

REVIEW ARTICLE

Chronic hepatitis B virus in the PhilippinesRobert G Gish,^{*,†,‡,§} Jose D Sollano Jr,[¶] Alex Lapasaran^{**} and Janus P Ong^{††}

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Abstract

Multiple studies have shown a high prevalence of chronic hepatitis B (CHB) infection in the Philippines, not only in high-risk populations but also in the general population. The most recent national study estimated HBsAg seroprevalence to be 16.7%, corresponding to an estimated 7.3 million CHB adults. The factors underlying the high prevalence of CHB and its sequelae include the inadequate use of vaccination for prevention and the lack of treatment for many Filipinos. Because without medical monitoring and treatment of CHB the risk of progression to liver failure and death is 25–30%, the ultimate medical and societal costs will be very high if the Philippines fails to properly address hepatitis B infection. It will be very important to move forward with programs that can help to ensure universal vaccination of newborns, screening and vaccination nationwide, and monitoring and treatment for CHB persons. It will also be crucial to address transmission of HBV in the health-care setting (via contaminated needles and syringes and inadequately sterilized hospital equipment) and via injection drug use and tattooing. Because of the relatively low average per capita income and the lack of coverage by PhilHealth of outpatient visits and medications, there is an urgent need to move forward with a nationally supported program that includes education for both the general public and health-care workers on liver disease and screening for hepatitis viruses, followed by, as appropriate, vaccination or treatment, with expanded government coverage for these for all those who could not otherwise afford it.

Introduction

The World Health Organization (WHO) Western Pacific Region (WPR) is home to only 28% of the global population, but almost half ¹ of the 240 million people whom WHO currently estimates are chronically infected with hepatitis B virus (HBV) worldwide,² with most countries in this region having an estimated chronic infection prevalence of 8% or more.³ WHO estimates that HBV causes almost 890 deaths daily in this region, with nearly all occurring as the consequence of chronic infection decades after the initial infection at birth or in early childhood.⁴ Multiple studies have shown that the Philippines has a high rate of chronic hepatitis B (CHB) infection, not only in high-risk populations but in the general population as well.^{5,6} The Philippines Department of Health (DOH) has identified the lessening of the spread of HBV infection as one of its primary concerns.⁷

The WPR had defined as an interim milestone the reduction of the prevalence of CHB to less than 2% in children at least 5 years of age by 2012 and to less than 1% by 2017.⁸ However, in 2012, it was agreed that although birth dose coverage is improving, it must be increased further to achieve the goal.⁹ In December 2012,

WHO released its *Prevention & Control of Viral Hepatitis Infection: Framework for Global Action*, a plan intended to convey urgency about the need to address viral hepatitis worldwide and defining four axes for this: (i) raising awareness, promoting partnerships, and mobilizing resources; (ii) evidence-based policy and data for action; (iii) prevention of transmission; and (iv) screening, care, and treatment.¹⁰ WHO defines universal infant immunization as the key strategy for reducing HBsAg seroprevalence, with the first vaccine dose given within 24 h of birth, the latter noted as crucial,¹¹ followed by two doses, either at the time of the first and third doses of DTP vaccine or, if more convenient, by three doses coinciding with DTP or other infant vaccinations; the minimum interval between doses is 4 weeks. This strategy was chosen because the main risk factor for HBV-related liver disease is chronic infection acquired at birth or in early childhood.^{12,13} The risk of developing CHB after acute exposure ranges from approximately 90% in newborns of HBeAg-positive mothers to 25–30% in children under 5 years old to less than 5% in adults.^{14–18} In the WPR, most CHB results from vertical transmission at birth or horizontal transmission in children under the age of 5 years.³ It has been estimated that in the WPR almost three-

quarters of all HBV-associated deaths occur in those infected before the age of 5 years.¹⁹ However, in some Philippine villages, HBsAg seroprevalence peaks in 2- to 9-year-olds and in others in 30- to 49-year olds,²⁰ providing evidence for vertical, childhood horizontal, and adult horizontal transmission, all of which must be addressed to optimally reduce infection nationwide.

