

Missed opportunities for cervical screening at Worcester Hospital and Worcester Community Health Centre, Worcester, South Africa

^a Mphatsoe DS, MBChB, MFamMed

^b Pather MK, MBChB, MFamMed, BScHons Med Sciences

^a Family Physician, Bothaville

^b Division of Family Medicine and Primary Care, Faculty of Health Sciences, University of Stellenbosch

Correspondence to: Dr MK Pather, e-mail: mpath@sun.ac.za

Abstract

Background: Cervical cancer is the only gynaecological malignancy for which a screening modality is widely accepted and recommended for all women.¹ Just as in other developed countries, the decline in deaths from cervical cancer in the white population in South Africa after the mid-1960s has been attributed to cytological screening.² The purpose of this study was to determine the extent of missed opportunities for cervical cancer screening by the healthcare service at Worcester Hospital and the closely associated Worcester Community Health Centre (CHC) for patients 30 years and older who presented at these centres for reasons unrelated to cervical cancer screening.

Methods: A descriptive cross-sectional survey was conducted using a questionnaire that was administered through personal interviewing. A sample of 235 patients was selected from six sampling units. Sampling was done proportionately, according to the average numbers of patients normally seen daily at the various units.

Results: The mean age of the sample was 47, with 30 and 81 being the youngest and oldest patients respectively. The mean level of education for the sample was Grade 7 (Std 5). The overall rate for missed opportunities for cervical cancer screening was 93.2% (95% Confidence Interval (CI) 90%–96%), as only 6.8% of patients were asked about cervical (Papanicolaou) smears during consultation. None of the patients that were seen at the medical, surgical and orthopaedic clinics and casualty were asked about whether they had had a cervical pap smear; 56.5% (95% CI 36%–76%) of the patients that were seen at the gynaecology clinic were asked and 2.3% (95% CI 0.3%–4.8%) from Worcester Community Health Centre were asked whether they had had a cervical smear. A total of 15.7% [37/235: 95% CI 11%–20%] had never had a cervical smear, while 84.3% (198/235) had had a cervical smear previously. Of those who had had a cervical smear previously, 51% [101/198: (95% CI 44%–58%)] had it performed at a local clinic, 40.4% [80/198: (95% CI 34%–47%)] at a secondary hospital, 5.6% [11/198 (95%CI 2.3%–8.7%)] privately and 3% [6/198: 99% CI 0.6%–5.4%)] at a tertiary hospital.

Of those patients who had a smear done before (198), 52% [103/198: 52% (95% CI 45%–59%)] were not given an appointment to return for the results, 32% (95% CI 25.8%–38.8%) did not receive their results and 78.3% (95% CI 72.5%–84.0%) were not advised on further management in the future. It is noteworthy that only 2.1% (5/235) of the patients had personally requested a cervical smear from a doctor at Worcester Hospital and Worcester CHC.

A total of 6.8% (16/235) patients were asked during the consultation whether they had had a cervical smear done before. On enquiry, a total of 99.2% (95% CI 97.9%–100%) of the patients said that they would have preferred to have received information about a cervical smear from their doctor.

Conclusion: Opportunities for cervical cancer screening were missed in patients attending Worcester Hospital and Worcester CHC. Women 30 years and older should routinely be asked about whether they are up to date with their cervical smears, irrespective of their presenting complaint. If they are found not to be up to date, they should have a cervical smear done or be referred appropriately to their clinics to have a cervical smear performed. When a smear has been done, a follow-up appointment should be made for them to be given the results, as well as advice regarding when the next smear is due. All such interactions between the patient and the healthcare worker should be clearly documented in the patient's record.

