

# Eliminating Hepatitis B from Bangladesh by the Year 2030

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## Summary

Worldwide, hepatitis B virus (HBV) infection is still a major public health problem. Bangladesh having a large burden of HBV infection, should be a major contributor towards its elimination by 2030. The country has been making progress in reducing incidence of HBV infection during the past decades. The progresses are mainly due to large vaccination coverage among children and large coverage of timely birth-dose vaccine for prevention of mother-to-child transmission of HBV. However, Bangladesh still faces challenges in achieving target of reduction in mortality from HBV. On the basis of targets of the WHO's Global health sector strategy on viral hepatitis 2016–2021, we highlight priorities for action towards HBV elimination. To attain the target of reduced mortality we propose that, the service coverage targets

of diagnosis and treatment should be prioritized along with vaccination. Firstly, improvements are needed in the diagnostic and treatment abilities of medical institutions and health workers. Secondly, the government needs to reduce the costs of health care. Thirdly, better coordination is needed across existing national program and resources to establish an integrated system for prevention, screening, diagnosis and treatment of HBV infection. In this way, we can make progress towards achieving the target of eliminating HBV from Bangladesh by 2030.

**Key words:** Hepatitis B, Elimination, Bangladesh, Sustainable Development Goal (SDG).

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## Introduction:

According to the World Health Organization (WHO), about two billion people (one-third of the global population) are infected with the hepatitis B virus (HBV) throughout the world.<sup>1</sup> In 2016, Global prevalence of HBV was around 292 million (3.9% of the world population).<sup>2</sup> Those who are chronically infected have a 25% risk of dying from the consequences of chronic HBV infection, such as cirrhosis and hepatocellular

carcinoma (HCC).<sup>3</sup> Around 600000 people die every year due to the complications of chronic HBV infection.<sup>1</sup> Worldwide, chronic HBV infection is responsible for 54.4% of the cases of liver cancer.<sup>4</sup> HBV infection is one of the infectious diseases that can be prevented by vaccination. WHO, in 1991 recommended for inclusion of the hepatitis B vaccine into the national immunization program in countries with an HBV carrier prevalence of 8% or higher by 1995 and in all other countries by 1997.<sup>5</sup> The global health sector strategy was approved by the World Health Assembly to eliminate viral hepatitis as a threat to public health by 2030.<sup>6</sup>

According to the global health sector strategy, elimination of hepatitis B requires integration across five main interventions: (a) immunization against hepatitis B; (b) prevention of mother-to-child transmission (PMTCT) of HBV; (c) blood and injection safety; (d) harm reduction services for people who inject drugs; and (e) increased testing and treatment.<sup>6</sup>

## Target of SDG:

One of targets of SDG is to end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases, by 2030.<sup>7</sup>

**Definition of elimination:** Elimination means reduction to zero of the incidence of disease or infection in a defined geographical area.<sup>8</sup>

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For hepatitis, elimination is defined as a 90% reduction in incidence and a 65% reduction in the number of related deaths from a 2015 baseline.<sup>9</sup>

HBV in Bangladesh is indeed at a decline, and its prevalence is very likely in the neighborhood of 4%.<sup>10</sup> Accordingly, about 6600000 people are currently infected with HBV; and it needs to be reduced to 660000 by 2030 as per WHO target.

#### Methods:

We conducted an online search for articles published before July 31, 2019. We have gone through the Googles, PubMed and the Cochrane Library databases for English language articles. We have searched using the terms 'hepatitis B', 'elimination of hepatitis B', 'epidemiology of hepatitis B', 'vaccination against hepatitis B', 'PMTCT', 'diagnosis and treatment of hepatitis B'.

#### Elimination policy:

The model incorporates demographic data on population size, prevalence of HBV infection, mortality and morbidity related to HBV infection, preventive and treatment facilities currently available in the country. Bangladesh is a country with a current population load of about 164.7 million. Most of the people in the country live in a low socio economic environment. Both acute and chronic liver disease could be caused by hepatitis B and is a major cause of mortality and morbidity.<sup>11</sup> It is one of the major diseases of mankind, estimated to cause about 600000 deaths per year worldwide, mostly from liver cancer and cirrhosis. The natural history and the epidemiology of hepatitis B represents a landmark in the general understanding of viral infections, their distributions and their outcomes. The resolutions of the World Health Assembly in 2010 and 2014, have acknowledged at the political level that viral hepatitis is a global public health problem. HBV (hepatitis B, HBV related cirrhosis and HBV related liver cancer) represents the seventh highest cause of mortality worldwide.<sup>12</sup> The global prevalence of chronic carriage varies between 0.1% and more than 20%. Approximately 15%-40% of chronically infected patients will develop liver cirrhosis, liver failure, or hepatocellular carcinoma and 15%-25% will ultimately die. However, it can be prevented by safe and effective vaccine which is currently available.<sup>13</sup>

