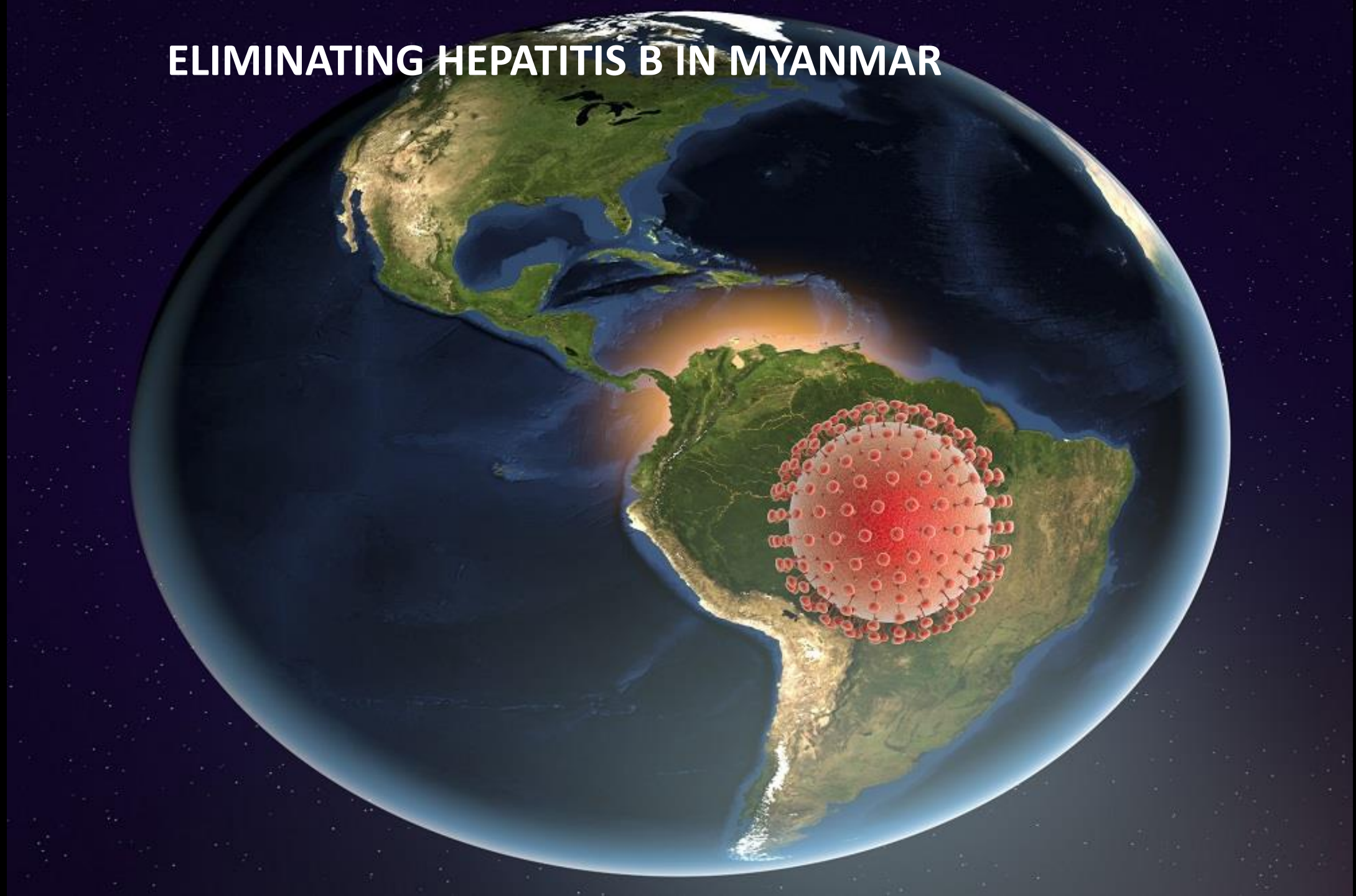
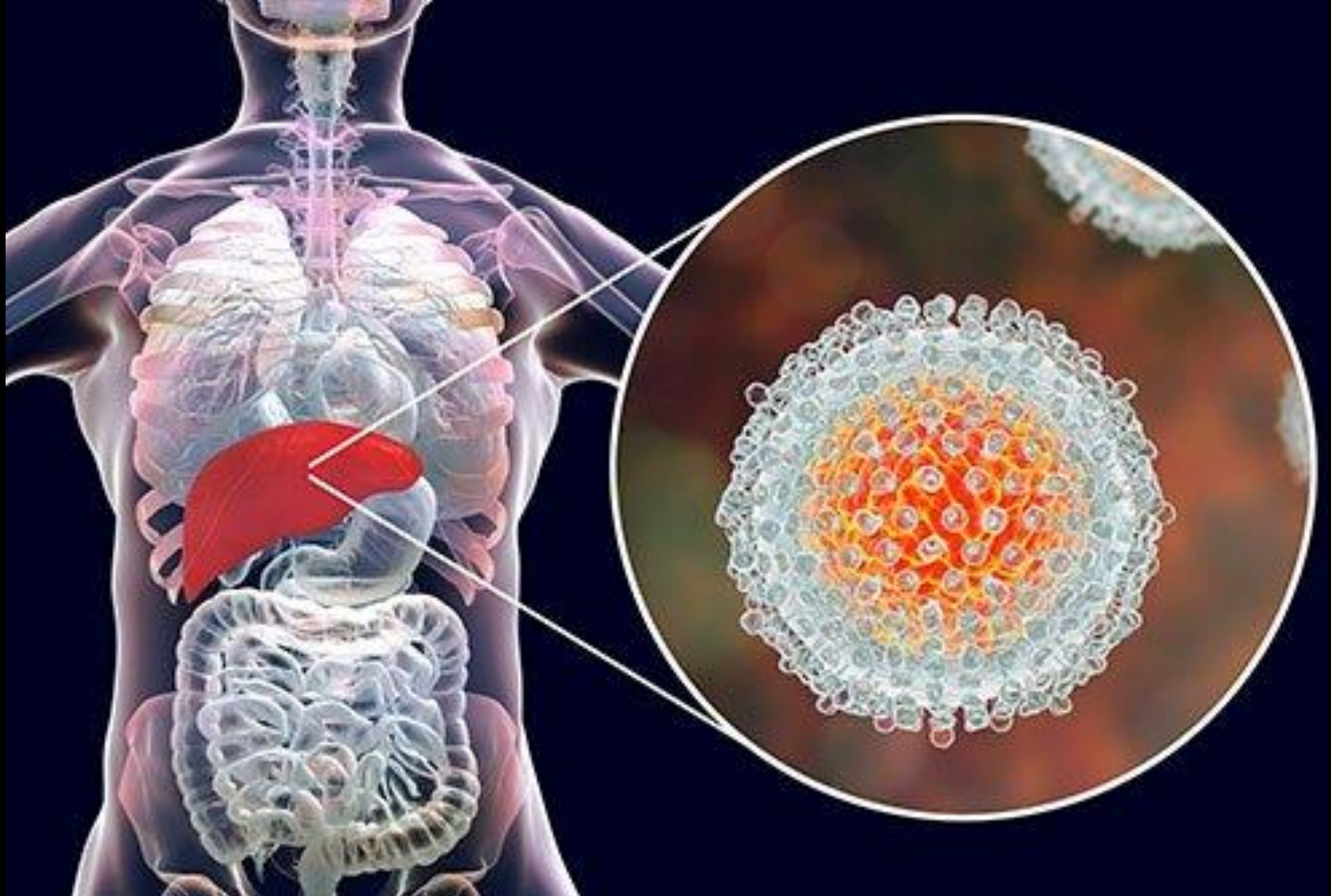
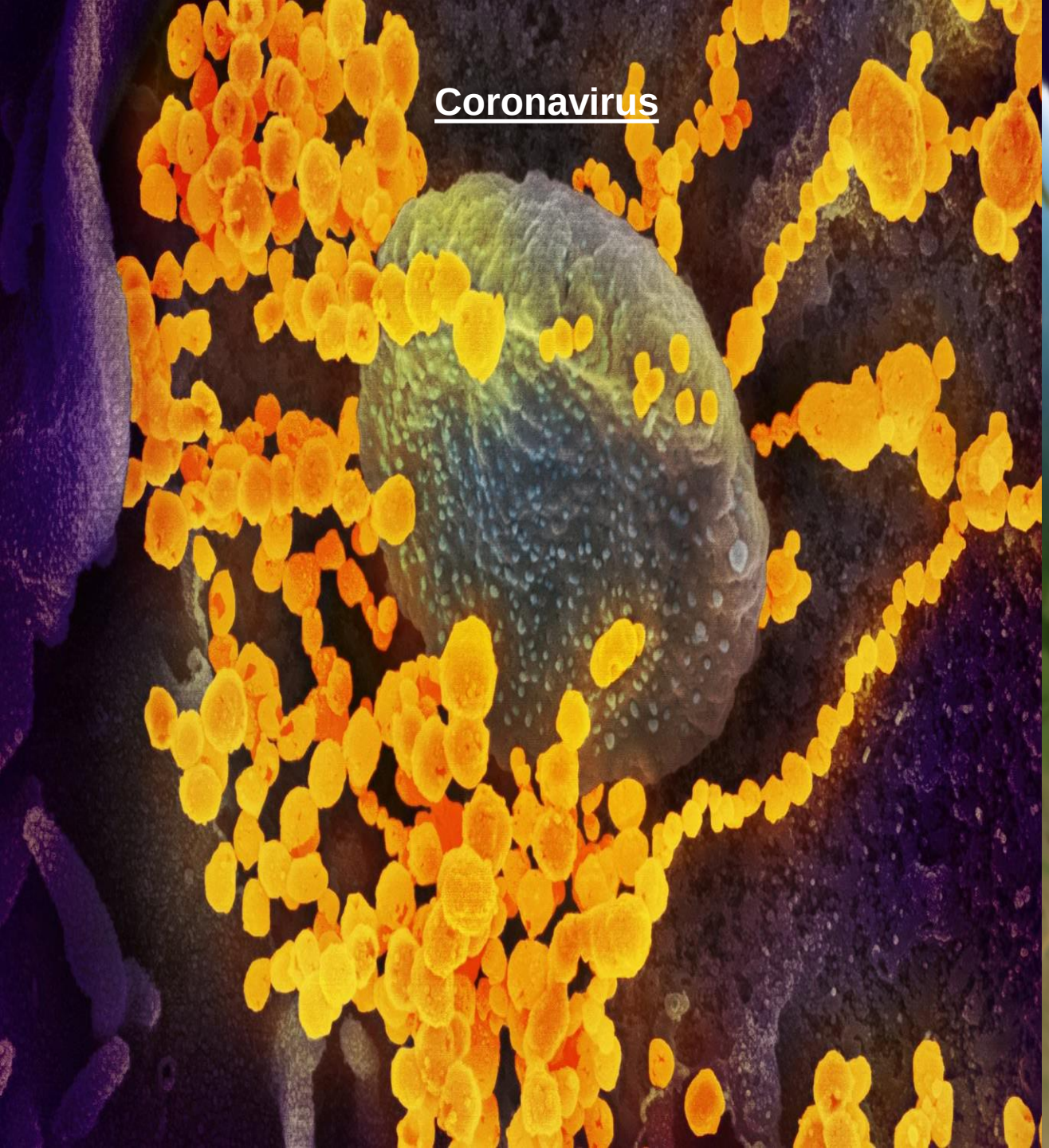
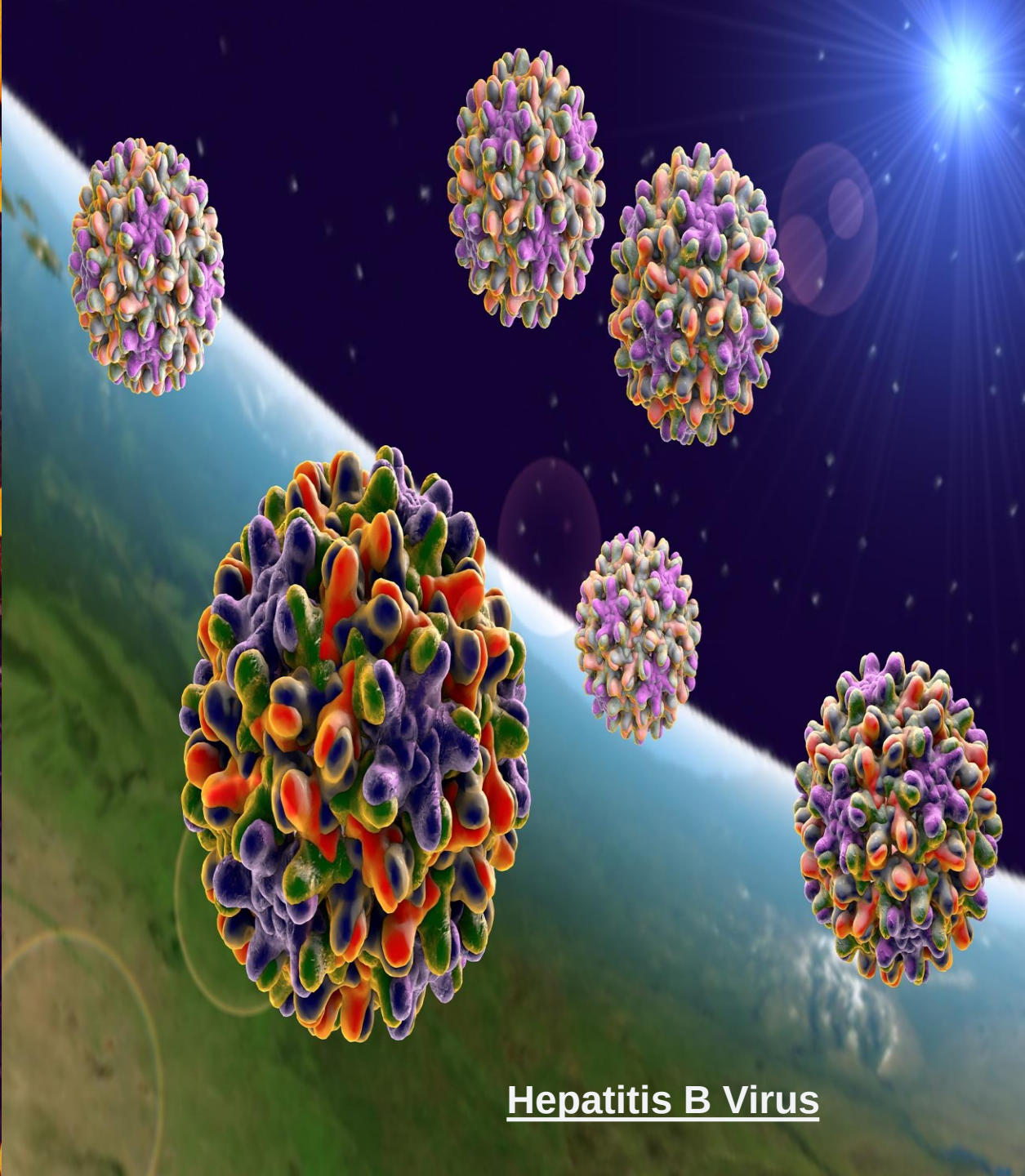
ELIMINATING HEPATITIS B IN MYANMAR







