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The distribution of Hepatitis B virus exposure and infection in a population-based sample of US Hispanic adults

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Abstract

Little is known regarding the prevalence and distribution of hepatitis B virus (HBV) infection in United States (US) Hispanics/Latinos. We sought to determine the prevalence of HBV exposure (anti-HBc), active HBV infection (HBsAg), and vaccine-induced HBV immunity (anti-HBs) in US Hispanics/Latinos and consider how these data inform clinical screening recommendations. Our analysis included 11,999 women and men of the Hispanic Community Health Study/Study of Latinos (HCHS/SOL), a population-based, cross-sectional household survey in four urban communities (Bronx, NY; Miami, FL; Chicago, IL; and San Diego, CA) of US civilian, non-institutionalized self-identifying Hispanic/Latino adults age 18–74. Vaccine-induced immunity was defined as detection of anti-HBs but not anti-HBc. However, if anti-HBc were present it was considered evidence of exposure to HBV, with detection of HBsAg used to distinguish those with active HBV infection. The mean age was 45.7 years and 7,153 were women. Vaccine-induced immunity was greatest among those aged 18–29 years (60.2% in women, 54% in men) and decreased with increasing age, regardless of country of birth. The prevalence of active HBV infection was 0.29% (95% CI: 0.19–0.43%), but varied by country of birth. Those born in the Dominican Republic had the highest prevalence of HBV exposure (20.3% in women, 29.7% in men) and active HBV infection (0.95%).

Conclusions—The overall age-standardized prevalence of active HBV infection in Hispanic/Latino adults (0.29%) was no different to the general US population estimate (0.27%) and did not exceed 2%, regardless of country of birth. These data do not support targeting HBV screening to US Hispanic/Latino adults based upon background.

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Keywords

Epidemiology; public health policy; ethnic differences; population health; immigrant health

Hepatitis B virus (HBV) is a global public health concern with over 240 million people chronically infected worldwide, (1) including 730,000 non-institutionalized adults in the United States (US) (2). Prevalence of active HBV in the US general population estimated by the National Health and Nutrition Examination Survey (NHANES) 1999–2008 was 0.27% and was substantially higher in Non-Hispanic blacks and in persons born outside the US, highlighting the relevance of nativity and ethnicity in the epidemiology of HBV (3). As a part of efforts to curb HBV-associated morbidity and mortality, the US Centers for Disease Control and Prevention (CDC) released a report entitled “Recommendations for Identification and Public Health Management of Persons with Chronic Hepatitis B Virus Infection” in 2008 (3). It recommended routine HBV testing for persons born in geographic regions with HBV surface antigen (HBsAg) prevalence of ≥2% (3). Additionally, persons who report risk factors for HBV infection should be vaccinated if they test negative for HBV (4–7).

Persons of Latin American heritage represent the largest minority group, and are represented in the largest foreign born communities in the US. US Hispanic/Latinos may originate from regions of low (HBsAg prevalence < 2%), intermediate (2–8%) or high HBV endemicity (>8%) and therefore under current clinical guidelines may be subject to screening depending upon their country of birth (3). However, it has been acknowledged that these recommendations are based on limited data that may not reflect the current prevalence among foreign born individuals by country of birth (1, 6). Furthermore, data on HBV epidemiology age and birth cohorts of the US are scarce. Past studies had relatively small sample size and combined persons of disparate Hispanic/Latino backgrounds into a single group which ignores many factors of heterogeneity including heterogeneity by country of birth (8). Without accurate and detailed information on the prevalence of HBV infection, it is unclear whether the current guidelines for prevention and control of HBV infection apply to this heterogeneous population or meet their specific needs.

Therefore, we assessed the prevalence of HBV exposure, active HBV infection, as well as vaccine-induced HBV immunity in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL); a large contemporary and representative sample of US Hispanic/Latino adults of diverse heritage and generational status in four US communities. We sought to consider whether current clinical practice recommendations about hepatitis B screening and vaccination reflect an accurate understanding of the distribution of HBV in US Hispanic/Latino immigrants.

