the first 2 weeks of October. On October 23, the district health department was informed about three area residents with legionellosis (with *Legionella pneumophila* serogroup 1 [Lp1] antigen detected in urine); one was a patient at hospital A, and two were patients at hospitals outside the jurisdiction of the health department.

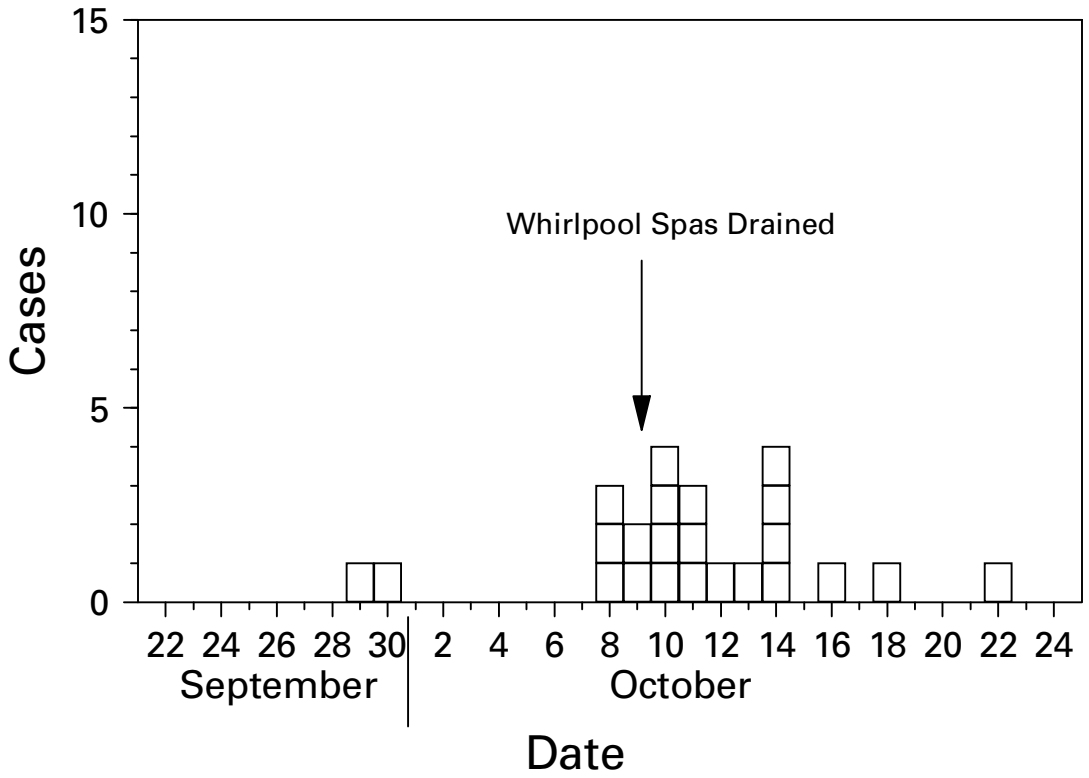
To identify all outbreak-associated cases, investigators reviewed medical records and laboratory reports of admissions to the three hospitals for pneumonia during September 1–November 12. Hospital personnel and area health-care providers collected and submitted specimens from patients with pneumonia, including serum for the determination of acute Lp1 antibody titers (to be followed by convalescent titers); sputum, when possible, for *Legionella* culture; and urine to detect Lp1 antigens.

A case of Legionnaires disease was defined as pneumonia in an area resident with onset of illness during September 1–November 12 with Lp1 identified by culture of sputum, antigen assay of urine, or fourfold rise in serum antibody titers. Based on the review of records, 23 cases eventually were identified, including 15 by urine antigen, seven by serology, and three by sputum culture; two were identified by urine antigen and sputum culture. Of the 23 case-patients, 22 were hospitalized, and two died. The mean age of case-patients was 65 years (range: 42–86 years), and most (17) were male. Although patients had onsets of illness during September 29–October 22, most (18 [78%]) had onsets during October 8–14 (Figure 1).

To identify potential exposures associated with Legionnaires disease, case-patients were asked about their activities during the 2 weeks before onset of illness. Based on these interviews, a questionnaire was developed and a case-control study was initiated on November 2 to assess potential risk factors for and exposures related to infection. Three controls were selected for each confirmed case by using office records of the primary-care physicians of the case-patients; controls were matched by

Legionnaires Disease — Continued

FIGURE 1. Number of cases of Legionnaires disease*, by date of onset — Virginia, September–October 1996†



*Pneumonia in an area resident with onset of illness during September–November 12 with *Legionella pneumophila* serogroup 1 identified by culture of sputum, antigen assay of urine, or fourfold rise in serum antibody titers.
†n=23.

age (within 10 years), sex, and underlying medical conditions. All case-patients and controls were asked whether, during the 2 weeks before onset of illness, they had visited any of 14 retail and manufacturing sites.

Of the 23 cases, 15 were included in the case-control study (one person died before the case-contol study was initiated and had no available exposure history, and seven patients were identified after convalescent serum became available 2 months following the case-control study). A history of having visited a large home-improvement center during the 2 weeks before onset of illness was reported by 14 (93%) of the 15 cases, compared with 12 (27%) of the 45 controls (matched odds ratio [MOR]=23.3; 95% confidence interval [CI]=3.0–182). Of the 13 case-patients and 12 controls who had visited the store and for whom there was a detailed in-store exposure history, cumulative duration of total store visits averaged 79 minutes for cases, compared with 29 minutes for controls (F-test $p<0.01$); in addition, 10 (77%) case-patients reported spending time in the area surrounding the spas during their visits to the store, compared with three (25%) of the 12 controls (MOR=5.5; 95% CI=0.7–256). Four of these case-patients and one of the controls reported only "walking by" the spa. No other activity, including drinking from the store's water fountains or visiting the 14 other locations in the community, was associated with illness.

