Factors Associated with Obtaining Health Screening Among Women of Reproductive Age

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Synopsis ....

Death and disability associated with breast and cervical cancer and hypertension can be reduced by early detection and treatment. The authors examined the rates for having obtained a Papanicolaou (Pap) test or pelvic examination, a breast physical examination, and a blood pressure test within the last 12 months among women of reproductive age in the United States in 1988, as reported by the 8,450 women interviewed for the 1988 National Survey of Family Growth.

Overall, the annual rates of screening for women ages 15–44 years for those tests were 67 percent for a Pap test or pelvic examination, 67 percent for a breast examination, and 82 percent for a blood pressure test. Standard recommendations for the frequency of screening and survey data were examined to see whether actual screening practice was consistent with those recommendations.

More than 90 percent of women who had a family planning service visit within 12 months received each of the tests, regardless of who provided the service or who paid for the visit. Women who were not sexually active, women with little education or low income, American Indian women, Hispanic women, and women of Asian or Pacific Islander descent had lower rates of screening than others, regardless of their risk status.

These findings strongly suggest that the likelihood of having obtained screening among women 15–44 years old is determined primarily by how often a woman uses health care, rather than by her risk of disease.

ESTIMATES OF THE LIFETIME RISK for women of developing breast cancer are 9.5 per 100 among whites and 6.9 among blacks (data for those born in 1980). Their risk for cervical cancer is 0.9 per 100 for whites and 2.0 for blacks (1). The National Health and Nutrition Examination Survey II (NHANES II) found women's rates of hypertension to be 31 per 100 among blacks and 15 per 100 among whites in the period 1976-80 (2).

The racial differences in risk increase with age and are much larger by ages 35-39 years (3). Screening tests are readily available, and disability and death associated with those conditions can be lessened through early detection and treatment.

We examined screening tests and estimated screening rates among women of reproductive age, 15-44 years, to identify those with low levels of screening. The screening tests examined were the Papanicolaou (Pap) test or pelvic examination for cervical cancer and pelvic disease, breast physical examination for breast cancer, and sphygmomano-

metry for hypertension. The findings may be applied to evaluations of current disease screening practices.

Because rates of breast cancer and hypertension increase with age, women most at risk for those disorders are beyond the age range of the reproductive age women considered in the survey that formed the basis for our study. However, because the incidence of invasive cervical cancer is almost as high among women ages 35-54 years as for women 55 years and older, a Pap test and pelvic screening are of special interest for women in the younger age group (4). Screening for hypertension is important for those women because of concerns about pregnancy-related hypertension or contraindications for hormonal contraception.

We provide national estimates of recent health screening of women from the 1988 National Survey of Family Growth (NSFG), with demographic and health characteristics. In the survey, a national sample of reproductive age women (15-44 years)

was asked whether the woman had a Pap test or pelvic examination, a breast physical examination, or a blood pressure test during a visit for health services in the 12 months before the survey interview.

We examined the health screening rates reported by the women in the survey and determined the characteristics of the women that were associated with the screening rates. We addressed three related questions: how many reproductive age women received the screening tests, were women at most risk for those diseases the women most likely to be tested for them, and were those testing procedures directed to the appropriate women?

Recommendations and Risks

The standard recommendations for the frequency of the tests and the risk factors for the diseases that the tests detect follow. The American Cancer Society (ACS), the National Cancer Institute (NCI), and the American College of Obstetricians and Gynecologists recommend that women who are sexually active or 18 years or older have a Pap test and pelvic examination annually for 3 years, followed by the option of reducing the frequency of screening if the first three tests are negative (5). Several characteristics place women at increased risk for cervical cancer. The risk of invasive cervical cancer is high among women in their late reproductive years (4). Black, Hispanic, and American Indian women have twice the risk of white women. Women are at increased risk who report an early age for first intercourse, more than one sexual partner, or a history of sexually transmitted disease (STD) (6). An increased risk associated with smoking has been reported (6). Some controversial evidence suggests that the use of oral contraceptives may be associated with the risk for cervical cancer (7).

ACS recommends breast physical examination by a health provider every 3 years for asymptomatic women ages 20 to 40 years and every year for women older than 40 (8). NCI has no stated policy for screening women younger than 40 years (9). ACS encourages women with a history or diagnosis of breast cancer or atypical epithelial hyperplasia to receive at least annual examinations. More frequent physical examinations are recommended for women with a family history of breast cancer. Mammography increases breast cancer detection and reduces mortality. While this screening modality detects smaller lesions than does the physical examination, there are reports of 5 to 10 percent of palpable

lesions not being detected by mammography (10, 11). Thus, physical examinations and mammography are complementary tools in the effort to detect early breast cancer.

