FACTORS ASSOCIATED WITH HEPATITIS B TESTING AMONG CAMBODIAN AMERICAN MEN AND WOMEN

Victoria M. Taylor [1]
Roshan Bastani [2]
Nancy Burke [3]
Jocelyn Talbot [1]
Channdara Sos [1]
Qi Liu [4]
J. Carey Jackson [5]
Yutaka Yasui [4]

1. Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, Washington
2. Department of Health Services, University of California at Los Angeles, Los Angeles, California
3. Department of Anthropology, History and Social Medicine, University of California at San Francisco, San Francisco, California
4. Department of Public Health Sciences, University of Alberta, Edmonton, Alberta, Canada
5. Department of Medicine, University of Washington, Seattle, Washington

Corresponding author:
Vicky Taylor MD, MPH
Fred Hutchinson Cancer Research Center (M3 – B232), 1100 Fairview Avenue North, Seattle, WA 98109, USA
Telephone: 206 – 667 – 5114
Fax: 206 – 667 – 5977
Email: vtaylor@fhcrc.org

ABSTRACT

Background: Cambodian Americans have an elevated risk of liver cancer. This health disparity is attributable to high rates of hepatitis B virus (HBV) infection. Our study examined factors associated with HBV testing among Cambodian men and women. **Methods:** A population-based survey was conducted in the Seattle area. The Health Behavior Framework guided our survey instrument development. We attempted to interview a man and a woman in each household. **Results:** The sample included 300 men and 367 women. About one-half of the male (45%) and female (54%) respondents had been tested for HBV. Two factors were independently associated with testing among men and women: a doctor had recommended testing and had asked a doctor for testing. Knowing that someone who looks and feels healthy can spread HBV was independently associated with testing among men. **Discussion:** Low levels of HBV testing remain a public health problem among Cambodians. Interventions should improve patient-provider communication by encouraging providers who serve Cambodians to recommend HBV testing, as well as by empowering Cambodians to ask for testing.

Key Words: Cambodian Americans, Hepatitis B Testing, Immigrant Health, Liver Cancer

INTRODUCTION

The 2000 United States (US) Census counted 206,000 Cambodians [1]. However, Census figures are widely considered to represent an undercount of the actual population in refugee and immigrant groups [2]. More recent estimates indicate that the Cambodian American population now approaches 250,000 [3]. Over 99% of Cambodian Americans came to the US as refugees or immigrants over the last three decades, or are the children of these individuals [1]. The majority of Cambodians live in one of three states: California, Massachusetts, and Washington [4].

While liver cancer is an uncommon tumor in the US, it is the most common malignancy in many Asian countries [5,6]. Over 80% of hepatic malignancies among Asian Americans are etiologically associated with hepatitis B virus (HBV) infection [7]. Individuals of Southeast Asian (including Cambodian, Laotian, and Vietnamese) descent have a substantially elevated risk of primary liver cancer when compared to all other racial/ethnic groups in the US [8,9]. Cancer registry data show that the incidence rate among Cambodian men exceeds 50 per 100,000, compared to 7 per 100,000 among non-Latino white men. The rates for Cambodian and non-Latina white women are 14 per 100,000 and 3 per 100,000, respectively [8].

In Asian countries where HBV is highly endemic, transmission often occurs vertically at birth [5]. However, several serologic studies conducted in the US show that the prevalence of previous infection increases steadily with age in Southeast Asian immigrant populations. Therefore, it is clear that horizontal transmission, through close household contact, also contributes to high HBV infection rates among Southeast Asians [10,11]. Finally, Southeast Asian adolescents and adults are at risk of HBV infection from sexual activity with other members of their community [12].

Exposure to HBV often results in a self-limiting infection that can be asymptomatic or present as acute hepatitis, usually followed by immunity. However, a significant proportion of those exposed to HBV become chronically infected. These individuals continue to be potentially infectious to others and are at considerable risk of liver cancer, chronic active hepatitis, and cirrhosis [13,14]. Available data indicate that about 10% of Cambodian immigrants have evidence of chronic HBV infection, compared to less than 0.5% of the general US population [15,16].

