CENTERS FOR DISEASE CONTROL

MMWR

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Health Objectives for the Nation

Public Health Burden of Vaccine-Preventable Diseases among Adults: Standards for Adult Immunization Practice

The week of October 22–26, 1990, is National Adult Immunization Awareness Week. This event, observed annually during the last week in October, emphasizes the importance of appropriately immunizing all adults. Immunization programs in the United States have markedly reduced the occurrence of vaccine-preventable diseases in children; however, adults who were not infected or immunized during childhood may be at increased risk for these diseases and their complications (*1*). Adults may also be at increased risk for vaccine-preventable diseases because of advancing age, occupation, lifestyle, or development of certain chronic diseases. Some vaccine-preventable diseases (e.g., hepatitis B) primarily affect persons ≥20 years of age (Table 1); for these diseases, most targeted risk groups for immunization are adults (*2*). Of the 19 national health objectives for the year 2000 that target infectious diseases, 10 are related to adult immunization (*3*). This report describes the public health impact of influenza, pneumococcal disease, hepatitis B, and measles on U.S. adults.

Influenza and Pneumococcal Disease

Influenza. The impact of influenza is greatest in persons ≥65 years of age. A typical influenza epidemic can cause >20,000 excess deaths, 80%–90% of which occur

TABLE 1. Number and percentage of selected vaccine-preventable diseases* reported in persons ≥20 years of age — United States, 1985–1989

Disease	Total cases	Cases in adults	
		No.	(%)
Diphtheria	11	7	(63.6)
Hepatitis B	125,237	109,422	(87.4)
Measles	34,348	5,128	(14.9)
Mumps	34,198	3,632	(10.6)
Rubella	2,108	954	(45.3)
Tetanus	301	278	(92.4)

*Influenza and pneumococcal disease are not included in the national system of notifiable disease reporting.

Adult Immunization — Continued

among persons aged ≥65 years. From January through March 1990, a major influenza epidemic was associated with a high proportion of pneumonia and influenza (P&I) deaths. Influenza A(H3N2), the predominant circulating subtype, accounted for 98% of the isolates reported to CDC. During the 1989–90 season, the proportion of all P&I deaths reported from 121 cities reporting regularly to CDC reached its highest level in 5 years. Persons ≥65 years of age accounted for approximately 80% of P&I-related deaths during the epidemic.

Pneumococcal Disease. Disease caused by *Streptococcus pneumoniae* (pneumococcus) remains a problem in the very young, the elderly, and persons with certain high-risk conditions (*4*). Pneumococcal pneumonia accounts for 10%–25% of all pneumonia and an estimated 40,000 deaths annually (*1,4*). The estimated annual rate for pneumococcal bacteremia in 1984 was 15–19 per 100,000 population and in 1986–87 was 50 per 100,000 persons ≥65 years of age, representing twofold to threefold increases over previously documented rates (*5,6*). In 1986 and 1987, the case-fatality rate for bacteremic patients was 18% in Charleston County, South Carolina; 91% of persons aged 19–64 years with bacteremia had underlying medical conditions for which pneumococcal vaccine is recommended (*6*).

The year 2000 health objectives include reduction of epidemic-related P&I deaths and provision of influenza and pneumococcal vaccines to at least 60% of high-risk populations.

Hepatitis B

In 1989, 23,426 acute hepatitis B cases were reported in the United States. However, each year hepatitis B virus (HBV) infection occurs in an estimated 300,000 persons, primarily young adults, of whom 6%–10% become chronic HBV carriers. In addition, approximately 4000 persons die from HBV-related cirrhosis and 800, from HBV-related liver cancer (*2*). Surveillance data suggest a recent decrease in the incidence of HBV infections among homosexual men (*7*). From 1981 through 1988, however, hepatitis B cases in heterosexuals and intravenous (IV)-drug users increased by 76.9% and 77.1%, respectively (*7*).

HBV infection is an occupational hazard for health-care workers, in whom an estimated 6000–8000 new HBV infections occur annually. Because the risk for HBV infection for health-care workers may be highest during training, immunization should be completed during training in medical, dental, and other health profession schools before the first occupational exposure to blood. In 1988, of 115 medical schools in the United States and Canada, 22 (19%) required HBV immunization at any time during medical school; 33 (29%) of schools did not offer HBV immunization to students (*8*).

The year 2000 health objectives include increasing hepatitis B immunization levels to at least 90% of those at occupational risk for infection and at least 50% of those who use IV drugs.

Measles

In 1989, 18,193 measles cases were reported in the United States, the highest number reported since 1978. Of these, 3104 (17%) occurred among adults ≥20 years of age. From 1980 through 1989, 6% of all reported measles cases were transmitted in college settings. Of all persons who acquired measles in college settings from 1986 through 1989, 49% had no evidence of measles vaccination. In 1989, 41 measles-associated deaths were reported: 10 deaths occurred among persons aged 19–35

Adult Immunization — Continued

years, and nine of these persons had never been vaccinated. The year 2000 objectives target complete elimination of indigenous measles.

Reported by: Div of Immunization, Center for Prevention Svcs; Div of Viral and Rickettsial Diseases, Div of Bacterial Diseases, Center for Infectious Diseases, CDC.

Editorial Note: Despite the continuing occurrence of vaccine-preventable diseases among adults in the United States, safe and effective vaccines recommended for adults (*2,4,9,10*) are not optimally used (*1*). For example, influenza vaccine is approximately 75% effective in reducing deaths in high-risk elderly persons (*1*); however, based on the 1985 United States Immunization Survey (USIS), only 20% of high-risk persons had received influenza vaccine in 1984. Moreover, CDC's Behavioral Risk Factor Surveillance System determined that the mean influenza vaccine coverage rate in 1987 was 32% among adults ≥65 years of age in the 31 participating states and the District of Columbia.

Pneumococcal vaccine is >60% effective in preventing invasive pneumococcal infections (*4*). Immunization against pneumococcal disease is recommended for persons aged ≥65 years and for persons with underlying conditions, including many persons for whom influenza vaccine is recommended (*4*). Despite these recommendations, the 1985 USIS indicated that only 10% of high-risk persons had been immunized with pneumococcal vaccine.

For the current hepatitis B immunization strategy to succeed, high-risk populations and their health-care providers must recognize the role of heterosexual activity in the transmission of HBV (*7*). Moreover, IV-drug users and all sexually active adults with multiple sex partners should be immunized to prevent infection with HBV. Universal immunization of infants and/or adolescents represents the optimal strategy to prevent hepatitis B in all groups.

Recent declines in the incidence of HBV infections among health-care workers are probably due to both increased use of the hepatitis B vaccine in this population and increased adherence to universal precautions in the workplace. However, hepatitis B in health-care workers could be further reduced if medical, dental, and allied schools of health required all students to be immunized before they have contact with patients (*2*). Regulations proposed by the Occupational Safety and Health Administration may mandate availability of hepatitis B vaccine to all at-risk health-care personnel at the employer's expense. These regulations may accelerate and broaden the use of hepatitis B vaccine in health-care workers and assure maximal efforts to prevent occupationally acquired infection in the 1990s (*11*).

To prevent measles outbreaks and ensure high levels of immunity among young adults on college and university campuses, the American College Health Association has recommended that colleges and universities implement a Prematriculation Immunization Requirement (PIR). PIRs require that students present evidence of immunity to measles and other vaccine-preventable diseases as a condition for matriculation (*12*). As of March 1990, 22 states, the District of Columbia, and Puerto Rico have implemented PIR laws or policies for colleges and universities. However, of the five states in which large college outbreaks occurred in 1989, only one had a PIR in place. In addition, the Immunization Practices Advisory Committee (ACIP) now recommends a routine two-dose measles vaccination schedule. Colleges, technical schools, and other institutions for post-high school education should require that, at the time of school entry, students provide documentation of two doses of live

Adult Immunization — Continued

measles-containing vaccines or other evidence of measles immunity (i.e., documentation of prior physician-diagnosed measles disease or laboratory evidence of measles immunity) (*10*). State and college PIRs can be used to enhance implementation of the ACIP recommendations and limit outbreaks in college settings.

In 1988, the National Coalition for Adult Immunization (NCAI) was formed to enhance efforts to immunize adults. The NCAI is a network of private, professional, and volunteer organizations and public health agencies. The goal of the NCAI is to reduce vaccine-preventable disease and death among adults in the United States by increasing the awareness of physicians, other health-care providers, and the general public about the need for and benefits of immunization. The NCAI supports the use of influenza, pneumococcal, hepatitis B, measles, mumps, and rubella vaccines and tetanus and diphtheria toxoids in adults.

To unify the diverse interests of the member organizations and offer a foundation of common goals among health-care providers, policy makers, and consumer interest groups, the NCAI has developed and adopted the "Standards for Adult Immunization Practice" (Table 2). The standards outline basic strategies that, if fully implemented, could markedly improve delivery of vaccines to adults and help achieve year 2000 national health objectives. Sustained collaborative efforts of the public and private sectors of health care are needed to decrease the public health impact of vaccine-preventable diseases.

