

## RESEARCH COMMUNICATION

# Hepatitis B Knowledge and Practices among Chinese Immigrants to the United States

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### Abstract

**Introduction:** Chinese immigrants to the United States experience high rates of liver cancer. Chronic carriage of hepatitis B virus (HBV) is the most common underlying cause of liver cancer among Chinese Americans. Our objective was to describe Chinese immigrants' hepatitis B knowledge, testing, and vaccination levels. **Methods:** A community-based, in-person survey of Chinese men and women was conducted in Seattle during 2005. Our study sample included 395 individuals. **Results:** Less than one-half (48%) of our study group indicated they had received a hepatitis B blood test, and about one-third (31%) indicated they had been vaccinated against hepatitis B. The proportions of respondents who knew HBV can be spread during childbirth, during sexual intercourse, and by sharing razors were 70%, 54%, and 55%, respectively. Less than one-quarter of the study group knew that HBV cannot be spread by eating food that was prepared by an infected person (23%) and by sharing eating utensils with an infected person (16%). **Discussion:** Over 50% of our respondents did not recall being tested for HBV. Important knowledge deficits about routes of hepatitis B transmission were identified. Continued efforts should be made to develop and implement hepatitis B educational campaigns for Chinese immigrant communities.

**Key Words:** Chinese - hepatitis B - liver cancer - immigrants

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### Introduction

Asians are one of the fastest growing racial/ethnic minority populations in the United States (US). Census Bureau data show that there were approximately 2,400,000 ethnic Chinese living in the US in 2000, and Chinese were the largest Asian American sub-group. Over two-thirds (69%) of Chinese Americans are foreign born, and 39% are recent immigrants who have lived in the US for less than 10 years (US Department of Commerce, 2004). Hepatitis B virus (HBV) infection is endemic in most Asian countries (Nguyen and Keeffe, 2003). Therefore, it is not surprising that the rate of chronic hepatitis B infection among Chinese Americans is over ten times the general US population rate of less than 0.5% (Asian Liver Center, 2005; Tong and Hwang, 1994). For example, 9% of 666 Chinese tested in New York and 14% of Chinese tested in Los Angeles were HBV carriers (Tong and Hwang, 1994).

Chronic carriage of HBV is the most common underlying cause of liver cancer in the majority of Asian American populations (Merican et al, 2000). Rosenblatt et al. used

cancer registry data to examine liver cancer incidence among Chinese migrants to the US and their descendants, relative to whites. Asian-born Chinese men had a liver cancer incidence of 26.5 per 100,000 person years and a rate ratio of 8.0 (95% CI: 5.3-12.1) compared to white men, and US-born Chinese men had an incidence of 9.8 and a rate ratio of 3.0 (95% CI: 1.9-4.5) compared to white men. The incidence rates among Asian-born Chinese, US-born Chinese, and white women were 3.7, 2.2, and 1.1 per 100,000 person years, respectively (Rosenblatt et al, 1996).

Exposure to HBV results in infection that can either be asymptomatic or present as acute hepatitis. While hepatitis B exposure among adults is usually followed by immunity, a proportion of those who are infected become carriers of the virus (Di Bisceglie et al, 1988; Lok and McMahon, 2001). Carriers continue to be potentially infectious to others, and are at increased risk of chronic active hepatitis and cirrhosis, as well as liver cancer (Lok and McMahon, 2001; Tong and Hwang, 1994). Chronically infected individuals may benefit from anti-viral therapy as well as regular screening for liver cancer, and should take precautions to avoid infecting others

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(Lin and Keefle, 2001; Lok and McMahon, 2001; Malik and Lee, 2000; Tong and Hwang, 1994). Therefore, the American Association for the Study of Liver Diseases recommends that population sub-groups at high risk for chronic HBV infection, including persons born in endemic areas of the world, receive hepatitis B testing (Lok and McMahon, 2001).

In Asian countries, HBV transmission usually occurs vertically from mother to child at birth (Merican et al, 2000). However, horizontal transmission can also occur through sexual intercourse or close household contact (e.g., through sharing razors) with a HBV carrier (Asian Liver Center, 2005). Potential strategies for controlling hepatitis B among Asian populations in the US include the routine testing of immigrants, vaccinating immigrants who have never been exposed to the virus (especially those who are at high risk of infection such as the family members of chronic carriers), and educating communities about the routes of hepatitis B transmission (Jenkins et al, 2001).

