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# Testing Targeted Approaches to Enhance Cancer Genetics Network Minority Recruitment within Asian Populations

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## Key Words

Cancer genetics · Minority recruitment · Cancer Genetics Network

## Abstract

**Background/Aims:** Asian Americans have been underrepresented in cancer research. The purpose of this study was to evaluate the efficacy of a multiple arm recruitment approach in improving Asian recruitment into the Cancer Genetics Network (CGN). **Methods:** 1,096 potential participants, identified through cancer registries located at University of California, Irvine (UCI) and Fred Hutchinson Cancer Research Center (FHCRC), were randomly assigned to receive one of four recruitment approaches. **Results:** A 6.2% gain in Asian participation into the CGN was achieved over a 2-year period at FHCRC and UCI, which contributed a 2% CGN-wide increase in overall Asian enrollment. Site-specific differences in recruitment success by study arm were observed. **Conclusion:** Novel recruitment approaches can assist in improving recruitment of Asian populations into cancer genetic research studies.

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## Introduction

Advances in human genetics have provided an important new opportunity to identify cancer genes through studies of cancer-prone families and individuals with no family history of cancer. However, recruitment into cancer research trials, including cancer genetics studies, has traditionally yielded large percentages of non-Hispanic Caucasians, with very little representation by minority populations. Although there is an urgency to continue cancer genetics research, additional observational and experimental studies are especially needed to evaluate the effects of different recruitment strategies on enrollment decisions among ethnic and racial minorities [1].

Barriers to recruitment of minority populations can affect the generalizability and impact of research findings for those populations [2, 3]. Although Asian Americans represent one of the major minority groups in the US, there is a paucity of published literature concerning the participation of Asian Americans in cancer research [3–6]. Many recruitment barriers exist among the Asian population [4–9], generally including a lack of knowledge related to cancer and genetics, as well as cultural beliefs which influence attitudes toward cancer. For example,

beliefs that cancer is a curse, a punishment from God, and is contagious, promotes behaviors of avoidance and denial rather than proactive health-seeking behavior [10, 11]. Other commonly reported barriers to participation in research among Asians include language problems, lack of culturally relevant cancer information, complex protocols, fear of ill effects, fear of experimentation or belief that experimental protocols are inferior to standard care, and influence of family in decision-making [4–6]. In addition, Vietnamese individuals may be reluctant to disclose personal health information fearing that the information may be used against them, or fearing that they will lose face within their family and community [Ghosheh et al., pers. commun.].

Orange County, California is home to the largest Vietnamese population outside of Vietnam. A local pilot study of Vietnamese-serving health care practitioners in Orange County, California, reinforced concepts that cultural attitudes and beliefs strongly influenced perceptions of cancer and genetics [Ghosheh et al., pers. commun.]. When queried about specific recruitment barriers, the following were prominent: (1) distrust in research; (2) language; (3) desire to stay only within their own community. The following were recommended actions to reduce recruitment barriers: (1) recruit from credible, trusted community leaders; (2) use grass roots community organizations; (3) sponsor local community dinners; (4) recruit through local Vietnamese radio. Anecdotally, it is worth noting that all practitioners stated that our standard population-based mail-out recruitment method would not be effective with Vietnamese subjects.

In 1998, the National Cancer Institute funded an innovative cancer family registry: the national Cancer Genetics Network (CGN) which provided participating researchers access to a breadth of research data not currently available to most individual cancer genetics programs. The CGN is comprised of eight main centers around the nation which are linked to a central informatics center. The Network supports collaborations to investigate the genetic basis of cancer susceptibility, explore mechanisms to integrate this new knowledge into medical practice, and identify ways to address associated psychosocial, ethical, legal, and public health issues [12]. Early recruitment efforts into the CGN did not specifically target minorities; thus, minority participation rates lagged behind those of Caucasian families [Bowen, Vu and Kasten-Sportes, this issue, pp. 191–192]. As of May 2002, the CGN contained data on 15,007 participants and 241,948 family members. The majority of CGN participants were of Non-Hispanic White/Caucasian ethnicity

