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**PUBLIC HEALTH PRACTICE | OPT-OUT APPROACH IN HIV TESTING**

**Use of Trained Non-Medical Staff to Improve Access to HIV Testing Services in Africa: Implementation of the World Health Organization Opt-out Approach in Cameroon**

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**ABSTRACT**

**Background:** The Joint United Nations Programme on HIV/AIDS (UNAIDS) in 2019 estimated that 450,000 to 50,000 people in Cameroon were living with HIV, yet only 79% knew their HIV status which is far from the 90% target for 2020. To address this situation, Cameroon adopted the “Opt-out” strategy of the World Health Organization (WHO) and use of trained non-medical cadre (psychosocial agents) to reach out to more people with HIV testing services (HTS). This describes the implementation and outcomes of this strategy by reviewing the activity of a typical day in the Yaoundé Central Hospital (YCH) in Cameroon.

**Methods:** HTS were offered to hospitalized and ambulatory patients (including their companions) in different departments of the YCH. Following screening for recent HIV testing, those with unknown HIV status that gave consent or did not explicitly refuse testing (as per the “Opt-out Strategy”), were counseled and tested for HIV. Testing followed the “National HIV Rapid Testing Algorithm” using rapid diagnostic test kits. Results were either positive, negative or indeterminate. Patients with positive HIV results were linked to the Care and Treatment Center for treatment initiation.

**Results:** Of the 350 patients screened and offered HTS using non-medical cadre (psychosocial agents), 193 (55.1%) were hospitalized and 157 (44.9%) came for outpatient visits. The age of participants ranged from 14 to 92 years and the yield of HIV testing in the sample population was 5.1% (6.2% for hospitalized patients and 3.8% for outpatient clinics). Statistics revealed that five HIV-positive patients had never been offered HTS before the study. The study revealed that HTS acceptance rate among hospitalized patients was 69.6% and that all new positive patients started antiretroviral treatment on the same day.

**Conclusion and Global Health Implications:** It is feasible to use trained non-medical staff for HIV testing services (HTS). Task-shifting by using trained psychosocial agents can help in case identification and linkage to HIV treatment services.

**Key words:** • Opt-out strategy • HIV • HIV Testing • Antiretroviral • HIV-positive • Evaluation  
• Implementation • Cameroon • Non-medical Staff • Psychological Agents • World Health Organization

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## I. Introduction

The most recent data from the World Health Organization (WHO) reveal that although HIV-related mortality is declining globally, it is still significant on the African continent. In 2019 in Africa, an estimated 448,000 people died from HIV/AIDS and related complications, compared to 818,200 in 2010.<sup>1</sup> This decrease of about 45% is partly explained by improved access to treatment.<sup>2,3</sup> Treatment has significantly improved survival rates, particularly since the increase in the availability of antiretrovirals.

HIV screening and testing remain an essential step in the fight against HIV because it does not only allow those who are positive to be treated but also makes it possible to educate those who test negatively and encourage them to adopt healthier and less risky lifestyles. Antiretroviral therapy is an essential means of reducing the transmission of HIV.<sup>2</sup> Scientific literature reveals that knowing one's status could reduce the likelihood of engaging in risky sexual behavior.<sup>4,5</sup>

The discourse on HIV testing has undergone a real transformation in recent years. Globally, the use of screening has increased considerably in all WHO regions.<sup>3</sup> However, a large proportion of the population still does not know their HIV status.<sup>1,3</sup> This high burden of undiagnosed HIV in sub-Saharan Africa constitutes a major obstacle to prevention and treatment.<sup>6</sup> For example, the prevalence of HIV in Cameroon remains high (3.1% according to the latest Joint United Nations Programme on HIV/AIDS (UNAIDS) 2020 Report) compared to other countries in sub-Saharan Africa and globally.<sup>7</sup> The UNAIDS 2020 report reveals that only 79% of people living with HIV (PLHIV) in Cameroon are aware of their HIV status which is far from the 90% target.<sup>7</sup>

In many countries battling to control their HIV epidemics, the "Opt-out" strategy is one of the highly recommended means of HIV case identification.<sup>8,9</sup> This has been demonstrated to objectively increase HIV testing among patients and highly vulnerable groups,<sup>10,11</sup> thereby favoring early detection of infection with HIV.

