



सत्यमेव जयते

Ministry of Health & Family Welfare  
Government of India

## National Program for Surveillance of Viral Hepatitis

# Seroprevalence of Hepatitis B and Hepatitis C

(Based on National Family Health Survey-4)

Factsheet  
2021

**National Centre for Disease Control**  
**Directorate General of Health Services**  
**Ministry of Health & Family Welfare**



**icmr**  
INDIAN COUNCIL OF  
MEDICAL RESEARCH  
Saving the nation since 1950



**icmr** **NARI**  
INDIAN COUNCIL OF  
MEDICAL RESEARCH | NATIONAL AIDS  
RESEARCH INSTITUTE



## Introduction

Viral hepatitis is a public health problem worldwide including India and is caused by Hepatitis A, B, C, D and E viruses. Hepatitis A and E, transmitted through fecal-oral route, usually present as acute infections which may occur sporadically or as outbreaks. Hepatitis B and C, transmitted predominantly by per-cutaneous or mucosal exposure to infected blood and various body fluids, can lead to chronic infection and progress to cirrhosis and hepatocellular carcinoma.

National Program on Surveillance of Viral Hepatitis (NPSVH) at National Centre for Disease Control (NCDC), DteGHS, MoHFW aims to obtain nationally representative data to assess the disease burden in India for Hepatitis B and Hepatitis C to assist in optimal planning for prevention and management of viral hepatitis in the country. Under a collaborative effort of NCDC, ICMR and IIPS, the left-over dried blood spots (DBS) collected under the National Family Health Survey-4 during 2015-16, were tested for serological biomarkers of Hepatitis B and Hepatitis C.

The National Family Health Surveys are being conducted under the stewardship of the Ministry of Health & Family Welfare (MoHFW), Government of India. The MoHFW has designated the International Institute for Population Sciences (IIPS), Mumbai, as the nodal agency for these surveys.

The 2015-16 National Family Health Survey (NFHS) was the fourth in the series after the surveys conducted in 1992-93, 1998-99 and 2005-06.

This factsheet highlights salient findings on seroprevalence of Hepatitis B and Hepatitis C, and a few associated factors in India, based on information available as per NFHS-4.

## Methodology

Under NFHS-4, DBS were collected from women aged 15-49 years and men aged 15-54 years to provide the estimate of national and sub-national level of seroprevalence of HIV. Eleven groups of States/UTs were formed under NFHS-4. Additionally, group 12 was made including states of Tripura, Assam, Sikkim, Meghalaya and Arunachal Pradesh which was used for national estimates of HIV and was considered for the present analysis. The Technical Resource Group (TRG) on surveillance under NPSVH in context of Hepatitis B and Hepatitis C adopted the same sampling strategy for this analysis.

The groups of States/UTs are as follows:

Group 1: Andhra Pradesh, Telangana
Group 2: Bihar, Jharkhand, West Bengal, Andaman and Nicobar Islands
Group 3: Gujarat, Dadra and Nagar Haveli and Daman and Diu
Group 4: Jammu and Kashmir (Former), Himachal Pradesh
Group 5: Karnataka
Group 6: Maharashtra, Goa
Group 7: Mizoram, Manipur, Nagaland
Group 8: Chhattisgarh, Odisha
Group 9: Haryana, Punjab, Chandigarh, Delhi
Group 10: Tamil Nadu, Kerala, Lakshadweep, Puducherry
Group 11: Rajasthan, Madhya Pradesh, Uttar Pradesh, Uttarakhand
Group 12: Sikkim, Arunachal Pradesh, Assam, Meghalaya, Tripura

A sub-sample of 1,45,912 from DBS collected under NFHS-4 were tested and analysed (considering higher prevalence of 0.8% in hepatitis C as compared to 0.3% for HIV) and merged with the NFHS-4 dataset. Prior consent from respondents for long term storage of DBS and unspecified additional testing was obtained under NFHS-4.