The 1988 report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure recommended that blood pressure be measured at each patient visit (12). Patients with a diastolic blood pressure of less than 85 milimeters of mercury (mm of Hg) should recheck their pressure within 2 years. Those with pressures in the 85 to 89 mm of Hg range are encouraged to have their pressure rechecked within 1 year. Oral contraceptives may elevate blood pressure in otherwise normotensive women (13). The prevalence of hypertension is higher among blacks than among whites and appears to be a special problem for blacks living in the southeastern United States (12). Among women, the black-white difference in prevalence of hypertension is small among teenagers, but is large by ages 35–39 (3).

Methods and Materials

Our report is based on data from the 1988 NSFG, a national sample of 8,450 women who were between the ages of 15 and 44 on March 15, 1988. The women were selected from the civilian, noninstitutionalized population. Personal interviews lasting an average of 70 minutes were conducted by female interviewers between January and August of 1988. The questionnaire focused on the women's reproductive health history and included questions related to pregnancies, contraceptive use, infertility, and use of family planning services. This survey was conducted by the National Center for Health Statistics (NCHS) and has been described in detail (14, 15).

The survey sample was drawn from households that had participated in the National Health Interview Survey (NHIS) in the 18-month period from October 1985 through March 1987. The response rate to the NSFG was high (82.5 percent) and similar for blacks (82.2 percent) and whites (82.6 percent). If the 4 percent nonresponse rate to the NHIS is counted as nonresponse to the NSFG, the overall NSFG response rate is 96 percent times 82.5 percent, or about 79 percent (16).

The women were asked whether they had received any of several health screening services as part of any medical visit in the 12 months before the interview. We examined the women's responses to questions regarding a Pap test or pelvic examination, a breast physical examination, and a blood

Table 1. Characteristics of 8,450 women 15–44 years old who had received screening consisting of a Pap test or pelvic examination, a breast examination, or a blood pressure test within 12 months

| Characteristic | Number | Pap test or pelvic examination | | Breast examination | | Blood pressure test | |
		Percent	SE	Percent	SE	Percent	SE
Total	8,450	67.3	0.6	67.2	0.6	82.3	0.5
Age (years):							
15–19	1,252	41.2	1.5	43.2	1.5	77.4	1.3
20–24	1,304	75.5	1.7	73.5	1.7	85.3	1.4
25–29	1,601	78.0	1.2	77.6	1.2	86.2	1.0
30–34	1,702	73.6	1.3	71.4	1.3	82.1	1.2
35–39	1,431	68.4	1.4	68.4	1.3	81.4	1.2
40–44	1,160	62.8	1.7	65.6	1.9	80.5	1.7
Race or ethnicity:							
Non-Hispanic white	4,888	67.1	0.8	67.3	0.8	83.1	0.6
Non-Hispanic black	2,684	76.3	1.1	74.2	1.2	85.4	0.9
Hispanic	641	63.6	2.1	62.9	2.1	77.9	1.8
Asian or Pacific Islander	156	50.0	3.9	53.3	3.9	67.9	3.6
American Indian	78	54.2	6.9	56.7	6.9	73.2	6.2
Education (years, excludes teenagers):							
Less than 12	1,207	65.5	2.0	62.9	1.9	75.1	1.8
12	2,666	70.8	1.1	69.9	1.1	81.8	1.0
13–15	1,970	73.7	1.3	74.3	1.1	85.6	1.0
16 or more	1,355	77.1	1.1	77.5	1.2	88.0	0.9
Income as percentage of poverty level:							
Less than 150	2,458	61.8	1.3	61.7	1.2	78.0	1.0
150–299	2,087	64.8	1.3	63.7	1.1	80.3	0.9
300–399	1,368	66.8	1.5	67.8	1.3	83.3	1.2
400 or more	2,537	72.9	1.0	73.2	1.0	86.1	0.8
Marital status:							
Currently married	4,031	73.6	0.9	73.0	0.9	83.3	0.7
Unmarried, sexually active	2,799	78.4	1.1	75.9	1.1	87.2	0.9
Unmarried, not sexually active	1,620	38.0	1.4	42.4	1.5	73.6	1.3
Gravidity:							
0	2,586	56.4	1.1	58.6	1.1	81.0	0.9
1	1,360	78.8	1.4	76.7	1.4	86.2	1.2
2	1,831	72.9	1.2	72.2	1.2	82.6	1.0
3	1,283	71.0	1.7	69.1	1.7	81.4	1.3
4 or more	1,390	70.2	1.5	69.8	1.7	81.7	1.4
Contraceptive use:							
Currently or recently pregnant	433	95.2	1.1	90.2	1.7	96.3	1.1
Currently using OC	1,541	95.0	0.8	91.2	1.1	94.6	0.9
Other	6,476	58.8	0.7	60.0	0.7	78.4	0.7
Family planning visits in previous 12 months:							
None	5,483	51.9	0.8	54.0	0.8	74.6	0.7
1	1,561	95.2	0.7	91.0	0.9	96.3	0.6
2	777	98.0	0.6	95.1	1.0	98.3	0.6
3 or more	629	97.6	0.8	92.7	1.3	96.8	0.9
Source of payment for family planning services:							
Private insurance	1,163	97.7	0.5	93.9	0.9	97.4	0.6
Self payment	1,114	96.8	0.6	92.1	1.0	96.8	0.6
Medicaid	311	93.0	2.3	87.8	2.9	94.8	2.0
Other government program	281	96.0	1.8	92.4	2.4	97.4	1.4
Other	98	83.4	4.6	86.1	4.3	93.8	3.0
No visit	5,483	51.9	0.8	54.0	0.8	74.6	0.7

