# Hepatitis B

## Are we on the path to elimination?

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Executive Board Member, World Hepatitis Alliance
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@swang8

May 23, 2018

NYC Viral Hepatitis Research Symposium

Saint Barnabas Medical Center
Center for Asian Health
華人醫療服務中心

RWJBarnabas HEALTH
Let's be healthy together.

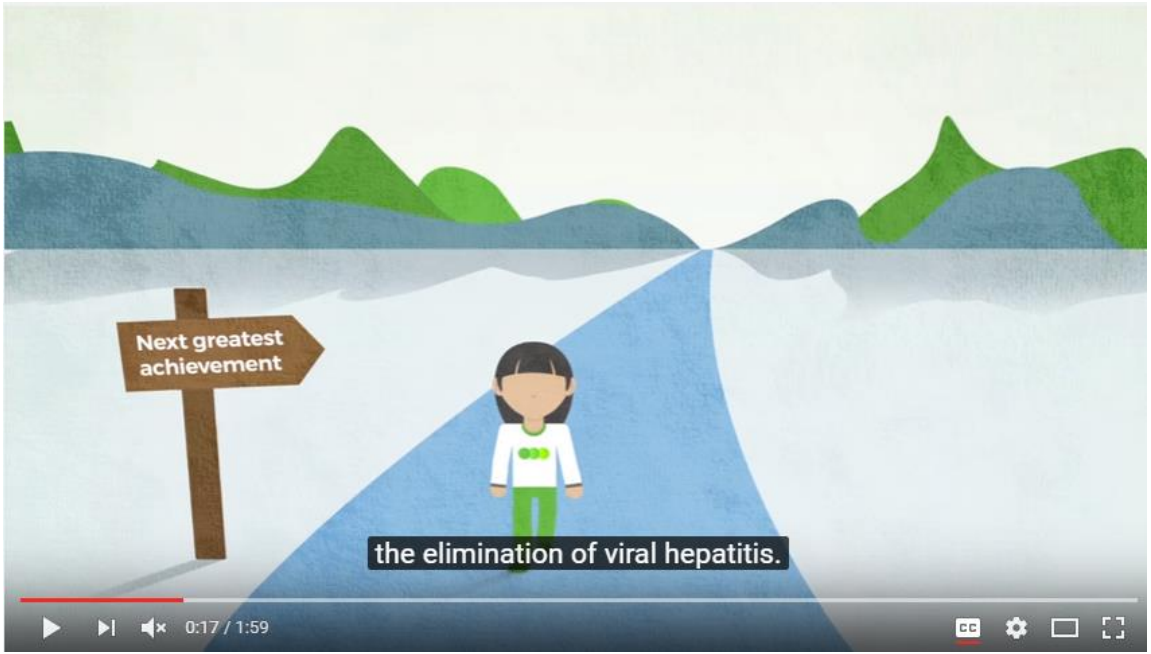
ELIMINATE ~~HEPATITIS~~

NOhep

WORLD HEPATITIS DAY

# May 2016: WHO Adopts Goal to Eliminate HBV by 2030

https://www.youtube.com/watch?v=cVttqfgExL0




World Hepatitis Alliance

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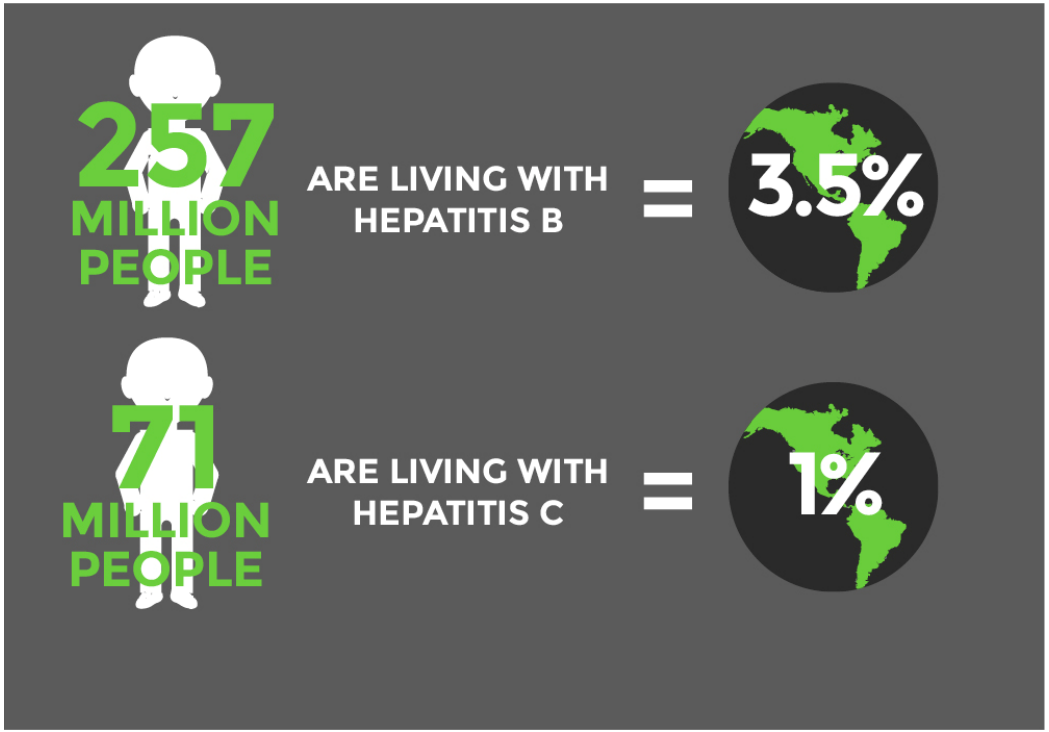


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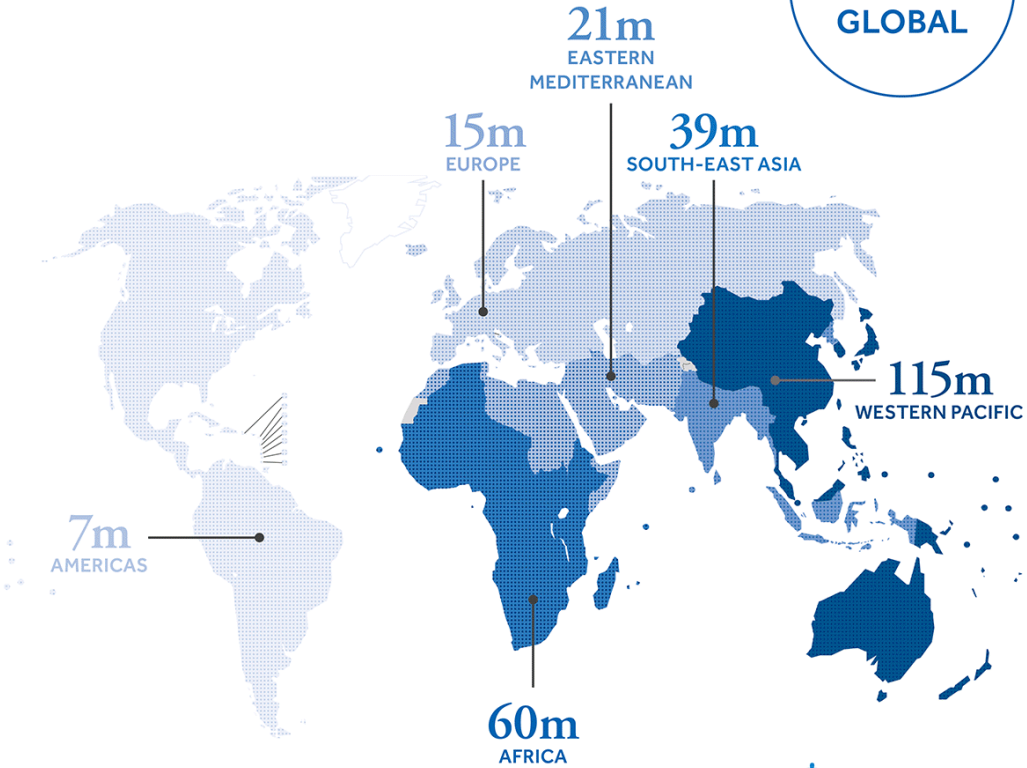
#WorldHepatitisDay

worldhepatitisday.org

# VIRAL HEPATITIS B IN THE WORLD

257m
GLOBAL




World Health Organization

# Worldwide Burden of Hepatitis B

- **260 Million with chronic hepatitis B (CHB) infection in the world**[1]
  - More prevalent than HIV (37M) and HCV (71M) globally
    - WPRO- 6.2% of adult infection has HBV
    - AFRO-6.1%
    - EMRO- 3.2%
  - Only 22 M (9%) know their diagnosis

- **Chronic hepatitis B is #1 leading cause of primary liver cancer (hepatocellular carcinoma) worldwide**[2]
  - 887,000 total deaths in 2015 due to Hep B, including HCC and cirrhosis


1. IOM (Institute of Medicine). 2010. *Hepatitis and Liver Cancer: A National Strategy for Prevention and Control of Hepatitis B and C.* Washington, DC: The National Academies Press
2. El-Serag HB, Mason AC. Risk factors for the rising rates of primary liver cancer in the United States. Arch Intern Med. 2000;160(21):3227-30

World Hepatitis Alliance

# ELIMINATE ~~HEPATITIS~~

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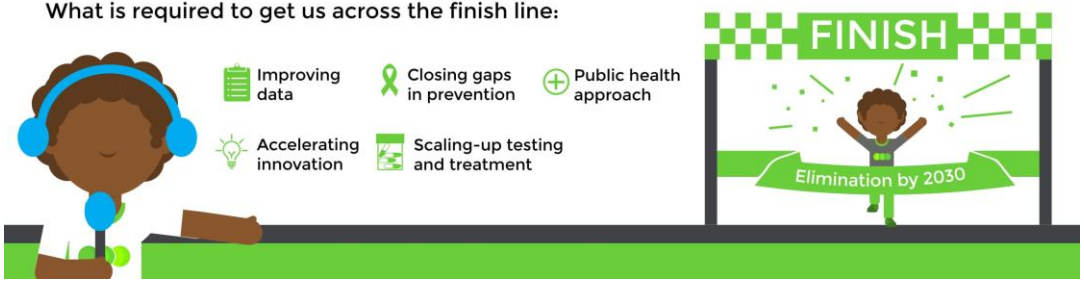
## *The race to elimination by 2030*


## Commentary and Analysis

### What is required to get us across the finish line:



# Chronic Hepatitis B Infection

**Active Hepatitis** →

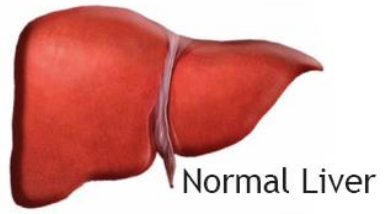
- Inflammation of liver from host immune response to virus presence in liver

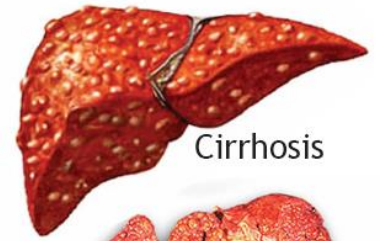
**Cirrhosis** →

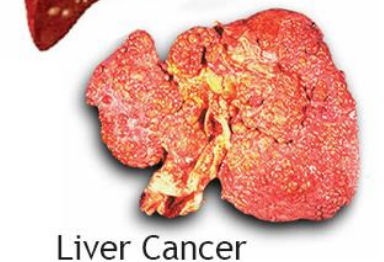
- Develops from chronic inflammation
- Fibrosis and cirrhotic nodules develop
- Leads to liver failure

**Liver Cancer** →

- Tumors can arise from cirrhotic or noncirrhotic livers

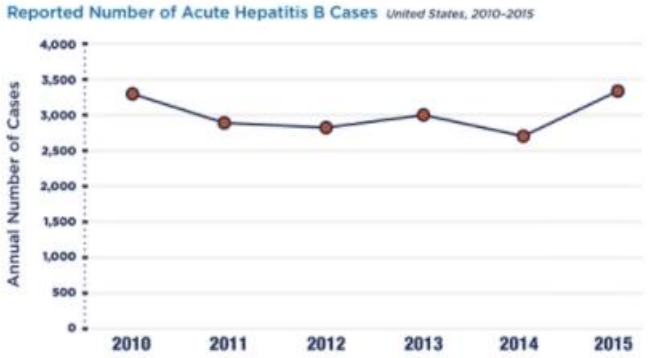


# We are Losing Ground in the Fight Against New Viral Hepatitis Infections

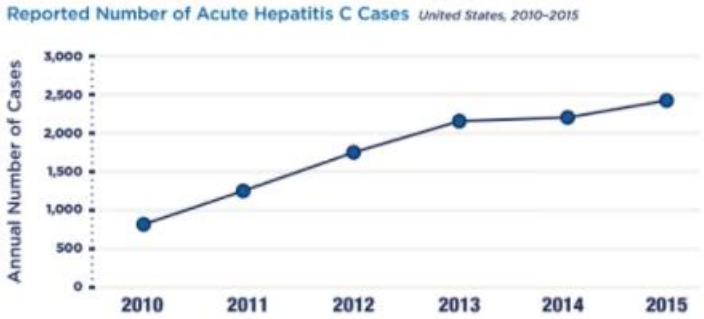
**Reported Number of Acute Hepatitis B Cases 2010 - 2015**