The Centers for Disease Control and Prevention (CDC) recommend HBV testing for all immigrants from endemic areas of the world, as well as their US-born children [17]. Serologic testing allows the identification of individuals who have chronic HBV infection and, therefore, should be screened for the development of liver cancer, may benefit from treatment with anti-viral medications, and should take precautions against infecting others [18-21]. It also allows the identification of individuals who have never been exposed to HBV, remain susceptible to future infection, and should be vaccinated against the virus [12,18].

A recent review of the published literature found that many Asian Americans have low levels of HBV awareness and knowledge, and have not been tested for HBV. The review also found that demographic characteristics, knowledge and health beliefs with respect to HBV, and health care system factors are all associated with HBV testing in Chinese American and Vietnamese American communities [22].

Viral hepatitis has recently received increasing attention in the US [23,24]. First, the Institute of Medicine (IOM) released its report addressing a national strategy for the prevention and control of hepatitis B and hepatitis C [23]. Second, the Department of Health and Human Services (DHSS) released its action plan for the prevention, care, and treatment of viral hepatitis [24]. The IOM report and DHSS plan call for HBV research and educational efforts focusing on at-risk

populations, and emphasize the importance of assessing HBV knowledge and practices among foreign-born populations from endemic geographic areas such as Southeast Asia [23,24].

We conducted a population-based survey of Cambodian households in the metropolitan Seattle area of Washington State during 2010. Our survey instrument development was guided by the Health Behavior Framework (HBF) which represents a synthesis of some of the major theoretical formulations in the area of health behavior, as well as an earlier qualitative study [25-28]. Survey items addressed the following constructs: demographic characteristics, acculturation, health care system factors, knowledge, health beliefs, and communication with others. Our goal was to obtain information about HBV testing barriers and facilitators that could be used to develop educational materials and intervention strategies for Cambodian communities in the US.

METHODS

Study Overview

We collaborate with an advisory group of 10 Cambodian community leaders. These individuals are Cambodian Americans who work for health and social services organizations. The advisory group provided advice about our sampling approach, survey implementation procedures, and survey instrument. Our survey was conducted over a six-month period (February–July, 2010). The Fred Hutchinson Cancer Research Center Institutional Review Board approved our survey instrument and study procedures. Individuals were eligible for the study if they were of Cambodian descent and in the 20–64 age group.

Sampling

Commonly used survey sampling methods, such as random digit dialing, are cost-prohibitive for surveys of smaller racial/ethnic populations. Therefore, name lists are often used to identify members of Asian immigrant communities [29]. We applied a list of Cambodian last names to

an electronic database of telephone listings for the metropolitan Seattle area. Specifically, we identified 1,147 addresses that were located in metropolitan Seattle (King County and the southern part of Snohomish County) and were associated with one of the Cambodian last names. All these addresses were included in our survey sample.

Survey Interviewers

Our survey workers were recruited from the Cambodian community (with the assistance of our advisory group members). They were all bilingual and bicultural Cambodian Americans. The interviewers attended a two-day training that covered human subjects issues (such as confidentiality), as well as general and project-specific interviewing techniques (such as dealing with participants' potential concerns about sensitive questions).

Survey Recruitment

Addresses in our survey sample received an introductory letter (Khmer and English versions) from the project. Surveys were conducted in participants' homes by our project interviewers (approximately two weeks after introductory mailings). Male survey workers interviewed men and female survey workers interviewed women. Written informed consent was obtained from participants immediately prior to survey completion. Respondents were given the option of completing their survey in Khmer or English, and received a $20 grocery store card as a token of appreciation for their time. Five door-to-door attempts were made to contact each household (including at least one daytime, one evening, and one weekend attempt). Each interview took approximately 30 minutes to complete.

