Reducing Liver Cancer Disparities: A Community-Based Hepatitis-B Prevention Program for Asian-American Communities

Chiehwen Ed Hsu, PhD, MPH; Louis Chih-Hung Liu, MA; Hee-Soon Juon, PhD, RN; Yu-Wen Chiu, MD, MSPH; Julie Bawa, MPH; Ulder Tillman, MD, MPH; Mark Li, MD; Jerry Miller, PhD; and MinQi Wang, PhD

Financial support: We acknowledge the support made available by the Montgomery County Department of Health and Human Services, Asian American Health Initiative Program, American Cancer Society and Gilead Pharmaceutical Inc. for health education, screening and vaccination activities. Their financial support is highly appreciated.

Objectives: Several Asian-American groups are at a higher risk of dying of liver diseases attributable to hepatitis-B infection. This culturally diverse community should be well informed of and protected against liver diseases. The present study assesses the knowledge of hepatitis B before and after a hepatitis-B educational program and determines the infection status of an Asian community.

Methods: Nine Asian communities of Montgomery County, MD, enrolled in the hepatitis-B prevention program between 2005 and 2006. They attended culturally tailored lectures on prevention, completed self-administered pre- and posttests, and received blood screening for the disease.

Results: More than 800 Asian Americans participated in the study. Knowledge of prevention was improved after educational delivery. The average infection rate was 4.5%, with Cambodian, Thai, Vietnamese, Chinese and Korean groups having higher infection rates. The age group of 36–45 had the highest percentage of carriers (9.1%).

Conclusion: Many Asian groups, particularly those of a southeast Asian decent, were subject to a higher probability of hepatitis-B infection. At an increased risk are first-generation Asian immigrants, groups with low immunization rates and those aged 36–45. The findings provide potential directions for focusing preventive interventions on at-risk Asian communities to reduce liver cancer disparities.

Key words: Asian Americans ■ hepatitis ■ liver ■ cancer ■ health disparities ■ minority health

 From the Department of Public and Community Health (Chiu, Hsu, Wang) and School of Public Policy (Liu), University of Maryland–College Park, College Park, MD; Department of Health, Behavior & Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD (Juon); Department of Community Medicine, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan (Chiu); Asian American Health Initiative Program (Bawa), Department of Health and Human Services (Tillman), Montgomery County, Rockville, MD; private practice, Wheaton, MD (Li, primary care physician); and Baylor College of Medicine, Houston, TX (Miller, research fellow). Send correspondence and reprint requests for *J Natl Med Assoc.* 2007;99:900–907 to: Dr. Chiehwen Ed Hsu, Assistant Professor, Public Health Informatics University of Maryland, College Park, 2371 HHP Building, Valley Drive College Park, MD 20742; phone: (301) 405-8161; fax: (301) 314-9167; e-mail: edhsu@umd.edu

BACKGROUND

The literature suggests that Asian Americans are at a greater risk of dying from liver disease and its complications, compared with their counterparts of other racial and ethnic groups. According to national statistics, the risk of dying from liver cancer is on average three times higher than the risk of dying in other racial/ethnic communities, with Chinese Americans at six times, Koreans eight times and Vietnamese 13 times higher than their white counterparts.[1] At the local level in the state of Maryland, a recent needs-assessment study of Asian American health in Montgomery County, MD, conducted by the University of Maryland confirmed the disease burden that paralleled national statistics: hepatitis-B infection (HBV) and liver cancer were cited as severe health concerns among four Asian groups—namely, Chinese, Filipino, Korean and Vietnamese communities.[2] On the other hand, these at-risk communities were often not aware of their infection status due to the lack of knowledge of prevention and screening services. Evidence from the needs assessment also suggested that the three at-risk groups—namely, Chinese, Korean and Vietnamese subjects—included in this study had relatively low screening rates of HBV when compared with those of other diseases and conditions. Because one of the overarching objectives of Healthy People 2010 provided by the Centers for Disease Control is to reduce the heath disparities among racial/ethnic groups,[3] it warrants notice that HBV is a disease highly preventable through screening and vaccination, manageable through lifestyle changes and medication, and as such could be very cost efficient in terms of the return on resource investment in health interventions for reducing health disparities.

This paper describes an HBV prevention program for eight Asian American communities in Montgomery County. The HBV prevention program included a health education outreach program that provided screening and vaccination in nine participating Asian subgroups.* The program also provided baseline infection rate data for future health program planning.