Coronavirus



Hepatitis B Virus

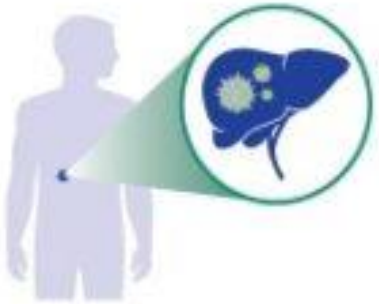
HEPATITIS B: ARE YOU AT RISK?

HEPATITIS B IS A SERIOUS & DEADLY DISEASE

Hepatitis B virus infects people of all ages & as many as

2.2 M people

in the US are chronically infected



Up to 40%

of chronic infections lead to cirrhosis, liver failure, and liver and other cancers, which may lead to death

HEPATITIS B IS EASILY SPREAD

Hepatitis B is

50 to100X more

infectious than HIV and can live outside the body for **7+ days** and still cause infection

2/3 of those living with chronic hepatitis B do not know they are infected but can still spread the virus to others

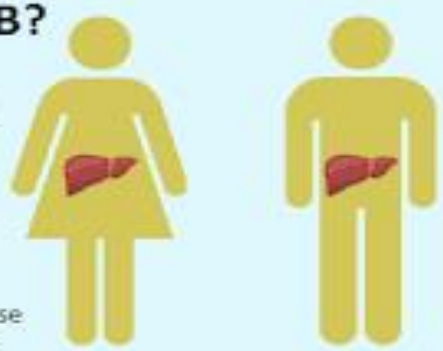
Get Tested for Hepatitis B

What is Hepatitis B?

Hepatitis B (hep B) is a liver disease caused by the hep B virus.

If a pregnant woman has hep B, the baby can get hep B during birth. All babies need to get shots to prevent hep B.

Hep B is the most common cause of liver cancer in the world.



You can get hep B through contact with an infected person's blood or body fluids.

Some people with hep B have no signs of disease.

You can prevent hep B by getting shots.

Who Should Get Tested?

People born in Asia or people whose parents were born in Asia

All pregnant women

People who live with someone who has hep B

Why Should I Get Tested?

Getting a test is the only way to know if you have hep B.

If you do not have hep B, make sure to get the hep B shots.

If you have hep B, treatment can keep you healthy.

Los Angeles County Department of Public Health
For information on hepatitis B testing call: (213) 351-7400

Public Health

GET TESTED FOR HEPATITIS B

IT COULD SAVE YOUR LIFE.

WHAT IS HEPATITIS B?

HEPATITIS B

LIVER CANCER caused by the HEPATITIS B VIRUS.

HEPATITIS B OFTEN DOESN'T CAUSE SYMPTOMS.
Many people can live with Hepatitis B for many years without feeling sick.

LIVER CANCER

If left untreated, it can lead to serious liver problems, **INCLUDING LIVER CANCER.**

DID YOU KNOW?