Although the focus here is on the Philippines, it is important to note that many of the same factors that underlie the high prevalence of CHB in the Philippines also underlie it in multiple other Asian Pacific countries. We discuss here the crucial importance of a multi-step approach to achieving universal infant immunization that includes timely birth dose coverage in the Philippines, but the same need is present in much of the WPR and in multiple other Asian countries. Although timely birth dose coverage has been increasing, according to WHO, it is achieved in only 76% of the WPR overall, and multiple countries still have very low birth dose coverage and major challenges for improving it, including increasing awareness of the need for the birth dose, increasing deliveries attended by skilled birth attendants, and ensuring vaccine availability.²¹ The same is true in some other countries in Asia where birth dose coverage is extremely low (for example, only 42% in India).²² Thus, the discussion here of the approaches that could improve birth dose coverage could apply to multiple other countries. We also discuss here the importance of addressing transmission of HBV in the health-care setting in the Philippines. In 2000, WHO estimated that in the greater WPR the proportion of injections administered with reused injection equipment was 30%²³ and that worldwide contaminated injections resulted in an estimated 21 million HBV infections annually, accounting for 32% of new infections.²⁴ Thus, the same issue of reducing transmission that occurs through contaminated needles and syringes and inadequately sterilized hospital equipment should be addressed throughout the WPR and other countries in Asia. We discuss here the fourfold higher risk of infection in Filipinos with a history of tattoo. A meta-analysis of 32 non-Philippine studies has shown a clear association of tattooing and hepatitis B transmission,²⁵ so the need for approaches to reducing this risk would apply to other Asian Pacific countries, particularly with the increasing popularity of tattoos in this part of the world, especially among young people. We discuss here the need for screening adults in the Philippines. The same need is certainly present in most other countries in the WPR because the prevalence of hepatitis B chronic infection among adults in the region is quite high (7–12%), while screening rates are low and most people who are infected do not know it.²¹ Thus, what we present here as approaches to reducing CHB prevalence in the Philippines should be considered an example that could apply to many other Asian Pacific countries.

HBsAg seroprevalence in the Philippines

In 2015, it is clear that the universal infant vaccination goal has not been met in the Philippines,²⁶ that HBsAg seroprevalence remains high,⁶ and that the Philippines remains hyperendemic. Data collected prior to the implementation of a national vaccine program have shown average prevalence of 12% (in four villages in different provinces from 1979 to 1982),²⁰ 8.8% (in rural villages in 1986),²⁷ and a range from 10% in rural communities to 11.8% in Metro Manila (based on 35,623 blood donor samples collected

from 1979 to 1980).²⁸ A 1994 review of pre-vaccine program prevalence surveys reported prevalence rates of CHB among both the rural poor and the urban well-to-do of 5–16%.²⁹ After the 1992 implementation of universal immunization, the first major study of a rural population reported an overall prevalence of 8.4% in 2006 in Oriental Mindoro, although with a wide variation between ethnic groups, only 5.2% among Tagalogs compared with 18.2% among Mangyans;³⁰ the reason for the large prevalence discrepancy is unclear but may relate to socioeconomic factors, including poor access to health services among the Mangyans.

In a study published in 2013 on CHB prevalence in 2150 Filipino adults who participated in the 2003 National Nutrition and Health Survey, the HBsAg seroprevalence was 16.7% (95% CI=14.3–19.1%), corresponding to an estimated 7.3 million adults with CHB in the Philippines.⁶ Because the National Nutrition and Health Survey is a survey carried out in 3400 enumeration areas nationwide, it is likely that this is the most accurate current prevalence estimate, especially in comparison with most other prevalence studies that either included small sample sizes or were carried out only in select populations and/or in limited geographic areas. In addition, many earlier studies were carried out with blood donors (who are pre-screened and excluded from donating if they report risk factors) and “healthy volunteers” (who are likely to have self-selected based on prior knowledge of HBV infection status). The prevalence of CHB was highest in the 20–29 (18.1%) and 30–39 (17.6%) age groups (in years); among those in the lowest income quartile, the latter possibly reflecting inequity in access to health care, including vaccination programs; and in those with lower educational status. Philippine studies have reported substantially higher CHB prevalence in patients with chronic liver disease (45.7%),³¹ hepatocellular carcinoma (70%³² to 74.8%³³), and cirrhosis (58.2%).³³ Testing carried out by the Philippines DOH/Research Institute of Tropical Medicine in 3538 persons in the HIV cohort has shown that 6% are HBV/HIV coinfecting (Ditangco R, unpublished data); there is no current data on HBV/hepatitis C coinfection. Without medical monitoring and treatment of CHB, the risk of developing cirrhosis and hepatocellular carcinoma with sequelae of liver failure and death is 25–30%.^{34–38}