References

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Adult Immunization — Continued

TABLE 2. National Coalition for Adult Immunization (NCAI)* standards for adult immunization practice, 1990†

The NCAI

1. Encourages the promotion of appropriate vaccine use through information campaigns for health-care practitioners and trainees, employers, and the public about the benefits of immunizations; and
2. Encourages physicians and other health-care personnel (in practice and in training) to protect themselves and prevent transmission to patients by assuring that they themselves are completely immunized; and
3. Recommends that all health providers routinely determine the immunization status of their adult patients, offer vaccines to those for whom they are indicated, and maintain complete immunization records; and
4. Recommends that all health-care providers identify high-risk patients in need of influenza vaccine and develop a system to recall them for annual immunization each autumn; and
5. Recommends that all health-care providers and institutions identify high-risk adult patients in hospitals and other treatment centers and assure that appropriate vaccination is considered either prior to discharge or as part of discharge planning; and
6. Recommends that all licensing/accrediting agencies support the development by health-care institutions of comprehensive immunization programs for staff, trainees, volunteer workers, inpatients, and outpatients; and
7. Encourages states to establish pre-enrollment immunization requirements for colleges and other institutions of higher education; and
8. Recommends that institutions that train health-care professionals, deliver health-care, or provide laboratory or other medical support services require appropriate immunizations for persons at risk of contracting or transmitting vaccine-preventable illnesses; and
9. Encourages health-care benefit programs, third-party payers, and governmental health-care programs to provide coverage for adult immunization services; and
10. Encourages the adoption of a standard personal and institutional immunization record as a means of verifying the immunization status of patients and staff.

*Full text of these standards and additional information about the NCAI is available from NCAI, 4733 Bethesda Avenue, Suite 750, Bethesda, MD 20814; telephone (301) 656-0003.

†Member organizations that have endorsed the "Standards" as of September 28, 1990: American Association for World Health; American College Health Association; American College of Physicians; American College of Preventive Medicine; American Indian Health Care Association; American Liver Foundation; American Lung Association; American Medical Association; American Nurses Association; American Podiatric Medical Association; American Public Health Association; American Society for Microbiology; American Society of Hospital Pharmacists; American Society of Internal Medicine; Association for Practitioners in Infection Control; Association of State and Territorial Health Officials; Association of Teachers of Preventive Medicine; Catholic Health Association; CDC; Connaught Laboratories, Inc., A Pasteur Merieux Company; Harvard Community Health Plan; Health Insurance Association of America; Infectious Diseases Society of America; Lederle-Praxis Biologicals; March of Dimes Birth Defects Foundation; Merck Sharp & Dohme; National Foundation for Infectious Diseases; Pharmaceutical Manufacturers Association; Phi Delta Chi Pharmacy Fraternity; Program for Appropriate Technology in Health (PATH); Service Employees International Union, American Federation of Labor—Congress of Industrial Organizations (AFL-CIO), Central Labor Council; Smith-Kline Beecham Pharmaceuticals; Saint Louis Department of Health and Hospitals; State of Washington Division of Health; U.S. Department of Defense; and Wyeth-Ayerst Laboratories.

Current Trends

Vaccine Adverse Event Reporting System — United States

Since 1988, health-care providers and vaccine manufacturers have been required by law to report to the U.S. Department of Health and Human Services (DHHS) certain suspected adverse events following specific immunizations (*1,2*) (Table 1). On November 1, 1990, the new DHHS Vaccine Adverse Event Reporting System (VAERS) will become fully operational. VAERS will accept *all* reports of suspected adverse events after the administration of *any* vaccine, including but not limited to those listed in Table 1. VAERS will serve as a single system for monitoring such reports, replacing CDC's Monitoring System for Adverse Events Following Immunization and the Food and Drug Administration's (FDA) Adverse Reaction Reporting System for publicly and privately purchased vaccines (*3*).

The new VAERS report form (Figure 1) is preaddressed and postage-paid. Health-care providers should complete a VAERS report form whenever they treat a patient for a possible vaccine adverse event (Table 1) and judge the event warrants reporting. Submission of a report does not necessarily denote that the vaccine caused the adverse event. Vaccine manufacturers should forward reports of vaccine adverse events directly to VAERS instead of FDA. Although lay persons may also report to VAERS, they are encouraged to obtain the assistance of a health professional in completing the form.

All VAERS patient-identifying information will be kept confidential as provided in the Privacy Act (*4*) and the National Childhood Vaccine Injury Compensation Act (*1*). All persons who submit the form will receive written notification that the report has been received by VAERS. VAERS staff will contact these persons for follow-up of the patient's condition at 60 days and at 1 year after report of serious adverse events.

Copies of the VAERS form and Table 1 have been mailed to physicians in the specialities of pediatrics, family practice, general practice, internal medicine, emergency medicine, and obstetrics/gynecology. Reporting forms and information about reporting requirements or completion of the form can be obtained through a toll-free number for VAERS ([800] 822-7967).

Reported by: National Vaccine Program, Office of the Assistant Secretary of Health. Office of Biological Product Review, Center for Biologics Evaluation and Research, Food and Drug Administration. Div of Immunization, Center for Prevention Svcs, CDC.

Editorial Note: The goal of immunization programs is to protect the public from vaccine-preventable diseases while minimizing the occurrence of adverse events following immunizations. The incidence rates of vaccine-preventable diseases in the United States have decreased dramatically since the mid-1950s, primarily because of the availability and widespread public acceptance of effective vaccines (*5*). During the initial period following introduction of a vaccine, the occurrence of adverse events may be overshadowed by the higher frequency of complications due to natural disease. As immunization efforts and coverage with a specific vaccine increase, disease incidence is substantially reduced and, for some diseases, is virtually eliminated (e.g., poliomyelitis). Because awareness about the public health benefits of a vaccine and its impact on disease then declines, adverse events following use of the vaccine may receive greater attention. Consequently, concerns about potential adverse events may lead to reductions in vaccine coverage and recurrence of epidemic disease (*6,7*).

VAERS — Continued

Because immunity to a given vaccine-preventable disease can be acquired only by natural infection or by immunization, immunization of a substantial proportion of each birth cohort will be needed until the disease is eradicated. Continuous monitoring of vaccine safety is therefore necessary to 1) evaluate the benefits and risks of

TABLE 1. Reportable events following immunization*

Vaccine/Toxoid	Event	Interval from immunization
DTP, P, DTP/Poliovirus combined	A. Anaphylaxis or anaphylactic shock	24 hours
	B. Encephalopathy (or encephalitis)†	7 days
	C. Shock-collapse or hypotonic-hyporesponsive collapse†	7 days
	D. Residual seizure disorder†	†
	E. Any acute complication or sequela (including death) of above events	No limit
	F. (See package insert)§	(See package insert)
Measles, Mumps, and Rubella; DT, Td, T toxoid	A. Anaphylaxis or anaphylactic shock	24 hours
	B. Encephalopathy (or encephalitis)†	15 days for measles, mumps, and rubella vaccines; 7 days for DT, Td, and T toxoids
	C. Residual seizure disorder†	†
	D. Any acute complication or sequela (including death) of above events	No limit
	E. (See package insert)§	(See package insert)
Oral Poliovirus vaccine	A. Paralytic poliomyelitis	
	—in a nonimmunodeficient recipient	30 days
	—in an immunodeficient recipient	6 months
	—in a vaccine-associated community case	No limit
	B. Any acute complication or sequela (including death) of above events	No limit
	C. (See package insert)§	(See package insert)
Inactivated Poliovirus vaccine	A. Anaphylaxis or anaphylactic shock	24 hours
	B. Any acute complication or sequela (including death) of above event	No limit
	C. (See package insert)§	(See package insert)

*Events listed are required by law to be reported to the U.S. Department of Health and Human Services; however, VAERS will accept *all* reports of suspected adverse events after the administration of *any* vaccine.

†**Aids to Interpretation:**

- Shock-collapse or hypotonic-hyporesponsive collapse may be evidenced by signs or symptoms such as decrease in or loss of muscle tone, paralysis (partial or complete), hemiplegia, hemiparesis, loss of color or change of color to pale white or blue, unresponsiveness to environmental stimuli, depression of or loss of consciousness, prolonged sleeping with difficulty arousing, or cardiovascular or respiratory arrest.
- Residual seizure disorder may be considered to have occurred if no other seizure or convulsion unaccompanied by fever or accompanied by a fever of <102 F occurred before the first seizure or convulsion after the administration of the vaccine involved,
  AND, if in the case of measles-, mumps-, or rubella-containing vaccines, the first seizure or convulsion occurred within 15 days after vaccination OR in the case of any other vaccine, the first seizure or convulsion occurred within 3 days after vaccination,
  AND, if two or more seizures or convulsions unaccompanied by fever or accompanied by a fever of <102 F occurred within 1 year after vaccination.
- The terms seizure and convulsion include grand mal, petit mal, absence, myoclonic, tonic-clonic, and focal motor seizures and signs.
- Encephalopathy means any substantial acquired abnormality of, injury to, or impairment of brain function. Among the frequent manifestations of encephalopathy are focal and diffuse neurologic signs, increased intracranial pressure, or changes lasting ≥6 hours in level of consciousness, with or without convulsions. The neurologic signs and symptoms of encephalopathy may be temporary with complete recovery, or they may result in various degrees of permanent impairment. Signs and symptoms such as high-pitched and unusual screaming, persistent unconsolable crying, and bulging fontanel are compatible with an encephalopathy, but in and of themselves are not conclusive evidence of encephalopathy. Encephalopathy usually can be documented by slow wave activity on an electroencephalogram.

