

Predisposing, Enabling and Reinforcing Factors Associated with the Use of Reproductive Cancer
Screening among Peruvian Women

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Abstract

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Epidemiology

Breast cancer is a major cause of death for women in Peru, and may soon surpass cervical cancer as the number one cause of cancer mortality among Peruvian women. Yet little is known about the determinants of reproductive cancer screening utilization in low and middle income countries. Data from a survey of risk factors for non-communicable diseases (FRENT), undertaken by the Ministry of Health in four Peruvian cities, was used to investigate variables representing three conceptual categories of barriers to obtaining mammograms, clinical breast exams, and pap smears based on a PRECEDE/PROCEED conceptual framework and previous qualitative work. Regression models revealed stress (predisposing), physician access and insurance (enabling), and marital status and previous child abuse (reinforcing) to be factors associated with screening, with some differences found across outcome and by age. Results provide evidence to direct interventions for increasing reproductive cancer screening in Peru.

Introduction

In Peru, as in many low/middle income countries, cancer rates are rising and cancer is expected to be one of the top causes of death by 2030 [1, 2]. Breast cancer is a major cause of death in Peru, and may soon surpass cervical cancer as the number one cause of cancer mortality among Peruvian women, a trend related to increased efforts to screen for cervical cancers. In 2008, 4300 Peruvian women were diagnosed with breast cancer (18.9% of all incident cancers in women), and 1365 died from the disease (9.9% of all female cancer deaths) [3]. The cost of breast cancer to Peruvian society is likely high due to the critical role that women play in supporting their families.

Breast cancer in Peru is characterized by high mortality when compared to higher resource countries [4], due in large part to advanced stage disease at diagnosis [5]; 85% of Peruvian women diagnosed with breast cancer present with disease that has advanced beyond stage I [1]. Breast screening and early detection have been shown to reduce breast cancer mortality [6, 7], highlighting a pressing need for expansion of these services in countries like Peru [8]. However, little research has been conducted on the determinants of breast screening use in low and middle resource countries.

This analysis, which utilizes the PRECEDE/PROCEED public health model and was informed by previous qualitative anthropological research [9] may, by identifying factors related to current reproductive screening practices, help direct use of scarce resources to develop appropriate and effective public health interventions strategies for breast cancer.

The purpose of this study was to evaluate the associations between selected proxies for *a priori* defined cultural determinants of screening use (stress emotions, physician access and

partner support) and utilization of reproductive cancer screening services (mammography, clinical breast exam, and Pap smear) as reported by a sample of women in Peru.

Methods

Study Design

The Prevalence of Risk Factors for Non-Communicable Disease (Factores de Riesgo de Enfermedades No Transmisibles – FRENT) study, conducted in Peru between 2003 and 2007, is a cross-sectional survey of the demographic, socioeconomic, behavioral and biological indicators of risk for non-communicable disease (NCD) in four cities: Villa El Salvador, Trujillo, Huancayo, and Lima –Callao. These areas represent much of the geographic (coastal and mountainous) and socioeconomic range of the country. More than a third of the national population resides in the Lima-Callao province.

The Department of Epidemiology, under the Peruvian Ministry of Health, initiated the FRENT study in response to rising rates of NCD morbidity and mortality, which exist against a backdrop of decreasing infectious disease mortality. The goal of the FRENT study was to establish a baseline of the magnitude of NCD-related risk factors. Data collection included the administration of a standardized questionnaire used in population-based studies and approved by the Panamerican Health Organization (PAHO). A brief medical exam was also completed as a part of the study.

In each city a clustered stratified random sample was identified in three phases in order to achieve a representative sample of the population age 15 and over in each geographic area. In the first phase a sample of city blocks was randomly selected; in the second phase a sample of residences was selected within the blocks; in the third phase a subject aged 15 years or older was

selected for recruitment from each residence. Individuals younger than 15 years of age, and those who had resided less than a year in the study site, or who were pregnant, were excluded from the study. Between 71 and 83% of solicited subjects agreed to participate in the study; the acceptance rate was higher among women than among men [10]. A total of 4036 individuals participated in the study, 64.7% of whom were women [10]. A total of 2608 women make up the sample for the current analysis.

This survey data includes women's responses to questions about their use of reproductive cancer screening: clinical breast exam (CBE), mammography and Pap smear. Prior to each question, interviewers gave a brief description of the service in question. For CBE: "A clinical breast exam is when a doctor, nurse, or other medical professional palpates the breasts to detect a nodule or small lump." For mammography: "Mammography is an X-ray of each breast to investigate the possibility of cancer in the breasts." For Pap smear: "A Pap smear, or cytological test, is an exam to detect cervical cancer." The Ministry of Health provided a copy of the survey questionnaire in both Spanish and English, to aid in secondary analysis of the data.

Variable Selection

The outcomes of interest for this study included prior use of: 1) mammogram, 2) clinical breast exam (CBE), and 3) Pap smear. The breast screening outcomes were of primary interest and cervical cancer screening of secondary, comparative, importance. The outcomes of interest were defined as whether a woman has *ever* or *never* used each of the screening services described.

The PRECEDE/PROCEED framework has been used extensively as a planning model to aid in design of public health programs [11] . Independent variables of interest were organized

according to the PRECEDE/PROCEED framework, as predisposing, enabling or reinforcing factors. Predisposing factors include personal knowledge, attitudes, beliefs and values; enabling factors include structural and societal level variables such as availability and accessibility of resources; reinforcing factors include social support, changing social norms, positive peer influence and advice and feedback from others [11, 12]. These variables and the key cultural determinants of interest available in the FRENT study are detailed below:

Category	Original Data Variable (type)
Predisposing	Stress level, scale (ordinal)*
	Health knowledge, smoking (categorical)
	Health knowledge, physical activity (categorical)
Enabling	Clinical visit in last year, yes/no (categorical)**
	Currently insured, yes/no (categorical)
	Family income, soles (continuous)
Reinforcing	Marital status (categorical)***
	Experience of domestic violence, frequency (ordinal)***
	Experience of child abuse, frequency (ordinal)
	Sense of safety in home, level (ordinal)
*A <i>a priori</i> proxy for the cultural determinant of anxiety/fear/worry	
**A <i>a priori</i> proxy for the cultural determinant of physician recommendation	
***A <i>a priori</i> proxy for the cultural determinant of partner support	

The three *a priori* variables of interest were 1) frequency of stress feelings (always, frequently, sometimes, rarely/never), provider access as indicated by a clinical visit in the last 12 months (yes, no) and partner support measured as marital status (single, married, no longer partnered, open union) and domestic violence (hit by one's partner: never/not in the last month, ever/at least monthly). No longer partnered women include those who were widowed, divorced or separated at the time of the survey. Each of these variables corresponds, respectively, with predisposing, enabling and reinforcing factors.

Statistical Analysis

Descriptive statistics were calculated based on mean (standard deviation) or count/N (percent) for variables of interest stratified by region. For each of the three specified outcomes, bivariate associations were evaluated for each of the exposures of interest (predisposing, enabling and reinforcing variables), with a focus on the identified *a priori* cultural determinants (stress, physician access and partner support), and were tested for significance with Pearson's chi-squared tests, t-tests and ANOVA. Unconditional logistic regression was used to investigate associations between each of the cancer screening outcomes categorized as binary variables using a hierarchical approach for the covariate adjustment.

Unadjusted logistic models were first developed for all covariates. Outcomes were then adjusted hierarchically by group for predisposing, enabling and reinforcing variables, using a 10% change in odds ratios as the criteria for confounding by age (continuous), education (0-6yrs, 7-11yrs, 12-14yrs, 15yrs) or study location (Villa El Salvador, Trujillo, Huancayo, Lima-Callao). In these hierarchical adjustments, tests for interaction with age, education and study location were also performed to determine if effect modification was present for the *a priori* cultural determinants. A final model for each outcome was developed with all variables, removing those with excess collinearity but including relevant confounders. For all models, odds ratios (OR), 95% confidence intervals (CI) and p-values are shown.

Apparent effect modification between age and the *a priori* variables of interest for all three outcomes led to the decision to stratify all results by age (<40yrs, <=40yrs). Each *a priori* variable of interest was first hierarchically adjusted for age, education and location. Stress as a predisposing variable was further adjusted hierarchically for preventive health knowledge

(correctly interpret cost/benefits of smoking/exercise or incorrectly interpret either). Physician access as an enabling variable was further hierarchically adjusted by whether the participant had current insurance (yes, no) and family income (<1000 soles/month, 1000-1999 soles/month, 2000-3999 soles/month, 4000+). Divisions for family income were based on data for poverty line during the time the survey was conducted [13]. Marital status and domestic violence as reinforcing factors were further hierarchically adjusted by how safe one felt in one's home (very safe, somewhat safe, somewhat unsafe, very unsafe) and frequency with which one experienced abuse as a child (never, infrequently, approximately once a month, approximately once a week, daily). In final models, the three *a priori* variables of interest were adjusted for all other variables (predisposing, enabling and reinforcing) and confounders (age, education, location).

This research project was approved by the Institutional Review Board of the University of Washington.

Results

Descriptive

Screening use varied by study location, as did several of the key variables of interest and the potential confounders (see **Table 1**). The highest prevalence of ever use of mammography was in Lima (23.1%) with Villa El Salvador (13.7%), Trujillo (11.7%) and Huancayo (7.1%) trailing behind. This trend was less notable for clinical breast exam. Huancayo had the lowest prevalence of CBE ever use (23.7%) while Lima (37.4%) was intermediate and Villa El Salvador (41.9%) and Trujillo (46.4%) had more comparable prevalences. For Pap smear, Villa El Salvador had the highest prevalence (77.2%) compared to Trujillo (64.6%), Huancayo (60.6%) and Lima (70.7%).

Age and education also varied by location. There were more women under the age of 40 in the capital of Lima (52.8%) than in Villa El Salvador (49.7%) and Trujillo (46%), though Lima was comparable to Huancayo (51.9%) in this respect. Far more women had only completed secondary education or less (≤ 11 years) in Villa El Salvador (75.4%) than in Trujillo (57.9%), Huancayo (62.2%) or Lima (59.9%).

Stress, the key predisposing variable of interest, showed some variability by location. Fewer women reported always or frequently feeling nervous or stressed in Trujillo (22.4%) compared to Villa El Salvador (31.4%), Huancayo (34.2%) or Lima (30.3%). The key enabling variable of interest, provider access, was defined as a clinical visit in the last 12 months. The lowest rate of recent clinical visit was in Huancayo (45.2%); the highest rate was in Lima (62.9%); Villa El Salvador (60.5%) and Trujillo (56.5%) were intermediate.

