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Colorectal Cancer Screening Prevalence and Predictors Among Asian American Subgroups Using Medical Expenditure Panel Survey National Data

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Abstract

Background—Asian American (AA) ethnic subgroups are diverse in socioeconomic status, years in US, English proficiency, and cultures with different health seeking behaviors and health care access. Fifty two percent of AAs, 50+ years had colorectal cancer screening (CRCS) in 2013, compared with 61% of Non-Hispanic Whites. We hypothesized that CRCS prevalence among AA ethnicities are heterogeneous, and reasons related to CRCS among AA subgroups are associated with demographic characteristics, acculturation, health care access, and health attitudes.

Conflict of Interest:

E Lim, LSI Ka'opua, M Kataoka-Yahiro, and Y Kinoshita have no interests to disclose.

Author Contributions: A. Sy developed the study concept, contributed to study discussion and interpretation, and developed and co-wrote the manuscript. E. Lim conducted the biostatistical analysis, wrote the Methods and Results, and reviewed the manuscript. LSI Ka'opua developed the study concept, contributed to study discussion and interpretation, and co-wrote the manuscript. M Kataoka-Yahiro contributed to study discussion and interpretation. Y Kinoshita reviewed the manuscript.

Methods—Medical Expenditure Panel Survey data for 2009–2014 compared CRCS status among Whites (N=28,834), Asian Indian (N=466), Chinese (n=652), and Filipinos (N=788). Multivariate logistic regression examined ethnic differences and correlates of CRCS accounting for complex sampling design.

Results—Whites had the highest prevalence of screening (62.3%) followed by Filipino (55.0%), Chinese (50.9%), and Asian Indian (48.6%). Older age, having health insurance and a usual care provider predicted CRCS across all ethnicities. Different demographic, health care access, and health attitude predictors within each ethnic group were related to CRCS.

Conclusion—This study contributes to the literature on influences of differential CRCS prevalence among AA subgroups. CRCS promotion should be tailored according to attitudes and structural barriers affecting screening behavior of specific ethnic subgroups to truly serve the health needs of the diverse AA population.

TOC image

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This study contributes to the literature on predictors of colorectal cancer screening among diverse Asian American ethnic subgroups. Attention to the use of valid, relevant research designs to draw comparisons across studies and to examine the social determinants of health are recommended for screening promotion with these diverse ethnicities.

Keywords

colorectal cancer screening; Asian Americans; Filipino; Chinese; Asian Indians

INTRODUCTION

Asian Americans (AA) are the fastest growing minority in the United States (US) and are diverse in socioeconomic status, immigration patterns, and English proficiency.^{1,2} The most populous AA subgroup is Chinese, with 4 million people, followed by Filipino and Asian Indian (AI) with 3.4 million and 3.2 million people, respectively.³

Colorectal cancer (CRC) is a leading cause of cancer deaths.⁴ Causes of CRC are not entirely known; CRC has been diagnosed in those who do not have any risk factors (older age, being male, lifestyle factors) or predisposing conditions. Because even those without CRC risk factors may develop CRC, CRCS can prevent CRC when detected early.⁴

AAs are diverse in cultural tradition, socioeconomic status, and life experiences, but data on AAs are often aggregated as one ethnicity, or ignored due to small sample sizes thus masking ethnic-based inequities among subgroups. When AA data are disaggregated through detailed race and ethnicity categories, varying positive and at-risk results are revealed.⁶

CRC is the third and second most diagnosed cancer for AA men and women respectively.^{7,8} When AA subgroups are disaggregated, cancer incidence among the AA subgroups varies. Among all ethnicities in US, CRC incidence is highest among Japanese American men

(62.2), and this incidence is also 25% higher than CRC in White men. CRC incidence is low among Asian Indian women (15.1).^{8,9}

The National Colorectal Cancer Roundtable in 2015 recommends prevention and early detection of CRC to increase colorectal cancer screening (CRCS) prevalence to 80% by 2018 to eliminate CRC as a public health problem. CRCS tests are fecal occult blood test (FOBT), colonoscopy, and sigmoidoscopy.