NOTE: SE = 1 standard error. To produce 95 percent confidence intervals, multiply by plus or minus 1.96; OC = oral contraceptive; Pap test = Papanicolaou test.

SOURCE: National Center for Health Statistics, 1988 National Survey of Family Growth, 1988.

pressure test. The overall rate of screening for a Pap test or pelvic examination was 65 percent. Both tests had been received by 62.5 percent of the women, and 67 percent reported that they had received at least one test. The rates for both tests were very similar in most of the subgroups exam- ined in the analysis. For this reason, and because we suspected that some women might not distin- guish between these two screening tests, we present data for the percent who reported either a Pap test or a pelvic examination, or both.

We examined characteristics of the women that

might affect their likelihood of receiving the various screening tests. The characteristics included demographic and reproductive health variables associated in the literature with breast cancer, cervical cancer, pelvic inflamatory disease (PID), and hypertension. We examined the effects of the characteristics on screening rates in bivariate cross-tabulations and in multivariate, logistic regression analyses. The logistic regression models included age, race, gravidity, education, current or recent pregnancy (pregnant or completed a pregnancy in the 6 weeks before the interview), family income, current use of oral contraceptives, marital status, whether the woman was sexually active, whether she had ever been treated for PID or vaginitis, and whether she had made a visit for family planning services in the 12 months before the interview. In addition, for blood pressure screening, we used a variable indicating the presence or absence of a history of hypertension.

The percents shown in this article are weighted national estimates. The weight for each case was determined in four steps. First, the weight was inflated by the reciprocal of the probability of selection. For example, if the probability of selection was 1 in 8,000, the first-stage weight was 8,000. Second, very large weights for a few cases were trimmed, or reduced to a maximum value. Third, the best predictors of nonresponse were determined, and response rates were calculated for 51 subgroups. The weight for the case was divided by the response rate in its group, such as 8,000 divided by 0.80 = 10,000. Fourth, the weights were forced to agree with control totals provided by the Bureau of the Census in a 72-cell set of categories by age, race, marital status, and parity (15, 16).

The resulting estimates are accurate for most purposes. Standard errors for the percentages in the cross-tabulations in this report were obtained by the balanced half-sample replication technique, which takes into account the complex sampling design of the NSFG (16).

Results

The overall rates of screening reported by the women interviewed were 67 percent for a Pap test or pelvic examination, 67 percent for a breast physical examination, and 82 percent for a blood pressure screening. In the bivariate analyses, screening rates differed by demographic factors (table 1). The associations tended to be stronger for a Pap test or pelvic examination and breast screening and weaker for blood pressure screening. When

the sample was stratified by age, women in their 20s were most likely to have received any of the screening tests.

Race and ethnic groups had different rates of screening. Non-Hispanic black women had the highest screening rates and were significantly more likely to have been screened than were non-Hispanic white women, who had the second highest screening rates. This difference was most pronounced for a Pap test or pelvic examination ($P < 0.001$) and very small for blood pressure screening. Non-Hispanic white women and Hispanic women had similar rates of Pap testing or pelvic examination and breast examination, but non-Hispanic whites were more likely to receive blood pressure testing than Hispanics ($P < 0.01$). Women of Asian or Pacific Islander descent and American Indian women were least likely to have received all forms of screening.

