Sociocultural Aspects of Cervical Cytology in Alameda County, Calif.

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WHILE investigating the methodology of data collection for epidemiologic studies in Alameda County, Calif., during the spring of 1962, information was assembled on the use of cervical cytology by women residents of the county. The methodological findings will be reported elsewhere. The extent to which Alameda County women know about and use the cytologic test for cancer is analyzed here. Particular attention is given to ethnic and social class factors in use of the test, the influences to which women attribute their having had the test, and the effect of various arrangements for obtaining medical care on the extent of cervical cytology. In view of the generally acknowledged importance of cervical cytology in preventing deaths from cancer of the cervix, it seems desirable to consider such elements in order to focus further efforts on the use of cytology where they can be most effective.

Alameda County, on the east side of San Francisco Bay, is mainly an urban and suburban community. The 1960 population was 908,209, about 23 percent greater than the population in 1950. Its age, racial, and social composition, as well as its generally high standard of medical care, is much like that of California as a whole.

An area probability sample was selected, and enumeration of persons was successfully completed in 97 percent of the occupied housing units. Of the 1,037 women 20 years of age and over so enumerated, 946 (91 percent) gave information for the study.

Comparison of the study group with the female population of Alameda County as described in the 1960 census revealed close correspondence in age, race, nativity, and social characteristics.

To estimate the validity of their responses concerning the use of cytology, the women were asked to name the physician or clinic or hospital where the test had been obtained. A records check confirmed the reports of four of every five women.

Use of Cervical Cytology

Eighty percent of the women responded that they had heard of the Papanicolaou test when asked the following: "There is a test for one kind of cancer in women called the Pap test, or Papanicolaou test. Sometimes it is called a vaginal cancer smear or Pap smear. The Pap test is made by taking a sample of cells from the female organ called the cervix. These cells are studied in a laboratory to see whether a woman has cancer of the cervix. Have you heard of the Pap test or a test that fits this description?"

About half of the women in the survey reported that they had had the test at least once. This finding places Alameda County's experience in the use of the Papanicolaou test somewhere between the national average, which a Gallup survey in February 1961 showed to be about 30 percent (*1*), and that of San Diego County, a community in which an exceptionally strong promotion of the test resulted in its use by 62 percent of the women in the city of San Diego (*2*) and by 72 percent of the women in the county outside the city of San Diego (*3*).

Use of the test appears to be increasing in

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Alameda County. From responses to questions concerning the first and most recent year in which the test had been obtained, it was estimated that in the mid-1950's, when the number of women 20 years of age and over was approximately 280,000, about 8,000 women received their first test each year. By 1961, when the population of women in this age group had increased to about 305,000, the number receiving their first test in a year had advanced to 23,000. About 8 percent had their first cytology test in 1961, and an additional 13 percent of the women had their second or subsequent tests that year. Thus, about one-fifth of the women 20 years of age and over in Alameda County had cervical cytology during 1961.

Another favorable sign is that women are taking the test at younger ages. In the mid-1950's only a third of the women taking the test for the first time were under age 35; in 1961 almost half were in this age group.

Furthermore, a majority, or 58 percent, of the women who have taken the test reported that they took the test more than once, and a third took three or more tests. Actually, the data from the present survey understate repeat performance: More than one-third of the women who reported only one test had this test within the 12 months preceding the interview and in the normal course of events would not have been expected to have had a second test. On the assumption that at least some of them will be retested, we estimate that multiple tests may be the practice of about two-thirds of the women who take the first test.

Cervical Cancer Morbidity

Despite these encouraging general trends, certain unfavorable aspects of the situation deserve careful attention. These relate primarily to the differential use of the Papanicolaou smear by various population groups. An examination of Alameda County morbidity data is appropriate here as a setting for study findings on the relationship between social characteristics and the use of cervical cytology.

Many studies in this country and abroad show higher morbidity and mortality from cervical cancer among Negro women and others of lower socioeconomic status. Data from Alameda County indicate the same relationship. For 1960, the latest year for which complete figures are available, 266 cases of cervical cancer were reported to the Alameda County cancer registry (table 1). Hospitals reporting to the registry accounted for an estimated 80 percent of the cervical cancer cases in the county.

