



## Research Article

# SARS CoV-2 pandemic mars the world hepatitis day theme 2020 of “Hepatitis free future in India” While Hepatitis -C, Research wins Nobel Price–2020

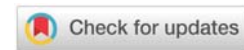
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## Abstract

The best news of the year 2020 about Hepatitis is the announcement of the winners of the prize for Medicine or Physiology for the discovery of the Hepatitis C virus to Americans Harvey J. Alter and Charles M. Rice, and British scientist Michael Houghton on Monday the 5th October 2020. Second good news is Global hepatitis strategy- 2020 endorsed by all WHO Member States, aiming to reduce new hepatitis infections by 90% and deaths by 65% by 2030. World Hepatitis Day (WHD) 2020 on 28 July intended to bring the world together under a single theme of ‘Hepatitis free future’ by finding the ‘Missing Millions’ and raising awareness to influence real change.

Hepatitis is an inflammation of the liver that can cause a range of health problems and can be fatal. There are five main strains of the hepatitis virus, referred to as types A, B, C, D and E. While they all cause liver disease, they differ in modes of transmission, severity of the illness, geographical distribution, and prevention methods. Recent estimates indicate that worldwide there are over 345 million infections of hepatitis all varieties put together and 1.5 million deaths each year. Majority of these cases belong to HBV, followed by HCV and HDV. WHO estimates that, there are 320 million people worldwide to be living with viral hepatitis B & C and most of them are unaware, as testing and treatment remains beyond their reach? Introduction and Scaling up of infant vaccination have demonstrated a reduction of HBV prevalence.

Hepatitis A Virus (HAV) and Hepatitis E Virus (HEV) are predominantly enterically transmitted pathogens and are responsible to cause both sporadic infections and epidemics of acute viral hepatitis. Public health measures to improve sanitation and provide safe drinking water for preventing HAV and HEV are in progress. HBV, HCV and HDV are predominantly spread via parenteral route and are notorious to cause chronic hepatitis which can lead to grave complications including cirrhosis of liver and hepatocellular carcinoma.

The Government of India has conveyed a political intent by setting up a comprehensive action plan- ‘National Viral Hepatitis Control Program (NVHCP)’. This is an integrated approach for prevention and control of viral hepatitis, aiming to end viral hepatitis by 2030 as envisaged in National Health Policy 2017. However, the good intentions of reaching target are not matched by resources and execution of plan. To add to this perineal systemic problem, the Jugaad approach for Covid-19 Pandemic management, since March 2020, the entire Government machinery is being mobilized for firefighting the pandemic, that has resulted in all other public health programs having a setback for want of resources, monitoring and requisite push.

There are many unfinished tasks left in prevention and elimination of viral hepatitis in developing countries, especially India. The prevailing water and sanitation issues continue haunt the country with HAV and HEV outbreaks. HAV vaccination strategies need redefining because of changing epidemiology. HEV vaccine should be made available in India. Encouraging voluntary blood donation and safe renal dialysis are in infancy and Individual blood and organ donors’ nucleic acid testing (NAT) detects infection for HIV, HBV, and HCV is yet to be used as a screening tool. For the management of chronic HBV infection, treatment should be targeted at those with highest risk of disease progression, based on the detection of persistently raised alanine transaminase (ALT) levels and HBV DNA more than 20,000 IU/ml in those older than 30 years.

In this article I have captured hepatitis infection status, major challenges in achieving hepatitis free India by 2030 competing with Covid-19 pandemic

## Introduction

The biggest news of the year 2020 relating to Hepatitis is the announcement of the winners of the prize for Medicine or Physiology on Monday the 5th October 2020 for the discovery of the Hepatitis C virus for 2020 to Americans Harvey J. Alter and Charles M. Rice, and British scientist Michael Houghton. They were awarded by the head of the Nobel Committee, Thomas Perlmann, first in a pack 6 prizes for the year. The other prizes awarded in the last 2 weeks are for outstanding work in the fields of physics, chemistry, literature, peace, and economics. The award carried particular significance this year due to the coronavirus pandemic, which has not only marred the disasters of all other viruses and highlighted the importance that medical research has for societies and economies around the world. The prestigious award comes courtesy of a bequest left 124 years ago by the prize's creator, Swedish inventor Alfred Nobel.

