

## **22. IMMUNIZATION AND INFECTIOUS DISEASES**

<b>Number</b>	<b>Objective</b>
1	Vaccine-preventable diseases
2	Impact of influenza vaccinations
3	Hepatitis A
4	Hepatitis B in infants
5	Hepatitis B, under 25
6	Hepatitis B in adults
7	Deaths from hepatitis B-related cirrhosis and liver cancer
8	Hepatitis C
9	Identification of persons with chronic hepatitis C
10	Deaths from hepatitis C-related cirrhosis and liver cancer
11	Tuberculosis
12	Hospital-acquired infections
13	Hospital-acquired infections from antimicrobial-resistant microorganisms
14	Antimicrobial use in intensive care
15	Occupational needle-stick exposures
16	Bacterial meningitis
17	Invasive pneumococcal infections
18	Invasive early-onset group B streptococcal disease
19	Lyme disease
20	Peptic ulcer hospitalizations
21	Immunization of children 19-35 months
22	States with 90 percent immunization coverage
23	Immunization coverage for children in day care, kindergarten, and first grade
24	Immunizations among adults
25	Curative therapy for tuberculosis
26	Preventive therapy among high-risk persons with tuberculosis
27	Antibiotics for ear infections
28	Antibiotics prescribed for colds
29	Inappropriate rabies postexposure prophylaxis
30	2-year-olds receiving vaccinations as part of primary care
31	Provider measurement of immunization coverage levels
32	Immunization registries
33	Vaccine-associated adverse reactions
34	Febrile seizures caused by pertussis vaccines
35	Prevention services for international travelers
36	Laboratory confirmation of tuberculosis cases



## **Immunization and Infectious Diseases**

### **Goal**

Prevent disease, disability, and death from infectious diseases, including vaccine-preventable diseases.

### **Terminology**

(A listing of all acronyms used in this publication appears on page 27 of the Introduction.)

**Emerging infectious diseases:** Diseases of infectious origin whose incidence in humans has increased within the past two decades or threatens to increase in the near future. Recognition of an emerging disease can occur because the disease is present in the population for the first time, the disease has been detected for the first time, or links between an infectious agent and a chronic disease or syndrome have only recently been identified

**Reemerging infectious diseases:** Reappearance of a known infection after a decline in incidence. Reemergence of “old” infectious agents can be the result of lapses in public health measures, changes in human behavior that increase person-to-person transmission of infectious agents, changes in food handling or eating habits, or changes in the way humans interact with their environment.

**Influenza high-risk populations:** (1) persons older than 65 years of age; and (2) persons with chronic underlying disorders of the cardiovascular, pulmonary, or renal systems, as well as those with metabolic diseases (including diabetes mellitus), severe anemia, and compromised immune function.

**Hospital-acquired infection:** Any infection that a patient acquires as a result of medical treatment while in the hospital.

**Patient day:** A day or any part of a day for which a patient was hospitalized.

**Invasive pneumococcal infection:** Isolating the bacteria *Streptococcus pneumoniae* from a normally sterile site including blood, cerebrospinal fluid, or pleural fluid.

**Invasive group B streptococcal disease:** Isolation of group B streptococcus from a normally sterile site such as blood or cerebrospinal fluid.

**Surveillance regions:** The nine regions of the United States used for influenza surveillance purposes. These regions are the same ones used by the State and territorial epidemiologists to report notifiable diseases data and by the Centers for Disease Control and Prevention (CDC) to report mortality data from the 122-city system.

**Penicillin resistant:** Having a minimum inhibitory concentration (MIC)  $\geq 2$   $\mu\text{g/mL}$ . Note that strains with “intermediate” susceptibility are not included in this category.

**Early onset of group B streptococcal disease:** Illness onset at  $< 7$  days of age.

**Common cold:** Defined based on ICD-9 diagnostic codes 460.0, 461.0, 465.0, 465.8, 465.9, 472.0.

1 **Inappropriate rabies postexposure prophylaxis:** Any actions that are contrary to current  
2 recommendations described by CDC (1991. Rabies prevention-United States, 1991. *MMWR* 40:RR-3, pp.  
3 1-19).

## 4 5 **Overview**

### 6 7 *Infectious Disease Issues and Strategies*

8  
9 Although many experts predicted that the public health significance of infectious diseases would continue  
10 to wane in the United States, they remain major sources for morbidity and mortality in this country. In  
11 addition, we continue to detect new infectious agents and diseases, and diseases considered to be under  
12 control have reemerged in recent years. An example of an emerging disease in the 1990s is a previously  
13 unrecognized hantavirus that caused an outbreak of fatal respiratory illness in the American Southwest.  
14 This agent has now been identified in more than half of the States. Other examples include contamination  
15 of a public water supply with the parasite *Cryptosporidium*, resulting in the largest waterborne outbreak in  
16 U.S. history; widespread outbreaks of foodborne illness due to *Escherichia coli* O157:H7; and a subtype of  
17 influenza A not previously associated with human illness that produced an outbreak of disease in Hong  
18 Kong. Compounding the problem of emerging infections, antimicrobial resistance is evolving rapidly in a  
19 variety of hospital- and community-acquired infections. These trends provide timely reminders of the  
20 importance and potential volatility of infectious diseases as we approach the new century.

21  
22 Between 1980 and 1992, data show that overall mortality from infectious diseases rose 58 percent in the  
23 United States. A significant proportion of this increase is accounted for by the increasing burden of HIV-  
24 associated disease. However, even when HIV-associated diagnoses are removed, mortality from infectious  
25 diseases still increased 22 percent during this time. Considered as a group, in 1992 infectious diseases  
26 were the third leading cause of death in the United States, the most recent year for which final data were  
27 available and analyzed. The direct and indirect economic costs of infectious diseases are significant. For  
28 example, every hospital-acquired infection adds an average of \$2,100 to a hospital bill. Bloodstream  
29 infections result in an average of \$3,517 in additional hospital charges per infected patient, and cause the  
30 patient to stay in the hospital an average of 7 additional days. A typical case of Lyme disease diagnosed in  
31 the early stages incurs about \$174 in direct medical treatment costs. However, delayed diagnosis and  
32 treatment can result in complications that cost from \$2,228 to \$6,724 per patient in direct medical costs in  
33 the first year alone.

34  
35 The global context of infectious diseases also must be considered. Increases in international travel,  
36 importation of foods, improper human and veterinary use of antibiotics in the U.S. and abroad, and global  
37 environmental changes increase the potential for global epidemics of infectious diseases, including  
38 emerging and reemerging diseases as well as drug-resistant strains. International cooperation and  
39 collaboration on disease surveillance, response, research, and training are essential to prevent or control  
40 these epidemics. The action taken in one country will affect the health of people globally.

41  
42 Because of their impact on society, a coordinated strategy is necessary to understand, detect, control, and,  
43 ultimately, prevent infectious diseases. Such a strategy is needed to protect the gains achieved in life  
44 expectancy over the 20th century, resulting from the control and prevention of infectious diseases and to  
45 ensure further improvements in the 21st century. CDC has published a prevention strategy for emerging  
46 and reemerging diseases, *Addressing Emerging Infectious Disease Threats II: Entering the 21st Century*.  
47 This strategy includes four goals: surveillance and response, applied research, infrastructure and training,  
48 and prevention and control.

1 *Surveillance* is needed to promptly recognize and monitor emerging pathogens and outbreaks. A *response*  
2 is mounted when surveillance or other data indicate a change in the incidence or distribution of an  
3 infectious disease or when a new variant of a known pathogen is recognized. Through *applied research*,  
4 scientists answer questions about the cause, transmission, and diagnosis of emerging infectious diseases  
5 and develop interventions. Research, surveillance, and response all depend on the public health  
6 *infrastructure* that supports, trains, and equips public health workers and links them in national and global  
7 networks. *Training* the next generation of public health scientists is a crucial component of the public  
8 health infrastructure. Ultimately, effective *prevention and control* result from the convergence of  
9 surveillance and response, applied research, and infrastructure and training.

10  
11 The National Institutes of Health (NIH) Research Agenda for Emerging Infectious Diseases includes major  
12 research goals on ecologic and environmental factors that influence emergence of diseases; microbial  
13 changes and adaptation that influence emergence; human susceptibility to new and changing microbes; and  
14 new and improved control strategies. Basic research in infectious diseases conducted by NIH provides the  
15 foundation on which diagnostics, vaccines, therapies, and other interventions are developed. Additionally,  
16 NIH has a crucial component for training public health scientists in infectious disease work.

### 17 ***At-Risk Populations***

18  
19  
20 To accomplish the goals of controlling and preventing infectious diseases, the CDC plan focuses on certain  
21 categories of emerging infectious disease issues and on particular groups of people who are at special risk.  
22 Many of the priority areas are included, in whole or in part, as 2010 objectives. Issues that are covered  
23 here or in other chapters include antimicrobial resistance, foodborne and waterborne diseases, vector-borne  
24 and zoonotic diseases, diseases transmitted through transfusion of blood or blood products, and vaccine  
25 development and use. At-risk populations that are discussed in this chapter or in other chapters include  
26 persons with impaired host defenses, pregnant women and newborns, and travelers, immigrants, and  
27 refugees. Some 2010 objectives target diseases and pathogens that were unknown only 20 years ago.  
28 Others represent reemergent problems once thought to be well controlled. Taken together, our hope is that  
29 these objectives give our public health partners, and society in general, a road map for prevention and  
30 control of many of the priority emerging and reemerging infectious diseases over the next decade.

31  
32 Any context for addressing an issue as complex as the prevention and control of emerging and reemerging  
33 infectious diseases would be doomed to failure without effective partnerships and collaborations with  
34 Federal agencies, State and local health departments, other governments and nongovernmental  
35 organizations, academic institutions, professional societies, international organizations, and experts in  
36 public health infectious diseases and medical microbiology. Prevention efforts are effective only to the  
37 extent that society as a whole chooses to adopt the prevention strategy both in the U.S. and abroad.  
38 Therefore, the infectious disease prevention strategy includes a comprehensive group of individuals  
39 representing organizations that are partners in the effort to make this world a healthier place to live through  
40 the prevention and control of emerging and reemerging infectious diseases. Through our dedicated work  
41 now and into the next millennium, we plan to be successful in decreasing death and sickness attributable to  
42 infectious diseases.

### 43 ***Nature of Vaccine-Preventable Disease Strategies***

44  
45  
46 Vaccines are biological substances that interact with the immune system and usually produce an immune  
47 response that is identical to that produced by the natural infection, yet does not subject a person to “full-  
48 blown” disease or complications.

1 This Nation's experience with the ravaging effects of disease, primarily among our youth, taught us that  
2 vaccines can play a powerful role in preventing the debilitating and, in some cases, fatal effects of  
3 infectious diseases. In the 1950s, the annual summer-autumn devastations of polio resulted in 25,000 or  
4 more individuals falling victim to infections, causing them to require braces, crutches, wheelchairs, and  
5 iron lungs. In addition, prior to vaccines, most children had measles. Some who survived were left with  
6 deficits ranging from seizures to severe mental retardation. During one year in the 1960s, more than  
7 20,000 infants were born with major malformations including deafness, blindness, congenital heart  
8 disease, and mental retardation due to rubella virus infecting their pregnant mothers. However, the  
9 organisms have not disappeared. Rather, they have receded into the background due to the remarkable  
10 effect that vaccines have had in preventing them and will reemerge if vaccination coverage levels drop.  
11 The serious health burden of vaccine-preventable diseases (VPDs) is evident from the measles resurgence  
12 of 1989 to 1991, which resulted in over 55,000 cases, more than 120 deaths, and over 11,000  
13 hospitalizations, with over \$100 million spent on direct medical care costs.

14  
15 Vaccines protect more than the vaccinated individual. They protect society as well. When immunization  
16 levels in a community are high, the few who cannot be vaccinated, such as those too young for vaccination  
17 and those who have legitimate contraindications to immunization, are often indirectly protected because  
18 they are surrounded by vaccinated persons and do not get exposed to disease (herd immunity).

19  
20 Few measures in public health can compare with the benefits of vaccines. Cost-benefit analyses have been  
21 performed for vaccines routinely recommended for children. Two vaccines, measles, mumps, and rubella  
22 vaccine (MMR) and *Haemophilus influenzae* type b (Hib), vaccine accrue substantial direct medical  
23 savings for each dollar spent to ensure that children are immunized against these diseases. Varicella  
24 vaccine saves roughly 90 cents in direct medical costs for every dollar invested. However, when indirect  
25 savings also are measured, which includes prevention of work loss by parents to take care of ill children,  
26 prevention of death, and prevention of lost earnings from disability, all the vaccines routinely  
27 recommended for children are highly cost saving. These range as high as \$13 saved for every dollar spent  
28 on MMR to \$2 saved for the hepatitis B vaccine.

### 29 30 *Dynamics of the Vaccine-Preventable Disease Strategy*

31  
32 The major strategies for ensuring that children are protected from vaccine-preventable diseases are:

- 33  
34 1. Improving the quality of vaccination delivery services.
- 35  
36 2. Minimizing financial burdens for needy children.
- 37  
38 3. Increasing community participation, education, and partnership.
- 39  
40 4. Improving monitoring of disease and vaccination coverage.
- 41  
42 5. Improving vaccines and vaccine use.