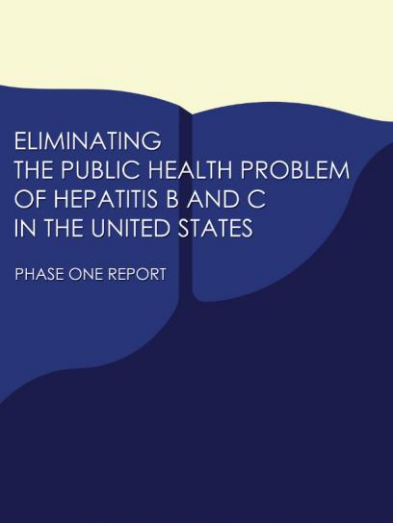



- National progress on hepatitis B prevention has stalled

- New hepatitis C infections increased almost 300% from 2010 – 2015

**Reported Number of Acute Hepatitis C Cases 2010 - 2015**

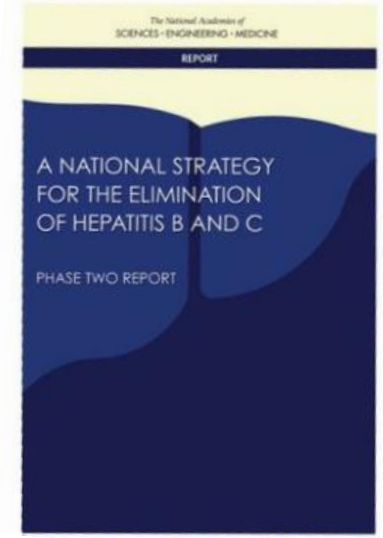


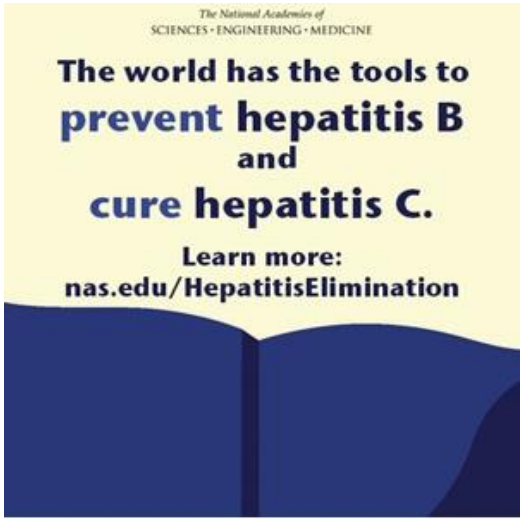



# Viral Hepatitis Elimination in the US: The National Academy of Science Report Phase I (2016) Phase II (2017)

**"We have the tools to eliminate, but will require significant resource allocation, commitment and strategy"**

Committee Chair, Dr. Brian Strom,
Chancellor of Rutgers Medical School



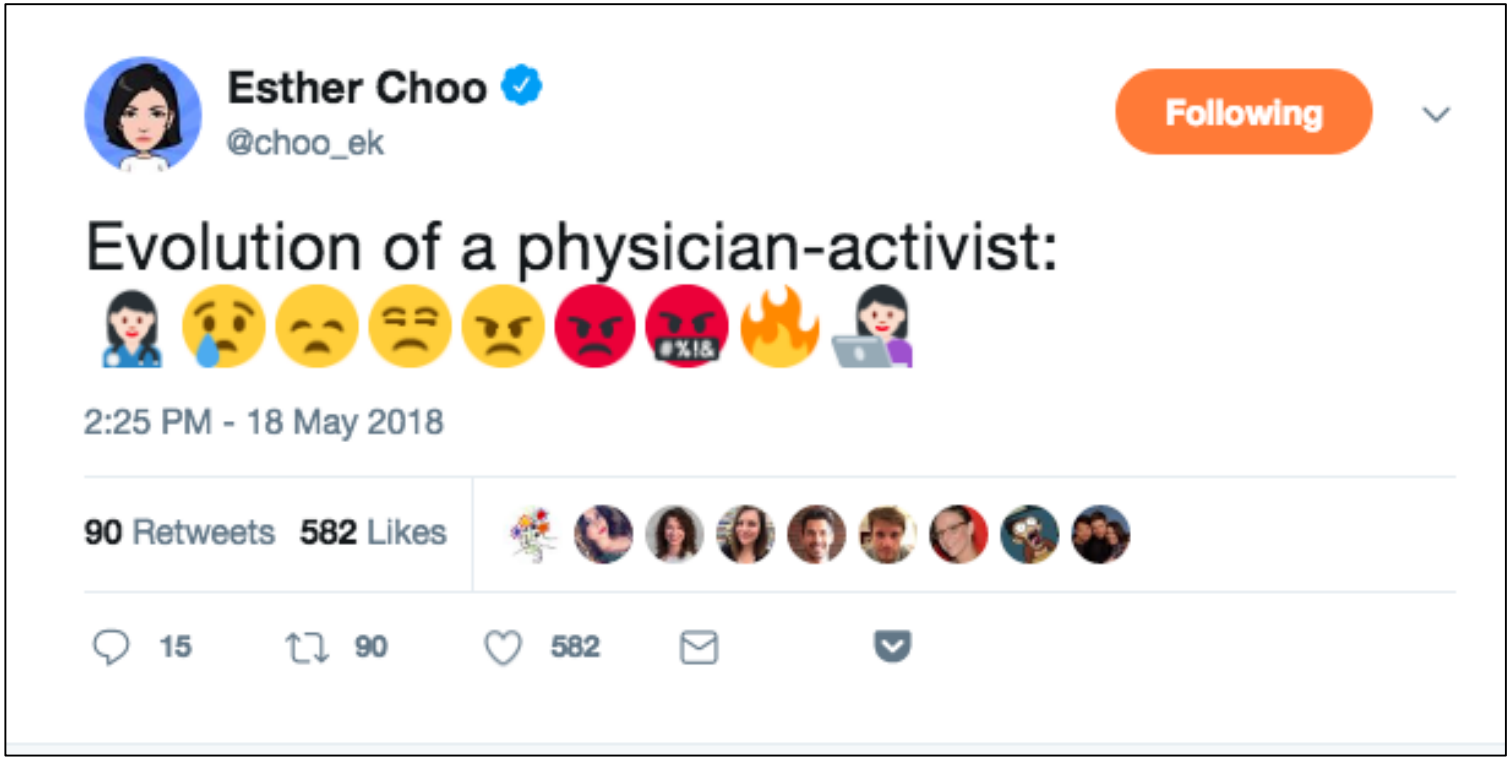



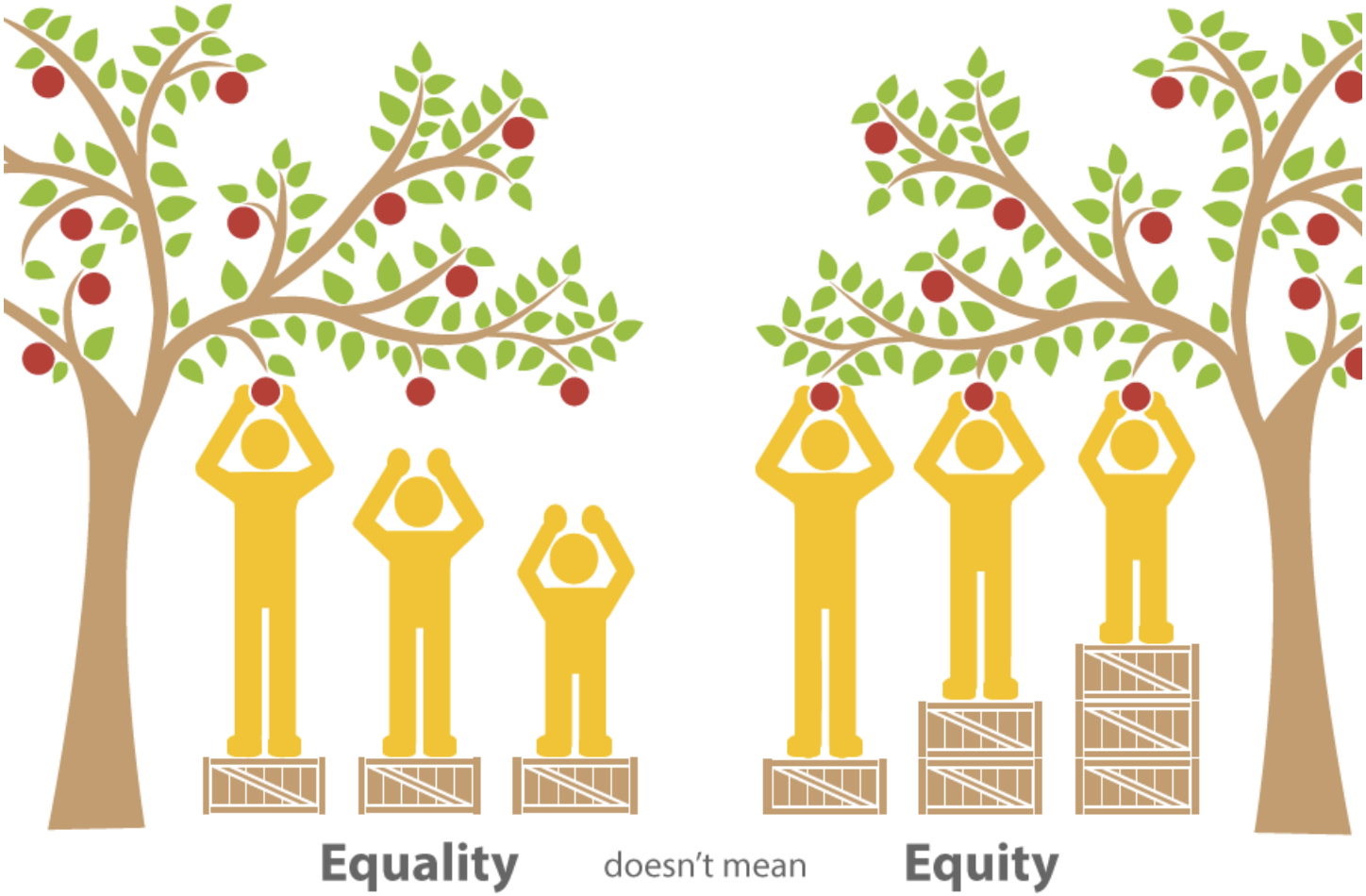
# Hepatitis is Underfunded

| Virus | US population | CDC NCHHSTP Budget '18 $1,127,000,000 |
|---|---|---|
| **HBV**<br>**HCV** | 0.8-2.2 million<br>2.7-3.5 million | **Division of Viral Hepatitis- $39 Million**<br>**3%** (for all viral hepatitis, domestic/international) |
| **HIV** | 1.1 million | **HIV/AIDS- $788 Million**<br>**69%** (domestic, not including international HIV work) |

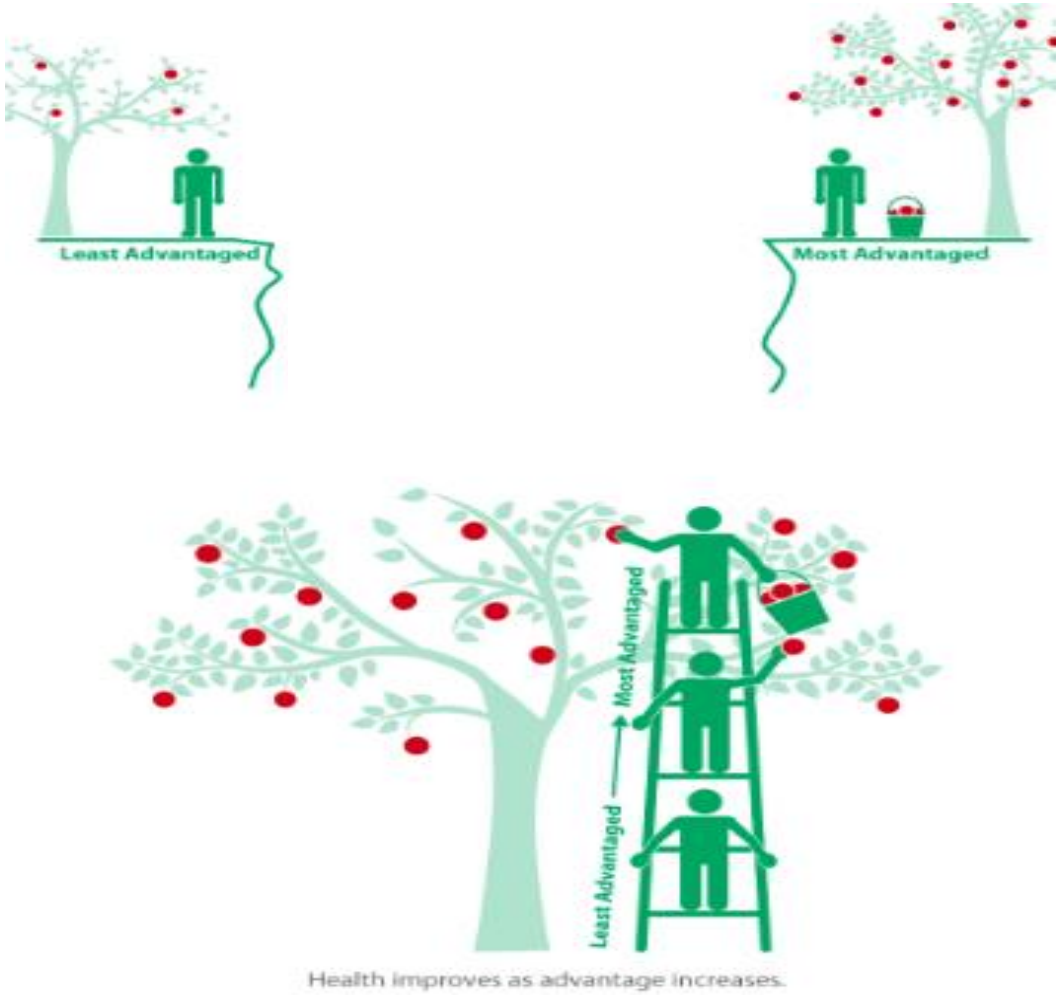
- Those affected are often the silent minorities, may not have political representation
- Health Disparity/Equity Issue
  - We have the tools-vaccine, medications for cure/treatment, medical knowledge
  - Those most at-risk are falling through the system