Participant Selection

Cambodians in the 20–64 age group were included in our survey. Because the survey was used to recruit men and women for a subsequent liver cancer control household intervention program, we aimed to interview a man and a woman aged 20 to 64 years in each household

(rather than one individual in each household). If a household included more than one age-eligible Cambodian man, we attempted to interview the man with the most recent birthday. The same approach was used if a household included two or more age-eligible Cambodian women [30].

Survey Instrument

We used or adapted survey items that were recently developed for a program project focusing on HBV in three other Asian American populations (Hmong, Koreans, and Vietnamese) [27]. Prior research has shown that Asians have more difficulty completing Likert scales than other populations, our community advisory group recommended that we avoid Likert scales (when possible), and many Cambodian immigrants have little formal education [31,32]. Therefore, we made the response options for our survey items as simple as possible. Specifically, the response options for most of our survey items were yes, no, and not sure/don't know. The survey instrument was developed in English, translated into Khmer, back translated to ensure lexical equivalence, and reconciled [33]. Both the Khmer and English versions of the survey instrument were pretested with 10 individuals.

Respondents were asked whether they had ever heard of hepatitis B. After responding to this question, they were read the following statement: "Hepatitis B is an inflammation of the liver caused by a viral infection. It sometimes makes the skin and eyes go yellow. However, many infected people do not have any symptoms**."** Respondents were then asked if they had ever had a blood test specifically for hepatitis B. When this question was asked, respondents were reminded that routine blood testing (e.g., during annual physical exams) does not include a hepatitis B test.

Survey participants provided information about their age, educational level, household income, marital status, and employment status (demographic characteristics). They also provided

information about their birthplace and English-language proficiency. Foreign-born participants specified how many years they had lived in the US (acculturation). Participants indicated whether they had health insurance coverage; and whether there was one hospital, clinic or doctors office where they usually went for health care and, if so, whether they usually saw one doctor (health care system factors). Other HBF survey items are provided in Table 1.

Data Analysis

Because a relatively large number of respondents were unsure of their household income or declined to provide income information, income was classified as <$30,000, ≥$30,000, and unknown. Proportion of life in the US (which is considered to be a good measure of acculturation) was calculated from responses to questions addressing age and years since immigration [34]. Categories for this variable were <25%, 25–49%, and ≥50%. US-born respondents were included in the ≥50% category.

Our study sample included men and women from the same households and individual responses from the same household may have been correlated (i.e., the independence of observations could not be assumed). Therefore, we used bootstrap (with re-sampling of households) when comparing the characteristics of male and female respondents. This is a statistical method that can be used instead of Generalized Estimating Equations when there are more than two categories for a variable [35].

Associations between HBF variables and HBV testing were examined among men and women separately. Chi-square tests were used to examine the relationship between each HBF variable and testing in bivariable analyses [36]. Multivariable log-binomial regression models were used to assess independent associations between HBF variables and testing [37]. Variables with a p-value of 0.20 or less in bivariable comparisons were included in multivariable analyses [38]. Associations were quantified as relative risks (RR) with corresponding large-sample 95%

confidence intervals (CI). In cases where log-binomial models did not converge with the standard algorithm of SAS for fitting generalized linear models, the COPY method of Deddens and Petersen was employed [39]. All data analyses were performed with SAS version 9.2 (SAS institute, Cary, North Carolina).

RESULTS

Survey Response

Table 2 presents dispositions for the 1,147 addresses in our survey sample. We were able to verify that 580 of the addresses were Cambodian households (included one or more Cambodians). Table 3 presents dispositions for men and women in these 580 households. A total of 667 Cambodians completed a survey. Surveys were completed by 300 (67%) of the 449 Cambodian men that interviewers were able to contact, and 367 (73%) of the 501 Cambodian women that interviewers were able to contact. Our respondents were from 414 Cambodian households. In 253 of these households both a Cambodian man and woman participated in the survey, in 47 of these households a man (but not a woman) participated, and in 114 of these households a woman (but not a man) participated.

