National Health and Nutrition Examination Survey

nhanes

CDC SAFER • HEALTHIER • PEOPLE™

Immunizations

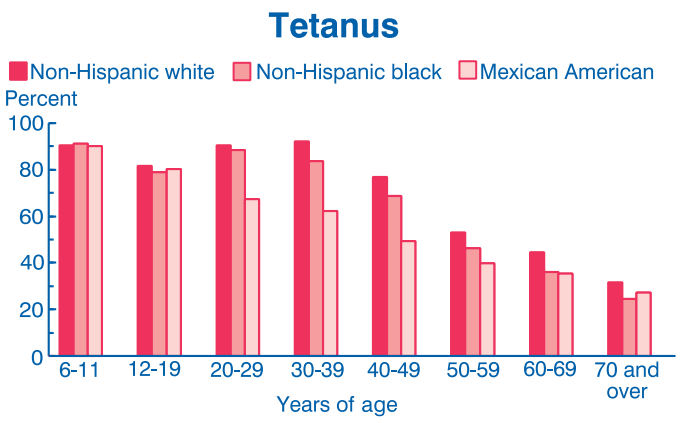
Vaccines have been cited as one of the most effective public health interventions. Routine immunization against diphtheria and tetanus has been standard practice in the United States since the late 1940's. Measles vaccination began in 1957 and rubella vaccination began in 1969. Due largely to Federal and State funding programs, school entry laws, and improved strategies for delivering immunizations, U.S. childhood immunization coverage is at all-time high levels. However, successful childhood vaccination alone will not eliminate specific disease problems. A substantial proportion of the remaining morbidity and mortality from vaccine-preventable diseases presently occurs among older adolescents and adults.

What do data from the National Health and Nutrition Examination Survey (NHANES) tell us?

NHANES serology results can supplement data from other sources about the vaccination coverage and the burden of these four vaccine-preventable diseases by providing insights into potential "reservoirs" of susceptible persons. In the case of diphtheria, measles, and rubella, a large enough reservoir could allow an outbreak or sustain ongoing transmission of disease. Blood samples collected in the third NHANES (1984–94) were used to assess the presence of protective antibody levels against tetanus, diphtheria, measles, and rubella among persons 6 years of age and over. The work was conducted in cooperation with the National Immunization Program.

Tetanus and diphtheria

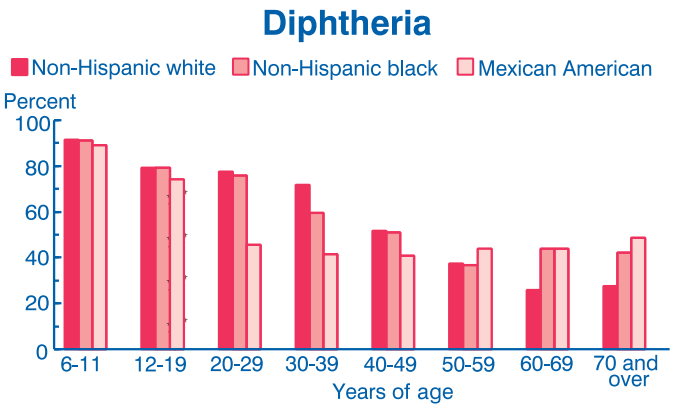
- Overall, immunity to tetanus among persons 6 years of age and over was 72 percent (figure 1).
- Men were more likely to have protective levels of antibodies to tetanus.
- By age 70 years, only 21 percent of women were immune to tetanus compared with 45 percent of men.
- Mexican Americans had lower levels of protective antibodies for both diseases than did non-Hispanic whites and non-Hispanic blacks.



SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics.

Figure 1

- Of the total population, 60 percent was immune to diphtheria (figure 2).
- Generally, immunity declined with age. However, for diphtheria, there was an increase for Mexican Americans after 50 years of age and for non-Hispanic blacks after 60 years of age. This was most likely due to natural infection.



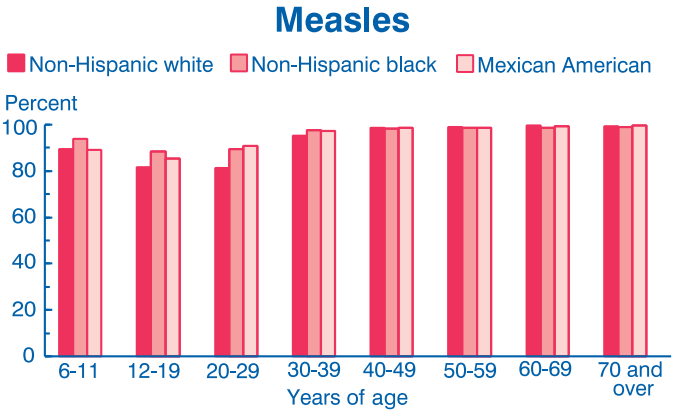
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics.

Figure 2

Administering a booster dose of tetanus and diphtheria toxoids every 10 years after age 12 as recommended is the only way to reduce the burden of tetanus disease and assure that diphtheria outbreaks do not occur.

Measles and rubella

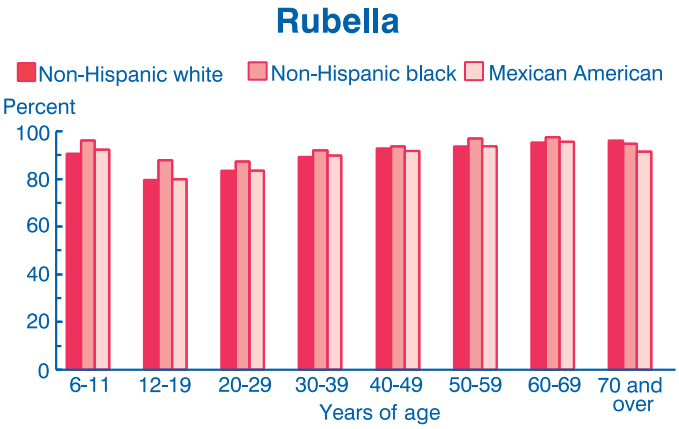
- Overall, immunity to measles among persons 6 years of age and over was 93 percent (figure 3).
- Immunity to measles varied for those under 40 years of age where it was lowest among non-Hispanic whites.
- Immunity to rubella was 89 percent (figure 4).



SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics.

Figure 3

- Immunity to rubella also varied with age and was lowest among persons 12–19 years of age.
- Low rates of immunity in this age group suggests a "lost generation" of young people who were born too late to acquire measles and rubella immunity through natural infection yet too early to receive vaccine mandated by school entry laws.



SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics.

Figure 4

Following the current recommendation to vaccinate all adolescents and adults who do not have evidence of immunity (documentation of at least one dose of measles-containing vaccine and one dose of rubella-containing vaccine, or positive serology results) can assure that the pattern of susceptibility seen for these two diseases does not threaten disease elimination.

For further information, you can contact us by e-mail:
nchsquery@cdc.gov
by letter:
National Center for Health Statistics
Data Dissemination Branch
6525 Belcrest Road, Room 1064
Hyattsville, Maryland 20785-2003
by telephone:
(301) 458-4636
or visit our Web site at:
www.cdc.gov/nchs/nhanes.htm

01-0291