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Ten Great Public Health Achievements — United States, 1900–1999

During the 20th century, the health and life expectancy of persons residing in the United States improved dramatically. Since 1900, the average lifespan of persons in the United States has lengthened by >30 years; 25 years of this gain are attributable to advances in public health (*1*). To highlight these advances, *MMWR* will profile 10 public health achievements (see box) in a series of reports published through December 1999.

Many notable public health achievements have occurred during the 1900s, and other accomplishments could have been selected for the list. The choices for topics for this list were based on the opportunity for prevention and the impact on death, illness, and disability in the United States and are not ranked by order of importance.

The first report in this series focuses on **vaccination**, which has resulted in the eradication of smallpox; elimination of poliomyelitis in the Americas; and control of measles, rubella, tetanus, diphtheria, *Haemophilus influenzae* type b, and other infectious diseases in the United States and other parts of the world.

Ten Great Public Health Achievements — United States, 1900–1999

- Vaccination
- Motor-vehicle safety
- Safer workplaces
- Control of infectious diseases
- Decline in deaths from coronary heart disease and stroke
- Safer and healthier foods
- Healthier mothers and babies
- Family planning
- Fluoridation of drinking water
- Recognition of tobacco use as a health hazard

Ten Great Achievements — Continued

Future reports that will appear in *MMWR* throughout the remainder of 1999 will focus on nine other achievements:

- Improvements in **motor-vehicle safety** have resulted from engineering efforts to make both vehicles and highways safer and from successful efforts to change personal behavior (e.g., increased use of safety belts, child safety seats, and motorcycle helmets and decreased drinking and driving). These efforts have contributed to large reductions in motor-vehicle–related deaths (*2*).
- Work-related health problems, such as coal workers' pneumoconiosis (black lung), and silicosis—common at the beginning of the century—have come under better control. Severe injuries and deaths related to mining, manufacturing, construction, and transportation also have decreased; since 1980, **safer workplaces** have resulted in a reduction of approximately 40% in the rate of fatal occupational injuries (*3*).
- **Control of infectious diseases** has resulted from clean water and improved sanitation. Infections such as typhoid and cholera transmitted by contaminated water, a major cause of illness and death early in the 20th century, have been reduced dramatically by improved sanitation. In addition, the discovery of antimicrobial therapy has been critical to successful public health efforts to control infections such as tuberculosis and sexually transmitted diseases (STDs).
- **Decline in deaths from coronary heart disease and stroke** have resulted from risk-factor modification, such as smoking cessation and blood pressure control coupled with improved access to early detection and better treatment. Since 1972, death rates for coronary heart disease have decreased 51% (*4*).
- Since 1900, **safer and healthier foods** have resulted from decreases in microbial contamination and increases in nutritional content. Identifying essential micronutrients and establishing food-fortification programs have almost eliminated major nutritional deficiency diseases such as rickets, goiter, and pellagra in the United States.
- **Healthier mothers and babies** have resulted from better hygiene and nutrition, availability of antibiotics, greater access to health care, and technologic advances in maternal and neonatal medicine. Since 1900, infant mortality has decreased 90%, and maternal mortality has decreased 99%.
- Access to **family planning** and contraceptive services has altered social and economic roles of women. Family planning has provided health benefits such as smaller family size and longer interval between the birth of children; increased opportunities for preconceptional counseling and screening; fewer infant, child, and maternal deaths; and the use of barrier contraceptives to prevent pregnancy and transmission of human immunodeficiency virus and other STDs.
- **Fluoridation of drinking water** began in 1945 and in 1999 reaches an estimated 144 million persons in the United States. Fluoridation safely and inexpensively benefits both children and adults by effectively preventing tooth decay, regardless of socioeconomic status or access to care. Fluoridation has played an important role in the reductions in tooth decay (40%–70% in children) and of tooth loss in adults (40%–60%) (*5*).

Ten Great Achievements — Continued

- **Recognition of tobacco use as a health hazard** and subsequent public health anti-smoking campaigns have resulted in changes in social norms to prevent initiation of tobacco use, promote cessation of use, and reduce exposure to environmental tobacco smoke. Since the 1964 Surgeon General's report on the health risks of smoking, the prevalence of smoking among adults has decreased, and millions of smoking-related deaths have been prevented (*6*).

The list of achievements was developed to highlight the contributions of public health and to describe the impact of these contributions on the health and well being of persons in the United States. A final report in this series will review the national public health system, including local and state health departments and academic institutions whose activities on research, epidemiology, health education, and program implementation have made these achievements possible.
Reported by: CDC.

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Achievements in Public Health, 1900–1999

Impact of Vaccines Universally Recommended for Children — United States, 1900–1998

At the beginning of the 20th century, infectious diseases were widely prevalent in the United States and exacted an enormous toll on the population. For example, in 1900, 21,064 smallpox cases were reported, and 894 patients died (*1*). In 1920, 469,924 measles cases were reported, and 7575 patients died; 147,991 diphtheria cases were reported, and 13,170 patients died. In 1922, 107,473 pertussis cases were reported, and 5099 patients died (*2,3*).

In 1900, few effective treatment and preventive measures existed to prevent infectious diseases. Although the first vaccine against smallpox was developed in 1796, >100 years later its use had not been widespread enough to fully control the disease (*4*). Four other vaccines—against rabies, typhoid, cholera, and plague—had been developed late in the 19th century but were not used widely by 1900.

Vaccines — Continued

Since 1900, vaccines have been developed or licensed against 21 other diseases (*5*) (Table 1). Ten of these vaccines have been recommended for use only in selected populations at high risk because of area of residence, age, medical condition, or risk behaviors. The other 11 have been recommended for use in all U.S. children (*6*).

During the 20th century, substantial achievements have been made in the control of many vaccine-preventable diseases. This report documents the decline in morbidity from nine vaccine-preventable diseases and their complications—smallpox, along with the eight diseases for which vaccines had been recommended for universal use in children as of 1990 (Table 2). Four of these diseases are detailed: smallpox has been eradicated, poliomyelitis caused by wild-type viruses has been eliminated, and measles and *Haemophilus influenzae* type b (Hib) invasive disease among children aged <5 years have been reduced to record low numbers of cases.

Information about disease and death during the 20th century was obtained from the *MMWR* annual summaries of notifiable diseases and reports by the U.S. Department of Health, Education, and Welfare. For smallpox, Hib, and congenital rubella syndrome (CRS), published studies were used (*2,3,7–14*).

Current Delivery and Use of Vaccines

National efforts to promote vaccine use among all children began with the appropriation of federal funds for polio vaccination after introduction of the vaccine in 1955 (*5*). Since then, federal, state, and local governments and public and private health-care providers have collaborated to develop and maintain the vaccine-delivery system in the United States.

Overall, U.S. vaccination coverage is at record high levels. In 1997, coverage among children aged 19–35 months (median age: 27 months) exceeded 90% for three or more doses of diphtheria and tetanus toxoids and pertussis vaccine (DTP), three or more doses of poliovirus vaccine, three or more doses of Hib vaccine, and one or more doses of measles-containing vaccine. Coverage with four doses of DTP was 81%

TABLE 1. Vaccine-preventable diseases, by year of vaccine development or licensure — United States, 1798–1998

Disease	Year	Disease	Year
Smallpox*	1798†	Rubella*	1969§
Rabies	1885†	Anthrax	1970§
Typhoid	1896†	Meningitis	1975§
Cholera	1896†	Pneumonia	1977§
Plague	1897†	Adenovirus	1980§
Diphtheria*	1923†	Hepatitis B*	1981§
Pertussis*	1926†	*Haemophilus influenzae* type b*	1985§
Tetanus*	1927†	Japanese encephalitis	1992§
Tuberculosis	1927†	Hepatitis A	1995§
Influenza	1945§	Varicella*	1995§
Yellow fever	1953§	Lyme disease	1998§
Poliomyelitis*	1955§	Rotavirus*	1998§
Measles*	1963§		
Mumps*	1967§		

*Vaccine recommended for universal use in U.S. children. For smallpox, routine vaccination was ended in 1971.
†Vaccine developed (i.e., first published results of vaccine usage).
§Vaccine licensed for use in United States.

