
12-County Program: Screening of 34,318 Women for Cervical Cancer in California, 1975-78

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PROVIDING CERVICAL CYTOLOGY EXAMINATIONS (Pap tests) to large numbers of women at high risk of cervical cancer was the aim of the screening program begun in July 1975 by the California Department of Health Services (DHS). Evaluation of the effectiveness of the methods used to reach such women and motivate them to make use of the screening services offered was another objective of the program.

Women were regarded as being at high risk if they were in the poverty or low-income brackets, were members of minority groups, or had never been Pap tested or had received this test infrequently. Additionally, in this California program, priority was given to women 45 years or older who, because of their age, were considered not only at higher risk of invasive cervical cancer but were also less likely to have received routine Pap tests.

For women with other than normal smears, the study design required that they be recalled for retesting, referred to appropriate medical care providers for diagnostic evaluation if needed and for treatment if indicated. Collection of followup information on the screenees concerning all diagnostic and therapeutic measures was also required.

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Invitations to participate in the screening program were extended to health agencies in 21 counties where 90 percent of the State's poverty-level women over age 45 resided. Residents of these counties were found to have an estimated 91 percent of all new cases of invasive cervical cancer that were reported in California in 1974 (1). Eventually, screening programs were established in 12 counties. Ten were conducted by local health departments and two by universities. When the program was concluded in December 1978, 34,318 women had been screened, and 7,811 had returned for from 1 to 3 annual rescreening examinations.

This report is confined to the activities and results associated with the provision of Pap tests to women at high risk of cervical cancer and to the problems encountered in evaluating further those with abnormal test results and bringing them to treatment.

Materials and Methods

The local programs offered Pap screening services in four types of settings: clinics in fixed locations in central or district health or family planning centers, mobile clinics held in urban community sites, mobile clinics in rural areas, and a large general hospital. Table 1 summarizes the population, clinic settings, persons performing examinations, and numbers of women screened and rescreened in individual programs.

Rigid standards of performance were imposed on the local programs. Administration of Pap tests by physicians, nurse practitioners, or specially trained registered nurses was a program requirement. Processing and

Table 1. Participants in California cervical cancer screening program by county, type of clinic, and personnel performing examinations

| Local agency | Women 15 years and older ¹ | Type of clinic | | | Personnel performing examination | | | Women screened | |
|-----------------------------|---------------------------------------|--------------------------------|---------------|---------------|----------------------------------|--------------------|------------------|----------------|-------------------------|
| | | Health department ² | Mobile, urban | Mobile, rural | Physician | Nurse Practitioner | Registered nurse | New | Rescreened ³ |
| Berkeley City | 50,046 | + | | | + | + | | 103 | |
| Contra Costa County | 201,400 | + | | | + | + | | 753 | 61 |
| Los Angeles County | 2,701,322 | | + | | | | + | 7,785 | 1,751 |
| Riverside County | 170,485 | + | + | + | + | + | + | 4,487 | 879 |
| San Bernardino County | 244,519 | + | | + | + | + | + | 4,106 | 874 |
| San Diego County | 478,002 | + | + | + | + | | | 3,873 | 391 |
| San Francisco County | 304,840 | | | | + | + | | 463 | |
| Santa Barbara County | 98,562 | + | | | + | + | | 1,345 | 254 |
| Santa Clara County | 378,682 | + | | | + | | + | 4,365 | 1,429 |
| Solano County | 57,666 | + | + | + | | + | | 1,528 | 385 |
| Sonoma County | 78,012 | + | | | | + | | 1,823 | 446 |
| Ventura County | 127,912 | + | + | + | + | + | | 3,687 | 1,341 |
| Total | 4,891,448 | | | | | | | 34,318 | 7,811 |

¹ 1970 U.S. Census. ² Or other fixed location where screening clinics are held routinely. ³ Women with 1 or more annual rescreening examinations.

interpreting of the Pap smears were entrusted only to qualified personnel in DHS-certified laboratories. Local programs were also required to notify screenees of the test results.

