

## Screening for Cervical Cancer Still Not Included as Routine Health Care for Women

<sup>1</sup>Rosemary, B.D., <sup>2</sup>L.C. Grace, <sup>3</sup>G.H. Allan, <sup>4</sup>S. Joseph, <sup>5</sup>M.K.A. Richard, <sup>6</sup>D. Rudolph and <sup>7</sup>K.A. John

<sup>1</sup>Department of Surgery, Beth Israel Deaconess Medical Center, Harvard Medical School

<sup>2</sup>Department of Medicine, Beth Israel Deaconess Medical Center,  
Harvard Medical School,

<sup>3</sup>Department of Population and International Health, Harvard School of Public Health,  
677 Huntington Avenue, Boston, MA. 02115

<sup>4</sup>Department of Surgery, Korle Bu Teaching Hospital, University of Ghana, Accra, Ghana

<sup>5</sup>Department of Obstetrics and Gynecology

<sup>6</sup>Department of Obstetrics and Gynecology, Korle Bu Teaching Hospital

<sup>7</sup>Institute for Statistical, Social and Economic Research, University of Ghana, Accra, Ghana

---

**Abstract:** A comprehensive community-based study of adult women living in Accra, Ghana was conducted to determine demographic characteristics associated with prior cervical cancer screening of the 1317 women who responded, only 26 (2.0%) ever had a Papanicolaou (Pap) smear for cervical cancer. One of the 26 (3.7%) reported being diagnosed with cervical cancer. There was a significant association with a prior Pap smear and 5 or more lifetime sexual partners (OR 1.68 [1.27-2.21],  $p < 0.001$ ); education at any level compared to no education (OR 3.18 [1.17-8.69],  $p < 0.001$ ); higher than secondary level education (OR 5.72 [1.74-4.17],  $p < 0.001$ ); 3 or more induced abortions (OR 3.09 CI [1.27-7.52],  $p = 0.013$ ); prior mammography (OR 18.97 [5.67-63.46],  $p < 0.001$ ) and a prior clinical breast examination (OR 3.88 [1.70-8.85],  $p = 0.001$ ). There was no association with risk factors including current age, age at first intercourse, age at first pregnancy, stillbirths, miscarriages, unprotected sexual intercourse, diagnosis or symptoms of sexually transmitted diseases, HIV status, number of lifetime partners, ethnicity, religion, occupation or income with prior cervical cancer screening. This study reveals that despite years of efforts to improve screening for cervical cancer, these measures are not reaching the community of women. Educated women appear to have taken it upon themselves to undergo screening for both breast and cervical cancer.

**Key words:** Cervical cancer, screening, west africa, sub-saharan Africa

---

### INTRODUCTION

The effectiveness of Papanicolaou (Pap) smear screening in decreasing the incidence and mortality from cervical cancer has been demonstrated in several large retrospective studies<sup>[1-4]</sup>. However, as a result of limited health care infrastructure and resources, few developing nations have been able to establish screening programs. Thus, the sad corollary to the success of Pap smear screening in industrialized nations is that epidemiologic data on cervical cancer points to this potentially preventable disease as the leading cause of cancer death among women in developing countries, where 80% of the cases in the world occur annually<sup>[5]</sup>.

Several small studies on the pattern of gynecologic cancer in Sub-Saharan Africa demonstrate that cervical cancer is not only the most prevalent gynecologic

malignancy but also suggest that women living in these countries may present with cervical cancer at a younger age and in more advanced stages<sup>[6-10]</sup>. In addition to a paucity of screening, these findings may indicate other factors are also associated with increased cervical cancer mortality rates in this area of the world. Yet to date, there have been few large studies establishing the validity of these findings among a population of Sub-Saharan African women.

The Women's Health Study of Accra (WHSa) was a comprehensive study conducted in 2003 to quantify the burden of communicable and non-communicable disease among adult women in Accra, Ghana through a detailed questionnaire, clinical history and a physical examination along with the collection of laboratory and radiographic data. The primary objective of this analysis is to determine whether or not women had been undergoing prior cervical cancer screening.

---

**Corresponding Author:** Rosemary, B.D., Department of Surgery, Beth Israel Deaconess Medical Center, Harvard Medical School, 330 Brookline Avenue, Boston, MA. 02215

## MATERIALS AND METHODS

**Study site:** The greater Accra Metropolitan Area is inhabited by 1.66 million people, 365,550 households and 839,310 women (March 2000 census). Songsore and Goldstein demonstrated considerable socioeconomic and cultural diversity<sup>[11]</sup> within this area of Accra which is geographically subdivided by the 2000 Population and Housing Census into 1731 Enumeration Areas (EAs).