(90%), with few numbers of Hispanic (4%), Black (3%), Asian (1%), and other ethnicities (2%). Therefore, the CGN investigators initiated a program (1) to increase minority enrollment in the CGN and (2) to contribute to the scientific knowledge about enhancement of minority participation in genetics studies. This study presents data from one of the projects in that effort. Since Asians make up more than 7% of all cancers diagnosed in the states of Washington and California, it was essential to work toward a greater representation of this population in a multi-ethnic registry.

The study described herein offered an opportunity to examine relative benefits of four mail-out recruitment strategies, thereby altering the customary population-based recruitment approach in order to potentially increase Asian participation in the CGN. The purpose of this paper was to evaluate the efficacy of a multiple-arm recruitment approach conducted through cancer registries located at University of California, Irvine (UCI), and Fred Hutchinson Cancer Research Center (FHCRC), and evaluate the relative efficacy of each arm in enhancing Asian recruitment to the CGN.

## Materials and Methods

### *Conceptual Framework for Recruitment Approaches*

Since the decision to accept or decline participation in an initial survey to collect epidemiological and medical history information is similar to decisions to participate in survey-based research, we have used conceptual models from this body of research to develop the recruitment approaches for the proposed research [13].

### *Incentive Approach*

First, the opportunity cost [13] approach argues that the typical invitee to the CGN is rational, in the sense that they compare the perceived costs and benefits of participation in a survey. The perceived costs of participating are likely based on the time needed to complete the task, other competing tasks being neglected or postponed, cognitive burden required to comply with the survey requests, the future obligations that participation may incur, and the possible embarrassment or discomfort associated with providing (or not being able to provide) a family medical history. The perceived benefits may include the novelty of participating in a research project, and the possibility that participation will improve the diagnosis, treatment, and prevention of cancer. In general, when perceived benefits outweigh perceived costs, an invitee is more likely to enroll and complete the questionnaires. Providing an enrollment incentive to probands may increase perceptions of the benefits of CGN participation in relation to perceptions of the costs (i.e. time) of participating.

The theory of social exchange (SE) [14, 15] argues that the key element affecting participation in survey research is the perceived equity between a person and the institution conducting the study.

This theory predicts that an individual will enter into and stay within a relationship so long as there is reciprocation and the social 'ledger' is roughly in balance. The commodities involved in a relationship include those that are social (trust, approval) as well as economic (money, information) in nature. SE theory may apply to a wide range of obligations and expectations over an extended period of time between individuals and social institutions. The theory is best suited for studying long-term associations between individuals or between individuals and institutions (e.g. spouse or employee-employer dyads). In the case of the CGN, where the individual is being asked to agree to a potentially long-term relationship with the CGN, the ideas embodied in SE theory are relevant. As individuals evaluate whether they will participate, they will likely consider what it means to provide consent to join the CGN in terms of future studies and the potential involvement of family members. Whether there is perceived equity between what the individual will provide and what the individual will receive will depend in part on how well the CGN is able to describe the protocol and persuade individuals of the value of their participation. This, however, is a moot point for persons who are not interested enough to even read about the protocol and the study design. An incentive, as proposed here, will likely increase the chances that the subject will sufficiently consider enrolling in the CGN. According to SE theory, the phone card incentive proposed here additionally will create an inequity such that the individual will feel more obliged to participate. The provision of phone cards is also a well-tailored intervention in that it allows individuals to remain in contact with family members with whom they also have a long-term relationship.

