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Research

Exploring barriers to follow-up care after conventional cytology screening in Libreville, Gabon

Étude des obstacles au suivi post-dépistage cytologique conventionnel à Libreville, Gabon

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Abstract

Papanicolaou (Pap) testing has helped reduce the incidence of cervical cancer and remains the primary screening tool in Gabon. However, cervical cancer is still a major public health problem in the country. To improve the effectiveness of Pap smear screening, this study aimed to describe post-screening follow-up and identify barriers to appropriate follow-up. A retrospective study was conducted between January 2018 and December 2019 in the Libreville region of Gabon. We assessed follow-up care among 619 women aged 17 years or older after conventional cytology screening. Individual attitudes (59.6%) and community beliefs (39.6%) were the main reported barriers to the collection of pathology reports and physician consultation, respectively. Among women with abnormal cytology and documented management, 28.7% of reported management decisions were consistent with expected recommendations. In conclusion, this study shows that post-screening follow-up challenges were mainly linked to limited knowledge, community beliefs, and reported or undocumented management gaps. However, these findings should be interpreted cautiously because management information was obtained through patient self-report.

Keywords: Cervical cancer, Pap smear, barriers to follow-up, Gabon

Résumé

Le test de Papanicolaou (Pap) a permis de réduire l'incidence du cancer du col de l'utérus et constitue, au Gabon, l'examen principal de dépistage. Malgré cela, ce cancer demeure un problème majeur de santé publique. Afin d'améliorer l'efficacité du dépistage par frottis cervico-utérin, les objectifs de cette étude étaient de décrire le suivi post-dépistage et

d'identifier les obstacles à un suivi adéquat chez les patientes. Il s'agit d'une étude rétrospective réalisée entre janvier 2018 et décembre 2019 dans la région de Libreville. Le suivi après un frottis de cytologie conventionnelle a été évalué chez 619 femmes âgées de 17 ans et plus. Les principales barrières identifiées étaient, d'une part, les attitudes individuelles (59,6 %), qui entravaient surtout le retrait du compte rendu cytologique, et, d'autre part, les croyances communautaires (39,6 %), qui freinaient la consultation médicale. Par ailleurs, parmi les femmes ayant une cytologie anormale et une prise en charge documentée, 28,7 % des décisions de prise en charge rapportées étaient conformes aux recommandations attendues. En conclusion, cette étude montre que les difficultés de suivi après un frottis cervico-utérin étaient principalement liées à un manque de connaissances, aux croyances communautaires et à des insuffisances de prise en charge, rapportées ou non documentées. Toutefois, cette interprétation doit rester prudente car les informations relatives aux recommandations médicales étaient auto-déclarées.

Mots-clés : cancer du col de l'utérus, frottis cervico-utérin, obstacles au suivi, Gabon

1. Introduction

Cervical cancer is preventable. The implementation of conventional Pap smear and liquid-based cytology (LBC) testing has dramatically reduced the incidence and mortality of cervical cancer in high-income countries through organised national programmes. Cytological screening enables the detection and treatment of precancerous lesions that may precede invasive cervical cancer for several years and are related to persistent high-risk human papillomavirus (HPV) infection (Bosch FX 2008).

However, cervical cancer remains an important public health problem, with around 660,000 new cases worldwide in 2022, mainly in developing countries (WHO 2024). In Gabon, uterine cervix cancer was the most prevalent cancer in females from 1984 through 1993 (Nze Nguema F 1996). Since 2013, cervical cancer has been the second most prevalent female cancer at the Institut de Cancérologie d'Akanda (ICA).

In many low- and middle-income countries, post-screening loss to follow-up occurs when women do not receive their results, do not return for clinical evaluation, or experience incomplete, delayed, undocumented, or suboptimal management after screening. These gaps are recognised as important barriers to cervical cancer control and are explicitly addressed in the World Health Organization (WHO) elimination strategy and recent WHO guidance (WHO 2021). In Gabon, there is no organised cervical cancer screening programme, and screening coverage remains low. Conventional cytology is still widely used in Libreville. Although previous work has described gaps in screening uptake and women's knowledge (Ivanga M 2021), data on post-screening follow-up remain scarce. Moreover, the few published studies on post-screening barriers mainly concern the management of abnormal smears in other settings (Ilic I 2024; Martinez-Gutierrez 2023; Brooks SE 2021).