Marital status and domestic violence were considered, jointly, to be the reinforcing variables of interest. In Villa El Salvador there were both fewer single women (14.7%) and more women in open unions (35.1%) - meaning partnered and likely living together but unmarried - than in any of the other three locations where the study was carried out. The prevalences of single/open union marital status were: Trujillo (29.8%, 17.7%), Huancayo (29.8%, 17.7%), and Lima (32.1%, 18.5%). It is notable that for Villa El Salvador and Lima, the prevalences of single and open union marital status were almost exactly reversed. The percentages of women reporting domestic violence ever or at least in the last month were the following: Villa El Salvador (14.4%), Trujillo (9%), Huancayo (20.0%), Lima (9.7%).

Confounding and Interaction

Age, education and study location were significantly associated with all three outcomes ($p < .001$), with the only exception being the strength of the association between education and Pap smear use ($p = .037$). Using the test of the 10% change in odds ratios, the relationship between mammography use and both stress and marital status was confounded by age. The relationship with monthly family income was confounded by location. For clinical breast exam, none of the odds ratios changed by more than 10% when comparing the crude to adjusted ORs. For Pap smear, stress was confounded by age. To allow for comparability, all final models were adjusted for age, education and location.

For all outcomes (mammography, CBE and PAP) interactions with age were found for several of the *a priori* variables of interest (stress, provider access, partner support). Those interactions with age that remained in the hierarchically adjusted group models were: for mammography, physician access ($p = .0185$); for CBE, marital status ($p = .0016$) and domestic violence ($p = .0178$); for Pap smear, none. All outcomes were stratified by age (<40 , ≥ 40) to account for interactions with age. Age as a continuous variable was kept in the final models to control for residual confounding.

Predisposing

Mammography:

In the hierarchically adjusted group model (see **Tables 3a** and **3b**) reported stress showed an association with mammography use only for women under the age of 40 (**Table 3a**); women who reported frequent stress had a 46% lower odds of ever mammography use compared to women who reported never feeling stressed ($p = .031$). In the final models (see **Tables 6a** and **6b**)

which adjust for all predisposing, enabling variables, and confounders, stress was not significantly associated with mammography use for women in either age strata.

Clinical Breast Exam:

Stress was not significantly associated with CBE use for either age strata, in either the group models (**Tables 4a** and **4b**) or the final models (**Tables 6a** and **6b**).

Pap smear:

Stress was significantly associated with Pap smear use only among women under age 40 in the group level model (**Table 5a**); women under 40 reporting higher stress (compared to those reporting no stress) had higher odds of having ever had a Pap smear. The OR for women reporting frequent stress was 1.55 ($p = .030$) and the OR for women reporting always feeling stressed was 2.09 ($p = .005$). This relationship, among women under 40, remains in the final model (**Table 6a**); those reporting always feeling stressed had a 94% higher odds ($p = .020$) of ever having had a Pap smear compared to those who report no stress.

Enabling

Mammography:

In the hierarchically adjusted group models (**Tables 3a** and **3b**) provider access was significantly associated with mammography use in women aged 40 and older, but not among women under 40. Controlling for insurance status, monthly family income, age, education and study location, women 40 years of age or older who had a clinical visit in the last year had a 70% higher odds ($p < .001$) of ever mammography use compared to women who did not have a clinical visit in the last year. This relationship remained in the final model (**Table 6b**), with an odds ratio of 1.81 ($p < .001$).

In addition, in the final adjusted model for women 40 and over (**Table 6b**), both insurance status and monthly family income maintained significant associations with mammography use; those with current insurance had a 62% greater odds of mammography use than those without, and those with a family income of 2000-3999 soles had a greater odds of ever mammography use (OR=1.99, p .009) compared to those making less than 1000 soles, as did those with an income of 4000 soles or more monthly (OR= 2.57, p= .015).

Clinical Breast Exam:

In the hierarchically adjusted group models, women under 40 reporting a clinical visit in the last year (indicating physician access) had a 69% (p< .001) greater odds of ever having had a CBE than those who reported no recent clinical visit. For women 40 and older, the significance of this association was attenuated in the group model (p= .054). But in the final fully adjusted models (**Tables 6a** and **6b**), for both women under 40 and those 40 and older, reporting a clinical visit in the last year was significantly associated with ever having had a CBE; the odds ratios were, respectively, 1.71 (p< .001) and 1.30 (p= .045).

Unlike mammography, where provider access, insurance status and monthly family income remained significantly associated with screening (for women 40 and older) when all are included in the final regression, for CBE the effect of insurance status and monthly family income was attenuated when adjusting for physician access and all other variables and confounders. In the final models for women younger than 40 (**Table 6a**) physician access maintained its significant association with CBE (p< .001) but neither insurance status nor monthly family income had significant associations with CBE. In the final model for women 40 and older (**Table 6b**) insurance status remained important; those with insurance had a 51%

greater odds ($p = .003$) of ever having had CBE. But the association with monthly family income goes away in the presence of provider access, as seen in the group level model (**Table 4b**).

Pap smear:

Similarly to results for mammography and CBE, there was a positive relationship between provider access and Pap smear for women in both age strata. This relationship existed likewise at the group level and in the final models where, for women younger than 40, those reporting a clinical visit in the last year had a 56% higher odds ($p = .002$) of ever having had a Pap smear (**Table 5a**). And for women 40 and older (**Table 5b**), those reporting a clinical visit in the last year had a 66% higher odds ($p = .003$) of ever having had a Pap smear.

The relationships with the other enabling variables (insurance status, and monthly family income) were different compared to those seen for mammography and clinical breast exam. In neither the group level models nor the final models did insurance status have a statistically significant relationship with Pap smear use. This applied for both age strata.

The relationship with monthly family income was not significant for women aged 40 and over. Interestingly, in the group level model for women under 40 (**Table 5a**), those with a family income of 1000-1999 monthly soles in fact had lower odds ($OR = .70, p = .034$) of having ever had a Pap smear than those whose monthly income is less than 1000 soles, though this association went away in the final adjusted model.

Reinforcing

Mammography:

For both age strata, neither marital status nor domestic violence was associated with mammography use in the adjusted group (**Tables 3a and 3b**) or final models (**Tables 6a and 6b**).

Clinical Breast Exam:

Among women under the age of 40, marital status was associated with CBE at both the group level and in the final models. In both cases single women had lower odds of having ever had CBE than women who had partners (married or open union) or who had ever been partnered (widowed, divorced, separated). In the final, fully adjusted, model, compared to single women, women who were no longer partnered (OR= 2.13, p= .025) and women in open unions (OR=1.76, p= .001) had higher odds of having had CBE. In this model the relationship between being married and CBE was attenuated such that it is no longer significant (OR=1.42, p= .055).

However, among women aged 40 and over the relationship between marital status and CBE ever use was quite different. In both the group model (**Table 4b**) and the final model (**Table 6b**), women in open unions had a lower odds of ever having had a CBE compared to single women. In the final fully adjusted model this OR was .59 (p= .036).

Domestic violence was not associated with CBE ever use in either the group or final models.

Pap smear:

As for CBE, women in the FRENT study under the age of 40, who were either currently partnered or had ever been partnered, had higher odds of Pap smear than single women. This was true for both the group models and final adjusted models. For women under 40, those who were married (OR=3.44, p< .001), no longer partnered (OR=4.09, p< .001) or in open unions (OR=4.6, p< .001) had higher odds of ever Pap use than single women.

For women aged 40 or older there was a similar trend. Compared to single women, married women (OR= 3.10, p< .001), formerly partnered women (OR=2.02, p= .007), and women in open unions (OR=2.23, p= .012) all had higher odds of ever having had a Pap smear.

This was in the final model that adjusts for all other variables, including the confounders of age, education and study location.

Only one other reinforcing variable had a significant relationship with Pap smear use. In the final model for women aged 40 or older, women who reported feeling somewhat unsafe in their homes had a lower odds (OR= .64, p= .031) of ever Pap smear use than women who reported feeling completely safe in their homes.

Discussion

Like many Hispanic women in the North America [14], most women in Peru have never had a breast exam. The overall prevalence of mammogram use and CBE in the FRENT survey data is, respectively, 15.9% and 36.9%. This is in contrast to the relatively high prevalence of Pap smear (68.8%). This is important to keep in mind when interpreting the associations between cultural proxies and each of the three screening exams.

Likewise, the specific context of Peru was taken into consideration when making analytical decisions, such as to include all women in the FRENT survey (including those as young as 15 years of age) in the analysis, and to stratify those women using the age of 40 as the cutoff. While the recommended age for breast screening (both mammography and CBE) in Peru is 40-65, this norm has only recently been developed and applied at a national level. Yet, as is the case with screening norms in higher income countries [15], these protocols are not always followed by health care providers in Peru. This has been directly observed in the north of Peru where current recommendations for CBE are not being followed and 44% of women receiving CBE are under the age of 30. In addition, CBE has now become a standard part of pre-natal care, with women receiving the exam as part of their first pre-natal visit. Finally, while a division at 40

reflects the increasing risk of breast cancer with age, it also helps capture changing social norms of preventive health seeking that are associated with age [9].

For comparability, the cutoff age of 40 has also been applied to Pap smear, although this decision is also supported by the literature on Pap smear use and cervical cancer risk by age, such that the stratified results for Pap smear use are of interest independent of comparisons with breast screening. For instance, a study of prevalence in HPV infection among women in New York found that prevalence was much higher among women under 25 (36%) than for women 45 or older (2.8%). In logistic regression younger age was associated with infection independent of number of sex partners in the previous year [16], suggesting a biological effect of age. A similar difference was found between Latin American women in their 20s and 30s, compared with those in their 40s and 50s [17]. In addition, several studies have found that elderly women are less likely to be screened for cancer [18] and that for some Hispanic groups in the United states, younger women are more likely to have had Pap smear [19].

PRECEDE/PROCEED framework

Several studies demonstrate that the PRECEDE/PROCEED model can capture multilevel determinants of breast screening use, are applicable across different populations and cultures, and may be used to inform interventions on modifiable factors related to breast cancer screening utilization.

In their study of mammography use among Hispanic and non-Hispanic White women in a rural setting, Tejeda et al. [20] hypothesized that constructs from the PRECEDE/PROCEED framework would influence screening practices. They found that predisposing factors including age, education and knowledge were associated with screening while attitudes about cancer had

only a marginal influence. Enabling factors of health insurance and exam cost played a greater role than logistical issues of transportation and childcare. Nuño et al.[21] also found a consistent relationship of insurance use and screening. These findings are in accord with those of the current study, showing that, for women 40 and older, insurance status is associated with ever use of each of the three screening exams in a model that includes both age and education.

