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Evaluation of Safety Devices for Preventing Percutaneous Injuries Among Health-Care Workers During Phlebotomy Procedures — Minneapolis-St. Paul, New York City, and San Francisco, 1993–1995

Health-care workers (HCWs) are at risk for infections with bloodborne pathogens resulting from occupational exposures to blood through percutaneous injuries (PIs). Phlebotomy, one of the most commonly performed medical procedures, has been associated with 13%–62% of injuries reported to hospital occupational health services (*1,2*) and with 20 (39%) of the 51 documented episodes of occupationally acquired human immunodeficiency virus (HIV) infection reported in the United States (CDC, unpublished data, 1996). Although safety devices designed to prevent PIs associated with phlebotomy have been available for use in the United States, clinical evaluation of these devices has been difficult because 1) ascertainment of PIs is difficult (many injuries are unreported [*2,3*], and observation of all procedures is impractical because phlebotomy is performed throughout the hospital by different groups of HCWs at all hours), 2) data to calculate PI rates (i.e., the number of phlebotomies performed and devices used) are not routinely available, 3) a large number of phlebotomies must be evaluated because of the low rates of phlebotomy-related PI, and 4) rates of safety-feature activation are difficult to assess. This report summarizes a collaborative study by CDC and six hospitals to evaluate safety devices for phlebotomy. The findings indicate that use of safety devices significantly reduced phlebotomy-related PI rates while having minimal clinically apparent adverse effects on patient care.*

The study was conducted in two phases during 1993–1995 at six university-affiliated hospitals in Minneapolis-St. Paul, Minnesota (three hospitals), New York, New York (one hospital), and San Francisco, California (two hospitals). Each hospital selected the products to be evaluated (vacuum-tube blood-collection devices and/or winged steel needles with safety features). The assessment was restricted to a comparison of safety devices with conventional devices, not with other safety devices. Products evaluated included a resheathable winged steel needle (Safety-Lok™ [Becton Dickinson, Franklin Lakes, New Jersey]† [six hospitals]); a bluntable vacuum-

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tube blood-collection needle activated while in the patient's vein (Punctur-Guard™ [Bio-Plexus, Inc., Tolland, Connecticut] [three hospitals]); and a vacuum-tube blood-collection needle with a hinged recapping sheath (Venipuncture Needle-Pro™ [Smith Industries (Concord Portex), Keene, New Hampshire] [four hospitals]). Each product requires the HCW to activate the safety feature during or after phlebotomy. Before introducing safety devices, each hospital conducted a comprehensive training program for HCWs that included "hands-on" experience with the equipment.

During phase I (mean duration among the hospitals: 10 months; range: 9–12 months), hospitals used conventional phlebotomy devices and conducted enhanced surveillance for injuries (e.g., encouraging reporting, publishing notices in the hospital newsletter, posting educational materials, and/or providing inservice training for staff). An anonymous survey was distributed to four groups of HCWs who routinely perform phlebotomies[§] to estimate their rates of underreporting of PIs to hospital surveillance systems and to determine the average number of phlebotomies performed each day and average number of days worked each week. The rates of PIs associated with phlebotomy devices for HCWs in each of these four groups were estimated by dividing the number of phlebotomy-related PIs reported to the hospital's surveillance system during the study period (adjusted for underreporting by occupation) by the total number of phlebotomies performed (estimated from the daily average number of phlebotomies performed by each HCW, the number of HCWs in each of the four groups, and the duration of the study period).

During phase II (mean duration among the hospitals: 12 months; range: 6–15 months), investigators replaced conventional phlebotomy devices with safety devices hospitalwide, monitored supplies of phlebotomy equipment to attempt to ensure that only safety devices were available, continued enhanced surveillance for injuries, and inventoried the autoclaved contents of a representative sample of disposal containers for sharp instruments to determine rates of use of safety devices and conventional devices and rates of activation of safety features. The HCW survey was repeated 1–2 months before the end of phase II, and the estimated PI rates for safety and conventional devices were compared. The second HCW survey also included questions to assess HCW satisfaction with safety devices and to determine the occurrence of adverse effects in patients that were apparent at the time of the phlebotomy[¶].

The overall response rate for each of the two HCW surveys was approximately 75%, based on estimates of the number of HCWs who received survey forms; 1699 HCWs responded in phase I and 1421 in phase II. Overall, respondents acknowledged reporting 302 (54%) of 563 needlestick injuries they had sustained from all types of needles during the previous year. Reporting rates varied by occupation: 91% of injuries among phlebotomists were reported, as were 68% among nurses, 35% among medical students, and 31% among residents. Within occupations, reporting rates were similar among hospitals and between the two surveys. Because estimated

[§]Phlebotomists (including laboratory technicians who frequently draw blood); nurses (on representative medical and surgical wards, intensive-care units, and in the emergency department); residents (medical, pediatric, and surgical); and medical students (third- and fourth-year).

[¶]Examples of adverse effects include vein trauma resulting in hematoma, increased patient discomfort, and the need for repeated phlebotomy attempts. Because certain events reported as patient adverse effects (e.g., slow blood return or other difficulty drawing blood, sometimes requiring repeat phlebotomies) also were considered technical difficulties, responses were classified as "adverse patient effects or technical difficulties."

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rates of phlebotomy-related PI by device and occupation were similar for each hospital in which a particular device was used, data were aggregated among hospitals to permit comparison of PI rates for safety and conventional phlebotomy devices. Compared with conventional devices, PI rates were lower for safety devices (Table 1).

Of 41 PIs associated with safety devices, 34 (83%) involved winged steel needles and seven (17%) involved vacuum-tube blood-collection needles (Table 1). Twenty-five (61%) involved an injury before activation of the safety feature was appropriate or possible (e.g., within seconds after the device was removed from the vein); six (15%) occurred during activation of the safety feature (all with Safety-Lok™). For eight (20%), the safety feature had not been activated, and for two (5%), the mechanism of injury was unknown. Safety devices constituted 12,681 (89%) of the 14,261 phlebotomy devices in autoclaved sharps-disposal containers. In the phase II HCW survey, HCWs were asked "Do you prefer the safety device over conventional equipment?" Among 1108 HCWs, 1879 responses were related to one or more of the three devices; 822 (44%) responded yes; 622 (33%), no; and 435 (23%), unsure.

Reported by: M Mendelson, MD, R Solomon, MS, E Shekletski, Mt. Sinai Medical Center, New York City. K Henry, MD, S Campbell, MSPH, A Collins, St. Paul Ramsey Medical Center, St. Paul; J Thurn, MD, F Lebahn, MT, Minneapolis Veterans Affairs Medical Center, Minnesota; F Rhame, MD, Univ of Minnesota Hospital, Minneapolis. J Gerberding, MD, R Fahrner, MS, K Turner-Hubbard, MS, San Francisco General Hospital; P Jensen, MD, San Francisco Veterans Affairs Medical Center, California. Hospital Infections Program, National Center for Infectious Diseases, CDC.

Editorial Note: The findings in this report suggest that safety devices for phlebotomy can reduce the risk for occupational PIs among HCWs. In particular, there was a significant reduction in phlebotomy-related PIs associated with use of each of the vacuum-tube blood-collection devices and a reduction in PIs associated with use of the winged steel needles. Further decreases in phlebotomy-related PIs might have been possible with increased use of safety devices and/or increased activation of safety features by HCWs. Experts have recommended that safety devices include safety features that activate automatically and do not rely on activation by HCWs (*4,5*). Although the assessment of potential patient complications in this study was limited, short-term complications were clinically minimal, and although patients were not systematically monitored for long-term follow-up, phlebotomy needles are not indwelling devices and long-term complications of phlebotomy are rare.

Results of this study also suggest that safety devices for phlebotomy may be generally acceptable to users. Activation rates of safety features and user acceptability may be influenced by factors such as the perceived risk for occupational infection by the HCW, design of the device, training provided before and after introduction of the device, length of time needed to become adept at using the device, ease of use, necessary changes in technique, and previous experience with safety devices (*5*). Further analyses will assess whether safety-feature activation rates and user acceptability in this study varied by hospital, city, occupation, or device used. Acceptability of a device to an institution may be influenced by cost.

In this study, only 54% of PIs were reported to hospital surveillance systems—a rate consistent with those documented in previous studies (range: 5%–60% [*2,3*]). Failure to report PIs may compromise appropriate postexposure management, including postexposure prophylaxis for HIV and hepatitis B virus, and assessment of occupational hazards and preventive interventions (*6,7*). Health-care institutions and HCWs

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TABLE 1. Evaluation of three safety devices* used in phlebotomies based on surveillance and surveys of health-care workers (HCWs)†, by characteristic — Minneapolis–St. Paul, New York City, and San Francisco, 1993–1995§

Characteristics	Winged steel needle	Vacuum-tube blood-collection device	
	Safety-Lok™¶	Punctur-Guard™**	Venipuncture Needle-Pro™
Study site (no. hospitals)	Minneapolis-St. Paul (3) New York City (1) San Francisco (2)	Minneapolis-St. Paul (3)	Minneapolis-St. Paul (1) New York City (1) San Francisco (2)
No. phlebotomy-related percutaneous injuries (PIs)			
Unadjusted			
Conventional device	53	14	19
Safety device	34	2	5
Adjusted for underreporting by occupation			
Conventional device	102	19	33
Safety device	58	4	8
Estimated no. phlebotomies performed			
Conventional device	2,540,500	523,561	895,054
Safety device	1,875,995	501,596	628,092
Estimated no. PIs per 100,000 phlebotomies			
Conventional device	4.0	3.6	3.6
Safety device	3.1	0.9	1.2
Percentage reduction in PI rate with safety device††	23% (p=0.07)	76% (p=0.003)	66% (p=0.003)
No. (%) safety devices with activated safety features observed in disposal containers	2257 (56%) of 4065	2984 (57%) of 5255	3250 (98%) of 3319
No. (%) HCWs noting technical difficulties or adverse patient effects with safety device (preliminary results)§§	97 (10%) of 955	201 (44%) of 452	19 (5%) of 385

*Safety-Lok™ (Becton Dickinson, Franklin Lakes, New Jersey), Punctur-Guard™ (Bio-Plexus, Inc., Tolland, Connecticut), and Venipuncture Needle-Pro™ (Smith Industries [Concord Portex], Keene, New Hampshire).

†Phlebotomists; nurses on representative medical and surgical wards, intensive-care units, and the emergency department; medical, pediatric, and surgical residents; and third- and fourth-year medical students.

§This study was not designed to compare one safety device with another.

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**According to the manufacturer, the design of this product has been modified since study completion.

††Safety versus conventional device.

§§Approximately 60% of respondents answered this question. Perception of technical difficulties may be influenced by training provided, length of time using the device, perception of risk for occupational infection, and other factors.

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must further assess reasons for underreporting and improve reporting of all occupational blood exposures.