Legionnaires Disease — Continued

Samples were collected and cultured for the presence of *Legionella* from water sources in the home-improvement center, including a whirlpool spa basin, spa filters, a greenhouse sprinkler system, a decorative fish pond and fountain, potable water fountains, urinals, and hot and cold water taps in the store's restrooms. In addition to these potential sources, a second whirlpool spa had been sold, drained on October 9, and removed from the store floor on October 11. Three filters were available for testing from the two spas. One of these filters was from the purchased spa, and the other two had been used in the spa that was in operation until October 28, but that had been drained and out of service during October 9–17. Lp1 was isolated from the filter from the purchased spa; that isolate was an exact match, by monoclonal antibody subtyping and arbitrarily primed polymerase chain reaction, to the sputum isolates cultured from two of the cases. A third isolate from the case-patient that did not visit the home-improvement center had a different monoclonal antibody pattern. All other environmental sources, including the other two filters, tested negative.

Reported by: J Hershey, MD, B Burrus, V Marcussen, J Notter, K Watson, R Wolford, RE Shaffner III, New River Health District; Carilion Giles Memorial Hospital, Pearisburg; Carilion Radford Community Hospital, Radford; Columbia Lewis Gale Hospital, Salem; Columbia Montgomery Regional Hospital, Blacksburg; Department of Veterans Affairs Medical Center, Salem; E Barrett, DMD, D Woolard, MPH, L Branch, R Hackler, B Rouse, L Gibson, S Jenkins, VMD, J Rullan, MD, G Miller, Jr, MD, State Epidemiologist, Virginia Dept of Health; S Curran, Div of Consolidated Laboratory Svcs, Richmond, Virginia. Laboratory Corporation of America. Childhood and Respiratory Diseases Br, Div of Bacterial and Mycotic Diseases, National Center for Infectious Diseases; State Br, Div of Applied Public Health Training (proposed), Epidemiology Program Office, CDC.

Editorial Note: Approximately 10,000–15,000 cases of Legionnaires disease occur each year in the United States; most occur sporadically (*1*). Investigations of outbreaks have documented aerosol transmission of *Legionella* from contaminated cooling towers and evaporative condensers (*2,3*), showers (*4*), decorative fountains (*5*), humidifiers (*6*), respiratory therapy equipment (*7*), and whirlpool spas (*8*). However, the proportion of sporadically occurring disease attributable to these sources has not yet been determined.

In contrast with other spa- or whirlpool-associated outbreaks, in this outbreak, none of the case-patients actually entered the water. Instead, all were most likely exposed by walking by or spending time in the area surrounding the spa. Although most community-wide outbreaks of legionellosis have resulted from transmission from an outdoor source (e.g., cooling towers), this report underscores the potential for such outbreaks in association with contaminated indoor sources.

Even though the epidemiologic findings of the case-control study indicated that the source of the outbreak was located in a home-improvement center, the laboratory findings were critical in identifying the exact source of exposure within the store. Case-patients were more likely than controls to have reported exposure to the spas, but the difference was not statistically significant. By matching the two clinical Lp1 isolates to the isolate from the purchased spa, molecular epidemiologic typing helped link the spa to illness.

Enhanced surveillance during investigations of legionellosis outbreaks may result in the detection of some sporadically occurring cases. For example, in the investigation of this outbreak, one case-patient did not report visiting the home-improvement center. However, the sputum Lp1 isolate from this patient did not match that of the

Legionnaires Disease — Continued

whirlpool spa filter or the other available clinical isolates, suggesting this case was not related to the outbreak.

Although the source of the outbreak was removed before the investigation was initiated, cases continued to occur. However, all of these cases, except the case not related to the outbreak, occurred within the normal incubation period for Legionnaires disease (i.e., 2–10 days) following removal of the source.

Following the investigation, VDH recommended that whirlpool spas being used as displays be regularly inspected and maintained with biocides and that filters be regularly changed or decontaminated. In response to a recent outbreak of Legionnaires disease on a cruise ship (*8*), CDC developed guidelines for the maintenance of whirlpool spas on cruise ships (*9*). Based on the findings of this investigation, CDC is assessing these guildelines to determine whether modifications are necessary regarding use of land-based whirlpool spas, including those that are being operated while on display.

References

1. Marston BJ, Lipman HB, Breiman RF. Surveillance for Legionnaires' disease: risk factors for morbidity and mortality. Arch Intern Med 1994;154:2417–22.
2. Dondero TJ Jr, Rendtorff RC, Mallison GF, et al. An outbreak of Legionnaires' disease associated with a contaminated air-conditioning cooling tower. N Engl J Med 1980;302:365–70.
3. Breiman RF, Cozen W, Fields BS, et al. Role of air sampling in the investigation of an outbreak of Legionnaires' disease associated with exposure to aerosols from an evaporative condenser. J Infect Dis 1990;161:1257–61.
4. Breiman RF, Fields BS, Spika JS, Sanden GN, Volmer L, Meier A. Association of shower use with Legionnaires' disease: possible role of amoebae. JAMA 1990;263:2924–6.
5. Fenstersheib MD, Miller M, Diggins C, et al. Outbreak of Pontiac fever due to *Legionella anisa*. Lancet 1990;336:35–7.
6. Mahoney FJ, Hoge CW, Farley TA, et al. Community wide outbreak of Legionnaires' disease associated with a grocery store mist machine. J Infect Dis 1992;165:736–9.
7. Mastro TD, Fields BS, Breiman RF, Campbell J, Plikaytis BD, Spika JS. Nosocomial Legionnaires' disease and use of medication nebulizers. J Infect Dis 1991;163:667–71.
8. Jernigan DB, Hofmann J, Cetron MS, et al. Outbreak of Legionnaires' disease among cruise ship passengers exposed to a contaminated whirlpool spa. Lancet 1996;347:494–9.
9. National Center for Environmental Health/National Center for Infectious Diseases. Final recommendations to minimize transmission of Legionnaires' disease from whirlpool spas on cruise ships. Atlanta, Georgia: US Department of Health and Human Services, Public Health Service, CDC, 1996.

Child Passenger Safety Awareness Week — February 9–15, 1997

February 9–15 is National Child Passenger Safety Awareness Week. As of January 29, 1997, a total of 35 children have died as a result of injuries associated with deployment of air bags in motor-vehicle crashes. Hundreds more children aged <5 years die each year because they are not buckled into a child-safety seat or the child-safety seat is misused; approximately 80,000 more are seriously injured (*1*).

