Race and Ethnic Disparities in Cervical Cancer Screening in a Safety-Net System

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Objectives: The three objectives of this research were: 1) to examine the use of Pap smear tests among low-income women, including minority and immigrant women who were patients in a safety-net healthcare system; 2) to identify policy relevant variables that could lead to changes in use of Pap smear screening services for these women; and 3) to contribute to the literature on use of Pap smear screening, especially among minorities and immigrants. The Behavioral Model for Vulnerable Populations was used as the theoretical framework. *Methods*: Pap smear screening predictors were examined using telephone interviews with a random sample of women aged 18–60, including 465 Non-Hispanic Whites, 285 African Americans, 164 Hispanic Americans, and 256 Hispanic immigrants, enrolled in a safety-net healthcare system in Texas in Fall 2000. Binary logistic regression analysis was used. *Results*: The research revealed that Non-Hispanic Whites were most likely to have been screened ever and in the past 3 years, followed by African Americans, Hispanic immigrants, and Hispanic Americans. Among Hispanics, immigrants were most likely to have had Pap smear screening, supporting the "healthy immigrant hypothesis." Older women were most likely to have ever been screened, with younger women, most likely in the past year. Having a usual source of healthcare and a checkup for current pregnancy increased screening, while competing needs (food, clothing, housing) affected screening negatively. *Conclusions*: Culturally competent, community-based care for women is needed to increase Pap smear screening among minority groups, especially Hispanic immigrant and Hispanic American women.

KEY WORDS: healthcare quality; access, and evaluation; utilization of cervical cancer screening; health services research; healthcare surveys.

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INTRODUCTION

In this study, our three objectives were to: 1) examine the use of Pap smear tests among low-income women, including minority and immigrant women who were patients in a safety-net healthcare system; 2) identify policy relevant variables that could lead to changes in use of Pap smear screening services for these women; and 3) contribute to the literature on use of Pap smear screening, especially among minorities and immigrants. The data were collected from patients in a safety-net hospital and its network of community health centers in Fort Worth, Texas. The patient population is a vulnerable one (1, 2),

consisting largely of low-income, uninsured people who have no other options for obtaining healthcare than to use this provider.

The poor, minorities, and the uninsured are experiencing declining access to healthcare in America. Low-income women are especially likely to have multiple risks for accessing and receiving optimal healthcare. These risks stem from one or more of their vulnerable statuses, including a lack of health insurance or inadequate insurance, lack of a usual source of healthcare, low-socioeconomic status, and multiple competing needs that create barriers to use of healthcare (1–5). This predisposition to vulnerability faced by low-income women is compounded by additional characteristics such as being a member of a minority population (1, 3) and/or being an immigrant (1, 3, 6). The vulnerable groups are especially likely to forego preventive health services (6–14). Factors like these that hinder access to and utilization of needed healthcare may prevent early identification and treatment of disease, with the possibility that the care may be more expensive in the long run, in terms of both financial and human costs.

The Papnicolaou (Pap) test or Pap smear is used to screen for cancer of the cervix (11, 15, 16). Globally, cervical cancer is the second most common form of cancer among women, after breast cancer (17). In the U.S., cervical cancer accounts for 6% of all cancers among women, with approximately 15,700 new cases reported each year, resulting in approximately 4900 deaths. Cervical cancer occurs disproportionately in women who are economically disadvantaged, and in minority women, especially Hispanic women. In the U.S., incidence rates and mortality rates have been found to vary consistently by race and ethnicity, with Hispanic women having the highest incidence rates, followed by African Americans, and Non-Hispanic Whites with the lowest incidence. For cervical cancer mortality rates among women in the U.S., the pattern is reversed for Hispanic and African American women, with African American women having the highest mortality rates, followed by Hispanic Americans, and Non-Hispanic White women having the lowest mortality rates.

Half of all women in the U.S. who are diagnosed with cervical cancer have never had a Pap smear, and another 10% have not had a Pap smear in the previous 5 years. The National Institute of Health's Consensus Panel concluded that Pap smear screening is the most effective method of detecting cervical cancer early when it can be effectively treated (18). The World Health Organization estimates that mortality from cervical cancer could be cut by 85% worldwide if all women were screened every 5 years, and by 64% if all women were screened every 10 years (19).