Factors underlying high chronic hepatitis B prevalence and lack of treatment

The factors underlying the high rate of CHB and its sequelae in the Philippines include the inadequate use of vaccination for prevention and the lack of treatment for many. Both much of the general public and many health-care providers have no real understanding of the risks and long-term consequences of untreated infection and the need for screening, followed by vaccination of the uninfected and treatment for those already infected. Because the initial infection with HBV is generally asymptomatic, particularly in young children, and complications most commonly only develop after decades, there are no obvious signs in either children or young women of childbearing age that might make the public more aware of this disease. Nationwide, too many policymakers and legislators are unaware of the full impact that HBV infection has on the Philippines, decreasing the likelihood of policies being established to fully address this disease.

In a country with a relatively low average per capita income (\$3980 in purchasing power parity international \$, 2009) and a WHO-estimated total health expenditure per capita of only \$68,³⁹ access to health-care services for screening and vaccination or treatment is limited. It will be crucial to design any intervention with a complete understanding of what is and is not likely to be covered for the average person. In the *Health Service Delivery Profile: Philippines 2012*, created through a WHO–DOH collaboration, health financing is described as fragmented, with high inequity, weak social protection, and insufficient government investment.³⁹ Not all people are covered by PhilHealth, the country's national health insurance program, with recent coverage estimates ranging from 82% (2011 estimate by PhilHealth) to 38% (2008 Demographic Household Survey).³⁹ Of particular importance in terms of HBV screening and treatment, outpatient consultations and medications are not currently covered by PhilHealth. These limitations and the fact that many people are not enrolled in PhilHealth result in high out-of-pocket payments for many, a potentially serious barrier to fully addressing HBV in the Philippines. Thus, there is an urgent need to move forward with a nationally supported program that includes education on HBV infection, screening, and vaccination or treatment, with expanded government coverage for those who could not otherwise afford it. A national surveillance system to monitor HBV transmission and associated disease needs to be put in place despite the challenges, which will include making surveillance a national policy, allotting sufficient funding, and establishing an anti-discrimination policy that protects persons diagnosed with CHB.

Educating health-care workers and the public

Health-care providers must be educated about the high HBV prevalence and the need for screening, vaccination, and effective CHB management, including treatment and liver cancer surveillance, and should be provided up-to-date treatment guidelines. Medical societies could participate in providing this education. Although the majority of Philippine Continuing Medical Education (CME) courses are currently delivered in classrooms, to efficiently reach health professionals nationwide, internet CME courses should be made available to all physicians, public health professionals, pharmacists, and nurses, with the focus on (i) screening, vaccination, and treatment; (ii) the risks and absolute unacceptability of re-using needles and syringes and of inadequate sterilization of hospital equipment; and (iii) guidelines for health-care providers who are HBV infected, using the guidelines released by relevant societies such as the Asian Pacific Association for the Study of the Liver.⁴⁰ Training could also be provided on infection control with safer injections including information on hand hygiene, single-use devices, proper use of multi-dose vials, proper preparation of injection medication, strict observation of universal precautions, and proper disposal of sharps and non-sharps waste after injection procedures.

Health educators should be provided training to improve their knowledge, awareness, attitude, and behavior related to the high risk of HBV and the need for screening, vaccination, and treatment. Public health programs in the Philippines are commonly administered through government hospitals and health centers in local villages. As part of the Hospitals as Centers for Wellness

program, the DOH assigns each public hospital a health education and promotion officer; programs are geared toward managing the country's major health issues. Enlisting these officers in the HBV awareness campaign could be very important. The Yellow Warriors Society of the Philippines, a national organization of HBV patients and advocates, could also contribute.