Vaccines — Continued

TABLE 2. Baseline 20th century annual morbidity and 1998 provisional morbidity from nine diseases with vaccines recommended before 1990 for universal use in children — United States

Disease	Baseline 20th century annual morbidity	1998 Provisional morbidity	% Decrease
Smallpox	48,164*	0	100%
Diphtheria	175,885†	1	100%§
Pertussis	147,271¶	6,279	95.7%
Tetanus	1,314**	34	97.4%
Poliomyelitis (paralytic)	16,316††	0§§	100%
Measles	503,282¶¶	89	100%§
Mumps	152,209***	606	99.6%
Rubella	47,745†††	345	99.3%
Congenital rubella syndrome	*823§§§*	5	*99.4%*
Haemophilus influenzae type b	20,000¶¶¶	54****	99.7%

* Average annual number of cases during 1900–1904 (*1*).
† Average annual number of reported cases during 1920–1922, 3 years before vaccine development.
§ Rounded to nearest tenth.
¶ Average annual number of reported cases during 1922–1925, 4 years before vaccine development.
** Estimated number of cases based on reported number of deaths during 1922–1926 assuming a case-fatality rate of 90%.
†† Average annual number of reported cases during 1951–1954, 4 years before vaccine licensure.
§§ Excludes one cases of vaccine-associated polio reported in 1998.
¶¶ Average annual number of reported cases during 1958–1962, 5 years before vaccine licensure.
*** Number of reported cases in 1968, the first year reporting began and the first year after vaccine licensure.
††† Average annual number of reported cases during 1966–1968, 3 years before vaccine licensure.
§§§ Estimated number of cases based on seroprevalence data in the population and on the risk that women infected during a childbearing year would have a fetus with congenital rubella syndrome (*7*).
¶¶¶ Estimated number of cases from population-based surveillance studies before vaccine licensure in 1985 (*8*).
**** Excludes 71 cases of *Haemophilus influenzae* disease of unknown serotype.

and for three doses of hepatitis B vaccine was 84%. Coverage was substantially lower for the recently introduced varicella vaccine (26%) and for the combined series of four DTP/three polio/one measles-containing vaccine/three Hib (76%) (*15*). Coverage for rotavirus vaccine, licensed in December 1998, has not yet been measured among children aged 19–35 months. Coverage among children aged 5–6 years has exceeded 95% each school year since 1980 for DTP; polio; and measles, mumps, and rubella vaccines (CDC, unpublished data, 1998).

Vaccine Impact

Dramatic declines in morbidity have been reported for the nine vaccine-preventable diseases for which vaccination was universally recommended for use in children before 1990 (excluding hepatitis B, rotavirus, and varicella) (Table 2).

Vaccines — Continued

Morbidity associated with smallpox and polio caused by wild-type viruses has declined 100% and nearly 100% for each of the other seven diseases.

Smallpox. Smallpox is the only disease that has been eradicated. During 1900–1904, an average of 48,164 cases and 1528 deaths caused by both the severe (variola major) and milder (variola minor) forms of smallpox were reported each year in the United States (*1*). The pattern in the decline of smallpox was sporadic. Outbreaks of variola major occurred periodically in the first quarter of the 1900s and then ceased abruptly in 1929. Outbreaks of variola minor declined in the 1940s, and the last case in the United States was reported in 1949. The eradication of smallpox in 1977 enabled the discontinuation of prevention and treatment efforts, including routine vaccination. As a result, in 1985 the United States recouped its investment in worldwide eradication every 26 days (*1*).

Polio. Polio vaccine was licensed in the United States in 1955. During 1951–1954, an average of 16,316 paralytic polio cases and 1879 deaths from polio were reported each year (*9,10*). Polio incidence declined sharply following the introduction of vaccine to <1000 cases in 1962 and remained below 100 cases after that year. In 1994, every dollar spent to administer oral poliovirus vaccine saved $3.40 in direct medical costs and $2.74 in indirect societal costs (*14*). The last documented indigenous transmission of wild poliovirus in the United States occurred in 1979. Since then, reported cases have been either vaccine-associated or imported. As of 1991, polio caused by wild-type viruses has been eliminated from the Western Hemisphere (*16*). Enhanced use of the inactivated polio vaccine is expected to reduce the number of vaccine-associated cases, which averaged eight cases per year during 1980–1994 (*17*).

Measles. Measles vaccine was licensed in the United States in 1963. During 1958–1962, an average of 503,282 measles cases and 432 measles-associated deaths were reported each year (*9–11*). Measles incidence and deaths began to decline in 1965 and continued a 33-year downward trend. This trend was interrupted by epidemics in 1970–1972, 1976–1978, and 1989–1991. In 1998, measles reached a provisional record low number of 89 cases with no measles-associated deaths (*13*). All cases in 1998 were either documented to be associated with international importations (69 cases) or believed to be associated with international importations (CDC, unpublished data, 1998). In 1994, every dollar spent to purchase measles-containing vaccine saved $10.30 in direct medical costs and $3.20 in indirect societal costs (*7*).

Hib. The first Hib vaccines were polysaccharide products licensed in 1985 for use in children aged 18–24 months. Polysaccharide-protein conjugate vaccines were licensed subsequently for use in children aged 18 months (in 1987) and later for use in children aged 2 months (in 1990). Before the first vaccine was licensed, an estimated 20,000 cases of Hib invasive disease occurred each year, and Hib was the leading cause of childhood bacterial meningitis and postnatal mental retardation (*8,18*). The incidence of disease declined slowly after licensure of the polysaccharide vaccine; the decline accelerated after the 1987 introduction of polysaccharide-protein conjugate vaccines for toddlers and the 1990 recommendation to vaccinate infants. In 1998, 125 cases of Hib disease and *Haemophilis influenzae* invasive disease of unknown serotype among children aged <5 years were provisionally reported: 54 were Hib and 71 were of unknown serotype (CDC, unpublished data, 1998). In less than a decade, the use of the Hib conjugate vaccines nearly eliminated Hib invasive disease among children.

Vaccines — Continued

Future Direction

Vaccines are one of the greatest achievements of biomedical science and public health. Despite remarkable progress, several challenges face the U.S. vaccine-delivery system. The infrastructure of the system must be capable of successfully implementing an increasingly complex vaccination schedule. An estimated 11,000 children are born each day in the United States, each requiring 15–19 doses of vaccine by age 18 months to be protected against 11 childhood diseases (*6*). In addition, licensure of new vaccines is anticipated against pneumococcal and meningococcal infections, influenza, parainfluenza, respiratory syncytial virus (RSV), and against chronic diseases (e.g., gastric ulcers, cancer caused by *Helicobacter pylori*, cervical cancer caused by human papilloma virus, and rheumatic heart disease that occurs as a sequela of group A streptococcal infection). Clinical trials are under way for vaccines to prevent human immunodeficiency virus infection, the cause of acquired immunodeficiency syndrome.

To achieve the full potential of vaccines, parents must recognize vaccines as a means of mobilizing the body's natural defenses and be better prepared to seek vaccinations for their children; health-care providers must be aware of the latest developments and recommendations; vaccine supplies and financing must be made more secure, especially for new vaccines; researchers must address increasingly complex questions about safety, efficacy, and vaccine delivery and pursue new approaches to vaccine administration more aggressively; and information technology to support timely vaccinations must be harnessed more effectively. In addition, the vaccine-delivery system must be extended to new populations of adolescents and adults. Each year, thousands of cases of potentially preventable influenza, pneumococcal disease, and hepatitis B occur in these populations. Many of the new vaccines will be targeted at these age groups. The U.S. vaccine-delivery system must routinely include these populations to optimally prevent disease, disability, and death.

Despite the dramatic declines in vaccine-preventable diseases, such diseases persist, particularly in developing countries. The United States has joined many international partners, including the World Health Organization and Rotary International, in seeking to eradicate polio by the end of 2000. Efforts to accelerate control of measles, which causes approximately one million deaths each year (*5*), and to expand rubella vaccination programs also are under way around the world. Efforts are needed to expand the use of existing vaccines in routine childhood vaccination programs worldwide and to successfully introduce new vaccines as they are developed. Such efforts can benefit the United States and other developed countries by decreasing disease importations from developing countries.

Reported by: National Immunization Program, CDC.

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Vaccines — Continued

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Tobacco Use Among Middle and High School Students — Florida, 1998 and 1999

Tobacco use is the single leading preventable cause of death in the United States (*1*), and an estimated $2 billion is spent annually in Florida to treat disease caused by smoking (*2*). Florida appropriated $23 million in fiscal year 1997 and $70 million in fiscal year 1998 to fund the Florida Pilot Program on Tobacco Control to prevent and reduce tobacco use among Florida youth. To determine the prevalence of cigarette, cigar, and smokeless tobacco (i.e., chewing tobacco and snuff) use among Florida middle and high school students in public schools, the Florida Department of Health conducted the Florida Youth Tobacco Survey (FYTS) in February 1998 and February 1999. The purpose of these surveys was to establish baseline parameters and monitor the progress of the pilot program, which began in April 1998. This report summarizes advance data from the surveys, which indicate that, from 1998 to 1999, the percentage of Florida public middle and high school students who smoked cigarettes decreased significantly and that the percentage of middle school students who smoked cigars and used smokeless tobacco products decreased significantly.

