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# Screening for Precancerous Cervical Lesions in Women of Reproductive Age in the Kara Region of Togo in 2022

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## Abstract

**Introduction:** Worldwide, cervical cancer is the 4<sup>th</sup> most common cancer in women and is a public health problem. The objective of this study was to estimate the prevalence of precancerous cervical lesions and to describe its associated factors among women of reproductive age in the Kara region of Togo. **Methods:** A cross-sectional study was conducted from March 6 to 14, 2022 in 11 health centers in Kara. Data were collected using a standardized questionnaire and screening for precancerous cervical lesions was performed by visual inspection of the cervix, after application of 5% acetic acid and Lugol's. Logistic regression analysis was performed to describe factors associated with precancerous lesions. **Results:** A total of 728 women with a median age of 36, interquartile range [31 - 41] were enrolled. The prevalence of precancerous cervical lesions was 3.9%, 95% confidence interval (95% CI: [2.6 - 5.4]). Factors associated with the presence of precancerous lesions were age at first sexual intercourse  $\geq 18$  years (adjusted odds ratio (aOR) = 3.67; 95% CI [1.17 - 18.4]) and being a sex worker (aOR = 8.14; 95% CI [1.96 - 27.1]). HIV infection was not associated with the presence of precancerous lesions. **Conclusion:** The results of this study underscore the importance of intensifying cervical cancer screening efforts in resource-limited countries for better management. These efforts should prioritize vulnerable populations such as female sex workers.

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## Keywords

Precancerous Lesions, Cervix, Visual Inspection, Togo

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### 1. Introduction

Worldwide, cervical cancer is the fourth most common cancer in women, with an estimated 604,000 new cases in 2020 [1]. Of the 342,000 deaths from cervical cancer in 2020, about 90% occurred in low- and middle-income countries [2]. The standardised mortality rate for cervical cancer among women worldwide was 13.3/100,000 in 2020 and could be reduced through screening and vaccination against human papillomavirus (HPV) [3]. More than 95% of cervical cancers are caused by HPV, the most common sexually transmitted infection (STI) in the world [4].

There are several high-risk types of human papillomavirus (HPV) that are known to be strongly associated with the development of cervical cancer and other types of cancers. The most common high-risk HPV types include HPV type 16 and 18. [5] HPV-31, HPV-33, HPV-45, HPV-52, HPV-58 are also considered high-risk and are known to contribute to cervical cancer development [5].

The progression from HPV infection to cervical cancer is influenced by various factors, including the type of HPV, the persistence of the infection, individual immune response, and lifestyle factors [6].

Most sexually active women and men will become infected at some point in their lives, with the possibility of recurrence [7]. It begins as a pre-cancerous lesion of the cervix with a cell abnormality before developing into cancer [8]. The length of time from a precancerous lesion to cancer is 10 to 20 years. This gives enough time to screen, detect and treat precancerous lesions to prevent them from developing into cancer [9]. The definitive diagnosis of cervical cancer is based on the histological examination of a cervical specimen [10]. However, in limited-resources settings, the World Health Organization (WHO) recommends that without the means to make a diagnosis based on histological examination, inspection of the cervix by the naked eye after application of 5% acetic acid (VIA) and/or Lugol's iodine (VILI) should be performed. This is a simple test for the early detection of precancerous cervical lesions and early invasive cancer [11] [12]. Visual inspection of the cervix is a cost-effective way to detect high-grade cervical lesions [13] [14]. In Togo, cervical cancer is the 2nd most common cancer in women [15], with an estimated mortality rate of 12.8% [16] and an average age of onset of 47 years. Despite this relatively high morbidity and mortality, cervical cancer screening in Togo is mainly based on the cervicovaginal smear test, which is only available in Lomé (the capital of Togo), a city located 411 km from Kara (the country's second-largest city) [17]. HPV vaccination is the main cervical cancer prevention method recommended by the WHO. However, it is also dif-

difficult to access because it is not covered by national vaccination programmes. Also, access to treatment for cancerous lesions (cancer surgery, radiotherapy and chemotherapy) is limited, resulting in a higher rate of death from this cancer [18]. In Togo, there is no cervical cancer screening programme based on visual inspection. We conducted a pilot study of cervical precancer screening among women in the Kara region to collect evidence for the initiation of a large-scale cancer screening program. The objective of this study was to estimate the prevalence of precancerous cervical lesions and to describe its associated factors among women of reproductive age in the Kara region.

