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## RESEARCH COMMUNICATION

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# Cancer Screening, Reproductive History, Socioeconomic Status, and Anticipated Cancer-related Behavior among Hmong Adults

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### Abstract

**In the United States, breast, cervical, colorectal and prostate cancer screening rates are low or non-existent in the Hmong population compared to non-Hispanic Whites. No Hmong adults report ever participating in prostate (male only) and colorectal cancer screening. US-born Hmong women, those living in the US  $\geq 20$  years, and those  $\leq 39$  years old are more likely to be screened for breast and cervical cancer than other women. The Hmong, in general, are a young population (median age = 34 years) with low socioeconomic status. As a function of these characteristics, 52% of Hmong women reported having their first child at 15-19 years old and continued to bear children until 40-54 years old. The combination of young age at first pregnancy and multiparity probably protects Hmong women from breast cancer but elevates cervical cancer risk.**

**Key Words:** Cancer screening - cancer treatment - socioeconomics - Hmong immigrants to the USA

*Asian Pacific J Cancer Prev*, 7, 79-85

### Introduction

Numerous studies have found that the utilization of screening services for early detection of cancers has been disproportionately low in Asian subgroups (Wong et al, 2005; Walsh et al, 2004). Data from the California Health Interview Survey (2003) revealed that only 29% of Asian men  $\geq 40$  years, compared to 53% of NHW men of the same age have ever had a prostate-specific antigen (PSA) test. The higher percentage of PSA utilization among NHW men could be attributed to the fact that the PSA test was massively distributed and used as a screening tool for prostate cancer in the late 1980s. Additionally, among adults  $\geq 50$  years old, only 38% and 43% of Asians compared to 56% and 58% of NHW have ever had a fecal occult blood test and colon exam, respectively. Similarly, the proportion of Asian women screened for breast and cervical cancers was approximately 88%, which was lower than reported for NHW (93%).

In multi-factorial diseases, such as cancer, screening is important because a given factor that appears to be protective against one type of cancer may elevate the risk for another type of cancer. A good example of this phenomenon is reproductive history and its health benefit and risk to breast and cervical cancers. Early studies have shown that high parity and young age at first pregnancy provide certain levels of protection against breast cancer (Henderson et al, 1996). At the same time, early age of first pregnancy and

multiparity, especially full-term pregnancy, were found to elevate the risk for cervical cancer (Schiffman et al., 1996).

Socioeconomic status (SES) is another factor with both health benefit and risk. Low (SES) has been associated with low utilization of screening services and increased risk for cervical (Khan et al, 2005) and prostate (Richardson et al, 2004) cancers. Economically poor and less educated individuals are more likely to be less familiar with or knowledgeable of preventive services, thus, decreases the likelihood of getting screened. On the other hand, high SES is correlated with increased risk of colorectal (Ross and Schottenfeld, 1996) and breast cancer (Robert et al, 2004). In breast cancer, high SES women are more likely to delay marriage and pregnancy until later age, compared to economically poor and less educated women. By delaying marriage and pregnancy, high SES women lack protection against breast cancer offered by the body's biological defense mechanism associated with human reproduction.

While under utilization of preventive services may be commonly observed among Asian subgroups, the decision whether to seek medical assistance may be facilitated or hindered by numerous factors, including socioeconomic status, cultural and religious practices, and life experiences associated with western medicines. These factors are common in the US Hmong, who are primarily refugees from Laos (Quincy, 1995). Hmong individuals commonly get married early, start a family at a young age, and have a large

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family (Podhisita et al, 1990). Most Hmong are also low in SES (US Census Bureau, 2000) due to recent immigration to the US. Thus, Hmong would be expected to be less knowledgeable about cancer, cancer-related preventive services, cancer risks and outcomes.

The purpose of the present study is to evaluate patterns of cancer screening, reproductive history, and cancer health behaviors among the Hmong adults living in Fresno County, California. It is hoped that the results from this study will provide significant insight into designing a culturally responsive cancer health education/prevention effort to target Hmong individuals with potentially elevated risk of certain types of cancer.