The liver is a vital organ that processes nutrients, filters the blood, and fights infections. When the liver is inflamed or damaged, its functions can be affected. Hepatitis is an inflammation of the liver. The condition can be self-limiting or can progress to fibrosis (scarring), cirrhosis or liver cancer. Acute infection may occur with limited or no symptoms or may include symptoms such as jaundice (yellowing of the skin and eyes), dark urine, extreme fatigue, nausea, vomiting and abdominal pain. Hepatitis viruses are the most common cause of hepatitis in the world but other infections, toxic substances (e.g. alcohol, certain drugs), and autoimmune diseases can also cause hepatitis. The spectrum of viral hepatitis differs with respect to aetiological agents in different geographical regions of the world. There are 5 main hepatitis viruses, referred to as types A, B, C, D and E. These 5 types are of greatest concern because of the burden of illness and death they cause and the potential for outbreaks and epidemic spread. Hepatitis B and C lead to chronic disease in hundreds of millions of people and, are the most common cause of liver cirrhosis and cancer [1].

Hepatitis A and E are typically caused by ingestion of contaminated food or water. HAV and HEV infections are the major cause of acute sporadic and epidemic hepatitis in India. Hepatitis B, C and D usually occur because of parenteral contact with infected body fluids. Common modes of transmission for these viruses include receipt of contaminated blood or blood products, invasive medical procedures using contaminated equipment and for hepatitis B virus transmission from mother to child at birth, from family member to child, and by sexual contact. About 15–30 % cases of acute hepatitis in India is due to HBV [2].

### Hepatitis A virus (HAV)

A disease due to lack of basic sanitation, especially mixing of pipelines carrying drinking water and sewage side by side and accidental leakage or bursting and mixing up of sewage in drinking water. Most of Indian cities with piped water supplies saw HAV outbreaks for last 5 decades and continue to be dominating even now. Out of 125–150 outbreaks reported in India annually, 80–90% are due to Hepatitis A virus. The rest by Hepatitis E viruses or combination of both. The improvement

in sanitation over last 2 decades has reduced the number of outbreaks in the recent years. Apart from water, other source of HAV infections could be imported packed foods. HAV infection is responsible for 10 to 30 % of acute viral hepatitis and 15 to 45 % of acute liver failure (ALF) in India. Fortunately, there is an effective vaccine but sparingly used. WHO estimates that hepatitis A caused approximately 7,134 deaths in 2016 and 1.427 million cases (based on case fatality rate of about 0.5%)? In countries where the risk of infection from food or water is low, there are outbreaks among men who have sex with men (MSM) and sharing of syringes and needles by the persons who inject drugs. HAV is the most neglected infection by global hepatitis authorities as it does not affect much the developed world.

### Hepatitis B Virus (HBV)

HBV is a chronic infection and a leading cause of Primary Cancer of Liver. HBV is of intermediate endemicity with nearly 4% of the population being chronic HBV carriers with a total pool of approximately 40 million carriers. HBV is known to cause about 50 % cases of chronic liver disease in India. Wide variations in social, economic, and health factors in different regions may explain variations in carrier rates from one part of the country to another. It is a self-limiting infection lasting for 4–8 weeks and 90% of those infected adults will totally recover. Two thirds of those infected do not even know that they are infected. However, about 5% people who get hepatitis B as adults become “carriers.” There is no cure for hepatitis B. There is an effective vaccine that was introduced in national Immunization program in 2003 and expanded to cover entire country by 2012–13. The present cost of hepatitis B vaccine ranges between USD 1–5 per paediatric dose of 10 microgram in 0.5ml. The cost of adult dose of 20 microgram is nearly double. The hepatitis B vaccine is a safe and effective vaccine that is recommended for all infants at birth and for children up to 18 years. It is also recommended for adults living with diabetes and those at high risk for infection due to their jobs, lifestyle, living situations, or country of birth. Outbreaks of acute and fulminant hepatitis B still occur mainly due to improperly sterilized needles and syringes, as demonstrated by an outbreak of acute hepatitis B in Modasa town of Gujarat in 2018 [3].

