



A comparison of HIV outpatient care in primary and secondary healthcare-level settings in Zimbabwe

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Setting: Decentralisation of HIV care to nurse-led primary care services is being implemented across low- and middle-income countries in sub-Saharan Africa.

Objective: To compare services offered to clients attending for HIV care at a physician-led and a nurse-led service in Harare, Zimbabwe.

Design: A cross-sectional study was performed at Harare Central Hospital (HCH) and Budiro Primary Care Clinic (PCC) from June to August 2018. An interviewer-administered questionnaire was used to collect sociodemographics, HIV treatment and clinical history from clients attending for routine HIV care. The Mann-Whitney *U*-test was used to evaluate for differences between groups for continuous variables. For categorical variables, the χ^2 test was used.

Results: The median age of the 404 participants recruited was 38 years (IQR 28–47); 69% were female. Viral suppression was comparable between sites (HCH, 70% vs. PCC, 80%; $P = 0.07$); however, screening for comorbidities such as cervical cancer screening (HCH, 61% vs. PCC, 41%; $P = 0.001$) and provision of referral services (HCH, 23% vs. PCC, 13%; $P = 0.01$) differed between sites.

Conclusion: Efforts to improve service provision in primary care settings are needed to ensure equity for users of health services.

As efforts to implement universal testing and treatment and achieve UNAIDS 90-90-90 targets (90% of people living with HIV [PLHIV] know their diagnosis, 90% of these people are accessing treatment and 90% of those on ART have achieved viral suppression) intensify globally, more people than ever are accessing antiretroviral therapy (ART). In sub-Saharan Africa in 2018, where 54% of the world's people with HIV live, an estimated 13.8 million PLHIV were accessing HIV treatment and care.¹ To ensure ease of access to treatment and remove barriers to care, including shortage of healthcare providers, distance to travel to clinics and overcrowded facilities, decentralisation of HIV services from secondary to primary care-level health facilities and task-shifting from physician-led services to nurse-led services have been widely implemented in many low-income settings.^{2,3}

HIV programmes often focus on HIV viral suppression following initiation of ART as a marker of successful treatment outcomes.⁴ However, optimum care should include provision for screening and prevention of opportunistic infections, comorbidities, as well as

sexual and reproductive health (SRH) services and psychosocial support.^{5,6} As people with HIV live longer, there is an increasing push towards integrating screening and management of risk factors for chronic comorbidities.^{6–8} The different health facility tiers may vary in their ability to offer services beyond the direct treatment and monitoring of HIV treatment. In 2004, the Zimbabwean Ministry of Health and Child Care (MOHCC) adopted a strategy of decentralising HIV care to primary healthcare level.⁹ Since then, the number of sites able to provide HIV treatment services and ART coverage has increased rapidly and by 2017, there were 1566 ART sites (initiating and follow up) and an estimated 1 119 909 PLHIV were accessing ART by the end of September 2016.¹⁰ Recent MOHCC guidance recommends that all health care facilities provide basic prevention, testing and treatment for HIV, integrated with sexual and reproductive health services and screening for non-communicable diseases.⁹

We compared services offered to adult clients attending for HIV care at a physician-led service in a hospital-based outpatient HIV clinic and those offered in a nurse-led primary care clinic in Harare, Zimbabwe.

METHODS

Study design and setting

A cross-sectional study was performed at Harare Central Hospital (HCH) HIV clinic and the Budiro Primary Care clinic (PCC) from June to August 2018. HCH is the largest public sector hospital in Harare. Its adult HIV outpatient clinic has 3200 registered adult clients (aged ≥ 18 years). The clinic is staffed by two physicians and 18 support staff, consisting of nurses and HIV counsellors. ART and cotrimoxazole are provided free of charge through the national ART programme. Attendance to see a nurse or physician is free of charge. Budiro PCC is situated in a high-population density suburb in south west Harare, within the catchment area of HCH. It is managed by Harare City municipal health services. It has 5400 registered clients with HIV aged ≥ 15 years. It has a staff complement of 12 nurses and HIV counsellors who work on a rotational basis, with an average 1–2 nurses staffing the HIV care and treatment department daily. A physician visits weekly to attend to complex clinical cases identified by nursing staff. ART and cotrimoxazole are provided free of charge at this clinic; however, a user fee of US\$1.00 is charged each time a client sees a nurse, which is required prior to collection of ART medication.