The proportion of cases of cervical cancer in Negro women (21 percent) reported to the registry was twice as high as the proportion of Negro women in the county population (11 percent). If we assume that 20 percent of all persons with cervical cancer in the county were diagnosed in hospitals not yet reporting to the registry and that none was Negro, the proportion of Negroes with cervical cancer would still be 17 percent. This observation appears significant because it is the only major site of cancer which is relatively so concentrated among Negro women. The race distribution of all women with cancer is similar to the race distribution of the adult female population as a whole.

Mortality data for Alameda County underscore the vulnerability of Negro women. During 1959–61, 131 resident women in the county, an average of 44 per year, died from cervical cancer. Of these, 26 percent were listed as Negroes, more than twice their proportion in the population.

Social class is indicated in the Alameda County cancer registry only in the hospital source of reporting. The private hospitals, on the whole, encompass a wide range of the socioeconomic spectrum, but probably they exclude most of the very low income segment. There are no medical school-affiliated hospitals in the county. The county hospital, on the other hand, generally treats cases from the lowest socioeconomic stratum.

In 1960 the county hospital cases comprised one of four, or 24 percent, of the cervical cancer cases reported to the Alameda County cancer registry. By contrast, only 14 percent of all female cancer cases reported to the registry came from the county hospital, and persons admitted for whatever cause to the county hospital accounted for only 13 percent of all hospital admissions in Alameda County. Thus, the general observation that the lowest social class has the highest incidence of cervical cancer seems to apply in Alameda County, too.

Turning now to the age distribution of cervi-

cal cancer cases in Alameda County, we find that women in the age group 30 to 44 years appear in much higher proportion (50 percent) among the cervical cancer cases of the Alameda County cancer registry than would be expected from this age group's representation among adult women in the population (33 percent). This holds generally for both racial groups, though somewhat less for Negroes.

The data also suggest that Negro women may fall victim to cervical cancer at an earlier age than white women. Among the women diagnosed as having cervical cancer, the proportion of Negroes aged 20 to 29 was twice (10 percent) that of the white women (5 percent) in the same age group (table 2).

Two-thirds, or 65 percent, of the cervical cancer cases reported to the Alameda County cancer registry for 1960 were diagnosed in situ; the other third, in the invasive stage. The in situ stage precedes by about 4 to 5 years the earliest stage which is clinically recognizable (*4*). Between the earliest clinical stage and the actual diagnosis, additional years may elapse. Thus, the time interval from the earliest stage of in situ to clinical diagnosis could range up to 9 years, a pertinent factor in analyzing morbidity data by age and also an indication of the need for cervical cytology among young women.

Women who marry early or have multiple marriages, who start and complete their families early, and who have many pregnancies and children are reported to be at higher risk of contracting cervical cancer.

Much of this detail is not available from the Alameda County cancer registry, but what there is conforms generally with these findings. The

Table 1. Cancer morbidity reported in women 20 years of age and over, by race, Alameda County, 1960

Race	Cancer registry				1960 census	
	Cervical cancer		All cancer		Number of women	Percent
	Cases	Percent	Cases	Percent		
Total	266	100	1,162	100	301,960	100
White	205	77	1,017	87	260,755	86
Negro	57	21	113	10	33,236	11
Other	4	2	32	3	7,969	3

Table 2. Age distribution (percentage) of cervical cancer patients and of women 20 years of age and over, by race, Alameda County, 1960

Age group (years)	Total		White		Negro	
	Cervical cancer	Women 20 and over	Cervical cancer	Women 20 and over	Cervical cancer	Women 20 and over
	N=266 [1]	N=301,960 [1]	N=205	N=260,755	N=57	N=33,236
Total	100	100	100	100	100	100
20–29	7	19	5	19	10	22
30–34	17	11	17	10	19	13
35–44	33	22	33	21	32	28
45–54	21	18	21	18	21	19
55–64	10	14	10	14	11	10
65 and over	12	16	14	18	7	8

[1] Total also includes women who are neither white nor Negro.

proportion of single women with cervical cancer (4 percent) was smaller than the proportion in the general population (9 percent). On the other hand, divorced and separated women, who are most likely to be in the multiple marriage category, were found in considerably higher proportion in the registry than in the general population (19 percent compared with 8 percent). This relationship holds for all age groups.

