Utilization of Health Care Services Related to Cancer Prevention for Women in the Medicaid Program

Final Report

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Utilization Rates of Pap Tests for Women in the Medicaid Program

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Utilization Rates of Pap Tests for Women in the Medicaid Program

Abstract

Objectives: To analyze Pap test rates for women in Medicaid from 1993-1995 in four states.

Methods: Pap test rates were analyzed by race and ethnicity utilizing 1993-1995 SMRF data from California, Georgia, Missouri and New Jersey. Descriptive and multivariate results are reported.

Results: Approximately one-half of women continuously enrolled in Medicaid received Pap tests during the three-year timeframe. Once controlling for various factors, odds ratios varied by race and ethnicity across states.

Conclusions: Results indicated that Pap test screening rates differed by race and ethnicity across the four states, and rates were below recommendations. Race, ethnicity and age were strong predictors of receiving a test.

INTRODUCTION

One objective of Healthy People 2010 (HP2010) is to increase the proportion of women who have ever received a Pap test to 97 percent by 2010. A second objective is to increase the proportion of women who have had Pap tests in the prior three years from 79 percent in 1998 to 90 percent by 2010.[1] These goals are ambitious but worthwhile as much of the decrease in the past thirty years in the incidence of and mortality from cervical cancer has been attributed to the use of Pap tests.[2,3] When cervical cancer is found early, and coupled with appropriate treatment and follow-up, the likelihood of survival is nearly 100 percent.[1] Yet, despite such findings, minority, elderly, and low-income women are still greatly affected by the disease in comparison to the rest of the population.[2]

Research has indicated that the receipt of Pap tests varies by race and ethnicity. Although white women have the highest incidence of cervical cancer, African American women have the highest rate of death from cervical cancer, followed by American Indians/Alaskan Native women, Hispanic women and women from Asia and the Pacific Islands.[2,4] Despite the disparities in mortality rates, some studies have indicated that African American women are equally or more likely to receive Pap tests compared to white women.[5-7] Analysis of the 1987-1992 National Health Interview Survey Cancer Control Supplements revealed that 71.6 percent of African American women compared to 64.9 percent of white women and 62.6 percent of Hispanic women had reported having a Pap test in the previous three years.[7]

Very few studies been conducted on the receipt of cancer screening tests for women enrolled in Medicaid. A study of the Oregon Health Plan found that non-disabled Medicaid women were more likely to visit a physician and more likely to receive a Pap test compared to low-income privately insured women and low-income uninsured women.[8] The purpose of this study is to review Pap test screening rates by race and ethnicity using claims data from 1993-1995 for Medicaid-eligible women living in California, Georgia, Missouri and New Jersey. These rates can be used as a baseline to measure progress towards HP2010 objectives.

METHODS

To study whether women with Medicaid received Pap tests, we utilize the State Medicaid Research Files (SMRF) from four states over a three-year period (1993-1995). The SMRF files are claims files created from the Medicaid Statistical Information System files for states that submit their claims to the Center for Medicare & Medicaid Services (CMS). The files include a standardized person summary file as well as claims organized by inpatient, long term care, prescription drugs and other services.

In choosing states, we required that states have large Medicaid programs, which would allow us to sufficiently study as many racial and ethnic groups as possible. Because we wanted to study women over a number of years, we required that states have three years worth of SMRF data available, which further limited the number of states available to study as not all met this requirement. In addition, we excluded states with high managed care enrollment because we would not be able to analyze encounter data. Four states that met these criteria were California, Georgia, Missouri and New Jersey.

Our sample consisted of women enrolled in Medicaid aged 13 and older. We chose to include the 13-17 year old age group as it is recommended by the American Cancer Society for women to be screened by the age of 18 or when they become sexually active, whichever occurs first.[9]

The sample included women ages 13 and older who were eligible for fee-for-service Medicaid for at least one month in 1994. We excluded women from the sample who were enrolled in managed care or fee-for-service for the entire three-year timeframe. A few women have private coverage or private catastrophic coverage and qualify for Medicaid. For these women, their private insurance is the primary payer and Medicaid is secondary. Women were also excluded who were dually eligible for Medicare and Medicaid and who were medically needy. Medically needy programs allow persons who do not qualify for Medicaid but have high medical expenditures to qualify for Medicaid once they spend a certain percent of their income on medical services. These women were excluded because we would not be able to see the full set of services they consumed. There are no claims for persons in managed care and persons with other coverage would only have claims for Medicaid as the payer of last resort.

Women were identified as having Pap tests using procedure codes from outpatient claims using the SMRF "other services" file. The codes for cervical cancer screening were selected using NCQA HEDIS® recommendations, review of CPT and ICD-9 codebooks from 1992-1996, and review by our physician consultant. The Pap test codes used during our study period were 88150, 88151, 88155, 88156, 88157, P3000, P3001, 91.46 and 923 (the last one was a code from UB-92).

Two separate Pap test rates were calculated based on unique women and women who were continuously eligible over the three-year period. Unique women were those who had at least one month of eligibility during the three years. Their rates were then weighted by the number of total months of eligibility. Women defined as continuously enrolled were enrolled for at least 30 months out of the 36-month timeframe. In calculating the rates, the denominator consisted of all women in the sample, and the numerator consisted of women who had a Pap test during the study period. Because research has shown that women with a usual source of care were more likely to have regular check-ups and receive cancer screens,[10-13] we also reported results of Pap test rates as a function of the number of office visits a woman had during her eligibility.

The rates were age-adjusted to our sample Medicaid population using the direct method. This allowed us to better compare the rates by race and ethnicity because age is correlated with Pap test screening, and each racial and ethnic group had a different age profile.[18] In analyzing rates we used chi-squares to test for significance comparing each racial and ethnic group to white women. All statistical testing used standard errors that accounted for age adjustment. We did not report results for small samples where the relative standard error was greater than 30 or where samples were less than 200.[15] This standard is used by the National Center for Health Statistics and is a standard measure of reliability.

We estimated logistic regressions and reported log-odds ratios and chi-square tests of significance. The logistic regressions weighted by months of enrollment. One model was run for each state to separate differences in Medicaid programs and populations due to state-specific differences. The dependent variable was whether a woman received a Pap test in the 36-month window, and the model controlled for race, ethnicity, age, whether the woman received cash assistance and number of physicians per population. The cash assistance variable was included in the models to differentiate a woman's dependence on Medicaid. We hypothesized that women with the lowest income who received cash assistance may be more dependent on Medicaid. A variable indicating physician supply was also included in the model, as we hypothesized that women were more likely to receive Pap tests in areas where there were more physicians. We created this variable using county-level data from the Census Bureau.[16] This variable was scaled to be reported as per 10,000 people.