Ⓟ This article has been peer reviewed. Full text available at www.safpj.co.za

SA Fam Pract 2008;50(4):68

Literature review

According to the World Health Organization (WHO), the incidence of cervical cancer is about four times greater in the developing world than elsewhere and industrialised countries have a low incidence, which is expected to decrease further due to screening.³

In South Africa, cancer of the cervix makes up 33% of all malignant tumours in black females. This is a deplorable situation, since it is a preventable condition, the incidence of which can be reduced by up to 90% through the use of a properly designed cervical cytology population screening programme.⁴ Between 1993 and 1995, an average of 3 387 new cases of cancer of the cervix were reported.⁵ By contrast, 1 497 deaths from cancer of the cervix were reported by the Central Statistical Services (CSS) for 1994.⁵ The crude incidence rate was 17/100 000 and the age standardised incidence rate (ASIR) was 22/100 000.⁵ Cancer of the cervix was the second most common cancer in women, comprising 16.6% of all cancers.⁵ It is the most common cancer in black (31.2%) and coloured (22.9%) women, the second most common in Asian women (8.9%) and the fourth most common in white women (2.7%).³ The lifetime risk for all is one in 41.⁵ Many studies done in South Africa show that there is a high prevalence of cervical carcinoma, particularly in the black communities.⁶⁻⁹

Cervical cancer is the only gynaecological malignancy for which a screening modality is widely accepted and recommended for all women.¹ Early detection of pre-cancerous lesions through cytological screening has been and most probably will remain the mainstay for global control of the disease for some time.¹⁰ Cervical smear screening with follow-up treatment of dysplastic lesions remains the best available method of reducing the mortality and incidence of cervical cancer.¹¹ As in other developed countries, the decline in deaths from cervical cancer in the white population in South Africa after the mid-1960s has been attributed to cytological screening.²

While wide-scale cervical cancer screening has helped to decrease the incidence of the disease in developed countries, this has come at a massive cost, which appears prohibitive for developing countries with low-resource settings. There is increasing evidence in the literature to encourage new techniques as attractive alternatives to cervical screening in developing countries.¹²⁻²⁰ However, Sawaya and Grimes, who caution about new technologies for cervical screening, warn that the shifting of resources for this purpose might cause net harm if the result is fewer screening opportunities for high-risk women. New screening technologies do not address the problem of the utilisation gap and might widen it by driving the cost of screening out of reach of high risk-women. Greater decreases in morbidity and mortality from cancer of the cervix would likely result if the same resources were invested in a comprehensive national screening programme that targeted women at highest risk.²¹

Studies reveal that cervical cancer screening and education in South Africa has been conducted on an opportunistic basis. This has resulted in multiple re-screening of a small proportion of the population at the exclusion of most women at high risk, and a low population coverage.^{2,22,23} Re-organising cervical screening programmes in the light of experiences from other countries and lessons from past failures, while also aiming for higher population coverage (> 80%), will help countries like South Africa to achieve better results in the control of cervical carcinoma.²⁰

There is evidence from the literature that there is a significantly high rate of missed opportunities for cervical screening. In one retrospective

study, where the medical records of patients who had been diagnosed with invasive cervical cancer were examined up to about three years prior to the diagnosis of the disease, it was shown that 60% had not had a smear in the said period, and that 75% of these patients had had contact with the medical system, at least once, through clinics.²⁴ Another study showed that 65% of subjects with invasive cervical cancer had never had a pap smear until diagnosis, while 88% of them had seen a physician in the preceding three years.^{1,25}

Yet another study, done in a low-income community, showed that 52% of new patients with invasive carcinoma of the cervix had no previous pap smear, while 62% of cases did not have a smear within five years prior to the diagnosis of the disease. In the five-year period before the diagnosis, it was shown that 73% of the unscreened women had received ambulatory medical care (including 41% who had regular care for chronic conditions), while 16% had been hospitalised.²⁶

No figures relating to the incidence of missed opportunities are available for the Western Cape Province.²⁷

It also emerges from the literature that there are four factors that contribute to the increased rate of missed opportunities for cervical screening, namely a combination of patient, provider, practice and access barriers. Patient and provider barriers represent human reasons or factors why both groups may be reluctant to participate in screening, while practice and access barriers exemplify systems factors that impede the screening process for both groups. Perceptions about these human and systems factors have been identified as reasons why the primary care providers may miss the opportunity to perform or recommend screening for their patients.^{28,29,30} However, it has been shown that the majority of the patients are receptive to cervical screening and that the most common reason for not having had a test was that they had never heard of it.³¹ This finding reveals the responsibility incumbent upon the doctors and the exceptional potential in each of their primary care consultations as healthcare providers to perform or at least recommend cervical screening.³² Seminars with experts in preventive care, guidelines and pamphlets have been found to be strategies to which many doctors are receptive and which would be most useful for improving cancer screening in general practice.³³ In this study, only the provider barrier factor was investigated. The published literature on missed opportunities for cervical screening is mainly from studies done on identified cases of cervical cancer. This study is different in that it targets the population at risk that is being missed by healthcare providers in our health facilities. It therefore does not focus on the records of identified cases of cervical cancer patients as a way of determining the rate of missed opportunities. The rate of missed opportunities for screening was determined from cases where screening was indicated but was not done or recommended by the doctor during the consultation.