**Sampling design/ participants:** The sampling design was comprised of two stages: 1) the selection of EAs and 2) the selection of eligible women. The 1731 EAs in the 2000 census of metropolitan Ghana were characterized and stratified by socio-economic status through the work of Megill<sup>[12]</sup>. To minimize selection bias due to geographic location (e.g., prevalence of certain diseases may be influenced by environmental conditions), 200 EAs were selected with probability proportional to population size within 4 socio-economic strata. In the second stage, we visited each household living in the 200 selected EAs and listed the names and addresses of all eligible women-Ghanaian women aged 18 and older usually resident in the household. To keep the design effect small, seventeen women from each EA were randomly selected to participate in the WHSA according to age. The women in the WHSA are a representative sampling of the adult women residing in Accra based on the information from the 2000 census.

**Data collection:** Household Surveys (HHS) were conducted first in order to acquire demographic information as well as information regarding lifestyle habits and living conditions. These interviews were conducted by interviewers fluent in at least two Ghanaian languages and had been trained by study coordinators. The Comprehensive history, physical and Laboratory Examination (CMLE) was performed approximately one month following the HHS at the gynecology out-patient clinic at Korle Bu Teaching Hospital, University of Ghana, Accra. In the gynecologic section of the questionnaire in the clinic, women were asked if they had ever had a Pap smear performed at any time in the past as a screening measure for cervical cancer. The term Pap smear was explained to the patient to mean any test performed that would screen for cervical cancer. Women were also asked if they had ever had a mammogram or a clinical breast examination as a means of determining the screening measures that might be performed for cancers.

**Statistical analysis:** Data was entered into SPSS version 13 database and SAS version 8 for windows. Statistical analysis was performed using descriptive frequencies, Chi-square analysis, binary nonparametric analyses logistics, and Fischer's Exact Test (one-sided and two-sided). The Odds Ratio (OR) with a 95%

Confidence Interval (CI) was used to describe the strength of the association. Statistical significance was defined as  $p < 0.05$ .

**Institutional review board approval:** This study was approved by the Human Subjects Committee at Harvard School of Public Health, Noguchi Memorial Institute for Medical Research, University of Ghana and data analysis approved by the Beth Israel Deaconess Medical Center. Informed consent was obtained by signature or thumbprint. The women were allowed to opt out of any portion of the study at their discretion.

## RESULTS

The women who participated in this study are a representative sampling of the adult female population in the Accra Metropolitan Area, Ghana. Of the 518,693 women over 18 in the Accra Metropolitan Area, 3175 women were interviewed at home and 1328 of those women were examined in the outpatient clinic.

The demographic characteristics of the patients in this study are provided in Table 1. The descriptive characteristics are provided in Table 2. Of the 1328 women interviewed, 1317 responded to the question regarding previous cervical cancer screening. Only 26 women (2.0%) stated that they ever had such a procedure performed, 1270 (96.4%) reported none and 21 (1.6%) were uncertain. 22(81.5%) reported a normal finding, 4(14.8%) were unaware of the results and 1 (3.7%) reported being diagnosed with cervical cancer. All of 26 women were sexually active and only one was nulliparous.

In comparison, 17/1318 (1.3%) of women ever had a screening mammogram performed; 165/1310 (12.6%) had a Clinical Breast Examination (CBE) and 459/1322 (34.7%) women performed self breast examinations at least monthly. Twenty five per cent of the women who had a mammogram also reported cervical cancer screening (OR 18.97 [5.67-63.46],  $p < 0.001$ ). Women who also had a CBE had an increased chance of reporting a previous Pap smear (OR 3.88 [1.70-8.85],  $p = 0.003$ ).

Current age woman was not associated with cervical cancer screening ( $p = \text{NS}$ ). The mean age of those who did have a prior Pap smear was  $53.3 \pm 15.5$  years (range 25-82) compared to those who did not have a previous Pap smear  $46.7 \pm 18.0$  (18-100),  $p = \text{NS}$ . The number of lifetime sexual partners of 5 or more was significantly associated with having a previous Pap smear, OR 1.68 [1.27-2.21],  $p < 0.001$ . Other risk factors for cervical cancer that include age at first intercourse, age at first delivery and a history of Sexually Transmitted Infections (STI) or symptoms suggestive of STI were not associated with cervical cancer screening.