We are not aware of any national data addressing HBV knowledge and behavior among Asian American populations. A few surveys of Asian sub-groups have previously been conducted in defined geographic areas of the US (Butler et al, 2005; McPhee et al, 2003; Taylor et al, 2002; Taylor et al, 2005; Thompson et al, 2002). However, these surveys were either conducted in Vietnamese communities, only included women, or had small sample sizes. Health education programs for immigrant groups should be based on a thorough understanding of the target population's health knowledge, beliefs, and practices (Hubbell et al, 1995). We conducted a needs assessment survey of Chinese American men and women in Seattle, Washington during 2005. This descriptive report focuses on Chinese immigrants' hepatitis B knowledge, testing levels, and vaccination levels.

## Subjects and Methods

### *Survey Sampling*

Our survey sample was drawn from 17 Seattle zip codes with a relatively high proportion of Chinese residents. A previously validated list of Chinese last names was applied to an electronic version of the Seattle telephone book (Lauderdale and Kestenblum, 2000). We identified 1,902 Chinese households in the target zip codes. These households were all included in our survey sample. To ensure gender compatibility between interviewers and interviewees, we randomly assigned households to those where we asked to speak with a man and those where we asked to speak with a woman. Households randomized to the "male group" were approached by a male interviewer and households randomized to the "female group" were approached by a female interviewer.

### *Survey Procedures*

The questionnaire and survey procedures were reviewed and approved by the Institutional Review Board at the Fred

Hutchinson Cancer Research Center. Households received an introductory mailing which included a letter (traditional Chinese, simplified Chinese, and English versions) as well as a small incentive (a calendar). The letters described the survey and allowed potential participants the opportunity to telephone the project office if they had questions or did not want to participate in the study. Each household was subsequently approached by a Chinese interviewer, and asked to complete an in-person interview.

Individuals were eligible for our survey if they were of Chinese ethnicity (regardless of country of origin); aged 20 to 64 years; and able to speak Cantonese, Mandarin, or English. When a household included two or more age-eligible Chinese men or women, we asked to speak to the man or woman with the most recent birthday. Respondents were offered \$20 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). Respondents were given the option of completing their survey in Cantonese, Mandarin, or English.

### *Survey Instrument*

The questionnaire was developed in English, translated into Chinese (Cantonese and Mandarin versions), and pre-tested. Survey participants specified their age, marital status, and educational level. They were also asked how many years they had lived in the US, how well they spoke English, and where they were born.

Respondents 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. People with hepatitis sometimes lose their appetite and experience nausea as well as vomiting." They were then asked if they had ever had a blood test to see if they currently have hepatitis B or have had it in the past. Those who reported hepatitis B testing were asked where they had their blood test. Respondents were also asked whether they had been vaccinated against hepatitis B and, if so, where they were vaccinated. After answering the testing and vaccination questions, participants were also asked if a doctor had ever told them they were a hepatitis B carrier.

The survey instrument included a section addressing knowledge about hepatitis B transmission and the potential consequences of infection. Respondents were asked whether they thought hepatitis B can be spread during sexual intercourse, during childbirth, by sharing razors, and by someone who looks healthy. Another question asked whether hepatitis B is more easily spread than AIDS. We also queried participants about routes of transmission that are not applicable to HBV. Specifically, we asked whether they thought hepatitis B can be spread by eating food prepared by an infected person or by sharing eating utensils. Finally, we asked each respondent whether he/she thought that people can be infected with HBV for life, whether hepatitis B disease causes cirrhosis, and if hepatitis B disease causes liver cancer.

**Table 1. Survey Response (N = 1902)**

Household Disposition	n
Interview completed	436
Household refused	314
Household ineligible <sup>a</sup>	628
Unable to contact household <sup>b</sup>	419
Non-residential address <sup>c</sup>	105

<sup>a</sup>Household not Chinese; no Chinese man/woman in the 20-64 age-group; or household Chinese but did not speak Cantonese, Mandarin, or English <sup>b</sup>Nobody home after five attempts; unable to access secure apartment/condominium building; or insufficient address information <sup>c</sup>Vacant dwelling or business

**Results**

*Survey Response*

The survey cooperation rate was 58%. Specifically, surveys were completed by 436 individuals and 314 households refused participation. Table 1 provides detailed information about the survey response. Six respondents were excluded because they were older than 64 years of age (and should not have been interviewed). Because this study focused on immigrants, a further 35 respondents were excluded because they were born in the US. Therefore, the sample for this analysis included 395 individuals. Two hundred and forty (61%) of the respondents completed the survey in Cantonese, 106 (27%) completed the survey in Mandarin, and 49 (12%) completed the survey in English.