# My goal for this talk




Equality
doesn't mean
Equity

# Health Disparities



# HBV SCREENING

# Screening is the First Step

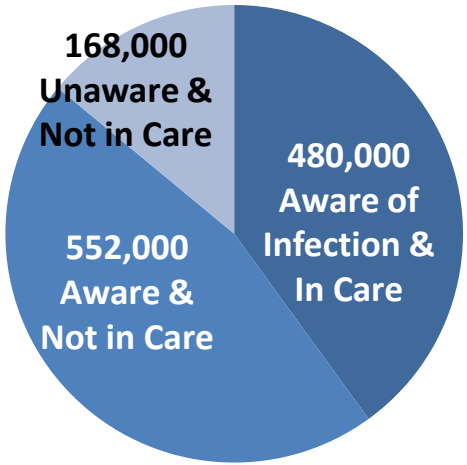
World Hepatitis Alliance


**Only 9% of those with viral hepatitis have been identified worldwide**

# Impact of national screening strategies: HIV vs HBV Care Cascade

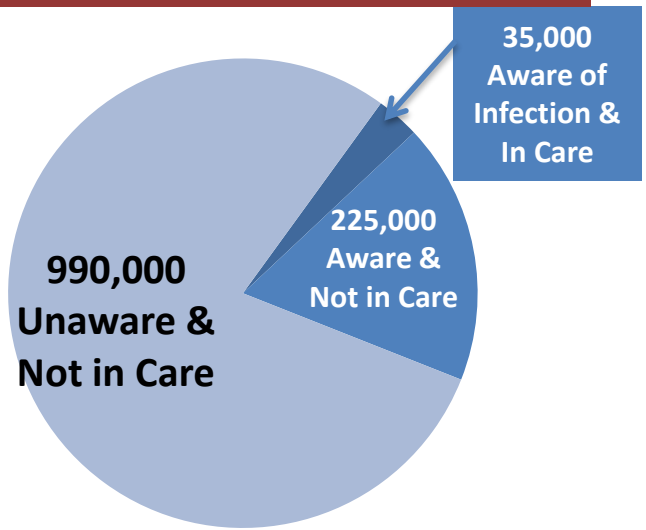
**1,200,000**
in US with **HIV**

**Routine Screening**
**One time for all adults, as of 2006**




**1,250,000**
in US with Chronic **HBV**
(low estimate)

**Risk-Based Screening**




HIV –CDC HIV Surveillance System & Monitoring Project, 2011 https://www.cdc.gov/vitalsigns/hiv-aids-medical-care/
HBV - Cohen, C. (2011) Is chronic hepatitis B being undertreated in the United States?. Journal of Viral Hepatitis, 18: 377–383

# Hepatitis B Screening Covered


- **2015 USPSTF upgrades HBV screening to grade B** (Grade B)
  - **Recommends HBV screening for at-risk populations**
  - **Must be covered by insurance plans as a preventative service**


- **October 2016, Medicare begins covering HBV screening under part A & part B**

# HBV Vaccination, Screening and Linkage to Care
# Best Practice Advice from ACP (American College of Physicians) & CDC
December 2017

ACP

Annals of Internal Medicine®

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CLINICAL GUIDELINES | 5 DECEMBER 2017

## Hepatitis B Vaccination, Screening, and Linkage to Care: Best Practice Advice From the American College of Physicians and the Centers for Disease Control and Prevention FREE

*Winston E. Abara, MD, PhD; Amir Qaseem, MD, PhD, MHA; Sarah Schillie, MD, MPH, MBA; Brian J. McMahon, MD; Aaron M. Harris, MD, MPH *; for the High Value Care Task Force of the American College of Physicians and the Centers for Disease Control and Prevention*

Article, Author, and Disclosure Information

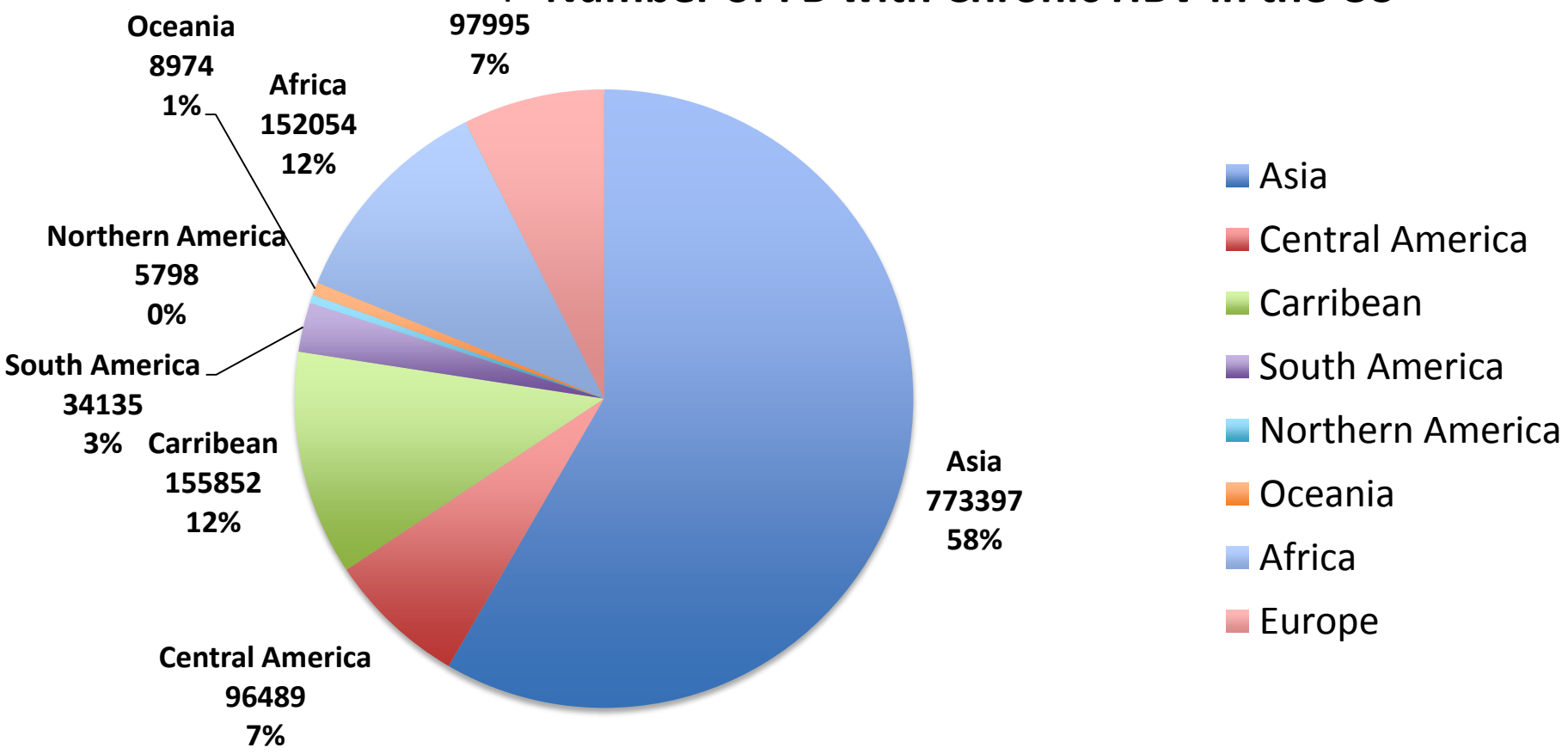
FULL ARTICLE

- Abstract
- Methods
- Vaccination
- Screening
- Linkage to Care
- Harms of Vaccination, Screening, and Linkage

### Abstract

**Background:** Vaccination, screening, and linkage to care can reduce the burden of chronic hepatitis B virus (HBV) infection. However, recommendations vary among organizations, and their implementation has been suboptimal. The American College of Physicians' High Value Care Task Force and the Centers for Disease Control and Prevention developed this article to present best practice statements for hepatitis B vaccination, screening, and linkage to care.

# Number of FB with Chronic HBV in the US

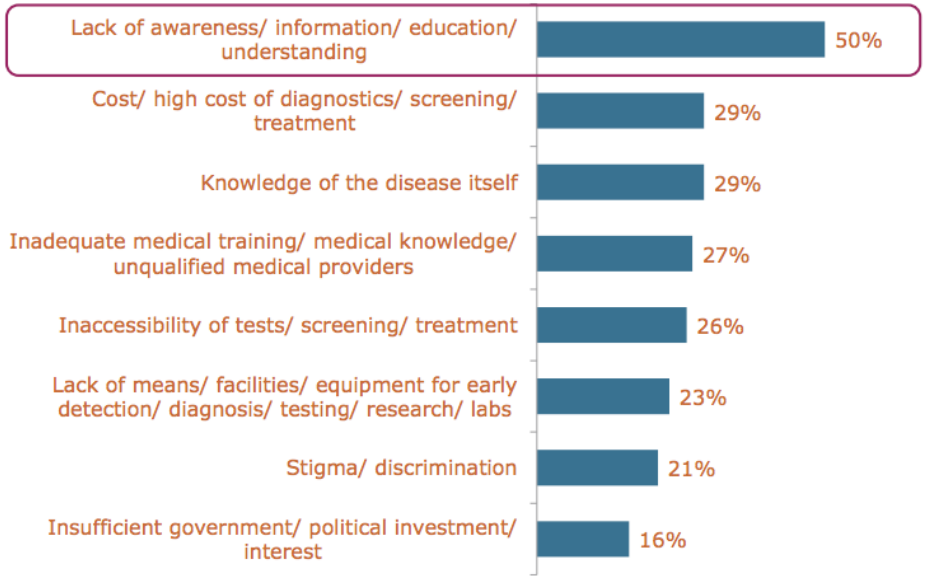



Kowdley KV, et al. *Hepatology.* 2012;56(2):422-433.

# World Hepatitis Alliance Survey on Barriers to Diagnosis: Finding the Missing Millions

## Lack of awareness of the virus was spontaneously highlighted as the main barrier to diagnosis

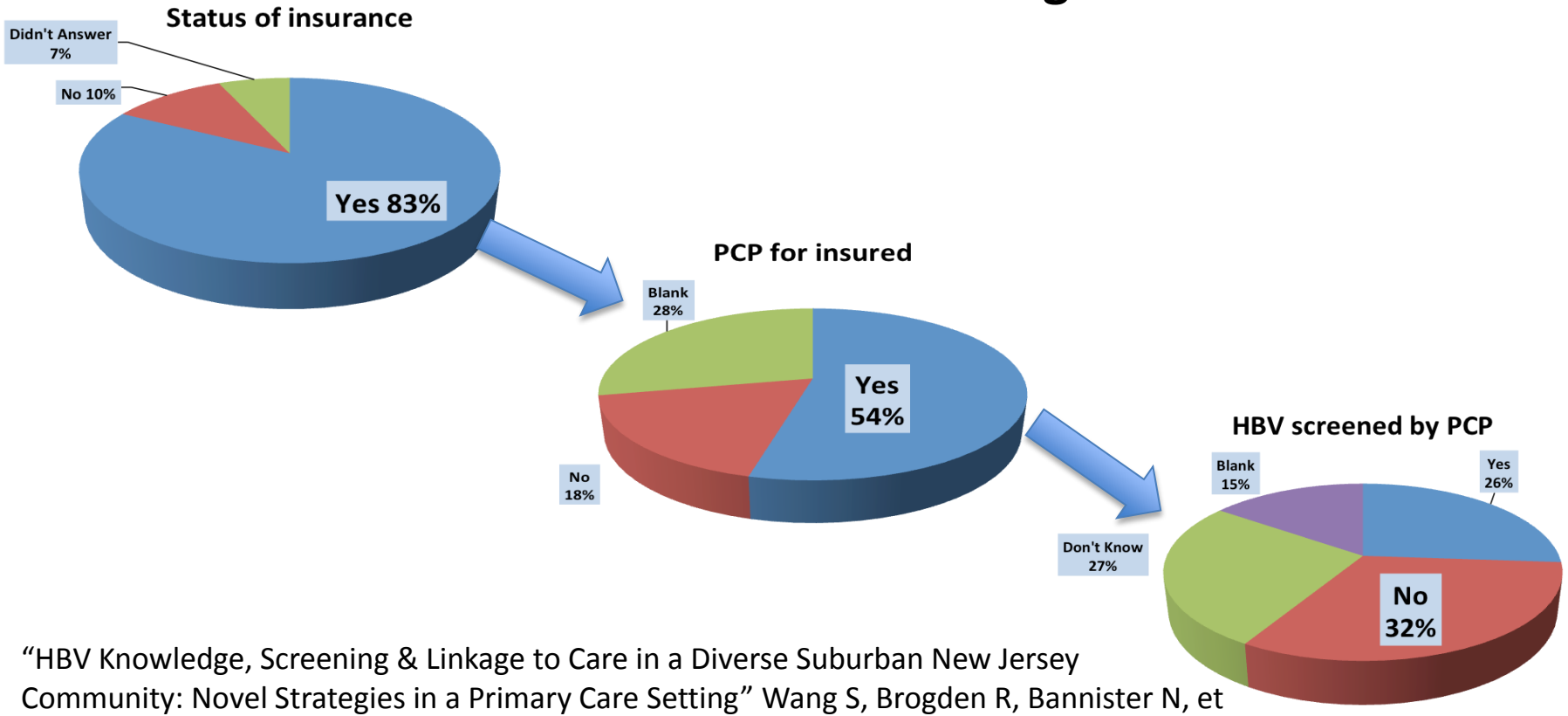
**In your opinion what are some of the barriers to diagnosis of hepatitis B in your country?** [CODED DATA]




21

Base: All respondents answering on hepatitis B or on both hepatitis B and C (402). Source Q05 (open question) – In your opinion what are some of the barriers to diagnosis of hepatitis B in your country?