This study therefore aimed to determine the proportions of missed opportunities regarding cervical screening for patients 30 years and older who attended the Worcester Hospital as well as the Worcester CHC for reasons unrelated to obtaining a cervical smear.

Methods

This was a descriptive cross-sectional survey using a questionnaire that was administered through personal interviewing. Following consultation with a statistician, a sample of 235 patients was selected from six sampling units. Sampling was done proportionately according to the average numbers of patients normally seen at the various units per day. A sampling unit was an individual clinic or a community health

centre. Systematic random sampling was used, in that every fifth patient seen by a doctor or nurse was included in the study.

Patients were selected from the following units, with the respective number of patients selected per unit in brackets.

1. Worcester Community Health Centre (133)
2. Orthopaedic clinic (26)
3. Casualty (39)
4. Gynaecological clinic (23)
5. Surgical clinic (7)
6. Medical clinic (7)

A missed opportunity was defined as existing for a particular patient if all of the following criteria were present: intervention regarding cervical cancer screening was indicated, the patient was receptive to such intervention but did not receive such intervention or qualified for a cervical smear according to the South African Department of Health guidelines on cervical screening but did not have a cervical smear done, even if she presented with an unrelated clinical problem.

Patients were interviewed in private and the questionnaires, which were available in English, Afrikaans and Xhosa, were cross validated. Anonymity and confidentiality were maintained for all patients. The target population included all women 30 years and older attending Worcester Hospital and Worcester CHC. Patients under 30 years of age and those needing emergency care were excluded. Only those patients who actually consulted a doctor at these centres were included. The questionnaire was administered to the patients upon their exit from the clinic without the knowledge of the doctor and nurses working in the particular unit or clinic. The choice of an age cut-off of 30 years in this study was motivated by research studies, limited resources and the guidelines of the national policy of the Department of Health on cervical screening, which recommends three smears per lifetime, with a 10-year interval between each smear commencing at age 30.^{5,34–37}

Informed consent was obtained from all the patients interviewed. The patients were assured of their anonymity, and formal consent to conduct the study was obtained from the superintendents of Worcester Hospital and Worcester CHC, as well as from the Department of Family Medicine and Primary Care. Ethics approval was granted by the Ethics Committee, Faculty of Health Sciences, University of Stellenbosch. The folders of all the patients were also audited for entries regarding cervical cancer screening interventions as a way of validating the responses of the patients.

The questionnaire elicited the following information:

1. Demographic data.
2. Language used during the consultation with the doctor and whether or not they were comfortable with it.
3. Whether the doctor spoke to them about a cervical smear and whether they would have liked to have received such information from him/her.
4. Whether they had had a cervical smear before and, if they had, to provide details about their last cervical smear regarding time, place, follow-up appointment, results and any advice given concerning further follow up in the future.
5. Consent to do a cervical smear for those who had never had one and those whose last had been more than five years previously.

In cases where a missed opportunity for cervical screening was identified, a cervical smear was done immediately and a follow-up

appointment was made for the results. Information leaflets were given to the patients for perusal at home. These were made available in English, Afrikaans and Xhosa and were obtained from the Cancer Association of South Africa and the Department of Health.