Methods

Design, Setting and Participants

The HCHS/SOL is a community-based cohort study of 16,415 Hispanic/Latino adults aged 18–74 years from four urban US communities (Bronx, NY; Miami, FL; Chicago, IL; and

San Diego, CA). Its main goals are to describe chronic disease burden and to quantify all-cause mortality in US Hispanic/Latino adults. Detailed methods and sampling design have been published elsewhere (9, 10). Participants were selected through a multi-stage probability sample designed to oversample the largest Hispanic/Latino background groups living in the US today (Dominicans, Central Americans, Cubans, Puerto Ricans, and South Americans), and persons aged 45–74 years. Participants completed a comprehensive baseline examination in 2008–2011 that included detailed questionnaires as well as clinical and behavioral examinations. Informed consent was obtained from all participants and the study was approved by the institutional review boards at each participating institution.

Of the 16,415 persons enrolled in the HCHS/SOL, 4,416 (26.9%) were excluded in the present analyses, including, 4,196 participants who were enrolled before the appropriate informed consent incorporating hepatitis testing was introduced into the study, 213 who refused to consent for hepatitis testing, 1 person who had indeterminate laboratory values, and 6 who were outside the sampling age range of 18–74. Overall, 11,999 (73.1%) participants were included in the analytic sample and their characteristics did not significantly differ by sex or education from the excluded subjects. However, those excluded were more likely to be older and varied slightly by Hispanic/Latino background (Appendix Table 1).

Laboratory Methods

HCHS/SOL serum specimens from the baseline examination were processed within 2 hours of collection, transported to a central lab and stored at −70° C. Serum specimens were tested for antibodies against hepatitis B surface antigen (anti-HBs) and core antibody (anti-HBc) and, if anti-HBc was positive, for hepatitis B surface antigen (HBsAg). Measurement of anti-HBs, HBsAg and anti-HBc was conducted using an ADVIA Centaur System (Siemens Healthcare Diagnostics, Deerfield, IL) at the HCHS/SOL Central Laboratory at the University of Minnesota Fairview Hospital Clinical Laboratory, Minneapolis, MN. The ADVIA system uses direct chemiluminometric technology for assessment of anti-HBs and HBsAg while anti-HBc is assessed using a sandwich immunoassay.

Data on HCV infection were also available for analyses (11). Lab methods described previously (11).

Outcome definitions

We defined the presence of vaccine-induced immunity when anti-HBs was positive and anti-HBc was negative. We defined a subject as HBV exposed (with past or active infection) when anti-HBc was positive. Active HBV infection was defined if a person was positive for HBsAg.

Other Measurements

In this report, we analyzed HBV prevalence by key demographic variables that were obtained at the baseline interview: self-reported age (categorized in 18–29, 30–39, 40–49, 50–59, 60–69, and 70–74 age groups), sex, place of birth (US [within the 50 US states, excluding territories], Dominican Republic, Central America, Cuba, Mexico, Puerto Rico,

and South America), and education (less than high school, high school equivalent, or greater than high school). Persons born in the US, regardless of Hispanic/Latino background, were considered as a single group as they would have been exposed to the same vaccination policies as the general population. While residents of Puerto Rico are US citizens by birth, for the purposes of this manuscript we considered Puerto Ricans born in the island separately from those born stateside.

Statistical Analysis

All statistical analyses accounted for study probability sampling design and non-response with appropriate sampling weights, and were completed with SAS-callable SUDAAN 11.0 (Research Triangle Institute, Research Triangle Park, NC). Weighted results are representative of non-institutionalized Hispanic/Latino adults age 18–74 years of age in the defined community areas. To allow comparability between HBV prevalence in HCHS/SOL with those from those of other studies, prevalence estimates were age-standardized to the 2010 US Census in ten-year age groups (18–29, 30–39, 40–49, 50–59, 60–69, and 70–74) using the *Descript* procedure (12). We examined age-standardized prevalence of (1) vaccine induced HBV immunity, (2) exposure to HBV, and (3) active HBV infection by key demographic characteristics (nativity and Hispanic/Latino background, exposure to HCV, and education level). Data were stratified by gender, except for the prevalence of active infection, where the number of cases was small (n=36). To assess birth cohort trends, prevalence of vaccine-induced immunity and exposure to HBV infection were also assessed by decade of birth and by nativity and Hispanic/Latino background using the *Crosstab* procedure.