Therefore, we approached follow-up as a care cascade influenced by individual, community, environmental, and health-system determinants. The aim of this study was to highlight shortcomings in post-screening follow-up, with particular attention to patient-reported clinical management as a component of quality of care.

Objectives
To describe the follow-up care cascade after conventional Pap smear screening and identify barriers to retrieving pathology reports and consulting physicians after screening.
Specific objectives
• To describe reported management decisions and, when these decisions were documented, assess their consistency with evidence-based management standards for Pap smear results.
• To describe follow-up and adequacy of management according to Pap smear result categories (normal vs abnormal subtypes).
• To describe the distribution of barriers across the socio-ecological levels (individual, community, environmental, and health system).

2. Methods

2.1. Study setting
Libreville is the capital city of Gabon. During the study period, conventional Pap smears were performed at the Anatomical Pathology and Cytology laboratory of the Institut de Cancérologie d'Akanda (ICA) and the Hôpital d'Instruction des Armées Omar Bongo Ondimba (HIA-OBO), both located on the outskirts of the capital. Slides were read within 72 hours by the same pathologist and reported using Bethesda terminology (Pangarkar 2022). The pathology report contained recommendations regarding the result, as proposed by Massad et al. (2013). In routine practice, women were usually notified by phone when the results were available and were advised to collect the pathology report and consult a physician for interpretation and management. To assess expected post-screening management, we used the recommendations cited in the pathology reports and in available evidence-based guidance, including Massad et al. (2013) and Brun et al. (2025). This assessment was based on information reported during the interview and on available documentation, not on a systematic independent review of complete medical records.
2.2. Study design and population
We retrospectively conducted a multicentre descriptive study from January 2018 to December 2019. This design was chosen because the main objective was not to estimate causal effects but to document real-world post-screening follow-up trajectories and identify barriers along the pathway from result notification to medical consultation and subsequent management.

The source population comprised all women who underwent a conventional Pap smear in the two participating laboratories during the study period. A total of 1,035 cytology records were reviewed. Women were eligible for telephone contact if a usable phone number was recorded in the registers. Women were included in the phone interview if they had undergone a Pap smear during the study period, were aged 17 years or older at the time of interview, and provided verbal informed consent. The age threshold of 17 years corresponded to the minimum age observed among the women interviewed; it was used only as an inclusion criterion and was not intended to define a national screening threshold. Women with missing or unusable contact information, those who were unreachable after repeated attempts, those who declined participation, and those unable to provide informed consent were excluded from the interview analyses.

2.3. Conceptual framework

The study was guided by a dual conceptual framework (Stuart G 2021). First, post-screening follow-up was approached as a care cascade in which women could be lost at successive steps, ranging from contactability and result retrieval to physician consultation and subsequent reported management. Second, barriers were organised using a socio-ecological framework, which assumes that determinants of follow-up may arise at the individual, community, environmental, and health-system levels. This framework was used to structure the analysis and avoid a purely post hoc categorisation of barriers.

2.4. Data sources and collection

During the phone interview, reported barriers were grouped into four predefined categories: 1) individual factors, including financial problems, morbidities, fear, negligence, or other attitudes; 2) community factors, including beliefs and influence of relatives or friends; 3) environmental factors, limited in this study to transportation difficulties and weather conditions; and 4) health-system factors, including laboratory organisation, physician availability, and reported or undocumented management after consultation.

Data were collected from two complementary sources. First, cytology registers from the two laboratories were reviewed to identify screened women and extract available information on the study site and cytology results. Second, a standardised phone interview was conducted among the included women to document the post-screening pathway. The interview recorded self-reported information on notification that the pathology report was available, report retrieval, physician consultation after result collection, the recommendation or treatment reportedly received, and adherence to the reported recommendation. Sociodemographic characteristics, previous screening history, and self-reported history of sexually transmitted infections were also collected.