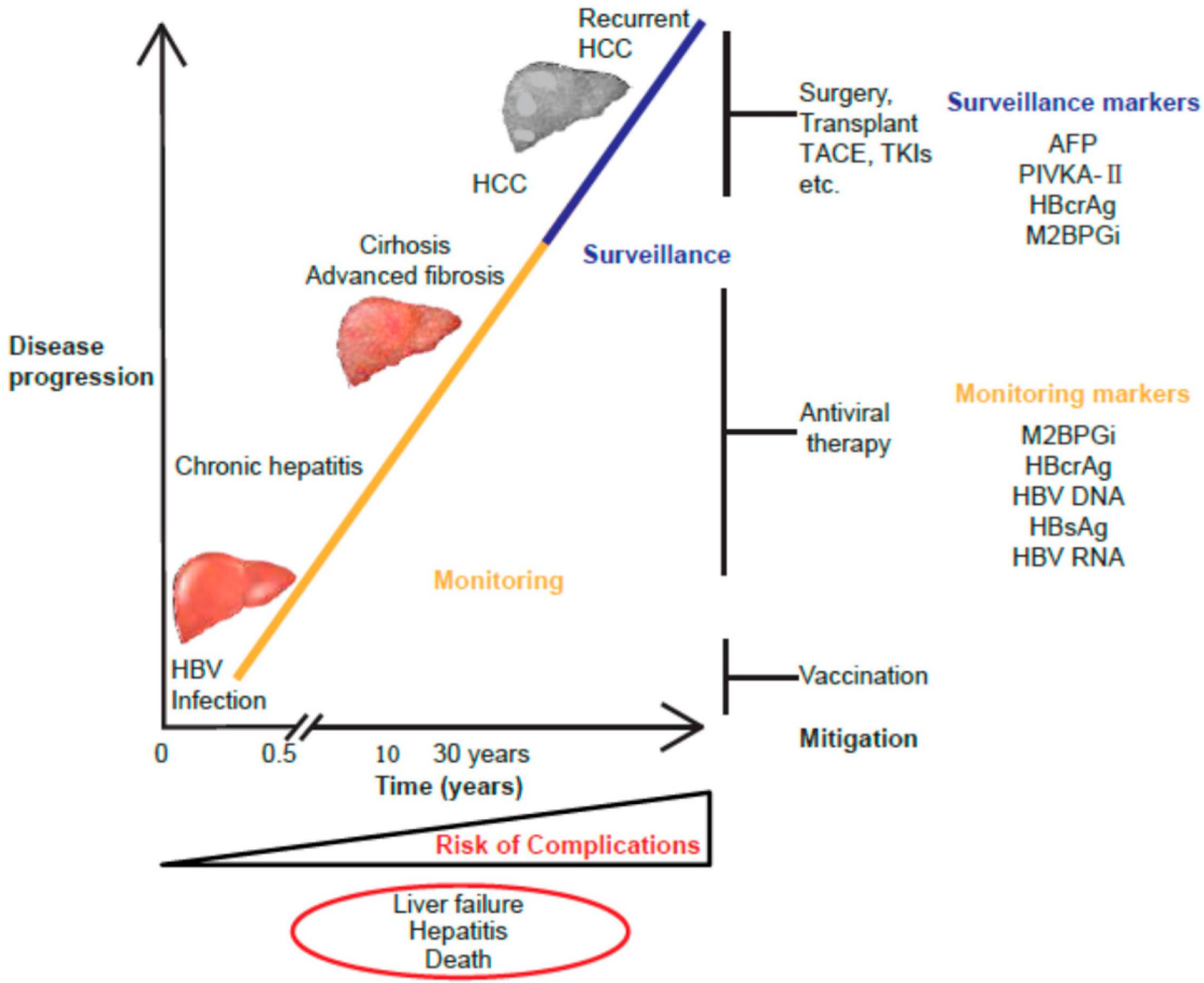
1 IN 12

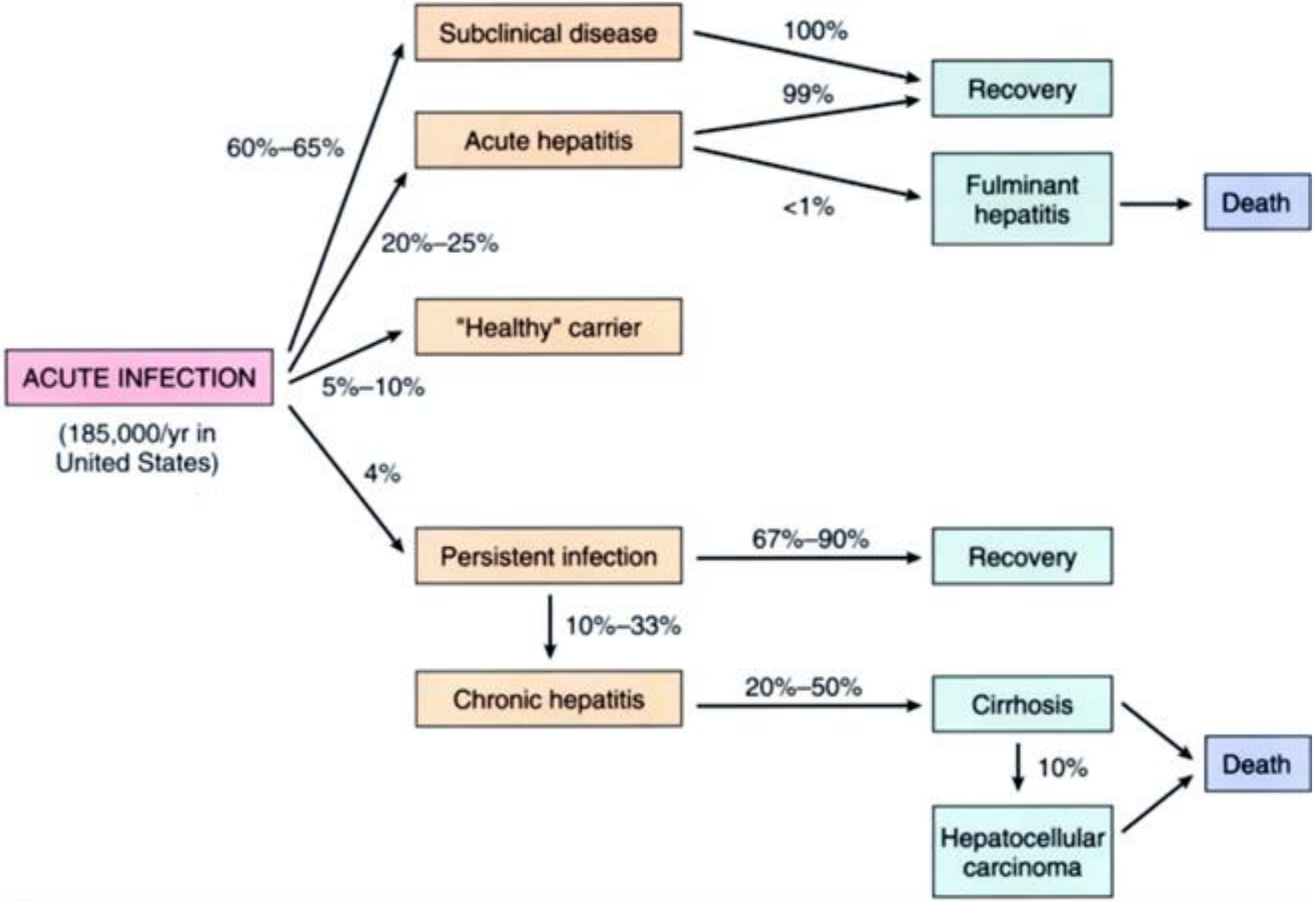
1 IN 12 ASIAN AMERICANS is infected with Hepatitis B and most don't know it.

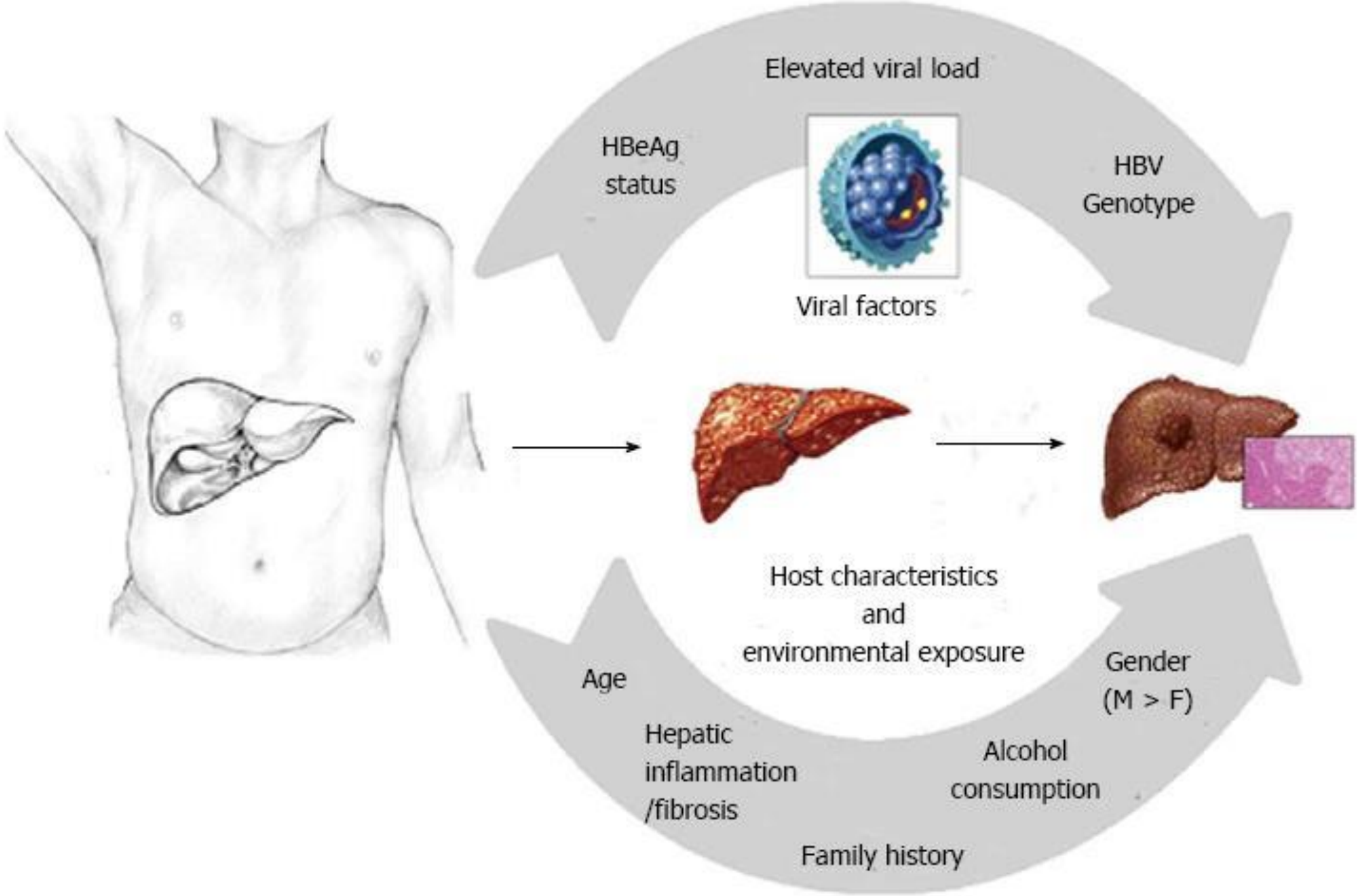
Most people born in Asia who have Hepatitis B were infected as **INFANTS OR YOUNG CHILDREN.**

Hepatitis B is the **LEADING CAUSE OF LIVER CANCER** among Asian Americans.