Results

General Characteristics

The mean age of the analytic cohort was 45.7 years (SD=13.9) and 7,153 (59.2%) were women. The number that were US born and foreign-born by Hispanic/Latino background were as follows: Dominican [n=103 (0.9%) and n=1024 (8.5%)], Central American [n=60 (0.5%), n=1191 (9.9%)], Cuban [n=90 (0.8%), n=1857 (15.5%)], Mexican [n=772 (6.4%), n=3903 (32.5%)], Puerto Rican [n=759 (6.3%), n=1068 (8.9%)], South American [n=37 (0.3%), n=747 (6.2%)], and mixed/other background [n=207 (1.7%), n=136 (1.1%)]. The majority of the participants preferred to be interviewed in Spanish [n=9,700 (90.8%)] and were foreign-born [n=9,931 (92.8%)].

Prevalence of vaccine-induced immunity

Among women, 25.0% (95% CI: 23.6–26.5) had vaccine-induced immunity as compared with 21.0% (95% CI: 20.0–22.6) of men (Table 1). In both women and men, vaccine-induced immunity prevalence was the highest among younger age group of 18–29 years (60.2% and 53.7% respectively) and decreased with age. The prevalence of vaccine-induced immunity were 26.0% (95% CI: 23.3–28.9) in US born women and 27.2% (95% CI: 23.8–30.9) in US born men. Among the US born, the prevalence were similar among different Hispanic/Latino background groups (data not shown). However, among foreign-born Hispanics, prevalence of vaccine-induced immunity varied by Hispanic/Latino background.

Those born in Cuba had the highest prevalence of vaccine-induced immunity in both women and men (39.5% and 34.3%, respectively), while those born in Central America and Mexico had the lowest. Those having less than high school education had the lowest vaccine-induced immunity prevalence.

To examine time trend in HBV vaccination, we examined prevalence of vaccine-induced immunity by decade of birth among the US born and the foreign-born Hispanics/Latinos by their place of birth (Figure 1). The general pattern is that the prevalence of vaccine-induced immunity increased progressively with each birth decade, and the highest prevalence was among those born in or after 1990. Among participants born in 1990 or after, US born participants and foreign-born Cubans had the highest vaccine-induced immunity rate of 76.8% and 78.9%, respectively, and foreign-born Mexicans had the lowest of 40.3%. Among those born between 1980 and 1989, even greater disparity was observed in the prevalence of vaccine-induced immunity between the US born (nearly 60% prevalent) and those with other countries of birth. In general, there was an inverse association between vaccine-induced immunity and HBV exposure in US born and foreign-born Hispanic/Latino adults. These results are suggestive rather than conclusive due to limited sample size in some subgroups.

Prevalence of exposure to HBV

Serological evidence consistent with exposure to HBV was statistically significantly higher in men than in women (10.0% versus 6.4%, $P < 0.0001$, Table 1). The gender-difference was statistically significant ($P < 0.05$) in foreign-born Hispanic/Latino adults but not in those born in the US. Prevalence of exposure to HBV increased with age and the peak prevalence was in persons 70–74 years old in both women and men. Among all groups defined by birthplace, foreign-born Dominicans had the highest prevalence (20.3% in women and 29.7% in men). Those born in Puerto Rico had the greatest gender difference in HBV exposure (6.5% among women and 18.3% among men, $P < 0.0001$). Prevalence of HBV among those ever infected with HCV was high, exceeding 40% among women and 50% among men. The prevalence of exposure to HBV varied profoundly by decade of birth (Figure 1). Over time, prevalence of exposure to HBV within birth cohorts decreased as the prevalence of vaccine induced immunity increased. In US born participants, the greatest prevalence of HBV exposure (16.8%) was observed in persons born between 1950–1959. Among Mexico-born and Puerto Rico-born individuals, the peak HBV exposure was in persons born between 1950–1959. In contrast, those born in the Dominican Republic, Central America, and South America all had peak prevalence of HBV exposure among persons born between 1933–1939. Prevalence of HBV exposure in subsequent decades was lower.