Most of these fatalities and injuries are preventable but require the combined effort of increased public education, improved child passenger safety laws, and strong enforcement of these laws. National Child Passenger Safety Awareness Week is a time to enhance activities focusing on child passenger safety. Additional information about materials to support such activities is available from the Office of Communications and Outreach, National Highway Traffic Safety Administration (NHTSA), 400 Seventh St., S.W., NTS-20, Washington, DC 20590; fax (202) 493-2062; or the NHTSA World Wide Web site at http://www.nhtsa.dot.gov.

Reference

1. National Highway Traffic Safety Administration. Traffic safety facts, 1995: alcohol. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Research, and Development, 1996.

Quarterly Immunization Table

To track progress toward achieving the goals of the Childhood Immunization Initiative (CII), CDC publishes quarterly a tabular summary of the number of cases of nationally notifiable diseases preventable by routine childhood vaccination reported during the previous quarter and year-to-date (provisional data). In addition, the table compares provisional data with final data for the previous year and highlights the number of reported cases among children aged <5 years, who are the primary focus of CII. Data in the table are reported through the National Electronic Telecommunications System for Surveillance (NETSS).

Number of reported cases of nationally notifiable diseases preventable by routine childhood vaccination — United States, October–December 1996 and 1995–1996*

Disease	No. cases, October–December 1996	Total cases January–December 1995	Total cases January–December 1996	No. cases among children aged <5 years† January–December 1995	No. cases among children aged <5 years† January–December 1996
Congenital rubella syndrome	1	**6**	**2**	6	2
Diphtheria	0	**0**	**1**	0	0
Haemophilus influenzae§	321	**1180**	**1078**	290	277
Hepatitis B¶	2666	**10,805**	**10,167**	81	78
Measles	39	**310**	**494**	107	114
Mumps	167	**906**	**666**	165	142
Pertussis	2860	**5137**	**6911**	2733	3097
Poliomyelitis, paralytic**	0	**6**	**1**	4	1
Rubella	15	**128**	**210**	9	15
Tetanus	8	**41**	**28**	2	0

*Data for 1995 are final and for 1996 are provisional.

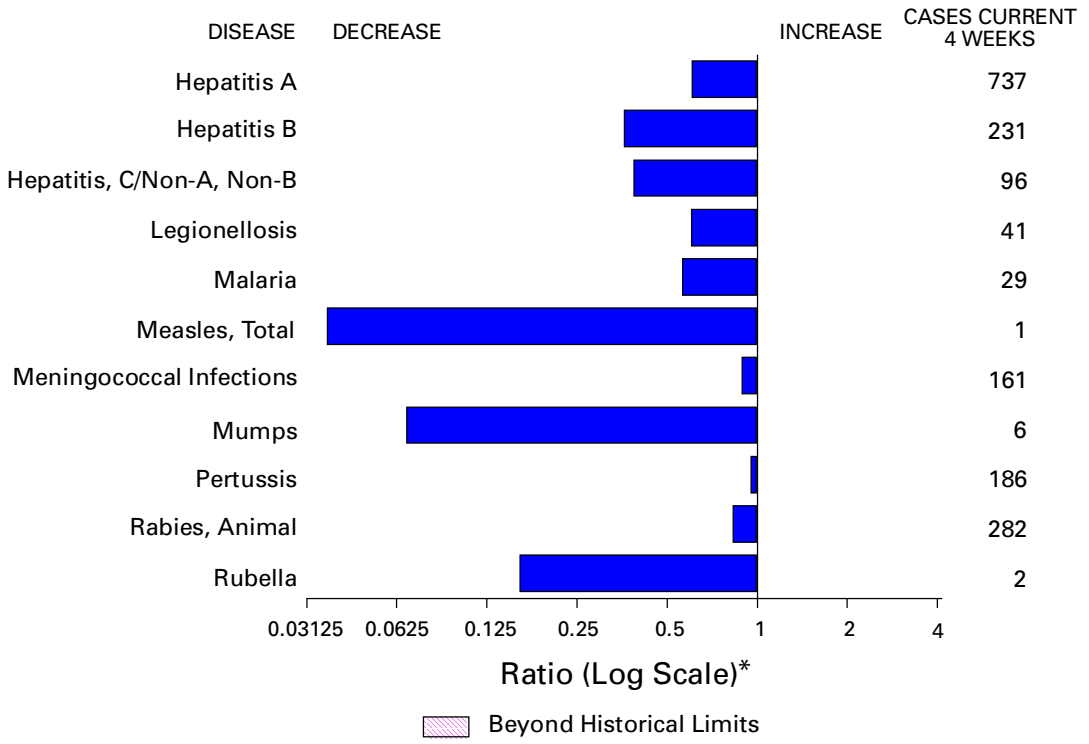
†For 1995 and 1996, age data were available for ≥94% of cases, except for 1996 age data for measles, which were available for 89% of cases.

§Invasive disease; *H. influenzae* serotype is not routinely reported to the National Notifiable Diseases Surveillance System. Of 277 cases among children aged <5 years, serotype was reported for 95 cases, and of those, 31 were type b, the only serotype of *H. influenzae* preventable by vaccination.

¶Because most hepatitis B virus infections among infants and children aged <5 years are asymptomatic (although likely to become chronic), acute disease surveillance does not reflect the incidence of this problem in this age group or the effectiveness of hepatitis B vaccination in infants.

**Five suspected cases with onset in 1996 have been reported to date. One additional suspected case with onset in 1995 is under investigation.

FIGURE I. Selected notifiable disease reports, comparison of provisional 4-week totals ending January 25, 1997, with historical data — United States



*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 — provisional cases of selected notifiable diseases, United States, cumulative, week ending January 25, 1997 (4th Week)

	Cum. 1997		Cum. 1997
Anthrax	-	Plague	-
Brucellosis	1	Poliomyelitis, paralytic	-
Cholera	-	Psittacosis	1
Congenital rubella syndrome	3	Rabies, human	-
Cryptosporidiosis*	44	Rocky Mountain spotted fever (RMSF)	3
Diphtheria	-	Streptococcal disease, invasive Group A	29
Encephalitis: California*	-	Streptococcal toxic-shock syndrome*	2
eastern equine*	-	Syphilis, congenital¶	-
St. Louis*	-	Tetanus	1
western equine*	-	Toxic-shock syndrome	8
Hansen Disease	6	Trichinosis	2
Hantavirus pulmonary syndrome*†	-	Typhoid fever	10
Hemolytic uremic syndrome, post-diarrheal*	-	Yellow fever	-
HIV infection, pediatric*§	-		

-:no reported cases
*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 HIV, STD, and TB Prevention (NCHSTP), last update December 24, 1996.
¶Updated quarterly from reports to the Division of STD Prevention, NCHSTP.

TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending January 25, 1997, and January 27, 1996 (4th Week)

Reporting Area	AIDS*		Chlamydia		*Escherichia coli* O157:H7		Gonorrhea		Hepatitis C/NA,NB	
					NETSS†	PHLIS§				
	Cum. 1997	Cum. 1996	Cum. 1997	Cum. 1996	Cum. 1997	Cum. 1997	Cum. 1997	Cum. 1996	Cum. 1997	Cum. 1996
UNITED STATES	-	3,215	14,482	23,077	54	-	13,066	24,215	102	183
NEW ENGLAND	-	196	932	1,213	4	-	366	593	-	2
Maine	-	-	-	-	-	-	-	3	-	-
N.H.	-	2	10	41	-	-	3	7	-	-
Vt.	-	-	14	37	-	-	1	11	-	2
Mass.	-	133	545	478	4	-	182	245	-	-
R.I.	-	9	151	142	-	-	45	44	-	-
Conn.	-	52	212	515	-	-	135	283	-	-
MID. ATLANTIC	-	1,193	1,060	421	-	-	653	2,051	2	5
Upstate N.Y.	-	155	N	N	-	-	-	-	-	3
N.Y. City	-	697	-	-	-	-	-	1,012	-	1
N.J.	-	204	480	421	-	-	252	254	-	-
Pa.	-	137	580	-	N	-	401	785	2	1
E.N. CENTRAL	-	272	2,611	5,526	5	-	2,517	4,779	43	31
Ohio	-	66	863	1,177	3	-	704	1,008	3	1
Ind.	-	-	286	-	-	-	312	621	1	-
Ill.	-	155	765	1,884	-	-	425	1,517	-	8
Mich.	-	36	641	1,667	2	-	1,015	1,210	39	22
Wis.	-	15	56	798	N	-	61	423	-	-
W.N. CENTRAL	-	74	1,304	2,299	10	-	542	1,084	2	4
Minn.	-	20	-	562	7	-	U	-	-	-
Iowa	-	-	383	1	3	-	67	-	2	-
Mo.	-	51	611	848	-	-	384	782	-	4
N. Dak.	-	-	83	37	-	-	6	-	-	-
S. Dak.	-	2	49	52	-	-	9	6	-	-
Nebr.	-	-	17	432	-	-	2	66	-	-
Kans.	-	1	161	367	-	-	74	230	-	-
S. ATLANTIC	-	124	3,087	2,282	4	-	5,752	7,822	9	6
Del.	-	32	-	-	-	-	91	124	-	-
Md.	-	67	382	215	-	-	741	1,207	3	-
D.C.	-	2	N	N	-	-	391	360	-	-
Va.	-	1	755	836	N	-	622	604	-	-
W. Va.	-	7	-	-	N	-	39	45	-	3
N.C.	-	1	-	-	2	-	1,222	1,210	4	1
S.C.	-	-	18	-	-	-	869	1,176	2	1
Ga.	-	9	591	-	2	-	687	2,012	U	-
Fla.	-	5	1,341	1,231	-	-	1,090	1,084	-	1
E.S. CENTRAL	-	147	1,163	1,976	6	-	1,363	2,334	12	47
Ky.	-	38	447	505	5	-	335	328	-	-
Tenn.	-	56	153	781	-	-	133	783	-	47
Ala.	-	35	563	685	-	-	895	1,106	1	-
Miss.	-	18	-	5	1	-	-	117	11	-
W.S. CENTRAL	-	399	822	2,814	1	-	955	2,759	3	28
Ark.	-	19	84	74	1	-	170	344	-	-
La.	-	19	401	-	-	-	483	344	1	1
Okla.	-	1	337	307	-	-	302	243	-	25
Tex.	-	360	-	2,433	-	-	-	1,828	2	2
MOUNTAIN	-	111	1,158	810	14	-	315	645	25	50
Mont.	-	2	22	-	-	-	4	2	2	2
Idaho	-	1	90	87	-	-	11	5	6	8
Wyo.	-	-	37	51	-	-	3	5	10	10
Colo.	-	53	-	-	9	-	-	163	4	7
N. Mex.	-	1	321	292	3	-	78	81	1	16
Ariz.	-	36	525	63	N	-	188	313	2	4
Utah	-	17	97	107	1	-	9	28	-	3
Nev.	-	1	66	210	1	-	22	48	-	-
PACIFIC	-	699	2,345	5,736	10	-	603	2,148	6	10
Wash.	-	64	572	705	-	-	150	221	-	-
Oreg.	-	48	-	350	2	-	-	9	1	2
Calif.	-	577	1,620	4,555	8	-	385	1,838	-	7
Alaska	-	3	95	27	-	-	42	43	-	1
Hawaii	-	7	58	99	N	-	26	37	5	-
Guam	-	-	-	26	N	-	-	13	-	-
P.R.	-	-	N	N	1	U	40	-	-	5
V.I.	-	1	N	N	N	U	-	-	-	-
Amer. Samoa	-	-	-	-	N	U	-	-	-	-
C.N.M.I.	-	-	N	N	N	U	-	5	-	-

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 HIV, STD, and TB Prevention, last update December 24, 1996.
†National Electronic Telecommunications System for Surveillance.
§Public Health Laboratory Information System.