Cameroon's national guidelines on HIV testing take into account the two strategies: "Opt-in" and "Opt-out." In 2016, the Minister of Health in Cameroon ordered that HIV testing be systematically offered to everyone visiting a health care facility.<sup>12</sup> Following this decision, there has been a shift from less of patient-initiated voluntary HIV testing to provider-initiated HIV testing through the "Opt-out" approach. This was in line with scaling up of accessibility anti-retroviral therapy following the adoption of "Test and Start" by the country. In resource constrained countries like Cameroon with a high burden of HIV, there arose operational challenges to the scale-up of HTS through "Opt-out" HIV testing.<sup>13</sup> One of such challenges is that of the availability of human resources in contexts where the healthcare workforce is already overburdened.<sup>14,15</sup> The use of trained non-medical cadre (locally referred to as psycho-social agents) working under supervision in offering HTS has been a model used to address the challenge of availability of human resources. This study was done to describe the implementation of this strategy and present the outcomes of a typical week's activity by the 'psycho-social agents' in the Yaoundé Central Hospital in Cameroon.

## 2. Methods

### 2.1. Study Setting

This study was conducted in medical, surgical, emergency and obstetric departments, comprising

a total of 19 units of the Yaoundé Central Hospital (YCH). The YCH is a referral level, tertiary healthcare establishment in Cameroon that provides patients with medical care. The YCH has a bed capacity of 470 for all specialties combined, and an average occupancy rate of 74% or 348 people in the hospital per day. The Day Hospital of the YCH is the first-ever accredited and reference clinic for HIV/AIDS management in Cameroon. Alongside with other approved HIV treatment centers, it serves the population of Yaoundé: a cosmopolitan town with over 2.5 million inhabitants. It currently has about 11,000 people living with HIV enrolled in the unit, and sees approximately 8500 to 10,000 of them every month.

## 2.2. Study Design

This was an observational study of the HIV testing related activities by psychosocial workers in a typical week at the Yaoundé Central Hospital. A cross-section of the patient population was offered HTS and eventually tested for HIV. The study activities were completed daily between December 11 and 15, 2017, during which the data collection took place.

## 2.3. Selection Criteria

Eligible participants for this study were all hospitalized patients or ambulatory patients who came to the YCH for consultations, regular medical visits, or as companions of such patients, and who explicitly gave consent or did not outrightly refuse HIV testing services when it was proposed to them (presumption of consent as allowable by YCH). This was in line with the national HIV testing policy “Opt-out” approach. Patients under the age of 18 were able to participate, provided that they gave their assent and their parent or guardian accepted that HIV testing be carried out. However, all patients unable to give informed consent (suffering from significant mental illness, comatose patients and under anesthesia) were excluded from the study. Also, patients who were already on antiretroviral therapy were excluded. More so, the blood bank was not included given that the algorithm of the HIV testing in the blood bank was different from that of the general population.

## 2.4. Sample Size and Sampling Method

This was an observational review of routine activities of psycho-social agents in their offer of HTS to the patient population. Sample size calculation was not necessary as the goal was implementation and to offer HTS to as many of the eligible patients as possible. The sampling method employed to recruit eligible patients was consecutive sampling.

## 2.5. Study Procedure and Data Collection

The team (doctors, nurses and psychosocial agents) had a briefing before the start of the activities on the questionnaire designed for the exercise. This was primarily to get them acquainted with the data collection tool. The psychosocial agents were trained on the principles and specifics of HIV testing.

While at the different departments, these trained psychosocial agents worked in collaboration and under the guidance of ward supervisors and doctors to offer HIV rapid testing services (HTS) to patients and their companions as well as admit persons for voluntary testing and counseling, and patients referred to them for HTS. After obtaining a patient’s consent for an HIV test, bedside pre-test counseling was offered and rapid testing was done at the bedside. Patients or companions who could ambulate pre-test counseling followed by HIV rapid testing were preferably done at the HIV testing post in the ward unit to guarantee patient confidentiality.