The 1998 FYTS used a two-stage cluster sample design within each of seven geographic regions (i.e., selecting schools within a region and classrooms within schools) for public middle schools (grades 6–8) and for public high schools (grades 9–12) to

Tobacco Use — Continued

obtain a representative sample of 11,865 middle and 10,675 high school students. The 1999 survey was conducted in 242 of the 255 schools that participated in the 1998 survey sample, among a representative sample of 11,724 middle and 9254 high school students. The middle school response rates for 1998 and 1999 were 97% and 93%, respectively; the student response rates were 82% and 88%, respectively; and the overall response rates were 80% and 82%, respectively. For the high school surveys, school response rates for 1998 and 1999 were 95% and 89%, respectively; the student response rates were 76% and 79%, respectively; and the overall response rates were 72% and 70%, respectively. Data were weighted to provide estimates that can be generalized to all public school students in grades 6–12 in the seven regions and in the state. Survey data were analyzed and point estimates were generated using SAS software, and variance estimates and 95% confidence intervals were calculated using SUDAAN.

Students completed a self-administered questionnaire that included questions about tobacco use (cigarette, cigar, and smokeless tobacco), exposure to environmental tobacco smoke, minors' ability to purchase or otherwise obtain tobacco products, knowledge and attitudes about tobacco, familiarity with pro- and anti-tobacco media messages, and tobacco-use curriculum in schools. Current tobacco use prevalence data are presented in this report; data on other findings and survey methodology are available from the Florida Department of Health (*3*). Current cigarette, cigar, and smokeless tobacco users were students who reported product use on ≥1 of the 30 days preceding the survey.

From 1998 to 1999, the prevalence of current cigarette use among middle school students declined from 18.5% to 15.0% ($p<0.01$) (Table 1); among high school students, use declined from 27.4% to 25.2% ($p=0.02$) (Table 2). Among middle school students, declines in current cigarette use were significant for both males and females; among high school students, the decline was statistically significant among females. Among both middle and high school students, the declines were most pronounced among non-Hispanic white students: from 22.0% to 16.1% ($p<0.01$) among middle school students and from 34.8% to 31.3% ($p=0.02$) among high school students. The change in prevalence of current cigarette use among non-Hispanic black or Hispanic students at the middle or high school level was not statistically significant. Prevalence of current cigarette use in these groups was lower than that among non-Hispanic whites in both 1998 and 1999.

Current cigar use declined significantly only among middle school students, from 14.1% in 1998 to 11.9% in 1999 ($p<0.01$). This overall decline was almost entirely accounted for by the decline among males, from 17.6% to 14.2%. Among racial/ethnic groups at the middle school level, the decline in current use of cigars was statistically significant only among non-Hispanic white students.

Current smokeless tobacco use declined among middle school students from 6.9% in 1998 to 4.9% in 1999. The decline occurred among male and female middle school students and among non-Hispanic white and Hispanic middle school students. Students at every grade in middle school were significantly less likely to use smokeless tobacco in 1999 than in 1998. Current use of smokeless tobacco products remained unchanged among high school students from 1998 to 1999.

Tobacco Use — Continued

TABLE 1. Percentage of public middle school students who used cigarettes, cigars, or smokeless tobacco, by sex, race/ethnicity, and grade — Florida Youth Tobacco Survey, 1998 and 1999

	Current cigarette use*					Current cigar use†					Current smokeless tobacco use§				
	1998 (n=11,031)		1999 (n=10,268)			1998 (n=11,535)		1999 (n=10,890)			1998 (n=11,633)		1999 (n=10,919)		
Characteristic	**%**	**(95% CI¶)**	**%**	**(95% CI)**	**p value**	**%**	**(95% CI)**	**%**	**(95% CI)**	**p value**	**%**	**(95% CI)**	**%**	**(95% CI)**	**p value**
Sex															
Female	18.1	(±1.5)	14.9	(±1.8)	<0.01	10.3	(±1.0)	9.4	(±1.4)	0.26	4.4	(±0.6)	2.8	(±0.6)	<0.01
Male	18.9	(±1.7)	15.0	(±1.4)	<0.01	17.6	(±1.3)	14.2	(±1.3)	<0.01	9.3	(±1.1)	6.8	(±0.9)	<0.01
Race/Ethnicity**															
Non-Hispanic white	22.0	(±1.8)	16.1	(±1.7)	<0.01	14.5	(±1.2)	11.1	(±1.4)	<0.01	7.6	(±1.1)	4.8	(±0.8)	<0.01
Non-Hispanic black	9.5	(±1.4)	8.5	(±1.5)	0.34	13.0	(±1.6)	12.3	(±1.9)	0.55	5.3	(±1.1)	4.4	(±1.4)	0.27
Hispanic	16.8	(±2.1)	16.1	(±2.6)	0.51	13.6	(±1.7)	12.9	(±2.3)	0.53	5.5	(±1.3)	3.6	(±1.1)	0.02
Grade															
6	10.5	(±1.4)	8.0	(±1.3)	0.01	7.8	(±0.9)	6.7	(±1.2)	0.16	6.0	(±1.0)	3.9	(±0.9)	<0.01
7	19.3	(±2.1)	16.6	(±2.5)	0.07	14.2	(±1.7)	11.4	(±1.8)	0.02	7.0	(±1.2)	5.2	(±1.0)	0.01
8	25.0	(±2.3)	19.5	(±2.5)	<0.01	19.5	(±1.7)	16.8	(±2.2)	0.06	7.1	(±1.1)	4.8	(±1.0)	<0.01
Total	**18.5**	**(±1.4)**	**15.0**	**(±1.3)**	**<0.01**	**14.1**	**(±1.0)**	**11.9**	**(±1.1)**	**<0.01**	**6.9**	**(±0.7)**	**4.9**	**(±0.6)**	**<0.01**

*Smoked cigarettes on ≥1 of the 30 days preceding the survey.
†Smoked cigars on ≥1 of the 30 days preceding the survey.
§Used smokeless tobacco on ≥1 of the 30 days preceding the survey.
¶Confidence interval.
**Numbers for other racial/ethnic groups were too small for meaningful analysis.

TABLE 2. Percentage of public high school students who used cigarettes, cigars, or smokeless tobacco, by sex, race/ethnicity, and grade — Florida Youth Tobacco Survey, 1998 and 1999

Characteristic	Current cigarette use*					Current cigar use†					Current smokeless tobacco use§				
	1998 (n=9,991)		1999 (n=9,991)			1998 (n=10,473)		1999 (n=9,099)			1998 (n=10,202)		1999 (n=9,041)		
	%	(95% CI¶)	%	(95% CI)	p value	%	(95% CI)	%	(95% CI)	p value	%	(95% CI)	%	(95% CI)	p value
Sex															
Female	28.3	(±1.9)	25.9	(±2.0)	0.04	14.1	(±1.2)	14.1	(±1.6)	0.96	2.1	(±0.5)	2.4	(±0.7)	0.59
Male	26.5	(±1.9)	24.6	(±2.4)	0.16	27.0	(±1.8)	24.7	(±1.9)	0.08	11.2	(±1.6)	10.3	(±1.6)	0.26
Race/Ethnicity**															
Non-Hispanic white	34.8	(±1.8)	31.3	(±2.0)	0.02	22.7	(±1.6)	21.4	(±2.2)	0.24	8.7	(±1.5)	8.0	(±1.7)	0.32
Non-Hispanic black	9.8	(±1.5)	9.4	(±1.9)	0.61	17.1	(±2.1)	14.8	(±1.9)	0.09	3.5	(±1.1)	2.8	(±0.7)	0.24
Hispanic	24.8	(±2.6)	24.2	(±2.8)	0.70	17.9	(±2.0)	18.5	(±2.4)	0.82	2.9	(±0.8)	4.4	(±1.2)	0.07
Grade															
9	25.9	(±2.6)	23.3	(±2.8)	0.17	19.3	(±2.3)	18.8	(±2.7)	0.78	6.5	(±1.4)	6.8	(±1.7)	0.74
10	25.5	(±2.8)	24.4	(±2.8)	0.50	19.5	(±2.2)	19.1	(±2.2)	0.76	7.0	(±1.7)	5.9	(±1.5)	0.38
11	29.8	(±2.5)	27.0	(±2.4)	0.08	23.2	(±2.5)	19.2	(±2.2)	0.01	7.3	(±1.4)	5.3	(±1.1)	0.02
12	29.8	(±2.9)	27.8	(±4.0)	0.32	21.5	(±2.7)	21.2	(±2.8)	0.86	6.4	(±1.3)	7.1	(±1.7)	0.47
Total	**27.4**	**(±1.6)**	**25.2**	**(±1.8)**	**0.02**	**20.7**	**(±1.2)**	**19.5**	**(±1.5)**	**0.14**	**6.7**	**(±1.0)**	**6.4**	**(±0.9)**	**0.22**

*Smoked cigarettes on ≥1 of the 30 days preceding the survey.
†Smoked cigars on ≥1 of the 30 days preceding the survey.
§Used smokeless tobacco on ≥1 of the 30 days preceding the survey.
¶Confidence interval.
**Numbers for other racial/ethnic groups were too small for meaningful analysis.