The general public must be educated about the high prevalence of this infection in the Philippines, given clear information on the risks for infection, and taught that vaccination, including provision of the vaccine birth dose within 24 h of birth, can provide lifelong protection and that, in those already infected, CHB can be effectively and safely treated. It will also be important for the general public to be informed that household transmission is possible, although limited to only certain risk factors. In a Philippines study of 526 CHB patients, HBV infection in family members was found in one in five patients' families, most commonly in the mother and siblings.⁴¹ Perinatal transmission may explain a substantial percentage of infection in family members, but there are other risks for household transmission. However, in educational materials intended for the general public, it will be important to carefully differentiate between those things that are actual risks for transmission within households (sharing toothbrushes or razors because HBV in blood on such objects can survive for at least 7 days outside the body) or in workplaces (exposure within hospitals, health clinics, or other medical facilities) and the things that are not risk factors within households or in workplaces, making it clear that HBV is not transmitted casually and cannot be spread through air, food, water, breast-feeding, kissing, hugging, coughing, sneezing, sharing eating utensils or drinking glasses, or casual contact in the workplace. Increasing the public's understanding of the latter is particularly important because of the current too widely believed myths that have resulted in stigmatization and discrimination against people living with CHB, many of whom have been unable to find employment because of false beliefs that they are unable to work or could be contagious to others in the standard work environment. Under the Department of Labor and Employment's *Guidelines for the Implementation of a Workplace Policy and Program on Hepatitis B* it is mandatory for all private workplaces to have an HBV policy preventing discrimination and to implement a workplace program that includes education, preventive strategies, and referral to screening and treatment services.

Development of written materials and videos that effectively convey the need for screening, vaccination, and treatment will be important. Creative use of both mass and social media to convey information and direct the public to online resources with both simple-to-understand information and step-by-step guidance for accessing screening, vaccination, and treatment resources could be very effective for reaching the greater Philippines population. A 2012 survey by the Health Research Institute found that one-third of those surveyed are using social media for health-related matters and that, particularly in younger age groups (18–24 years), nearly 90% of individuals would trust information found via social media.⁴²

Preventing mother-to-child infection transmission

Timely vaccine birth dose delivery and completion of the vaccine series have long been the cornerstones for preventing mother-

to-child transmission of infection. However, despite the 1992 implementation of the immunization program, timely HBV vaccination to prevent perinatal transmission is not yet universal. In a 2007 study of birth dose delivery after 55 719 deliveries in 85 of the country's largest 150 hospitals (56%), only 54% of infants had a documented birth dose, with only 22% vaccinated within 24 h of delivery.⁴³ Distribution of detailed and specific guidelines, conducting effective training with supervisory follow up, and having hospital standing orders substantially increased birth dose coverage. Unfortunately, as of May, 2014, WHO estimates that the first dose is still not given within the first 24 h in almost two-thirds (65%) of all births²² and that there has actually been a steady decline in completion of the three-dose vaccine series each year from 2008 (88%) to 2012 (70%).⁴⁴

A 2012 study carried out by WHO, the DOH, and the US Centers for Disease Control and Prevention which assessed birth dose coverage in 142 health facilities in 8 of 18 regions in the Philippines found that not all facilities provided vaccine, including seven private hospitals (58%) and five government hospitals (42%), with the reasons given for this including lack of a vaccine administration policy (25%), no trained staff (25%), and lack of vaccine supply (67%).²⁶ Median timely birth dose coverage, defined as vaccine given on the day of birth or the day after, varied widely, ranging from 90% at government clinics to 87% at government hospitals to only 50% at private hospitals; it was only 62% in facilities where the outpatient department or Expanded Programme on Immunization (EPI) staff were responsible for vaccine delivery compared with 92% (76–100%) where ward/delivery staff were responsible.

Factors that contributed to inadequate birth dose coverage included the following:

- failure to vaccinate on weekends (in 26% of government clinics, 16% of government hospitals, and 6% of private hospitals);
- belief by health facility staff in false contraindications for vaccination, resulting in failure to vaccinate newborns who are premature (in 37% of government clinics, 41% of government hospitals, and 50% of private hospitals), have low birth weight (in 18% of government clinics, 29% of government hospitals, and 45% of private hospitals), or are ill (in 69% of government clinics, 71% of government hospitals, and 82% of private hospitals);
- refusal of vaccination by families;
- vaccine availability; 38% of government clinics, 53% of government hospitals, and 19% of private hospitals reported having been out of stock of vaccine on one or more occasions during the previous 17 months; and
- only 6% of staff attending home births bring vaccine; most simply advise the family to come to a health facility.