CONTEXT

Asian Americans in Maryland and Asian Subgroups in Montgomery County

According to the U.S. Census Bureau (Census 2000), the Washington, DC–Baltimore metropolitan area was among the top five U.S. metropolitan areas with the largest Asian population (following Los Angeles, CA; New York, NY; San Francisco, CA; and Honolulu, HI).[4] In 2005, there were 119,566 self-identified Asians residing in Montgomery County alone, representing >13.5% of county residents. They represented the communities of Asian Indians (n=31,882, 26%), Chinese (31,749, 26%), Korean (17,849, 15%), Vietnamese (13,521, 11%), Filipino (9,389, 8%), Japanese (3,465, 3%) and others (11,771, 10%).[5]

Literature Review: Hepatitis B and the Health Disparities among Asian American Communities

The rate of chronic HBV in non-Hispanic Whites was 0.1%, Hispanics 0.1%, and African Americans 0.5%. These are much lower than the chronic HBV infection rate in Asian Americans and Pacific Islanders (AAs/PIs) of 7%, non U.S.-born AAs/PIs of 9% and U.S.-born AAs/PIs of 1.5%.[6] Studies suggest that HBV infections account for the majority (about 80%) of the liver cancer deaths in the Asian community.[7] The literature indicates that the mortality disparities in Asian communities are potentially attributable to both demographic characteristics and social barriers. For instance, in terms of the incidence rate by race/ethnicity, Vietnamese-American men have the highest incidence of liver cancer of all racial/ethnic groups (41.8 per 100,000). Incidence among Korean males (24.8) and Chinese males (20.9) is much higher than among white males (3.7).[8] In addition, a recent study in New York City reported that 14.8% of AAs/PIs were chronically infected with HBV[7]—namely, one in seven AAPI members in this study was infected with HBV.

In addition to race/ethnicity, studies suggest that HBV is related to other demographic and social characteristics, such as age, length of U.S. residence; and social barriers, such as a lack of literacy, education or cultural fluency. Edmunds et al. investigated the relation between the age of infection with HBV and the development of the carrier state.[9] The results suggested that the introduction of vaccination in early childhood could be the most conducive to HBV protection. Moreover, infection with the disease varied by the length of U.S. residency for immigrants. HBV disproportionally affected many first-generation (foreign-born) Asian immigrants. For example, in the New York City study cited earlier, 99% of the participants at the community screening program were foreign born: 60% were from China, 30% were from Korea and 7% were from Malaysia. Of those born in China about one-third were infected, and 11.3% of those born in Korea or other Asian countries were infected.[7] In reference to HBV screening, 56.6% reported not having been screened previously for HBV infection.[7] Factors associated with low HBV screening include low English proficiency, low level of education[8] and a lack of HBV knowledge,[10,11] and culturally appropriate intervention.[12-14] For instance, in a focus group study of Korean Americans, HBV and liver cancer beliefs and knowledge were found to be lower among first-generation Korean Americans than second-generation ones.[8] Other studies supported similar culturally tailored educational intervention practice: in a controlled trial of Vietnamese-American children ages 3–18, two public health outreach "catch-up" campaigns evaluated the effects of the intervention and its associated costs. They found that both campaigns (i.e., community mobilization and media) significantly increased the knowledge of parents about HBV vaccination and the receipt of vaccination among their children.[15,16] These findings suggest that culturally tailored interventions that target specific ethnic groups such as Asian Americans are needed when designing liver cancer education programs.[17]

Goal and Objectives

The overall goal of this project is to reduce HBV and ultimately eliminate the disparities of the infection between Asian communities and their counterparts in Montgomery County. There are two primary objectives of the present study. First, we sought to evaluate the effectiveness of HBV education intervention. This is accomplished through the analysis of pre- and post-test data collection in community education outreach as described below. Second, we sought to establish the baseline data for the HBV infections statuses by demographic information and to assess the need for vaccination in this particular Asian community. The data may provide insight into reduction of the health disparities between Asian communities and their counterparts of

* These nine groups were so chosen primarily based on the Asian subgroups of Census data collection and categorization. Taiwanese community was so chosen according to U.S. Census 2000 categorization of Asian subgroups, and the Maryland Governors' Commission on APA's designation as a stand-alone Asian community. www.marylandasian.org/house.htm

other race/ethnicity in terms of HBV-caused morbidity and mortality.