The few data sources and studies that have disaggregated AA ethnic groups report differing and lower screening prevalence than national guidelines.^{10,11}

The California Health Interview Survey (CHIS) and the Hawaii Behavioral Risk Factor Surveillance System (BRFSS) are two epidemiological datasets that collect CRCS prevalence on AA subgroups, e.g., Filipino, Japanese. From 2001 to 2009, CHIS reports an increasing trend of CRCS prevalence for each AA group. CHIS and the Hawaii BRFSS show that CRCS prevalence nonetheless varied considerably between AA groups depending on the year of study.^{10–15} Similarly, local studies (Northern California health care organization, Chicago Asian Community Survey, Asian American Liver Cancer Program) found different screening prevalence between AA subgroups, and this prevalence was lower than reported from the epidemiological datasets (Table 1).^{2,16,17}

Varying CRCS prevalence among subgroups highlight factors that influence CRCS, e.g., access to care and/or physician, immigration and acculturation patterns, knowledge and attitudinal barriers, educational and income levels.^{17,18} Risk factors associated with CRCS from previous studies on the three largest AA subgroups (Chinese, Filipino, South Asian) are summarized. (AIs comprise 89% of the South Asian US population.¹⁹) For Chinese and Filipinos, *health care access* factors associated with CRCS are having health insurance, a regular provider, and being able to afford a doctor.^{10,11,14} *Demographic* factors associated with CRCS were income and years in US for Chinese, Filipinos, and South Asians; English use for Filipinos and South Asians; and education level of Chinese and Filipinos.^{2,19,21,23–25} For Filipinos and South Asians, *knowledge and attitude* factors have been studied and are found to be associated with CRCS, e.g., CRCS benefits, perceived CRCS barriers.^{19,22–25}

The purpose of this study was to compare CRCS predictors among AAs who comprise the largest subgroups in the US. AA adults 50–75 years of age were examined using the Medical Expenditure Panel Study (MEPS). We hypothesized that CRCS prevalence among AA ethnicities is heterogeneous, and reasons related to CRCS among AA ethnic subgroups are associated with social demographics, acculturation, health care access and satisfaction, and health attitudes.

METHODS

Data Source

The consolidated data from the MEPS years 2009–2014 were utilized. The MEPS is a nationally representative survey of families and individuals, medical providers, and employers conducted in English, Spanish, and “other languages” (category marked if

interview was not done in English and/or Spanish, but language was not specified). Data on the cost and use of health care and health insurance are collected at five panels over two years. The MEPS samples are drawn from a subsample of households participating in the prior two years in the National Health Interview Survey (NHIS). Since disaggregated AA ethnicities were available from year 2013 in the MEPS, and AAs are aggregated in the earlier years, we linked the MEPS 2009–2012 to the corresponding NHIS 2007–2011 to disaggregate ethnicities.

Study Participants

Participants were eligible if they were 1) between 50 and 75 years, 2) Non-Hispanic White, Chinese, Filipino, or AI, 3) no diagnosis of colon cancer, and had responded to the Self-Administration Questionnaire (SAQ) of the MEPS. The sample was comprised of 31,835 eligible participants. Non-Hispanic Whites were included as a reference group.

Variables

Based on the US Preventive Services Task Force recommendation, three tests were used to determine CRCs—FOBT annually, colonoscopy every 10 years, or sigmoidoscopy every 5 years with FOBT every 3 years. “Up to date screening” was the primary outcome variable, coded as a dichotomous indicator to identify whether a participant met the CRCs recommendation. Demographic variables were age, gender, marital status, education, income, employment, and insurance.

