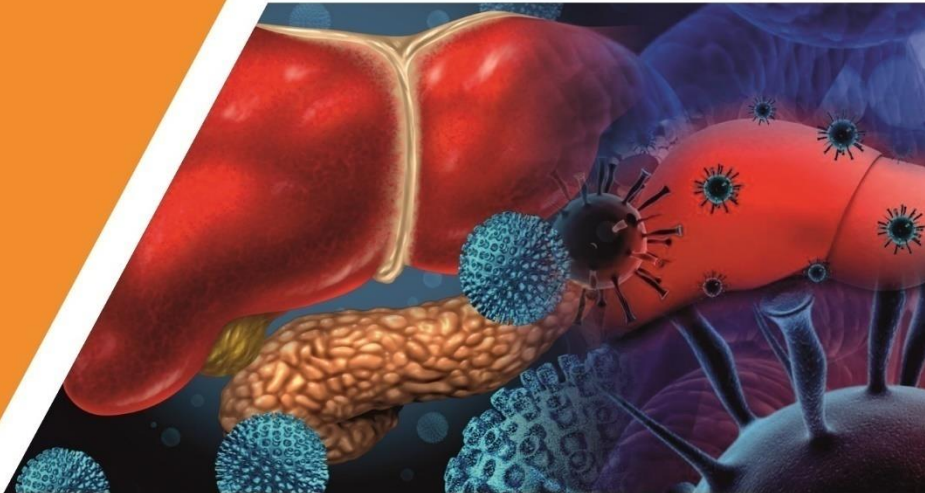




# PROJECT PRAKASH

Programmed Approach to Knowledge and Sensitization on Hepatitis



## HEPATITIS INDUCTION PROGRAM FOR NURSES

### OVERVIEW OF VIRAL HEPATITIS

Dr. Archana Ramalingam,  
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**INSTITUTE OF LIVER & BILIARY SCIENCES, NEW DELHI**

[www.ilbs.in](http://www.ilbs.in)

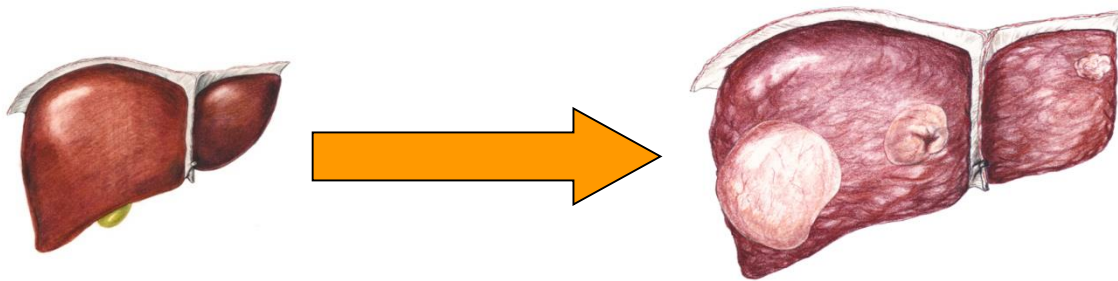


## **INSTITUTE OF LIVER & BILIARY SCIENCES, NEW DELHI**

OVERVIEW OF VIRAL HEPATITIS – Dr. Sapna Chauhan.

# What Is Viral Hepatitis

- Hepar (liver) + itis (inflammation)= Hepatitis
- Hepatitis means inflammation of the liver
- Viral hepatitis means inflammation (swelled or enlarged) liver due to hepatitis viruses



# Viral Hepatitis- an overview



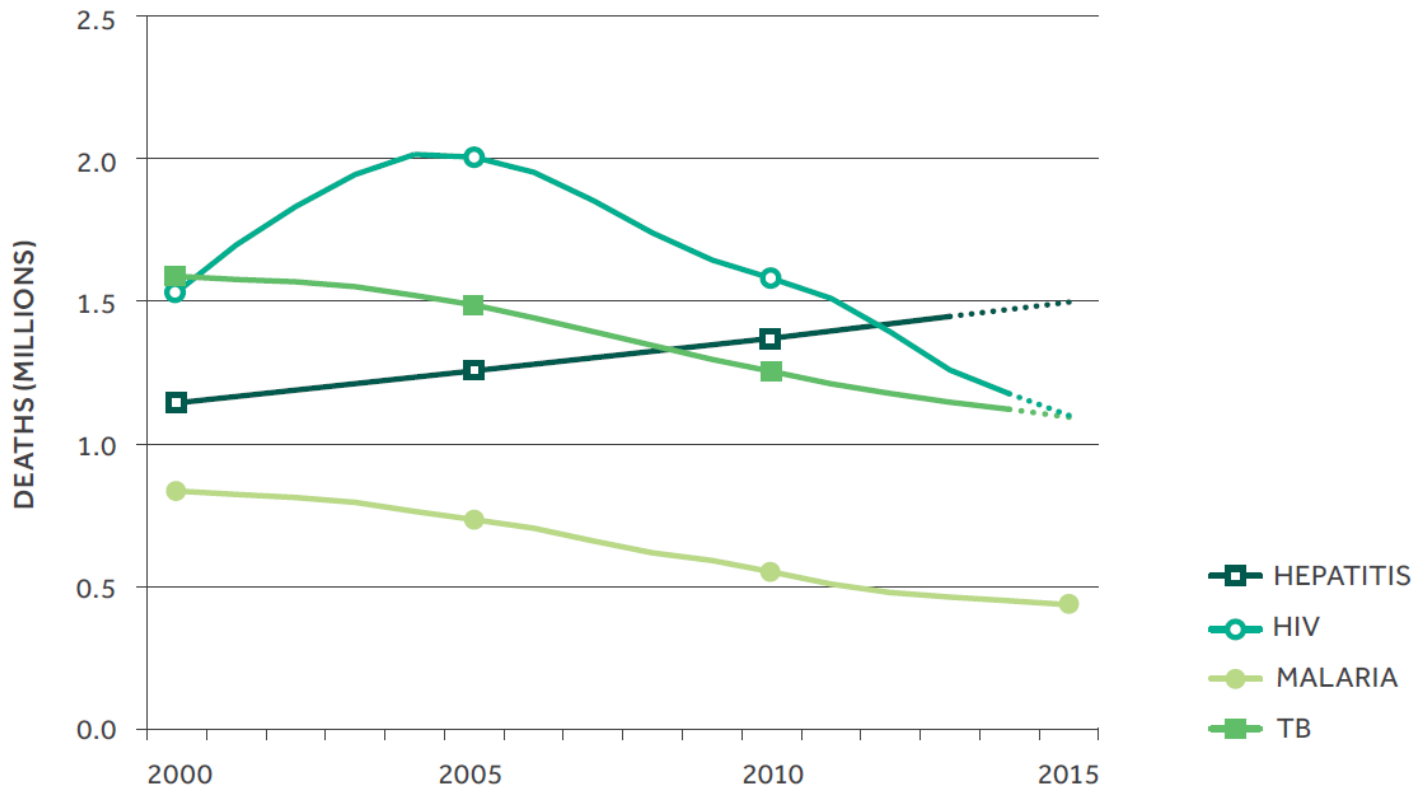


# Sustainable Development Goals (SDGs)

## **GOAL 3.3**

By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and **combat hepatitis**, water-borne diseases and other communicable diseases