Screening rates for Pap test or pelvic examination, for example, ranged from 76 percent for non-Hispanic blacks to 54 percent for American Indians and 50 percent for women of Asian or Pacific Islander descent. The differences in screening rates between non-Hispanic white women and women of Asian or Pacific Islander descent were statistically significant. Because of the small number of American Indians in the sample, there was not sufficient study power to detect statistical significance in the large differences in screening rates between American Indians and non-Hispanic whites.

Women with high levels of education and income were more likely to have received all forms of screening than those with low levels. Women who were not sexually active in the 3 months before the interview were only half as likely to have received a Pap test or pelvic examination screening (38 percent) as married women (74 percent) or unmarried sexually active women (78 percent). These differences by marital status and sexual activity were very large for breast examinations, but the differences in blood pressure screening were much smaller.

Women who had obtained clinical family planning services in the 12 months prior to the interview were much more likely to have received a Pap test or pelvic examination, breast examination, and blood pressure screening than other women, regardless of the number of visits or source of payment for the visit. For example, 54 percent of women with no family planning visits received a breast examination, compared with 91 percent of those with one visit (table 1). Current users of oral

Table 2. Adjusted odds ratios (OR) and 95 percent confidence interval (CI) for the association between selected characteristics and the likelihood of having received screening for 7,572 women 15–44 years old

Characteristic	Pap test or pelvic examination		Breast examination		Blood pressure test	
	OR	CI	OR	CI	OR	CI
Age (years):						
Younger than 20	0.4	0.3–0.5	0.5	0.4–0.7	1.1	0.9–1.4
20–39[1]	1.0	...	1.0	...	1.0	...
40 or older	1.1	0.9–1.3	1.2	1.0–1.4	1.3	1.1–1.5
Race or ethnicity:						
White[1]	1.0	...	1.0	...	1.0	...
Black	1.9	1.6–2.2	1.7	1.5–1.9	1.2	1.1–1.5
Education (years):						
0–11	0.6	0.5–0.8	0.7	0.6–0.8	0.7	0.6–0.8
12 or more[1]	1.0	...	1.0	...	1.0	...
Income as percent of poverty level:						
0–149	0.8	0.7–0.9	0.8	0.7–1.0	0.8	0.6–0.9
150–399[1]	1.0	...	1.0	...	1.0	...
400 or more	1.3	1.1–1.5	1.3	1.1–1.5	1.3	1.1–1.5
Marital status:						
Currently married	1.6	1.3–1.9	1.5	1.2–1.8	0.9	0.7–1.1
Unmarried, sexually active	1.9	1.5–2.2	1.5	1.2–1.7	1.0	0.8–1.3
Unmarried, not sexually active[1]	1.0	...	1.0	...	1.0	...
Gravidity:						
0–1[1]	1.0	...	1.0	...	1.0	...
2 or more	1.1	1.0–1.3	1.1	0.9–1.2	1.0	0.8–1.1
Contraceptive use:						
Currently using OC	2.5	1.8–3.6	1.8	1.4–2.3	1.0	0.8–1.5
Currently not using OC[1]	1.0	...	1.0	...	1.0	...
Currently or recently pregnant:						
Yes	5.9	3.1–11.1	2.0	1.3–3.0	2.6	1.4–4.7
No[1]	1.0	...	1.0	...	1.0	...
Family planning visits in previous 12 months:						
Yes	13.6	10.6–17.5	6.7	5.5–8.1	9.1	6.8–12.2
No[1]	1.0	...	1.0	...	1.0	...
History of treatment for PID:						
Yes	1.2	1.0–1.4	1.2	1.0–1.4	1.3	1.1–1.6
No[1]	1.0	...	1.0	...	1.0	...
History of treatment for vaginitis:						
Yes	1.7	1.5–1.9	1.6	1.4–1.8	1.8	1.6–2.1
No[1]	1.0	...	1.0	...	1.0	...
History of hypertension:						
Yes	...	...	...	...	1.8	1.4–2.2
No[1]	...	...	...	...	1.0	...

[1] Referent category.
OC = oral contraceptive; PID = pelvic inflammatory disease; Pap test = Papanicolaou test.

contraceptives and currently or recently pregnant women were more likely to have received all forms of screening than other women. Women who had never been pregnant were less likely to have received a Pap test or pelvic examination or breast screening than women with at least one pregnancy.

Because of the small sample sizes and the likelihood of statistical interactions with other independent variables, we did not evaluate further the Hispanic, women of Asian or Pacific Islander descent and American Indian women. Focused studies of disease screening and risk in these groups would be useful in view of the findings shown in table 1.

Non-Hispanic white and non-Hispanic black women were included in three multivariate logistic regression analyses that used each of the screening tests in turn as the dependent variable (table 2). Table 2 includes all the control variables contained in the regression model.