TABLE II. (Cont'd.) Provisional cases of selected notifiable diseases, United States, weeks ending January 25, 1997, and January 27, 1996 (4th Week)

Reporting Area	Legionellosis		Lyme Disease		Malaria		Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal
	Cum. 1997	Cum. 1996	Cum. 1997	Cum. 1996	Cum. 1997	Cum. 1996	Cum. 1997	Cum. 1996	Cum. 1997	Cum. 1996	Cum. 1997
UNITED STATES	42	56	96	163	51	64	376	849	413	785	317
NEW ENGLAND	2	1	3	3	-	3	10	15	9	12	31
Maine	-	-	-	-	-	-	-	-	-	1	1
N.H.	-	-	1	-	-	-	-	-	-	-	-
Vt.	1	-	1	-	-	1	-	-	-	-	9
Mass.	1	-	-	-	-	2	3	6	3	2	3
R.I.	-	1	1	3	-	-	-	-	1	4	-
Conn.	N	N	-	-	-	-	7	9	5	5	18
MID. ATLANTIC	6	7	66	142	6	15	5	18	30	30	84
Upstate N.Y.	-	-	-	1	-	-	-	-	-	-	62
N.Y. City	-	-	1	67	4	5	-	7	12	7	-
N.J.	1	3	13	27	1	9	1	4	5	10	6
Pa.	5	4	52	47	1	1	4	7	13	13	16
E.N. CENTRAL	16	25	3	1	6	8	32	152	64	153	1
Ohio	12	10	2	1	1	-	13	64	33	14	-
Ind.	-	5	1	-	-	-	9	25	7	11	1
Ill.	-	2	-	-	-	3	6	44	24	128	-
Mich.	4	8	-	-	5	3	-	-	-	-	-
Wis.	-	-	U	U	-	2	4	19	-	-	-
W.N. CENTRAL	-	3	-	2	-	1	7	36	9	11	28
Minn.	-	-	-	-	-	-	-	4	7	2	2
Iowa	-	-	-	-	-	-	-	-	-	3	20
Mo.	-	2	-	1	-	1	7	24	1	3	1
N. Dak.	-	-	-	-	-	-	-	-	1	-	4
S. Dak.	-	-	-	-	-	-	-	-	-	-	-
Nebr.	-	1	-	-	-	-	-	3	-	-	-
Kans.	-	-	-	1	-	-	-	5	-	3	1
S. ATLANTIC	9	6	14	9	10	12	191	213	39	35	161
Del.	1	-	-	2	1	2	2	4	-	2	2
Md.	7	1	13	7	1	2	33	22	6	-	32
D.C.	1	-	-	-	1	1	6	6	6	-	1
Va.	-	1	-	-	1	3	19	31	-	1	18
W. Va.	-	1	-	-	-	-	-	-	3	4	3
N.C.	-	3	1	-	1	2	50	48	9	11	73
S.C.	-	-	-	-	1	-	37	33	15	17	2
Ga.	-	-	-	-	2	1	24	55	-	-	14
Fla.	-	-	-	-	2	1	20	14	-	-	16
E.S. CENTRAL	2	6	7	5	-	-	72	238	24	63	4
Ky.	-	3	-	2	-	-	11	19	-	3	2
Tenn.	-	1	-	3	-	-	11	65	5	21	-
Ala.	1	-	-	-	-	-	50	44	19	19	2
Miss.	1	2	7	-	-	-	-	110	-	20	-
W.S. CENTRAL	-	-	-	-	-	-	51	112	-	14	5
Ark.	-	-	-	-	-	-	2	16	-	3	-
La.	-	-	-	-	-	-	38	21	-	-	-
Okla.	-	-	-	-	-	-	11	1	-	11	5
Tex.	-	-	-	-	-	-	-	74	-	-	-
MOUNTAIN	5	4	-	-	4	5	4	16	10	26	1
Mont.	-	-	-	-	1	-	-	-	-	-	-
Idaho	-	-	-	-	-	-	-	-	-	1	-
Wyo.	-	-	-	-	-	-	-	-	1	-	-
Colo.	2	2	-	-	3	3	-	5	1	14	-
N. Mex.	-	-	-	-	-	1	-	-	2	-	-
Ariz.	1	1	-	-	-	-	4	9	4	11	1
Utah	2	-	-	-	-	1	-	-	-	-	-
Nev.	-	1	-	-	-	-	-	2	2	-	-
PACIFIC	2	4	3	1	25	20	4	49	228	441	2
Wash.	-	-	-	-	-	-	-	-	7	14	-
Oreg.	-	-	1	1	2	2	-	1	-	8	-
Calif.	2	4	2	-	23	18	4	48	199	402	2
Alaska	-	-	-	-	-	-	-	-	4	10	-
Hawaii	-	-	-	-	-	-	-	-	18	7	-
Guam	-	-	-	-	-	-	-	2	-	-	-
P.R.	-	-	-	-	1	-	11	5	-	-	1
V.I.	-	-	-	-	-	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	-	-	-	-	-	-

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

TABLE III. Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending January 25, 1997, and January 27, 1996 (4th Week)