Table 1: Demographic Characteristics by History of Previous Cervical Cancer Screening

Demographic characteristic	Pap smear reported (n%) 26 / 2.0	Pap smear not reported (n%) 1270 / 96.4
Total No(%)		
Age (yrs)		
Mean± S.D	53.3±15.5	46.7±18.0
Range	25-82	18-100
Socioeconomic status(%)		
Low	5 / 1.6	301 / 98.4
Low middle	3 / 0.9	347 / 99.1
High middle	10 / 3.0	324 / 97.0
High	8 / 2.6	297 / 97.4
Total	26	1269
Monthly income % less than		
300,00	6 / 1.9	309 / 98.1
300,000-500,000	7 / 2.6	258 / 97.4
500,000-1,000,000	7 / 2.3	300 / 97.7
1,000,000-5,000,000	3 / 3.3	87 / 96.7
Total	23	954
Level of education (%*)		
No education	1 / 0.3	370 / 99.7
Primary	6 / 4.8	119 / 95.2
Middle	7 / 1.3	525 / 98.7
Secondary	3 / 1.9	156 / 98.1
Higher	8 / 9.5	76 / 90.5
Total	25	1246
Work status (%)		
Formal employment	5 / 4.1	118 / 95.9
Self-employed	14 / 2.1	652 / 97.9
Student or apprentice	0 / 0	75 / 100
Housewife	1 / 2.7	36 / 97.3
Retired	2 / 5.6	34 / 94.4
Unemployed	4 / 1.2	337 / 98.8
Total	26	1252
Ethnicity %		
Akan	7 / 1.9	369 / 98.1
Ga	12 / 2.1	570 / 97.9
Ewe	3 / 1.8	163 / 98.2
Guan	2 / 20.0	8 / 80.0
Mole-Dagbani	1 / 4.2	23 / 95.3
Grussi	0 / 0	7 / 100
Hausa	1 / 2.6	38 / 97.4
Other	0 / 0	77 / 100
Total	26	1255
Religion		
Catholic	1 / 1.1	88 / 98.9
Anglican	3 / 4.3	67 / 95.7
Protestant, Other	13 / 2.8	448 / 97.2
Muslim	2 / 1.3	152 / 98.7
Spiritualist	1 / 2.3	6 / 100
Charismatic	3 / 1.7	169 / 98.3
Pentecostal	3 / 1.3	225 / 98.7
Traditional	0 / 0	6 / 100
None	0 / 0	31 / 100
Other	0 / 0	26 / 100
Total	26	1255

\* Any level of education compared to no education was significantly associated with having reported a Pap smear, p=0.023. Higher education than secondary school was significantly associated with having reported a previous Pap smear

Other variables not associated with cervical cancer screening included menopause status, HIV status and number of pregnancies, stillbirths or miscarriages, income level, ethnicity, area of residence or occupation. The mean age of the study for first intercourse was 18.97±3.2 years, range age 10 to 36.

Table 2: Descriptive Characteristics of Women by History of Previous Cervical Cancer Screening

Demographic characteristic	Pap smear reported (n%) 26 / 2.0	Pap smear not reported (n%) 1270 / 96.4
Total No / %		
HIV Status		
Positive	1 / 2.9	33 / 97.1
Negative	25 / 2.0	1209 / 98.0
Total	26	1242
Age at first intercourse		
< 12 years	0 / 0	3 / 100
12 – 15 years	1 / 0.8	124 / 99.2
16 – 20 years	17 / 2.2	767 / 97.8
21 – 25 years	5 / 2.4	202 / 97.6
> 25 years	1 / 2.9	33 / 97.1
Total	24	1129
Age at first delivery		
< 15 years	0 / 0	17 / 100
16-18 years	4 / 2.0	201 / 98.0
19-20 years	3 / 1.4	218 / 98.6
21-25 years	4 / 1.0	391 / 99.0
26-30 years	6 / 4.9	116 / 95.1
> 30 years	2 / 7.1	26 / 92.9
Total	19	969
Lifetime number of partners*		
None	0 / 0	2 / 100
1 only	8 / 21	367 / 97.9
2 to 4	9 / 1.2	730 / 98.8
5 to 9	6 / 7.1	79 / 92.9
> 10	3 / 6.4	44 / 93.6
Total	26	1222
Marital status		
Single	1 / 0.5	197 / 99.5
Married	13 / 2.4	525 / 97.6
Widowed/Divorced/Separated	12 / 2.3	519 / 97.7
Total	26	1241
Menopause status		
Pre	8 / 1.4	551 / 98.6
Post	15 / 2.5	582 / 97.5
Total	23	1133

