Evaluation of a Hepatitis B Lay Health Worker Intervention for Chinese Americans and Canadians

In press, Journal of Community Health

Vicky M. Taylor MD, MPH • T. Gregory Hislop MDCM • Shin-Ping Tu MD, MPH • Chong Teh PhD • Elizabeth Acorda MA • Mei-Po Yip PhD • Erica Woodall MPH • Yutaka Yasui PhD

Vicky M. Taylor • Elizabeth Acorda • Erica Woodall
Cancer Prevention Program
Fred Hutchinson Cancer Research Center
1100 Fairview Avenue North
Seattle, WA 98109, USA
e-mail: vtaylor@fhcrc.org

T. Gregory Hislop • Chong Teh
Cancer Control Research Program
British Columbia Cancer Agency,
675 West 10th Avenue
Vancouver, British Columbia V5Z 1L3, Canada

Shin-Ping Tu • Mei-Po Yip
Department of Medicine
University of Washington
401 Broadway Avenue
Seattle, WA 98104, USA

Yutaka Yasui
Department of Public Health Sciences
Clinical Sciences Building
University of Alberta
Edmonton, Alberta T6G 2G3, Canada

This publication was supported by grant R01-CA-113663 from the National Cancer Institute, cooperative agreement U01-CA-114640 from the National Cancer Institute, and cooperative agreement U48-DP-000050 from the Centers for Disease Control and Prevention. The contents of the article are solely the responsibility of the authors and do not necessarily represent the views of the National Cancer Institute nor the Centers for Disease Control and Prevention.

Abstract Hepatitis B testing is recommended for immigrants from countries where hepatitis B infection is endemic. However, only about one-half of Chinese in North America have received hepatitis B testing. We conducted a randomized controlled trial to evaluate the effectiveness of a hepatitis B lay health worker intervention for Chinese Americans/Canadians.Four hundred and sixty individuals who had never been tested for hepatitis B were identified from community-based surveys of Chinese conducted in Seattle, Washington, and Vancouver, British Columbia. These individuals were randomly assigned to receive a hepatitis B lay health worker intervention or a direct mailing of physical activity educational materials. Follow-up surveys were completed six months after randomization. Self-reported hepatitis B testing was verified through medical records review. A total of 319 individuals responded to the follow-up survey (69% response rate). Medical records data verified hepatitis B testing since randomization for nine (6%) of the 142 experimental group participants and three (2%) of the 177 control group participants ($p=0.04$). At follow-up, a higher proportion of individuals in the experimental arm than individuals in the control arm knew that hepatitis B can be spread by razors ($p<0.001$) and during sexual intercourse ($p=0.07$). Our findings suggest that lay health worker interventions can impact hepatitis B-related knowledge. However, our hepatitis B lay health worker intervention had a very limited impact on hepatitis B testing completion. Future research should evaluate other intervention approaches to improving hepatitis B testing rates among Chinese in North America.

Key Words Chinese Americans/Canadians • Hepatitis B • Lay health worker

Introduction

Asians are one of the fastest growing racial/ethnic groups in the United States (US). The Asian American population increased nearly 50% between 1990 and 2000, and Asians are expected to comprise over 10% of all Americans by the year 2050.[1] However, a recent review found that few US government-funded grants (0.2%) and research publications (0.1%) addressing health disparities in the US have focused on Asian Americans.[2] Chinese are the largest Asian sub-group in North America, and about 2,400,000 Americans and 1,100,000 Canadians are of Chinese descent. Most Chinese Americans/Canadians are foreign born and over two-thirds speak a Chinese language/dialect at home.[3,4]

Hepatitis B virus infection is endemic in most Asian countries.[5] Therefore, it is not surprising that the rate of chronic hepatitis B infection among Chinese in North America is over ten times the general population rate.[6-8] In Asian countries, hepatitis B transmission usually occurs vertically from mother to child at birth.[9] However, horizontal transmission can also occur through sexual intercourse or close household contact (e.g., by sharing razors) with a hepatitis B carrier.[10] 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.[11]

