Updates in the Prevalence of Chronic HBV in the United States

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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 foreign 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
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. Gish5

(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)

<table>
<thead>
<tr>
<th>Region</th>
<th>FB in the U.S.</th>
<th>FB with CHB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>14,785,266</td>
<td>869,787</td>
</tr>
<tr>
<td>Americas</td>
<td>24,410,150</td>
<td>274,081</td>
</tr>
<tr>
<td>Oceania</td>
<td>297,510</td>
<td>13,261</td>
</tr>
<tr>
<td>Africa</td>
<td>2,575,550</td>
<td>222,779</td>
</tr>
<tr>
<td>Europe</td>
<td>5,894,567</td>
<td>90,649</td>
</tr>
<tr>
<td>All Regions</td>
<td>47,963,043</td>
<td>1,470,557</td>
</tr>
</tbody>
</table>

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 (Kowdle, 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**
  - **U.S.**: 1,754,693
  - **Europe**: 
  - **Africa**: 
  - **Americas**: 
  - **Asia**: 

- **2018**
  - **U.S.**: 1,890,557
  - **Europe**: 
  - **Africa**: 
  - **Americas**: 
  - **Asia**: 

Legend:
- **U.S.**
- **Europe**
- **Africa**
- **Americas**
- **Asia**
- **Oceania**
Take Home Points

• Comprehensive meta-analyses of studies from 1980 – 2019 that incorporated potential changes in immigration patterns affecting U.S. populations as well as changes in country-specific CHB prevalence demonstrated:
  – Number of foreign-born adults with CHB living in the U.S. in 2018 was 1.47M (95% CI: 1.21–1.73)
  – This represented an increase of 11% from 1.32M (95% CI: 1.04–1.61) in 2009, primarily drive by increased immigration.
  – Estimating 0.42M (95% CI: 0.28–0.67) U.S.-born persons with CHB in 2018, estimated total CHB in the U.S. was 1.89M (range 1.49–2.40) persons with CHB (FB and U.S.-born) may be living in the U.S. in 2018
Thank You

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

Microsoft Word Document