

# Barriers to Breast Cancer Screening In a Managed Care Population

Sharp Health Plan wanted to increase mammography screening for its at-risk female population. Thirty percent of at-risk members were non-adherent. Members' reasons for avoiding screening were examined.

Sandra R. Parkington, MPH, RN<sup>1</sup>; Nora Faine, MD, MPH<sup>2</sup>; Marcia C. Nguyen<sup>3</sup>; Michelle T. Lowry, MPH<sup>4</sup>; Poorva A. Virginkar<sup>5</sup>

<sup>1</sup>Quality Improvement Coordinator, Sharp Health Plan; <sup>2</sup>Chief Medical Officer, Sharp Health Plan; <sup>3</sup>Senior Data Analyst, Sharp Health Plan; <sup>4</sup>Quality Assistant, Sharp Health Plan; <sup>5</sup>MHSA candidate 2009

## INTRODUCTION

According to the Centers for Disease Control and Prevention, scientific evidence from clinical trials shows that mammography screening of women ages 50 to 69 can reduce mortality from breast cancer by as much as 20 to 35 percent (CDC, 2007). However, many women ages 50 and older do not receive mammography screening every 1 to 2 years as recommended. In fact, research shows that Asian/Pacific Islander and Hispanic women are even less likely to receive mammograms (Purc-Stephenson, 2008). While lack of access to screening services is undoubtedly an instrumental factor, even women with health care coverage do not receive regular screenings. To achieve the national goals of reducing morbidity and death from breast cancer, more complete mammography outreach is needed in every community across the United States.

### Conflict of interest

The authors report no conflicts of interest.

### Corresponding Author

Sandra R. Parkington, MPH, RN  
4305 University Ave. Suite 200  
San Diego, CA 92105  
sandra.parkington@sharp.com  
(619) 228-2342

## ABSTRACT

**PURPOSE:** In 2006, Sharp Health Plan (SHP) conducted a campaign to increase mammography screening for at-risk female members that consisted of mailing each eligible member an informational mammography postcard with an appointment tracker. Then came an automated phone call reminder. After the mammography campaign, 70 percent of SHP members sought mammography screening while 30 percent remained nonadherent. SHP decided to conduct a survey to better understand members' barriers to breast cancer screening.

**DESIGN:** A survey based on Prochaska and Velicer's Transtheoretical Model of Change was designed to assess members' behavioral stage and barriers to breast cancer screening.

**METHODOLOGY:** The survey was administered to all nonadherent members via personal phone calls with nearly 50 percent of the nonadherent completing the interview. All quantitative data were examined, and a code book was created to assess additional qualitative data. Findings were further analyzed by stage of change, ethnicity/race, and region of San Diego.

**PRINCIPAL FINDINGS:** The top three barriers identified were: *Mammogram not a priority*, *Knowledge deficit*, and *Had a bad experience in the past*.

**CONCLUSION:** A common set of mammography barriers was found in the SHP member population. However, when segmented into ethnic, racial, geographic, and behavioral stage groups, various barriers were identified. SHP providers can use this information to develop more tailored interventions and to increase the rate of breast cancer screening for their member population.

## TeleVox breast cancer screening intervention

Sharp Health Plan (SHP) in San Diego, Calif., is a subsidiary of the integrated health delivery system Sharp Health Care. In 2006, SHP organized an intervention to increase mammography screening by 5 percent for at-risk female members. Eligible par-

ticipants were women ages 52 to 69 in 2006 who were continuously enrolled in Sharp Health Plan in 2005, who were active at the time of report pull, and who had not received a mammogram during the 2005 measurement year (MY) or in 2004, the year prior to the MY. Excluded from the intervention were deceased members

and members whose claims data indicate a bilateral and or double unilateral mastectomy.

Eligible members were identified using a corporate run IT SQL code written according to Integrated Healthcare Association (IHA) and SHP specifications, using data from the Sharp Health Care IDX data warehouse. The IHA measures used to determine eligibility came from pay-for-performance (P4P) guidelines, although SHP does not currently pay providers for their performance. The Integrated Healthcare Association is a collaboration of California health plans, physician groups, and health care systems, plus academic, consumer, purchaser, and pharmaceutical representatives. It was designed to create the business case for quality at the physician group level. The goal is to reward physician groups for performance in clinical care and patient experience by providing a clear set of health plan expectations, use of common metrics, and public reporting (IHA, 2009).

SHP enlisted TeleVox to assist with the intervention. The intervention consisted of mailing each eligible member a postcard, newly designed by the SHP staff to include information regarding the importance of breast cancer screening and a section to write in a scheduled appointment.

After the postcard mailing, an automated reminder phone call was made to each member. All communications were translated into Spanish for members who had a documented preference for Spanish. The intervention was conducted in two waves, with the first occurring in March 2006 and repeated in September 2006 for members whose claims data indicated no mammogram after the first wave.

In the initial March mailing, 2,200 postcards were sent. Through a quality check known as "salting," where several staff members' names were added to the database, it was deter-

mined that the cards were indeed mailed by the vendor. TeleVox reported a 90.2 percent success rate of completed reminder phone calls, with success defined as the number of completed automated reminder calls delivered either in person or to an answering machine.

By the fall 2006 campaign, 1,261 of the original 2,200 targeted members remained with SHP. Upon analysis after the intervention, it was determined that 746 were nonadherent with breast cancer screening.