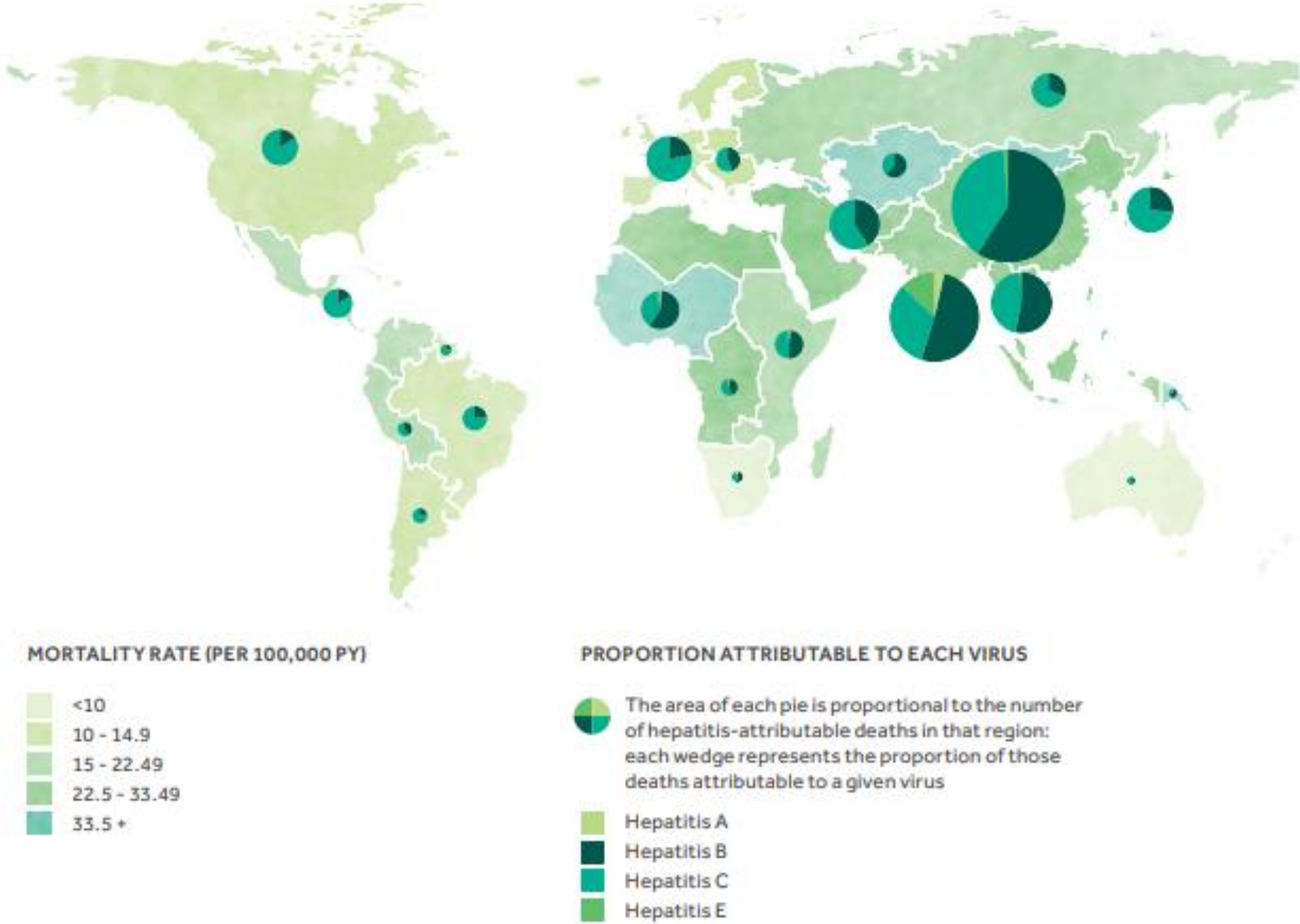
Chronic hepatitis B virus (HBV) infection related to liver disease progression



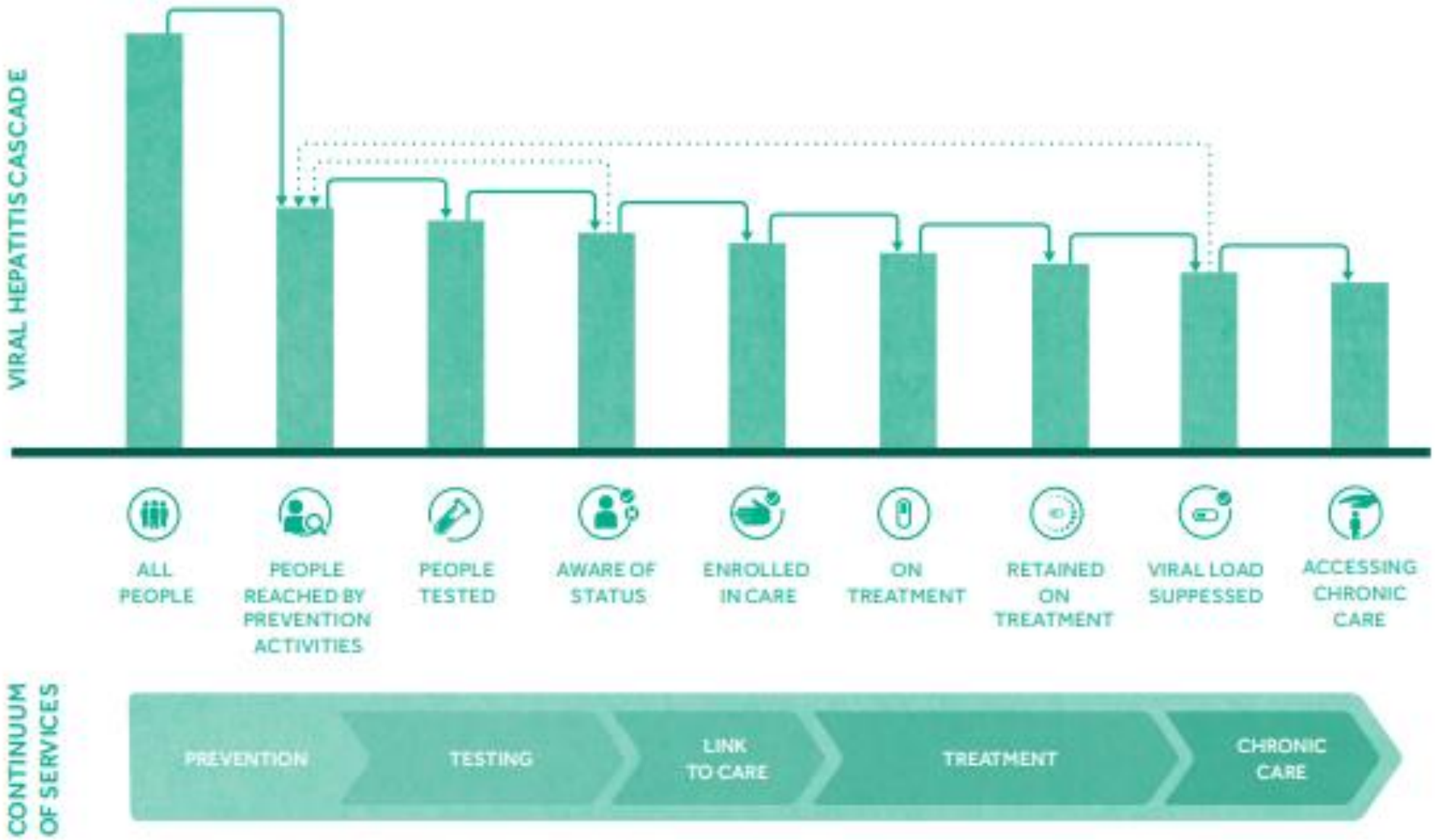

ACUTE INFECTION
(185,000/yr in United States)
60%–65%
20%–25%
5%–10%
4%
Subclinical disease
Acute hepatitis
"Healthy" carrier
Persistent infection
Chronic hepatitis
100%
99%
<1%
Recovery
Fulminant hepatitis
Death
67%–90%
Recovery
10%–33%
20%–50%
Cirrhosis
10%
Hepatocellular carcinoma
Death