Michielutte et al.[22] found the predisposing factor of knowledge to be a significant predictor of mammography use among women 60 and older in rural North Carolina. The enabling factor of cost was greater for clinical breast exam than for mammography (reflecting perceptions of insurance coverage) and the reinforcing factor of physician referral remained a significant predictor of mammography use in multivariate analysis. Nuño et al. [21] similarly found physician referral to be a significant predictor of mammography and Pap smear use among Hispanic women living near the United States-Mexico border.

Although the current study did not assess screening knowledge, as this was not included in the FRENT survey, monthly family income and physician access may be considered closely aligned with cost and physician referral. For women over 40, physician access was important across all three screening exams. However, among these women, the association between screening and both physician access and monthly family income was stronger for mammography than for CBE. While physician access was associated with Pap smear in women 40 and older, monthly family income did not have a statistically significant association. As in the current study, Nuño et al. [21] found that annual healthcare visits are associated with mammography use. Notably, Nuño et al. [21] found that physician referral, income, medical insurance and annual healthcare visits had greater association with screening use than the predisposing factors, which included primarily demographic variables.

Cultural Determinants

While the PRECEDE/PROCEED is a good general model, it becomes stronger when adapted appropriately to specific social, economic and cultural circumstances. Therefore *a priori* proxies for cultural determinants of reproductive cancer screening were chosen from the FRENT survey based on findings from prior qualitative work on facilitators and barriers to clinical breast exam in Peru [9] and place within the broader PRECEDE/PROCEED model.

The stress variable was selected as the proxy for a belief reported by women that worry can make illness worse and that stress emotions may thus constitute barriers to seeking clinical care. Report of clinical visit in last 12 months was chosen to approximate provider access because Peruvian women identified direct provider recommendation as a key motivator to seeking clinical health services, including breast exams and Pap smear. Finally, women stated a preference for being accompanied by their partner when seeking clinical care, highlighting a potentially important role for partner support in use of secondary prevention screening services. Marital status and domestic violence were selected from the FRENT study as proxies for partner support.

Stress

As Consedine et al. [23] note, given that many demographic factors known to be related to screening practices, such age and income, are not easily modifiable, it is important to research and target areas that are amenable to change and where improvements can be made. Stress may be considered a broad category that includes the emotions labeled as fear, worry and anxiety, and may prove to be an area of interest when seeking modifiable determinants of screening behavior [23].

In their review of stress emotions and their relationship to screening behavior, Consedine et al. [23] found that it is frequently unclear whether these emotions are barriers or facilitators to screening; in some studies individuals reporting greater stress emotions are less likely to have screened for cancer and in others they are more likely to have been screened. This is further complicated by whether the researchers have assessed stress emotions related to a particular disease, or via a more general psychological profile.

The authors also point out the difficulty of generalizing study results across different ethnic and age groups. They propose, preliminarily, that stress emotions related to components of screening itself may lead to avoidance of screening to reduce stress, while more generalized cancer worry may be acted on by seeking screening in order to reduce it. A key step missing in many studies on stress emotions and breast screening behavior is a definition of whether the emotion is related to the screening process itself, the outcome of the screening, or is a more generalized affective trait [23].

In the current study, the variable selected as a stress proxy from the FRENT survey describes a more generalized affective trait, whereas in the earlier qualitative work on perceptions of breast cancer and screening in Peru [9], stress was related to cancer outcomes (i.e. that thinking and worrying about breast cancer could provoke the illness, or make an existing breast problem worse). Contrary to Consedine et al.'s proposal [23], the formative qualitative work suggests that, for some people in this population, generalized cancer worry may in fact reduce motivation to seek screening.

What is clear from the literature is that stress emotions related to cancer are strong among many groups. For instance, Betancourt and colleagues [24] found that anxiety was one of the most important emotions provoked in women when thinking about CBE, Pap or mammography.

What is less clear from the literature is how women interpret stress emotions in ways that inform behavior.

The arguments put forth by Consedine and colleagues are given some support by the findings in a study of mammography among different ethnic groups in New York; stress and embarrassment were negatively associated with mammography use while cancer worry was positively associated with mammography use [25]. The authors note that the magnitude of the effect of stress and worry in this study were comparable to the magnitude of the effect of physician recommendation, a historically strong predictor of screening use. Similarly, in a study of breast self-exam (BSE) among six ethnic groups in Brooklyn, New York, cancer worry predicted BSE but this relationship varied depending on the participant's ethnicity, with worry having a positive effect on BSE adherence in some groups and a negative effect in others [26].

In a study of breast screening among Mexican-American women in Phoenix, researchers rated women's cancer anxiety on a 3-point scale for the following questions: 1) Is thinking about cancer emotionally stressful? 2) Are you worried about the results of screening studies? 3) Are you fearful that if something is found you would probably die? 4) If cancer is mentioned in a discussion with a friend, how comfortable would you feel? The results showed that cancer anxiety in this population was strongly predictive of cancer screening behavior, including BSE, CBE, Pap smear and pelvic exam, even when controlling for access to health care (knowledge, financial and convenience barriers) and ease of communication with providers [27].

In the current study no relationship was found between stress and mammography, or between stress and CBE, in the final models. However, for women under 40, greater stress is positively associated with use of Pap smear. There is greater Pap smear awareness than breast screening awareness, in general, among women in Peru, likely due to an emphasis on Pap smear

via public health promotion and campaigns. In addition, Pap smear is more accessible to women in Peru than breast exams, as indicated by a much higher prevalence of Pap smear than either mammography or CBE. Pap smear is especially accessible among Women of Fertile Age (*Mujeres de Edad Fertile*, or *MEF*). This is a designation by the state for women aged 15-49, who are able to access care through public health facilities and for whom Pap smear has been prioritized in Peru. It may be that while enabling and reinforcing variables override any effect of stress for mammogram and CBE, and for Pap smear among women 40 and older, lowering of these barriers for Pap smear among younger women allows for the effect of stress to be emerge. Although stress here is described as a general affective trait, the finding that higher stress is associated with higher Pap smear would perhaps suggest some support for Consedine et al.'s [23] argument that more generalized cancer worry increases motivation to seek screening.

Physician access

Physician recommendation has consistently shown to be positively associated with screening for women's reproductive cancers, including mammography and Pap smear [14, 21, 22, 25, 28-31] with physician recommendation and insurance often the most robust predictors of mammography use [25]. This relationship between physician recommendation and breast screening has been shown to be case for Hispanic women as well [14]. Of course, while physician recommendation is a strong cue to action, opportunities for behavior change are lost when that cue is not given. A regional telephone survey among women 50 and over in Pennsylvania and New York found that physician recommendation was the strongest predictor of mammography adherence, but only 60% of women reported that their physicians had ever recommended mammography [30].

Personal messages from trusted social connections in general are important to screening utilization. A randomized control study [32] examining predisposing, enabling and reinforcing factors of breast screening among interurban women over 50 years of age, found that reinforcing factors, including advice from friends, family or a physician, were associated with mammography use. One interesting finding in a study of physician recommendation for mammography among Black and White women in North Carolina indicated while access to and participation in the medical care system was strongly associated with physician recommendation of mammogram, indicators of vulnerability (older age and lower SES) had a greater association with the rate of physician recommendation [33].

In the current study physician referral was not available as a variable for analysis. But the strength of the provider access proxy variable (a clinical visit in the last 12 months), shows a similarly strong relationship to screening use. Mammography use among women older than 40 is significantly associated with provider access; these women have an 81% higher odds of mammogram than women who haven't had a clinical visit in the last 12 months. For women in both age strata, an annual provider visit is associated with mammography use.

For CBE, the fact that odds of screening associated with physician access is higher for younger women than older women (OR 1.71 vs 1.30) may reflect the current clinical practice of including CBE in early pre-natal visits. Notably, while the other enabling variables of insurance status and monthly family income remain strong in the model for mammography use, these variables are less important with respect to CBE. This likely reflects the cost-prohibitive nature of mammography, which costs anywhere from 80-100 soles at a private clinic when not covered by insurance.

For Pap smear, insurance status is not associated with screening for either age strata. And in fact for women under 40 women who have a monthly family income of 1000-1999 soles are less likely to have had Pap smear than those with a monthly family income of <1000. This may reflect an emphasis on Pap smear and promotion through health campaigns in Peru that are targeted toward lower-income women.

Partner support

Marital status as a type of social support in general has been researched broadly and many studies have shown that married people tend to be healthier (according to a variety of indicators) and have lower mortality [34]. However the role of marital status, and partner support characterized more broadly, has received less attention with respect to women's cancer screening practices.

A review of the literature reveals that many studies on partner support and breast health focus on the influence of social support elements among women diagnosed with breast cancer (e.g. stage of illness, breast cancer survival and mortality). In addition, size of social networks with respect to women's cancer screening practices has been studied. For instance, a study among lower-income, older Mexican-American women in Texas found that larger social-networks were positively associated with 2-year prevalence of mammography and Pap smear, with the number of close friends being the most significant predictor [35]. The role of partner support and breast screening practices has been explored to a far lesser degree.

To address this gap in the literature a recent qualitative study of male knowledge and support toward reproductive cancer screening for their female partners found among couples of Mexican descent in New York. Through a series of focus groups where both male and female

partners participated, men said they would be able to provide better support to their female partners if they knew more about female cancers, and expressed a desire to do so [36].

As with breast cancer, some qualitative studies have indicated a role for men in screening programs for cervical cancer [36-38]. An intervention study in Uganda found that for women with a positive cervical cancer test, those asked to deliver a letter to their male partner asking that he assist her in returning for follow-up services were more likely to return than those who only received standard post-screening education [39].

Quantitative work also provides some preliminary evidence for the role of partner support in women's cancer screening practices. A recent analysis of the Framingham Heart Study found that women's breast screening behavior was not influenced by screening behavior of people in their social networks, with the exception that women with sisters who screened for breast cancer, and those with spouses who had recently screened for colorectal cancer (compared to unmarried women) had slightly higher the odds of breast screening [40].

Another body of work has shown that marital status is associated with mammography use. Specifically single marital status has been reported to be a predictor of poorer use of mammography, showing a 30% lower likelihood of screening [25]. In a survey of more than 1600 women aged 65 and older in England, women who were married, separated or divorced were had significantly higher rates of breast cancer screening ($p < .01$) than women who were single [41].

The present study shows a very interesting finding that may be specific to Peru. The category of "open union" for marital status is common in Peru, making up 21.2% of the sample. Being in an open union means that one is partnered and likely living with one's partner (*conviviente*) but this relationship has not been formalized. After 2 years of cohabitation, partners

are considered to be married under law. While marital status showed no significant association with mammography, there was an association with CBE. For women over the age of 40, those in an open union had 41% lower odds of having ever had a CBE, compared with single women. This finding is of interest given the findings from the previous qualitative study [9] on likely barriers and facilitators to clinical breast exam for low-income women in northern coastal Peru, which suggest women need partner support to actively seek services in a clinical setting.