Statistical analysis

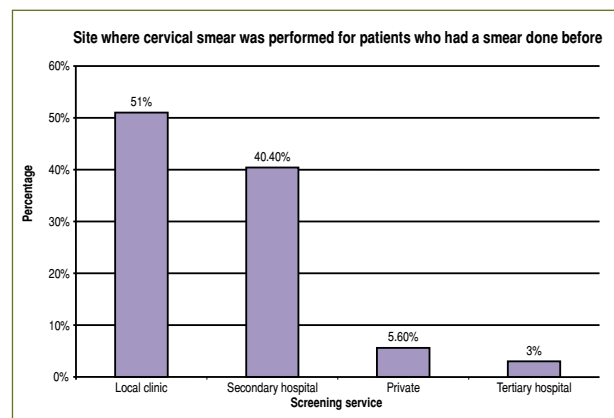
The results of the survey were analysed using the Microsoft Excel Programme.³⁸ Categorical variables were compared by means of the chi-square test. P values of less than 0.05 were regarded as statistically significant. The formal assistance of a statistician was obtained and 95% confidence intervals were calculated for proportions and rounded off to the nearest integer.

Results

The mean age of the sample was 47, with the youngest and oldest patients being 30 and 81 respectively. The mean level of education for the sample was Grade 7 (Std 5).

The overall prevalence rate for missed opportunities for cervical cancer screening was 93.2% (95% CI 90%–96%). The true missed rate, indicating those patients needing a cervical smear that were missed during consultation, was 46.8% (95% CI 38%–56%). None of the patients that were seen at the medical, surgical and orthopaedic clinics and casualty was asked about whether they had ever had a cervical smear, 56.5% (95% CI 36%–76%) of patients that were seen at the gynaecology clinic were asked, and 2.3% (95% CI 0.3%–4.8%) at the Worcester CHC were asked whether they had had a cervical smear. A total of 15.7% patients [37/235: 95% CI 11%–20%] had never had a cervical smear before and 84.3% (198/235) had a cervical smear performed previously. Of those who had a cervical smear done previously, 51% [101/198 (95% CI 44%–58%)] had it performed at a local clinic, 40.4% [80/198 (95% CI 34%–47%)] at a secondary hospital, 5.6% [11/198 (95% CI 2.3%–8.7%)] privately and 3% [6/198 (95% CI 0.6%–5.4%)] at a tertiary hospital (see Figure 1).

Figure 1: Site where cervical smear was performed



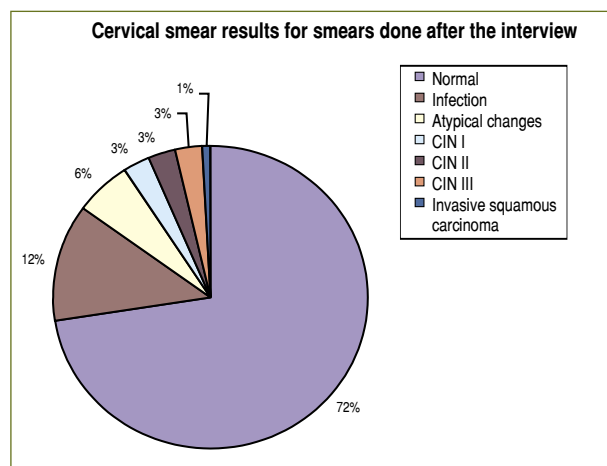
Of those patients who had a smear done before (198), 52% [103/198–52% (95% CI 45%–59%)] were not given an appointment to return for the results, 32% (95% CI 25.8%–38.8%) did not get their results and 78.3% (95% CI 72.5%–84.0%) were not advised regarding further management. It is interesting to note that only 2.1% (5/235) of the patients had ever personally requested a cervical smear from a doctor at Worcester Hospital and Worcester CHC.

A total of 16 out of 235 patients were asked during the consultation whether they had a cervical smear done before. On enquiry, a total of 99.2% (95% CI 97.9%–100%) of patients said that they would have

preferred to have received information about a cervical smear from their doctor. In 97.9% of cases [230/235 (95% CI: 96.0%–99.7%)], the record audit was consistent with the patient response during the interview. In 2.1% of cases (five cases: two at the Gynaecological clinic and three at the Worcester Community Health Centre), the patients reported that they were not asked about a cervical smear when the record audit revealed that the doctor had documented that the patient was asked about a cervical smear.