Preventive healthcare services, including Pap smears, are under-utilized by low-income and minority women in the U.S. (6, 9, 20–22). In the U.S., Hispanic women are much less likely than Anglo or African American women to have ever had a Pap smear. In the 2000 Behavioral Risk Factor Surveillance System (BRFSS), 7.1% of Hispanic women 18 years of age and older in the U.S. reported that they had never had a Pap smear, compared to 4.5% of African American women and 4.2% of Non-Hispanic White women (23). Trends in the state of Texas are similar, although the data indicate much larger race and ethnic disparities. In the Texas BRFSS, 12.5% of Hispanic women and 7.5% of African American women reported that they had never had a Pap smear, compared to only 3.8% of Non-Hispanic White women. Minority women in Texas reported almost twice the rate of never having had a Pap smear as women in the U.S. as a whole.

In developing countries, such as Mexico and other countries in Central America, cervical cancer is more prevalent than in the United States. In Mexico, the country of origin of most of the Hispanic immigrants in this study, the mortality rate for cervical cancer is 3 times the rate in the U.S. (19). Even though Mexico adopted a national plan in 1974 to increase screening for cervical cancer, the implementation of the plan has been hampered by lack of funding and adequate medical infrastructure, so that only one-fifth of the adult female population can be screened in any given year (24). Thus, the Hispanic immigrant population may be especially at risk of developing cervical cancer because annual exams are not the norm in Mexico and because the immigrants may therefore not understand the importance of early screening and detection. Hispanics in general, and Hispanic immigrants in particular, may also be more likely to hold fatalistic attitudes and beliefs that make them less likely to seek out preventive care, such as Pap smears (25, 26). Hispanic immigrant women who hold erroneous beliefs about the causes of cervical cancer have been found to be less likely to get Pap smears. Language preference and acculturation issues are also related to willingness to use preventive care (26–28). Gains in acculturation as measured by gains in English proficiency have been found to be positively related to seeking Pap smear screening.

Minorities may also under-utilize cancer screening prevention because of negative experiences they have had with the healthcare system (29). Shireman *et al.* suggest that time costs associated with cervical cancer screening represent an important opportunity cost and need to be considered in studies which attempt to identify barriers to screening (30). Other studies have found that even when preventive services are free and when there are no competing needs such as need for transportation, childcare, and health insurance, people may not use them (8, 31–33).

THEORETICAL FRAMEWORK

We examined the implications of multiple vulnerabilities for use of preventive cervical cancer screening using the framework of the Behavioral Model for Vulnerable Populations (34). Aday defines vulnerability as the risk of having poor physical, psychological, or social health. Her list of Vulnerable Populations includes low-income people, women, minorities, and immigrants (1, 3). The Behavioral Model for Vulnerable Populations has three categories of predictor variables—predisposing, enabling, and need variables. Predisposing factors predict the propensity of an individual to use health-care. They include demographic and social structural factors such as age, gender, race and ethnicity, level of education, marital status, family composition, and health beliefs. Enabling factors enable or impede use of healthcare services, including individual characteristics, such as income and health insurance coverage, as well as structural factors, such as the availability of healthcare services in their geographic area. Need characteristics include objective and subjective assessment of health status (34–37). Applying models of health services utilization to vulnerable groups can be especially helpful in identifying the challenges each group faces in obtaining needed services and may provide insights into maintaining or improving their health status (34).

Based on the prevailing literature, we hypothesized that race, ethnicity, and immigration status would be related to having a Pap smear (6, 14, 29, 38). We combined race, ethnicity and immigration status in our dataset to categorize our respondents into four ethnic groups: Non-Hispanic Whites, African Americans, Hispanic Americans, and Hispanic immigrants. Non-Hispanic White women will be most likely to have had a Pap smear, followed by African American women, Hispanic American women, and finally Hispanic immigrant women.