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ACKNOWLEDGEMENTS

This work was supported through Wellcome Trust Senior Fellowship (London, UK) awarded to Professor R Ferrand (Grant No. 206316/Z/17/Z).
Conflicts of interest: none declared.

KEY WORDS

decentralisation; nurse-led care; comorbidities; sub-Saharan Africa

Received 17 February 2020
Accepted 17 July 2020

PHA 2020; 10(3): 92–96
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Inclusion criteria for study participation were age \geq 18 years and receiving ART for at least 6 months. Eligible participants were consecutively recruited, restricted to 15 a day for logistical ease. An interviewer-administered questionnaire was used to collect data on sociodemographic characteristics, medical history, including ART regimen, health services received at the clinic, understanding of what viral load and CD4 count results mean, and referrals for additional services within the healthcare system, for community-based services or both. Laboratory test results were obtained from the medical records.

Data were collected on an electronic database on android tablets; statistical analysis was performed using STATA v12 (Stata Corp, College Station, TX, USA). The Mann-Whitney *U*-test was used to evaluate for differences between groups for continuous variables. For categorical variables, the χ^2 test was used.

Ethical considerations

Prior to written informed consent being obtained from participants, an information sheet, translated into Shona, should the participant prefer to read in their vernacular language, was provided. Questions were answered by research assistants regarding study participation. Written informed consent was obtained from all participants. Should a participant choose to withdraw from the study at any time, they were permitted to do so.

Ethical approval for the study was obtained from the Medical Research Council of Zimbabwe (Harare), the Harare City Health Department Ethics Committee (Harare), Harare Hospital Ethics Committee (Harare), Biomedical Research and Training Institute Institutional Review Board (Harare, Zimbabwe) and the London School of Hygiene & Tropical Medicine Ethics Committee, London, UK.

RESULTS

A total of 404 participants were recruited across both sites. The median age was 38 years (interquartile range [IQR] 28–47) and 69% were female (Table). The median time since HIV diagnosis was 7 years (IQR 4–11), and the median duration on ART was 6 years (IQR 4–10). While participants attending HCH received HIV care free of charge, 186 (93%) participants at Budiro PCC incurred a consultation fee at each visit; 14 (7%) clients were exempt from paying a consultation fee as they were older than 65 years or were employees of Harare City Municipal Service. The frequency of clinical review i.e., the consultation with a nurse or physician involving symptom review and clinical examination (if indicated) prior to routine ART refill differed between settings. Furthermore, participants at PCC were required to attend for clinical review on a 3-monthly basis compared to participants at HCH (HCH 75% vs. PCC 93%; $P \leq 0.001$). In addition, those attending the PCC had longer waits to see a healthcare provider, with 70% at the PCC vs. 15% at the hospital-based clinic having to wait longer than 2 hours. (Table).

ART provision and HIV viral load testing

The proportion on second-line regimens (i.e., protease inhibitor or integrase inhibitor-based regimens) was higher among participants attending HCH clinic services (31% vs. 1%; $P < 0.001$), as would be expected as patients attending PCCs who are thought to be failing treatment or have issues with drug tolerability are referred to hospital-based clinics for further management.

Drug stock outs in the previous 12 months were rarely reported for both settings, with only one participant reporting a stock out of atazanavir/ritonavir at HCH on one occasion and one

participant in Budiro PCC reporting a stock out of cotrimoxazole on one occasion. In total, 361 (89%) participants had an HIV viral load performed in the past 12 months: 193 (95%) attendees at HCH vs. 168 (84%) attendees at the Budiro PCC ($P < 0.001$). Viral load testing was performed on site (i.e., participants did not have to travel to another institution for testing) for 334 of those who had an HIV viral load performed. However, 42% of those who had had a viral load test in the past 12 months had to return on a different day to that of their clinical review for the test to be performed, with this occurring more frequently at the PCC (HCH 37% vs. PCC 48%; $P = 0.03$). Free viral load testing was provided for 359 (99%) participants; of these, 19 paid an additional amount for an additional consultation fee at the PCC, as they had to return on a different day for a test. One participant had a test performed at a private laboratory for US\$90.00 and one participant had to pay US\$5.00. Of the 361 participants who had an HIV viral load measurement, 251 (70%) participants received their results and 225 (62%) had a record of the result in their patient-held records. There was no difference in the proportion who received their HIV viral load result by setting (HCH 88% vs. PCC 91%; $P = 0.40$). In total, 191 (85%) of those with a viral load result had a viral load of <1000 copies/ml, with no difference in the proportion of participants with virological suppression by setting (HCH 70% vs. PCC 80%; $P = 0.07$).