### Hepatitis C Virus (HCV)

It is an infectious disease caused by the Hepatitis C virus (HCV) that mainly affects the liver. HCV infection is a leading cause of liver transplants and liver cancers. It can spread through contact with infected blood, by sharing needles or needle-stick injuries. Blood transfusion and Renal dialysis processes are intricately linked to HCV infections in India. The frequency of HCV has been reported to be 1–2 % among voluntary blood donors. HCV is an uncommon cause of acute icteric hepatitis but causes most of the post-transfusion hepatitis. HCV is known to cause about 20% cases of chronic liver disease in India and 250,000 people die of HCV or its sequelae every year.

### Hepatitis D Virus (HDV)

Known as “delta hepatitis,” occurs only in people who are



also infected with the HBV (coinfection). It is spread when blood or other body fluids from a person infected with the virus enters the body of someone who is not infected. HDV infection can be an acute, short-term infection or become a long-term, chronic infection, causing severe symptoms and serious illness that can lead to life-long liver damage and even death. Most of the affected persons are infected with HBV first and then with HDV (“superinfection”). There is no vaccine to prevent HDV. However, prevention of HBV infection with HBV vaccine also protects against future HDV infection. The pooled prevalence of HDV is 0.80% among the general population and 13.02% among HBV carriers, corresponding to 48–60 million infections globally. Among HBV patients with fulminant hepatitis, cirrhosis, or hepatocellular carcinoma, globally HDV prevalence is 26.75%, 25.77% and 19.80% respectively. The odds ratio (OR) of HDV infection among HBV patients with chronic liver disease compared with asymptomatic controls is 4.55%. Hepatitis delta virus-coinfected patients are more likely to develop cirrhosis than HBV-mono-infected patients with OR of 3.84. HDV infection progresses to cirrhosis within 5 years and to hepatocellular carcinoma within 10 years [4].

### Hepatitis E Virus (HEV)

HEV is found in the stool of an infected person. It is spread when someone unknowingly ingests the virus – even in microscopic amounts. In developing countries, people most often get hepatitis E from drinking water contaminated by faeces from people who are infected with the virus. In the developed countries hepatitis E is not common but can get it after eating raw or undercooked pork, venison, wild boar meat, or shellfish or people who had recently travelled to countries where hepatitis E is common. Symptoms of hepatitis E can include fatigue, poor appetite, stomach pain, nausea, and jaundice. However, many people with hepatitis E, especially young children, have no symptoms. HEV infection is responsible for 10 to 40 per cent of acute hepatitis and 15 to 45 per cent of ALF cases in India. No vaccine for hepatitis E is currently available.

The Government of India has launched a new National Viral Hepatitis Control Program (NVHCP) on World Hepatitis Day –28 July 2018. It is an integrated approach for prevention and control of viral hepatitis by 2030. The plan envisages to provide free of charge screening, diagnosis, treatment & counselling services to all, and specially to people belonging to high-risk groups. It is expected facilitate the achievement of Indian commitment to sustainable development (SDG) goal 3.3 of ending viral hepatitis by 2030 as envisaged Indian National Health Policy 2017 [5].