Where the descriptive rate is reliable according to the RSE standard, separate regressions were estimated for each race/ethnicity group for all four states. Separate regressions allow all coefficients to vary by race/ethnicity and are the preferred way to mode racial and ethnic differences.[17]

To test whether the estimated models by race and ethnicity were statistically different from each other, we estimated the equations in a slightly different, but equivalent way. For each potentially significant difference between white women and women of another racial/ethnic group, we combine the sample of white women and the women of another specific racial/ethnic group, such as African American women. The regression is re-estimated with the same independent variables. All of the independent variables are interacted with race. This creates and "unrestricted" model where we generate effectively two different sets of coefficients for white and African American women, like in the independent regressions. This regression generates the appropriate log-likelihood statistic to use in a comparison with a "restricted" model, which has the independent variables and an indicator for race, without all the interaction terms. From these two models, we calculated a likelihood ratio test that determines whether the intersections are jointly significant. The statistic is the difference between the restricted value of (-2*logliklihood) and the unrestricted value. This statistic takes on a chi-square distribution and that has degrees of freedom equal to the number of independent variables multiplied by the number of equations one is testing. We only test for differences between whites and each of the other racial and ethnic groups individually, so there are always two equations.

RESULTS

Sample Characteristics. As seen from Table 1, the states' mix of racial and ethnic groups varied considerably. For example, over one-third of the sample in California consisted of Hispanics, with 31.3 percent of the sample whites and 17.4 percent African Americans. In Georgia, whites accounted for nearly one-third of the sample and African Americans two-thirds. The numbers are almost reversed in Missouri: whites composed 63.2 percent and African Americans nearly 36 percent of the population. African Americans represented the largest percentage of Medicaid beneficiaries in New Jersey, followed by whites and Hispanics. There was less than 1 percent of Asian Pacific Islanders in all states except California, and American Indians and Alaskan Natives accounted for less than one-half of 1 percent in all states. Women with an unknown race range from 3.8 percent of beneficiaries in Georgia to 8.4 percent of beneficiaries in New Jersey. Women aged 18-39 represented the majority of women in each state, followed by females aged 13-17 and 40-49. Almost three-quarters of all women in each state received cash assistance (AFDC), and there were more than 2 physicians per 10,000 population in each of the states except Missouri where there were only 0.9 physicians per 10,000 population.

Pap Test Rates. Table 2 displays the results of Pap tests for unique women and continuously eligible women, respectively, over a three-year period. The Pap test rates for women enrolled in Medicaid for at least one month in the three-year timeframe ranged overall from 44 percent in New Jersey to 55 percent in Georgia. In California, African American and Hispanic women had significantly lower rates that white women, while women from Asia and the Pacific Islands had significantly higher rates. It should be noted that in many instances throughout this report, the results may be statistically significant, but the absolute differences are

Table 1

Sample Characteristics by State for Women on Medicaid

Variable	California	Georgia	Missouri	New Jersey
Race (%)				
White[1]	31.3	30.5	63.2	26.5
African American[1]	17.4	64.3	35.8	42.1
Hispanic	34.2	0.9	0.4	22.0
Asian or Pacific Islander	9.0	0.5	0.1	0.8
American Indian or Alaska Native	0.5	0.0	0.5	0.2
Unknown	7.6	3.8	0.0	8.4
Age (%)				
13-17	15.4	16.4	15.0	13.4
18-39	62.1	64.7	66.0	62.9
40-49	11.9	9.3	8.9	10.4
50-64	8.1	8.6	8.4	9.1
65+	2.6	1.0	1.7	4.3
Receives Cash Assistance (%)	75.0	72.7	73.1	79.6
MDs per 10,000 population	2.3	2.0	0.9	2.5
Sample Size	1,687,737	327,671	199,569	269,372

Note:
Results are weighted by months of enrollment.
[1] Not Hispanic

SOURCE: Developed by HER staff from analysis of the 1993-1995 State Medicaid Research Files.

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Table 2

Pap Test Rates for Unique Women 1993-1995

	California	Georgia	Missouri	New Jersey
Overall	**46%**	**55%**	**53%**	**44%**
White [1]	47	52	51	40
Black or African American [1]	45*	57*	56*	47*
Hispanic or Latino	46*	53	44	48*
Asian or Pacific Islander	48*	50	41	39
American Indian or Alaska Native	46	46	50	45
Unknown Race	38*	49*	--	35*
N	1,206,127	213,568	128,360	167,091

Pap Test Rates for Continuously Eligible Women 1993-1995

	California	Georgia	Missouri	New Jersey
Overall	**50%**	**59%**	**57%**	**46%**
White[1]	51	53	55	39
Black or African American[1]	48*	61*	61*	51*
Hispanic or Latino	52*	62	54	52*
Asian or Pacific Islander	54*	51	45	37
American Indian or Alaska Native	53	NR	56	54
Unknown Race	42*	46*	--	35
N	588,694	81,445	49,985	53,643

NOTES: Rates are age-adjusted.

* Significantly different from whites at 0.05.

[1] Not Hispanic

SOURCE: Developed by HER staff from analysis of the 1993-1995 State Medicaid Research Files quite small. In Georgia, Missouri and New Jersey, African American women have statistically significant higher rates than white women (57 v. 52 percent, 56 v. 51 percent, and 47 v. 40 percent, respectively). Also, Hispanic women in New Jersey have significantly higher Pap test rates than white women in New Jersey.

The rates were consistently higher for women continuously enrolled in Medicaid in comparison to women enrolled at least one month. Overall, rates for women continuously enrolled increased by four percentage points in three of the states, while the rates increased in New Jersey by two percentage points compared to unique women. Further, with the exception of New Jersey, half of all continuously eligible women on Medicaid received a Pap test at least once during enrollment. The rates by race and ethnicity within state mirrored those of unique women with one exception: Hispanic women continuously enrolled in Medicaid in California had significantly higher rates compared to white women (52 percent v. 51 percent).

Pap Test Rates Based on Office Visits. Figure 1 demonstrates the results of a woman having a Pap test based on the number of office visits she had during her eligibility. (Table 3 is a companion table.) The rate of Pap tests increased steadily as the number of office visits increased. With one office visit, the Pap test rate was at least 36 percent for women in each state; with two, the rate was well over 40 percent (51 percent for New Jersey). For most states, rates leveled out between 65 and 70 percent, although the rates for New Jersey never quite reached 60 percent. Overall, the rates for women with office visits exceeded the rates of those shown in Table 2. However, in all states rates actually begin to decrease as office visits increase. Further, the number of women who did not have any office visits was quite large: 9 percent for Georgia, 10 percent for Missouri, 27 percent for California and 31 percent in New Jersey.