Acculturation was assessed with three variables: time in US, and English fluency. Time in US was classified as born in US, lived in US more than 10 years, and lived in US less than or equal to 10 years. To assess English fluency, we combined ‘language spoken most in home’ and ‘not comfortable speaking English’ to avoid systematic missing because the latter was asked only those who do not speak English in home. From 2013, the MEPS changed the “*Not comfortable speaking English*” question (yes/no) to “*How well do you speak English.*” We defined ‘very well’ and ‘well’ as comfortable and ‘not well’ and ‘not at all’ as not comfortable.

Access to Health Care was reflected with three questions: “*Have usual source of care (USC) provider,*” “*How long it takes to get to USC provider*” and “*How difficult is to get to USC.*” If respondents did not have a USC provider, the latter two questions were skipped. ‘Don’t have USC’ was added as another category for them.

For Satisfaction with Health Care, two items were used: “*Show respect for medical, traditional, and alternative treatments that the person is happy with*” and “*Present and explain all options to the person.*” All items were dichotomized. These questions also included the skip pattern when respondents do not have a USC provider. ‘Don’t have USC’ was added as another category to all of these questions to avoid systematic missing.

From the SAQ, General Health and Attitudes toward Health were considered as predictors for CRCs. “*General health today*” uses a 5 point Likert scale categorized to “excellent/very good,” “good,” and “fair/poor.” The questions on health attitudes were four items covering health insurance, and health risks and seeking: “*Do not need health insurance,*” “*Health*

insurance not worth cost,” “More likely to take risks than the average person,” and “Can overcome illness without help from a medically trained person.” All items were dichotomized after exploring the distribution of CRCS.

Statistical Analysis

Analyses were conducted in SAS version 9.4. Descriptive statistics were presented using weighted percentages or means. To investigate differences in demographics, bivariate analyses with race/ethnicity were conducted using Rao-Scott chi-square tests for categorical variables and linear regressions for continuous variables.

To determine predictors for CRCS for each subgroup, multivariable logistic regressions were conducted. Since the questions of Access to Health and Satisfaction with Health Care were correlated with the variable ‘Have a USC provider’, we only included *“Have USC provider”* in the multivariate logistic regressions to avoid multicollinearity.

The predictors of CRCS were determined by backward stepwise selection until all predictors in the model were significant. C-statistic was computed to assess the goodness of fit of the model. PROC SURVEYFREQ and PROC SURVEYLOGISTIC accounted for complex data with strata, primary sampling unit, and sampling weight as recommended by the MEPS. A two-sided p-value<0.05 was considered statistically significant. The results are presented as odds ratios (ORs) and 95% confidence intervals.

RESULTS

The study population (N=30,740) was comprised of 93.8% White, 1.0% AI, 2.1% Chinese, and 2.6% Filipino (Table S1). Average age was 60.3 years, and 51.4% were female, and 52.1% had high income. Significant differences were found in sex, marital status, education, income, and insurance (all p<0.001)

The CRCS prevalence of the study population was 62.0%. Whites had the highest CRCS (62.3%) followed by Filipino (55.0%), and Chinese (50.9%), AI (48.6%). These differences were statistically significant (p<0.001).

All three acculturation questions showed significant differences between groups (all p<0.001). Most Whites (89.6%) were born in US while 2.9%, 18.8%, and 23.9% of AI, Chinese, and Filipino respectively were born in US. While 89.1% of Whites speak English at home, 59.6%, 66.3%, and 42.7% of AI, Chinese, and Filipino respectively speak a language other than English.

Access to Health Care showed significant differences between Whites/Filipinos and the other groups studied (all p<0.001). Most Whites (87.9%) and Filipinos (87.6%) reported having a USC, while 81.8% and 78.2% of AI and Chinese respectively reported having a USC. For *“How difficult is to get to USC,”* 68.4% of Filipinos and 67.1% Whites reported “not at all” followed by AI (61.0%) and Chinese (48.3%).

