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## Rates and Independent Correlates of Pap Smear Testing among Korean-American Women

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### ABSTRACT

**Objectives.** This study reports population estimates of Pap smear testing among Korean-American women and evaluates correlates of testing.

**Methods.** Korean Americans in 2 California counties were surveyed by telephone. Frequencies were age-adjusted to the 1990 census to produce population estimates of testing. Logistic regression models were used to evaluate independent correlates of testing.

**Results.** Only 50% of the Korean-American women surveyed had a Pap test in the previous 2 years. The strongest independent correlate was having had a regular check-up in the previous 2 years (odds ratio 7.2, 95% confidence interval 4.2, 12.1).

**Conclusions.** Rates of Pap testing among Korean-American women are well below national objectives. Collaboration and community-sensitive research are essential to collect data and design programs to improve the health of ethnic minority communities. (*Am J Public Health*. 1998;88:656-660)

### Introduction

Asian Americans are the fastest growing minority in the United States and comprise many diverse ethnic groups.<sup>1</sup> Korean Americans are the fifth largest such group (12%), and their numbers increased by 125% from 1980 to 1990.<sup>1</sup>

Available data suggest that cervical cancer is an important cause of morbidity among Korean-American women. In California, where almost one third of Korean Americans reside,<sup>2</sup> cervical cancer was the fourth most commonly diagnosed invasive cancer among Korean-American women (average annual age-adjusted incidence 14.7 per 100 000, 9.9 per 100 000 for all races/ethnicities).<sup>3</sup>

National and state surveys suggest that Asian-American ethnicity is associated with a lack of Pap smear testing.<sup>4,5</sup> National objectives for cervical cancer screening<sup>6</sup> have not been met for Chinese-American<sup>7,8</sup> and Vietnamese-American women.<sup>8-10</sup> No published data are available for Korean-American women.

Correlates of cervical cancer testing for Asian Americans may differ from those for women of other races/ethnicities because of unique cultural, linguistic, and financial factors.<sup>11</sup> Since these factors vary between groups, it is important to examine their effect on testing for each group.

"Health is Strength," the Korean Breast and Cervical Cancer Screening Intervention Project, is a collaboration between Asian Health Services and the Center for Family and Community Health at the University of California, Berkeley. Its goals are to improve breast and cervical cancer testing among Korean-American women through community intervention and to empower the community to take charge of its health. The design is quasi-experimental, with baseline and follow-up surveys in intervention and control counties. We present baseline cervical cancer testing estimates and correlates of behavior.

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## Methods

### Sample

The 1994 Korean Health Survey (August 1994 to February 1995) was a household telephone survey of Korean-American adults in Alameda and Santa Clara counties, California. The sampling frame was Korean surname-based telephone lists from the 2 counties. The surname lists included almost 500 names; they were generated by Genesys Sampling Systems (Fort Washington, Pa) and revised by Korean project staff and Korean Community Advisory Board members. Telephone lists were purchased from Genesys Sampling Systems and Four Winds Research Corporation (San Francisco, Calif).

Telephone numbers were stratified by county and then randomly sampled without replacement. Within each household, all eligible Korean Americans aged 18 and older were enumerated, and one was randomly sampled.<sup>12</sup> Women and men were sampled from Alameda County, but only women were sampled from Santa Clara County. Women aged 50 and older were oversampled. Fifty-two households were resampled to reach the target sample size in Alameda County, which was 385. This provided 95% confidence intervals (CIs) of  $\pm 5\%$  for an assumed underlying percentage of 50%.

The survey instrument was developed in English, translated into Korean, back-translated, reconciled, and pretested. Questions about breast and cervical cancer testing, sociodemographics, immigration, and other areas were included. Interviews were conducted by bilingual Korean Americans who were trained and monitored by project staff. The study was approved by the Committee for the Protection of Human Subjects at the University of California, Berkeley.

Overall, 10 900 telephone numbers were purchased; 10 086 were sampled or resampled. Of these, 1357 (13%) were deemed eligible, 8353 (83%) were ineligible, and 376 (4%) were of unknown eligibility. Most ineligible numbers (73%) represented a household without an eligible Korean American adult. Of the 1357 eligible numbers, 1090 interviews (80%) were completed. Respondents who did not complete an interview did not differ in sex or age from those interviewed. This analysis was confined to all 818 sampled women.

