



Immunization and Infectious Diseases

Lead Agency: Centers for Disease Control and Prevention

14

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Goal

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

Overview

Infectious diseases remain major causes of illness, disability, and death. Moreover, new infectious agents and diseases are being detected, and some diseases considered under control have reemerged in recent years. In addition, antimicrobial resistance is evolving rapidly in a variety of hospital- and community-acquired infections. These trends suggest that many challenges still exist in the prevention and control of infectious diseases.¹

Issues

Between 1980 and 1992, the number of deaths from infectious diseases rose 58 percent in the United States.¹ Even when human immunodeficiency virus (HIV)-associated diagnoses are removed, deaths from infectious diseases still increased 22 percent during this period. Considered as a group, three infectious diseases—pneumonia, influenza, and HIV infection—constituted the fifth leading cause of death in the United States in 1997.

Infectious diseases also must be considered in a global context. Increases in international travel, importation of foods, inappropriate use of antibiotics on humans and animals, and environmental changes multiply the potential for worldwide epidemics of all types of infectious diseases. International cooperation and collaboration on disease surveillance, response, research, and training are essential to prevent or control these epidemics. Actions taken to improve health in one country affect the health of people worldwide.

Vaccines. Vaccines are biological substances that interact with the person's immune system to produce an immune response identical to that produced by the natural infection.

Vaccines protect more than the vaccinated individual. They also protect society. When vaccination levels in a community are high, the few who cannot be vaccinated—such as young children and persons with contraindications to vaccination—often are indirectly protected because of group immunity (in other words, they live among vaccinated persons who may offer protection from exposure to disease).

Trends

In 1996, a vaccine against hepatitis A virus (HAV) was licensed that has the potential to reduce the health burden of this disease. The vaccine is now recommended primarily for high-risk groups. To decrease HAV transmission, universal vaccination was recommended in 1999 for children who lived in States where the rate of new cases was greater than two times the national average.²

Disparities

The updated *Preventing Emerging Infectious Diseases: A Strategy for the 21st Century* focuses on certain emerging infectious disease issues and on particular groups of people at risk.³ Historically, childhood vaccination rates have been lower in certain racial and ethnic populations, compared to the white population. Vaccination rates for preschool children in racial and ethnic groups with lower vaccination rates, however, have been increasing at a more rapid rate, significantly narrowing the gap.

Opportunities

A coordinated strategy is necessary to understand, detect, control, and prevent infectious diseases. Such a strategy will protect the gains achieved in life expectancy in the 20th century resulting from control and prevention of infectious diseases and ensure further improvements in the 21st century.

Priority issues include antimicrobial resistance, foodborne and waterborne diseases, vector-borne and zoonotic diseases, diseases transmitted through transfusion of blood or blood products, and vaccine development and use. Some of these diseases and pathogens were unknown 20 years ago. Others are reemergent problems once thought under control. At-risk populations include persons with impaired host defenses; pregnant women and newborns; travelers, immigrants, and refugees; older adults; or other persons identified by the Advisory Committee on Immunization Practices (ACIP).

The major strategies to protect people from vaccine preventable diseases (VPDs) are the following:⁴

- Improving the quality and quantity of vaccination delivery services.
- Minimizing financial burdens for needy persons.
- Increasing community participation, education, and partnership.
- Improving monitoring of disease and vaccination coverage.
- Developing new or improved vaccines and improving vaccine use.

In the United States, most VPDs occur among adults. Pneumococcal disease and influenza account for more than 30,000 deaths annually, most of which occur in elderly persons. Studies have consistently shown that focusing efforts to improve coverage on health care providers, as well as health care systems, is the most effective means of raising vaccine coverage in adults. For example, all health care providers should assess routinely the vaccination status of their patients. Likewise, health plans should develop mechanisms for assessing the vaccination status of their participants. Also, nursing home facilities and hospitals should ensure that policies exist to promote vaccination.