The TeleVox breast cancer screening intervention resulted in a 4.2 percent increase in overall mammography screening since the prior measurement year — just short of the 5 percent goal. Approximately 70 percent of at-risk SHP members became compliant with breast cancer screening. Although this rate was above the 68.4 percent IHA average for the 2005 MY, SHP was still curious as to why approximately 30 percent of its at-risk members remained nonadherent even after intervention. To better understand its members, and develop tailored interventions, SHP decided that the nonadherent members would be further analyzed to determine the barriers to obtaining mammography.

## **METHODS**

The nonadherent members remaining after the TeleVox breast cancer screening intervention were used as the study population for the breast cancer screening barrier analysis.

To collect information on screening barriers, each eligible member was contacted by phone. The survey design was based on the Stages of Change Transtheoretical Model (TTM), which is based on more than two decades of research. It explains intentional behavior change along the temporal dimension, utilizing both cognitive and performance-based components (Prochaska, 1997). TTM has found that people move through a series of stages — precontempla-

tion, contemplation, preparation, action, and maintenance — in the adoption of healthy behaviors or the cessation of unhealthy ones. As each stage of change is associated with distinct behavioral and psychological characteristics, an understanding of an individual's stage can be helpful in designing appropriate and relevant interventions. The barrier analysis survey attempted to 1) establish members' recall of intervention methods, 2) determine members' stage of change, 3) assess barriers for mammography screening, and 4) collect members' ethnicity, if not already in the database (See Appendix A).

The main surveyor was female and bilingual in English and Spanish, and therefore met most members' language needs. For members who preferred a language other than Spanish or English, Language Line provided an appropriate interpreter.

Female interpreters were used for study consistency and because of the nature and sensitivity of the topic.

Attempts were made to contact all eligible participants. In addition, the collected data were monitored on a weekly basis to ensure that the demographics in each collected segment were representative of the entire sample of eligible nonadherent women.

After all possible members were surveyed and barrier data were obtained, two SHP employees, both with master's degrees in public health, examined the quantitative data and created a code book for the additional qualitative data (see Appendix B and C).

For each inter-rater reliability test, 10 percent of the randomly selected data were coded independently by the two raters. Results were compared and discussed to determine coding categories, resulting in 80 percent, 87 percent, and 89 percent agreement.

Multiple discussions also took place after each inter-rater reliability test to further clarify coding categories.

## RESULTS

### Characteristics of nonadherent members

Of the 746 eligible nonadherent members, over half (n=390, 52 percent) were actually reached and participated in the survey (Figure 1).

### Characteristics by ethnicity/race

The survey participants came from a number of ethnic and racial backgrounds. Following the recommendations of the Office of Management and Budget (OMB), SHP defined ethnicity as 1 of 2 categories: Hispanic/Latino, or non-Hispanic/non-Latino, and race as 1 of 7 categories: American Indian, Alaskan native, Asian, native Hawaiian, other Pacific Islander, black, or white. Two charts

show the breakdown of race and ethnicity for the 390 members who participated in the survey (Figure 2 and Figure 3).

### Characteristics by recall of TeleVox intervention

Of the 390 survey participants, almost half (n=182, 47 percent) remembered receiving a postcard, a telephone call reminder, or both (Figure 4).

### Characteristics by stage of change

Question 2 of the survey was designed to determine the stage of change a member was in (see Appendix A for exact wording). Of the 390 members surveyed, five gave partial

data. Only 385 responses were given for question 2. The largest response group was those in the contemplation stage of getting a mammogram — 64 percent of women surveyed (n=245) were in this group. Figure 5 provides member responses to question 2.

Ninety-eight members (25 percent) were found to be in the action state of change: They had received a mammogram in the last year. These members may have received a mammogram at a Sharp facility, but because of a delay in the receipt of claims, the information may not have been captured by the investigators. It is also possible that these members received their mammogram at an out-of-network location. These members were not included in the subsequent barrier analysis.

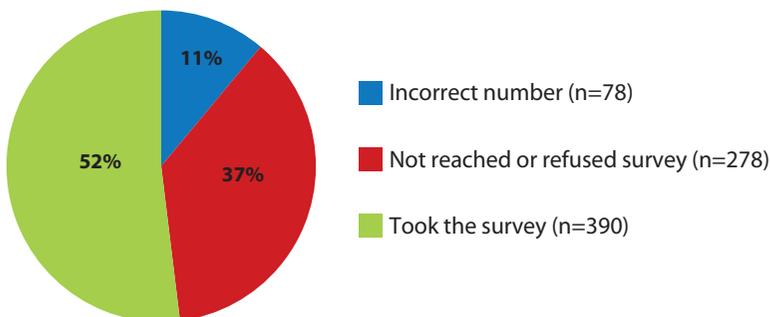
### Quantitative barriers

When asked about breast cancer screening barriers, members were given multiple-choice options as well as the opportunity to give an “other” response if their reason for delaying screening was not listed. The multiple-choice options were categorized as quantitative responses and the “other” remarks as qualitative.