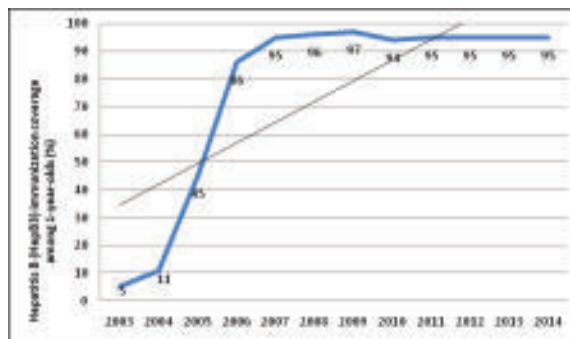
Like a threat for the world's population, hepatitis B infection is a threat for people of all age groups of Bangladesh and other South Asian countries.<sup>14</sup>

Bangladesh had a HBsAg-seroprevalence of 7.5% in healthy adult population,<sup>15</sup> and 4.2% in children under 5 years of age, with a population of 150 million.<sup>16</sup> Most HBV infections in Bangladesh occur in childhood, as suggested by the high rate of interfamilial infection, history of low rate of acute hepatitis, and large number of younger populations affected.<sup>17</sup> In the past HBV prevalence was estimated to be 2.3% - 9.7% with an approximate carrier pool of about 10 million. Bangladesh is in intermediate endemic zone for HBV and younger populations are affected mostly.<sup>16</sup>

#### Immunization against Hepatitis B in Bangladesh:

Expanded program on immunization (EPI) is the national vaccination campaign or schedule in Bangladesh. It started as a pilot project in 1979 to eradicate or eliminate some vaccine preventable diseases<sup>18</sup>. Hepatitis B vaccine has been incorporated in EPI schedule since 2004 in Bangladesh. Immunoprophylaxis of babies of HBsAg positive mothers and post exposure prophylaxis are effective ways of prevention.<sup>19</sup> As many as 90% of infants born to Hepatitis B e Antigen (HBeAg) positive mothers become carriers themselves and, therefore, in long term are more likely to develop chronic liver disease,<sup>20</sup> if proper immunoprophylactic measures are not taken.

According to global health observatory data repository report, Bangladesh is doing very well in vaccination under EPI. About 95% of Bangladeshi children are now vaccinated with hepatitis B vaccine (Figure 1). In 2003 only 5% under one year infant were under coverage of this vaccine. After incorporation of hepatitis B vaccine in EPI schedule the number has been gradually increasing. And since 2007, less than one year age infant hepatitis B vaccination coverage rate is 95%, where globally it is 82% in 2014.<sup>21</sup>



**Fig.-1:** Hepatitis B immunization coverage in Bangladesh 2003- 2014.

**Prevention of mother-to-child transmission (PMTCT) of HBV:** Under this program, every pregnant mother should be tested for seropositivity of HBsAg and Anti HBe(T), and immunoprophylaxis to be adopted for upcoming baby against mother-to-child transmission of HBV. We recommend screening and treatment of pregnant mothers, and birth dose vaccination should be free of cost.

For preventing HBV infection, strategies also need to be focused on the immunization of high-risk groups: healthcare workers, drug users, recipients of certain blood products, and close contacts.

**Blood and injection safety:** The government of Bangladesh has already adopted a policy of screening blood and blood products before transfusion, and at the same time, using disposable syringes and needles in the health care delivery institutions throughout the country. We emphasize on the use of disposable items those are required for patients care such as oxygen mask, suction catheter, nebulization materials, tongue depressor etc. Any pitfalls or negligence in the implementation of the policy need to be properly monitored.

**Testing and diagnosis:** Testing and diagnosis of HBV infection is the initial step for patients to access both prevention and treatment services, and is an important component of an effective response to the hepatitis B epidemic.<sup>22</sup> In attempt to increase the coverage of testing, the Bangladesh government requires medical institutions to screen for hepatitis B in all pregnant women during antenatal care and in patients who undergo hospitalization, surgery, haemodialysis or invasive diagnosis and treatment. We recommend testing of HBsAg in government hospitals should be free of cost. Testing free of cost will encourage general people in participating in the prevention process, as well as allow detection of HBV infected cases.