## **2. Methods**

### **2.1. Study Design and Period**

A descriptive and analytical cross-sectional study was conducted from March 6<sup>th</sup> to 14<sup>th</sup>, 2022 in Kara. Kara is the second largest city of Togo, located in the north of Togo, 420 km from the capital, Lomé. Out of a total of 125 urban and rural health centers in the Kara region, 11 were selected for the study.

### **2.2. Study Population and Sample Size**

The study population was women of reproductive age in the Kara region. Any woman 26 years old and above, who ever had sexual intercourse, who had lived in the region for at least 12 months prior to the survey and who had signed a consent form was enrolled in the study. The selection of participants was based on consecutive recruitment.

### **2.3. Selection of Health Centers**

All 7 health districts in the Kara region were selected in order to have a representative sample of health districts. From these districts, a random selection of one or two health centers was completed based on the availability of a well-trained midwife, a basic technical platform for gynaecological consultations, and a medical analysis laboratory. This allowed 11 urban and rural health centers in the region to be selected for the study.

### **2.4. Data Collection Tool**

A standardised, face-to-face questionnaire was developed for data collection. The questionnaire was designed based on data from the literature [7] [19] [20] [21] and included items on socio-demographic characteristics; sexuality; gynaeco-obstetrical history; contraception; condom use; history, STI symptoms and STI screening. The administration of the questionnaire and the gynaecological examinations were carried out by midwives who had been trained in the survey procedures.

### **2.5. Study Procedures**

Prior to the survey, an extensive awareness campaign was carried out in public

places, markets, churches, mosques, the media and social networks in the region. This enabled all women of childbearing age in the region to have information about the study and the list of health centers selected for the study. The midwives were trained on the objectives of the study, the selection of study participants, the content of the questionnaire, confidentiality, the consent process, and screening for precancerous lesions by an experienced gynecologist. The study information leaflet and questionnaires were administered in the languages understood by the participants. The questionnaire was pretested with 30 women of reproductive age from the Kara region to rephrase questions that were difficult to understand. The main adjustment concerned the term STI symptom, which was replaced by STI sign. Women who took part in the pre-test did not participate in the final survey.

## **2.6. Screening of Precancerous Lesions**

The method of visual inspection of the cervix after the application of 5% acetic acid (VIA) and Lugol's iodine (VILI) was used to screen for precancerous cervical lesions. The 5% acetic acid was applied to the cervix and after one minute the midwives visually inspected the cervix under strong light. The appearance of a well-defined, dense, whitish, act-white discolouration near or within the squamocolumnar junction indicated a positive test. VILI was applied if the VIA test was positive. The procedure consisted of applying an iodine solution to the cervix and observing the colour changes. The appearance of a saffron yellow or mustard yellow colour at the squamocolumnar junction marked the positivity of the VILI test. For patients with a negative VILI test, a black or mahogany coloration of the cervix was observed. All women diagnosed with a precancerous cervical lesion were referred to the gynaecology department of Kara University Hospital for care.

## **2.7. Screening for STIs, HIV and Syphilis**

For STI diagnosis, the midwife inspected the vulva and labia for local signs of STIs and malformations and then placed the COLLIN gynaecological speculum to explore the vaginal walls, visualise the cervix in its appearance (normal, inflammatory, bleeding, cervical mucus), position (anteverted, retroverted, central), orifice (closed, open, traumatic, necrotic), visualise the presence/type of discharge (non-bloody or bloody). HIV and syphilis screening was carried out on-site by laboratory technicians from the 11 selected health centres. Blood samples were collected and tested using the WHO-approved "SD-BIOLINE HIV/Syphilis Duo<sup>®</sup> (Abbott, Santa Clara, CA, USA)" rapid tests [22]. Positive HIV tests were confirmed by another rapid test (First Response<sup>®</sup> HIV 1-2-O Card Test; Premier Medical Corporation Pvt. Ltd., Maharashtra, India). Pre- and post-test counselling was provided, and HIV and syphilis status was communicated to participants on the same day at the health centres. The participants who were included received free STI awareness and free interventions (cervical precancer screening, HIV and

Syphilis).

