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Lessons Learned From 7 Years of Implementing Cervical Cancer Screening and Treatment in Equatorial Guinea

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ABSTRACT

PURPOSE This study aimed to assess the results of the Cervical Cancer Screening and Treatment (CCST) project in Equatorial Guinea and the reach of facility-based and community outreach service delivery strategies.

MATERIALS AND METHODS The CCST project implemented the single-visit, screen-and-treat approach, using visual inspection with acetic acid (VIA) and treatment with cold coagulation (and referral for further evaluation where needed) for women age 20-60 years. The project deployed two service delivery strategies: in health facilities and through community outreach. The project conducted cascaded training, routine supervision for quality improvement, communication campaigns, and community mobilization efforts.

RESULTS Between 2017 and 2023, 26,998 women were screened. The two strategies reached almost equal numbers of women. Community outreach reached more women in the country's mainland. It also reached significantly more married women, women with age at first sexual intercourse at or before 16 years, and those who were puerperal, postmenopausal, and multiparous than facility-based screening. VIA positivity rate was 2.6% overall, with higher rates among younger women. Fifty-five percent of VIA-positive women were treated with cold coagulation, 10% were referred for further evaluation, and 18% received no treatment.

CONCLUSION To our knowledge, this first-ever effort in CCST in Equatorial Guinea has shown that both facility-based and community outreach are effective in implementing the single-visit, screen-and-treat approach and underscores the need to continue and further expand the effort, strengthen the quality of services delivered and data capture, and increasingly transfer the capacity to implement facility-based screening and community outreach to the Ministry of Health.

INTRODUCTION

Noncommunicable diseases, such as cervical cancer, are a growing burden of death and disability in sub-Saharan Africa.[1] The WHO estimates that cervical cancer is the second most frequent cancer globally among women. Sub-Saharan Africa was home to 19 of the 20 high-burden countries for cervical cancer in 2018.[2] The WHO age-standardized incidence rate for cervical cancer in Equatorial Guinea was 32.8 per 100,000 women-years in 2020,[3] compared with the global average of 13.3 in the same year.[4]

Cervical cancer is one of the most preventable and treatable forms of cancer, if detected early and managed effectively.

The human papillomavirus (HPV) causes nearly all cases of cervical cancer making primary prevention achievable through the HPV vaccine. The usual 10- to 20-year progression from mild dysplasia to overt cancer means regular screening can help detect and treat them. The WHO Global Strategy to Eliminate Cervical Cancer as a Public Health Problem[5] has proposed the 90-70-90 targets for 2030: 90% of girls fully vaccinated with HPV vaccine; 70% of women screened by age 35 years and again by age 45 years; and 90% of women with cervical disease treated, including treating 90% of women with precancerous lesions and managing 90% of women with invasive cancer. These targets are a critical step toward achieving elimination, which the Global Strategy defines as incidence below four per 100,000 women-years.

CONTEXT

Key Objective

What is the reach of the two service delivery strategies in providing cervical cancer screening using the single-visit, screen-and-treat approach in the context of Equatorial Guinea where cervical cancer screening and treatment has never been implemented before?

Knowledge Generated

Both strategies of facility-based opportunistic screening and proactive community outreach screening supported by community mobilization efforts are able to efficiently deliver the single-visit, screen-and-treat service. Screening through community outreach appears to reach more women from some demographic groups that may be less inclined or able to seek care in health facilities. Community outreach also reached more women in the mainland than facility-based screening. Fifty-five percent of visual inspection with acetic acid–positive women were treated with cold coagulation, equally among women screened through both approaches.

Relevance

This 7-year initiative contributed to setting up cervical cancer screening in Equatorial Guinea with lessons learned on how to improve reach, quality of the service, and accuracy of the related data. The analysis also demonstrates that increased attention, funding, and capacity are needed to prevent cervical cancer in low-resource settings.

In Equatorial Guinea, policies guiding primary and secondary prevention, monitoring, and surveillance of cervical cancer are underdeveloped. In 2016, MCD Global Health launched a Cervical Cancer Screening and Treatment (CCST) project in Equatorial Guinea with funding from Noble Energy EG Ltd (a Chevron company) and under the leadership of the National Reproductive Health Program of the Ministry of Health, Social Welfare, and Health Infrastructure (MOH). The CCST project implements CCST using the single-visit, screen-and-treat approach with a focus on strengthening country capacity and in close collaboration with MOH.