Carriers of hepatitis B continue to be potentially infectious to others and are at increased risk of chronic active hepatitis, cirrhosis, and liver cancer.[8,11] These individuals may benefit from anti-viral therapy, often need regular screening for liver cancer, and should take precautions to avoid infecting others.[8,11-13] Further, individuals who have not been exposed to hepatitis B and are at risk of future infection (e.g., the family members of carriers) should receive vaccination.[14] Therefore, the American Association for the Study of Liver Diseases recommends that population sub-groups at high risk for chronic hepatitis infection, including persons born in endemic areas of the world, receive hepatitis B testing.[11]

Available data indicate that hepaitis B testing rates are relatively low among Chinese populations in North America, and Chinese Americans/Canadians have important hepatitis B knowledge deficits.[15-20] For example, only about one-half of Chinese living in Seattle, Washington and Vancouver, British Columbia report previous serologic testing for hepatitis B.[15-17,19] The Cochrane Database for Systematic Reviews recently concluded that lay health worker interventions represent a promising approach to health promotion and disease prevention, and recommended further research on the effectiveness of lay health worker approaches for different health topics and population sub-groups.[21] We developed, implemented, and evaluated a lay health worker intervention that aimed to improve levels of hepatitis B serologic testing and hepatitis B-related knowledge among Chinese in North America.

Mwthods

Overview of Trial Design

Our trial was conducted in two west coast cities with sizeable Chinese communities: Seattle (Washington) and Vancouver (British Columbia). The researchers collaborated with Chinese community coalitions in both cities. Figure 1 summarizes the study design. Trial participants were individuals of Chinese descent who participated in baseline, community-based surveys (conducted in Seattle and Vancouver) during 2005. Chinese men and women were eligible for baseline survey participation if they were aged 20-64 years and able to speak Cantonese, Mandarin, or English. Six months after baseline survey completion, respondents who reported they had never been tested for hepatitis B were randomly assigned to an experimental group or a control group. Seattle and Vancouver participants were randomly assigned separately.

After random assignment, individuals in the experimental group received a hepatitis B lay health worker intervention. Control group participants received a mailing of physical activity print materials (pamphlet and fact sheet), as well as a pedometer with instructions for use. Our primary trial outcome was hepatitis B testing completion within six months of randomization.

Secondary outcomes included the following knowledge variables: Chinese are more likely to be infected with hepatitis B than whites; hepatitis B can be spread during childbirth, during sexual intercourse, and by sharing razors; and hepatitis B can cause liver cancer. Trial participants completed a follow-up survey six months after receiving the hepatitis B lay health worker or physical activity direct mail intervention. Outcome ascertainment was based on follow-up survey responses. Medical record review was also performed for the primary outcome.

Translation and Personnel

All study materials that were read by participants (e.g., letters, consent forms, and pamphlets) were translated into simplified and traditional Chinese using standard double-forward methods. Similarly, study materials that were read to participants (e.g., study questionnaires) were translated into Cantonese and Mandarin.[22,23] All project personnel with direct participant contact (i.e., survey interviewers and lay health workers) were bicultural, trilingual (Cantonese, Mandarin, and English) Chinese Americans/Canadians. Study personnel and study participants were matched by gender.

Baseline Survey and Trial Recruitment

Previous articles provide detailed descriptions of our baseline survey methods.[15-17,19] To identify Chinese households, a previously validated list of 50 Chinese last names was applied to electronic versions of the metropolitan Seattle and Vancouver telephone directories. All identified households in geographic areas of Seattle with a relatively high proportion of Chinese residents were included in the US baseline survey sample. In Canada, a random sample of identified households in East Vancouver (an area with a high proportion of Chinese residents) was selected.

Introductory mailings were sent to households selected for inclusion in the survey. Subsequently, interviewers made multiple household contact attempts (including weekday, weekend, and evening attempts). If a household included two or more eligible Chinese adults, the nearest birthday method was used to select one study participant from the household. Interviews were conducted face-to-face in participants' homes. Respondents received a small financial incentive for baseline survey completion.