§Refer to the CONTRAINDICATION section of the manufacturer's package insert for each vaccine.

VAERS — Continued

FIGURE 1. Vaccine Adverse Event Reporting System report form

VAERS

VACCINE ADVERSE EVENT REPORTING SYSTEM
24 Hour Toll-free information line 1-800-822-7967
Patient identity kept confidential

For CDC/FDA Use Only
VAERS Number _____
Date Received _____

Patient Name:
_____
Last First M.I.
Address
_____
_____
_____
_____
City State Zip
Telephone no. (_____)_____

Vaccine administered by (Name):
_____
Responsible Physician _____
Facility Name/Address
_____
_____
_____
_____
City State Zip
Telephone no. (_____)_____

Form completed by (Name):
_____
Relation to ☐ Vaccine Provider ☐ Patient/Parent Patient ☐ Manufacturer ☐ Other
Address *(if different from patient or provider)*
_____
_____
_____
_____
City State Zip
Telephone no. (_____)_____

1. State | 2. County where administered | 3. Date of birth ___/___/___ (mm dd yy) | 4. Patient age | 5. Sex ☐M ☐F | 6. Date form completed ___/___/___ (mm dd yy)

7. Describe adverse event(s) (symptoms, signs, time course) and treatment, if any

8. Check all appropriate:
☐ Patient died (date ___/___/___ mm dd yy)
☐ Life threatening illness
☐ Required emergency room/doctor visit
☐ Required hospitalization (_____days)
☐ Resulted in prolongation of hospitalization
☐ Resulted in permanent disability
☐ None of the above

9. Patient recovered ☐ YES ☐ NO ☐ UNKNOWN

10. Date of vaccination ___/___/___ (mm dd yy) Time _____ AM PM

11. Adverse event onset ___/___/___ (mm dd yy) Time _____ AM PM

12. Relevant diagnostic tests/laboratory data

13. Enter all vaccines given on date listed in no. 10

	Vaccine (type)	Manufacturer	Lot number	Route/Site	No. Previous doses
a.					
b.					
c.					
d.					

14. Any other vaccinations within 4 weeks of date listed in no. 10

	Vaccine (type)	Manufacturer	Lot number	Route/Site	No. Previous doses	Date given
a.						
b.						

15. Vaccinated at:
☐ Private doctor's office/hospital ☐ Military clinic/hospital
☐ Public health clinic/hospital ☐ Other/unknown

16. Vaccine purchased with:
☐ Private funds ☐ Military funds
☐ Public funds ☐ Other /unknown

17. Other medications

18. Illness at time of vaccination (specify)

19. Pre-existing physician-diagnosed allergies, birth defects, medical conditions (specify)

20. Have you reported this adverse event previously? ☐ No ☐ To health department ☐ To doctor ☐ To manufacturer

Only for children 5 and under
22. Birth weight _____ lb. _____ oz.
23. No. of brothers and sisters

21. Adverse event following prior vaccination (check all applicable, specify)

	Adverse Event	Onset Age	Type Vaccine	Dose no. in series
☐ In patient				
☐ In brother or sister				

Only for reports submitted by manufacturer/immunization project
24. Mfr. / imm. proj. report no.
25. Date received by mfr. / imm. proj.
26. 15 day report? ☐ Yes ☐ No
27. Report type ☐ Initial ☐ Follow-Up

Health care providers and manufacturers are required by law (42 USC 300aa-25) to report reactions to vaccines listed in the Vaccine Injury Table. Reports for reactions to other vaccines are voluntary except when required as a condition of immunization grant awards.

Form VAERS -1

F

VAERS — Continued

immunization, 2) develop policies that maximize the beneficial impact of the vaccine on public health, and 3) determine the potential needs for further vaccine improvement.

Before licensure, vaccines are evaluated extensively for immunogenicity, safety, and efficacy in animals and in human volunteers through controlled clinical trials. Because of the relatively small sample sizes of most prelicensure trials, rare adverse events are unlikely to be detected. Therefore, postlicensure or postmarketing surveillance (i.e., the continued monitoring of vaccine safety in the general population after licensure) is critical for identifying and evaluating rare or uncommon adverse events.

Postmarketing surveillance by a passive system, such as VAERS, detects "spontaneous" reports from health-care providers after an adverse event occurs. However, because passive surveillance systems are not linked to unimmunized comparison groups, these systems generally cannot be used to assess whether a reported adverse event occurs more often than expected. This limitation complicates assessment of a specific vaccine's role in causing a given adverse event. Other methods used for postmarketing surveillance, such as case-control studies or analysis of data bases that link immunization and outcome (e.g., hospital discharge) records, provide comparison groups but may not be timely or practical for ongoing surveillance (*8*). Based on these considerations, DHHS expects that VAERS may 1) provide a means for detecting new or previously unreported vaccine-related adverse events associated with existing and new vaccines (*9*), 2) assist in determining the number of adverse events reported nationwide, 3) permit collection and analysis of vaccine-specific adverse event information, and 4) assist in the assessment of potential risk factors for adverse events.

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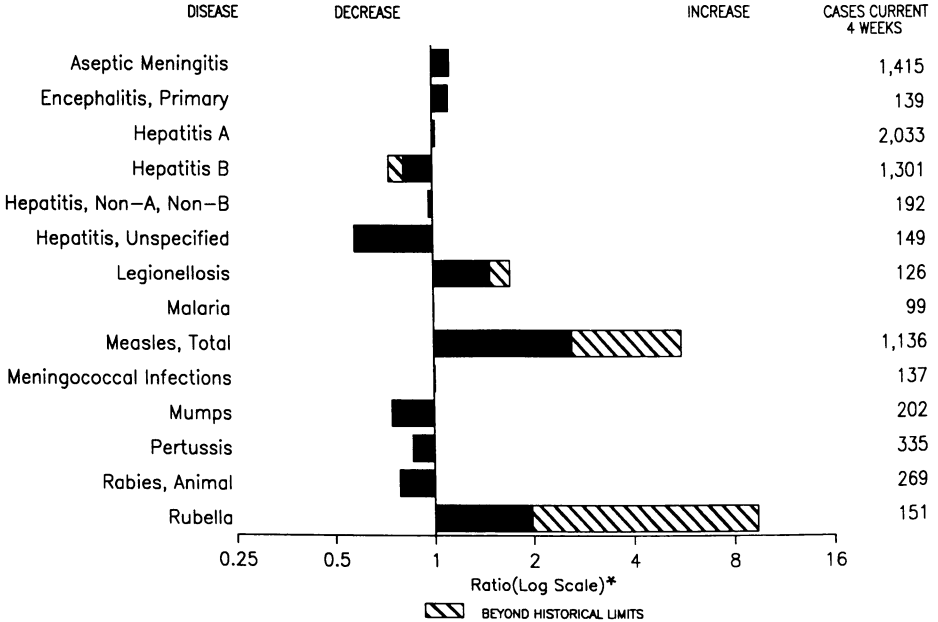
FIGURE I. Notifiable disease reports, comparison of 4-week totals ending October 13, 1990, with historical data — United States



*Ratio of current 4-week total to mean of 15 4-week totals (from comparable, previous, and subsequent 4-week periods for past 5 years).

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending October 13, 1990 (41st Week)

	Cum. 1990		Cum. 1990
AIDS	33,498	Plague	1
Anthrax	-	Poliomyelitis, Paralytic*	-
Botulism: Foodborne	16	Psittacosis	87
Infant	47	Rabies, human	1
Other	5	Syphilis: civilian	37,325
Brucellosis	68	military	194
Cholera	4	Syphilis, congenital, age < 1 year	685
Congenital rubella syndrome	3	Tetanus	45
Diphtheria	3	Toxic shock syndrome	239
Encephalitis, post-infectious	78	Trichinosis	22
Gonorrhea: civilian	520,796	Tuberculosis	18,142
military	6,957	Tularemia	109
Leprosy	166	Typhoid fever	386
Leptospirosis	39	Typhus fever, tickborne (RMSF)	556
Measles: imported	1,064		
indigenous	22,105		

*Three cases of suspected poliomyelitis have been reported in 1990; five of the 13 suspected cases in 1989 were confirmed and all were vaccine-associated.