While mammography is prohibitively expensive for most, and while Pap smear is brought to the public via health campaigns or is integrated into reproductive health care, CBE falls into a unique space in the public health system. It is currently incorporate into pre-natal visits but this appears to be a relatively recent development such that older women are less likely to have experience of CBE via this route. The combination of these health service factors, and the potentially greater vulnerability for women in open unions (via reduced partner support), may help explain the current finding.

Non-significant associations

While significant associations were found with several of the selected cultural proxies, some of the non-significant findings are of note. Under the predisposing factors group, preventive health knowledge was not associated with any of the three outcomes, likely due to the fact that there was so little variability in responses. More than 96% of all women in the sample indicated that smoking was bad for one's health and exercise good for one's health. In future studies a more appropriate measure of preventive health might be actual health behaviors, such as smoking status or weekly exercise.

In the reinforcing factor group, domestic violence was not associated with the three outcomes in the final models. However, domestic violence is expected to be highly underreported in this population. Surveys were conducted in people's homes, likely in the presence of other family members, which may have contributed to underreporting. More accurate or sensitive measures of domestic violence in future work may still show a role for this factor in women's clinical health-seeking practices.

Limitations

The FRENT study is a national study of risk factors for NCDs and was not designed with the PRECEDE/PROCEED framework in mind. In this secondary analysis, proxy variables were chosen anticipated to best fit within that conceptual framework. Therefore a major limitation of this analysis is that the questions in the survey (e.g. regarding social support or health knowledge) are not posed specifically with respect to reproductive cancer screening. The broad, non-specific, nature of the questions may inhibit the ability to detect bi- and multivariate relationships. In addition, the cross-sectional nature of the survey limits the ability to detect temporal or causal relationships. For instance, questions on health insurance refer to coverage at the time the survey was administered, while questions about breast cancer screening are about ever-use. Nonetheless the findings from the current study provide intriguing evidence for the role for cultural determinants of screening use such that further studies and research would be warranted.

Conclusions

Breast cancer screening has not been as widely promoted as Pap smear although breast cancer may soon surpass cervical cancer as the top cause of cancer death among Peruvian women. It is only since 2010 that the Peruvian government came to an accord on cancer control and prevention overall, making breast cancer one of the top five priority cancers. While there is plenty of evidence that there is much to be improved with respect to screening for cervical cancer in Peru [42], the current study suggests a need for increasing attention to breast cancer screening efforts perhaps along the lines of what has already been started for cervical cancer. Comparison of the determinants of breast cancer screening versus Pap smear may aid in identifying the characteristics of women who are early adopters of novel health services. Addressing women's anxieties around reproductive cancers, increasing cancer screening messaging from health care providers, and targeting older women whom current health services have neglected, may improve screening rates for breast cancer.

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Table 1: Characteristics of women in FRENT study by study location

		Villa El Salvador (n=504)		Trujillo (n=446)		Huancayo (n=553)		Lima-Callao (n=1105)		Pearson's Chi-squared test	ANOVA F test
		<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>p-value</u>	<u>p-value</u>
Age (years)										p< .001	
	<i>continuous</i>	<i>41.1 (mean)</i>	<i>13.8 (sd)</i>	<i>41.9 (mean)</i>	<i>16.7 (sd)</i>	<i>39.6 (mean)</i>	<i>14.9 (sd)</i>	<i>40.4 (mean)</i>	<i>16.0 (sd)</i>		p= .1042
	15-19	12	2.4	28	6.3	42	7.6	98	8.9		
	20-29	93	18.5	104	23.3	118	21.3	222	20.1		
	30-39	145	28.8	73	16.4	127	23	263	23.8		
	40-49	124	24.6	97	21.8	120	21.7	208	18.8		
	50-59	76	15.1	76	17	83	15	167	15.1		
	60+	54	10.7	68	15.3	62	11.2	147	13.3		
	<i>Missing</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>0.2</i>	<i>0</i>	<i>0</i>		
Education (years)										p< .001	
	<i>continuous</i>	<i>9.0 (mean)</i>	<i>4.3 (sd)</i>	<i>10.6 (mean)</i>	<i>4.4 (sd)</i>	<i>10.5 (mean)</i>	<i>4.7 (sd)</i>	<i>10.8 (mean)</i>	<i>4.0 (sd)</i>		p< .0001
	0-6 (hasta primaria)	161	31.9	103	23.1	122	22.1	193	17.5		
	7-11 (hasta secundaria)	219	43.5	155	34.8	222	40.1	468	42.4		
	12-14 (superior no universitario)	92	18.3	87	19.5	66	11.9	232	21		
	15+ (superior universitario)	31	6.2	87	19.5	119	21.5	180	16.3		
	<i>Missing</i>	<i>1</i>	<i>0.2</i>	<i>14</i>	<i>3.1</i>	<i>24</i>	<i>4.3</i>	<i>32</i>	<i>2.9</i>		
Monthly family income (soles)										p< .001	
	<i>continuous</i>	<i>770.4 (mean)</i>	<i>474.8 (sd)</i>	<i>929.1 (mean)</i>	<i>998.6 (sd)</i>	<i>503.6 (mean)</i>	<i>439.6 (sd)</i>	<i>1266.2 (mean)</i>	<i>1389.9 (sd)</i>		p< .0001
	<1000	370	73.4	291	65.3	412	74.5	532	48.1		
	1000-1999	121	24	97	21.8	47	8.5	266	24.1		
	2000-3999	13	2.6	27	6.1	6	1.1	118	10.7		

	4000+	0	0	10	2.2	1	0.2	53	4.8		
	<i>Missing</i>	0	0	21	4.7	87	15.7	136	12.3		
Any dr. visit this year?										p< .001	
	Yes	305	60.5	252	56.5	250	45.2	695	62.9		
	No	195	38.7	185	41.5	299	54.1	383	34.7		
	<i>Missing</i>	4	0.8	9	2	4	0.7	27	2.4		
Marital status										p< .001	
	Single	74	14.7	133	29.8	127	23	355	32.1		
	Married	181	35.9	176	39.5	263	47.6	443	40.1		
	Widowed	28	5.6	28	6.3	34	6.2	50	4.5		
	Divorced	3	0.6	8	1.8	8	1.5	16	1.5		
	Open Union	177	35.1	79	17.7	95	17.2	204	18.5		
	Separated	41	8.1	22	4.9	23	4.2	31	2.8		
	<i>Missing</i>	0	0	0	0	3	0.5	6	0.5		
Currently insured?										p< .001	
	Yes	120	23.8	140	31.4	134	24.2	412	37.3		
	No	383	76	306	68.6	419	75.8	692	62.6		
	<i>Missing</i>	1	0.2	0	0	0	0	1	0		
Smoking is bad for health?										p= .269	
	Yes	490	97.2	443	99.3	545	98.6	1069	96.7		
	No	10	2	2	0.5	5	0.9	10	0.9		
	<i>Missing</i>	4	0.8	1	0.2	3	0.5	26	2.4		
Exercise is good for health?										p< .001	
	Yes	500	99.2	445	99.8	537	97.1	1040	94.1		
	No	2	0.4	0	0	1	0.2	31	2.8		
	<i>Missing</i>	2	0.4	1	0.2	15	2.7	34	3.1		
Hit as a child?										p< .001	

	Never	68	13.5		78	17.5		74	13.4		247	22.4		
	Infrequently	268	53.2		255	57.2		279	50.5		495	44.8		
	~1/month	43	8.5		35	7.9		54	9.8		100	9.1		
	~1/week	44	8.7		21	4.7		56	10.1		99	9		
	Daily	79	15.7		42	9.4		57	10.3		126	11.4		
	<i>Missing</i>	2	0.4		15	3.4		33	6		38	3.4		
Hit by partner													p< .001	
	Never/not in last month	432	85.7		398	89.2		439	79.4		995	90.1		
	~1/month	58	11.5		30	6.7		87	15.7		67	6.1		
	1-2x/week	5	1		1	0.2		4	0.7		11	1		
	Daily	2	0.4		1	0.2		2	0.4		5	0.5		
	<i>Missing</i>	7	1.4		16	3.6		21	3.8		27	2.4		
Feel safe in home?													p< .001	
	Very secure	246	48.8		199	44.6		324	58.6		642	58.1		
	Somewhat secure	116	23		138	30.9		118	21.3		262	23.7		
	Somewhat insecure	116	23		86	19.3		80	14.5		156	14.1		
	Very insecure	26	5.2		23	5.2		31	5.6		41	3.7		
	<i>Missing</i>	0	0		0	0		0			4	0.4		
Nervous or stressed in general?													p< .001	
	Always	83	16.5		42	9.4		75	13.6		113	10.2		
	Frequently	75	14.9		58	13		114	20.6		222	20.1		
	Sometimes	231	45.8		226	50.7		269	48.6		533	48.2		
	Rarely/Never	115	22.8		120	26.9		92	16.6		234	21.2		
	<i>Missing</i>	0	0		0	0		3	0.5		3	0.3		
Ever had mammogram?													p< .001	

	Yes	69	13.7		52	11.7		39	7.1		255	23.1		
	No	423	83.9		385	86.3		465	84.1		814	73.7		
	<i>Missing</i>	<i>12</i>	<i>2.4</i>		<i>9</i>	<i>2</i>		<i>49</i>	<i>8.9</i>		<i>36</i>	<i>3.3</i>		
Ever had a clinical breast exam?													p< .001	
	Yes	211	41.9		207	46.4		131	23.7		413	37.4		
	No	276	54.8		228	51.1		367	66.4		653	59.1		
	<i>Missing</i>	<i>17</i>	<i>3.4</i>		<i>11</i>	<i>2.5</i>		<i>55</i>	<i>9.9</i>		<i>9</i>	<i>3.5</i>		
Ever had a Pap smear?													p< .001	
	Yes	389	77.2		288	64.6		335	60.6		781	70.7		
	No	97	19.3		147	33		180	32.6		292	26.4		
	<i>Missing</i>	<i>18</i>	<i>3.6</i>		<i>11</i>	<i>2.5</i>		<i>38</i>	<i>6.9</i>		<i>32</i>	<i>2.9</i>		