This study presents a description of the activities carried out by the CCST project over 7 years and the results of screening and of the reach of service delivery strategies used to screen and treat/refer women for cervical cancer.

MATERIALS AND METHODS

Training

The CCST project began implementing the screen-and-treat approach at the Malabo and Bata regional hospitals in 2016 and expanded to four provincial hospitals and one health center in 2017 (Fig 1). Six gynecologists, six midwives, four nurses, and four general practitioners were trained in the screen-and-treat procedure by specialists in sexual and reproductive health. Two of them were also trained as master trainers.

The Single-Visit Screen-and-Treat Procedure

The approach targets women age 20-60 years using visual inspection with acetic acid (VIA). The attending nurse applies exclusion criteria on the woman (pregnancy, outside the target age range, active bleeding, and hysterectomy), provides information about the procedure, obtains verbal consent, and fills in the woman's information in a paper-based register. The HIV status of the women is not collected because of the stigma attached to the disease. The attending gynecologist or physician visually inspects the uterine cervix and, if there are no lesions, applies acetic acid to look for acetowhite areas. The VIA test is positive if there is a raised, thickened, white plaque at or close to the squamocolumnar junction (SCJ) of the cervix, as defined by the International Agency for Research on Cancer for precancerous changes. If the VIA result is positive, the provider informs the woman about the finding and explains the next step of cold coagulation. The provider treats the VIA-positive area with cold coagulation if the woman verbally consents to the procedure and invites her for follow-up in 2 weeks, or refers her for further tests if uncertain about the VIA result, the entire SCJ is not visualized, or the largest cold coagulation tip does not cover the entire acetowhite area.

If the VIA returns negative, the woman is asked to return for rescreening in 3 years. If visual inspection shows a lesion or discharge suggestive of sexually transmitted infections, VIA is not conducted. Instead, the woman is referred for investigations and treatment and is asked to return for VIA after she completes the treatment. If visual inspection shows any lesion suspicious of cancer, the woman is referred for further investigation after explaining the findings to her and her family.