Reporting Area	*H. influenzae*, invasive		Hepatitis (Viral), by type				Measles (Rubeola)					
			A		B		Indigenous		Imported†		Total	
	Cum. 1997*	Cum. 1996	Cum. 1997	Cum. 1996	Cum. 1997	Cum. 1996	1997	Cum. 1997	1997	Cum. 1997	Cum. 1997	Cum. 1996
UNITED STATES	58	90	1,101	1,629	327	510	1	1	-	-	1	1
NEW ENGLAND	2	4	23	12	4	14	-	-	-	-	-	-
Maine	-	-	1	2	-	-	-	-	-	-	-	-
N.H.	1	4	1	1	-	-	-	-	-	-	-	-
Vt.	-	-	2	-	-	-	-	-	-	-	-	-
Mass.	1	-	5	2	2	1	-	-	-	-	-	-
R.I.	-	-	1	2	-	1	-	-	-	-	-	-
Conn.	-	-	13	5	2	12	-	-	-	-	-	-
MID. ATLANTIC	10	12	85	93	50	66	-	-	-	-	-	-
Upstate N.Y.	-	1	-	2	-	4	-	-	-	-	-	-
N.Y. City	4	1	37	59	24	37	-	-	-	-	-	-
N.J.	4	8	30	19	21	16	-	-	-	-	-	-
Pa.	2	2	18	13	5	9	-	-	-	-	-	-
E.N. CENTRAL	8	15	89	169	51	79	-	-	-	-	-	-
Ohio	8	13	40	65	5	9	-	-	-	-	-	-
Ind.	-	-	15	10	4	3	-	-	-	-	-	-
Ill.	-	2	-	46	-	31	-	-	-	-	-	-
Mich.	-	-	34	25	42	26	-	-	-	-	-	-
Wis.	-	-	-	23	-	10	U	-	U	-	-	-
W.N. CENTRAL	-	5	50	131	14	34	-	-	-	-	-	-
Minn.	-	-	1	-	-	1	-	-	-	-	-	-
Iowa	-	3	12	31	10	5	-	-	-	-	-	-
Mo.	-	2	18	65	1	22	-	-	-	-	-	-
N. Dak.	-	-	-	1	-	-	-	-	-	-	-	-
S. Dak.	-	-	1	6	-	-	-	-	-	-	-	-
Nebr.	-	-	-	18	1	3	-	-	-	-	-	-
Kans.	-	-	18	10	2	3	-	-	-	-	-	-
S. ATLANTIC	15	10	74	50	29	72	-	-	-	-	-	-
Del.	-	-	4	1	1	-	-	-	-	-	-	-
Md.	6	1	36	17	14	20	-	-	-	-	-	-
D.C.	2	-	1	1	1	1	-	-	-	-	-	-
Va.	1	-	12	3	-	4	-	-	-	-	-	-
W. Va.	-	-	1	2	1	3	-	-	-	-	-	-
N.C.	4	2	7	12	8	36	-	-	-	-	-	-
S.C.	-	-	2	6	2	4	-	-	-	-	-	-
Ga.	1	7	1	-	-	-	-	-	-	-	-	-
Fla.	1	-	10	8	2	4	-	-	-	-	-	-
E.S. CENTRAL	1	3	22	79	17	57	-	-	-	-	-	-
Ky.	1	-	-	4	-	6	-	-	-	-	-	-
Tenn.	-	2	-	45	-	47	-	-	-	-	-	-
Ala.	-	1	6	7	1	4	-	-	-	-	-	-
Miss.	-	-	16	23	16	U	-	-	-	-	-	-
W.S. CENTRAL	2	4	85	187	4	11	-	-	-	-	-	-
Ark.	-	-	11	31	3	4	-	-	-	-	-	-
La.	-	-	-	3	-	1	-	-	-	-	-	-
Okla.	2	4	67	139	-	6	-	-	-	-	-	-
Tex.	-	-	7	14	1	-	-	-	-	-	-	-
MOUNTAIN	4	7	266	248	73	70	-	-	-	-	-	-
Mont.	-	-	6	5	-	-	-	-	-	-	-	-
Idaho	-	1	19	37	-	10	-	-	-	-	-	-
Wyo.	-	-	2	1	1	-	-	-	-	-	-	-
Colo.	2	1	64	17	24	11	-	-	-	-	-	-
N. Mex.	-	2	17	45	27	25	-	-	-	-	-	-
Ariz.	2	1	99	55	13	9	-	-	-	-	-	-
Utah	-	1	49	63	6	10	-	-	-	-	-	-
Nev.	-	1	10	25	2	5	-	-	-	-	-	-
PACIFIC	16	30	407	660	85	107	1	1	-	-	1	1
Wash.	-	-	4	11	-	3	-	-	-	-	-	-
Oreg.	5	2	43	123	12	8	-	-	-	-	-	-
Calif.	9	27	348	518	71	96	1	1	-	-	1	-
Alaska	-	-	3	1	-	-	-	-	-	-	-	-
Hawaii	2	1	9	7	2	-	-	-	-	-	-	1
Guam	-	-	-	1	-	-	U	-	U	-	-	-
P.R.	-	-	5	10	6	10	-	-	-	-	-	-
V.I.	-	-	-	-	-	-	U	-	U	-	-	-
Amer. Samoa	-	-	-	-	-	-	U	-	U	-	-	-
C.N.M.I.	-	8	-	1	-	3	U	-	U	-	-	-

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

*Of 8 cases among children aged <5 years, serotype was reported for 2 and of those, 0 were type b.

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

TABLE III. (Cont'd.) Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending January 25, 1997, and January 27, 1996 (4th Week)