Whole blood samples for rapid testing were collected by finger prick. In the case of a positive test result by the psychosocial agent, a second sample is collected by phlebotomy into EDTA tubes for verification testing at the care and treatment center laboratory following the same algorithm. Personal information that could help identify a patient was not used in the questionnaire. An anonymous identifier was used to label all specimens. Collected specimens were tested for HIV following standard procedures as spelled out in laboratory manuals for HIV rapid tests and in accordance with the manufacturer instructions using either Alere Determine® HIV-1/2 (Alere Medical Co., Ltd.) or OraQuick® Advance HIV-1/2 (OraSure Technologies). A result was said to be negative when the first rapid test (Alere Determine®)

was not reactive. When the first rapid test was reactive and the second (OraQuick® Advance HIV-1/2) was also reactive, the result of the HIV tests was confirmed to be positive, and these patients were transferred to the Care and Treatment Center for verification testing. The same algorithm was followed during verification testing at the care and treatment laboratory. Patients with indeterminate results (first test reactive and second test not reactive) were either given an appointment to return in three to four weeks for retesting or referred to the hospital's central laboratory for confirmatory testing, depending on the patient's means, as the confirmatory testing was not free. This was in line with the national algorithm for HIV rapid tests. From testing to getting the result of the test took 15 to 20 minutes; following which results were communicated to patients in a post-test counseling session.

The questionnaire designed for this study was administered to the patients during the counseling sessions. The questionnaire used for this study was designed to collect the following data: gender (male or female), age (in nearest completed years), profession, level of education, marital status, number of children, systematic use of condoms, number of sexual partners in the last 12 months, history concerning previous HIV testing (knowledge of the status, HIV test, context of last HIV test). For information regarding time since the last HIV test (in months), it was taken to be zero from when the last HIV test done by the patient was not up to a month.

### 2.6. Ethical and Administrative Considerations

Ethical approval for the study was obtained from the Ethics Committee of the YCH. This study was an assessment of routine care activities and consequently, there was the possibility of patients revealing personal information. As such, consent was sought from participants following a detailed explanation of the study with each person given an opportunity to have any doubts clarified. This was a voluntary process without any form of coercion. Participants were free to withdraw from the study at any point in time and have their collected information remain unused. Any patient who tested positive for HIV was effectively linked to start live-saving

antiretroviral therapy. Confidentiality, anonymity and privacy of all information were guaranteed at all levels of this study. Research authorization was obtained from the management of the YCH before study commencement.

### 2.7. Data Analysis

Data were collected and entered into a Microsoft® Excel 2016 (Microsoft Corporation, Redmond, WA) spreadsheet. Descriptive analysis was done using Microsoft Excel® and Epi info® software version 7.1.5 (CDC, Atlanta, GA). Quantitative data were expressed as an average  $\pm$  standard deviation and frequencies.

## 3. Results

### 3.1. General Characteristics of the Participant

Three hundred and fifty (350) people participated in this study; there were 336 adults and 14 adolescents (age <18 years). The mean age was  $39 \pm 16$  years, ranging from 14 to 92 years of age. Among the 350 participants tested, 193 (55.1%) were hospitalized

**Table 1: General characteristics of study population**

Categories	N (%)
Age (in years)	
Mean	39
SD	16
Min.	14
Max.	92
Gender	
Female	207 (59%)
Male	143 (41%)
Level of education	
None	18 (5%)
Primary	70 (20%)
Secondary	165 (47%)
Higher	97 (28%)
Sexual Orientation	
Heterosexual	349 (99.7%)
Homosexual	0
Bisexual	1 (0.3%)
Marital status	
Single	171 (49%)

(Contd...)

**Table 1: (Continued)**

Categories	N (%)
Divorced	3 (1%)
Married (monogamy)	124 (35%)
Married (polygamy)	6 (2%)
Cohabitation	26 (7%)
Widow/widower	20 (6%)
Systematic use of condoms	
No	209 (60%)
Yes	120 (34%)
Missing	21 (6%)
Number of sexual partners in last 12 months	
Mean	1.1
SD	0.9
Min.	0
Max.	6
Duration till last HIV test (in months)	
Mean	17
SD	26
Minimum	0
Maximum	120
Circumstance of last HIV test	
Health campaign	93
Clinic	50
PMTCT services	20
Voluntary testing	53
Occupational blood exposure	2
Blood donation	10
Number of sexual partners in last 12 months	
Mean	1.0
SD	0.9
Min.	0
Max.	5

patients and 157 (44.9%) were ambulatory patients seen for routine visits and consultations. Women constituted 59% of our population; 207 women and 143 men (41%). The majority of the study population had a secondary education, 165 patients (47%). A 45-year-old woman, bisexual, otherwise, the others identified as heterosexual. The study population was predominantly single (49%).