# Insurance, Primary Care Physician Status & Previous HBV Testing




"HBV Knowledge, Screening & Linkage to Care in a Diverse Suburban New Jersey Community: Novel Strategies in a Primary Care Setting" Wang S, Brogden R, Bannister N, et al. AASLD Liver Meeting, Washington, DC October 23, 2017

# At-Risk Groups Include

- ✓ Persons born in HBV endemic regions of the world: Asia, Africa, Pacific Islands, Middle East, Eastern Europe, Mexico, Central America, and the Caribbean
- ✓ Injection drug users
- ✓ Men who have sex with men
- ✓ Persons with condition that may require immune-modifying therapy
- ✓ Persons with elevated ALT/AST of unknown etiology
- ✓ Blood or tissue donors
- ✓ Pregnant women
- ✓ Infants born to HBV-infected mothers
- ✓ Hemodialysis patients
- ✓ Household and sexual contacts of HBV-infected individuals
- ✓ HIV-positive individuals

HBV screening must be covered by insurance plans under ACA rules
(As a preventative service with no cost sharing to patient)

# Interpretation of Serologic Test Results for HBV

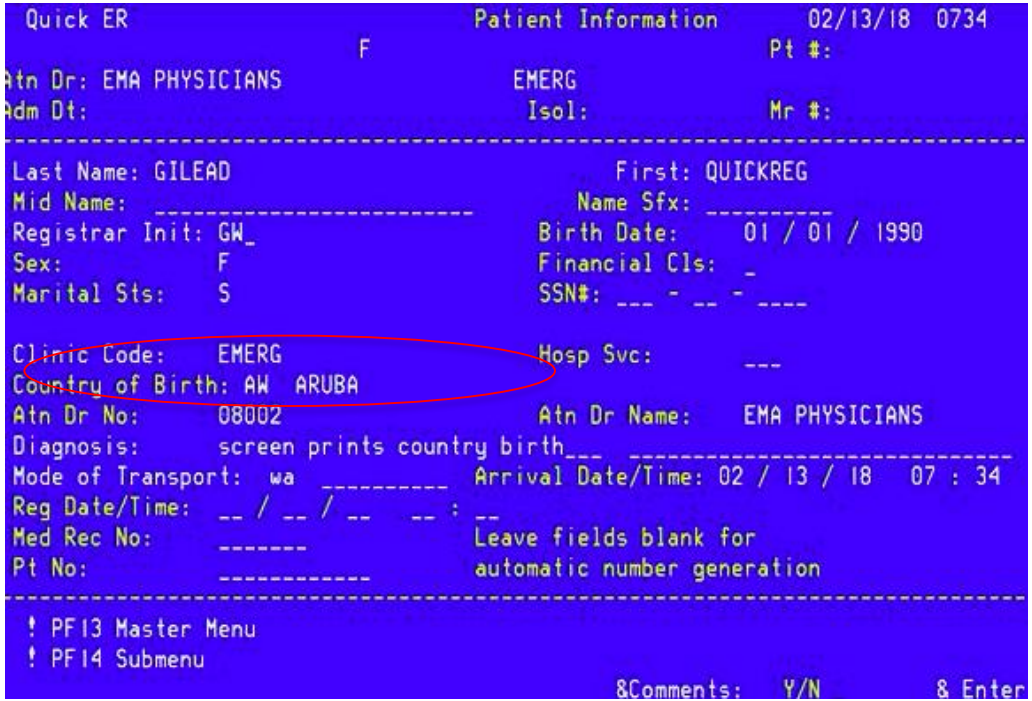
| HBsAg | Total Anti-HBc | Anti-HBs | Interpretation |
|---|---|---|---|
| - | - | - | **Susceptible to HBV, not infected/not immune –> vaccinate** |
| + | + | - | **Infected** |
| - | + | + | **Recovered from past infection and immune** |
| - | - | + | **Immune from immunization** |
| - | + | - | **Immune but HbsAb waned or occult HBV infection or false positive** |

**Weinbaum CM, et al. *MMWR Recomm Rep.* 2008;57(RR-8):1-20.**

# Novel Screening Approaches

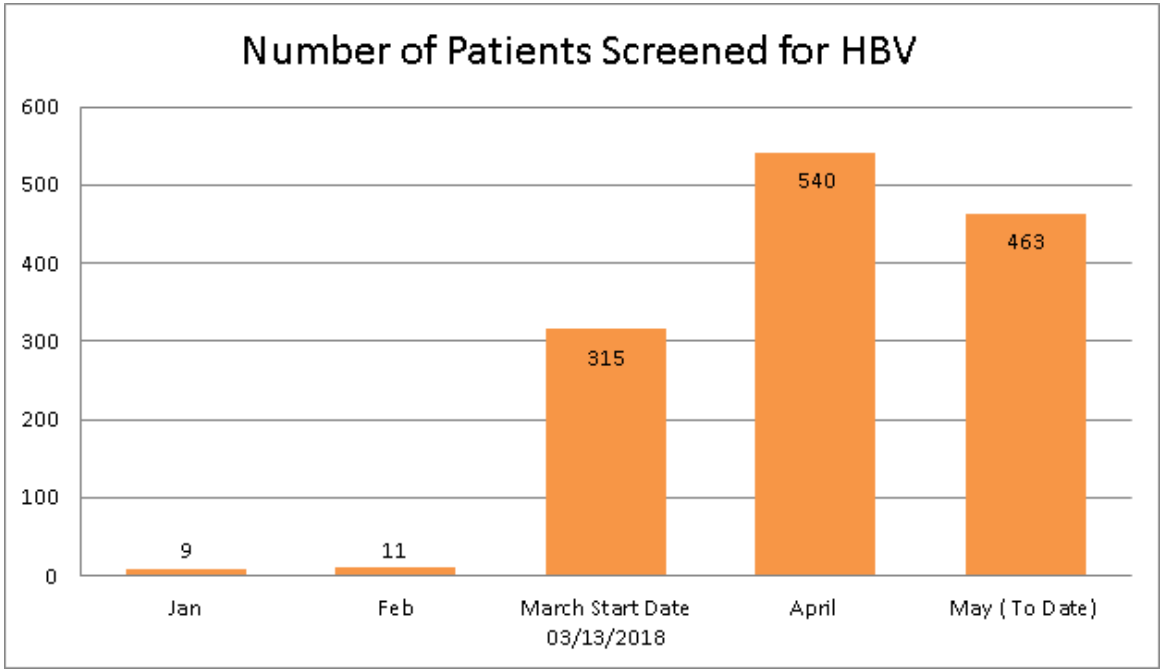
## Automated HBV Test based on Country of Birth

Saint Barnabas Medical Center ED (~100,000 visits/year)




- Collect Country of Birth (COB) at Registration
- EMR Protocol
  - If bloodwork ordered by provider and COB is HBV endemic
  - Automatic HBsAg test added
  - Nurse alerted, pt informed, opt out

# Dramatic increase in screening




Top 10 countries represented

| | |
|---|---|
| Haiti | 258 |
| Jamaica | 111 |
| Ecuador | 81 |
| Guyana | 59 |
| Dominican Republic | 58 |
| Peru | 51 |
| Brazil | 50 |
| Portugal | 50 |
| Puerto Rico | 46 |
| India | 45 |

# VACCINATION

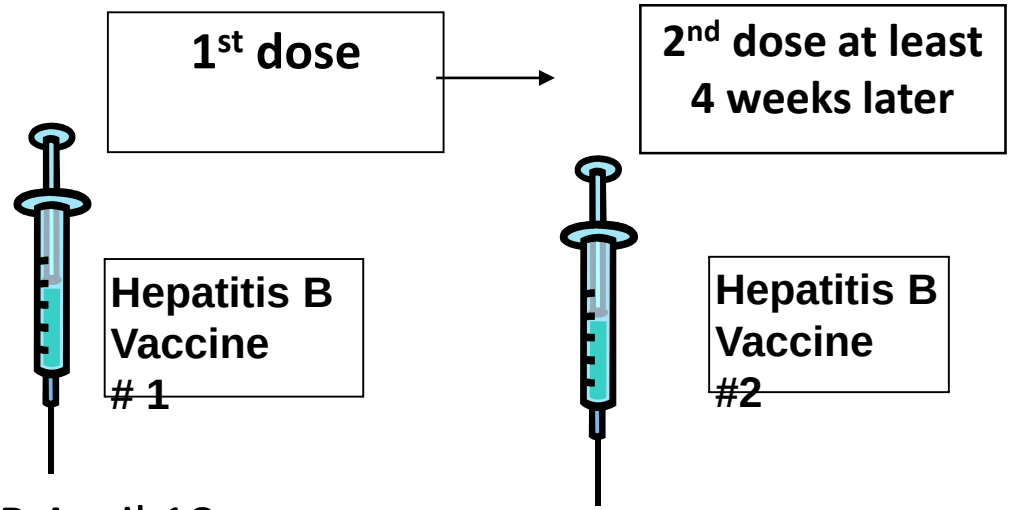
New Adult Vaccine- Heplisav-B

Hepatitis B Birth Dose

# New Adult Hepatitis B Vaccination: Heplisav-B

Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Recommendations and Reports / Vol. 67 / No. 1
January 12, 2018

**Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices**




- Approved by ACIP April 18
- 2 doses in shorter time frame is opportunity to improve vaccine completion rate
- Interchangeability: can start with 3 shot series (Engerix or Recombivax) and with this

# Give HBV Birth Dose within 24 hours

Pediatrics
September 2017, VOLUME 140 / ISSUE 3
From the American Academy of Pediatrics
Policy Statement

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

## Elimination of Perinatal Hepatitis B: Providing the First Vaccine Dose Within 24 Hours of Birth

COMMITTEE ON INFECTIOUS DISEASES, COMMITTEE ON FETUS AND NEWBORN

The AAP statement recommends that all medically stable newborns with a minimum birth weight of 2000 grams (about 4 lbs., 6 oz.) receive the vaccine within 24 hours of birth. This AAP statement follows the practice now recommended by the Advisory Committee on Immunization Practices (ACIP), part of the Centers for Disease Control and Prevention.

The previous policy statement included an option to delay the first dose of Hepatitis B vaccine until the first newborn pediatric checkup. In the updated statement, the AAP recommends the first dose be given within the first 24 hours because this timing maximizes the effectiveness of the vaccine in preventing newborn infection.