The next series of figures and tables examine office visits by race and ethnicity for each state (Figures 2-5, Tables 4-7). Although there were some difference among states, office visits by race and ethnicity generally followed similar patterns as states overall. In California, Georgia and New Jersey, African American and Hispanic women had higher numbers of office visits compared to other states, while women of unknown races and Asian Pacific Islanders had lower numbers of office visits.

Logistic Regression Results. Once age and other variables were controlled for in the logistic regressions, racial and ethnic differences remained (Table 8). The differences varied depending upon the state. With the exception of California, African American women on

Figure 1

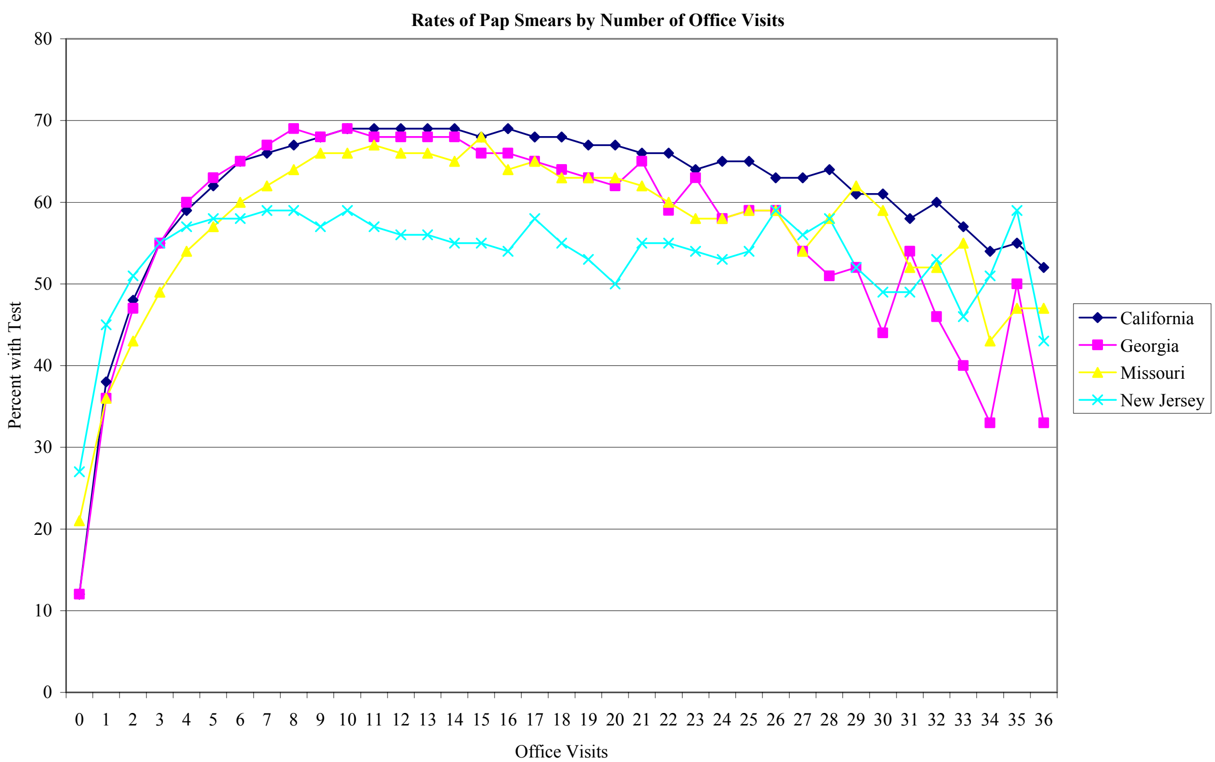

Table 3

Pap Test Rates by Number of Visits
1993-1995

# Visits	California	Georgia	Missouri	New Jersey
0	12	12	21	27
1	38	36	36	45
2	48	47	43	51
3	55	55	49	55
4	59	60	54	57
5	62	63	57	58
6	65	65	60	58
7	66	67	62	59
8	67	69	64	59
9	68	68	66	57
10	69	69	66	59
11	69	68	67	57
12	69	68	66	56
13	69	68	66	56
14	69	68	65	55
15	68	66	68	55
16	69	66	64	54
17	68	65	65	58
18	68	64	63	55
19	67	63	63	53
20	67	62	63	50
21	66	65	62	55
22	66	59	60	55
23	64	63	58	54
24	65	58	58	53
25	65	59	59	54
26	63	59	59	59
27	63	54	54	56
28	64	51	58	58
29	61	52	62	52
30	61	44	59	49
31	58	54	52	49
32	60	46	52	53
33	57	40	55	46
34	54	33	43	51
35	55	50	47	59
36	52	33	47	43
Total N	1,196,380	213,260	128,389	162,929
Percent of sample with zero visits	27	9	10	31

SOURCE: Developed by HER staff from analysis of the 1993-1995 State Medicaid Research Files

