

New Opportunities to Address Viral Hepatitis

Despite decreases in acute viral hepatitis, chronic infection continues to affect millions of Americans.^{1,2} Deaths due to hepatitis C are increasing from those who were infected before control measures were implemented. The hepatitis C mortality rate increased significantly from 1999 to 2007, when hepatitis C virus (HCV) caused 15,106 deaths. Because persons born from 1945 through 1965 account for three-fourths of all U.S. HCV infections and 73 percent of HCV-associated mortality, CDC recently recommended one-time testing for all persons in this birth cohort.³ CDC predicts this age-based screening could identify 800,000 new cases and avert 120,000 deaths.

Expanded health insurance coverage should improve patient access to services (e.g., health education, testing, vaccination, referral, antiviral therapy, counseling, substance abuse/addiction treatment, and medical monitoring). However, future outreach activities may increase interest in testing beyond the current system's funded capacity for tests and treatment. Even with upcoming expansions in insurance coverage, additional resources may be needed to ensure that all persons who should be screened also have access to appropriate treatment and care.

State and territorial health agencies are instrumental in disease surveillance, treatment of infected persons, and prevention of new cases. With appropriate support and capacity, they can advance efforts to ensure control of viral hepatitis.

Background

Viral hepatitis is a leading infectious cause of death and claims the lives of 12,000 to 15,000 Americans each year. However, most of the 3.5 to 5.3 million Americans living with viral hepatitis do not know that they are infected. Hepatitis B virus (HBV) and HCV can produce chronic infections that often remain clinically silent for decades while increasing risk for liver disease and liver cancer, which can be severe or even fatal. It is important for infected individuals to be aware of their status and linked to care.

State and territorial health agencies conduct a wide array of activities to address viral hepatitis, including education and preventive services, testing, surveillance, and care and treatment. Some states have developed viral hepatitis prevention plans to prioritize the development of prevention activities, integrate hepatitis prevention into existing public health programs, and obtain resources for implementation. At the national level, the [HHS Viral Hepatitis Action Plan](#) presents robust and dynamic steps for improving viral hepatitis prevention, care, and treatment.⁴

Federally-Funded State Hepatitis Programs

State and territorial health agencies struggle to secure adequate funding for viral hepatitis-related programs. To mitigate this obstacle, CDC provides funding to states for some viral hepatitis activities (see Table 1). CDC funds a viral hepatitis prevention coordinator (VHPC) in each of the 50 states and 6 large cities. The VHPC supports the technical expertise necessary for management and coordination of prevention activities and integration of viral hepatitis prevention services into varied settings and programs (e.g., STD, HIV, immunization, correctional health, substance abuse treatment, syringe exchange). This funding began in 2000 specific to hepatitis C and was expanded in 2007 to focus on

adult hepatitis. However, as this funding only provides for one full-time position and some travel for each jurisdiction, its impact is limited in the context of this public health problem's magnitude.

CDC also funds perinatal hepatitis B prevention programs among its 64 immunization awardees. This funding began in 1991, and the programs have made great progress in preventing hepatitis B transmission from infected mothers to infants. In 2007, an estimated 799 children were perinatally infected with hepatitis B, clearly indicating that there is still work to be done to appropriately identify affected pregnant women and provide needed immunization services to their infants.

CDC provides funding for perinatal hepatitis B prevention program operations through Section 317 program funding,* which is distributed to state and urban immunization awardees based on a formula that accounts for need, base personnel cost, and immunization coverage levels. The formula for the territories and freely associated states includes additional variables, including but not limited to poverty level, number of islands per awardee, and percentage of government-provided vaccines.

In 2012, CDC began providing additional support to decrease the burden of chronic viral hepatitis, including the launch of the national education campaign "Know More Hepatitis" as well as new funding to support implementation of viral hepatitis testing initiatives.

Transmission

Viral hepatitis can be transmitted through a variety of activities, which makes it important to address all potential modes of transmission and populations at risk. Hepatitis A can be contracted through ingestion of fecal matter from close person-to-person contact or ingestion of contaminated food or water. Hepatitis B can be contracted through sharing needles, syringes, or other equipment to inject drugs; needlestick injuries in healthcare settings; sex with an infected partner; or birth. HBV can also occur among contacts who share items such as razors or toothbrushes with an infected person or have direct contact with the blood or open sores of an infected person. Hepatitis C is transmitted primarily through sharing needles, syringes, or other equipment to inject drugs or through needlestick injuries in healthcare settings. Much less often, HCV transmission occurs among infants born to HCV-infected mothers.

