

Viral Hepatitis

Viral hepatitis represents a group of infections that produce a large burden of disease in the United States. Hepatitis is inflammation of the liver and is most commonly caused by infection with one of five different viruses (respectively called A, B, C, D, and E). Hepatitis A and hepatitis E are transmitted by the fecal-oral route and do not cause a chronic infection. Hepatitis B, hepatitis C, and hepatitis D are bloodborne infections that often produce a chronic infection that can result in chronic liver disease. Hepatitis A and hepatitis B can be prevented by vaccination.

New cases of each type of viral hepatitis do not occur with the same frequency. Hepatitis A is the most frequent type, followed by hepatitis B and hepatitis C (figure 1). In addition, an estimated 4percent of persons with acute hepatitis B are co-infected with hepatitis D. Hepatitis E has only rarely been reported in the United States, almost always in persons who had recently traveled to developing countries where this disease is endemic.

To make accurate estimates of the burden of disease from viral hepatitis requires accurate data on the prevalence of infection with each of these viruses in the United States population. This is important for several reasons. New infections with each of the hepatitis viruses often do not produce symptoms. However, serological testing can determine whether a person has been infected with any of the hepatitis viruses. In addition, the chronic infections produced by the bloodborne hepatitis viruses (B, C, and D) often remain asymptomatic until they cause extensive injury (cirrhosis), which results in liver failure or liver cancer. Serologic testing can determine if a person has a chronic infection with a hepatitis virus.

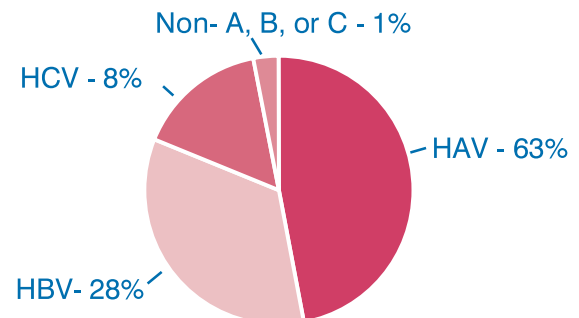
Infection with hepatitis B virus (HBV) is more likely to cause a chronic infection in infants and young children (60–90percent) than adults (3–6percent), and an estimated 5,000 to 6,000 deaths a year occur from chronic hepatitis B liver disease. Infection with hepatitis C virus (HCV) results in a chronic infection in 75–85percent of persons, and an estimated 8,000 to 10,000 deaths a year occur from hepatitis C liver disease.

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

Serologic testing in NHANES has been performed to obtain accurate estimates of the prevalence of infections with the hepatitis viruses in the United States. Testing for markers of infection with hepatitis viruses (A and B) was first performed on NHANES II specimens (conducted 1976–80), and testing for markers of HCV infection was added to NHANES III (conducted 1988–94). The current NHANES, started in 1999, is a continuous yearly survey. Blood from participants is being tested for markers of hepatitis A, hepatitis B, hepatitis C, and hepatitis D.

NHANES provides an estimate of infection in the civilian noninstitutionalized U.S. population and in two of the largest minority groups, non-Hispanic blacks and Mexican Americans. NHANES does not cover other populations, such as prisoners, the homeless, or institutionalized persons who might be at increased risk for infection with the hepatitis viruses. Additionally many smaller racial/ethnic groups (Asians, Alaskan natives, and American Indians), many of whom have higher rates of

Distribution of acute hepatitis cases in the United States: 1991-1998



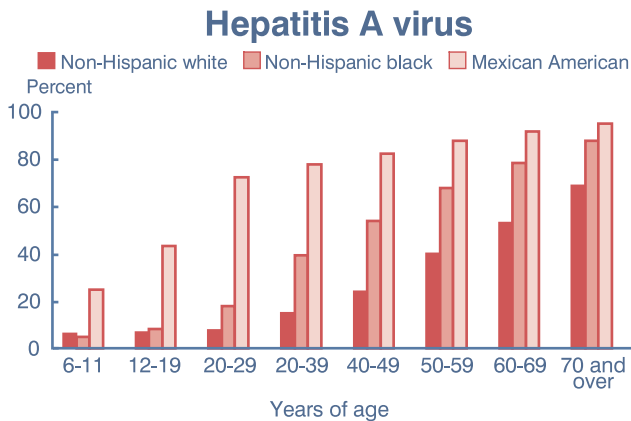
SOURCE: Sentinel County Study on Viral Hepatitis Centers for Disease Control and Prevention, National Center for Infectious Diseases.