US Health and Human Services has set a goal of **0 perinatal HBV transmissions** by 2020

# HBV is a vaccine success story, but there are gaps

## Low Coverage of Universal Birth Dose

Institute of Medicine Report (2010):
"The goal of eliminating perinatal HBV transmission has not been achieved largely because of incomplete coverage of newborns with a birth dose of hepatitis B vaccine"

**HBV Birth Dose in the Americas**

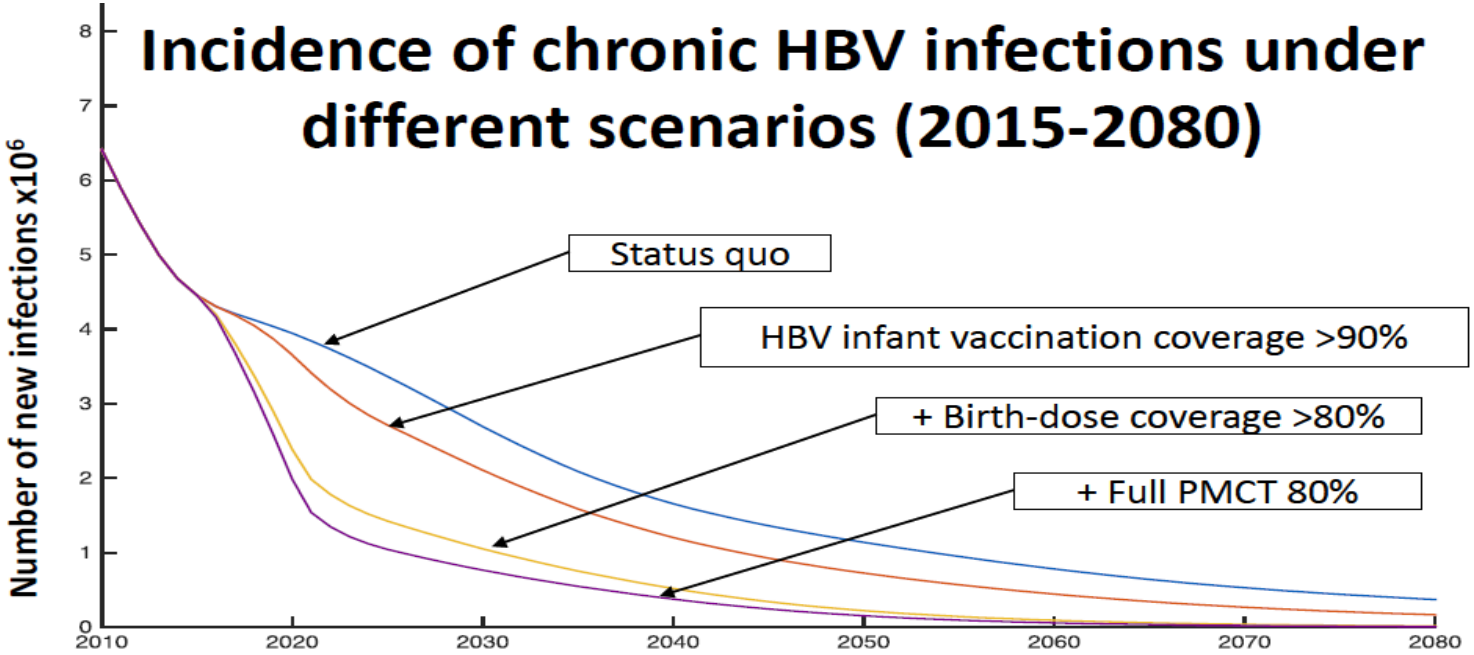
- **US: 69%***
- Mexico 89%
- Costa Rica 89%
- Dominican Republic 82%

*Compared to 96.6% receive vit K at birth

**New Jersey (48) & NY rank at the bottom of US states for HBV Birth Dose**

*http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6245a4.htm?s_cid=mm6245a4_w
^ http://www.iom.edu/Reports/2010/Hepatitis-and-Liver-Cancer-A-National-Strategy-for-Prevention-and-Control-of-Hepatitis-B-and-C.aspx

# Modeling of PMTCT intervention impact




Razavi, Homie “Presentation to PAHO Technical Advisory Group”, Center for Disease Analysis, Polaris Observatory, http://polarisobservatory.org

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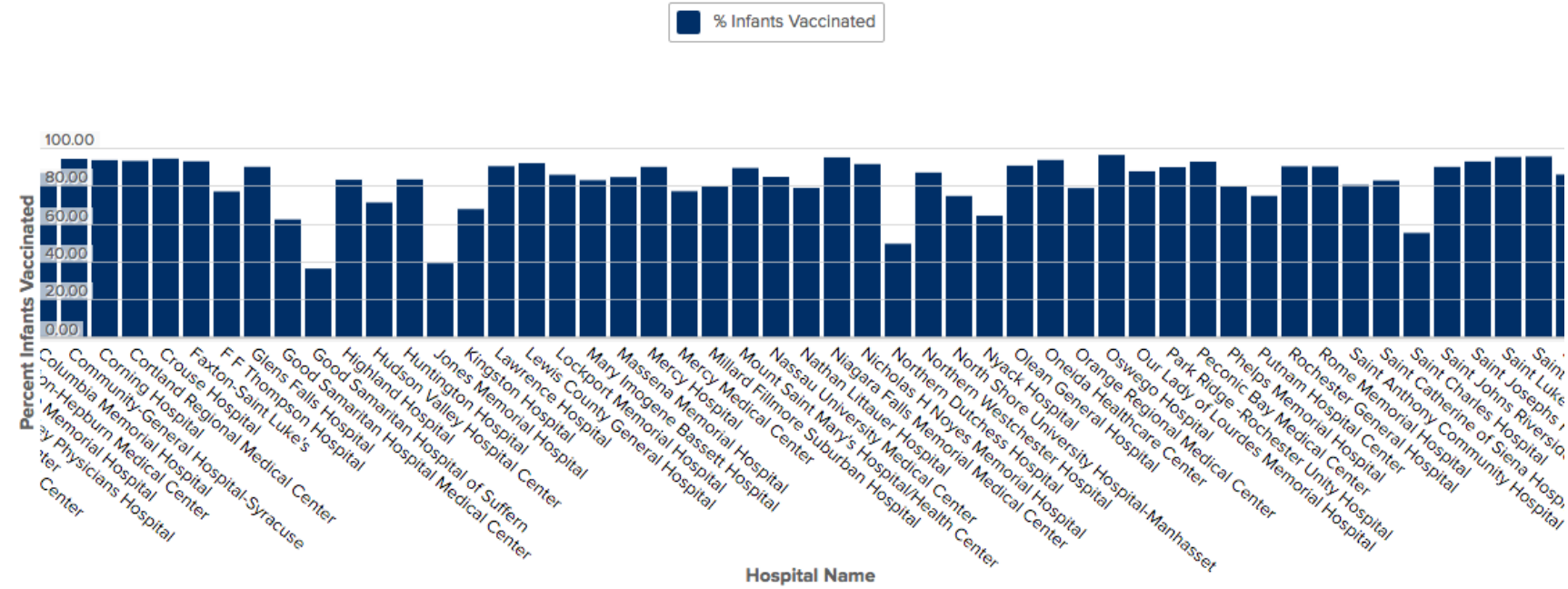
# Hepatitis B Birth Dose Percent Vaccinated by Hospital: 2016

Based on Hepatitis B Birth Dose Vaccination Rates: Beginning 2012

This dataset contains an annual summary of the number of infants receiving a dose of hepatitis B vaccine within 3 days of birth at hospitals around the ▸

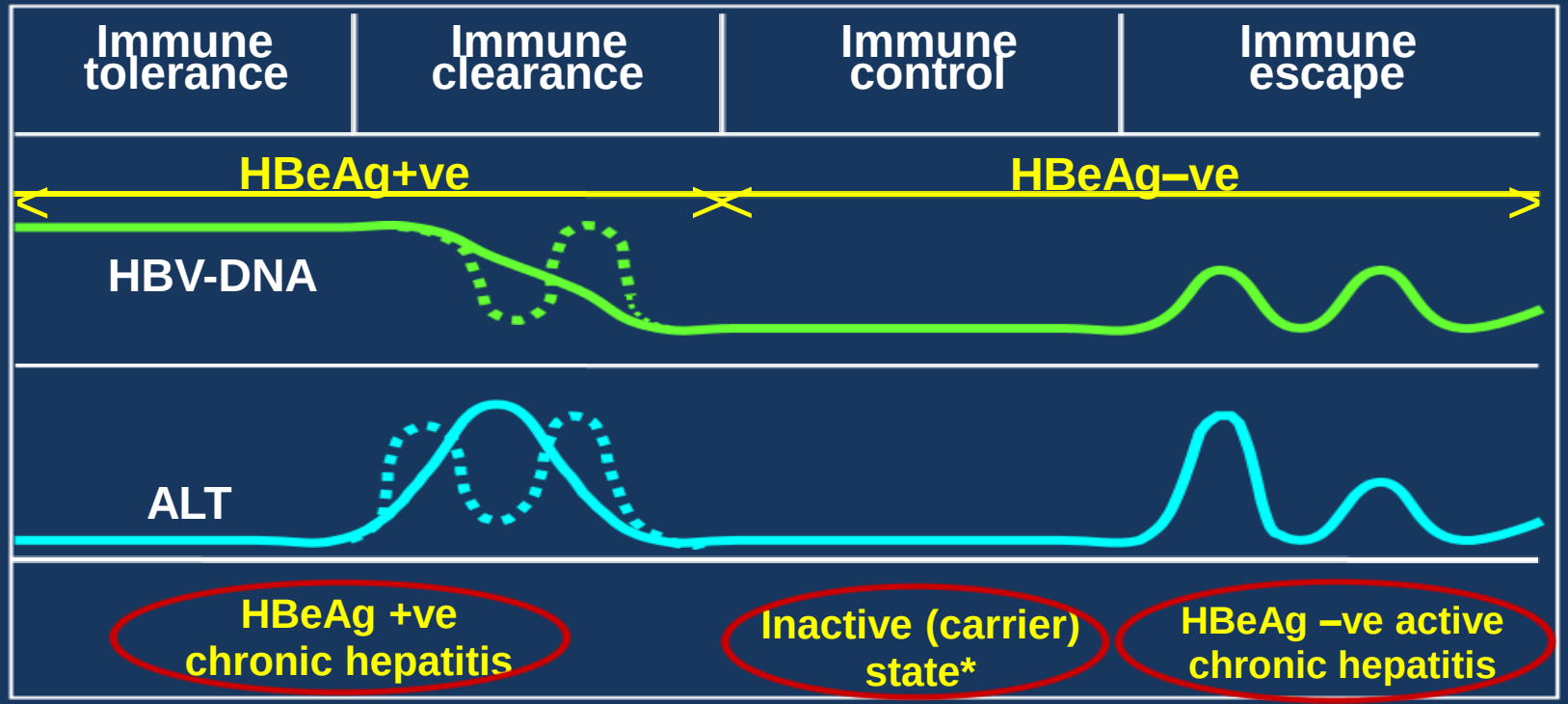
Manage More Views Filter



# HBV CARE & TREATMENT

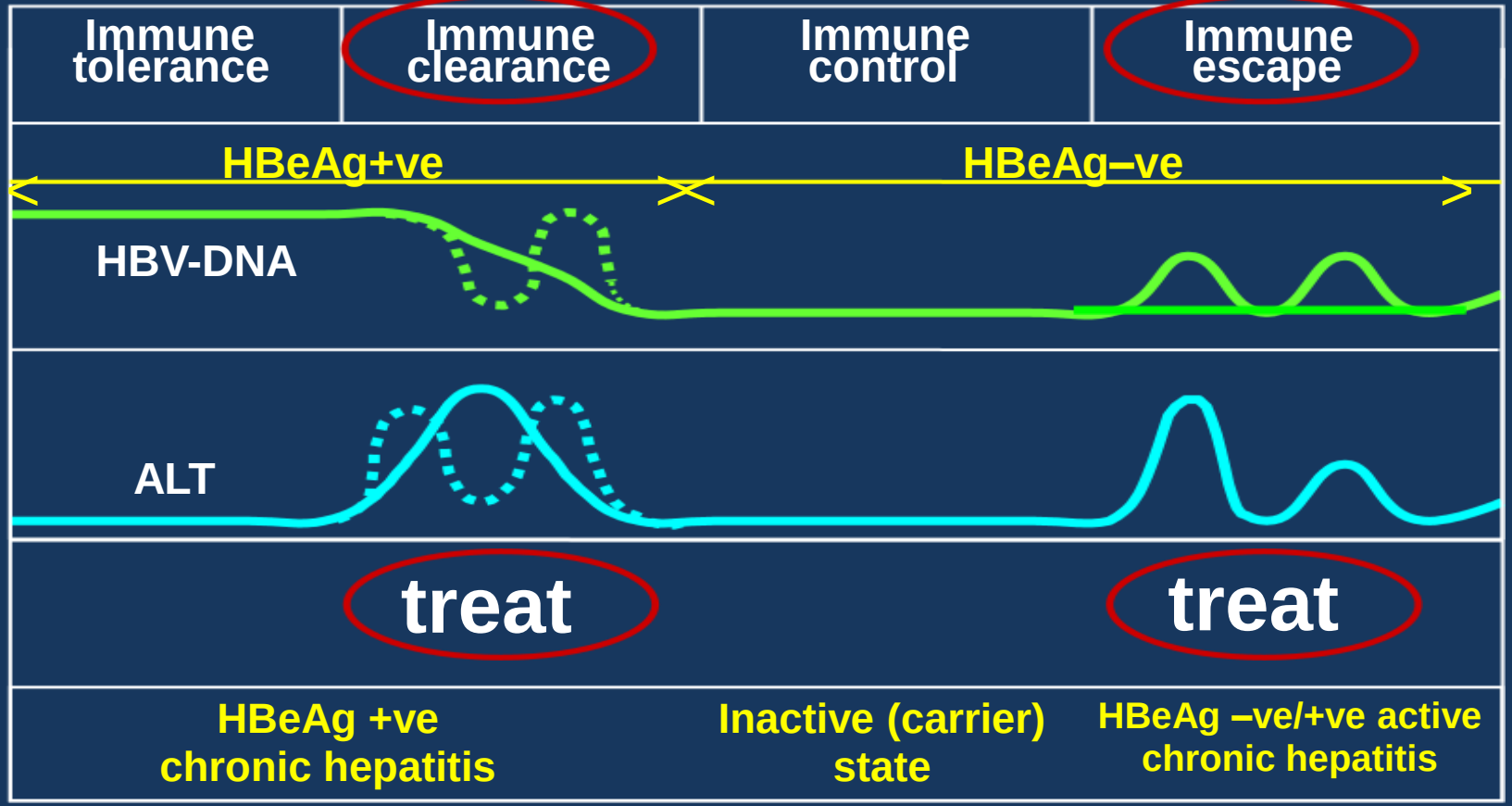
## RECENT RECOMMENDATIONS

# The phases of chronic hepatitis B




*Previously considered to be ‘healthy carriers’

# Who should be considered for treatment?



# AASLD Hep B Guidelines for Treatment of CHB August 2015

https://www.aasld.org/sites/default/files/guideline_documents/hep28156.pdf

HEPATOLOGY
Official Journal of the American Association for the Study of Liver Diseases

PRACTICE GUIDELINE

## AASLD Guidelines for Treatment of Chronic Hepatitis B

Norah A. Terrault,[1] Natalie H. Bzowej,[2] Kyong-Mi Chang,[3] Jessica P. Hwang,[4] Maureen M. Jonas,[5] and M. Hassan Murad[6]

### Objectives and Guiding Principles

***Guiding Principles***

This document presents official recommendations of the American Association for the Study of Liver Diseases (AASLD) on the treatment of chronic hepatitis B (CHB) virus (HBV) infection in adults and children. Unlike previous AASLD practice guidelines, this guideline was developed in compliance with the Institute of Medicine standards for trustworthy practice guidelines and uses the Grading of Recommendation Assessment, Development and Evaluation (GRADE) approach.[1] Multiple systematic reviews of the literature were conducted to support the recommendations in this practice guideline. An enhanced understanding of this guideline will be obtained by reading the applicable portions of the systematic reviews.