To obtain uniform data on demographic items and known or potential risk factors, a questionnaire was administered to each screenee. Additionally, each woman was asked how she had heard about the offer of the test. Local agencies forwarded copies of the questionnaire responses, together with a unit screening report showing the date and result of the cytologic examination, to the department.

Cytologic examination results were reported as negative, unsatisfactory, mild dysplasia, moderate dysplasia, severe dysplasia, dysplasia—severity not stated, carcinoma of cervix *in situ* (CIS), invasive cervical cancer, endometrial cancer, and other gynecologic cancer. Smears exhibiting benign changes such as inflammatory atypia or metaplasia were classified as negative. Women with unsatisfactory smear results were recalled for retesting. To insure correct and consistent categorization of the test results, we required local agencies to submit to the program staff in Berkeley copies of the original laboratory reports on all test results not designated as normal. These were then reviewed by E.F.

Followup of screenees with abnormal test results was typically the responsibility of a public health nurse. She informed the woman of the cytologic test result and its implications and referred her to a private physician or a clinic. The nurse also obtained the required information on results of biopsies and treatment performed and forwarded the data to us.

In this study we used the U.S. Department of Labor's 1979 definition of the poverty level, namely, incomes up to \$6,000 for a family of four. We classified family incomes that were up to twice the poverty level as low, three times the poverty level as medium, and incomes greater than medium as high. "Spanish origin" denoted white persons born in Spain, Mexico, and the Spanish-speaking countries of Central and South America and the Caribbean islands or persons whose ancestors were born in these areas. Persons of Chinese, Japanese, Korean, and Vietnamese origin were designated as "oriental." Blacks, American Indians, and whites were self-identified on the questionnaire.

Findings

General and screened population compared. The program reached women who were older, less affluent and, except for black women, had a higher proportion of minority groups than the general population of California women aged 15 years and older. The two groups differed in several respects, as the following percentages show:

| Demographic item | Screenees | General population |
|----------------------|-----------|--------------------|
| <i>Age</i> | | |
| Under 25 years | 7.1 | 23.6 |
| Over 54 years | 36.6 | 26.3 |
| <i>Income</i> | | |
| Poverty | 31.1 | 11.6 |
| Low income | 37.8 | 18.0 |
| <i>Ethnicity</i> | | |
| Spanish origin | 28.8 | 12.7 |
| Oriental | 4.6 | 2.0 |
| Black | 3.4 | 6.3 |

Table 2. Results of the first Pap test of 34,318 women, by selected variables, in percentages

| Variable | Number of women | Negative | Unsatisfactory | Cervical dysplasia | | | | Cervical cancer | | |
|-----------------------------|-----------------|----------|----------------|--------------------|----------|--------|------------|-----------------|----------|--------------------|
| | | | | Mild | Moderate | Severe | Not stated | In situ | Invasive | Endometrial cancer |
| Total: | | | | | | | | | | |
| Number | 34,318 | 33,505 | 361 | 220 | 95 | 30 | 50 | 32 | 15 | 10 |
| Percent | 100.00 | 97.63 | 1.05 | .64 | .28 | .09 | .15 | .09 | .04 | .03 |
| Age group (years): | | | | | | | | | | |
| Under 25 | 2,452 | 96.37 | 1.84 | 1.02 | .45 | .04 | .24 | .. | .. | .04 |
| 25-34 | 6,945 | 97.57 | .81 | .88 | .23 | .20 | .19 | .09 | .04 | .. |
| 35-44 | 6,539 | 97.71 | .75 | .69 | .34 | .05 | .18 | .20 | .08 | .02 |
| 45-54 | 5,812 | 97.90 | .91 | .57 | .28 | .09 | .12 | .10 | .. | .03 |
| 55-64 | 6,604 | 98.22 | .97 | .41 | .21 | .05 | .10 | .02 | .02 | .. |
| 65 and older | 6,506 | 97.31 | 1.52 | .48 | .26 | .06 | .09 | .09 | .09 | .09 |
| Socioeconomic group: | | | | | | | | | | |
| Poverty | 10,684 | 96.86 | 1.33 | .86 | .35 | .11 | .21 | .16 | .08 | .05 |
| Low | 12,962 | 97.89 | .96 | .54 | .29 | .07 | .14 | .08 | .03 | .02 |
| Medium | 7,458 | 97.84 | 1.07 | .55 | .24 | .04 | .13 | .05 | .03 | .04 |
| High | 3,166 | 98.70 | .47 | .54 | .09 | .16 | .. | .03 | .. | .. |
| Not stated | 48 | 97.92 | .. | .. | .. | 2.08 | .. | .. | .. | .. |
| Ethnic origin: | | | | | | | | | | |
| White | 21,353 | 97.76 | .96 | .59 | .30 | .10 | .15 | .08 | .04 | .03 |
| Black | 1,169 | 96.41 | 2.14 | .34 | .43 | .34 | .26 | .09 | .. | .. |
| Spanish | 9,870 | 97.49 | 1.16 | .75 | .22 | .05 | .12 | .12 | .06 | .03 |
| Oriental | 1,580 | 97.66 | .89 | .95 | .13 | .. | .13 | .13 | .06 | .06 |
| American | | | | | | | | | | |
| Indian | 172 | 97.67 | 1.16 | .. | 1.16 | .. | .. | .. | .. | .. |
| Other | 174 | 98.28 | .. | .57 | .. | .. | 1.15 | .. | .. | .. |