Elevated viral load
HBeAg status
HBV Genotype
Viral factors
Host characteristics and environmental exposure
Age
Gender (M > F)
Hepatic inflammation /fibrosis
Alcohol consumption
Family history

Regional distribution of viral hepatitis deaths



The continuum of viral hepatitis services and the retention cascade



ELIMINATION OF HEPATITIS B VIRAL INFECTION

1. Global action, national plans
2. Testing
3. Treatment
4. Hepatitis B immunization
5. Preventing mother-to-child transmission
6. Blood safety
7. Harm reduction

GLOBALLY, LESS THAN

5%

OF PERSONS LIVING WITH CHRONIC VIRAL HEPATITIS ARE AWARE OF THEIR STATUS

TESTING

POC STI Tests: Available and Pipeline*

OncoE6™
Arbor Vita Corp.
HPV

careHPV™
Qiagen
HPV

GeneXpert®
Cepheid
CT/NG, TV, HPV

Solana®
Quidel
TV

Truelab™ PCR
Molbio/bigTec
CT, NG, TV, HPV

NEDxA®
GENOMICA
HPV - 2020

ID NOW™
Abbott
CT/NG - 2020

Accula Dock
Mesa Biotech
CT/NG/TV

Lucira Health
CT/NG

io™
binx health
CT/NG – 2019
MSTI (CT/NG/TV/MG)

SAMBA II
DRW
CT/NG - 2020

GynTect®
Oncgnostics/BLINK
HPV

XenoStrip-Tv™,

OSOM®
RDTs for TV

STI Array
Vivalytic/Bosch
MSTI (CT/NG/TV/MG)

Q-POC™
QuantuMDx®
HPV – 2020
CT/NG/TV/MG

GeneXpert®
Omni
HPV

RT CPA
Ustar
CT

Prior to 2015 | 2015 | 2016 | 2017/18 | 2019 and beyond

*Estimated as of June 2019 - timeline and sequence may change.

----- No market launch date set by company.

TREATMENT

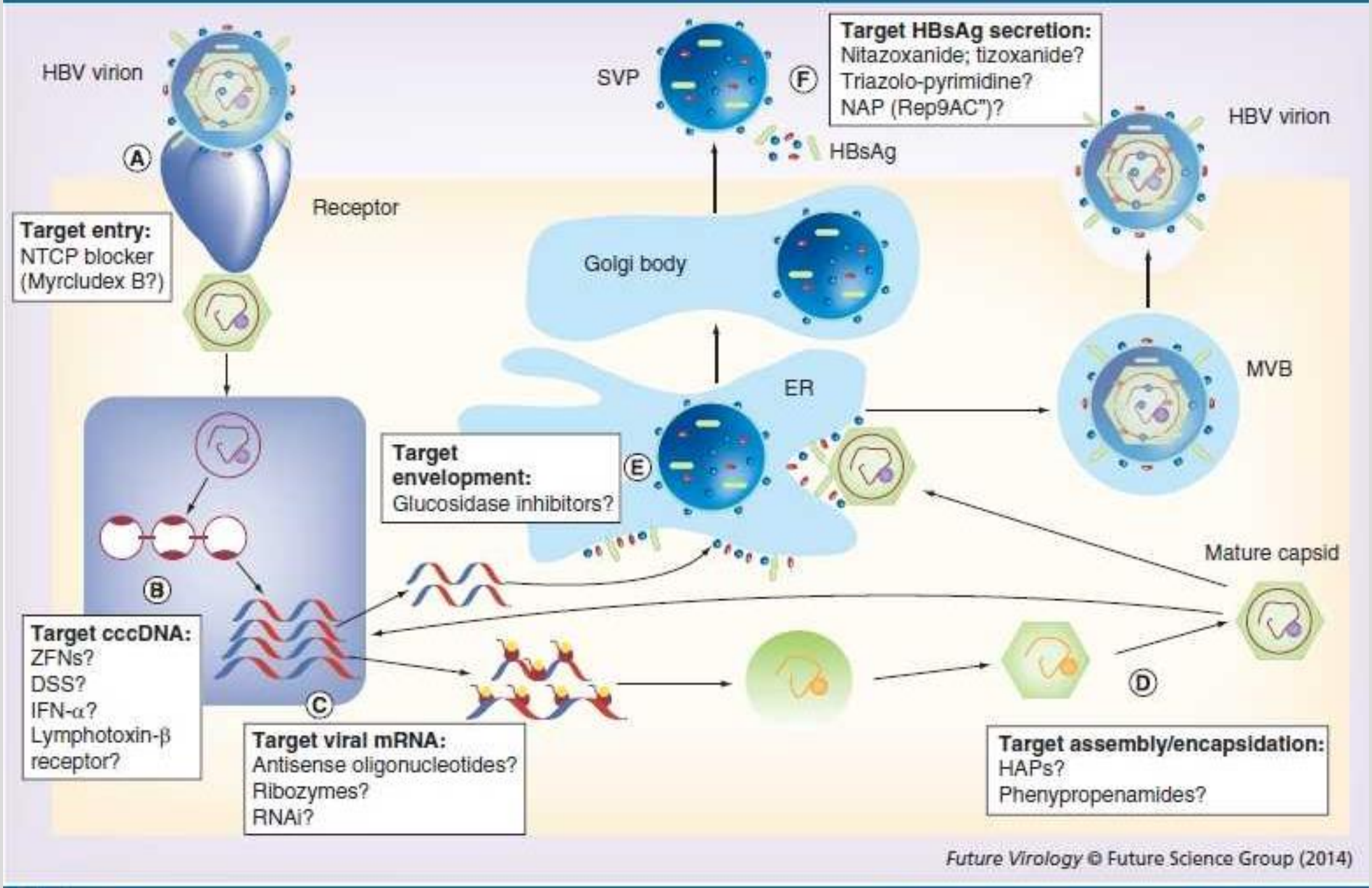
IN 2015 LESS THAN

1%

OF PEOPLE WITH CHRONIC HEPATITIS INFECTION WERE RECEIVING TREATMENT

Goals of Hepatitis B Treatment

- Prevention of long-term negative clinical outcomes (eg, cirrhosis, HCC, death) by durable suppression of HBV DNA
- Remission of liver disease
- Primary treatment endpoint
  - Sustained decrease in serum HBV DNA level to low or undetectable
- Secondary treatment endpoints
  - Decrease or normalize serum ALT
  - Induce HBeAg loss or seroconversion
  - Induce HBsAg loss or seroconversion
  - Improve liver histology


HBV virion
A
Receptor
Target entry:
NTCP blocker
(Myrcludex B?)
SVP
F
Target HBsAg secretion:
Nitazoxanide; tizoxanide?
Triazolo-pyrimidine?
NAP (Rep9AC")?
HBsAg
HBV virion
Golgi body
ER
MVB
Target envelopment:
Glucosidase inhibitors?
E
Mature capsid
B
Target cccDNA:
ZFNs?
DSS?
IFN-α?
Lymphotoxin-β receptor?
C
Target viral mRNA:
Antisense oligonucleotides?
Ribozymes?
RNAi?
D
Target assembly/encapsidation:
HAPs?
Phenypropenamides?
Future Virology © Future Science Group (2014)

Clinical Practice Guidelines

EASL JOURNAL OF HEPATOLOGY

EASL 2017 Clinical Practice Guidelines on the management of hepatitis B virus infection☆

European Association for the Study of the Liver*

Summary

Hepatitis B virus (HBV) infection remains a global public health problem with changing epidemiology due to several factors including vaccination policies and migration. This Clinical Practice Guideline presents updated recommendations for the optimal management of HBV infection. Chronic HBV infection can infection require specific focus. Future treatment strategies to achieve 'cure' of disease and new biomarkers are discussed.

Medical Errors

HEPATOLOGY

AASLD

PRACTICE GUIDANCE | HEPATOLOGY, VOL. 67, NO. 4, 2018

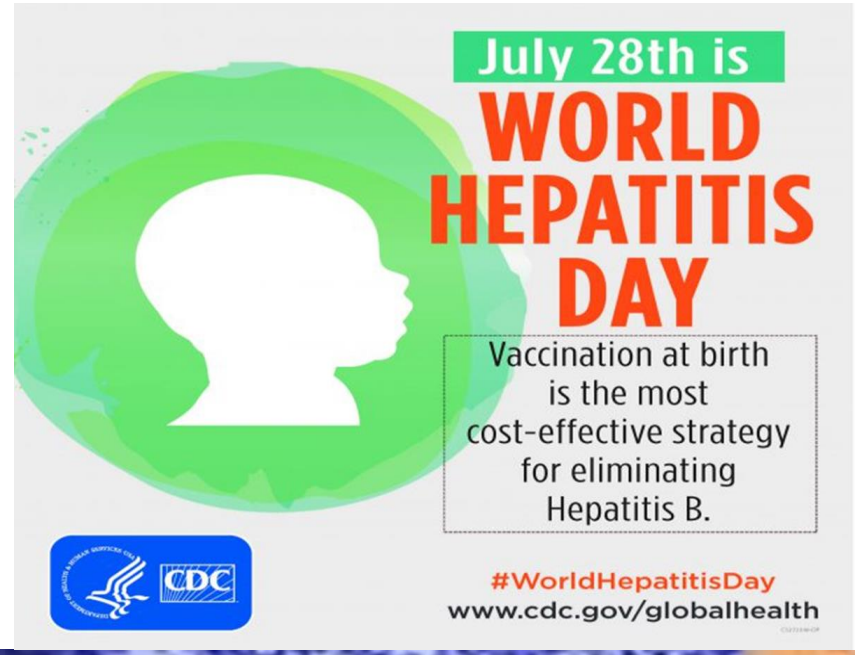
Update on Prevention, Diagnosis, and Treatment of Chronic Hepatitis B: AASLD 2018 Hepatitis B Guidance