This guideline focuses on using antiviral therapy in chronic HBV infection and does not address other related and important issues, such as screening, prevention, and

2. *Should adults with immune-tolerant infection be treated with antiviral therapy to decrease liver-related complications?*
3. *Should antiviral therapy be discontinued in hepatitis B e antigen (HBeAg)-positive persons who have developed HBeAg seroconversion on therapy?*
4. *Should antiviral therapy be discontinued in persons with HBeAg-negative infection with sustained HBV DNA suppression on therapy?*
5. *In HBV-monoinfected persons, does entecavir therapy, when compared to tenofovir therapy, have a different impact on renal and bone health?*
6. *Is there a benefit to adding a second antiviral agent in persons with persistent low levels of viremia while being treated with either tenofovir or entecavir?*
7. *Should persons with compensated cirrhosis and low levels of viremia be treated with antiviral agents?*
8. *Should pregnant women who are hepatitis B sur*

# AASLD 2018 Hepatitis B Guidance

February 2018

https://www.aasld.org/sites/default/files/HBVGuidance_Terrault_et_al-2018-Hepatology.pdf

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)] 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)]

# 2018 AASLD Practice Guidelines – an Update to those published in 2016

| | |
|---|---|
| **HBV Screening** | ▪ Updated screening, counseling, and prevention of hepatitis B recommendations<br>▪ Selected diagnostic tests used in the screening (HBsAg, Anti-HBs, and Anti-HBc) |
| **Disease Monitoring** | ▪ New ULN for ALT 35 U/L for males and 25 U/L for females<br>▪ Management of chronic hepatitis B (eg, qHBsAg, resistance testing, genotyping) |
| **Treatment** | ▪ TAF joins the list of preferred HBV therapies, along with ETV, TDF and Peg-IFN<br>▪ Update on management of CHB in special populations including: acute hepatitis B, pregnancy, coinfected patients, recipients of immunosuppressive therapy, and transplant recipients |

Terrault NB et al. Hepatology 2018; Published online February 5, 2018: doi:10.1002/hep.29800.

# Summary of Treatment Recommendations for CHB

| Guideline | HBeAg+ | | HBeAg- | |
|---|---|---|---|---|
| | HBV DNA IU/mL | ALT U/L | HBV DNA IU/mL | ALT U/L |
| **AASLD 2018** | >20,000 | >2 x ULN‡ or significant histological disease | >2,000 | >2 x ULN‡ or significant histological disease |
| **AATA 2018** | >2,000 | >ULN | >2,000 | >ULN |
| **EASL 2017** | ≥2000 | >ULN and/or at least moderate liver necroinflammation or fibrosis | ≥2,000 | >ULN and/or at least moderate liver necroinflammation or fibrosis |
| | ≥20,000 | >2 x ULN irrespective of fibrosis | ≥20,000 | >2 x ULN irrespective of fibrosis |
| **JSH 2017** | ≥2,000 | >ULN^ | ≥2,000 | >ULN^ |
| **APASL 2015** | ≥20,000 | Varies | ≥2,000 | Varies |
| **US Algorithm 2015†** | ≥2000 | >ULN | ≥2,000 | >ULN |

† If patients with HBV DNA ≥ 2000 IU/mL and elevated ALT without fibrosis do not undergo treatment, monitor HBV DNA and ALT every 3–6 months.
*Liver biopsy Stages 1–3, Grade 1–3; and/or Risk Impact Score ≥3;
‡ ALT ULN: Males 35 U/L, females 25 U/L ^ ALT ULN: 31 U/L
AASLD: American Association for the Study of Liver Diseases; AATA: Asian American Treatment Algorithm; ALT: alanine aminotransferase; APASL: Asian Pacific Association for the Study of the Liver; CHB: chronic hepatitis B; EASL: European Association for the Study of the Liver; HBeAg: hepatitis B e antigen; ULN: upper limit of normal; JSH, Japan Society of Hepatology

Terrault NB et al. Hepatology 2018; Published online February 5, 2018: doi:10.1002/hep.29800
Tong MJ, Pan CQ, Han SB, et al. An expert consensus for the management of chronic hepatitis B in Asian Americans. Aliment Pharmacol Ther. 2018
EASL Clinical Practice Guidelines on the management of hepatitis B virus infection. J Hepatol 2017; doi: 10.1016/j.jhep.2017.03.021
JSH Guidelines for the Management of Hepatitis B Virus Infection. 2017
Sarin SK, et al. Hepatol Int 2015; doi 10.1007/s12072-015-9675-4; Martin P, et al. Clin Gastroenterol Hepatol 2015;13: 2071–87
Martin P, et al. *Clin Gastroenterol Hepatol* 2015; Published online July 15, 2015: http://dx.doi.org/10.1016/j.cgh.2015.07.007

# Real World Settings & Guidelines:
## CDCs Chronic Hepatitis Cohort Study (CHeCS)

- 2338 patients, 2006-13
- 4 sites
  - Geisinger Health System (PA)
  - Henry Ford Health System (MI)
  - Kaiser-Permanente- Northwest (OR)
  - Kaiser-Permanente-Honolulu (HI)
- ALT testing
  - 78% had ≥ 1 ALT done per year
- Overall 32% prescribed antiviral therapy
  - 41% with cirrhosis
  - 62% with HBV DNA >2000 IU/ml and elevated ALT before initiating
  - 17% with biopsy of F2-F4
- HBV DNA
  - 37% had ≥ 1 HBV DNA per year follow up
  - 44% had < annual testing,
  - 18% never had HBV DNA
  - 57% elevated ALT results had subsequent HBV DNA done within 60 days
- Cirrhotics
  - 54% with HBV DNA done annually, 35% less than annually,
  - 11% never had HBV DNA done
  - 53% had at least 1 hepatic imaging but only 27% had annual imaging
  - 56% prescribed antiviral therapy

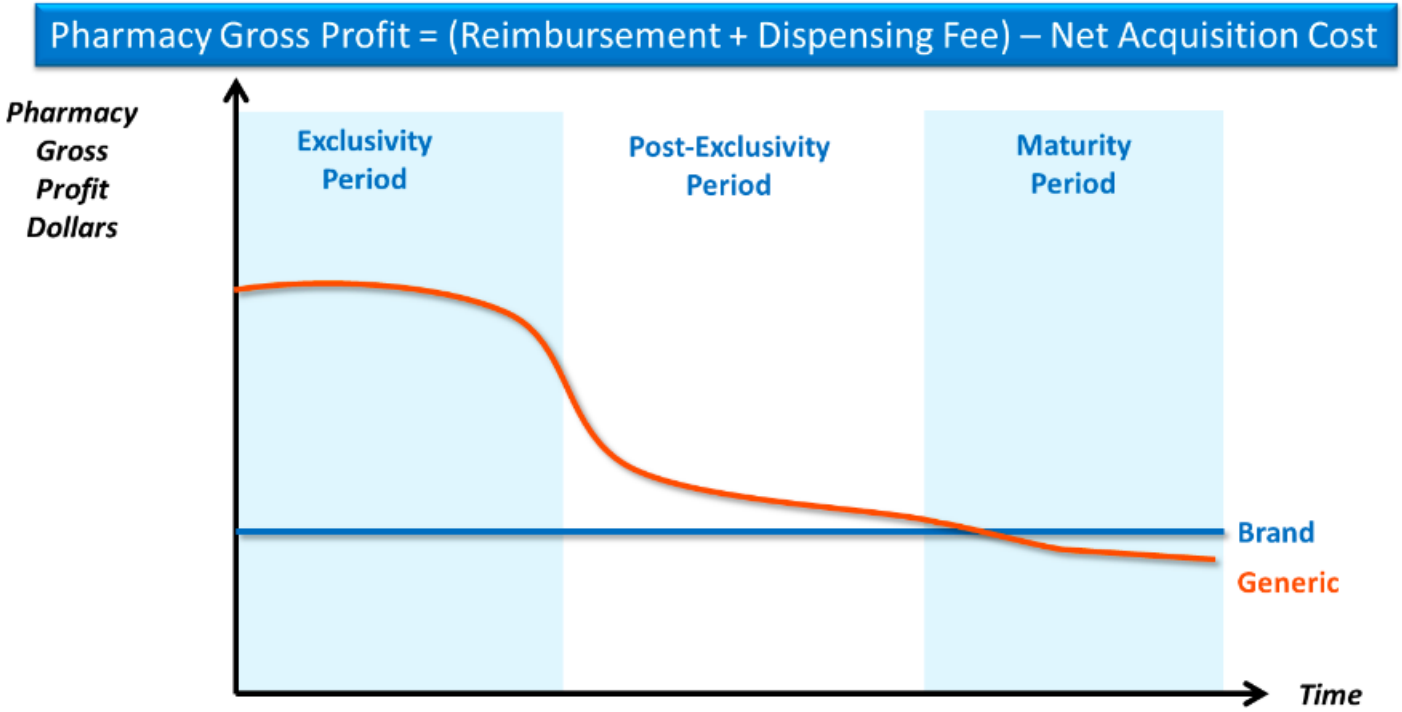
Spradling, PR, et al. "Infrequent Clinical Assessment of Chronic Hepatitis B Patients in United States General Healthcare Settings". Clin Infect Dis. 2016 Nov 1;63(9):1205-1208. Epub 2016 Aug 2.

# FDA Approved Hepatitis B Therapies

| Generic | Brand Name | Dose | Approved | Comments |
|---|---|---|---|---|
| **First Line** | | | | |
| **Entecavir (ETV)** | **Baraclude** | **0.5mg/1.0 mg po qd** | 2005 | Generic |
| **Tenofovir (TDF)** | **Viread** | **300 mg po qd** | 2008 | Generic in US 2018 |
| **Tenofovir alafenamide (TAF)** | **Vemlidy** | **25 mg po qd** | 2016 | Less bone, renal toxicity |
| **Peginterferon alfa-2a** | **Pegasys** | **180 ug SQ q week** | 2005 | Finite tx, 48 weeks |
| **Second Line** | | | | |
| **Adefovir (ADV)** | **Hepsera** | **10 mg po qd** | 2002 | Low potency, high rate of resistance |
| **Telbivudine (LDT)** | **Tyzeka** | **600 mg po qd** | 2006 | High potency, high rate of resistance |
| **Third Line** | | | | |
| **Lamivudine (LAM)** | **Epivir** | **100 mg po qd** | 1998 | Low potency, high rate of resistance |

. Available at: http://www.accessdata.fda.gov/scripts/cder/drugsatfda/.

# Typical Lifecycle Path of Pharmacy Gross Profits, Brand vs. Multi-Source Generic




Source: *2012-13 Economic Report on Retail, Mail and Specialty Pharmacies*, Drug Channels Institute, January 2013. (http://drugchannelsinstitute.com/products/industry_report/pharmacy/)

Published on Drug Channels (www.DrugChannels.net) on December 13, 2012.

