

Appendix
Annotated Synthesis Matrix

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Research Question(s): To what extent are Southeast Asian immigrant populations in King County, WA, affected by Hepatitis B virus (HBV) infections? What are the primary barriers to HBV testing and intervention in this group? What are the best practices to test vaccinate for and treat HBV in Southeast Asian immigrant populations in King County?

Main Idea/Theme #1: Southeast Asian cultural views of healthcare

First Author / Year	Article Title (Abbrev.)	Study Design	Sample Size	Study population	Aims of Study	Main <u>and</u> Unique Findings	Limitations
Choe, J 2005	Hepatitis B and liver cancer beliefs among Korean immigrants in Western Washington	Qualitative Study (primary res)	30 in interviews, 18 in focus groups, 48 total	First-generation Korean immigrants aged 18-64 living in Western Washington	To understand hepatitis and liver cancer prevention, behavior and beliefs among the target population	Majority of Koreans in Western WA are foreign born. Traditional medicine is highly valued; emphasis on balance of energies. Acupuncture & herbal medicine are popular modalities for this group. Most Koreans utilize traditional & Western approaches to medicine	Small study size
Hwang, J. 2012	Attitudes toward Hepatitis B virus among Vietnamese, Chinese and Korean Americans in Houston	Qualitative study utilizing focus groups (primary research)	113	Those with self-reported ethnicity of Chinese, Korean or Vietnamese in Houston, TX, divided by degree of acculturation	Explore attitudes about prevention, screening and treatment of HBV of target population	Traditional medicine used when Western medicine fails or is financially out of reach. Concern about blood being taken. Healing hope associated with Eastern medicine, even with Western medicine fails. Traditional medicine treats root causes. Health information sought from HCPs and community members	Incomplete demographic data of participants, limited duration of groups (not time to explore all themes that emerged), some nuances may have been lost in the language interpret process; more females than males in less acculturated groups

Owiti, J 2015	Illness perceptions and explanatory models of viral hepatitis B and C among immigrants and refugees	Systematic review	51	Quantitative and qualitative studies of HBV and HCV infections among foreign-born and first generation immigrants from countries of high disease prevalence, published in English. Intervention studies excluded	Synthesize evidence on immigrants' knowledge of HBV and HCV and how this understanding can impact use of clinical interventions. To inform design and delivery of RCT for targeted screening and treatment	Illness attributed karma, fate, lifestyle factors, imbalance in the body	Many studies used convenience samples; data aggregation led to very large ranges of participant knowledge, which to me left it so open-ended that it wasn't particularly useful information. Data from many ethnic groups aggregated together
Clough, J 2013	Barriers to Health Care Access among Asian Immigrants in the United States: a Traditional Review	Traditional review (not systematic)	Not identified	Articles searched in two databases; search terms were related to Asians and health care and barriers to immigrant health care. Published 1988 - 2011 in English.	To understand the barriers to health care facing Asian American immigrants	Cupping and coin-rubbing seen as valuable traditional healing modalities. Blood as source of nonrenewable energy. Asian Americans tend to seek health care only after symptoms appear.	Possible article selection bias of authors. Non-systematic approach. English language studies only. Limited date range of analysis.

What do these sources tell you about your research question?

While not explicitly answering a specific research question, this information provides important context that informs best practices for engaging with Southeast Asian immigrants, thus indirectly impacting the third research question. Any intervention, program or approach should honor the target population's perspective on health, which includes use of traditional medicine, lifestyle medicine and energy balance in addition to allopathic approaches. The population's perspective on blood and karma should also be taken into account.