The small percentage of black women can be attributed to the special effort by the Los Angeles program to screen Mexican American women, a group that was believed to be at greatly increased risk of cervical cancer (2). The program was highly successful in recruiting them and, since the Los Angeles clinics contributed 23 percent of all screenees, the ethnic mix was strongly affected.

Results of first Pap test. Results of the first Pap test by age, ethnic origin, and socioeconomic group are presented in table 2. Of the 34,318 tests administered, the results for 97.63 percent were reported as negative, 1.05 percent as unsatisfactory, 1.16 percent as showing some form of dysplasia, and 0.16 percent as malignant. Among the results reported as malignant, 32 or 56.1 percent were reported as CIS, 15 or 26.3 percent as invasive cervical cancer, and 10 or 17.5 percent as suggestive of endometrial cancer. Unsatisfactory smears were most frequent among women in the age groups at the two extremes. The proportions of women with mildly and moderately dysplastic smears generally diminished with age, while severe dysplasias were most common at ages 25-34. Smears showing CIS peaked among women ages 35-44, while those suggestive of

invasive cervical cancer showed a biphasic distribution, occurring most frequently among women aged 35-44, and again at age 65 and older.

Among ethnic groups, black women had the smallest proportion of negative and the greatest proportions of unsatisfactory and severely dysplastic smears. Women of Spanish and oriental descent had a somewhat greater share of cancerous smears, although the differences from other ethnic categories were not great.

Tabulation by socioeconomic status revealed that women living in poverty had the highest proportion of abnormal test results in all categories except severe dysplasia, where high-income women had the greatest proportion. Conversely, negative smears were most frequent among high-income women.

In table 3 we tabulated the results of the initial test by interval since the last preprogram test. Approximately one-half had had a Pap test within 2 years, and an additional one-fourth had been tested within 2 to 3 years. For 12.6 percent, 4 or more years had elapsed since their last Pap test.

Overall, 9.1 percent of the women participating in the program had never before had a Pap test. The women who had never been tested had the lowest rate of negative results and the highest proportions of