Finally, the theory of social isolation suggests that persons who are isolated or alienated from larger society will be less likely to accept an invitation to participate in a study to the extent that the sponsors of the study are viewed as representing the interests of the larger study (i.e. the federal government, the medical profession). This argument has been used to explain lower participation rates among ethnic minorities, persons of low socioeconomic status and the elderly [13]. To some extent, participating in a survey is similar to voting, where more isolated or disenfranchised persons are less prone to involve themselves in an activity that is beneficial to larger society. On the other hand, an invitation to participate can also be seen as an opportunity for the individual to provide input about an issue that can be empowering, thereby reducing his/her level of perceived alienation. It is also possible that the individual will not see the interests of medicine or the government being served but rather the individual's own family. This attitude may arise if individuals are viewing themselves as cancer survivors or members of high-risk cancer families. An incentive to participate may be especially effective at enhancing cooperation rates among the poor or the most disenfranchised who may view it as a form of appreciation on the part of the CGN.

#### Culturally Appropriate (Pan-Asian) Message Letter

The culturally appropriate message letter was conceived based on evidence that individuals from minority cultures report feeling left out or otherwise disenfranchised from research projects and studies [1]. Recruiting Asian individuals poses additional complications of diverse cultures, languages, and perspectives within the label 'Asian'. Many studies hire staff and provide materials that reflect the language, images, and skin color of the in-

dividuals to be recruited to demonstrate inclusion in all areas of the project. Recruitment through a cancer registry is a commonly used and efficient population-based method of identifying cancer patients for participation in a wide variety of studies. However, SEER-based recruitment offers no option for personal contact prior to recruitment and no option for determining the specific Asian culture of the potential recipient. Therefore, a simple, culturally appropriate message letter was designed that welcomes people to participate in six key Asian languages and in English. The letter is intended to convey a welcoming feeling to the potential participant, so that when the approach packet arrives, or an interviewer calls to determine eligibility and interest, the participant is more likely to engage the interviewer and to ultimately join the CGN.

#### Study Population

The Institutional Review Board at both institutions approved the study. Potential participants were identified through the Cancer Surveillance System at FHCRC which collects data on malignancies in thirteen counties in northwestern Washington State and the Cancer Surveillance Program of Orange, San Diego and Imperial County at UCI. Cancer cases are reported mandatorily via state-wide tumor registries; therefore, the majority of cases are identified without patient consent. Participant consent is obtained if a patient chooses to enroll in a study. In this study, Asian men and women age 18 and older, diagnosed with breast, lung, stomach, ovarian, prostate, or colorectal (UCI only) cancer between the years of 1998 and 2002 were eligible if they were able to speak English (FHCRC only) or English or Vietnamese (UCI only). Although beyond the scope of this study to specifically distinguish Asian subgroup differences, it was hypothesized that the Asian community at FHCRC would be composed of multiple ethnicities, including Vietnamese, Chinese, Korean, Japanese, and Filipino, many of whom would have lived in the US longer than the relatively recent immigrant Vietnamese community in southern California, which comprised the largest Asian subgroup for the UCI sample.

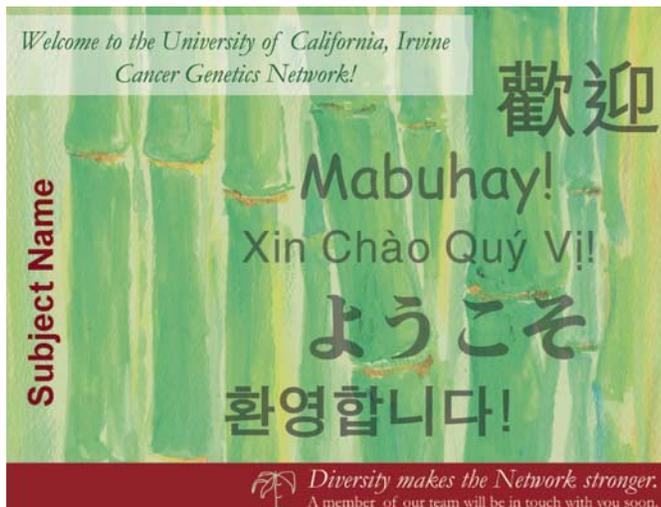
#### Study Design

Eligible subjects were stratified by age (<50, ≥50 years) and gender. Potential participants were randomly assigned, through the process of allocation concealment [16], which is used to conceal the randomization assignment until after the randomization process is over, to receive one of the following recruitment approaches:

(1) Traditional approach packet: This includes an institution-specific invitation letter, study brochure (FHCRC subjects) or cancer registry brochure (UCI subjects), consent form, study questionnaire, and business reply envelope. Usual telephone follow-up occurred approximately 1 week after mailing.

(2) Traditional approach packet + phone card incentive with mailing: This included the traditional approach packet materials outlined above, with the addition of a phone card incentive printed in English, but with international calling capacity. The incentive, a USD 20 (maximum value) telephone calling card, was included in the approach packet and was highlighted within the body of the invitation letter.

(3) Traditional approach packet + pan-Asian message greeting with mailing: This included the traditional approach packet materials outlined above (1), with the addition of a pan-Asian



**Fig. 1.** Example of pan-Asian message letter.

message greeting (fig. 1). The colorful cultural message letter says ‘hello’ in Chinese, Tagalog, Vietnamese, Japanese, and Korean. Each letter was personalized to include the subject’s name on the left. The message welcomes the subject to the Cancer Genetics Network and contains the phrase ‘Diversity makes the Network stronger, a member of our team will be in touch with you soon’. This sheet was placed first (on top) in the packet of materials.

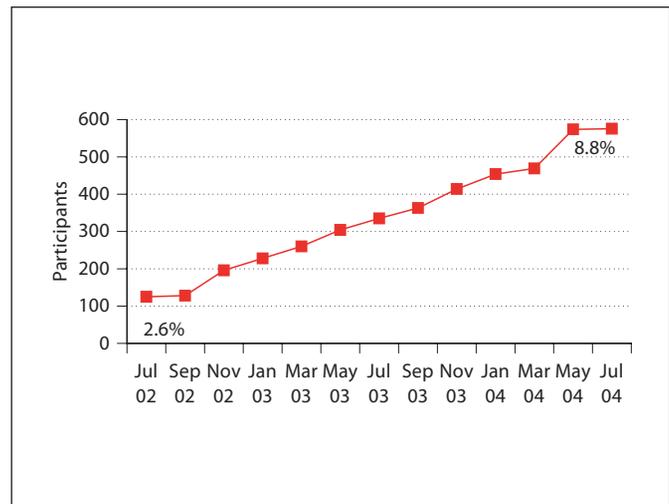
(4) Traditional approach packet + pan-Asian message greeting + phone card incentive with mailing: This included the traditional approach packet materials outlined above, in addition to the phone card incentive and personalized pan-Asian message greeting (1–3).

At UCI, the study introductory letter, consent form, and questionnaire were translated into Vietnamese. Subjects who were identified as Vietnamese in the Cancer Registry received a mail-out packet containing study documents in both English and Vietnamese. Telephone follow-up with identified Vietnamese subjects was conducted with a bilingual Vietnamese interviewer; an English-speaking interviewer followed up with other Asian participants.

#### Measures

##### Core Data Elements Survey

Participants were asked to complete the standard CGN Core Data Elements (CDE) Survey. The CDE is an extensive questionnaire that evaluates the participant’s demographic information (age, education level, marital status, and ethnicity), general medical history (i.e. personal cancer history, surgeries received), and cancer family history. In terms of cancer family history, participants were asked to provide information (i.e. relative’s name, type of cancer, age at diagnosis, current age, and vital status) about first-, second- and sometimes third-degree relatives from both maternal and paternal sides of the family. The CDE Survey took approximately 30–40 min to complete.