The Occupational Safety and Health Administration requires that primary methods to reduce occupational PIs include engineering controls (*8*), and the Food and Drug Administration has urged that needleless or recessed needle systems be used to replace hypodermic needles for accessing intravenous administration sets (*9*). Some manufacturers are continuing efforts to develop and refine safety devices to improve the effectiveness and acceptability of products. The findings in this report and in a companion report evaluating blunt suture needles (*10*) suggest that safety devices can be an effective component in a needlestick-prevention program. The Public Health Service is evaluating the implications of these and other data in assessing the possible need for further guidance on selection, implementation, and evaluation of safety devices in health-care settings.

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Evaluation of Blunt Suture Needles in Preventing Percutaneous Injuries Among Health-Care Workers During Gynecologic Surgical Procedures — New York City, March 1993–June 1994

Infections with bloodborne pathogens resulting from exposures to blood through percutaneous injuries (PIs) (e.g., needlestick injuries and cuts with sharp objects) are an occupational hazard for health-care workers (HCWs) (*1*). PIs have been reported during 1%–15% of surgical procedures, mostly associated with suturing (*1,2*). Most suturing is done using curved suture needles, although straight needles are used by

Blunt Suture Needles — Continued

some surgeons for suturing skin. Blunt suture needles (curved suture needles that have a relatively blunt tip) may be less likely to cause PIs because they do not easily penetrate skin. Based on small studies and anecdotal experience, blunt suture needles appear able to replace conventional curved suture needles for suturing many tissues, although they may require more pressure to penetrate the tissues (*3–6*). This report summarizes results of a study in which CDC collaborated with three teaching hospitals in New York City during 1993–1994 to evaluate a safety device (a blunt suture needle) in gynecologic surgery. The findings indicate that use of blunt needles was associated with statistically significant reductions in PI rates, minimal clinically apparent adverse effects on patient care, and general acceptance by gynecologic surgeons in these hospitals.*

Blunt suture needles (Ethiguard™, Ethicon, Inc., Somerville, New Jersey)† were evaluated as a potential replacement for conventional curved needles in gynecologic surgery, a specialty in which high PI rates have been reported (*2*). From March 1993 through June 1994, trained nurse observers at the three hospitals systematically recorded information about the nature and frequency of all PIs and the number and type of suture needles used during gynecologic surgical procedures (laparoscopy and dilation and curettage procedures were excluded from the study). PIs observed or reported during surgery were confirmed by inspection of HCWs' hands before they left the operating room. Beginning in February 1994, hospital investigators replaced conventional curved suture needles with blunt needles on all gynecologic surgical instrument trays; however, surgeons retained the option of requesting conventional needles.

During March 1993–June 1994, a total of 1464 gynecologic surgery procedures were observed; of these, 1062 (73%) were performed using only conventional curved needles, 55 (4%) using only blunt needles, and 347 (24%) using both. Straight needles were used in addition to curved needles in 104 procedures. Overall, 87 PIs occurred during 84 (6%) of the 1464 procedures; of these, 61 (70%) involved suture needles, and 26 (30%) involved other surgical devices. Of the 61 injuries involving suture needles, 56 (92%) were associated with conventional curved needles, none with blunt needles, and five (8%) with straight needles.

The mean number of curved suture needles used per procedure (24 needles) was constant throughout the study period. The percentage of blunt needles used during a calendar quarter increased, from <1% to 55% during the study; during April–June 1994, at least one blunt suture needle was used in 243 (81%) of 299 procedures. The increase in use of blunt suture needles was temporally associated with a decrease in PIs from curved suture needles, from 5.9 PIs per 100 procedures (49 PIs among 835 procedures) in 1993 to 1.1 PIs per 100 procedures (seven PIs among 629 procedures) in 1994 ($p<0.01$) (Figure 1). Rates of PIs with devices other than curved suture needles remained constant (2.1 PIs per 100 procedures). The rates of PIs associated with use of curved suture needles were 1.9 per 1000 conventional curved suture needles used (56 PIs among 28,880 conventional curved suture needles used) and zero per 1000 blunt suture needles used (0 PIs among 6139 blunt suture needles used) ($p<0.01$; relative

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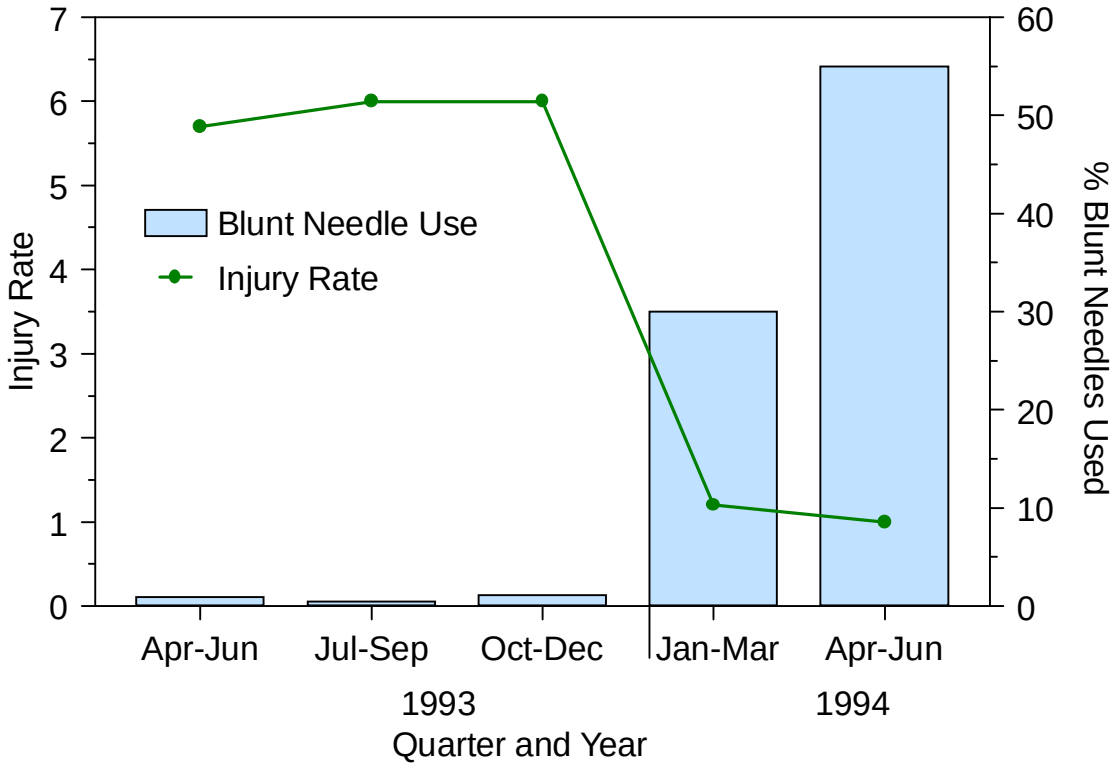
Blunt Suture Needles — Continued

FIGURE 1. Rate* of injury associated with use of curved suture needles during gynecologic surgical procedures and percentage of suture needles used that were blunt, by quarter — three hospitals, New York City, April 1993–June 1994



*Per 100 procedures.

risk=0.0; 95% confidence interval [CI]=0–0.03). For straight suture needles, the PI rate was 14.2 PIs per 1000 needles used (five PIs among 351 needles used).

A logistic regression model was developed to identify and control for potential risk factors for PI during a procedure, including type and duration of the procedure, selected aspects of surgical technique (e.g., using fingers to hold tissue being sutured), estimated patient blood loss, number and type of curved suture needles used, status of the primary surgeon (attending or resident), and whether the primary surgeon had participated in a training program on PI prevention. The model indicated that the use of blunt needles was protective: for each percentage point increase in blunt needles used during a procedure, the adjusted odds ratio for risk of curved suture needle injury was 0.96 (95% CI=0.92–0.98; $p<0.01$). For example, if the percentage of blunt needles used increased from 30% to 40%, the odds of a PI with a curved suture needle were reduced by 34% (i.e., 100 X [1–0.96^{10}]). According to the model, the estimated odds of a PI with a curved suture needle were reduced by 87% when 50% of the suture needles used during a procedure were blunt.

In 25 (6%) of the 402 procedures during which blunt needles were used, surgeons reported technical difficulties with the blunt needles, including problems penetrating tissue (18), tearing of tissue (three), needle slippage (three), and bleeding when the

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needle entered the tissue (one). However, none of these were reported to be clinically important; for procedures performed with and without blunt needles, mean blood loss was similar (328 cc and 351 cc, respectively; p=0.29), and mean operative time was similar (102 min and 106 min, respectively; p=0.24). Long-term complications (e.g., surgical site infections) were not assessed.

Reported by: M Mendelson, MD, R Sperling, MD, M Brodman, MD, P Dottino, MD, J Morrow, MD, J Solomon, MPH, Mt. Sinai Medical Center; B Raucher, MD, J Stein, MD, N Roche, MD, A Jacobs, MD, Beth Israel Medical Center; P Nicholas, MD, I Karmin, MD, B Brown, MD, Elmhurst Hospital, New York, New York. Hospital Infections Program, National Center for Infectious Diseases, CDC.

Editorial Note: The findings in this investigation indicate that in the three participating hospitals, use of blunt suture needles effectively reduced suture-related PIs during gynecologic surgical procedures. Smaller studies in other surgical specialities also concluded that use of blunt suture needles was not associated with PIs (*3–6*). Although some tissues cannot tolerate the increased force required to use a blunt needle, a blunt needle probably could be substituted for a conventional curved needle in a variety of procedures (*3–6*). Blunt suture needles may be particularly useful in preventing PIs during suturing in a poorly visualized anatomic space—a situation associated with increased risks for PI for surgeons and with transmission of hepatitis B virus from surgeons to patients (*7*). Blunt needles recently have become available in a variety of sizes and suture materials; the effectiveness of blunt needles in reducing PIs suggests that they should be considered for more widespread use in surgical procedures.

In this study, the PI rate for straight suture needles was more than seven times the rate associated with conventional curved needles. Straight needles are used by some surgeons to close the skin; however, because safer alternatives (e.g., staplers, conventional curved needles, and possibly blunt needles [*6*]) are available, indications and techniques for using straight suture needles should be reevaluated.

Safety devices designed to reduce the risk for PI to HCWs should not adversely affect patients. In this study, no clinically important patient-care complications attributable to blunt needles were reported by surgeons or suggested based on objective clinical parameters. One limitation of this assessment was the lack of systematic long-term follow-up of patients to assess possible delayed complications of surgery (e.g., surgical-site infections); however, a previously published report on a small number of patients did not document infections in association with use of blunt needles (*6*).

Safety devices must be acceptable to the HCWs who use them. In this and previous reports, blunt needles were acceptable to surgeons as replacement for some or all conventional curved needles in a variety of procedures (*3–5*). Although specific uses and limitations of blunt needles require further delineation, the findings of this report support the use of blunt needles as an effective component of a PI-prevention program in gynecologic surgery and possibly for other surgical specialties. The Public Health Service is continuing to evaluate the implications of these findings, data from a companion report on safety devices for phlebotomy (*8*), and other information to assess the need for further guidance on selection, implementation, and evaluation of safety devices in health-care settings.