Variations in Use of Cervical Cytology

Briefly, the survey findings on the use of the Papanicolaou smear by different population groups indicate that the test tends to be used least by the racial and socioeconomic minority groups of women whose morbidity and mortality from cervix cancer is highest.

Native-born white women are far more likely than any other group to have taken the smear test. Relatively small proportions of foreign-born whites or members of other races, who together constitute about one-fourth of the population of adult women in Alameda County, have experienced the test.

In Alameda County, 57 percent of the native-born white women 20 years of age and over reported having taken the Papanicolaou test, compared with 33 percent of the foreign-born whites, 33 percent of the Negroes, and 26 percent of the Orientals. (Age adjustment of the minority groups has negligible effect on the percentages.) As shown previously, Negroes are a high-risk group having a cervical cancer rate twice that expected, yet only a third of the Negro women in Alameda County take the Papanicolaou test.

Similarly, few women in the lowest social class take the Papanicolaou test. When women were classified by social class, defined according to husband's occupation, a pronounced downward gradient emerged (table 3). Among native whites, 66 percent of the women married to professionals and only 47 percent of those married to laborers took the test. For women other than native whites, the social class gradient appeared only at the lowest level. Again, their use of the Papanicolaou test was far below that of the native whites in each corresponding social class.

A large part of the variation in utilization of the test by social class is related to the differences in knowledge of the test. In social classes I and II, 87 percent of the women had heard of the test, but only 58 percent of the women in social class V had heard of it. Among those women who knew of the test, social class made very little difference in whether or not they took the test (68 percent in social classes I and II compared with 62 percent in social class V).

Table 3. Percentage of women who have taken Papanicolaou test, by social class and race-nativity, Alameda County, 1962

Social class	All women	Native whites	All others [1]
Total	51	57	32
I (professional)	63	66	36
II (proprietors, managers)	57	65	32
III (clerical, sales, craftsmen)	53	57	35
IV (operatives)	49	52	38
V (laborers, service workers)	36	47	26

[1] Number of women in individual race-nativity groups too small for separate analysis.

Analysis by respondents' education results in findings closely paralleling those of husbands' occupations.

Cross analysis of the occupation-education variables in relation to use of the Papanicolaou test reveals that educated women married to men in the higher occupations are most likely to have had the test; least likely are uneducated women married to unskilled men. Interestingly, the few deviant cases tended to follow the lower of the two variables. The college-educated women in the sample married to unskilled men reported taking the Papanicolaou test in about the same proportion as all those married to unskilled workers. Women with only a grade-school education married to white-collar men reported having taken the test to about the same extent as all women with only a grade-school education.

Analysis of the age distribution of women who have taken the Papanicolaou test reveals that about three-fifths of all women 30 to 64 years of age reported having the test, whereas only about one-third of those under 30 or over

64 have had the test (table 4). In each age group the proportion of native white women who have had the cervical cytology test substantially exceeded the corresponding proportion among all other women.

It will be remembered from the discussion on cervical cancer morbidity that women aged 30 to 44 are a high-risk group. Unlike some of the other high-risk groups, women in this age bracket are more likely to take the Papanicolaou smear, although their participation (60 percent) is less than desirable. Their high-risk status, in conjunction with the development period of the disease, suggests the importance of taking cervical cytology at an earlier age, when our data indicate that only a minority of women are taking advantage of the test. The smaller use of the Papanicolaou test by lower social class women holds true for women aged 30 to 64 years. For younger women and for older women, the trend is ambiguous, partly owing to the smaller number of women in these groups.

Because morbidity and mortality studies of cervical cancer have shown differences associated with various aspects of marriage and childbearing, use of the Papanicolaou test by Alameda County women was examined in relation to certain of these variables. Analysis of such factors as age at first marriage, age at first pregnancy, the number of pregnancies, and the number of children indicates that these variables do not appear to be primary factors in utilization of the test. Rather, the primary factors are age, education, economic status, and race.

As might be expected in families where either the respondent or one of her relatives had cancer, use of the Papanicolaou smear is reported more frequently than in cancer-free families. Even so, native white women in cancer-free families are more likely to take the test than are women in other race-nativity groups with cancer in the family (table 5).