Baseline survey participants specified their age, marital status, and educational level. They were also asked how many years they had lived in North America and how well they spoke English. 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. Finally, respondents were asked whether they thought Chinese or white residents of North America are more likely to be infected with hepatitis B; whether they thought hepatitis B can be spread during sexual intercourse, during childbirth, and by sharing razors; and whether they thought hepatitis B disease causes liver cancer.

The survey was completed by a total of 969 Chinese men and women (436 in Seattle and 533 in Vancouver). The cooperation rates for the baseline survey in Seattle and Vancouver were 58% and 59%, respectively. Individuals who completed the baseline survey were eligible for randomization into the trial if they had no history of hepatitis B testing (52% of Seattle respondents and 44% of Vancouver respondents). The sample for the randomized controlled trial included 460 individuals (226 in Seattle and 234 in Vancouver).

Intervention Materials

We used findings from an earlier qualitative study to develop culturally and linguistically appropriate materials for use in the hepatitis B lay health worker intervention.[24] These materials included a video (available in Cantonese, Mandarin, and with English sub-titles) and a pamphlet (with simplified Chinese, traditional Chinese, and English text). Our audio-visual and print materials emphasized the importance of hepatitis B serologic testing for all individuals of Chinese descent, and also addressed key hepatitis B facts. For example, the materials included information about the high rate of hepatitis B infection among Chinese, routes of person-to-person hepatitis B virus transmission, and the association between chronic hepatitis B infection and the development of liver cancer. Two visual aids were also developed by the project to emphasize key educational points: A world map showing rates of chronic hepatitis B infection by country and a graph showing liver cancer rates in North America by race/ethnicity.

Lay Health Worker Intervention

Lay health workers made up to 11 attempts to complete an educational and motivational home visit with each experimental group participant. Individuals who refused a home visit were offered the educational materials (video and pamphlet). If a lay health worker was unable to contact a participant, the educational materials were mailed to his/her home. The lay health workers were trained to act as role models, give social support, and provide tailored responses to each individual's barriers to hepatitis B testing (e.g., believing that testing is unnecessary for asymptomatic people). During home visits, lay health workers systematically asked participants if they could watch the video together, offered participants a copy of the video and pamphlet, and showed participants the two visual aids.

Follow-up Survey and Medical Record Review

To trace individuals who had recently moved, we used contact information for friends and relatives, provided at the time of the baseline survey, and the most recent telephone books for

Seattle and Vancouver. The follow-up survey implementation procedures were identical to those used at baseline. Specifically, multiple contact attempts were made, the interviews were completed face-to-face, and a small financial incentive was provided. Follow-up survey interviewers were unaware of each participant's trial randomization assignment. Our follow-up questionnaire included the same hepatitis B testing and knowledge items as the baseline questionnaire. Additionally, two follow-up survey questions assessed the use of hepatitis B audio-visual and print educational materials among individuals randomized to the experimental arm.

Follow-up survey respondents who reported they had received hepatitis B testing in the six-month interval since their random assignment were asked why they had been tested. They were then asked to provide information about the date of testing, as well as the location of the clinic or doctor's office where testing was performed. Each of these participants was also asked to sign a medical release form giving project staff permission to request medical record verification of his/her self-reported hepatitis B test. A copy of the hepatitis B test result was then requested (from the relevant clinic or doctor's office) using a form that provided the participant's name, age, and self-reported date of testing. The project contacted each health care facility up to three times (twice by mail and once by telephone).

Process Evaluation

Process data were collected to document the implementation and content of our hepatitis B lay health worker intervention. Specifically, lay health workers routinely completed forms addressing the outcome of home visit attempts (e.g., agreed to participate in a home visit, refused a home visit but accepted the educational materials, or refused a home visit and the health education materials). They also documented use of the project video, pamphlet, and visual aids.

Statistical Analysis

We conducted an “intent-to-treat” analysis and included all randomly assigned individuals with follow-up data. Chi-square tests and, when necessary, Fisher’s exact tests, were used to evaluate statistical significance with respect to differences in proportions. Unconditional logistic regression techniques were used to adjust for the following potential confounders: City (Seattle versus Vancouver), age-group (<45 years versus ≥45 years), educational level (<12 years versus ≥12 years), marital status (currently married versus not currently married), proportion of life spent in North America (<50% versus ≥50%), English language proficiency (spoke very well or fluently versus did not speak well or at all). Regression analysis of knowledge at follow-up also included baseline knowledge (for the knowledge variable under consideration) as a covariate.