Significant difference between Whites and AA groups on a question for Attitude toward Health (*“Do not need health insurance”*) and Satisfaction with Health Care was found. More

Whites (88.0%) and Filipinos (84.4%) disagreed “*Do not need health insurance*” than Chinese (81.7%) and AI (79.0%) ($p<0.001$). For Satisfaction with Health Care, (“*Show respect for medical, traditional, and alternative treatments that the person is happy with*”) more Whites (60.9%) and Filipinos (60.3%) responded Always, than AI (58.6%) and Chinese (41.1%) ($p<0.001$).

Table 2 presents predictors of CRCs in the final model for each group by backward selection. The model fit of all the models was acceptable, ranging from 0.716 (Filipino) to 0.769 (AI).

Common Predictors

Three variables were common predictors across all groups – older age, have health insurance, and “*Have USC provider*.” The odds of having preventive CRCs increase as age increases. All groups who have health insurance (private – White: OR=2.23; AI: OR=8.66; Chinese OR=5.29; Filipino OR=3.75; public - White: OR=1.66; AI: OR=2.93; Chinese OR=4.68; Filipino OR=2.36) and USC (White: OR=2.72; AI: OR=2.37; Chinese: OR=3.52; Filipino: OR=2.82) provider were more likely to be screened.

Whites

Predictors specific to Whites were marital status, education, income, employment, time in US, and three Attitude toward Health questions. Married Whites were more likely to get CRCs (OR=1.16). People who were born in US or lived in the US more than 10 years were more likely to get CRCs (Born in US: OR=2.30; >10 years: OR=2.08). Whites with negative health attitudes were less likely to get CRCs. Whites with lower education and income levels were less likely to get screened. Unemployed or retired Whites were more likely to get screened than employed Whites (OR=1.30).

Filipinos

The predictors specific to Filipinos were gender, income, attitude, toward Health and general health. Filipino males had higher prevalence than females (OR=1.36). Those who disagreed on “*Health insurance not worth cost*” were more likely to get (OR=1.73). Filipinos with low income were less likely to get CRCs (OR=0.37). Filipinos who perceived excellent or very good general health were less likely to get screened (OR=0.53).

Chinese

The predictors specific to Chinese were education, English fluency, and Attitude toward Health. Chinese with high school education or lower were less likely to get screened than those with at least bachelor’s degree (OR=0.56). Chinese with positive health attitude (i.e., disagree on “*Can overcome illness without help from a medically trained person*”) were more likely to get CRCs (OR=1.85).

AI

The predictors specific to AIs were gender, employment, English fluency, and general health. AI males had higher prevalence of CRCs than females (OR=1.73). Those who perceived excellent or good general health were more likely to get CRCs (Excellent or very

good: OR=1.86; Good: OR=2.07). Those who speak English at home were more likely to get screened (OR=2.10). Unemployed or retired AIs were less likely to get screened than employed AIs (OR=0.65).

DISCUSSION

We identified CRCs prevalence and predictors among AA ethnicities. To the best of our knowledge, this is the first study that disaggregates AA groups from national data to examine CRCs prevalence and predictors of distinct subgroups. Whites had the highest prevalence of screening (62.3%) followed by Filipino (55.0%), Chinese (50.9%), and AIs (48.6%).

The disparities in CRCs prevalence among the disaggregated ethnicities is consistent with previous studies that report varying screening prevalence for subgroups, though which AA groups have higher and lower CRCs prevalence have differed by study. Previous regional studies have found CRCs prevalence for Chinese to range from 69.6% to 22%, Filipinos to range from 65.9% to 15.9%, and AIs to range from 58.5% to 22.5%. Variations in demographics and health care access may explain the range of regional prevalence. Overreporting of screening because of social desirability may occur with some forms of data collection, e.g., random anonymous, while community based data collection may yield more valid results because of familiarity with community health staff.