43  
44 The greatest burden of VPDs in the United States occurs among adults. Pneumococcal disease and  
45 influenza account for more than 45,000 deaths annually, most in the elderly. In September 1997, the  
46 Department of Health and Human Services approved an agencywide plan to improve adult immunization  
47 rates and reduce disparities among racial and ethnic minorities.

## **Disparities in Health**

Although childhood immunization rates have been historically lower in minority populations compared to the white population, rates for minority preschool children have been increasing at a more rapid rate, thereby significantly narrowing the gap. A report in the October 1997 issue of the *Morbidity and Mortality Weekly Report* presented findings from the National Immunization Survey, which documents substantial progress toward achieving 1996 Childhood Immunization Initiative coverage goals by racial and ethnic group. Despite this unprecedented progress, efforts to increase vaccination coverage need to be intensified, particularly for children living in poverty. In this country, “pockets of need” continue to exist in areas of each State and major city where substantial numbers of underimmunized children reside. These areas are of great concern because, particularly in large urban areas with traditionally underserved populations, there is potential for disease outbreaks.

In addition to the very young, adults are at increased risk for many VPDs. Although vaccination levels against pneumococcal infections and influenza among people aged 65 years and over have increased slightly for African Americans and Hispanics, the coverage in these groups remains substantially below the general population and the year 2000 targets of 60 percent. For example, influenza immunization rates for whites were 57 percent in 1994, while coverage rates for African Americans and Hispanics were only 39 and 38 percent, respectively. Similarly, pneumococcal immunization rates in the same year were 31 percent for whites, with African-American and Hispanic rates trailing at 15 and 14 percent, respectively.

## **Progress Toward Year 2000 Objectives**

**20.1** In general, significant progress has been made in reducing indigenous cases of VPDs. For example, according to provisional 1997 data, zero cases of wild-virus polio, four cases of congenital rubella syndrome, five cases of diphtheria among people 25 years and younger, and five cases of tetanus among people less than 25 years old were reported. Measles was reduced from a 1988 baseline of 3,058 cases to only 135, and rubella was reduced from 225 to 161. These VPDs have a Healthy People 2000 goal of zero cases. Mumps, with a Healthy People 2000 goal of 500 cases, was reduced from 4,866 to 612. Pertussis, with a Healthy People 2000 goal of 1,000 cases, has increased from 3,450 in 1988 to 6,568 cases in 1997.

**20.3** Substantial progress has been made in implementing a strategy to eliminate hepatitis B virus (HBV) transmission in the United States. From 1991 (when routine infant hepatitis B vaccination was first recommended) to 1996, the proportion of 19- to 35-month-old children who have received three doses of hepatitis B vaccine has increased from less than 10 percent to 82 percent. During this time period, rates of acute hepatitis B in children 7-10 years of age have declined by 27 percent and rates among children 3-6 years of age have declined by 62 percent. Implementation of programs for catch-up vaccination of all adolescents at 11-12 years of age have also recently begun, and as of December 1997, 26 percent of states have laws requiring adolescents to be vaccinated in order to enter school. In order to accelerate elimination of HBV transmission, future efforts will need to be focused on implementing programs to vaccinate adolescents and adults in high-risk groups.

A vaccine against hepatitis A was licensed in 1996, which provides the opportunity to potentially eliminate this disease as a public health problem in the United States. The vaccine is currently recommended primarily for high-risk groups. However, more wide-scale vaccination strategies, such as routine childhood vaccination, are expected to be needed in order to substantially lower

1 disease incidence because fewer than 15 percent of hepatitis A cases in the United States occur in  
2 high risk groups accessible for preexposure vaccination.  
3

4 **20.7** Achieving the year 2000 objective related to reduction in the incidence of bacterial meningitis was  
5 entirely due to introduction of Hib conjugate vaccines for infants. These vaccines were first  
6 licensed in 1990 for use in infants beginning at age 2 months. Hib conjugate vaccines are highly  
7 effective in protecting individuals against Hib meningitis and invasive disease, but also have an  
8 important effect on nasopharyngeal colonization with this organism, and thus interrupt  
9 transmission of the organism. The incidence of Hib meningitis declined by 94 percent from 1986  
10 to 1995.<sup>1</sup> During the same time period, bacterial meningitis due to the five leading agents  
11 (*Haemophilus influenzae*, *Streptococcus pneumoniae*, *Neisseria meningitidis*, group B  
12 *Streptococcus*, and *Listeria monocytogenes*) fell by 55 percent. Bacterial meningitis was  
13 traditionally a disease of childhood; the median age of persons with bacterial meningitis was 15  
14 months (1986). Following the dramatic reduction in Hib meningitis, which primarily occurs  
15 among children under 2 years of age, the median age of persons with bacterial meningitis shifted  
16 to 25 years (1995). The spectacular success of conjugate vaccines against Hib disease has  
17 stimulated efforts to develop conjugate vaccines for other pathogens, including *Streptococcus*  
18 *pneumoniae*, *Neisseria meningitidis*, and group B streptococcus. Conjugate vaccines against these  
19 three agents are currently being evaluated in clinical trials. Achievement of this year 2000  
20 objective related to bacterial meningitis suggests comparable success may be achieved for other  
21 important causes of meningitis, sepsis, and pneumonia, as these other conjugate vaccines move to  
22 routine usage in their target populations.  
23

24 **20.11** For the annual period ending June 30, 1997, immunization coverage levels for children aged 19 to  
25 35 months were at record high levels. Antigen-specific rates have shown striking progress since  
26 1992. For example, coverage for three or more doses of the diphtheria-tetanus-pertussis (DTP)  
27 vaccine increased from 83 percent in 1992 to 95 percent; coverage for three or more doses of oral  
28 polio vaccine (OPV) increased from 72 percent to 91 percent, and coverage for three or more  
29 doses of Hib vaccine increased from 28 percent to 92 percent. The 4DTP/3OPV/1MMR series,  
30 with a Healthy People 2000 goal of 90 percent, similarly increased from 55 percent in 1992 to 78  
31 percent. Significant achievements also were documented for the five racial and ethnic groups in  
32 that most of the Childhood Immunization Initiative coverage goals for 1996 were met for  
33 individual vaccines. Those goals not met were less than 4 percentage points from the target.  
34

35 In 1995, adult immunization rates continued to increase toward the Healthy People 2000 goal of  
36 60 percent. Influenza vaccine coverage rates were up from 33 percent in 1989 to 58 percent in  
37 1995, and pneumococcal vaccine coverage rates were up from 15 percent to 32 percent. Although  
38 coverage rates against pneumococcal infections and influenza among people aged 65 years and  
39 over have increased slightly for African Americans and Hispanics, the coverage in these target  
40 groups remains substantially below the general population and the year 2000 targets.  
41

42 **20.13** Progress has been made in expanding immunization requirements for schools and day care  
43 settings. For example, by the 1996-97 school year, the number of State and District of Columbia  
44 school requirements for measles increased from 46 to 51; for mumps, increased from 20 to 42; for  
45 rubella, from 43 to 49; and for tetanus, from 43 to 50. Similarly, requirements for day care  
46 settings were generally at or near 51 States and the District of Columbia. Selected increases  
47 included tetanus, from 40 to 51; pertussis, from 46 to 51; and Hib, from 9 to 46.  
48

49 **20.15** The financing of childhood immunizations has been significantly improved as a result of two  
50 major initiatives. The Vaccines for Children Program and the Child Health Insurance Program

cover children on Medicaid, uninsured children, and American Indian and Alaska Native children. In addition, underinsured children who receive immunizations at federally qualified health centers and rural health clinics are covered. Because free vaccines will be provided to needy children, the vaccine cost will not be a barrier to receipt of immunizations. Also, the 317 Grant Program and State funds help provide free vaccines for children not covered by the other programs who are served by the public sector, such as those who seek vaccines at health department clinics.

## **Draft 2010 Objectives**

### ***Vaccinations/Immunization***

#### **1. (Former 20.1) Reduce indigenous cases of vaccine-preventable disease.**

<b>Disease</b>	<b>1997</b>	<b>2010 Target</b>
Congenital rubella syndrome <sup>a</sup>	4	0
Diphtheria (people <35 years)	4	0
Haemophilus influenzae type b <sup>b</sup>	165	0
Hepatitis B (people <25 years)	8,693 <sup>c</sup>	0
Measles	135	0
Mumps	612	0
Pertussis (children <7 years)	2,633	2,000
Polio (wild-type virus) <sup>d</sup>	0	0
Rubella	161	0
Tetanus (among people <35 years)	10	0
Varicella (Chicken pox)	4 million <sup>e</sup>	400,000

<sup>a</sup> Source: National Congenital Syndrome Registry.

<sup>b</sup> Includes cases with type b and unknown serotype.

<sup>c</sup> Estimated Hepatitis B cases for 1996.

<sup>d</sup> Polio expected to be eradicated by the year 2000.

<sup>e</sup> Estimated from the National Health Interview Survey (NNHIS), 1990-94.

**Target Setting Method:** High coverage with highly effective vaccines has reduced reported cases of most VPDs of childhood to record low levels. Epidemiologic and virologic data support the interruption of indigenous transmission of measles in 1993, 1996, and 1997; with high coverage of two doses of MMR vaccine, interruption of indigenous transmission of both rubella and mumps is feasible. Polio due to wild-type virus already has been eliminated in the United States due to high vaccination coverage.

**Data Sources:** National Notifiable Disease Surveillance System (NNDSS) and National Congenital Syndrome Registry, CDC.

The epidemiology of diphtheria and the impact of vaccination with diphtheria toxoid are less well understood, but with widespread use of vaccine, reported cases are at or near zero. Tetanus toxoid is highly effective, but with the absence of herd immunity, all persons must be vaccinated and exposure to tetanus minimized to achieve zero cases. Reported cases of pertussis will be reduced by further increases in coverage, but cases will continue to occur because the organism circulates among older age groups and the vaccine is not 100 percent effective. Hepatitis B infection will be reduced greatly as the age groups covered by universal infant and adolescent immunization efforts age through adolescence and into young

1 adulthood, ages in which high-risk behaviors for hepatitis B begin to be initiated and are adopted.  
2 Conjugate vaccines for prevention of Hib are highly effective, and if their use results in decreased  
3 circulation of the organism, further reductions in disease incidence are anticipated as vaccine coverage  
4 increases. With increasing coverage with varicella vaccine, decreasing disease incidence is anticipated.

5  
6 There are highly effective vaccines that are used routinely in childhood for prevention of measles, mumps,  
7 rubella, varicella, diphtheria, tetanus, pertussis, polio, hepatitis B, and Hib invasive disease.

8  
9 **2. (Former 20.2) Monitor the national impact of influenza vaccinations on influenza-related**  
10 **hospitalizations and mortality among high-risk populations by annually collecting, analyzing,**  
11 **and reporting data from at least one medical care organization in all nine influenza surveillance**  
12 **regions of the country.** (Baseline: three medical care organizations [MCOs] in three influenza  
13 surveillance regions in 1997-98)

14  
15 **Target Setting Method:** Increase the number of participating MCOs so that all nine surveillance  
16 regions are represented and surveillance data will be collected throughout the United States.

17  
18 **Data Source:** Medical care organizations (MCOs) in nine surveillance regions, CDC, NCID and NIP.

19  
20 Approximately 70 million people in the United States are vaccinated annually against influenza. Yet data  
21 on the impact of influenza vaccination are not available on a regular basis. Despite the large number of  
22 annual vaccinations, influenza-related mortality fluctuates widely from year to year. These fluctuations are  
23 related to (1) seasonal differences in the prevalence of influenza infections; (2) continual mutations among  
24 influenza viruses that lead to changes in the antigenicity and virulence of circulating strains; (3) differences  
25 in the intrinsic immunogenicity of the vaccine strains; and (4) differences in the match of vaccine strains  
26 with circulating viruses. In addition, the number of persons vaccinated against influenza may still be too  
27 low to induce a protective “herd immunity” effect. As influenza vaccine use increases, information on  
28 reductions in hospitalization and mortality among vaccinated persons is necessary to monitor the impact of  
29 influenza vaccine and to demonstrate the benefit of annual influenza vaccination on groups at high risk for  
30 influenza-related complications and death.

31

1 **Hepatitis**

2  
3 The next eight objectives replace the former 20.3.

4  
5 **3. Reduce hepatitis A cases to an incidence of no more than 13.2 cases per 100,000.**

6

Select Populations	1996
African American	26.9
American Indian/Alaska Native	77.4
Asian/Pacific Islander	19.6
Hispanic	78.3
White	29.9

7  
8 **Target Setting Method:** The health status objective for hepatitis A will not be achieved until a  
9 vaccination strategy is implemented that produces high levels of immunity in children, who have the  
10 highest disease rates and who serve as the primary reservoir for new infections. The most effective  
11 means of achieving control of HAV infection will likely be to routinely vaccinate children against  
12 hepatitis A. Incorporation of hepatitis A vaccine into the routine childhood vaccination schedule  
13 would be facilitated by the availability of data on which to base recommendations on the dose and  
14 timing of vaccination in the first or second year of life and of vaccines that combine HAV antigen with  
15 other antigens.

16  
17 **Data Source:** National Notifiable Disease Surveillance System (NNDSS), CDC, EPO.