The strongest predictor for receiving all forms of screening was a visit for clinical family planning services in the previous 12 months (table 2). This association was most pronounced for a Pap test or pelvic examination (odds ratio [OR] = 13.6), but it was very strong as well for breast examination (OR = 6.7) and blood pressure testing (OR = 9.1). Other measures of use of health care had strong effects. Current or recent pregnancy was an important predictor of screening, especially for a Pap test

Table 3. Percentages of 2,692 users of family planning services in the past 12 months and 4,880 nonusers among 7,572 non-Hispanic white and non-Hispanic black women ages 15–44 years

Characteristic	Pap test or pelvic examination		Breast examination		Blood pressure test	
	Users	Nonusers	Users	Nonusers	Users	Nonusers
Age (years):						
Younger than 20	92	20	89	24	97	70
20–24	97	46	92	48	97	71
25–29	98	57	95	60	98	75
30–34	98	62	92	61	97	77
35–39	96	62	93	64	96	78
40–45	NTS	62	NTS	65	NTS	81
Race or ethnicity:						
White	97	51	93	54	97	76
Black	97	63	94	62	98	77
Education (years, excludes teenagers):						
0–11	96	52	90	52	97	68
12	97	58	93	59	96	75
13–15	98	61	95	63	98	80
16 or older	98	65	93	69	97	83
Income as percent of poverty level:						
0–149	95	43	91	46	97	70
150–399	97	52	92	53	97	75
400 or more	98	60	95	62	97	81
Marital status:						
Currently married	97	62	93	64	97	77
Unmarried, sexually active	97	58	92	58	97	77
Unmarried, not sexually active	95	32	95	37	97	73
Gravidity:						
0	97	38	94	42	97	75
1	97	61	92	62	97	75
2 or more	97	62	92	63	96	77
Contraceptive use:						
Currently using OC	96	[1]56	92	[1]50	95	[1]60
Currently or recently pregnant	97	[1]90	92	[1]75	97	[1]89
Other	60	53	61	55	80	76

[1] = number less than 100.
NOTE: NTS = number in category (66) is too small for analysis. OC = oral contraceptive; Pap test = Papanicolaou test.

or pelvic examination (OR = 5.9). The odds for receiving a Pap test or pelvic examination were 2.5 times higher for women currently using an oral contraceptive, compared with other women. A history of treatment for PID or vaginitis was associated with increased screening rates. The relationships between demographic factors and screening were similar to those observed in the bivariate analyses.

Because use of family planning services was such a major predicting characteristic, we stratified the sample by whether the woman had received family planning services in the previous 12 months (2,692 family planning users and 4,880 nonusers, table 3) and repeated the logistic regression analyses in each group (tables 4 and 5). Relationships between most of the predictor variables and screening rates were weak for family planning users because the screening rates were more than 90 percent for almost all subgroups of users (tables 3 and 4). The regression results for family planning users in table 4 show

that most of the variables have small or nonsignificant effects on screening. However, recent pregnancy and current use of oral contraceptives continued to be predictors of receiving screening tests (table 4).

Among women who were not family planning users (tables 3 and 5), other characteristics were more closely associated with the percent tested. The logistic regressions (table 5) show current or recent pregnancy to be the strongest predictor for all types of screening among nonusers of family planning services, controlling for all other variables. That predictor is another indicator of use of health care. Women younger than 20 years old were less likely to have received a Pap test or pelvic examination and a breast examination than older women. Differences at other ages were smaller and usually not significant. Black women were more likely than white women to have received a Pap test or pelvic examination and a breast examination. Not completing high school was associated with substan-

tially reduced chances of receiving screening. Women with high incomes were more likely to be screened. Married women and unmarried, sexually active women received a Pap test or a pelvic examination and a breast examination more frequently than unmarried women who currently were not sexually active. A history of treatment for PID or vaginitis was associated with increased screening rates. Women with a history of hypertension were more likely to have had blood pressure screening than those without such a history.

We repeated the models of tables 4 and 5 among non-Hispanic black and non-Hispanic white women to determine whether characteristics predictive for screening varied by race. Among women who had at least one family planning visit in the previous year, there were no substantive differences between black and white women in characteristics that predicted screening.

Among women who had not had a recent family planning visit, three characteristics appeared to differ for black and white women. These included recent pregnancy (which was a stronger predictor of all screening tests for white women than for black women), age younger than 20 years (which increased blood pressure screening for white teenagers but decreased it for black teenagers), and a history of treatment for vaginitis (which was a stronger predictor for black women for having had a Pap test or pelvic examination and a breast examination than for white women). The tabulation of these findings is available from the authors.