## Materials and Methods

This study is based on data collected from survey interviews of 248 Hmong individuals, age 18+ in Fresno, California. No comprehensive population listing of all Hmong in Fresno is available, thus, Hmong participants were recruited to form a stratified random sample, by age and sex, representative of the population.

Data were collected using a 38-question survey. The first 11 questions focus on demographic characteristics, and the remaining 27 questions elicit information on patterns of cancer screening, reproductive history, and health behaviors associated with cancer diagnosis. Since cultural sensitivity played a critical role in the interviewing process, bicultural, bilingual, and gender-specific interviewers were utilized to ensure that the study participants felt comfortable with gender-specific anatomical terminologies. Respondents were informed with written informed consent regarding the choice to skip or refuse any question they felt uncomfortable answering. A monetary stipend of \$20 was provided upon completion of a survey for each participant's time and effort. Consenting participants were required to print their names, sign, and date the written informed consent. Interviews were conducted in either English or Hmong, depending on the language preference of each individual participant. The survey was approved by the IRB at the Public Health Institute, Oakland, CA.

Respondents literate in English or Hmong were given the option to respond to the questionnaire individually, and at their own pace. For all other respondents, the interviews were conducted in either group or one-on-one sessions. In the group sessions, the interviewer guided the participants through the questionnaire by reading each question and the response options out loud. Then, the respondents were asked to mark the answer that best described his/her opinion on the survey. In one-on-one interviews, the interviewer recorded the answers, as the respondent answered each question when asked.

Completed questionnaires were coded, key-entered into a database, and analyzed. Both descriptive and chi-square analyses were performed. Chi-square comparisons were used to evaluate several socio-cultural characteristics (age, income, religion, education, and US residency), as these were

associated with certain health related behaviors. Health behaviors of interest are screening for prostate, colorectal, breast, and cervical cancers.

To compare Hmong to Non-Hispanic Whites (NHW) in Fresno, California, all "Don't know," "Refused," and "Not applicable" response categories were excluded from analyses for several variables that were also collected by the California Health Interview Survey (CHIS).

## Results

Demographics (data not shown): the results presented here are based on responses from 248 Hmong adults (122 men, 126 women) living in Fresno, California. Median age among the men and women were 33 and 34 years old, respectively. While a slightly higher proportion (86% male vs 75% female) of Hmong men attended school in the US, a higher percentage (35% female vs 33% male) of Hmong women attended junior colleges and universities. Length of US residency (average 15 years) was roughly the same in

**Table 1. Menstrual Characteristics and Reproductive History of Hmong women in Fresno, California, 2004**

Age at menarche	9-11	5.8%
	12-14	72.1%
	15+	22.1%
Menopausal status	No	81.1%
	Yes	18.9%
Ever been pregnant	No	23.9%
	Yes	76.1%
No of pregnancies	Never pregnant	24.1%
	1-3	9.8%
	4-5	17.9%
	6-7	21.4%
	8+	26.8%
Any miscarriage	Never pregnant	24.1%
	No	55.4%
	Yes	20.5%
Number of live births*	Never pregnant	25.9%
	1	6.3%
	2	7.1%
	3	11.6%
	4	6.3%
	5+	42.9%
Age pregnant with first child	Never pregnant	23.9%
	<15	7.9%
	15-19	52.2%
	20-24	12.4%
	25-29	2.7%
	30+	0.9%
Age had last baby*	Never pregnant	25.2%
	<=18	2.8%
	20-29	29.0%
	30-39	20.6%
	40-49	17.8%
	50+	4.7%

\* May not equal 100% in total due to rounding

**Table 2. Cancer Diagnosis and Anticipated Cancer-related Treatment Behaviors among Hmong Adults in Fresno, California, 2004**