Figure 1 below shows the adapted version of the Behavioral Model for Vulnerable Populations used

Population Characteristics
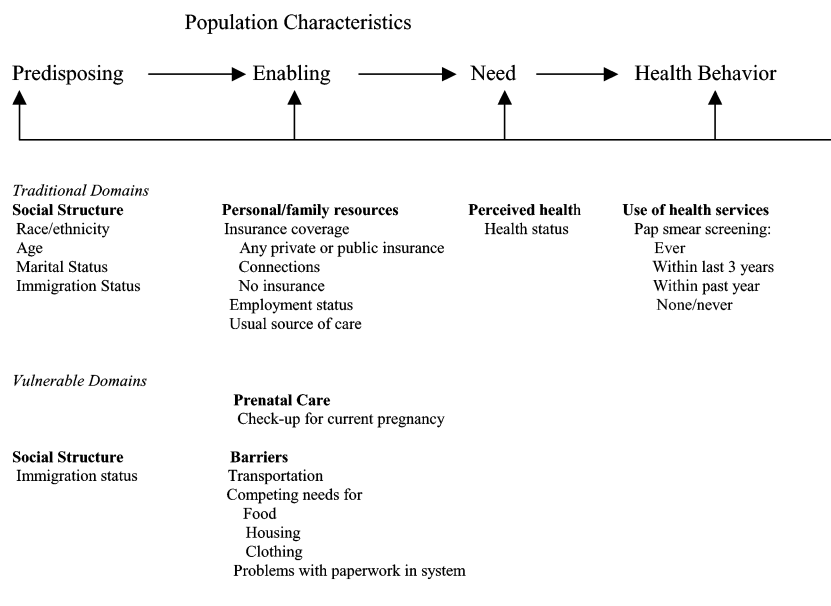
Adapted from Gelberg, L., Andersen R, and Leake, D., 2000 (34)

Fig. 1. The Behavioral Model for Vulnerable Populations.

for this study. Theoretically, we expected that each of the components of the predisposing, enabling, and need factors would make an independent contribution to explaining Pap smear screening for the sample. Each independent variable has either a traditional or vulnerable domain, or both.

Need

In general, perceived need for healthcare is the most immediate trigger for use of healthcare services (34). Cervical cancer is asymptomatic in the early stages and so women rarely perceive that they have the disease. In our study we hypothesized that low-income women who are in relatively poor health will be more likely to have contact with healthcare providers and therefore, will be more likely to be advised by a provider to have a Pap smear.

Enabling Predictors

Based on past research, we predicted that economically disadvantaged women would be less likely to get Pap smears than women who are more advantaged (8, 9, 32, 39). Public or private health insurance has also been found to be a critical factor for accessing healthcare services and was predicted to have a positive effect on use of Pap smears (1, 5, 9). Having a regular source of care should increase a patient's access to the healthcare system and was predicted to positively affect getting Pap smears. Women who are already accessing the system for other kinds of services, such as prenatal care, were predicted to be more likely to have had a Pap smear. Employment has been a major pathway to private health insurance in the U.S. in the second half of the twentieth century. Thus, women who were employed were hypothesized to be most likely to access preventive screening for cervical cancer (8, 9, 12).

Aday and Gelberg *et al.* made a major contribution to the research literature predicting use of healthcare services, by suggesting that Vulnerable Populations have competing needs for their resources, including time, energy, and money (1, 34). Low-income women who report that they have competing needs for the basic necessities of life were predicted to be less likely to be able to access preventive healthcare services.

Other Predisposing Predictors

In addition to race, ethnicity, and immigration status which were discussed above, age and marital status have also been found to predict use of preventive healthcare services. As women age and move out of their childbearing years, their access to screening for cervical cancer has been found to decrease (9, 27, 40).

Women who are not married are also less likely than married women to have had Pap smear screening, perhaps because they are less likely to be using birth control measures (9, 25, 32). Thus, we predicted that older women and women who were not married would be less likely to have used Pap smears recently than other women.

METHODS

Data Collection

The data were collected through telephone interviews using the Computer Assisted Telephone Interview (CATI) System by the Survey Research Center (SRC) at the University of North Texas. The research protocols were approved by the Institutional Review Boards at the University of North Texas, the University of North Texas Health Science Center, and JPS Health Network in Fort Worth. Names, addresses and phone numbers of all patients seen in the JPS Health Network in July and August 2000 were included in the pool. Patients in the pool were sent letters describing the study methodology. They were informed that their participation was voluntary and that all responses would be confidential and would not affect their participation in the network. They were also given the names, addresses and phone numbers of contacts in each of the three IRB offices and of each of the Principal Investigators. They were given a window of time when they would be contacted by the SRC by phone. When telephone contact was made, they were again informed of their rights. If the patient consented verbally, the interview proceeded. The letters, as well as the questionnaires and consent forms in English, were translated into Spanish, and then back translated to English to assure accuracy of the translation.