### Variables

Estimates of Pap smear testing were based on the answers to 2 questions: "Have you ever had a Pap smear?" and, if "yes,"

**TABLE 1—Estimates of Pap Smear Testing and Potential Correlates of Testing among Korean-American Women: Alameda and Santa Clara Counties, California, 1994 (n = 818)**

	Estimated n <sup>a</sup>	% (SE)
Pap smear		
Within 1 y	279	34.7 (2.5)
Within 2 y	401	49.9 (2.8)
Within 3 y	442	55.0 (2.8)
Ever	506	62.9 (2.8)
<b>Block 1: Sociodemographic and immigration characteristics, health status</b>		
Age		
<50 y	634	77.5 (1.5)
≥50 y	184	22.5 (1.5)
Marital status		
Married	533	65.2 (3.1)
Unmarried	284	34.8 (3.1)
Educational attainment		
≤High school diploma	300	37.1 (2.6)
>High school diploma	509	62.9 (2.6)
Employment status		
Employed	352	43.0 (2.7)
Not employed	466	57.0 (2.7)
Religious Activities		
Monthly or more often	615	75.6 (2.7)
Less than monthly	199	24.4 (2.7)
Proportion of life spent in the US		
≤25%	309	37.8 (2.5)
>25%	507	62.2 (2.5)
Health status		
Excellent/good	451	55.3 (2.8)
Fair/poor	364	44.7 (2.8)
<b>Block 2: Individual characteristics</b>		
Cancer knowledge/belief score		
Low (0–4)	155	18.9 (1.6)
High (5–7)	663	81.1 (1.6)
Breast self-examination		
Monthly or more often	194	24.2 (2.2)
Less than monthly	609	75.8 (2.2)
<b>Block 3: Access to health care</b>		
Doctor visits in past year		
0	140	17.6 (1.8)
≥1	654	82.4 (1.8)
Routine check-up		
Within 2 y	477	58.4 (2.8)
More than 2 y ago	340	41.6 (2.8)
Regular health care provider		
Yes	607	74.3 (2.4)
No	210	25.7 (2.4)
Health insurance		
Private	520	66.8 (2.5)
Public	92	11.8 (1.4)
None	167	21.4 (2.2)

*Continued*

"When did you have your last Pap smear?" Potential correlates were divided into 5 categories (Table 1). Blocks 2 through 5 corresponded to factors in Green and Kreuter's PRECEDE/PROCEED model.<sup>13</sup>

Principle factor analysis of proportion of life spent in the United States and 6 other immigration and acculturation variables (ability to speak English, ability to read

Korean, interview language, country of origin, years spent in the United States, and age at immigration) revealed that this variable had a Pearson correlation coefficient of .98 with a single factor that had an eigenvalue of 3.79 and accounted for 81% of the common variance. The cancer knowledge and belief score, seen as a summary variable for changeable predisposing characteristics, was

TABLE 1—Continued

	Estimated n <sup>a</sup>	% (SE)
<b>Block 4: Barriers to health care</b>		
Cost	428	52.9 (2.8)
Language	238	29.4 (2.4)
Transportation	88	10.9 (1.2)
Wait in waiting room	282	36.0 (2.9)
Wait for appointment	190	23.8 (2.4)
Having no time	203	24.9 (2.1)
Not knowing where to go	126	15.7 (2.0)
<b>Block 5: Sources of health information</b>		
Friends/relatives	643	79.0 (1.9)
Church	290	35.7 (2.6)
Signs/billboards	263	32.6 (2.8)
Korean businesses	80	10.0 (1.5)
Korean media	557	68.5 (2.6)
Printed materials	515	64.3 (2.4)
Western medical personnel	459	56.9 (2.7)
Eastern medical personnel	255	31.5 (2.5)

Note. Counts are weighted with poststratification weights and adjusted to the 1990 US census.

<sup>a</sup>Estimated n's for each characteristic do not always add up to 818 because respondents who refused to respond or who answered "Don't know/not sure" have been dropped.

calculated as the sum of correct answers to 7 questions about whether cancer can be inherited, contagious, caused by eating canned food, cured if detected early, asymptomatic, or discussed, and whether illness is a matter of fate. Seven health insurance questions were collapsed into 1 variable with 3 categories; private, public only (which includes Medicare and MediCal, California's Medicaid), and insurance. This was coded as 2 dummy variables for logistic regression.

Reliability was evaluated by calling every 10th interviewee to re-ask a subset of survey questions. Concordance for ever having had a Pap smear was 90%, and concordance for timing of last Pap smear was 92%. For the other categorical variables tested, concordance was more than 80%, except for Western medical personnel as a source of health information, for which it was 62%. The Pearson correlation coefficient was greater than 0.80 for all relevant continuous variables.