In this study, older age, health insurance, and USC predicted CRCs in all groups, factors consistently associated with AA CRCs.^{10,26} Having a USC may serve as a predictor of many types of preventive health services including CRCs.^{28,29} Having health insurance reaffirms the importance of health care coverage related to services like CRCs.

Different CRCs predictors were also identified within each group. Attitudes toward health variables were selected as predictors because health behavior change theories acknowledge attitudes and perceptions promote health behavior change.³⁰ All groups had at least one item related to positive health attitudes that predicted CRCs. English language, predicted CRCs for Chinese and AIs. Demographic factors associated with CRCs were male gender for Filipinos and AIs, employment for AIs, income for Filipinos, and education for Chinese.

Overall our findings on factors associated with CRCs among subgroups are consistent with the literature while adding new findings. Previous studies have found that AA males were less likely to obtain CRCs while this study found that AI and Filipino males were more likely to obtain CRCs.³¹ Likewise studies have found English proficiency to be associated with CRCs for AAs, but in this study, English language was not predictive of CRCs for Filipinos.

Explaining preventive health behavior patterns involves consideration of the complex social determinants of individual health. We found that Filipinos who perceived excellent or very good general health were less likely to get screened while AIs who perceived excellent or very good health were more likely to get screened. In this case, perceived health (i.e., feeling well) was a barrier or a facilitator of CRCs as influenced by other socio-cultural health attitudes and screening knowledge.

How AA health related attitudes (i.e., behavioral intentions, perceived barriers to screening) and CRCS knowledge predict screening requires further examination.³² Future research should include quantitative and qualitative strategies to identify sub-group specific CRCS facilitators and barriers. Understanding sub-group specific influences for CRCS addresses culturally and linguistically relevant health education. For example, discussing with patients their perceived barriers and ways in which barriers might be overcome toward CRCS behavioral intentions could be included.

Our study has several methodological limitations. First, since the data used for this study was cross-sectional, we could not assess a causal or temporal relationship between predictors and CRCS. Second, all the variables including CRCS status used in this study were self-reported. Third, we did not investigate other socio-cultural predictors, and other health-seeking behaviors. Fourth, the Other Asian category was not analyzed. This category would include AAs (e.g., Vietnamese, South Asians, Koreans) who may be medically underserved, including having low screening prevalence.^{2,10,11}

This study adds to the literature that disaggregates AA subgroups and their unique factors associated with CRCS, continuing to highlight the differential CRCS prevalence among subgroups and that factors associated with CRCS vary depending on the group. We also identified associations of CRCS among Filipinos and AIs, two understudied groups with suboptimal CRCS prevalence.

National and regional data need to continue to be collected on distinct AA ethnic subgroups so that public health policies and programs may equitably serve the health needs of this diverse population. Epidemiological studies with adequate sample size are needed to document CRCS prevalence between and within distinct AA subgroups. Because previous studies have found differing screening prevalence within an AA subgroup, consistent measures are recommended.

Continued identification of how the demographic, acculturation, health care access, and health attitudes are uniquely associated with CRCS for each AA ethnic subgroup including studying one or two groups and using relevant study designs and methods is recommended. Health related attitudes that include cultural preferences and gender norms, and distal social influences should be examined. Studies should include consistent and valid measures of the independent variables related to CRCS (health attitudes) and CRCS outcomes (i.e. not relying on self-report). Patients should be assessed individually in order to deliver culturally and linguistically appropriate health counseling, education, and outreach. Accordingly, randomized controlled trials to test CRCS promotion approaches tailored for subgroups should be included. Finally qualitative approaches will help identify social determinants of health.