Figure 6 lists the quantitative responses for the 287 women in the precontemplation, contemplation, or

**FIGURE 1 Breast cancer screening barrier survey**

Total population  
(n=746)

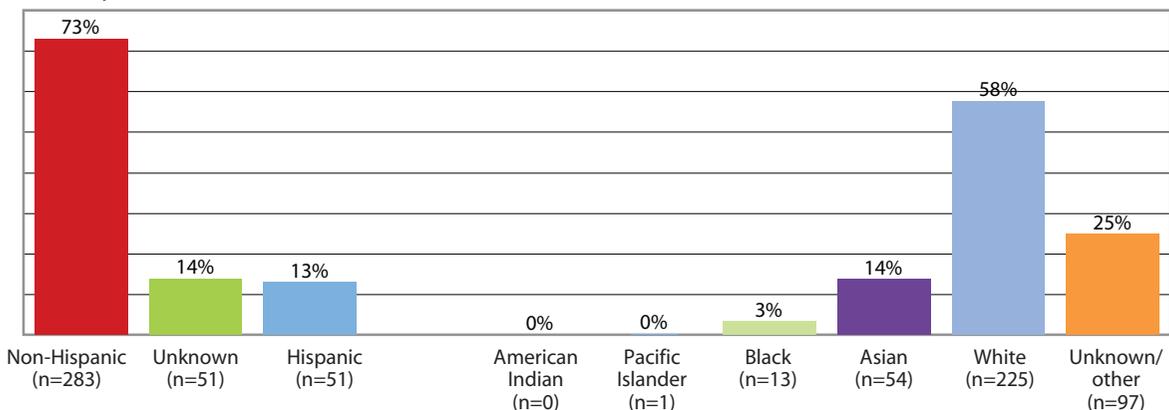


**FIGURES 2 & 3 Representation of ethnicity and race**

(n=390)

#### Ethnicity

#### Race



preparation stages of change. It should be noted that there were a total of 411 barrier responses; in the course of the surveyor's conversation with participants, despite being told to choose "one" statement, many gave multiple reasons. Rather than try to choose the most important reason for those members, the decision was made to include the multiple responses as a way to capture more possible barrier information.

The most common barriers cited in the quantitative responses were:

1. Had bad experience in the past (n=70, 17 percent)
2. Unable to get a convenient appointment time (n=50, 12 percent)
3. Don't want to think about the possibility of breast cancer (n=33, 8 percent)

### Qualitative barriers

Because the majority (n=225, 55 percent) gave an "other" or qualitative answer as to why they did not seek breast cancer screening, and some respondents cited more than one barrier, the decision was made to analyze and attempt to quantify the qualitative data for better understanding. A codebook was created to further examine the qualitative data (Appendix C).

Figure 7 shows a breakdown of the "other" (qualitative) responses.

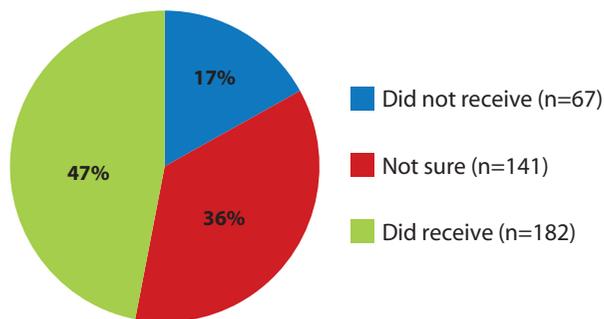
The top three barriers from the qualitative responses were:

1. Mammogram not a priority (n=113, 50 percent)
2. Knowledge deficit (n=98, 44 percent)
3. Physician or health system issues (n=40, 18 percent)

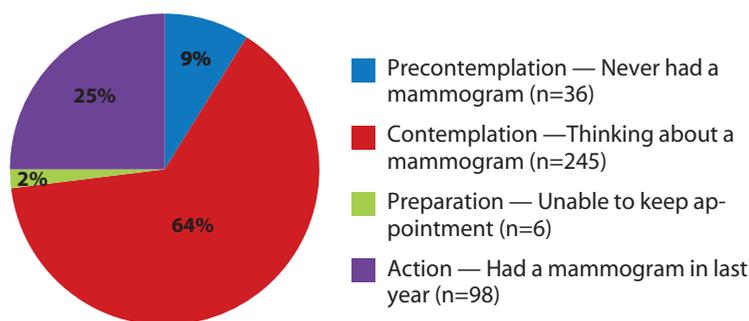
The top six barriers for mammogram screening, from combined quantitative and qualitative data, were:

1. Mammogram not a priority

**FIGURE 4 Recall of TeleVox intervention**  
(n=390)



**FIGURE 5 Stages of change for survey participants**  
(n=385)



- (n=113)
2. Knowledge deficit (n=98)
3. Had bad experience in the past (n=70)
4. Unable to get a convenient appointment time (n=50)
5. Physician or health system issues (n=40)
6. Don't want to think about the possibility of breast cancer (n=33)

### Segmentation analysis

A segmentation analysis was performed to further understand the barriers. By focusing on stages of change, ethnicity, race, and geographic region, SHP attempted to determine if specific groups of women reported a higher frequency of a particular barrier.

### Stage of change

#### Precontemplation

Thirty-six women (9 percent) said they had never had a mammogram. The top qualitative and quantitative barriers for this group were, in order:

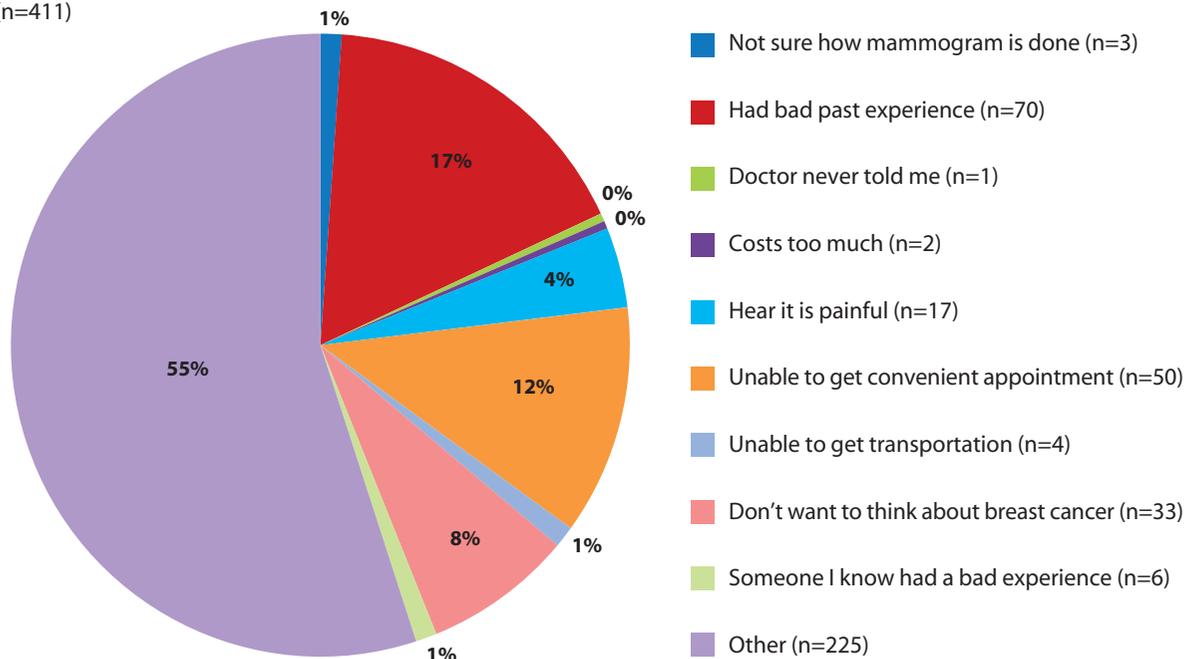
1. Knowledge deficit (n=27, 75 percent)
2. They heard that it is painful (n=14, 39 percent)
3. Anxiety (n=9, 25 percent)
4. Physician or health system issues (n=6, 17 percent)

#### Contemplation

Another 245 (64 percent) reported that they were thinking about having a mammogram. The top qualitative and quantitative barriers for this group were, in order:

**FIGURE 6 Qualitative barriers to breast cancer screening**

Members in precontemplation, contemplation, or preparation stages (n=411)



1. Mammogram not a priority (n=106, 43 percent)
2. Knowledge deficit (n=70, 29 percent)
3. Had a bad experience in the past (n=69, 28 percent)
4. Unable to keep the appointment (n=44, 18 percent)

*Preparation*

For those unable to keep their appointment, the top qualitative and quantitative barriers were, in order:

1. Unable to get a convenient appointment (n=3, 50 percent)
2. Mammogram not a priority (n=2, 33 percent)

3. Access issues (n=2, 33 percent)

**Ethnicity & race**

Of the 390 women surveyed, 51 (13 percent) identified themselves as Hispanic, 283 (73 percent) identified themselves as non-Hispanic, and 55 (14 percent) did not indicate an ethnicity. Figure 8 and Figure 9 list a further breakdown of each ethnicity into race categories. Members who identified themselves as Hispanic may have had mixed heritage and, as a result, also identified themselves as members of a particular race.

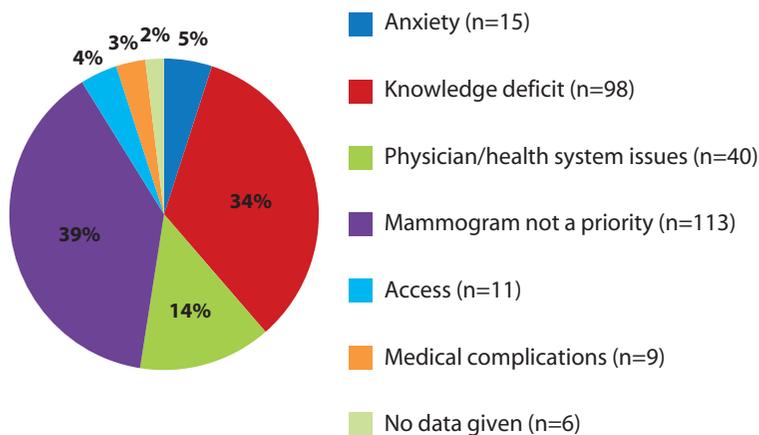
Because of sample size, in the segmentation analysis, the two ethnicities and only the three largest race groups were analyzed. The top barrier responses for the non-Hispanic, Hispanic, white, Asian, and black survey respondents are summarized in Table 1.

**Geographic region**

Barriers by geographic region were assessed according to the six regions of SHP's network: east San Diego, in-

**FIGURE 7 Qualitative barriers to breast cancer screening**

(n=292)



land north San Diego, metro San Diego, north coastal San Diego, south San Diego, and south Riverside. The top barriers for all regions are summarized in Table 2.

## DISCUSSION

### Implications of nonadherent response data

The majority of survey respondents did remember the earlier postcard/telephone intervention. However, they did not comply. This has two important implications: First, the initial intervention may not have been powerful enough to move them to action, and second, there are substantial barriers to receiving mammography screening outside of having health care coverage. For future interventions to be successful, they must be more relevant to the member population, possibly by addressing the specific outside barriers to receiving breast cancer screening.