# Global Number of deaths due to HIV, Hepatitis , Malaria and TB (2000-2015)



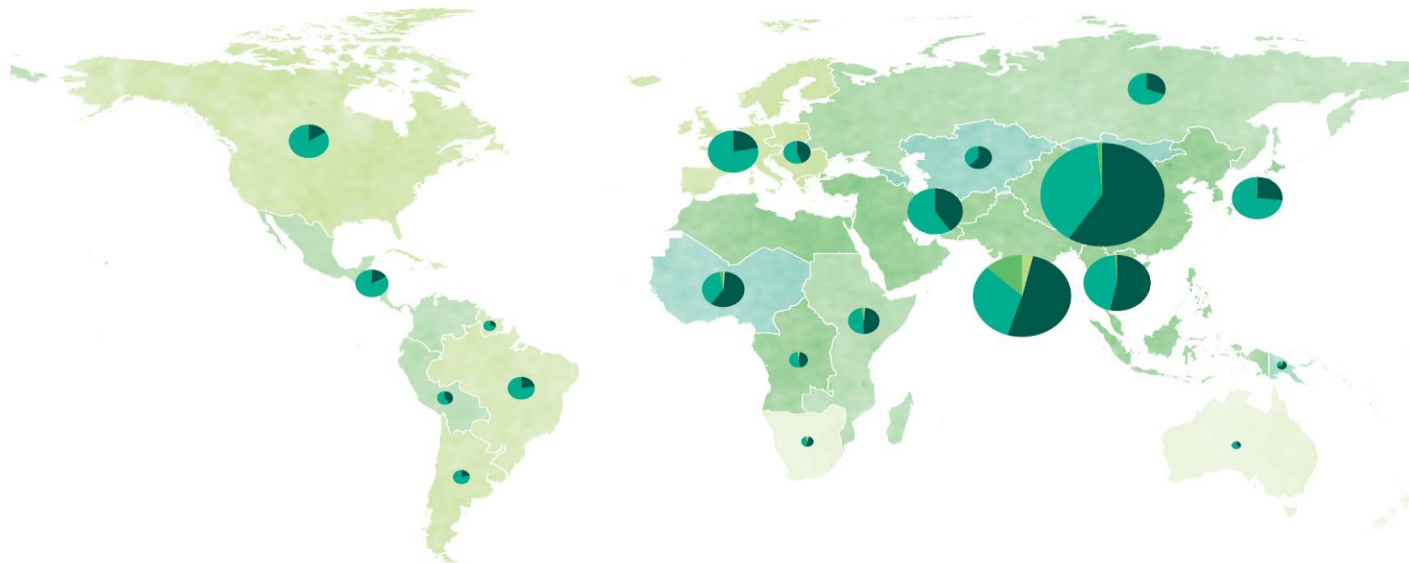
Source: Global Burden of Disease and WHO/UNAIDS estimates, see <http://ihmeuw.org/3pms>, <http://ihmeuw.org/3pmt> (accessed 2 April 2016).

# Mortality due to Viral hepatitis

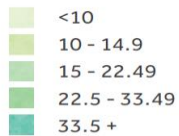
- **1.34 million**
  - Global deaths due to viral hepatitis in 2015
  - 96% of the deaths due to Hep B & C
  - 720 000: deaths due to cirrhosis
  - 470 000 deaths due to hepatocellular carcinoma



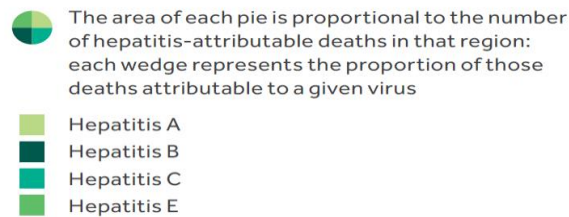
# Regional distribution of mortality due to viral hepatitis



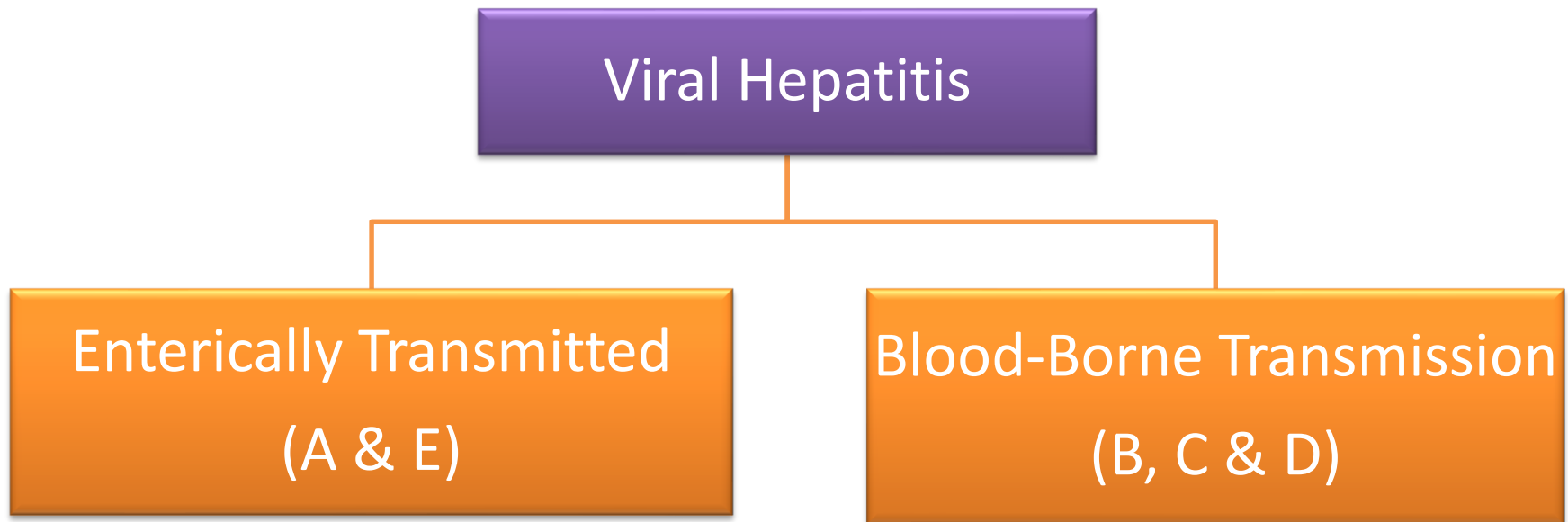
MORTALITY RATE (PER 100,000 PY)



PROPORTION ATTRIBUTABLE TO EACH VIRUS



WHO. GLOBAL HEALTH SECTOR STRATEGY ON VIRAL HEPATITIS 2016–2021



# Hepatitis A

- Causative agent:
  - HAV
  - ssRNA; Picornaviridae
- Globally, 1.4 million cases/ year
- SEARO region: 400,000 cases
- Inversely related to socioeconomic status

# Epidemiology- HAV

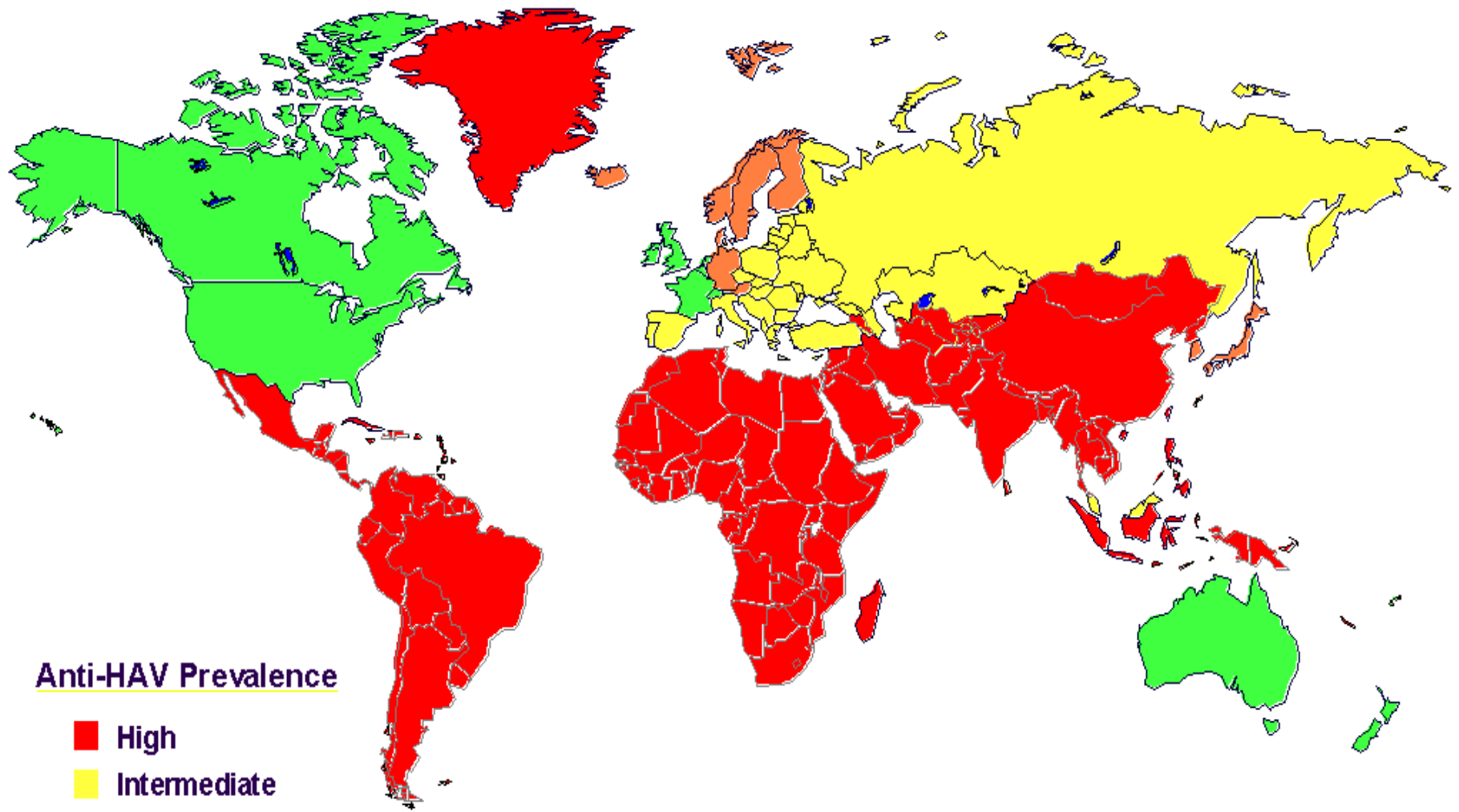
- HAV: Major cause of acute hepatitis in children
- 50% of fulminant hepatic failure in children in India
  - 50% vs 10% in rest of the world
- Does not cause chronic liver disease

Verma YS, Rajput N, Rajput SS. Seroprevalence of hepatitis A virus infection in different age groups of children. Annals of Tropical Medicine and Public Health. 2014 Sep 1;7(5):223.