Prevalence of active HBV infection

Overall prevalence of active HBV infection was 0.29% (95% CI: 0.19% to 0.43%). Men were marginally more likely than women to have active HBV infection (0.43% vs 0.16%, $P = 0.03$, Table 2). Prevalence was the highest among individuals aged 40 years and older. Among those who were foreign-born, the highest prevalence of active HBV infection was among those born in Dominican Republic (0.95%, 95% CI: 0.48% to 1.86%). Those with

HCV exposure did not have a higher prevalence of active HBV infection than those who did not, and the prevalence of active HBV infection decreased with increasing level of education, though these differences did not reach statistical significance.

DISCUSSION

We report the first large-scale population-based data on HBV infection among US Hispanic/Latino adults by place of birth. Overall prevalence was 22.3% for vaccine-induced immunity to HBV, 7.7% for exposure to HBV, and 0.29% for active HBV infection. For US born Hispanics/Latinos, age-standardized prevalence of active HBV infection was (0.57%) and as expected, vaccine-induced immunity was more common in the youngest age groups. Among foreign-born Hispanics/Latinos, our best estimate of the prevalence of active HBV infection did not exceed 2% in any group defined by their place of birth, regardless of Latin American background. Those born in the Dominican Republic had the highest prevalence of any group defined by birthplace, 0.95%, with an upper 95% confidence limit of 1.86%. Confidence intervals for all prevalence estimates were relatively wide due to the rarity of active HBV infection. However, our study, which is one of the only large studies to estimate HBV prevalence among Latin American migrants to the US, suggests that the approach of targeting clinical HBV screening to US Hispanic/Latino adults based upon country of birth has relativity weak ability to identify groups at high risk of HBV infection. Identification of groups at high risk of HBV infection by national background among Hispanics/Latinos is likely to be a relatively inefficient public health approach, as compared with targeting those who have individual risk factors for HBV infection or when are in close contact with an HBV infected person.

The striking differences in the prevalence of HBV vaccine-induced immunity by decade of birth were expected and are likely due to the different implementation of universal HBV vaccination for infants in the Americas (13). Within each birth cohort, the variation in vaccine-induced immunity by place of birth may reflect the different years HBV infant vaccination was introduced in each country. Data among US born Hispanics/Latinos are compatible with the introduction of an infant immunization strategy to eliminate transmission of HBV infection in 1991. The proportion of US born Hispanic/Latino adults vaccinated against HBV has risen among successive birth cohorts, reaching 76.8% among Hispanics/Latinos born in the US after 1990, and these data are consistent with trends in the general US population (8). Vaccination coverage in our study is above that reported by NHANES, however, these figures are below the 95% target of children in kindergarten (14) highlighting the need to improve universal childhood vaccination coverage. Indeed, disparities in vaccination coverage by socio-economic status and race/ethnicity have been well-documented for other vaccine-preventable diseases (15, 16). Overall, the prevalence of vaccine-induced immunity was significantly higher in women compared to men. Among foreign-born Hispanic/Latino adults, the prevalence of vaccine induced immunity tended to be higher in women as compared to men, though differences were only statistically significant for Mexicans born individuals. These gender differences may be attributed to antenatal testing in women and different health seeking behavior between men and women (17, 18).

The heterogeneity of past HBV exposure by place and decade of birth is consistent with the local epidemiology of HBV infection and with HBV vaccination programs in countries of birth (1, 7). By studying adults from various Latin American backgrounds over a wide range of age from 18 to 74 years old, we were able to document that differences in the epidemiology of HBV by place of birth are most pronounced among oldest persons and are decreasing across subsequent generations. Those born in the Dominican Republic, particularly the men, had a significantly higher prevalence of HBV exposure than those born in other regions.

For all the Hispanics/Latinos adults in HCHS/SOL, age-standardized prevalence of active HBV infection was 0.29%, which is comparable to the 0.28% national estimate from NHANES 1999–2008 (8). There were substantial differences by Latin American country of origin, though the best estimate of the prevalence of active HBV infection was below 2% for all places of birth. However, it is important to note that while the HCHS/SOL includes a diverse sample of the largest Hispanic/Latino background groups in the US, it does not take into account potential regional variation within nation of birth. For example, we do not distinguish persons from the Amazonian basin from those from urban areas of South America. Moreover, due in part to small numbers of active HBV infections, confidence intervals associated with prevalence estimates were wide, pointing to a need to additional data to refine the true prevalences of active HBV infection among immigrants from Latin America.