Results

Study Group Characteristics

Table 1 summarizes our follow-up survey response. The proportions of experimental and control group participants with follow-up data were 61% and 77%, respectively ($p<0.001$). The baseline characteristics of individuals assigned to the experimental and control arms (with follow-up data) are given in Table 2. Our two trial groups were equivalent with respect to gender, age, educational level, proportion of life in North America, and English proficiency. However the control group included a significantly higher proportion of currently married individuals than the experimental group ($p=0.03$).

[Table 1 here]

[Table 2 here]

Hepatitis B Testing

Twenty-two (15%) of the 142 experimental group participants reported hepatitis B testing

following randomization into the trial, compared to 17 (10%) of the 177 control group participants (p=0.21). Medical records were requested for 19 of these 22 experimental group participants (three experimental group participants refused to sign a medical release form), and 15 of these 17 control group participants (one control group participant refused to sign a medical release form and one control group participant reported testing outside North America). All the health care facilities responded to our requests for information about hepatitis B serologic testing. Medical records data verified hepatitis B testing since randomization for nine (6%) of the 142 experimental group participants and three (2%) of the 177 control group participants (p=0.04). (We were able to verify hepatitis B testing for four experimental group men and five experimental group women.)

As described above, each follow-up survey participant who reported hepatitis B testing in the interval between random assignment and follow-up was asked why he/she was tested. Table 3 shows the self-reported and medical records verified hepatitis B testing data in relation to self-reported reasons for hepatitis B testing. Twelve experimental group participants indicated they had completed hepatitis B testing because of information they received from the project, and we were able to verify testing for six of these 12 participants. A total of 14 participants (three experimental group participants and 11 control group participants) indicated they had been tested as part of a regular check-up. None of these hepatitis B testing self-reports were verifiable.

[Table 3 here]

Hepatitis B Knowledge

Table 4 provides baseline knowledge levels and follow-up knowledge levels for the experimental group and the control group, as well as p-values for pre-intervention versus post-intervention comparisons by randomization arm. At baseline, only about one-third of the experimental group

participants and control group participants knew that Chinese are at higher risk of hepatitis B infection than whites. In contrast, over-two thirds of the individuals in both study arms knew that hepatitis B can be spread during childbirth and hepatitis B disease causes liver cancer. There were no significant baseline knowledge differences between the experimental and control arms. Six months after randomization, the experimental group participants were significantly more likely than the control group participants to know hepatitis B can be spread by razors ($p<0.001$) and during sexual intercourse ($p=0.03$).

[Table 4 here]

Multivariable results for experimental group versus control group knowledge at follow-up (with adjustment for gender, age, educational level, marital status, proportion of life in North America, English language proficiency, city, and baseline knowledge for the knowledge variable under consideration) are given in Table 5. Our experimental group was significantly more likely to know that hepatitis B can be spread by razors than our control group ($p<0.001$). Marginal statistical significance was also seen for differences in the following two knowledge variables by arm: Chinese are more likely to be infected with hepatitis B than whites ($p=0.09$) and hepatitis B can be spread during sexual intercourse ($p=0.07$).

[Table 5 here]

Intervention Exposure

Lay health workers were able to successfully complete home visits with 145 (63%) of the 231 individuals randomized to our experimental arm (Table 6). The proportions of men and women in the experimental group who completed home visits were 66% and 60%, respectively ($p=0.41$). Project personnel reported watching the video with 84 (58%) of the 145 home visit participants. The hepatitis B map and liver cancer graph were shown to 138 (95%) and 135 (93%) of the individuals who agreed to home visits, respectively. Finally, the video was left with

134 (92%) of the home visit participants and the pamphlet was given to 142 (98%) of the home visit participants. Among the 142 experimental group participants who completed a follow-up survey, 98 (69%) reported they had watched the hepatitis B video and 56 (34%) reported they had read the hepatitis B pamphlet.