The project is implemented in both the country's mainland and islands and employs two delivery strategies described below.
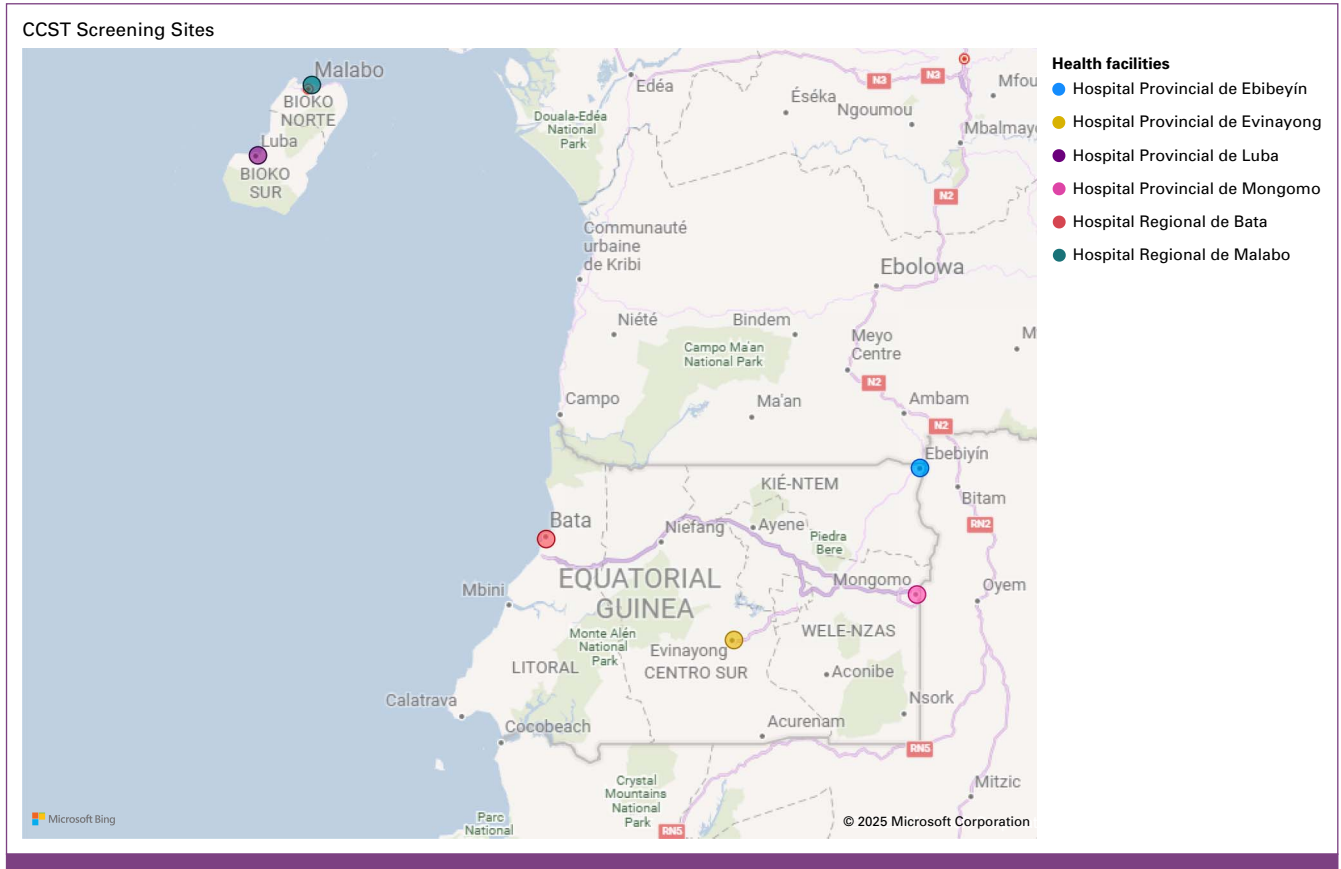
FIG 1. Locations of facility-based screening sites.

Facility-Based Approach

This is carried out in the seven health facilities with trained providers. Providers inform women who attend these facilities for other reasons about the screen-and-treat service. Women who are on their period or pregnant are followed up to be screened later.

Community Outreach

The project plans and delivers the community outreach strategy in collaboration with district health offices through annual national-level and monthly decentralized outreach campaigns, rotating among the country's health districts. Outreach campaigns use equipment and providers from facilities that conduct screening.

Two days before each outreach, district health office staff and the project team meet with community leaders and women and provide information on cervical cancer screening and activity details. The community outreach events are held in local health facilities, schools, or rented premises where there is sufficient space and privacy. School premises are used where convenient, but school-age children are not screened.

Communication

Information on the two service delivery strategies is broadcasted on local radio stations, and project staff discuss cervical cancer issues on television and radio programs. Thirty-nine members of the press have been oriented on cervical cancer prevention.

Supervision

In facilities providing the CCST service, the project supports twice-yearly outreach training and supportive supervision, MCD's signature approach and a recognized best practice for continuous quality improvement of services, which assesses capacity and provides support for the following, and provides on-the-job training for identified gaps:

1. The availability of infrastructure, supplies, and infection control measures.
2. The performance of screening, cold coagulation, and referral.

3. The quality and completeness of record-keeping.

Data Collection and Analysis

This study used demographic and clinical data from project implementation from 2017 to 2023 that were collected on paper-based registers and, later, digitized in a District Health Information Software 2 (DHIS2)–based database. Personal identifiers in the data set were used to identify women who had repeat screenings or follow-up visits but were subsequently removed. The final data set included 26,998 records from clients' first visit or visit with a positive VIA result.

Defining Reach

This study defined reach as the number, proportion, and risk characteristics of those from the target population that participated in the service provided. This definition is adapted from the RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework.[6]

Data were analyzed in RStudio version 4.4.0. Analysis included descriptive statistics, comparative, and outcome analyses. Demographic characteristics were compared to describe the reach of the two service delivery strategies. A chi-squared test was used to evaluate standardized residuals and determine statistical significance of observed differences between the two delivery strategies. P values <.001 were considered statistically significant. Outcomes analysis included VIA positivity and treatment and referral of VIA-positive women.