Tobacco Use — Continued

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Editorial Note: Nationwide, the prevalence of cigarette smoking among adolescents has increased during the 1990s (*4,5*); however, smoking prevalence rates among adolescents may have peaked and could be starting to decline (*6*). National data for comparison with the Florida data for 1998 and 1999 are unavailable, but the significant decline from 1998 to 1999 in Florida is larger than any annual decline observed nationally among youth since 1980 (*5,6*). In California and Massachusetts, which have initiated comprehensive tobacco prevention and education efforts, annual smoking rate increases among youth appear to have slowed, but no decline similar to that reported in Florida has been observed (*7,8*).

The Florida Pilot Program on Tobacco Control implements activities to combat tobacco use among youth aged <18 years and tobacco's attractiveness to youths. The program's major component is a youth-oriented, counter-marketing media campaign developed to reduce the allure of smoking. Community partnerships in all 67 Florida counties, an education and training initiative, and enhanced enforcement of youth tobacco access laws are the other program components. The FYTS is a key instrument to assess the program's effectiveness; however, more direct assessments are needed to determine how much of the decline in tobacco use can be attributed to the various pilot program activities and how much may be a result of cigarette price increases that occurred during the study period. Additional evaluation of program activities can be used to strengthen the program's effectiveness for diverse populations such as non-Hispanic black and Hispanic students, among whom no statistically significant declines in cigarette use were observed.

The findings described in this report are subject to at least four limitations. First, these data apply only to youth who attend public middle or high school and, therefore, are not representative of all persons in this age group. During the 1997–98 school year in Florida, 5.9% of persons aged ≥16 years had left a high school program and had not completed high school (M.J. Butler, Florida Department of Education, personal communication, 1999). In addition, approximately 11% of middle and high school students are enrolled in private schools. Second, in both survey years, tobacco use is based on self-report. Third, trend analysis is limited to 2 years and will be enhanced by additional data collection. Finally, data are not available to fully assess the impact of recent cigarette price increases and program activities on the decline in tobacco use in Florida.

Comparisons between the significant decline in tobacco use among middle and high school students in Florida and trends in the United States overall will enable the findings in this report to be assessed more fully. However, if the observed declines in youth tobacco use are sustained over time, programs similar to the Florida Pilot Program on Tobacco Control or program components should be considered by other states to reverse the nationwide increase in youth smoking observed during the 1990s (*4,5*).

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Tobacco Use — Continued

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Transfusion-Transmitted Malaria — Missouri and Pennsylvania, 1996–1998

Malaria is a rare but potentially serious complication of blood transfusion. During 1958–1998, 103 cases of transfusion-transmitted malaria in the United States were reported to CDC. This report summarizes the investigation of three cases that occurred during 1996–1998 in Missouri and Pennsylvania and illustrates the key features of transfusion-transmitted malaria and the importance of donor screening.

Case 1, Missouri

A 70-year-old man with Waldenström's macroglobulinemia received 3 units of packed red blood cells (RBCs) on November 12, 1996. On November 27, he was hospitalized with fever; peripheral blood smears showed intraerythrocytic parasites suspected to be either *Plasmodia* or *Babesia*. Despite treatment with oral quinine and clindamycin, the patient developed respiratory and renal failure and died on November 30. He had not traveled outside the United States since the 1940s but had received 7 units of packed RBCs during 1996 (two in May, two in June, and the three received in November).

CDC confirmed *Plasmodium falciparum* parasites in the patient's blood smears (6% parasitemia). Stored serum samples from all donors were tested for antimalarial antibodies at CDC by the indirect fluorescent antibody (IFA) test. One of the donors, a U.S. Army reservist whose blood was collected by a civilian blood center, had elevated titers (1:16,384 to *P. falciparum*, 1:256 to both *P. malariae* and *P. ovale*, and 1:64 to *P. vivax*). Blood smears obtained from this donor in March 1997 demonstrated rare *P. falciparum* rings, and DNA of the same species was detected by polymerase chain reaction (PCR) of whole blood. The donor reported no fever at the time of blood donation. He had immigrated to the United States from west Africa in April 1996 (*1*). He was treated with quinine and doxycycline.

Transfusion-Transmitted Malaria — Continued

Case 2, Missouri

An 85-year-old man was hospitalized October 9–11, 1997, for gastrointestinal bleeding and received 5 units of packed RBCs. He was again hospitalized on November 1 with recurrent gastrointestinal bleeding and fever, and peripheral blood smears showed *P. falciparum* infection. Treatment was initiated with oral quinine and doxycycline but changed to intravenous quinidine and doxycycline when his mental status deteriorated the following day. A computerized tomography scan showed a cerebral vascular accident; the patient died on November 18. He had not traveled outside the United States since the 1940s.

Stored serum samples from all donors were tested. One donor, a recruit at a military training base whose blood was collected by a civilian blood center and who had immigrated to the United States from west Africa in 1995 (*1*), had positive malaria serology (titers were 1:16,384 to *P. falciparum*, 1:4096 to *P. malariae*, 1:1024 to *P. ovale*, and 1:64 to *P. vivax*). Blood smears obtained from this donor in November 1997 did not show malaria parasites, but *P. falciparum* DNA was detected by PCR of whole blood. He was treated with quinine and doxycycline.

Case 3, Pennsylvania

A 49-year-old man received 4 units of packed RBCs during surgery for hip replacement on January 15, 1998. He was again hospitalized on February 19 with fever, hypotension, and renal failure. Blood smears showed *P. falciparum* (12% parasitemia). He was treated successfully with intravenous quinidine and doxycycline and exchange blood transfusion. He had never traveled outside the United States.

Stored serum samples from all donors were tested, and one donor had elevated IFA titers (1:16,384 to *P. falciparum*, 1:16,384 to *P. malariae*, 1:1024 to *P. ovale*, and 1:256 to *P. vivax*). This donor was born in west Africa, had lived in Europe, then had returned to west Africa where he had lived for approximately 20 years before immigrating to the United States in 1996. PCR performed on a stored sample from the time of donation detected *P. falciparum* DNA.

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Editorial Note: Transfusion-transmitted malaria is rare in the United States, occurring at an estimated rate of 0.25 cases per million blood units collected (*2*). Because no approved tests are available in the United States to screen donated blood for malaria, prevention of transfusion-transmitted malaria requires careful questioning of prospective donors (*3*). Recommendations for deferral of such donors have been published by the Food and Drug Administration (FDA) (*3*); the American Association of Blood Banks (AABB) has published standards consistent with FDA recommendations (*4*). Correct application of these standards should have prevented these three cases.

Transfusion-Transmitted Malaria — Continued

Donors who are residents of nonmalarious countries are deferred for 1 year after return from travel to a malarious area. Donors who have had malaria are deferred for 3 years; immigrants, refugees, citizens, or residents of malarious areas are deferred for 3 years after leaving such areas. These criteria are supported by observations that 97% and 99% of reported malaria cases in U.S. and foreign civilians occur within 1 and 3 years, respectively, of having been in a malarious area (CDC, unpublished data, 1995).

Persons who emigrate from highly malarious areas and have acquired malarial immunity may have asymptomatic parasitemia that can persist for varying periods, depending on the species. *P. falciparum* rarely persists longer than 2 years, although it has persisted for up to 13 years (*5,6*). *P. malariae* can persist asymptomatically in the blood at low levels for up to 40 years. Therefore, rare cases of transfusion-transmitted malaria will continue to occur despite correct application of donor exclusion criteria. FDA, in consultation with CDC, is developing a new guidance document for blood collection centers, with revised recommendations for donor questioning about exposure to malaria and exclusion criteria for donor deferral.

In the three cases described in this report, the screening process at the time of donation, which is critical to reducing the risk for transfusion-transmitted malaria (particularly infections caused by species other than *P. malariae*), did not yield accurate information. A history of having been in a malarious area within the previous 3 years was elicited only during subsequent questioning. In cases 1 and 2, the screening questions about travel to malarious areas, previous malaria infection, or antimalarial drug use within the previous 3 years were not successful in preventing donation. The AABB has recommended uniform donor-history questions that, instead of relying on donors to determine whether they have been in a malarious area, inquire generally about travel outside the United States or Canada within the previous 3 years. Blood bank staff then determine whether travel was to a malarious area. In case 3, these questions were asked but failed to elicit accurate information, presumably because the donor misunderstood the travel-related questions.