Table 4. Percentage of women who have taken Papanicolaou test, by age and race-nativity, Alameda County, 1962

Age group (years)	All women	Native whites	All others
Total	51	57	32
20–29	35	38	24
30–44	60	68	30
45–64	58	63	43
65 and over	36	44	23

Table 5. Percentage of women who have taken Papanicolaou test, by cancer experience and race-nativity, Alameda County, 1962

Cancer experience	All women	Native whites	All others
Total	51	57	32
Respondent had cancer	68	72	50
Relative had cancer	58	61	39
Neither respondent nor relative had cancer	46	53	28

Physician a Major Influence

Most women who had the Papanicolaou test reported that suggestion by their physician principally influenced them in taking the test. The role the physician plays in getting women to have the first test is clearly demonstrated by the answers the women gave in response to the question: How did you happen to have your first Papanicolaou test?

Fifty-eight percent of the women answered that they had their first test in the course of a routine physical examination, 27 percent said their doctor wanted them to have the test, 2 percent mentioned an obstetrical-gynecological examination, and 2 percent referred to symptoms and surgery.

Thus, 9 of 10 women received their first Papanicolaou test when the physician took the initiative. Only 1 woman in 10 reported that she asked to have the test.

The importance of the physician's role emerges also from analysis of the answers of women who plan to have another test. Of those who have taken at least one test, 79 percent said they would have another. Important reasons were "routine physical examination" and "physician's advice."

Health Insurance Plans

To assess the influence of health insurance plans on obtaining the Papanicolaou test, respondents were asked to indicate whether they were covered by health insurance and, if so,

what type. Seventy-seven percent indicated that they have a health insurance plan. Of these, approximately one-fifth stated that they were enrolled in the Kaiser Health Plan. Table 6 indicates that women who are covered by health insurance have received the test to a substantially greater extent than women who do not have health insurance. Those enrolled in the Kaiser Health Plan, which emphasizes screening examinations, have a particularly favorable experience in respect to use of the test. Seventy percent of the women enrolled have had it.

Compared with health plan members, women not covered by health insurance were twice as likely to be members of racial and ethnic minority groups (40 percent as compared with 18 percent), twice as likely to be in social class V (22 percent versus 10 percent), and three times as likely to be in the age group 65 years and over (24 percent versus 8 percent). Again a good part of the variation in the use of the Papanicolaou test by those that do and do not have a health plan is explained by the basic variables of race, nativity, age, and social class. Kaiser subscribers, who are generally similar to members of other health insurance plans with respect to age and social class but with a higher proportion of racial and ethnic minority groups than other plans (27 percent compared with 16 percent), participated in the Papanicolaou test more than members of other plans (70 percent compared with 54 percent).

Table 6. Percentage of women who have taken Papanicolaou test, by health insurance plan and race-nativity, Alameda County, 1962

Insurance status	All women	Native whites	All others
Total	51	57	32
With health insurance plan	57	60	41
Kaiser	70	77	51
Other	54	57	37
Without health insurance plan	34	43	19

Summary

Use of the cervical cytologic test in Alameda County has been profoundly influenced by sociocultural factors. Women in minority racial and ethnic groups, those of low social status as defined by their husbands' occupations, and those with low educational attainment have used the test to a far lesser extent than women in more favorable social circumstances. Of particular importance to cancer control, the very groups of women with least utilization of the test have been the ones with the highest rate of cervical cancer, as measured by morbidity and mortality data.

By far the greatest influence on women in obtaining the test was the advice or action of their physician. Nine of ten women who took the test stated that they obtained their first test in the course of a routine physical examination or at the specific suggestion of their physician. Only 1 of 10 reported that she independently asked to have the test.

Participation in a health insurance plan was positively related to obtaining the Papanicolaou test, particularly a health plan emphasizing screening examinations. Finally, knowledge of the test has an important bearing on utilization. Among those women who knew of the test, social class made little difference in whether or not they took the test.

A major conclusion of this study is that further efforts to promote the use of the cytologic test for cancer of the cervix should be concentrated in the minority ethnic-racial-socioeconomic complex identified as being at greatest risk of cervical cancer yet with least use of the test up to the present time. The importance of using cervical cytology at an early age (20–30 years) also is emphasized.

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