CONCLUSION

AAs are ethnically heterogeneous with complex cultures and demographic and socio-cultural factors that may affect each subgroup's health outcomes. Interventions to increase CRCS should be tailored to each group's culture and factors related to CRCS. This is the

first study using the NHIS and MEPS data disaggregating AA subgroups to examine CRCs prevalence and screening factors. This study contributes to the literature on differential CRCs among AA groups, reasons why prevalence varies, and the complex interplay of individual, cultural, social, and health care access factors depending on each ethnic subgroup.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Colorectal Cancer Screening Prevalence by Datasets, Years, and Ethnicity

Data Source	Years	Ethnic Subgroup, CRCs prevalence (%)						
		White	Japanese	Chinese	Filipino	South Asian	Korean	Vietnamese
California Health Interview Survey ^{abcd}	2001–2009	57.7–71.4 ^{10–13}	56.0–66.2 ^{10–13}	44.5–69.6 ^{10–13}	41.7–65.9 ^{10–13}	28.2–58.5 ^{10–13}	27.9–62.0 ^{10–13}	44.9–70.0 ¹³
Hawaii Behavioral Risk Factor Surveillance Survey ^{abcd}	2011–2014 ¹⁴	73.8	70.9	68.9	56.8	nd	nd	nd
	2015 ¹⁵	75.4	68.5	nd	57.7	nd	nd	nd
Other Local Surveys ^{bcef}	2012, ¹⁵ 2014, ¹⁶ 2015 ²	Nd	8.8	22.0–64.4	15.9	22.5	43.9	31.0–52.5

nd=no data

^a population estimate

^b 50–75 years old

^c 50 years and older

^d up to date screening, all modalities

^e sample estimate

^f up to date and ever screened

Table 2

Odds Ratio (and 95% Confidence Interval) of Multivariable Logistic Regression by Race/Ethnicity

Variable	White		Asian Indian		Chinese		Filipino	
	Full Model	Final Model	Full Model	Final Model	Full Model	Final Model	Full Model	Final Model
Demographic								
Age, 5 year unit	1.38 (1.33–1.44) ***	1.37 (1.33–1.42) ***	1.96 (1.40–2.74) ***	2.01 (1.65–2.44) ***	1.38 (1.16–1.64) ***	1.29 (1.11–1.51) **	1.28 (1.13–1.44) ***	1.31 (1.19–1.45) ***
Sex (ref=Female)								
Male	0.97 (0.89–1.07)		2.36 (1.04–5.36) *	1.73 (1.13–2.65) *	0.88 (0.59–1.30)		1.23 (0.95–1.60)	1.36 (1.09–1.70) **
Marital Status (ref=Other)								
Married	1.16 (1.06–1.27) **	1.16 (1.06–1.27) **	0.44 (0.16–1.26)		1.12 (0.74–1.71)		1.09 (0.65–1.85)	
Education (ref=≥Bachelor’s)								
≤High school/GED	0.58 (0.52–0.66) ***	0.58 (0.52–0.65) ***	1.23 (0.58–2.59)		0.58 (0.33–1.04)	0.56 (0.31–1.00) *	0.61 (0.39–0.95) *	
Some college	0.79 (0.71–0.89) ***	0.80 (0.71–0.89) ***	1.09 (0.48–2.48)		1.56 (0.88–2.78)	1.41 (0.83–2.41)	0.77 (0.47–1.28)	
Income (ref=High)								
Low	0.65 (0.57–0.74) ***	0.65 (0.58–0.74) ***	0.62 (0.20–1.95)		0.77 (0.42–1.43)		0.40 (0.20–0.79) *	0.37 (0.20–0.68) **
Medium	0.73 (0.67–0.81) ***	0.74 (0.67–0.81) ***	1.21 (0.51–2.85)		0.85 (0.56–1.30)		1.07 (0.66–1.72)	0.99 (0.71–1.39)
Employment (ref= Employed)								
Unemployed/Retired	1.29 (1.16–1.44) ***	1.30 (1.17–1.45) ***	0.80 (0.32–2.00)	0.65 (0.46–0.91) *	0.49 (0.23–1.05)		1.70 (0.89–3.25)	
Insurance (ref= Uninsured)								
Any private	2.21 (1.93–2.54) ***	2.23 (1.94–2.55) ***	11.82 (1.89–73.88) **	8.66 (5.44–13.77) ***	3.53 (1.31–9.51) *	5.29 (2.08–13.45) **	2.49 (1.06–5.84) *	3.75 (1.75–8.03) **
Public only	1.65 (1.40–1.94) ***	1.66 (1.42–1.94) ***	4.06 (0.51–32.55)	2.93 (1.34–6.44) **	4.77 (1.89–12.04) **	4.68 (1.87–11.69) **	1.44 (0.58–3.56)	2.36 (1.04–5.38) *
Acculturation								
Time in US (ref=≤10 years)								
Born in US	2.05 (1.18–3.57) *	2.26 (1.38–3.71) **	1.26 (0.21–7.56)		1.37 (0.41–4.57)		1.17 (0.69–2.01)	
>10 years	2.01 (1.20–3.39) **	2.08 (1.29–3.36) **	0.94 (0.40–2.21)		1.46 (0.49–4.31)		1.00 (0.58–1.73)	
English fluency (ref=Not comfortable)								
English in home	1.10 (0.86–1.41)		1.90 (0.85–4.23)	2.10 (1.17–3.76) *	1.48 (0.74–3.00)	1.88 (1.09–3.24) *	1.19 (0.68–2.08)	