*Study Group Characteristics*

The demographic characteristics of the study group are given in Table 2. Thirty-seven percent were less than 45 years of age, 87% were currently married, and 38% had less than 12 years education. Nearly two-thirds had lived in the US for less than 20 years (63%) and were born in China (60%).

*Hepatitis B Testing and Vaccination*

Less than one-half (48%) of our study group indicated they had received a hepatitis B blood test, and about one-third (31%) indicated they had been vaccinated against hepatitis B. The proportions of survey participants reporting they had been tested and vaccinated, tested but not vaccinated, vaccinated but not tested, and neither tested nor vaccinated were 20%, 28% 11%, and 41%, respectively. Twenty-nine percent of the 190 immigrants who had been tested for HBV reported their blood test was done in Asia (rather than the US), and 42% of the 124 immigrants who had been vaccinated reported they had received their shots in Asia. Nineteen (5%) of our respondents reported that a doctor had told him/her that he/she is a hepatitis B carrier. Chi-square tests were used to compare the demographic characteristics of respondents who did and did not report a previous hepatitis B test as well as those who did and did not report vaccination. Table 2 provides our findings from these bivariate comparisons. Previous testing and vaccination were both significantly associated with a higher educational level, greater English proficiency, and country of birth. HBV

**Table 2. Demographic Variables Associated with Hepatitis B Testing and Vaccination (N=395)**

Variable	n (%)	HBV Testing %	p-value	HBV Vaccination %	p-value
Gender					
Male	184 (47)	52	0.22	29	0.35
Female	211 (53)	45		34	
Age (years)					
20 – 44	146 (37)	53	0.13	43	<0.001
45 – 64	245 (63)	45		24	
Marital status					
Now married	343 (87)	49	0.35	31	0.64
Previously or never married	51 (13)	41		35	
Education (years)					
< 12	150 (38)	41	0.03	21	0.001
≥ 12	245 (62)	53		38	
Length of time in US (years)					
< 20	248 (63)	51	0.17	34	0.15
≥ 20	146 (37)	43		27	
English proficiency					
Fluent or well	236 (60)	53	0.02	38	0.001
Not well	159 (40)	41		22	
Birth country					
China	237 (60)	46	0.049	27	0.03
Hong Kong	53 (13)	55		47	
Taiwan	47 (12)	64		36	
Other Asian	58 (15)	40		31	

vaccination was also associated with younger age. The highest levels of testing were found among immigrants from Taiwan (64%) while the highest levels of vaccination were found among immigrants from Hong Kong (47%).

*Hepatitis B Knowledge*

The hepatitis B knowledge results are given in Table 3. Less than one-third of the study group knew that HBV is more easily spread than AIDS (30%), cannot be spread by eating food that was prepared by an infected person (23%),

**Table 3. Hepatitis B Knowledge (N=395)**

Variable	n	%
HBV is more easily spread than AIDS	120	30
HBV can be spread by someone who looks healthy	311	79
HBV can not be spread by eating food prepared by an infected person	89	23
HBV can not be spread by sharing eating utensils	63	16
HBV can be spread during sexual intercourse	211	54
HBV can be spread during childbirth	277	70
HBV can be spread by sharing razors	216	55
People with HBV disease can be infected for life	144	37
HBV disease can cause cirrhosis	297	75
HBV disease can cause liver cancer	289	73

and cannot be spread by sharing eating utensils with an infected person (16%). In addition, only 37% knew that people can be infected with HBV for life. The proportions who knew HBV can be spread during childbirth, during sexual intercourse, and by sharing razors were 70%, 54%, and 55%, respectively. A majority knew that HBV can be spread by a person who looks healthy (79%), HBV can cause cirrhosis (75%), and HBV can cause liver cancer (73%).

## Discussion

Our study indicates that less than one-half (48%) of Chinese immigrants in the US Pacific Northwest have been tested for hepatitis B. We conducted a small survey of Chinese women in Seattle during 1999 (Thompson et al, 2002). A comparison of findings from our 1999 and 2005 surveys suggest improvements in hepatitis B testing levels over the last six years have been modest, despite hepatitis B educational efforts by groups such as the National Task Force on Hepatitis B (National Task Force on Hepatitis B, 2004). Specifically, about one-third (35%) of the Chinese women who completed our 1999 survey reported previous hepatitis B testing, compared to 44% of the Chinese women in our 2005 survey.