Donors who have been implicated as the infection source in transfusion-transmitted malaria cases typically have very low levels of parasitemia that may be undetectable, even with microscopic examination of several thick blood films. Of 60 cases reported in the United States during 1963–1998 where a blood smear was obtained, only 18 (30%) of implicated donors had *Plasmodium* parasites detected on the blood smear. Detection of malaria antibodies provides evidence of an immune response to current or past infection, but these tests may remain positive for more than 10 years after parasitemia has resolved; therefore, malaria antibody detection to screen blood donations would result in the exclusion of otherwise healthy persons. PCR has increased sensitivity over blood film examination, positivity indicating current malaria infection (*7*), and species differentiation when microscopic examination may be inconclusive (*8*). The availability of testing for malaria by antibody detection or PCR is limited by lack of commercial reagents. In previous investigations of transfusion-transmitted malaria cases, antibody detection has been the method of choice to identify infected donors (*9*). However, since detection of antibodies does not necessarily indicate parasitemia, the use of PCR is a helpful tool for investigations.

These cases illustrate the importance of considering malaria in diagnosing a febrile illness following blood transfusion in any patient. Transfusion-transmitted malaria

Transfusion-Transmitted Malaria — Continued

usually occurs in patients with underlying diseases or who have undergone surgery (*10*) and can be life-threatening. Diagnosis may be delayed because fever may be attributed to the underlying illness, postoperative infection, or tissue reaction to surgical trauma (*10*).

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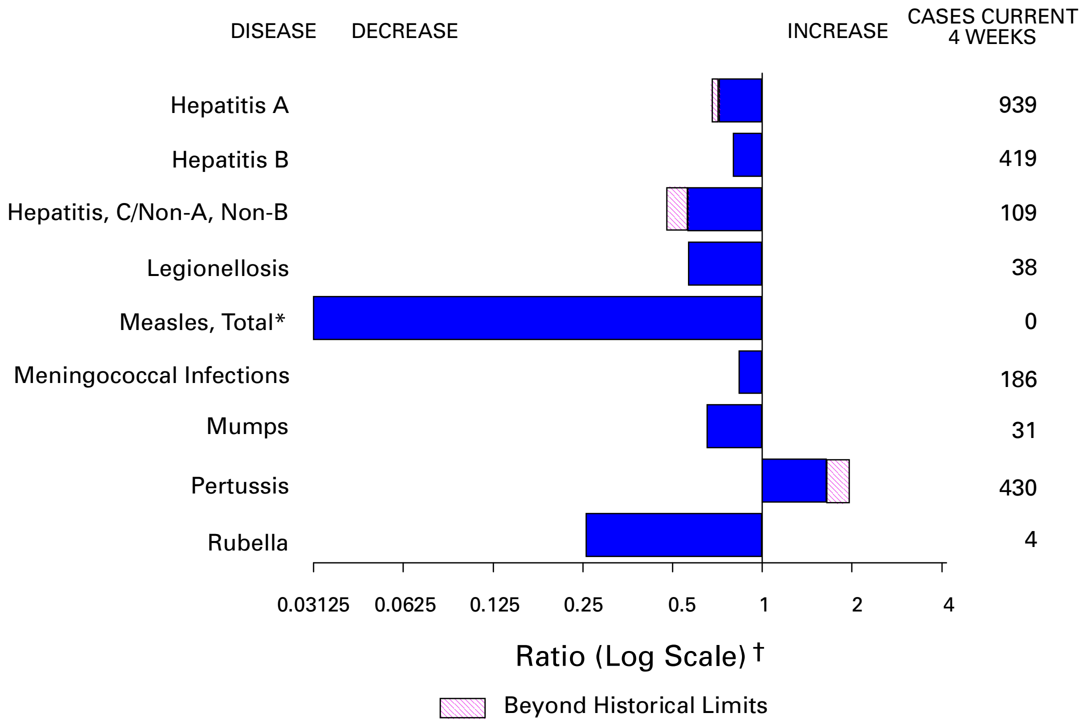
Notice to Readers

Publication of *An Ounce of Prevention...What Are the Returns?*

The second edition of *An Ounce of Prevention...What are the Returns?* is now available. This publication outlines strategies for and economic benefits of health promotion and disease and injury prevention. In addition, it outlines interventions in 19 areas of chronic and infectious disease and injury in which prevention can improve the quality of life and increase longevity. Each section presents the health impact of the disease, injury, or disability on U.S. society; the effectiveness of prevention strategies; the costs of the disease, injury, or disability; and the cost-effectiveness of prevention strategies.

An Ounce of Prevention is available on the World-Wide Web, <http://www.cdc.gov/epo/prevent.htm>, or from CDC's Prevention Effectiveness Branch, Division of Prevention Research and Analytic Methods, Epidemiology Program Office, Mailstop D-01, 1600 Clifton Road, N.E., Atlanta, GA 30333; e-mail epopeb@cdc.gov.

FIGURE I. Selected notifiable disease reports, comparison of provisional 4-week totals ending March 27, 1999, with historical data — United States



* No measles cases were reported for the current 4-week period, yielding a ratio for week 12 of zero (0).

† 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 March 27, 1999 (12th Week)

	Cum. 1999		Cum. 1999
Anthrax	-	Plague	-
Brucellosis	10	Poliomyelitis, paralytic	-
Cholera	-	Psittacosis	8
Congenital rubella syndrome	-	Rabies, human	-
Cryptosporidiosis*	221	Rocky Mountain spotted fever (RMSF)	29
Diphtheria	-	Streptococcal disease, invasive Group A	411
Encephalitis: California*	1	Streptococcal toxic-shock syndrome*	11
eastern equine*	-	Syphilis, congenital¶	-
St. Louis*	-	Tetanus	4
western equine*	-	Toxic-shock syndrome	24
Hansen Disease	12	Trichinosis	3
Hantavirus pulmonary syndrome*†	2	Typhoid fever	58
Hemolytic uremic syndrome, post-diarrheal*	5	Yellow fever	-
HIV infection, pediatric*§	18		

-: 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 from reports to the Division of HIV/AIDS Prevention–Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention (NCHSTP), last update February 21, 1999.
¶ Updated from reports to the Division of STD Prevention, NCHSTP.

TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending March 27, 1999, and March 28, 1998 (12th Week)