### Analysis

SAS 6.10 (SAS Institute Inc, Cary, NC) was used to generate Pap smear testing and other frequency estimates and to perform logistic regression analyses to determine independent correlates of testing. SUDAAN 6.04 (Research Triangle Park, NC) was used to calculate standard errors and confidence intervals.

Sampling weights were calculated to account for unequal probabilities of selection. Poststratification weights, which

incorporated the sampling weights, were calculated to adjust the sample to the age distribution of Korean-American women in the 2 counties from the 1990 census.

Pap smear in the previous 2 years was the dependent variable for logistic regression. Independent variables having a regression coefficient with  $P \leq .25$  (Wald  $\chi^2$ ) for bivariate analysis were entered into a multivariable model for the block. Variables were deleted stepwise and were retained permanently if  $P \leq .05$  (residual  $\chi^2$ ) for that step or if there was evidence of confounding. A final multivariable analysis was performed with all variables from the final blocks.

On the basis of regression diagnostics, selected multiplicative interaction terms were tested in the final model for block 1, then deleted stepwise. An interaction term between marital status and employment was retained.

### Results

Only 63% of the women were estimated to have ever had a Pap smear, and only half were estimated to have been tested in the previous 2 years (Table 1).

The characteristics most strongly associated with having had a Pap smear in the previous 2 years were having had a routine check-up in the previous 2 years and being married, employed, or both (Table 2). The results are based on the 667 respondents without "don't know/not sure" or "refused" responses for any variables in the final

multivariable model. These respondents did not differ significantly from those not included on Pap smear behavior, marital status, or employment status; however, they were younger and more educated.

### Discussion

Asian Americans are a small but rapidly growing population for whom valid and reliable health information is needed. To our knowledge, these are the first population-based estimates and independent correlates of Pap smear testing for Korean Americans.

The reported Pap smear testing estimates were below national objectives<sup>6</sup> and below those reported for women of all races/ethnicities in the United States.<sup>4</sup> Our estimates were similar to those reported for Chinese-American<sup>7</sup> and Vietnamese-American women.<sup>8,10</sup>

The strongest correlate of testing was having had a regular check-up. Although this variable measured access, it could also have reflected individual preventive health orientation. Either some health care providers missed opportunities or some women declined testing, because there were women who reported having had a regular check-up but no Pap smear.

Marital and employment status were the strongest sociodemographic correlates of testing, but only women who were both unmarried and not employed were less likely than others to be tested. Perhaps improvement in income, social support, or both were afforded by either marriage or employment.

Our proxy measure of immigration and acculturation (proportion of life spent in the United States) was not related to Pap smear testing. Perhaps the reason that we did not detect a difference was because this characteristic affected other important variables in the model, such as the access variables.

Our survey had several limitations. The use of Korean surname-based telephone lists may have produced a biased sample, but given that the Korean-American population is small and geographically dispersed, other options were less practical or too costly. Fewer than 2% of Korean Americans in the 2 counties do not have telephones.<sup>14</sup> Korean Americans may be less likely to have unlisted numbers because they may be unfamiliar with the option. We used almost 500 surnames to reach as many Korean-American households as possible. Adjusting the sample to the age distribution of the population corrected some of the possible bias.

**TABLE 2—Odds Ratios for Having Had a Pap Smear in the Previous 2 Years, Final Multivariate Model: Korean-American Women, Alameda and Santa Clara Counties, California, 1994 (n = 667)**

	Odds Ratio	95% Confidence Interval
Age		
<50 y	2.67	1.66, 4.30
≥50 y	1.00	...
Marital and employment status		
Unmarried, not employed	1.00	...
Married, not employed	5.79	2.71, 12.36
Unmarried, employed	4.79	1.65, 13.95
Married, employed	5.88	2.69, 12.82
Proportion of life spent in the US		
≤25%	1.00	...
>25%	1.32	0.75, 2.35
Health status		
Excellent/good	1.00	...
Fair/poor	1.71	1.06, 2.76
Cancer knowledge/belief score		
Low (0-4)	1.00	...
High (5-7)	1.60	0.94, 2.72
Breast self-examination		
Monthly or more often	1.00	0.58, 1.74
Less than monthly	1.00	...
Doctor visits in past year		
0	1.00	...
≥1	1.63	0.82, 3.23
Routine check-up		
Within past 2 y	7.18	4.25, 12.10
More than 2 y ago	1.00	...
Health insurance		
Private	1.33	0.69, 2.56
Public	2.38	1.06, 5.34
None	1.00	...
Transportation barrier to care		
Yes	1.00	...
No	2.64	1.20, 5.82
Friends/relatives source		
Yes	1.54	0.85, 2.78
No	1.00	...
Korean media source		
Yes	1.34	0.74, 2.41
No	1.00	...
Western medical personnel source		
Yes	1.44	0.87, 2.38
No	1.00	...