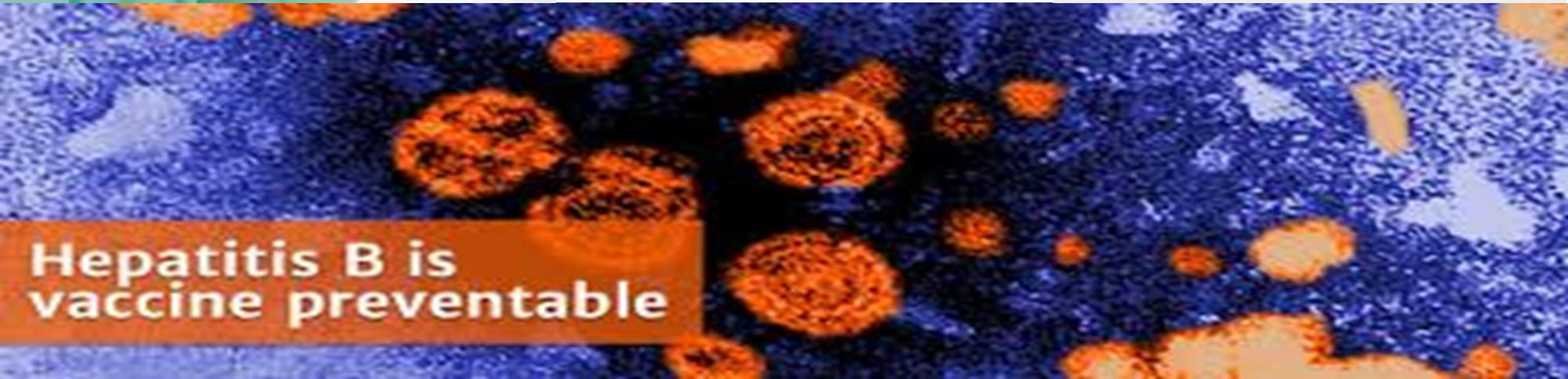
Norah A. Terrault,[1] Anna S.F. Lok,[2] Brian J. McMahon,[3] Kyong-Mi Chang,[4] Jessica P. Hwang,[5] Maureen M. Jonas,[6] Robert S. Brown Jr.,[7] Natalie H. Bzowej,[8] and John B. Wong[9]

Purpose and Scope of the Guidance

This AASLD 2018 Hepatitis B Guidance is intended to complement the AASLD 2016 Practice Guidelines for Treatment of Chronic Hepatitis B[(1)] and update the previous hepatitis B virus (HBV) hepatitis B. It differs from the published 2016 AASLD *guidelines*, which conducted systematic reviews and used a multidisciplinary panel of experts to rate the quality (level) of the evidence and the strength of each recommendation using the Grading of Recommendations Assessment, Development and Evaluation system in support of guideline recommendations.[(1–4)] In contrast, this *guidance* document was developed by

Hepatitis B immunization





Hepatitis B Shots Are Recommended for All New Babies

Hepatitis B is preventable! Make sure your baby gets vaccinated in the hospital at birth.

Recommended doses of currently licensed formulations of hepatitis B vaccine, by age group and vaccine type

	Single-antigen vaccine				Combination vaccine					
	Recombivax HB		Engerix-B		Comvax*		Pediarix†		Twinrix§	
Age group	Dose (μg)¶	Volume (mL)	Dose (μg)¶	Volume (mL)	Dose (μg)¶	Volume (mL)	Dose (μg)¶	Volume (mL)	Dose (μg)¶	Volume (mL)
Infants (<1 yr)	5	0.5	10	0.5	5	0.5	10	0.5	NA**	NA
Children (1–10 yrs)	5	0.5	10	0.5	5*	0.5	10†	0.5	NA	NA
Adolescents										
11–15 yrs	10††	1.0	NA	NA	NA	NA	NA	NA	NA	NA
11–19 yrs	5	0.5	10	0.5	NA	NA	NA	NA	NA	NA
Adults (≥20 yrs)	10	1.0	20	1.0	NA	NA	NA	NA	20§	1.0
Hemodialysis patients and other immunocompromised persons										
<20 yrs§§	5	0.5	10	0.5	NA	NA	NA	NA	NA	NA
≥20 yrs	40¶¶	1.0	40***	2.0	NA	NA	NA	NA	NA	NA

* Combined hepatitis B–*Haemophilus influenzae* type b conjugate vaccine. This vaccine cannot be administered at birth, before age 6 weeks, or after age 71 months.

† Combined hepatitis B–diphtheria, tetanus, and acellular pertussis-inactivated poliovirus vaccine. This vaccine cannot be administered at birth, before age 6 weeks, or at age ≥7 years.

§ Combined hepatitis A and hepatitis B vaccine. This vaccine is recommended for persons aged ≥18 years who are at increased risk for both hepatitis B virus and hepatitis A virus infections.

¶ Recombinant hepatitis B surface antigen protein dose.

** Not applicable.

†† Adult formulation administered on a 2-dose schedule.

§§ Higher doses might be more immunogenic, but no specific recommendations have been made.

¶¶ Dialysis formulation administered on a 3-dose schedule at age 0, 1, and 6 months.

*** Two 1.0-mL doses administered at one site, on a 4-dose schedule at age 0, 1, 2, and 6 months.

VACCINE INFORMATION STATEMENT

Hepatitis B Vaccine

What You Need to Know

Many Vaccine Information Statements are available in Spanish and other languages. See www.immunize.org/vis

Hojas de Información Sobre Vacunas están disponibles en Español y en muchos otros idiomas. Visite http://www.immunize.org/vis

1 What is hepatitis B?

Hepatitis B is a serious infection that affects the liver. It is caused by the hepatitis B virus.

- In 2009, about 38,000 people became infected with hepatitis B.
- Each year about 2,000 to 4,000 people die in the United States from cirrhosis or liver cancer caused by hepatitis B.

Hepatitis B can cause:

Acute (short-term) illness. This can lead to:

- loss of appetite
- diarrhea and vomiting
- tiredness
- jaundice (yellow skin or eyes)
- pain in muscles, joints, and stomach

Acute illness, with symptoms, is more common among adults. Children who become infected usually do not have symptoms.

Chronic (long-term) infection. Some people go on to develop chronic hepatitis B infection. Most of them do not have symptoms, but the infection is still very serious, and can lead to:

- liver damage (cirrhosis)
- liver cancer
- death

Chronic infection is more common among infants and children than among adults. People who are chronically infected can spread hepatitis B virus to others, even if they don't look or feel sick. Up to 1.4 million people in the United States may have chronic hepatitis B infection.

Hepatitis B virus is easily spread through contact with the blood or other body fluids of an infected person. People can also be infected from contact with a contaminated object, where the virus can live for up to 7 days.

- A baby whose mother is infected can be infected at birth;
- Children, adolescents, and adults can become infected by:
  - contact with blood and body fluids through breaks in the skin such as bites, cuts, or sores;
  - contact with objects that have blood or body fluids on them such as toothbrushes, razors, or monitoring and treatment devices for diabetes;
  - having unprotected sex with an infected person;
  - sharing needles when injecting drugs;
  - being stuck with a used needle.

2 Hepatitis B vaccine: Why get vaccinated?

Hepatitis B vaccine can prevent hepatitis B, and the serious consequences of hepatitis B infection, including liver cancer and cirrhosis.

Hepatitis B vaccine may be given by itself or in the same shot with other vaccines.

Routine hepatitis B vaccination was recommended for some U.S. adults and children beginning in 1982, and for all children in 1991. Since 1990, new hepatitis B infections among children and adolescents have dropped by more than 95% – and by 75% in other age groups.

Vaccination gives long-term protection from hepatitis B infection, possibly lifelong.

3 Who should get hepatitis B vaccine and when?

Children and Adolescents

- Babies normally get 3 doses of hepatitis B vaccine:
  - 1st Dose: Birth
  - 2nd Dose: 1-2 months of age
  - 3rd Dose: 6-18 months of age

Some babies might get 4 doses, for example, if a combination vaccine containing hepatitis B is used. (This is a single shot containing several vaccines.) The extra dose is not harmful.

- Anyone through 18 years of age who didn't get the vaccine when they were younger should also be vaccinated.

Adults

- All unvaccinated adults at risk for hepatitis B infection should be vaccinated. This includes:
  - sex partners of people infected with hepatitis B,
  - men who have sex with men,
  - people who inject street drugs,
  - people with more than one sex partner,
  - people with chronic liver or kidney disease,
  - people under 60 years of age with diabetes,
  - people with jobs that expose them to human blood or other body fluids,
  - household contacts of people infected with hepatitis B,
  - residents and staff in institutions for the developmentally disabled,
  - kidney dialysis patients,
  - people who travel to countries where hepatitis B is common,
  - people with HIV infection.
- Other people may be encouraged by their doctor to get hepatitis B vaccine; for example, adults 60 and older with diabetes. Anyone else who wants to be protected from hepatitis B infection may get the vaccine.
- Pregnant women who are at risk for one of the reasons stated above should be vaccinated. Other pregnant women who want protection may be vaccinated.

Adults getting hepatitis B vaccine should get 3 doses — with the second dose given 4 weeks after the first and the third dose 5 months after the second. Your doctor can tell you about other dosing schedules that might be used in certain circumstances.