Five or more lifetime sexual partners was significantly associated with having reported a previous pap smear for cervical cancer screening, p<0.001

Women with an education level of primary school and higher were significantly more likely to have a Pap smear (OR 3.18 [1.17-8.69], p=0.023). Women with an education level higher than completing secondary school were more likely to have a pap smear than any educational level (OR 5.72 [1.74-4.17], p<0.001).

## DISCUSSION

Even in a country with limited resources for health care and other services, cervical cancer screening must be a public health priority. Based on the results of this study, few women in Accra, Ghana recall ever having had a previous Pap smear or screening for cervical cancer. Even women with risk factors for cervical cancer have not been routinely screened. It was expected that more women, and especially more of the younger women over age 50 years, would have had at least one Pap smear or similar test because of the previous report from Ghana that demonstrated that the women at highest risk of

cervical cancer were 50 years and older<sup>[13]</sup>. What is also concerning is that 14.8% of the women who were screened were unaware of their test results.

Invasive cervical cancer has been reported to be the most common malignancy in several sub-Saharan African studies<sup>[14]</sup>. It was also the most common genital tract cancer treated at an urban center in Ghana<sup>[15]</sup>. In previous studies on unscreened population in sub-Saharan Africa, the prevalence of LGSIL lesion are estimated to be approximately 2.4%, HGSIL to be ~1.8% and cervical cancer to be ~1%<sup>[16]</sup>. The age-specific prevalence rate of cervical cancer was studied in this South Africa investigation. The average age for those diagnosed with cervical cancer was 51.3 years, significantly higher than those diagnosed with LGSILs (33.1 years) or HGSILs (38.0 years). A clear relationship was found with young age and LGSILs and older age and invasive cancer. These data indicate that cervical cancer is a common disease and that it is a disease of older women in an unscreened women residing in developing countries. The mean age of woman in our group with LGSILs and HGSILs was higher than reported in this study.

Previous studies from Sub-Saharan Africa in similar unscreened populations estimate that the prevalence of low-grade squamous intraepithelial lesions (LGSILs) is 2.4%, the prevalence rate for high grade squamous intraepithelial lesions (HGSILs) is 1.8% and 1% for cervical squamous cell carcinoma. The risk factors for HPV infection/cervical cancer include increasing number of sexual partners, history of venereal diseases, high parity, low socioeconomic status, limited education, possibly men's sexual behavior and smoking<sup>[17-19]</sup>.

The retrospective study conducted by Nykekyer in 2000 described a cervical prevalence rate of 1.6% among Ghanaian women admitted to the gynecologic unit at Korle Bu Teaching Hospital. This hospital based study represented woman who were referred to the unit from all areas of Ghana, not just Accra. Based on these estimation from the literature for SSA, it was expected that 20 women would have been identified with low-grade (LGSILs in the Bethesda Classification), 15 woman with high-grade lesions and 8 with a cervical cancer. Based on these rates, our inability to detect any cause of cancer is statistically significant from the expected rates previously noted ( $p < 0.001$ ).

One interesting finding is the significant association of ever having a previous Pap smear and a history of having a prior mammogram. While the confidence interval is wide for this association, the association can be explained by this very well highlighted public health initiative. It also emphasizes that if awareness is

increased about a particular condition with the right amount of publicity, support and attention, the women will respond. Priority setting for cervical cancer screening by the public health officials is pertinent to ensure the healthy living of the women<sup>[20]</sup>.

The more educated women were also more likely to have had a prior Pap smear than women with a high school education or lower. This suggests initiative taken by the women to have a Pap smear and a mammogram performed rather than this service being provided as routine care. In a recent survey of 175 well-educated women in Accra, Ghana, 93% reported that they had heard of cervical cancer, 37% had adequate knowledge of the disease, 39% had adequate knowledge of Pap smears and of those, only 8.5% ever had a Pap smear<sup>[21]</sup>. The level of knowledge was not necessarily translated into utilization of the test. The author highlights the need for an organized cervical cancer screening program that would include better public education and increased initiative from medical doctors to perform routine Pap smears. The WHSA, which found that only 9.5% of women with higher than secondary education had a previous Pap smear, supports the findings from this smaller survey.