# Epidemiology- HAV

- Mild and subclinical in most of the cases
- Clinical spectrum: linked to age of the infected individual
  - Asymptomatic in young children and leads to lifelong immunity
  - Probability to develop clinical symptoms increases with age

# Geographic Distribution of HAV Infection



## Anti-HAV Prevalence

- High
- Intermediate
- Low
- Very Low

# Epidemiology- HAV

- **Epidemiological shift:**
  - High to intermediate endemicity
  - Improvement in sanitary conditions
  - Less % of children infected in early childhood
  - Increased possibility of infection in later age and more severe disease

[http://www.searo.who.int/entity/emerging\\_diseases/topics/Hepatitis/en/](http://www.searo.who.int/entity/emerging_diseases/topics/Hepatitis/en/)

# Transmission- HAV

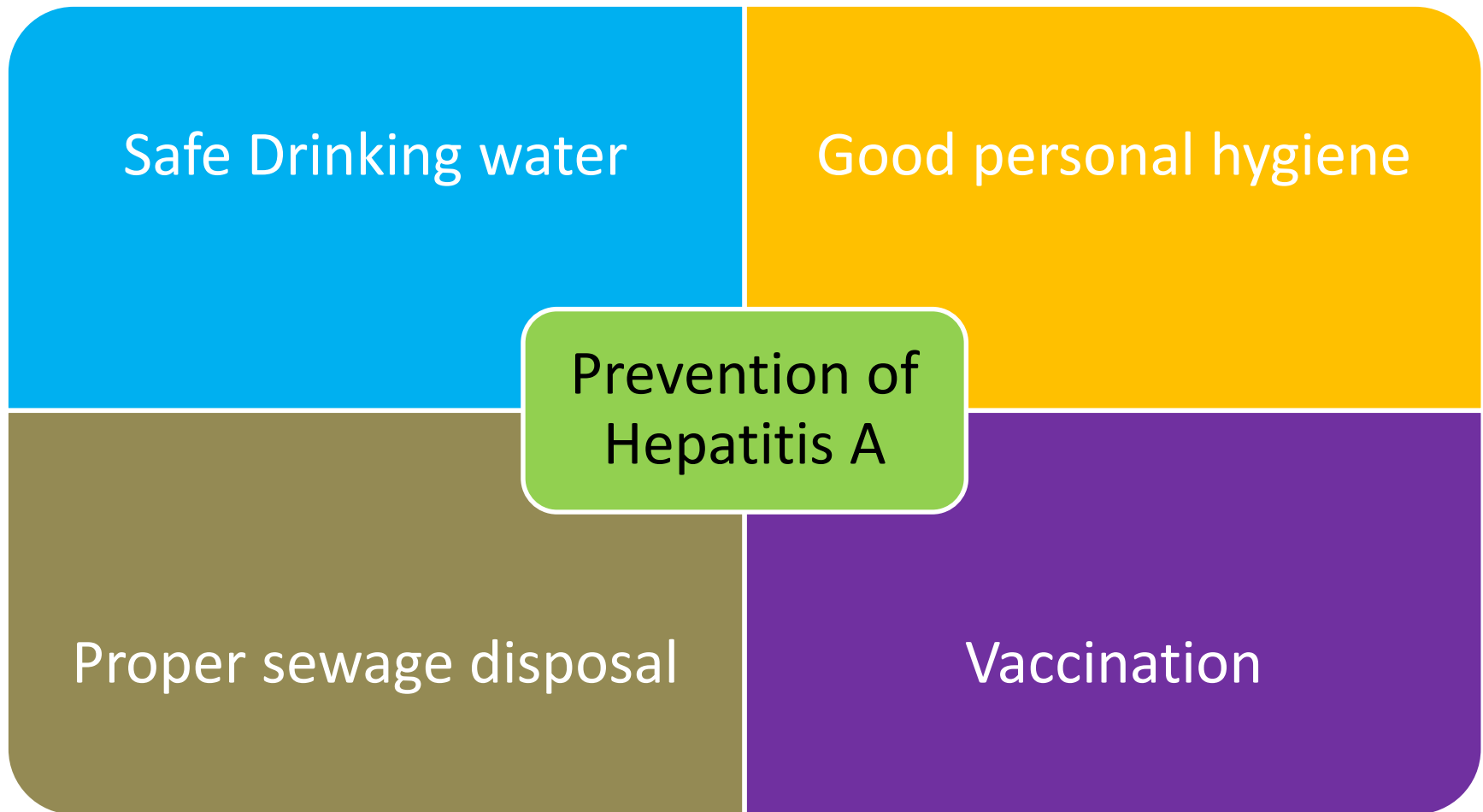
- Feco-oral route
  - Food handlers, Raw food
- Close personal contact
  - Household contact, sexual contact, child care centres



# Laboratory diagnosis - HAV

- Acute infection: detection of anti-HAV IgM  
through EIA
- Past Infection: detection of IgG anti-HAV

# Prevention-HAV



# HAV-Vaccine

- Killed and live attenuated hepatitis A vaccines
- Most countries:
  - No definite policies for hepatitis A vaccination
- India:
  - Not part of the National Immunisation Schedule
  - IAP recommends two doses 6 months apart after 1 year of age

# Hepatitis E

- Caused by
  - Hepatitis E virus; ss RNA virus
- Hepatitis E:
  - Enteric and Epidemic
  - Acute, self-limiting
  - Occasionally leads to fulminant hepatitis: pregnant women
- Usually no chronicity

# Burden: Hepatitis E

- SEARO Region:
  - 50% of global deaths due to Hepatitis E
  - Annually,
    - 12 million infected
    - 42,000 deaths and
    - 1800 stillbirths

[http://www.searo.who.int/entity/emerging\\_diseases/topics/Hepatitis/en/](http://www.searo.who.int/entity/emerging_diseases/topics/Hepatitis/en/)

# Risk factors-HEV

- Age>15yrs
- Lower socio-economic status
- Contaminated water sources
- Higher attack rates are seen in pregnant women

# Transmission-HEV

- Feco-oral
- Through contaminated water
  - Outbreaks are more likely due to contaminated water than foodborne infection