18  
19 Until recommendations exist for routine hepatitis A vaccination of all children, the interim strategy to  
20 prevent and control hepatitis A focuses on preexposure vaccination of persons in high-risk groups and  
21 routine vaccination of children in selected areas.

22  
23 High-risk groups for which hepatitis A vaccination is recommended include:

- 24  
25
- 26 • Illegal drug users
  - 27 • Men who have sex with men
  - 28 • Persons traveling to HAV-endemic countries (see objectives 35)
  - 29 • Persons with occupational risk of infection (i.e., persons who work with HAV-infected primates or  
30 with HAV in a research laboratory). (No other occupational groups have been shown to be at  
31 increased risk of exposure.)
  - 32 • Persons with chronic liver disease
  - 33
  - 34
  - 35

36  
37 Routine hepatitis A vaccination is recommended for children  $\geq 2$  years of age living in communities  
38 with high rates of HAV infection and periodic hepatitis A outbreaks and hepatitis A vaccine is  
39 included in the CDC Vaccines for Children program. Routine vaccination of children is being  
40 implemented in many communities with high rates of hepatitis A (e.g., American Indian/Alaska  
41 Native) to attempt to control community wide outbreaks of disease. A high priority for controlling  
42 hepatitis A in these communities is to increase the percentage of clinical service providers with  
43 programs that offer routine hepatitis A vaccination to children.

1 As an interim strategy, accelerated control of hepatitis A could also be achieved by implementing  
2 routine childhood vaccination of children  $\geq 2$  years of age in states or regions with high hepatitis A  
3 disease rates. In areas where recommendations for routine childhood vaccination are established, an  
4 important mechanism to achieve high level of vaccine coverage among children will be to implement  
5 State laws requiring hepatitis A vaccination prior to a child entering child day care, kindergarten, or  
6 both.

7  
8 Rationale for selection: Periodic epidemics of hepatitis A have occurred in the United States  
9 approximately every decade; the last nationwide epidemic was in 1989. Between epidemics, hepatitis  
10 A continues to occur at relatively high rates, mainly in extended community-wide epidemics in which  
11 the infection is acquired primarily by person-to-person contact. At least 35 percent of reported cases  
12 occur in children  $<20$  years of age, and a large number of asymptomatic infections occur in children  $<5$   
13 years of age. Thus, children play a critical role in sustaining hepatitis A virus (HAV) transmission in  
14 these community-wide epidemics. In 1996, a total of 31,032 cases were reported to CDC's National  
15 Notifiable Disease Surveillance System (NNDSS), which reflects an estimated 92,500 cases and  
16 180,000 infections when data were corrected for underreporting and asymptomatic infections.  
17 Incidence varies by race/ethnicity, with highest rates among American Indians/Alaska Natives and  
18 lowest rates among Asians. Rates among Hispanic are higher than among non-Hispanics.

19  
20 **4. Reduce to no more than 400 chronic hepatitis B virus infections in infants (perinatal infections).**  
21 (Baseline: 1,682 chronic infections in 1995)

22  
23 **Target Setting Method:** To prevent perinatal hepatitis B virus (HBV) transmission, infants born to  
24 mothers who are infected with HBV need to receive: (1) the appropriate first dose of hepatitis B  
25 vaccine within 12 hours of birth, along with hepatitis B immunoglobulin (HBIG); (2) the remaining  
26 appropriate doses of vaccine at 1 to 2 months and 6 months of age; and (3) postvaccination serologic  
27 testing by 12 to 15 months of age to ensure they are not infected and have developed immunity to the  
28 virus.

29  
30 **Data Source:** Perinatal Hepatitis B Prevention Program, CDC, NIP.

31  
32 In order to achieve the health status objective for perinatal HBV infections, programs need to be  
33 implemented to:

- 34
- 35 • Ensure all pregnant women are screened for hepatitis B surface antigen (HBsAg), which indicates the  
36 mother is infected with HBV, during an early prenatal visit in *each* pregnancy. In a national survey  
37 conducted in 1993, 84 percent of women who delivered in hospitals had HBsAg test results available  
38 in either the maternal or infant hospital record. State laws and regulations (or equivalent programs) are  
39 a critical method to ensure that all pregnant women are screened for HBsAg. In 1997, 14 States had  
40 such laws and regulations.
  - 41  
42 • Ensure all infants of HBsAg-positive mothers receive HBIG at birth and three doses of hepatitis B  
43 vaccine by 6 months of age. In national surveys conducted from 1993 to 1995, 85 to 93 percent of  
44 identified infants of HBsAg-positive mothers received HBIG and hepatitis B vaccine at birth; however,  
45 only 62 to 69 percent completed the hepatitis B vaccination series by 6 to 8 months of age. Supervised  
46 case management has been found to be a key element to ensure high levels of completion of  
47 postexposure prophylaxis.

48  
49 Each year in the United States approximately 19,000 children are born to mothers who are infected with  
50 HBV. Without prevention programs, about 8,000 of these infants would become infected with HBV;

1 however, 95 percent of these infections can be prevented through appropriate maternal screening and  
2 infant immunoprophylaxis.

3  
4 **5. Reduce to zero cases per 100,000 hepatitis B rates in persons less than 25 years of age (except**  
5 **perinatal infections).**  
6

<b>Select Populations</b>	<b>1996</b>
African American	20.2
American Indian/Alaska Native	12.9
Asian/Pacific Islander	29.4
Hispanic	6.7
White	5.0
Aged 2-4	1.5
Aged 5-14	2.9
Aged 15-24	31.6

7  
8 **Note:** In 1991, ACIP recommended an immunization strategy with the overall goal of eliminating  
9 HBV transmission in the United States. Key elements of the hepatitis B elimination strategy are  
10 routine infant hepatitis B vaccination, which was first recommended in 1991, and catch-up vaccination  
11 of all adolescents at 11 to 12 years of age, which has been recommended since 1995. An important  
12 mechanism to achieve high levels of vaccine coverage among children (see objectives 11 and 12) will  
13 be to implement State laws requiring hepatitis B vaccination before a child can enter kindergarten (29  
14 States had such laws in 1997) and before a child can enter 9th grade (13 States had such laws in 1997)  
15 (see objective 19).

16 **Target Setting Method:** Follows ACIP immunization strategy.

17 **Data Source:** National Notifiable Disease Surveillance System (NNDSS), CDC, EPO. Estimated  
18 cases are derived from reported cases by adjusting for underreporting.

19  
20 In the United States, 5 percent of the population has been infected with HBV and an estimated 250,000 to  
21 300,000 infections have occurred annually over the past 20 years. Although most infections occur among  
22 young adults with high-risk behaviors (e.g., multiple sex partners, injection drug use), young children have  
23 the highest risk of chronic infection. Chronic infection with HBV often leads to chronic liver disease,  
24 including cirrhosis and liver cancer.  
25

1 **6a. Reduce by 75 percent hepatitis B cases per 100,000 among adults more than 25 years of age.**

2

Age Group	1996	2010 Target
25-39 years	44.5	11.1
≥40 years	3.7	.9

3  
4 **6b. Reduce by 75 percent hepatitis B cases in high-risk groups.**

5

Risk Group	1996	2010 Target
Injection drug users	10,216	2,554
Heterosexually active persons	19,831	4,958
Men who have sex with men	9,615	2,404
Occupationally exposed workers	407	102

6 **Target Setting Method:** 75 percent improvement.

7  
8 **Note:** To approach elimination of HBV transmission in the United States by 2010, vaccination  
9 programs targeted to adolescents and adults in high-risk groups need to be implemented. The primary  
10 means of achieving high levels of vaccine coverage in groups with behavioral risk factors for HBV  
11 infection (see objective 13) is to identify settings where these individuals can be vaccinated. Sites  
12 where hepatitis B vaccination should be offered to all susceptible patients include clinics that treat  
13 sexually transmitted diseases, correctional facilities (juvenile detention facilities, prisons, jails), drug  
14 treatment clinics, and community-based HIV prevention sites. The primary means of achieving high  
15 levels of vaccine coverage among household and sex contacts of the estimated 1.25 million persons in  
16 the United States with chronic HBV infection will be establishing programs that offer followup for all  
17 HBsAg-positive persons reported to State and local health departments.

18  
19 **Data Sources:** National Notifiable Disease Surveillance System (NNDSS), CDC, EPO; Sentinel  
20 Counties Study of Viral Hepatitis, CDC, NCID. Estimated cases are derived from reported cases by  
21 adjusting for underreporting.

22  
23 Implementation of routine infant vaccination will eventually produce a highly immune population  
24 sufficient to eliminate HBV transmission in the United States. However, high rates of acute hepatitis B  
25 continue to occur, with an estimated 65,000 cases in 1996. Most of these cases occur in young adult risk  
26 groups, including persons with a history of multiple sex partners (more than one partner in the prior 6  
27 months); men who have sex with men; injecting drug users; incarcerated persons; and household and sex  
28 contacts of persons with HBV infection. In most of these risk groups, vaccine coverage is low and most  
29 persons with acute hepatitis B cases also have had a missed opportunity to be vaccinated. Among acute  
30 hepatitis B cases reported in the Sentinel Counties Study of Viral Hepatitis in 1996, 42 percent had been  
31 treated for a sexually transmitted disease in the past, 31 percent had been in prison or jail at some time in  
32 their lifetime, and 25 percent reported sex or household contact with a person with hepatitis B. Overall, 70  
33 percent had a missed opportunity for vaccination.

1 **7. (Developmental) Decrease by \_\_ percent deaths from hepatitis B-related cirrhosis and liver**  
2 **cancer.**

3  
4 **Potential Data Sources:** National Vital Statistics System (NVSS), CDC, NCHS; Sentinel  
5 Surveillance for Chronic Liver Disease Study, CDC, NCID.

6  
7 Identification of persons with chronic HBV infection affords the opportunity to provide medical  
8 management, including antiviral therapy, which has been shown to eliminate chronic infection in up to 40  
9 percent of infected persons.

10  
11 Approximately 1.25 million Americans are chronically infected with HBV, and an estimated 5,000 to  
12 6,000 deaths occur each year among chronically infected persons from hepatitis B-related liver disease,  
13 including cirrhosis and liver cancer. Currently, the medical and work-loss costs of HBV-related chronic  
14 liver disease are estimated to exceed \$300 million annually.

15  
16 **8. Reduce newly acquired hepatitis C cases to an incidence of no more than 1 case per 100,000**  
17 **people.**

18

Select Populations	1995
African American	1.1
American Indian/Alaska Native	12.1
Asian/Pacific Islander	<1.0
Hispanic	3.9
White	2.5

19  
20 **Target Setting Method:** Better than the best.

21  
22 **Data Source:** Sentinel Counties Study of Viral Hepatitis, CDC, NCID.

23  
24 Hepatitis C virus (HCV) is the most common bloodborne viral infection in the United States. This virus is  
25 most commonly transmitted through large or repeated percutaneous exposures to blood, for example,  
26 through transfusions or transplants from infectious donors, inadvertent contamination of supplies shared  
27 among patients undergoing long-term hemodialysis, or sharing of equipment between injecting drug users.  
28 Transmission of HCV also may occur from exposures to infected contacts through sexual activity,  
29 household contact, perinatal exposure, and percutaneous exposures in the health care setting. HCV  
30 infection affects persons of all ages, but most new cases are among young adults. The highest proportion  
31 of new cases is among whites, but the highest incidence rates are among nonwhite racial and ethnic groups.

32  
33 **9. (Developmental) Increase to \_\_ percent the persons with chronic hepatitis C virus (HCV)**  
34 **infection who are identified by State and local health departments.**

35  
36 **Potential Data Sources:** National Health and Nutrition Examination Survey (NHANES), CDC,  
37 NCHS; State and local health departments.

38  
39 An estimated 4 million Americans are chronically infected with HCV. Although the annual number of  
40 newly acquired HCV infections has declined from an estimated 180,000 in the mid-1980s to an estimated  
41 28,000 in 1995, this large reservoir of chronically infected persons can transmit the virus to others and are  
42 at risk of the severe consequences of chronic liver disease. HCV infection affects persons of all ages, but  
43 the highest seroprevalence of chronic infection is among young adults. More whites are infected with  
44 HCV, but the highest prevalence rates are among nonwhite racial and ethnic groups. Because of the large

1 number of people with chronic HCV infection, identification of these persons must be a major focus of a  
2 comprehensive prevention strategy. Identification of HCV-infected persons allows for counseling about  
3 prevention of further HCV transmission, vaccination against HAV and HBV to prevent additional liver  
4 damage, evaluation for chronic liver disease, possible antiviral therapy, and counseling concerning  
5 avoidance of potential hepatotoxins, such as alcohol, that may increase the severity of HCV-related liver  
6 disease.

7  
8 **10. (Developmental) Decrease by \_\_ percent deaths from hepatitis C-related cirrhosis and liver**  
9 **cancer.**

10  
11 **Potential Data Sources:** National Vital Statistics System (NVSS), CDC, NCHS; Sentinel  
12 Surveillance for Chronic Liver Disease Study, CDC, NCID.