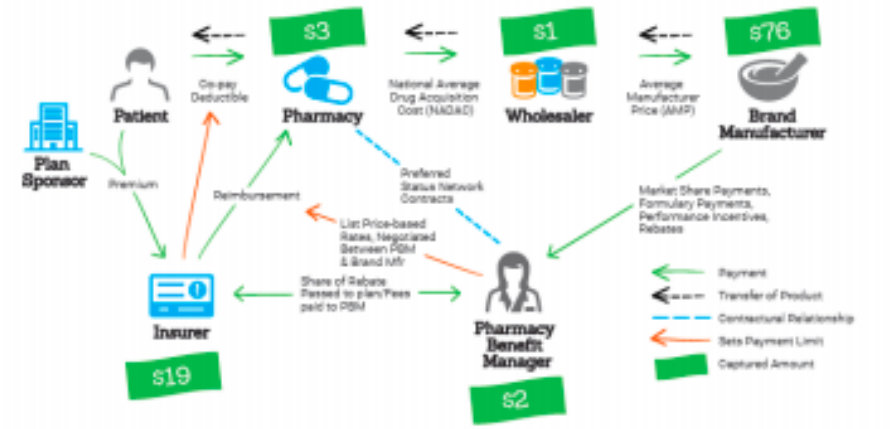
# Tenofovir newly generic in 2018, but patients can still pay high prices (copay $300-1000/month)

## Working Through the Mechanics of the Generic Supply Chain

Figure 4: Spread $100 across various generic channels


Source: AAM

Figure 5: Spread $100 across various branded channels



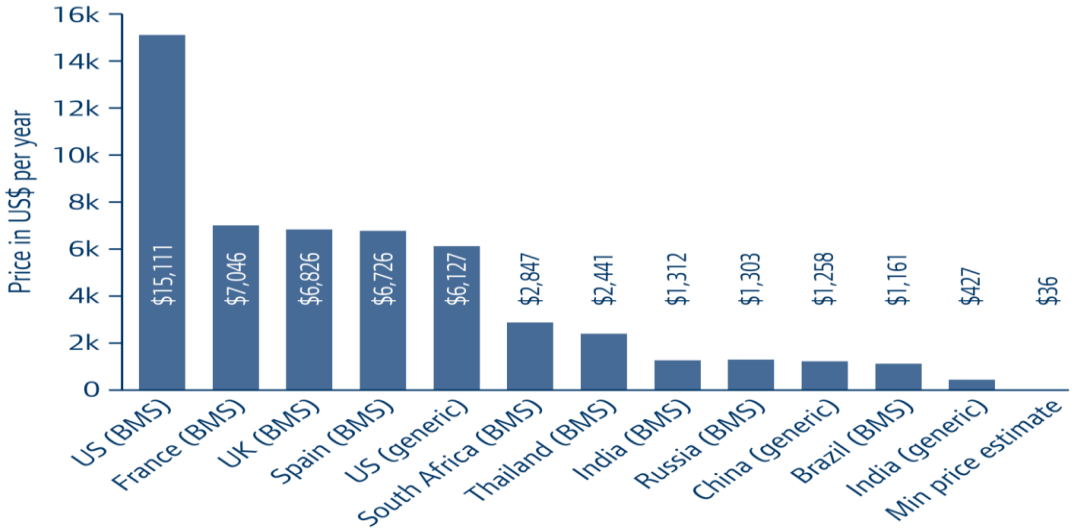

Source: AAM

# Access to the recommended regimens: HBV

## Global and USA price overview for HBV drugs

| Drug | USA price (originator) (per patient per year) | Global lowest price (per patient per year) |
|---|---|---|
| Entecavir | $15,111 | $427 |
| Tenofovir (TDF) | $10,718 | $38 |
| Lamivudine | $2,627 | $10 |

The lowest price for **entecavir** 0.5 mg in selected countries (per patient per year)

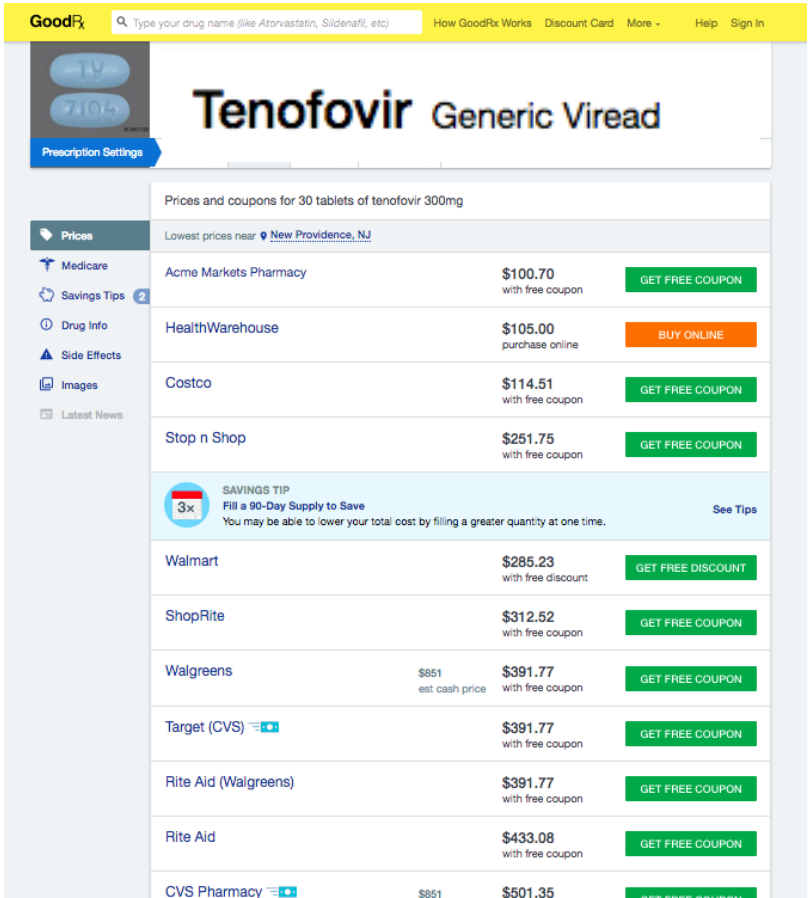


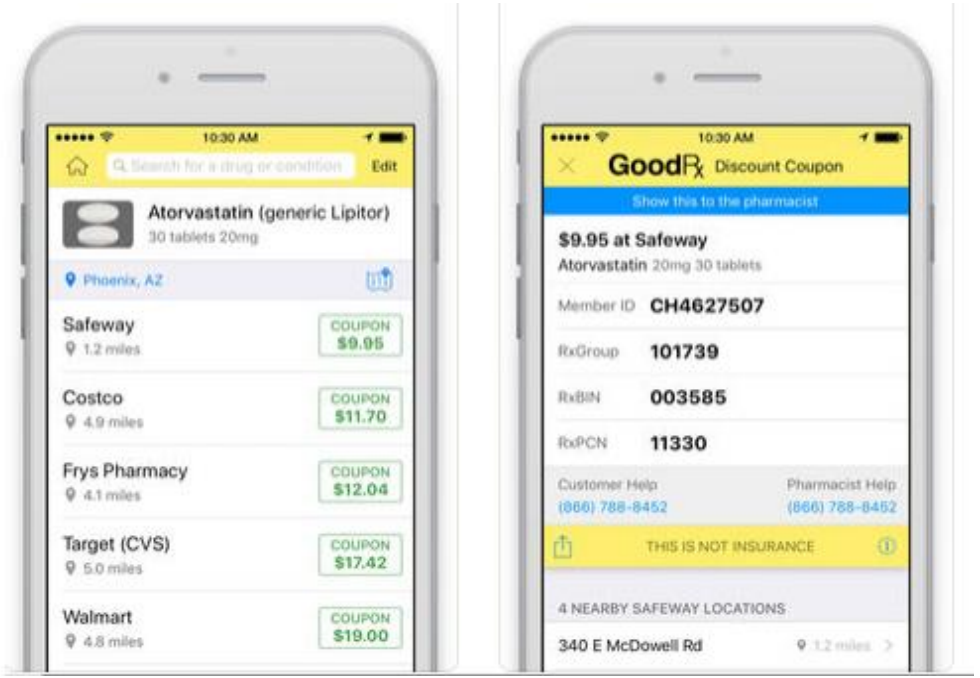

Source: Hill A, 2015 *Journal of Virus Eradication*. 2015;1(2):103-110.

# Rx assistance options for patients

- Use 340B pharmacy if you are able
- Patient assistance programs (PAP) with pharmaceutical companies
- Foundations to help with copays
- Good Rx app- finds nearest pharmacy with the best price under insurance or without insurance
  - Drugs can be cheaper when you pay out of pocket not using your insurance

# GoodRx: Collates Prices & Discounts at Local Pharmacies

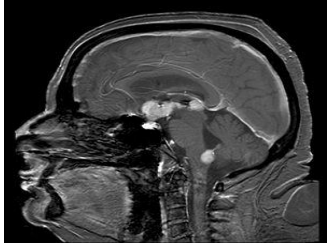



REACHING FOR
Health Equity
Reducing health disparities brings us closer to reaching health equity.
BEST HEALTH POSSIBLE
BEST HEALTH POSSIBLE
Programs designed to reduce health disparities
CDC
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention
http://www.cdc.gov/minorityhealth/strategies2016/
CS262907

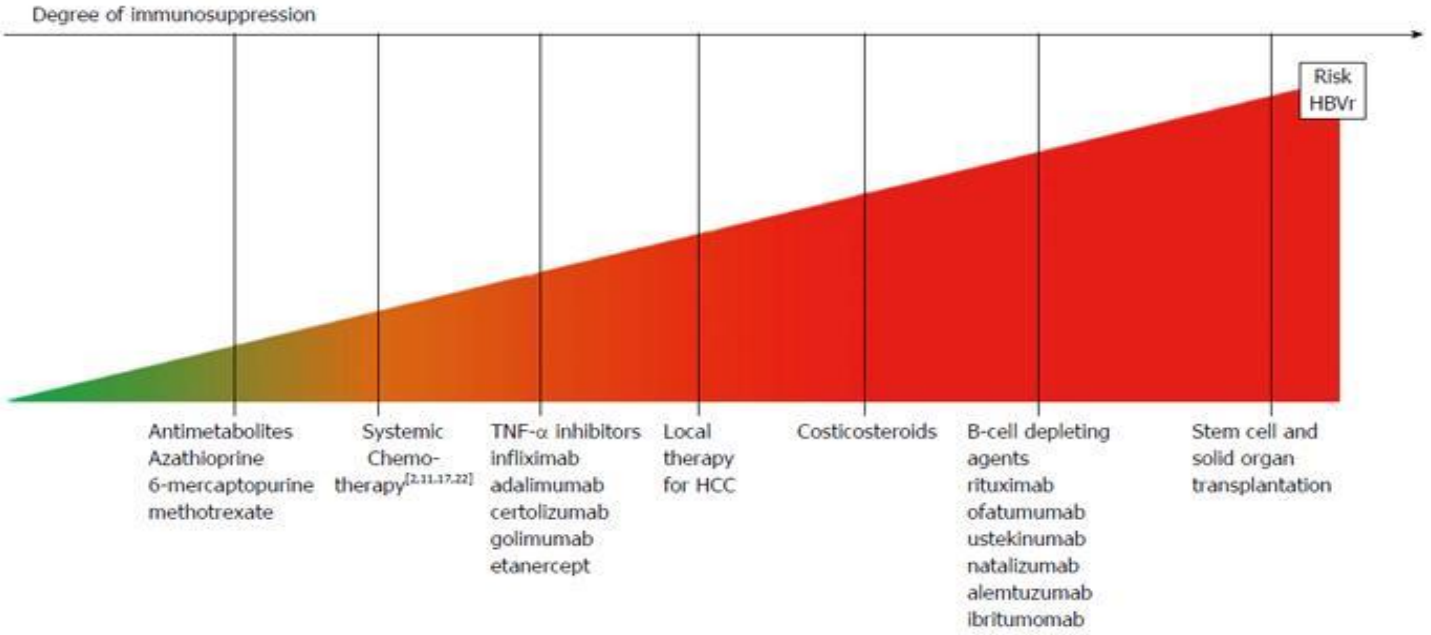
# REACTIVATION & CURE

# Hep B Reactivation



- 66 yr old healthy Chinese-American man dx with Primary Central Nervous System Lymphoma
- Treated with Temozolomide & Methotrexate
- 2/15 Routine Labwork
  - **HBsAg negative**
  - **HBcAb IGM neg**
    - (IgM only positive if acute infection- would not screen for previous exposure to HBV)
  - **Should have tested with HBcAb, IgG or Total**
- 4/16 starting 6th cycle of methotrexate, ALT became abnormal (from 26/55-->384/664)
- HBV retested- HBsAg+,
  - Oncologist recommendation: treat HBV after chemo completed
- HBV DNA 95,000,000 IU/ml
  - Pt symptomatic with Nausea, vomiting and diarrhea
  - Admitted to ICU with fulminant, liver failure and admitted in ICU (too late to start antivirals)
- Late April - passed away

# Immunosuppressing agents and related risk of hepatitis B reactivation




Bessone F, Dirchwolf M. Management of hepatitis B reactivation in immunosuppressed patients: An update on current recommendations. *World Journal of Hepatology*. 2016;8(8):385-394. doi:10.4254/wjh.v8.i8.385.