A sample of 2034 patients aged 18–60 years was drawn randomly in Fall 2000 from a population of 10,000 patients in the safety-net system in July and August 2000. Only data from the 1170 women in

the sample who were Non-Hispanic Whites, African Americans, or Hispanics were included in this analysis. Women of Asian and Native American ancestry were excluded from the study because there were too few of them to make meaningful comparisons. Most patients who use the safety-net system have family incomes below 200% of the federal poverty level. Frequencies for the variables in the model are presented in Table I.

Measurement

Dependent Variables

Pap smear screening was measured three ways as a dichotomous variable: (a) ever had a Pap smear test, (b) had Pap smear screening within the last 3 years, and (c) had Pap smear screening within the past year. A total of 90% percent of the women in the sample reported that they had a Pap smear at some time in their lives, 81% had a Pap smear in the past 3 years, and 63% had the procedure within the past year.

Predictors

The patient sample was ethnically mixed with almost 40% being Non-Hispanic White, a quarter African American, about one-fifth Hispanic immigrants, and 14% Hispanic Americans. Three-fourths of the women were aged 18–44 years, and only one-fourth were 45–60 years of age. Less than half, only 46%, of the women were married. Among the enabling variables, we found that most of the patients—almost 87%—reported that they had a usual source of healthcare. Only a little more than half of the women were employed—53%.

The safety-net healthcare network in this study has a policy of encouraging patients to use the network as a usual source of care, rather than using the system as a one-shot stop in an emergency (41). The network has developed an HMO-style management plan, called "Connections." Patients who use the system must register and be certified for care ahead of time. Registration procedures require that potential patients provide proof of legal residency in the United States (e.g., passport, birth certificate, or INS "green card"); of legal residency within the state (e.g., driver's license); of legal residency in the county (e.g., rent receipt, electric bill in head of household's

Table I. Characteristics of the Sample

Variable	N/(%)
Dependent variables	
Pap smear screen	
Ever	
No	120 (10.3)
Yes	1050 (89.7)
Within past 3 years	
No	219 (18.7)
Yes	951 (81.3)
Within past year	
No	429 (36.7)
Yes	741 (63.3)
Predisposing variables	
Race, ethnicity, immigration status	
Non-Hispanic Whites	465 (39.7)
African American	285 (24.4)
Hispanic American	164 (14.0)
Hispanic Immigrant	256 (21.9)
Demographic characteristics	
Age	
Younger (18–44 years)	882 (75.4)
Older (45–60 years)	288 (24.6)
Enabling variables	
Personal/family resources	
Usual source of care	
No	153 (13.1)
Yes	1017 (86.9)
Employment	
No	550 (47.0)
Yes	620 (53.0)
Any private, public insurance	
No	942 (80.5)
Yes	228 (19.5)
No insurance	
No	936 (80.0)
Yes	234 (20.0)
Connections	
No	462 (39.5)
Yes	708 (60.5)
Are you pregnant now?	
No	1110 (94.9)
Yes	60 (5.1)
Barriers	
Difficulty with transportation	
No	1016 (86.8)
Yes	154 (13.2)
Competing need for food, clothing or housing	
No	781 (66.8)
Yes	389 (33.2)
Problem with paperwork	
No	1024 (87.5)
Yes	146 (12.5)
Need variables	
Perceived health status	
Good health	
No	430 (36.8)
Yes	740 (63.2)

name); and proof of income (e.g., check statements for all employed family members in the household). Families with incomes up to 200% of the federally defined poverty level are certified to receive subsidized healthcare in the county safety-net system. Families with incomes less than 100% of poverty level have lower co-pays and deductibles than patients with family incomes between 100 and 200% of poverty. Patients with family incomes above 200% of poverty level must pay the full cost of their healthcare. Families must be re-certified for the Connections program annually, or when their circumstances change. Sixty percent of the women in this study were certified to receive subsidized healthcare in the system, 20% of the women had public or private health insurance coverage, and 20% had no healthcare coverage or subsidized care of any kind.

We also asked the women if they were pregnant, and if they were, had they had a check-up for this current pregnancy. Five percent of the women reported that they were pregnant, only 70% of whom reported that they had had a check-up for the pregnancy.