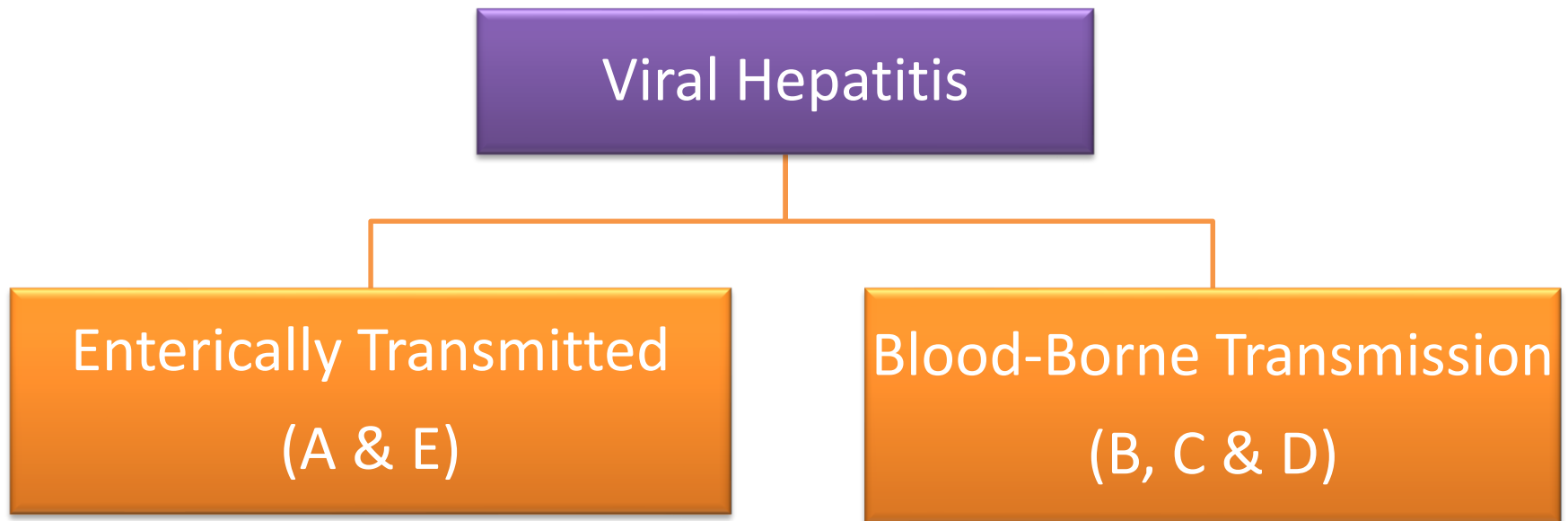
# Diagnosis-HEV

- Detection of IgM-anti-HEV by ELISA
- In very early acute cases,
  - IgM antibodies may not be detectable
  - HEV RNA: method of choice



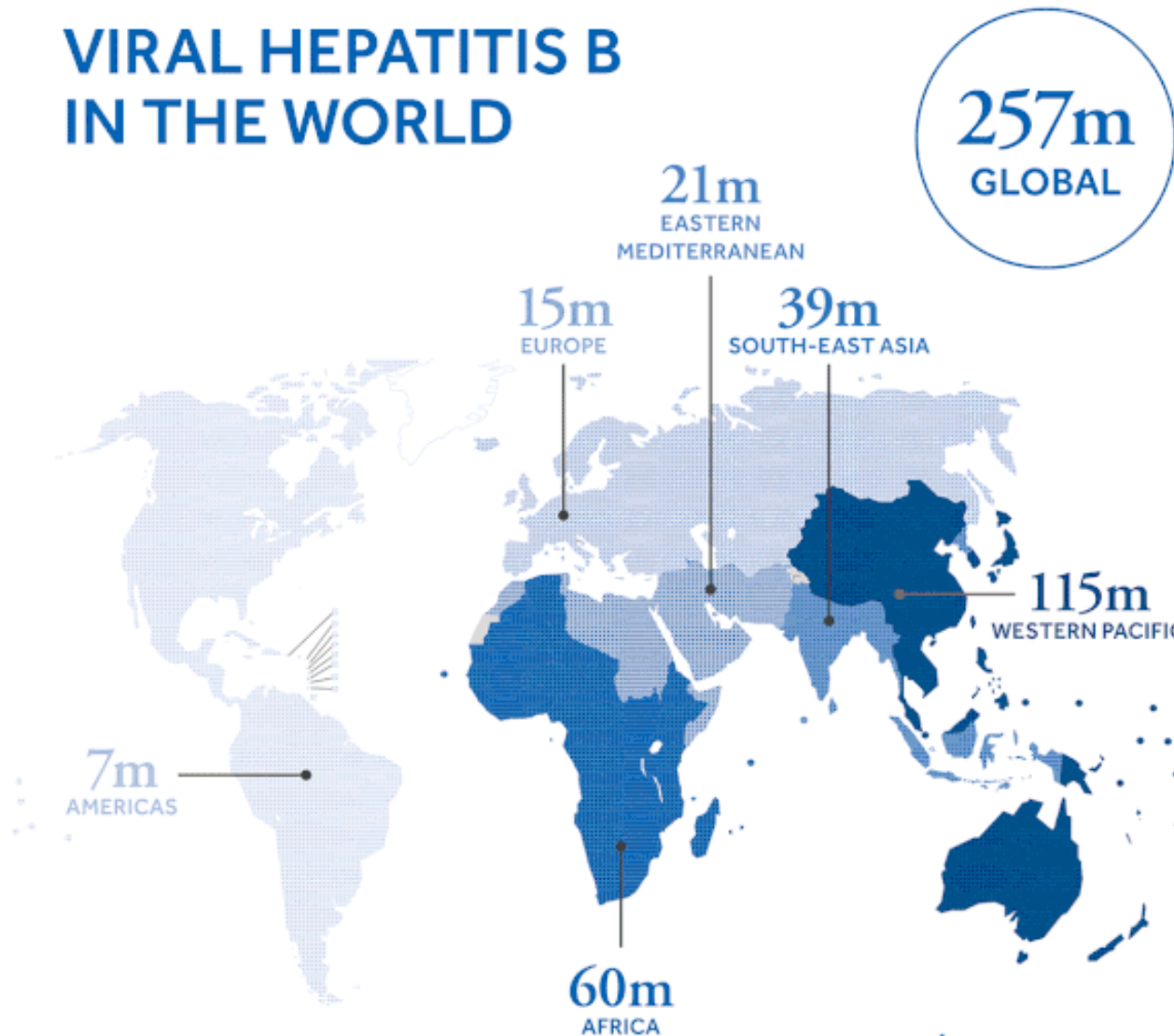
# Prevention-HEV

- Safe water and sanitation
- Health education
- Personal hygiene
- Vaccine not yet approved in India