Blunt Suture Needles — Continued

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Q Fever Outbreak — Germany, 1996

In May 1996, the Health Department of Marburg-Biedenkopf in Marburg, Hessen, Germany, was notified of a cluster of persons with high and persistent fever who resided in a rural town (Rollshausen [1996 population: 300]) and in five surrounding towns approximately 0.5–2.0 miles from Rollshausen, in the district of Lohra. Serologic testing of some patients by local health authorities suggested acute Q fever. In Germany, Q fever is a reportable disease and 27–100 cases are reported annually; during 1995, no cases had been reported from Lohra. In July 1996, the Robert Koch Institute (RKI) was invited to assist in an investigation of this cluster. This report summarizes the investigation of this outbreak, which indicated a high attack rate of Q fever in persons residing near the zoonotic origin of infection.

Before the outbreak, two flocks of sheep were kept near Rollshausen. One flock included 1000–2000 sheep that had been maintained on farm property northwest of Rollshausen from October 1995 through May 1996; lambing occurred both indoors and outdoors in December 1995 and January 1996. The second flock included 20 sheep and, since 1995, had been kept northeast of Rollshausen.

To characterize the extent of and risk factors for this outbreak, RKI and local health authorities conducted a retrospective cohort study of all Rollshausen residents aged ≥15 years. On July 10 and 11, 1996, a self-administered questionnaire was distributed to all households, and *Coxiella burnetii* antibody testing was offered to all residents. The questionnaire asked about symptoms since January 1, 1996, demographics, occupation, livestock exposure, drinking raw milk, tick bites, and outdoor activities. In addition, family doctors and hospitals serving the area were contacted to identify possible cases. A clinical case was defined as fever ≥102.2 F (≥39 C) lasting >2 days and three or more symptoms (i.e., chills, sweats, severe headache, cough, aching muscles/joints, back pain, fatigue, or feeling ill) with onset after January 1, 1996. A

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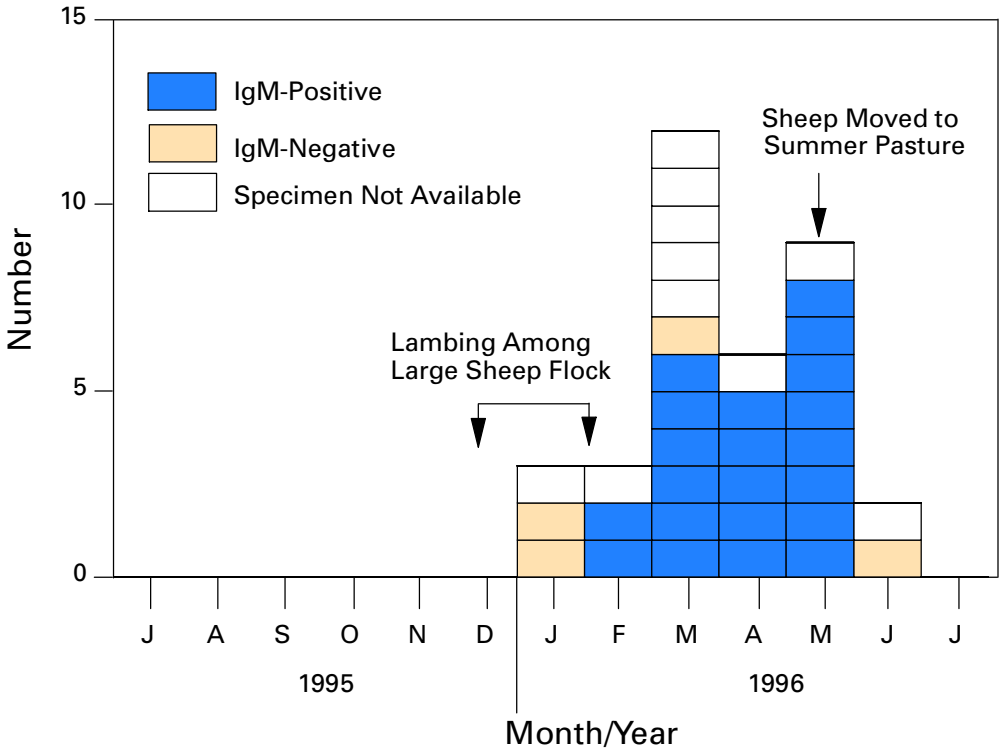
laboratory-confirmed case was defined as a positive result for IgM *C. burnetii* antibodies. *C. burnetii* antibody testing was conducted by an enzyme-linked immunosorbent assay. Human serum was tested for IgG and IgM antibodies; in animal samples, IgG and IgM were not distinguished.

Of the 239 eligible residents, 200 (84%) submitted a blood sample (120 [50%]) and/or completed the questionnaire (193 [81%]). A total of 49 (25%) of the 200 residents had either clinical (35 [18% of those completing questionnaire]) or laboratory-confirmed (35 [29% of those with antibody testing]) cases. Onsets of illness occurred from January through June; the first persons with laboratory-confirmed Q fever had onset in February (Figure 1). The 49 case-patients resided in all parts of Rollshausen. Attack rates (AR) were similar for males (24%) and females (25%) and did not vary by age. The most common symptoms were fatigue (80%), fever (78%), feeling ill (76%), and chills (71%). Of the 35 persons with clinical cases, four (11%) were hospitalized, and all had radiologically confirmed pneumonia.

Risk for Q fever was twofold greater among residents who reported proximity to sheep (i.e., having been near a sheep stable or pasture) than those without this exposure (AR: 36% versus 19%; risk ratio [RR]=1.9; 95% confidence interval [CI]=1.2–3.1) and in residents who reported walking near the large sheep farm (AR: 33% versus 18%; RR=1.8; 95% CI=1.1–2.9). Although walking as a leisure activity was not an independent risk factor, among the 121 persons who reported walking as a leisure activity, the risk was nearly fourfold greater among those who had walked near the large sheep farm than those who had not (AR: 35% versus 9%; RR=3.8; 95% CI=1.5–9.2).

FIGURE 1. Persons with clinical cases* of Q fever, by month of symptom onset — Rollshausen, Germany, July 1995–July 1996



*Fever ≥102.2 F (≥39 C) lasting >2 days and three or more symptoms (i.e., chills, sweats, severe headache, cough, aching muscles/joints, back pain, fatigue, or feeling ill).

Q Fever Outbreak — Continued

Cases also were identified in 12 persons residing in towns other than Rollshausen (clinical [11] and/or laboratory [11]). Onsets of illness occurred from January through May. Eight persons resided in immediately neighboring towns, and four resided in a town approximately 19 miles south of Rollshausen—the latter had spent weekends in a cottage adjacent to the large sheep farm in Rollshausen; all four residents of the town south of Rollshausen had onset of fever during March, and two required hospitalization.

Of 20 sheep tested from the large flock, 15 were positive for *C. burnetii* antibodies, and the nine tested from the small flock were negative. Meteorologic data (obtained from the German Weather Service/Climate and Environmental Evaluation) indicated that from December 1995 through April 1996, the wind blew from the northwest (from the direction of the large sheep farm toward Rollshausen) an average of 17 days per month. In addition, there were 5.2 inches of rain compared with 7.4–15.0 inches during each of the 3 previous years. In January 1996, there were only 0.2 inches of rain, compared with 3.2–3.8 inches during each of the 3 previous years.

Reported by: O Lyytikäinen, MD, L Petersen, MD, B Schwartländer, MD, Robert Koch Institute, Berlin; P Matzdorff, MD, C Kuhnhen, MD, Health Dept of Marburg-Biedenkopf, Marburg; C Burger, Institute for Hygiene and Infectious Diseases of Animals of the Justus-Liebig Univ, Gießen; W Krug, State Veterinary Center, Marburg, Germany. T Ziese, MD, Swedish Institute for Infectious Disease Control, Stockholm, Sweden. European Program for Intervention Epidemiology Training, Brussels, Belgium. Viral and Rickettsial Zoonoses Br, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases, CDC.

Editorial Note: Q fever is a zoonotic disease caused by the rickettsial organism *C. burnetii*. Its most common reservoirs are domesticated ruminants, primarily cattle, sheep, and goats. Humans typically acquire Q fever by inhaling infectious aerosols and contaminated dusts generated by animals or animal products. Although many infections are asymptomatic, the protean manifestations of acute infections include self-limited influenza-like illness, hepatitis, pneumonia, myocarditis, pericarditis, and meningoencephalitis. Mortality associated with acute infections generally is low (<1%) but may be as high as 2.4% (*1,2*). Endocarditis and other chronic complications occur in a small proportion of patients and often are fatal.

Although most cases of Q fever occur sporadically, three features of the organism and its route of transmission account for occasional outbreaks of clustered disease: 1) coxiellae are highly resistant to desiccation and to a variety of physical and chemical agents, and viable organisms may persist in contaminated soils for several months (*3*); 2) *C. burnetii* is among the most infectious of all bacteria, and inhalation of a single organism can produce infection in a susceptible host (*4*); and 3) airborne particles containing bacteria can initiate infections in susceptible hosts at distances of ≥0.5 miles from the origin of the particles.

The findings in this report indicate that the large sheep farm was the most likely source of this outbreak and the principal mode of transmission of *C. burnetii* was airborne. The lambing period in December and January immediately preceded the outbreak, and the first persons documented to have IgM antibody had onsets of illness in February, consistent with the average 20-day incubation period for Q fever (*4*). Outbreaks of Q fever commonly occur after lambing because *C. burnetii* is reactivated in ewes during pregnancy. Because of multiplication of *C. burnetii* in the placental villi, high numbers of coxiellae (i.e., as many as one billion organisms per gram of placenta) may be present in placentae, amniotic fluid, and fetal membranes (*3*). The

Q Fever Outbreak — Continued

attack rate among Rollshausen residents was high (25%) and case-patients resided in all parts of the town, suggesting a ubiquitous exposure consistent with airborne transmission. This finding probably reflects the outdoor lambing, the exceptionally dry weather, and the wind pattern (blowing from the direction of the large sheep farm toward the town). Infected birth products can contaminate the ground and dry periods may enhance the formation and propagation of infectious dusts and aerosols (*1,3*). Other associated factors include the high percentage of infected ewes (75%), the increased risk among persons who had been in contact with sheep and walking in the areas near the large sheep farm, and the occurrence of Q fever among the four persons who had spent weekends next to the large sheep farm.

Tetracycline compounds are the treatment of choice for persons with Q fever. Doxycycline 100 mg twice a day for 15–21 days is recommended for patients with acute disease. The optimal regimen for chronic disease has not been established but generally involves prolonged treatment with a tetracycline in combination with rifampin or trimethoprim-sulfamethoxazole, administered for a minimum of 2–3 years (*4*).