Variable	White		Asian Indian		Chinese		Filipino	
	Full Model	Final Model	Full Model	Final Model	Full Model	Final Model	Full Model	Final Model
Comfortable speaking English	0.93 (0.73–1.17)		0.80 (0.31–2.02)	0.93 (0.60–1.45)	1.71 (0.84–3.46)	2.05 (1.10–3.84)*	1.42 (0.71–2.84)	
<i>Access to Health Care</i>								
Have USC provider (ref=No)								
Yes	2.73 (2.39–3.12)***	2.72 (2.38–3.10)***	1.79 (0.63–5.05)	2.37 (1.54–3.65)***	3.11 (1.56–6.20)**	3.52 (1.81–6.88)***	2.68 (1.36–5.28)**	2.82 (1.65–4.84)***
<i>Attitude toward Health</i>								
Do not need health insurance (ref=Positive)								
Negative	1.47 (1.27–1.69)***	1.46 (1.28–1.67)***	1.05 (0.37–2.97)		1.54 (0.87–2.70)		0.72 (0.41–1.26)	
Health insurance not worth cost (ref=Positive)								
Negative	1.15 (1.06–1.25)***	1.16 (1.07–1.25)***	1.06 (0.37–2.97)		0.90 (0.64–1.28)		1.89 (1.25–2.86)**	1.73 (1.26–2.38)***
More likely to take risks than the average person (ref=Positive)								
Negative	1.00 (0.92–1.09)		1.99 (0.93–4.22)		1.00 (0.54–1.84)		0.97 (0.67–1.41)	
Can overcome illness without help from a medically trained person (ref=Positive)								
Negative	1.29 (1.17–1.43)***	1.30 (1.18–1.43)***	0.92 (0.38–2.22)		2.09 (1.26–3.45)**	1.85 (1.28–2.67)**	1.56 (0.98–2.47)	
<i>General Health</i>								
General health (ref=Fair/Poor)								
Excellent/Very good	0.96 (0.84–1.09)		1.64 (0.65–4.12)	1.86 (1.13–3.07)*	0.99 (0.53–1.84)		0.59 (0.28–0.88)*	0.53 (0.35–0.80)**
Good	0.94 (0.84–1.06)		1.79 (0.72–4.46)	2.07 (1.11–3.88)*	1.01 (0.51–1.99)		0.69 (0.41–1.18)	0.76 (0.51–1.14)

* p<0.05;
** p<0.01;
*** p<0.001.

USC=Usual source of care.

Negative=Disagree strongly/disagree somewhat. Positive=Uncertain/agree somewhat/agree strongly.

Full model=model with all variables. Final model=model selected by backward selection