Main Theme #2: Prevalence and impact of HBV among Southeast Asian immigrants

First Author / Year	Article Title (Abbrev.)	Study Design	Sample Size	Study population	Aims of Study	Main and Unique Findings	Limitations
Chen Jr, Moon 2015	Hepatitis B among Asian Americans: Prevalence, Progress, and Prospects for Control	Systematic Review	N/A	Asian American Immigrants	Review the magnitude of HBV infection burden among Asian Americans and the progress being made to mitigate this burden.	Asian Americans comprise about 6% of the population but experience about 60% of the CHB burden.	Hepatitis B among Asian Americans: Prevalence, Progress, and Prospects for Control
Smith, Michael 2012	Hepatitis B on the Rise in US Immigrants	Systematic Review		Asian American Immigrants	Address the wide discrepancy in the current estimates of the chronic HBV burden in the US	Their analysis suggests that the total prevalence of HBV is significantly higher than previously reported, exceeding 2 million cases or about twice the number previously reported.	Data for CHB for many countries is limited, also much of the data was reported before the year 2000.
Kennedy, K 2018	Hepatocellular carcinoma among US and non-US-born patients with chronic hepatitis B: Risk factors and age at diagnosis	case control study	278	Patients with CHB and HCC followed over a 14 year span from 2002-2015	To identify the demographic and clinical factors associated with Hepatocellular carcinoma among a diverse cohort of patients with CHB infection.	Of the 278 cases, 67% were 60 years of age or older, 78% were male, 87% had cirrhosis and 72% were Asian. The main factors independently associated with greater odds of HCC overall were Asian race and cirrhosis.	This didn't specify what countries the Asian immigrants came from.
Choe, J 2005	Hepatitis B and liver cancer beliefs among Korean immigrants in Western Washington	Qualitative Study (primary research)	30 in interviews, 18 in focus groups, 48 total	First-generation Korean immigrants aged 18-64 living in Western Washington	To understand hepatitis and liver cancer prevention, behavior and beliefs among the target population	Chronic hepatitis is most significant cause of primary liver cancer in Asian Americans. Asian immigrants impacted more than other groups	Small study size

Lee, H 2016	Correlates of hepatitis B virus-related stigmatization experienced by Asians: a scoping review of literature	Systematic review	21	Literature published between 1988-2016 and indexed in 8 different databases; search terms related to stigma and Asian; studies in English language; include Asians or Asian Americans; did not focus on a specific age group	Examine existing literature related to HBV stigma among Asians and Asian immigrants to non-Asian countries	Asian Americans affected by HBV at over 30x the rate of non-Hispanic whites in America. HBV is leading cause of hepatocellular carcinoma.	Searching a limited date range, utilizing studies only in English, and having Chinese persons represented more than other countries of origin in the source studies
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What do these sources tell you about your research question?

There are two key learnings from the above research which answer the first research question which corresponds to the degree to which Southeast Asian immigrants are impacted by HBV. First, the research shows that this group is particularly at risk for HBV as compared to other groups; the degree of impact is dramatic and warrants the attention of the medical community. Second, since chronic HBV is highly correlated with the development of hepatocellular cancer, this group is at risk not only for HBV but also cancer. The prevalence impacts the Southeast Asian immigrant community itself and also presents a risk to others due to the infectious nature of the disease.

Main Theme #3: Barriers to HBV screening, vaccination and treatment

First Author / Year	Article Title (Abbrev.)	Study Design	Sample Size	Study population	Aims of Study	Main <u>and</u> Unique Findings	Limitations
Li, Dorothy 2012	The Impact of HBV knowledge and stigma on screening in Canadian Chinese persons.		343	Chinese individuals at a family physicians office and at an ESL class in Toronto	To understand factors that influence HBV testing behavior among the Chinese community and determine whether stigma acts as a barrier to screening.	Greater levels of stigma were associated with decreased likelihood of screening for HBV.	The Impact of HBV knowledge and stigma on screening in Canadian Chinese persons.
A, Vedio 2016	Improving access to healthcare for CHB among migrant Chinese populations: A systematic mixed methods review of barriers and enablers	Systematic Review	NA	Migrant Chinese populations in Western countries.	To identify obstacles and supports to timely and appropriate health service use among this population.	There was strong consistent evidence of low levels of knowledge among patients and community members, but interventions to improve knowledge had little positive effect on testing or vaccination. - Stigma strongly associated with HBV with weak but consistent evidence that it was a barrier to care. - There was strong consistent evidence that healthcare providers miss opportunities for testing and vaccination	Improving access to healthcare for CHB among migrant Chinese populations: A systematic mixed methods review of barriers and enablers
Haeok, Lee 2016	Correlates of Hepatitis B Virus-related Stigmatization Experienced by Asians: A Scoping Review of Literature	Systematic Review	NA	Asian communities in the United States	To examine the existing research literature about HBV-related stigma among Asians and Asian immigrants residing in other countries.	The major factors of most studies were on knowledge and attitudes toward HBV; only three studies focused on stigma as the primary purpose of the research. Few studies focused on the measurement of stigma, conceptual aspects of stigma, or interventions to alleviate the experience of being stigmatized.	None