TABLE II. Cases of specified notifiable diseases, United States, weeks ending October 13, 1990, and October 14, 1989 (41st Week)

Reporting Area	AIDS	Aseptic Menin-gitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionel-losis	Leprosy
			Primary	Post-in-fectious			A	B	NA,NB	Unspeci-fied		
	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	33,498	7,864	745	78	520,796	550,753	22,669	15,773	1,842	1,334	1,001	166
NEW ENGLAND	1,190	297	22	-	14,550	15,923	499	859	59	55	50	10
Maine	48	10	3	-	157	216	7	24	4	1	4	-
N.H.	52	33	-	-	119	140	7	37	5	3	4	-
Vt.	12	27	2	-	44	54	5	41	4	-	6	-
Mass.	681	97	11	-	6,161	6,079	325	534	36	49	29	9
R.I.	66	95	1	-	918	1,142	47	38	-	2	7	1
Conn.	331	35	5	-	7,151	8,292	108	185	10	-	-	-
MID. ATLANTIC	9,615	734	42	6	68,439	81,157	3,136	2,046	186	85	316	20
Upstate N.Y.	1,174	415	35	1	11,264	13,056	934	566	63	23	121	1
N.Y. City	5,578	124	3	2	27,232	33,223	463	543	25	43	79	14
N.J.	1,921	-	1	-	11,866	12,135	370	452	37	-	43	4
Pa.	942	195	3	3	18,077	22,743	1,369	485	61	19	73	1
E.N. CENTRAL	2,372	2,159	203	13	100,046	101,433	1,811	1,861	216	78	247	2
Ohio	521	412	68	4	30,351	26,837	169	323	69	12	79	-
Ind.	228	254	4	7	9,053	7,677	122	321	13	15	44	-
Ill.	974	328	57	2	32,225	32,824	898	357	38	16	15	1
Mich.	458	831	60	-	22,387	25,625	315	515	30	35	74	1
Wis.	191	334	14	-	6,030	8,470	307	345	66	-	35	-
W.N. CENTRAL	868	416	77	2	27,061	25,443	1,366	733	117	31	54	1
Minn.	147	72	41	1	3,405	2,775	196	90	24	1	5	-
Iowa	42	78	5	-	1,941	2,193	241	49	10	4	4	-
Mo.	508	169	7	1	16,396	15,707	409	461	56	20	26	-
N. Dak.	2	17	3	-	76	114	17	5	2	1	1	-
S. Dak.	3	9	3	-	211	216	227	7	4	-	2	-
Nebr.	50	30	7	-	1,314	1,198	77	30	4	-	9	1
Kans.	116	41	11	-	3,718	3,240	199	91	17	5	7	-
S. ATLANTIC	7,244	1,416	187	25	148,709	147,005	2,652	3,074	261	196	150	6
Del.	82	38	4	-	2,504	2,580	98	77	8	2	11	-
Md.	840	199	19	1	18,700	16,953	873	436	45	11	54	3
D.C.	571	9	-	-	9,962	8,802	14	36	4	-	1	-
Va.	580	252	42	1	14,091	12,822	250	202	33	140	13	-
W. Va.	58	49	50	-	960	1,116	17	69	4	8	4	-
N.C.	462	157	34	-	22,450	21,964	577	852	99	-	22	1
S.C.	287	18	1	-	11,871	13,533	36	483	14	8	18	-
Ga.	985	240	4	1	31,932	28,303	302	367	10	7	18	-
Fla.	3,379	454	33	22	36,239	40,932	485	552	44	20	9	2
E.S. CENTRAL	847	569	51	2	45,413	43,548	308	1,230	153	8	49	-
Ky.	146	154	23	-	4,693	4,273	73	425	46	6	20	-
Tenn.	272	111	21	2	14,305	14,697	142	661	88	-	16	-
Ala.	192	216	7	-	15,102	13,642	92	140	17	1	13	-
Miss.	237	88	-	-	11,313	10,936	1	4	2	1	-	-
W.S. CENTRAL	3,679	633	39	7	56,130	57,571	2,506	1,644	78	229	42	33
Ark.	168	21	1	-	6,931	6,717	422	66	9	20	9	-
La.	587	82	6	-	9,530	12,197	163	252	4	7	13	-
Okla.	169	64	3	6	4,836	4,974	471	127	23	24	13	-
Tex.	2,755	466	29	1	34,833	33,683	1,450	1,199	42	178	7	33
MOUNTAIN	876	320	20	2	10,173	11,773	3,626	1,176	176	102	38	2
Mont.	10	4	-	-	162	151	144	58	7	4	3	-
Idaho	20	7	-	-	109	144	79	65	8	-	3	-
Wyo.	2	6	1	-	125	81	52	15	5	1	1	-
Colo.	281	78	4	-	2,301	2,508	236	141	43	34	7	-
N. Mex.	75	17	-	-	988	1,064	746	158	10	7	3	-
Ariz.	264	151	8	-	4,192	4,844	1,663	410	63	39	11	2
Utah	88	27	3	-	316	371	446	86	23	7	3	-
Nev.	136	30	4	2	1,980	2,610	260	243	17	10	7	-
PACIFIC	6,807	1,320	104	21	50,275	66,900	6,765	3,150	596	550	55	92
Wash.	475	-	6	1	4,060	5,203	1,124	469	97	28	12	6
Oreg.	244	-	-	-	1,987	2,477	692	327	46	8	-	-
Calif.	5,938	1,136	90	19	43,019	58,049	4,713	2,245	437	504	41	70
Alaska	24	101	7	-	834	742	169	50	6	5	-	-
Hawaii	126	83	1	1	375	429	67	59	10	5	2	16
Guam	2	2	-	-	186	133	12	2	-	11	-	-
P.R.	1,378	60	6	-	584	866	117	249	5	22	-	6
V.I.	10	-	-	-	339	515	1	11	-	-	-	-
Amer. Samoa	-	1	-	-	51	47	26	-	-	-	-	10
C.N.M.I.	-	-	-	-	153	77	10	9	-	15	-	4