Figure 1

infection as shown by other studies, are not adequately represented so estimates for these populations can not be determined by NHANES. Data from the present and future yearly surveys will be needed to measure the effect of the Centers for Disease Control and Preventions (CDC) recommendations for routine infant and adolescent hepatitis B and hepatitis A vaccination since NHANES III was conducted prior to these recommendations.

Hepatitis A (figure 2)

- NHANES III showed that 31percent of Americans have been infected with the hepatitis A virus (HAV). Prevalence of infection increased with age, with 23percent of persons under 20 years of age having been infected compared with 78percent of persons over 40 years of age.
- The prevalence of HAV infection was highest in Mexican Americans, followed by African-Americans and white persons.
- Household crowding and poverty were associated with increased rates of HAV infection in all racial/ethnic groups.
- In NHANES III, 9.4percent of 6–11-year-old participants were infected compared with 11percent in NHANES II (1976–80).
- Since natural infection results in life long immunity, this increase in the proportion of younger persons susceptible to HAV infection indicates the need for immunization in these age groups to prevent and eliminate disease transmission.



SOURCE: National Health and Nutrition Examination Survey III, Centers for Disease Control and Prevention, National Center for Health Statistics.

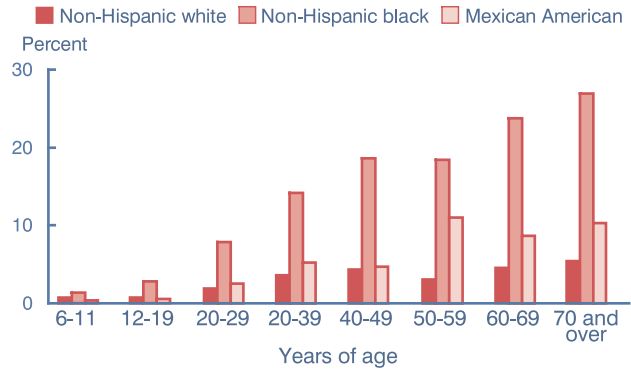
Figure 2

Hepatitis B (figure 3)

- NHANES II and NHANES III showed that the prevalence of HBV infection in Americans has remained at 5percent over the past two decades.
- HBV infection was significantly higher in non-Hispanic blacks than whites, and prevalence of infection increased with age in all racial/ethnic groups. The highest prevalence of infection was in older blacks. Infection prevalence declined in this group between the two surveys indicating a change in risk by birth cohort.

- HBV infection was associated with an increasing number of sexual partners, birth in another country, and cocaine use.
- NHANES III showed that healthcare occupation was no longer associated with an increased risk of HBV infection because of the high rate of immunization in this group.

Hepatitis B virus

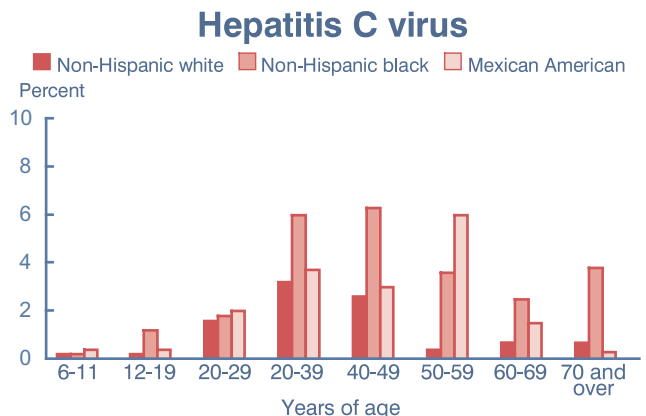


SOURCE: National Health and Nutrition Examination Survey III, Centers for Disease Control and Prevention, National Center for Health Statistics.

Figure 3

Hepatitis C (figure 4)

- NHANES III showed that 1.8percent of Americans have been infected with HCV. Testing for HCV RNA demonstrated that 74percent were chronically infected.
- The highest prevalence of infection was among adults 39–50 years of age, and men had a higher rate of infection than women.
- HCV infection was associated with a history of illegal drug use, early onset of sexual activity, and an increased number of sex partners. However, because HCV had not been discovered at the time the NHANES III was planned, the survey did not inquire about other risk factors for infection such as blood transfusion and injection drug use.
- HCV infection was not associated with military service or health care occupation.



SOURCE: National Health and Nutrition Examination Survey III, Centers for Disease Control and Prevention, National Center for Health Statistics.

Figure 4