Study Group Characteristics

Table 4 gives frequencies for the HBF variables. Only 40 of our 667 survey participants were born in the US. A majority knew that HBV can be spread during childbirth, during sexual intercourse, by sharing razors, and by someone who looks and feels healthy. Similarly, a majority knew that people with HBV can be infected for life, HBV can cause liver cancer, and there is treatment for HBV infection. However, less than one-quarter knew that Cambodians are more likely to be infected with HBV than whites. Only about one-third of the respondents had received a doctor recommendation for testing and had asked a doctor for testing.

Men reported significantly higher levels of education, income, and English language proficiency than women. Female respondents were more likely to have health insurance, a regular source

of care, and regular provider than male respondents. Finally, men were more likely to know that HBV can be spread by someone who looks and feels healthy, as well as that people with HBV can be infected for life. There were no significant gender differences for the other knowledge and health belief variables or for any of the communication variables.

Bivariable Results

The proportions of men and women reporting HBV testing were 45% and 54%, respectively (p=0.01). Results from our bivariable analyses are shown in Table 5. The following HBF variables were significantly associated with HBV testing among men and women: having a regular source of health care, having a regular provider, knowing HBV can be spread by someone who looks and feels healthy, family member had suggested testing, employer had requested testing, doctor had recommended testing, and had asked doctor for testing. Higher household income, knowing HBV can be spread during sexual intercourse, knowing HBV can be spread by sharing razors, and believing HBV can cause liver cancer were associated with HBV testing among men but not women. Three variables were associated with HBV testing among female respondents but not male participants: lower proportion of life in the US, believing there is treatment for HBV infection, and friend had suggested testing.

Multivariable Results

Table 6 gives RR and 95% CI for HBF variables that showed significant associations with HBV testing in multivariable analyses. In the male participant analysis, the following HBF variables were independently associated with HBV testing: knowing that HBV can be spread by someone who looks and feels healthy, doctor had recommended testing, and had asked doctor for testing. Doctor had recommended testing and had asked doctor for testing were independently associated with HBV testing in the female participant analysis.

DISCUSSION

Our study indicates that about one-half of Cambodians in the Seattle metropolitan area have been tested for HBV. Similarly, a 2006 survey conducted in Lowell, Massachusetts found that 49% of Cambodians had received HBV testing [40]. We conducted a survey of Cambodian women in Seattle during 1999 [41]. A comparison of findings from our 1999 and 2010 surveys suggest that improvements in HBV testing levels among Cambodians have been modest over the last decade (despite national efforts to promote testing in Asian American populations) [42]. Specifically, 38% of the Cambodian women who completed our 1999 survey reported previous HBV testing, compared to 54% of the Cambodian women in our 2010 survey [41].

Nguyen and colleagues recently examined correlates of HBV testing among Vietnamese residents of the San Francisco Bay and Metropolitan Washington DC areas. Factors negatively associated with testing included longer duration of US residence, less Vietnamese fluency, lower income, and believing that HBV can be deadly. Factors positively associated with testing included having discussed HBV with family members and/or friends, an employer had requested testing, and a doctor had recommended testing [43].

Cambodian women were significantly more likely to report HBV testing than Cambodian men ($p=0.01$). The CDC have recommended universal HBV testing during pregnancy since 1988 and, therefore, Cambodian women who have received prenatal care in the US during the last two decades should have received HBV testing [44]. Additionally, our findings indicate that Cambodian women are significantly more likely to have a regular source of health care and a regular health care provider than Cambodian men.

We are not aware of any previous studies that have compared factors associated with HBV testing among Asian American men and women, and found some important gender differences in our bivariable comparisons. Knowledge about routes of HBV transmission (during sexual

intercourse and by sharing razors) was strongly associated with HBV testing among men (p=0.009 for sexual intercourse and p=0.001 for sharing razors) but not women. In contrast, reporting a friend had suggested HBV testing was strongly associated with testing among female respondents (p=0.006) but not male respondents. These findings suggest that HBV intervention programs for men might usefully focus on raising levels of knowledge, and that intervention programs that use social networks to promote HBV testing may be effective for women.