Note. Analyses were performed with sampling weights. All variables listed in the table are included as independent variables in the model, as well as an interaction term for marital status and employment. Variables not included in the model are religious activities, language, wait in the waiting room, having no time, church, signs/billboards, Korean businesses, and Eastern medical personnel, which were not significant in bivariate analysis; and educational status, regular health provider, cost, wait for appointment, knowing where to go, and printed materials, which were not significant in multivariable analysis by block.

There may have been measurement error as a result of our using self-reports of Pap smear testing. In one study, concordance between patient report and the medical record was 78% for Pap smear testing.<sup>15</sup> Most discordance was from women who reported having had a test but had no record of testing. To the extent that these

findings are generalizable, the actual percentage screened was even lower than our estimates.

A community-sensitive approach was used.<sup>16</sup> Asian Health Services and the Center for Family and Community Health were equal partners. The Korean Community Advisory Board participated in all aspects

of decision making to ensure the cultural appropriateness and sustainability of community changes. Without this approach, our survey results would have been less valid and reliable and less likely to affect the community's health. However, added time for relationship building and decision making and a broadening of focused funding priorities to include those of the community were required.

We believe this approach can be applied to research with other ethnic minority communities and will become increasingly important. Ethnic minorities overall constitute a large proportion of the population in some states, and many of these groups are growing. Because of the unique characteristics of ethnic minority groups, a community-sensitive approach is necessary to permit collection of relevant health data and to implement tailored programs to improve the health of these groups. □

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## ABSTRACT

**Objectives.** The authors examined factors predicting abortion use in two communes in northern Vietnam.

**Methods.** A survey of 504 rural and 523 urban women of childbearing age was conducted.

**Results.** For the 13.6% of urban and 19% of rural commune women having had an abortion in the previous year, logistic regression analyses demonstrated that use of an intrauterine device reduced the likelihood of subsequent abortion in both communes. Traditional method use in the rural commune, however, increased women's likelihood of a subsequent abortion.

**Conclusions.** Contraceptive use in these 2 communes affected abortion more than sociodemographic factors. Traditional method use by rural women is a risk for abortion. (*Am J Public Health*. 1998;88: 660-663)

# Contraception and Abortion in Two Vietnamese Communes

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## Introduction

Pregnancy termination remains a clandestine and poorly understood behavior in many parts of the world. The Socialist Republic of Vietnam—with a population of 75 million and an average of 3.1 births and 2.5 abortions per woman in her reproductive lifetime—is one of the few developing countries in which abortion is legal and widely available and can openly be studied. This study examined how sociodemographic factors and contraceptive use affect the likelihood of abortion for women of childbearing age in an urban commune and a rural commune in northern Vietnam.

Legal since Vietnam's independence from France in 1945, abortion services are available from the basic primary health unit in the larger district and provincial hospitals and, since 1989, in private medical practices. Two abortion procedures predominate: "menstrual regulation" by manual vacuum aspiration and abortion by sharp curettage. Abortion use rose from 70 281 procedures reported in 1976 to 811 176 in 1987<sup>1</sup> and to 1.37 million in 1993.<sup>2</sup> The 1988 Vietnam Demographic and Health Survey<sup>3</sup> found an abortion rate of 3.1% to 3.5%, while the 1994 Intercensal Demographic Survey<sup>4</sup> found that 12.8% of ever-married women had experienced menstrual regulation or abortion.

A large proportion of abortions may result from high failure rates associated with traditional methods of contraception (rhythm/periodic abstinence or withdrawal), used by 21% of all married women.

Intrauterine devices are used by one third of women, and use of other modern methods (pill, condom, and female sterilization) is still low, resulting in an overall contraceptive prevalence of 65%.<sup>4</sup> Studying the relationship between contraceptive method type and abortion use can suggest directions for improving the quality of family planning services in Vietnam.

## Methods

A survey was conducted in April 1994 in an urban commune in Hai Hung province and a rural commune in Ha Bac province under the sponsorship of the government of Vietnam's National Committee for Population and Family Planning. The committee's

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