A total of 44.6% [105/235 (95% CI 38.3%–51.0%)] had a pap smear done following the interview, while 11 patients could not have a cervical smear done immediately after the interview and were referred appropriately or a follow-up booking was made. A total of 72.6% [76/105 (95% CI 64.1%–81.1%)] had a normal cervical smear result, 12.4% [13/105 (95% CI 6.1%–18.7%)] had a result showing infection or absent endocervical cells, 5.7% (6/105 (95% CI 1.3%–10.1%)) had results showing atypical cell changes of unknown potential, 2.8% [3/105 (95% CI 0.4%–6.0%)] had results showing cervical intraepithelial neoplasia stage I (CIN I), 2.8% [3/105 (95% CI 0.4%–6.0%)] had a result showing CIN II, 2.8% [3/105 (95% CI 0.4%–6.0%)] had a result showing CIN III and 0.95% [1/105 (95% CI 1.85%–2.8%)] had a result showing squamous cell carcinoma of the cervix (see Figure 2).

Figure 2: Results for cervical smears done after the interview



Discussion

There is a high rate of missed opportunities for cervical cancer screening in patients attending Worcester Hospital and Worcester Community Health Centre. Given the burden of the clinical problem of cervical cancer in developing countries, the widely acceptable nature of its screening modality and the availability of screening services and equipment, especially in South Africa, the failure of these facilities to utilise the opportunity provided them during consultation is a source of concern. Patients would benefit from at least enquiring from them about whether they are up to date with their cervical smears and recommending clinic attendance to them if a smear is indicated.

It is the burden of the disease on society, along with its possible effects on the whole patient, that should dictate the interactions between the clinician and the patient during the consultation, and not the interests of the clinician in a specific branch of medicine. The primary healthcare clinician serves a key role in prevention of disease and promotion of health, especially with regard to cervical screening.

Most cervical smears are performed at primary healthcare level. This finding is consistent with the widely acknowledged vital importance

of the role played by primary healthcare in health promotion. If ever higher population coverage regarding cervical cancer screening is to be achieved, it will most likely be through the primary healthcare service. However, this study has shown that many patients who have cervical smears at the clinics concerned are not given follow-up appointments to obtain the results of their cervical smear. Patients may assume that the results of the cervical smear are normal if no further contact and arrangements for follow-up are made between them and the clinic. The service provision can therefore be improved through simply giving patients a follow-up date for their cervical smear results, written on their clinic card at the time when a cervical smear is performed.

It is important to note that, while the healthcare service may divide service delivery according to forms of disease and specialities of medicine, patients do not generally recognise those divisions. A significant 99.2% of the patients said that they would have liked to have received information about a cervical smear from their doctor during the consultation on the day of their visit. Furthermore, the index doctor might be the only doctor the patient will ever see before developing cervical carcinoma.

The following findings in this study remain cause for concern:

1. All the patients seen at the medical, surgical and orthopaedic clinics and casualty were not asked about a cervical smear.
2. Only 2.3% of the patients were asked about a cervical smear at Worcester CHC, a primary healthcare clinic.
3. Only 2.1% of the patients had ever personally requested a cervical smear from a doctor at Worcester Hospital and Worcester CHC.
4. A total of 52% of the patients who had cervical smears performed were not given follow-up appointments for their cervical smear results.
5. A total of 32.3% of the patients who had cervical smears performed did not get their cervical smear results.
6. A total of 15.7% of eligible patients had never had a cervical smear before.
7. A total of 78.3% of the patients were not given any information regarding when their next cervical smear was due.
8. A total of 10% of the patients who had cervical smears performed after the interview had some form of cervical intraepithelial neoplasia

Given the stated high prevalence of cervical intraepithelial neoplasia that was detected in this sample, every effort should be made to encourage regular cervical screening at primary care level, as well as making full use of the opportunities for cervical screening that are present at primary care level. It is at least encouraging to note that 99.2% of the patients would have liked to have received information regarding cervical smears from their doctor. This indicates the willingness of the patients to receive instruction or education in this regard and points to an opportunity that is not adequately utilised.

The frequent changing of staff at Worcester Hospital and Worcester CHC results in a disturbing number of different doctors consulted at each visit. This leads to a lack of continuity of care and a poor doctor-patient relationship, which may be associated with missed opportunities.