Effective control and prevention of Q fever in humans requires the identification of infections in domesticated animal populations. When *C. burnetii* infection is suspected or detected in a sheep flock, prevention efforts should focus on reducing environmental contamination from infected placental membranes and aborted materials and subsequent airborne spread and inhalation of *C. burnetii*. Lambing should not take place outdoors, and separate indoor facilities should be appointed for parturition. After parturition, appropriate disposal of placentae, fetal membranes, and aborted material is critical. Birth products should be destroyed by incineration, and the lambing area should be treated with an effective disinfectant (e.g., 1% Lysol®* or 5% hydrogen peroxide).

Persons at risk for Q fever include abattoir workers, dairy farmers, workers involved in meat or dairy processing, and veterinarians. When livestock operations are close to human habitation, communication between veterinarians, local public health officials, and health-care providers facilitates recognition of disease in exposed persons. Human Q fever vaccine is commercially available in Australia and Eastern Europe, but not in Germany or in the United States.

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

Update: Pulmonary Hemorrhage/Hemosiderosis Among Infants — Cleveland, Ohio, 1993–1996

In November 1994, private physicians and public health officials in Cleveland, Ohio, and CDC reported a cluster of eight cases of acute pulmonary hemorrhage/hemosiderosis that had occurred during January 1993–November 1994 among infants in one area of the city (*1*). Two additional cases were identified in December 1994. All 10 infants lived within seven contiguous postal tracts in eastern metropolitan Cleveland. Pulmonary hemorrhages recurred in five of the infants after they returned to their homes shortly after hospital discharge; one infant died as a result of pulmonary hemorrhage. This report summarizes the findings of the follow-up investigation, including a case-control study and an assessment by the county coroner of cases of infant death. These findings documented an association between acute pulmonary hemorrhage/hemosiderosis in this cluster of cases and mold growth in their water-damaged homes.

Case-Control Study of Risk Factors for Pulmonary Hemorrhage

To determine risk factors for acute pulmonary hemorrhage among the infants in the cluster, the Rainbow Babies and Childrens Hospital (RBCH), the Cuyahoga County Board of Health, the Cleveland Department of Public Health, and CDC conducted a case-control study. A case was defined as an episode of acute, diffuse pulmonary hemorrhage of unknown etiology during the first year of life in a previously healthy infant that required hospitalization at RBCH during January 1993–December 1994. The study compared 10 case-infants with 30 age-matched control infants from the same area in Cleveland (*2*).

Of the 10 case-infants, nine were male; in comparison, of the 30 controls, 15 (50%) were male ($p<0.05$). Breastfeeding was reported for none of the case-infants but for 11 (37%) of the controls (odds ratio [OR]=0.2; 95% confidence interval [CI]=0–1.2]. In addition, nine of 10 case-infants and 16 (53%) of 30 controls resided in households with smokers (OR=7.9; 95% CI=0.9–70.6). All 10 case-infants and seven (23%) of the 30 controls resided in homes where major water damage (as a result of chronic plumbing leaks or flooding) had occurred during the previous 6 months (OR=16.3; 95% CI=2.6–infinity). The latter finding prompted a visual inspection and quantitative air sampling for and microscopic identification of fungi in the study homes. The quantity of fungi, including the toxigenic fungus *Stachybotrys atra* (whose toxins have been implicated in hemorrhagic disorders in animals), was higher in the homes of case-infants than in those of controls (OR=1.6; 95% CI=1.0–30.8).

Active surveillance by the RBCH identified an additional 11 cases of acute pulmonary hemorrhage/hemosiderosis among infants in the Cleveland area during January 1995–December 1996. Of these 11 infants, two had died as a result of acute pulmonary hemorrhage. The demographic characteristics and clinical presentation of these 11 cases was consistent with the initial cluster of cases.

Based on the findings of the case-control study, health authorities in Cleveland recommended prompt clean-up and disposal of all moldy materials in the water-damaged homes and have designed a prevention program focusing on water-damaged homes.

Pulmonary Hemorrhage/Hemosiderosis — Continued

Coroner's Investigation of Infant Deaths

The three infant deaths resulting from pulmonary hemorrhage prompted the county coroner to re-examine all infant deaths in Cuyahoga County during January 1993–December 1995 to determine whether cases of pulmonary hemorrhage had been misclassified. Postmortem examinations were reviewed for all 172 infants who died in the county during that period, including 117 deaths attributed to SIDS; premature infants who died in a hospital were excluded. Pathologic lung specimens were sectioned, stained with Prussian blue, and screened for the presence of hemosiderin.

Extensive hemosiderin-laden macrophages were present in lung tissue of nine (5%) infants—a finding indicating major pulmonary hemorrhage preceding death. Of these nine deaths, two resulted from homicide, and one had a recent history of child abuse. No apparent etiologies for pulmonary hemorrhage/hemosiderosis were identified for the other six infants presumed to have died from SIDS, all of whom had lived in the same postal tracts as the initial cluster; three were male, and two were siblings. A review of the clinical circumstances for five infants indicated that some symptoms of pulmonary hemorrhage had been present before death: two infants had had episodes of epistaxis or mild hemoptysis within 7 days before death, and four had had additional symptoms (e.g., cough, pulmonary congestion, or black stools).

Reported by: DG Dearborn, MD Infeld, PG Smith, LJ Brooks, C Carroll-Pankhurst, R Kosick, BB Dahms, Rainbow Babies and Childrens Hospital; EK Balraj, R Challener, Cuyahoga County Coroner's Office; TM Allan, TE Horgan, Cuyahoga County Board of Health; R Staib, C Wallace, Cleveland Dept of Public Health; TJ Halpin, MD, State Epidemiologist, Ohio Dept of Health. BB Jarvis, Univ of Maryland, College Park. JD Miller, Agri-Canada, Ottawa, Ontario. Air Pollution and Respiratory Health Br, Div of Environmental Hazards and Health Effects, National Center for Environmental Health, CDC.

Editorial Note: The findings of the investigation described in this report suggest that, in Cleveland, the infants with pulmonary hemorrhage were more likely than controls to reside in homes that had been affected by major water damage during the previous 6 months. The water damage may have promoted the growth of fungi, including *S. atra*. Because *S. atra* requires water-saturated cellulose-based materials for growth in buildings, it is considered uncommon in homes. Although *S. atra* has been associated with gastrointestinal hemorrhaging in animals that had consumed moldy grain (*3*), the fungus previously has not been associated with disease in infants.

SIDS is diagnosed only after exclusion of other known causes of death. The review by the Cuyahoga County coroner indicated that some infant deaths initially attributed to SIDS actually resulted from pulmonary hemorrhage. Agonal alveolar hemorrhage may occur in approximately two thirds of infant autopsies (*4*); however, the presence of extensive hemosiderosin-laden macrophages within the alveoli indicates major predeath pathologic processes, which precludes the diagnosis of SIDS. Macrophages require approximately 48 hours to convert the iron of the ingested erythrocytes into hemosiderin; therefore, the presence of hemosiderin-laden macrophages in alveoli indicates alveolar bleeding for at least 2 days preceding death (*5*). Causes of such bleeding and pulmonary hemosiderosis may include cardiac lesions associated with increased left atrial pressure, trauma, pneumonia, and perhaps suffocation.

The findings of this investigation—including the association of environmental factors with pulmonary hemorrhage/hemosiderosis and the presence of extensive hemosiderin-laden macrophages in some infants with SIDS—underscore the need for

Pulmonary Hemorrhage/Hemosiderosis — Continued

further investigation of these relations. In particular, further efforts are needed to clarify the association between pulmonary hemorrhage in infants and exposure to water-damaged building materials and to evaluate pathologic methods to identify and quantify pulmonary hemorrhage and hemosiderosis.

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Notice to Readers

Recommended Childhood Immunization Schedule — United States, 1997

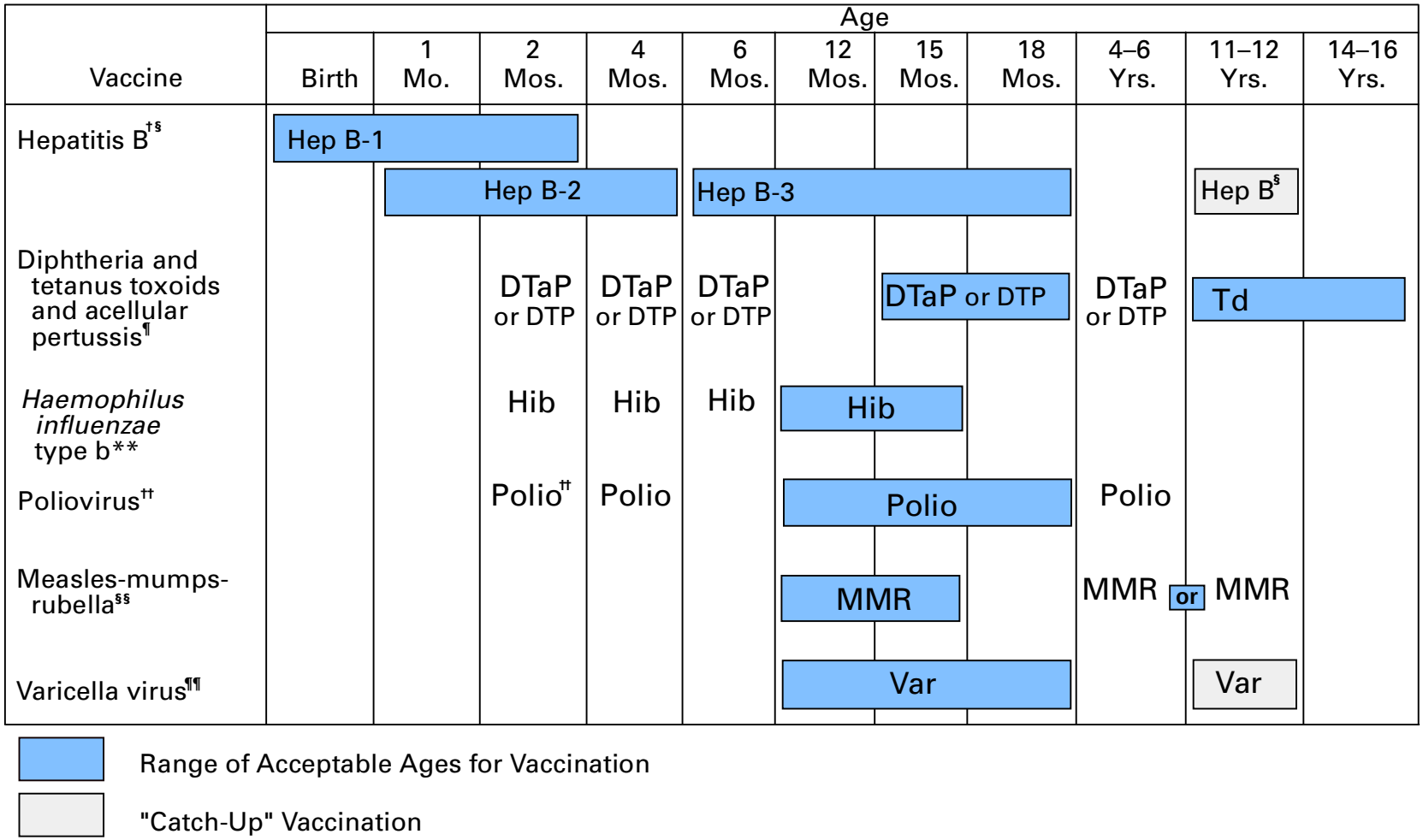
Since publication of the recommended childhood immunization schedule in July 1996 (*1*), the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP) have made important changes in recommendations for preventing pertussis and poliomyelitis (Figure 1). Following the licensure of two acellular pertussis vaccines for infants, the advisory groups now recommend use of acellular pertussis vaccine (Tripedia®* or ACEL-IMUNE®†)§ as the preferred vaccine for pertussis vaccination for infants beginning at age 2 months. To reduce the risk for vaccine-associated paralytic poliomyelitis (VAPP), recommendations for poliovirus vaccination have expanded the use of inactivated poliovirus vaccine (IPV) by providing three options for poliovirus vaccination (sequential IPV/oral poliovirus vaccine [OPV], all IPV, or all OPV). In addition, a combination *Haemophilus influenzae* type b (Hib) and hepatitis B vaccine and a combination diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP) and Hib vaccine have been licensed for use in certain situations. This report presents

*Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Adsorbed, prepared and distributed as Tripedia® by Connaught Laboratories, Inc. (CLI) (Swiftwater, Pennsylvania). The purified acellular pertussis vaccine component is produced by BIKEN/Tanabe Corporation (Osaka, Japan) and is combined with diphtheria and tetanus toxoids manufactured by CLI.

†Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Adsorbed, prepared and distributed as ACEL-IMUNE® by Lederle Laboratories, Inc. (LLI) (Pearl River, New York). The purified acellular pertussis vaccine component is produced by Takeda Chemical Industries, Ltd. (Osaka, Japan), and is combined with diphtheria and tetanus toxoids manufactured by LLI.

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

FIGURE 1. Recommended childhood immunization schedule* — United States, 1997



* This schedule indicates the recommended age for routine administration of currently licensed childhood vaccines. Some combination vaccines are available and may be used whenever administration of all components of the vaccine is indicated. Providers should consult the manufacturers' package inserts for detailed recommendations. Vaccines are listed under the routinely recommended ages. Bars indicate range of acceptable ages for vaccination. Shaded bars indicate catch-up vaccination: at 11–12 years, hepatitis B vaccine should be administered to children not previously vaccinated, and varicella virus vaccine should be administered to unvaccinated children who lack a reliable history of chickenpox.

† **Infants born to hepatitis B surface antigen (HBsAg)-negative mothers** should receive 2.5 μg of Merck vaccine (Recombivax HB®) or 10 μg of SmithKline Beecham (SB) vaccine (Energix-B®). The second dose should be administered >1 month after the first dose. **Infants born to HBsAg-positive mothers** should receive 0.5 mL hepatitis B immune globulin (HBIG) within 12 hours of birth and either 5 μg of Merck vaccine (Recombivax HB®) or 10 μg of SB vaccine (Engerix-B®) at a separate site. The second dose is recommended at age 1–2 months and the third dose at age 6 months. **Infants born to mothers whose HBsAg status is unknown** should receive either 5 μg of Merck vaccine (Recombivax HB®) or 10 μg of SB vaccine (Engerix-B®) within 12 hours of birth. The second dose of vaccine is recommended at age 1 month and the third dose at age 6 months. Blood should be drawn at the time of delivery to determine the mother's HBsAg status; if it is positive, the infant should receive HBIG as soon as possible (no later than age 1 week). The dosage and timing of subsequent vaccine doses should be based on the mother's HBsAg status.

§ Children and adolescents who have not been vaccinated against hepatitis B during infancy may begin the series during any childhood visit. Those who have not previously received three doses of hepatitis B vaccine should initiate or complete the series at age 11–12 years. The second dose should be administered at least 1 month after the first dose, and the third dose should be administered at least 4 months after the first dose and at least 2 months after the second dose.

¶ Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP) is the preferred vaccine for all doses in the vaccination series, including completion of the series in children who have received one or more doses of whole-cell diphtheria and tetanus toxoids and pertussis vaccine (DTP). Whole-cell DTP is an acceptable alternative to DTaP. The fourth dose of DTaP may be administered as early as 12 months of age provided 6 months have elapsed since the third dose and if the child is considered unlikely to return at age 15–18 months. Tetanus and diphtheria toxoids (Td), absorbed, for adult use, is recommended at age 11–12 years if at least 5 years have elapsed since the last dose of DTP, DTaP, or diphtheria and tetanus toxoids. Subsequent routine Td boosters are recommended every 10 years.

** Three *H. influenzae* type b (Hib) conjugate vaccines are licensed for infant use. If PRP-OMP (PedvaxHIB® [Merck]) is administered at ages 2 and 4 months, a dose at age 6 months is not required. After completing the primary series, any Hib conjugate vaccine may be used as a booster.

†† Two poliovirus vaccines are currently licensed in the United States: inactivated poliovirus vaccine (IPV) and oral poliovirus vaccine (OPV). The following schedules are all acceptable by ACIP, AAP, and AAFP, and parents and providers may choose among them: 1) IPV at ages 2 and 4 months and OPV at age 12–18 months and at age 4–6 years; 2) IPV at ages 2, 4, and 12–18 months and at age 4–6 years; and 3) OPV at ages 2, 4, and 6–18 months and at age 4–6 years. ACIP routinely recommends schedule 1. IPV is the only poliovirus vaccine recommended for immunocompromised persons and their household contacts.

§§ The second dose of measles-mumps-rubella vaccine is routinely recommended at age 4–6 years or at age 11–12 years but may be administered during any visit provided at least 1 month has elapsed since receipt of the first dose and that both doses are administered at or after age 12 months.

¶¶ Susceptible children may receive varicella vaccine (Var) during any visit after the first birthday, and unvaccinated persons who lack a reliable history of chickenpox should be vaccinated at age 11–12 years. Susceptible persons aged ≥13 years should receive two doses at least 1 month apart.

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

Source: Advisory Committee on Immunization Practices (ACIP), American Academy of Pediatrics (AAP), and American Academy of Family Physicians (AAFP).

Notices to Readers — Continued

the recommended childhood immunization schedule for 1997 and explains the changes that have occurred since the last publication of the schedule.

Licensure of Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccines for Infants

Since 1992, two DTaP vaccines, ACEL-IMUNE® and Tripedia®, have been licensed for use as the fourth and fifth doses of diphtheria and tetanus toxoids and pertussis vaccine (DTP) in children aged 15 months–6 years. In 1995, data became available about the clinical protection conferred by acellular pertussis vaccines when administered to young infants. Multiple controlled trials conducted in Europe demonstrated that, when administered to infants beginning at age 2 months, the protective efficacy of acellular pertussis vaccines was similar to the expected range for most whole-cell vaccines (70%–90%) and these vaccines were associated with fewer local reactions, fevers, and other systemic adverse events than whole-cell pertussis vaccines (*2–5*).

In 1996, the Food and Drug Administration (FDA) licensed two DTaP vaccines, Tripedia® (July 31) for the initial four doses and ACEL-IMUNE® (December 30) for all five doses of the DTP vaccination series. As with whole-cell DTP, the first three doses of DTaP are recommended at ages 2, 4, and 6 months. The fourth dose is recommended at age 15–18 months and the fifth dose at age 4–6 years. The fourth dose of DTaP can be administered as early as 12 months of age if at least 6 months have elapsed since receipt of the third dose and if the provider considers the child to be unlikely to return at age 15–18 months to receive this dose.

DTaP is preferred for all doses of the pertussis vaccination series, but whole-cell pertussis vaccines remain acceptable alternatives. Both Tripedia® and ACEL-IMUNE® continue to be recommended for administration of doses four and five to children who have received three doses of whole-cell DTP vaccine and are preferred for these doses.

Change in Polio Vaccination Recommendations: Sequential Polio Vaccination Schedule

The elimination of wild-virus–associated polio in the Western Hemisphere (*6*) and the reduced threat of poliovirus importation into the United States because of rapid progress in global polio-eradication efforts have resulted in the most important change in polio vaccination policy since the introduction of OPV in 1961. Since 1980, an average of eight to nine cases of VAPP have been reported annually in the United States, and VAPP has been the only indigenous paralytic polio in this country since 1979. Although the risk for acquiring VAPP is low (about one case per 2.4 million doses distributed or one case per 750,000 children receiving their first dose of OPV), the relative benefits of OPV have diminished, and the risk for VAPP attributable to OPV is now considered less acceptable. Therefore, ACIP, AAP, and AAFP now recommend a greater reliance on IPV, with a transition policy that will increase use of IPV and decrease use of OPV during the next 3–5 years.

ACIP, AAP, and AAFP recommend three options for polio vaccination: sequential administration of IPV and OPV, all IPV, or all OPV. For overall public health benefit, ACIP recommends a sequential schedule of two doses of IPV followed by two doses of OPV for routine childhood vaccination; however, all three polio vaccination options meet acceptable standards of care. Parents should be informed of the benefits and risks associated with each schedule and should choose among them. Implementation

Notices to Readers — Continued

of these recommendations should reduce the risk for VAPP and facilitate a transition to exclusive use of IPV following further progress toward global polio eradication.

The recommended schedule for **sequential IPV/OPV** vaccination consists of two doses of IPV administered at ages 2 and 4 months, followed by two doses of OPV, administered at age 12–18 months and at age 4–6 years. If an **all IPV schedule** is used, the timing of doses is the same as for the sequential schedule (i.e., 2 months, 4 months, 12–18 months, and 4–6 years of age). If an **all OPV schedule** is used, the first two doses are recommended at ages 2 and 4 months, the third dose at age 6–18 months, and the fourth dose at age 4–6 years.

Licensure of New Combination Vaccines

Two new combination vaccines have recently been licensed. On September 27, 1996, FDA licensed one Hib conjugate vaccine (Act-HIB®¶) reconstituted with Tripedia® for the fourth dose of the DTP and Hib vaccination series. This vaccine is not licensed for the primary three-dose series; children receiving the primary series should either be vaccinated simultaneously with DTaP and Hib vaccines or with combined whole-cell DTP-Hib vaccine.**

A combination Hib and hepatitis B vaccine (ComVax® ††) was licensed on October 2, 1996. The vaccine is routinely recommended at ages 2, 4, and 12–15 months and constitutes a complete series of Hib and hepatitis B vaccines. As with other licensed combination products, these vaccines may be used whenever administration of all vaccine components is indicated. Use of combination vaccines may reduce the number of injections required at a single visit.

Detailed recommendations about the use of vaccines are available from the manufacturers' package inserts, the *1994 Red Book* (*7*), or the vaccine-specific ACIP statements.