# AGA and ASCO Guidelines for HBV Reactivation (HBVr)

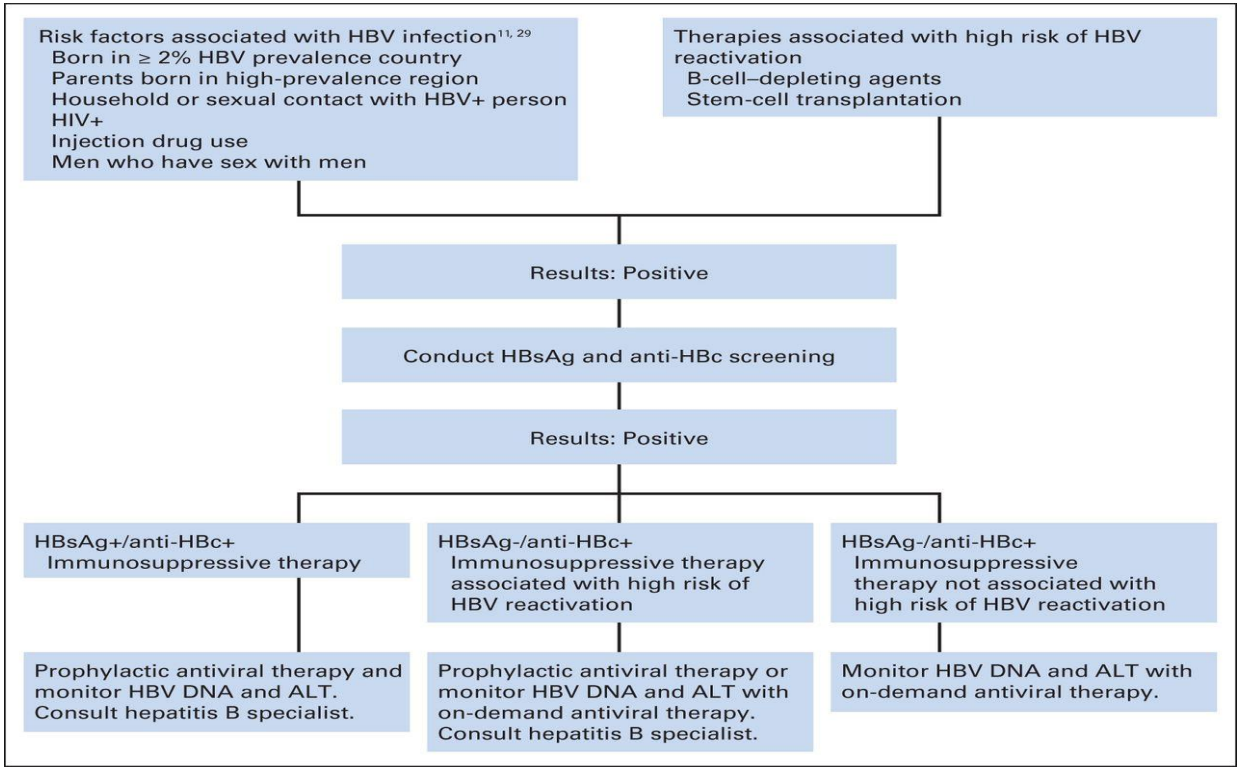
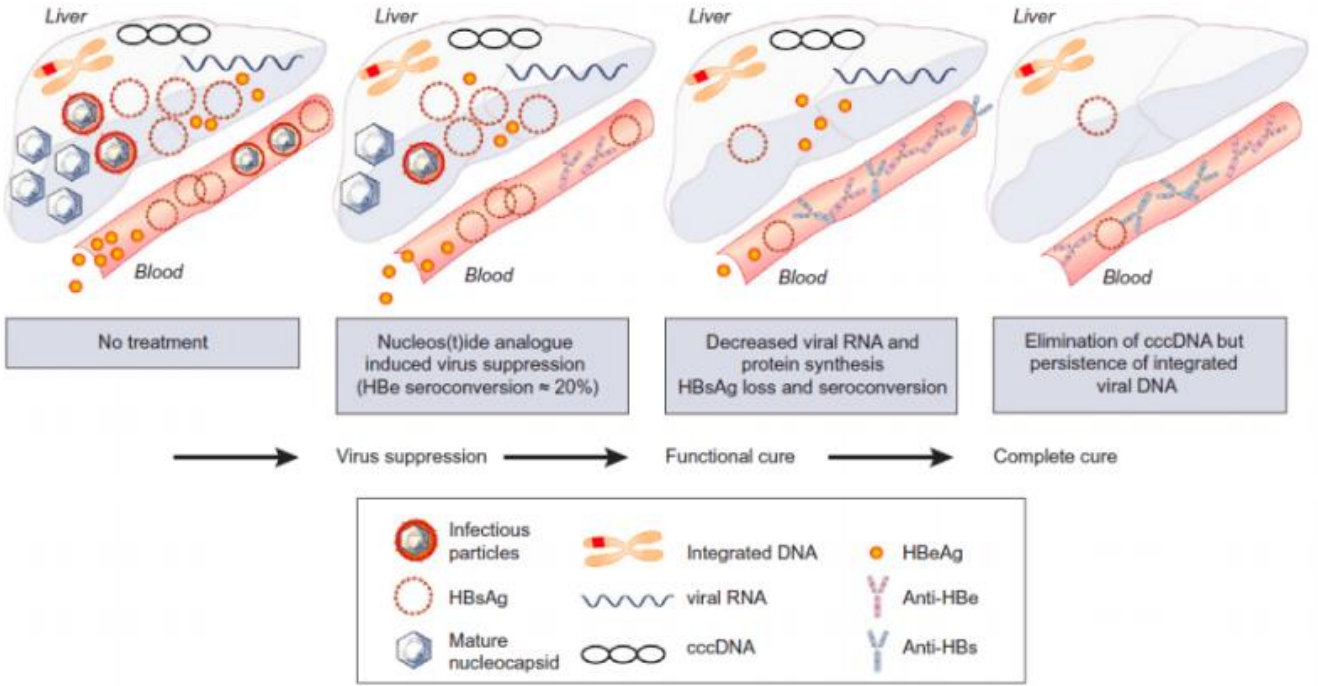



*Fig 2. Risk-adaptive hepatitis B virus (HBV) screening and management decision-making algorithm for patients with cancer before immunosuppressive therapy. anti-HBc, antihepatitis B core antibody (either total or immunoglobulin G); HBsAg, hepatitis B surface antigen.*

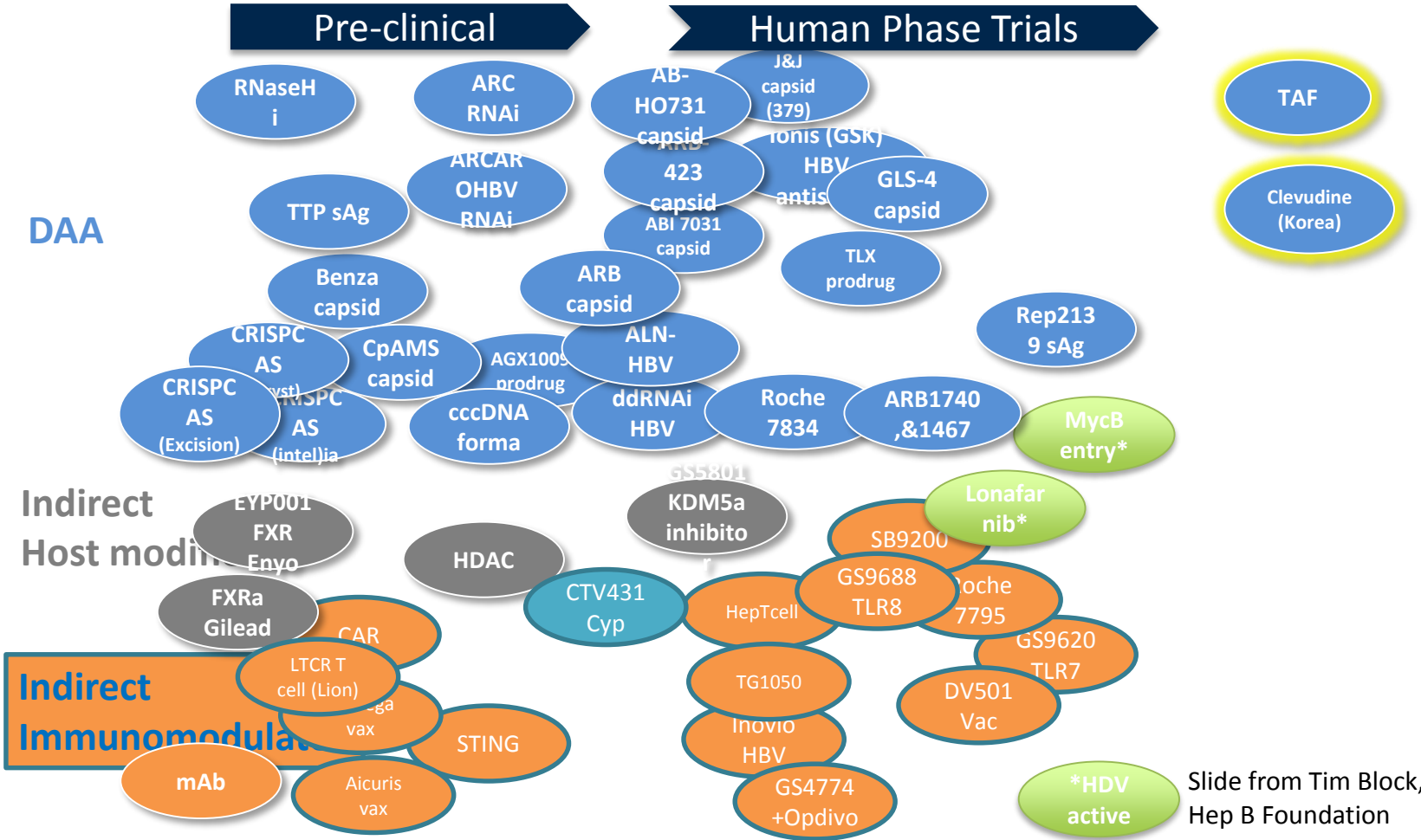
Published in: Jessica P. Hwang; Mark R. Somerfield; Devena E. Alston-Johnson; Donna R. Cryer; Jordan J. Feld; Barnett S. Kramer; Anita L. Sabichi; Sandra L. Wong; Andrew S. Artz; *JCO* **2015,** 33, 2212-2220.

# What does HBV Cure look like?

## Viral suppression vs Functional Cure vs Sterilizing Cure



# The HBV Therapeutic Development Landscape as of 12. 2017

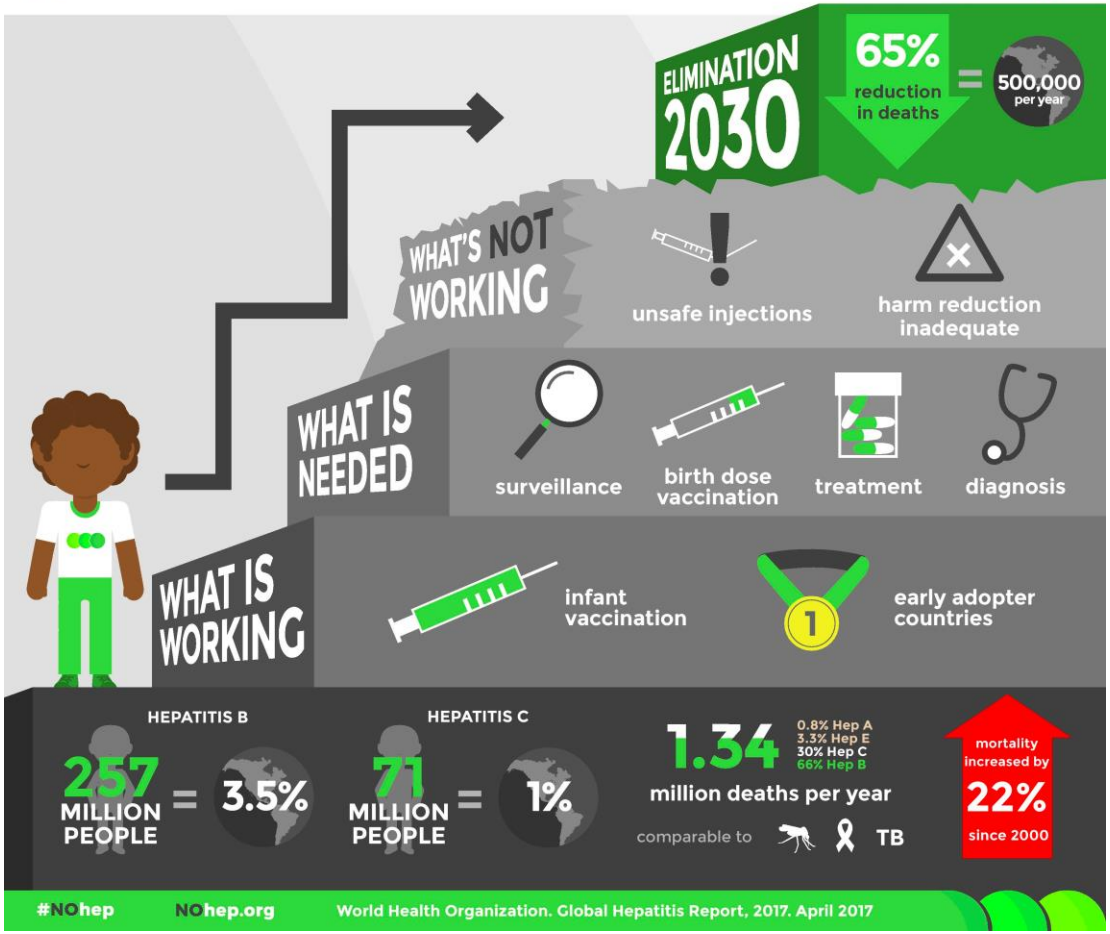



Slide from Tim Block, Hep B Foundation

World Hepatitis Alliance

# ELIMINATE ~~HEPATITIS~~

NOhep




# Harnessing the Power of the Medical Community

**We have the tools, but it will take a global movement to eliminate viral hepatitis.**

**Sign up to be a Visionary.**

**#NOhep**

www.nohep.org