Seventy-eight percent of our male respondents and 70% of our female respondents knew that someone who looks and feels healthy can spread HBV. This HBF knowledge factor was associated with HBV testing among men and women in bivariable comparisons. Further, our multivariable analysis of male respondents found that men who knew that someone who looks and feels healthy can spread HBV were 70% more likely to have been tested than those who did not. These findings suggest that HBV educational initiatives for Cambodian American communities should emphasize that people with chronic HBV infection may be asymptomatic, and that chronically infected individuals who appear to be healthy can transmit the virus to others.

We found that about two-thirds (65%) of Cambodian men and three-quarters (77%) of Cambodian women have one doctor that they usually see, but only about one-third of Cambodian men (36%) and women (37%) had received a physician recommendation for HBV testing. Further, we found having received a physician recommendation for testing and having asked a physician for testing were strongly associated with test receipt. Previous studies have found that physician recommendation is also an important determinant of HBV testing among Chinese and Vietnamese Americans [43,45]. Efforts to increase HBV testing levels in Asian American communities should enable individuals who are without a usual source of care to find a primary care doctor. Additionally, intervention programs should improve patient-provider

communication by encouraging health care providers to recommend HBV testing, as well as by empowering people to ask for testing [24].

The study has several strengths. Specifically, we used population-based sampling methods and had relatively high cooperation rates. However, there are also several limitations. Our survey was conducted in one metropolitan area of the US and the findings may not be applicable to other geographic regions. Households with wireless only telephone coverage were excluded, and wireless only coverage is relatively high among lower income and immigrant groups [46]. Survey participants may have had different demographic characteristics and preventive behavior patterns than those who were unreachable or refused participation. Respondents may be more likely to provide desirable responses to questions addressing preventive behaviors during surveys that are administered face-to-face than telephone and self-administered surveys. Finally, self-reports of HBV serologic testing may be faulty due to inaccurate recall or confusion about the purpose of other blood tests (such as liver function tests) [43].

Avoidable mortality from hepatitis B-related liver disease is one of the most important health disparities experienced by individuals of Southeast Asian descent, and Cambodian immigrants are over 25 times more likely to have evidence of chronic HBV infection than the general US population [18,47]**.** Our findings indicate that a high proportion of chronically infected Cambodians are unaware of their HBV infection because they have not been tested, and confirm the need for continued efforts to develop and implement targeted educational campaigns to reduce the high burden of chronic HBV infection and liver cancer experienced by this racial/ethnic population. Such campaigns should aim to increase HBV serologic testing rates, vaccination rates among individuals who remain susceptible to infection, and levels of knowledge about transmission [22-24].

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Table 1: Health Behavior Framework Survey Items

Knowledge
Do you think hepatitis B can be spread from an infected mother to a baby during childbirth?
Do you think hepatitis B can be spread during sexual intercourse with an infected person?
Do you think sharing razors with an infected person can spread hepatitis B?
Do you think an infected person who looks and feels healthy can spread hepatitis B?
Health Beliefs
Do you think Cambodians in the US or whites in the US are more likely to be infected with hepatitis B?
Do you think people can be infected with hepatitis B for life?
Do you think hepatitis B can cause liver cancer?
Do you think there is any treatment for hepatitis B?
Communication with Others
Have any of your family members ever suggested that you get tested for hepatitis B?
Have any of your friends ever suggested that you get tested for hepatitis B?
Have any of your employers ever asked you to get tested for hepatitis B?
Has a doctor ever told you that you should be tested for hepatitis B?
Have you ever asked a doctor to test you for hepatitis B?