Though we do not have data on risk factors for HBV infection, several observations suggest that most of the HBV transmission in the Hispanic/Latino community in the US was likely to have taken place outside of childhood. First, the excess of ever HBV infected individuals over actively infected individuals is large, and it is well known that clearance of HBV is more common when infections are acquired in adulthood (19). Second, significantly higher prevalence of past exposure to HBV in men as compared with women is consistent with transmission during adolescence and adulthood as these well documented gender differences may be attributed to the higher frequency of risky behaviors, such as intravenous drug-use and having multiple sexual partners, in men (8). Finally, persons with positive HCV serology were significantly more likely to have been exposed to HBV than those without, an expected finding given both viruses share transmission routes such as unsafe blood transfusion and injection equipment (20). While current guidelines recommend HBV vaccination for patients with HCV infection, our data identifies missed opportunities for HBV vaccination in the HCV infected population which may be explained by a lack of awareness of HCV serostatus (11). We cannot infer from our data, though, if HBV infection or vaccination took place before or after migration into the US.

There are several limitations to the present study. The HCHS/SOL population was sampled in four urban areas of the US with concentrated Hispanic/Latino populations, and incarcerated or homeless persons were not included in our study sample which may lead to an underestimate of the true HBV infection prevalence. We used a household based sampling approach, albeit we did not assess the HBV status of all members at each household. Hispanics/Latinos in other regions of the US, such as New Mexico, Texas, and Arizona, are not included in our analysis.

These regions have a predominance of immigrants from Mexico which is a country known to have low prevalence of HBV exposure (21). Mexican immigrants living in several other US regions were captured in our survey. The present study is underpowered to provide HBV prevalence estimates for some Hispanic/Latino background groups that were not adequately captured in our survey. Strengths include the large sample size with standardized methods for specimen collection and testing, and population-based sampling which allows for weighted prevalence estimates by place of birth.

Our findings have important clinical and public health policy implications. With the exception of migrants from the Dominican Republic, the prevalence of active HBV infection of foreign-born Hispanic/Latinos may not be different than that among the general US population. In all populations, including the Dominican Republic group, our best estimate of the prevalence of active HBV infection falls below the 2% threshold, which is the criterion for defining high prevalence in the current HBV screening recommendations. Our findings are timely and provide an answer to the call issued by USPSTF for tools to help clinicians efficiently and accurately identify populations at high risk for HBV infection. Given the apparently low prevalence of active HBV infection in all groups studied here, applying HBV screening in certain groups of Hispanics/Latinos in the US as defined by place of birth may not be an efficient strategy. Since confidence intervals for prevalence estimates were wide, our study highlights the need for more data to refine our understanding of populations at risk. Instead, efforts should be focused to reach those Hispanic/Latinos at risk for HBV infection based on established behavioral risk factors, and to maximize compliance with childhood vaccination recommendations. Finally, cost-effectiveness analysis (19) might be applied to develop the best HBV testing and adult vaccination approaches in the US Latino population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Abbreviations

HBV	Hepatitis B virus
HBsAg	serum HBV surface antigen

anti-HBs	antibody against HBV surface antigen
anti-HBc	serum HBV core antibody
US	United States
HCHS/SOL	Hispanic Community Health Study/Study of Latinos
NHANES	National Health and Nutrition Examination Survey