METHODS

This project involved health education, screening and vaccination activities. To evaluate educational intervention, we chose the "one-group pretest/posttest" design to test the effect of HBV prevention educational delivery. This design is one of the more frequently used designs in the social sciences and is particularly appropriate for the purpose of our study. This design is so chosen that pretest observations were recorded on a single group of persons who later received a treatment (i.e., HBV educational intervention), after which posttest observations were made.[18] The subjects of this study were selected from a purposive, convenient sample from the Asian faith-based organizations (FBOs) or community-based organizations (CBOs) in Montgomery County. There was no age limit for the education program. However, with available funding resources we could only provide screening and vaccination to those aged 18–35. The selection criteria actually helped focus our limited resources to target those at-risk Asian members who are regular attendees of those functions that took place in FBOs/CBOs of the Asian communities. This study was accomplished through a collaborative partnership among a) CBOs and FBOs, b) Asian community healthcare providers, c) academic institutions of higher education to raise HBV awareness in Asian communities, and d) Asian American Health Initiative of the Montgomery County Department of Health and Human Services.

Data Collection for Health Education

This study was designed to understand the effectiveness of HBV education, and it included the pretest, education that included a slide presentation and consultation, and posttest. This project provided culturally and linguistically appropriate Asian health education materials to the healthcare providers and the community. The coalition adopted the HBV educational materials developed by the Asian Liver Center of Stanford University (http://liver.stanford.edu), with the educational materials translated in the native languages of participating communities. The contents included the following health information:

- What is HBV?
- How does HBV spread? Who is at risk?
- HBV disease burden on Asian Americans
- Asian culture myths of HBV
- The importance of screening and prevention
- Available treatment options

These health education programs were delivered in different healthcare provider meetings, various language schools, churches and temples, community centers, health fairs and other community functions. Each community was heavily involved in the research process, including educational delivery, subject recruitment and event facilitation. Culturally tailored activities were delivered through community health promoters. Every community had ≥1 community health promoters (mostly healthcare providers) who delivered culturally and linguistically appropriate education to the community. All communities used the same culturally tailored program, and the screening (blood drawing) was conducted in community settings, such as CBOs/FBOs and community clinics. All instruments (including human subject informed consents) were prepared in both English and were translated in Asian languages of participating communities.

The pretest survey included demographic information (including such information as gender, age, marital status, race/ethnicity, length of U.S. residence, education level, household income, employment status, health insurance status and Montgomery county residence for eligibility of vaccination if found unprotected) and 10 questions related to prevention materials. These questions were so designed as to coincide with the HBV educational materials delivered (Appendix A). The same 10 questions were used in the posttest. Participants took the posttest immediately after they completed the education session. The instrument was primarily drawn from the educational materials developed by Stanford Asian Cancer Center. Several questions are culturally tailored (e.g., questions 2, 4 and 10) to clarify the myths of HBV that were common misconceptions in Asian culture.

All research protocols associated with human subjects of this project, including informed consent, pre-and posttest instruments of education intervention, and procedures of data analysis and reporting were approved by the institutional review board of the University of Maryland to ensure their full compliance with relevant federal guidelines governing the treatment of human subjects.

Recruitment for Education, Preventive Screening and Vaccination Program

The program covered nine different Asian-American FBOs and CBOs. Community members participating in the educational program self-enrolled into the screening program by contacting their respective community centers or FBOs. Subjects were not provided with monetary incentives for participation, but they were aware that after receiving blood screening they would be informed of the results of their infection status, and those found unimmunized would have an opportunity for receiving vaccination. There was no eligibility restriction for education and screening. However, the only selection criterion for vaccination for those found unprotected is that the subject be between 18–35 years old to receive vaccination. (The age limit is so defined because many youngsters aged <18 may have received the vaccination

in school.) Subjects had their blood drawn at either the education location or physicians' clinics. Blood specimen was obtained from each subject, and the specimen was sent to a local lab capable of analyzing the presence of HBsAg and HBsAb. Each subject was notified of their infection status through their physician's office.