### Materials & methods

The key data is accessed from the outbreaks data 2018–20 from Integrated Health Information Platform (IHIP)- www.idsp.nhp.gov.in, national and states National health missions. 2. Central Bureau of Health Intelligence (CBHI), is the health intelligence wing of the Directorate General of Health Services in the Ministry of Health & FW, GOI. CBHI functions as WHO Collaborating Centre on Family of International Classifications

and International Classification of Functioning, Disability and Health (ICF) (ICD – 10 & ICF) in India. It promotes the development & use of ICD- X and ICF in the country. It collates the facility-based details of the number of patients treated with diagnosis as per ICD X proforma in public sector hospitals, monthly and annually analyses and provides feedback for programming. For this study I have accessed the annual report of 2018 & 2019. 3. Findings of a ICMR serosurvey, 2017–18 and other small studies by Medical Colleges Table 1.

## Results

### Estimated Global Hepatitis Infections, cases, and deaths

The data for HBV and HCV infections and cases by diagnosis are available and reliable for USA, UK and other developed countries and major cities in India. The best assessment by WHO, CDC and worldwide hepatitis statistics indicate that HBV and HCV infections contribute nearly 90% of hepatitis infections worldwide. HDV contributes about 4% and HEV around 5.8%. Symptomatic cases proportion is around 70% of infections in HBV and 50–85% in HCV, HDV.HAV and HEV being the problems of developing countries there is gross under reporting. The case fatality is also highest in HBV, followed by HCV, HEV and HAV [6]. WHO recently estimated that about 325 million people live worldwide with HBV and HCV infections unaware of them due to inaccessibility for diagnosis and treatment? [7].

### Thailand

Since the beginning of hepatitis B vaccination in Thailand all new-borns since 1992, at least 95% of one-year-olds are currently receiving 3–4 hepatitis B doses. The second vaccination of new-borns of carrier mothers at 1 month of age has contributed to an effective reduction in mother-to-child transmission. Universal vaccination, blood donation screening, and decreasing needle sharing have reduced hepatitis B infection. Under the test and treat model, cost-effective screening at the health centre or village hospital is implemented for adults >30 years old and referral to a tertiary healthcare centre for a treatment plan is being developed in disease management plan. HCV prevalence is also decreasing because of blood-borne pathogen awareness. Current HCV infection is highest for adults born prior to 1983, and a screening is recommended once in their lifetime. The availability of direct antiviral agents with high cure rates is expected to contribute to the reduction in hepatitis C transmission and mortality as set forth [8].

Table 1: Estimated Hepatitis cases- Global.

	Cases		
	Infected	Symptomatic	Deaths
A	1.5 Million	NA	7,000
B	240 Million	168 Million	786,000
C	71 Million	35-60 Million	400,000
D	15 Million	10 Million	NA
E	20 Million	3.3 Million	44,000
TOTAL	345 Million	215-240 Million	1.5Million



## India

The average estimated carrier rate of hepatitis B virus (HBV) in India is 4%, with a total pool of approximately 36 million carriers. Wide variations in social, economic, and health factors in different regions may explain variations in carrier rates from one part of the country to another. Professional blood donors constitute the major high-risk group for HBV infection in India, with a hepatitis B surface antigen positivity rate of 14%. Blood transfusions represent the most important route of HBV transmission among adults. However, most of India's carrier pool is established in early childhood, predominantly by horizontal spread due to crowded living conditions and poor hygiene. Acute and subacute liver failure are common complications of viral hepatitis in India and HBV is reckoned to be the aetiological agent in 42% and 45% of adult cases, respectively. HBV is reported to be responsible for 70% of cases of chronic hepatitis and 80% of cases of cirrhosis of the liver. About 60% of patients with hepatocellular carcinoma are HBV marker positive. Small numbers of patients have been reported to be infected with the pre-core mutant virus but none with the S mutant. Coinfection with hepatitis C virus or hepatitis delta virus is comparatively uncommon. In conclusion, hepatitis B is a major public health problem in India and will continue to be until appropriate nationwide vaccination programmes and other control measures are established. (Epidemiology of Hepatitis in India, 1996). The study showed that in the two and a half decades after 1984, hepatitis B infection was more serious than hepatitis C. Now, in 2012, this difference is even greater. Chronic hepatitis C has become a curable disease. Chronic hepatitis B is manageable, but not yet curable. An estimated 0.5–1 per cent of the country's population (or 10–13 million people) suffers from Hepatitis C, according to scientists. Today, chronic HCV is usually curable with oral medications taken every day for two to six months. Still, about half of people with HCV do not know they are infected [5].