4 Who should not get hepatitis B vaccine?

- Anyone with a life-threatening allergy to yeast, or to any other component of the vaccine, should not get hepatitis B vaccine. Tell your doctor if you have any severe allergies.
- Anyone who has had a life-threatening allergic reaction to a previous dose of hepatitis B vaccine should not get another dose.
- Anyone who is moderately or severely ill when a dose of vaccine is scheduled should probably wait until they recover before getting the vaccine.

Your doctor can give you more information about these precautions.

Note: You might be asked to wait 28 days before donating blood after getting hepatitis B vaccine. This is because the screening test could mistake vaccine in the bloodstream (which is not infectious) for hepatitis B infection.

5 What are the risks from hepatitis B vaccine?

Hepatitis B is a very safe vaccine. Most people do not have any problems with it.

The vaccine contains non-infectious material, and cannot cause hepatitis B infection.

Some mild problems have been reported:

- Soreness where the shot was given (up to about 1 person in 4).
- Temperature of 99.9°F or higher (up to about 1 person in 15).

Severe problems are extremely rare. Severe allergic reactions are believed to occur about once in 1.1 million doses.

A vaccine, like any medicine, could cause a serious reaction. But the risk of a vaccine causing serious harm, or death, is extremely small. More than 100 million people in the United States have been vaccinated with hepatitis B vaccine.

6 What if there is a moderate or severe reaction?

What should I look for?

- Any unusual condition, such as a high fever or unusual behavior. Signs of a serious allergic reaction can include difficulty breathing, hoarseness or wheezing, hives, paleness, weakness, a fast heart beat or dizziness.

What should I do?

- **Call** a doctor, or get the person to a doctor right away.
- **Tell** your doctor what happened, the date and time it happened, and when the vaccination was given.
- **Ask** your doctor, nurse, or health department to report the reaction by filing a Vaccine Adverse Event Reporting System (VAERS) form. Or you can file this report through the VAERS web site at **www.vaers.hhs.gov**, or by calling **1-800-822-7967**.

VAERS does not provide medical advice.

7 The National Vaccine Injury Compensation Program

The National Vaccine Injury Compensation Program (VICP) was created in 1986.

Persons who believe they may have been injured by a vaccine can learn about the program and about filing a claim by calling **1-800-338-2382** or visiting the VICP website at **www.hrsa.gov/vaccinecompensation**.

8 How can I learn more?

- Ask your doctor They can give you the vaccine package insert or suggest other sources of information.
- Call your local or state health department.
- Contact the Centers for Disease Control and Prevention (CDC):
  - Call **1-800-232-4636 (1-800-CDC-INFO)** or
  - Visit CDC's website at **www.cdc.gov/vaccines**

Vaccine Information Statement (Interim)
Hepatitis B Vaccine
2/2/2012
42 U.S.C. § 300aa-26

MYANMAR
National capital
Division or state capital
Town, village
Major airport
International boundary
Division or state boundary
Main road
Secondary road
Railroad
BHUTAN
INDIA
BANGLADESH
CHINA
VIET NAM
LAO PEOPLE'S DEMOCRATIC REPUBLIC
THAILAND
CAMBODIA
Bay of Bengal
Andaman Sea
Gulf of Thailand
KACHIN
SHAN STATE
CHIN STATE
MANDALAY
MAGWAY
RAKHINE STATE
BAGO
YANGON DIVISION
AYEYARWADY
MON STATE
TANINTHARYI
Naypyidaw
Yangon
Mandalay
Dhaka
Bangkok (Krung Thep)
Vientiane (Viangchan)
© Nations Online Project
0 100 200 300 km
0 100 200 mi

Preventing mother-to-child transmission

- Role of maternal HBV DNA (28wks) on transmision

Measurement of viral DNA has replaced eAg as the most sensitive test of viral activity.

- HBV DNA < 10^8 copies/mL= 0% transmission
- HBV DNA > 10^8 copies/mL= 32% transmission

World J Gastroenterol 2004; 10: 3215–7.

Aboubakr Elnashar

High-risk mothers who are seronegative
CDC, 2010

- Vaccine can be given during pregnancy.
- Her husband infected with hepatitis B,
- household contacts of people infected with hepatitis B
- Jobs that expose them to human blood or other body fluids
- travel to countries where hepatitis B is common
- Chronic liver or kidney disease,
- kidney dialysis patients
- Diabetes
- HIV infection.

Aboubakr Elnashar

Blood safety

WHO IS FIT TO DONATE BLOOD

- Healthy people with clean habits in the **age group of 18-65 can donate blood once in three months**
- Their **haemoglobin count should be over 12.5 g/dl**
- They must **weigh over 45 kg**

ANY BLOOD BANK MUST TEST THE DONATED BLOOD FOR FIVE DISEASES

HIV 1 and 2 | Hepatitis B | Hepatitis C | Malaria | Syphilis bacteria

HELP CENTRES

- Tamil Nadu State AIDS Control Society (TANSACS) supports **89 blood banks which are functioning in Government Hospitals across the state**
- The Integrated Counselling and Testing Centre (ICTC) is a gate-way, **entry point for a host of HIV/AIDS related services in prevention and care**
- **There are 2,163 centres that offer counselling** and testing services in the state

Harm reduction

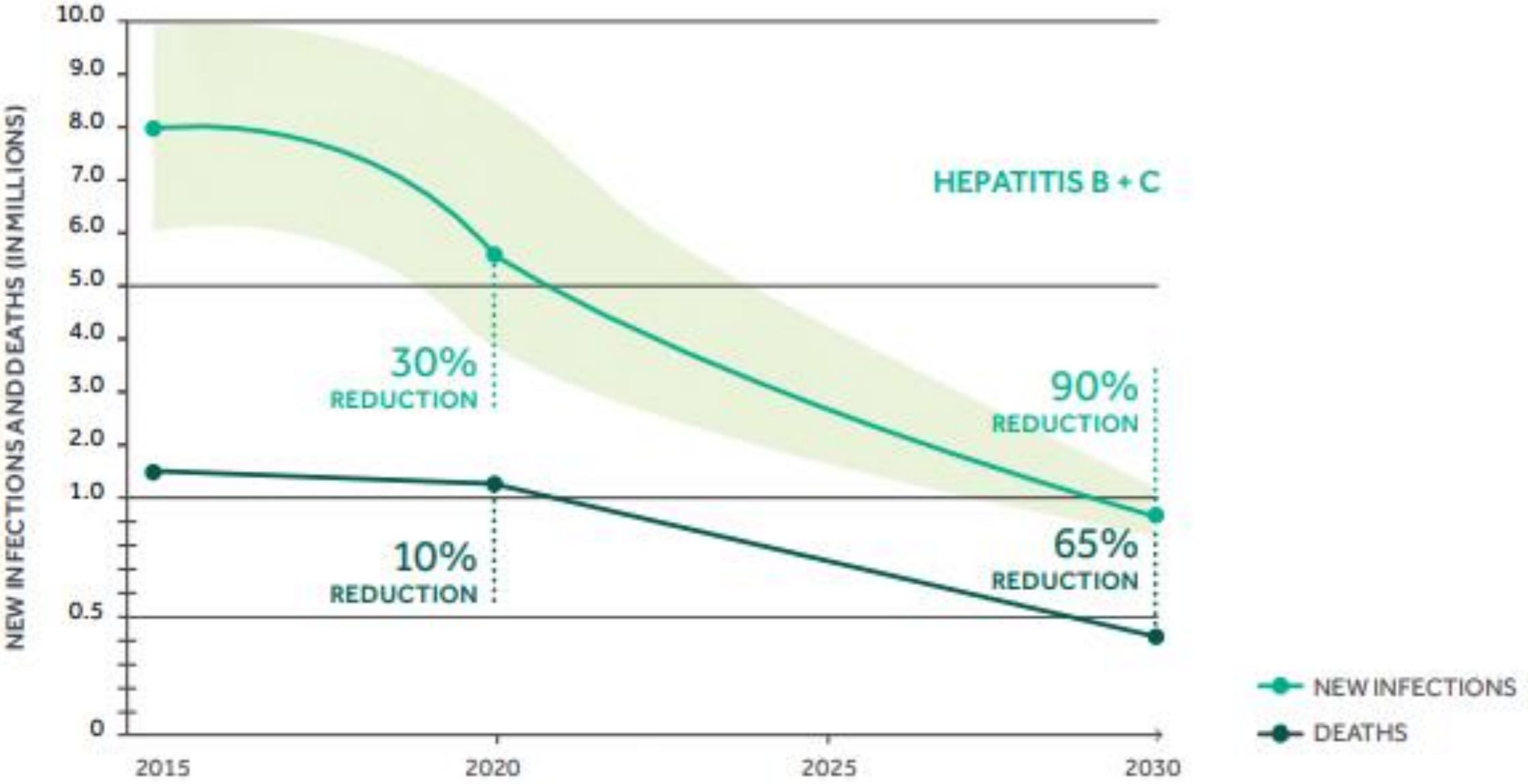
Myanmar makes progress in harm reduction measures

The Feasibility of Eliminating Hepatitis B as a Public Health Problem in the United States with Critical Factors for Success and Crosscutting Problems