Table 3. Results of first Pap test, by interval since last test

| Interval since last test (years) | Total | Negative | Unsatisfactory | Cervical dysplasia | | | | Cervical cancer | | |
|---|--------|----------|----------------|--------------------|----------|--------|------------|-----------------|----------|--------------------|
| | | | | Mild | Moderate | Severe | Not stated | In situ | Invasive | Endometrial cancer |
| Number of tests | | | | | | | | | | |
| Total | 33,686 | 33,149 | 95 | 217 | 94 | 30 | 45 | 32 | 15 | 9 |
| Never | 3,073 | 3,005 | 17 | 20 | 8 | 2 | 9 | 4 | 7 | 1 |
| Less than 2 | 17,572 | 17,291 | 51 | 113 | 56 | 16 | 17 | 18 | 5 | 5 |
| 2-3 | 8,791 | 8,663 | 23 | 58 | 18 | 6 | 13 | 7 | 1 | 2 |
| 4 and more | 4,250 | 4,190 | 4 | 26 | 12 | 6 | 6 | 3 | 2 | 1 |
| Percent according to test result | | | | | | | | | | |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Never | 9.12 | 9.07 | 17.89 | 9.22 | 8.51 | 6.67 | 20.00 | 12.50 | 46.67 | 11.11 |
| Less than 2 | 52.16 | 52.16 | 53.69 | 52.07 | 59.57 | 53.33 | 37.78 | 56.25 | 33.33 | 55.56 |
| 2-3 | 26.10 | 26.13 | 24.21 | 26.73 | 19.15 | 20.00 | 28.89 | 21.88 | 6.67 | 22.22 |
| 4 and more | 12.62 | 12.64 | 4.21 | 11.98 | 12.77 | 20.00 | 13.33 | 9.37 | 13.33 | 11.11 |
| Percent according to interval since last test | | | | | | | | | | |
| Total | 100.00 | 98.38 | .30 | .64 | .28 | .09 | .15 | .09 | .04 | .03 |
| Never | 100.00 | 97.79 | .55 | .65 | .26 | .07 | .29 | .13 | .23 | .03 |
| Less than 2 | 100.00 | 98.40 | .29 | .64 | .32 | .09 | .10 | .10 | .02 | .02 |
| 2-3 | 100.00 | 98.54 | .26 | .66 | .20 | .07 | .15 | .08 | .01 | .02 |
| 4 and more | 100.00 | 98.59 | .09 | .61 | .28 | .14 | .14 | .07 | .05 | .02 |

¹ Excludes 632 women for whom interval could not be calculated.

dysplasias of unstated severity and of *in situ* and invasive cervical cancers. None of the four *in situ* cancers in this group was found in women aged 55 years and over; three occurred in women aged 35-44. Of the seven invasive cancers, three occurred in women under 45, three in women over 65, and one in the 45-54-year age group.

Results of rescreening examinations. Each local agency was responsible for deciding how much to emphasize the annual rescreening of women with negative first smear results. Overall, 22.8 percent of the women returned for 1 annual rescreening and 5.4 percent for 2. Because the individual programs lasted 3.5 years at the most, there was little opportunity for screenees to return a third time: only 80 women did so.

As expected, the proportions of smears with negative results increased successively between screenings, and the proportions with abnormal results decreased (table 4). Between the original screening and the first rescreen, each nonnegative category decreased except for invasive cervical cancer, for which the proportion (0.04 percent) remained the same. No cancers were found in subsequent rescreenings. The minor deviation from this general trend in the severe dysplasia category is probably due to small numbers.

Retesting of the women with unsatisfactory first

smears revealed abnormal test results for 40 women. Table 5 shows their distribution by cytologic test result and indicates the total numbers of women with abnormal Pap tests identified during the program. The final test results indicated dysplasia in 484, *in situ* cervical cancer in 41, invasive cervical cancer in 22, and endometrial cancer in 13.

Results of followup. In keeping with the program's requirement that all women with other than negative test results be investigated further and, if necessary, receive treatment, the DHS and local agencies expended intensive effort to resolve all such cases. Depending on their financial ability, women were referred to private care or to community or university hospitals. Several local programs had facilities for diagnosis and treatment, either through dysplasia clinics or association with general or teaching hospitals.