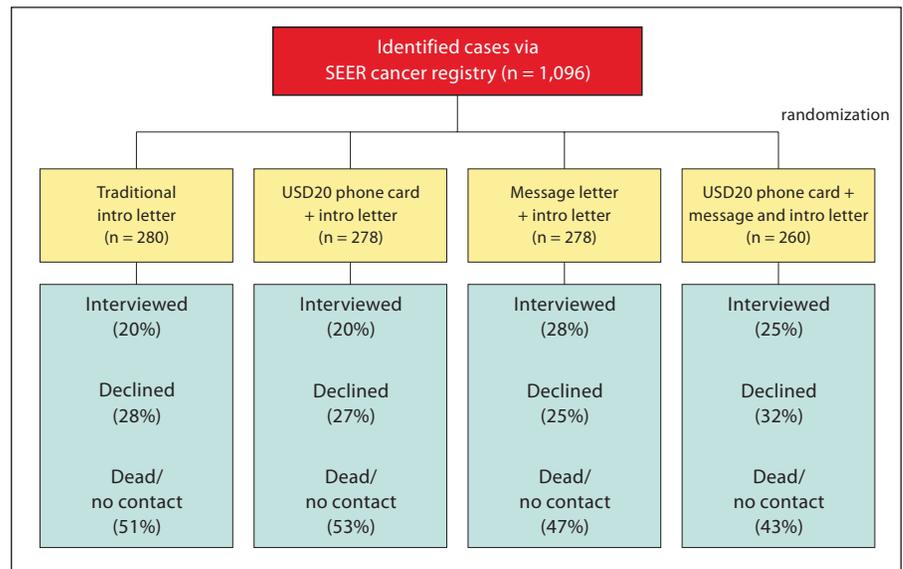
**Fig. 2.** Percent of Asian participants of total CGN participants as of July 2004 data transmission (FHCRC and UCI).

#### Refuser Survey

Participants who declined enrollment in the CGN were asked to complete the refuser survey over the phone. The refuser survey consists of four questions that address patient’s ethnicity, language(s) spoken at home, reasons for disinterest in CGN enrollment, and effect, if any, the approach materials had on their decision to participate. The purpose of the survey is to evaluate the effectiveness of our randomized trial and to identify potential CGN enrollment barriers. The ethnicity, language, and incentive questions were also included in the core survey.

#### Data Analysis

The overall response rate in the CGN population-based centers ranges from 60 to 75%. However, the response rate calculation was based on a primarily Caucasian sample. We anticipated that the response rate for an Asian sample would be less than the response rate for Caucasians, by at least 20%, based on previous research [1]. Therefore, based upon the experience of this investigative team in conducting other interview-based case-control studies of cancer in the same population, approximately 40% of the eligible cases were projected to return completed questionnaires. Since the main outcome of this study was to enroll Asian participants into the CGN, the change in Asian enrollment due to the intervention was measured. Outcome evaluations of participant enrollment in the CGN were conducted following the study invitation. Specifically, CGN records at both centers were reviewed to determine whether eligible subjects provided informed consent to participate in the CGN and completed the CDE survey. Descriptive statistics were generated to characterize the study sample. Comparisons between participation rates were conducted using the likelihood ratio  $\chi^2$  test. Logistic regressions were used to estimate odds ratios and 95% confidence intervals, where participant enrollment (accept or decline) in the CGN was the outcome of interest. These models were based on all individuals invited to join the CGN. Data were analyzed with SAS for Windows, v8.2 [17].



**Fig. 3.** Study disposition of identified subjects.

## Results

### Primary Outcome: Overall Enrollment

The primary objective was to increase Asian participation into the CGN. As shown in figure 2, a 6.2% gain in Asian participants over a 2-year period at FHCRC and UCI was achieved. The total composition of the CGN at FHCRC and UCI prior to targeting Asians for enrollment was only 2.6%. By the end of this study, almost 9% of enrollees at the two centers were Asian. This contributed to a 2% CGN-wide increase in overall Asian enrollment. The overall participation rate (after excluding deceased and no contact subjects) was 45.5%.