### IDSP- outbreaks information

The key objective of the IDSP programme is to strengthen /maintain decentralized laboratory based IT enabled disease surveillance system for epidemic prone diseases to monitor disease trends and to detect and respond to outbreaks in early rising phase through trained Rapid Response Team (RRT). At the national level data is analysed for presumptive cases from P forms that report cases based on clinicians provisional diagnosis and some of them investigated and confirmed by laboratories are reported in L form by each facility from each district and state in the country. The reported outbreaks of all infectious diseases are investigated, and containment measures taken. These are also analysed on weekly basis.

For example, the number of presumptive acute viral hepatitis cases was 46562 in February 2018, 45088 in February 2019 and 63218 in February 2020, respectively. These presumptive cases were diagnosed based on case definitions provided under IDSP {(Icterus in sclera/skin (Jaundice) of less than 4 weeks duration} [7]. For the same period reported

laboratory confirmed cases (L form) for Viral Hepatitis A, were in February 2018– 17006 samples were tested out of which 876 (5.15%) were found positive. In February 2019 out of 23668 samples, 991 (4.19%) were found to be positive and in February 2020, out of 24887 samples, 1147 (4.6%) were found to be positive. Sample positivity of cases tested for Hepatitis A has been 5.15%, 4.19% and 4.61% in February month of 2018, 2019 & 2020, respectively.

Similarly, laboratory confirmed cases as reported in L form for Viral Hepatitis E, in February 2018; 7721 samples were tested out of which 548 were found positive. In February 2019; out of 10063 samples, 525 were found to be positive and in February 2020, out of 8693 samples, 535 were found to be positive. Sample positivity of samples tested for Hepatitis E has been 7.10%, 5.22% and 6.15% in February month of 2018, 2019 & 2020, respectively [9] Tables 2–4.

**Table 2:** Impact of Covid 19 on reporting of Outbreaks.

Year	Total outbreaks of Viral aetiology Dengue, Measles, Hepatitis, Japanese Encephalitis etc	Only Hepatitis Aetiology Outbreaks	Bacterial origin Outbreaks Acute Diarrhoeal Diseases, Food poisoning	Outbreaks due to Rickettsia, parasites etc. Malaria, Scrub typhus	Grand Total Outbreaks
2020	205 (24.3%)	57 (42.5%)	120 (15.8%)	15 (16.1%)	340 (20%)
2019	842	134	761	93	1696

**Table 3:** Comparison of Hepatitis outbreaks reported in first 33 Weeks of 2020,2019 and 2018.

Outbreak Particulars > Years (1-33 weeks)	HAV	HEV	HBV	Total
2020	23	8	0	31
2019	69	12	0	81
2018	34	4	1	39

**Table 4:** Comparison of the number of outbreaks reported in first 33 weeks and entire year of 2019.

2019	69 (64%)	12 (54.5%)	0	81 (61.8%)
2019 (52 weeks)	108	22	1	131

### CBHI reports

The viral Hepatitis cases reported as per CBHI in 2018 stood at 143974 cases and 584 (CFR–0.4%) deaths and males contributed 84096 (58.4%) cases and 405(69.3%) deaths as against Female cases 59878 (41.6%) and deaths 179 (30.7%). The highest number of cases were reported from Uttar Pradesh (14793) Punjab (10887) and Delhi (7227), Maharashtra 5390 and Haryana (5183). The total number of cases reported had no relevance to the number of outbreaks. These numbers are severe or complicated cases, that reported at public sector health facilities [8]. Another similar number of hepatitis cases that reach private sector facilities do not get reflected. We also know that many more cases are managed by Indian system of medicine or traditional methods, especially in Rural India [10].