Table 6 shows that followup was successful, that is, that complete information on diagnostic evaluation and treatment was obtained for 456, or 69.1 percent of the 660 women with nonnegative Pap tests. Among the 100 women with unsatisfactory smears, 11 biopsies were performed, of which 9 were reported as negative. Clinical findings for the other two women made immediate biopsies necessary. One woman was found to have severe dysplasia, and the other, cancer *in situ*. Among

Table 4. Results of first Pap test and of annual rescreening examinations

| Screening | Total | Nega- tive | Unsats- factory | Cervical dysplasia | | | | Cervical cancer | | |
|-----------------------------------|--------|---------------|--------------------|--------------------|----------|--------|---------------|-----------------|---------------|-----------------------|
| | | | | Mild | Moderate | Severe | Not stated | In situ | Inva- sive | Endometrial cancer |
| Number | | | | | | | | | | |
| First Pap test | 34,318 | 33 505 | 361 | 220 | 95 | 30 | 50 | 32 | 15 | 10 |
| First rescreen ¹ . . . | 7,811 | 7,684 | 63 | 40 | 11 | 2 | 5 | 2 | 3 | 1 |
| Second rescreen ¹ . . | 1,852 | 1,834 | 14 | 3 | .. | 1 | .. | .. | .. | .. |
| Percent | | | | | | | | | | |
| First Pap test | 100.00 | 97.63 | 1.05 | .64 | .28 | .09 | .15 | .09 | .04 | .03 |
| First rescreen ¹ . . . | 100.00 | 98.37 | .81 | .51 | .14 | .03 | .06 | .03 | .04 | .01 |
| Second rescreen ¹ . . | 100.00 | 99.03 | .76 | .16 | .. | .05 | .. | .. | .. | .. |

¹ Only women whose previous test was negative.

Table 5. Initial and final Pap test results

| Result | First Pap test | | Annual rescreens | Conversion of unsats- factory tests | Final results | |
|------------------------------|----------------|---------|---------------------|---|---------------|---------|
| | Number | Percent | | | Number | Percent |
| Negative | 33,505 | 97.63 | -91 | 244 | 33,658 | 98.08 |
| Unsatisfactory | 361 | 1.05 | 23 | -284 | 100 | .29 |
| Cervical dysplasia | 395 | 1.16 | 62 | 27 | 484 | 1.41 |
| Cervical cancer: | | | | | | |
| In situ | 32 | .09 | 2 | 7 | 41 | .12 |
| Invasive | 15 | .04 | 3 | 4 | 22 | .06 |
| Endometrial cancer | 10 | .03 | 1 | 2 | 13 | .04 |

Table 6. Outcome of followup for women with nonnegative Pap tests

| Outcome of followup | Total nonnegative | | Unsatisfactory | | Dysplasia | | Cervical cancer | | | | Endometrial cancer | |
|--|----------------------|--------------|----------------|--------------|-------------|--------------|-----------------|--------------|-------------|--------------|-----------------------|--------------|
| | Num- ber | Per- cent | Num- ber | Per- cent | Num- ber | Per- cent | In situ | | Invasive | | Num- ber | Per- cent |
| | | | | | | | Num- ber | Per- cent | Num- ber | Per- cent | | |
| Total | 660 | 100.0 | 100 | 100.0 | 484 | 100.0 | 41 | 100.0 | 22 | 100.0 | 13 | 100.0 |
| Successful | 456 | 69.1 | 11 | 11.0 | 386 | 79.8 | 31 | 75.6 | 18 | 81.8 | 10 | 76.9 |
| Negative repeat Pap tests | 203 | 30.8 | .. | .. | 199 | 41.1 | 3 | 7.3 | 1 | 4.5 | .. | .. |
| Negative biopsy | 104 | 15.8 | 9 | 1.0 | 80 | 16.5 | 9 | 22.0 | 1 | 4.5 | 5 | 38.4 |
| Treated: positive biopsy, smear | 149 | 22.5 | 2 | 2.0 | 107 | 22.1 | 19 | 46.3 | 16 | 72.7 | 5 | 38.4 |
| Unsuccessful | 204 | 30.9 | 89 | 89.0 | 98 | 20.2 | 10 | 24.4 | 4 | 18.2 | 3 | 23.1 |
| Died | 2 | 0.3 | 1 | 1.0 | 1 | 0.2 | .. | .. | .. | .. | .. | .. |
| Pending ¹ : | | | | | | | | | | | | |
| After biopsy | 14 | 2.1 | .. | .. | 10 | 2.1 | 3 | 7.3 | 1 | 4.5 | .. | .. |
| Before biopsy | 34 | 5.2 | 18 | 18.0 | 15 | 3.1 | .. | .. | .. | .. | 1 | 7.7 |
| Lost to followup: | | | | | | | | | | | | |
| After biopsy | 14 | 2.1 | .. | .. | 8 | 1.6 | 4 | 9.8 | 1 | 4.5 | 1 | 7.7 |
| Before biopsy | 140 | 21.2 | 70 | 70.0 | 64 | 13.2 | 3 | 7.3 | 2 | 9.1 | 1 | 7.7 |