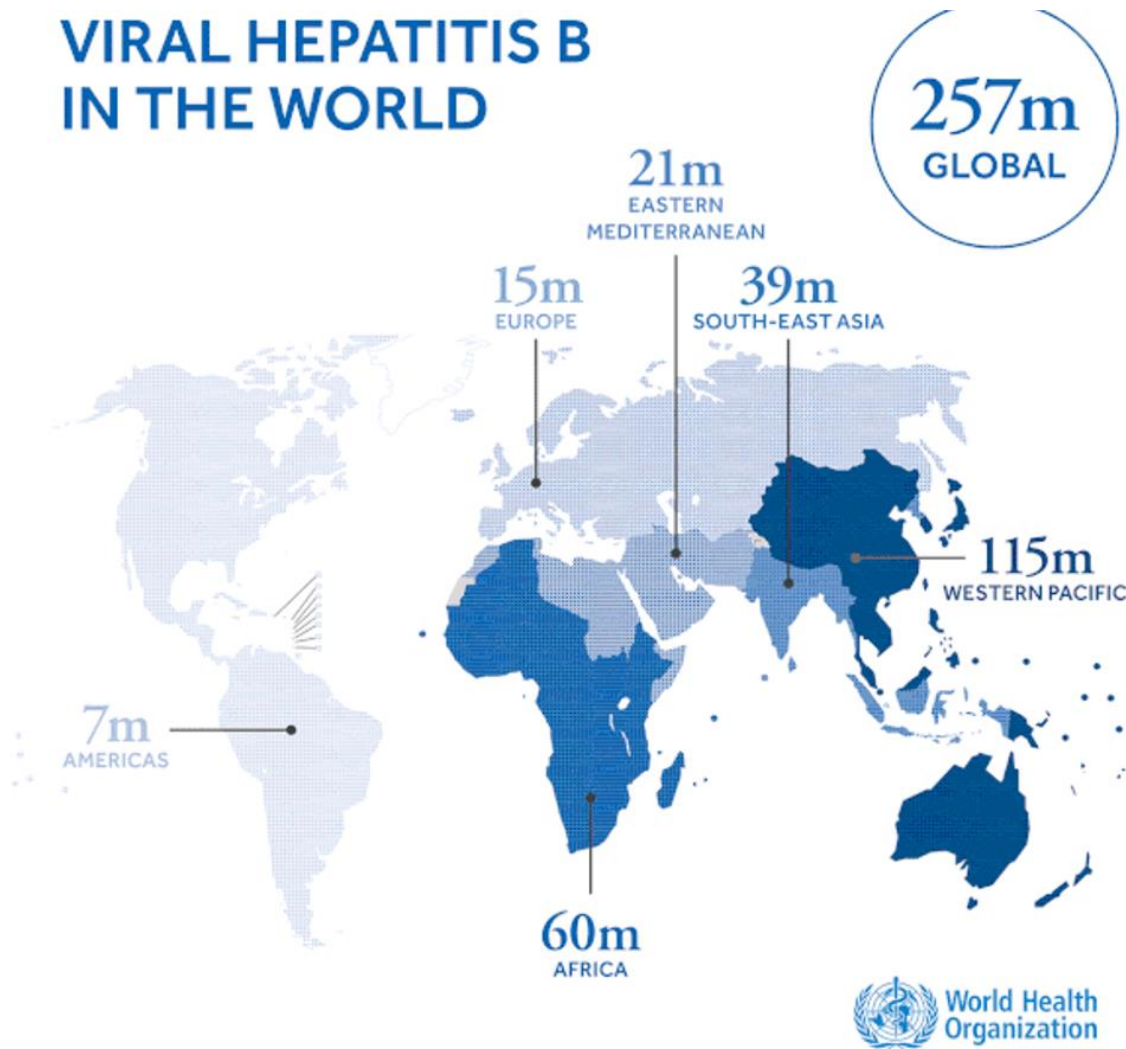
# VIRAL HEPATITIS B IN THE WORLD



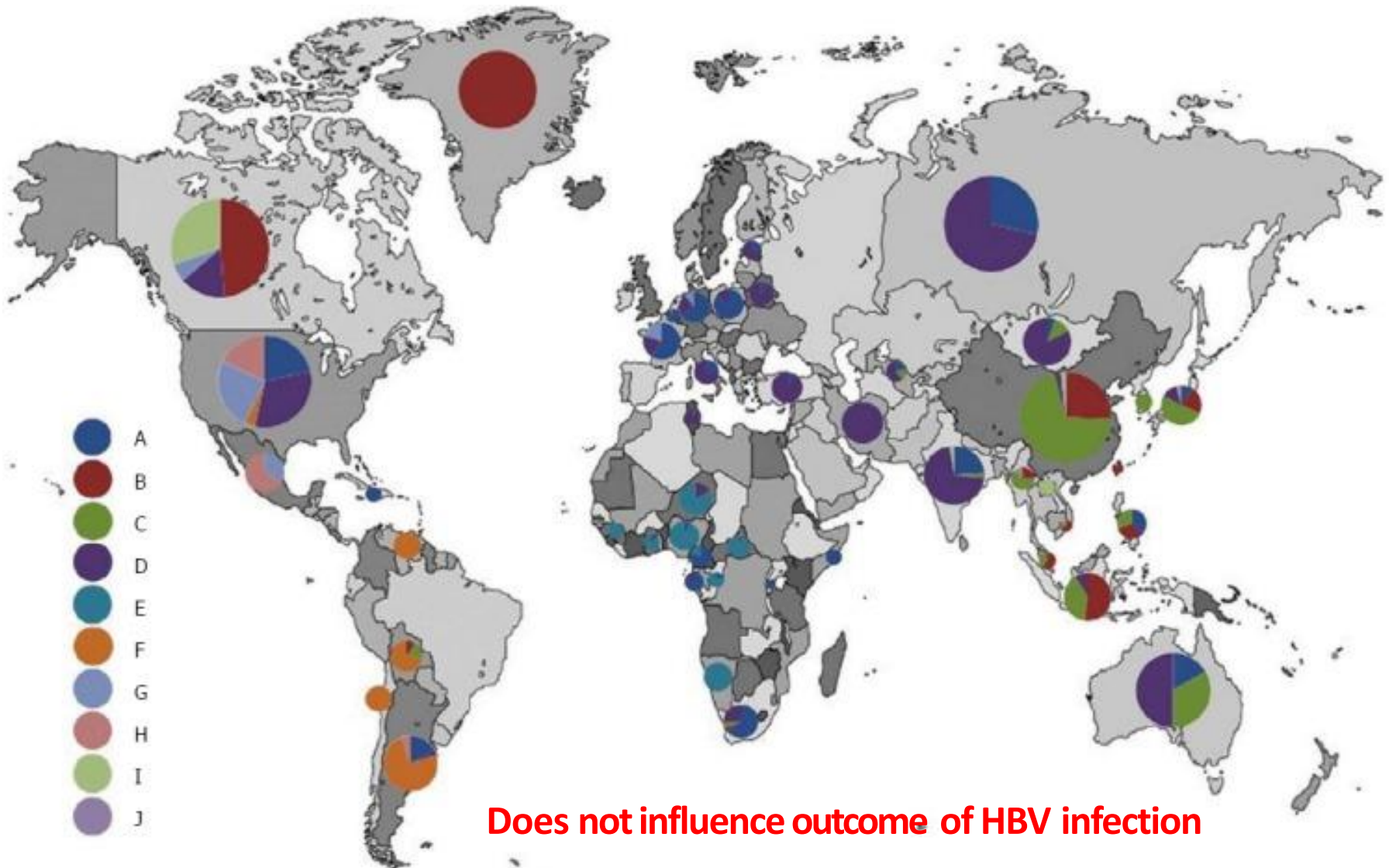
# Hepatitis B

- Causative agent:
  - Hepatitis B virus (HBV); Circular DS DNA
- 3-5% Prevalence
- High risk for Hepatocellular carcinoma

# VIRAL HEPATITIS B IN THE WORLD



# HBV Genotypes



**Does not influence outcome of HBV infection**

# Transmission- HBV

- Percutaneous/ mucosal contact:
  - infectious blood or body fluids
- Routes:
  - **Vertical (Mother to child Transmission)**
  - **Horizontal**
    - Parenteral
    - Sexual
    - Contact with blood or open sores of an infected person
    - Sharing razors, toothbrushes with an infected person

# Transmission- HBV

- HBV is not spread through:
  - food or water
  - sharing eating utensils
  - breastfeeding
  - hugging, kissing, hand holding
  - Coughing or sneezing

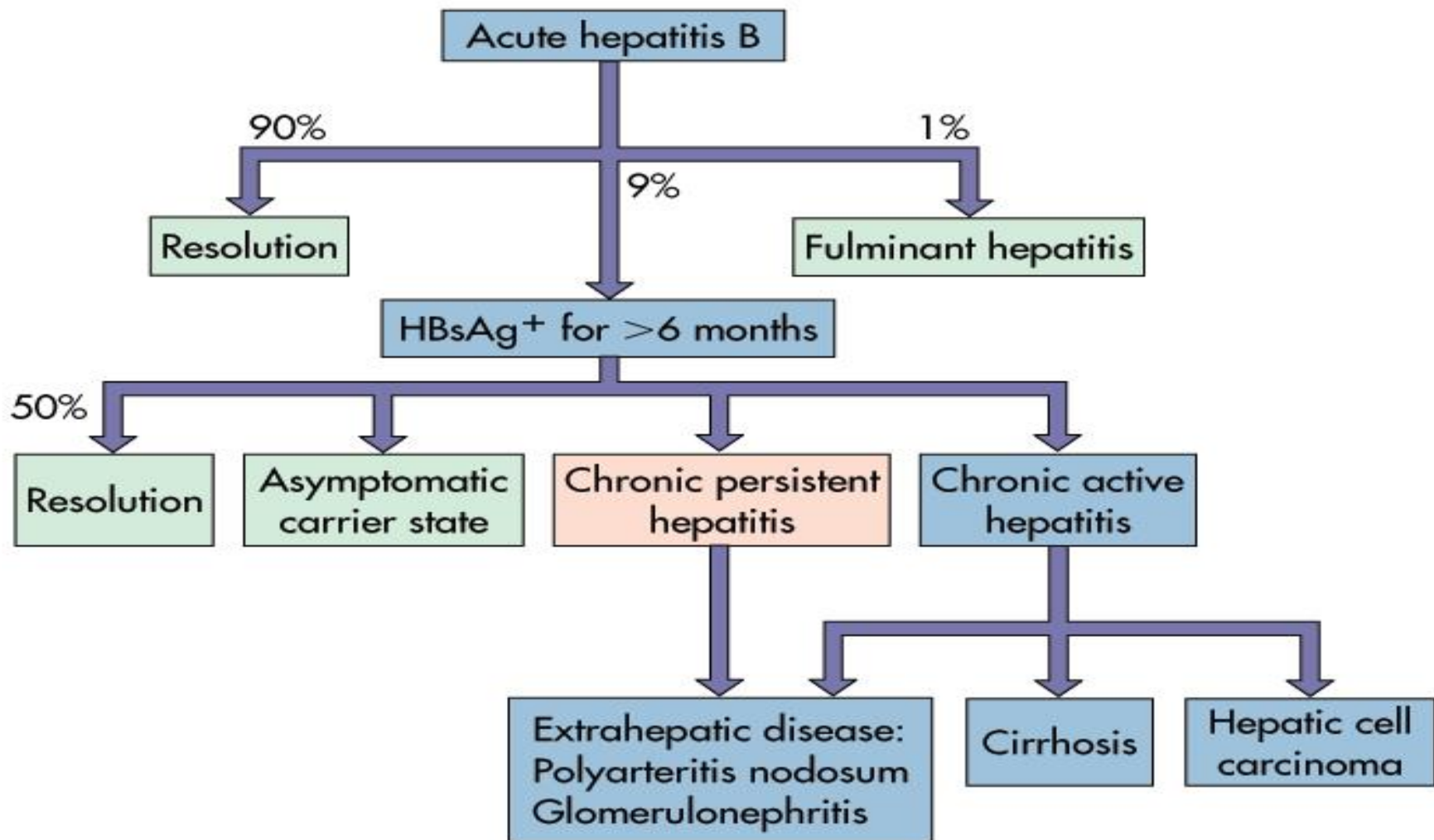


# High Risk Groups-HBV

- Infants born to infected mothers
- Sex partners of infected persons
- Men who have sex with men
- Injection drug users
- Household contacts of known persons with chronic HBV infection
- Health care professionals
- Hemodialysis patients