2.5. Construction and classification of barriers

Barriers were elicited during the phone interview and coded according to the socio-ecological framework adopted for the study. Reported reasons were grouped into four categories: individual factors (attitudes, financial problems, or morbidities), community factors (beliefs or influence of relatives), environmental factors (transportation difficulties or weather conditions), and health-system factors (laboratory organisation, physician availability, and reported or undocumented management gaps).

2.6. Assessment of reported management consistency

Reported recommendations or treatments were considered consistent with expected management when the action described by the participant matched the recommendation contained in the pathology report and/or the relevant published management guidance for the cytology category. Because this classification relied on patient report and limited available documentation, it should be interpreted as an assessment of reported management consistency rather than a definitive audit of physician performance.

2.7. Statistical analysis

Analyses were performed using R software (version 4.0.0). The analysis was exclusively descriptive because the aim of the study was to document losses to follow-up and the distribution of barriers within the care cascade rather than to test causal hypotheses. Categorical variables were summarised using counts and percentages. Variable-specific denominators were reported for all key indicators. Missing data were not imputed; analyses were conducted on

available data for each variable, and the denominator used for each percentage was explicitly indicated.

2.8. Potential biases and methodological limitations

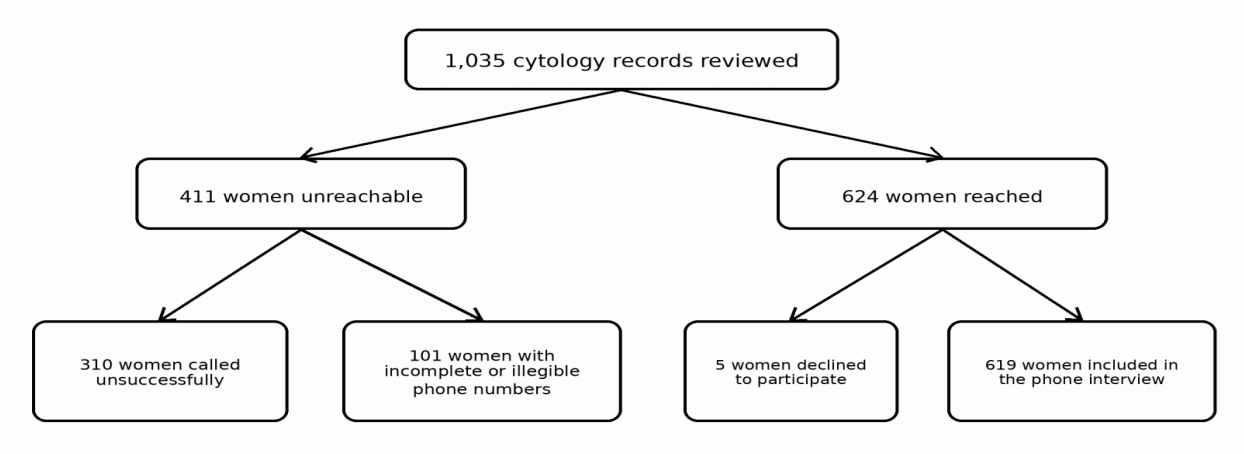
Phone-based data collection introduced recall and social desirability biases because follow-up events, recommendations, and treatments received after consultation were self-reported. The study did not include a systematic review of medical records; therefore, the consistency of reported management with expected recommendations cannot be interpreted as a definitive assessment of clinician competence. The high proportion of unreachable women constituted a major source of potential selection bias, since women who could be reached may have differed systematically from those who could not. Consequently, the findings primarily apply to women who were reachable by phone and willing to participate. Finally, the retrospective descriptive design did not allow causal inference, and the environmental barrier category was limited to transportation and weather-related issues.