## Sero-surveys

**Indian Council of Medical Research (ICMR) study:** Introduced hepatitis-B (HB) vaccine in Universal immunization program in 2002–2003 on pilot basis, expanded to 10 states in 2007–2008 (phase-1) and entire country in 2011–2012 (phase-2). ICMR tested sera from a nationally representative serosurvey, to estimate seroprevalence of different markers of HB infection among children aged 5–17 years in India and assess the impact of vaccination. The findings of this study are considered as an interim assessment of impact of hepatitis B vaccine introduction in India [11].

ICMR got tested sera from 8273 children for different makers of HB infection and estimated weighted age-group specific seroprevalence of children who were chronically infected (Hepatitis B surface antigen (HBsAg and anti-HBc positive) and immune due to past infection (anti-HBc positive and HBsAg negative) and having serological evidence of HB vaccination. They compared prevalence of serological markers among children born before (aged 11–17 years) and after (aged 5–10 years) introduction of HB-vaccine from phase-1 states.

The results indicated that among children aged 5–8 years, 1.1% were chronic carriers, 5.3% immune due to past infection, and 23.2% vaccinated. The corresponding proportions among children aged 9–17 years were 1.1%, 8.0% and 12.0% respectively. In phase-1 states, children aged 5–10 years had significantly lower prevalence of anti-HBc (4.9% vs 7.6%,  $p < 0.001$ ) and higher prevalence of anti-HBs (37.7% vs 14.7%,  $p < 0.001$ ) compared to children aged 11–17 years. HBsAg positivity however was not different in two age groups. The study concludes that Children born after introduction of HB vaccination had lower prevalence of past HBV infection and higher prevalence of anti-HBs [11].

Karnataka, India home state of the author, the incidence of the HCV disease is as 0.2–0.5 % as compared to HBV which is about 2% nationally. In states like Punjab/NE states the incidence is much higher at around 5%–10%. mainly because they have no symptoms, which can take decades to appear. In April, this year Indian drug manufacturing companies received a patent for producing the generic versions of Sovaldi and Harvoni. The generic version of these drugs is available in cities such as Bengaluru Hyderabad and Chennai at the cost of Rs70000 or around \$1000 USD for the entire treatment regimen as compared to US \$ 80,000–100,000 in USA. Bengaluru has become the hub of medical tourism for patients for Chronic conditions particularly Hepatitis C infections. A consultant gastroenterologist in Columbia Asia Hospital reported that in Bengaluru approximately 40% of the patients he treats for hepatitis C are from outside India. At least two new hepatitis C patients from abroad every day in each of 4–5 Hospitals in Bengaluru. With a target to eliminate Hepatitis C by 2030, India has managed to put 50,000 people on treatment since 2018, when the National Viral Hepatitis Control Programme (NVHCP), was launched [12–14].

## Discussions

In 2020 India is besieged with Covid-19 pandemic as any other country and overall, the integrated disease surveillance

under IDSP has suffered till this day in 2020. Basically this is due to the pre-occupation of peripheral field workers and facility level staff in Covid-19 related Severe Acute Respiratory Illnesses (SARI) and Influenza Like Illnesses ( ILI) survey, testing, tracking and contact tracing and awareness creation work and case management at facilities.