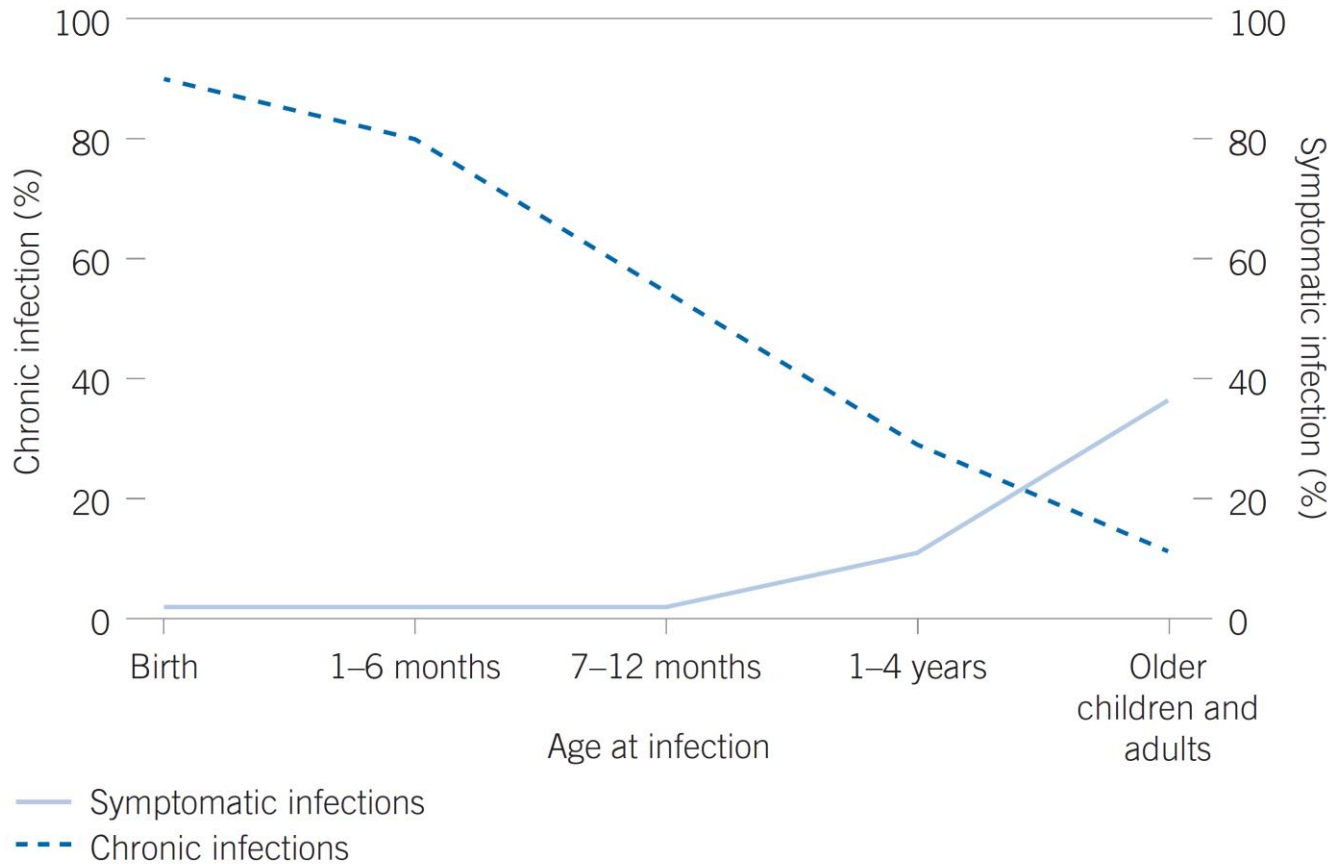


# Clinical outcomes of Hepatitis B infections





# Outcome of viral hepatitis by age at infection



<http://www.who.int/hepatitis/publications/hepatitis-b-guidelines/en/>

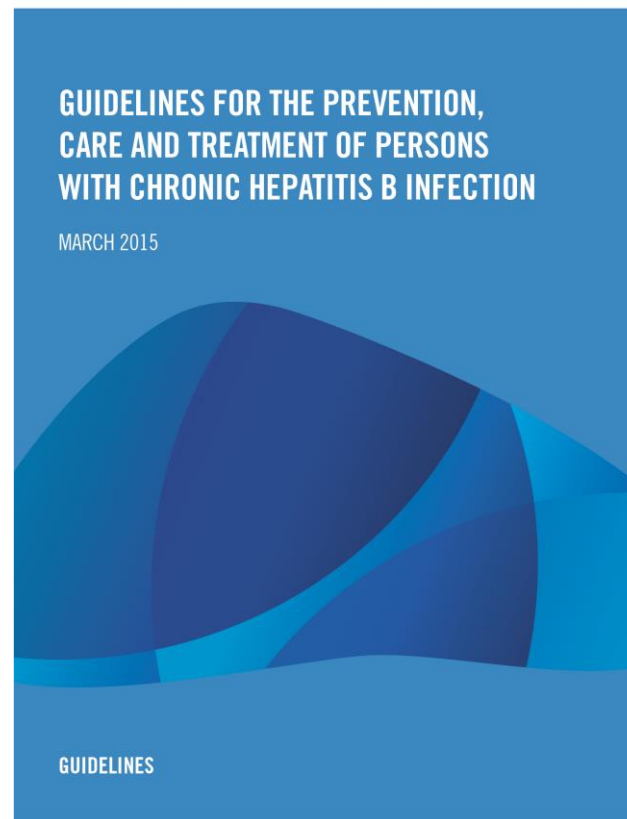
# Treatment of HBV

- Acute: treatment is supportive
- Chronic patients:
  - Regular follow up
  - prevent liver damage & HCC
  - Guidelines for treatment

# Prevention-HBV

- Hepatitis B vaccine: effective
  - NFHS-4: 66.3% coverage for all 3 doses
- Maternal screening for HBsAg
- Safe sex
- Do not share needles
- Universal precautions for HCWs