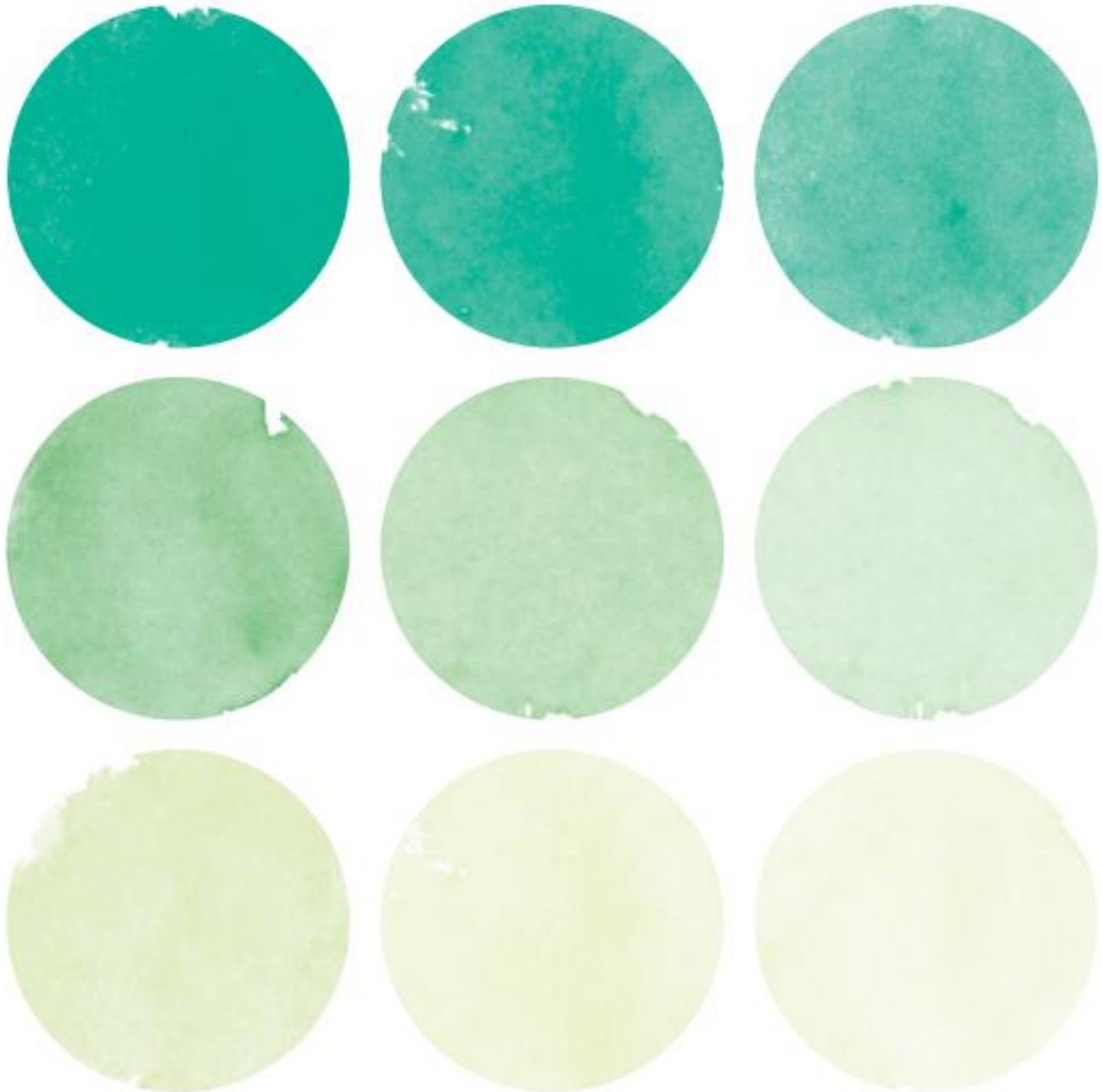
Goal		Feasibility	Critical Factors	Crosscutting Barriers
Ending Transmission	Perinatal	Highly feasible	• Identifying HBV-infected mothers • Consistent birth dosing with HBV vaccine	• Surveillance is sporadic and underfunded. • Vaccine tracking across jurisdictions is poor. • Stigma keeps people from screening and care. • Foreign-born adults can be difficult to reach with screening and treatment programs. • Much of the burden for managing chronic hepatitis B falls on overworked primary care providers. • There is a need to better understand the virus and the management of chronic hepatitis B.
	Children	Highly feasible	• Consistent vaccination and attention to catch-up dosing	
	Adults	Feasible	• No system for vaccinating adults • Undiagnosed, asymptomatic chronic infections a reservoir for infection	
Reducing morbidity and mortality attributable to ongoing infection	Slowing progression to cirrhosis	Feasible	• Need for physicians trained in the management of chronic HBV infection • The threat of reactivation in chronic or resolved infection • No available treatment eliminates cccDNA or cures the disease	
	Reducing deaths			

NOTE: cccDNA, covalently closed circular DNA; HBV, hepatitis B virus.

Targets for reducing new cases of and deaths from chronic viral hepatitis B and C infection



TOWARDS ENDING VIRAL HEPATITIS



TOWARDS ENDING VIRAL HEPATITIS

GLOBAL VISION

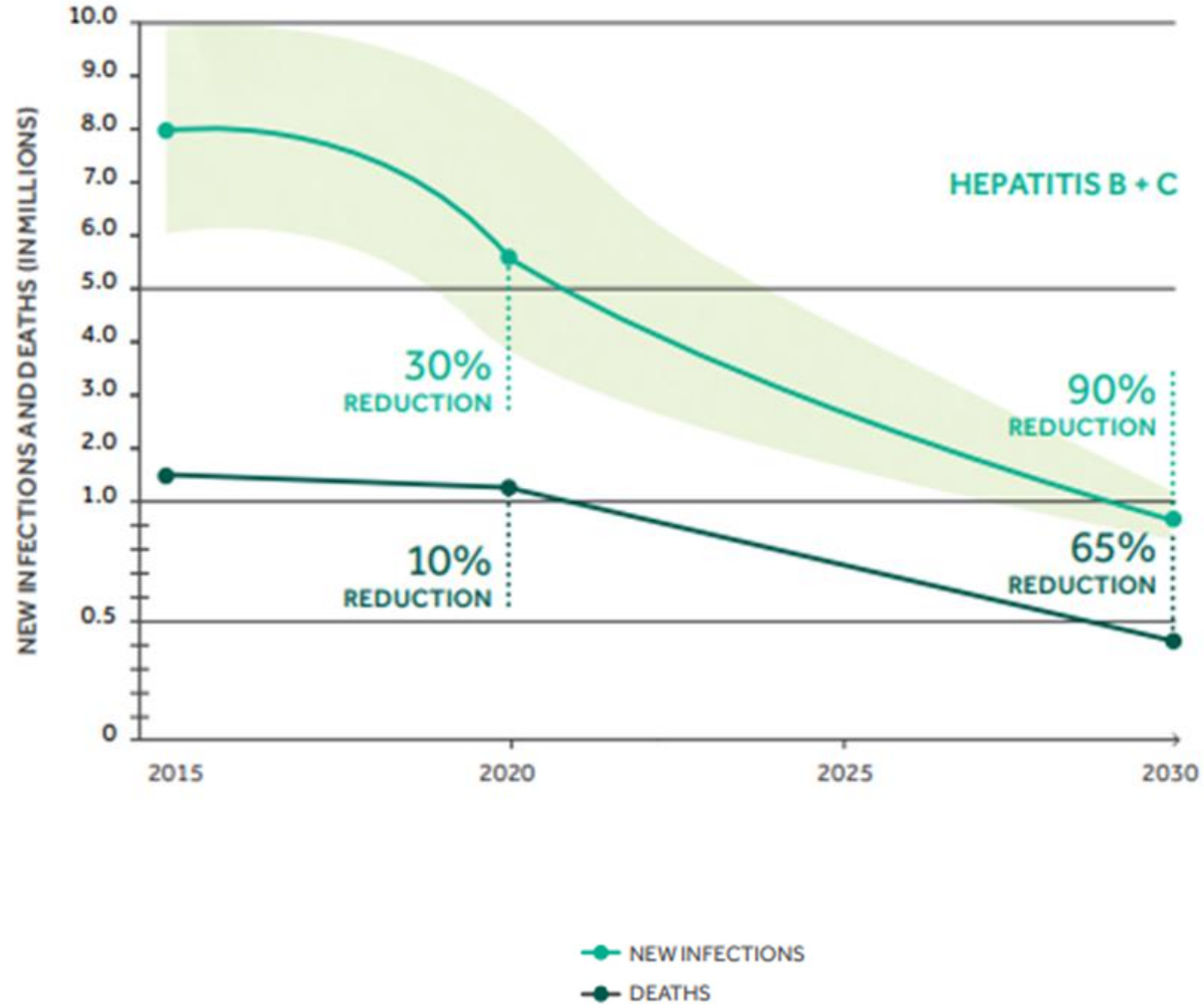
A world where viral hepatitis transmission is halted and everyone living with viral hepatitis has access to safe, affordable and effective prevention, care and treatment services.

GOAL

Eliminate viral hepatitis as a major public health threat by 2030.[8]

TARGETS FOR 2020 AND 2030

Countries can contribute to the elimination of viral hepatitis as a major global public health threat if they act with enough resolve to achieve a set of ambitious targets for 2020 and 2030. These targets (see Table 1) apply to everyone at risk of viral hepatitis infection: children, adolescents and adults; rich and poor; women and men; and all populations affected and at risk.



GLOBAL LEADERS HAVE RECOGNIZED VIRAL HEPATITIS AS AN INTERNATIONAL PUBLIC HEALTH AND DEVELOPMENT PRIORITY

Find The Missing Millions.

NOhep

NOhep.. Our Next Greatest Achievement

Taking action now will save 7 million lives by 2030

Join NOhep.. to make the elimination of viral hepatitis our next greatest achievement

THANK YOU

ELIMINATE ~~HEPATITIS~~

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