Data completeness varied across variables, with missing values ranging from 0.3% to 19%. The highest proportion of missing data was for the number of pregnancies (19%), followed by menstrual status (6.2%), VIA results (2%), and age at first sexual intercourse (AFSI) (1%). We applied mode imputation, replacing missing values with the most common category for each variable. A sensitivity analysis compared results before and after imputation and showed no substantial difference in VIA results.

Ethical Considerations

Ethical approval for this study was obtained from the Ministry of Health, Social Welfare, and Health Infrastructure.

RESULTS

Demographic Characteristics of the Women Screened

About 45% of the screenings were conducted in facilities and 55% through community outreach. About 38% of the women screened were from the island and 62% from the mainland. Women age 20-29 years made up the highest proportion overall, and the numbers are progressively lower for older age groups. Married women made up 50% of all women

screened, and single women were 42.6% of the total. About 42% of the women screened reported the age AFSI of 16 years or younger. Women having menstrual cycles constituted 72.5% of all women screened and multiparous women were 87% of the total. Community outreach yielded two thirds of the screenings in the mainland. Overall, community outreach reached 2.2 times more women age 50-60 years, and 1.7 times more married women than facility-based screening. Compared with facility-based screening, community outreach also included 1.4 times more women with AFSI of 16 years or younger, 1.7 times more puerperal women, 2.3 times more postmenopausal women, and 1.4 times more multiparous women. Data on menstrual status and parity were missing for a considerable number of women. All the above differences were statistically significant (Table 1).

Results of Examination and VIA

These were reported as VIA negative, VIA positive, and suspected cancer. About 97% women had a negative VIA test, and 2.6% had a positive test. Forty-six women (0.2%) had suspected cancer, and results were missing for about 2% of the women. The youngest age group (20-29 years) had the highest VIA positivity rate and accounted for 36% of positive VIA cases. Women age 30-39 years were close behind (33%). The oldest age group (50-60 years) had the highest number of women with suspected cancer (Table 2).

Treatment and Referral

Approximately 55% (n = 390) of those who tested positive for VIA received treatment with cold coagulation, and 10% (n = 71) were referred for further evaluation and treatment. Of the latter, 16 were referred because the acetowhite area spread over more than three quadrants of the cervix, the acetowhite area could not be fully covered by the largest available cold coagulation tip, or the acetowhite area extended into the endocervical canal, precluding treatment by cold coagulation. The reason for referral was not available for the other 55 women who were referred. About 18% (n = 127) of the women who tested positive were not given any treatment. Of them, 15 women had lesions, such as warts or polyps; the reason for not providing treatment was not recorded for the remaining 112 women. Information on treatment and/or referral was missing for 16% (n = 115). The distribution of treatment and referral were almost equal between those who tested VIA positive in facility-based screening and in community outreach (Fig 2).

DISCUSSION

The CCST project is the first-ever effort to provide CCST in Equatorial Guinea. The project's reach of 26,998 women over 7 years represents an estimated 4.5% coverage on the basis of an estimated population of 602,000 women age 20-60 years in 2019.[3] This highlights substantial gaps in meeting WHO's 2030 target of screening 70% women. This coverage