Interim Progress Toward Year 2000 Objectives

Substantial progress has been made in reducing hepatitis B virus (HBV) transmission. Data for viral hepatitis indicate that targets for hepatitis B and C were met in the early 1990's.

Note: Data are from Centers for Disease Control and Prevention, National Center for Health Statistics, *Healthy People 2000 Review, 1998-99*.



REPRODUCTIVE HEALTH-RELATED OBJECTIVES

Immunization and Infectious Diseases

Goal:

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

Number Objective Short Title

Diseases Preventable Through Universal Vaccination

14-3. Hepatitis B in adults and high-risk groups

Infectious Diseases and Emerging Antimicrobial Resistance

14-9. Hepatitis C

Vaccination Coverage and Strategies

14-28. Hepatitis B vaccination among high-risk groups

HEALTHY PEOPLE 2010 OBJECTIVES

Diseases Preventable Through Universal Vaccination

14-3. Reduce hepatitis B.

Target and baseline:

Objective	Reduction in Hepatitis B	1997	2010
		Baseline	Target
		Rate per 100,000 Population	
Adults			
14-3a.	19 to 24 years	24.0	2.4
14-3b.	25 to 39 years	20.2	5.1
14-3c.	40 years and older	15.0	3.8
		Number of Cases	
14-3d.	Injection drug users	7,232	1,808
14-3e.	Heterosexually active persons	15,225	1,240
14-3f.	Men who have sex with men	7,232	1,808
14-3g.	Occupationally exposed workers	249	62

Target setting method: Better than the best for 14-3a, 14-3b, and 14-3c; 75 percent improvement for 14-3d, 14-3f, and 14-3g; 92 percent improvement for 14-3e.

Data sources: National Notifiable Disease Surveillance System (NNDSS), CDC, EPO; Sentinel Counties Study of Viral Hepatitis, CDC, NCID.

Select Age Groups, 1997	Hepatitis B Cases		
	14-3a. Aged 19 to 24 Years	14.3b. Aged 25 to 39 Years	14.3c. Aged 40 Years and Older
	Rate per 100,000		
TOTAL	24.0	20.2	15.0
Race and ethnicity			
American Indian or Alaska Native	16.0	20.1	10.9
Asian or Pacific Islander	42.2	30.4	33.2
Asian	DNC	DNC	DNC
Native Hawaiian and other Pacific Islander	DNC	DNC	DNC
Black or African American	48.3	32.5	27.6
White	10.4	10.2	7.4
Hispanic or Latino	16.9	16.0	18.1
Not Hispanic or Latino	25.2	20.7	14.8
Black or African American	50.6	34.1	28.4
White	10.3	10.2	7.1
Gender			
Female	24.1	15.4	9.4
Male	22.5	24.1	20.8
Family income level			
Poor	DNC	DNC	DNC
Near poor	DNC	DNC	DNC
Middle/high income	DNC	DNC	DNC

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

To reduce HBV transmission in the United States by 2010, vaccination programs must be targeted to adolescents and adults in high-risk groups. The primary means of achieving high levels of vaccination coverage in groups with behavioral risk factors for HBV infection is to identify settings where these individuals can be vaccinated. Such sites include clinics that treat sexually transmitted diseases, correctional facilities (juvenile detention facilities, prisons, jails), drug treatment clinics, and community-based HIV prevention sites. The primary means of achieving high levels of vaccine coverage among household and sex



contacts of the estimated 1.25 million persons in the United States with chronic HBV infection are programs that offer followup for all hepatitis B surface antigen (HbsAg)-positive persons reported to State and local health departments.

Routine infant vaccination eventually will produce a highly immune population sufficient to eliminate HBV transmission in the United States. However, high rates of acute hepatitis B continue to occur, with an estimated 65,000 cases in 1996. Most cases occur in young adult risk groups, including persons with a history of multiple sex partners, men who have sex with men, injection drug users, incarcerated persons, and household and sex contacts of persons with HBV infection. Investigation of reported cases of acute hepatitis B indicates that as many as 70 percent of these individuals previously had been seen in settings such as drug treatment clinics, correctional facilities, or clinics for the treatment of STD, where they could have received vaccine.