Reporting Area	AIDS		Chlamydia		*Escherichia coli* O157:H7		Gonorrhea		Hepatitis C/NA,NB	
					NETSS†	PHLIS§				
	Cum. 1999*	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1999	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998
UNITED STATES	7,049	10,878	114,094	130,076	249	117	63,077	76,310	500	924
NEW ENGLAND	359	310	4,343	4,847	42	27	1,434	1,367	46	21
Maine	5	4	153	211	3	-	10	11	-	-
N.H.	13	12	225	233	2	1	19	26	-	-
Vt.	4	8	107	66	3	-	12	1	1	2
Mass.	245	92	2,060	1,924	19	16	644	501	45	19
R.I.	20	34	510	577	1	1	126	74	-	-
Conn.	72	160	1,288	1,836	14	9	623	754	-	-
MID. ATLANTIC	1,497	3,359	16,204	15,704	13	1	8,540	9,094	32	86
Upstate N.Y.	74	426	N	N	10	-	727	1,510	28	75
N.Y. City	837	1,934	7,966	8,251	-	1	3,825	3,817	-	-
N.J.	375	516	2,310	2,748	3	-	1,161	1,649	-	-
Pa.	211	483	5,928	4,705	N	-	2,827	2,118	4	11
E.N. CENTRAL	487	793	17,035	19,675	40	25	11,571	14,915	107	113
Ohio	95	154	5,418	6,530	21	8	3,205	3,826	-	5
Ind.	52	80	-	-	5	7	726	1,456	-	2
Ill.	231	373	6,456	4,536	4	3	4,277	4,095	2	15
Mich.	80	144	4,249	5,392	10	4	2,967	4,294	105	91
Wis.	29	42	912	3,217	N	3	396	1,244	-	-
W.N. CENTRAL	161	195	3,774	8,266	54	15	1,319	3,536	21	143
Minn.	26	31	1,284	1,653	16	12	496	565	-	-
Iowa	12	9	396	874	5	2	160	239	-	3
Mo.	84	100	-	2,927	4	1	-	1,701	20	140
N. Dak.	3	3	102	234	2	-	7	21	-	-
S. Dak.	4	7	418	390	1	-	38	66	-	-
Nebr.	11	14	679	713	19	-	291	288	-	-
Kans.	21	31	895	1,475	7	-	327	656	1	-
S. ATLANTIC	1,888	2,971	25,922	25,643	26	10	19,353	20,594	50	27
Del.	31	40	694	563	1	-	403	334	-	-
Md.	254	334	1,805	1,740	1	-	2,114	2,073	18	3
D.C.	67	193	N	N	-	-	588	813	-	-
Va.	103	176	3,153	2,774	6	2	2,170	1,820	6	1
W. Va.	14	19	547	1,117	-	1	94	365	6	2
N.C.	126	216	5,062	5,097	7	3	4,448	4,416	-	7
S.C.	132	162	4,816	4,026	1	1	2,397	2,607	6	-
Ga.	209	370	3,366	5,866	1	-	2,422	4,663	1	8
Fla.	952	1,461	6,479	4,460	9	3	4,717	3,503	13	6
E.S. CENTRAL	303	382	8,722	9,063	17	4	7,615	8,664	25	30
Ky.	37	63	-	1,448	5	-	-	850	1	6
Tenn.	132	140	3,370	3,030	8	3	2,627	2,597	23	21
Ala.	71	118	3,290	2,379	4	-	3,010	2,965	1	3
Miss.	63	61	2,062	2,206	-	1	1,978	2,252	-	-
W.S. CENTRAL	989	1,356	12,798	18,501	6	6	7,823	11,038	24	16
Ark.	34	52	1,234	849	2	2	590	1,092	2	2
La.	69	207	3,881	2,813	1	2	3,349	2,442	12	-
Okla.	20	71	1,944	2,183	2	2	1,011	1,169	1	-
Tex.	866	1,026	5,739	12,656	1	-	2,873	6,335	9	14
MOUNTAIN	213	348	6,355	6,952	16	6	1,702	1,848	46	136
Mont.	3	10	271	211	-	-	5	11	4	4
Idaho	5	8	399	454	-	1	25	41	4	54
Wyo.	1	1	180	180	1	1	7	10	14	32
Colo.	57	65	1,748	1,813	5	2	460	588	7	8
N. Mex.	9	52	971	951	1	-	173	176	4	19
Ariz.	89	126	1,837	2,382	4	1	724	805	10	-
Utah	27	35	356	512	5	1	38	58	1	9
Nev.	22	51	593	449	-	-	270	159	2	10
PACIFIC	1,152	1,164	18,941	21,425	35	23	3,720	5,254	149	352
Wash.	59	74	2,810	2,526	4	8	495	443	2	5
Oreg.	32	40	1,119	1,362	12	9	162	198	-	8
Calif.	1,040	1,027	14,124	16,568	19	6	2,906	4,445	147	304
Alaska	5	-	453	466	-	-	90	71	-	1
Hawaii	16	23	435	503	-	-	67	97	-	34
Guam	1	-	-	73	N	-	-	6	-	-
P.R.	214	271	U	U	1	U	68	102	-	-
V.I.	3	13	N	N	N	U	U	U	U	U
Amer. Samoa	-	-	U	U	N	U	U	U	U	U
C.N.M.I.	-	-	N	N	N	U	-	8	-	-

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

*Updated monthly from reports to the Division of HIV/AIDS Prevention–Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention, last update February 21, 1999.

†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 March 27, 1999, and March 28, 1998 (12th Week)

Reporting Area	Legionellosis		Lyme Disease		Malaria		Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal
	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999*	Cum. 1998*	Cum. 1999
UNITED STATES	168	280	695	899	223	259	1,260	1,647	990	1,598	984
NEW ENGLAND	12	17	137	172	3	9	16	18	77	78	176
Maine	2	1	-	1	-	-	-	1	3	2	32
N.H.	1	2	-	5	-	-	-	1	-	2	13
Vt.	3	-	-	2	-	-	1	-	-	1	34
Mass.	2	5	91	39	3	9	10	14	41	41	40
R.I.	1	4	8	14	-	-	1	-	15	9	15
Conn.	3	5	38	111	-	-	4	2	18	23	42
MID. ATLANTIC	42	60	377	565	60	90	47	64	374	359	211
Upstate N.Y.	12	13	116	241	18	21	4	7	32	44	130
N.Y. City	3	15	2	17	13	48	22	9	227	221	U
N.J.	5	3	97	67	21	12	1	20	115	94	51
Pa.	22	29	162	240	8	9	20	28	U	U	30
E.N. CENTRAL	39	109	19	19	14	18	235	236	45	64	1
Ohio	17	33	13	14	2	1	20	46	U	U	-
Ind.	5	25	5	4	4	1	32	37	U	U	-
Ill.	2	15	-	-	-	9	157	98	U	U	-
Mich.	14	15	1	1	6	6	26	38	38	40	1
Wis.	1	21	U	U	2	1	-	17	7	24	-
W.N. CENTRAL	6	17	9	9	8	11	6	45	87	56	92
Minn.	-	1	3	1	-	4	1	2	36	26	20
Iowa	4	2	1	6	2	2	1	-	-	-	20
Mo.	1	7	-	1	5	4	-	33	41	13	4
N. Dak.	-	-	1	-	-	-	-	-	1	1	29
S. Dak.	1	-	-	-	-	-	-	-	3	4	-
Nebr.	-	7	-	-	-	-	1	4	4	-	1
Kans.	-	-	4	1	1	1	3	6	2	12	18
S. ATLANTIC	30	34	98	97	65	54	475	631	149	334	374
Del.	2	6	-	2	-	1	1	6	-	5	-
Md.	5	8	78	85	19	22	102	167	U	U	78
D.C.	-	2	1	4	6	3	10	21	10	25	-
Va.	4	3	-	1	10	5	36	49	17	53	98
W. Va.	N	N	1	-	1	-	1	-	10	17	16
N.C.	4	4	13	-	5	6	130	192	60	161	90
S.C.	5	4	1	-	-	-	61	73	52	73	24
Ga.	-	-	-	2	5	12	56	51	U	U	33
Fla.	10	7	4	3	19	5	78	72	U	U	35
E.S. CENTRAL	8	9	12	11	3	8	228	296	73	132	51
Ky.	2	5	-	1	-	-	-	34	U	U	13
Tenn.	5	2	4	5	2	4	126	148	U	U	21
Ala.	1	1	6	5	1	2	75	62	67	87	17
Miss.	-	1	2	-	-	2	27	52	6	45	-
W.S. CENTRAL	1	2	-	-	5	5	199	211	49	439	16
Ark.	-	-	-	-	-	1	24	30	27	18	-
La.	1	-	-	-	3	3	59	82	U	U	-
Okla.	-	-	-	-	1	-	60	12	22	26	16
Tex.	-	2	-	-	1	1	56	87	-	395	-
MOUNTAIN	11	15	2	1	10	13	18	59	35	52	30
Mont.	-	1	-	-	1	-	-	-	-	2	12
Idaho	-	-	-	-	1	1	-	-	-	1	-
Wyo.	-	1	1	-	-	-	-	-	-	1	8
Colo.	1	4	-	-	4	4	-	4	U	U	1
N. Mex.	1	1	1	-	1	4	-	4	10	9	-
Ariz.	1	1	-	-	3	2	16	46	U	U	9
Utah	4	6	-	-	-	1	1	2	11	11	-
Nev.	4	1	-	1	-	1	1	3	14	28	-
PACIFIC	19	17	41	25	55	51	36	87	101	84	33
Wash.	2	1	-	-	3	-	5	4	58	41	-
Oreg.	-	-	1	2	7	10	-	2	U	U	-
Calif.	17	16	40	23	42	41	29	81	U	U	30
Alaska	-	-	-	-	-	-	1	-	8	10	3
Hawaii	-	-	-	-	3	-	1	-	35	33	-
Guam	-	1	-	-	-	1	-	-	-	34	-
P.R.	-	-	-	-	-	-	52	52	-	6	14
V.I.	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	-	-	-	-	-	-	50	-	26	-

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

*Cumulative reports of provisional tuberculosis cases for 1998 and 1999 are unavailable ("U") for some areas using the Tuberculosis Information Management System (TIMS).