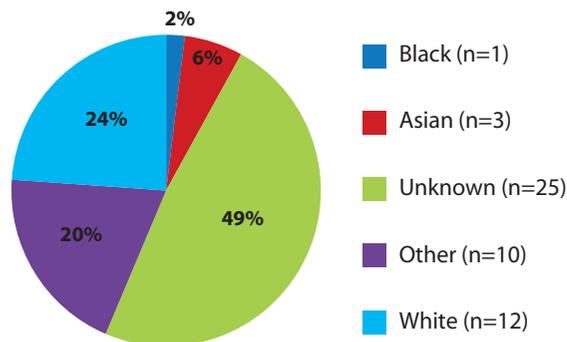
### Implications of stages of change

After survey data were collected, the majority of respondents were found to be in "contemplation." The contemplation stage is characterized by an understanding of the importance of behavioral change, but difficulty weighing the costs and benefits of action. People in contemplation can be frozen in a state of procrastination because of their inability to make a decision (Glanz, 2002). An appropriate intervention strategy for women in contemplation of breast cancer screening would be to increase knowledge of the benefits of immediate mammography and the costs of delay.

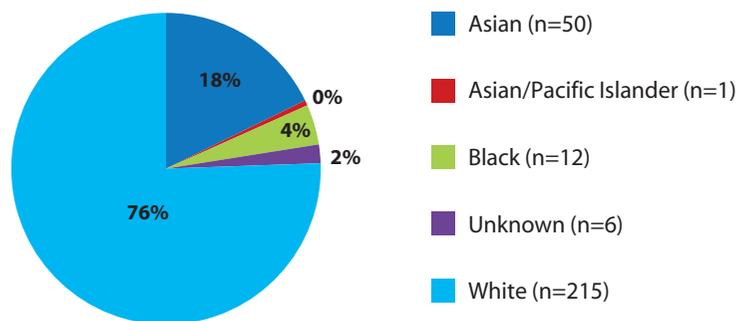
### Implications of most prevalent barriers

Survey respondents identified *mammograms are not considered a priority* (N=113), *knowledge deficit* (N=98), *had one in the past and it was a bad experience* (N=70), and *unable to get a convenient time for the appointment* (N=50) as the most preva-

**FIGURE 8 Hispanic, divided by race**  
(n=51)



**FIGURE 9 Non-Hispanic/non-Latino, divided by race**  
(n=284)



lent obstacles. Member-oriented and provider-oriented strategies can address these prevalent barriers.

Member-oriented interventions could focus on increasing knowledge of the importance of screening and of the technical aspects of screening by making educational material available. Such materials might include:

- Radiation — the chances of getting breast cancer from a mammogram are 1 in a million, but the chances of getting breast cancer once you are over 50 are 1 in 5
- Mammogram vs. breast self exam — detection of lumps is

better with mammography

- Differences between MRI, ultrasound and mammogram

Provider-oriented interventions could focus on improving provider awareness of member barriers so that the appropriate action can be taken to reduce barriers. Addressing the barriers may also help increase the stage of readiness. Examples include:

- Advising mammography technicians to discuss technical information to better prepare patients, including the necessity of compression
- Encouraging provider groups to

**TABLE 1 Top barriers by ethnicity/race\***

Ethnicity/race	Barrier #1	Barrier #2
<b>Hispanic (n=51)</b>	Knowledge deficit, 41% (n=14)	Mammogram not a priority, 38% (n=13)
<b>Non-Hispanic (n=283)</b>	Mammogram not a priority, 40% (n=92)	Knowledge deficit, 32% (n=72)
<b>White (n=225)</b>	Mammogram not a priority, 42% (n=73)	Knowledge deficit, 29% (n=50)
<b>Black (n=13)</b>	Mammogram not a priority, 53% (n=8)	Knowledge deficit, 33% (n=5)
<b>Asian (n=54)</b>	Knowledge deficit, 74% (n=14)	Mammogram not a priority, 47% (n=9)

\* All efforts were made to ensure that the demographics in each collected segment were representative of the entire sample of eligible noncompliant women.

add evening and weekend appointment times

- Piloting an incentive offering to increase compliance of a targeted group that remains non-adherent
- Educating providers on the importance of giving members a more detailed explanation of the mammogram experience

In addition, member and provider interventions could be tailored according to regional and ethnic/racial information. Examples include:

- In the south Riverside region, where *no convenient appoint-*

*ment* was a primary barrier, extending practice hours to increase mammogram appointment availability

- For Hispanic and Asian women, for whom *knowledge deficit* was the primary barrier, offering more breast cancer and mammography educational materials
- For white and black women for whom *mammography was not a priority*, providing information on the urgency of screening

Finally, because the top identified barriers came from qualitative survey responses, future barrier surveys should be modified to include those

items as quantitative options.

### Comparison of data to other study results

SHP's barrier survey was one of few studies conducted from a member perspective. The article "Reducing Barriers to Use of Breast Cancer Screening," from the National Cancer Institute (NCI), identifies the chief reasons for not getting mammograms as *procrastination* and *not believing a mammogram was needed*. These were very similar to SHP's results of *mammogram is not a priority* and *knowledge deficit*. The differences lie in the fact that *procrastination* is an outside perspective, most probably

**TABLE 2 Barriers by region**

Region	Barrier #1	Barrier #2
<b>East (n=83)</b>	Mammogram not a priority, 42% (n=35)	Knowledge deficit, 31% (n=26)
<b>Inland north (n=41)</b>	Knowledge deficit, 41% (n=17)	Knowledge deficit, 31% (n=13)
<b>Metro (n=87)</b>	Mammogram not priority, 40% (n=35)	Knowledge deficit, 29% (n=25)
<b>North coastal (n=19)</b>	Bad experience, 36% (n=7)	Mammogram not a priority, 32% (n=6)
<b>South (n=52)</b>	Knowledge deficit, 46% (n=24)	Mammogram not a priority, 42% (n=22)