¹ Program ended before followup could be completed.

the women with abnormal smears, the proportions followed successfully ranged from 75.6 percent for the *in situ* cervical cancer group to 81.8 percent for the invasive cervical cancer group. For nearly two-thirds of the women with abnormal smears, dysplasia or cancer was ruled out on the basis of consistently negative repeat smears or negative biopsies. Women with dysplastic smears accounted for all but 4 of the 203 with negative repeat smears and for 80 of the 104 with negative biopsies.

Followup was incomplete or unsuccessful for 204 women, or 30.9 percent. Two women died from causes other than gynecologic cancer. Forty-eight women were screened so late in the program that there was not enough time to obtain complete followup information. However, for 14 of these, we had biopsy reports that confirmed a diagnosis of dysplasia or cancer of the cervix. All women in this group were under care at the termination of the program. There were 154 women who could not be followed to a definitive resolution. We had biopsy reports for 14, but the women were lost to followup before information about their treatment could be obtained. The final lost-to-followup rates for women with cytologic test results indicative of dysplasia or cancer (before and after biopsy) ranged from 14 to 17 percent. There were higher proportions of young, poor, and minority women among those lost to followup than in the general screened population.

Results of biopsies and treatment. Reports of the histologic examination of cervical biopsies were received for a total of 282 women. Sixty-one percent of those biopsied also had colposcopies. Table 7 correlates the histologic diagnoses with the cytologic test results.

In instances of multiple smears or biopsy reports, the most serious diagnosis was coded. Histologic examination revealed neither cancer nor dysplasia in 109 cases. Eighty of the 109 had had a cytologic diagnosis of dysplasia and 15, cancer of the cervix or endometrium. The histologic diagnosis was dysplasia in another 108 cases. Of these, 90 had had a cytologic diagnosis of dysplasia and 17 of cervical cancer. In 58 cases, the histologic diagnosis was cancer of the cervix. The smears for these 58 had been interpreted as indicative of cervical cancer in 27, endometrial cancer in 2, dysplasia in 27, and as negative and unsatisfactory in 1 case each. There were, finally, also seven cases of endometrial cancer diagnosed by tissue examination; four of these had been diagnosed as such cytologically, and three smears had been read as dysplastic.

The treatment received was reported for 152 women (table 8). All women with invasive cancer of either

cervix or endometrium and 82 percent of those with CIS of the cervix were treated with hysterectomy or radiation, alone or in combination. Cryosurgery was the most frequent treatment for dysplastic lesions of the cervix. Review of the records of the 11 women for whom no biopsy result was reported revealed that cytologic examination had shown mild to moderate dysplasia in 10 and invasive cervical cancer in 1; she was one of the three women in this group treated by hysterectomy. The second had a history of conization because of CIS, and in the third the hysterectomy was performed primarily because of an extensive cystocele and rectocele.

Discussion

Two features of the program are responsible for the general interest in the results. First, the screened population, although not a random sample of California's female population, was drawn from a wide area and is large enough to represent the type of women who respond to an invitation to be screened for cervical cancer. Second, this screening and referral program was carried out by community agencies using existing community resources and therefore, it can serve as a model.