When asked about problems using the healthcare system and about problems that might create barriers to their use of healthcare services, 13.2% reported having difficulty getting transportation to get needed healthcare in the past year. In response to questions about competing needs that might hinder their access to healthcare services, 33.2% reported that they had to put off getting healthcare in the past year because they needed the money to pay for food, clothing or housing. Only 12.5% reported that they had problems with paperwork in the safety-net system in the past year.

Finally, for the measure of health status, 63.2% of the women perceived that they were in good health, while the rest perceived that their health was not good.

Data Analyses

Binary logistic regression models were used to examine the effects of race, ethnicity and immigration status on Pap smear screening. Race, ethnicity, and immigration status were combined to create the four major predictor categories—Non-Hispanic Whites, African Americans, Hispanic Americans, and Hispanic immigrants. The dependent variable, Pap smear screening, was measured at the nominal level as a dichotomous dummy variable, thus logistic regression was appropriate (42–44).

All predictor variables were coded into dummy variables (one fewer dummy than the number of categories), employing values of "1" and "0" (with the lowest group being the reference category) (43). Race/ethnicity/immigration status was dummied as African American, Hispanic American, and Hispanic immigrant, with non-Hispanic Whites being the reference group. Age was dummied with the younger age group (18–44 years) coded as one, with the older age group (45–60 years) as the reference group. The perceived health variable was dummied showing good health, with the reference category being bad health. Good health was operationalized by combining excellent, very good, and good health whereas bad health was operationalized as a combination of having fair and poor health.

RESULTS

Results from the binary logistic regression analyses for the full model with all predictor variables included are presented in Table II.

Pap Smear Screening Ever

The results of testing the model for ever having had a Pap smear is shown in the first column of Table II. The chi-square for this model is highly significant ($\chi^2 = 62.701$, df $= 14$, $p \leq .001$), indicating that at least one or more independent variables included in each model has a statistically significant effect on ever having had a Pap smear test. Race/ethnicity/immigration status, age, and check-up for current pregnancy are statistically significant predictors of ever having had a Pap smear. African Americans and Hispanics are significantly less likely to have ever had a Pap smear, compared to Non-Hispanic Whites. The odds of ever having a Pap smear for African Americans are 46.1% lower than the odds for Non-Hispanic Whites [The odds are calculated as $(46.1\% = 100 \times [.539-1])$]. The odds for Hispanics are even lower. The odds for ever having a Pap smear test for Hispanic Americans and Hispanic immigrants are, respectively, 79.6 and 77.3% lower than the odds for Non-Hispanic Whites. Younger women (ages 18–44) are 46.2% less likely than older women (45–60 years) to have ever had a Pap smear. Women who are pregnant and who have had a check-up for their current pregnancy are 542.8% more

Table II. Odds Ratios from Binary Logistic Regressions of Pap Smear Screening Ever, Within Past 3 Years, and Within the Past Year on Selected Factors

Variables	Ever	Past 3 years	Past year
Predisposing variables			
Race/ethnicity/immigration status			
African American	.539*	.945*	1.070
Hispanic American	.204*	.508*	.808
Hispanic immigrant	.227*	.798*	1.106
Age	.538*	1.134	1.567*
Marital status	1.443	1.176	1.106
Enabling variables			
Usual source of care	1.632	1.549*	1.606*
Employment status	1.002	.889	1.000
Health insurance coverage			
Any private or public insurance	.827	1.320	1.051
No insurance	.847	.913	.785
Check-up for this pregnancy	5.428*	7.758*	3.490*
Competing needs/problem			
Competing need for transportation	1.036	.896	.738
Competing needs for food, clothing or housing	1.093	.716	.737*
Problem with paperwork	1.186	1.350	1.017
Perceived Health Status			
Good health	1.258	1.306	1.234
−2 log likelihood	711.092	1088.668	1482.324
Model chi-square	62.701***	39.463***	55.425***
Model degrees of freedom (df)	14	14	14

*Significant at $p \leq .05$. **Significant at $p \leq .01$. ***Significant at $p \leq .001$

likely to have had a Pap smear than other women in the sample.