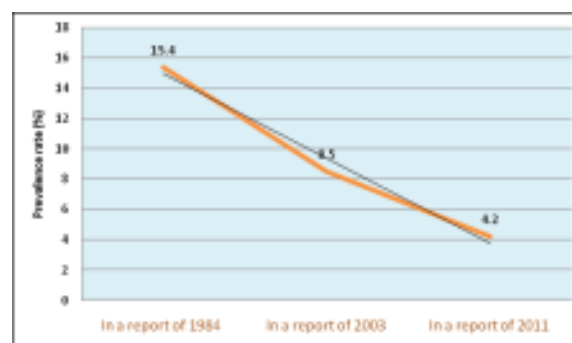
**Harm reduction services for people who inject drugs:** Parenteral drugs and infusions should be administered through safe technique by the trained personnel. The government has already passed ban on the reuse of disposable sterile medical devices in health facilities. Sharing needles is a problem for the drug abusers which is to be combated through multi disciplinary approach.

**Screening for HBsAg and Treatment:** Strategy include screening of persons who are at risk of acquiring HBsAg, vaccination for those who are seronegative, and treatment of those who have chronic hepatitis B.

#### Management of Hepatitis B:

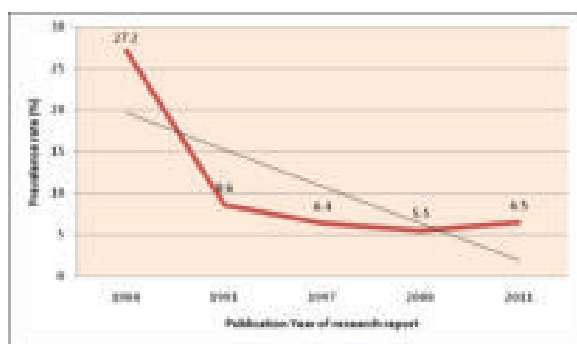
“Update on Prevention, Diagnosis, and Treatment of Chronic Hepatitis B: American Association for the Study of Liver Diseases (AASLD) 2018 Hepatitis B Guidance” has recommended several drugs for the management of CHB<sup>23</sup> like, Nucleoside and nucleotide analogue eg: tenofovir dipovoxil fumarate, tenofovir alafenamide and entacavir as preferred drugs. Immunomodulatory drug eg: pegylated interferon is also recommended. All the drugs are available in Bangladesh produced by local pharmaceutical companies. Our patients need to get the drugs free of cost for better adherence to the management.

**Trend of seroprevalence HBsAg amongst Bangladeshi children and adult:** Islam NM et al in 1984 reported that, prevalence of HBsAg among children was 15.4%<sup>24</sup>, whereas, Zakir H et al in 2003<sup>25</sup> reported that prevalence was 4.5%. So, seroprevalence of HBsAg among children has been reduced by about more than three times during the last period from 1984 to 2003 (Figure 2).



**Fig.-2:** Trend of Seroprevalance of HBsAg among Bangladeshi children.

In 1984 Islam NM et al<sup>24</sup> reported that, seroprevalence of HBsAg among adult was 27.2%; in 2011 Rudro S et al<sup>26</sup> in their study found seroprevalence of 6.5%. So, in case of adult, during the period from 1984 to 2011, seroprevalence of HBsAg has been reduced by about four times (Figure 3).



**Fig.-3:** Trend of Seroprevalence of HBsAg among Bangladeshi Adult.

**Success story:** In WHO South-East Asia Region, Bangladesh, Bhutan, Nepal and Thailand have become the first countries to achieve hepatitis B control, with prevalence of the deadly disease dropping to less than one per cent among five-year-old children, the World Health Organization announced on 26<sup>th</sup> July' 2019. Hepatitis B vaccination program through childhood immunization has made this achievement possible.<sup>26</sup>

#### **Recommendation:**

We recommend as follows - (i) Screening and treatment of pregnant mothers, and birth dose vaccination should be free of cost. (ii) Testing of HBsAg in government hospitals should be free of cost. (iii) Our patients need to get the drugs free of cost for better adherence to the management.

We need contribution from government, medical personnel, social workers and non- government organizations to achieve the targets.

#### **Conclusion:**

HBV still remains the important cause of chronic liver disease in Bangladesh. In spite, the good news is that, the prevalence of HBV infection in the country is decreasing because of nationwide large scale vaccination program, as well as with the increase of public awareness. Bangladesh has made good progress in reducing HBV infection in the past two decades.<sup>27,28</sup> We are hopeful that, we will achieve the WHO target of elimination of hepatitis B by 2030. However, the country still is facing challenges to achieve its target of reduction of mortality by 2030. To remove the gap of mortality, we propose that, priorities need to be given in achieving service coverage targets of diagnosis and

treatment. The government of Bangladesh needs to (i) improve the diagnostic and treatment abilities of medical institutions and health workers; (ii) reduce health-care costs of the patients; and (iii) boost up the existing national program, integrate them with the resources for prevention, screening, diagnosis and treatment of HBV infection across the life cycle. In this way, we can make progress towards the target of elimination of hepatitis B by 2030 from Bangladesh.

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