Figure 3 describes the disposition of all identified study subjects, as recommended by Altman et al. [18]. In this, 1,096 subjects were identified for this study at FHCRC and UCI, 280 subjects were randomized to receive the standard mailing, 278 received the standard mailing plus phone card, 278 received the standard plus message letter, and 260 received the standard packet plus phone card and message letter. A total of 256 subjects enrolled into the CGN by completing the questionnaire: 57 (20%) in the traditional mail-out group, 56 (20%) in the phone card group, 77 (28%) in the message letter group, and 66 (25%) in the combined group. A total of 307 subjects declined to participate in the CGN: 79 (28%) in the traditional mail-out group, 75 (27%) in the phone card group, 70 (25%) in the message letter group, and 83 (32%) in the combined group. The major reasons cited for declining included no interest, bad health, and time com-

mitment involved in participating in the CGN. Finally, 533 people were not available to study due to ineligibility, inability to be contacted due to wrong address and phone number, or death: 144 (51%) in the traditional mail-out group, 147 (53%) in the phone card group, 131 (47%) in the message letter group, and 111 (43%) in the combined incentive group. Overall participation rates did not differ among study arms with data from both centers combined: 41.9% for controls (i.e. traditional recruitment arm 1), 42.8% for the phone card group, 52.4% for the message letter group, and 44.3% for the combined group.

### Demographic and Medical Variables

Table 1 provides a description of the study participants' demographics. Participants were 34.8% Vietnamese, 17.6% Japanese, 14.8% Filipino, 13.3% Chinese, 4.3% Korean, and 15.2% other Asian ethnicities. Additionally, 54.7% of participants were female, 78.5% were age 50 or more, and 61.3% completed some college or more. The majority of participants were diagnosed with breast or prostate cancer. Other diagnoses included colorectal, lung, liver, cervix, ovarian, and stomach cancers.

### Participation by Center

With the control group set as the reference, subjects were as likely to participate in the study whether they received an incentive or not (table 2). However, a logistic regression by center revealed that the FHCRC group did have a significant effect of incentives on enrollment. Specifically, the USD 20 phone card group was almost 3 times

**Table 1.** Demographics of enrolled participants (n = 256)

	n	%
<b>Ethnicity</b>		
Vietnamese	89	34.8
Japanese	45	17.6
Filipino	38	14.8
Chinese	34	13.3
Korean	11	4.3
Other	39	15.2
<b>Sex</b>		
Male	116	45.3
Female	140	54.7
<b>Age at interview</b>		
<50 years	55	21.5
≥50 years	201	78.5
<b>Education</b>		
High school or less	96	37.5
Some college or more	157	61.3
Unknown	3	1.2

more likely to enroll than the control group; participants who received the message letter were 4.5 times more likely to enroll, and the two-incentive group (phone card plus message letter) was 3 times more likely to enroll. Although an incentive effect was not found at UCI, it is important to note that Vietnamese participants were significantly more likely to enroll in the CGN than other Asians, independent of gender and age ( $p < 0.0001$ ) (49 vs. 29%). This effect held for each study arm, although it was statistically significant in the traditional study arm only ( $p = 0.0028$ ; table 3). Specific to family history, no significant difference was observed in participation rates between those with no first-degree relatives with cancer and those with at least one first-degree relative with cancer.

#### *Factors Influencing Decision to Enroll in the CGN*

Various factors were cited as being influential to participants in deciding to enroll in the CGN. Chief among them was the ability to help find new treatments for cancer (91.4%), help find new genes that may cause cancer (89.3%), help their children and family (84.8%), help learn more about hereditary cancers (72.5%), and do their part to help science (57.6%).