Table 2: Bivariate associations																
*a priori selected proxies for cultural determinants of screening																
		Ever mamm.		Never mamm		p-value	Ever CBE		Never CBE		p-value	Ever Pap smear		Never Pap smear		p-value
		n=415		n=2087			n=962		n=1524			n=1793		n=716		
		<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>		<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>		<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	
Age (years)						p< .001					p< .001					p< .001
	<i>continuous</i>	50.7 <i>mean</i>	12.8 <i>sd</i>	38.9 <i>mean</i>	15.1 <i>sd</i>	<i>p< .0001</i>	43.5 <i>mean</i>	13.8 <i>sd</i>	39 <i>mean</i>	16 <i>sd</i>	<i>p< .0001</i>	43.3 <i>mean</i>	13.3 <i>sd</i>	34.9 <i>mean</i>	18.2 <i>sd</i>	<i>p< .0001</i>
	15-19	3	0.7	153	7.3		18	1.9	135	8.9		17	1	133	18.6	
	20-29	25	6	484	23.2		145	15.1	372	24.4		274	15.3	243	33.9	
	30-39	45	10.8	547	26.2		227	23.6	361	23.7		483	26.9	113	15.8	
	40-49	113	27.2	418	20		259	26.9	267	17.5		462	25.8	72	10.1	
	50-59	130	31.3	266	12.8		190	19.8	199	13.1		334	18.6	60	8.4	
	60+	99	23.9	219	10.5		123	12.8	190	12.5		223	12.4	95	13.3	
	<i>Missing</i>	0	0	0	0		0	0	0	0		0	0	0	0	
Education (years)						p< .001					p< .001					p=.037
	0-6	91	21.9	470	22.5		175	18.2	381	25		414	23.1	149	20.8	
	7-11	133	32.1	882	42.3		361	37.5	646	42.4		732	40.8	285	39.8	
	12-14	86	20.7	363	17.4		200	20.8	252	16.5		306	17.1	147	20.5	
	15+	101	24.3	307	14.7		207	21.5	196	12.9		299	16.7	109	15.2	
	<i>Missing</i>	4	1	65	3.1		19	2	49	3.2		42	2.3	26	3.6	
Location						p<.001					p<.001					p<.001
	Villa El Salvador	69	16.6	423	20.3		211	21.9	276	18.1		389	21.7	97	13.6	
	Trujillo	52	12.5	385	18.5		207	21.5	228	15		288	16.1	147	20.5	
	Huancayo	39	9.4	465	22.3		131	13.6	367	24.1		335	18.7	180	25.1	
	Lima-Callao	255	61.5	814	814		413	42.9	653	42.9		781	43.6	292	40.8	
	<i>Missing</i>	0	0	0	0		0	0	0	0		0	0	0	0	

Nervous or stressed in general?*						p=.022					p=.014					p<.001
	Siempre	51	12.3	251	12		124	12.9	173	11.4		233	13	70	9.8	
	Frecuent.	72	17.4	382	18.3		168	17.5	282	18.5		343	19.1	114	15.9	
	Alguna vez	194	46.8	1023	49		461	47.9	754	49.5		871	48.6	346	48.3	
	Rara/nunca	96	23.1	428	20.5		206	21.4	313	20.5		343	19.1	184	25.7	
	Missing	2	0.5	3	0.1		3	0.3	2	0.13		3	0.2	2	0.3	
Smoking is bad for health?						p=.724					p=0.448					p=.192
	Yes	403	97.1	2041	97.8		940	97.7	1489	97.7		1745	97.3	706	98.6	
	No	5	1.2	21	1		7	0.7	18	1.2		20	1.1	6	0.8	
	Missing	7	1.7	25	1.2		15	1.6	17	1.1		28	1.6	4	0.6	
Exercise is good for health?						p=.045					p=.003					p=.186
	Yes	402	96.9	2019	96.7		942	97.9	1467	96.3		1738	96.9	690	96.4	
	No	9	2.2	25	1.2		9	0.9	24	1.6		19	1.1	14	2	
	Missing	4	1	43	2.1		11	1.1	33	2.2		36	2	12	1.7	
Any dr. visit this year?*						p< .001					p< .001					p< .001
	Yes	318	76.6	1142	54.7		655	68.1	798	52.4		1111	62	348	48.6	
	No	89	21.5	911	43.7		285	29.6	705	46.3		649	36.2	358	50	
	Missing	8	1.9	34	1.6		22	2.3	21	1.4		33	1.8	10	1.4	
Monthly family income (soles)						p< .001					p< .001					p=.007
	<1000	186	44.8	1357	65		537	55.8	990	65		1107	61.7	434	60.6	
	1000-1999	103	24.8	412	19.7		224	23.3	289	19		360	20.1	155	21.7	
	2000-3999	52	12.5	107	5.1		84	8.7	76	5		121	6.8	39	5.5	
	4000+	28	6.8	36	1.7		41	4.3	23	1.5		55	3.1	9	1.3	
	Missing	46	11.1	175	8.4		76	7.9	146	9.6		150	8.4	79	11	
Currently insured?						p< .001					p< .001					p< .001
	Yes	230	55.4	553	26.5		389	40.4	385	25.3		611	34.1	170	23.7	
	No	185	44.6	1532	73.4		573	59.6	1137	74.6		1181	65.9	545	76.1	
	Missing	0	0	2	0.1		0	0	2	0.1		1	0.1	1	0.1	
Marital status						p< .001					p< .001					p< .001
	Single	75	18.1	572	27.4		188	19.5	458	30.1		252	14.1	389	54.3	

Married	239	57.6	793	38		460	47.8	561	36.8		877	48.9	160	22.4	
Widowed	34	8.2	99	4.7		50	5.2	79	5.2		89	5	43	6	
Divorced	14	3.4	21	1		15	1.6	20	1.3		28	1.6	7	1	
Open Union	37	8.9	499	23.9		204	21.2	333	21.9		445	24.8	98	13.7	
Separated	16	3.9	94	4.5		44	4.6	66	4.3		94	5.2	18	2.5	
Missing	0	0	9	0.4		1	0.1	7	0.5		8	0.5	1	0.1	
Hit by partner*					p= .048					p= .044					p= .001
Never/not in last month	373	89.8	1793	85.9		835	86.8	1318	86.5		1519	84.7	653	91.2	
~1/month	25	6	213	10.2		88	9.2	151	9.9		192	10.7	47	6.6	
1-2x/week	6	1.5	15	0.7		8	0.8	13	0.9		16	0.9	5	0.7	
Daily	1	0.2	9	0.4		4	0.4	6	0.4		9	0.5	0	0	
Missing	10	2.4	57	2.7		27	2.8	36	2.4		57	3.2	11	1.5	
Hit as a child?					p<.001					p=.078					p=.037
Never	104	25.1	353	16.9		180	18.7	274	18		318	17.7	134	18.7	
Infrequently	196	47.2	1.39	49.8		490	50.9	743	48.8		867	48.4	378	52.8	
~1/month	28	6.8	188	9		72	7.5	146	9.6		157	8.8	65	9.1	
~1/week	24	5.8	189	9.1		77	8	131	8.6		154	8.6	58	8.1	
Daily	50	12.1	248	11.9		115	12	179	11.8		239	13.3	57	8	
Missing	13	3.1	70	3.4		28	2.9	51	3.4		58	3.2	24	3.4	
Feel safe in home?					p<.001					p=.002					p<.001
Very secure	246	59.3	1094	52.4		507	52.7	834	54.7		951	53	390	54.5	
Somewhat secure	81	19.5	528	25.3		228	23.7	380	24.9		439	24.5	176	24.6	
Somewhat insecure	69	16.6	363	17.4		180	18.7	242	15.9		310	17.3	124	17.3	
Very insecure	17	4.1	101	4.8		46	4.8	67	4.4		91	5.1	26	3.6	
Missing	2	0.5	1	0.1		1	0.1	1	0.1		2	0.1	0	0	

Table 3a: MAMMOGRAPHY USE <40YRS OLD			Unadjusted		Adjusted*		Group Model**	
Group of Associated Factors	Factor	Categories	OR [95% CI]	p-value	OR [95% CI]	p-value	OR [95% CI]	p-value
Predisposing	Stress	always: frequently: sometimes: rarely/never:	.78 [.41-1.49] .61 [.35-1.05] .71 [.47-1.08] REF	p= .457 p= .075 p= .113 REF	.73 [.38-1.40] .54 [.31-.95] .67 [.44-1.03] REF	p= .343 p= .031 p= .070 REF	.73 [.38-1.41] .54 [.31-.94] .67 [.44-1.03] REF	p= .348 p= .031 p= .071 REF
	Preventive health knowledge	high: moderate/low:	REF .89 [.21-3.86]	REF p= .876	REF .86 [.20-3.74]	REF p= .836	REF .86 [.20-3.79]	REF p= .846
Enabling	Physician Access	yes: no:	1.01 [.71-1.43] REF	p= .977 REF	1.01 [.70-1.45] REF	p= .978 REF	.96 [.67-1.39] REF	p= .837 REF
	Insurance Status	yes: no:	1.27 [.85-1.89] REF	p= .242 REF	1.32 [.88-2.00] REF	p= .182 REF	1.27 [.82-1.94] REF	p= .280 REF
	Monthly family income	<1000: 1000-1999: 2000-3999: 4000+:	REF 1.12 [.71-1.77] 1.43 [.71-2.90] 1.35 [.39-4.63]	REF p= .621 p= .317 p= .632	REF 1.15 [.71-1.84] 1.42 [.68-2.99] 1.50 [.41-5.44]	REF p= .568 p= .349 p= .536	REF 1.12 [.70-1.80] 1.32 [.62-2.82] 1.34 [.36-4.96]	REF p= .638 p= .470 p= .660
Reinforcing	Marital status	Single: Married: No longer partnered: Open Union:	REF .82 [.53-1.26] 1.43 [.64-3.18] .63 [.41-.99]	REF p= .368 p= .385 p= .043	REF .81 [.48-1.38] 1.39 [.58-3.33] .63 [.38-3.33]	REF p= .448 p= .460 p= .070	REF .87 [.51-1.49] 1.61 [.66-3.89] .73 [.44-1.23]	REF p= .622 p= .295 p= .239

	Domestic violence	Never/not in last month: Ever/at least in last month:	REF .55 [.28-1.07]	REF p= .076	REF .53 [.27-1.04]	REF p= .067	REF .62 [.31-1.25]	REF p= .184
	Feel safe in home	Very safe: Somewhat safe: Somewhat unsafe: Very unsafe:	REF .65 [.42-1.00] .85 [.52-1.39] .23 [.06-.97]	REF p= .053 p= .527 p= .045	REF .70 [.45-1.09] .91 [.55-1.50] .24 [.06-1.01]	REF p= .116 p= .712 p= .051	REF .71 [.45-1.11] .95 [.58-1.58] .28 [.07-1.18]	REF p= .128 p= .858 p= .083
	Child Abuse	Never: On a few occasions: More or less 1x/month: More or less 1x/week: Almost every day:	REF 1.61 [.91-2.87] 1.91 [.93-3.95] .79 [.31-1.99] 1.00 [.46-2.21]	REF p= .102 p= .079 p= .613 p= .992	REF 1.68 [.94-3.01] 1.88 [.90-3.93] .78 [.31-2.01] .99 [.44-2.19]	REF p= .082 p= .093 p= .612 p= .972	REF 1.64 [.91-2.95] 1.95 [.93-4.10] .79 [.31-2.03] 1.11 [.49-2.53]	REF p= .099 p= .077 p= .625 p= .790
Confounders	Age	continuous:	.99 [.97-1.02]	p= .442	-	-	-	-
	Education	0-6 (hasta primaria): 7-11 (hasta secundaria): 12-14 (superior no universitario): 15+ (superior universitario):	REF 1.50 [.75-3.00] 1.87 [.91-3.86] 1.23 [.55-2.76]	REF p= .247 p= .089 p= .611	-	-	-	-
	Location	Villa El Salvador: Trujillo: Huancayo: Lima-Callao:	.86 [.54-1.39] .34 [.17-.70] 1.10 [.72-1.69] REF	REF p= .551 p= .168 p= .719	-	-	-	-

*Adjusted for age, education and location.