Data Analysis

For the results of pre- and posttests, a grading system was developed to evaluate learners' achievement from the HBV prevention education. The pre- and-posttest scores were calculated based on numerical values ranging from 0–1, with each correctly answered question earning 0.1 point, and correctly answering all 10 questions obtaining 1 point. The analyses included basic descriptive statistics, and t test (specifically, paired-samples t test that were based on groups of individuals who experience both tests of the variables of interest) was employed to evaluate where the mean scores of pre-and-posttest by each subgroup present statistically significant difference. A significance level of p=0.05 was chosen for all statistical tests. To adjust for the possible inflation of type-1 errors when the multiple t tests were conducted, the Bonferroni technique was used to adjust the nominal significance level:

Adjusted $\alpha = \alpha / K = 0.05/9 = 0.005$
(K=number of 'tests', i.e., Asian subgroups)

In other words, the p value for any statistical test (Tables 2 and 3) has to be ≤0.005 to be considered significant. Microsoft Access™ database was developed to store the collected survey data. Data were analyzed using Microsoft Excel® 2003 and SPSS® version 11.5.

Table 1. Demographic information of study participants (n=807)

Category	Frequency N (%)*
Gender	
Female	392 (48.6%)
Male	321 (39.8%)
Marital Status	
Divorced	13 (1.6%)
Married	394 (48.8%)
Separate	6 (0.7%)
Single	172 (21.3%)
Education	
≤ High-school diploma	246 (30.5%)
Vocational training program	45 (5.6%)
Bachelor's degree	241 (29.9%)
≥ Master's degree	115 (14.3%)
Household Income	
<$10,000	127 (15.7%)
$10,000–$30,000	127 (15.7%)
$30,000–$50,000	141 (17.5%)
$50,000–$70,000	74 (9.2%)
≥$70,00	125 (15.5%)
Insurance Status	
Insured/Medicaid	6 (0.7%)
Insured/Medicare	48 (5.9%)
Insured/other	304 (37.7%)
Insured/private	59 (7.3%)
Not insured	210 (26%)
U.S. Residency History	
Born in United States	45 (5.6%)
<1 year	23 (2.9%)
1–4 years	52 (6.4%)
5–9 years	102 (12.6%)
≥10 years	437 (54.2%)
Employment Status	
Full time	379 (48.4%)
Part time	75 (9.6%)
Retired	107 (13.7%)
Self-employed	74 (9.5%)
Student	83 (10.6%)
Unemployed	65 (8,3%)

* Due to rounding or missing data, percentages may not equal 100

RESULTS

Pre- and Posttests

The study included 807 subjects screened for HBV from eight Asian-American groups in Montgomery County between October 2005 and July 2006. Complete demographic information is presented on Table 1. After excluding the 94 (11.6%) participants who did not complete all demographic information fields, we found that there were slightly more female (392, 48.6%) than male (321, 39.8%) participants. Because the completion of pre- and posttests were completely voluntary, there were 592 (73.4%) valid survey responses collected in this study. Valid responses refer to that all 10 questions in both pre- and posttests were completed by participants. In addition, the analysis did not include the N/A (not available/not answered) group into account because the N/A group may include race/ethnicity background that went beyond the scope of analysis for this study.

Table 2 showed the results of pre- and posttests by race/ethnicity. The Taiwanese-speaking group had the highest mean pretest score (0.735), followed by the Chinese (0.673) and Korean (0.665) groups. Posttest score revealed that the Taiwanese group had obtained the highest score (0.955), followed by the Filipino (0.938) and Chinese (0.921) groups. On the other hand, many groups of southeast Asian immigrants had overall lower pretest scores. These included the Thai (0.543), Cambodian (0.576) and Vietnamese (0.634) groups. Our results demonstrated that the education intervention did significantly improve participants' knowledge on HBV across every subgroup in the participating Asian-American communities.

Table 3 shows the result of pre- and posttests by age distribution. The 26–35 age group had the highest mean pretest score (0.669), followed by the 18–25 group (0.654). Posttest scores revealed that the 26–35 age group obtained the highest score (0.888), followed by the 18–25 group (0.875). The test scores of both pre- and posttests improved with the subjects' ages. These results also demonstrated that the education intervention did significantly improve participants' knowledge on HBV among all six age groups.

Blood Screening

Blood was drawn from participating subjects to test for HBV surface antigen and surface antibody. The test results fall into three categories: 1) immunized [HBsAg (-), HBsAb(+)]; 2) infected [HBsAg(+), HBsAb(-)]; and 3) unimmunized [HBsAg(-), HBsAb(-)].