13  
14 Chronic liver disease (cirrhosis and liver cancer) is the 10th leading cause of death among adults in the  
15 United States. Population-based studies conducted by CDC indicate that 40 to 60 percent of chronic liver  
16 disease is HCV related and results in an estimated 8,000 to 12,000 deaths each year. In the absence of  
17 effective preventive and therapeutic measures, the number of deaths due to HCV-related chronic liver  
18 disease might be expected to triple in the next 10 to 20 years as the large number of infected people reach  
19 the age at which chronic liver disease occurs. Currently, the medical and work-loss costs of HCV-related  
20 acute and chronic liver disease are estimated to exceed \$600 million annually.

21  
22 **11. (Former 20.4) Reduce tuberculosis to an incidence of no more than 1.0 per 100,000.** (Baseline:  
23 national tuberculosis (TB) case rate of 8.0 per 100,000 in 1996)

24  
25 **Target Setting Method:** 88 percent improvement.

26  
27 **Data Source:** National TB Surveillance System, CDC, NCHSTP.

28  
29 The original *Strategic Plan for the Elimination of TB in the United States* (published in 1989) set a TB  
30 elimination goal of reducing the incidence of TB to one per million by 2010 with an interim goal of 3.5 per  
31 100,000 by 2000. However, in the mid-1980s the trend toward TB elimination was reversed, and drug-  
32 resistant strains emerged that were even more deadly than before. TB cases increased by 20 percent  
33 between 1985 and 1992. As a result of the resurgence, Congress appropriated increased funding for TB  
34 control, enabling the rebuilding of the TB-related infrastructure. From 1993 through 1997, TB incidence  
35 again declined, although the resurgence of TB and related outbreaks set back TB elimination efforts by  
36 about a decade.

37  
38 The commitment of the additional TB-related resources and subsequent rebuilding of the TB-related  
39 infrastructure made it reasonable to target the achievement of a national TB case rate of no more than 1.0  
40 per 100,000 by 2010. Achievement will depend upon continued resources and significant cooperation  
41 between public and private health care providers and agencies at the Federal, State, and local levels.  
42

1 **Health Care Associated Infections**  
2

3 The next four objectives replace the former 20.5.  
4

5 **12. Reduce the incidence of hospital-acquired infections to 8.8 per 1,000 patient days.** (Baseline: in  
6 1995, 9.8 infections per 1,000 patient days)  
7

8 **Target Setting Method:** 10 percent improvement.  
9

10 **Data Source:** National Nosocomial Infections Surveillance System (NNISS), CDC, NCID.  
11

12 The rate of hospital infections has increased largely because (1) today's hospital patients on average are  
13 older and sicker than those of 20 years ago and thus more susceptible to infection and (2) medical advances  
14 that can save or prolong lives also carry risks for infections. Both trends are expected to continue, and  
15 therefore even a modest reduction, as opposed to a continued increase, can result in thousands of saved  
16 lives.  
17

18 Hospital-acquired infections are a leading cause of disease and death in the United States. Each year, 36  
19 million patients are admitted to U.S. hospitals. Annually, nearly 2 million of these patients are stricken  
20 with a hospital-acquired infection. Of these, nearly 90,000 die. The annual cost of hospital-acquired  
21 infections is approximately \$4.5 billion a year. In the last 20 years, the rate of these infections has  
22 increased 36 percent.  
23

24 **13. Reduce by 30,000 the number of hospital-acquired infections caused by the six most common**  
25 **antimicrobial-resistant microorganisms.** (Baseline: in 1995, these organisms caused 300,000  
26 hospital-acquired infections)  
27

28 **Target Setting Method:** 10 percent improvement.  
29

30 **Data Source:** National Nosocomial Infections Surveillance System (NNISS), CDC, NCID.  
31

32 Antibiotic-resistant microorganisms account annually for over 300,000 hospital-acquired infections and  
33 16,000 deaths. These infections pose an increasingly greater risk to the health and lives of both patients  
34 and health care workers. Six pathogens account for 52 percent of all hospital-acquired infections:  
35 *Staphylococcus aureus*, coagulase-negative staphylococci, enterococci, *Escherichia coli*, *Pseudomonas*  
36 *aeruginosa*, and *Klebsiella pneumoniae*. Seventy percent of these pathogens are resistant to at least one of  
37 the most commonly used antibiotics. Decreasing the number of hospital-acquired infections caused by  
38 antimicrobial-resistant microorganisms is of vital public health importance. Research shows that reductions  
39 of a least 10 percent can be achieved through emphasis on infection control guidelines, appropriate use of  
40 antimicrobials, and continued education of health care workers on prevention and control of hospital  
41 infections and appropriate antimicrobial use.  
42

43 **14. Reduce the rate of antimicrobial use in intensive care unit patients to fewer than 120 daily doses**  
44 **per 1,000 patient days.** (Baseline: in 1995, 150 daily doses per 1,000 patient days)  
45

46 **Target Setting Method:** 20 percent improvement.  
47

48 **Data Source:** National Nosocomial Infections Surveillance System (NNISS), CDC, NCID.  
49

1 Hospital-acquired infections caused by antimicrobial-resistant pathogens can be virtually untreatable.  
2 Further, antimicrobial resistance that develops in the hospital setting can spread into the community and  
3 has the potential to cause a public health disaster. Excessive use of antimicrobials, which occurs most  
4 frequently in intensive care units (ICUs), is the major cause of antimicrobial resistance. Research indicates  
5 that antibiotics are being used more often than hospital prescription guidelines recommend. For example,  
6 one recent study indicated that as much as 60 percent of the hospital prescriptions for vancomycin are not  
7 in accordance with the guidelines. Decreasing the use of antimicrobials, especially in ICUs (where  
8 hospital-acquired infections occur most often), is the critical step in reducing the public threat of  
9 antimicrobial resistance. Studies have shown that interventions in individual hospitals have achieved  
10 reductions of 20 percent or more in antimicrobial use, and consultation with experts indicates that similar  
11 results are achievable on a national level.

12  
13 **15. Decrease to 350,000 exposures the annual number of occupational needle-stick exposures to**  
14 **blood among health care workers.** (Baseline: 500,000 needle-stick exposures occurred among  
15 health care worker in 1995)

16  
17 **Target Setting Method:** 30 percent improvement.

18  
19 **Data Sources:** National Surveillance System for Health Care Workers, CDC, NCID, NCHSTP, NIP,  
20 NIOSH.

21  
22 Needle-stick exposures to blood among health care workers can transmit HIV and hepatitis, with both fatal  
23 and debilitating consequences. Many of these exposures are preventable with currently available  
24 technology. Two studies that evaluated safety devices, ongoing surveillance of occupational injuries and  
25 consultation with experts in occupational safety and injury prevention, indicate that at least a 30 percent  
26 reduction can be achieved with new technologies and changes in technique.

27  
28 **16. (Former 20.7) Reduce the incidence of bacterial meningitis in children 1 month to 23 months to**  
29 **11.0 per 100,000 children 1-23 months.** (Baseline: 14.6 per 100,000 in 1995)

30  
31 **Note:** Pneumococcal conjugate vaccines, modeled after the successful construction of Hib conjugate  
32 vaccines, are currently in clinical trials. Before 2010, we expect licensure and widespread use of these  
33 new products and thus believe the year 2010 objective will be attainable.

34  
35 **Target Setting Method:** 25 percent improvement.

36  
37 **Data Source:** Active Bacterial Core Surveillance (ABCS), Emerging Infection Programs, CDC,  
38 NCID.

39  
40 We reached the year 2000 objective ahead of schedule because of the licensure and widespread utilization  
41 of conjugate vaccines for prevention of meningitis due to Hib. The revised objective focuses on children  
42 between 1 month and 2 years of age, who have higher rates of meningitis than older persons. The objective  
43 to further reduce bacterial meningitis in this age group is designed to track the impact of new vaccines for  
44 pneumococcal disease, including pneumococcal meningitis.

1 **17a. (Former 20.10) Decrease the incidence of invasive pneumococcal infections to 49 per**  
2 **100,000 persons less than 5 years of age and to 53 per 100,000 persons aged 65 and older.**  
3 (Baseline: 81.7 per 100,000 population less than 5 in 1995-96; 70.7 per 100,000 population aged  
4 65 and older in 1995-96)  
5

6 **17b. Decrease the incidence of invasive penicillin-resistant pneumococcal infections to 7.4 per**  
7 **100,000 population less than 5 years and to 6.2 per 100,000 population aged 65 and older.**  
8 (Baseline: 12.4 per 100,000 population less than 5 years in 1995-96; 8.2 per 100,000 population  
9 aged 65 and older in 1995-96)  
10

11 **Note:** These estimates represent a 40 percent reduction in the incidence of pneumococcal disease  
12 (and drug-resistant pneumococcal infections) in children less than 5 years of age and 25 percent  
13 reduction in the incidence of pneumococcal disease (and drug-resistant infections) in persons aged  
14 65 years and older. For children less than 5 years of age, we assumed that conjugate vaccines will  
15 cover at least 80 percent of serotypes causing invasive pneumococcal disease, that 80 percent  
16 coverage can be achieved, and that vaccines will be at least 62 percent efficacious against invasive  
17 disease  $(.80 \times .80 \times .62) = .40$ . Although these are conservative estimates, it is also possible that  
18 without intervention invasive pneumococcal disease would be increasing, since limited data  
19 suggest that increasing resistant strains can result in higher rates of disease. Thus, a 40 percent  
20 reduction from current rates might reflect a larger reduction from what invasive pneumococcal  
21 rates may rise to before conjugate vaccines become widely available. For persons aged 65 years  
22 and older, we assumed that by 2010, vaccine coverage could be increased from 37 percent to 80  
23 percent and that disease reduction in the additional 43 percent of vaccinated individuals would  
24 reduce disease by 56 percent (vaccine efficacy against invasive infection for all patients  $[.56 \times$   
25  $.43 = .24$ , rounded to target 25 percent reduction]).<sup>2</sup>  
26

27 **Target Setting Method:** 40 percent improvement for children younger than 5 years; 25 percent  
28 improvement for those aged 65 and older.  
29

30 **Data Source:** Active Bacterial Core Surveillance (ABCS), Emerging Infection Programs, CDC,  
31 NCID.  
32

33 The number of invasive penicillin-resistant pneumococcal infections can be reduced by reducing the  
34 proportion of invasive pneumococcal infections that are due to drug-resistant strains or by reducing  
35 invasive pneumococcal infections in general. The objectives for specific age groups shown above are  
36 designed to address the key age groups at risk for invasive pneumococcal infections. Among children less  
37 than 5 years of age, promoting judicious antibiotic use may reverse the current trends toward increasing  
38 proportions of infections being caused by drug-resistant strains. In addition, licensure and widespread use  
39 of pneumococcal conjugate vaccines between now and 2010 could dramatically reduce all invasive  
40 pneumococcal infections in persons aged 65 years and older; promoting judicious antibiotic use may have  
41 some impact on the proportion of pneumococcal infections caused by drug-resistant strains. In this age  
42 group, a much greater impact is potentially achievable through improved utilization of licensed 23-valent  
43 pneumococcal polysaccharide vaccine for the prevention of invasive pneumococcal disease. We believe  
44 improving utilization of this vaccine in the elderly could have an important impact on the rate of drug-  
45 resistant invasive pneumococcal infections.  
46

47 We propose monitoring both total invasive pneumococcal disease and invasive pneumococcal disease due  
48 to penicillin-resistant organisms, because over the next 12 years, we expect initial improvement among  
49 children less than 5 years old to reflect promotion of judicious antibiotic use and reduction in the  
50 proportion of disease due to drug-resistant strains, whereas over the latter part of the next 12 years we

*Healthy People 2010 Objectives: Draft for Public Comment*

1 expect the introduction of conjugate pneumococcal vaccines to affect total rates of pneumococcal disease.  
2 Among persons over 65, drug-resistant strains may be reduced through efforts to promote judicious  
3 antibiotic use in children and adults, as well as through improved use of pneumococcal conjugate vaccines.  
4

5 Racial disparity currently exists for the rates of these conditions as follows:

- 6 • Invasive pneumococcal infections in persons less than 5 years:  
7 Baseline in African Americans = 170.4 per 100,000 population less than 5 years in July 1995-June  
8 1996  
9 Baseline in non-African Americans = 65.1 per 100,000 population less than 5 years in July 1995-June  
10 1996  
11
- 12 • Invasive pneumococcal infections in persons aged 65 and older:  
13 Baseline in African Americans = 94.2 per 100,000 population aged 65 and older in July 1995-June  
14 1996  
15  
16 Baseline in non-African Americans = 68.7 per 100,000 population aged 65 and older in July 1995-  
17 June in 1996  
18
- 19 • Invasive penicillin-resistant ( $\text{MIC} \geq 2 \mu\text{g/mL}$ ) pneumococcal infections in persons less than 5 years of  
20 age:  
21 Baseline in African Americans = 19.8 per 100,000 population less than 5 years in July 1995-June 1996  
22 Baseline in non-African Americans = 11.0 per 100,000 population less than 5 years in July 1995-June  
23 1996  
24
- 25 • Incidence of invasive penicillin resistant ( $\text{MIC} \geq 2 \mu\text{g/mL}$ ) pneumococcal infections in persons aged 65  
26 and older:  
27 Baseline in African Americans = 8.0 per 100,000 population aged 65 and older in July 1995-June  
28 1996  
29 Baseline in non-African Americans = 8.1 per 100,000 population aged 65 and older in July 1995-June  
30 1996  
31

1 **18. Decrease the incidence of invasive early-onset group B streptococcal disease to 0.5 cases per**  
2 **1,000 live births.** (Baseline: 0.71 per 1,000 births in 1996; 0.66 per 1,000 births in 1996; 0.99 1,000  
3 births in 1996.)