Dam, L 2016	Hepatitis B stigma and knowledge among Vietnamese in Ho Chi Minh City and Chicago	Survey (primary research)	170 in Chicago cohort, 842 in Ho Chi Minh cohort, 1012 in total	Vietnamese individuals living in Chicago and Ho Chi Minh City	To characterize and compare HBV knowledge and stigma in Vietnamese individuals in Ho Chi Minh City and Chicago. To evaluate cultural context of HBV stigma	It was found that both cohorts were characterized by significant HBV knowledge deficits, most notably with respect to modes of transmission. Interestingly, Chicago participants were associated with higher levels of stigma related to the disease compared to those in Ho Chi Minh City. In general, higher education levels corresponded with higher levels of HBV knowledge. Not wanting to upset or shame the family is a major theme of care avoidance	Significant differences in cohort size between Chicago and Ho Chi Minh City group; convenience samples used
Choe, J 2005	Hepatitis B and liver cancer beliefs among Korean immigrants in Western WA	Qualitative Study (primary research)	30 in interviews, 18 in focus groups, 48 total	First-generation Korean immigrants aged 18-64 living in Western Washington	To understand hepatitis and liver cancer prevention, behavior and beliefs among the target population	Chronic hepatitis is most significant cause of primary liver cancer in Asian Americans. Asian immigrants impacted more than other groups	Small study size
Lee, H 2016	Correlates of hepatitis B virus-related stigmatization experienced by Asians: a scoping review of literature	Systematic review	21	Literature published between 1988-2016 and indexed in 8 different databases; search terms related to stigma and Asian; studies in English language; include Asians or Asian Americans; did not focus on a specific age group	Examine existing literature related to HBV stigma among Asians and Asian immigrants to non-Asian countries	Stigma related to concept of "saving face" in Asian culture; stigma impedes treatment. Fear of social exclusion and discrimination as reasons for non-disclosure. Lower HBV knowledge associated with higher stigma	Searching a limited date range, utilizing studies only in English, and having Chinese persons represented more than other countries of origin in the source studies

Hwang, J 2012	Attitudes toward Hepatitis B virus among Vietnamese, Chinese and Korean Americans in Houston	Qualitative study utilizing focus groups (primary research)	113	Those with self-reported ethnicity of Chinese, Korean or Vietnamese in Houston, TX, divided by degree of acculturation	Explore attitudes about prevention, screening and treatment of HBV of target population	Lifestyle factors, food contamination blamed for HBV cause. Costs of screening and treatment are barriers to care. Worry, fatigue, hygiene noted as disease causes among those in groups. Confusion about vaccination and how sequencing vax prior to exposure is important in preventing HBV. Medical jargon confusing.	Incomplete demographic data of participants, limited duration of groups (not time to explore all themes), some nuances may have been lost in the language interpretation process; more females than males in less acculturated groups
Owiti, J 2015	Illness perceptions and explanatory models of viral hepatitis B and C among immigrants and refugees	Systematic review	51	Quantitative and qualitative studies of HBV and HCV infections among foreign-born and first generation immigrants from countries of high disease prevalence, published in English. Intervention studies excluded	Synthesize evidence on immigrants' knowledge of HBV and HCV and how this understanding can impact use of clinical interventions. To inform design and delivery of RCT for targeted screening and treatment	Confusion about different types of hepatitis. Lifestyle factors again blamed for HBV; lack of awareness of infectious pathway. "Weak liver" blamed for HBV. False association of food contamination as disease cause. Insufficient information about the cost and efficacy of vaccination. Fear with interacting with the medical system due to incomplete explanations by HCPs. Difficulty getting and getting to appointments. Immigrants having apparent knowledge may give false impression that they are fully educated on HBV when they aren't.	Many studies used convenience samples; data aggregation led to very large ranges of participant knowledge, which to me left it so open-ended that it wasn't particularly useful information. Data from many ethnic groups aggregated together