Given the small numbers of women who reported a history of previous Pap smears, the significance of these differences is difficult to interpret. In addition, as we did not collect detailed information regarding the timing and context of previous Pap smears, recall bias may certainly have been a factor. However, these findings certainly illustrate the need to improve awareness of the risks and prevalence of cervical cancer and to increase the availability of the cervical cancer screening tests to all women.

## REFERENCES

1. Devesa, S.S., D.T. Silverman, J.L. Young, E.S. Jr Pollack and C.C. Brown, *et al.*, 1987. Cancer incidence and mortality trends among whites in the United States, 1947-84. *J. Natl. Cancer Inst.*, 79: 701-707.
2. Cook, G.A. and G.J. Draper, 1984. Trends in cervical cancer and carcinoma in situ in Great Britain. *Br. J. Cancer*, 50: 367-375.
3. Dat, N.E., 1984. Effect of cervical cancer screening in Scandinavia. *Obstet Gynecol*, 63: 714-18.
4. Johannesson, D., G. Geirsson and N. Day, 1978. The effect of mass screening in Iceland, 1965-74, on the incidence and mortality of cervical carcinoma. *Int. J. Cancer*, 21: 418-425.
5. Reichenbach, L., 2002. The politics of priority setting for reproductive health: Breast and cervical cancer in Ghana. *Repro. Health Matters*, 10: 47-58.

6. Nkyekyer, K., 2000. Pattern of Gynecologic Cancers in Ghana. *East Afr. Med. J.*, 10: 534-538.
7. Rogo, K.O., J. Omany, J.N. Onyango, S.B. Ojwang and U. Stendahl, 1990. Carcinoma of the cervix in the African setting. *Intl. J. Gyneec Obstet*, 33: 249-255.
8. Kasule, J., 1989. The pattern of gynecologic malignancy in Zimbabwe. *East Afr. Med. J.*, pp: 393-9.
9. Emembolu, J.O. and C.C. Ekwempu, 1988. Carcinoma of the cervix uteri in Zaria: etiologic factors. *Int. J. Gynec. Obste*, 26: 265-69.
10. Armon, P.J., 1978. Carcinoma of the cervix in Tanzania. *East Afr. Med. J.*, pp: 534-537.
11. Songsore, J. and G. Goldstein, 1996. Wealth health and the urban household. Chapter 8 in: *Urban health research in developing nations* Oxford, CAB International.
12. Megill, D., 2002. Recommendations for designing master sample for Ghana intercensal household survey program. Ghana Statistical Service and U.S. Bureau of Census.
13. Adadevoh, S.W. and B.K. Forkouh, 1993. Cervical cancer screening: First results and future directions in Ghana. *Intl. J. Gyneacol Ob.*, 43: 63-64.
14. Nkyekyer, K., 2000. Pattern of Gynecologic Cancers in Ghana. *East Afr. Med. J.*, 10: 534-538.
15. Adadevoh, S.W., 1994. Clinical presentation of cervical carcinoma in Kumasi, Ghana. *Int. J. Gyneacol. Ob.*, 46: 333-334.
16. Fonn, S., B. Bloch, M. Mabina and H. Cronje *et al.*, 2002. Prevalence of pre-cancerous lesions and cervical in South Africa-A multicenter study. *South Africa Med. J.*, 92: 148-156.
17. Chichareon, S., R. Herron and N. Munoz *et al.*, 2002. Risk factors for cervical cancer in Thailand: A case-control study. *J. Natl. Cancer Inst.*, 90: 50-57.
18. Ngelangel, C., N. Munoz and F.X. Bosch *et al.*, 1998. Causes of cervical cancer in the Philippines: A case-control study. *J. Natl. Cancer Inst.*, 90: 43-49.
19. Munoz, N., X. Castellsaque and F.X. Bosch *et al.*, 1996. Difficulty in elucidating the male role in cervical cancer in Columbia, a high risk area for the disease. *J. Natl. Cancer Inst.*, 88: 1068-1075.
20. Reichenbach, L., 2002. The politics of priority setting for reproductive health: breast and cervical cancer in Ghana. *Repro. Health Matters*, 10: 47-58.
21. Adanu, R.M.K., 2001. Cervical Cancer Knowledge and Screening in Accra, Ghana (Eds). *J. Women's Health and Gender-Based Medicine*, 11: 487-488.