There were also significant gaps in supervision, with 26% of health facilities reporting no EPI supervisory visit in the previous 6 months, including 31% of government hospitals and 53% of private hospitals.²⁶ The researchers emphasized the importance of EPI supervision to ensure that vaccine is properly stored, handled, and administered, and noted disturbing examples of failures in these, including vaccine storage in a freezer (which inactivates it) and failure to observe that the heat threshold had been exceeded (in which case the vaccine should be discarded).

Based on these findings, the DOH recommends that national guidance be strengthened through training and collaboration with government hospitals and professional societies to ensure that vaccination guidelines are in place, with special efforts focused on private health facilities, and that health-care workers attending home births be trained and supplied vaccine for birth dose vaccination. Such health-care workers would need to be carefully trained not only in the actual delivery of the vaccine and the absolute requirement to give the birth dose within 24 h of delivery but also, very importantly, in the need for maintenance of proper cold chain compliance.

A study that gathered data from multiple Philippines health facilities showed that of 1431 sampled infants, only 77% completed the full three-injection hepatitis B vaccination series, with only 10% following the recommended schedule.⁴⁵ Addressing all factors that have so far prevented correctly administered HBV vaccination from becoming truly universal could greatly reduce vertical transmission. The Philippine government has provided support for this with Republic Act No. 10152, the Mandatory Infants and Children Health Immunization Act of 2011, which requires that all children under 5 years old be given for free basic immunization against vaccine-preventable diseases and that all infants be given the birth dose of the HBV vaccine within 24 h of birth, with subsequent doses given according to the recommended schedule.⁴⁶ The law specifically mandates that when the birth occurs in a hospital, health center, health infirmary, or lying-in center, the vaccine will be administered by any licensed physician, nurse, or midwife; when the birth occurs outside these settings, any physician, nurse, or midwife who provides delivery assistance is responsible for administering the vaccine. For all other deliveries, the law requires that the infant be brought to any available health-care facility to be immunized "within twenty-four (24) hours after birth but not later than seven (7) days."⁴⁶ All health-care facilities should make their staff members aware of these requirements.

Because a substantial percentage of births in the Philippines occur at home, it will be crucial to have widespread education about the need for timely vaccination of newborns directed not only toward the midwives and traditional birth attendants who often attend home births but also toward the general population and pregnant women. WHO estimates that 65% of births occur at home (90% in the Autonomous Region of Muslim Mindanao)⁴⁷ while the 2011 Family Health Survey (FHS) estimates 44.8%. In the 5 years prior to the 2011 FHS, an estimated 72.2% of live births nationwide were delivered by a health professional. However, this varied greatly by region, ranging from 91.5% in the National Capital Region to only 31.9% in the Autonomous Region of Muslim Mindanao. According to the 2011 FHS, assistance at delivery is mostly provided by physicians (41%), midwives (29%), and hilots (traditional birth attendants, 27%).⁴⁸ Enlisting the DOH's National Safe Motherhood Programme, which prioritizes the creation of community-based women's health teams⁴⁹ as an ally for education of pregnant women on the need for timely neonatal vaccination, as well as for delivery of vaccination services, could be very useful.

Because failure of immunoprophylaxis, infection of the newborn despite vaccination, occurs in 1–14% of vaccinated infants,⁵⁰ with higher risk of failure strongly associated with higher maternal viral load,^{51–53} experts in the field have recommended testing

pregnant women for infection and initiating antiviral therapy in infected women late in the second or at the beginning of the third trimester of pregnancy, particularly in women with serum HBV–DNA >105 copies/mL.⁵⁰ Data from the Antiretroviral Pregnancy Registry have shown that the overall birth defect rate in children born to mothers treated with lamivudine or tenofovir is not significantly different from population-based controls.⁵⁴ The European Association for the Study of the Liver clinical practical guidelines now recommend treatment in the last trimester of pregnancy in HBsAg-positive women with serum HBV–DNA >106–7 IU/mL; if therapy is given only for the prevention of perinatal transmission, it can be discontinued within the first 3 months after delivery.⁵⁵ Such discontinuation has not been shown to be associated with a significant increase in the risk of alanine aminotransferase flares.⁵⁶ Because tenofovir is a prodrug that results in low concentrations in breast milk, it is thought to be safe to use during breastfeeding.⁵⁷