[Table 6 here]

Discussion

Three-quarters of the individuals who were randomized into our experimental group either agreed to participate in a lay health worker home visit or accepted the project's audio-visual and print educational materials (even though they declined to participate in a home visit). Our lay health worker intervention was associated with improvements in hepatitis B-related knowledge among the experimental arm participants. For example, the experimental group participants were more than twice as likely to know that hepatitis B can be transmitted from one person to another by sharing razors as the control group participants. While we found a statistically significant difference between the proportions of experimental group and control group participants who completed hepatitis B serologic testing (using medical records data), we were only able to document hepatitis B testing among 6% of the lay health worker intervention group.

We previously completed a similar randomized controlled trial to evaluate a lay health worker intervention to promote the use of Pap testing among Chinese women in Seattle and Vancouver. Women who participated in community-based surveys and had not received recent Pap testing were randomized to a lay health worker intervention or control status. Outcome evaluation was based on results from a follow-up survey and medical records verification. Thirty-nine percent of women who received the lay health intervention and 15% of controls received Pap testing in the six months following randomization ($p<0.001$). These results were confirmed by analyses using medical records data, as well as multivariable techniques.[25]

For most adults, hepatitis B testing is only required on one occasion (rather than at regular intervals). Fourteen of our trial participants reported they had recently been tested for hepatitis B during a regular check-up. However, we were unable to verify hepatitis B testing for any of these individuals. Therefore, it is likely that at least some Chinese Americans/Canadians think hepatitis B testing is completed during routine interval blood testing (e.g., at the time of annual physical exams). Future research might usefully focus on cognitive testing of survey items to assess individuals' hepatitis B testing status. Further, evaluations of intervention programs that aim to enhance levels of hepatitis B serologic testing in Asian immigrant populations should not rely on self-report data.

Several recent reports have addressed hepatitis B and liver cancer control initiatives for Asian Americans.[26,27] The Jade Ribbon Campaign is a culturally targeted, community-based outreach program to promote the prevention, early detection, and management of chronic hepatitis B virus infection and liver cancer among Chinese and other Asian Americans. In 2001, 476 Chinese American adults from the San Francisco Bay Area attended a hepatitis B screening clinic and educational seminar. After one year, two-thirds (67%) of those with chronic hepatitis B infection had consulted a physician for liver cancer screening, and 78% of all participants had encouraged family members to be tested for hepatitis B.[26]

In 2003, the Hepatitis B Initiative–DC worked closely with a large Korean church in northern Virginia, and pilot-tested a faith-based hepatitis B program that includes education, hepatitis B serologic testing, and hepatitis B vaccination. This pilot program was later expanded to include a total of nine Korean and Chinese American churches, as well as a Pastor's Conference targeting Asian American pastors from around the US. During 2003-2006, a total of 1,775 Asian Americans were tested for hepatitis B infection through the Hepatitis B Initiative–DC program.[27]

Our study has several limitations that should be recognized. First, we recruited individuals living

in selected areas of two cities, and the results may not be applicable to all Chinese Americans/Canadians. Second, only individuals who agreed to complete a baseline survey were eligible for participation in the trial, and survey responders may be more receptive to health education programs than survey non-responders. Third, although we requested the medical records of all individuals who reported hepatitis B testing since randomization, we made no attempt to verify the accuracy of self-reports among individuals who reported that they had not been tested. It is possible that some of these individuals received a hepatitis B test, without their knowledge, at the same time as another blood test. Finally, our trial had a differential loss to follow-up among the experimental group and control group, and individuals who completed the follow-up survey may have had different levels of hepatitis B testing and hepatitis B-related knowledge than those who did not complete a follow-up survey.

Conclusion

Our findings suggest that lay health worker interventions are acceptable to both male and female Chinese American/Canadian populations, and can impact hepatitis B-related knowledge. However, our hepatitis B lay health worker intervention had a very limited impact on hepatitis B serologic testing completion. Given the resources that are required for lay health worker intervention approaches, the effect was not significant from a public health perspective.[28] Our findings also suggest that intervention approaches that are clearly effective in promoting the use of one recommended screening test (e.g., Pap testing) may be much less effective in promoting the use of other screening tests (e.g., hepatitis B serologic testing). Future research should evaluate other intervention approaches to improving hepatitis B testing rates among Chinese in North America.