Figure 2

California: Office Visits by Race

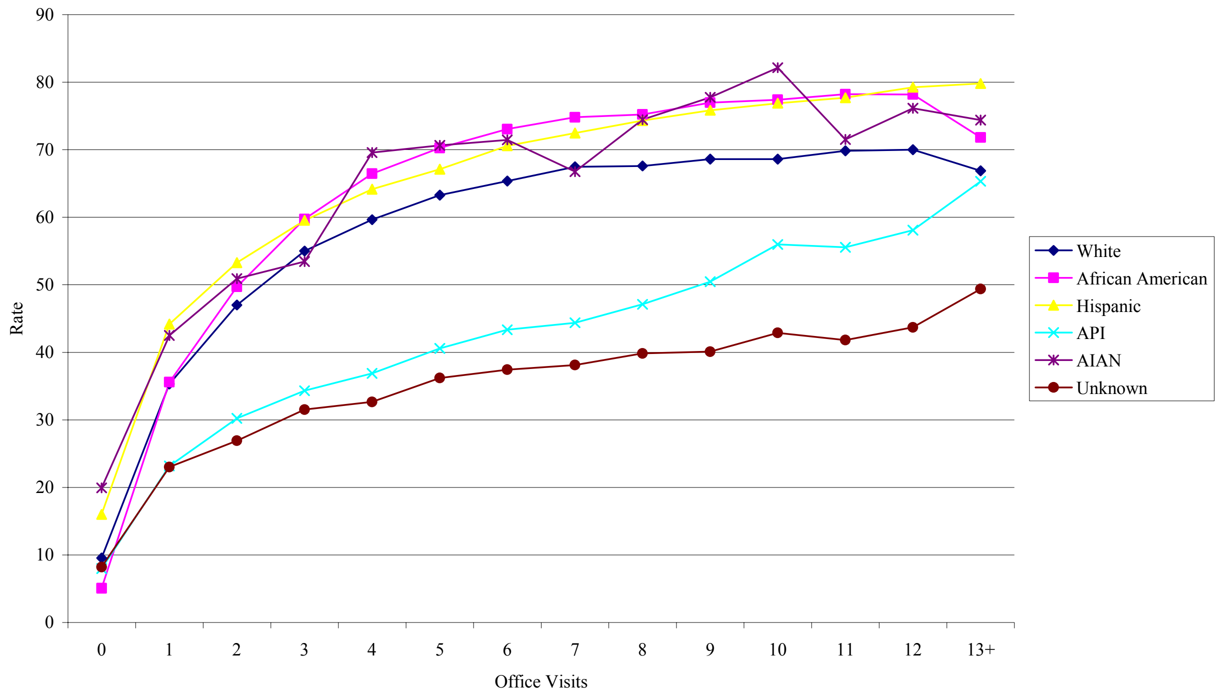

Figure 3

Georgia: Office Visits by Race

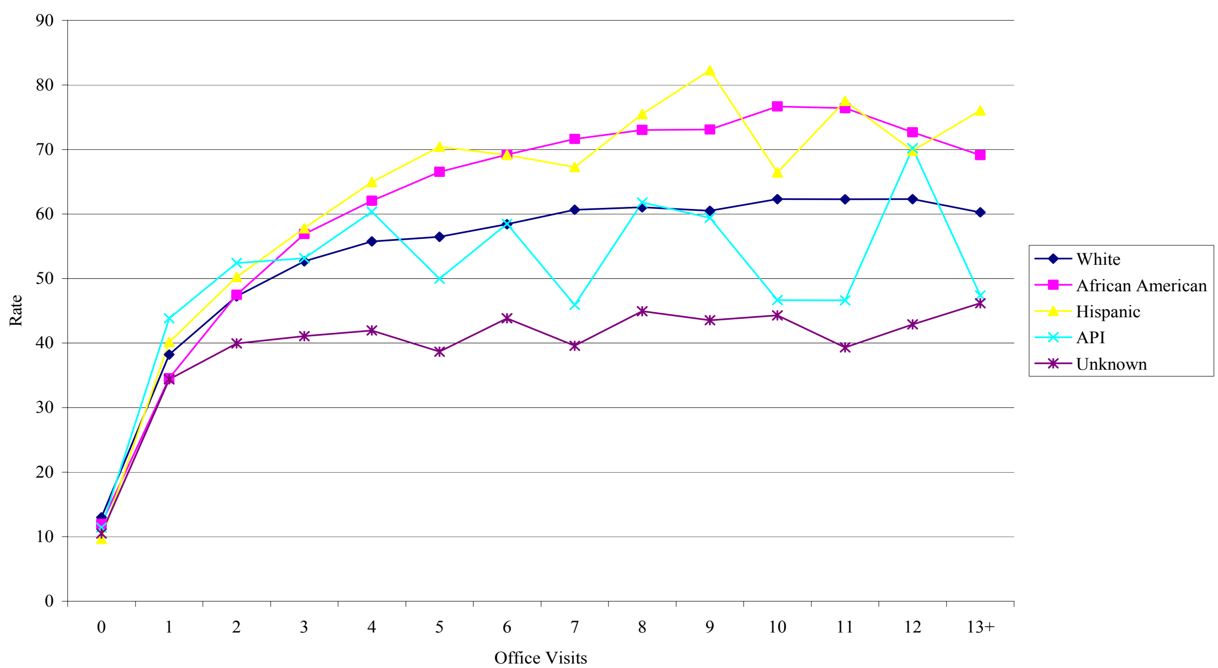

Figure 4

Missouri: Office Visits by Race

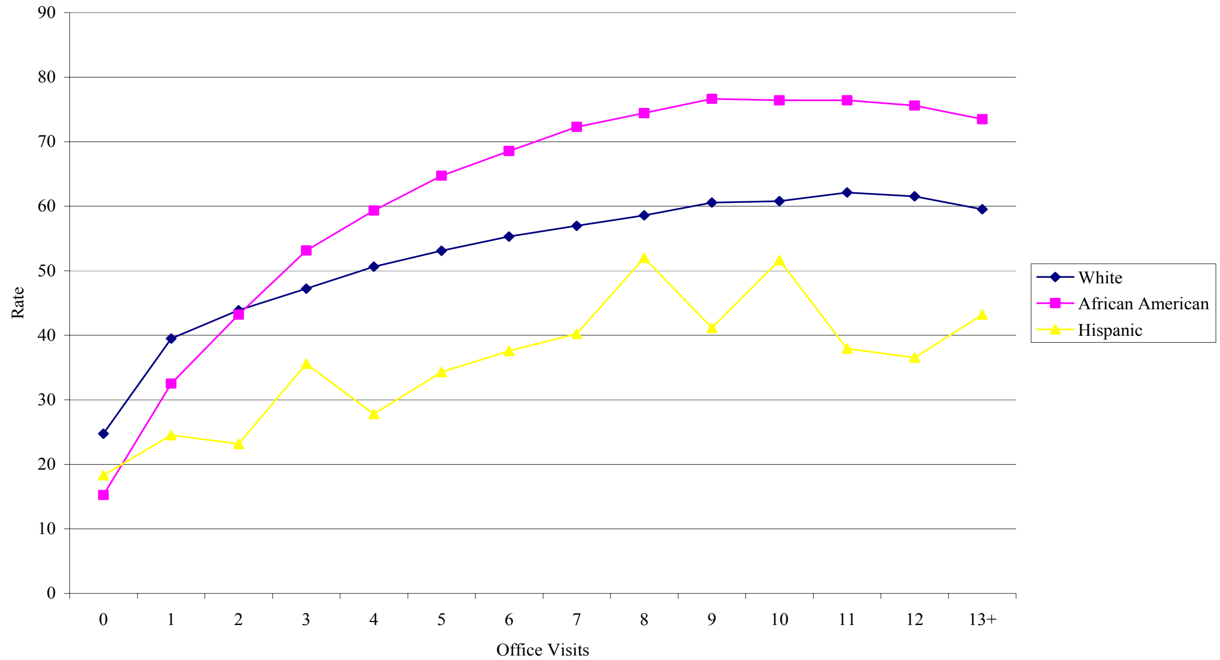

Figure 5

New Jersey: Office Visits by Race

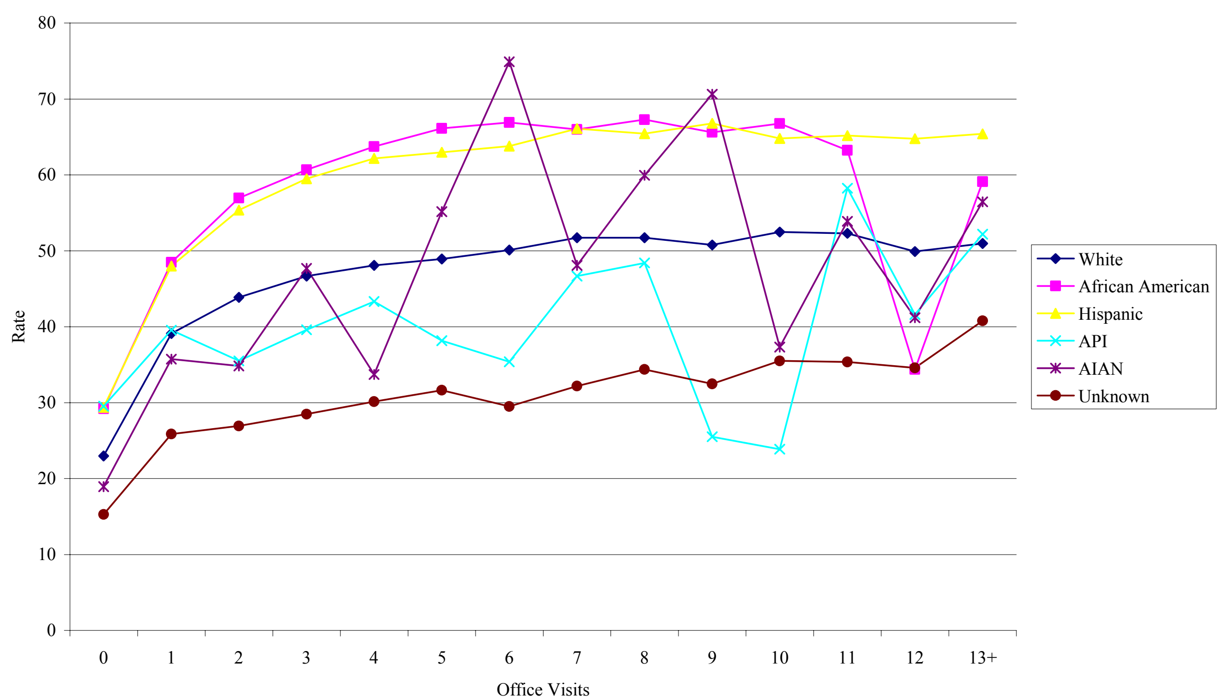

Table 4

Office Visit Rates by Race
California
1993-1995

# Visits	White	African American	Hispanic	Asian or Pacific Islander	American Indian or Alaska Native	Unknown
0	10	5	16	8	20	8
1	35	36	44	23	43	23
2	47	50	53	30	51	27
3	55	60	60	34	53	32
4	60	66	64	37	70	33
5	63	70	67	41	71	36
6	65	73	71	43	71	37
7	67	75	72	44	67	38
8	68	75	74	47	74	40
9	69	77	76	50	78	40
10	69	77	77	56	82	43
11	70	78	78	56	72	42
12	70	78	79	58	76	44
13+	67	72	80	65	74	49
Total N	373,626	208,581	409,227	107,689	6,280	90,977
Percent of sample with zero visits	22	30	36	12	32	15

Program: offi03r.lst

SOURCE: Developed by HER staff from analysis of the 1993-1995 State Medicaid Research Files.

Table 5

Office Visit Rates by Race
Georgia
1993-1995

# Visits	White	African American	Hispanic	Asian or Pacific Islander	Unknown
0	13	12	10	11	10
1	38	35	40	44	34
2	47	47	50	52	40
3	53	57	58	53	41
4	56	62	65	60	42
5	56	67	70	50	39
6	58	69	69	58	44
7	61	72	67	46	40
8	61	73	76	62	45
9	61	73	82	59	44
10	62	77	66	47	44
11	62	76	78	47	39
12	62	73	70	70	43
13+	60	69	76	47	46
Total N	64,890	137,191	1,886	1,148	8,061
Percent of sample with zero visits	8	10	13	11	8

Program: offi03r.lst

SOURCE: Developed by HER staff from analysis of the 1993-1995 State Medicaid Research Files.

Table 6

Office Visit Rates by Race
Missouri
1993-1995

# Visits	White	African American	Hispanic
0	25	15	18
1	39	32	25
2	44	43	23
3	47	53	36
4	51	59	28
5	53	65	34
6	55	69	38
7	57	72	40
8	59	74	52
9	61	77	41
10	61	76	52
11	62	76	38
12	62	76	37
13+	60	73	43
Total N	80,959	45,992	566
Percent of sample with zero visits	10	11	16