**Including variables within given risk factor group (predisposing, enabling or reinforcing) and age, education and location.

Table 3b: MAMMOGRAPHY USE >40YRS OLD			Unadjusted		Adjusted*		Group Model**	
Group of Associated Factors	Factor	Categories	OR [95% CI]	p-value	OR [95% CI]	p-value	OR [95% CI]	p-value
Predisposing	Stress	always: frequently: sometimes: rarely/never:	.65 [.43-.98] .80 [.55-1.18] .71 [.52-.97] REF	p= .041 p= .262 p= .030 REF	.95 [.61-1.49] .88 [.58-1.33] .76 [.54-1.05] REF	p= .824 p= .533 p= .096 REF	.95 [.61-1.49] .88 [.58-1.33] .76 [.54-1.05] REF	p= .827 p= .532 p= .096 REF
	Preventive health knowledge	high: moderate/low:	REF 1.30 [.64-2.65]	REF p= .475	REF .87 [.40-1.87]	REF p= .717	REF .89 [.41-1.91]	REF p= .761
Enabling	Physician Access	yes: no:	2.43 [1.84-3.9] REF	p< .001 REF	1.95 [1.46-2.61] REF	p< .001 REF	1.70 [1.26-2.30] REF	p= .001 REF
	Insurance Status	yes: no:	2.72 [2.13-3.49] REF	p< .001 REF	2.01 [1.53-2.63] REF	p< .001 REF	1.75 [1.32-2.33] REF	p< .001 REF
	Monthly family income	<1000: 1000-1999: 2000-3999: 4000+:	REF 1.87 [1.38-2.53] 4.14 [2.63-6.50] 6.02 [3.10-11.67]	REF p< .001 p< .001 p< .001	REF 1.17 [.84-1.64] 2.34 [1.42-3.86] 3.20 [1.56-6.56]	REF p= .360 p= .001 p= .002	REF 1.06 [.75-1.49] 2.02 [1.22-3.36] 2.53 [1.22-5.27]	REF p= .755 p= .007 p= .013
Reinforcing	Marital status	Single: Married: No longer partnered: Open Union:	REF .95 [.66-1.38] .80 [.52-1.23] .34 [.20-.60]	REF p= .802 p= .307 p< .001	REF 1.27 [.86-1.90] 1.11 [.69-1.78] .57 [.31-1.02]	REF p= .234 p= .670 p= .057	REF 1.32 [.88-1.98] 1.09 [.67-1.76] .61 [.34-1.12]	REF p= .182 p= .735 p= .112
	Domestic violence	Never/not in last month: Ever/at least in last month:	REF .64 [.40-1.00]	REF p= .051	REF .88 [.54-1.42]	REF p= .598	REF .93 [.57-1.53]	REF p= .783

	Feel safe in home	Very safe: Somewhat safe: Somewhat unsafe: Very unsafe:	REF .80 [.59-1.09] .64 [.45-.91] .95 [.53-1.70]	REF p= .164 p= .012 p= .869	REF .90 [.65-1.25] .78 [.54-1.12] 1.15 [.63-2.10]	REF p= .528 p= .174 p= .653	REF .92 [.66-1.28] .81 [.56-1.18] 1.21 [.66-2.25]	REF p= .601 p= .276 p= .538
	Child Abuse	Never: On a few occasions: More or less 1x/month: More or less 1x/week: Almost every day:	REF .73 [.54-.99] .60 [.36-1.00] .51 [.30-1.12] .73 [.48-1.12]	REF p= .040 p= .049 p= .010 p= .152	REF .91 [.66-1.25] .81 [.47-1.39] .66 [.38-1.14] 1.20 [.75-1.90]	REF p= .554 p= .438 p= .140 p= .456	REF .92 [.66-1.28] .82 [.47-1.43] .73 [.47-1.43] 1.26 [.43-1.29]	REF p= .625 p= .486 p= .280 p= .344
Confounders	Age	continuous:	1.01 [1.00-1.03]	p= .010	-	-	-	-
	Education	0-6 (hasta primaria): 7-11 (hasta secundaria): 12-14 (superior no universitario): 15+ (superior universitario):	REF 1.29 [.95-1.76] 2.92 [1.99-4.28] 2.60 [1.83-3.69]	REF p= .107 p< .001 p< .001	-	-	-	-
	Location	Villa El Salvador: Trujillo: Huancayo: Lima-Callao:	.37 [.26-.53] .37 [.26-.53] .32 [.23-.46] REF	p< .001 p< .001 p< .001 REF	-	-	-	-

*Adjusted for age, education and location.

**Including variables within given risk factor group (predisposing, enabling or reinforcing) and age, education and location.

TABLE 4a: CBE USE <40YRS OLD			Unadjusted		Adjusted*		Group Model**	
Group of Associated Factors	Factor	Categories	OR [95% CI]	p-value	OR [95% CI]	p-value	OR [95% CI]	p-value
Predisposing	Stress	always: frequently: sometimes: rarely/never:	1.43 [.94-2.18] .81 [.57-1.16] .84 [.63-1.12] REF	p= .095 p= .257 p= .232 REF	1.45 [.94-2.23] .83 [.57-1.19] .83 [.61-1.11] REF	p= .091 p= .307 p= .206 REF	1.47 [.95-2.27] .83 [.57-1.20] .83 [.62-1.12] REF	p= .081 p= .306 p= .216 REF
	Preventive health knowledge	high: moderate/low:	REF .59 [.21-1.61]	REF p= .302	REF .64 [.23-1.81]	REF p= .407	REF .61 [.22-1.71]	REF p= .352
Enabling	Physician Access	yes: no:	1.82 [1.44-2.30] REF	p< .001 REF	1.72 [1.35-2.20] REF	p< .001 REF	1.69 [1.32-2.16] REF	p< .001 REF
	Insurance Status	yes: no:	1.37 [1.05-1.79] REF	p= .020 REF	1.23 [.93-1.62] REF	p= .141 REF	1.15 [.86-1.53] REF	p= .346 REF
	Monthly family income	<1000: 1000-1999: 2000-3999: 4000+:	REF 1.06 [.79-1.42] 1.34 [.83-2.17] 1.39 [.61-3.18]	REF p= .692 p= .228 p= .431	REF .97 [.71-1.32] 1.29 [.77-2.14] 1.16 [.49-2.77]	REF p= .845 p= .335 p= .731	REF .95 [.69-1.29] 1.16 [.69-1.97] .99 [.41-2.40]	REF p= .725 p= .568 p= .981
Reinforcing	Marital status	Single: Married: No longer partnered: Open Union:	REF 1.72 [1.28-2.30] 2.49 [1.37-4.52] 1.76 [1.33-2.32]	REF p< .001 p= .003 p< .001	REF 1.53 [1.09-2.17] 2.23 [1.18-4.22] 1.78 [1.30-2.44]	REF p= .014 p= .014 p< .001	REF 1.54 [1.09-2.19] 2.21 [1.16-4.21] 1.78 [1.28-2.48]	REF p= .015 p= .016 p= .001
	Domestic violence	Never/not in last month: Ever/at least in last month:	REF 1.16 [.82-1.64]	REF p= .404	REF 1.22 [.85-1.74]	REF p= .282	REF 1.08 [.74-1.57]	REF p= .687

	Feel safe in home	Very safe: Somewhat safe: Somewhat unsafe: Very unsafe:	REF 1.07 [.82-1.40] 1.29 [.94-1.77] 1.66 [.98-2.80]	REF p= .620 p= .121 p= .058	REF 1.03 [.78-1.36] 1.20 [.86-1.66] 1.60 [.94-2.74]	REF p= .827 p= .279 p= .084	REF .98 [.74-1.30] 1.09 [.78-1.52] 1.57 [.90-2.71]	REF p= .880 p= .623 p= .109
	Child Abuse	Never: On a few occasions: More or less 1x/month: More or less 1x/week: Almost every day:	REF 1.23 [.87-1.73] .97 [.60-1.56] 1.10 [.67-1.81] 1.04 [.66-1.64]	REF p= .236 p= .885 p= .699 p= .858	REF 1.26 [.88-1.78] 1.03 [.63-1.69] 1.24 [.74-2.07] 1.04 [.66-1.67]	REF p= .204 p= .904 p= .401 p= .851	REF 1.28 [.90-1.84] 1.00 [.61-1.65] 1.22 [.73-2.04] .93 [.58-1.50]	REF p= .164 p= 1.00 p= .456 p= .771
Confounders	Age	continuous:	1.04 [1.02-1.06]	p< .001	-	-	-	-
	Education	0-6 (hasta primaria): 7-11 (hasta secundaria): 12-14 (superior no universitario): 15+ (superior universitario):	REF 1.43 [.94-2.17] 1.64 [1.05-2.57] 2.01 [1.25-3.24]	REF p= .096 p= .030 p= .004	-	-	-	-
	Location	Villa El Salvador: Trujillo: Huancayo: Lima-Callao:	1.39 [1.02-1.89] 1.59 [1.15-2.21] .86 [.63-1.17] REF	p= .036 p= .005 p= .344	-	-	-	-

*Adjusted for age, education and location.

**Including variables within given risk factor group (predisposing, enabling or reinforcing) and age, education and location.