Select Populations	1996
African American	0.99
American Indian/Alaska Native	Not available
Asian/Pacific Islander	Not available
Hispanic	Not available
White	0.99

4  
5 **Target Setting Method:** The incidence of early-onset group B streptococcal (GBS) disease in 1996  
6 already reflected a substantial decline from earlier years, before intervention became common practice.  
7 We know that additional prevention is possible, since cases that continue to occur are more likely to  
8 represent failure to offer prevention than antibiotic failures. The target we propose requires on average  
9 a further decline of 30 percent in the incidence of disease. In certain areas, rates approximating 0.5 per  
10 1,000 births have already been achieved. We believe this may represent the background rate of  
11 nonpreventable cases; however, most geographic areas should be able to achieve these low rates, and  
12 the racial disparity in rates should be eliminated with more aggressive use of prevention protocols.  
13

14 **Data Source:** Active Bacterial Core Surveillance (ABCS), Emerging Infection Programs, CDC,  
15 NCID.

16  
17 In 1996, CDC, the American College of Obstetrics and Gynecology, and the American Academy of  
18 Pediatrics issued consensus recommendations for the prevention of perinatal GBS disease.<sup>3</sup> The  
19 recommendations urged all obstetric programs to adopt a prevention policy (two different strategies were  
20 provided as alternatives, a screening-based approach and a risk-based approach) and to advise patients of  
21 the strategy available to them. There has been substantial geographic and racial variation in the incidence  
22 of early-onset GBS disease (defined as isolation of GBS from normally sterile sites in an infant less than 7  
23 days of age). In certain geographic areas, there has already been a decline of more than 40 percent in the  
24 incidence of early-onset disease, while in other areas the incidence has stayed high.

25  
26 Instead of having a percent reduction in disease as the target, which would be achievable in areas that have  
27 not yet implemented GBS strategies but probably not in areas where substantial declines have already  
28 occurred, we propose an objective that focuses on achieving a low rate of disease in all areas. African  
29 Americans have consistently had rates approximately twice those observed in other races. With  
30 implementation of GBS prevention policies, we expect the disparity to be eliminated. Thus, the target of  
31 0.5 cases per 1,000 births is one we believe can be obtained in all geographic areas and all racial and  
32 ethnic groups. By the year 2010, reductions in early-onset disease might represent the result of both  
33 improved use of intrapartum antibiotic prophylaxis and implementation of GBS conjugate vaccines, which  
34 are currently in clinical trials.  
35

36 **19. Reduce the incidence of Lyme disease to no more than 6.5 per 100,000 population in endemic**  
37 **States.** (Baseline: 17.4 cases per 100,000 population [1992-1996: Connecticut, Delaware, Maryland,  
38 Massachusetts, Minnesota, New Jersey, New York, Pennsylvania, Rhode Island, Wisconsin])

39 **Target Setting Method:** The target was determined by calculating the number of Lyme disease cases  
40 that would hypothetically be prevented by vaccination and a host-targeted acaricide in 50 percent of  
41 endemic communities for 10 years and vaccine coverage of 40 percent with 80 percent vaccine  
42 efficacy.

43 **Data Source:** National Electronic Telecommunications System for Surveillance (NETSS), CDC.

1  
2 In 1991 a standardized case definition for Lyme disease was adopted by the Council of State and  
3 Territorial Epidemiologists. Since then, the number of reported cases of Lyme disease has increased from  
4 8,257 in 1993 to 16,455 in 1996. From 1992 through 1996, 92 percent of cases were reported from 10  
5 endemic States. CDC is committed to prevention and control of Lyme disease and seeks to make a  
6 significant impact on the incidence of this disease by the year 2010.

7  
8 **20. Reduce hospitalizations caused by peptic ulcer disease in the United States to 57 per 100,000**  
9 **population.** (Baseline: 81 per 100,000 population in 1995)

10  
11 **Note:** NHDS will be used to monitor changes in hospitalization rates due to peptic ulcer disease. In  
12 the 1995 NHDS, there were 81 hospital discharges per 100,000 population for peptic ulcer disease and  
13 its complications. This rate includes extrapolated data for ICD-9 codes 531-534 for first listed  
14 diagnosis for discharges from short-stay hospitals. These ICD-9 codes include discharges caused by  
15 gastric ulcer, duodenal ulcer, peptic ulcer, and gastrojejunal ulcer and include persons with  
16 uncomplicated ulcers and those with ulcers complicated by bleeding or perforation. The Healthy  
17 People 2010 objective will be to reduce hospitalizations caused by peptic ulcer disease by 30 percent  
18 from 81 per 100,000 population in 1995 to 57 per 100,000 in 2010.

19  
20 **Target Setting Method:** 30 percent improvement.

21  
22 **Data Source:** National Hospital Discharge Survey (NHDS) data, CDC, NCHS.

23  
24 In the United States peptic ulcer disease affects up to 25 million people during their lifetimes and causes  
25 up to 6,500 deaths each year. Until recently, peptic ulcers were thought to be caused by stress, spicy foods,  
26 and excess acid in the stomach. Most patients were treated with antacids or acid-reducing medications and  
27 recurrences were the rule after therapy was discontinued. However in the 1980s the discovery that a  
28 bacterial organism, *Helicobacter pylori*, caused up to 90 percent of peptic ulcers has changed the way  
29 ulcers are evaluated and managed. Appropriate antibiotic regimens can now successfully eradicate the  
30 infection and prevent recurrence of the ulcer and complications of ulcers such as bleeding or perforation.

31  
32 Despite extensive scientific data linking peptic ulcer disease to *H. pylori*, studies indicate that many health  
33 care providers and consumers are still not aware of the relationship and many people with ulcers have not  
34 yet received appropriate therapy. In 1997, Congress recommended that CDC develop and implement a  
35 campaign to educate health care providers and consumers about *H. pylori* and its link to peptic ulcer  
36 disease. The educational campaign was launched in October 1997 in collaboration with partners from  
37 academic institutions, government agencies, and industry and has received media attention nationwide.  
38 We anticipate that increased awareness of the link between *H. pylori* and ulcers among health care  
39 providers and consumers, through the educational efforts of CDC and others, will lead to the increased use  
40 of appropriate antibiotics to cure ulcers. This improved treatment should decrease hospitalization rates  
41 (which are an indicator for severe morbidity) due to peptic ulcer disease and its complications.

1 **21. (Former 20.11) Achieve immunization coverage of at least 90 percent among children 19-35<sup>a</sup>**  
 2 **months of age.**  
 3

<b>Recommended Immunization</b>	<b>1996</b>
At least 4 doses of diphtheria-tetanus-pertussis containing vaccine	81%
At least 3 doses of Hib	93%
At least 1 dose of measles-mumps-rubella vaccine <sup>b</sup>	91%
At least 3 doses of hepatitis B vaccine	84%
At least 1 dose of varicella vaccine	26%
At least 3 doses of polio vaccine <sup>c</sup>	91%
4 DTP, 3 polio, 1 MMR, 3 Hib <sup>d</sup>	76%
4 DTP, 3 polio, 1 MMR, 3 Hib, 3 hepatitis B <sup>d</sup>	Not available

4  
 5 <sup>a</sup> Two years of age is measured at 19 to 35 months of age by the National Immunization Survey.

6 <sup>b</sup> MMR estimate in 1997 is based on all measles-containing vaccines.

7 <sup>c</sup> Polio expected to be eradicated by the year 2000.

8 <sup>d</sup> This series will change as new vaccines are incorporated.

9  
 10 **Target Setting Method:** Retain year 2000 target. Immunization coverage levels of 90 percent are, in  
 11 general, sufficient to prevent circulation of viruses and bacteria-causing VPDs.

12  
 13 **Data Source:** National Immunization Survey (NIS), CDC, NCHS, NIP.

14  
 15 Maintenance of high immunization coverage levels in early childhood is the best way to prevent the spread  
 16 of VPDs in childhood and provide the foundation for controlling VPDs among adults. The measles  
 17 epidemic of 1989-91 demonstrated that achievement of high coverage levels at the time of school entry  
 18 was insufficient to control VPD outbreaks. Although coverage levels are currently the highest ever  
 19 recorded, recent introduction of hepatitis B and varicella vaccines in the universal childhood vaccination  
 20 schedule highlight the need to continuously monitor coverage levels and to search for gaps in  
 21 immunization coverage. Monitoring of coverage levels helps Federal, State, and local health agencies  
 22 direct strategies to increase vaccination coverage and reduce the risk of future disease outbreaks.  
 23

24 **22. (Former 20.11) Ensure that all 50 States achieve immunization coverage of at least 90 percent**  
 25 **among children 19-35 months of age for each of the following antigens:**

<b>Recommended Immunization</b>	<b>1996-1997</b>
At least 3 doses of diphtheria-tetanus-pertussis-containing vaccine	50
At least 3 doses of Hib vaccine	45
At least 1 dose of measles-mumps-rubella vaccine	37
At least 3 doses of hepatitis B vaccine	1
At least 1 dose of varicella vaccine	0
At least 3 doses of polio vaccine <sup>a</sup>	40

26  
 27 <sup>a</sup> Polio expected to be eradicated by the year 2000.

28 **Target Setting Method:** Retain year 2000 target. Immunization coverage levels of 90 percent are, in  
 29 general, sufficient to prevent circulation of viruses and bacteria-causing VPDs.

30 **Data Source:** National Immunization Survey (NIS), CDC, NCHS, NIP.

1  
2 The achievement in 1996 of two of the six disease-elimination goals established by the Childhood  
3 Immunization Initiative (tetanus among children aged less than 15 years and polio caused by wild polio  
4 virus), the disease-reduction goal for mumps and the lowest ever incidence of the other targeted VPDs, is  
5 attributed to achieving record-high national vaccination coverage levels of 90 percent for all targeted  
6 vaccines and 82 percent for hepatitis B vaccine. Similarly, most of the States already have achieved high  
7 coverage for several of the recommended vaccines. Publication of State coverage levels under the  
8 Childhood Immunization Initiative resulted in increased activities by States to attain high coverage levels.  
9 Ongoing dissemination of State-specific data is expected to help direct and motivate the State and local  
10 activities necessary to achieve and maintain uniformly high coverage levels.

11  
12 Although national coverage may achieve levels in excess of 90 percent, variation in the level of coverage  
13 among smaller areas may include subgroups of the population at substantially lower levels of protection.  
14 These subgroups or “pockets” of underimmunized persons make the population vulnerable to major  
15 outbreaks of VPDs. Monitoring of coverage at smaller geographic levels within the Nation helps ensure  
16 that potential pockets of underimmunized children are identified and receive appropriate intervention. The  
17 best protection against VPDs is the maintenance of a homogeneously high level of coverage throughout the  
18 Nation. By promoting high coverage at the State and local level, this goal seeks to further reduce the risk of  
19 VPD outbreaks.

20  
21 **23. (Former 20.11) Maintain immunization coverage at 95 percent for children in licensed day care**  
22 **facilities and children in kindergarten through the first grade.**

23

Recommended Immunization	1995–1996	
	Day Care	K-1st Grade
Diphtheria-tetanus-pertussis	95%	98%
Measles, mumps, rubella	95%	99%
<i>Haemophilus influenzae</i> type b	Not available	Not available
Hepatitis B (3 doses)	Not available	Not available
Varicella	Not available	Not available
Polio (3 doses) <sup>a</sup>	95%	98%

24  
25 <sup>a</sup> Polio expected to be eradicated by the year 2000.

26  
27 **Note:** Uniformly high coverage levels are required to prevent circulation of the viruses and bacteria  
28 causing VPDs. The target level was set to be consistent with the Healthy People 2000 objective since  
29 (1) the achievement of that objective has been successful at preventing disease spread, and (2) this  
30 objective is to maintain the high coverage that has been achieved in these settings.

31  
32 **Target Setting Method:** Retain year 2000 target.

33  
34 **Data Source:** Annual survey by State immunization programs.

35  
36 School and day care entry requirements are the most effective interventions the States have to ensure that  
37 children are appropriately vaccinated. The impact of the school entry requirements has been profound—  
38 greater than 97 percent of children are vaccinated prior to school entry. Several studies support the role that  
39 school entry requirements have had in increasing immunization rates and decreasing measles incidence. A  
40 1978 study showed that States vigorously enforcing comprehensive school immunization requirements have  
41 experienced a several fold reduction in measles incidence compared to other States without such

1 requirements. A second study comparing States with high and low measles incidence documents that the  
 2 major difference was strict enforcement of school immunization laws.