# Further Reading

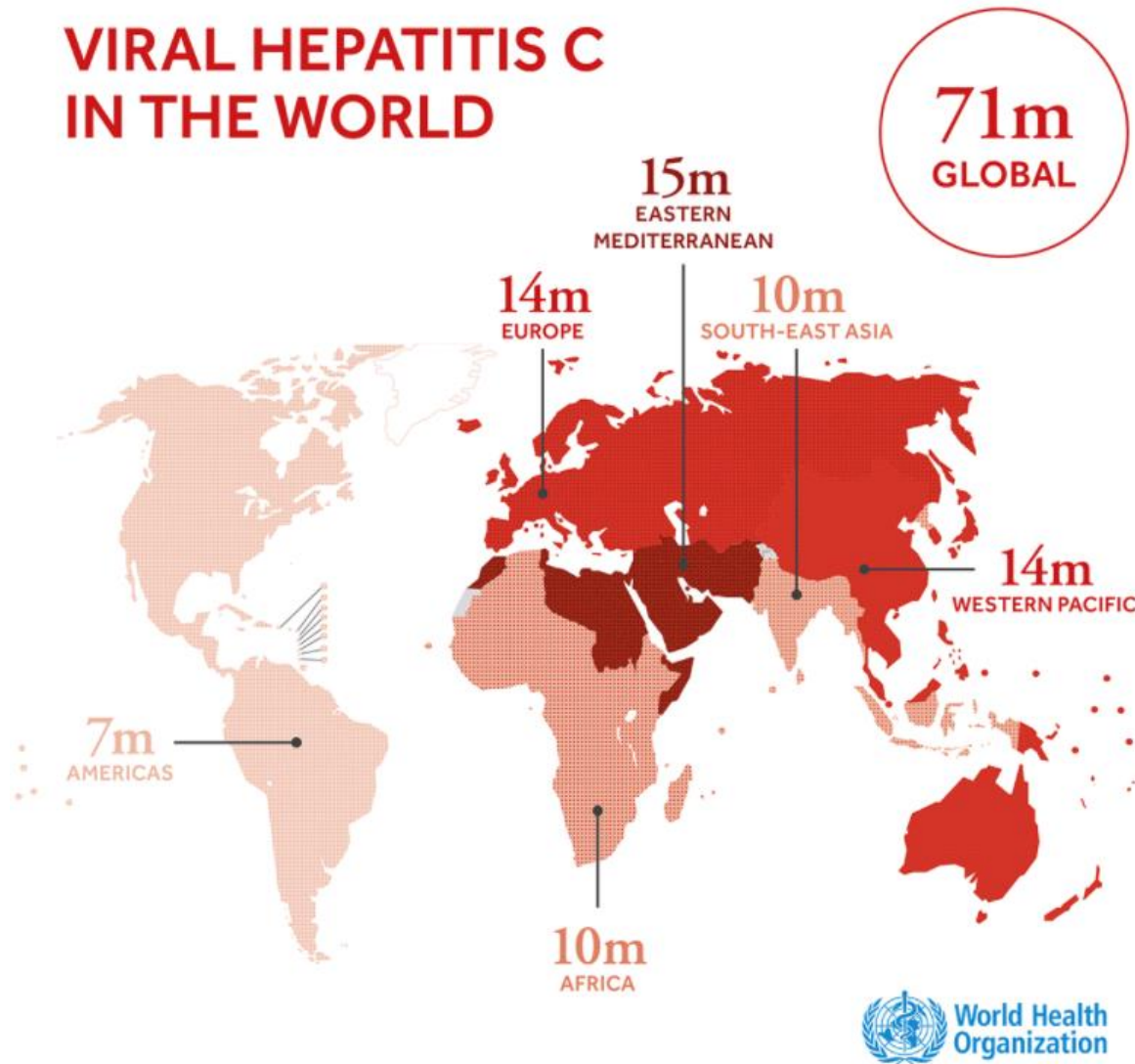


# Hepatitis C

- Earlier known as post-transfusion non A-non B hepatitis (PT-NANB).
- Viral genotypes (1-6)
- In India:
  - Genotype 3 (70%) and 1 (29%) are common



# VIRAL HEPATITIS C IN THE WORLD





# Epidemiology-HCV

- Prevalence: general population is 1-2%
- Anti-HCV positivity is high
  - **PWID (People Who Inject Drugs)**
  - **Dialysis patients**
  - **Multiple BTs (Blood transfusions)**
  - **HCWs (Health care workers)**

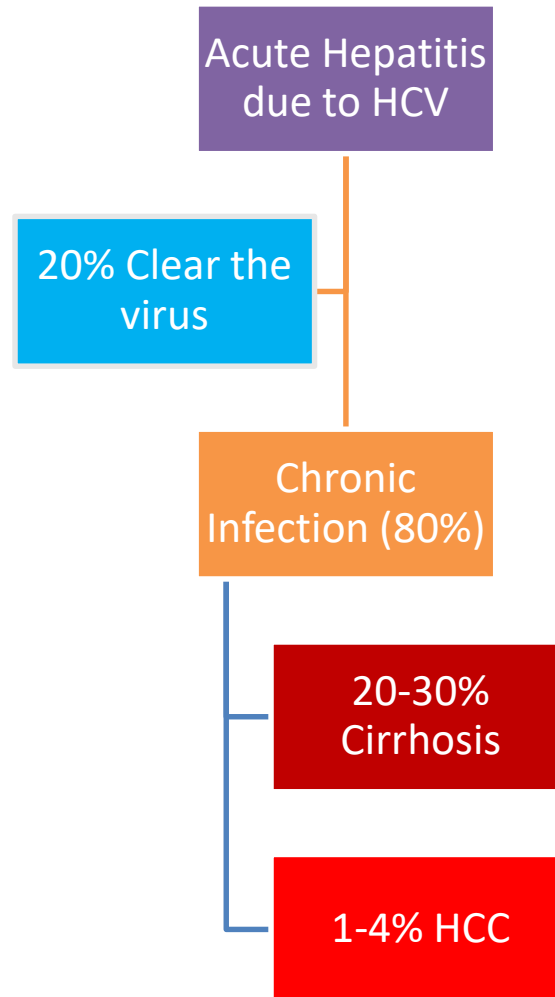
# The disease- Hepatitis C

- High chronicity potential (80%)
- Important cause for cirrhosis and primary Hepatocellular carcinoma

# Transmission-HCV

- Parenteral transmission
  - infected needles & unsafe injections
- Blood and blood products transfusions (before 2001)
- Other modes like sexual, vertical and intra-familial are infrequent

# Natural History of Hepatitis C



Adapted from Lauer and Walker, NEJM 2001

# Lab Diagnosis-HCV

- No marker to distinguish between acute and chronic infections
- Anti-HCV screening
- HCV RNA (Qual)
- HCV RNA (Quan) HCV viral load is a very important parameter in disease staging and response to antiviral therapy

# Treatment

- Hepatitis C is curable
- Effective Direct acting antivirals (DAAs)
- Genotype based treatment regimens
- Three pan-genotypic regimens approved by WHO
- Treatment duration: 12-24 weeks

# Prevention-HCV

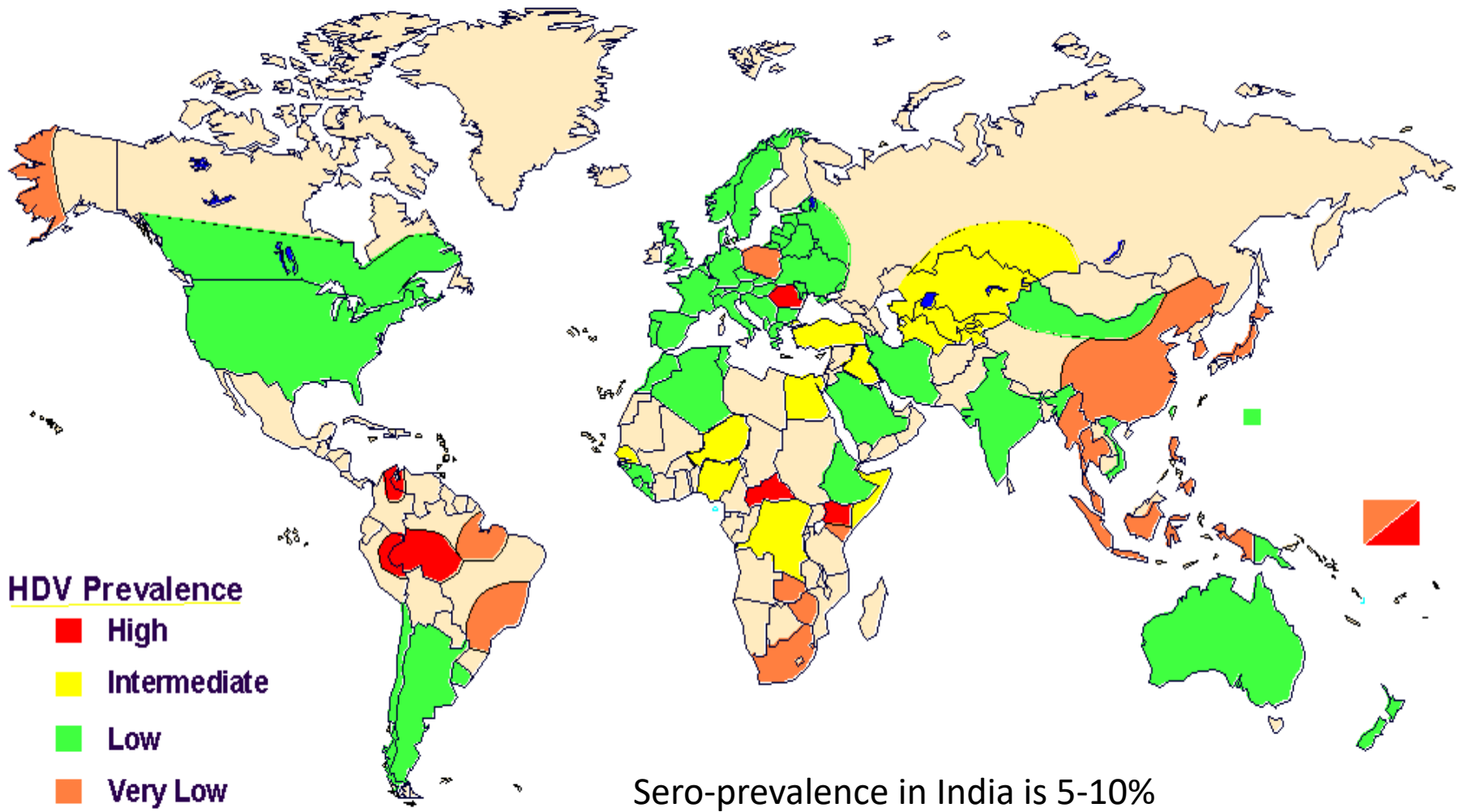
- **Universal precautions**
- Safe injections
- Safe blood