Program: offi03r.lst

SOURCE: Developed by HER staff from analysis of the 1993-1995 State Medicaid Research Files.

Table 7

Office Visit Rates by Race
New Jersey
1993-1995

# Visits	White	African American	Hispanic	Asian or Pacific Islander	American Indian or Alaska Native	Unknown
0	23	29	29	30	19	15
1	39	48	48	40	36	26
2	44	57	55	36	35	27
3	47	61	59	40	48	28
4	48	64	62	43	34	30
5	49	66	63	38	55	32
6	50	67	64	35	75	29
7	52	66	66	47	48	32
8	52	67	65	48	60	34
9	51	66	67	26	71	32
10	52	67	65	24	37	35
11	52	63	65	58	54	35
12	50	34	65	42	41	35
13+	51	59	65	52	56	41
Total N	43,054	68,637	35,917	1,246	369	13,706
Percent of sample with zero visits	30	32	29	41	33	28

Program: offi03r.lst

SOURCE: Developed by HER staff from analysis of the 1993-1995 State Medicaid Research Files.

Table 8

Odds Ratios from Logistic Regressions for Receiving a Pap Test
3-Year Rates 1993-1995

Variable	California Odds Ratio	Georgia Odds Ratio	Missouri Odds Ratio	New Jersey Odds Ratio
Race				
White[1]	Reference	Reference	Reference	Reference
African American[1]	0.92 **	1.13 **	1.22 **	1.33 **
Hispanic	1.07 **	0.98	0.73 **	1.37 **
Asian or Pacific Islander	1.11 **	0.83 **	0.67 *	0.92
American Indian or Alaska Native	0.96	0.79	0.91	1.28 *
Unknown	0.77 **	0.90 **	--	0.96
Age				
13-17	0.21 **	0.35 **	0.34 **	0.28 **
18-39	Reference	Reference	Reference	Reference
40-49	0.70 **	0.42 **	0.43 **	0.53 **
50-64	0.52 **	0.27 **	0.28 **	0.34 **
65+	0.23 **	0.12 **	0.10 **	0.12 **
Receives Cash Assistance	1.69 **	0.95 **	0.87 **	0.97 *
MDs per 10,000 population	0.31 **	2.13 **	1.00	1.70 **
Sample Size	1,687,737	327,671	199,569	269,372

NOTES:
** Significant Chi Square at 1 percent
* Significant Chi Square at 5 percent
All equations weighted by months of eligibility
[1] Not Hispanic

OUTPUT: X11116B.LST

SOURCE: Developed by HER staff from analysis of the 1993-1995 State Medicaid Research Files.