The results by age group and by race/ethnicity are summarized in Tables 4 and 5. Some ethnic groups were more active in participating than the others in this program due to self-enrollment. The number of subjects of the sample was not entirely distributed in proportion to the distribution of population subgroups in Montgomery County.

The screening results of HBV suggest that infection status varied by age and ethnicity group. In terms of age group, the results indicate that the age group 36–45 has the highest prevalence of HBV carriers, followed by age group 46–55. By race/ethnicity group, the Cambodian group (7.3%) and Thai group (7.3%) both had the highest infection rates among the eight groups, followed by the Vietnamese (6.5%) community. On the other hand, the Taiwanese group has the lowest (1.9%) prevalence of HBV.

In terms of unimmunized/unprotected rate, the Asian-Indian group had the highest unprotected rate (69.7%) among the eight Asian-American communities, followed by Thai (56.1%), Filipino (54.2%) and Cambodian (51.2%). The Taiwanese group, on the other hand, presented the lowest unprotected rate of HBV (22.6%).

The relationship between HBV prevalence and residence history suggested that, for non-U.S.-born Asian members, HBV infection increases with the duration of U.S. residence (Table 6).

DISCUSSION

The results of pre- and posttests suggested that our culturally tailored HBV education program (i.e., by using community health promoters to provide culturally and linguistically appropriate education and using translated materials) might have substantially improved the knowledge of preventing this disease in the Asian communities across different Asian ethnic and age groups. In terms of screening of HBV infection, consistent with the literature, the study confirms that many southeast Asian groups have a high prevalence of HBV infection. In addition, the findings of low immunization rates and

Table 2. Results of pre-and posttests by Asian subgroups

Ethnicity	Frequency (%)	Pretest (SD)	Posttest (SD)	T	P Value
Asian Indian	66 (11.15%)	0.55 (0.19)	0.72 (0.16)	-5.28	<0.001*
Cambodian	39 (6.59%)	0.58 (0.17)	0.90 (0.15)	-8.63	<0.001*
Chinese	202 (34.12%)	0.67 (0.17)	0.92 (0.11)	-17.53	<0.001*
Filipino	24 (4.05%)	0.62 (0.16)	0.94 (0.12)	-7.72	<0.001*
Korean	103 (17.40%)	0.67 (0.16)	0.90 (0.13)	-11.49	<0.001*
Taiwanese	40 (6.76%)	0.74 (0.16)	0.96 (0.09)	-7.52	<0.001*
Thai	28 (4.73%)	0.54 (0.12)	0.78 (0.17)	-5.90	<0.001*
Vietnamese	75 (12.67%)	0.63 (0.21)	0.77 (0.20)	-3.89	<0.001*
Other	15 (2.53%)	0.55 (0.23)	0.81 (0.28)	-2.34	0.0274
Total	592 (100%)	0.64 (0.18)	0.87 (0.88)	-22.49	<0.001*

* Bonferroni adjusted significance at p≤0.005

Table 3. Results for pre- and posttest by age

Age	Frequency (%)	Pretest	Posttest	T	P Value
NA	55 (9.58%)	0.64 (0.15)	0.92 (0.13)	-10.78	<0.001*
18–25	106 (17.91%)	0.65 (0.17)	0.88 (0.14)	-9.79	<0.001*
26–35	123 (20.77%)	0.67(0.15)	0.89 (0.15)	-11.27	<0.001*
36–45	58 (9.80%)	0.61 (0.19)	0.86 (0.18)	-7.03	<0.001*
46–55	98 (16.55%)	0.62 (0.20)	0.838 (0.19)	-7.60	<0.001*
56–65	99 (16.72%)	0.64 (0.18)	0.84 (0.17)	-8.07	<0.001*
≥66	53 (8.95%)	0.61 (0.21)	0.84 (0.17)	-5.98	<0.001*
Total	592 (100%)	0.64 (0.18)	0.87 (0.88)	-22.49	<0.001*

* Bonferroni adjusted significance at p≤0.005

low pre- and posttest scores render support for the immunization for these groups. In terms of infection status, the participating Asian community subjects in the county present a consistently high rate of HBV (4.5%), compared with the screening results of other Asian communities.[7,8] On the other hand, the low immunization rate warrants further attention, especially in view of the fact that infection rates were found to be higher with age, suggesting that possibility of community transmission of the virus.