Cancer dx	Yes	0.4%
	No	99.6%
See who first if cancer dx		
	Shaman	1.2%
	Herbal	3.7%
	MD	82.9%
	Other	2.0%
	Don't know	10.2%
If chose herbal/shaman first, why?		
	Can't speak English	3.2%
	Don't trust MD	4.0%
	No health insurance	1.6%
	Financial reason	3.6%
	Other reasons	56.9%
	Don't know	29.8%
First treatment choice for cancer dx		
	None	3.3%
	Radiation	16.7%
	Chemotherapy	31.7%
	Surgery	15.9%
	Herbal	6.9%
	Shaman	4.1%
	Don't know	21.1%
At what point use non-traditional treatment (shamanistic rituals, herbal medicine, etc.)		
	After exhausting traditional treatments	5.9%
	Use traditional/non-traditional together	61.3%
	Don't know	32.8%

both gender groups. A higher percentage of Hmong men (61%) also speak English fluently than Hmong women (53%). While more Hmong women (43%) tended to be slightly overweight than Hmong men (40%), both genders were equally obese (21%). A great proportion (>71%) of Hmong continue to practice traditional religion. On average Hmong men (\$1,425) received slightly higher monthly personal income than Hmong women (\$1,270).

Reproductive health history (Table 1): reproductive health data reported here were based on responses from the 126 Hmong women participants. The proportion of age at menarche starting at 9-11, 12-14, and 15+ years old were about 6%, 72%, and 22%, respectively. About 19% of the Hmong women in this survey were menopausal (defined as 6+ months since last menstrual period). When asked about ever being pregnant, 24% reported never been pregnant, and 76% indicated having been pregnant. Among the ever-pregnant women, those having had 1-3, 4-5, 6-7, and 8+ pregnancies were 10%, 18%, 21%, and 27%, respectively. Twenty-one percent also indicated a miscarriage. About 6% had 1 live birth, 7% 2 live births, 12% 3 live births, and 49% 4+ live births. Eight percent were < 15 years old at first pregnancy, 52% between 15-19 years old, 12% between 20-24 years old, 3% between 25-29 years old, and approximately 1% between 30-34 years old. About 3% were ≤18 years old, 29% for 20-29 years old when they had their

**Table 3. Cancer Screening Behavior among Hmong Men and Women in Fresno, California, 2004**

Ever did breast self-exam (n=119)	Yes 30.3%	No 69.7%
Mammogram (n=114)	Yes 15.8%	No 84.2%
Pap test (n=112)	Yes 27.7%	No 72.3%
Colorectal exam for men and women age 50+ (n=53)	Yes 0.0%	No 100.0%
PSA test for men age 40+ (n=46)	Yes 0.0%	No 100.0%

last live birth, 21% were 30-39 years old, 18% were 40-49 years old, and 5% were 50-54 years old.

Cancer-related health behavior (Table 2). Less than 1% of the 248 Hmong participants indicated having been diagnosed with cancer. When asked whom the participant would see first if they were diagnosed with cancer, more than 82% reported they would see medical doctors, and less than 10% indicated they would see other healers first. Additionally, 21% indicated they would not know what would be their first choice of treatment if diagnosed with cancer. While more than 64% noted that their first treatment choice would be chemotherapy, radiation, or surgery, 11% preferred to use traditional healing methods. When asked at what point would the participant seek or use non-traditional treatments if they were diagnosed with cancer, 61% said they would use both western and traditional treatments concurrently, 33% would not know when to use western treatments, and 6% reported they would resort to western treatments only after exhausting all traditional treatments.

Cancer screening (Table 3). For those at risk of colorectal cancer (age 50+), not one of the study participants had ever received a colorectal exam. Similarly none of the men at risk of prostate cancer (age ≥40) had a PSA test done either. For women of all ages, only 30% reported ever performing a breast self-exam (BSE), and only 20% of those ≥40 years old indicated ever performing BSE. Among those women who had performed BSE, about 19% reported doing so rarely, 44% monthly, 22% 2-3 times in the last 12 months, and 16% once every 2-3 month in the last year. For mammogram, only 16% indicated ever having a mammogram but almost 89% of these women had gone in for a mammogram in the last 12 months. As for cervical cancer screening, only 28% reported ever having a Pap test. Of those having a Pap test, about 81% indicated they had one done in the past year.