Medicaid were significantly more likely than white women on Medicaid to receive Pap tests. African American women were more likely to receive Pap tests in Georgia (OR=1.13), Missouri (OR=1.22) and New Jersey (OR=1.33), but less likely in California (OR=0.92). Hispanic women were significantly more likely in California (OR=1.07) and New Jersey (OR=1.37) to receive Pap tests compared to whites; however, Hispanic women were significantly less likely in Missouri (OR=0.73) to receive them compared to white women. Asian Pacific Islanders were, on the other hand, significantly less likely to receive Pap tests compared to whites in Georgia (OR=0.83) and Missouri (OR=0.67) but significantly more likely to receive them in California (OR=1.11). American Indians/Alaskan Natives were more likely to receive Pap tests compared to whites in New Jersey (OR=1.28). Women with unknown races were significantly less likely than whites to receive Pap tests in both California (OR=0.77) and Georgia (OR=0.90).

Age was always a strong predictor of whether a woman received a Pap test regardless of the state she lived in. Women aged 18 to 39 were always more likely to receive Pap tests compared to women of any other age group.

Whether a woman received cash assistance was also a strong predictor of receipt of Pap tests, but it differed in its effect across states. For example, women in California receiving cash assistance were more likely to receive a Pap test compared to women not receiving cash assistance (OR=1.69). Conversely, women receiving cash assistance were less likely to receive Pap tests in Georgia (OR=0.95), in Missouri (OR=0.87) and in New Jersey (OR=0.97).

The variable representing physician supply suggested mixed results. Women in Georgia were more than twice as likely to receive Pap tests in areas with a large number of physicians in the population, while women in New Jersey were 1.7 times more likely. Women in California, on the other hand, were less likely to receive Pap tests in areas with more physicians compared to women in areas with fewer physicians.

Logistic Regression Results by State and by Race and Ethnicity. Tables 9 through 12 display results from logistic regressions run by race and ethnicity for each state.[1] The effect of receiving cash assistance varied by race and ethnicity in California (Table 9). While white, African American and American Indian/Alaskan Native women were more likely to receive Pap tests if they received cash assistance (OR~1.4), Hispanic women were nearly 1.8 times more likely, women of unknown races were twice as likely and Asian Pacific Islanders were 3.8 times more likely than women of the same race who did not receive cash benefits. A high concentration of physicians had a negative effect on the receipt of pap tests for all women except Asian Pacific Islanders. Asian Pacific Islanders were more likely to receive a Pap in areas with high numbers of physicians compared to Asian Pacific Islanders living in areas with low concentrations of physicians (OR=1.68).

In Georgia the impact of receiving cash assistance on the receipt of a Pap test varied by race and ethnicity (Table 10). African American women were more likely to receive a Pap if they received cash assistance compared to African Americans who did not receive cash assistance (OR=1.04), while white women were less likely to receive a Pap test compared to white women who did not receive assistance (OR=0.82). The physician supply variable was also a strong predictor. African American, Hispanic and women of unknown races were more than two times more likely to receive a Pap test in areas with high physician concentration. White

[1] It should be noted that age was a strong predictor of receipt of a Pap test across all groups and states. Where significant, women of any age were less likely to receive Pap tests compared to women aged 18-39.

Table 9

Odds Ratios from Logistic Regressions for Receiving a Pap Test, California

Variable	White	African American***	Hispanic***	Asian or Pacific Islander***	American Indian Alaskan Native	Unknown**
Age						
13-17	0.27 **	0.33 **	0.18 **	0.06 **	0.30 **	0.29 **
18-39	Reference	Reference	Reference	Reference	Reference	Reference
40-49	0.70 **	0.57 **	0.63 **	0.79 **	0.53 **	1.01
50-64	0.53 **	0.44 **	0.45 **	0.50 **	0.31 **	0.75 **
65+	0.30 **	0.17 **	0.08 **	0.47 **	0.15 **	0.28 **
Receives Cash Assistance	1.37 **	1.40 **	1.79 **	3.77 **	1.38 **	2.02 **
MDs per 10,000 Population	0.23 **	0.75 **	0.06 **	1.68 **	0.43 *	0.88
Sample Size	498,235	255,606	637,477	137,030	8,575	150,814

*** Regression results as a whole are significantly different from the regressions for whites at 1 percent using a log-likelihood test and based on a Chi Square with degrees of freedom equal to 4 times the number of variables in the regression.

** Significant Chi Square at 1 percent

* Significant Chi Square at 5 percent

NOTE:
All equations weighted by months of eligibility

OUTPUT: X11116B.LST

Table 10

Odds Ratios from Logistic Regressions for Receiving a Pap Test, Georgia

Variable	White	African American***	Hispanic***	Asian or Pacific Islander***	Unknown***
Age					
13-17	0.33 **	0.36 **	0.20 **	0.08 **	0.63 **
18-39	Reference	Reference	Reference	Reference	Reference
40-49	0.50 **	0.38 **	0.38 **	0.31 **	0.77 **
50-64	0.30 **	0.24 **	0.24 **	0.17 **	0.47 **
65+	0.15 **	0.12 **	0.19 *	0.09 **	0.16 **
Receives Cash Assistance	0.82 **	1.04 *	0.86	0.79	0.67 **
MDs per 10,000 Population	1.67 **	2.23 **	2.14 *	1.88	2.38 **
Sample Size	115,601	192,824	4,343	2,523	12,205

*** Regression results as a whole are significantly different from the regressions for whites at 1 percent using a log-likelihood test and based on a Chi Square with degrees of freedom equal to 4 times the number of variables in the regression.
** Significant Chi Square at 1 percent
* Significant Chi Square at 5 percent

NOTES:
All equations weighted by months of eligibility

OUTPUT: X11116B.LST

SOURCE: Developed by HER staff from analysis of the 1993-1995 State Medicaid Research Files.

women were more likely (OR=1.67) to receive a Pap test in areas with high physician concentration, compared to women of the same races in areas with low physician concentration.

