
MMWR. 2007;56:441-445

3 figures omitted

Hepatitis B virus (HBV) infection is a leading cause of illness and death in China. Approximately 60% of the population has a history of HBV infection, and 9.8% of persons in China are chronically infected with HBV and at risk for premature death from liver disease. Each year, an estimated 263,000 persons in China die from HBV-related liver cancer or cirrhosis, accounting for 37%-50% of HBV-related deaths worldwide. Because most HBV infections occur during infancy or early childhood, when HBV infection is most likely to become chronic, vaccination of infants beginning at birth is the key strategy for preventing chronic HBV infection. This report describes China’s progress in increasing coverage among infants with hepatitis B vaccine (HepB) and timely administration of the HepB birth dose (i.e., within 24 hours of birth). Infant vaccination coverage with both the timely birth dose and the complete vaccine series was substantially higher among children born during 2003 than among those born during 1997; timely birth-dose coverage increased from 29.1% to 75.8%, and HepB series completion increased from 70.7% to 89.8%. Furthermore, in economically disadvantaged populations in western and middle provinces* targeted by the China-Global Alliance for Vaccines and Immunization (China-GAVI) project, reported coverage with timely HepB birth dose increased from 64% in 2004 to 81% in 2006, and coverage with the complete HepB series increased from 52% in 2001 to 92% in 2006. China has established a goal to reduce chronic HBV infection among children aged <5 years to <1% by 2010. Achieving this goal will require continued commitment to increasing vaccination coverage in impoverished regions and ensuring that infants born at home are vaccinated within 24 hours of birth.

Hepatitis B Immunization Program

HepB was first recommended for routine vaccination of infants in China in 1992, with the first dose to be administered within 24 hours of birth and subsequent doses at ages 1 and 6 months. However, because of high vaccine prices and user fees charged to parents by local health departments for vaccine purchase and administration, until 2002, infant vaccination occurred primarily in large cities of the wealthier eastern provinces. Beginning in 2002, infant hepatitis B vaccination was added to China’s National Immunization Program. Also in 2002, the China Ministry of Health began a project with the GAVI Alliance† (formerly known as the Global Alliance for Vaccines and Immunisation) to ensure HepB availability in China’s poorest provinces and counties. The 5-year China-GAVI project provides free HepB, targeting approximately 5.6 million children born each year in 12 western provinces and in government-designated poor counties in 10 middle provinces, covering approximately 36% of China’s child population. In 2005, a new vaccination regulation abolished all charges and user fees for all nationally recommended vaccines, including hepatitis B; the vaccine is now free to all children in China.

To estimate national 3-dose HepB coverage and timely (i.e., within 24 hours of birth) HepB birth-dose coverage and to describe the effects of province and location of birth (e.g., home versus hospital) on vaccination coverage levels, data from two national vaccination coverage surveys conducted by the China Ministry of Health in 1999 and 2004 were reviewed. In both 1999 and 2004, parents were interviewed in house-to-house surveys regarding the vaccination status of eligible children born during the study periods. Sampling of households in each province was conducted using the probability proportional to size (PPS) method. In the 1999 survey, counties in each province were divided into four economic strata, and PPS sampling was conducted within each strata. In 2,173 counties in 31 provinces, parents of 25,878 children born during 1997 were interviewed. In the 2004 survey, 273 counties were selected randomly from all counties throughout the country, including at least three counties in each province, and PPS sampling was conducted in each county; parents of 171,188 children born during 2001-2003 were interviewed. For both surveys, 3-dose HepB and timely HepB birth-dose coverage were measured by dividing the number of children receiving 3-dose HepB and timely HepB birth dose, respectively, by the number of children surveyed, taking into account the PPS sampling design.

To examine in more detail the impact of the China-GAVI project, routine immunization-reporting—system data from 2001 through 2006 for China-GAVI–funded provinces were reviewed. In this national reporting system, the numbers of children targeted for and receiving each dose of routinely recommended vaccines are compiled by each immunization clinic and reported monthly to provincial and national immunization programs. For this analysis, 3-dose HepB and timely HepB birth-dose coverage in China-GAVI–funded provinces were measured by comparing the ratio of the number of children receiving doses of HepB to the number of children targeted to receive doses of diphtheria, tetanus, pertussis...
provinces and in the counties in 10 middle provinces supported by the China-GAVI project. In 2006, the ratios of 3-dose HepB/3-dose DTP coverage and timely HepB birth dose/first-dose DTP coverage were 92% and 81%, respectively. During 2003-2006, approximately 15.4 million children in China-GAVI project counties received the 3-dose HepB series, preventing an estimated 1.47 million chronic HBV infections in children and 265,000 future deaths attributable to chronic HBV infection.