Results of bivariate analyses were presented for women only since no study participants had engaged in PSA or colorectal cancer screening (Table 4). Hmong women who attended a college/university in the US were more likely ( $p < 0.05$ ) to have ever performed BSE than women who did not attend school. Similarly, women who speak English fluently and have higher monthly personal income were also more likely ( $p < 0.05$ ) to engage in BSE than other women with limited English ability and lower income status. In addition, women who were either born in the US or lived in

**Table 4. Percentages of Hmong Women who had ever had BSE, Mammography, and Pap Smear Test by Selected Characteristics**

	Ever performed breast self-examination			Ever had mammography			Ever had Pap smear test		
	p-value	No.	%	p-value	No.	%	p-value	No.	%
School in US	0.001			0.385			0.006		
No		1	3.7		15	17.6		2	7.4
Yes		35	38.5		3	10.7		29	34.5
Type of school	0.000			0.200			0.006		
Don't know		2	7.7		3	11.1		2	7.7
Adult/high school		11	22.9		10	23.8		10	24.4
College/university		2	51.1		5	11.1		19	42.2
Speak English	0.007			0.029			0.008		
No		2	7.7		3	11.5		1	4.0
A little		7	30.4		8	34.8		8	34.8
Yes		27	41.5		7	11.7		22	36.7
US residency	0.000			0.056			0.000		
Born in US		3	23.1		1	7.7		3	23.1
≤14 years		6	16.2		3	8.6		1	2.9
15-19 years		4	11.1		4	12.1		7	21.9
20+ years		23	69.7		10	30.3		20	60.6
Monthly income	0.001			0.093			0.000		
<\$800		6	13.3		5	11.6		6	14.6
\$801-\$1,300		6	19.4		2	6.9		2	6.9
\$1,301+		18	48.6		9	25.0		18	50.0
Age	0.166			0.331			0.026		
≤27		13	31.0		4	10.3		11	28.2
28-39		13	41.9		4	13.8		13	44.8
40+		10	21.7		10	21.7		7	15.9
Religion	0.517			0.446			0.077		
Traditional		24	28.2		14	17.3		19	24.1
Christianity		9	32.1		3	11.3		8	29.6
Don't know		3	50.0		1	16.7		4	66.7

the US ≥20 years were more likely to perform BSE when compared to other women. Hmong women who could converse fluently in English were significantly more likely ( $p < 0.05$ ) to get a mammogram than women who could not speak English. Attending a school in the US, length of US residency, monthly personal income, age, and religion had no significant impact on whether a woman had ever had a mammogram. Hmong women who had attended a school in the US, who speak English fluently, who have lived in the US ≥20 years or who were born in the US were significantly more likely to use the Pap smear test to screen for cervical cancer ( $p < 0.05$ ). Furthermore, utilization of the Pap smear test is highly age-dependent. Women who were ≤39 years old were significantly more likely ( $p < 0.05$ ) than women ≥40 years old to ever had a Pap test done.

## Discussion

The participants in the present study were fairly young (median age = 34) and with low incomes (average monthly

personal income = \$1,345). The majority (72%) of Hmong women started their menstrual cycle between 12-14 years of age. The young age structure and high prevalence of premenopausal women may explain why more than 76% of Hmong women reported ever being pregnant. More than half (52%) of these women had their first child between 15-19 years old, compared to about 17% for NHW females in same age group (CHIS, 2001). With young age of first pregnancy, Hmong women have more years to become pregnant multiple times, which probably contributes to 48% having had six or more pregnancies because Hmong women continue to bear children well into the advanced maternal ages of 40-54 years old. In addition, a high number of children is highly desirable for Hmong (Minkler et al., 1988) and represents a family's wealth (Faller, 1992). As such, 43% indicated having had five or more live births.