Pap Smear Screening Within the Last 3 Years

Results of our data for Pap smear screening within the last 3 years are shown in the second column in Table II. The model is statistically significant ($\chi^2 = 39.463$, df = 14, $p \leq .001$). There is little difference in odds between African Americans and Non-Hispanic Whites for the odds of having had a Pap smear within the last 3 years. The odds that African Americans have had a Pap smear within the last 3 years are 5.5% lower than the odds for Non-Hispanic Whites. Hispanic immigrants are 20.2% less likely than Non-Hispanic Whites to have had a Pap smear within the last 3 years. Hispanic Americans are the least likely to have had a Pap smear within the last 3 years, compared to Non-Hispanic Whites. Hispanic Americans are 49.2% less likely than Whites to have had a Pap smear in the past 3 years. The odds that women with a usual source of care have had a Pap smear are 54.9% greater than the odds for women without a usual source of care. The odds that pregnant women who have had check-up for the cur-

rent pregnancy have had a Pap smear within the last 3 years are 775.8% greater than the odds for all other women in the study.

Pap Smear Screening Within the Past Year

The results of the analyses of predictors of Pap smear screening within the past year are presented in the third column of Table II. The chi-square for this model is statistically significant ($\chi^2 = 55.425$, df = 14, $p \leq .001$). Unlike the previous two measures, race, ethnicity and immigration status are not significant predictors of having gotten a Pap smear in the past year. The variables that do have significant effects are age, usual source of care, check-up for current pregnancy, and competing needs for food, clothing, and housing. The odds that younger women have had a Pap smear test within the past year is 56.7% higher than the odds for older women. The odds that respondents who have a usual source of care have had a Pap smear within the past year is 60.6% greater than the odds for those who do not have a usual source of care. The odds that pregnant women who have had check-up for the current pregnancy had a Pap smear within the past year are 249% greater than the odds

for other women in the sample. Finally, the odds that women with competing needs for food, clothing, and housing have had a Pap smear test within the past year are 26.3% lower than the odds for women without these competing needs.

DISCUSSION AND CONCLUSIONS

In a safety-net system, access to services should be equally available to all and, therefore, used equally by all, regardless of race or ethnicity. In the safety-net system we studied, however, we continued to find disparities. Hispanic women are much less likely than Non-Hispanic White women to get Pap smears. African American women are also less likely than Non-Hispanic White women to have had a Pap smear although they were more likely to have had a Pap smear than were either of the two groups of Hispanic women. Surprisingly, Hispanic Americans are less likely to have used these services than are Hispanic immigrants. This difference between Hispanic American and Hispanic immigrant women may be due to the "healthy immigrant" phenomenon (45). This hypothesis is based on the study of mortality rates among Latino migrants that revealed that migrants are healthier than non-migrants and have lower mortality rates than those who do not migrate. Our data suggest that one reason the migrants may be healthier is that they are more likely to get preventive healthcare both before and after they migrate.

These data are consistent with national and state data that reveal that Hispanic women are much less likely than Non-Hispanic White women or African American women to have ever had a Pap smear (23). In our sample from a safety-net system, we found that the rates of never having had a Pap smear are comparable to the Texas state rates for Non-Hispanic Whites (4.5%) and African American women (8.8%), but much higher for the two Hispanic groups—18.9% for Hispanic Americans and 16.8% for Hispanic immigrants. This finding indicates that despite the fact that these women were all in a system where barriers to access have been minimized for all people with low income, significant disparities continue to exist, and are even greater than in the general population in the state.

Why do the health disparities exist among the race and ethnic groups in the safety-net system? When we looked at the effect of variables other than race, ethnicity, and immigration status on use of Pap smears, we find that women who have a usual healthcare provider are more likely to have had a Pap smear in the past 3 years, and within the past year, than are women who do not have a usual source of care. These findings support the system of encouraging patients to enroll in the safety-net managed care system and to plan ahead for their care as much as possible; in effect, to have a "usual source of care."

The findings for the usual source of care are further supported by the data which show that women in the study who were pregnant, and who had already had a check-up for the pregnancy, are much more likely to have had a Pap smear than are women who were not pregnant or who were pregnant but had not had a check-up. Women who are still active in childbearing are linked into a system through their need for healthcare providers in the process of childbirth. This connection between childbirth and receiving other healthcare is further supported by the finding that young women are more likely than middle-aged women to have had a Pap smear in the past year while older women are more likely to have had a Pap smear than younger women at some time during their lives.