The country is seeing a drastic reduction in number of all outbreaks other than Covi-19 getting reported in 2020 [9]. Surprisingly, IDSP, the integrated surveillance system did not capture many Covid-19 outbreaks (in single digits) due to setting up of parallel vertical reporting. While overall outbreaks reported in the first thirty- three weeks of 2020 compared to the same period in 2019 was just 20%. Hepatitis outbreaks were least effected at 42.5%, all viral origin (including hepatitis) outbreaks were 24.3% and bacterial and other parasitic and rickettsia outbreaks were around 16% each of number of outbreaks reported in 2019 under respective category. This clearly indicates that the regular IDSP surveillance system was working at exceptionally low efficiency for surveillance of conditions. Since the human resource is limited and all of them were pressed into Covid -19 reporting, SARI & ILI survey, testing and contact tracing.

A detailed analysis of number of types of hepatitis outbreaks reported (Table 3) in the first 33 weeks of each calendar year for last 3 years indicates that as against 34 HAV 4 HEV and only 1 HBV outbreaks in 2018 , there were 69 HAV, 12 HEV and 0 HBV outbreaks in 2019. The number of outbreaks in 2020 (33 weeks) were only HAV- 23 and HEV-8. The above table indicates that number of outbreaks reported in first 33 weeks of 2020 were about 33% of 2019 and 68% of 2018 [9].

Table 4 indicates the proportion of first 33 weeks contributing to entire 2019 years surveillance. The first 33 weeks had contributed 61.8% of all hepatitis outbreaks. HAV infections in first 33 weeks were 64% when compared to 54% of HEV outbreaks. It clearly is a sign of poor reporting in 2020 due to the pressure of Covid- 19 surveillance and diverting the field workers attention to covid-19 only. It could also be due to lower proportion of hepatitis cases reaching the facilities due the fear of catching covid-19 infections. It is also possible that people had disciplined and were not venturing eating outside home during the epidemic fear and since most of the restaurants and eateries were closed.

The number of cases reported to CBHI and under IDSP hardly match as can be seen. While CBHI reported about 144,000 cases and less than 600 deaths in 2018, the number of cases reported in the month of February alone in the same year under IDSP were 46,562 indicating gross under-reporting with CBHI. This discrepancy is mainly due to the poor reporting of cases from primary health care facilities to CBHI, that gets the reports from larger hospitals [10].

With the recent availability of locally produced generic versions of Sovaldi and Harvoni drugs, the cost of treatment and liver transplants is a fraction of what it is in USA or other developing countries. Patients are flocking to India from countries like Afghanistan Pakistan and Bangladesh Middle East Yemen and Iraq. Nearly 40% of cases managed in all bigger cities in India are from out-side of India [4,12,13].



## Conclusions

The World Hepatitis Day 2020 had intended to bring the world together for a hepatitis free world under a single approach of 'Find the Missing Millions'. This was to be achieved through raising awareness of the global burden of viral hepatitis and to influence real change.

India has conveyed a political commitment by setting up NVHCP an integrated approach for prevention and control of viral hepatitis.

But there are many unfinished tasks left in prevention and elimination of viral hepatitis globally and in developing countries, especially India as one does not see the commensurate actions. Covid-19 pandemic has added resource challenge and diversion of attention from non-Covid-19 public health programs including NVHCP.

HAV vaccination strategies need redefining because of changing epidemiology. HEV vaccine should be made available in our country. Improving basic sanitation, especially laying pipelines carrying drinking water and sewage at a distance and minimizing accidental leakage or bursting and mixing up of sewage in drinking water.

Encouraging voluntary blood donation and safe renal dialysis are in infancy. Individual donors' nucleic acid testing (NAT) detects infection for HIV, HBV, and HCV need to be used as a screening tool. For the management of chronic HBV infection, treatment should be targeted at those with highest risk of disease progression, by detection of persistently raised alanine transaminase (ALT) levels and HBV DNA more than 20,000 IU/ml in those older than 30 years.