By western obstetric standards, the continuation of childbearing at advanced maternal age, as observed in Hmong women, is associated with increased risk of many pregnancy-induced diseases and fetal complications (Bianco

et al., 1996). However, studies have found that Hmong pregnancy outcomes are surprisingly good despite high risk factors, such as indigent status, older maternal age, multiple full-term pregnancies, short stature, late or lack of prenatal care, and poor nutrition (Kunstadter et al., 1993; Edwards et al., 1987). While the young age at first pregnancy and high parity observed among Hmong women (Faller, 1992; Edwards et al., 1987) may be protective against breast cancer (Russo et al., 2005), these factors, at the same time, may elevate their risk for cervical cancer (Munoz et al., 2002). In a recent study comparing cervical cancer in Hmong women to NHW women, Hmong women were found to be four times more likely to get cervical cancer than NHW women (Yang et al., 2004). Multiparity may increase the chance of contracting the human papillomavirus, which is the main culprit for most cervical cancer (Munoz et al., 2003).

With 82% of the participants preferring to see a medical doctor over a traditional healer and 64% indicating they would select western (chemotherapy, radiation, or surgery) versus traditional medicine as first course of treatment if diagnosed with cancer, it was anticipated that utilization of screening tools would also be high. However, cancer-screening patterns were quite the opposite among Hmong adults. PSA test was essentially absent in Hmong men  $\geq 40$  years old, compared to 46% of NHW men ever having a PSA test (CHIS, 2001). Similarly, screening for colorectal cancer by Hmong adults  $\geq 50$  years old was also completely lacking, compared to about 49% among NHW adults (CHIS, 2001).

Research data show that Hmong experience prostate and colorectal cancer incidence rates lower than NHW adults (Ross et al., 2004; Mills and Yang, 1997). A recent study (Mills et al., 2005) revealed that Hmong men were 10 times less likely to get prostate cancer, compared to NHW men. Hmong women and men were also three and four times less likely to develop colorectal cancer, compared to NHW adults, respectively. Of course, it would be expected that the zero participation in screening programs from Hmong adults would make the incidence rates of prostate and colorectal cancers observed in the Hmong appear lower than NHW who have high participation rates in screening regimens. However, the lower incidence rates experienced by Hmong adults may not only result from the lack of detection but also differences in several factors, including but not limited to, ethnic background, diet and lifestyle practices. Hmong, like other Asian Americans (Ross and Schottenfeld, 1996; Schottenfeld and Winawer, 1996), came from geographic regions that are lower in prostate and colorectal cancers. Additionally, the daily diets of most Hmong prior to immigrating to the US comprised mainly of rice, green vegetables, other fibrous food items, and less so in processed foods and red meat. A study in early 1990s confirmed these dietary habits in the Hmong (Ikeda et al., 1991). Both processed foods and red meat were also consumed but at lower frequencies, as these dietary fat-related foods have been found to increase the risk of prostate

(Walker et al., 2005; Giovannucci et al., 1993) and colorectal cancers (Marques-Vidal, 2005).

Patterns of breast cancer screenings among Hmong women also appear unfavorable when compared to NHW females. Only about 30% of Hmong women of all ages ever performed BSE. Among those Hmong women 40 years or older, the proportion of ever performed BSE was even lower (20%). This low usage of screening service pales in comparison to the 73% reported for NHW women (CHIS, 2001). Utilization of mammography was also discouraging. Only 16% of Hmong women reported ever had a mammography done, compared to 82% for NHW women.