3  
 4 **24. (Former 20.11a and b) Increase to 90 percent the rate of immunization coverage among adults**  
 5 **65 years of age or older; 60 percent for high-risk adults 18-64 years of age.**  
 6

<b>Recommended Immunization</b>	<b>1995</b>	<b>2010 Target</b>
<b>a) Noninstitutionalized adults 65 years of age or older</b>		
Influenza vaccine <sup>a</sup>	58%	90%
Pneumococcal vaccine <sup>b</sup>	32%	90%
<b>b) Noninstitutionalized high-risk<sup>c</sup> adults 18-64 years of age</b>		
Influenza vaccine	30%	60%
Pneumococcal vaccine	15%	60%
<b>c) Institutionalized adults (persons in long-term or nursing homes)</b>		
Influenza vaccine	62% <sup>d</sup>	90%
Pneumococcal vaccine	23% <sup>e</sup>	90%

7  
 8 <sup>a</sup> One dose of influenza vaccine administered in the last 12 months.

9 <sup>b</sup> Ever received one dose of pneumococcal vaccine.

10 <sup>c</sup> High-risk adults as defined by the Advisory Committee on Immunization Practices.

11 <sup>d</sup> 22 percent answered “don’t know” (1995 National Nursing Home Survey).

12 <sup>e</sup> 43 percent answered “don’t know” (1995 National Nursing Home Survey).

13  
 14 **Target Setting Method:** Better than the best.

15  
 16 **Data Source:** National Health Interview Survey (NHIS), CDC, NCHS.

17  
 18 Recent Federal initiatives have highlighted the need to focus resources on adults. Current coverage levels  
 19 among adults vary widely by risk group. Influenza and pneumococcal vaccines are covered by Medicare,  
 20 thus supporting the feasibility of vaccinating greater numbers of older adults.

21  
 22 Approximately 45,000 adults die each year from complications associated with pneumococcal disease and  
 23 influenza. With the aging of our population, increasing numbers of adults will be at risk for these major  
 24 causes of death and illness. Persons with high-risk conditions (e.g., heart disease, diabetes, chronic  
 25 respiratory disease and asthma) remain at increased risk, as do persons living in institutional settings.  
 26 Vaccination is an effective strategy to reduce illness and deaths due to pneumococcal disease and influenza.  
 27

28 **25. Increase to at least 90 percent the proportion of all tuberculosis patients who complete curative**  
 29 **therapy within 12 months.** (Baseline: 67.6 percent in 1994)

30  
 31 **Target Setting Method:** 33 percent improvement.

32  
 33 **Data Source:** National TB Surveillance system, CDC, NCHSTP.

34  
 35 Patients with drug-susceptible TB should complete a successful regimen within 12 months. Multidrug-  
 36 resistant TB presents difficult treatment problems, often requiring consultation and longer treatment

1 regimens. The measurement of completion of therapy is a long-accepted measure of the effectiveness of  
2 community TB control efforts. Health departments have traditionally reported completion of therapy results  
3 to CDC and used this information locally and statewide as an evaluation measure. (Note: If TB treatment  
4 recommendations for persons with HIV infection are changed so that some are treated with regimens that do  
5 not contain rifampin, then their treatment may exceed 12 months and the objective would have to be revised  
6 to reflect the change.)

7  
8 The highest priority for TB control is to ensure that persons with the disease complete curative therapy. If  
9 treatment is not continued for a sufficient length of time, such persons often become ill and contagious  
10 again. Completion of therapy is essential to prevent transmission of disease as well as to prevent outbreaks  
11 and the development and transmission of drug-resistant TB.

12  
13 **26. (Former 20.17) Increase to at least 85 percent the proportion of contacts, including other high-**  
14 **risk persons with tuberculosis infection, who complete courses of preventive therapy.** (Baseline:  
15 65.4 in 1995)

16  
17 **Target Setting Method:** 22 percent improvement.

18  
19 **Data Source:** Completion of Preventive Therapy Report forms submitted by State and local health  
20 departments, CDC, NCHSTP.

21  
22 Preventive therapy substantially reduces the risk that TB infection will progress to disease. Certain groups  
23 are at very high risk of developing TB disease once infected. Groups at high risk for TB vary in time and  
24 from area to area, depending on unique and changing TB-related demographics. The current TB high-risk  
25 groups are defined in the CDC TB screening statements. CDC, together with its partners, periodically  
26 redefines “high-risk groups” based on epidemiologic analysis of national, State, and local TB morbidity  
27 data. The selection of this objective and target is based on the perceived ability of TB programs to better use  
28 TB-related resources and improve targeting of individuals at high risk of TB for completion of preventive  
29 therapy.

30  
31 **27. (Former 20.9) Reduce to 65 the number of courses of antibiotics for ear infections per 100**  
32 **children aged 4 and younger.** (Baseline: July 1996-June 1997: 79 antibiotic courses for otitis media  
33 per 100 children aged 4 and younger were administered, based on a total of 15,496,889 million courses  
34 of antibiotics for otitis media [ICD-9 diagnostic codes: 381.0, 381.4, 382.0, 382.4, 382.9] in children  
35 aged 4 years and younger)

36  
37 **Target Setting Method:** 18 percent improvement.

38  
39 **Data Source:** National Disease Therapeutic Index.

40  
41 The target for objective 27 represents an 18 percent reduction in current courses of antibiotics for otitis  
42 media diagnoses. Approximately 30 percent of ear infections are otitis media with effusion, which do not  
43 need antimicrobial treatment. Through promotion of judicious antimicrobial use, we believe we can  
44 eliminate 60 percent of the courses of antibiotics being used for this indication. Another potential way to  
45 accomplish this objective is to reduce the incidence of otitis media (and thus the need for antimicrobial  
46 therapy for acute otitis media, which does need therapy). Pneumococcus causes approximately 40 percent  
47 of acute otitis media. An 18 percent reduction in otitis media can be accomplished if pneumococcal  
48 conjugate vaccines include serotypes covering 65 percent of pneumococcal isolates responsible for  
49 pneumococcal otitis, vaccine coverage is approximately 80 percent, and vaccine efficacy is 87 percent  
50 against vaccine serotypes.

1  
2 We revised former objective 20.9, which focused on the number of episodes of middle ear infections per  
3 child (which had been based on NHIS) to track instead the total burden of antibiotic-treated otitis media.  
4 We believe antibiotic courses for otitis media can be reduced through two methods. A portion of otitis  
5 media cases (otitis media with effusion, as opposed to acute otitis media) do not require antimicrobial  
6 treatment. Through a national campaign for judicious antibiotic use, we aim to reduce inappropriate  
7 antibiotic treatment for this portion of otitis media. The leading cause of otitis media is pneumococcus and  
8 pneumococcal media. The second strategy to reduce courses of antibiotics for otitis media is to prevent  
9 pneumococcal otitis media following licensure of pneumococcal conjugate vaccines. We believe through  
10 one or both of these strategies, a 20 percent reduction in courses of antibiotics for otitis media can be  
11 achieved by 2010.

12  
13 **28. Reduce to 2,785 the number of courses of antibiotics prescribed for the “common cold” per**  
14 **100,000 population.** (Baseline: 14,500,765 antibiotic courses for “common cold” during the period  
15 July 1996-June 1997 in all ages, or rate of 5,570 antibiotic courses per 100,000 population [assumes  
16 total population of 260,340,990])

17  
18 **Note:** The common cold does not require antimicrobial therapy. We targeted reducing inappropriate  
19 therapy for the common cold by 50 percent through promotion of judicious antimicrobial use. The  
20 estimate that 50 percent of this use could be reduced is based on the assumption that highly effective  
21 and judicious antibiotic use programs may be launched in many communities that could reduce  
22 prescription of antibiotics for the common cold by 100 percent in those areas, but coverage of these  
23 programs by the year 2010 is not likely to be homogeneous.

24  
25 **Target Setting Method:** 50 percent improvement.

26  
27 **Data Source:** National Disease Therapeutic Index.

28  
29 Prescribing antibiotics for the “common cold” is not appropriate. Through promotion of a judicious  
30 antibiotic use campaign, a substantial proportion of antibiotic prescriptions for these upper respiratory  
31 infections can be reduced. Thus, attaining this objective by 2010 is not based on the belief that effective  
32 strategies for the prevention of viral upper respiratory infections (see diagnostic codes above) will have been  
33 identified but is based on the assumption that caregivers and patients can be reeducated to accept that  
34 antibiotics should not be given for colds.

35  
36 **29. (Developmental/Former 20.12) Decrease to \_\_ the number of inappropriate rabies postexposure**  
37 **prophylaxis, as defined by current Advisory Committee on Immunization Practices (ACIP)**  
38 **guidelines.**

39  
40 Although there are approximately 40,000 estimated total postexposure prophylaxis (PEP) in the United  
41 States annually, no baseline data on their appropriateness exist. We intend to utilize annual national,  
42 regional, and special local study sources to provide estimates of commercial biologic product consumed,  
43 extrapolate from historical animal rabies case data related to exposed persons, and use annual selected  
44 regional State estimates to determine total vaccine use and assess the percentage of unnecessary PEPs.  
45 Since rabies in wildlife populations in the United States has increased in recent years, an objective to reduce  
46 overall rabies vaccine utilization is inappropriate, but one that reduces unnecessary use is vital to maintain  
47 the needed supply, reduce costs, and limit potential side effects.

1 **30. Increase to 90 percent the number of 2-year-old children who receive vaccinations as part of**  
2 **comprehensive primary care.\*** (Baseline: 66 percent in 1996)

3  
4 \*Comprehensive primary care includes all aspects of **routine** health care (preventive, diagnostic, and  
5 therapeutic) delivered by a trained health care provider.

6  
7 **Target Setting Method:** 50 percent improvement.

8  
9 **Data Source:** National Immunization Survey (NIS) Provider Record Check. The survey asks parents  
10 to identify all immunization providers for their child; these providers are surveyed in the provider  
11 record check component of the NIS. One question asked of the providers is whether the practice has  
12 ever been the “medical home for primary care” for the child. This information provides a measure of  
13 the objective.

14  
15 The purpose of this objective is to encourage vaccination as part of routine care for infants and young  
16 children. Parents whose children have a regular source of primary care prefer to have their children  
17 vaccinated at the primary care provider office rather than be referred to another provider to immunize.  
18 Referrals from a primary care provider to an immunization clinic cause missed opportunities for  
19 immunization, and these missed opportunities are associated strongly with incomplete vaccination. Federal,  
20 State, and private sector improvements in children’s health care financing and organization have the  
21 common goal of coupling vaccination with primary care.

22  
23 Compared to fully immunized children, children who are not completely vaccinated have fewer health care  
24 visits and fewer screenings for conditions such as anemia and lead exposure. Interventions to bring  
25 incompletely vaccinated children to their primary care provider are known to improve these other health  
26 aspects. Thus, coupling vaccination and primary care improves more than vaccination status.

27  
28 **31. (Developmental) Increase to \_\_ percent the number of immunization providers who have**  
29 **systematically measured the immunization coverage levels in their practice population.**

30  
31 **Potential Data Sources:** Provider-based surveys; provider record check component of the National  
32 Immunization Survey (NIS), CDC, NCHS, NIP.

33  
34 In 1996, approximately 75 percent of public health department providers had their coverage levels assessed.  
35 State immunization programs have begun collaborating with private providers to extend the use of  
36 provider-based assessments in the private sector. With the increasing role of managed care and use of  
37 Health Employer Data Information Set (HEDIS) measures, private providers should have additional  
38 occasions to examine their coverage levels.

39  
40 Most providers overestimate the immunization coverage level they are achieving among their clients.  
41 Assessment of practice-based coverage levels and feedback of those data to the providers has been an  
42 effective strategy for increasing immunization of children served by a given practice. Managed care  
43 organizations have begun reporting immunization coverage levels using the HEDIS criteria as a way of  
44 evaluating quality of care. Practice-based assessment has also been recommended by the ACIP, National  
45 Vaccine Advisory Committee (NVAP), the American Academy of Pediatrics, and the American Academy  
46 of Family Physicians.

1 **32. (Developmental) Increase to \_\_\_ percent the number of children enrolled in a fully functional**  
2 **population-based immunization registry (birth through age 5).<sup>1</sup>**  
3

4 **Note:** Participation in immunization registries will continue to increase. The concept of a childhood  
5 immunization registry has widespread support, and the technology required to develop them is  
6 becoming less expensive and simpler to use. Registries also form part of the current general trend  
7 toward computerization of medical data in the United States.  
8

9 **Potential Data Source:** Provider record check component of the National Immunization Survey (NIS),  
10 CDC, NCHS, NIP.  
11

12 A fully functional registry includes capabilities to automatically enroll all children at birth, give provider  
13 access to complete immunization history, recommend needed immunizations, recall children who are  
14 overdue for immunizations, and assess coverage at the practice and geographic level. Optimally, such  
15 registries should contain additional important functions such as automation of the submission of adverse  
16 event reports.  
17

18 State and community immunization registries will be the cornerstone of our Nation's immunization system  
19 by 2010. Registries facilitate the timely immunization of children by ensuring that the child's complete  
20 vaccination history is available to the health care provider at the time of a health care visit. The information  
21 registries contain also facilitates several proven methods for increasing immunization coverage, for  
22 example, reminder/recall systems and feedback of practice-based coverage levels to immunization  
23 providers. Registries also provide a simple means for assessment of immunization coverage at the  
24 geographic level and population level, thus facilitating efforts to reduce gaps in coverage among subgroups  
25 of persons.  
26

27 Few immunization registries existed before 1992 and little data are available regarding the extent to which  
28 they have been implemented. However, a 1997 CDC survey showed immunization registries were planned  
29 in all States, had been started in at least one public clinic in 44 States, and were active at all public clinic  
30 sites in 13 States (unpublished data, CDC).  
31

32 **Goal: Reduce number of vaccine-associated adverse reactions.**  
33

34 **33. Reduce to zero the number of cases of vaccine adverse reactions attributable to vaccine-**  
35 **associated paralytic polio.** (Baseline: 6-10 cases attributable to vaccine-associated paralytic polio  
36 [VAPP] in 1997)  
37

38 **Note:** VAPP has been one vaccine reaction that has been well documented to be caused by the OPV  
39 vaccine, since there are no natural reservoirs for wild poliomyelitis. With global polio eradication  
40 targeted for sometime shortly after 2000, it should be possible to decrease and then stop the use of OPV  
41 completely, at which time there should be zero cases of VAPP.  
42

43 **Potential Data Source:** National Notifiable Disease Surveillance System (NNDSS), CDC, EPO.  
44

45 Since 1980, no indigenous cases of paralytic poliomyelitis due to wild polio virus transmission have  
46 occurred in the United States. Over 125 cases of VAPP have been reported in this same period, however,  
47 averaging 8 or 9 cases per year. Cases of VAPP suffer the full range of morbidity and loss of social  
48 function associated with being partially or fully paralyzed. Due to the progress in global poliomyelitis  
49 eradication and to reduce the burden of VAPP in the United States, the ACIP in 1997 recommended the  
50 expanded use of inactivated polio virus vaccine (IPV), initially in a sequential schedule of two doses of IPV

1 followed by two doses of OPV, but with expected continued progress in global polio eradication, ultimately  
2 to an all IPV schedule. This should result in eradication of VAPP cases as well.