# Hepatitis Delta Virus (HDV)

- Defective RNA virus
- Requires HBV replication for its multiplication
- Occurs as co- or super-infection with HBV
- Leads to severe course of liver disease
- Parenterally transmitted



# Geographic Distribution of HDV Infection



# Hepatitis D - Prevention

- HBV-HDV Co-infection

Pre or post exposure prophylaxis to prevent HBV infection

- HBV-HDV Super-infection

Education to reduce risk behaviors among persons with chronic HBV infection

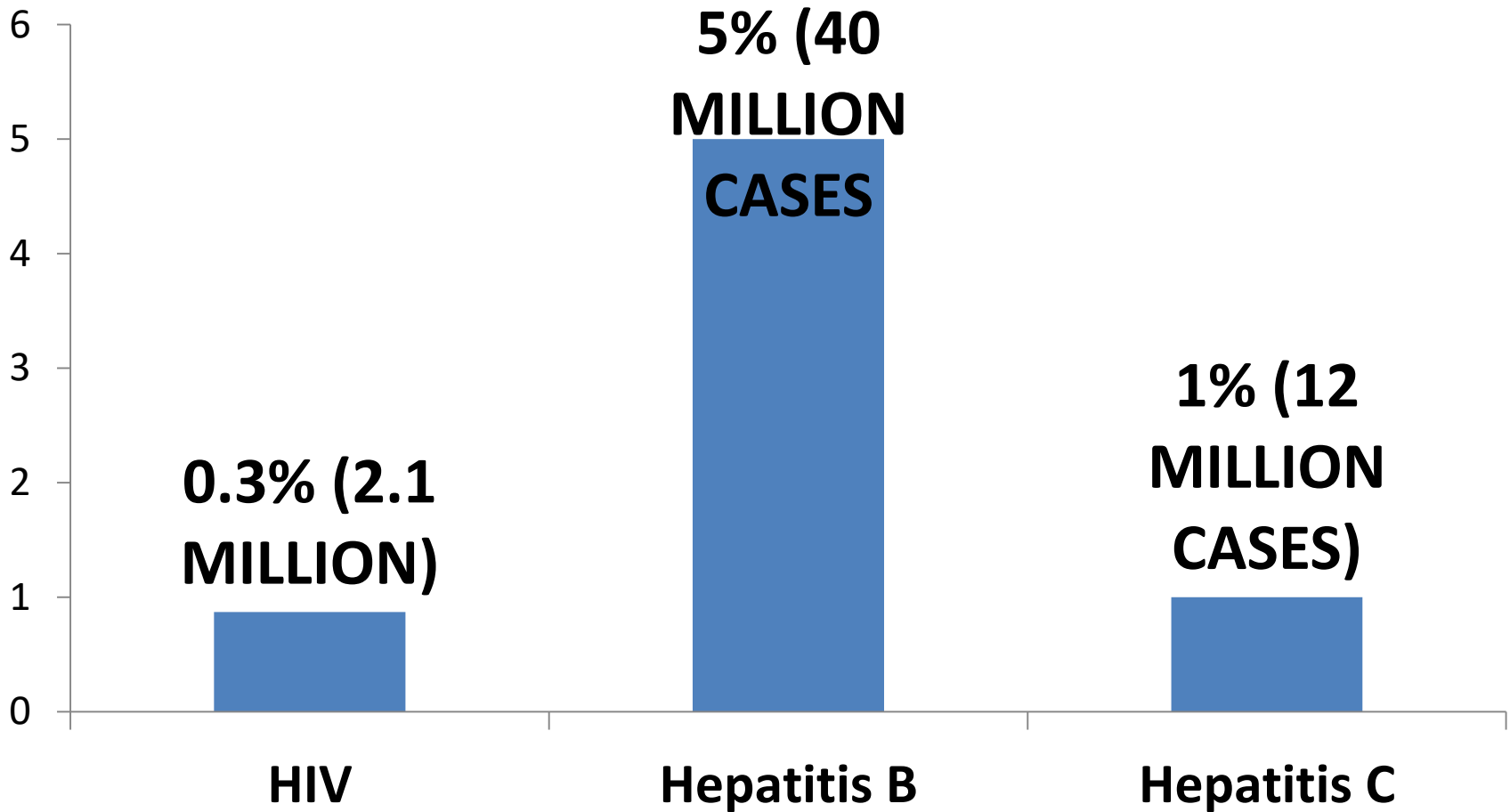
# Viral Hepatitis- *An overview*

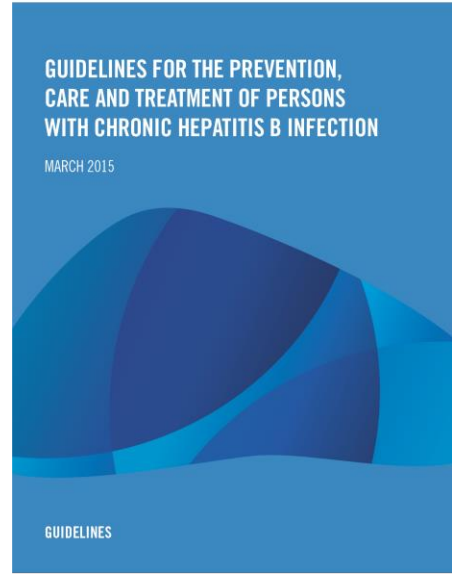
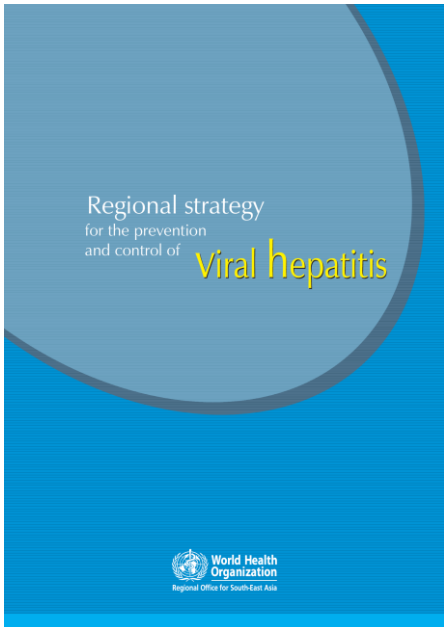
	<b>Types of Viral Hepatitis</b>				
	<b>Hepatitis A</b>	<b>Hepatitis B</b>	<b>Hepatitis C</b>	<b>Hepatitis D</b>	<b>Hepatitis E</b>
<b>Classification and Genetic material</b>	Picorna, Linear SS RNA	Hepadna, Circular DS DNA	Flavi, Linear SS RNA	Delta, Circular SS RNA	Calci, Linear SS RNA
<b>Mode of transmission</b>	Feco-oral	Vertical Blood borne Sexual	Blood borne Sexual Vertical	Blood borne Sexual Vertical	Feco-oral
<b>Incubation Period &amp; Chronicity</b>	15-40 days, No	60-180 days, <b>Yes</b>	60-120 days, <b>Yes</b>	60-180 days, <b>Yes</b>	21-42 days, No
<b>Prevention</b>	Vaccine, Safe water and Sanitation	Vaccine, Blood Donor Screening, Risk Behaviour Modification	Blood Donor Screening, Risk Behaviour Modification	Vaccine for HBV, Risk Behaviour Modification	Safe water and Sanitation

# Viral Hepatitis- an overview

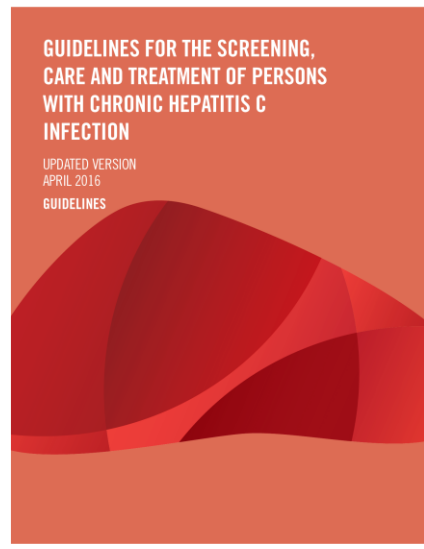


# Burden of Hepatitis B and C Vs HIV





**GLOBAL HEPATITIS REPORT,  
2017**





**SDG target 3.3 is to combat Viral Hepatitis by 2030**

**Thank you**