The main recommendation arising from this study is that all women 30 years and older should be routinely asked about whether their cervical smears are up to date and, if not, they should have one done or be

referred appropriately or advised and assisted in seeking help at their local clinic. When a smear has been done, a follow-up appointment should be made for the results to be provided and, upon giving the results, they should be given advice on when the next cervical smear will be due. Patients often have a high regard for any verbal advice from their doctor, and what the doctor does not emphasise during the consultation may be perceived as being unimportant. If the doctor does not talk about cervical screening to the patients, the patients may not be able to appreciate the value of this screening. Any advice given to a patient should be followed by clear documentation in the patient records.

It is hoped that the findings of this study will help healthcare workers (especially doctors) at the primary care level to appreciate the value of vigorous screening for cervical cancer as a doorway to early diagnosis and curative treatment of the most common cancer affecting the lives of women in their area of practice.

Acknowledgements

The authors would like to thank and acknowledge the following people for their contributions and assistance in this research: Dr Charl Oettle, Dr Helise Schumann, Dr Martin Kidd, Mr Makade, Ms Champ, Nurse Zinkfontein, and Florence and Lerato Mphatsoe for their support and encouragement.

Declaration

We declare that we have no financial or personal relationship(s) that may have inappropriately influenced us in writing this paper.

References

- Lea JS, Miller DS. Optimum screening interventions for gynaecologic malignancies. *Tex Med* 2001;97:49–55.
- Baillie RS, Selvey CE, Bourne D, Bradshaw D. Trends in cervical cancer mortality in South Africa. *Int J Epidemiology* 1996;25:488–93.
- WHO – Fact number 43: 50 facts: Global health situation and trends 1955–2025. The World Health Report 1998. – Life in the 21st Century: A vision for all [http://www.who.int/whr/1998/media centre/50facts/en/](http://www.who.int/whr/1998/media%20centre/50facts/en/) (Accessed 16/12/2004)
- Bloch B. Carcinoma of the cervix. In: Bassin J (ed.). Topics in obstetrics and gynaecology. Johannesburg: Julmar Communications; 1996. p. 302–4.
- South African National Cancer Registry (CANSAs) website: www.cansa.co.za (Accessed 16/12/2004).
- Heystek MJ, De Jonge ET, Meyer HP, Lindeque BG. Screening for cervical neoplasia in Mamelodi – lessons from an unscreened population. *S Afr Med J* 1995;85:1180–2.
- Fonn S, Block B, Mabina M, et al. Prevalence of precancerous lesions and cervical cancer in South Africa – a multi-centre study. *S Afr Med J* 2002;92:148–56.
- Lancaster EJ, Banach L, Lekalakala T, Mandiwana I. Carcinoma of the uterine cervix: results of Ka-Ngwane screening programme and comparison between the results obtained from urban and other unscreened rural communities. *East Afr Med J* 1999;76:101–4.
- Nel JT, De Lange L, Meiring PJ, De Wet JL. Cervical intraepithelial neoplasia and invasive cervical cancer in black and white patients. *S Afr Med J* 1994;84:18–9.
- World Health Organization (WHO) and European Research Organisation on Genital Infection and Neoplasia (EUROGIN) Report on Cervical Cancer Control; Oncology (Williston Park). 1997 Sep;11(9):1344. .
- Shingleton HM, Patrick RL, Johnston WW, Smith RA. The current status of the Papanicolaou smear. *CA: A Cancer Journal for Clinicians* 1995;45:305–20.
- Guidozzi F. Screening for cervical cancer. *Obstet Gynaecol Surv* 1996;51:247–52.
- Symonds RP. Screening for cervical cancer: different problems in the developing and the developed world. *Eur J Cancer Care(Engl)* 1997;6:275–9.