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

TABLE II. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending October 13, 1990, and October 14, 1989 (41st Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	1990	Cum. 1990	Cum. 1989
UNITED STATES	941	168	22,105	20	1,064	13,438	1,954	54	4,226	74	2,973	2,932	13	947	332
NEW ENGLAND	79	1	264	-	25	333	149	-	38	21	344	309	-	8	6
Maine	1	1	28	-	2	1	12	-	-	6	16	20	-	1	-
N.H.	4	-	-	-	8	15	11	-	9	-	48	6	-	1	4
Vt.	6	-	-	-	1	3	12	-	2	-	6	6	-	-	1
Mass.	43	-	22	-	7	60	67	-	11	15	247	248	-	2	1
R.I.	8	-	27	-	3	41	12	-	5	-	4	11	-	1	-
Conn.	17	-	187	-	4	213	35	-	11	-	23	18	-	3	-
MID. ATLANTIC	208	-	1,218	-	156	968	310	2	271	4	456	222	-	11	34
Upstate N.Y.	43	-	203	-	111	152	114	1	119	3	299	92	-	10	13
N.Y. City	76	-	382	-	21	112	45	-	-	-	-	6	-	-	15
N.J.	66	-	258	-	15	441	65	-	64	-	21	32	-	-	6
Pa.	23	-	375	-	9	263	86	1	88	1	136	92	-	1	-
E.N. CENTRAL	57	-	3,257	-	143	4,621	256	3	450	9	592	399	-	161	28
Ohio	7	-	549	-	3	1,330	80	-	89	-	154	45	-	131	3
Ind.	3	-	325	-	1	78	25	-	19	7	110	19	-	-	-
Ill.	22	-	1,290	-	10	2,610	66	-	158	-	134	140	-	18	21
Mich.	16	-	348	-	125	325	63	3	137	2	75	40	-	9	1
Wis.	9	-	745	-	4	278	22	-	47	-	119	155	-	3	3
W.N. CENTRAL	16	2	880	-	14	685	63	2	136	3	172	196	-	22	6
Minn.	4	2	419	-	4	23	12	-	14	-	31	53	-	17	-
Iowa	2	-	25	-	1	11	1	1	20	-	18	15	-	4	1
Mo.	9	-	96	-	-	398	26	1	55	2	93	116	-	-	4
N. Dak.	-	-	-	-	-	-	2	-	-	-	2	2	-	1	-
S. Dak.	-	-	15	-	8	-	2	-	-	-	1	1	-	-	-
Nebr.	-	-	97	-	1	113	5	-	5	-	7	6	-	-	-
Kans.	1	-	228	-	-	140	15	-	42	1	20	3	-	-	1
S. ATLANTIC	187	17	907	20	376	619	346	27	1,755	9	267	306	1	20	10
Del.	3	-	8	-	3	40	3	-	4	-	5	1	-	-	-
Md.	51	-	194	-	18	98	40	10	987	-	60	64	-	2	2
D.C.	10	U	15	U	7	40	11	U	33	U	14	2	U	1	-
Va.	48	-	84	-	2	22	45	1	99	1	18	33	-	1	-
W. Va.	2	-	6	-	-	53	14	-	42	1	24	28	-	-	-
N.C.	14	-	9	-	15	188	50	13	294	7	71	66	-	-	1
S.C.	3	-	4	-	-	3	24	3	54	-	5	-	-	-	-
Ga.	15	17	99	20§	259	2	59	-	85	-	32	37	1	1	-
Fla.	41	-	488	-	72	173	100	-	157	-	38	75	-	15	7
E.S. CENTRAL	20	-	183	-	3	235	118	1	91	3	145	192	10	15	3
Ky.	2	-	41	-	1	44	35	-	-	-	-	1	-	1	-
Tenn.	9	-	93	-	-	141	51	-	51	2	70	111	10	14	2
Ala.	9	-	23	-	2	50	30	-	14	1	67	69	-	-	1
Miss.	-	-	26	-	-	-	2	1	26	-	8	11	-	-	-
W.S. CENTRAL	56	-	4,179	-	91	3,193	134	3	624	3	156	317	-	66	50
Ark.	3	-	16	-	28	22	17	-	134	-	17	22	-	3	-
La.	6	-	10	-	-	11	30	-	107	-	30	18	-	-	5
Okla.	9	-	174	-	-	110	20	-	105	3	50	49	-	1	1
Tex.	38	-	3,979	-	63	3,050	67	3	278	-	59	228	-	62	44
MOUNTAIN	22	-	828	-	100	414	63	5	318	-	243	574	-	109	36
Mont.	1	-	-	-	1	13	10	-	1	-	32	33	-	14	1
Idaho	4	-	16	-	10	7	6	-	143	-	38	67	-	49	32
Wyo.	1	-	-	-	15	-	-	-	2	-	-	-	-	-	2
Colo.	2	-	91	-	47	97	19	1	24	-	74	61	-	4	-
N. Mex.	4	-	81	-	12	31	9	N	N	-	17	28	-	-	-
Ariz.	9	-	291	-	12	145	5	3	123	-	49	365	-	32	-
Utah	-	-	127	-	-	114	7	-	9	-	29	19	-	2	-
Nev.	1	-	222	-	3	7	7	1	16	-	4	1	-	8	1
PACIFIC	296	148	10,389	-	156	2,370	515	11	543	22	598	417	2	535	159
Wash.	25	-	202	-	69	54	63	1	47	7	162	170	-	-	-
Oreg.	12	-	168	-	44	61	56	N	N	2	74	15	-	11	4
Calif.	253	142	9,917	-	37	2,225	382	5	467	7	302	210	2	511	133
Alaska	2	-	78	-	2	1	9	-	4	-	5	1	-	-	-
Hawaii	4	6	24	-	4	32	5	5	25	6	55	21	-	13	22
Guam	3	U	-	U	1	4	-	U	4	U	1	1	U	-	-
P.R.	3	3	1,656	-	-	546	12	1	8	-	10	4	-	-	8
V.I.	-	-	21	-	3	4	-	-	11	-	-	-	-	-	-
Amer. Samoa	35	U	190	U	-	-	-	U	19	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	8	U	4	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE II. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending October 13, 1990, and October 14, 1989 (41st Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	37,325	34,146	239	18,142	16,719	109	386	556	3,361
NEW ENGLAND	1,345	1,359	21	439	472	3	24	18	5
Maine	7	11	7	11	12	-	-	-	-
N.H.	40	11	1	3	19	-	-	1	2
Vt.	1	1	1	8	8	-	-	-	-
Mass.	542	403	10	225	261	3	23	15	-
R.I.	18	26	1	58	53	-	-	-	-
Conn.	737	907	1	134	119	-	1	2	3
MID. ATLANTIC	7,295	7,154	24	4,294	3,343	1	83	28	731
Upstate N.Y.	703	725	8	310	268	-	17	15	91
N.Y. City	3,314	3,285	5	2,664	1,890	-	48	1	-
N.J.	1,207	1,117	-	734	640	1	15	7	262
Pa.	2,071	2,027	11	586	545	-	3	5	378
E.N. CENTRAL	2,749	1,463	54	1,766	1,693	2	28	45	151
Ohio	413	121	19	315	293	1	6	33	9
Ind.	77	52	1	163	162	1	1	2	14
Ill.	1,167	654	8	877	776	-	13	2	26
Mich.	821	507	26	342	369	-	7	8	48
Wis.	271	129	-	69	93	-	1	-	54
W.N. CENTRAL	405	259	26	474	422	38	5	49	540
Minn.	74	40	2	89	80	-	-	-	206
Iowa	61	29	7	44	44	-	1	1	17
Mo.	217	137	8	248	193	28	3	32	23
N. Dak.	1	3	-	16	13	-	-	-	75
S. Dak.	1	1	-	11	24	4	-	2	177
Nebr.	9	21	3	15	18	3	-	1	4
Kans.	42	28	6	51	50	3	1	13	38
S. ATLANTIC	12,317	12,118	21	3,377	3,533	4	63	234	940
Del.	146	161	1	31	34	-	-	1	22
Md.	942	629	1	257	308	-	31	17	353
D.C.	881	623	1	123	143	-	-	2	-
Va.	680	451	2	283	290	1	7	21	157
W. Va.	64	14	-	54	59	-	1	1	34
N.C.	1,370	848	10	452	446	2	2	135	8
S.C.	841	672	2	386	396	1	1	38	112
Ga.	3,130	2,995	1	567	542	-	2	17	174
Fla.	4,263	5,725	3	1,224	1,315	-	19	2	80
E.S. CENTRAL	3,601	2,361	12	1,309	1,315	7	4	70	152
Ky.	76	43	2	302	313	1	1	10	42
Tenn.	1,516	1,032	8	372	420	6	1	50	27
Ala.	1,081	713	2	393	364	-	2	10	80
Miss.	928	573	-	242	218	-	-	-	3
W.S. CENTRAL	5,613	4,631	11	2,135	2,022	35	13	89	388
Ark.	443	301	-	277	205	26	-	20	30
La.	1,176	1,151	1	185	269	-	1	2	28
Okla.	193	89	7	160	179	8	2	61	113
Tex.	3,801	3,090	3	1,513	1,369	1	10	6	217
MOUNTAIN	707	526	26	430	386	15	20	12	193
Mont.	-	1	-	22	11	-	-	4	42
Idaho	6	1	2	11	22	-	-	1	6
Wyo.	2	6	2	5	-	5	-	1	47
Colo.	38	58	7	27	39	3	-	1	21
N. Mex.	35	25	3	88	72	4	-	1	11
Ariz.	509	250	8	194	170	-	18	1	32
Utah	16	13	4	32	36	3	-	3	16
Nev.	101	172	-	51	36	-	2	-	18
PACIFIC	3,293	4,275	44	3,918	3,533	4	146	11	261
Wash.	282	368	4	214	190	1	20	2	-
Oreg.	108	187	2	99	107	-	4	1	1
Calif.	2,880	3,707	37	3,422	3,047	-	114	3	238
Alaska	15	3	-	32	49	3	-	-	22
Hawaii	8	10	1	151	140	-	8	5	-
Guam	2	4	-	36	71	-	-	-	-
P.R.	260	433	-	88	229	-	1	-	33
V.I.	11	8	-	4	4	-	-	-	-
Amer. Samoa	-	-	-	12	7	-	1	-	-
C.N.M.I.	3	8	-	42	23	-	4	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending October 13, 1990 (41st Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	607	414	103	58	16	16	47
Boston, Mass.	176	96	42	26	3	9	15
Bridgeport, Conn.	45	35	5	4	1	-	1
Cambridge, Mass.	26	22	2	2	-	-	2
Fall River, Mass.	22	19	3	-	-	-	-
Hartford, Conn.§	62	43	12	5	1	1	5
Lowell, Mass.	26	18	5	2	1	-	1
Lynn, Mass.	14	11	2	-	1	-	1
New Bedford, Mass.	17	13	2	2	-	-	-
New Haven, Conn.	49	31	7	5	5	1	6
Providence, R.I.	32	23	4	4	-	1	2
Somerville, Mass.	7	7	-	-	-	-	-
Springfield, Mass.	43	32	5	3	1	2	4
Waterbury, Conn.	23	18	3	2	-	-	4
Worcester, Mass.	65	46	11	3	3	2	6
MID. ATLANTIC	2,581	1,664	484	276	53	103	152
Albany, N.Y.	59	36	13	6	-	4	-
Allentown, Pa.	11	8	1	1	1	-	3
Buffalo, N.Y.	100	70	20	6	1	3	4
Camden, N.J.	39	26	7	5	1	-	-
Elizabeth, N.J.	16	12	1	3	-	-	1
Erie, Pa.†	43	33	8	-	-	2	2
Jersey City, N.J.	61	41	15	4	-	1	2
N.Y. City, N.Y.	1,296	822	234	181	32	27	50
Newark, N.J.	80	31	23	7	3	15	4
Paterson, N.J.	27	16	4	4	2	1	4
Philadelphia, Pa.	394	228	83	32	9	42	31
Pittsburgh, Pa.†	50	31	12	2	2	3	4
Reading, Pa.	40	34	5	-	1	-	9
Rochester, N.Y.	130	96	23	10	-	1	16
Schenectady, N.Y.	25	20	4	-	-	1	3
Scranton, Pa.†	31	26	4	1	-	-	3
Syracuse, N.Y.	109	84	16	6	1	2	9
Trenton, N.J.	32	21	7	3	-	1	3
Utica, N.Y.	19	15	2	2	-	-	3
Yonkers, N.Y.	19	14	2	3	-	-	1
E.N. CENTRAL	2,262	1,524	434	168	56	80	104
Akron, Ohio	62	48	8	2	2	2	-
Canton, Ohio	39	28	6	3	1	1	3
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	119	83	21	7	4	4	16
Cleveland, Ohio	160	97	35	13	4	11	4
Columbus, Ohio	153	101	33	6	6	7	12
Dayton, Ohio	118	84	20	11	3	-	7
Detroit, Mich.	254	155	48	28	12	11	4
Evansville, Ind.	45	28	13	2	1	1	2
Fort Wayne, Ind.	60	45	8	7	-	-	2
Gary, Ind.	19	9	4	4	1	1	-
Grand Rapids, Mich.	72	51	13	6	-	2	8
Indianapolis, Ind.	152	110	25	9	5	3	7
Madison, Wis.§	36	27	5	3	1	-	2
Milwaukee, Wis.	136	94	26	8	2	6	2
Peoria, Ill.	33	25	5	-	-	3	2
Rockford, Ill.	49	39	3	4	1	2	3
South Bend, Ind.	53	43	5	3	-	2	4
Toledo, Ohio	96	67	22	3	2	2	9
Youngstown, Ohio	42	28	9	4	1	-	1
W.N. CENTRAL	767	533	143	51	23	16	33
Des Moines, Iowa	69	56	10	2	-	1	2
Duluth, Minn.	41	31	7	2	1	-	2
Kansas City, Kans.	35	21	6	3	4	1	-
Kansas City, Mo.	125	93	20	7	1	4	2
Lincoln, Nebr.	28	18	8	1	1	-	1
Minneapolis, Minn.	167	112	37	11	4	3	16
Omaha, Nebr.	71	44	11	6	7	3	4
St. Louis, Mo.	120	83	21	12	4	-	4
St. Paul, Minn.	65	51	11	2	-	1	-
Wichita, Kans.	46	24	12	5	1	3	2
S. ATLANTIC	1,279	747	274	156	49	53	60
Atlanta, Ga.	146	83	24	24	3	12	1
Baltimore, Md.	166	96	39	19	7	5	15
Charlotte, N.C.	97	58	22	9	6	2	5
Jacksonville, Fla.	127	80	27	11	3	6	11
Miami, Fla.	161	84	44	23	6	4	-
Norfolk, Va.	49	30	11	2	3	3	5
Richmond, Va.	84	50	20	7	2	5	3
Savannah, Ga.	42	31	5	5	-	1	3
St. Petersburg, Fla.	55	41	4	5	1	4	5
Tampa, Fla.	149	97	32	13	4	3	4
Washington, D.C.	171	69	44	37	13	8	7
Wilmington, Del.	32	28	2	1	1	-	1
E.S. CENTRAL	830	525	190	59	25	31	41
Birmingham, Ala.	92	52	24	7	3	6	2
Chattanooga, Tenn.	58	36	12	7	1	2	3
Knoxville, Tenn.	112	79	23	6	3	1	8
Louisville, Ky.	136	87	34	10	3	2	2
Memphis, Tenn.	183	109	39	11	9	15	12
Mobile, Ala.§	81	53	18	6	3	1	2
Montgomery, Ala.	32	18	10	2	1	1	2
Nashville, Tenn.	136	91	30	10	2	3	10
W.S. CENTRAL	1,764	1,050	390	178	85	60	57
Austin, Tex.	47	33	12	1	1	-	3
Baton Rouge, La.	67	40	12	8	2	5	2
Corpus Christi, Tex.	45	25	16	-	-	4	2
Dallas, Tex.	191	106	32	24	15	14	3
El Paso, Tex.	51	33	10	5	3	-	1
Fort Worth, Tex	105	60	22	8	10	5	6
Houston, Tex.§	734	436	169	89	24	16	18
Little Rock, Ark.	47	32	9	2	3	1	2
New Orleans, La.§	104	62	23	10	8	1	-
San Antonio, Tex.	206	119	44	21	13	8	7
Shreveport, La.	69	36	20	4	3	6	6
Tulsa, Okla.	98	68	21	6	3	-	7
MOUNTAIN	810	516	168	71	19	35	33
Albuquerque, N. Mex.	100	63	20	12	-	5	2
Colo. Springs, Colo.	44	33	7	2	-	2	2
Denver, Colo.	116	71	17	17	2	8	9
Las Vegas, Nev.	115	64	34	10	5	2	4
Ogden, Utah	27	22	3	1	1	-	3
Phoenix, Ariz.	169	98	38	16	7	10	6
Pueblo, Colo.	26	18	6	2	-	-	3
Salt Lake City, Utah	47	28	9	6	1	3	2
Tucson, Ariz.	166	119	34	5	3	5	2
PACIFIC	1,740	1,108	305	197	72	51	97
Berkeley, Calif.	17	13	1	3	-	-	3
Fresno, Calif.	89	60	15	6	2	6	6
Glendale, Calif.	13	8	5	-	-	-	1
Honolulu, Hawaii	77	50	15	4	3	5	7
Long Beach, Calif.	64	44	13	6	1	-	15
Los Angeles Calif.	461	280	85	55	22	14	15
Oakland, Calif.	72	37	11	17	3	4	4
Pasadena, Calif.	22	18	2	2	-	-	-
Portland, Oreg.	122	87	17	12	4	2	5
Sacramento, Calif.	133	94	21	13	3	2	8
San Diego, Calif.	158	82	34	24	10	7	17
San Francisco, Calif.	161	85	32	32	8	3	3
San Jose, Calif.	130	89	23	10	4	4	9
Seattle, Wash.	136	94	23	10	6	3	2
Spokane, Wash.	53	45	3	1	4	-	2
Tacoma, Wash.	32	22	5	2	2	1	-
TOTAL	12,640††	8,081	2,491	1,214	398	445	624