TABLE 4b: CBE USE >=40YRS OLD			Unadjusted		Adjusted*		Group Model**	
Group of Associated Factors	Factor	Categories	OR [95% CI]	p-value	OR [95% CI]	p-value	OR [95% CI]	p-value
Predisposing	Stress	always: frequently: sometimes: rarely/never:	.71 [.49-1.04] .87 [.61-1.25] .82 [.62-1.10] REF	p= .078 p= .447 p= .183 REF	.90 [.60-1.34] .99 [.68-1.45] .86 [.64-1.17] REF	p= .590 p= .964 p= .336 REF	.90 [.60-1.34] .98 [.67-1.44] .87 [.64-1.17] REF	p= .604 p= .936 p= .357 REF
	Preventive health knowledge	high: moderate/low:	REF .64 [.32-1.29]	REF p= .212	REF .62 [.30-1.29]	REF p= .201	REF .63 [.30-1.32]	REF p= .221
Enabling	Physician Access	yes: no:	1.55 [1.23-1.95] REF	p< .001 REF	1.42 [1.11-1.81] REF	p= .005 REF	1.28 [1.00-1.65] REF	p= .054 REF
	Insurance Status	yes: no:	2.00 [1.59-2.51] REF	p< .001 REF	1.67 [1.30-2.14] REF	p< .001 REF	1.52 [1.17-1.97] REF	p= .001 REF
	Monthly family income	<1000: 1000-1999: 2000-3999: 4000+:	REF 1.67 [1.26-2.21] 2.44 [1.54-3.86] 4.57 [2.14-9.72]	REF p< .001 p< .001 p< .001	REF 1.22 [.90-1.66] 1.76 [1.07-2.90] 3.24 [1.46-7.20]	REF p= .206 p= .026 p= .004	REF 1.13 [.83-1.54] 1.59 [.96-2.62] 2.75 [1.23-6.15]	REF p= .448 p= .073 p= .014
Reinforcing	Marital status	Single: Married: No longer partnered: Open Union:	REF .80 [.57-1.14] .57 [.38-.86] .54 [.35-.85]	REF p= .226 p= .007 p= .007	REF .91 [.63-1.32] .74 [.48-1.13] .61 [.38-.99]	REF p= .634 p= .163 p= .046	REF .92 [.63-1.34] .72 [.46-1.11] .60 [.37-.99]	REF p= .674 p= .135 p= .043
	Domestic violence	Never/not in last month: Ever/at least in last month:	REF .62 [.42-.92]	REF p= .017	REF .69 [.46-1.04]	REF p= .077	REF .67 [.44-1.03]	REF p= .065

	Feel safe in home	Very safe: Somewhat safe: Somewhat unsafe: Very unsafe:	REF .96 [.73-1.27] 1.09 [.80-1.47] .85 [.50-1.46]	REF p= .778 p= .589 p= .558	REF 1.00 [.75-1.33] 1.15 [.84-1.58] .88 [.50-1.54]	REF p= .987 p= .378 p= .652	REF 1.00 [.74-1.34] 1.20 [.87-1.65] .88 [.87-1.65]	REF p= .998 p= .261 p= .667
	Child Abuse	Never: On a few occasions: More or less 1x/month: More or less 1x/week: Almost every day:	REF 1.09 [.82-1.45] .87 [.55-1.38] .97 [.62-1.51] 1.07 [.72-1.59]	REF p= .567 p= .563 p= .891 p= .742	REF 1.24 [.92-1.68] 1.12 [.69-1.81] 1.29 [.81-2.06] 1.44 [.95-2.21]	REF p= .156 p= .650 p= .289 p= .089	REF 1.28 [.94-1.74] 1.16 [.71-1.89] 1.42 [.88-2.30] 1.53 [.99-2.34]	REF p= .114 p= .547 p= .150 p= .054
Confounders	Age	continuous:	.98 [.98-1.00]	p= .010	-	-	-	-
	Education	0-6 (hasta primaria): 7-11 (hasta secundaria): 12-14 (superior no universitario): 15+ (superior universitario):	REF 1.65 [1.25-2.16] 3.78 [2.57-5.56] 3.08 [2.19-4.32]	REF p< .001 p< .001 p< .001	-	-	-	-
	Location	Villa El Salvador: Trujillo: Huancayo: Lima-Callao:	1.00 [.74-1.35] 1.14 [.84-1.54] .61 [.45-.83] REF	p= .996 p= .415 p= .001 REF	-	-	-	-

*Adjusted for age, education and location.

**Including variables within given risk factor group (predisposing, enabling or reinforcing) and age, education and location.

TABLE 5a: PAP USE <40YRS OLD			Unadjusted		Adjusted*		Group Model**	
Group of Associated Factors	Factor	Categories	OR [95% CI]	p-value	OR [95% CI]	p-value	OR [95% CI]	p-value
Predisposing	Stress	always: frequently: sometimes: rarely/never:	2.24 [1.43-3.51] 1.86 [1.31-2.64] 1.40 [1.06-1.84] REF	p< .001 p= .001 p= .019 REF	2.02 [1.22-3.36] 1.56 [1.05-2.31] 1.28 [.93-1.76] REF	p= .007 p= .027 p= .123 REF	2.09 [1.25-3.49] 1.55 [1.04-2.30] 1.29 [.94-1.78] REF	p= .005 p= .030 p= .115 REF
	Preventive health knowledge	high: moderate/low:	REF .53 [.23-1.28]	REF p= .155	REF .43 [.16-1.21]	REF p= .109	REF .40 [.14-1.11]	REF p= .079
Enabling	Physician Access	yes: no:	1.54 [1.23-1.93] REF	p< .001 REF	1.62 [1.24-2.10] REF	p< .001 REF	1.62 [1.24-2.11] REF	p< .001 REF
	Insurance Status	yes: no:	1.19 [.91-1.57] REF	p= .202 REF	1.08 [.79-1.48] REF	p= .632 REF	1.01 [.73-1.39] REF	p= .967 REF
	Monthly family income	<1000: 1000-1999: 2000-3999: 4000+:	REF .70 [.53-.93] .84 [.52-1.36] 1.56 [.61-3.96]	REF p= .015 p= .481 p= .355	REF .71 [.51-.98] 1.09 [.63-1.91] 1.50 [.53-4.19]	REF p= .040 p= .752 p= .444	REF .70 [.50-.97] 1.03 [.59-1.83] 1.37 [.48-3.86]	REF p= .034 p= .906 p= .557
Reinforcing	Marital status	Single: Married: No longer partnered: Open Union:	REF 7.84 [5.66-10.85] 8.91 [4.09-19.43] 7.68 [5.65-10.46]	REF p< .001 p< .001 p< .001	REF 3.58 [2.45-5.22] 4.02 [1.74-9.29] 4.82 [3.42-6.80]	REF p< .001 p= .001 p< .001	REF 3.58 [2.43-5.25] 4.08 [1.79-9.73] 4.68 [3.27-6.70]	REF p< .001 p= .001 p< .001
	Domestic violence	Never/not in last month: Ever/at least in last month:	REF 2.21 [1.49-3.27]	REF p< .001	REF 1.79 [1.16-2.75]	REF p= .008	REF 1.14 [.72-1.79]	REF p= .575

	Feel safe in home	Very safe: Somewhat safe: Somewhat unsafe: Very unsafe:	REF 1.11 [.85-1.45] 1.31 [.95-1.81] 2.08 [1.14-3.79]	REF p= .427 p= .102 p= .017	REF 1.09 [.81-1.48] 1.03 [.72-1.49] 2.01 [1.04-3.9]	REF p= .555 p= .856 p= .039	REF .94 [.68-1.29] .77 [.52-1.14] 1.42 [.70-2.88]	REF p= .700 p= .197 p= .329
	Child Abuse	Never: On a few occasions: More or less 1x/month: More or less 1x/week: Almost every day:	REF 1.09 [.78-1.51] 1.43 [.90-2.27] 1.19 [.74-1.92] 2.60 [1.61-4.20]	REF p= .620 p= .133 p= .475 p< .001	REF 1.11 [.77-1.62] 1.66 [.98-2.80] 1.10 [.64-1.90] 2.20 [1.29-3.76]	REF p= .569 p= .058 p= .733 p= .004	REF 1.19 [.81-1.77] 1.67 [.96-2.91] 1.06 [.60-1.89] 1.78 [1.01-3.12]	REF p= .376 p= .067 p= .837 p= .046
Confounders	Age	continuous:	1.17 [1.14-1.19]	p< .001	-	-	-	-
	Education	0-6 (hasta primaria): 7-11 (hasta secundaria): 12-14 (superior no universitario): 15+ (superior universitario):	REF .73 [.48-1.09] .51 [.33-.79] .60 [.37-.95]	REF p= .126 p= .002 p= .028	-	-	-	-
	Location	Villa El Salvador: Trujillo: Huancayo: Lima-Callao:	1.81 [1.29-2.53] .62 [.45-.86] .81 [.60-1.08] REF	p= .001 p= .004 p= .145 REF	-	-	-	-

*Adjusted for age, education and location.

**Including variables within given risk factor group (predisposing, enabling or reinforcing) and age, education and location.

Table 5b: PAP USE >=40YRS OLD			Unadjusted		Adjusted*		Group Model**	
Group of Associated Factors	Factor	Categories	OR [95% CI]	p-value	OR [95% CI]	p-value	OR [95% CI]	p-value
Predisposing	Stress	always: frequently: sometimes: rarely/never:	.97 [.60-1.57] 1.17 [.72-1.88] 1.10 [.76-1.60] REF	p= .902 p= .529 p= .622 REF	.95 [.57-1.59] 1.18 [.71-1.94] 1.05 [.71-1.56] REF	p= .849 p= .526 p= .793 REF	.95 [.57-1.59] 1.16 [.70-1.92] 1.06 [.71-1.57] REF	p= .853 p= .553 p= .780 REF
	Preventive health knowledge	high: moderate/low:	REF .70 [.31-1.56]	REF p= .380	REF .68 [.29-1.60]	REF p= .383	REF .69 [.29-1.61]	REF p= .390
Enabling	Physician Access	yes: no:	1.68 [1.25-2.25] REF	p= .001 REF	1.80 [1.31-2.47] REF	p< .001 REF	1.69 [1.22-2.34] REF	p= .002 REF
	Insurance Status	yes: no:	1.59 [1.17-2.16] REF	p= .003 REF	1.54 [1.09-2.17] REF	p= .014 REF	1.38 [.97-1.98] REF	p= .073 REF
	Monthly family income	<1000: 1000-1999: 2000-3999: 4000+:	REF 1.26 [.87-1.83] 1.89 [.96-3.74] 2.99 [.91-9.83]	REF p= .218 p= .067 p= .071	REF .97 [.64-1.46] 1.45 [.70-3.02] 2.07 [.60-7.12]	REF p= .879 p= .317 p= .248	REF .88 [.58-1.34] 1.27 [.60-2.66] 1.71 [.49-5.93]	REF p= .562 p= .530 p= .399
Reinforcing	Marital status	Single: Married: No longer partnered: Open Union:	REF 2.71 [1.80-4.08] 1.29 [.82-2.03] 2.42 [1.39-4.22]	REF p< .001 p= .272 p= .002	REF 3.25 [2.10-5.03] 2.11 [1.29-3.46] 2.31 [1.27-4.20]	REF p< .001 p= .003 p= .006	REF 3.31 [2.12-5.19] 2.08 [.126-3.44] 2.32 [1.25-4.28]	REF p< .001 p= .004 p= .007
	Domestic violence	Never/not in last month: Ever/at least in last month:	REF 1.32 [.77-2.25]	REF p= .312	REF 1.24 [.71-2.17]	REF p= .442	REF 1.07 [.60-1.91]	REF p= .807