For HIV testing history, 253 participants reported having done an HIV test at least once in the past

with the average time lapse since the last HIV test being 17 months (range 0 to 120 months) as shown in Table 1. Regarding the sexual behavior of the 311 people who responded, we had an average of  $1.1 \pm 0.9$  (range 0 to 6) reported partners. In total, 60% of our population reported non-systematic and incorrect use of condoms during sexual intercourse, 45% of which were singles. (Table 1).

### 3.2. Profile of Newly Identified Cases

Eighteen (18) patients tested positive following the national rapid HIV test algorithm, giving an HIV test positivity rate of 5.1%. The average age among those who tested positive for HIV was  $40 \pm 11$  years (range from 22 to 63 years old). Among the positive patients, 8 were women and 10 men with an overall HIV positivity rate of 3.9% and 7.0% among females and males respectively. Singles represented 78% of all newly identified HIV-infected individuals. Of the 18 newly identified people living with HIV, 17 provided information about sexual partners and the average number of sexual partners over the past 12 months was  $1.4 \pm 1.3$  partners (range: 0 and 6 partners).

More than half (55.6%) of the 18 people who tested positive had never had an HIV test before, 5 of which were hospitalized patients (Table 2). Twelve of them (66.7%) were hospitalized and 6 (33.3%) came from outpatient consultations. Thus, the general HIV positivity rate among hospitalized and ambulatory patients was 5.9% and 4.1% respectively.

The acceptance rate for HTS was evaluated just for hospitalized patients. The HTS acceptance rate among this group of patients was rated 69.6%. The prevalence rates in the departments were as follows: infectiology (40%), gastroenterology (23.5%) and neurology (22.2%) (Table 3).

## 4. Discussion

The HIV prevalence rate in our study was 5.1%. This rate is higher than the national prevalence rate which is 3.1%.<sup>7</sup> This difference is explained by the fact that our study was done in a healthcare setting. However, we had more positive men than women (7.0% compared to 3.9%). This is contrary to all demographic survey studies, whether in Cameroon or in Togo where the ratio for HIV prevalence of

**Table 2: Profile of newly-identified cases of HIV in study population**

Categories	N (%)
Age (in years)	
Mean	40
SD	11
Minimum	22
Maximum	63
Gender	
Female	8 (44%)
Male	10 (56%)
Marital status	
Single	14 (78%)
Married (monogamy)	3 (17%)
Cohabitation	1 (6%)
Level of education	
Primary	5 (28%)
Secondary	11 (61%)
Higher	2 (11%)
Number of sexual partners in last 12 months	
Mean	1.4
SD	1.3
Min.	0
Max.	6
Duration till last HIV test (in months)	
Mean	27
SD	44
Min.	1
Max.	120

women to men is 0.52 and 0.55 respectively.<sup>16</sup> In fact, men often present late with advanced HIV disease and thus, are more likely to be seen admitted to hospital. Women generally have more opportunities to get tested earlier for HIV. They do so in prenatal consultations, and they are the ones who accompany children for vaccinations and when a child is sick. Women have more opportunities to be in contact with healthcare structures, where awareness about HIV is more created through routine health talks. This finding reinforces and seems to point to the need for actions on WHO recommendations regarding the opinion that HTS activities (partner notification and testing) could increase access of males (who often present with late HIV disease) to