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

**Pneumonia and influenza.

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

††Total includes unknown ages.

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

Perspectives in Disease Prevention and Health Promotion

1990 Secretary's Community Health Promotion Awards

On October 9, 1990, the Secretary of Health and Human Services announced the 173 recipients of the 1990 Secretary's Community Health Promotion Awards. Thirty-two projects received the Secretary's Award for Excellence in Community Health Promotion, 92 received the Secretary's Outstanding Community Health Promotion Certificate of Merit, and 49 received the Secretary's Letter of Recognition.

The awards were established in 1982 to recognize the efforts of communities, states, and territories to improve the health of their citizens. All state and territorial health agencies are invited by the CDC director to participate in the awards program. Awards are based on a consideration of the following criteria: a statement of the problem to be addressed, clear and measurable objectives, a description of the work accomplished, and an evaluation of the project.

Projects receiving the Secretary's Award for Excellence in Community Health Promotion addressed current leading health problems in the following categories of the 1990 Health Objectives for the Nation (*1*):

HEALTH PROMOTION

Smoking and Health

Rocky Mountain Tobacco-Free Challenge (Phoenix, Arizona)
Project S.O.S. (Snuff Out Smokeless) (Springfield, Illinois)
Coalition for a SmokeFree Anderson County (Anderson, South Carolina)

Misuse of Alcohol and Drugs

Youth Educator Program (Pleasant Hill, California)
Project I-STAR (Indiana Students Taught Awareness and Resistance) (Indianapolis, Indiana)
Drinking and Driving Reduction Program (Hattiesburg, Mississippi)
Mountain Community Health Choices (Park City, Utah)

Physical Fitness and Exercise

U.S. Army Tank-Automotive Command (TACOM) Corporate Fitness Program (Warren, Michigan)

General

San Francisco Adult Day Health Network (San Francisco, California)
Colorado Action for Healthy People (Denver, Colorado)
Almost Home Program (Grand Island, Nebraska)
Zuni Wellness Center (Zuni, New Mexico)
Community Health Advocacy Program (CHAP) (Greenville, North Carolina)
HIV/AIDS Awareness & Prevention Program (Hendersonville, North Carolina)
Cleveland Health Education Project (Cleveland, Ohio)
Resource Education and Community Health Project (R.E.A.C.H.) (Vermillion, South Dakota)
Worksite and Community Health Promotion/Risk Reduction Project (Marion, Virginia)
Harrison County Health Education Enrichment Pilot Program (Clarksburg, West Virginia)