**FIGURE 10 BCS barriers comparison**

NCI study's top barriers	SHP's top barriers
<ul style="list-style-type: none"> <li>• <b>Procrastination</b></li> <li>• <b>Not believing mammogram needed</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Mammogram not a priority</b></li> <li>• <b>Knowledge deficit</b></li> <li>• <b>Had a bad experience in the past</b></li> <li>• <b>Unable to get a convenient appointment time</b></li> <li>• <b>Physician or health system issues</b></li> <li>• <b>Don't want to think about possibility of breast cancer</b></li> </ul>
2001 quality profile barriers	
<ul style="list-style-type: none"> <li>• <b>Lack of knowledge</b> (of coverage)</li> <li>• <b>Discomfort</b> (procedure is painful)</li> <li>• <b>Access/convenience</b> (locations and times)</li> <li>• <b>Physician oversight</b> (did not recommend test)</li> <li>• <b>Fear</b> (of positive result)</li> <li>• <b>Embarrassment</b> (self-conscious)</li> </ul>	

**FIGURE 11 Qualitative barriers to breast cancer screening**

2006 messages	2008 messages
<ul style="list-style-type: none"> <li>• <b>A screening mammogram is one of the best ways to detect breast cancer early, when the chance of successful treatment is greatest</b></li> <li>• <b>1 in 8 women will get breast cancer</b></li> <li>• <b>Breast cancer is the second leading cause of cancer deaths in women in the United States</b></li> <li>• <b>Breast cancer risk increases with age and every woman is at risk</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>The earlier breast cancer is caught, the less serious the treatment</b></li> <li>• <b>A mammogram screening can detect lumps up to two years before you or your doctor can</b></li> <li>• <b>A mammogram detects lumps as small as a pinhead, while the smallest a self-exam detects is pea-sized</b></li> <li>• <b>30 minutes once a year can save your life. It is worth the time!</b></li> <li>• <b>3 out of 4 women with breast cancer do not have a strong family history</b></li> <li>• <b>1 in 8 women will get breast cancer</b></li> </ul>

from a medical professional, while *mammogram is not a priority* is a judgment by the member. Also, the NCI barrier of *not believing a mammogram was needed* was based on many patients believing that a doctor

exam or self exam was sufficient to detect breast cancer. SHP members also felt that if there was no family history of breast cancer, they did not need a mammogram.

Interestingly, SHP findings are par-

allel with the NCQA Quality Profiles. SHP's top barrier, *mammogram is not a priority*, was not present in the NCQA report, but NCQA did find that "in a time crunch, women failed to get a mammogram if they were busy." The *knowledge deficit* barrier was found in NCQA data in reference to ignorance of coverage, whereas the SHP barrier was lack of knowledge of the importance of mammography. Other similarities between NCQA Quality Profiles and SHP data are outlined in Figure 10.

The major conclusion that can be drawn from the fact that SHP survey results were similar to both NCI and NCQA data is that women face a common set of barriers and that a better understanding of these barriers will allow for more tailored and successful interventions. Decision-makers who want to improve screening rates may want to consider the specific barriers that their female members may face in making the decision to receive a screening mammogram. They may want to provide clear, accurate, informative messages regarding the importance of making mammograms a priority. When you increase knowledge, you may also increase priority.

### Study limitations

These aspects of the study may limit the generalizability of the data:

- More than half of the initial nonadherent population was reached in the barrier survey. Although this is an adequate sample size and all efforts were made to ensure that the demographics in each collected segment were representative of the entire sample of eligible noncompliant women, SHP was limited by the demographics present in the database and may not know of the specific barriers facing the other half of its membership.
- Because of the methodology—a phone survey that members

volunteered to take — the data may be influenced by nonrandom participation.

- Because SHP conducted the survey, and all survey respondents were members of the health plan, reactive effects may have resulted. Specifically, members may have provided answers to please the SHP interviewer. A single person was assigned to administer the survey, and so the reliability of the data is high. However, the validity may be influenced by this reactive effect.
- In categorizing race, SHP used the categories defined by the OMB. SHP could have delineated racial categories into further subcategories in order to gather more detailed barrier information. Also, SHP did not provide an “other” option for self-defined ethnicity and race.
- It is important to note that with a limited sample size of six members (<1 percent), meaningful conclusions cannot be made about the “preparation” population as a whole.
- Finally, the generalizability of the study to other managed care populations may be limited by the small sample size and possible recall bias.