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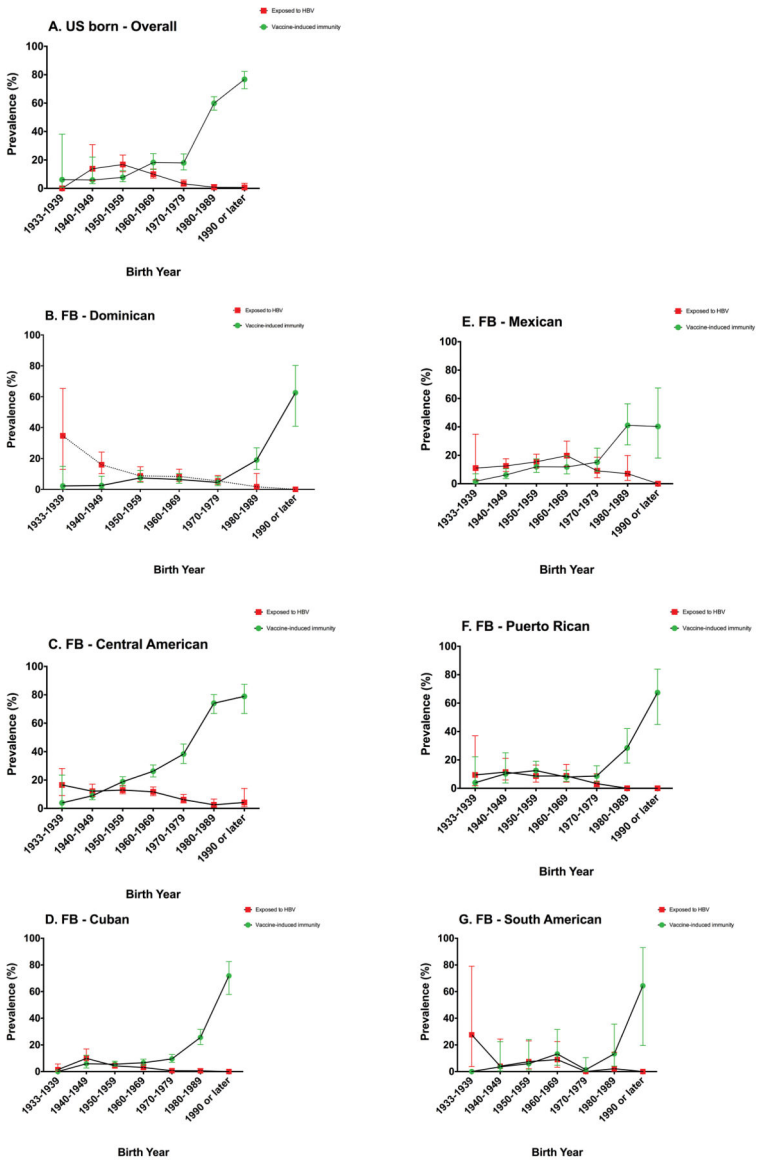

Figure 1.

Table 1

Age-standardized prevalence of vaccine-induced immunity and exposure to Hepatitis B virus stratified by sex in US Hispanic adults, HCHS/SOL 2008–2011*

	Women			Men		
		Vaccine-induced immunity	Exposed to HBV		Vaccine-induced immunity	Exposed to HBV
	Subgroup N	Prevalence % (95% CI)	Prevalence % (95% CI)	Subgroup N	Prevalence % (95% CI)	Prevalence % (95% CI)
Overall	7,153	25.0 (23.6, 26.5)	6.4 (5.6, 7.3)	4,846	21.0 (20.0, 22.6)	10.0 (9.0, 11.1)
Age Group†						
18–29	1,029	60.2 (56.5, 63.7)	1.2 (0.7, 2.1)	932	53.7 (49.4, 57.9)	1.7 (0.9, 3.4)
30–39	1,039	18.7 (15.5, 22.3)	3.2 (2.1, 4.8)	759	15.0 (12.0, 18.6)	4.5 (3.1, 6.5)
40–49	1,916	14.7 (12.4, 17.2)	8.4 (6.7, 10.6)	1,200	13.4 (10.7, 16.6)	12.3 (9.8, 15.4)
50–59	1,952	13.8 (11.7, 16.2)	9.6 (8.0, 11.6)	1,182	8.8 (7.1, 10.9)	15.2 (13.0, 17.8)
60–69	995	9.7 (7.3, 12.9)	10.5 (8.1, 13.6)	642	6.6 (4.5, 9.7)	16.8 (13.5, 20.7)
70–74	222	3.7 (1.2, 11.1)	12.0 (7.2, 19.2)	131	1.8 (0.4, 6.9)	24.1 (15.9, 34.9)
Place of Birth						
US born – Overall	1,136	26.0 (23.3, 28.9)	6.1 (4.4, 8.4)	892	27.2 (23.8, 30.9)	9.1 (6.1, 13.5)
Foreign-born – Overall	7,128	23.8 (22.0, 25.6)	6.5 (5.7, 7.5)	4,831	17.4 (15.6, 19.4)	10.2 (9.1, 11.5)
Foreign-born Dominican Republic	682	28.0 (23.8, 32.6)	20.3 (16.8, 24.3)	342	20.4 (16.2, 25.2)	29.7 (25.2, 34.7)
Foreign-born Central America	708	9.7 (7.1, 13.0)	5.7 (3.8, 8.5)	483	10.5 (7.3, 15.0)	10.6 (7.5, 14.7)
Foreign-born Cuba	991	39.5 (36.5, 42.6)	7.1 (5.6, 8.8)	866	34.3 (31.3, 37.4)	10.5 (8.8, 12.5)
Foreign-born Mexico	2,452	18.3 (15.7, 21.2)	3.3 (2.1, 5.2)	1,452	8.9 (6.9, 11.3)	2.9 (1.9, 4.3)
Foreign-born Puerto Rico	627	22.8 (17.4, 29.4)	6.5 (4.0, 10.3)	441	15.4 (11.2, 20.7)	18.3 (14.0, 23.4)
Foreign-born South America	454	20.9 (15.3, 28.0)	3.9 (2.2, 7.1)	293	14.8 (10.6, 20.2)	9.5 (6.1, 14.5)
HCV						
Ever exposed	99	9.6 (13.3, 49.7)	41.3 (22.8, 62.7)	161	13.0 (4.0, 35.2)	56.7 (40.4, 71.7)
Never exposed	7,033	25.0 (23.7, 26.5)	6.0 (5.2, 6.8)	4,673	21.2 (19.8, 22.8)	8.6 (7.6, 9.7)
Education						
Less than high school	2,661	20.8 (18.1, 23.3)	8.7 (7.2, 10.3)	1,765	15.2 (13.0, 17.8)	11.8 (10.1, 13.8)
High school graduate or equivalent	1,692	23.7 (21.4, 26.1)	5.7 (4.3, 7.5)	1,345	22.7 (20.4, 25.1)	9.1 (7.2, 11.5)
More than high school	2,617	28.8 (26.7, 31.0)	4.9 (3.8, 6.2)	1,653	23.7 (21.3, 26.4)	9.4 (7.9, 11.1)