In terms of the relationship of infection status and residential history, the results presented in Table 6 are generally consistent with the literature in that infection status increases with the length of U.S. residency. Somewhat surprisingly, there was no infection case found in the U.S.-born subjects in our study. All the carriers are non-U.S.-born participants, with the infection rates increased by the length of U.S. residency. This suggests that the non-U.S.-born Asian community, particularly those nonrecent immigrants, may be at an elevated risk that warrants priority intervention and enhanced screening efforts. In addition, those aged 36–45 had the highest infection rate (9.1%) but had among the lowest immunization rate. Those in this age group warrant further education or vaccination intervention.

Several potential routes of transmission for this prevalent disease in Asian countries were suggested, including pregnancy and childbirth (i.e., vertical transmission) and the sharing of wine cups in some Asian countries as a cultural practice in drinking. More research should be conducted to further confirm the routes of transmission and develop intervention plans in this community.

For health education, our results suggest that those with low infection rates (i.e., Taiwanese, Filipino, etc.) had higher pre- and posttest scores, while those with high infection rates [such as Thai (7.3%), Cambodian (7.3%) and Vietnamese (6.5%)] had among the lowest pretest scores [Thai (54%), Cambodian (58%) and Vietnamese (63%)] and posttest scores [Thai (77.5%), Cambodian (89.5%) and Vietnamese (76.9%)]. This demonstrates a need for education among these communities of southeast Asian decent. Likewise, an analysis of age classification reveals the same trend, such as those in the age groups of higher rates of HBV (i.e., age 36–45 group), who presented lower pretest scores. The trend provides evidence for focusing HBV education on specific age groups.

There were further data issues that warrant discussion since our research involved data collection and reporting of Asian subgroups. First, federal standards of collecting and reporting health data (OMB Statistical Directive 15, revision of 1997) provide the basis for collecting and reporting five categories for data on race (i.e., American Indian or Alaska native, Asian, black or African American, native Hawaiian or other Pacific Islander, and white) and two ethnicities (i.e., "Hispanic or Latino," and "not Hispanic or Latino.") for all federally sponsored research. The guidance provides an important basis for improving

Table 4. Hepatitis-B infection status by race/ethnicity

Ethnicity	Immunized	Infected	Unimmunized	Total (% of Total)
Asian Indian	27 (30.3%)	0	62 (69.7%)	89 (11.03%)
Cambodian	17 (41.5%)	3 (7.3%)	21 (51.2%)	41 (5.08%)
Chinese	108 (44.8%)	13 (5.4%)	120 (49.8%)	241 (29.86%)
Filipino	10 (41.7%)	1 (4.2%)	13 (54.2%)	24 (2.97%)
Korean	105 (52.5%)	8 (4.0%)	87 (43.5%)	200 (24.78%)
Taiwanese	40 (75.5%)	1 (1.9%)	12 (22.6%)	53 (6.57%)
Thai	15 (36.6%)	3 (7.3%)	23 (56.1%)	41 (5.08%)
Vietnamese	58 (53.7%)	7 (6.5%)	43 (39.8%)	108 (13.38%)
Other*	0	0	10	10 (1.24%)
Total	380 (47.1%)	36 (4.5%)	391 (48.4%)	807

*Other includes: Indonesian, Malaysian, Sri Lankan, etc.

Table 5. Hepatitis-B infection status by age group

Age	Immunized	Infected	Unimmunized	Total (% of Total)
18–25	74 (57.8%)	2 (1.6%)	52 (40.6%)	128 (15.86%)
26–35	82 (45.8%)	5 (2.8%)	92 (51.4%)	179 (22.18%)
36–45	33 (37.5%)	8 (9.1%)	47 (53.4%)	88 (10.9%)
46–55	58 (42.6%)	9 (6.6%)	69 (50.7%)	136 (16.85%)
56–65	80 (51.0%)	8 (4.5%)	69 (43.9%)	157 (19.45%)
≥66	42 (42.9%)	3 (3.1%)	53 (54.1%)	98 (12.14%)
NA	11 (52.4%)	1 (4.7%)	9 (42.9%)	21 (2.6%)
Total	380 (47.1%)	36 (4.5%)	391 (48.4%)	807

the traditional health data collection practice, since published literature addressing minority health and health disparities (including some published in *JNMA*)[19,20] has primarily focused on African and Latino Americans, potentially due to the unavailability or a lack of specification of Asian community health data in many current health data collection systems.[21,22] Second, in terms of collecting data at the subgroup level, there are strengths and weaknesses associated with reporting data by Asian subgroups. The strengths of this federal guidance are that it addresses health disparities in various communities of the American demographic landscape by identifying specific groups at higher risk of particular diseases and conditions. In addition, it could provide surveillance of health status and disparities over time. On the other hand, our study also reveals the challenges of reporting health data beyond minimum federal standards in collecting and reporting health data. Among other weaknesses, the reporting of subgroup data lacks a directive/standard for enforcement and because some subgroups often include a small number of residents, there is a potential of violating confidentiality or privacy.