TABLE III. Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending March 27, 1999, and March 28, 1998 (12th Week)

Reporting Area	*H. influenzae*, invasive		Hepatitis (Viral), by type				Measles (Rubeola)					
			A		B		Indigenous		Imported†		Total	
	Cum. 1999*	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	1999	Cum. 1999	1999	Cum. 1999	Cum. 1999	Cum. 1998
UNITED STATES	267	299	3,298	4,569	1,236	1,934	-	8	-	9	17	9
NEW ENGLAND	21	21	34	86	20	32	-	-	-	1	1	1
Maine	2	2	2	9	-	-	-	-	-	-	-	-
N.H.	2	1	5	5	2	4	-	-	-	1	1	-
Vt.	3	2	1	4	1	-	-	-	-	-	-	-
Mass.	11	16	11	25	15	16	-	-	-	-	-	1
R.I.	-	-	-	5	2	1	-	-	-	-	-	-
Conn.	3	-	15	38	-	11	-	-	-	-	-	-
MID. ATLANTIC	35	41	187	366	142	284	-	-	-	-	-	1
Upstate N.Y.	21	15	57	79	33	70	U	-	U	-	-	-
N.Y. City	2	12	28	139	28	72	-	-	-	-	-	-
N.J.	12	13	33	69	24	51	-	-	-	-	-	1
Pa.	-	1	69	79	57	91	-	-	-	-	-	-
E.N. CENTRAL	25	41	808	750	110	433	-	-	-	-	-	1
Ohio	16	19	192	94	26	20	-	-	-	-	-	-
Ind.	1	5	29	87	4	214	U	-	U	-	-	-
Ill.	7	16	89	196	-	58	-	-	-	-	-	-
Mich.	1	-	496	311	80	119	-	-	-	-	-	1
Wis.	-	1	2	62	-	22	-	-	-	-	-	-
W.N. CENTRAL	22	8	166	421	68	103	-	-	-	-	-	-
Minn.	5	2	11	15	9	6	-	-	-	-	-	-
Iowa	5	1	28	176	12	13	U	-	U	-	-	-
Mo.	8	1	103	179	39	72	-	-	-	-	-	-
N. Dak.	-	-	-	2	-	1	-	-	-	-	-	-
S. Dak.	1	-	2	2	-	1	-	-	-	-	-	-
Nebr.	1	-	13	10	6	4	-	-	-	-	-	-
Kans.	2	4	9	37	2	6	-	-	-	-	-	-
S. ATLANTIC	70	58	392	389	229	204	-	-	-	-	-	5
Del.	-	-	-	-	-	-	-	-	-	-	-	-
Md.	22	14	92	94	42	39	-	-	-	-	-	1
D.C.	2	-	15	13	6	3	-	-	-	-	-	-
Va.	8	9	31	60	23	25	-	-	-	-	-	2
W. Va.	1	2	2	-	1	1	-	-	-	-	-	-
N.C.	11	8	39	24	44	48	-	-	-	-	-	-
S.C.	2	1	5	8	25	-	-	-	-	-	-	-
Ga.	12	17	74	109	27	57	U	-	U	-	-	1
Fla.	12	7	134	81	61	31	-	-	-	-	-	1
E.S. CENTRAL	22	20	97	118	84	120	-	-	-	-	-	-
Ky.	2	5	6	5	7	8	U	-	U	-	-	-
Tenn.	11	9	65	64	52	90	-	-	-	-	-	-
Ala.	8	5	24	30	25	22	-	-	-	-	-	-
Miss.	1	1	2	19	-	-	-	-	-	-	-	-
W.S. CENTRAL	12	17	261	292	76	126	-	-	-	2	2	-
Ark.	-	-	8	11	9	23	-	-	-	-	-	-
La.	3	7	9	8	8	10	-	-	-	-	-	-
Okla.	7	8	91	105	22	7	-	-	-	-	-	-
Tex.	2	2	153	168	37	86	-	-	-	2	2	-
MOUNTAIN	36	49	342	782	112	185	-	1	-	-	1	-
Mont.	1	-	4	7	1	2	-	-	-	-	-	-
Idaho	1	-	9	46	6	7	-	-	-	-	-	-
Wyo.	1	-	1	11	-	2	-	-	-	-	-	-
Colo.	2	9	76	62	26	23	-	1	-	-	1	-
N. Mex.	10	-	8	42	41	75	-	-	-	-	-	-
Ariz.	17	25	193	507	16	41	-	-	-	-	-	-
Utah	4	4	14	45	8	16	-	-	-	-	-	-
Nev.	-	11	37	62	14	19	U	-	U	-	-	-
PACIFIC	24	44	1,011	1,365	395	447	-	7	-	6	13	1
Wash.	-	1	67	136	7	30	-	-	-	-	-	-
Oreg.	10	30	58	188	19	70	-	6	-	-	6	-
Calif.	12	10	883	1,019	360	340	-	1	-	6	7	1
Alaska	2	1	2	1	6	2	-	-	-	-	-	-
Hawaii	-	2	1	21	3	5	-	-	-	-	-	-
Guam	-	-	-	-	-	-	U	-	U	-	-	-
P.R.	-	1	17	13	24	144	-	-	-	-	-	-
V.I.	U	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	-	-	-	-	21	U	-	U	-	-	-

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

*Of 55 cases among children aged <5 years, serotype was reported for 23 and of those, 4 were type b.

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

TABLE III. (Cont'd.) Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending March 27, 1999, and March 28, 1998 (12th Week)

	Meningococcal Disease		Mumps			Pertussis			Rubella		
Reporting Area	Cum. 1999	Cum. 1998	1999	Cum. 1999	Cum. 1998	1999	Cum. 1999	Cum. 1998	1999	Cum. 1999	Cum. 1998
UNITED STATES	608	827	11	86	107	75	916	998	1	6	104
NEW ENGLAND	32	45	-	1	-	1	99	212	-	-	16
Maine	3	4	-	-	-	-	-	4	-	-	-
N.H.	-	1	-	1	-	-	18	17	-	-	-
Vt.	2	1	-	-	-	-	10	25	-	-	-
Mass.	22	19	-	-	-	1	65	161	-	-	1
R.I.	2	3	-	-	-	-	2	-	-	-	-
Conn.	3	17	-	-	-	-	4	5	-	-	15
MID. ATLANTIC	57	83	-	10	9	-	126	110	-	-	58
Upstate N.Y.	9	21	U	2	2	U	97	70	U	-	53
N.Y. City	18	10	-	-	5	-	-	6	-	-	1
N.J.	15	19	-	-	-	-	-	6	-	-	4
Pa.	15	33	-	8	2	-	29	28	-	-	-
E.N. CENTRAL	91	128	3	10	14	4	97	122	-	-	-
Ohio	47	48	3	6	7	4	83	34	-	-	-
Ind.	7	24	U	-	-	U	2	34	U	-	-
Ill.	26	28	-	-	-	-	-	5	-	-	-
Mich.	11	13	-	4	7	-	12	13	-	-	-
Wis.	-	15	-	-	-	-	-	36	-	-	-
W.N. CENTRAL	70	66	-	2	9	1	13	76	-	-	-
Minn.	18	3	-	-	4	-	-	39	-	-	-
Iowa	15	10	U	2	3	U	5	15	U	-	-
Mo.	26	30	-	-	1	-	6	11	-	-	-
N. Dak.	-	-	-	-	1	-	-	-	-	-	-
S. Dak.	5	5	-	-	-	1	2	2	-	-	-
Nebr.	2	3	-	-	-	-	-	3	-	-	-
Kans.	4	15	-	-	-	-	-	6	-	-	-
S. ATLANTIC	108	115	4	17	13	8	70	68	1	2	1
Del.	2	1	-	-	-	-	-	-	-	-	-
Md.	17	14	-	3	-	1	22	15	-	1	-
D.C.	1	-	-	1	-	-	-	-	-	-	-
Va.	14	14	-	2	2	-	7	-	-	-	-
W. Va.	1	3	-	-	-	-	-	1	-	-	-
N.C.	14	19	2	3	6	1	22	34	1	1	1
S.C.	15	15	-	2	3	-	6	6	-	-	-
Ga.	14	33	U	-	-	U	4	-	U	-	-
Fla.	30	16	2	6	2	6	9	12	-	-	-
E.S. CENTRAL	46	67	-	1	1	-	14	14	-	-	-
Ky.	10	11	U	-	-	U	1	1	U	-	-
Tenn.	18	24	-	-	-	-	9	4	-	-	-
Ala.	13	24	-	1	1	-	4	9	-	-	-
Miss.	5	8	-	-	-	-	-	-	-	-	-
W.S. CENTRAL	30	50	2	11	21	1	27	43	-	4	22
Ark.	11	9	-	-	-	1	4	4	-	-	-
La.	7	16	-	-	-	-	-	-	-	-	-
Okla.	10	17	-	1	-	-	2	6	-	-	-
Tex.	2	8	2	10	21	-	21	33	-	4	22
MOUNTAIN	51	53	-	7	8	12	155	176	-	-	5
Mont.	-	2	-	-	-	-	1	1	-	-	-
Idaho	5	3	-	-	-	6	81	66	-	-	-
Wyo.	2	3	-	-	1	-	1	-	-	-	-
Colo.	16	13	-	2	1	2	21	40	-	-	-
N. Mex.	7	7	N	N	N	1	10	47	-	-	1
Ariz.	16	18	-	-	2	1	20	14	-	-	1
Utah	3	6	-	4	-	2	19	4	-	-	2
Nev.	2	1	U	1	4	U	2	4	U	-	1
PACIFIC	123	220	2	27	32	48	315	177	-	-	2
Wash.	16	23	-	-	4	44	174	62	-	-	-
Oreg.	19	63	N	N	N	-	3	17	-	-	-
Calif.	81	130	2	23	19	4	137	95	-	-	1
Alaska	3	1	-	1	2	-	1	-	-	-	-
Hawaii	4	3	-	3	7	-	-	3	-	-	1
Guam	-	-	U	-	2	U	-	-	U	-	-
P.R.	2	2	-	-	1	-	-	2	-	-	-
V.I.	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	-	U	-	2	U	-	1	U	-	-