Screening and vaccination of older children

Children born to CHB mothers should also be screened between ages 1 and 5 years because approximately 13% of infants will become infected despite vaccination.⁵⁸ In addition, an effective catch-up vaccination program could provide protection for children and adolescents not previously successfully vaccinated. Screening prior to such catch-up vaccination should be mandatory. Although the WHO position is currently to not routinely screen prior to catch-up vaccination, in part because it is more cost-effective, there are several important reasons that this policy should be changed. First, there has been a substantial decrease in the price of screening, especially with point-of-care (POC) test kits that are much less expensive and more easily available. Second, the high HBV prevalence in the Philippines means that with prior screening, a large amount of unnecessary vaccination would be eliminated, with cost savings accrued accordingly. Third and most important, without prior screening, children who are, in fact, infected could be given vaccine, providing false reassurance to them and their parents that they are protected. The result would be twofold. First, believing themselves to be HBV free, they are unlikely to receive treatment, especially at an early time when viral control or clearance would be more likely. Second, because in later life they would believe themselves to be safe from infection, they would be unaware of the need for practicing safe sex and carrying out transmission prevention measures within their households, thus becoming a source of infection of others.

Screening of adults

To prevent horizontal transmission, effective approaches to screening must be established nationwide in order to identify and increase vaccination rates among the susceptible, while also identifying and informing individuals with immunity and those who are infected, referring the latter for assessment and treatment. Of particular concern in the adult population are health-care workers who are at increased risk of workplace-acquired HBV infection. Disturbingly, a 2007 WHO survey found that in 80 facilities in seven regions of the Philippines, only 61.2% of health-care providers reported having received three or more doses of the HBV

vaccine and 77.5% at least one dose of the vaccine, with 50% reporting a high frequency of needle stick injuries, most of which were not reported.⁵⁹ The DOH should mandate that all uninfected health-care workers receive the full vaccine series.

Risk factors for hepatitis B virus transmission in the Philippines

It will also be very important to educate both the general public and health-care providers about all the risk factors for transmission of HBV, including (i) unsafe sex with an infected partner; (ii) exposure to blood via reuse of syringes, needles, or sharp instruments (including not only in the health-care setting but also in the home or when used for tattoos or in traditional medicine practices); (iii) inadequately sterilized medical equipment; (iv) sharing such items as razors or toothbrushes; (v) direct contact with an infected person's blood or open sores; and (vi) sharing needles, syringes, or other drug-injection equipment. There has been little research to determine specific risk factors for HBV infection in the Philippines. In a study that assessed this among women admitted to the Philippine General Hospital in 2004 for an elective gynecologic surgery, the odds of developing HBV infection were eightfold higher in patients who had a history of illegal intravenous drug use, acupuncture, hemodialysis, hepatoma, or exposure to an HIV+ person and fourfold higher in patients with a history of blood donation, tattooing, sexually transmitted disease, or exposure to someone with hepatitis.⁶⁰

As part of a total approach to reducing CHB in the Philippines, it will be very important to address transmission of HBV in the health-care setting via contaminated needles and syringes and inadequately sterilized hospital equipment. In 2000, WHO estimated that in the WPR, which includes the Philippines, the proportion of injections administered with reused injection equipment was 30%²³ and that worldwide, in the year 2000, contaminated injections resulted in an estimated 21 million HBV infections, accounting for 32% of new infections.²⁴ A 2007 assessment survey of injection safety in 80 government health facilities in seven regions of the Philippines found that only approximately 80% of procedures were observed to use new sterile syringes and needles, lancets, or other devices taken from sterile packets or fitted caps, including only 65.7% of intravenous injections.⁵⁹ The survey also found a high frequency of high-risk practices prone to needle stick injuries and inadequate availability of sharps disposal containers in the majority of health facilities. Inadequately sterilized hospital equipment may be another risk because studies have reported that the risk of developing HBV infection is eightfold higher in patients with a history of hemodialysis and fourfold higher in patients with a history of blood donation⁶⁰ and that 8.7% of hemodialysis patients were HBsAg positive compared with 5.9% of healthy adults.³¹

In addition to the education of health-care workers already discussed, training should be provided on infection control with safer injections including information on hand hygiene, single-use devices, proper use of multi-dose vials, proper preparation of injection medication, strict observation of universal precautions, and proper disposal of sharps and non-sharps waste after injection procedures. The DOH should strengthen rules and regulations on proper waste management and injection safety at the local and national level to comply with international standards. Injection

safety and waste management manuals should be placed online and their availability publicized.