Limitations of the study include the fact that participating Asian groups varied and were not equally represented. Some racial subgroups and faith-based groups are more active in participation than the others. This limitation also led to potential selection bias for the sample: this study included more members from FBOs compared with CBOs. In addition, because the completion of the pre- and posttests was voluntary, >25% of respondents who did not complete all 10 questions were excluded from the analysis. The substantial number of missing data may limit the ability of extrapolating the results of the present study to other Asian communities. Therefore, the results of education intervention and screening presented in the study may be best appreciated as one snapshot of the HBV status in the Asian community of Montgomery County, rather than a complete picture that is replicable in other Asian communities. Lastly, the program was conducted from October 2005 to July 2006. Seasonal variation may be a factor influencing the participation rate, as ≥2 community events were interrupted and rescheduled due to unexpected snow.

CONCLUSION

Health disparities, specifically HBV infection, exist among Asian communities of Montgomery County, MD. Pre- and posttest results suggest that the educational interventions were effective. The southern Asian group has both the highest infection rates and lower pretest scores in their knowledge of HBV prevention. In addition, the screening results suggest that all infected careers are non-U.S.-born Asian Americans. At an increased risk of HBV infection are those of non-U.S.-born immigrants, and those aged 36–45 had the highest infection rate yet had among the lowest unimmunization rates. These groups presented the need for vaccination and follow-up. In reducing liver cancer disparities as a result of HBV, the experiences learned from this project render potential lessons of expanding the HBV prevention program to a wider scale, within or beyond Asian-American community.

Table 6. Hepatitis-B infection by U.S. residence history

Residence History	Immunized (n, %)	Infected (n, %)	Unimmunized (n, %)	Total (% of Total)
Born in the United States	21 (47.7%)	0	24 (53.3%)	45 (5.58%)
<1 year	11 (47.8%)	0	12 (52.2%)	23 (2.85%)
1–4 years	29 (55.8%)	1 (1.9%)	22 (42.3%)	52 (6.44%)
5–9 years	47 (46.1%)	4 (3.9%)	51 (50%)	102 (12.64%)
≥10 years	195 (44.6%)	26 (5.9%)	216 (49.4%)	437 (54.15%)
NA	77 (52%)	5 (3.4%)	66 (44.6%)	148 (18.34%)
Total	380 (47.1%)	36 (4.5%)	391 (48.5%)	807 (100%)

Appendix A. Pre- and posttest questions

1. Hepatitis B can be passed on from mother to child during childbirth.
2. One can be infected with hepatitis B by sharing food.
3. About 10% of the Asian-Americans population is infected with hepatitis B.
4. The majority of chronic hepatitis-B patients has no symptoms.
5. Hepatitis-B infection cannot be cured, but the disease can be managed.
6. Hepatitis-B virus is significantly more contagious than HIV.
7. Chronic hepatitis B causes liver cancer and cirrhosis if not properly managed.
8. Asian Americans have the same risk of dying of liver cancer as their white counterparts.
9. Twenty percent of liver cancer is caused by hepatitis B.
10. It is safe to breastfeed even if the mother is infected with hepatitis B.

ACKNOWLEDGEMENTS

The Asian American Health Initiative Steering Committee members, Asian community physicians, university researchers, and members of community-based and faith-based organizations who volunteered their time and energy to provide guidance and assist with the project are highly appreciated. Drs. C.Y. Lau and T.P. Lee provided helpful comments on an earlier draft that helped improve the manuscript. The opinion and analysis in this article are solely of the authors and therefore they do not reflect the views of the agencies or institutions they serve or are affiliated with.

REFERENCES

1. The White House Initiative on Asian Americans and Pacific Islanders. www.aapi.gov Accessed 06/29/07.

2. Hsu CE, Atkinson N, Billing A et al. Asian American Health Initiative of Montgomery County, Maryland. www.maahs.umd.edu/docs/AAHI_Summary.pdf Accessed 06/29/07.