Infectious Diseases and Emerging Antimicrobial Resistance

14-9. Reduce hepatitis C.

Target: 1 new case per 100,000 population.

Baseline: 2.4 new cases of hepatitis C per 100,000 population in selected counties were reported in 1996.

Target setting method: Better than the best.

Data source: Sentinel Counties Study of Viral Hepatitis, CDC, NCID.

Note: The table below may continue to the following page.

Total Population, 1996	New Hepatitis C Cases
	Rate per 100,000
TOTAL	2.4
Race and ethnicity	
American Indian or Alaska Native	DNC
Asian or Pacific Islander	DSU
Asian	DNC
Native Hawaiian and other Pacific Islander	DNC
Black or African American	DSU
White	3.0
Hispanic or Latino	DSU
Not Hispanic or Latino	DSU
Black or African American	DSU
White	DSU

Total Population, 1996	New Hepatitis C Cases
	Rate per 100,000
Gender	
Female	2.0
Male	2.8
Family income level	
Poor	DNC
Near poor	DNC
Middle/high income	DNC

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.
 Note: Data represent rates based on estimates from selected counties.

Note: The table above may have continued from the previous page.

Hepatitis C virus (HCV) is the most common chronic bloodborne viral infection in the United States.⁵ This virus is usually transmitted through large or repeated percutaneous exposures to blood—for example, through sharing of equipment between injection drug users. HCV infects persons of all ages, but most new cases are among young adults aged 20 to 39 years. The highest proportion of new cases is among whites, but the highest rates of new cases are among nonwhite racial and ethnic groups.

Vaccination Coverage and Strategies

14-28. Increase hepatitis B vaccine coverage among high-risk groups.

Target and baseline:

Objective	Increase in Hepatitis B Vaccine Coverage in High-Risk Groups	1995 Baseline	2010 Target
Percent			
14-28a.	Long-term hemodialysis patients	35	90
14-28b.	Men who have sex with men	9	60
14-28c.	Occupationally exposed workers	71	98

Target setting method: 157 percent improvement for long-term hemodialysis patients; 567 percent improvement for men who have sex with men; 38 percent improvement for occupationally exposed workers.

Data sources: Young Men's Survey, CDC, NCHSTP; Annual Survey of Chronic Hemodialysis Centers, CDC, NCID, and HCFA; periodic vaccine coverage surveys, CDC, NCID.



Hepatitis B vaccination has been recommended for persons with risk factors for hepatitis B virus infection since the vaccine was first licensed in 1981. These risk groups include the following: hemodialysis patients, men who have sex with men, incarcerated persons, health care and public safety workers who have exposure to blood in the workplace, persons with a history of sexually transmitted diseases or multiple sex partners, injection drug users, and household and sex contacts of HBV-infected persons. While data currently are not collected for inmates in long-term correctional facilities, it is recommended that prison officials should consider undertaking screening and vaccination programs directed at inmates with histories of high-risk behaviors.

Terminology

Advisory Committee on Immunization Practices (ACIP): Federally chartered advisory committee with the goals of providing advice to the CDC Director on decreasing disease through the use of vaccines and other biological products and on improving the safety of their use.

Emerging infectious diseases: Diseases of infectious origin whose occurrence in humans has increased within the past two decades or threatens to increase in the near future. Recognition of an emerging disease occurs 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.

Multiple sex partners: More than one partner in the prior 6 months.

National Notifiable Disease Surveillance System (NNDSS): Tracking system that State health departments use to report cases of selected diseases to CDC. (See Reportable disease.)

Reemerging infectious diseases: Reappearance of a known infection after a decline in occurrence. 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.

Reportable disease: A disease for which there are legal requirements for reporting and notification to public health authorities. In the United States, requirements for reporting diseases are mandated by State laws or regulations, and the list of reportable diseases in each State differs.

Vaccines: Biological substances used to stimulate the development of antibodies and thus confer active immunity against a specific disease or number of diseases.

References

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