Community Health Promotion Awards — Continued

PREVENTIVE HEALTH SERVICES

Cancer Screening and Control

Project Nammy (Native American Mammography) (Fort Thompson, South Dakota)

Diabetes Screening and Control

"Paso a Paso" (Step by Step) (El Paso, Texas)

Hispanic Diabetes Detection and Education Program (Toledo, Ohio)

Family Planning and Pregnancy and Infant Health

Youth Yellow Pages, Teen Pregnancy/Parenting Program (Idaho Falls, Idaho)

The Bronx Community Based Perinatal Outreach and Education Program (South Bronx, New York)

Sullivan County Health Department/Kingsport City Schools Family Life Education (Blountville, Tennessee)

General

Self Help Group Development (Atlanta, Georgia)

Foot Care for the Homeless (Chicago, Illinois)

Adolescent Services Network (Rootstown, Ohio)

HEALTH PROTECTION

Accident Prevention and Injury Control

Tucson Drowning Prevention Committee (Tucson, Arizona)

Community and Home Injury Prevention Project for Seniors (CHIPPS) (San Francisco, California)

Monroe County Toy Safety Program (Rochester, New York)

Injury Prevention Program (Monroe, Wisconsin)

Toxic Agent Control

Drainage Water Pollution Control Program (Fort Worth, Texas)

This recognition of successful projects promotes them as models for programs in other areas. Interested agencies should contact the appropriate state health departments for more specific information. Descriptive abstracts of all 173 projects are available in the computerized Combined Health Information Database through Bibliographic Retrieval Services (BRS) Information Technologies.

A publication describing the Secretary's Health Promotion Awards Program and the 1990 awards will be available in January 1991 from state health departments and from the Coordinator, Secretary's Health Promotion Awards Program, Division of Chronic Disease Control and Community Intervention, Center for Chronic Disease Prevention and Health Promotion, Mailstop F46, CDC, Atlanta, GA 30333; telephone (404) 488-4605.

Reported by: Community Health Promotion Br, Div of Chronic Disease Control and Community Intervention, Center for Chronic Disease Prevention and Health Promotion, CDC.

Reference

1. Public Health Service. Promoting health/preventing disease: objectives for the nation. Washington, DC: US Department of Health and Human Services, Public Health Service, 1980.

Current Trends

Imported Dengue — United States, 1989

In 1989, 30 states and the District of Columbia reported 94 cases of imported dengue (i.e., dengue-like illness following travel and apparent exposure outside the United States) to CDC (Table 1). Twenty-two cases were serologically or virologically confirmed as dengue; 56 were serologically negative; and 16 could not be determined because of the lack of a convalescent serum sample. In four cases, the dengue serotype was identified by virus isolation.

Travel histories were available for 21 persons with confirmed dengue. Eleven infections were acquired in the Caribbean; five in Oceania; two in South America; and one each in Africa, Asia, and Mexico.

TABLE 1. Suspected and confirmed cases of imported dengue, by reporting area — United States, 1989

Area	Total	Confirmed	Travel history of persons with confirmed dengue (serotype, if known)
Alabama	3	1	USVI*
Arkansas	1	0	
California	5	2	USVI, Mexico
Colorado	4	1	USVI
Connecticut	3	2	Puerto Rico, Caribbean
District of Columbia	1	1	Sri Lanka, India
Florida	2	1	Kenya, Tanzania (DEN-3)
Georgia	3	1	Paraguay (DEN-1)
Illinois	6	0	
Indiana	2	0	
Iowa	3	1	Philippines
Kansas	1	1	USVI
Kentucky	2	0	
Maryland	3	1	Puerto Rico (DEN-2)
Massachusetts	15	3	Fiji (1) (DEN-1), USVI (2)
Michigan	2	1	Unknown
Minnesota	1	0	
Mississippi	1	0	
Missouri	1	1	USVI
New Jersey	2	0	
New Mexico	2	0	
New York	16	1	USVI
North Carolina	2	1	Australia, New Zealand, Fiji, Tahiti
North Dakota	1	0	
Oregon	2	1	South America
Pennsylvania	1	1	Tahiti
Rhode Island	1	0	
Texas	1	1	Tahiti
Virginia	3	0	
Washington	3	0	
Wisconsin	1	0	
Total	**94**	**22**	

*St. Croix, U.S. Virgin Islands.

Imported Dengue — Continued

Twelve (55%) of the 22 confirmed cases were in males. Age was reported for 19 patients and ranged from 23 to 74 years (mean: 48 years). Most patients had symptoms consistent with classic dengue fever (e.g., fever, headache, and myalgia). One person with serologically confirmed dengue died with bilateral, diffuse pneumonia within 24 hours of return to the continental United States from St. Croix, U.S. Virgin Islands.

In addition to the cases reported above, nine cases of laboratory-confirmed dengue infections occurred in persons (some from the continental United States) who participated in relief duties on St. Croix in the aftermath of Hurricane Hugo, which struck the island on September 17–18, 1989.

Reported by: State and territorial health departments. Dengue Br, Div of Vector-Borne Infectious Diseases, Center for Infectious Diseases, CDC.

Editorial Note: Dengue is an acute viral disease caused by any of four virus serotypes (DEN 1–4) and is characterized by sudden onset of fever, headache, myalgia, rash, nausea, and vomiting. Although most infections result in relatively mild illness, some may cause the severe form of the disease, dengue hemorrhagic fever (characterized by variable degrees of bleeding, most commonly petechiae, purpura, mild gum bleeding, nosebleeds, or menorrhagia and/or gastrointestinal bleeding). The most recent outbreak of dengue hemorrhagic fever occurred in Venezuela in 1989–90 and involved >3000 cases of severe dengue and 74 deaths (*1*).

In the Americas, dengue is transmitted by the *Aedes aegypti* mosquito. Although nearly eradicated in the 1960s, this species is now found in all tropical countries of the region. Dengue is endemic in Puerto Rico, many other islands in the Caribbean, Mexico, and several countries in Central and South America. Three of the four serotypes (DEN-1, DEN-2, and DEN-4) have been circulating in the Americas for several years. Although endemic transmission of DEN-3 has not occurred in the region in over a decade, this serotype can be reintroduced into the Americas and was isolated from a Florida resident who returned from Africa in October 1989.

Physicians should consider dengue in the differential diagnosis for all patients presenting with compatible symptoms and a travel history to tropical areas. When dengue is suspected, the patient's hematocrit and platelet count should be monitored for evidence of hemoconcentration and thrombocytopenia. For management of fever, acetaminophen products should be used instead of acetylsalicylic acid (aspirin). Acute (<5 days from onset) and convalescent-phase (>14 days from onset) serum samples should be obtained for serodiagnosis. Suspected dengue cases should be reported to state health departments along with a clinical summary, dates of onset of illness and blood collection, a detailed travel history with dates and location of travel, and other epidemiologic information (e.g., patient age and sex). Serum samples should be sent for confirmation through the state health department laboratory to: Dengue Branch, Division of Vector-Borne Infectious Diseases, Center for Infectious Diseases, CDC, GPO Box 364532, San Juan, PR 00936; telephone (809) 749-4400; FAX (809) 749-4450.

Reference

1. PAHO. Dengue hemorrhagic fever in Venezuela. Washington, DC: Pan American Health Organization. Epidemiol Bull 1990;11:7–9.

International Notes

Carbon Monoxide Levels in Indoor Tractor-Pull Events — Manitoba, Canada

Carbon monoxide (CO) and other noxious gases produced by internal combustion devices are health hazards in enclosed spaces. In facilities such as underground garages and indoor arenas, CO is a particular concern because of its rapid toxic effects and potentially high concentrations. In February and November 1988, the City of Winnipeg Health Department (WHD), Manitoba, Canada, conducted surveys of two tractor-pull events in an indoor 15,000-seat arena to determine levels of CO. During the November event, an attempt was made to mitigate CO levels. This report summarizes findings from the two surveys.

A "tractor" is a truck or other vehicle modified to look like a farm tractor (e.g., large rear wheels and smaller front wheels) and powered by a variety of units (e.g., aircraft turbines and supercharged car engines). During a typical "pull," approximately 12 tractors compete in pulling a 40- to 50-ton sled across a 75-m (82-yd)–long dirt surface in the fastest time. A tractor-pull event lasts approximately 2½ hrs and involves 25 individual pulls.

Previous monitoring of CO in the arena's seating area during full-occupancy hockey games indicated CO levels of 0–10 ppm; an ice-edger and an ice-resurfacing machine, both of which emit CO, were used several times each during each game. The WHD's recommended indoor guideline levels are 33 ppm for a 1-hr exposure and 18 ppm for an 8-hr exposure.

To measure CO levels during the tractor-pull events, certified public health inspectors used a Gastech CO–82 Carbon Monoxide Detector* to record levels before the events and at half hour intervals during the events at 25 seating locations at varying heights within the arena.