3  
4 **34. Reduce by 50 percent the number of febrile seizures caused by pertussis vaccines.** (Baseline: 151  
5 febrile seizures in 1997)

6  
7 **Target Setting Method:** 50 percent improvement.

8  
9 **Data Sources:** Vaccine Adverse Event Reporting System (VAERS) and Vaccine Safety Datalink  
10 (VSD), CDC.

11  
12 Double-blind randomized trials comparing the safety and efficacy of several acellular pertussis (aP) vs. one  
13 whole cell pertussis (wP) vaccine were completed in 1995 in Sweden and Italy. The incidence of high fever  
14 (rectal temperature  $\geq 40.5^{\circ}\text{C}$ ) ranged from 0.8 to 1.6 percent for aP compared to 6.8 to 13.3 percent for wP.  
15 The incidence of convulsions ranged from 0.0 to 0.8 percent for aP compared to 0.5 to 0.6 percent for wP.  
16 The sample size in each of these trials was approximately 10,000, however, thereby limiting accurate  
17 assessment of rare reactions. From 1991 to 1993, about 5 million doses of aP vaccine were administered  
18 after it was licensed for use as the fourth and fifth doses in the pertussis immunization series. The reporting  
19 rate of seizures to the Vaccine Adverse Event Reporting System (VAERS) was 0.5 per 100,000 doses for aP  
20 and 1.7 per 100,000 doses for wP vaccines (about 27 million doses given over the same time). This  
21 suggests that replacement of wP vaccine with aP vaccine should reduce febrile seizures by over 50 percent.  
22 Additional phase IV studies using large linked databases are under way to improve precision of these  
23 estimates.

24  
25 In controlled clinical trials, whole cell pertussis (wP) vaccines have been shown to cause seizures at a  
26 frequency of once per 1,750 doses. The great majority of these seizures are febrile seizures without any  
27 residual deficit. Nevertheless, such seizures are extremely frightening to patients and parents alike and  
28 frequently result in emergency room or other medical visits as well as costly diagnostic evaluations to rule  
29 out evolving neurologic disorders. Recently licensed aP vaccines have been shown in clinical trials to be  
30 less likely to cause fever. With the increasing use of acellular pertussis vaccines, the number of pertussis-  
31 vaccine-associated febrile seizures should be reduced by 50 percent.

32  
33 **35. (Developmental/Former 20.6) Increase to \_\_ percent the proportion of international travelers**  
34 **who receive recommended prevention services when traveling in areas of risk for select infectious**  
35 **diseases: hepatitis A,\* malaria,\*\* typhoid.\*\*\***

36  
37 \* Travelers to risk areas will be defined as those travelers to moderate and high prevalence areas of  
38 hepatitis A as identified in the most recent edition of CDC's *Health Information for International*  
39 *Travel*. Travelers who received either hepatitis A vaccine or immune globulin according to current  
40 ACIP recommendations will be considered protected.

41  
42 \*\* An appropriate prescription of antimalarial prophylaxis medications constitutes recommended  
43 preventive services for this disease. Risk areas will be identified by referencing the malaria section in  
44 the most recent edition of *Health Information for International Travel*.

45  
46 \*\*\* Travelers to risk countries will be considered those to countries with intermediate to high  
47 endemicity for typhoid fever infection. Three vaccines currently are available in the United States for  
48 prevention of typhoid fever and all these are considered adequate protection. If new vaccines are  
49 approved and identified by CDC as efficacious, they also could be included.

1 **Note:** The number of international travelers from the United States has increased an average of 3  
2 percent a year for the last decade. Recognition of such increases will be factored into the analysis for  
3 denominator data.

4  
5 **Potential Data Source:** Abstract of International Travel To and From the United States, Department  
6 of Commerce.

7  
8 The three diseases highlighted account for a high portion of severe infectious disease morbidity in  
9 international travelers. The national surveillance data for these diseases are well established. However, we  
10 presently have no formal data collection instrument on the percentage of travelers using prevention  
11 measures for these diseases. Travelers can be divided into those who go to a travel clinic before they travel,  
12 those who go to primary care providers before they travel, and those who receive no travel care. To  
13 determine the baseline coverage for each of these diseases, we will survey patients from travel clinics,  
14 patients of primary care providers, and travelers at airports and borders. By the year 2002, the baseline data  
15 will be obtained and the appropriate percentage for each disease objective for Healthy People 2010 will be  
16 determined. We will compare our traveler survey data with the CDC national surveillance data, geosentinel  
17 site data, and available pharmaceutical data. The denominator for all U.S. travelers to risk areas will be  
18 obtained using the Department of Commerce data, "Abstract of International Travel To and From the  
19 United States."

20  
21 **36. (Former 20.19) Reduce to 48 hours the time it takes for a laboratory to confirm and report 75**  
22 **percent of the number of tuberculosis cases.** (Baseline: 21 days in 1996)

23  
24 **Target Setting Method:** Recently approved, commercially available nucleic acid amplification tests  
25 are capable of detecting *Mycobacterium tuberculosis* in a specimen within 48 hours of receipt.  
26 However, such tests are not widespread in use because of concerns regarding sensitivity, cost, quality  
27 control, and special expertise requirements.

28  
29 **Data Source:** Survey of State Public Health Laboratories, CDC, NCHSTP.

30  
31 CDC programs to upgrade TB laboratory capabilities and facilities, to provide training in state-of-the-art  
32 mycobacteriology, and to evaluate proficiency should enable State public health laboratories to apply these  
33 new rapid tests to the diagnosis of TB and meet the year 2010 goal.

## 34 **Related Objectives From Other Focus Areas**

### 35 **Educational and Community-Based Programs**

- 36 2 School health education
- 37 4 School nurse-to-student ratio
- 38 5 Worksite health promotion programs
- 39 6 Participation in employer-sponsored health promotion activities
- 40 7 Patient satisfaction with health care provider communication
- 41 8 Patient and family education
- 42 9 Community disease prevention and health promotion activities
- 43 10 Community health promotion initiatives
- 44 11 Culturally appropriate community health promotion programs

### 45 **Environmental Health**

- 46 4 Waterborne disease
- 47 8 Discharge from livestock production operations

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49

**Food Safety**

- 1 Foodborne infections
- 2 *Salmonella* and *Escherichia coli*
- 3 *Listeria monocytogenes* and *Vibria vulnificus*
- 4 Antimicrobial-resistant bacterial pathogens
- 5 Food-induced anaphylaxis

**Occupational Safety and Health**

- 15 Hepatitis B infections
- 16 Hepatitis B vaccinations

**Access to Quality Health Services**

- A.1 Uninsured children and adults
- A.2 Insurance coverage
- A.4 Reporting on service delivery
- A.5 Training to address health disparities
- B.1 Source of ongoing primary care
- B.2 Failure to obtain all needed health care
- B.4 Access to primary care providers in underserved areas
- B.5 Racial/ethnic minority representation in the health professions
- B.6 Preventable hospitalization rates for chronic illness
- C.2 Insurance coverage

**Maternal, Infant, and Child Health**

- 37 Primary care services for babies 18 months and younger

**Public Health Infrastructure**

- 1 Competencies for public health workers
- 2 Training in essential public health services
- 3 Continuing education and training by public health agencies
- 5 Onsite access to data
- 6 Access to public health information and surveillance data
- 7 Tracking Healthy People 2010 objectives for select populations
- 8 Data collection for Healthy People 2010 objectives
- 9 Use of geocoding in health data systems
- 10 Performance standards for essential public health services
- 11 Health improvement plans
- 12 Access to laboratory services
- 13 Access to comprehensive epidemiology services
- 14 Model statutes related to essential public health services
- 16 Collaboration and cooperation in prevention research efforts

**Health Communication**

- 1 Public access to health information
- 2 Centers for excellence
- 3 Evaluation of communication programs
- 4 Satisfaction with health information
- 5 Health literacy programs

## Healthy People 2010 Objectives: Draft for Public Comment

- 1 6 Quality of health information
- 2 7 Health communication/media technology curricula

3

### 4 HIV

- 5 7 Knowledge of HIV serostatus among people with tuberculosis

6

### 7 Resources

8

9 Schuchat, A.; Robinson, K.; Wenger, J.D.; et al. Bacterial meningitis in the United States in 1995. *New England*

10 *Journal of Medicine* 337:970-976, 1997.

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

Shapiro, et al. *New England Journal of Medicine* 325:1453-60, 1991.

*MMWR Recommendations and Reports* 45(RR-7), May 31, 1996.

### 1

Centers for Disease Control and Prevention (CDC). Status report on the Childhood Immunization Initiative: National, State, and urban area vaccination coverage levels among children aged 19-35 months—United States, 1996. *MMWR* 46:657-664, 1997.

American Academy of Pediatrics. Measles. In: Peter, G., ed. *1997 Red Book: Report of the Committee on Infectious Diseases, 24<sup>th</sup> Edition*. Elk Grove Village, IL: American Academy of Pediatrics; 1997.

Rota, J.S.; Heath, J.L.; Rota, R.A.; et al. Molecular epidemiology of measles virus: Identification of pathways of transmission and implications for measles elimination. *Journal of Infectious Diseases* 173:32-37, 1996.

CDC. Measles—United States, 1996 and the interruption of indigenous transmission. *MMWR* 46:242-246, 1997.

CDC. Pertussis vaccination: use of acellular pertussis vaccines among infants and young children. *MMWR* 1997;46(No.RR-7):1-25.

Guris, D.; Strebel, P.M.; Tachdjian, R.; et al. Effectiveness of the pertussis vaccination program as determined by use of the screening method: United States, 1992-1994. *Journal of Infectious Diseases* 176:456-463, 1997.

Onorato, I.M.; Wassilak, S.G.; Meade, B. Efficacy of whole-cell pertussis vaccine in preschool children in the United States. *JAMA* 267:2745-2749, 1992.

Jenkinson, D. Duration of effectiveness of pertussis vaccine: evidence from a 10 year community study. *British Medical Journal* 296:612-614, 1988.

Bigard, K.M.; Hardy, I.R.B.; Popovic, T.; Strebel, P.M.; Chen, R.T.; Wharton, M.; Hadler, S.C. Respiratory diphtheria in the United States, 1980-1995. *American Journal of Public Health*, 1998, in press.

CDC. Toxigenic *Corynebacterium diphtheriae*—Northern Plains Indian Community, August-October 1996. *MMWR* 46:506-510, 1997.

Bardenheier, B.; Prevots, D.R.; Khetsuriani, N.; Wharton, M. Tetanus—United States, 1995-1997. *MMWR* 47, 1998, in press.

CDC. Progress towards elimination of *Haemophilus influenzae* type b disease among infants and children—United States, 1987-1995. *MMWR* 45:901-906, 1996.