TABLE 1. Demographic Characteristics of Women by Screening Strategy

Characteristic	Facility-Based, No. (%)	Community Outreach, No. (%)	Total, No. (%)
Number of women screened			
Women screened[a]	12,051[b]	14,914[b]	26,965
Region			
Island	5,803 (48.2)[b]	4,522 (30.3)[b]	10,325 (38.3)
Mainland	6,248 (51.8)[b]	10,392 (69.7)[b]	16,640 (61.7)
Age group, years			
20-29	4,130 (34.4)[b]	4,158 (27.9)[b]	8,288 (30.7)
30-39	3,849 (31.8)[b]	3,891 (26.1)[b]	7,740 (28.7)
40-49	2,412 (20.0)[b]	3,256 (21.8)[b]	5,668 (21.1)
50-60	1,660 (13.8)[b]	3,609 (24.2)[b]	5,269 (19.5)
Civil status			
Single	5,660 (47.1)[b]	5,836 (39.3)[b]	11,496 (42.8)
Married	5,645 (47.0)[b]	7,853 (52.8)[b]	13,498 (50.2)
Separated/widowed	706 (5.9)[b]	1,175 (7.9)[b]	1,881 (7.0)
Missing	40	50	
AFSI			
<16 years	4,655 (39.1)[b]	6,515 (44.2)[b]	11,170 (41.9)
≥16 years	7,268 (60.9)[b]	8,229 (55.8)[b]	15,497 (58.1)
Missing	128	170	
Menstrual status			
Menstruating	9,102 (80.8)[b]	9,247 (65.8)[b]	18,349 (72.5)
Postmenopausal	1,773 (15.7)[b]	4,039 (28.8)[b]	5,812 (23)
Puerperal	274 (2.5)[b]	469 (3.3)[b]	743 (2.9)
Amenorrheic for other reasons	116 (1.0)[b]	286 (2.1)[b]	402 (1.6)
Missing	786	873	
No. of pregnancies			
≤2	1,310 (14.4)[b]	1,487 (11.9)[b]	2,797 (12.9)
>2	7,833 (85.6)[b]	10,993 (88.1)[b]	18,826 (87.1)
Missing	2,908	2,434	

[a]Information on delivery strategy (facility-based v community outreach) was missing for 33 women.
[b]$P < .001$.

rate places Equatorial Guinea in a similar range as Cameroon (3.5%) and Côte d'Ivoire (5.6%), but below Namibia (39.3%) and Kenya (16.8%).[7]

Of the implementation strategies complied by the Expert Recommendations for Implementing Change,[8] this project used Conduct educational meetings, Increase demand, Provide clinical supervision, Tailor strategies, and Use mass media. Change service sites partly captures the project's approach as facilities and community outreach were used simultaneously.

The project's single-visit, screen-and-treat approach of VIA followed by cold coagulation is considered the most feasible modality for the single-visit approach, especially in low-resource settings.[9] The approach was also demonstrated

TABLE 2. VIA Results by Age Group

Age Group, Years	VIA Positive, No. (rate)	Suspected Cancer, No.	VIA Negative, No.	Missing, No.
20-29	254 (3.1)	5	7,865	172
30-39	232 (3.0)	12	7,370	134
40-49	129 (2.3)	12	5,417	121
50-60	88 (1.7)	17	5,055	115
Totals, n	703	46	25,707	542

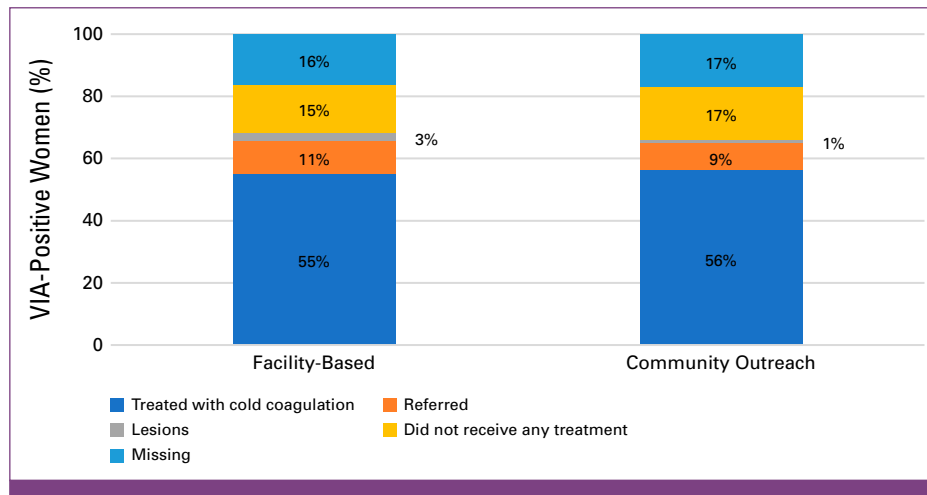Abbreviation: VIA, visual inspection with acetic acid.