## 2.8. Statistical Analysis

After data collection, the data were entered and saved in a database developed in EPIDData (French version 3.1). The data were analysed with STATA version 14.1 (StataCorp, College Station, Texas, USA). Quantitative variables were presented as median with their interquartile range (IQR) and categorical variables were presented as numbers and proportions. The prevalence of precancerous cervical lesions was estimated with its 95% confidence interval. Regression analyses were performed to identify factors associated with cervical precancer. The significance level for statistical tests was set at 5%.

## 2.9. Ethical Considerations

This study received a favourable decision from the Bioethics Committee for Health Research (decision number 02/2022/CBRS of 18 January 2022). The objectives of the study were explained to the participants. They were informed that their participation was voluntary and that they were free, without justification, to withdraw at any time without any negative consequences for them. They were given the necessary time to think before deciding whether or not to participate in the study. The anonymity of the participants and the confidentiality of the data collected were guaranteed.

## 3. Results

### 3.1. Socio-Demographic Characteristics

A total of 728 women with a median age of 36 years old (interquartile range (IQR): [31 - 41]) participated in the study. The majority (99.4%) of participants were Togolese and 81.9% of participants were married. The socio-demographic characteristics of the participants are summarised in **Table 1**.

### 3.2. Sexual Behaviour and Gynaeco-Obstetric History

Nearly half (51.5%) of the women had their first sexual intercourse after the age of 18 and 3.1% had at least two sexual partners at the time of the survey. Sex workers represented 2.2% of the study population. Nearly two-thirds of the women (65.7%) had not made any gynaecological visits in the 12 months preceding the survey.

**Table 2** describes the sexual behaviour and gynaecological and obstetric history of the women.

### 3.3. Prevalence of Precancerous Cervical Lesions, HIV and Syphilis

Cervical cancer stands as a paramount public health. **Table 3** summarises the prevalence of precancerous cervical lesions. The prevalence of precancerous cervical lesions was 3.9% (95% CI: [2.56 - 5.40]). The prevalence of HIV and syphilis

**Table 1.** Sociodemographic characteristics of women (N = 728), Kara, Togo, 2022.

Variables	n (%)
<b>Nationality</b>	
Togolese	724 (99.4)
Other	4 (0.6)
<b>Age (years)</b>	
<36	341 (46.8)
≥36	387 (53.2)
<b>Level of study</b>	
No education	88 (12.1)
Primary	234 (32.2)
Secondary	314 (43.1)
Higher	92 (12.6)
<b>Marital status</b>	
Single	80 (10.9)
Married	596 (81.9)
Divorced/widowed	52 (7.2)
<b>Place of residence</b>	
Urban	405 (55.6)
Rural	323 (44.4)

**Table 2.** Sexual behaviour and gynaeco-obstetric history of women. Kara, Togo, 2022 (N = 728).

Variables	n (%)
<b>Age at first sexual intercourse (years)</b>	
≤18	353 (48.5)
>18	375 (51.5)
<b>Number of sexual partners</b>	
≤1	706 (96.9)
≥2	22 (3.1)
<b>Female sex workers</b>	
No	712 (97.8)
Yes	16 (2.2)
<b>Number of previous pregnancies</b>	
0	15 (2.1)
1 - 2	202 (27.7)
3 - 4	298 (40.9)

**Continued**

>4	213 (29.3)
<b>Number of previous births</b>	
0	48 (6.6)
1 - 2	261 (35.9)
3 - 4	292 (40.1)
>4	127 (17.4)
<b>History of gynaecological examination</b>	
No	478 (65.7)
Yes	250 (34.3)

**Table 3.** Prevalence of precancerous cervical lesions. HIV and Syphilis Kara, Togo in 2022 (N = 728).

Variables	n	Prevalence (%)	95% CI
Precancerous cervical lesions	29	3.9	[2.56 - 5.40]
HIV	27	3.7	[2.34 - 5.08]
Syphilis	1	0.1	[0.0 - 0.41]

HIV: Human Immunodeficiency Virus; 95% CI: 95% confidence interval.

was 3.7% (CI95%: [2.34 - 5.08]) and 0.1% (CI95%: [0.0 - 0.41]) respectively.