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¶ *Haemophilus* b Conjugate Vaccine (Tetanus Toxoid Conjugate) is manufactured by Pasteur Mérieux Sérums & Vaccins S.A. (Lyon, France). ActHIB® is identical to *Haemophilus* b Conjugate Vaccine (Tetanus Toxoid Conjugate)–OmniHIB® (distributed by SmithKline Beecham Pharmaceuticals [Philadelphia, Pennsylvania]) and is manufactured by Pasteur Mérieux Sérums & Vaccins S.A.

** Tetramune® (DTP-HbOC) is a sterile combination of diphtheria and tetanus toxoids and pertussis vaccine adsorbed (manufactured by LLI) and a conjugate of oligosaccharides of the capsular antigen of *H. influenzae* type b and diphtheria CRM_{197} protein (manufactured by Praxis Biologics, Inc. [West Henrietta, New York]). ActHIB® may be reconstituted at the time of use with CLI DTP. Both Tetramune® and CLI DTP-ActHIB® are licensed for use in infants beginning at age 2 months.

†† The vaccine contains 7.5 μg of *H. influenzae* polyribosylribitol phosphate (PRP) covalently bound to an outer membrane protein (OMP) component of *Neisseria meningitidis* B11 and 5 μg of hepatitis B surface antigen and is manufactured by Merck, Inc. (West Point, Pennsylvania).

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Notice to Readers

Satellite Videoconference on Adult Immunization

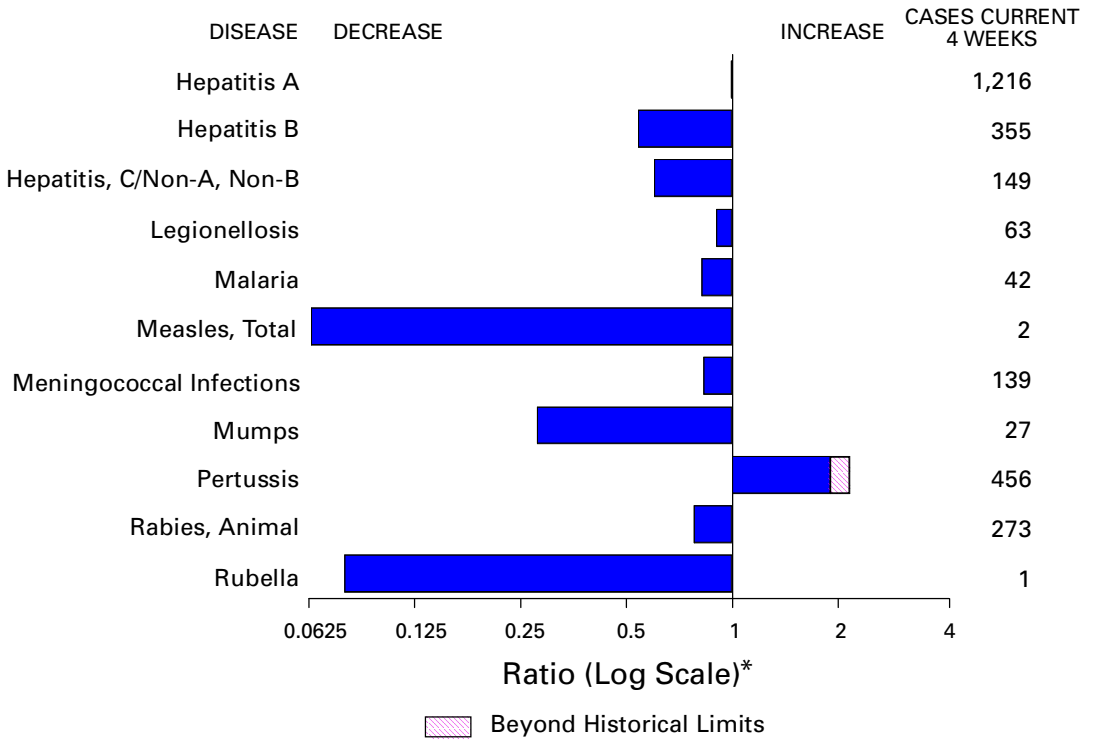
Adult Immunization: Strategies That Work, a live satellite videoconference, will be broadcast from 8 a.m. to 10:30 a.m. and again from 11 a.m. to 1:30 p.m. eastern daylight time on April 24, 1997, over the Public Health Training Network. Cosponsors are CDC; the Health and Sciences Television Network; the Association of Schools of Public Health; the University of North Carolina at Chapel Hill School of Public Health's Center for Distance Learning and Health Communications; and the North Carolina Department of Environment, Health, and Natural Resources.

The interactive videoconference will provide practical, proven strategies to reduce the gap between the number of adults at risk for vaccine-preventable diseases and the number who actually receive the vaccines. Registration information is available from state immunization coordinators; Training Coordinator, National Immunization Program, CDC, telephone (404) 639-8897, e-mail cmp3@nip1.em.cdc.gov; or the World Wide Web (includes state immunization contact information) at www.sph.unc.edu/cdlhc.

Erratum: Vol. 45, No. 49

In the article "Update: Fatal Air Bag-Related Injuries to Children—United States, 1993–1996," the recommendations should have indicated that children aged ≤12 years, instead of <12 years, should always ride in the back seat in age-appropriate occupant restraints. On page 1075, in the first full paragraph, the second sentence should read, "Until passenger vehicles and light trucks are equipped with these smart air bags and they are shown to be safe and effective (*3*), all children aged ≤12 years should ride in the back seat using age- and size-appropriate occupant restraints (*6,7*) (see box)." On the same page, in the box titled "Recommendations to Prevent Air Bag-Associated Injuries to Infants and Children," the first sentence of the second bulleted item should read, "All children aged ≤12 years should be properly secured in the back seat."

FIGURE I. Selected notifiable disease reports, comparison of provisional 4-week totals ending January 11, 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 11, 1997 (2nd Week)

	Cum. 1997		Cum. 1997
Anthrax	-	Plague	-
Brucellosis	-	Poliomyelitis, paralytic	-
Cholera	-	Psittacosis	-
Congenital rubella syndrome	-	Rabies, human	-
Cryptosporidiosis*	14	Rocky Mountain spotted fever (RMSF)	1
Diphtheria	-	Streptococcal disease, invasive Group A	9
Encephalitis: California*	-	Streptococcal toxic-shock syndrome*	2
eastern equine*	-	Syphilis, congenital¶	-
St. Louis*	-	Tetanus	1
western equine*	-	Toxic-shock syndrome	1
Hansen Disease	2	Trichinosis	1
Hantavirus pulmonary syndrome*†	-	Typhoid fever	2
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 11, 1997, and January 13, 1996 (2nd 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	-	-	5,556	7,939	13	-	5,273	10,843	40	76
NEW ENGLAND	-	-	482	583	-	-	149	265	-	-
Maine	-	-	-	-	-	-	-	2	-	-
N.H.	-	-	2	22	-	-	-	5	-	-
Vt.	-	-	4	16	-	-	1	8	-	-
Mass.	-	-	297	267	-	-	47	95	-	-
R.I.	-	-	60	56	-	-	22	24	-	-
Conn.	-	-	119	222	-	-	79	131	-	-
MID. ATLANTIC	-	-	221	132	-	-	136	591	-	-
Upstate N.Y.	-	-	N	N	-	-	-	4	-	-
N.Y. City	-	-	-	-	-	-	-	412	-	-
N.J.	-	-	119	132	-	-	125	13	-	-
Pa.	-	-	102	-	N	-	11	162	-	-
E.N. CENTRAL	-	-	963	1,885	2	-	1,049	1,885	23	15
Ohio	-	-	287	382	-	-	298	317	3	-
Ind.	-	-	99	-	1	-	98	285	-	-
Ill.	-	-	419	898	-	-	215	770	-	4
Mich.	-	-	153	196	1	-	434	288	20	11
Wis.	-	-	5	409	N	-	4	225	-	-
W.N. CENTRAL	-	-	124	917	2	-	39	590	-	-
Minn.	-	-	-	-	-	-	U	-	-	-
Iowa	-	-	-	-	2	-	-	-	-	-
Mo.	-	-	-	453	-	-	-	408	-	-
N. Dak.	-	-	37	-	-	-	2	-	-	-
S. Dak.	-	-	32	13	-	-	5	3	-	-
Nebr.	-	-	-	246	-	-	-	54	-	-
Kans.	-	-	55	205	-	-	32	125	-	-
S. ATLANTIC	-	-	1,338	623	1	-	2,348	4,325	2	1
Del.	-	-	-	-	-	-	46	53	-	-
Md.	-	-	125	-	-	-	423	547	2	-
D.C.	-	-	N	N	-	-	190	136	-	-
Va.	-	-	394	200	N	-	227	455	-	-
W. Va.	-	-	-	-	N	-	15	-	-	-
N.C.	-	-	-	-	-	-	516	574	-	-
S.C.	-	-	-	-	-	-	262	554	-	1
Ga.	-	-	576	-	1	-	497	1,545	U	-
Fla.	-	-	243	423	-	-	172	461	-	-
E.S. CENTRAL	-	-	643	1,165	1	-	723	1,723	3	26
Ky.	-	-	222	165	1	-	184	111	-	-
Tenn.	-	-	153	330	-	-	133	347	2	26
Ala.	-	-	268	666	-	-	406	1,174	1	-
Miss.	-	-	-	4	-	-	-	91	-	-
W.S. CENTRAL	-	-	482	284	1	-	485	404	-	12
Ark.	-	-	10	38	1	-	20	159	-	-
La.	-	-	257	-	-	-	293	60	-	-
Okla.	-	-	215	246	-	-	172	185	-	12
Tex.	-	-	-	-	-	-	-	-	-	-
MOUNTAIN	-	-	386	366	3	-	79	344	11	17
Mont.	-	-	-	-	-	-	2	1	-	1
Idaho	-	-	42	48	-	-	4	3	3	5
Wyo.	-	-	20	21	-	-	1	3	5	-
Colo.	-	-	-	-	2	-	-	73	1	3
N. Mex.	-	-	206	89	1	-	38	22	1	6
Ariz.	-	-	67	61	N	-	27	192	1	1
Utah	-	-	30	72	-	-	1	27	-	1
Nev.	-	-	21	75	-	-	6	23	-	-
PACIFIC	-	-	917	1,984	3	-	265	716	1	5
Wash.	-	-	321	247	-	-	89	85	-	-
Oreg.	-	-	-	166	1	-	-	9	-	-
Calif.	-	-	560	1,535	2	-	157	577	-	4
Alaska	-	-	33	13	-	-	17	28	-	1
Hawaii	-	-	3	23	N	-	2	17	1	-
Guam	-	-	-	9	N	-	-	6	-	-
P.R.	-	-	N	N	-	U	9	-	-	3
V.I.	-	-	N	N	N	U	-	-	-	-
Amer. Samoa	-	-	-	-	N	U	-	-	-	-
C.N.M.I.	-	-	N	N	N	U	-	3	-	-