FIG 2. Management of VIA-positive women (n = 703). VIA, visual inspection with acetic acid.

successfully in a three-country facility-based pilot in Francophone Africa in 2018-2021.[10]

The proportion of women reached in the mainland and island (61.7% and 38.3%, respectively) is proportionate to the population distribution of 75% and 25%, respectively between the two regions. The two delivery strategies reached nearly equal numbers of women overall; however, community outreach reached more women than facility-based screening in the mainland (24% more, *P* < .001). Overall, community outreach also reached more married women, puerperal, postmenopausal, and multiparous women than facility-based screening (*P* < .001). This could be because these groups use facility-based health services less. This points to the critical role that community outreach plays in reaching them.

Most VIA-screening programs screen women age 25-50 years,[9] but this project included women from 20 years of age. This seems justified given that 41.3% of women screened reported AFSI ≤16 years. A pooled analysis of data from eight low-resource countries found that women with AFSI ≤16 years have a 2.31 higher odds for developing invasive cervical cancer compared with those with AFSI ≥21 years owing to earlier and more prolonged exposure to HPV.[11] An analysis of Nepal's Demographic Health Survey (2011) data showed that individuals who have early sexual debut are more likely to engage in behaviors that place them at an increased risk of acquiring STIs/HIV.[12] HIV-positive women have a higher risk of acquiring HPV infection and progression of HPV-related disease.[13] We extended the upper limit to 60 years to detect the rare cases of cancer among older women without straining the project's budget.

The overall VIA positivity rate of 2.6% in this study is notably lower than rates reported in comparable settings. Although the three-country pilot by Selmouni et al found positivity rates ranging from 2.9% to 15.6%, the relatively low rate reached in this project could indicate either a true lower prevalence of precancerous lesions or, more likely, variations in VIA test performance and inconsistent interpretation of the findings. The project will put in place data on training quality and on health worker performance in conducting screening and VIA tests.

The treatment completion rate of 55% among VIA-positive women also falls short of WHO's 2030 target of 90% treatment coverage for cervical cancer. The lack of any treatment or referral for 18% of VIA-positive women could be due to personal choice, the need for family permission, or medical contraindications. The lack of documentation of reasons and the lack of resources for individual follow up were limitations of this study.

Missing values ranging from 0.3% to 19% across the various data points is a considerable limitation of this study. This has likely constrained the analysis and conclusions of this study, although mode imputation showed no substantial difference in VIA results before and after the imputation. Information on treatment or referral was missing for 16% of VIA-positive women (n = 115). These point to gaps in data collection which will be a focus of future program improvements.

HIV status was not collected for the women screened, as HIV is a considerable source of stigma in the country, and requiring this information could have a negative impact on women coming forward for screening. This is a notable limitation because women with HIV are six times more likely to develop cervical cancer[14] and is likely a confounding factor in the proportion of women attending facility-based and community outreach, as HIV-positive women are more likely to visit health facilities.

This was a small-scale project with limited funding, not intended to reach nationwide coverage, and as such, does not lend itself to an impact evaluation. If MOH introduced a national cervical cancer screening program, we will work with MOH and other partners to measure impact. To support

Equatorial Guinea in its progress toward WHO's 90-70-90 targets, there is need to expand service delivery points in facilities and through community outreach, particularly in underserved areas; better targeted awareness campaigns using women's groups and culturally appropriate educational material; develop a systematic tracking of VIA-positive women including mobile phone–based reminders, community health worker follow-up, and transportation support for referral when needed; enhance quality assurance measures; and strengthen MOH capacity to implement community outreach. These recommendations align with strategies implemented in countries achieving higher screening coverage, such as Namibia and Kenya, while accounting for local context and resources.[7]

In conclusion, to our knowledge, this first-ever effort in cervical cancer screening in Equatorial Guinea represents an important initial step toward achieving the global targets. This project has demonstrated that cervical cancer screening can be successfully integrated within the public health care system. The project has shown that both facility-based and community outreach strategies are viable, with community outreach being able to reach women who might not typically access facility-based services. The low VIA positivity and treatment completion rates and missing data indicate areas requiring strengthening. With sustained commitment to these improvements, Equatorial Guinea can expand cervical cancer screening coverage and contribute to the elimination of cervical cancer.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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Open Payments is a public database containing information reported by companies about payments made to US-licensed physicians (Open Payments).

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