### 3.4. Factors Associated with Precancerous Cervical Lesions

In multivariate analysis, the risk factors associated with the presence of precancerous lesions were age at first sexual intercourse  $\geq 18$  years (aOR = 3.67; 95% CI [1.17 - 18.4]) and being a sex worker (aOR = 8.14; 95% CI [1.96 - 27.1]). HIV infection was not associated with the presence of precancerous lesions. (Table 4)

## 4. Discussion

This cross-sectional study conducted from March 6<sup>th</sup> to 14<sup>th</sup> 2022 in the Kara region of Togo among 728 women of median age 36, estimated the prevalence of precancerous cervical lesions among women of childbearing age and described the associated factors. The prevalence of precancerous cervical lesions was 3.9%. Factors positively associated with the presence of precancerous lesions were age at first intercourse  $\geq 18$  years (aOR = 3.67) and being a sex worker (aOR = 8.14). HIV infection was not associated with the presence of precancerous lesions in this region of Togo.

Most surveys on the prevalence of precancerous lesions or cervical cancer are often conducted among women at high risk of developing cancer (sex workers and HIV-positive women) but rarely in the general population [23]. Our study was conducted among women of childbearing age during an awareness campaign and included a package of interventions including screening for precancerous



**Table 4.** Factors associated with precancerous cervical lesions in women of reproductive age in the Kara region (N = 728). Togo, 2022.

Variables	Univariate model			Multivariate model		
	OR	95% CI	<i>p</i>	AOR	95% CI	<i>p</i>
<b>Age (years)</b>						
<36	1					
≥36	0.83	[0.39 - 1.76]	0.633			
<b>Level of study</b>						
No education	1					
Primary and above	0.65	[0.26 - 1.96]	0.388			
<b>Number of previous pregnancies</b>						
<4	1					
≥4	0.99	[0.47 - 2.10]	0.970			
<b>Number of previous births</b>						
≤3	1					
>3	1.42	[0.65 - 3.10]	0.37			
<b>Age at first sexual intercourse (years)</b>						
<18	1			1		
≥18	4.04	[1.19 - 25.2]	0.059	3.67	[1.17 - 18.4]	0.023
<b>Number of sexual partners</b>						
≤1	1			1		
≥2	2.51	[0.39 - 9.23]	0.229	0.62	[0.05 - 4.95]	0.684
<b>Female sex workers</b>						
No	1			1		
Yes	6.09	[1.34 - 20.3]	0.007	8.14	[1.96 - 27.1]	0.007

95% CI: 95% confidence interval; OR: Odds Ratio; AOR: adjusted Odds Ratio.

lesions, HIV and bacterial STIs. In this population with 3.7% HIV prevalence, the prevalence of precancerous cervical lesions was 3.9%. Similar proportions were reported in Cameroon in 2019 in a survey of 60 women with a prevalence of precancerous lesions of 3.3% [24]. In Côte d'Ivoire in 2010, a survey of 1047 HIV-negative women reported a prevalence of precancerous lesions of 3.9% after using the visual cervical inspection method with acetic acid and Lugol [25]. In the literature, higher prevalence of precancerous lesions has been reported. In Côte d'Ivoire in a large study of 16,169 women (7628 HIV positive and 8541 HIV negative) in 2019, the prevalence of precancerous lesions was 10% after VIA. This prevalence was higher in HIV-positive women than in HIV-negative women (10.8% vs 9.3%.  $p = 0.002$ ) [26]. However, this difference related to HIV status was not observed in our study and could be explained by the size of our

sample, which was relatively smaller than that of Côte d'Ivoire.