Transmission via reuse of syringes by injection drug users (IDUs) is another risk factor, with one study reporting eightfold higher odds of developing HBV infection in patients with a history of illegal intravenous drug use⁶⁰ and another showing substantially higher prevalence of HBsAg positivity in IDUs compared with the general population.⁶¹ It will be important to support outreach programs that provide education to IDUs related to the need for screening and for protection against infection and to provide needle/syringe exchange.

A meta-analysis of 32 non-Philippine studies has shown a clear association of tattooing and hepatitis B transmission,²⁵ and a Philippine study found a fourfold higher risk in people with a history of tattoo,⁶⁰ a concern with the increasing popularity of tattoos, especially among young people, in the Philippines. Reuse of razors in barbershops is also common as a cost-saving measure. It is important to investigate the best approaches for reaching out to these commercial enterprises in order to provide guidance on eliminating unsafe practices by barbers and tattoo artists nationwide.

Because a substantial portion of the population uses traditional healing practices, it will also be important to address the risk of infection transmission in this area. A 2010 WHO WPRO study estimated that 70% of the Philippines population uses traditional and complementary medicines, including Filipino traditional medicine and a wide variety of other traditional practices introduced from other countries, including Chinese acupuncture.³⁹ As has been shown to be true in other countries in WPR B,⁶² acupuncture has been identified as a major risk factor for HBV infection in the Philippines.⁶⁰ In 2008, the Philippine Institute of Traditional and Alternative Medicine (PITAHC) began the accreditation of acupuncturists in the Philippines, including both physicians and non-medical practitioners who perform acupuncture. The education and training provided by PITAHC may reduce the reuse of needles and ultimately the risk of infection transmission through them.

Although most Filipino traditional medicine practices confer no risk of infection, some traditional therapies, including “laway” (in which there is use of saliva) and skin abrasions (created through the use of coins or wood sticks, which may be reused), could be risk factors for HBV transmission. To reduce such risks, it could be helpful to enlist the aid of authorities from the UP-Philippine General Hospital Traditional and Integrative Medicine Clinic, the DOH’s Traditional Medicine Unit, PITAHC, and De La Salle University College of Medicine’s Center for Indigenous Medicine to design effective outreach to traditional healers about the need for measures to prevent hepatitis virus infection transmission.

Addressing barriers to screening

It will be crucial to identify and address any barriers to screening. In areas where it is possible that the fear of social stigma and discrimination against those identified as HBsAg positive may discourage people from being tested, providing free anonymous testing sites may be important to increase the willingness to be tested. It will also be important to provide simplified guidelines for proper use and interpretation of HBV screening assays.

Point-of-care (POC) testing is a key innovation that can simplify patient screening and dramatically reduce per-patient cost. Bioland (Chungbuk, Korea) tests for HBsAg (NanoSign HBs) and anti-HBs (NanoSign anti-HBs) are already available, which can be carried out on-site, with a 20-min turnaround to obtain results. The per-person cost for both test kits is approximately \$1.00. POC tests need to include HBsAg (if positive, indicating infection), anti-HBc (indicating exposure), and anti-HBs (indicating immunity) to assist in proper patient allocation to vaccination or linkage to care, or to determine that the patient has cleared infection and needs no further intervention. Further refinements of the development of POC testing will include validation via comparison with licensed global assays.

Conclusion

Because without medical monitoring and treatment of CHB the risk of progression to liver failure and death is 25–30%, the ultimate medical and societal costs will be very high if the Philippines fails to properly address hepatitis B infection. It will be very important to move forward with programs that can help to ensure universal vaccination of newborns, screening and vaccination nationwide, and monitoring and treatment for the seven million or more people currently living with CHB in the Philippines. It will also be crucial to address transmission of HBV in the health-care setting (via contaminated needles and syringes and inadequately sterilized hospital equipment) and via injection drug use and tattooing. Because of the relatively low average per capita income and the lack of coverage by PhilHealth of outpatient visits and medications, there is an urgent need to move forward with a nationally supported program that includes education on all aspects of liver disease and screening for hepatitis viruses, followed by, as appropriate, vaccination or treatment, with expanded government coverage for these for all those who could not otherwise afford it.

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