Reporting Area	Meningococcal Disease		Mumps			Pertussis			Rubella		
	Cum. 1997	Cum. 1996	1997	Cum. 1997	Cum. 1996	1997	Cum. 1997	Cum. 1996	1997	Cum. 1997	Cum. 1996
UNITED STATES	208	319	4	8	27	61	228	87	2	2	9
NEW ENGLAND	18	16	-	-	-	20	53	9	-	-	-
Maine	-	3	-	-	-	-	3	1	-	-	-
N.H.	2	1	-	-	-	12	18	1	-	-	-
Vt.	-	1	-	-	-	8	31	2	-	-	-
Mass.	12	2	-	-	-	-	1	5	-	-	-
R.I.	-	3	-	-	-	-	-	-	-	-	-
Conn.	4	6	-	-	-	-	-	-	-	-	-
MID. ATLANTIC	14	26	-	-	4	1	1	4	-	-	-
Upstate N.Y.	-	2	-	-	1	-	-	3	-	-	-
N.Y. City	4	5	-	-	-	-	-	-	-	-	-
N.J.	5	10	-	-	2	-	-	1	-	-	-
Pa.	5	9	-	-	1	1	1	-	-	-	-
E.N. CENTRAL	28	52	-	-	9	2	5	29	-	-	-
Ohio	23	25	-	-	5	-	-	14	-	-	-
Ind.	3	3	-	-	-	-	-	-	-	-	-
Ill.	-	15	-	-	1	-	-	2	-	-	-
Mich.	2	2	-	-	3	2	5	4	-	-	-
Wis.	-	7	U	-	-	U	-	9	U	-	-
W.N. CENTRAL	12	36	-	-	2	2	7	2	-	-	-
Minn.	-	-	-	-	-	-	-	-	-	-	-
Iowa	9	7	-	-	-	2	6	-	-	-	-
Mo.	1	20	-	-	-	-	-	2	-	-	-
N. Dak.	-	-	-	-	2	-	-	-	-	-	-
S. Dak.	1	2	-	-	-	-	1	-	-	-	-
Nebr.	-	4	-	-	-	-	-	-	-	-	-
Kans.	1	3	-	-	-	-	-	-	-	-	-
S. ATLANTIC	45	41	-	-	2	6	11	5	-	-	-
Del.	2	1	-	-	-	-	-	-	-	-	-
Md.	4	6	-	-	1	6	11	4	-	-	-
D.C.	1	2	-	-	-	-	-	-	-	-	-
Va.	2	3	-	-	-	-	-	-	-	-	-
W. Va.	1	-	-	-	-	-	-	-	-	-	-
N.C.	6	6	-	-	-	-	-	-	-	-	-
S.C.	13	8	-	-	1	-	-	-	-	-	-
Ga.	10	13	-	-	-	-	-	1	-	-	-
Fla.	6	2	-	-	-	-	-	-	-	-	-
E.S. CENTRAL	13	24	-	2	1	2	3	7	-	-	-
Ky.	-	6	-	-	-	-	-	5	-	-	-
Tenn.	-	6	-	-	-	-	-	1	-	-	-
Ala.	9	10	-	-	1	-	1	1	-	-	-
Miss.	4	2	-	2	-	2	2	-	-	-	N
W.S. CENTRAL	5	28	-	-	1	-	1	1	-	-	-
Ark.	3	5	-	-	-	-	-	1	-	-	-
La.	-	6	-	-	1	-	-	-	-	-	-
Okla.	1	2	-	-	-	-	-	-	-	-	-
Tex.	1	15	-	-	-	-	1	-	-	-	-
MOUNTAIN	16	24	2	2	2	7	98	16	2	2	-
Mont.	1	-	-	-	-	-	-	-	-	-	-
Idaho	1	2	-	-	-	-	70	-	-	-	-
Wyo.	-	-	-	-	-	-	1	-	-	-	-
Colo.	1	3	1	1	-	5	18	-	-	-	-
N. Mex.	3	7	N	N	N	2	5	7	-	-	-
Ariz.	7	8	-	-	-	-	4	-	2	2	-
Utah	2	1	1	1	-	-	-	-	-	-	-
Nev.	1	3	-	-	2	-	-	9	-	-	-
PACIFIC	57	72	2	4	6	21	49	14	-	-	9
Wash.	7	3	-	-	-	1	1	1	-	-	-
Oreg.	23	16	-	-	-	-	2	12	-	-	-
Calif.	27	51	1	1	5	20	45	-	-	-	9
Alaska	-	1	-	-	-	-	1	-	-	-	-
Hawaii	-	1	1	3	1	-	-	1	-	-	-
Guam	-	1	U	-	1	U	-	-	U	-	-
P.R.	-	-	-	-	-	-	-	-	-	-	-
V.I.	-	-	U	-	-	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 122 U.S. cities,* week ending January 25, 1997 (4th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	>65	45-64	25-44	1-24	<1	
NEW ENGLAND	633	475	100	36	9	13	61
Boston, Mass.	152	95	32	11	4	10	21
Bridgeport, Conn.	44	35	7	1	1	-	3
Cambridge, Mass.	18	15	3	-	-	-	2
Fall River, Mass.	33	31	2	-	-	-	3
Hartford, Conn.	65	47	8	9	1	-	3
Lowell, Mass.	34	31	3	-	-	-	4
Lynn, Mass.	22	19	2	-	-	1	2
New Bedford, Mass.	32	24	7	1	-	-	1
New Haven, Conn.	45	35	4	3	1	2	3
Providence, R.I.	65	51	8	5	1	-	4
Somerville, Mass.	5	4	-	1	-	-	1
Springfield, Mass.	41	33	5	3	-	-	8
Waterbury, Conn.	12	9	3	-	-	-	-
Worcester, Mass.	65	46	16	2	1	-	6
MID. ATLANTIC	2,630	1,872	471	204	42	38	187
Albany, N.Y.	67	49	8	4	3	3	4
Allentown, Pa.	20	17	2	1	-	-	-
Buffalo, N.Y.	73	53	14	3	3	-	6
Camden, N.J.	37	23	9	2	1	2	3
Elizabeth, N.J.	15	11	3	1	-	-	-
Erie, Pa.§	38	31	5	2	-	-	3
Jersey City, N.J.	59	42	12	4	1	-	4
New York City, N.Y.	1,363	972	247	107	15	22	74
Newark, N.J.	80	31	20	20	5	2	4
Paterson, N.J.	26	18	4	4	-	-	2
Philadelphia, Pa.	400	274	75	34	11	5	35
Pittsburgh, Pa.§	66	53	10	2	-	1	9
Reading, Pa.	12	10	2	-	-	-	7
Rochester, N.Y.	153	109	29	10	2	3	14
Schenectady, N.Y.	22	19	2	1	-	-	1
Scranton, Pa.§	47	41	5	-	1	-	2
Syracuse, N.Y.	72	54	16	2	-	-	13
Trenton, N.J.	46	36	7	3	-	-	5
Utica, N.Y.	34	29	1	4	-	-	1
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	2,453	1,710	462	166	44	71	203
Akron, Ohio	49	39	4	5	-	1	-
Canton, Ohio	38	20	16	-	1	1	4
Chicago, Ill.	529	316	118	56	10	29	50
Cincinnati, Ohio	225	158	36	19	5	7	24
Cleveland, Ohio	158	109	27	10	3	9	5
Columbus, Ohio	247	171	52	15	8	1	27
Dayton, Ohio	120	98	18	2	1	1	29
Detroit, Mich.	237	153	57	18	8	1	12
Evansville, Ind.	56	42	10	3	-	1	2
Fort Wayne, Ind.	71	53	11	3	1	3	9
Gary, Ind.	U	U	U	U	U	U	U
Grand Rapids, Mich.	51	42	6	1	-	2	5
Indianapolis, Ind.	164	111	32	10	5	6	1
Lansing, Mich.	57	38	13	5	-	1	4
Milwaukee, Wis.	120	87	26	3	-	4	7
Peoria, Ill.	59	49	7	2	1	-	1
Rockford, Ill.	64	49	8	4	-	3	2
South Bend, Ind.	47	38	5	4	-	-	3
Toledo, Ohio	93	77	10	4	1	1	17
Youngstown, Ohio	68	60	6	2	-	-	1
W.N. CENTRAL	880	643	136	53	19	14	73
Des Moines, Iowa	U	U	U	U	U	U	U
Duluth, Minn.	35	31	4	-	-	-	1
Kansas City, Kans.	48	30	13	4	1	-	1
Kansas City, Mo.	143	91	21	11	1	4	14
Lincoln, Nebr.	47	36	7	2	2	-	4
Minneapolis, Minn.	171	129	19	15	7	1	19
Omaha, Nebr.	124	91	25	2	4	2	11
St. Louis, Mo.	124	89	21	10	1	3	8
St. Paul, Minn.	78	68	5	2	1	2	5
Wichita, Kans.	110	78	21	7	2	2	10
S. ATLANTIC	1,384	930	252	144	34	24	112
Atlanta, Ga.	143	98	28	14	2	1	10
Baltimore, Md.	289	181	64	34	5	5	31
Charlotte, N.C.	131	89	25	10	4	3	14
Jacksonville, Fla.	135	96	26	13	-	-	5
Miami, Fla.	107	74	18	14	1	-	2
Norfolk, Va.	59	49	4	4	2	-	6
Richmond, Va.	U	U	U	U	U	U	U
Savannah, Ga.	55	46	5	1	-	3	9
St. Petersburg, Fla.	66	50	12	2	1	1	6
Tampa, Fla.	185	128	34	16	5	2	22
Washington, D.C.	195	103	36	33	14	9	7
Wilmington, Del.	19	16	-	3	-	-	-
E.S. CENTRAL	591	423	106	37	15	9	59
Birmingham, Ala.	39	21	5	8	4	-	1
Chattanooga, Tenn.	100	79	14	5	-	2	18
Knoxville, Tenn.	120	86	20	10	3	1	19
Lexington, Ky.	48	34	10	2	2	-	3
Memphis, Tenn.	U	U	U	U	U	U	U
Mobile, Ala.	49	39	8	2	-	-	-
Montgomery, Ala.	55	46	7	1	1	-	7
Nashville, Tenn.	180	118	42	9	5	6	11
W.S. CENTRAL	1,592	1,025	344	135	57	31	126
Austin, Tex.	101	65	23	10	2	1	4
Baton Rouge, La.	54	33	12	4	3	2	3
Corpus Christi, Tex.	63	39	15	4	2	3	2
Dallas, Tex.	232	139	60	24	5	4	11
El Paso, Tex.	91	60	16	8	4	3	10
Ft. Worth, Tex.	132	88	20	13	9	2	9
Houston, Tex.	439	277	89	40	23	10	42
Little Rock, Ark.	72	49	13	7	1	2	3
New Orleans, La.	43	25	13	2	2	1	-
San Antonio, Tex.	158	104	35	16	1	2	18
Shreveport, La.	64	42	18	3	1	-	5
Tulsa, Okla.	143	104	30	4	4	1	19
MOUNTAIN	1,210	861	213	84	28	24	135
Albuquerque, N.M.	120	85	21	12	1	1	3
Boise, Idaho	43	35	7	1	-	-	2
Colo. Springs, Colo.	60	42	9	4	2	3	5
Denver, Colo.	123	85	26	7	2	3	24
Las Vegas, Nev.	305	206	67	18	8	6	25
Ogden, Utah	31	26	3	1	-	1	5
Phoenix, Ariz.	191	122	29	23	9	8	17
Pueblo, Colo.	42	35	5	1	-	1	6
Salt Lake City, Utah	113	82	20	7	3	1	17
Tucson, Ariz.	182	143	26	10	3	-	31
PACIFIC	1,690	1,243	280	113	31	23	203
Berkeley, Calif.	19	14	2	1	1	1	4
Fresno, Calif.	127	85	26	10	3	3	13
Glendale, Calif.	17	13	4	-	-	-	2
Honolulu, Hawaii	83	67	10	5	-	1	15
Long Beach, Calif.	112	86	20	5	1	-	29
Los Angeles, Calif.	323	229	55	27	10	2	14
Pasadena, Calif.	36	25	3	5	-	3	2
Portland, Oreg.	162	127	24	9	2	-	17
Sacramento, Calif.	U	U	U	U	U	U	U
San Diego, Calif.	127	88	24	10	2	3	18
San Francisco, Calif.	136	94	26	12	2	2	30
San Jose, Calif.	239	186	35	9	6	3	30
Santa Cruz, Calif.	40	33	5	1	1	-	9
Seattle, Wash.	133	93	25	10	3	2	8
Spokane, Wash.	66	51	7	5	-	3	9
Tacoma, Wash.	70	52	14	4	-	-	3
TOTAL	13,063¶	9,182	2,364	972	279	247	1,159