## References

- Breast Cancer Screening, Improving Access and Awareness. *NCQA & Pfizer Quality Profiles 2nd Ed.* 2001; Women's Health: 53–56.
- CDC. Use of mammograms among women aged 40 Years — United States, 2000–2005. *Morb Mortal Wkly Rep.* 2007;56(3):49–51.
- Glanz K, Lewis FM, Rimer BK. *Health Behavior and Health Education: Theory, Research, and Practice.* 3rd ed. San Francisco: Jossey-Bass; 2002.
- Integrated Healthcare Association (IHA) 2009 available at: <http://www.iha.org/index.html>.
- Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. *Am J Health Pro.* 1997;12:38–48.
- Purc-Stephenson RJ, Gorey KM. Lower adherence to screening mammography guidelines among ethnic minority women in America: A meta-analytic review. *Prev Med.* 2008;46(6):479–88.
- Stoddard AM, Fox SA, Costanza ME, Lane DS, Andersen MR, Urban N, et al. Effectiveness of telephone counseling for mammography: results from five randomized trials. *Prev Med* 2002;34(1):90–99.
- U.S. Office of Management and Budget (OMB). Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity. 1997. Available at: <http://www.whitehouse.gov/omb/fedreg/1997standards.html>
- ### Background references
- Amonkar MM, Madhavan S, Rosenbluth SA, Simon KJ. Barriers and facilitators to providing common preventive screening services in managed care settings. *J Community Health.* 1999;24(3):229–47.
- Baron RC, Rimer BK, Coates RJ, Kerner J, et al. Client-directed interventions to increase community access to breast, cervical, and colorectal cancer screening a systematic review. *Am J Prev Med.* 2008;35(1 Suppl):S56–66.
- Breast Cancer Screening Consortium Mammography Telephone Counseling Protocol. National Cancer Institute. 2000.
- Buena Vida: Protecting your family from Breast Cancer. The National Hispanic Leadership Initiative on Cancer.
- Guerra C, Krumholz M, Shea J. Literacy and knowledge, attitudes and behavior about mammography in Latinas. *J. Health Care Poor Underserved.* 2005;16:152–166.
- Guide to Community Preventative Services. Client-Oriented Cancer Screening Interventions: Client Incentives Alone. Available at: <http://www.thecommunityguide.org/cancer/screening/client-oriented/index.html>. Accessed March 29, 2009.
- Guide to Community Preventative Services. Client-Oriented Cancer Screening Interventions: Client Reminders. Available at: <http://www.thecommunityguide.org/cancer/screening/client-oriented/reminders.html>. Accessed March 29, 2009.
- Guide to Community Preventative Services. Client-Oriented Cancer Screening Interventions: One-on-One Education. Available at: <http://www.thecommunityguide.org/cancer/screening/client-oriented/OneOnOneEducation.html>. Accessed March 29, 2009.
- Guide to Community Preventative Services. Client-Oriented Cancer Screening Interventions: Small Media. Available at: <http://www.thecommunityguide.org/cancer/screening/client-oriented/SmallMedia.html>. Accessed March 29, 2009.
- Guide to Community Preventative Services. Client-Oriented Cancer Screening Interventions: Reducing Structural Barriers. Available at: <http://www.thecommunityguide.org/cancer/screening/client-oriented/ReducingStructuralBarriers.html>. Accessed March 29, 2009.
- Guide to Community Preventative Services. Client-Oriented Cancer Screening Interventions: Multicomponent Interventions. Available at: <http://www.thecommunityguide.org/cancer/index.html>. Accessed March 29, 2009.
- Healthy Roads Media. Mammogram. Health Information Translations a partnership of The Ohio State University Medical Center, Mount Carmel Health and OhioHealth, Columbus, Ohio. Available at: <http://www.healthyroadsmedia.org/english/Files/pdf/EngMam.pdf>. Accessed March 29, 2009.
- Kranhold K. Seeking a Better Breast Scan. *The Wall Street Journal.* April 24, 2007; D:4.
- National Cancer Institute. Costs of Cancer Care. Available at: <http://progressreport.cancer.gov/about.asp>. Accessed March 29, 2009.
- National Cancer Institute. Reducing barriers to use of breast cancer screening. Available at: <http://epi.grants.cancer.gov/LIBCSP/projects/Barriers.html>. Accessed March 29, 2009.
- Menon U, Champion V, Monahan PO, Daggy J, Hui S, Skinner CS. Health Belief Model Variables as Predictors of Progression in Stage of Mammography Adoption. *Am. J. Health Promot.* 2007; 21(4):255–261.
- Rimer B, Lipscomb J. Enhancing the use of mammography: Effectiveness and cost. *Eff Clin Pract.* 2000;3(5):213–220.
- Schueler KM, Chu PW, Smith-Bindman R. Factors associated with mammography utilization: A systematic quantitative review of the literature *J Womens Health.* 2008;17(9):1477–98.
- Smith-Bindman R, Miglioretti DL, Lurie N, Abraham L, Barbash RB, Strzelczyk J, et al. Does utilization of screening mammography explain

racial and ethnic differences in breast cancer? *Ann Intern Med.* 2006; 144(8):541–53.  
UNC Chapel Hill, Breast Imaging Section. Facts about Breast Cancer and Screening Mammography. Available

at: [www.rad.unc.edu/pisano](http://www.rad.unc.edu/pisano). Accessed March 29, 2009.  
U.S. Department of Health and Human Services. Women: Stay Healthy at Any Age Checklist for Your Next Checkup. AHRQ Pub. No. APPIP03-

0008. Available at: <http://www.ahrq.gov/ppip/healthywom.htm>. Accessed March 29, 2009.

## Appendix A: The barrier analysis survey

Hello, this is \_\_\_\_\_ from Sharp Health Plan. We are conducting a brief survey. May I please speak with [Member Name]?  
(If member isn't there, find out the best time to call back.)

### Speaking with member:

I am calling to ask a few questions about an important preventive health screening test. Is this a good time to talk? I just have 2 questions and it should only take 5 minutes.

- IF NOT, find out better time to call.
- IF OK, proceed . . .
- If they *do not speak English well*, find out what language in which they prefer to speak and we will have an interpreter call them back.
- Preferred language \_\_\_\_\_

I. Last year Sharp Health Plan sent a postcard reminder with a phone call to our members who are eligible to receive mammograms. Do you recall receiving a postcard, a phone call, or both about mammograms for women? Please CHOOSE from the following options:

- A. I'm absolutely sure that I *did not receive* a postcard or phone call about mammograms.
- B. I'm *not sure* whether I received a postcard or phone call about mammograms.
- C. I'm absolutely sure that I *did receive* either a postcard or a phone call about mammograms.