The outcome data demonstrated that the program was successful in discovering premalignant and malignant lesions of the cervix in a substantial number of asymptomatic women and in assuring that women found to have such lesions received appropriate treatment. The results were compared with unpublished data of the Resource for Cancer Epidemiology, State of California Department of Health Services, for the San Francisco Bay area for 1969 through 1973. Compared with the annual rates for newly diagnosed cases of bay area women, the rates for these 34,318 women were twice as high for CIS and three times as high for invasive cervical cancer.

Because such rates are affected by many factors—for example, frequency of screening, interval between tests, and accuracy of the cytologic diagnosis—comparison of our rates with those reported in other studies conducted in the United States and abroad should be guarded (3). An extensive cervical cytology program carried out in San Diego County, Calif., between 1958 and 1963 showed a much higher prevalence of tests resulting in a diagnosis of CIS and invasive cervical cancer than we observed (4). However, at that time the proportions of women who had ever had a Pap test and of those screened repeatedly were much lower. In our population, 9 of 10 women had had at least 1 previous test, and more than one-half had had their last test within a period of 2 years. Comparable

Table 7. Histologic diagnosis by result of Pap test ¹

| Histological diagnosis | Total | Cytologic result | | | | | |
|-----------------------------|-------|------------------|----------------|--------------------|-----------------|----------|--------------------|
| | | Negative | Unsatisfactory | Cervical dysplasia | Cervical cancer | | Endometrial cancer |
| | | | | | In situ | Invasive | |
| Total | 282 | 6 | 11 | 200 | 35 | 19 | 11 |
| Negative ² | 109 | 5 | 9 | 80 | 9 | 1 | 5 |
| Dysplasia | 108 | .. | 1 | 90 | 14 | 3 | .. |
| Cervical cancer: | | | | | | | |
| In situ | 49 | 1 | 1 | 21 | 11 | 14 | 1 |
| Invasive | 9 | .. | .. | 6 | 1 | 1 | 1 |
| Endometrial cancer | 7 | .. | .. | 3 | .. | .. | 4 |

¹ Coded to most serious histologic diagnosis or cytologic test result. ² Negative for dysplasia or cancer.

screening rates were found for California in a statewide Pap smear survey conducted by the American Cancer Society in 1976 (5).

The distribution of abnormal smear results by the woman's age in our population was similar to that observed in the San Diego study (4). Our findings are consistent also with the increased risk of cervical neoplasia associated with low socioeconomic and minority status reported by others (3). As regards the underrepresentation of blacks in the program, social influences were a factor in addition to the programmatic ones mentioned earlier. Although it is beyond the scope of this report to analyze these influences fully, experiences of several of the local agencies in our program suggest strategies for increasing participation of black women. The most successful program in terms of proportions of black women screened was conducted in the San Francisco General Hospital, which routinely gave Pap tests to patients in several wards and outpatient clinics. The proportion of black women screened in this hospital was twice that in the general population. In two other programs that were unable to attract black women in desired numbers, the hiring of black

outreach workers to recruit women in primarily black neighborhoods increased the numbers of black women participating to beyond their proportion in the county's population.

Correct classification of laboratory results was a major problem that we encountered. Twelve different laboratories were employed by the local agencies in the course of the screening, and each used its own terminology and classification. Although we provided guidelines for the categorization of results, changes in personnel and failure to pass on instructions frequently led to erroneous interpretation of the laboratory findings. Eventually we solved this problem by requiring copies of the laboratory reports, and we reviewed each one for uniformity in categorization.