In Missouri the effect of the physician supply variable varied by race and ethnicity (Table 11). In areas with large numbers of physicians, white women were more likely to receive a Pap test compared to white women living in areas with fewer physicians (OR=1.19). African American women, on the other hand, were less likely to receive a Pap compared to African American women who lived in areas with large numbers of physicians (OR=0.79). In addition, white women on cash assistance were less likely to receive a Pap test compared to white women who did not receive cash assistance (OR=0.81).

Table 11

Odds Ratios from Logistic Regressions for Receiving a Pap Test, Missouri

Variable	White	African American**	Hispanic	American Indian Alaskan Native
Age				
13-17	0.31 **	0.40 **	0.09 **	0.26 **
18-39	Reference	Reference	Reference	Reference
40-49	0.45 **	0.40 **	0.47 *	0.99
50-64	0.27 **	0.33 **	0.25 **	0.46 *
65+	0.09 **	0.12 **	0.09 **	0.09 **
Receives Cash Assistance	0.81 **	1.03	1.07	0.80
MDs per 10,000 Population	1.19 **	0.79 **	0.89	2.60
Sample Size	133,715	62,959	976	1,615

*** Regression results as a whole are significantly different from the regressions for whites at 1 percent using a log-likelihood test and based on a Chi Square with degrees of freedom equal to 4 times the number of variables in the regression.
** Significant Chi Square at 1 percent
* Significant Chi Square at 5 percent

NOTES:
All equations weighted by months of eligibility

OUTPUT: X11116B.LST

SOURCE: Developed by HER staff from analysis of the 1993-1995 State Medicaid Research Files.

population was also a strong predictor for several races and ethnicities. Hispanic, African American women and women of unknown races were significantly more likely to receive Pap tests in areas with large numbers of physicians in comparison to Hispanic, African American women and women of unknown races in areas fewer physicians (OR=2.20, 3.15, 3.11, respectively). However, white women were significantly less likely to receive Pap tests in areas with large numbers of physicians compared to white women in areas with fewer physicians (OR=0.51).

Table 12

Odds Ratios from Logistic Regressions for Receiving a Pap Test, New Jersey

Variable	White	African American***	Hispanic***	Asian or Pacific Islander	American Indian Alaskan Native	Unknown
Age						
13-17	0.25 **	0.35 **	0.19 **	0.06 **	0.37 **	0.20 **
18-39	Reference	Reference	Reference	Reference	Reference	Reference
40-49	0.55 **	0.40 **	0.65 **	0.47 **	0.44	0.89 *
50-64	0.37 **	0.26 **	0.34 **	0.27 **	0.62	0.54 **
65+	0.13 **	0.09 **	0.11 **	0.12 **	0.09 *	0.16 **
Receives Cash Assistance	0.86 **	0.97	1.13 **	1.23	1.19	0.92
MDs per 10,000 Population	0.51 **	3.15 **	2.20 **	1.80	1.56	3.11 **
Sample Size	73,707	104,989	67,157	2,644	694	20,181

*** Regression results as a whole are significantly different from the regressions for whites at 1 percent using a log-likelihood test and based on a Chi Square with degrees of freedom equal to 4 times the number of variables in the regression.
** Significant Chi Square at 1 percent
* Significant Chi Square at 5 percent

NOTES:
All equations weighted by months of eligibility

OUTPUT: M11011BR.LST

SOURCE: Developed by HER staff from analysis of the 1993-1995 State Medicaid Research Files.

DISCUSSION

The results from the analysis of the 1993-1995 SMRF data indicate that the rate of Pap test screenings for women at that time were short of government expectations. Only about one-half of women continuously enrolled in Medicaid received Pap tests. (The rate was lower for women who were not continuously enrolled.) The results further indicated that women who were continuously enrolled in Medicaid were more likely to receive Pap tests compared to women enrolled for shorter times. This was encouraging as it provided some evidence that women received necessary preventive care the longer they were enrolled in Medicaid. However, it might have been possible that women who were not continuously enrolled in Medicaid received Pap tests while they were not on Medicaid, as they could have been insured privately or paid for the test on their own.

These results also indicated that, at least for women in the Medicaid program, racial and ethnic disparities in the receipt of Pap tests remained, although the patterns differed across states. It should be noted that due to differences in Medicaid programs and populations, the rates in each state cannot be directly compared with each other. It should also be noted that although many of the differences were statistically significant, the absolute differences between the races and ethnicities were not in all instances large. With the exception of California, African Americans were significantly more likely to receive Pap tests compared to white women on Medicaid, regardless of whether women were continuously enrolled. Rates for Hispanic women compared to white women were mixed for those enrolled at least one month, but significantly higher for Hispanic women continuously enrolled in California and New Jersey. Women from Asia and the Pacific Islands also had significantly higher rates in California.

Age was a significant predictor of whether a woman received a Pap test. The majority of results indicated that all age groups underwent Pap tests less often than women aged 18-39. This finding was consistent with the literature that indicated that as women age, and certainly as they pass their reproductive age, they do not receive Pap tests as often as women in their childbearing ages.[18] Research also suggested that older women, particularly older minority women, are underrepresented in cancer screening programs.[19] Although Pap tests are important because of their effectiveness in detecting cervical cancer, recommendations differ as to whether women who had hysterectomies (which nearly always remove the cervix and uterus, and the frequency of which increases as women age) should undergo Pap tests.[20] This may also be one reason for the low rates of Pap tests as women age.

The results for whether the number of physicians in an area had an impact on the receipt of Pap tests varied. In some states, it was more likely that women would receive a Pap compared to women in areas of lesser concentrations, while in other states, it was not. The results suggested that access problems might exist in areas although there would seem to be a supply of physicians.

Racial and ethnic differences in the receipt of Pap tests may be affected by a number of barriers that cannot be addressed in this study. These barriers may account for the reasons why Asian Pacific Islanders have Pap test rates consistently lower than white women, and why the results are mixed for Hispanic women compared to white women. For example, several studies show that Asian Pacific Islanders face structural and psychosocial barriers of undergoing Pap smear screening. In separate studies, it was revealed that factors affecting rates of Pap tests for Asian Pacific Islanders included the lack of knowledge about cervical cancer, language difficulties, a short length of time living in the U.S. and low income.[21,22] Two studies reported that Hispanic and Spanish-speaking women underutilized Pap screenings because of language problems, fear and embarrassment of cancer, and underestimation of the benefits of prevention.[23,24] Women from these cultures may further forego screens because of modesty.[11,24-25]