	Feel safe in home	Very safe: Somewhat safe: Somewhat unsafe: Very unsafe:	REF 1.04 [.71-1.51] .64 [.44-.92] .84 [.42-1.67]	REF p= .843 p= .015 p= .622	REF 1.10 [.75-1.63] .66 [.45-.98] .89 [.43-1.81]	REF p= .622 p= .037 p= .742	REF 1.03 [.69-1.53] .62 [.42-.93] .87 [.42-1.82]	REF p= .902 p= .020 p= .718
	Child Abuse	Never: On a few occasions: More or less 1x/month: More or less 1x/week: Almost every day:	REF 1.20 [.84-1.74] .90 [.52-1.57] 1.40 [.76-2.58] 1.29 [.76-2.19]	REF p= .319 p= .710 p= .273 p= .340	REF 1.32 [.90-1.95] 1.00 [.55-1.80] 1.62 [.86-3.05] 1.49 [.85-2.62]	REF p= .153 p= .994 p= .138 p= .161	REF 1.36 [.91-2.02] 1.01 [.55-1.85] 1.93 [.99-3.73] 1.56 [.88-2.76]	REF p= .131 p= .965 p= .052 p= .126
Confounders	Age	continuous:	.96 [.94-.97]	p< .001	-	-	-	-
	Education	0-6 (hasta primaria): 7-11 (hasta secundaria): 12-14 (superior no universitario): 15+ (superior universitario):	REF 1.99 [1.40-2.82] 5.02 [2.55-9.85] 2.14 [1.37-3.35]	REF p< .001 p< .001 p= .001	-	-	-	-
	Location	Villa El Salvador: Trujillo: Huancayo: Lima-Callao:	1.06 [.70-1.62] .71 [.48-1.05] .61 [.42-.88] REF	p= .782 p= .087 p= .009 REF	-	-	-	-
*Adjusted for age, education and location.								
**Including variables within given risk factor group (predisposing, enabling or reinforcing) and age, education and location.								

women <40 yrs of age*		Mammography		Clinical Breast Exam		Pap smear	
Variable	Categories	OR [95% CI]	p-value	OR [95% CI]	p-value	OR [95% CI]	p-value
Stress	always:	.89 [.46-1.76]	p= .743	1.37 [.87-2.15]	p= .169	1.94 [1.11-3.39]	p= .020
	frequently:	.60 [.34-1.06]	p= .079	.76 [.52-1.12]	p= .164	1.48 [.97-2.26]	p= .070
	sometimes:	.72 [.46-1.11]	p= .136	.82 [.60-1.11]	p= .189	1.33 [.95-1.87]	p= .097
	rarely/never:	REF	REF	REF	REF	REF	REF
Preventive Health Knowledge	high:	REF	REF	REF	REF	REF	REF
	moderate/low:	.96 [.21-4.33]	p= .957	.72 [.25-2.05]	p= .532	.44 [.15-1.32]	p= .143
Physician Access	yes:	1.01 [.69-1.47]	p= .957	1.71 [1.33-2.20]	p< .001	1.56 [1.18-2.08]	p= .002
	no:	REF	REF	REF	REF	REF	REF
Insurance Status	yes:	1.24 [.79-1.94]	p= .344	1.14 [.84-1.53]	p= .405	1.05 [.74-1.49]	p= .791
	no:	REF	REF	REF	REF	REF	REF
Monthly Family Income	<1000:	REF	REF	REF	REF	REF	REF
	1000-1999:	1.07 [.66-1.74]	p= .772	.99 [.72-1.35]	p= .930	.79 [.55-1.13]	p= .198
	2000-3999:	1.25 [.58-2.71]	p= .568	1.26 [.74-2.15]	p= .402	1.09 [.60-2.00]	p= .775
	4000+:	1.27 [.33-4.87]	p= .724	1.07 [.43-2.64]	p= .889	1.57 [.50-4.93]	p= .437
Marital Status	Single:	REF	REF	REF	REF	REF	REF
	Married:	.82 [.48-1.42]	p= .486	1.42 [.99-2.04]	p= .055	3.44 [2.32-5.09]	p< .001
	No longer partnered:	1.59 [.64-3.90]	p= .315	2.13 [1.10-4.11]	p= .025	4.09 [1.74-9.60]	p= .001
	Open Union:	.75 [.44-1.26]	p= .271	1.76 [1.26-2.47]	p= .001	4.61 [3.20-6.65]	p< .001
Domestic Violence	Never/not in last month:	REF	REF	REF	REF	REF	REF
	Ever/at least in last month:	.65 [.32-1.30]	p= .220	1.06 [.72-1.55]	p= .767	1.09 [.69-1.73]	p= .701
Feel safe in home	Very safe:	REF	REF	REF	REF	REF	REF
	Somewhat safe:	.74 [.47-1.16]	p= .190	1.00 [.75-1.33]	p= .994	.94 [.68-1.30]	p= .714
	Somewhat unsafe:	1.01 [.60-1.69]	p= .971	1.13 [.80-1.59]	p= .493	.74 [.50-1.11]	p= .146
	Very unsafe:	.29 [.07-1.25]	p= .097	1.53 [.87-2.70]	p= .141	1.32 [.64-2.73]	p= .455

Child abuse	Never:	REF	REF	REF	REF	REF	REF
	On a few occasions:	1.72 [.95-3.12]	p= .073	1.35 [.94-1.94]	p= .107	1.21 [.81-1.81]	p= .341
	More or less 1x/month:	2.09 [.99-4.44]	p= .053	1.04 [.63-1.74]	p= .866	1.69 [.97-2.96]	p= .065
	More or less 1x/week:	.87 [.34-2.27]	p= .780	1.31 [.77-2.23]	p= .313	1.09 [.60-1.96]	p= .786
	Almost every day:	1.24 [.54-2.85]	p= .608	.96 [.59-1.57]	p= .884	1.69 [.94-3.02]	p= .078

*Adjusted for age, education and location.

women >=40 yrs of age		Mammography		Clinical Breast Exam		Pap smear	
Variable	Categories	OR [95% CI]	p-value	OR [95% CI]	p-value	OR [95% CI]	p-value
Stress	always:	1.00 [.62-1.61]	p= .986	.88 [.58-1.34]	p= .564	.91 [.53-1.58]	p= .743
	frequently:	.78 [.50-1.21]	p= .273	.92 [.62-1.36]	p= .667	1.01 [.60-1.71]	p= .965
	sometimes:	.74 [.52-1.05]	p= .088	.86 [.63-1.17]	p= .337	.97 [.65-1.47]	p= .894
	rarely/never:	REF	REF	REF	REF	REF	REF
Preventive Health Knowledge	high:	REF	REF	REF	REF	REF	REF
	moderate/low:	.98 [.44-2.17]	p= .957	.74 [.35-1.58]	p= .441	.82 [.34-1.99]	p= .662
Physician Access	yes:	1.81 [1.33-2.47]	p< .001	1.30 [1.01-1.69]	p= .045	1.66 [1.19-2.32]	p= .003
	no:	REF	REF	REF	REF	REF	REF
Insurance Status	yes:	1.62 [1.21-2.18]	p= .001	1.51 [1.16-1.97]	p= .003	1.26 [.87-1.83]	p= .220
	no:	REF	REF	REF	REF	REF	REF
Monthly Family Income	<1000:	REF	REF	REF	REF	REF	REF
	1000-1999:	1.05 [.74-1.74]	p= .791	1.09 [.79-1.51]	p= .582	.80 [.52-1.25]	p= .329
	2000-3999:	1.99 [1.18-3.36]	p= .009	1.65 [.99-2.76]	p= .057	1.09 [.51-2.35]	p= .824
	4000+:	2.57 [1.20-5.48]	p= .015	2.79 [1.23-6.31]	p= .014	1.62 [.45-5.84]	p= .461
Marital Status	Single:	REF	REF	REF	REF	REF	REF
	Married:	1.14 [.75-1.74]	p= .545	.80 [.55-1.18]	p= .266	3.10 [1.96-4.93]	p< .001
	No longer partnered:	1.09 [.66-1.79]	p= .733	.69 [.44-1.08]	p= .106	2.02 [1.21-3.38]	p= .007
	Open Union:	.58 [.31-1.07]	p= .080	.59 [.36-.97]	p= .036	2.23 [1.19-4.15]	p= .012
Domestic Violence	Never/not in last month:	REF	REF	REF	REF	REF	REF
	Ever/at least in last month:	.96 [.58-1.59]	p= .866	.69 [.45-1.06]	p= .088	1.08 [.60-1.92]	p= .805
Feel safe in home	Very safe:	REF	REF	REF	REF	REF	REF
	Somewhat safe:	.89 [.63-1.26]	p= .515	1.01 [.75-1.36]	p= .969	1.00 [.67-1.50]	p= .995
	Somewhat unsafe:	.89 [.60-1.30]	p= .539	1.28 [.93-1.78]	p= .132	.64 [.42-.96]	p= .031
	Very unsafe:	1.34 [.71-2.53]	p= .371	.97 [.54-1.75]	p= .929	.88 [.42-1.86]	p= .745

Child abuse	Never:	REF	REF	REF	REF	REF	REF
	On a few occasions:	.95 [.68-1.35]	p= .789	1.29 [.95-1.77]	p= .106	1.27 [.85-1.91]	p= .242
	More or less 1x/month:	.91 [.52-1.62]	p= .761	1.21 [.74-1.99]	p= .445	.93 [.51-1.73]	p= .827
	More or less 1x/week:	.83 [.47-1.48]	p= .530	1.46 [.89-2.39]	p= .131	1.87 [.95-3.68]	p= .068
	Almost every day:	1.38 [.84-2.24]	p= .199	1.59 [1.02-2.46]	p= .039	1.57 [.88-2.81]	p= .127

*Adjusted for age, education and location.