Another problem was obtaining timely and complete followup on women with abnormal smear results. The reasons for this difficulty are complex. We indicated earlier that women lost to followup differed from the program's screenees in that they were poorer and, more often, were minority women. This observation suggests the existence of economic and sociocultural barriers to further diagnosis and treatment. We also found that

Table 8. Type of treatment reported for 152 women, by histological diagnosis

| Treatment | Total | No biopsy report | Cervical dysplasia | Cervical cancer | | Endometrial cancer |
|----------------------------------|-------|------------------|--------------------|-----------------|----------|--------------------|
| | | | | In situ | Invasive | |
| Total | 152 | 11 | 80 | 45 | 9 | 7 |
| Conization only | 23 | .. | 19 | 4 | .. | .. |
| Cervical amputation | 2 | .. | 2 | .. | .. | .. |
| Total hysterectomy | 46 | 3 | 14 | 25 | 2 | 2 |
| Radical hysterectomy | 15 | .. | 1 | 9 | 5 | .. |
| Radiation only | 8 | .. | 1 | 2 | 2 | 3 |
| Hysterectomy and radiation | 3 | .. | .. | 1 | .. | 2 |
| Cryosurgery | 52 | 7 | 42 | 3 | .. | .. |
| Other | 3 | 1 | 1 | 1 | .. | .. |

the staff of local agencies frequently considered that their role ended with the referral of the patient to a physician or clinic. Some staffs maintained that seeking information on diagnostic tests or treatment, or both, put too severe a strain on their resources; others regarded it as interference in the physician-patient relationship. For a small proportion of women enrolled in prepaid health plans and the CHAMPUS plans, repeated inquiries for information remained unanswered. However, our attrition rate compares favorably with rates reported by others (6,7).

Although we strongly encouraged referral to a gynecologist, women who did not have such a specialist or who lived in geographically isolated areas often turned to general practitioners whom they had consulted in the past. Our third major problem arose from this practice. Not content to accept the results of the program's smear, some of these physicians hastened to repeat the Pap test. If the result was reported as negative, they interpreted this outcome as an indication that the program staff was mistaken and had unnecessarily alarmed the patient. Confused by conflicting instructions, some of the women lost confidence in the program and withdrew from followup. According to Koss (8), ruling out cervical neoplasia on the basis of a negative repeat smear is highly fallacious. This researcher found that repeat smears obtained within 3 months of the first abnormal smear were negative in 30 to 40 percent of cases with proven *in situ* cancer and recommends that all patients with abnormal smears be examined colposcopically. Since about 60 percent of the biopsies performed within our program were colposcopy-directed, we can infer that the majority of women with abnormal test results eventually did reach the appropriate specialist.

Finally, we would like to point out also that the likelihood of success in bringing patients with abnormal smears to diagnostic workup and treatment is closely related to the setting where screening is conducted. In our program, screening of jail and county hospital populations was fruitful in yielding abnormal smears. However, the transient nature of these populations made followup extremely difficult. We would suggest therefore that screening be done in such settings only if laboratory work can be completed quickly and diagnostic procedures or treatment, or both, can be instituted before the woman is released from the facility.

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SYNOPSIS

SCHWARZ, PATRICIA J. (California Department of Health Services), FASAL, ELFRIEDE, and SIMMONS, MARTHA E.: *12-county program: screening of 34,318 women for cervical cancer in California, 1975-78 Public Health Reports, Vol. 96, November-December 1981, pp. 547-554.*

The California Department of Health Services conducted a cervical cancer screening program in 12 counties where local health agencies provided the screening services. A major purpose of the study was to screen women at high risk of cervical

cancer and to assure that women with abnormal results on cervical cytology testing obtained appropriate diagnostic workup and treatment.

A total of 34,318 women were screened, and 7,811 returned for up to 3 annual rescreening examinations. Final cytologic results were 33,658 normal, 100 unsatisfactory, and 560 abnormal smears. Of the abnormal smears, 484 were indicative of cervical dysplasia, 41 of *in situ* cervical cancer and 22 of invasive cervical cancer. In 13 women, endometrial cancer was suspected. Complete followup information on

diagnostic evaluation and treatment was obtained for 80 percent of the women with abnormal Pap test results. Histological confirmation of neoplasia was reported for 173 women. The diagnoses were cervical dysplasia in 108, cervical cancer in 58 (49 *in situ*, 9 invasive) and endometrial cancer in 7.

The program reached greater proportions of older women, the less affluent, women of Spanish origin and oriental women and a smaller proportion of blacks than were present in the general female population of California.