Both HBV and HCV can be spread in healthcare settings. From 2008 to 2011, 31 outbreaks of HBV or HCV infection in healthcare settings were reported to CDC, and it is possible that additional transmissions occurred and were not recognized or reported.⁵ These outbreaks resulted in approximately 250 persons acquiring HBV and/or HCV and the notification of approximately 88,000 persons potentially at risk for infection. Outbreaks of HBV infections have been associated with shared blood glucose monitors in assisted living facilities.⁶ Drug diversion is also a potential risk for spreading viral hepatitis, as was observed in New Hampshire in 2012.⁷

Transmission: Healthcare Settings

The New York City Department of Health and Mental Hygiene (DOHMH) has developed a systematic approach to addressing cases of HBV or HCV potentially transmitted in healthcare settings. DOHMH begins by conducting the least resource-intensive investigation components for each reported case, with findings from the initial investigation then guiding decisions to expand the investigation to more resource-intensive components. In practice, this means interviews with patients and healthcare providers are conducted for all cases, and if it is deemed likely that a case is linked to a cluster of healthcare-associated infections, the department moves on to site visits, active case finding, and broader notification of other patients.⁸

Surveillance

State health agencies report incident cases of hepatitis to CDC, but because not all infected individuals are screened for infection, these numbers likely underestimate the true burden of disease. However, data from the National Notifiable Diseases Surveillance Systems (NNDSS) can be used to assess trends in viral hepatitis over time. Between 2000 and 2010, the number of reported cases of acute hepatitis A declined by approximately 88 percent (from 13,397 to 1,670) and cases of acute hepatitis B decreased about 58 percent (8,036 to 3,350). Changes in the epidemiology of these diseases have occurred due to the implementation of prevention strategies and the introduction of vaccines. The number of reported cases of acute hepatitis C declined from 2000 to 2002 and has remained mostly stable since then, with 850 cases in 2010.

Surveillance: Examining Data

Although most persons with HCV infection were born between 1945 and 1965, some states are noticing increases in cases among adolescents and young adults. The Massachusetts Department of Public Health (MDPH) examined its disease surveillance information, collected through an electronic data system, and found that from 2002 to 2006, HCV cases increased for those aged 15 to 24. During 2007-2009, MDPH conducted a surveillance initiative to collect more detailed case information, which they used to determine that the increase appears to be related to drug use among adolescents and young adults.⁹

Although surveillance infrastructure is in place for reporting of acute infection, reports of chronic hepatitis B and C, which account for the greatest burden of disease, are not submitted by most states or territories. In addition, health agencies have inadequate capacity (such as staff time or information systems) to collect relevant information from laboratory and clinical records, such as risk factors. This underdeveloped system results in incomplete information about the true burden of viral hepatitis and how it is being transmitted in individual communities.

To better count and characterize cases of viral hepatitis and estimate the burden of disease, CDC currently supplements NNDSS data with those obtained from select enhanced surveillance sites, national surveys, and vital statistics. Enhanced surveillance sites are funded for more active viral hepatitis surveillance through CDC's Emerging Infections Program (EIP). Since 2004, participating EIP sites have conducted routine surveillance for chronic HBV and HCV infections. All chronic cases of viral hepatitis obtained through these sites are de-duplicated; additionally, for a

percentage of cases, followup is conducted to obtain clinical and laboratory data and information regarding risk behaviors and exposures. The Viral Hepatitis Action Plan recommends strengthening the capacity of state and local health departments to collect a core set of viral hepatitis surveillance data across states.

For more information, visit <http://www.cdc.gov/hepatitis>.

** The perinatal hepatitis B prevention program is one of many immunization activities conducted by state, local, and territorial immunization programs that rely on Section 317 program funds for implementation. Section 317 program funding is limited and is awarded annually to immunization awardees.*

Sources

1. Weinbaum CM, Williams I, Mast EE, et al. "Recommendations for Identification and Public Health Management of Persons with Chronic Hepatitis B Virus Infection." *Morbidity and Mortality Weekly Report*. 2008. 57(RR-8):1-20. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5708a1.htm>. Accessed 6-3-13.
2. Armstrong GL, Wasley AM, Simard EP, et al. "The prevalence of hepatitis C virus infection in the United States, 1999 through 2002." *Ann Intern Med*. 2006. 144:705–14.
3. Smith BD, Morgan RL, Beckett GA, et al. "Recommendations for the Identification of Chronic Hepatitis C Virus Infection Among Persons Born During 1945–1965." *Morbidity and Mortality Weekly Report*. 2012. 61(RR04);1-18. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6104a1.htm>. Accessed 6-3-2013.
4. HHS. Combating the Silent Epidemic of Viral Hepatitis: Action Plan for the Prevention, Care and Treatment of Viral Hepatitis. Available at http://www.hhs.gov/ash/initiatives/hepatitis/actionplan_viralhepatitis2011.pdf. Accessed 6-3-2013.
5. Onofrey S, Church D, Kludt P, et al. "Hepatitis C Virus Infection Among Adolescents and Young Adults—Massachusetts, 2002-2009." *Morbidity and Mortality Weekly Report*. 2011. 60(17):537-541. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6017a2.htm>. Accessed 6-3-2013.
6. CDC. "Healthcare-associated hepatitis B and C outbreaks reported to the CDC in 2008-2011." Available at <http://www.cdc.gov/hepatitis/statistics/healthcareoutbreaktable.htm>. Accessed 6-3-2013.
7. McIntosh YG, Powell TA, Tipple M, et al. "Multiple Outbreaks of Hepatitis B Virus Infection Related to Assisted Monitoring of Blood Glucose Among Residents of Assisted Living Facilities—Virginia, 2009-2011." *Morbidity and Mortality Weekly Report*. 2012. 61(19):339-343. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6119a3.htm>. Accessed 6-3-2013.
8. United States Attorney's Office, New Hampshire. "Former Employee of Exeter Hospital Arrested in Connection with Hepatitis C Outbreak." 2012. Available at <http://www.justice.gov/usao/nh/press/2012/Kwiatkowski.html>. Accessed 6-3-2013.
9. Bornschlegel K, Dentinger C, Layton M, et al. "Investigation of Viral Hepatitis Infections Possibly Associated with Health-Care Delivery—New York City, 2008-2011." *Morbidity and Mortality Weekly Report*. 2012. 61(19);333-338. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6119a2.htm>. Accessed 6-3-2013.