Overall, 262 (65%) participants understood that when HIV infection is well controlled, HIV viral load is low, and 292 (72%) participants reported that CD4 count should be high. In total, 31 (8%) participants did not know whether viral load and CD4 measurements should be high or low if HIV viral control was optimal. Participants' understanding of viral load and the relationship of CD4 count measurements to HIV infection control did not differ between sites.

Only 200 (50%) participants had been referred to a support group, with a higher proportion of HCH attendees being referred than those attending the Budiro PCC (55% vs. 43%). Referral for additional medical and social services such as food aid, social services, mental health services and family planning was generally low across both settings (Table).

Ancillary services

Screening for hypertension, chronic kidney disease and cervical cancer occurred more frequently at HCH than at Budiro PCC (Table); 162 (42%) participants had a blood pressure measurement performed at each clinic visit (HCH 63% vs. PCC 21%; $P < 0.0001$) and measurement of creatinine, a recommended annual test for those taking tenofovir (TDF) containing HIV regimens had occurred at least once for 85% of clients at HCH compared to 98% of clients taking TDF at Budiro PCC. A higher proportion of HCH clinic participants had received isoniazid prophylactic therapy (IPT) for the prevention of tuberculosis (51% vs. 19%; $P < 0.001$), although only 35% of all participants had ever received IPT. The same applied to free condom provision with 75% of HCH participants vs. 55% of Budiro clinic participants receiving condoms at clinic visits. The proportion of participants who had children living in their households of unknown HIV status was low ($n = 64$, 16%), and overall 70% had been asked to have their children tested, with no difference in proportion offered by setting.

DISCUSSION

The process of decentralisation of HIV care has brought the provision of HIV care closer to clients and communities; task-shifting

TABLE Sociodemographic and HIV history according to treatment site

	Total (n = 404) n (%)	Hospital-based clinic (n = 204) n (%)	Primary healthcare clinic (n = 200) n (%)	P value
Age, years, median [IQR]	38 [28–47]	33.5 [23–44]	42 [34–49.5]	<0.001
Female sex	279 (69)	138 (68)	141 (71)	0.55
Time since HIV diagnosis, years, median [IQR]	7 [4–11]	8 [4–12]	6 [4–10]	0.01
Duration on ART, years, median [IQR]	6 [4–10]	7 [4–11]	6 [3–9]	0.02
ART regimen				
NNRTI*	339 (84)	141 (69)	198 [†] (99)	<0.001
PI	63 (16)	61 (30)	2 (1)	0.001
INSTI	1 (<1)	1 (1)	0 (0)	0.32
HIV viral load in past 12 months	361 (89)	193 (95)	168 (84)	<0.001
Received HIV VL result	251 (70)	135 (70)	116 (69)	40.85
VL < 40 copies/ml	168 (75)	83 (70)	85 (80)	0.07
VL > 1000 copies/ml	32 (14)	17 (14)	15 (14)	0.97
Time taken to see a provider				
<30 min	43 (11)	38 (19)	5 (3)	<0.001
30 min–1 h	101 (25)	83 (41)	18 (9)	<0.001
1–2 h	90 (22)	53 (26)	37 (18)	0.07
>2 h	170 (42)	30 (15)	140 (70)	<0.001
Received isoniazid prophylactic therapy	143 (35)	105 (51)	38 (19)	<0.001
Renal function testing				
Ever	187 (46)	128 (63)	59 (30)	<0.001
Among those who take tenofovir	167 (89)	109 (85)	58 (98)	<0.001
Ever offered cervical screening	142 (51)	84 (61)	58 (41)	0.001
Correct understanding by client about association between VL and HIV control				
No	77 (19)	36 (18)	41 (21)	0.47
Yes	262 (65)	139 (68)	123 (62)	0.16
Don't know	65 (16)	29 (14)	36 (18)	0.30
Correct understanding by client about association between CD4 and HIV control				
Yes	292 (72)	150 (74)	142 (71)	0.57
No	69 (17)	30 (15)	39 (20)	0.20
Don't know	43 (11)	24 (12)	19 (9)	0.46
Referral to secondary services				
Food aid	72 (18)	46 (23)	26 (13)	0.01
Community based NGOs	52 (13)	30 (15)	22 (11)	0.27
Social services	44 (11)	28 (14)	16 (8)	0.06
Mental health services	18 (4)	13 (6)	5 (3)	0.06
Sexual health				
Offered condoms	262 (65)	153 (75)	109 (54)	0.20
Offered hormonal contraception	86 (21)	49 (24)	37 (19)	0.18