2.9. Ethical considerations

Ethical approval was obtained from the Medical Ethics Committee of Gabon (PROT no. 0010/2013/SG/CNE). Verbal informed consent was obtained from all participants during phone interviews, and confidentiality was maintained throughout data collection and analysis.

3. Results

Of the 1,035 cytology records reviewed, 411 women (39.7%) were unreachable despite repeated contact attempts. Among them, 310 women were called unsuccessfully, and 101 had incomplete or illegible phone numbers. Of the 624 women who could be reached, 5 declined to participate. Therefore, 619 women were included in the phone interview and provided usable responses (Figure 1). Because nearly two-fifths of the initial records could not be reached, the results should be interpreted as applying to reachable and consenting women.



Participant characteristics

The characteristics of the participants are presented in Table 1. The included women were predominantly aged 25–45 years. A history of Pap smear testing was reported by 125 women (20.1%). Most participants had a secondary or higher level of education, and 78.8% reported a history of sexually transmitted infection. A family history of cervical cancer was reported in 103 patients (16.6%), while 10 patients (1.6%) had a personal history of cervical cancer.

Table 1. Characteristics of participants

Variable	Category	n/N (%)	Missing data
Site	ICA	212/619 (34.2%)	0
	HIA-OBO	407/619 (65.7%)	
Age	<25	32/615 (5.2%)	5
	25–35	184/615 (29.9%)	
	36–45	197/615 (32.0%)	
	46–55	130/615 (21.1%)	
	56–65	55/615 (8.9%)	
	≥66	17/615 (2.8%)	
Previous Pap smear	Yes	125/619 (20.1%)	0
	No	495/619 (79.9%)	
Province of origin	Estuaire	41/577 (7.1%)	43
	Haut-Ogooué	71/577 (12.3%)	
	Moyen-Ogooué	29/577 (5.0%)	
	Ngounié	150/577 (26.0%)	
	Nyanga	70/577 (12.1%)	
	Ogooué-Ivindo	32/577 (5.5%)	
	Ogooué-Lolo	37/577 (6.4%)	
	Ogooué-Maritime	13/577 (2.3%)	
	Woleu-Ntem	134/577 (23.2%)	
Marital Status	Single	244/567 (43.0%)	53
	Married/Cohabitation	288/567 (50.8%)	
	Divorced/Widow	35/567 (6.2%)	
Education	Illiterate	17/541 (3.1%)	79
	Elementary	84/541 (15.5%)	
	Secondary	289/541 (53.4%)	
	Higher	151/541 (27.9%)	
History of STI*	Yes	435/552 (78.8%)	68
	No	117/552 (21.2%)	
	Chlamydiae trachomatis	389/468 (83.1%)	152
	Syphilis	70/378 (18.5%)	
	HIV	21/354 (5.9%)	
Family history of cervical cancer		103/619 (16.6%)	0
Personal history of cervical cancer		10/619 (1.6%)	0

*Sexually transmitted infection

Barriers to follow-up care after conventional cytology screening

Among women who did not receive their Pap test results, the main reported barrier was individual attitudes (59.6%), followed by laboratory-related issues (13.5%) and transportation difficulties (9.6%). Among those who did not consult a physician after obtaining their results, the most frequently reported barriers were community beliefs (39.6%) and individual attitudes (38.5%). Examples reported during interviews included negligence or delay in result collection, fear of cancer, reliance on prayer, and the perception by some women or relatives that no action was required when the word “cancer” did not appear in the pathology report. Regarding failure to follow expected recommendations after medical consultation, the predominant category was health-system related, mainly physician unavailability and reported or undocumented management gaps (78.7%) according to patient self-report. However, for 20.1% of women in this step, the specific barrier was not documented. Table 2 shows the different barriers to follow-up.

Table 2. Barriers to follow-up care after conventional cytology screening.