HTS as a means of reducing HIV related morbidity and mortality.<sup>17</sup>

The services with the highest HIV positive rates are infectious disease services (40%), followed by gastroenterology (23.5%) and neurology (22.8%). Although we had few infectious disease patients, this distribution is consistent with literature that digestive and neurologic complications and opportunistic infections are frequently seen in HIV-infected persons.<sup>18,19,20</sup> It is important to note that at the YCH, patients with acute pulmonary infectious conditions, like Tuberculosis, are hospitalized in the infectious diseases unit which might contribute to this as HIV is prevalent among people with tuberculosis. What stands out in our study is the number of patients testing positive in outpatient clinics and in other services such as the trauma service. In fact, we had an incidence rate of 3.1%, which is much higher than what we find in mass HIV testing outreach campaigns with generally poor case identification in light of resources used.<sup>21</sup> This result emphasizes the need to reinforce the implementation of the ministerial decision to request and systematically offer the HIV test to anyone in contact with a health care structure. In addition, about half of the patients who tested positive had not been offered HTS before. Several reasons could possibly explain this observation. A study in Ghana revealed that several practitioners were in agreement with provider-initiated testing and counseling (PITC) but expressed reluctance with the “Opt-out” strategy. Additionally, this is further compounded by the observations that patients demonstrated incomplete knowledge of HIV and still widely believed that spiritual healers and prayer could cure the infection<sup>22</sup> presenting a potential challenge to the “Opt-out” strategy. While this can be another reason to insist on the respect of the recommendation to provide HTS services to all who present at health facilities irrespective of their reasons, we can also say it also points to the proposition that using trained non-medical cadre could help circumvent personnel needs as well as serve to help reach more people with HTS while helping in case identification. This result from efforts by psychosocial agents demonstrate that emergency

**Table 3: HIV Case Identification by hospital unit**

Service/Department	Number Tested	Number in Admission	Tested Positive	HIV Testing Acceptance Rate (%)	HIV Testing Positivity Rate (%)
Surgical Emergency Landing	5	7	1	71.4	20.0
Cardiology	17	25	0	68.0	0.0
General Surgery	14	21	0	66.7	0.0
Pediatric Surgery	5	11	0	45.5	0.0
Outpatient Clinic	145	0	6	Not evaluated	4.1
Endocrinology	9	13	0	69.2	0.0
Gastroenterology	17	21	4	81.0	23.5
Private	5	9	0	55.6	0.0
Hematology	4	10	0	40.0	0.0
Infectious Disease	5	6	2	83.3	40.0
Physiotherapy	7	0	0	Not evaluated	0.0
Obstetrics and Gynecology	18	20	0	90.0	0.0
Neurosurgery	15	29	0	51.7	0.0
Neurology	9	13	2	69.2	22.2
Ophthalmology	2	0	0	Not evaluated	0.0
ENT	7	9	1	77.8	14.3
Radiology	3	0	0	Not evaluated	0.0
Intensive Care	5	6	0	83.3	0.0
Rheumatology	7	7	0	100.0	0.0
Orthopedics	33	37	1	89.2	3.0
Medical Emergency Landing	6	12	1	50.0	16.7
Urology	12	20	0	60.0	0.0
Total	350	276	18	69.6	5.1

units might present with missed opportunities for diagnosing undetected HIV infection.<sup>23</sup>

The overall acceptance rate for HIV testing was (69.6%) which is poor. This likely points to the need for continuous capacity building of psychosocial agents on counseling. Contrary to expectations, in wards with many beds, the acceptance rate was better (100%) than in private wards (40%). Perhaps the ripple effect played a role, as seeing a neighboring patient accept a service was more likely to make another patient accept the service as well. This poor rate of testing acceptance is comparable to the 76% HTS acceptance rate reported in a study within a polyclinic in London and emergency units in South Africa,<sup>23,24</sup> however, this is in contrast to data from other hospitals in Cameroon.<sup>25</sup> The discrepancy can be explained principally by the observation that pediatric case finding was the principal objective

of that study and explains why our study was concerned with the general population.

The concordance between results of the positive HIV tests performed at the patient's bedside by Psychosocial agents and verification testing carried out by the laboratory for all 18 newly identified HIV infected individuals, points to the feasibility of Psychosocial agents correctly executing HIV rapid testing procedures as they are simple, hence reinforcing the idea that this task can be carried out by non-medical personnel under supervision. Thus, this makes room for task-shifting or delegation which will give healthcare workers the ability to address more complex procedures.

## 5. Conclusion and Global Health Implications

This study shows that it is feasible to utilize trained psychosocial agents in implementing the "Opt-out"

strategy to reach the populations presently coming to health facilities with HTS. Task-shifting by using trained Psychosocial agents, non-medical personnel, can help with the implementation of differentiated HIV and could be an opportunity to help attain the UNAIDS objective to ensure that 90% of persons with HIV know their status (the First 90 target) as well as effectively improve linkage to care and initiation of ART which in this study was 100%.