Reported by: FQ Cui, MD, XJ Wang, MD, L Cao, MD, XF Liang, MD, China Center for Disease Control and Prevention, Beijing; Y Lu, MD, Shaanxi Provincial Center for Disease Control and Prevention, Xian; YS Hu, Qinghai Provincial Center for Disease Control and Prevention, Xining; Qinghai; SC Hadler, MD, World Health Organization Office in China, Beijing, China; CN Shapiro, MD, ST Wiersma, MD, JW Ward, MD, Div of Viral Hepatitis, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, CDC.

CDC Editorial Note: China has made substantial progress in implementing universal, timely hepatitis B vaccination for infants and in reducing disparities in coverage between the poorest and wealthiest parts of the country. The support from the China-GAVI project has improved vaccination coverage and helped prevent chronic HBV infection in children. During 2003-2006, approximately 15 million children in China-GAVI-funded provinces and approximately 42 million children nationwide received HepB.

Since 2002, implementation of universal infant hepatitis B vaccination in China has focused particularly on improving timely administration of the birth dose. Approaches used to increase timely birth-dose coverage have included (1) increasing the percentage of births that occur in hospitals; (2) improving vaccine availability in hospitals and township health facilities; (3) building collaboration among delivery services (i.e., maternal and child health programs and obstetrics) and between vaccination services (i.e., immunization programs and pediatrics) in hospitals and township health centers; (4) increasing the awareness of the importance of timely birth-dose administration among providers and parents; (5) intensifying training, supervision, and monitoring of county, township, and village health workers; and (6) providing subsidies to village doctors to provide vaccines.

Disparities in vaccination coverage continue to exist by region and by location of birth. Despite the China-GAVI activities, during 1997-2006, children from eastern provinces had substantially higher coverage than those from middle or western provinces, as did children born in hospitals versus those born at home. Income levels continue to be highest in China’s eastern provinces and lowest in the western provinces; residents in eastern provinces generally have greater access to and ability to pay for health care, including hospital care for childbirth. Children born in hospitals generally have better access to immunization services and can be vaccinated more easily within 24 hours of birth. In western China, children are more likely to live in remote, mountainous areas and have less access to hospital delivery and immunization services. The China Ministry of Health is implementing programs to increase births in hospitals nationwide by expanding and improving obstetric care in health-care facilities throughout China and providing incentives to give birth in hospitals.

Prevention of chronic HBV infection in China is integral to global initiatives to reduce the burden of HBV infection. In 1992, the World Health Assembly passed resolution 45.17, which called for all World Health Organization (WHO) member states to integrate cost-effective new vaccines, including HepB, into national immunization programs where feasible. The same year, WHO recommended that HepB be included in routine vaccination schedules for all children in all countries. During 2000-2006, the GAVI Alliance has provided support for HepB introduction to 51 less developed member states (i.e., countries with less than [U.S.] $1,000 per capita gross national income).
income), and these countries have made substantial progress in introducing HepB into their vaccination schedules. As of 2005, a total of 154 (80%) of 192 WHO member states reported having integrated HepB into their routine infant vaccination schedules; global coverage with 3-dose HepB had increased from 32% in 2001 to 55% in 2005, with 2005 coverage varying by WHO region (South-East Asia: 27%; Africa: 39%; Eastern Mediterranean: 74%; Europe: 76%; Americas: 85%; Western Pacific: 87%). The advances in hepatitis B vaccination have led countries and WHO regions to set goals for the elimination of HBV transmission. The WHO Western Pacific Region has committed to reducing chronic HBV infection in children aged <5 years to <2% by 2012.

The findings in this report are subject to at least two limitations. First, the design of the national surveys conducted in 1999 and 2004 differed in how counties were stratified before PPS sampling, which might limit comparability of the two surveys. Second, for the analyses using data from the routine immunization reporting system, the precise number of children requiring vaccination at local levels is not known because some children might not be registered; hence, the use of children targeted to receive DTP vaccine as a surrogate for total number of children might result in overestimation of reported vaccination coverage.

Despite China’s progress in increasing hepatitis B vaccination coverage and timely administration of the birth dose, challenges remain to reaching the national goal of <1% chronic HBV infection among children aged <5 years by 2010. Achieving this goal will require increasing 3-dose HepB coverage to the same level as 3-dose DTP coverage and increasing timely HepB birth-dose coverage to 90% in all provinces. The greatest challenge is to increase administration of the birth dose among children born at home. Three provinces (Guizhou, Tibet, and Yunnan) and 42% of China-GAVI project counties still have timely birth-dose coverage levels of <75% and are most in need of targeted interventions. Although most hospitals now are achieving >95% timely birth-dose coverage for infants born in hospitals, strategies are needed to ensure that false contraindications to vaccination, including low birth weight and unstable medical condition at birth, do not delay administration of the birth dose. Innovative measures also are needed to reach infants born at home, particularly through linking prenatal care and birthing-care providers with immunization program staff at township and village levels. With these improvements, China can reduce substantially the burden of hepatitis B.

Acknowledgments
This report is based on contributions from village, township, county, prefecture, provincial, national, and international health staff involved in China’s hepatitis B immunization program.

REFERENCES

©2007 American Medical Association. All rights reserved.