Table 2: Dispositions of Addresses in Survey Sample (N=1,147)

Disposition	N
Household included one or more Cambodians	**580**
Household verified to be ineligible (no Cambodians in household)	**250**
Household eligibility not established	**182**
– Unable to contact household (no-one home after five attempts)	120
– Unable to locate unit in an apartment or condominium complex (address did not include unit number)	47
– Unable to access secure apartment or condominium building	15
Not a residential address	**135**
– Vacant house, apartment or condominium	106
– Business address	29

Table 3: Dispositions in Households with One or More Cambodians (N=580)

Disposition	N
Men	
Interview completed by age-eligible Cambodian man	300
No age-eligible Cambodian man	105
Age-eligible Cambodian man not home after five attempts	26
Age-eligible Cambodian man refused	149
Women	
Interview completed by age-eligible Cambodian woman	367
No age-eligible Cambodian woman	61
Age-eligible Cambodian woman not home after five attempts	18
Age-eligible Cambodian woman refused	134

Table 4: Study Group Characteristics

Variable	Men N=300 n (%)	Women N=367 n (%)	p-value
Demographic			
Age (years)			
<35	58 (19)	91 (25)	0.13
35–49	128 (43)	134 (37)	
≥50	113 (38)	140 (38)	
Education (years)			
<7	78 (26)	148 (41)	**<0.001**
7–11	60 (20)	94 (26)	
≥12	158 (53)	121 (33)	
Income ($)			
<30,000	69 (23)	127 (35)	**<0.001**
≥30,000	184 (61)	171 (47)	
Unknown	47 (16)	68 (19)	
Marital status			
Currently married	221 (74)	256 (70)	**<0.001**
Previously married	26 (9)	67 (18)	
Never married	53 (18)	43 (12)	
Employment status			
Employed full-time	179 (60)	181 (49)	**0.02**
Employed part-time	32 (11)	57 (16)	
Not employed	89 (30)	129 (35)	
Acculturation			
Birthplace			
Cambodia	261 (87)	329 (90)	0.43
Thailand or Vietnam	19 (6)	17 (5)	
US	20 (7)	20 (5)	
Proportion of life in US (%)			
<25	30 (10)	66 (18)	**<0.001**
25–49	87 (29)	119 (33)	
≥50	182 (61)	180 (49)	
English language proficiency			
Speaks fluently or well	85 (28)	77 (21)	**<0.001**
Speaks so so	148 (49)	118 (32)	
Speaks poorly or not at all	67 (22)	172 (47)	

Table 4: Study Group Characteristics (continued)

Variable	Men N=300 n (%)	Women N=367 n (%)	p-value
Health Care Factors			
Health insurance			
Yes	184 (62)	270 (74)	**<0.001**
No	115 (38)	97 (26)	
Regular source of care			
Yes	215 (72)	328 (89)	**<0.001**
No	85 (28)	39 (11)	
Regular provider			
Yes	194 (65)	284 (77)	**<0.001**
No	105 (35)	83 (23)	
Knowledge			
HBV can be spread during childbirth			
Yes	211 (70)	250 (68)	0.50
No	89 (30)	117 (32)	
HBV can be spread during sexual intercourse			
Yes	225 (75)	254 (69)	0.08
No	75 (25)	113 (31)	
HBV can be spread by sharing razors			
Yes	247 (82)	286 (78)	0.14
No	53 (18)	81 (22)	
HBV can be spread by someone who looks and feels healthy			
Yes	233 (78)	256 (70)	**0.02**
No	67 (22)	110 (30)	

Table 4: Study Group Characteristics (continued)

Variable	Men N=300 n (%)	Women N=367 n (%)	p-value
Health Beliefs			
Cambodians are more likely to be infected with HBV than whites			
Yes	72 (24)	82 (22)	0.52
No	224 (76)	284 (78)	
People can be infected with HBV for life			
Yes	185 (62)	199 (54)	**0.04**
No	115 (38)	168 (46)	
HBV can cause liver cancer			
Yes	229 (76)	262 (71)	0.15
No	71 (24)	105 (29)	
There is treatment for HBV			
Yes	198 (66)	245 (67)	0.88
No	102 (34)	122 (33)	
Communications with Others			
Family member(s) had suggested HBV testing			
Yes	59 (20)	68 (19)	0.72
No	241 (80)	298 (81)	
Friend(s) had suggested HBV testing			
Yes	32 (11)	52 (14)	0.14
No	268 (89)	315 (86)	
Employer had requested HBV testing			
Yes	27 (9)	30 (8)	0.70
No	273 (91)	337 (92)	
Doctor had recommended HBV testing			
Yes	109 (36)	137 (37)	0.77
No	191 (64)	229 (63)	
Had asked doctor for HBV testing			
Yes	92 (31)	124 (34)	0.37
No	208 (69)	243 (66)	