HIV = human immunodeficiency virus; IQR = interquartile range; ART = antiretroviral therapy; NNRTI = non-nucleoside reverse transcriptase inhibitors; PI = protease inhibitor; INSTI = integrase strand transfer inhibitor; VL = viral load; NGO = non-governmental organisation.

has helped relieve some of the pressure on heavily burdened services in high HIV prevalence settings, as shown by the larger number of clients enrolled for HIV care and treatment at Budiriro PCC. However, clients continued to spend significant periods of time waiting for healthcare consultations in primary care-level HIV services. Our findings demonstrate a high level of viral suppression across both sites, supporting the findings of previous studies that task shifting of routine HIV care to nurse-led facilities does not compromise virological outcomes.^{11,12} While virological outcomes were reassuring, a higher proportion of clients underwent viral testing in the hospital clinic than at the PCC. The necessity to return on a different day from the clinical visit for virological monitoring to be performed may be an explanation for this, but this represents a barrier to access of HIV treatment moni-

toring as it requires clients to pay a user fee for an additional visit as well as potential loss of earning potential while attending the clinic.

The attrition between undergoing the viral test and receiving the results is a matter of concern. It is necessary for health care providers to communicate client's virological results in order to address issues related to adherence, drug interactions and if necessary, facilitate regimen change to ensure virological suppression occurs.⁴

The focus of HIV management has until recently focused on immunological and virological outcomes, but optimum care also needs to focus on the psychosocial and sexual health needs of people with HIV.⁵ HIV is associated with an increased risk of infections and other comorbidities such as tuberculosis and cervical

cancer, as well as non-infectious comorbidities such as cardiovascular disease.^{4,7,13} As populations on ART age, the risk of certain comorbidities will also increase, and there is increasing recognition that comprehensive HIV care will need to include screening and management for common comorbidities such as hypertension and diabetes.^{14,15} A recent modelling study in Zimbabwe reported that the mean age of PLHIV will increase to 45 years by 2035, and suggests that at least 26% of PLHIV will have at least one non-communicable disease.¹⁶ In sub-Saharan Africa, the prevalence of chronic kidney disease is estimated to be 13% in the general population.^{17,18} In the case of PLHIV, ART drugs, particularly TDF, is an additional risk factor for development of renal impairment.¹⁹ A 3-monthly clinical review allows the opportunity to screen for such illnesses; however, in general, those on TDF-containing regimens had previously had at least one measurement of their renal function. It is important that such measurements are built into an annual health screen so as to become routine and not just a one-off, potentially ad-hoc event. There was a significant difference between the frequencies of measurement of blood pressure at both sites; although clients attending the hospital clinic were younger, the proportion of those who had blood pressure measured at each visit was significantly higher than at the PCC.

While virological outcomes appeared to be similar by setting in our study, those attending the physician-led, hospital-based facility received more holistic care. Referrals for cervical cancer screening was higher in females attending physician-led services in the hospital-based clinic than in those attending nurse-led services in primary health care; however, overall only 51% of women had ever been referred for the service despite visual inspection with acetic acid and camera (VIAC) testing being available on site at the PCC.

IPT was infrequently offered to clients regardless of setting, despite being recommended in the national guidelines. This may be due to drug supply shortage, challenges in excluding active tuberculosis or inadequate training of staff. Overall, the provision of condoms to clients and family planning was poor in both settings. To note, the proportion of children living in clients households with unknown HIV status was less than 20% overall, and the children of the majority of participants had been offered HIV testing.

There are some limitations to this study: it is a cross-sectional study comparing only two sites and relies on individual recall and client-held records for virological outcomes. However, there were equal numbers interviewed at both sites and both sites were broadly representative of secondary and primary care level. A qualitative component to understand the experiences of clients and health providers in both settings may provide additional insights into the challenges that may exist in accessing and providing services in primary care settings.