Clough, J 2013	Barriers to Health Care Access among Asian Immigrants in the United States: a Traditional Review	Traditional review	Not identified	Articles searched in two databases; search terms were related to Asians and health care and barriers to immigrant health care. Published 1988 - 2011 in English.	To understand the barriers to health care facing Asian American immigrants	Asian Americans affected by model minority myth. Over 50 nationalities of Asian immigrants in the US - this diversity makes a one-size fits all approach impossible. Unique challenges/strengths of each group are lost when data is aggregated under the umbrella "Asian". Lower rates of health insurance and health system utilization compared to US-born Asians. Refugees have less resources than other immigrants due to the circumstances of their immigration. Patient-provider language barriers negatively impact care. Stigma of being an immigrant compounds health-status stigma. Fears related to illegal immigrant status keep some from seeking health care	Possible article selection bias of authors. Non-systematic approach. English language studies only. Limited date range of analysis.
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What do these sources tell you about your research question?

Stigma has been consistently shown to be a major barrier to testing and treatment in this population. Education about HBV has been shown to be low in this population, however education about HBV does not affect the rates of testing or vaccination, but may reduce stigma associated with the disease. Many people in this community face many of the same obstacles to healthcare that other low income/underinsured populations see.

Main Theme #4: Strategies/best practices to overcome barriers

First Author / Year	Article Title (Abbrev.)	Study Design	Sample Size	Study population	Aims of Study	Main and Unique Findings	Limitations
Bajkik, Chris 2010	Hepatitis B Testing and Vaccination in Immigrants Attending English as a Second Language Classes in British Columbia, Canada		759	Asian immigrants in Vancouver, BC attending ESL classes.	Describe the sociodemographic characteristics associated with a history of HBV testing & vaccination in immigrants from countries with a high prevalence of HBV.	Respondents were mainly Female, had post secondary education and had recently immigrated from China (since 2005)	Hepatitis B Testing and Vaccination in Immigrants Attending English as a Second Language Classes in British Columbia, Canada
Taylor, Vicky M 2012	Hepatitis B ESL Education for Asian immigrants	Rando mized trial	218, only 180 complete d study	Asian immigrants in Seattle	To evaluate the effectiveness of HBV education in ESL	Half of the participants were given HBV education, half were given Phys Ed . The experimental group were more likely to know that Asian immigrants were at higher risk for HBV as well as knowledge about transmission 6 months after the education was provided. The education did not have any effect on likelihood for testing or vaccination, but may reduce stigma.	Small possibility that experimental group had higher knowledge of HBV at baseline.
Stanford, Jevetta, 2016	Community-engaged strategies to promote hepatitis B testing and linkage to care in immigrants of Florida		1516	Foreign born immigrants	To develop a community engaged program with the goals of identifying people with HBV & link them to care. This study also reports the successes & challenges they faced.	They had success with utilizing faith and community based orgs. - The organizations that offered testing worked closely with the organizations that offered treatment, as none of the 36 community partners did both.	They cited diversity within the immigrant communities as an issue. Also the collaboration of the community partners left a lot of institutional obstacles to overcome.