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

TABLE IV. Deaths in 122 U.S. cities,* week ending March 27, 1999 (12th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	>65	45-64	25-44	1-24	<1	
NEW ENGLAND	581	437	100	31	6	7	57
Boston, Mass.	133	92	32	8	-	1	12
Bridgeport, Conn.	52	38	11	3	-	-	2
Cambridge, Mass.	21	17	3	-	1	-	-
Fall River, Mass.	36	31	2	2	1	-	3
Hartford, Conn.	50	34	10	5	1	-	5
Lowell, Mass.	24	21	1	2	-	-	6
Lynn, Mass.	23	18	3	2	-	-	3
New Bedford, Mass.	24	22	2	-	-	-	1
New Haven, Conn.	33	22	6	3	-	2	3
Providence, R.I.	59	46	11	1	1	-	1
Somerville, Mass.	2	2	-	-	-	-	-
Springfield, Mass.	37	26	4	3	1	3	5
Waterbury, Conn.	34	28	4	2	-	-	2
Worcester, Mass.	53	40	11	-	1	1	14
MID. ATLANTIC	2,470	1,792	440	167	34	36	123
Albany, N.Y.	59	45	7	7	-	-	6
Allentown, Pa.	26	22	4	-	-	-	-
Buffalo, N.Y.	107	77	24	2	1	2	5
Camden, N.J.	23	14	3	4	1	1	1
Elizabeth, N.J.	19	16	3	-	-	-	-
Erie, Pa.	43	37	4	-	2	-	7
Jersey City, N.J.	30	22	4	3	1	-	-
New York City, N.Y.	1,246	880	244	91	15	16	27
Newark, N.J.	52	23	15	12	1	1	3
Paterson, N.J.	20	13	6	-	1	-	-
Philadelphia, Pa.	402	288	62	32	12	8	24
Pittsburgh, Pa.§	94	70	15	4	-	5	10
Reading, Pa.	27	25	1	1	-	-	2
Rochester, N.Y.	133	108	20	4	-	1	15
Schenectady, N.Y.	26	20	4	2	-	-	2
Scranton, Pa.	29	24	4	1	-	-	2
Syracuse, N.Y.	80	65	11	2	-	2	16
Trenton, N.J.	23	18	4	1	-	-	1
Utica, N.Y.	31	25	5	1	-	-	2
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	2,319	1,645	395	143	63	73	216
Akron, Ohio	62	48	8	4	1	1	1
Canton, Ohio	43	35	3	3	-	2	5
Chicago, Ill.	465	309	73	47	17	19	44
Cincinnati, Ohio	111	78	19	4	1	9	19
Cleveland, Ohio	187	120	46	7	7	7	7
Columbus, Ohio	172	113	28	13	12	6	21
Dayton, Ohio	183	143	30	7	2	1	27
Detroit, Mich.	236	147	50	23	6	10	12
Evansville, Ind.	64	48	12	2	2	-	4
Fort Wayne, Ind.	95	78	10	3	1	3	9
Gary, Ind.	23	12	7	3	1	-	-
Grand Rapids, Mich.	62	47	6	3	2	4	13
Indianapolis, Ind.	201	141	44	8	3	5	4
Lansing, Mich.	60	51	5	3	1	-	6
Milwaukee, Wis.	127	96	24	5	1	1	20
Peoria, Ill.	55	38	12	1	2	2	4
Rockford, Ill.	52	46	2	2	-	2	10
South Bend, Ind.	51	38	7	3	3	-	4
Toledo, Ohio	U	U	U	U	U	U	U
Youngstown, Ohio	70	57	9	2	1	1	6
W.N. CENTRAL	800	600	129	38	16	17	95
Des Moines, Iowa	102	80	18	2	-	2	14
Duluth, Minn.	26	21	3	-	1	1	4
Kansas City, Kans.	U	U	U	U	U	U	U
Kansas City, Mo.	96	69	18	6	3	-	10
Lincoln, Nebr.	41	34	2	4	-	1	1
Minneapolis, Minn.	225	176	29	8	6	6	30
Omaha, Nebr.	103	73	24	1	3	2	17
St. Louis, Mo.	123	84	24	10	2	3	11
St. Paul, Minn.	84	63	11	7	1	2	8
Wichita, Kans.	U	U	U	U	U	U	U
S. ATLANTIC	1,052	738	198	72	27	17	88
Atlanta, Ga.	U	U	U	U	U	U	U
Baltimore, Md.	183	114	38	19	9	3	31
Charlotte, N.C.	143	96	31	11	4	1	12
Jacksonville, Fla.	155	112	30	6	4	3	6
Miami, Fla.	U	U	U	U	U	U	U
Norfolk, Va.	64	42	9	8	4	1	2
Richmond, Va.	67	43	19	2	2	1	3
Savannah, Ga.	36	23	11	2	-	-	9
St. Petersburg, Fla.	68	59	5	3	1	-	3
Tampa, Fla.	221	168	35	10	3	5	19
Washington, D.C.	101	69	18	11	-	3	3
Wilmington, Del.	14	12	2	-	-	-	-
E.S. CENTRAL	962	695	161	70	11	21	74
Birmingham, Ala.	221	164	39	10	-	4	29
Chattanooga, Tenn.	79	64	6	7	2	-	9
Knoxville, Tenn.	97	77	13	4	2	1	1
Lexington, Ky.	70	43	22	4	1	-	4
Memphis, Tenn.	203	149	27	17	3	7	13
Mobile, Ala.	94	61	20	10	-	3	1
Montgomery, Ala.	28	23	3	2	-	-	6
Nashville, Tenn.	170	114	31	16	3	6	11
W.S. CENTRAL	1,571	1,074	310	106	45	36	139
Austin, Tex.	89	62	17	9	-	1	9
Baton Rouge, La.	88	62	18	3	3	2	1
Corpus Christi, Tex.	58	46	8	1	2	1	7
Dallas, Tex.	208	141	41	15	6	5	5
El Paso, Tex.	110	82	19	4	1	4	7
Ft. Worth, Tex.	152	98	36	5	8	5	24
Houston, Tex.	388	237	89	38	14	10	40
Little Rock, Ark.	81	54	19	5	1	2	3
New Orleans, La.	U	U	U	U	U	U	U
San Antonio, Tex.	205	149	34	14	5	3	22
Shreveport, La.	75	54	13	3	3	2	10
Tulsa, Okla.	117	89	16	9	2	1	11
MOUNTAIN	963	712	152	53	29	17	80
Albuquerque, N.M.	99	76	8	9	4	2	5
Boise, Idaho	45	30	9	2	4	-	3
Colo. Springs, Colo.	71	48	14	5	2	2	6
Denver, Colo.	117	87	17	5	3	5	16
Las Vegas, Nev.	202	144	40	9	6	3	14
Ogden, Utah	32	28	3	1	-	-	5
Phoenix, Ariz.	95	68	13	7	6	1	2
Pueblo, Colo.	22	18	2	1	-	1	2
Salt Lake City, Utah	116	84	21	8	2	1	14
Tucson, Ariz.	164	129	25	6	2	2	13
PACIFIC	1,666	1,200	290	108	40	23	153
Berkeley, Calif.	19	13	6	-	-	-	-
Fresno, Calif.	99	76	15	5	3	-	10
Glendale, Calif.	20	19	-	1	-	-	2
Honolulu, Hawaii	59	41	13	3	1	1	5
Long Beach, Calif.	57	45	9	2	1	-	9
Los Angeles, Calif.	369	255	72	28	7	7	20
Pasadena, Calif.	18	15	2	-	1	-	2
Portland, Oreg.	111	74	24	8	3	2	6
Sacramento, Calif.	185	143	27	9	6	-	34
San Diego, Calif.	147	93	34	14	6	-	14
San Francisco, Calif.	U	U	U	U	U	U	U
San Jose, Calif.	230	175	34	13	-	8	26
Santa Cruz, Calif.	33	28	2	3	-	-	2
Seattle, Wash.	141	92	24	13	7	5	11
Spokane, Wash.	69	51	15	2	1	-	8
Tacoma, Wash.	109	80	13	7	4	-	4
TOTAL	12,384¶	8,893	2,175	788	271	247	1,025

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 this Pennsylvania city, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

¶Total includes unknown ages.

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