Finally, co-payments required for office visits for subsidized patients are low—$5 a visit for patients with family incomes at 100% of poverty or less, and $10 a visit for those with incomes between 101 and 200% poverty. Such low co-payments are designed to minimize income as a barrier to getting care, while still allowing the system to recover some of the cost of care from the patients. These modest charges are also justified by providing a disincentive for patients to use the system frivolously, and to give the patients a sense that they are paying for their care—a factor important to the self-esteem of many. Nevertheless, the data support the conclusion that income is still a significant barrier for some women who report that they had to choose between healthcare and basic necessities for themselves or their families, indicating that our safety-net system for Pap smears needs strengthening, and that for some women, even the low co-payments required are still a barrier.

In conclusion, in our study we found that being linked to a healthcare system by having a usual source of care or by having a checkup for pregnancy increased the probability that women would be screened for cervical cancer, while competing needs for basic necessities of food, shelter, and clothing among these low-income women was a major barrier. Two reports, one from NIH and one from WHO, suggest ways healthcare providers might strengthen

Hispanic women's connections to healthcare systems and overcome income barriers to preventive cancer screening.

The NIH Consensus Panel recommended use of culturally sensitive, community-based programs and public awareness campaigns to decrease barriers to Pap smear screening in ethnic communities (18). Specific suggestions that could increase women's access to healthcare providers include having bilingual staff, locating screening sites at locations that are convenient for women, offering free transportation to clinics or having mobile clinics, providing free childcare at the screening sites, and reducing waiting times for appointments. Furthermore, the NIH panel went a step beyond suggesting that financial barriers, such as the modest co-payments paid by women in our study, be eliminated. NIH suggested that women be given incentives for participating in screening, a suggestion that would no doubt be welcomed by those women who have to choose between a roof over their heads or food to eat, and healthcare.

WHO provides one example of the development and implementation of a cancer-screening program based on principles similar to those recommended by the NIH Panel. The program was implemented with a low-income population of Non-Hispanic White and Mexican American women in west Texas (46) and was successful in increasing cancer screening through use of case management services. It provides an illustrative model of how coalitions of government and community organizations, working with healthcare providers, might cooperate to develop community-based screening programs for low-income women. The consortium began with four partners—the Cancer Consortium of El Paso, the Texas Department of Health, the Texas Cancer Council, and Texas Tech Medical School. These partners formed a broadly based community steering committee to administer and coordinate the consortium. Members from 12 participating counties included representatives of county government, healthcare providers, county residents, and major funders. Bilingual community residents recruited as lay health workers were a key component of the program. These health workers provided case management, including follow-up services for medical appointments and transportation when necessary, and outreach education about early detection and treatment of chronic disease, including cancer. As a result of this program, the number of screenings for breast and cervical cancer increased 85% in 3 years in the target area. Not only were more women screened, but problems were detected at earlier stages. Based on our findings that pregnancy is positively related to cervical cancer screening, the advantages of case management services are apparent. Specifically, annual follow-up programs for new mothers might be linked to well-child visits, and thus be more convenient for women, as they would need only one trip to the clinic instead of two. Case management could also be an effective tool to increase women's perception of these program as a usual source of care, and thus increase use of clinic sites for other health problems as well cancer screening.

In addition to overcoming cultural barriers to use of cancer screening, cost barriers also need to be reduced. If a program such as the one in West Texas described by WHO were developed by safety-net providers, there is money already available to pay for the treatment. In 2002, the U.S. Congress passed the Breast and Cervical Cancer Prevention and Treatment Act (Public Law 106-354) that authorizes states to use Medicaid money to cover treatment for breast and cervical cancer for uninsured women under 65 years of age, in families with incomes less than 200% of the federal poverty level (47–49). This payment program supplements the Centers for Disease Control's National Breast and Cervical Cancer Early Detection Program, established in 1991 to provide access to free or low-cost screening for low-income, uninsured, and underserved populations, including recent immigrants (50). The Texas legislature adopted the BCCPTA legislation in 2001 (Senate Bill 532) and the CDC has multiple NBCCEDP sites in the county (48). Unlike many other healthcare problems, there are resources for cervical cancer screening and treatment for low-income women with no insurance. Safety-net providers should connect their patients, especially the underserved Hispanic population, both native born and immigrant, with these resources through culturally appropriate outreach programs based in community clinics using case management systems that can provide the women with a usual source for all healthcare.

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