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 11, 1997, and January 13, 1996 (2nd 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	14	31	10	60	21	26	148	409	92	349	147
NEW ENGLAND	-	1	1	-	-	1	1	4	5	6	13
Maine	-	-	-	-	-	-	-	-	-	1	1
N.H.	-	-	-	-	-	-	-	-	-	-	-
Vt.	-	-	1	-	-	-	-	-	-	-	2
Mass.	-	-	-	-	-	1	1	1	1	-	2
R.I.	-	1	-	-	-	-	-	-	-	4	-
Conn.	N	N	-	-	-	-	-	3	4	1	8
MID. ATLANTIC	-	5	-	49	-	11	1	6	-	2	41
Upstate N.Y.	-	-	-	-	-	-	-	-	-	1	40
N.Y. City	-	-	-	14	-	5	-	2	-	1	-
N.J.	-	2	-	14	-	6	1	-	-	-	1
Pa.	-	3	-	21	-	-	-	4	-	-	-
E.N. CENTRAL	13	12	4	1	1	3	11	69	43	105	-
Ohio	5	4	1	1	-	-	6	31	28	5	-
Ind.	3	3	3	-	-	-	1	6	2	2	-
Ill.	-	1	-	-	-	1	4	25	13	98	-
Mich.	5	4	-	-	1	2	-	-	-	-	-
Wis.	-	-	U	U	-	-	-	7	-	-	-
W.N. CENTRAL	-	1	-	-	-	1	-	22	2	2	11
Minn.	-	-	-	-	-	-	-	-	2	-	-
Iowa	-	-	-	-	-	-	-	-	-	-	11
Mo.	-	1	-	-	-	1	-	14	-	1	-
N. Dak.	-	-	-	-	-	-	-	-	-	-	-
S. Dak.	-	-	-	-	-	-	-	-	-	-	-
Nebr.	-	-	-	-	-	-	-	3	-	-	-
Kans.	-	-	-	-	-	-	-	5	-	1	-
S. ATLANTIC	-	3	4	8	3	1	77	92	6	6	75
Del.	-	-	-	1	1	1	-	-	-	2	-
Md.	-	1	4	7	1	-	23	1	2	-	17
D.C.	-	-	-	-	-	-	2	4	4	-	-
Va.	-	-	-	-	-	-	12	16	-	-	-
W. Va.	-	1	-	-	-	-	-	-	-	-	1
N.C.	-	1	-	-	-	-	20	25	-	-	49
S.C.	-	-	-	-	1	-	-	8	-	4	-
Ga.	-	-	-	-	-	-	12	32	-	-	4
Fla.	-	-	-	-	-	-	8	6	-	-	4
E.S. CENTRAL	-	5	-	2	-	-	34	189	9	28	4
Ky.	-	3	-	-	-	-	3	10	-	2	2
Tenn.	-	-	-	2	-	-	11	27	-	3	-
Ala.	-	-	-	-	-	-	20	63	9	11	2
Miss.	-	2	-	-	-	-	-	89	-	12	-
W.S. CENTRAL	-	-	-	-	-	-	22	10	-	9	3
Ark.	-	-	-	-	-	-	-	10	-	-	-
La.	-	-	-	-	-	-	18	-	-	-	-
Okla.	-	-	-	-	-	-	4	-	-	9	3
Tex.	-	-	-	-	-	-	-	-	-	-	-
MOUNTAIN	-	1	-	-	-	1	-	10	3	12	-
Mont.	-	-	-	-	-	-	-	-	-	-	-
Idaho	-	-	-	-	-	-	-	-	-	-	-
Wyo.	-	-	-	-	-	-	-	-	-	-	-
Colo.	-	-	-	-	-	1	-	-	1	8	-
N. Mex.	-	-	-	-	-	-	-	-	2	-	-
Ariz.	-	1	-	-	-	-	-	8	-	4	-
Utah	-	-	-	-	-	-	-	-	-	-	-
Nev.	-	-	-	-	-	-	-	2	-	-	-
PACIFIC	1	3	1	-	17	8	2	7	24	179	-
Wash.	-	-	-	-	-	-	-	-	-	7	-
Oreg.	-	-	-	-	1	1	-	1	-	1	-
Calif.	1	3	1	-	16	7	2	6	13	164	-
Alaska	-	-	-	-	-	-	-	-	3	4	-
Hawaii	-	-	-	-	-	-	-	-	8	3	-
Guam	-	-	-	-	-	-	-	1	-	-	-
P.R.	-	-	-	-	-	-	5	-	-	-	-
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 11, 1997, and January 13, 1996 (2nd 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	22	33	312	767	106	219	-	-	-	-	-	-
NEW ENGLAND	1	-	7	6	2	6	-	-	-	-	-	-
Maine	-	-	1	1	-	-	-	-	-	-	-	-
N.H.	-	-	-	1	-	-	U	-	U	-	-	-
Vt.	-	-	1	-	-	-	-	-	-	-	-	-
Mass.	1	-	2	1	2	-	-	-	-	-	-	-
R.I.	-	-	-	-	-	-	-	-	-	-	-	-
Conn.	-	-	3	3	-	6	-	-	-	-	-	-
MID. ATLANTIC	-	3	1	27	-	18	-	-	-	-	-	-
Upstate N.Y.	-	-	-	-	-	-	-	-	-	-	-	-
N.Y. City	-	-	1	8	-	6	-	-	-	-	-	-
N.J.	-	2	-	12	-	8	-	-	-	-	-	-
Pa.	-	1	-	7	-	4	U	-	U	-	-	-
E.N. CENTRAL	3	6	41	93	18	48	-	-	-	-	-	-
Ohio	3	5	20	46	-	3	-	-	-	-	-	-
Ind.	-	-	5	2	-	3	-	-	-	-	-	-
Ill.	-	1	-	23	-	21	-	-	-	-	-	-
Mich.	-	-	16	10	18	13	-	-	-	-	-	-
Wis.	-	-	-	12	-	8	U	-	U	-	-	-
W.N. CENTRAL	-	5	3	57	7	12	-	-	-	-	-	-
Minn.	-	-	-	-	-	-	-	-	-	-	-	-
Iowa	-	3	3	17	7	2	-	-	-	-	-	-
Mo.	-	2	-	27	-	7	-	-	-	-	-	-
N. Dak.	-	-	-	-	-	-	U	-	U	-	-	-
S. Dak.	-	-	-	2	-	-	-	-	-	-	-	-
Nebr.	-	-	-	9	-	1	U	-	U	-	-	-
Kans.	-	-	-	2	-	2	-	-	-	-	-	-
S. ATLANTIC	9	1	19	13	15	20	-	-	-	-	-	-
Del.	-	-	-	-	-	-	-	-	-	-	-	-
Md.	3	-	12	4	6	8	-	-	-	-	-	-
D.C.	2	-	1	-	1	1	-	-	-	-	-	-
Va.	-	-	-	-	-	-	-	-	-	-	-	-
W. Va.	1	-	1	-	-	-	-	-	-	-	-	-
N.C.	3	1	4	3	7	10	-	-	-	-	-	-
S.C.	-	-	1	3	-	-	-	-	-	-	-	-
Ga.	-	-	-	-	-	-	-	-	-	-	-	-
Fla.	-	-	-	3	1	1	-	-	-	-	-	-
E.S. CENTRAL	1	1	1	51	-	32	-	-	-	-	-	-
Ky.	1	-	-	4	-	3	-	-	-	-	-	-
Tenn.	-	1	-	30	-	27	-	-	-	-	-	-
Ala.	-	-	1	1	-	2	-	-	-	-	-	-
Miss.	-	-	-	16	-	U	U	-	U	-	-	-
W.S. CENTRAL	-	2	13	75	1	4	-	-	-	-	-	-
Ark.	-	-	2	5	1	-	-	-	-	-	-	-
La.	-	-	-	-	-	-	-	-	-	-	-	-
Okla.	-	2	11	70	-	4	-	-	-	-	-	-
Tex.	-	-	-	-	-	-	-	-	-	-	-	-
MOUNTAIN	1	2	96	126	34	33	-	-	-	-	-	-
Mont.	-	-	2	1	-	-	-	-	-	-	-	-
Idaho	-	1	11	15	-	3	-	-	-	-	-	-
Wyo.	-	-	1	-	1	-	-	-	-	-	-	-
Colo.	1	-	21	7	6	6	-	-	-	-	-	-
N. Mex.	-	-	10	31	18	14	-	-	-	-	-	-
Ariz.	-	-	34	27	7	3	-	-	-	-	-	-
Utah	-	-	17	29	2	3	-	-	-	-	-	-
Nev.	-	1	-	16	-	4	-	-	-	-	-	-
PACIFIC	7	13	131	319	29	46	-	-	-	-	-	-
Wash.	-	-	-	-	-	-	-	-	-	-	-	-
Oreg.	2	1	24	66	7	5	-	-	-	-	-	-
Calif.	5	12	107	252	22	41	-	-	-	-	-	-
Alaska	-	-	-	-	-	-	-	-	-	-	-	-
Hawaii	-	-	-	1	-	-	-	-	-	-	-	-
Guam	-	-	-	1	-	-	-	-	-	-	-	-
P.R.	-	-	-	-	1	1	-	-	-	-	-	-
V.I.	-	-	-	-	-	-	U	-	U	-	-	-
Amer. Samoa	-	-	-	-	-	-	U	-	U	-	-	-
C.N.M.I.	-	1	-	1	-	-	U	-	U	-	-	-

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

*No cases were reported in children <5 years.