						Overall they recommend 1) Maintain a strong community presence (build relationships with faith based leaders)2) Establish partnerships and linkage process 3)Develop a sustainability plan and 4) Ensure the presence of dedicated program staff.	
Djoufack, R. 2017	Hepatitis B virus outreach to immigrant population in Greater Boston area: key to improving hepatitis B knowledge	Intervention study	101, though only 56 completed post-session questionnaires	Greater Boston area immigrants from 21 countries and plus 7 US-born participants (greater representation from African countries as compared to Asian countries)	To understand HBV knowledge among target population and assess outreach efforts' impact on HBV knowledge	The educational session did significantly improve knowledge in most areas. Social networks helped increased study participation among some groups. The study also highlights that refugees may face challenges that are unique from other immigrants. Though not stated in the article, I think the noted confusion underscores the need for group-specific sessions such as to avoid confusion, especially those rooted in language barriers	45% of participants did not complete postsession questionnaire; small sample size; questionnaire was not validated; language barriers during sessions; long term knowledge retention not measured
Hwang, J 2012	Attitudes toward Hepatitis B virus among Vietnamese, Chinese and Korean Americans in Houston	Qualitative study utilizing focus groups (primary res)	113	Those with self-reported ethnicity of Chinese, Korean or Vietnamese in Houston, TX, divided by degree of acculturation	Explore attitudes about prevention, screening and treatment of HBV of target population	Asians Americans most likely to go to a health care provider that speaks their native language	Incomplete demographic data of participants, limited duration of groups (not time to explore all themes), some nuances may have been lost in the language interpretation process; more females than males in less

							acculturated groups
Owiti, J 2015	Illness perceptions and explanatory models of viral hepatitis B and C among immigrants and refugees	Systematic review	51	Quantitative & qualitative studies of HBV and HCV infections among foreign-born and first generation immigrants from countries of high disease prevalence, published in English. Intervention studies excluded	Synthesize evidence on immigrants' knowledge of HBV and HCV and how this understanding can impact use of clinical interventions. To inform design and delivery of RCT for targeted screening and treatment	Targeting whole families and communities could potentially increase uptake of vaccination and screening. Informed consent and thorough communication throughout the screening and vax process is essential. Mass media education associated with higher levels of knowledge.	Many studies used convenience samples; data aggregation led to very large ranges of participant knowledge, which to me left it so open-ended that it wasn't particularly useful information
Clough, J 2013	Barriers to Health Care Access among Asian Immigrants in the United States: a Traditional Review	Traditional review	Not identified	Articles searched in two databases; search terms were related to Asians & health care & barriers to immigrant health care. Published 1988 - 2011 in English.	To understand the barriers to health care facing Asian American immigrants	Availability of interpreter services within the healthcare delivery system is key. Patient navigators very helpful.	Possible article selection bias of authors. Non-systematic approach. English language studies only. Limited date range of analysis.
Yoo, G 2015	Destigmatizing Hepatitis B in the Asian American	Qualitative study	23	Individuals/"key informants"	To understand what campaign messages were most impactful	Utilizing highly respected community leaders/influencers as voice of	None were listed. Very little information was provided as to how the

	community: Lessons Learned from the San Francisco Hep B Free campaign	(primary research)		involved in the community outreach campaign	to Asian Americans living in San Francisco	campaign and role models was a critical aspect of its success. When respected Asian community leaders admitted publicly that they had HBV, it was effective in helping reduce stigma. Involving the community was positive; the idea that everyone can be a hero. Media campaigns showed Asians of many nationalities. Combated fatalism by emphasizing self-efficacy and that taking action can make a positive difference.	information was gathered from the 23 informants, so I'm unable to ascertain limitations of the study based on this limited information
Rice, R 2014	Reducing STD/HIV stigmatizing attitudes through community popular opinion leaders in Chinese markets	Randomized controlled trial	3912	Market vendors across 40 food markets in China	Test the effectiveness of using community popular opinion leaders to reduce stigma through discussing HIV/AIDS in everyday venues	Diffusion of innovation theory-based approaches may be a successful means of stigma reduction. Use of clothing with logos helped increase community knowledge of the campaign. The more people a person talked with about HIV/STD, the less stigma they had over time (demonstrates advantage of multiple role models). People trust information when it comes from someone they trust and can relate to. Intervention impact was greatest for the community leaders themselves	Lessons learned from this study may not be generalizable to HBV given a study focus on HIV

What do these sources tell you about your research question?

Community engagement and culturally competent care has been shown to have better outcomes for testing, treatment and vaccination. Most people in this population respond best to providers who are also part of their community. Education materials should be in their native languages. Healthcare providers should be aware that people from Asian countries have higher risk of HBV and should test for it.