3. Healthy People 2010. CDC. www.healthypeople.gov. Accessed 02/06/2007.

4. Asian American. Statistics. Wikipedia the free encyclopedia. http://en.wikipedia.org/wiki/Asian_American. Accessed 06/20/2007.

5. American Community Survey 2004. U.S. Census Bureau. www.mdp.state.md.us/msdc/American_Community_Survey/2004/ Montgomery County MD.pdf Accessed 01/07/2007.

6. Asian Liver Center, Stanford University. http://liver.stanford.edu/Edu/Edu_hepbinasians.php Accessed 06/29/07.

7. Pollack H, Wan K, Ramos R, et al. Screening for chronic hepatitis B among Asian/Pacific Islander populations—New York City, 2005. *MMWR Morbid Mortal Wkly Rep.* 2006;55:505-509.

8. Choe JH, Taylor VM, Yasui Y, et al. Health care access and sociodemographic factors associated with hepatitis B testing in Vietnamese American men. *J Immigr Minor Health.* 2006;8:193-201.

9. Edmunds WJ, Medley GF, Nokes DJ, et al. The influence of age on the development of the hepatitis B carrier state. *Proc Biol Sci.* 1993;253:197-201.

10. Taylor VM, Tu SP, Woodall E, et al. Hepatitis B knowledge and practices among Chinese immigrants to the United States. *Asian Pac J Cancer Prev.* 2006;7:313-317.

11. Taylor VM, Yasui Y, Burke N, et al. Hepatitis B testing among Vietnamese American men. *Cancer Detect Prev.* 2004;28:170-177.

12. Burke NJ, Jackson JC, Thai HC, et al. Honoring tradition, accepting new ways: development of a hepatitis B control intervention for Vietnamese immigrants. *Ethn Health.* 2004;9:153-169.

13. Chen MS Jr. Cancer health disparities among Asian Americans: what we do and what we need to do. *Cancer.* 2005;104:2895-2902.

14. McGarvey EL, Clavet GJ, Johnson JB, et al. Cancer screening practices and attitudes: comparison of low-income women in three ethnic groups. *Ethn Health.* 2003;8:71-82.

15. Zhou F, Euler GL, McPhee SJ, et al. Economic analysis of promotion of hepatitis B vaccinations among Vietnamese-American children and adolescents in Houston and Dallas. *Pediatrics.* 2003;111:1289-1296.

16. McPhee SJ, Nguyen T, Euler GL, et al. Successful promotion of hepatitis B vaccinations among Vietnamese-American children ages 3 to 18: results of a controlled trial. *Pediatrics.* 2003;111:1278-88.

17. Taylor VM, Choe JH, Yasui Y, et al. Hepatitis B awareness, testing, and knowledge among Vietnamese American men and women. *J Community Health.* 2005;30:477-490.

18. Cook TD, Campbell DT. Quasi-Experimentation: Non-equivalent Control Group Designs. In: Cook TD, Campbell DT, eds. Quasi-Experimentation. Design and Analysis Issues for Field Settings. Boston, MA: Houghton Mifflin Co.; 1979:99-102.

19. Hsu CE, Soto Mas F, Miller JA, et al. A Spatial-Temporal Approach to Conducting Surveillance of Prostate Cancer Disparities in Population Subgroups. *J Natl Med Assoc.* 2007;99:72-86.

20. Hsu CE, Soto Más F, Jacobson HE, et al. Public health preparedness of health providers: meeting the needs of diverse, rural communities. *J Natl Med Assoc.* 2006;98:1784-1791.

21. Hsu CE, Soto Mas F, Hickey JM, et al. Surveillance of the Colorectal Cancer Disparities Among Demographic Subgroups—a Spatial Analysis. *South Med J.* 2006;99:949-956.

22. Hsu CE, Jacobson H, Soto Mas F. Evaluating the Disparity of Female Breast Cancer Mortality Among Racial Groups—a Spatiotemporal Analysis. *Int J Health Geogr.* 2004;3(4). ■

We Welcome Your Comments

The *Journal of the National Medical Association* welcomes your Letters to the Editor about articles that appear in the *JNMA* or issues relevant to minority healthcare. Address correspondence to EditorJNMA@nmanet.org.