REFERENCES

1. Barnes PM, Adams PF, Powell-Griner E. Health characteristics of the Asian adult population: United States, 2004-2006. Advance Data 2008; 394:1-23.
2. Ghosh C. Healthy People 2010 and Asian American/Pacific Islanders: Defining a baseline of information. Am J Public Health 2003; 93:1093-1098.
3. Department of Commerce. We the people – Asians in the United States: Census 2000 special reports. Washington DC: Department of Commerce, 2004.
4. Statistics Canada. Population by selected ethnic origins. www.statcan.ca. Retrieved, 2006.
5. Nguyen MH, Keeffe EB. Chronic hepatitis B and hepatitis C in Asian Americans. Rev Gastroenterol Dis 2003; 3:125-134.
6. Lin SY, Chang ET, So SK. Why we should routinely screen Asian American adults for hepatitis B: A cross-sectional study of Asians in California. Hepatol 2007; 46:1034-1040.
7. McBride G. Hepatitis B virus-induced liver cancer in Asian Americans: A preventable disease. J Natl Cancer Inst 2008; 100:528-529.
8. Tong MJ, Hwang SJ. Hepatitis B virus infection in Asian Americans. Gastroenterol Clin North Am 1994; 23:523-536.
9. Merican I, Guan R, Amarapuka D, et al. Chronic hepatitis B virus infection in Asian countries. J Gastroenterol Hepatol 2001; 15:1356-1561.
10. Asian Liver Center. Hepatitis B in Asian Americans. www.liver.stanford.edu. Retrieved, 2005.
11. Lok A, McMahon B. Chronic hepatitis B. Hepatol 2007; 45:507-539.
12. Lin OS, Keefle E. Current treatment strategies for chronic hepatitis B and C. Ann Rev Med 2001; 52:29-49.
13. Malik AH, Lee WM. Chronic hepatitis B virus infection: Treatment strategies for the next millennium. Ann Intern Med 2000; 132:723-731.

14. Jenkins CNH, Buu C, Berger W, Son DT. Liver carcinoma prevention among Asian Pacific Islanders. Cancer 2001; 91:252-256.

15. Coronado GD, Taylor VM, Tu SP, et al. Correlates of hepatitis B testing among Chinese Americans. J Community Health 2007; 32:379-390.

16. Hislop TG, Teh C, Low A, et al. Predisposing, reinforcing, and enabling factors associated with hepatitis B testing among Chinese Canadians in British Columbia. Asian Pacific J Cancer Prev 2007; 8:39-44.

17. Hislop TG, Teh C, Low A, et al. Hepatitis B testing and vaccination levels in Chinese immigrants to British Columbia, Canada. Can J Public Health 2007; 98:125-129.

18. Nguyen TT, Taylor V, Chen MS, Bastani R, Maxwell A, McPhee SJ. Hepatitis B awareness, knowledge, and screening among Asian Americans. J Cancer Educ 2007; 22:266-272.

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

20. Wu CA, Lin SY, So SK, Chang ET. Hepatitis B and liver cancer knowledge and preventive practices among Asian Americans in the San Francisco Bay Area, California. Asian Pacific J Cancer Prev 2007; 8:127-134.

21. Lewin SA, Dick J, Pond P, et al. Lay health workers in primary and community health care. The Cochrane Library 2008; Issue 1.

22. Eremenco SL, Cella D, Arnold BJ, et al. A comprehensive method for the translation and cross-cultural validation of health status questionnaires. Eval Health Prof 2005; 28:212-232.

23. Tu SP, Jackson C, Teh C, et al. Translation challenges of cross-cultural research and program development. Asian Am Pacific Islander J Health 2003; 10:58-66.

24. Chen H, Tu SP, Teh C, et al. Lay beliefs about hepatitis among North American Chinese: Implications for hepatitis prevention. J Community Health 2006; 31:94-112.

25. Taylor VM, Hislop TG, Jackson JC, et al. A randomized controlled trial of interventions to promote cervical cancer screening among Chinese women in North America. J Natl Cancer Inst 2002; 94:670-677.