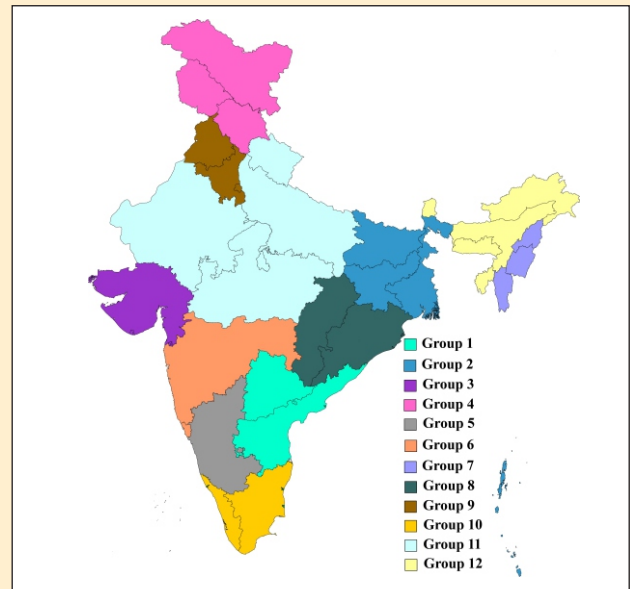


Figure 1: Map showing group-wise distribution of States/UTs

Testing was done for presence of Hepatitis B surface antigen (HBsAg) and antibodies to Hepatitis C virus (anti-HCV) as biomarkers for Hepatitis B and Hepatitis C, respectively. Kits were validated for use on DBS through a multi-centre study. Testing was carried out as per the standardized protocols. Quality control check was conducted for all reactive and 2% of the non-reactive specimens, as per the plan.

## Hepatitis B

### Seroprevalence of Hepatitis B and its geographical distribution:

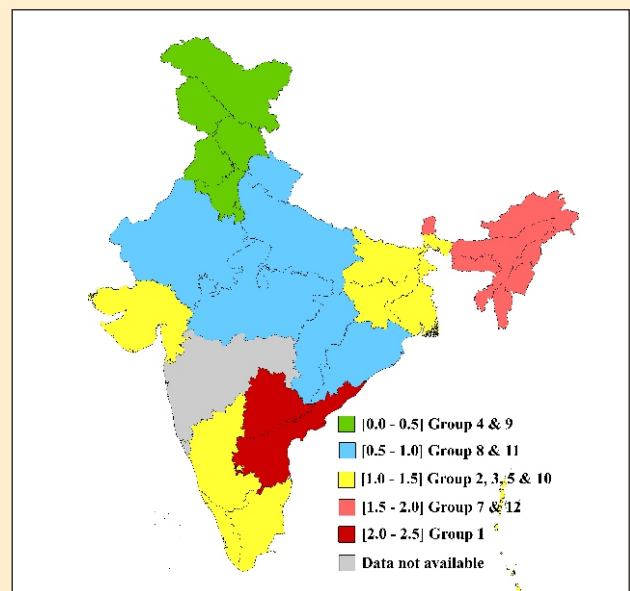


Figure 2: Seroprevalence of Hepatitis B (National and sub-national level)

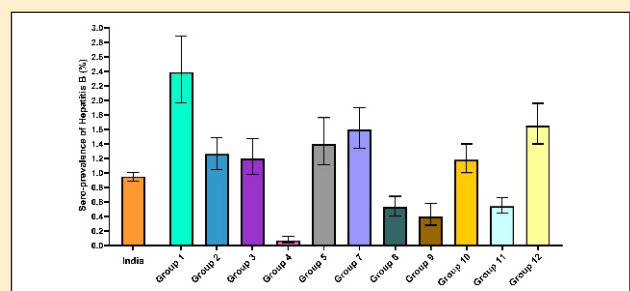


Figure 3: Seroprevalence of Hepatitis B (National and sub-national level)

- ◆ National seroprevalence of Hepatitis B was 0.95% (0.89-1.01).
- ◆ Seroprevalence was highest in group 1 [2.39% (1.97-2.89)], followed by the North Eastern states as shown in group 12 [1.65% (1.4-1.96)] and group 7 [1.6% (1.34-1.9)].
- ◆ Other groups which had seroprevalence above the national average were group 5 [1.4% (1.11-1.76)]; group 2 [1.26% (1.05-1.49)]; group 3 [1.2% (0.98-1.47)]; group 10 [1.18% (1.0-1.4)].

Due to paucity of DBS samples, seroprevalence in group 6 (Maharashtra and Goa) could not be determined. However, Group 6 data was included for estimation of national level seroprevalence.