## Moving forwards

There is a dire need to build public health system's capacity to make country free of viral hepatitis by 2030, and many other infectious diseases, along with tackling Covid -19 Pandemic. Synchronization of data from all sources, analysis, and district- based program implementation plans, their aggressive implementation and monitoring progress with outcomes evaluation. All out efforts must be made to finding the undiagnosed cases and linking them to care assured under NVHCP

All liver cirrhosis cases should be treated regardless of ALT levels, hepatitis B e antigen status or HBV DNA levels (as per national guidelines). There is a strong need to standardise dialysis care in India which will reduce the transmission

of HBV and HCV through infected blood. Currently patients with renal failure form a large patient base of HCV infections. HCV core antigen (HCVcAg) quantification can be used as a surrogate marker for HCV viraemia testing. Aggressive efforts for outbreak investigations of all hepatitis cases and outbreaks with laboratory supported diagnosis and treatment. Improving appropriate community level safe water supply and ensuring food hygiene needs attention particularly in urban poor localities. Periodical assessment of impact of hepatitis B vaccine by districts with reported achievement of high coverage apart from overall coverage by states and India as a whole and Promote medical tourism for liver transplantation in major cities that are offering the services at a low cost.

## References

1. What is hepatitis. [Link: https://bit.ly/3o1vlw8](https://bit.ly/3o1vlw8)
2. Kar P (2019) Raise awareness of the global burden of viral hepatitis & to influence real change. *Indian J Med Res* 150: 1-3. [Link: https://bit.ly/33hZzZd](https://bit.ly/33hZzZd)
3. Patel DA, Gupta PA, Kinariwala DM, Shah HS, Trivedi GR, et al. (2012) An investigation of an outbreak of viral hepatitis B in Modasa town, Gujarat, India. *J Glob Infect Dis* 4: 55-59. [Link: https://bit.ly/3fCYuAc](https://bit.ly/3fCYuAc)
4. Miao Z, Zhang S, Ou X, Li S, Ma Z, et al. (2020) Estimating the Global Prevalence, Disease Progression, and Clinical Outcome of Hepatitis Delta Virus Infection. *J Infect Dis* 221: 1677-1687. [Link: https://bit.ly/2JbAFU5](https://bit.ly/2JbAFU5)
5. Suresh K (2020) Viral Hepatitis in India. *Arch Hepat Res* 6: 003-006. [Link: https://bit.ly/2HEXpE](https://bit.ly/2HEXpE)
6. Daniel C, Burakoff R (2020) Worldwide Hepatitis Statistics. [Link: https://bit.ly/2JgjoB](https://bit.ly/2JgjoB)
7. 325 m live with HBV and HCV, 27 July 2020.
8. Posuwan N, Wanlapakorn N, Sintusek P, Wasitthankasem R, Poovorawan K, et al. (2020) Towards the elimination of viral hepatitis in Thailand by the year 2030. *Journal of Virus Eradication* 6. [Link: https://bit.ly/3fGUxKM](https://bit.ly/3fGUxKM)
9. Weekly outbreak reports-on Integrated Health Information Platform. [Link: https://bit.ly/2JcgENz](https://bit.ly/2JcgENz)
10. Table 3.1.15(B) State/UT wise Cases and Deaths due to Viral Hepatitis in India. [Link: https://bit.ly/3lftcR](https://bit.ly/3lftcR)
11. Murhekar MV, Santhosh Kumar M, Kamaraj P, Khan SA, Allam RR, et al. (2020) Hepatitis-B virus infection in India: Findings from a nationally representative serosurvey, 2017-18. *Int J Infect Dis* 100: 455-460. [Link: https://bit.ly/3mcAiax](https://bit.ly/3mcAiax)
12. Bengaluru City-turns-new-medical-tourism-hub-for-Hepatitis-C-patients. [Link: https://bit.ly/2Klr6fp](https://bit.ly/2Klr6fp)
13. Covid woes dent health tourism in South India; hospital revenues take a hit. [Link: https://bit.ly/36cYvYN](https://bit.ly/36cYvYN)
14. Hepatitis C treatment in India - A fraction of cost. [Link: https://bit.ly/39jkFu5](https://bit.ly/39jkFu5)