

Viral Hepatitis: The Silent Epidemic

Hepatitis, or inflammation of the liver, can be caused by infection with any of several hepatitis viruses and kills 1.4 million people worldwide each year. This briefing will focus on hepatitis B virus (HBV) and hepatitis C virus (HCV), which can become chronic infections and lead to liver cancer.

Transmission of HBV and HCV occur primarily through contact with blood or other bodily fluids of infected individuals. Common infection paths include transfusion of infected blood (especially in poorly-regulated environments or prior to regulations), use or accidental stick of infected needles in healthcare settings, and injection drug use. Both viruses can also be spread from infected mother to child during birth. Neither virus can be spread through casual contact, though they can be spread sexually, more commonly HBV than HCV.

Initial **clinical presentation** can include jaundice (yellowing of skin and eyes), fatigue, and vomiting, though many infected individuals experience no symptoms at all during the infection phase. Many people recover in weeks to months without treatment, particularly from HBV, but those who develop **chronic viral hepatitis** are significantly impacted. HBV becomes chronic in roughly 10% of those infected, but HCV becomes chronic in a staggering 75-85% of infected individuals. Chronic HBV risk is far greater (80-90%) in infants and children than in adults (WHO, "Hepatitis B", "Hepatitis C").

Chronic hepatitis causes cirrhosis (scarring) of the liver, eventual liver cancer, and death in 15-25% of chronic HBV cases. Chronic HCV develops into chronic liver disease in 60-70% of cases, with 5-20% cirrhosis rates over many years. HCV is among the leading causes of liver cancer and associated deaths. However, most infected individuals can live for many years, even decades, before symptoms of chronic liver disease are evident, during which time the individual is able to spread the disease. This has earned the hepatitis viruses the term the **Silent Epidemic**. The CDC estimates that 75% of infected individuals do not know that they are infected, and thus may unknowingly spread the disease (CDC, "About").

Rates of infection vary globally, with highest rates of both HBV and HCV in Africa, East Asia, and parts of the Amazon region. On the maps below, the darkest shaded region in HBV infection (left) was 8+% of the population, while in the HCV map (right), the darkest shaded regions are 10+% infection.

Prevalence maps removed due to copyright restrictions.

Figures from www.nathnac.org: prevalence of **HBV chronic infection, 2006**; prevalence of **HCV infection, 2007**.

Altogether, over **2 billion people** are currently or have previously been infected with HBV. There are an estimated **240-350 million chronic cases** worldwide. But this is largely preventable, due to a highly effective vaccine against HBV. Unfortunately there does not currently exist a vaccine against HCV, and there are an estimated **150 million cases** worldwide today (WHO, "World Hepatitis Day").

Vaccination is a promising tool in the fight against the spread of HBV. The vaccine is 95% effective and has been safely used since the 1980s. It requires a series of injections over a period of months for effective vaccination, and the first injection can be administered just after birth. In high-resource settings, this vaccine is a standard of care in early childhood. In low-resource settings, HBV vaccinations are less common and therefore early childhood HBV infections are more prevalent. As of 2011, 179 WHO member states included HBV vaccine in their infant vaccination schedules (WHO, "Hepatitis B").

For both viruses, **transmission prevention** through safe handling of blood products and medical equipment is essential, especially given the lack of HCV vaccine. WHO recommends single-use or auto-disabling syringes for healthcare settings to prevent the spread of these viruses through contaminated needles. All regulated blood banks and transfusion settings screen blood for both viruses, but unregulated blood or blood products can still pose a risk. And the sharing of needles or other sharps, in injection drug use, tattooing, piercing, etc., poses a risk of spreading these viruses. Protection during sexual contact can also prevent transmission from infected individuals.

Treatment requires diagnosis, which in the cases of HBV and HCV can often not occur until symptomatic late-stage liver disease. For this reason, screening is recommended, via blood tests, for susceptible individuals. Treatment options for both viruses include antivirals and interferon medications, which combat (but not cure) the virus and can slow the progression of cirrhosis, though they are often not well-tolerated by patients. In low-resource settings, however, these treatments are not widely accessible. The basic treatment for HCV, pegylated interferon, was added to the WHO Model Essential Medicines List in July of 2013, which indicates that it is safe and cost-effective, and which will hopefully increase accessibility to this treatment in all areas. When liver disease progresses to liver cancer, it is almost always fatal, liver transplantation can occur, largely unavailable in resource-poor settings.

A challenge in viral hepatitis cases is the significant **co-infection with HIV**. Many of the transmission routes of HBV and HCV are the same as for HIV, so frequently the scenarios that enable HIV transmission (needle-sharing, unprotected sex, unsafe handling of blood products) can enable viral hepatitis transmission as well. In the US, it is estimated that 25% of HIV-positive individuals are also infected with HCV, and that number rises to 50-90% among injection drug users (CDC, "HIV/AIDS"). As mentioned previously, hepatitis can be largely asymptomatic for many years, so this co-infection can go undiagnosed. HIV infection can speed the progression of hepatitis to cirrhosis, and likewise hepatitis can impede HIV treatment, so co-infection is a serious problem among infected individuals.

Opportunities for improved care delivery are three-fold: widespread HBV vaccination, increased access to HCV treatment, and global prevention measures. Awareness in communities of the transmission routes of HBV and HCV, as well as the need for screening tests for susceptible individuals, would decrease the disease's ability to spread silently prior to diagnosis or symptoms. Given the effectiveness of HBV vaccination, promotion and distribution globally can bring further reduction to the infection rates, especially among children. Similarly, public health messaging around safe blood-handling, not sharing needles, and protected sex can also limit transmission. The treatments that are available for HCV, now on the WHO List, should be made accessible as cost-effectively as possible in a variety of settings, but particularly in the parts of the world where infection rates are highest. Affecting 2 billion people worldwide, viral hepatitis needs immediate resources and attention.

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