Results analyzing the receipt of Pap tests based on office visits underscore the importance of ambulatory care in the receipt of Pap tests as rates increased markedly with office visits. The results further suggest that women with a large number of office visits receive these tests less often than women with fewer office visits. These women perhaps have high rates of office visits due to chronic illness or disability. Women with functional limitations face an entirely different set of barriers to receiving cancer screenings. One study indicated that women with physical disabilities were less likely than women without disabilities to receive pelvic exams.[26] Women with disabilities may have difficulty finding a physician to provide health care for them. Alternatively, physicians may assume that the disabled are not sexually active and, therefore, not in need of a Pap smear.[27] Physicians may also lack the correct equipment to perform these exams for the disabled, and the exams themselves may cause the disabled too much discomfort.[27]

This study had several limitations. The data used were from 1993 through 1995. Because of the age of the data, it is difficult to compare to goals set for the year 2010, but it does provide a benchmark for women who are publicly insured. We do not know how these rates changed over the years and across racial and ethnic groups. In addition, the rates presented in this study include those of pregnant women. As a standard of care, pregnant women should receive Pap tests to screen for cervical cancer as well as sexually transmitted diseases. Rates that include this population may be higher because all pregnant women should receive Pap tests during the course of their pregnancy.[28] However, despite the inclusion of pregnant women, Pap test rates for Medicaid women are very low. Further, the rates were based on data from four states. Therefore, the results cannot be generalized to other states or nationally.

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REFERENCES

1. CDC, NIH. *Healthy People 2010. Cancer.* Available at URL: http://www.health.gov/healthypeople/Document/pdf/Volume1/24Cancer.pdf.

2. The Office on Women's Health, *Women's Health Issues: Priority Women's Health Issues.* Available at URL: http://www.4woman.gov/owh/pub/womhealth%20issues/priority.htm. May 2000; accessed 4 August 2000.

3. Devesa SS, Young JL, Brinton LA, et al. Recent trends in cervix uteri cancer. *Cancer.* 1989; 64: 2184-90.

4. Hicks ML, Phillips JS, Parham G, *et al*. The National Cancer Data Base Report on Endometrial Carcinoma in African American Women. *Cancer.* 1998; 83: 2629-37

5. Makuc DM, Fried VM, Kleinman JC. National Trends in the Use of Preventive Health Care by Women. *American Journal of Public Health.* 1989; 79: 21-26.

6. Calle EE, Flanders WD, Thun, MJ, *et al*. Demographic Predictors of Mammography and Pap Smear Screening in US Women. *American Journal of Public Health.* 1993; 83: 53-60.

7. Anderson LM, May DS. Has the Use of Cervical, Breast and Colorectal Cancer Screening Increased in the United States? *American Journal of Public Health.* 1995: 85: 840-842.

8 Mitchell JB, et al.: Impact of the Oregon Health Plan on Access and Satisfaction of Low-Income Adults. *Health Services Research,* forthcoming 2001.

9 American Cancer Society. Pap Test. Accessed at http//www.cancer.org/eprise/main/docroot/PED/content/PED_2_3X_Pap_Test?sitearea on 3 December 01.

10. Baquet C, Ringen K. Health Policy: Gaps in Access, Delivery and Utilization of the Pap Smear in the United States. *The Milbank Quarterly.* 1987; 65(Supp.2): 322-347.

11. Mandelblatt JS, Gold K, O'Malley AS, et al. Breast and cervix cancer screening among multiethnic women: Role of age, health, and source of care. *Preventive Medicine.* 1999; 28: 418-425.

12. Martin LM, Calle EE, Wingo PA, *et al*. Comparison of mammography and Pap test use from the 1987 and 1992 National Health Interview Surveys: Are we closing the gaps? *American Journal of Preventive Medicine.* 1996; 12: 82-90.

13. Hayward RA, Bernard AM, Freeman HE, et al. Regular Source of Ambulatory Care and Access to Health Services. *American Journal of Public Health.* 1991; 81: 434-438.

14. Kulas E., Hoover S., Adamache W., Mitchell J. "Utilization of Health Care Services Related to Cancer Prevention for Women in the Medicaid Program: Report on Preliminary Findings." CMS Contract No. 500-96-0014, T.O. No. 2, July 16, 2001.

15. National Center for Health Statistics. Current Estimates from the National Health Interview Survey. DHHS, 1999.

16. www.census.gov. 1990.

17. White Means SI: Conceptualizing Race in Economic Models of Medical Utilization: A Case Study of Community-based elders and the Emergency Room, *Health Services Research.* 1995; 30(1), Part II: 207-223.

18. Madelblatt J, Gopaul I, Wistreich M. Gynecologic care of elderly women: another look at Papanicolaou smear testing. *JAMA*. 1986; 256: 367-371.
19. Mandelblatt JS, Yabroff KR. Breast and cervical cancer screening for older women: recommendations and challenges for the 21st century. *Journal of American Medical Women's Associations.* 2000; 55: 210-215.
20. Saraiya M, Lee NC, Blackman D, Smith Moira-Jayne, Morrow B, McKenna MA. Self-Reported Papanicolaou Smears and Hysterectomies Among Women in the United States. *Obstetrics & Gynecology.* 2001; 98; 269-278.
21. Lee MC. Knowledge, Barriers and Motivators Related to Cervical Cancer Screening Among Korean-American Women. A Focus Group Approach. *Cancer Nurs.* 2000; 23: 168-175.
22. Yi JK. Factors associated with cervical cancer screening behavior among Vietnamese women. *Journal of Community Health.* 1994; 19: 189-200.
23. Suarez L. Knowledge, Behavior, and Fears Concerning Breast and Cervical Cancer Among Older Low-Income Mexican-American Women. *American Journal of Preventive Medicine.* 1997; 13(2): 137-142.
24. Harlan, LC, Bernstein AB, Kessler LG. Cervical Cancer Screening: Who Is Not Screened and Why? 1991; 81(7): 885-890.
25. Maxwell AE, Bastani R, Warda US. Demographic Predictors of Cancer Screening Among Filipino and Korean Immigrants in the United States. *American Journal of Preventive Medicine.* 2000; 18: 62-68.
26. Nosek MA, Howland CA. Breast and cervical cancer screening among women with physical disabilities. *Arch Phys Med Rehabil* 1997; 78: S39-S44.
27. Centers for Disease Control: Use of Cervical and Breast Cancer Screening Among Women with and without Functional Limitations – United States, 1994-1995. *MMWR Weekly.* 1998; 47(40): 853-856.
28. In a companion study results indicated that Pap test rates varied by race and ethnicity across the same four states, but no more than 60% of the women in any state received a Pap test during pregnancy. Hoover S, Mitchell J, Kulas E, Urato M, Adamache W. Utilization Rates of Pap Tests for Pregnant Women in the Medicaid Program. CMS Contract No. HCFA-500-96-0014, T.O. 2, Marsha Davenport, M.D., Project Officer, December 2001.