Updates in the Prevalence of Chronic HBV in the United States

Robert Wong, MD, MS
Clinical Associate Professor (Affiliated), Division of Gastroenterology and Hepatology
Stanford University School of Medicine
Staff Physician, Gastroenterology and Hepatology Section
VA Palo Alto Healthcare System

5/16/2023
Objectives

• Review updated estimates of chronic HBV prevalence in the United States
Background

• The majority of individuals with chronic HBV in the United States are non-US-born

• Existing studies that estimate chronic HBV prevalence using large datasets or surveillance data may be limited in accurately assessing disease prevalence among ethnic minorities and vulnerable populations

• Under-diagnosis or under-reporting due to sub-optimal HBV screening and HBV linkage to care also present challenges to understanding HBV epidemiology
HBV Cascade of Care – Global Estimates

Figure 2: Global and regional hepatitis B virus cascade of care in 2016
AFRO=Regional Office for Africa. EMRO=Eastern Mediterranean Regional Office. EURO=Regional Office for Europe. PAHO=Pan American Health Organization. SEARO=South-East Asia Regional Office. WPRO=Western Pacific Regional Office.

Polaris collaborators, Lancet 2018;3:383-403
~270 million (2020 estimates)
Less new infections – vaccination
Increased mortality of aging HBV population

WHO GOALS by 2030
90% diagnosed
80% treated
65% reduction in mortality
HBV Epidemiology – United States

Up to 2.4 million adults with chronic HBV in the U.S.

CDA Foundation – POLARIS Observatory; Wong, et al. Hepatology 2021
An Updated Assessment of Chronic Hepatitis B Prevalence Among Foreign-Born Persons Living in the United States

Robert J. Wong,1,2 Carol L. Brosgart,3 Sue Welch,4 Tim Block,5,6 Mark Chen,4 Chari Cohen,5,6 W. Ray Kim,1 Kris V. Kowdley,7 Anna S. Lok,8 Naoky Tsai,9 John Ward,10 Steven S. Wong,4 and Robert G. Gish.5

(Hepatology 2021;74:607-626).
Methods

• Systematic review of country and region specific chronic CHB prevalence with focus on population-based studies
• Linked data from country specific studies assessing CHB prevalence to the 2018 U.S. Census Bureau American Community Survey Public Use Microdata Sample to calculate country-specific populations by country of birth and decade of entry
• Pooled CHB prevalence estimates were calculated for each country of origin using random effects meta-analyses
• To estimate the number of foreign-born adults with CHB in the U.S. in 2018 by country of origin, pooled CHB rates from country-specific meta-analyses were multiplied by the number of FB from each country living in the U.S. in 2018
• Estimates were added to existing U.S. born estimates of CHB to provide an overall estimate of CHB prevalence in the U.S.
• A total of 2,800 HBsAg seroprevalence surveys involving 112M subjects were included in the analyses.

• Of these, 457 were surveys in emigrants (involving 1.2M subjects from 65 countries) and 2,343 were surveys of populations living in countries of origin (involving 110.8M subjects in 98 countries).

• About 21% of the surveys were conducted before 1990, 25% from 1990–1999, 33% from 2000–2009, and 20% in 2010 and later.

• Overall, 27% of the 112.0M survey participants were male and 58% female; sex was not reported for 15% of the sample.
Figure 2: FB Populations Living in the U.S. and Number of FB with CHB Living in the U.S. from Random Effects Meta-Analysis by World Region of Origin, 2018

Foreign-born in the U.S., 2018 (millions)

- Asia: 14,785,266 (869,787 CHB)
- Americas: 24,410,150 (274,081 CHB)
- Oceania: 297,510 (13,261 CHB)
- Africa: 2,575,550 (222,779 CHB)
- Europe: 5,894,567 (90,649 CHB)

FB in the U.S. from all world regions: 47,963,043
FB with CHB in the U.S. from all world regions: 1,470,557

Abbreviations: CHB, chronic hepatitis B; FB, Foreign-born.
* Northern America = FB from Canada and Bermuda living in the U.S.
Figure 3. Number of Foreign-Born Persons with CHB Living in the U.S.: Comparison of Estimates

Random effects meta-analyses, 2018 (All surveys combined) 1,470,557
Random effects meta-analyses, 2018 (FB entering by decade x rate by decade) 1,598,602
Random effects meta-analyses, 2018 (FB entering by sex x rate by sex) 1,579,996
Random effects meta-analyses, 2018 (Emigrant surveys only) 1,347,169
Fixed effects meta-analyses, 2018 (All surveys combined) 924,857
CLDF estimate based on NHANES and other sources (Lim, 2020) 1,345,776
Estimate from NHANES 2011-2016 (Le, 2020) 546,649
Random Effects meta-analyses, 2009 (Kowdley, 2012) 1,324,693
Schweitzer review country-specific rates x FB populations (Schweitzer, 2015) 1,245,316
Polaris Observatory review country-specific rates x FB populations (Polaris Observatory Collaborators, 2016) 1,555,725

Number of foreign-born persons with CHB living in the U.S.

Abbreviations: CLDF, Chronic Liver Disease Foundation; FB, Foreign-born; NHANES, National Health and Nutrition Examination Survey.
Estimating Chronic HBV Prevalence Among U.S. Adults by Place of Birth

2009: 1,754,693
2018: 1,890,557
Updated HBV Screening and Testing Recommendations – CDC, March 10, 2023

- HBV screening at least once during lifetime for adults aged ≥18 years
- Triple panel testing: HBsAg, anti-HBs, total anti-HBc
- Rationale for new recommendations:
  - Simplifying implementation of screening to improve diagnosis
  - Risk-based testing has failed and has been a barrier to timely diagnosis
  - Assessment of risk is complex and risks stigmatizing individuals
  - Early diagnosis and treatment reduces morbidity and mortality and reduces transmission
  - Cost-effective
  - Readily available inexpensive testing
  - Identify individuals at risk of reactivation and appropriate for linking to HBV vaccination

Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022

Weekly / April 1, 2022 / 71(13):477–483

Please note: This report has been corrected.

Mark K. Weng, MD¹; Mona Doshani, MD¹; Mohammed A. Khan, PhD¹; Sharon Frey, MD¹; Kevin Ault, MD¹; Kelly L. Moore, MD¹; Eric W. Hall, PhD¹; Rebecca L. Morgan, PhD¹; Doug Campos-Outcalt, MD¹; Carolyn Wester, MD¹; Noele P. Nelson, MD, PhD¹ (View author affiliations)
Take Home Points

• Most recently updated estimate of chronic HBV prevalence in the U.S. is **1.89M (range 1.49–2.40)**.
• Large proportion of chronic HBV remains undiagnosed and not linked to viral hepatitis care and treatment.
• Recent updates in guidelines and policy changes recommending universal HBV screening and near-universal HBV vaccination is an important first step to improve HBV care.
• However, more resources and advocacy are needed to continue to improve HBV care cascade and progress towards viral hepatitis elimination efforts.
Thank You

• Questions and Discussion
Tables from CHB Prevalence Manuscript (backup)