The reasons for the differences observed in service provision may reflect staffing type and levels, different levels of training, higher patient load and different level of resources available to providers. While viral suppression outcomes appeared similar, clients accessing primary care were disadvantaged in terms of access to a wider base of screening, referral and preventive services.

In summary, it is necessary to provide equal standards of care to clients attending for HIV care and management to ensure equitable outcomes, whether care is provided by a physician or a nurse. Low-cost screening tests such as blood pressure measurement, mental health screening and cervical cancer screening needs to be strengthened in primary care settings. Further studies should investigate quality of service provision beyond direct HIV treatment outcomes to evaluate the ability of primary care clinics to screen and monitor development of non-communicable diseases that can develop as PLHIV grow older. Standardised guidelines should be accompanied by monitoring and evaluation, as well as adequate support for healthcare providers at primary care level to provide optimum care for the increasing numbers of people accessing HIV care.

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Contexte : La décentralisation de la prise en charge du VIH aux services de soins de santé primaires gérés par des infirmiers est en voie de mise en œuvre dans des pays à revenu faible ou moyen d'Afrique sub-saharienne.

Objectif : Comparer les services offerts aux clients consultant pour la prise en charge du VIH dans un service géré par un médecin et dans un service géré par un infirmier à Harare, Zimbabwe.

Schéma : Une étude transversale a été réalisée à l'hôpital central de Harare (HCH) et dans les structures de soins de santé primaires (PCC) de Budiriro de juin à août 2018. Un questionnaire réalisé lors d'un entretien a permis de recueillir des données relatives aux facteurs sociodémographiques, au traitement du VIH et aux antécédents des clients se présentant pour des soins de routine du VIH. Le test de

Mann-Whitney a été utilisé pour évaluer les différences entre les groupes pour les variables continues. Pour les variables catégoriques, on a utilisé le test du χ^2 .

Résultats : Au total, 404 participants ont été recrutés, d'âge médian 38 ans (IQR 28–47) ; 69% étaient des femmes. La suppression virale a été comparable pour les deux sites (HCH, 70% contre PCC, 80% ; $P = 0,07$). Par contre, le dépistage des comorbidités comme celui du cancer du col (HCH, 61% contre PCC, 41% ; $P = 0,001$) et l'offre de services de référence (HCH, 23% contre PCC, 13% ; $P = 0,01$) ont différé.

Conclusion : Des efforts d'amélioration de la prestation de services en soins de santé primaires sont requis pour assurer l'équité aux usagers des services de santé.

Marco de referencia: En la actualidad se está implementando la descentralización de los servicios relacionados con la infección por el VIH hacia servicios de atención primaria a cargo del personal de enfermería en los países de ingresos bajos y medianos en África subsahariana.

Objetivo: Comparar los servicios que se ofrecen a los usuarios que acuden a los servicios relacionados con el VIH dirigidos por personal médico o personal de enfermería en Harare, Zimbabwe.

Método: Fue este un estudio transversal realizado en el Hospital Central de Harare (HCH) y el consultorio de atención primaria (PCC) de Budiriro de junio a agosto del 2018. Mediante un cuestionario presentado por un entrevistador, se recogieron datos sociodemográficos, información sobre el tratamiento de la infección por el VIH y la historia clínica de los usuarios que acudían a la atención

corriente del VIH. Se evaluaron las diferencias de las variables continuas entre los grupos con la prueba de la U de Mann-Whitney. Las variables categóricas se evaluaron con la prueba de la χ^2 .

Resultados: De los 404 participantes inscritos, la mediana de la edad fue 38 años (IQR 28-47 años); 69% era de sexo femenino. Los datos de supresión viral fueron equivalentes en los diferentes centros (HCH, 70% contra PCC, 80%; $P = 0,07$); sin embargo, se observaron diferencias con respecto a la detección sistemática de enfermedades concomitantes como el cáncer de cuello uterino (HCH, 61% contra PCC, 41%; $P = 0,001$) y la oferta de servicios de remisión (HCH, 23% contra PCC, 13%; $P = 0,01$).

Conclusión: Es necesario introducir medidas que mejoren la prestación de servicios en el entorno de la atención primaria, con el fin de garantizar la equidad a los usuarios de los servicios de salud.