II. From our records, we've noticed that you have not had a screening mammogram in the last few years. A mammogram is an X-ray of your breasts which may show if you might have any indications of breast cancer, a treatable condition.

Which one of these *best* describes you?

- A. I've never had a mammogram.
- B. I am thinking about having a mammogram.
- C. I had an appointment, but I was unable to keep it.
- D. I've had a mammogram in the last year.

Continue with next question depending on answer above.

### If answer is A: I've never had a mammogram.

Many women have various reasons why they haven't had a screening mammogram. In order to better understand why our members may not have had a screening mammogram we would like to know which *one* of these statements most closely describes your reason for *not having a mammogram*:

1. I am not sure how a mammogram is done.
2. My doctor never told me to have one.
3. It costs too much.
4. I've heard that it is painful.
5. I am unable to get a convenient appointment for a mammogram.
6. I am unable to get transportation to get a mammogram.
7. I don't want to think about the possibility of having breast cancer.
8. Someone I know had a bad experience with having a mammogram.
9. Other \_\_\_\_\_

**If answer is B: I am thinking about having a mammogram**

Many women think about having a screening mammogram, yet they may delay scheduling and having one for a variety of reasons. In order to better understand why our members might delay having a screening mammogram, we would like to know which *one* of these statements most closely describes your reason for *thinking about having, but not having a mammogram*:

1. It costs too much.
2. I had one in the past and had a bad experience.
3. Someone I know had a bad experience with having a mammogram.
4. I am unable to get a convenient appointment for a mammogram.
5. I am unable to get transportation to get a mammogram.
6. I don't want to think about the possibility of having breast cancer.
7. Other \_\_\_\_\_

**If answer is C: I had an appointment, but I was unable to keep it.**

Many women have made appointments for a screening mammogram, yet may have been unable to keep the appointment for a variety of reasons. In order to better understand why our members might not be able to keep an appointment for a screening mammogram, we would like to know which *one* of these statements most closely describes your reason for *not being able to keep your appointment for a mammogram*:

1. It costs too much.
2. I am unable to get a convenient appointment for a mammogram.
3. I am unable to get transportation to get a mammogram.
4. I don't want to think about the possibility of having breast cancer.
5. I had one in the past and had a bad experience.
6. Someone I know had a bad experience with having a mammogram.
7. Other \_\_\_\_\_

**If answer is D: I've had a mammogram in the last year**

In order to better understand where our members are obtaining their screening mammograms, would you mind sharing where you received this service?

---

III. ONLY IF NO ETHNICITY LISTED IN DATABASE:

Sometimes people in a particular culture or certain ethnic group have beliefs about cancer and other medical conditions that keep them from seeking health screenings or medical care. In order to improve our quality of services, would you be willing to share your ethnic group with us?  
If YES:

*Please describe your ethnic group:*

- a. Hispanic or Latino
- b. Not Hispanic or Latino
  - a. American Indian
  - b. Alaska Native
  - c. Asian
  - d. Black or African American
  - e. Native Hawaiian
  - f. Other Pacific Islander
  - g. White

If NO: I understand; thank you very much for your time.

**Thank you; your answers will help us improve our services.**

**Appendix B: Quantitative codebook**

Code book of all possible responses for Q3 groups from stage of change A,B, C

- 31 I am not sure how a mammogram is done.
- 32 I had one in the past and had a bad experience.
- 33 My doctor never told me to have one.
- 34 It costs too much.
- 35 I've heard that it is painful.
- 36 I am unable to get a convenient appointment for a mammogram.
- 37 I am unable to get transportation to get a mammogram.
- 38 I don't want to think about the possibility of having breast cancer.
- 39 Someone I know had a bad experience with having a mammogram.
- 40 Other.

## Appendix C: Qualitative codebook

There are seven main categories with typical responses listed below for each:

### 101 Anxiety

- Afraid of radiation
- Embarrassed, self conscious
- Afraid of experience
- Afraid of being trapped in machine

### 102 Knowledge deficit

- Thinks breast self exam (BSE) is sufficient
- Thinks mammograms can cause cancer
- Thinks mammograms do not help find cancer/are not accurate
- Little or no family history, so not worried
- Thinks doctor breast exam is sufficient
- Feels healthy, so not worried
- Thinks mammograms are harmful
- Believes in preventative/alternative methods instead (i.e. nutrition, exercise, breastfeeding, prayer, alternative medical care, etc.)
- Wants an MRI or ultrasounds instead, thinks they are better
- Not sure where to go

### 103 Physician/health system issues

- Physician has not told them to get mammogram
- Not happy with current physician
- Needs physician
- Lost referral
- Doesn't like/afraid of physicians
- No reminders from health system/physician, so didn't get it
- Health system too difficult to navigate
- Hygiene concerns

### 104 Mammogram not a priority

- On every 2 year schedule
- Busy with work
- Busy with taking care of family
- Concerned with other aspects of their life
- Not motivated, lazy
- Not worried about it
- Procrastinates
- Always forgets
- Just putting it off
- No time
- Other health issues take priority
- Too tired
- Even if breast cancer is found, would not seek treatment
- Overslept for appointment

### 105 Access

- Too far to drive
- Too much advance notice required
- Pain to get there
- Got lost, couldn't find imaging center
- Geography

### 106 Medical complications

- Breast surgery (i.e. implants, augmentation, etc.)
- Other health issues (i.e. hip surgery, pacemaker, etc.)
- Has diagnosis of breast cancer
- Depression

### 107 No data given