Abbreviations: HCHS/SOL = Hispanic Community Health Study/Study of Latinos; HBV = Hepatitis B virus; US = United States; FB=foreign born; HCV = Hepatitis C virus.

*All values (prevalence and 95% CI), except subgroup n, are weighted to account for survey design. Prevalence and 95% CI are age-standardized to 2010 US Census.

†Not age-standardized.

Table 2

Age-standardized prevalence of active Hepatitis B virus infection in US Hispanic adults, HCHS/SOL 2008–2011*

	Overall Active Infection	
	Subgroup N	**Prevalence % (95% CI)**
Overall	11,999	0.29 (0.19, 0.43)
Age Group†		
18–29	1,961	0.16 (0.05, 0.47)
30–39	1,798	0.14 (0.04, 0.42)
40–49	3,116	0.49 (0.24, 1.00)
50–59	3,134	0.39 (0.21, 0.72)
60–69	1,637	0.38 (0.10, 1.37)
70–74	353	0
Sex		
Women	7,153	0.16 (0.09, 0.29)
Men	4,846	0.43 (0.26, 0.72)
Place of Birth		
US born – Overall	2,028	0.57 (0.09, 3.48)
Foreign-born Dominican Republic	1,024	0.95 (0.48, 1.86)
Foreign-born Central America	1,191	0.13 (0.04, 0.40)
Foreign-born Cuba	1,857	0.39 (0.16, 0.95)
Foreign-born Mexico	3,903	0.14 (0.06, 0.31)
Foreign-born Puerto Rico	1,068	0.12 (0.03, 0.50)
Foreign-born South America	747	0.62 (0.15, 2.50)
HCV		
Ever exposed	260	0.18 (0.02, 1.26)
Never exposed	11,703	0.29 (0.19, 0.44)
Education		
Less than high school	4,423	0.46 (0.25, 0.84)
High school graduate or equivalent	3,037	0.26 (0.13, 0.56)
More than high school	4,270	0.15 (0.06, 0.37)

Abbreviations: HCHS/SOL = Hispanic Community Health Study/Study of Latinos; HBV = hepatitis B virus; US = United States; HCV = Hepatitis C virus.

*All values (prevalence and 95% CI), except subgroup n, are weighted to account for survey design. Prevalence and 95% CI are age-standardized to 2010 US Census.

†Not age-standardized.