The proportions of Hmong women ever participating in breast cancer screening (BSE or mammography) were lower than reported previously (Tanjasiri et al., 2001). The differences may be attributed to geographic exclusion and inclusion. While the current study concentrated on Hmong women living in Fresno County, the previous study included Hmong women living in Fresno, Orange, and San Diego Counties. The inclusion of Hmong women living in affluent counties, such as Orange and San Diego, may yield a higher percentage of Hmong women performing BSE or having had mammography. In the previous study, as well as in the current analysis, Hmong women who were of higher income were more likely to ever perform BSE and more likely to ever get a mammogram. Hmong women living in Orange and San Diego counties were more affluent and educated than Hmong women in Fresno County. The median family incomes for Hmong families in San Diego and Orange counties were respectively two and three times higher than in Fresno County.

Furthermore, the proportions of Hmong women 18 years or older with a high school or higher education in Fresno, San Diego, and Orange counties were 33%, 53%, and 52%, respectively (US Census Bureau, 2000). Nonetheless, epidemiological evidence has shown that Hmong women were several times less likely to get breast cancer, compared to other women (Mills et al., 2005; Ross et al., 2004; Mills and Yang, 1997). Yet, the argument regarding low screening and low cancer detection made for prostate and colorectal cancers in Hmong adults could also be made regarding breast cancer. Since lower percentages of Hmong women are participating in early detection regimens, it would be anticipated breast cancer incidence in Hmong women would seem lower than NHW women who are more actively involved in early detection services. However, breast cancer incidence rates may truly be lower in Hmong than NHW women. The decreased incidence may have less to do with lack of screening and more to do with other variables, such as ethnic background, early age pregnancy, and multiparity, which are protective against breast cancer.

It is noteworthy to mention that attending school, particularly college/university, in the US, the ability to speak fluent English, long residency in the US, and high personal income are positively associated with the performance of BSE. On the contrary, only the ability to speak English is associated with getting a mammography. These factors all

pointed to barriers to access and knowledge of health care options. Hmong women with shorter US residency may not have a good command of the English language, probably never attend college or university, and have less income due to the lack of employment skills, thus, are less knowledgeable of preventive services.

Self-reported cervical cancer screening service utilization by Hmong (28%) women was also much lower than NHW (98%) women. In several studies, Hmong women were found to be experiencing a higher incidence of cervical cancer when compared to other women (Mills and Yang, 1997; Ross et al., 2004; Yang et al., 2004; Mills et al., 2005). The low usage of cervical cancer screening services by Hmong women may be one of many contributing factors that resulted in the high percentage of late and advanced stage cervical cancers being detected in Hmong women, which were not effectively treated, and ultimately, led to the high mortality rate experienced by Hmong women (Yang et al., 2004). However, Hmong women who are under 40 years old, speak English fluently, educated in the US, either born in the US or living in the US 20 years or longer, and have a higher personal income are significantly more likely to be screened for cervical cancer than other Hmong women.

In summary, Hmong adults who have been in the US longer would certainly have more chance to attend school in the US, especially at the college and/or university levels, which enable them to speak English, a skill that is required for employment and income. These factors are important predictors of whether Hmong women perform BSE or get a Pap smear test to screen for breast and cervical cancers. Age was not a predictor of BSE and mammogram but it is predictive of Pap smear use. Therefore, younger Hmong women (39 years or younger) should encourage and persuade their older sisters, mothers, grandmothers, and friends to participate in Pap smear screening tests, as the results from a cervical cancer study (Yang et al., 2004) in Hmong women demonstrated that older Hmong women carried an unequal burden of cervical cancer.

In addition, Hmong are, by ethnicity and age structure, not at an elevated risk for breast, colorectal, and prostate cancers. Therefore, the under-utilization of screening tools for detecting breast cancer, colorectal, and prostate cancers is not a pressing issue at the current time. As the Hmong population ages and adapts to a more western lifestyle, individuals who meet the screening test criteria (e.g. age, family, history, etc) should be encouraged to seek screening for these common cancers.

## Acknowledgements

This study was funded by a grant from the California Cancer Research Program (No. 3IP0220-P). In addition, special thanks are extended to the Hmong staff of Fresno Center for New Americans, namely Kia Vang, Lung Vang, Blong Xiong, and Lue N. Yang for making the data collection phase of the project possible.

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