Discussion

This report complements earlier national studies of screening. Both the 1973 and the 1982 NHIS reported whether subjects ever had a breast examination or a Pap test, but did not provide information about recent pelvic examinations or characteristics associated with screening (17). The 1987 NHIS described characteristics associated with breast screening among women younger than 39 years (9) and associated with Pap testing among women older than 17 years (18). Reports on the 1974 and 1985 NHIS showed national screening rates by race and income, but did not include information about current or recent pregnancy, contraceptive use, sexual activity, history of STD, PID, or hypertension. Neither did it provide rates for detailed (5-year) age categories or for Hispanic, women of Asian or Pacific Islander descent, or American Indian women (19). The 1982 NSFG report was limited to women with recent family

planning visits and included only women who were most likely to be screened (20).

The overall rates of screening reported by the 1988 NSFG ranged from 67 percent to 82 percent. If all women ages 15–44 years were following the recommended guidelines, and many had already received their baseline evaluations, the screening rates in this survey would be generally acceptable for this age group. However, some subgroups of women reported comparatively low rates of screening in the 12 months before the survey. In addition, certain subgroups of women are at higher risk for these diseases. For cervical cancer, high risk groups examined in this report include black, Hispanic, and American Indian women, and women with a history of PID. Black women are at higher risk for hypertension as well. Other characteristics, such as a family history of hypertension or breast cancer, may predict disease risk, but this information was not collected in the 1988 NSFG.

The incidence of hypertension and breast cancer, and the morbidity and mortality associated with them, are higher in women older than the age range of this survey. The major predictors of screening reported here are not applicable to high risk women beyond reproductive age. However, the predictors are indicators of the use of health care. As found by a recent study of elderly women in Rhode Island, access to health care is a major determinant of screening (21).

Most of the independent variables we examined tended to have the same association with likelihood of screening, regardless of which screening test was analyzed. A number of our findings suggest that the likelihood of screening is more closely associated with the opportunity to access health providers than with risk status for the disease. This observation agrees with a recent literature review of predictors for Pap testing that noted that involvement with the medical system was a consistent predictor of the frequency of such testing (22). The strong association between use of family planning services and screening is the first of these examples. Women using family planning services may not be at higher than average risk of breast cancer or hypertension, but their attendance at a clinical office increases the likelihood that they will be screened for these disorders.

A related finding is the relationship between oral contraceptive use and screening. There are questions about whether women using oral contraceptives are more likely to develop breast or cervical cancer (23). Oral contraceptive use may lead to hypertension, and when hypertension is already

Table 4. Adjusted odds ratios (OR) and 95 percent confidence interval (CI) for the association between selected characteristics and the likelihood of receiving screening among 2,692 women who used family planning services in the previous 12 months

Characteristic	Pap test or pelvic examination		Breast examination		Blood pressure test	
	OR	CI	OR	CI	OR	CI
Age (years):						
Younger than 20	0.5	0.3–0.9	0.8	0.5–1.2	1.3	0.6–2.8
20 and older[1]	1.0	...	1.0	...	1.0	...
Race or ethnicity:						
White[1]	1.0	...	1.0	...	1.0	...
Black	1.3	0.8–2.0	1.4	1.0–2.0	1.4	0.8–2.4
Education (years):						
0–11	0.6	0.4–1.0	0.7	0.5–1.0	0.8	0.4–1.5
12 or more[1]	1.0	...	1.0	...	1.0	...
Income as percent of poverty level:						
0–149	0.7	0.4–1.2	0.8	0.5–1.1	0.7	0.4–1.2
150–399[1]	1.0	...	1.0	...	1.0	...
400 or more	1.3	0.7–2.4	1.3	0.9–2.0	1.0	0.6–1.8
Marital status:						
Currently married	1.0	0.4–2.3	0.6	0.3–1.3	0.9	0.3–2.4
Unmarried, sexually active	0.9	0.4–2.0	0.5	0.3–1.1	0.8	0.3–2.1
Unmarried, not sexually active[1]	1.0	...	1.0	...	1.0	...
Gravidity:						
0–1[1]	1.0	...	1.0	...	1.0	...
2 or more	0.9	0.5–1.5	1.0	0.7–1.4	0.8	0.5–1.3
Contraceptive use:						
Currently using OC	4.8	2.9–8.1	2.4	1.7–3.3	1.7	1.0–2.7
Currently not using OC[1]	1.0	...	1.0	...	1.0	...
Currently or recently pregnant:						
Yes	3.7	1.6–8.9	2.1	1.3–3.6	3.9	1.4–11.2
No[1]	1.0	...	1.0	...	1.0	...
History of treatment for PID:						
Yes	1.3	0.7–2.7	1.1	0.7–1.6	3.0	1.1–8.4
No[1]	1.0	...	1.0	...	1.0	...
History of treatment for vaginitis:						
Yes	1.8	1.2–2.9	1.2	0.9–1.6	1.7	1.1–2.7
No[1]	1.0	...	1.0	...	1.0	...
History of hypertension:						
Yes	...	...	...	...	1.6	0.7–3.6
No[1]	...	...	...	...	1.0	...