Hospital studies have also reported a very high prevalence of precancerous cervical lesions. This is the case of a study carried out on 339 women in Ethiopia, which reported a prevalence of pre-cancerous lesions of 27.4% [27]. Another study conducted in Ethiopia in 2021 among 293 women in hospitals reported a prevalence of 15.7% [23].

In summary, the prevalence found in our study is relatively low compared to the literature. This could be explained by the fact that our study population was drawn from the general population with few cases of HIV infection. However, comparisons between studies should be made with caution. They depend on the population studied (HIV-positive women or not), the place of recruitment (hospital or outpatient), the number of tests used (1 test or 2 tests), and the additional examinations performed (colposcopy or not).

In multivariate analysis, the factors associated with precancerous lesions were age at first intercourse at 18 years old and older and being a sex worker. Early sexual intercourse is known to be a risk factor for cervical cancer. A 2010 study in Côte d'Ivoire reported a 10% reduction in the risk of cervical cancer in women whose age at first intercourse was  $\geq 16$  years (aOR = 0.9; 95% CI: [0.5 - 1.7],  $p = 0.84$ ) [28]. In the present study, the risk of having precancerous cervical lesions increased significantly with age at first intercourse (aOR = 3.67; 95% CI [1.17 - 18.4],  $p = 0.023$ ). This result is inconsistent with the literature. The reasons for this result are probably related to misreporting of the age of first sexual intercourse, but also to a classification bias insofar as precancerous lesions do not always or necessarily mean a cancerous lesion. According to a study conducted in Côte d'Ivoire, only half of the precancerous lesions were histologically confirmed as cancer [25].

Among HIV-positive women, of the 268 cases of VIA on colposcopy 132 (49.2%) were confirmed. This proportion was 20/41 (48.7%) in HIV-negative women. Sex workers and multiple sexual partners are frequently reported in the literature as risk factors for cervical cancer. Among sex workers, STIs are often reported to be risk factors for cervical cancer [26]. For example, in Togo in 2017, the prevalence of the main STIs among female sex workers was 4.2% for *Neisseria gonorrhoeae*, 6.1% for *Chlamydiae trachomatis* and 6.5% for *Trichomonas vaginalis* [7]. The risk of developing precancerous cervical lesions was significantly higher among female sex workers (aOR = 8.14) in our study. This result is similar to the data in the literature. Several studies in sub-Saharan Africa and elsewhere have shown that female sex workers are at high risk of HPV infection (32.9% among female sex workers in Togo) [29]. They have a high number of sexual partners and condom use is not always systematic [30]. According to a 2014 study by Soohoo *et al.* in Africa, the number of weekly sexual partners among female sex workers varied from 2.3 to 20 [31].

## 5. Limitations

Our study has some limitations. A selection bias cannot be excluded given the

recruitment method, with a strong possibility for women with gynaecological problems to participate in this screening campaign. This could have overestimated the proportion of women with cervical lesions. However, the recruitment is appropriate for the design of the proposed intervention, since it was a combined STI and cervical precancer screening campaign. Memory and social desirability biases are also possible on age of first sexual intercourse, number of sexual partners and sex work. For logistical and financial reasons, we were not able to perform colposcopy, cytology and HPV testing. However, a previous study reported a high-risk HPV prevalence of 35.7% in Kara [5].

Further studies could explore the combination of another method with visual inspection, such as colposcopy, cytological analysis or HPV detection.

## 6. Conclusion

This pilot study shows that screening for precancerous lesions in areas with limited access to health services is necessary and should be part of the minimum package of activities. Women should be encouraged to have a gynaecological examination at least once a year, especially those from vulnerable populations such as sex workers. Further studies combining screening for precancerous lesions with cervical smear and HPV testing are needed to confirm the figures observed.

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## Authors' Contributions

DKE, FAG and GYSG conceived this study and participated in its design and coordination. GYSG, AJS, YRK, and WICZ participated in the study design and data collection. GYSG, MKT, DKE, ZO performed statistical analyses. GYSG, DKE, ZO, and AJS wrote the first draft of the manuscript and DKE, GYSG, LKA, MKT, AJS, YRK, AA, WICZ, FAG subsequently revised the manuscript. All authors read and approved the final manuscript.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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