#### **Discussion**

Representation from an ethnically diverse community is an essential component of the CGN. However, barriers to recruitment challenged that goal. Consequently, with-

**Table 2.** Odds ratio (OR) and confidence interval (CI) that a subject will participate in the CGN, by study arm

Group	Subjects	OR	CI
<b>FHCRC and UCI</b>			
Traditional	57	1	
USD 20 phone card	56	1.04	0.64–1.68
Message letter	77	1.53	0.95–2.44
USD 20 card, message letter	66	1.1	0.69–1.76
<b>FHCRC only</b>			
Traditional	15	1	
USD 20 phone card	26	2.89	1.02–8.19
Message letter	28	4.67	1.50–14.53
USD 20 card, message letter	30	3.33	1.19–9.37
<b>UCI only</b>			
Traditional	42	1	
USD 20 phone card	30	0.69	0.39–1.24
Message letter	49	1.17	0.68–2.00
USD 20 card, message letter	36	0.74	0.43–1.29

**Table 3.** Participation rates (%) by arm and ethnicity

Study arm	Vietnamese (n = 85)	Other Asian (n = 72)
Overall**	48.9	28.6
None*	57.5	28.4
USD 20 phone card	42.1	24.1
Message letter	54.3	35.8
Both	42.0	25.0

\*  $p = 0.0028$ ; \*\*  $p < 0.0001$ .

Dead/no contact was excluded from analysis, and only UCI data were used.

in the CGN the importance of developing and evaluating novel methods for identification and enrollment of ethnic minority groups in cancer genetics research became a priority [1]. The study reported herein tested registry-based traditional and novel recruitment approaches, resulting in a 6.2% gain in Asian participants over a 2-year period in two of the CGN centers, and a 2% CGN-wide increase in overall Asian enrollment.

Although initial analyses suggested that increased participation was not linked to a particular 'recruitment' arm, examination of these data by center (FHCRC or UCI) revealed important differences. First, at FHCRC, where all study arms were conducted in English, all novel recruitment arms significantly improved enrollment beyond the traditional method. This suggests that at least

among this population of Asians, who may be more acculturated than those at UCI, an enhanced effort beyond just a letter could be appreciated by potential participants, and fruitful in terms of clinical trial recruitment. Interestingly, the greatest enrollment success was the culturally tailored message greeting, which did not include a financial incentive. In addition, inclusion of both a phone card and the message greeting was no different than the phone card alone, perhaps suggesting that 'more is not necessarily better'.

In contrast, the large Vietnamese population was significantly more likely to enroll than other Asians, regardless of study arm. It is further interesting to note that use of the USD 20 phone card seemed to have the least impact on recruitment among both Vietnamese and other Asians at UCI. Similar to the FHCRC experience, these data suggested that the message greeting in itself could be a powerful motivator, and serve as a culturally appropriate invitation to participate in multicultural studies.

Use of the cancer registries for potential study participant identification could be considered a study strength, since a denominator is available within which to estimate disease type, time from diagnosis, ethnicity and some demographic information. Further, it could be considered a strength that two geographically and ethnically diverse

populations could contribute to these study findings, which enhances potential to generalize the overall results. However, several study weaknesses exist. First, true acculturation can not be measured by preferred language (i.e. English vs. Vietnamese). In fact, behavioral measures and inventories which assess internalized cultural values could be viewed as better determinants of acculturation, and these were not included in this study. In support of this statement, anecdotal experiences conveyed by the Vietnamese interviewer, who provided tremendous personal follow-up to each recruitment, suggests that some participants were suspect of the phone cards they received and did not want to use them. Further, between-arm comparisons among ethnicities may not be robust since the study was not sufficiently powered to reflect this. Nevertheless, interesting trends emerged for future consideration. To that end, perhaps the greatest weakness and one most amenable to immediate future research is incorporation of culturally sensitive community/advocacy input at the inception of study development. This could precede a qualitative component to ensure that barriers are addressed to the extent possible. This area of research requires additional focused attention from experts in the cultures and issues of ethnic minority communities in order to enhance cancer genetic study representation among this minority population.

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