U: Unavailable -: no reported cases

*Mortality data in this table are voluntarily reported from 122 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.

Contributors to the Production of the *MMWR* (Weekly)

Weekly Notifiable Disease Morbidity Data and 122 Cities Mortality Data

Denise Koo, M.D., M.P.H.
Deborah A. Adams
Timothy M. Copeland
Patsy A. Hall
Carol M. Knowles
Sarah H. Landis
Myra A. Montalbano

Desktop Publishing and Graphics Support

Morie M. Higgins
Peter M. Jenkins

The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available free of charge in electronic format and on a paid subscription basis for paper copy. To receive an electronic copy on Friday of each week, send an e-mail message to *lists@list.cdc.gov*. The body content should read *subscribe mmwr-toc*. Electronic copy also is available from CDC's World-Wide Web server at *http://www.cdc.gov/* or from CDC's file transfer protocol server at *ftp.cdc.gov*. To subscribe for paper copy, contact Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone (202) 512-1800.

Data in the weekly *MMWR* are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the following Friday. Address inquiries about the *MMWR* Series, including material to be considered for publication, to: Editor, *MMWR* Series, Mailstop C-08, CDC, 1600 Clifton Rd., N.E., Atlanta, GA 30333; telephone (404) 332-4555.

☆**U.S. Government Printing Office: 1997-532-228/47056 Region IV**