However, considerable efforts are still required to help reach out to persons in need of HIV testing services as is demonstrated by the finding that the most newly identified PLWHIV in our study had previously never been offered HIV testing. One way of doing this, as shown by this study, could be through decentralizing HIV testing at the level of health care facilities. This is done through the delegation of rapid testing tasks to psychosocial agents posted to different services and departments (especially high HIV positive yield services) in health institutions while providing an appropriate environment for testing. This strategy combined with screening has the potential to expedite the effective application of the ministerial decision regarding the systematic offering of HIV screening and testing services to the right patients presently coming to the health facilities.

### Compliance with Ethical Standards

**Conflict of Interest:** The authors declare that they have no conflict of interest. **Financial Disclosure:** None. **Funding/Support:** None. **Ethics approval:** Ethical approval for the study was sought from the Ethics Committee of the YCH. **Acknowledgments:** The authors are grateful to all who took part in this study. **Disclaimer:** None

### Key Messages

- ▶ It is feasible to use trained non-medical personnel in implementing the “Opt-out” strategy to reach out to the populations presently coming to health facilities with HIV testing services (HTS).
- ▶ Trained non-medical personnel present an opportunity in decentralizing HIV testing services in large tertiary health facilities through the delegation of rapid testing tasks while maintaining supervision of their activities by trained medical personnel.

### References

1. The Joint United Nations Programme on HIV/AIDS (UNAIDS). People living with HIV receiving ART. UNAIDS: AIDSinfo. <https://aidsinfo.unaids.org/>. Updated June 30, 2020. Accessed October 26, 2020.
2. Danforth K, Granich R, Wiedeman D, Baxi S, Padian N. Global mortality and morbidity of HIV/AIDS. In: Holmes KK, Bertozzi S, Bloom BR, Jha P, Piot P, eds. *Major Infectious Diseases*. Vol 6. 3rd ed. Washington, DC: World Bank Group; 2017. <http://www.ncbi.nlm.nih.gov/books/NBK525184>. Accessed October 28, 2020.
3. The Joint United Nations Programme on HIV/AIDS (UNAIDS). 2020 Global AIDS update: seizing the moment, tackling entrenched inequalities to end epidemics. UNAIDS. <https://www.unaids.org/en/resources/documents/2020/global-aids-report>. Published July 6, 2020. Accessed October 28, 2020.
4. Coates TJ, Kulich M, Celentano DD, et al. Effect of community-based voluntary counselling and testing on HIV incidence and social and behavioural outcomes (NIMH Project Accept; HPTN 043): a cluster-randomised trial. *Lancet Glob Health*. 2014;2(5):e267-e277. doi:10.1016/S2214-109X(14)70032-4.
5. George G, Beckett S, Cawood C, Khanyile D, Govender K, Kharsany ABM. Impact of HIV testing and treatment services on risky sexual behaviour in the uMgungundlovu District, KwaZulu-Natal, South Africa: a cross-sectional study. *AIDS Res Ther*. 2019;16(1):20. doi:10.1186/s12981-019-0237-z.
6. Pandey A, Galvani AP. The global burden of HIV and prospects for control. *Lancet HIV*. 2019;6(12):e809-e811. doi:10.1016/S2352-3018(19)30230-9
7. The Joint United Nations Programme on HIV/AIDS. UNAIDS Data 2020. WHO: UNAIDS. [https://www.unaids.org/sites/default/files/media\\_asset/2020\\_aids-data-book\\_en.pdf](https://www.unaids.org/sites/default/files/media_asset/2020_aids-data-book_en.pdf). Accessed October 26, 2020.
8. World Health Organization. Guidance on provider-initiated HIV testing and counselling in health facilities. WHO: UNAIDS. Geneva: World Health Organization; 2007. <https://www.who.int/hiv/pub/vct/pitc2007/en/>. Accessed October 28, 2020.
9. Branson BM, Handsfield HH, Lampe MA, et al; Center for Disease Control and Prevention (CDC). Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR Recomm Rep*. 2006;55(RR-14):1-CE4.
10. Topp SM, Chipukuma JM, Chiko MM, Wamulume CS, Bolton-Moore C, Reid SE. Opt-out provider-initiated HIV testing and counselling in primary care outpatient clinics in Zambia. *Bull World Health Organ*. 2011;89(5):328-335A. doi:10.2471/BLT.10.084442.