We found that younger adults (43%) were more likely to report HBV vaccination than older adults (24%). Taiwan, Hong Kong, and Singapore have led the world in universal childhood HBV vaccination programs (Farrell and Liaw, 2000). For example, Taiwan has implemented a series of population-based hepatitis B vaccination programs over the last two decades. These programs successively targeted the infants of carrier mothers, all infants, pre-school children, primary school children, and lastly teenagers (Hsu, 1999). In addition, targeted US efforts to vaccinate Asian American children and adolescents against HBV infection began in 1990 (Jenkins et al, 2000). It is possible that these programs positively impacted hepatitis B vaccination rates among the younger adults in our study.

Nineteen (5%) of the respondents reported a doctor had told him/her that he/she was a hepatitis B carrier. Since only 190 (approximately one-half) of our survey participants reported they had been tested for hepatitis B, these data are consistent with laboratory-based studies that found about 10% of Chinese immigrants to the US are hepatitis B carriers (Tong and Hwang, 1994). Just over one in ten (11%) of the study sample reported that they had been vaccinated against hepatitis B, but not tested for the disease. In Asian countries, the majority of hepatitis B carriers are infected as infants or young children (Merican et al, 2000). Therefore, a proportion of Chinese immigrants who have been vaccinated without testing are probably carriers (and, in some cases, would benefit from medication to control their chronic hepatitis B disease) (Malik et al, 2000).

About three-quarters of our study participants knew that chronic hepatitis B infection can lead to serious health problems such as cirrhosis (75%) and liver cancer (73%). However, we identified some important knowledge deficits,

particularly with reference to routes of hepatitis B transmission. For example, only about one-half of our respondents knew that hepatitis B can be spread by sexual intercourse (54%) and sharing razors (55%). In addition, very few respondents knew that hepatitis B is not transmitted by eating food that has been prepared by an infected person (23%) or by sharing eating utensils with an infected person (16%). These data suggest that many Chinese immigrants may be confusing hepatitis B with other communicable diseases such as hepatitis A.

Our study has several strengths: We used population-based sampling methods, administered the survey face-to-face in the language of each participant's choice, and had a relatively good cooperation rate. However, our study also has several limitations. Specifically, respondents were recruited in one geographic area of the US; only households with listed telephone numbers were eligible; individuals of Chinese descent who spoke a language/dialect other than Cantonese, Mandarin, or English were excluded; and a proportion of households were unreachable or refused to participate. Additionally, our study used self-reported data.

The findings confirm the need for continued efforts to develop and implement targeted educational campaigns to reduce the high burden of chronic hepatitis B infection and liver cancer (especially in less educated and acculturated Chinese immigrant communities). Our research group is currently conducting a randomized controlled trial to evaluate the impact of a multi-faceted outreach worker intervention (home visit by an outreach worker, a video, and a pamphlet) on hepatitis B knowledge and testing levels among Chinese Americans/Canadians. We are also conducting a group-randomized controlled trial to evaluate a hepatitis B educational curriculum for Chinese American/Canadian immigrants attending English as a Second Language classes.

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INTRODUCTION Chinese immigrants to the United States experience high rates of liver cancer. Chronic carriage of hepatitis B virus (HBV) is the most common underlying cause of liver cancer among Chinese Americans. Our objective was to describe Chinese immigrants' hepatitis B knowledge, testing, and vaccination levels. @article{Taylor2006HepatitisBK, title={Hepatitis B knowledge and practices among Chinese immigrants to the United States.}, author={Victoria M. Taylor and Shin-ping Tu and Erica D. Woodall and Elizabeth Acorda and Hueifang Chen and John H. Choe and Lin Li and Yutaka Yasui and Thomas Gregory Hislop}, journal={Asian Pacific journal of cancer prevention : APJCP} c. A relatively small agricultural sector is common among developed democracies. 2. During the Cold War, the developed democracies were commonly referred to by scholars as the a. top tier. b. peripheral. c. first world. d. nonaligned. c. first world. 11. The European Union was created as a response to the a. destruction caused by World War I. b. destruction caused by World War II. c. failure of the League of Nations. d. end of the Cold War. b. destruction caused by World War II. 12. Which of the following is the best-known example of the process of integration? a. formation of the European Union b. creation of the United States of America c. creation of the North American Free Trade Agreement d. creation of the Commonwealth of Independent States. a. formation of the European Union. Chinese immigrants to the United States experience high rates of liver cancer. Chronic carriage of hepatitis B virus (HBV) is the most common underlying cause of liver cancer among Chinese Americans. Our objective was to describe Chinese immigrants' hepatitis B knowledge, testing, and vaccination levels. METHODS: A community-based, in-person survey of Chinese men and women was conducted in Seattle during 2005. Our study sample included 395 individuals. RESULTS: Less than one-half (48%) of our study group indicated they had received a