Table 1: Fiscal Year 2011 Funding Levels

Grantee	Funding for Perinatal Hepatitis B	Funding for Prevention and Surveillance	Total
Alabama	\$436,290	\$97,642	\$533,932
Alaska	\$186,057	\$96,346	\$282,403
American Samoa	\$131,879		\$131,879
Arizona	\$451,227	\$104,556	\$555,783
Arkansas	\$373,996	\$61,991	\$435,987
California	\$3,020,577	\$683,808	\$3,704,385
Chicago	\$601,872	\$145,470	\$747,342
Colorado	\$609,756	\$610,984	\$1,220,740
Connecticut	\$224,438	\$590,857	\$815,295
Delaware	\$131,126	\$95,877	\$227,003
District of Columbia	\$154,227	\$99,295	\$253,522
Florida	\$1,133,978	\$286,728	\$1,420,706
Georgia	\$654,078	\$122,507	\$776,585
Guam	\$151,749		\$151,749
Hawaii	\$301,243	\$92,602	\$393,845
Houston	\$267,850	\$87,424	\$355,274
Idaho	\$98,507	\$21,096	\$119,603
Illinois	\$688,191	\$114,590	\$802,781
Indiana	\$127,457	\$72,728	\$200,185
Iowa	\$212,878	\$107,823	\$320,701
Kansas	\$474,611	\$70,593	\$545,204
Kentucky	\$472,151	\$94,100	\$566,251
Los Angeles		\$106,360	\$106,360
Louisiana	\$271,095	\$101,298	\$372,393
Maine	\$80,868	\$107,142	\$188,010
Marshall Islands	\$165,842		\$165,842
Maryland	\$672,616	\$108,389	\$781,005
Massachusetts	\$493,095	\$144,219	\$637,314
Michigan	\$626,924	\$305,131	\$932,055
Micronesia	\$198,703		\$198,703
Minnesota	\$560,343	\$385,884	\$946,227
Mississippi	\$211,759	\$58,432	\$270,191
Missouri	\$521,073	\$64,523	\$585,596
Montana	\$64,017	\$34,897	\$98,914
N. Mariana Islands	\$86,873		\$86,873



State Public Health Role in Addressing Hepatitis

Nebraska	\$86,002	\$94,927	\$180,929
Nevada	\$287,310	\$77,811	\$365,121
New Hampshire	\$84,603	\$105,863	\$190,466
New Jersey	\$722,199	\$92,793	\$814,992
New Mexico	\$307,066	\$215,273	\$522,339
New York	\$1,122,812	\$1,613,755	\$2,736,567
New York City	\$1,090,303	\$153,079	\$1,243,382
North Carolina	\$1,158,572	\$107,662	\$1,266,234
North Dakota	\$107,969	\$65,427	\$173,396
Ohio	\$725,630	\$328,866	\$1,054,496
Oklahoma	\$139,031	\$91,469	\$230,500
Oregon	\$109,627	\$627,478	\$737,105
Palau	\$80,718		\$80,718
Pennsylvania	\$1,549,009		\$1,549,009
Philadelphia	\$98,422	\$103,865	\$202,287
Puerto Rico	\$401,005		\$401,005
Rhode Island	\$130,897	\$120,238	\$251,135
San Antonio	\$160,557		\$160,557
South Carolina	\$406,481	\$75,160	\$481,641
South Dakota	\$134,751		\$134,751
Tennessee	\$577,753	\$237,144	\$814,897
Texas	\$326,651	\$93,541	\$420,192
Utah	\$339,615	\$64,580	\$404,195
Vermont	\$153,373	\$82,848	\$236,221
Virgin Islands	\$89,179		\$89,179
Virginia	\$861,419	\$67,494	\$928,913
Washington	\$286,633	\$111,830	\$398,463
West Virginia	\$20,791	\$55,286	\$76,077
Wisconsin	\$144,267	\$228,823	\$373,090
Wyoming	\$48,523	\$89,813	\$138,336
Total	\$26,608,514	\$9,978,317	\$36,586,831