11. Montoy JC, Dow WH, Kaplan BC. Patient choice in opt-in, active choice, and opt-out HIV screening: randomized clinical trial. *BMJ*. 2016;532:h6895. doi:10.1136/bmj.h6895.
12. Ministère de la Santé Publique. Lettre circulaire dépistage de routine du vih dans les formations sanitaires. <https://www.minsante.cm/site/sites/default/files/lettre%20circulaire%20d%C3%A9pistage%20de%20routine%20du%20vih%20dans%20les%20formations%20sanitaires.pdf#view=Fit>. Accessed October 28, 2020.
13. Ngangue P, Gagnon MP, Bedard E. Challenges in the delivery of public HIV testing and counselling (HTC) in Douala, Cameroon: providers perspectives and implications on quality of HTC services. *BMC Int Health Hum Rights*. 2017;17(1):9. doi: 10.1186/s12914-017-0118-2.
14. Negueu AB, Cumber SN, Donatus L, et al. Burnout chez les professionnels soignants de l'Hôpital Central de Yaoundé [Burnout among caregivers in the Yaounde Central Hospital, Cameroon]. *Pan Afr Med J*. 2019;34:126. doi:10.11604/pamj.2019.34.126.19969.
15. Tandji TE, Cho Y, Akam AJ, et al. Cameroon public health sector: shortage and inequalities in geographic distribution of health personnel. *Int J Equity Health*. 2015;14:43. doi:10.1186/s12939-015-0172-0.
16. Ministère de la Santé, Direction Générale de la Statistique et de la Comptabilité Nationale (DGSCN). *Enquête Démographique et de Santé au Togo 2013-2014*. Rockville, Maryland USA: MPDAT, MS et ICF International; 2015. <https://dhsprogram.com/pubs/pdf/FR301/FR301.pdf>. Accessed October 28, 2020.
17. World Health Organization. Guidelines on HIV self-testing and partner notification. World Health Organization. <https://www.who.int/hiv/pub/vct/hiv-self-testing-guidelines/en/>. Published October 8, 2019. Accessed October 28, 2020.
18. Apetse K, Assogba K, Kevi K, Balogou AAK, Pitche P, Gruntzky E. Infections opportunistes du VIH/sida chez les adultes en milieu hospitalier au Togo. *Bull Soc Pathol Exot*. 2011;104(5):352-354. doi:10.1007/s13149-011-0139-3.
19. Rubaihayo J, Tumwesigye NM, Konde-Lule J, Wamani H, Nakku-Joloba E, Makumbi F. Frequency and distribution patterns of opportunistic infections associated with HIV/AIDS in Uganda. *BMC Res Notes*. 2016;9(1):501. doi:10.1186/s13104-016-2317-7.
20. Kouanfack OSD, Kouanfack C, Billong SC, et al. Epidemiology of opportunistic infections in HIV infected patients on treatment in accredited HIV treatment centers in Cameroon. *Int J MCH AIDS*. 2019;8(2):163-172. doi:10.21106/ijma.302.
21. Ministère de la Santé Publique du Cameroun, Comité National de Lutte contre le Sida. Vacances sans SIDA 2020: La Tradition Respectée! [AIDS-free holidays 2020: the tradition respected!]. National AIDS Control Committee (CNLS). <http://www.cnls.cm/actualite/C3%A9s/vacances-sans-sida-2020-la-tradition-respect%C3%A9e>. Published September 15, 2020. Accessed October 29, 2020.
22. Tabb Z, Moriarty K, Schrier MW, Amekah E, Flanigan TP, Lartey M. Assessing acceptability and feasibility of provider-initiated HIV testing and counseling in Ghana. *R I Med J (2013)*. 2017;100(8):19-22.
23. Hansoti B, Stead D, Parrish A, et al. HIV testing in a South African emergency department: a missed opportunity. *PLoS One*. 2018;13(3):e0193858. doi:10.1371/journal.pone.0193858.
24. Ashby J, Braithewaite B, Walsh J, Gnani S, Fidler S, Cooke G. HIV testing uptake and acceptability in an inner-city polyclinic. *AIDS Care*. 2012;24(7):905-909. doi:10.1080/09540121.2011.647675.
25. Yumo HA, Kuaban C, Ajeh RA, et al. Active case finding: comparison of the acceptability, feasibility and effectiveness of targeted versus blanket provider-initiated-testing and counseling of HIV among children and adolescents in Cameroon. *BMC Pediatr*. 2018;18(1):309. doi:10.1186/s12887-018-1276-7.

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