Table 5: Bivariable Results

	Men		Women	
	% Tested	**p-value**	**% Tested**	**p-value**
Demographic				
Age (years)				
<35	40	0.15	58	0.31
35–49	52		55	
≥50	41		49	
Education (years)				
<7	36	0.08	47	0.16
7–11	43		55	
≥12	51		59	
Income ($)				
<30,000	30	**0.02**	55	0.07
≥30,000	51		57	
Unknown	45		42	
Marital status				
Currently married	45	0.24	53	0.49
Previously married	58		60	
Never married	38		49	
Employment status				
Employed full-time	50	0.06	54	0.98
Employed part-time	44		53	
Not employed	35		54	
Acculturation				
Birthplace				
Cambodia	46	0.64	54	0.95
Thailand or Vietnam	47		53	
US	35		50	
Proportion of life in US (%)				
<25	60	0.20	70	**0.002**
25–49	41		43	
≥50	45		54	
English language proficiency				
Speaks fluently or well	51	0.35	60	0.40
Speaks so so	45		54	
Speaks poorly or not at all	39		51	

Table 5: Bivariable Results (continued)

Variable	Men		Women	
	% Tested	p-value	% Tested	p-value
Health Care Factors				
Health insurance				
Yes	46	0.83	54	0.62
No	44		52	
Regular source of care				
Yes	51	**0.002**	55	**0.04**
No	31		38	
Regular provider				
Yes	51	**0.01**	58	**0.002**
No	35		39	
Knowledge				
HBV can be spread during childbirth				
Yes	45	0.81	54	0.96
No	46		54	
HBV can be spread during sexual intercourse				
Yes	49	**0.009**	54	0.71
No	32		52	
HBV can be spread by sharing razors				
Yes	49	**0.001**	55	0.53
No	25		51	
HBV can be spread by someone who looks and feels healthy				
Yes	52	**<0.001**	57	**0.02**
No	22		45	

Table 5: Bivariable Results (continued)

Variable	Men		Women	
	% Tested	p-value	% Tested	p-value
Health Beliefs				
Cambodians are more likely to be infected with HBV than whites				
Yes	49	0.47	60	0.22
No	44		52	
People can be infected with HBV for life				
Yes	48	0.26	54	0.97
No	41		54	
HBV can cause liver cancer				
Yes	49	**0.02**	56	0.21
No	32		49	
There is treatment for HBV				
Yes	47	0.34	58	**0.02**
No	41		45	
Communications with Others				
Family member(s) had suggested HBV testing	66	**<0.001**	79	**<0.001**
Yes	40		48	
No				
Friend(s) had suggested HBV testing				
Yes	50	0.55	71	**0.006**
No	44		51	
Employer had requested HBV testing				
Yes	63	**0.049**	77	**0.008**
No	43		52	
Doctor had recommended HBV testing				
Yes	69	**<0.001**	80	**<0.001**
No	31		38	
Had asked doctor for HBV testing				
Yes	74	**<0.001**	85	**<0.001**
No	32		37	

Table 6: Multivariable Results

Variable	Men		Women	
	RR	95% CI	RR	95% CI
HBV can be spread by someone who looks and feels healthy	1.7	1.03 – 2.7	—	—
Doctor had recommended HBV testing	1.6	1.1 – 2.2	1.3	1.04 – 1.7
Had asked doctor for HBV testing	1.4	1.02 – 2.0	1.8	1.4 – 2.3