### Seroprevalence of Hepatitis B by socio-demographic characteristics:

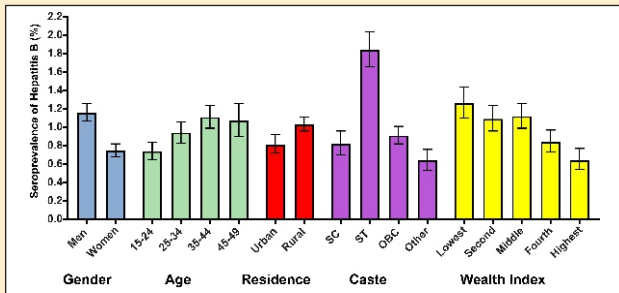
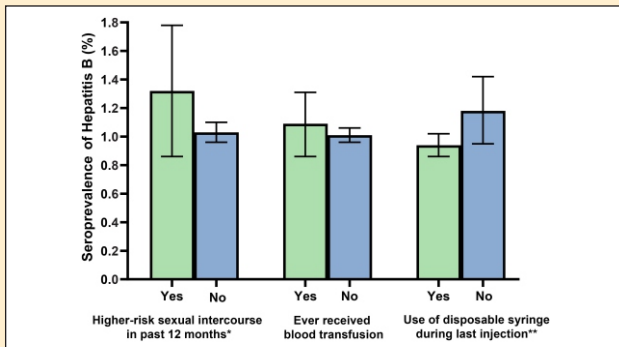


Figure 4: Seroprevalence of Hepatitis B by socio-demographic characteristics

- ◆ The seroprevalence was higher among men [1.16% (1.07-1.26)] than women [0.75% (0.68-0.82)].
- ◆ Seroprevalence had shown an increase with advancing age
- ◆ It was higher in rural areas [1.03% (0.96-1.11)] than urban areas [0.81% (0.72-0.92)].
- ◆ The analysis showed seroprevalence to be highest amongst scheduled tribes (ST) [1.84% (1.66-2.04)] as compared to other castes.

### Seroprevalence of Hepatitis B by some common associated factors:



\* Higher risk sexual intercourse in the past 12 months among those who had sex in last 12 months.  
 \*\* Use of disposable syringe during last injection among those who reported to receive an injection in last 12 months.  
 No overlapping associated factors were evaluated.

Figure 5: Seroprevalence of Hepatitis B by some common associated factors

- ◆ Seroprevalence was lower amongst those who were administered safe injections.
- ◆ Subjects with higher-risk sexual intercourse had shown greater seroprevalence [1.32% (0.86-1.78)] than those without higher-risk sexual intercourse [1.03% (0.96-1.1)].

## Hepatitis C

### Seroprevalence of Hepatitis C and its geographical distribution:

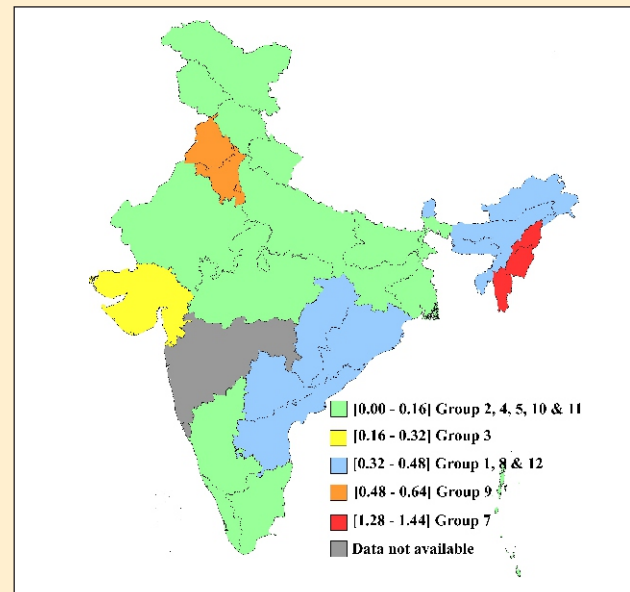


Figure 6: Seroprevalence of Hepatitis C (National and sub-national level)

- ◆ National seroprevalence of Hepatitis C was 0.32% (0.28-0.36).
- ◆ National and sub-national level estimates of seroprevalence of Hepatitis C is mentioned in table below:

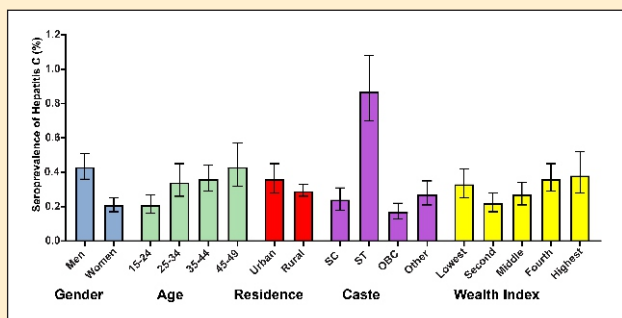
Groups of states	Hepatitis C seroprevalence% (95% CI)
India	0.32 (0.28-0.36)
Group 1	0.44 (0.29-0.68)
Group 2	0.16 (0.09-0.26)
Group 3	0.19 (0.1-0.34)
Group 4	0.02 (0.01-0.06)
Group 5	0.1 (0.05-0.23)
Group 7	1.68 (1.31-2.16)
Group 8	0.34 (0.25-0.45)
Group 9	0.56 (0.43-0.71)
Group 10	0.1 (0.06-0.16)
Group 11	0.08 (0.05-0.13)
Group 12	0.39 (0.28-0.55)

Table 1: Seroprevalence of Hepatitis C (National and sub-national level)

Due to paucity of DBS samples, seroprevalence in group 6 (Maharashtra and Goa) could not be determined. However, Group 6 data was included for estimation at national level.

- ◆ Seroprevalence of Hepatitis C was highest in group 7 [1.68% (1.31-2.16)] followed by group 9 [0.56% (0.43-0.71)]; group 1 [0.44% (0.29-0.68)]; group 12 [0.39% (0.28-0.55)] and group 8 [0.34% (0.25-0.45)] which were above the national average.

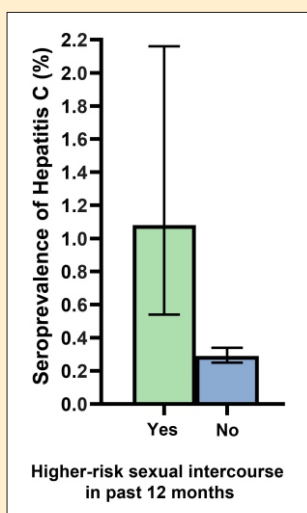
### Sero-prevalence of Hepatitis C by some socio-demographic characteristics:



**Figure 7:** Seroprevalence of Hepatitis C by some socio-demographic characteristics

- ◆ The seroprevalence was higher amongst men [0.43% (0.36-0.51)] than women [0.21% (0.17-0.25)].
- ◆ The analysis showed increase in seroprevalence with advancing age.
- ◆ It was higher in urban areas [0.36% (0.28-0.45)] than rural areas [0.29% (0.26-0.33)].
- ◆ Seroprevalence was highest amongst scheduled tribes (ST) [0.87% (0.70-1.08)] as compared to others.

### Seroprevalence of Hepatitis C by higher-risk sexual intercourse:



**Figure 8:** Seroprevalence of Hepatitis C by higher-risk sexual intercourse

- ◆ The increased seroprevalence was observed amongst higher-risk sexual intercourse [1.08% (0.54-2.16)] as compared to those without higher risk sexual intercourse [0.29% (0.25-0.34)]. *Confounding factors were not analysed.*

## Co-infection of Hepatitis B, Hepatitis C and HIV

Amongst 1,45,912 samples tested, 14 showed evidence of Hepatitis B and Hepatitis C co-infection, 10 showed co-infection for Hepatitis C and HIV and 6 showed co-infection for Hepatitis B and HIV. None of the samples showed evidence of co-infection for all the three markers i.e. Hepatitis B, Hepatitis C and HIV.

## Proposed Program Implementation Strategy as per the analysis

- ◆ Focused interventions (awareness, screening, and treatment services) are required in rural areas for Hepatitis B and in urban areas for Hepatitis C.
- ◆ Need to establish an inbuilt component of continuous surveillance as a part of the program through existing mechanisms.

## Conclusion

The data presented in the factsheet is the first ever nationally representative data which will provide a baseline for program planning purposes and will help get an initial understanding of disease burden in India. In order to monitor the trends and spread of Hepatitis B and Hepatitis C, we intend to collect robust data at regular intervals under the program, for better understanding of the epidemiology of Hepatitis B and Hepatitis C.

## Contributors

IIPS, Mumbai	ICMR	ICMR-NARI Pune	NCDC, DteGHS, MoHFW
Collaboration for NFHS-4 data and analysis	Technical collaboration for NFHS-4	Testing of biomarkers for Hepatitis B and Hepatitis C	Program Division supported by technical resource group on surveillance of viral hepatitis and national working group for estimation