Barrier	Specific barrier	Getting Pap results n (%)	Consulting a physician n (%)	Following appropriate recommendations n (%)
Individual	Financial problems	2 (3.8)	2 (2.1)	—
	Morbidities	4 (7.7)	2 (2.1)	—
	Attitudes	31 (59.6)	37 (38.5)	4 (1.2)
Community	Beliefs	1 (1.9)	38 (39.6)	—
	Entourage influence	1 (1.9)	6 (6.2)	—
Environmental factors	Transportation difficulties	5 (9.6)	6 (6.2)	—
	Meteorological conditions	1 (1.9)	—	—
Health-care system	Laboratory organization	7 (13.5)	—	—
	Physician unavailability / reported or undocumented management	—	5 (5.2)	270 (78.7)
Missing data	Unspecified / not documented barrier	—	—	69 (20.1)
	Total	52 (100)	96 (100)	343 (100)

Cytology results and consistency of clinical management with expected recommendations

Table 3 shows that among the 619 records with documented cytology results, 296 (47.8%) were normal and 323 (52.2%) were abnormal. Most abnormal results were inflammatory (50.2%), indicating that normal and inflammatory findings together accounted for 98.1% of records. A management decision was documented for only 240 of 457 consultations (52.5%). Among women with documented management, consistency with expected recommendations was observed in 127/139 (91.4%) normal results and 29/101 (28.7%) abnormal results, based on patient self-report.

Table 3. Management of Pap smear results.

Pap smear result	Cytology results n/N (%)	*Consulting a physician n/N (%)	**Documented management n/N (%)	Management consistent with expected recommendations n/N (%)
Normal	296/619 (47.8%)	220/265 (83.0%)	139/220 (63.2%)	127/139 (91.4%)
Inflammatory	311/619 (50.2%)	229/285 (80.4%)	95/229 (41.5%)	27/95 (28.4%)
ASC-US	5/619 (0.8%)	3/4 (75.0%)	2/3 (66.7%)	0/2 (0.0%)
LSIL	2/619 (0.3%)	1/2 (50.0%)	0/1 (0.0%)	NA
HSIL	2/619 (0.3%)	2/2 (100.0%)	2/2 (100.0%)	1/2 (50.0%)
ASC-H	0/619 (0.0%)	NA	NA	NA
AG-US	1/619 (0.2%)	1/1 (100.0%)	1/1 (100.0%)	0/1 (0.0%)
Non-contributive	1/619 (0.2%)	1/1 (100.0%)	1/1 (100.0%)	1/1 (100.0%)
All abnormal results	323/619 (52.2%)	237/295 (80.3%)	101/237 (42.6%)	29/101 (28.7%)
Overall	619/619 (100.0%)	457/560 (81.6%)	240/457 (52.5%)	156/240 (65.0%)

**The denominator for "Consulting a physician" corresponds to women with the relevant cytology result and non-missing consultation data.*

**The denominator for “Documented management” corresponds to women who consulted a physician. The denominator for “Management consistent with expected recommendations” refers to women for whom a management decision was documented; for abnormal results, this is 29/101 (28.7%).

Discussion

Uterine cervical cancer is preventable when regular screening and appropriate follow-up are ensured. In this study, most eligible and consenting women collected their results, but barriers persisted after conventional cytology screening in Gabon across four levels: individual, community, environmental, and health-care-system.

At the individual level, financial aspects had little impact on follow-up. The Gabonese national health insurance system (CNAMGS) has recently enabled a significant reduction in the cost of Pap smear from 10,000 FCFA (20.8 USD) to 3,000 FCFA (6.2 USD), making the test more accessible. In addition, Pap smear tests have been performed free of charge at ICA every year during Pink October since 2013. Concerning attitudes, negligence, mainly among screened women, prevented appropriate follow-up. Similar to abnormal BI-RADS follow-up (Ivanga M 2017), women followed recommendations when they considered that there was a high concern. Anxiety related to fear of cancer is often responsible for failure to adhere to follow-up (Martinez-Gutierrez J 2023; Ilic I 2024), and in our study, particularly when there was a family history of uterine cervical cancer, it prevented screened women from seeking additional medical advice.