## Healthy People 2010 Objectives: Draft for Public Comment

- 1 CDC. Recommendations for use of *Haemophilus b* conjugate vaccines and a combined diphtheria, tetanus, pertussis  
2 and *Haemophilus type b* vaccine: Recommendations of the Immunization Practices Advisory Committee (ACIP).  
3 *MMWR* 42(RR-13):1-15, 1993.  
4
- 5 Barbour, M.L. Conjugate vaccines and the carriage of *Haemophilus influenzae type b*. *Emerging Infectious Diseases*  
6 2:3:176-182, 1996.  
7
- 8 Bisgard, K.M.; Kao, A.; Leake, J.; Strelbel, P.M.; Perkins, B.A.; Wharton, M. The epidemiology of *Haemophilus*  
9 *influenzae* invasive disease in the United States, 1994 - 1995: near disappearance of a child vaccine preventable  
10 disease. *Emerging Infectious Diseases*, 1998, in press.  
11
- 12 Galil, K.; Singleton, R.; Levine, O.; Fitzgerald, M.; Ajello, G.; Bulkow, L.; Parkinson, A. *High Prevalence of*  
13 *Haemophilus Influenzae Type B (Hib) Carriage Among Alaskan Natives Despite Widespread Use of Hib Conjugate*  
14 *Vaccine*. Program and Abstracts of the 35th Annual Meeting of the Infectious Diseases Society of America,  
15 September 13-16, 1997, San Francisco, CA, abstract 421.  
16
- 17 CDC. Rubella and congenital rubella syndrome—United States, 1994-1997. *MMWR* 6:350-354, 1997.  
18
- 19 CDC. Rubella and congenital rubella syndrome—United States, January 1, 1991-May 7, 1994. *MMWR* 43:391,397-  
20 401, 1994.  
21
- 22 Kaplan, K.M.; Cochi, S.L.; Edmonds, D.L.; Zell, E.R.; Preblud, S.R. A profile of mothers giving birth to infants with  
23 congenital rubella syndrome. An assessment of risk factors. *American Journal of Disabilities in Children* 144:118-  
24 123, 1990.  
25
- 26 Robertson, S.E.; Cutts, F.T.; Samuel, R.; Diaz-Ortega, J.L. Control of rubella and congenital rubella syndrome (CRS)  
27 in developing countries, Part 2: Vaccination against rubella. *Bulletin of the World Health Organization* 75:69-80,  
28 1997.  
29
- 30 Cutts, F.T.; Robertson, S.E.; Diaz-Ortega, J.L.; Samuel, R. Control of rubella and congenital rubella syndrome (CRS)  
31 in developing countries, Part 1: Burden of disease from CRS. *Bulletin of the World Health Organization* 75:55-68,  
32 1997.  
33
- 34 CDC. Mumps surveillance—United States, 1988-1993. *MMWR* 44(SS-3), 1995.  
35
- 36 Hersh, B.S.; Fine, P.E.M.; Kent, W.K.; Cochi, S.L.; Kahn, L.H.; et al. Mumps outbreak in a highly vaccinated  
37 population. *Journal of Pediatrics* 119:187-193, 1991.  
38
- 39 Briss, P.A.; Fehrs, L.J.; Parker, R.A.; Wright, P.F.; Sannella, R.H.; et al. Sustained transmission of mumps in a highly  
40 vaccinated population: assessment of primary vaccine failure and waning vaccine-induced immunity. *Journal of*  
41 *Infectious Diseases* 169:77-82, 1994.  
42
- 43 Cheek, J.E.; Baron, R.; Atlas, H.; Wilson, D.L.; Crider, R.D. Mumps outbreak in a highly vaccinated school  
44 population: evidence for large scale vaccine failure. *Archives of Pediatric and Adolescent Medicine* 149:774-778,  
45 1995.  
46
- 47 Pelosi, J.W. and Besselink, L.C. *Reducing Mumps Morbidity in Texas*. 30th Immunization Conference Abstracts,  
48 Washington, DC, April 9-12, 1996, abstract 213.  
49
- 50 CDC. Prevention of varicella: Recommendations of the Advisory Committee on Immunization Practices (ACIP).  
51 *MMWR* 45(RR-11): 1-36, July 12, 1996.  
52
- 53 CDC. Varicella-related deaths among adults—United States, 1997. *MMWR* 46(19):409-412, May 16, 1997.  
54

## Healthy People 2010 Objectives: Draft for Public Comment

1 CDC. National, State, and urban area vaccination coverage levels among children aged 19-35 months—United  
2 States, July 1996-June 1997. *MMWR*, February 20, 1998.

### 3 4 12

5  
6 National Nosocomial Infections Surveillance System. Nosocomial infection rates for interhospital comparison:  
7 Limitations and possible solutions. *Infection Control and Hospital Epidemiology* 12:609-612, 1991.

8  
9 Archibald L. and Gaynes, R. Hospital-acquired infections in the United States: The importance of interhospital  
10 comparisons. *Infectious Disease Clinics of North America* 11:245-255, 1997.

11  
12 Gaynes, R. The impact of antimicrobial use on the emergence of antimicrobial-resistant bacteria in hospitals.  
13 *Infectious Disease Clinics of North America* 11(4):757-765, 1997.

14  
15 Tenover, F. and Gaynes, R. Dissemination of vancomycin-resistant enterococci in the United States. In: Brun-  
16 Buisson, C. and Eliopoulos, G., eds. *Bacterial Resistance to Glycopeptides*. Paris: Medecine-Sciences, 1998.

17  
18 Monnet, D.L.; Archibald, L.K.; Phillips, L.; Tenover, F.C.; McGowan, J.E.; Gaynes, R.P.; ICARE/National  
19 Nosocomial Infections Surveillance (NNIS) System. Antimicrobial usage and resistance in U.S. hospitals: Results  
20 from Phase One of Project ICARE (Intensive Care Antimicrobial Resistance Epidemiology). *Infection Control and*  
21 *Hospital Epidemiology*, in press.

### 22 23 16

24  
25 Schuchat, A., et al., op. cit.

26  
27 Adams, W.G.; Deaver, K.A.; Cochi, S.L.; et al. Decline of childhood *Haemophilus influenzae* type b disease in the  
28 Hib vaccine era. *Journal of the American Medical Association* 269:221-226, 1993.

### 29 30 17

31  
32 Centers for Disease Control and Prevention. Prevention of pneumococcal disease: Recommendations of the  
33 Advisory Committee on Immunization Practices (ACIP). *MMWR* 46(RR-8):1-24, 1997.

34  
35 Breiman, R.F.; Butler, J.C.; Tenover, F.C.; Elliott, J.A.; Facklam, R.R. Emergence of drug-resistant pneumococcal  
36 infections in the United States. *Journal of the American Medical Association* 271:1831-1835, 1994.

37  
38 Hofmann, J.; Cetron, M.S.; Farley, M.M.; et al. The prevalence of drug-resistant *Streptococcus pneumoniae* in  
39 Atlanta. *New England Journal of Medicine* 333:481-486, 1995.

40  
41 Centers for Disease Control and Prevention. Defining the public health impact of drug-resistant *Streptococcus*  
42 *pneumoniae*: report of a working group. *MMWR* 45(RR-1):1-14, 1996.

### 43 44 18

45  
46 CDC. Prevention of perinatal group B streptococcal disease: a public health perspective. *MMWR* 45(RR-7):1-24,  
47 1996.

48  
49 CDC. Decreasing incidence of perinatal group B streptococcal disease—United States, 1993-1995. *MMWR* 46:473-  
50 477, 1997.

51  
52 Rosenstein, N.E.; Schuchat, A.; Neonatal Group B Streptococcal Disease Study Group. Opportunities for prevention  
53 of perinatal group B streptococcal disease: A multistate surveillance analysis. *Obstetrics and Gynecology* 90:901-  
54 906, 1997.

## Healthy People 2010 Objectives: Draft for Public Comment

1 Whitney, C.; Plikaytis, B.D.; Gozansky, W.; Schuchat, A.; Neonatal Group B Streptococcal Disease Study Group.  
2 Prevention practices for perinatal group B streptococcal disease: A multistate surveillance analysis. *Obstetrics and*  
3 *Gynecology* 89:28-32, 1997.

### 21

7 CDC. Status report on the Childhood Immunization Initiative, op. cit.

9 CDC. Update: childhood vaccine-preventable diseases—United States, 1994. *MMWR* 43:718-720, 1994.

11 Gindler, J.S.; et al. Epidemiology of measles in the United States in 1989 and 1990. *Pediatric Infectious Disease*  
12 *Journal* 11: 841-846, 1992.

### 23

16 Robbins, K.B.; Brandling-Bennett, A.D.; Hinman, A.R. Low measles incidence: Association with enforcement of  
17 school immunization laws. *American Journal of Public Health* 71:270-274, 1981.

### 24

21 CDC. Prevention and control of influenza; Recommendations of the Advisory Committee on Immunization Practices  
22 (ACIP). *MMWR* 46(RR-9), April 25, 1997.

24 CDC. Prevention of pneumococcal disease; Recommendations of the Advisory Committee on Immunization  
25 Practices (ACIP). *MMWR* 46(RR-8), April 4, 1997.

27 CDC. Influenza and pneumococcal vaccination coverage levels among persons aged >65 years. *MMWR* 44(27):506,  
28 July 14, 1995.

30 Fedson, D.S. Summary of the National Vaccine Advisory Committee Report.

32 *JAMA* 72(14):1133, October 12, 1994.

### 27

36 McCaig, L.F. and Hughes, J.M. Trends in antimicrobial drug prescribing among office-based physicians in the  
37 United States. *JAMA* 273:214-219, 1995.

39 Dowell, S.F. and Schwartz, B. Resistant pneumococci: protecting patients through judicious use of antibiotics.  
40 *American Family Physician* 55:1647-1654, 1997.

42 Dowell, S.F.; Marcy, S.M.; Phillips, W.R.; Gerber, M.A.; Schwartz, B. Otitis media—Principles of judicious use of  
43 antimicrobial agents. *Pediatrics* 101:165-171, 1998.

### 28

47 Rosenstein, N.; Phillips, W.R.; Gerber, M.A.; Marcy, S.M.; Schwartz, B.; Dowell, S.F. The common cold—  
48 principles of judicious use of antimicrobial agents. *Pediatrics* 101:181-184, 1998.

50 Mainous, A.G.; Hueston, W.J.; Clark, J.R. Antibiotics and upper respiratory infection: Do some folks think there is a  
51 cure for the common cold? *Journal of Family Practice* 42:357-361, 1996.

53 Schwartz, R.H.; Freij, B.J.; Ziai, M.; Sheridan, M.J. Antimicrobial prescribing for acute purulent rhinitis in children:  
54 a survey of pediatricians and family practitioners. *Pediatric Infectious Disease Journal* 16:185-190, 1997.

## Healthy People 2010 Objectives: Draft for Public Comment

### 30

Bernier, R. Toward a more population-based approach to immunization: fostering private-and public-sector collaboration. *American Journal of Public Health* 84:1567-1568, 1994.

Lieu, T.; Smith, M.; Newacheck, P. Health insurance and preventive care sources of children at public immunization clinics. *Pediatrics* 93:373-378, 1994.

Mustin, H.; Holt, V.; Connell, F. Adequacy of well-child care and immunizations in US infants born in 1988. *JAMA* 272:1111-1115, 1994.

Adams, W. and Coffman, G. Anemia and plumbism in underimmunized children. *Archives of Pediatric and Adolescent Medicine* 150:77(abstract), 1996.

### 31

Advisory Committee on Immunization Practices, CDC. Programmatic strategies to increase vaccination rates—assessment and feedback of provider-based vaccination coverage information. *MMWR* 45:219-220, 1996.

CDC. *Standards for Pediatric Immunization Practices*. Washington, DC: U.S. Government Printing Office, 1993.

Darden, P.M., et al. Methodological issues in determining rates of childhood immunization in office practice.: a study from pediatric research in office settings (PROS). *Archives of Pediatric and Adolescent Medicine* 150:1027-1031, 1996.

LeBaron, C.W., et al. Impact of measurement and feedback on vaccination coverage in public clinics, 1988-1994. *JAMA* 277:631-635, 1997.

### 32

Abramson, J.S., et al. Development of a vaccine tracking system to improve the rate of age-appropriate primary immunization in children of lower socioeconomic status. *Journal of Pediatrics* 126: 583-586, 1995.

Cordero, J.F. and Orenstein, W.A. The future of immunization registries. *American Journal of Preventive Medicine* 13(suppl):S122-S124, 1997.

Watson, M.A.; et al. Inadequate history as a barrier to immunization. *Archives of Pediatric and Adolescent Medicine* 150: 135-139, 1996.

### 33

CDC. Poliomyelitis prevention in the U.S.: Recommendations of the Advisory Committee on Immunization Practices. *MMWR* 46(RR-3), 1997.

CDC. Diphtheria, tetanus, and pertussis: recommendations for vaccine use and other preventive measures. Recommendations of the Advisory Committee on Immunization Practices. *MMWR* 40(RR-10), 1991.

Rosenthal, S. and Chen, R.T. Reporting sensitivities of two passive surveillance systems for vaccine adverse events. *American Journal of Public Health* 85:1706-1709, 1995.

Rosenthal, S.; Chen, R.; Hadler, S.C. The safety of acellular pertussis vaccine versus whole cell pertussis vaccine: a post-marketing assessment. . *Archives of Pediatric and Adolescent Medicine* 150:457-460, 1996.

CDC. Pertussis vaccination: Use of acellular pertussis vaccines among infants and young children. Recommendations of the Advisory Committee on Immunization Practices. *MMWR* 46(RR-7), 1997.

*Healthy People 2010 Objectives: Draft for Public Comment*

1  
2  
3  
4  
5  
6  
7  
8

**36**

Denniston, M.; Bird, B.; Kelly, K. Contrast of survey results between state and a cohort of nonstate mycobacteriology laboratories: changes in laboratory practices. *Journal of Clinical Microbiology* 35:422-426, 1997.

Bird, B.; Denniston, M.; Huebner, R.; Good, R. Changing practices in mycobacteriology: A follow-up survey of state and territorial public health laboratories. *Journal of Clinical Microbiology* 34:554-559, 1996.