[1] Referent category.
OC = oral contraceptive; PID = pelvic inflammatory disease; Pap test = Papanicolaou test.

present, this condition is a contraindication for oral contraceptive use (13). However, the association we observed between oral contraceptive use and screening was more likely a result of the comparatively frequent followup visits to health providers that oral contraceptive use requires.

Another finding that suggests that frequency of health care use is linked with the likelihood of screening is the high screening rate among pregnant women. Pregnant women do need additional blood pressure screening to detect pregnancy-related hypertension, but the high rates of breast and cervical screening reported in the NSFG were probably a result of frequent prenatal care visits rather than special risk status.

Women with high levels of education or income are more likely to visit a health provider and receive screening than are poorer or less educated women. However, low income has been identified as a predictor of low screening rates independent of the frequency of physician visits (24). Unmarried women who are not sexually active do not have a decreased risk for breast cancer or hypertension, but they are unlikely to request family planning services from a health provider. We found this group to have lower rates of physical breast examination and blood pressure screening.

Screening rates among minority women are a concern. We did not find increased rates of Pap testing or pelvic examination among Hispanic and American Indian women, who are at higher risk for cervical cancer. We found very low screening rates among women of Asian or Pacific Islander descent. However, the NSFG was not designed to oversample Hispanics, women of Asian or Pacific Islander descent, or American Indian women, and

Table 5. Adjusted odds ratios (OR) and 95 percent confidence interval (CI) for the association between selected characteristics and the likelihood of receiving screening among 4,880 women who did not use family planning services in the previous 12 months

Characteristic	Pap test or pelvic examination		Breast examination		Blood pressure test	
	OR	CI	OR	CI	OR	CI
Age (years):						
Younger than 20	0.4	0.3–0.5	0.5	0.4–0.6	1.1	0.8–1.4
20–39[1]	1.0	...	1.0	...	1.0	...
40 or older	1.1	0.9–1.2	1.2	1.0–1.4	1.2	1.0–1.5
Race or ethnicity:						
White[1]	1.0	...	1.0	...	1.0	...
Black	2.0	1.7–2.3	1.7	1.5–2.0	1.2	1.0–1.4
Education (years):						
0–11	0.7	0.6–0.8	0.7	0.6–0.8	0.7	0.6–0.8
12 or more[1]	1.0	...	1.0	...	1.0	...
Income as percent of poverty level:						
0–149	0.8	0.7–0.9	0.8	0.7–1.0	0.8	0.6–0.9
150–399[1]	1.0	...	1.0	...	1.0	...
400 or more	1.3	1.1–1.5	1.3	1.1–1.5	1.3	1.1–1.6
Marital status:						
Currently married	1.6	1.3–2.0	1.5	1.2–1.8	0.9	0.7–1.1
Unmarried, sexually active	1.9	1.6–2.3	1.5	1.3–1.8	1.1	0.9–1.3
Unmarried, not sexually active[1]	1.0	...	1.0	...	1.0	...
Gravidity:						
0–1[1]	1.0	...	1.0	...	1.0	...
2 or more	1.1	1.0–1.3	1.0	0.9–1.2	1.0	0.8–1.2
Contraceptive use:						
Currently using OC	1.3	0.9–2.1	1.0	0.6–1.5	0.7	0.4–1.0
Currently not using OC[1]	1.0	...	1.0	...	1.0	...
Currently or recently pregnant:						
Yes	9.9	4.0–24.3	2.3	1.3–4.4	2.4	1.1–5.2
No[1]	1.0	...	1.0	...	1.0	...
History of treatment for PID:						
Yes	1.2	1.0–1.4	1.2	1.0–1.4	1.2	1.0–1.6
No[1]	1.0	...	1.0	...	1.0	...
History of treatment for vaginitis:						
Yes	1.7	1.5–1.9	1.6	1.4–1.9	1.8	1.5–2.1
No[1]	1.0	...	1.0	...	1.0	...
History of hypertension:						
Yes	...	...	...	...	1.8	1.4–2.2
No[1]	...	...	...	...	1.0	...

[1] Referent category.
NOTE: OC = oral contraceptive; PID = pelvic inflammatory disease; Pap test = Papanicolaou test.