- Chirenje ZM, Chipato T, Kasule J, Rusakaniko S. Visual inspection of the cervix as a primary means of cervical cancer screening: results of a pilot study. *Central Afr J Med* 1999;45:2:30–3. Erratum in: *Cent Afr J Med* 1999 Mar;45(3):79
- Kuhn L, Denny L, Pollack A, Lorincz A, Richart RM, Wright TC. Human papilloma virus DNA testing for cervical cancer screening in low resource settings. *J Natl Cancer Inst* 2000;92:8:18–25.
- Goldie SJ, Kuhn L, Denny L, Pollack A, Wright TC. Policy analysis of cervical cancer screening strategies in low-resource settings: clinical benefits and cost-effectiveness. *JAMA* 2001;285:3107–15.
- Denny L, Kuhn L, Risi L, et al. Two-stage cervical cancer screening: an alternative for resource-poor settings. *Am J Obstet Gynecol* 2000;183:383–8.
- Cronje HS, Cooreman BF, Beyer E, Bam RH, Middlecote BD, Divall PD. Screening for cervical neoplasia in a developing country utilizing cytology, cervicography and the acetic acid test. *Int J Gynaecol Obstet* 2001;72:151–7.
- Cronje HS, Van Rensburg E, Niemand I, Cooreman BF, Beyer E, Divall P. Screening for cervical neoplasia during pregnancy. *Int J Gynaecol Obstet* 2000;68:19–23.
- Sankaranarayanan R, Budukh AM, Rajkumar R. Effective screening programmes for cervical cancer in low- and middle-income developing countries. *Bull WHO* 2001;79: 954–62.
- Sawaya GF, Grimes DA. New technologies in cervical cytology screening: a word of caution. *Obst Gynaecol* 1999;94:307–10.
- Baillie RS, Bourne D. Surveillance for equity in cervical cytology screening. *Int J Epidemiol* 1996;25:46–52.
- Emond S, Gerard U, Jones R. Knowledge about and utilization of facilities for cervical smears among black women in Johannesburg. *S Afr Med J* 1984;65:289–90.
- Kinney W, Sung HY, Kearney KA, Miller M, Sawaya G, Hiatt RA. Missed opportunities for cervical cancer screening of HMO members developing invasive cervical cancer (ICC). *Gynaecologic Oncology* 1998;71:428–30.
- Norman SA, Talbott EO, Kuller LH, et al. The relationship of Papanicolaou testing and contact with the medical care system to stage at diagnosis for cervical cancer. *Archives of Internal Medicine* 1991;151:58–64.
- Fruchter RG, Boyce J, Hunt M. Missed opportunities for early diagnosis of cancer of the cervix. *American Journal of Public Health* 1980;70:418–20.
- Du Toit GC. Gynaecologic Oncology, Tygerberg Hospital (personal communication).
- Gultz E, Bustillo-Hernandez M, Kent EB. Missed cancer screening opportunities among older women: a provider survey. *Cancer Practice* 1998;6:325–32.
- Gultz E, Hernandez MB, Kent EB. Missed cancer screening opportunities among older women: a review. *Cancer Practice* 1998;6:289–95.
- Abrahams N, Wood K, Jewkes R. Barriers to cervical screening: women's and health workers' perceptions. *Curatonia* 1997;20:50–2.
- Baillie R, Pick W, Cooper D. Cervical cytology screening – knowledge, attitudes and practice in a peri-urban settlement. *S Afr Med J* 1996;86:9 Suppl:1185–8.
- Stott NCH, Davis RH. The exceptional potential in each primary care consultation. *Jnl Coll General Practitioners* 1979;29:201–5.
- Young JM, Ward JE. Strategies to improve cancer screening in general practice: are guidelines the answer? *Fam Pract* 1999;16:66–70.
- Cervical Cancer Screening Programme. Department of Health (South Africa). http://www.capegateway.gov.za/Text/2003/cervical_cancer_nat_guidelines.pdf (Accessed 16/12/2004)
- Sherlaw-Johnson C, Gallivan S, Jenkins D. Evaluating cervical cancer screening programmes for developing countries. *Int J Cancer* 1997;72:210–6.
- Learmonth GM, Durcan CM, Beck JD. The changing incidence of cervical intraepithelial neoplasia. *S Afr Med J* 1990;77:637–9.
- Wilson S, Lester H. How can we develop a cost effective quality cervical screening programme. *Br J Gen Pract* 2002;52:485–90.
- Microsoft Excel Programme, Microsoft Office Professional Edition 2003. Microsoft Corporation.