26. Chao SD, Chang ET, Le PV, Prapong W, Kiernan M, So SK. The Jade Ribbon Campaign: A model program for community outreach and education to prevent liver cancer in Asian Americans. J Immigr Minor Health 2007 [Epub ahead of print].

27. Juon HS, Strong C, Oh TH, Castillo T, Tsai G, Oh LD. Public health model for prevention of liver cancer among Asian Americans. J Community Health. 2008 33:199-205.

28. Thompson B, Thompson LA, Chan NL, Hislop TG, Taylor VM. Cost-effectiveness of two cervical cancer screening interventions among Chinese women in North America. Asian Pacific J Cancer Prev 2007; 8:287-293.

Table 1 Follow-up survey response (N=460)

Disposition	Intervention N=231 N (%)	Control N=229 N (%)
Completed	142 (61)	177 (77)
Refused	46 (20)	26 (11)
No contact after 11 attempts	27 (12)	16 (7)
Moved and unable to trace	16 (7)	10 (4)

Table 2 Baseline characteristics of participants with follow-up data (N=319)

Demographic	Intervention N=142 N (%)	Control N=177 N (%)
Male gender	60 (42)	88 (50)
< 45 years old	50 (35)	62 (36)
< 12 years education	49 (35)	61 (35)
Currently married †	111 (78)	155 (88)
< 50% of life in North America	87 (61)	107 (61)
Did not speak English well or at all	89 (63)	103 (59)
Seattle study participant	73 (51)	82 (46)

† Significant difference between intervention group and control group (p=0.03)

Table 3 Reasons for hepatitis B testing in relation to self-reported testing and medical records verified testing

Reason	Intervention		Control	
	Reported Tests (N = 22)	Verified Tests (N = 9)	Reported Tests (N = 17)	Verified Tests (N = 3)
Information from project	12	6	1	0
Regular check-up	3	0	11	0
Other †	7	3	5	3

† Two respondents gave each of the following reasons: Physician recommendation, gastrointestinal symptoms, family member with hepatitis B disease, and concern about exposure to hepatitis B
One respondent gave each of the following reasons: Insurance exam, at high risk for hepatitis B, and wanted to prevent health problems
One respondent did not provide a reason for testing

Table 4 Hepatitis B knowledge (N=319)

Variable	Intervention (N=142)			Control (N=177)		
	Baseline N (%)	Follow-up N (%)	p-value	Baseline N (%)	Follow-up N (%)	p-value
Chinese more likely to be infected than whites	44 (31)	70 (49)	<0.001	63 (36)	77 (44)	0.05
Spread by razors	84 (59)	101 (71)	0.01	103 (59)	93 (53)	0.17
Spread during sexual intercourse	91 (65)	97 (68)	0.43	102 (58)	99 (56)	0.69
Spread during childbirth	103 (73)	111 (78)	0.19	122 (69)	128 (73)	0.44
Can cause liver cancer	105 (74)	114 (80)	0.12	123 (69)	127 (72)	0.56

Table 5 Multivariable results for intervention group versus control group hepatitis B knowledge at follow-up

Variable	OR (95% CI)	p-value
Chinese more likely to be infected than whites	1.56 (0.93 – 2.62)	0.09
Spread by razors	2.66 (1.57 – 4.51)	<0.001
Spread during sexual intercourse	1.61 (0.96 – 2.71)	0.07
Spread during childbirth	1.34 (0.78 – 2.31)	0.29
Can cause liver cancer	1.49 (0.81 – 2.73)	0.20

Table 6 Lay health worker home visit outcome by gender

Disposition	Men N=100 N (%)	Women N=131 N (%)	Total N=231 N (%)
Completed home visit	66 (66)	79 (60)	145 (63)
Refused visit but accepted materials	8 (8)	19 (15)	27 (12)
No contact after 11 attempts (materials mailed)	9 (9)	3 (2)	12 (5)
Refused visit and materials	15 (15)	22 (17)	37 (16)
Moved and unable to trace	2 (2)	8 (6)	10 (4)

Figure 1: Trial Overview