SOURCE: National Center for Health Statistics, 1988 National Survey of Family Growth.

the number of sample cases in these groups in this survey was too small for detailed study. Special studies of these groups are warranted, but it is likely that their limited access to health care accounts at least in part for their low rates of screening.

Some high-risk characteristics did appear to be associated with higher screening rates. Black women are more likely to develop hypertension and cervical cancer, and less likely to survive breast cancer and cervical cancer, than white women (1, 2, 25). Our finding that black women were more likely to have obtained screening than white women agrees with reports from the 1985 National Health Interview Survey (19). The 1987 survey found similar rates between white and black women for recent breast screening (9) and higher rates among black women for Pap tests (18). However, the NSFG showed that black women were only slightly more likely to have received blood pressure testing, although rates of blood pressure testing were high in both groups. This small difference in screening rates was not in keeping with black women's doubled risk for hypertension when compared with that for white women (2).

We found that women with a history of treatment for PID or vaginitis were more likely to receive all screening tests than women with a negative history. Women with a history of treatment for PID are more likely than other women to develop PID again and to develop cervical cancer (6). Vaginitis is not necessarily a marker for

cervical cancer risk, but it is a disorder for which women would be likely to seek gynecologic care and thereby increase their likelihood of receiving a Pap test or other screening tests.

Women with a history of hypertension were more likely to receive blood pressure testing than women without such a history. However, blood pressure testing among women with a positive history of hypertension is usually a followup of those with a known disease, rather than a screening of apparently well women.

Interestingly, blood pressure testing, which is performed in most health care encounters, was done more frequently than the other screening tests. This difference may suggest missed opportunities for breast and cervical screening, although women can receive blood pressure screening in settings inappropriate for physical examinations. To assess whether women who are not tested receive any medical care in the past year, it would be useful to add a question to the survey that asks: "Did you go to a doctor for any reason in the last 12 months?" This would permit determining whether those who were not screened were receiving appropriate care, inadequate care, or no medical care.

Overall, the survey suggests that the majority of women ages 15–44 receive annual breast and cervical cancer screening and blood pressure testing. However, women who are at high risk for disease may not be the ones with the highest screening rates. Women who were using family planning services, were pregnant, or were using oral contraceptives had high rates of screening, probably because these conditions are associated with frequent visits to health care providers. However, women who are less likely to enter the health care system, such as women in minority groups, women with low incomes or education levels, and women who are not sexually active, may require special attention in screening programs to insure appropriate rates of testing. Our findings suggest that interventions to increase access to medical services may be more efficient for promoting health benefits than separate interventions directed to specific conditions.

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Attendance Patterns of Older Adults in a Health Promotion Program

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Synopsis ....

A group of 224 participants in a health promotion program for older adults had complete baseline data, including demographic information, self-perceived mental and physical health ratings, and measures of socialization and health limitations.

Participants were offered exercise sessions 3 times a week, weekly health education classes, and a weekly stress management group. Their attendance at these classes varied from no classes to approximately 750 classes. Initially, participants were divided into the following 5 subgroups: 90 with virtually no attendance, and approximately 30 in each of 4 quartiles of class attendance. The group with the lowest attendance (first quartile) was found to be statistically like the group whose participants never attended any classes; these groups were combined.

The Kruskal-Wallis One-Way Analysis of Variance was used to test for significant differences among the four groups on the variables of interest. In a comparison of the four groups from lowest to highest attendance, those participants with lowest attendance had lower incomes (P<.05), tended to live alone (P <.01), and were less likely to be able to climb two flights of stairs or walk a half-mile (P<.01) than those in greater attendance groups. Their socialization behaviors were poorer (P <.01), and their health often limited their activities (P <.05).

COMMUNITY-BASED SENIOR health promotion programs proliferated throughout the United States in the 1970s and 1980s (1) as a disease prevention-health maintenance strategy. In general, these programs were designed to help people modify unhealthy behaviors, increase use of screening tests and immunizations, and improve their overall knowledge of basic health (2).

Several studies have looked at relationships between psychosocial factors and level of exercise involvement (3,4). In particular, some research has indicated that older adults tend to participate in physical activities to satisfy needs for companionship and affiliation and to improve health status (5-8). Goal directedness was found to predict adherence to exercise programs among older adults (9). Social support and identification with others who are active were found to relate positively with exercise and adherence to exercise programs. Further, older adults perceiving themselves as physically able seem to be intrinsically motivated to engage in physical activity (10).

Various studies have focused on senior center participants and the relative importance of different variables in predicting center attendance. Sociodemographic variables have not been found to