At the community level, people had misconceptions about the natural history of dysplasia and the importance of follow-up after Pap screening. This result is in line with studies conducted in Gabon (Assoumou SZ 2015) and other countries (Makadzange EE 2022; Godfrey MAL 2019; Caine LC 2011), which reported that women had limited knowledge about Pap smears and cervical cancer. Women and/or their entourage also thought that they were able to interpret the Pap smear pathology report themselves. Moreover, religion or traditional beliefs questioned the utility of the screening test and acted as barriers to care. However, the study was not designed as a qualitative investigation, and the cultural, psychological, religious, or social meanings underlying these beliefs could not be explored in depth.

Environmental barriers were less frequently reported but remained present, particularly transportation difficulties, which represented 9.6% of barriers to obtaining results and 6.2% of barriers to medical consultation. However, our definition of environmental barriers was narrow and limited to transportation and meteorological conditions. Other structural determinants, such as distance to health facilities, clinic opening hours, service availability, infrastructure, and safety concerns, were not explored and may therefore have been underestimated.

Finally, at the health-care-system level, the main barrier identified should not be interpreted as a definitive measure of physician inadequacy but rather as reported or undocumented management gaps after medical consultation. These gaps included absence of documented treatment or recommendation when one was expected, lack of repeat cytology after inflammatory or unsatisfactory findings, and absence of documented referral or follow-up for some abnormal cytology categories. However, because this information was obtained mainly through patient report and not through systematic medical record review, these results should

be interpreted cautiously. Conventional Pap results can be rendered unsatisfactory by paucity of epithelial elements, obscuration of smear details by blood, inflammation, or too few squamous cells, which can delay the detection of high-grade cervical intraepithelial neoplasia (Sharma K 2021). Moreover, inflammation in Pap smears can suggest infection, and patients should be considered for appropriate treatment (Barouti E 2013), since pathogens may be isolated in many women with inflammatory smears (Baka S 2013; Woromogo SH 2021). In this study, 50.2% of results were inflammatory. Considering the importance of self-reported STI history in our population (78.8%), treating inflammation when clinically indicated and repeating cytology 2–4 months later may contribute to more appropriate cervical cancer screening follow-up. Chlamydia trachomatis and HIV, reported respectively in 83.1% and 5.9% of tested women, are among HPV cofactors that have been associated with cervical inflammation and increased risk of cervical cancer (Zhu H 2016; Mombo Maganga C 2024).

However, this study has limitations. As a retrospective descriptive study, it precluded causal inference. Moreover, follow-up events, medical consultations, recommendations received, and adherence to these recommendations were self-reported, exposing the study to recall and social desirability biases. In addition, the absence of systematic independent review of complete medical records limited the assessment of clinical management consistency. The high proportion of unreachable women may also have introduced selection bias and limited generalisability. Furthermore, missing or undocumented management data limited the interpretation of appropriate follow-up. Finally, environmental barriers and socio-cultural determinants were explored only superficially. Thus, these limitations highlight the need for prospective and qualitative studies with robust contact information, direct medical record review, and broader assessment of environmental and community determinants.

Conclusion

Cervical cancer remains an important public health problem in Gabon, as in many developing countries, but its incidence and mortality can be reduced through Pap smear screening and appropriate follow-up. Among reachable and consenting women, this study identified several barriers after conventional Pap smear screening: individual attitudes, community beliefs, environmental constraints, and, according to patient self-report, reported or undocumented management gaps after consultation.

To reduce these obstacles, public health action should include community education, improved result-tracking systems, systematic documentation of post-screening management, and continuing training for Pap smear providers and clinicians on evidence-based management recommendations. It is also crucial to improve the clinical management of inflammatory smears, and the use of LBC could reduce the number of unsatisfactory smears caused by obscuring inflammation. Finally, future prospective studies should combine rigorous collection of patient contact information, independent medical record review, and qualitative exploration of beliefs and individual attitudes. These studies should also better characterise management gaps in order to guide effective awareness campaigns and adapt governmental and infrastructural measures for cervical cancer control in Gabon.

Conflict of interest

The authors declare that they have no competing interests.

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