†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 11, 1997, and January 13, 1996 (2nd 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	56	137	-	1	16	36	123	31	-	-	9
NEW ENGLAND	4	10	-	-	-	2	14	1	-	-	-
Maine	-	3	-	-	-	-	3	-	-	-	-
N.H.	-	-	U	-	-	U	2	-	U	-	-
Vt.	-	1	-	-	-	2	9	1	-	-	-
Mass.	4	-	-	-	-	-	-	-	-	-	-
R.I.	-	-	-	-	-	-	-	-	-	-	-
Conn.	-	6	-	-	-	-	-	-	-	-	-
MID. ATLANTIC	-	7	-	-	2	-	-	1	-	-	-
Upstate N.Y.	-	-	-	-	-	-	-	-	-	-	-
N.Y. City	-	3	-	-	-	-	-	-	-	-	-
N.J.	-	1	-	-	2	-	-	1	-	-	-
Pa.	-	3	U	-	-	U	-	-	U	-	-
E.N. CENTRAL	5	26	-	1	6	3	4	6	-	-	-
Ohio	4	11	-	-	4	-	-	3	-	-	-
Ind.	-	1	-	-	-	-	-	-	-	-	-
Ill.	-	10	-	-	-	-	-	-	-	-	-
Mich.	1	1	-	1	2	3	4	-	-	-	-
Wis.	-	3	U	-	-	U	-	3	U	-	-
W.N. CENTRAL	3	20	-	-	-	2	2	1	-	-	-
Minn.	-	-	-	-	-	-	-	-	-	-	-
Iowa	3	4	-	-	-	1	1	-	-	-	-
Mo.	-	11	-	-	-	-	-	1	-	-	-
N. Dak.	-	-	U	-	-	U	-	-	U	-	-
S. Dak.	-	-	-	-	-	1	1	-	-	-	-
Nebr.	-	2	U	-	-	U	-	-	U	-	-
Kans.	-	3	-	-	-	-	-	-	-	-	-
S. ATLANTIC	19	13	-	-	1	2	2	-	-	-	-
Del.	1	-	-	-	-	-	-	-	-	-	-
Md.	1	1	-	-	-	2	2	-	-	-	-
D.C.	1	-	-	-	-	-	-	-	-	-	-
Va.	-	-	-	-	-	-	-	-	-	-	-
W. Va.	1	-	-	-	-	-	-	-	-	-	-
N.C.	4	2	-	-	-	-	-	-	-	-	-
S.C.	7	5	-	-	1	-	-	-	-	-	-
Ga.	3	4	-	-	-	-	-	-	-	-	-
Fla.	1	1	-	-	-	-	-	-	-	-	-
E.S. CENTRAL	3	13	-	-	1	1	1	5	-	-	-
Ky.	-	3	-	-	-	-	-	5	-	-	-
Tenn.	-	3	-	-	-	-	-	-	-	-	-
Ala.	3	6	-	-	1	1	1	-	-	-	-
Miss.	-	1	U	-	-	U	-	-	U	-	N
W.S. CENTRAL	1	8	-	-	-	-	-	-	-	-	-
Ark.	1	2	-	-	-	-	-	-	-	-	-
La.	-	-	-	-	-	-	-	-	-	-	-
Okla.	-	1	-	-	-	-	-	-	-	-	-
Tex.	-	5	-	-	-	-	-	-	-	-	-
MOUNTAIN	4	5	-	-	1	10	75	8	-	-	-
Mont.	1	-	-	-	-	-	-	-	-	-	-
Idaho	-	-	-	-	-	4	66	-	-	-	-
Wyo.	-	-	-	-	-	1	1	-	-	-	-
Colo.	-	2	-	-	-	5	5	-	-	-	-
N. Mex.	2	2	N	N	N	-	-	2	-	-	-
Ariz.	1	-	-	-	-	-	3	-	-	-	-
Utah	-	1	-	-	-	-	-	-	-	-	-
Nev.	-	-	-	-	1	-	-	6	-	-	-
PACIFIC	17	35	-	-	5	16	25	9	-	-	9
Wash.	-	-	-	-	-	-	-	-	-	-	-
Oreg.	10	8	-	-	-	-	2	9	-	-	-
Calif.	7	27	-	-	4	16	23	-	-	-	9
Alaska	-	-	-	-	-	-	-	-	-	-	-
Hawaii	-	-	-	-	1	-	-	-	-	-	-
Guam	-	1	-	-	1	-	-	-	-	-	-
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 11, 1997 (2nd Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	>65	45-64	25-44	1-24	<1	
NEW ENGLAND	740	563	118	36	15	8	56
Boston, Mass.	165	111	29	14	6	5	10
Bridgeport, Conn.	59	47	6	6	-	-	5
Cambridge, Mass.	30	28	2	-	-	-	3
Fall River, Mass.	41	35	4	2	-	-	6
Hartford, Conn.	71	56	11	1	1	2	1
Lowell, Mass.	37	28	8	1	-	-	2
Lynn, Mass.	32	29	2	-	1	-	-
New Bedford, Mass.	27	21	4	2	-	-	1
New Haven, Conn.	55	39	13	1	2	-	4
Providence, R.I.	67	51	13	2	1	-	4
Somerville, Mass.	3	3	-	-	-	-	-
Springfield, Mass.	47	35	9	1	2	-	7
Waterbury, Conn.	36	25	7	3	1	-	7
Worcester, Mass.	70	55	10	3	1	1	6
MID. ATLANTIC	3,192	2,232	593	263	61	42	245
Albany, N.Y.	60	43	12	4	1	-	3
Allentown, Pa.	23	19	3	1	-	-	1
Buffalo, N.Y.	74	52	15	3	3	1	6
Camden, N.J.	35	19	6	6	2	2	2
Elizabeth, N.J.	26	14	10	2	-	-	-
Erie, Pa.§	59	48	9	1	1	-	5
Jersey City, N.J.	64	41	10	8	4	1	4
New York City, N.Y.	1,773	1,206	352	158	35	21	111
Newark, N.J.	77	40	15	14	2	6	6
Paterson, N.J.	35	25	6	1	3	-	2
Philadelphia, Pa.	400	280	71	39	6	4	25
Pittsburgh, Pa.§	70	52	13	2	1	2	6
Reading, Pa.	11	9	-	2	-	-	5
Rochester, N.Y.	175	147	20	6	1	1	31
Schenectady, N.Y.	31	24	6	1	-	-	2
Scranton, Pa.§	39	34	5	-	-	-	4
Syracuse, N.Y.	140	110	22	4	1	3	18
Trenton, N.J.	31	24	1	5	-	1	8
Utica, N.Y.	31	25	3	2	1	-	1
Yonkers, N.Y.	38	20	14	4	-	-	5
E.N. CENTRAL	2,921	2,089	508	199	66	59	230
Akron, Ohio	77	58	14	2	-	3	3
Canton, Ohio	47	39	7	-	1	-	4
Chicago, Ill.	513	324	111	46	18	14	35
Cincinnati, Ohio	159	114	30	10	1	4	27
Cleveland, Ohio	248	173	41	20	7	7	5
Columbus, Ohio	261	191	43	19	5	3	20
Dayton, Ohio	150	109	26	13	1	1	14
Detroit, Mich.	358	226	72	35	14	11	20
Evansville, Ind.	75	62	10	1	2	-	7
Fort Wayne, Ind.	67	59	6	2	-	-	6
Gary, Ind.	19	9	6	3	-	1	-
Grand Rapids, Mich.	75	67	5	1	1	1	11
Indianapolis, Ind.	229	172	35	11	5	6	12
Lansing, Mich.	58	44	11	2	1	-	11
Milwaukee, Wis.	171	117	41	11	1	1	21
Peoria, Ill.	54	44	4	2	2	2	4
Rockford, Ill.	72	57	9	4	1	1	11
South Bend, Ind.	63	51	8	2	2	-	3
Toledo, Ohio	139	106	20	11	-	2	12
Youngstown, Ohio	86	67	9	4	4	2	4
W.N. CENTRAL	776	570	123	33	17	11	71
Des Moines, Iowa	U	U	U	U	U	U	U
Duluth, Minn.	41	32	4	1	-	4	4
Kansas City, Kans.	16	12	2	1	1	-	-
Kansas City, Mo.	130	78	25	4	1	1	11
Lincoln, Nebr.	50	46	3	1	-	-	4
Minneapolis, Minn.	215	158	37	12	7	1	19
Omaha, Nebr.	122	99	14	5	1	2	7
St. Louis, Mo.	110	74	25	4	4	3	15
St. Paul, Minn.	81	64	11	4	2	-	10
Wichita, Kans.	11	7	2	1	1	-	1

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	>65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,386	900	289	125	49	23	97
Atlanta, Ga.	277	162	64	28	14	9	12
Baltimore, Md.	233	155	47	24	5	2	39
Charlotte, N.C.	U	U	U	U	U	U	U
Jacksonville, Fla.	165	103	41	14	6	1	5
Miami, Fla.	82	55	11	13	1	2	-
Norfolk, Va.	107	68	22	11	3	3	7
Richmond, Va.	U	U	U	U	U	U	U
Savannah, Ga.	48	37	7	3	1	-	11
St. Petersburg, Fla.	68	51	9	4	1	3	1
Tampa, Fla.	224	164	36	16	7	1	16
Washington, D.C.	161	92	46	11	11	1	6
Wilmington, Del.	21	13	6	1	-	1	-
E.S. CENTRAL	886	620	174	65	23	3	63
Birmingham, Ala.	151	105	32	10	3	-	5
Chattanooga, Tenn.	81	53	19	6	1	2	4
Knoxville, Tenn.	72	42	19	9	2	-	9
Lexington, Ky.	107	78	22	5	1	1	10
Memphis, Tenn.	185	136	32	11	6	-	14
Mobile, Ala.	63	43	12	5	3	-	2
Montgomery, Ala.	64	53	7	3	1	-	8
Nashville, Tenn.	163	110	31	16	6	-	11
W.S. CENTRAL	1,442	948	265	134	52	43	71
Austin, Tex.	96	59	18	12	4	3	6
Baton Rouge, La.	81	55	12	5	6	3	5
Corpus Christi, Tex.	79	57	12	7	3	-	4
Dallas, Tex.	232	154	43	18	8	9	9
El Paso, Tex.	75	52	11	8	3	1	6
Ft. Worth, Tex.	151	103	31	12	4	1	5
Houston, Tex.	U	U	U	U	U	U	U
Little Rock, Ark.	84	58	15	6	2	3	-
New Orleans, La.	149	80	34	24	9	2	-
San Antonio, Tex.	285	185	57	24	7	12	23
Shreveport, La.	52	37	7	6	1	1	4
Tulsa, Okla.	158	108	25	12	5	8	9
MOUNTAIN	1,300	908	231	92	46	23	159
Albuquerque, N.M.	162	121	24	12	5	-	13
Boise, Idaho	75	41	15	10	8	1	10
Colo. Springs, Colo.	72	48	13	5	5	1	10
Denver, Colo.	114	71	25	8	4	6	13
Las Vegas, Nev.	244	156	55	24	7	2	18
Ogden, Utah	35	30	3	1	-	1	9
Phoenix, Ariz.	195	134	43	6	9	3	19
Pueblo, Colo.	33	25	5	2	-	1	3
Salt Lake City, Utah	158	123	20	8	5	2	22
Tucson, Ariz.	212	159	28	16	3	6	42
PACIFIC	2,199	1,618	362	142	44	33	239
Berkeley, Calif.	27	17	8	-	-	2	2
Fresno, Calif.	131	93	20	11	3	4	14
Glendale, Calif.	21	18	3	-	-	-	3
Honolulu, Hawaii	96	73	17	5	1	-	17
Long Beach, Calif.	101	80	12	7	1	1	17
Los Angeles, Calif.	474	337	82	33	13	9	19
Pasadena, Calif.	42	35	4	2	1	-	7
Portland, Oreg.	220	165	38	12	3	2	27
Sacramento, Calif.	U	U	U	U	U	U	U
San Diego, Calif.	191	135	33	15	4	4	22
San Francisco, Calif.	171	116	33	15	5	2	25
San Jose, Calif.	276	207	44	17	3	5	35
Santa Cruz, Calif.	49	40	4	4	-	1	10
Seattle, Wash.	174	122	30	14	6	2	13
Spokane, Wash.	82	63	12	3	3	1	12
Tacoma, Wash.	144	117	22	4	1	-	16
TOTAL	14,842¶	10,448	2,663	1,089	373	245	1,231

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

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