At the February event, measurements indicated an average level of 68 ppm at the start (8 p.m.) of the first of 25 pulls; however, several tractors had been running their engines before the first pull. By 10:30 p.m. (the end of the competition), the CO level had increased to 262 ppm. In general, CO levels were uniform throughout the seating area. During this event, however, the ventilation system had not been operating at full capacity, tractors had been allowed to run their engines before the event, and large doors to the arena's ground floor had been closed.

During the November event, measures to decrease CO levels included reducing the number of pulls to 24, expanding the event by 2 hrs to permit decay in the CO level, and opening ventilating louvres in the arena roof. WHD inspectors used the same measuring apparatus to take readings at the same locations as in the February event. CO levels at the beginning of the event averaged 77.5 ppm and increased to 435.7 ppm by the event's close.

This evaluation indicated that the control measures were not effective in reducing CO levels. Participants did not want to retrofit their tractors with pollution-control devices because this would decrease the horsepower of the tractors. Therefore, WDH officials required that appropriate ventilation improvements be implemented before further tractor-pull events could be permitted in the arena. However, because one

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

Carbon Monoxide Levels — Continued

evaluation concluded that the costs to implement the ventilation improvements were prohibitive, a tractor pull scheduled for February 1989 was cancelled, and no further such events are to be held in the arena.

Adapted from: Canada Diseases Weekly Report *1990;16–17:79–81, as reported by: G Solkoski, Director, Environmental Health Div, City of Winnipeg Health Dept, Manitoba. Div of Environmental Hazards and Health Effects, Center for Environmental Health and Injury Control, CDC.*

Editorial Note: Because CO poisoning is frequently not suspected in persons suffering from CO intoxication, morbidity from CO poisoning is difficult to estimate. Unintentional poisoning has resulted from exposure to high levels of CO from automobiles, ice-resurfacing machines, fork lifts, recreational vehicles, and kerosene heaters and other fuel-burning household devices (*1–3*). Current Environmental Protection Agency outdoor air quality standards permit 9 ppm CO as an 8-hr average and 35 ppm as a maximum 1-hr level (*4*). In the United States, there are no indoor air standards for CO. Japan has established a guideline of 10 ppm (*5*).

Because adverse effects have occurred in healthy persons who continuously breathe CO levels of 15 ppm (*6*) (and because susceptible persons may experience toxicity at lower levels), the levels attained in the Winnipeg arena during the tractor-pull events represented a potential health hazard to both participants and observers. However, the City of Winnipeg Ambulance Department, which provides staff and equipment for all major sporting events, did not report any incidents of CO intoxication during the tractor-pull events.

CO is a colorless, odorless, nonirritating gas produced by incomplete combustion of fuels and present in all exhaust and smoke, including cigarette smoke. CO is toxic because 1) it avidly binds to hemoglobin to form carboxyhemoglobin (COHb), which reduces the oxygen-carrying capacity of blood, and 2) it inhibits cytochrome oxidase within mitochondria, thereby poisoning cellular respiration. The latter effect is increased in cases in which tissue hypoxia already exists and in cases of chronic CO intoxication (*1*). The risk for toxicity is proportionate to metabolic rate, exercise, prolonged exposure, and high altitude. Populations at risk for CO poisoning include the elderly, the poor (during the winter heating season), pregnant women (because of risk to the fetus), and persons with heart disease, lung disease, or anemia.

Symptoms of mild to moderate CO poisoning are nonspecific; the most commonly reported symptoms are headache, dizziness, weakness, nausea, confusion, shortness of breath, and visual problems (*7*). In addition, CO exposure can cause or exacerbate cardiac abnormalities (e.g., angina), and low COHb levels can cause complex ventricular arrhythmias (*8*). Occult CO poisoning should be suspected when these symptoms occur in two or more persons who have a history of sharing enclosed quarters (*9*). A blood COHb level >2% in nonsmokers or >10% in smokers confirms CO exposure; levels of ≥30% are commonly associated with severe symptoms and may result in neuropsychiatric sequelae. Because COHb levels may not reflect tissue levels, they should be interpreted cautiously—especially in cases of chronic CO intoxication. Home or worksite measurement of ambient CO levels may be necessary to establish the diagnosis in cases of chronic low-level exposure.

Treatment in milder cases consists of 100% oxygen; hyperbaric oxygen should be used to treat moderate to severe intoxication (COHb >40%), particularly in pregnant women or when evidence exists of neurologic changes or cardiac arrhythmias (*1,10*). Preventive measures include regular automobile maintenance; routine cleaning and adequate venting of gas-fired stoves, furnaces, and appliances; and adequate ventilation and pollution controls during indoor events such as tractor pulls.

Carbon Monoxide Levels — Continued

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2. CDC. Carbon monoxide exposures at an ice skating rink—Colorado. MMWR 1986;35: 435–6,441.
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4. National Air Pollution Control Administration. Air quality criteria for carbon monoxide. Washington, DC: US Department of Health, Education, and Welfare, Public Health Service, Environmental Health Service, 1970; publication no. AP-62.
5. Walsh PJ, Dudney CS, Copenhaver ED, eds. Indoor air quality. Boca Raton, Florida: CRC Press, 1984:66.
6. Davies LM, Smith DJ. Electrocardiographic changes in healthy men during continuous low-level carbon monoxide exposure. Environ Res 1980;21:197–206.
7. Burney RE, Wu SC, Nemiroff MJ. Mass carbon monoxide poisoning: clinical effects and results of treatment in 184 victims. Ann Emerg Med 1982;11:394–9.
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9. Heckerling PS, Leikin JB, Maturen A. Occult carbon monoxide poisoning: validation of a prediction model. Am J Med 1988;84:251–6.
10. Broome JR, Skrine H, Pearson RR. Carbon monoxide poisoning: forgotten not gone! Br J Hosp Med 1988;39:298–305.

Notices to Readers

Second Conference on International Travel Medicine

The Second Conference on International Travel Medicine will be held May 9–12, 1991, in Atlanta. The conference will be cosponsored by the World Health Organization (Geneva), the World Tourism Organization (Madrid), the Emory University School of Medicine (Atlanta), the London School of Hygiene and Tropical Medicine, and CDC.

The program will focus on health risks for travelers; health aspects for temporary residents; acquired immunodeficiency syndrome; sexually transmitted diseases; vaccine-preventable diseases; malaria; travelers' diarrhea, respiratory diseases, and other infections; individual preventive measures; vaccines, immune globulins, and chemoprophylaxis; noninfectious diseases; jet lag and motion sickness; psychologic aspects of travel; substance abuse; injuries; health promotion for travelers; environmental health aspects; illness and medical care abroad; self-diagnosis and self-treatment; medical evacuation; and travelers' clinics.

Inquiries should be addressed to Hans O. Lobel, M.D., Division of Parasitic Diseases, Center for Infectious Diseases, Mailstop F12, CDC, Atlanta, GA 30333; FAX number (404) 488-4427. The deadline for submission of abstracts and early registration is December 1, 1990.

Conference on Health Effects of Air Pollution

A conference on the Health Effects of Air Pollution—Impact of Clean Air Legislation will be held March 25–27, 1991, in Crystal City, Virginia. This conference is the annual meeting of the Society for Occupational and Environmental Health (SOEH) and is cosponsored by the American Thoracic Society, American Petroleum Institute,

Air Pollution — Continued

Association of State and Territorial Health Officials, Environmental Defense Fund, Health Effects Institute, International Society for Environmental Epidemiology, National Institute for Environmental Health Sciences, Environmental Protection Agency, and CDC.

The conference will examine the relationship of scientific knowledge to the implementation of clean air legislation and will provide new information and a forum for discussion of government policy, public health strategies, and critical research on air pollution. CDC encourages state health departments to send representatives.

The deadline for submission of abstracts is November 30, 1990. Registration and abstract forms are available from the SOEH National Office, 6728 Old McLean Village Drive, McLean, VA 22101; telephone (703) 556-9222. For additional information contact James Rifenburg, Ph.D., Division of Environmental Hazards and Health Effects, Center for Environmental Health and Injury Control, Mailstop F28, CDC, Atlanta, GA 30333; telephone (404) 488-4682.

CDC Voice Information System

The CDC Voice Information System is an automated telephone service that provides information about the *MMWR* and public health topics, including acquired immunodeficiency syndrome, chronic fatigue syndrome, Lyme disease, rabies, hepatitis, influenza, international travel, and malaria. Information includes an overview of each topic; symptoms; prevention methods; immunization requirements, if any; and an option for transfer to a public health professional during business hours. The CDC Voice Information System is available 24 hours a day, 365 days a year; the telephone number is (404) 332-4555.

The *Morbidity and Mortality Weekly Report* is prepared by the Centers for Disease Control, Atlanta, Georgia, and is available on a paid subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, (202) 783-3238.

The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday. Accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials, as well as matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Mailstop C-08, Centers for Disease Control, Atlanta, Georgia 30333; telephone (404) 332-4555.

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