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Scaling up HIV viral load monitoring in Manicaland, Zimbabwe: challenges and opportunities from the field

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Background: Demand for viral load (VL) monitoring is expected to increase; however, implementation of the multifaceted VL testing poses numerous challenges. We report experiences from Médecins Sans Frontiéres (MSF) and partners in the scale-up of HIV VL in collaboration with the Ministry of Health and Child Care (MoHCC) of Zimbabwe.

Methods: A retrospective data review of routine reports from MSF-supported health facilities in Manicaland Province (Zimbabwe) was conducted. These secondary aggregate data were triangulated, and emerging themes of lessons learnt from VL monitoring were shared.

Results: A VL testing coverage of 63% (5966/9456) was achieved among the 40 health facilities, together with a switch rate to second-line antiretroviral therapy (ART) of 46.4% (108/233). The key enablers to scaling-up the VL monitoring were well-equipped and supported VL laboratories, the operationalisation of the on-the-job clinical mentoring and systematic weaning off of better performing health facilities. Concerted efforts from different implementing partners and funders in the HIV programme, and close collaboration with MoHCC were pivotal.

Conclusion: Our experience indicates that clinical mentoring is effective, and resulted in high VL testing coverage and up-skilling primary health care workers in VL monitoring. Attention must be focused on innovations for improving VL result utilisation, especially the identification and management of patients who fail ART.

Following the 2013 World Health Organization (WHO) recommendations,[1] nearly all countries with a high human immunodeficiency virus (HIV) burden have adopted a national policy on routine HIV viral load (VL) testing for monitoring antiretroviral therapy (ART). However, access to routine HIV VL testing remains low, at an estimated 50%.[2] In 2015, the WHO recommended immediate ART for all people infected with HIV.[3] ART has a two-fold benefit: it improves health outcomes and reduces sexual transmission of HIV.[4] Of the estimated 37.9 million people living with HIV, 24 million people are on ART,[5] and require the VL test to monitor treatment. Scale up of routine HIV VL testing in national programmes in high HIV burden low- and middle-income countries is suboptimal.

In 2016, an estimated 1 550 250 adults and children were living with HIV in Zimbabwe, and 86% were on ART.[6,7] With the help of partners, including Médecins Sans Frontiéres (MSF), the Ministry of Health and Child Care (MoHCC) of Zimbabwe published its national HIV VL scale-up plan in 2015 to guide coordinated national HIV VL testing scale-up. This aimed at progressively increasing the proportion of patients on ART accessing VL testing, from a national coverage of 3% in 2014 to 21% by end 2015, 50% by end 2016, 70% by end 2017 to a planned 90% by the end of 2018.[8] The estimated national VL testing coverage in 2017 was 27%.[7]

Implementing HIV VL testing at scale poses multiple challenges, from ensuring that laboratory systems are in place, to supporting clinicians to use VL test results swiftly and accurately, to empowering patients and communities to understand and advocate for VL testing.[9] Lessons learnt from the implementation of CD4 testing suggested that CD4 tests were not performed regularly, and results were hardly used in a timely fashion for patient management; it is possible VL testing face similar barriers.[10] The present brief report seeks to disseminate practices and lessons learnt from MSF's involvement in HIV VL scale-up in collaboration with the MoHCC of Zimbabwe in Manicaland Province.

METHODS

Programme description

In 2012, MSF commenced supporting the implementation of routine HIV VL in Buhera and Gutu Districts, Zimbabwe, where VL coverage was respectively 91% and 74%, while the national HIV VL coverage, mostly targeted VL, was 3%.[11–13] In this initial successful scale up, VL testing using dried blood spot (DBS) was conducted at a centralised National Reference Laboratory (NMRL).

In 2015, HIV VL monitoring was gradually introduced to 40 other primary health facilities (supported by MSF) in five districts of Manicaland (Mutare, Makoni, Mutasa, Chimanimani and Chipinge). This scale up was in collaboration with the Zimbabwe MoHCC, together with partners, which included the Association of Public Health Laboratory (APHL; Silver Spring, MD, USA), Family Health International (FHI360; Durham, NC, USA), the Organization for Public Health Intervention and Development (OPHID; Harare, Zimbabwe) and the US Agency for International Development, among others.

Mentoring programme

The MSF clinical mentors provided clinical mentoring and supportive supervision to 40 MSF-supported health facilities (HFs). The aim was to build capacity among HF staff on monitoring patients on ART using

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KEY WORDS
HIV viral load; low-resource settings; VL monitoring scale-up; clinical mentoring; HIV treatment cascade; partner collaboration; dried blood spot

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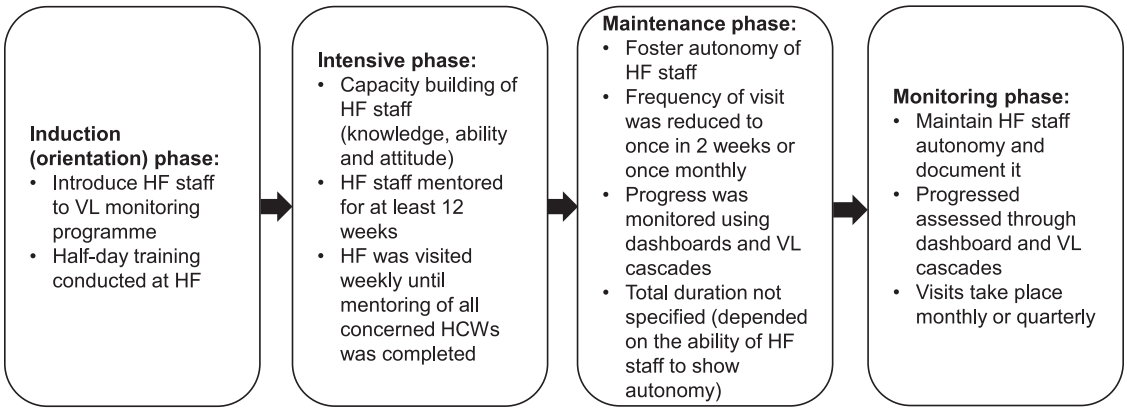

FIGURE 1 Phases in the MSF HF staff mentoring programme. VL = viral load; HF = health facility; MSF = Médecins Sans Frontières.

VL in an effort to operationalise the Zimbabwe MoHCC's mentoring plan in a phased approach (Figure 1).

Each of the four MSF clinical mentoring teams comprised a doctor, two registered general nurses, two patient support mentors and a pharmacy technician. These clinical mentorship teams visited the HFs according to a set schedule; 1-2 HFs were visited per day. Mentees included medical focal ART nurses, counsellors, pharmacists and laboratory technicians. The choice of HF to support was based on the recommendations of the district health executive. Mentorship covered provision of support to identify patients due for VL, management of ART toxicities and opportunistic infections, enhanced adherence counselling (EAC), switching to second-line ART, differentiated service delivery (DSD) models, pharmacy management and provincial laboratory support.

The mentoring was divided into four phases (Figure 1) and involved an orientation period, followed by an intensive phase, and the mentorship maintenance and monitoring phases. HFs that performed well on clinical care and systems issues (based on set targets of quarterly HF dashboard, mentee dashboard and 6-monthly VL cascades) were gradually weaned off from mentoring visits.

The national guidelines recommended routine VL testing for all patients, 6 months after ART initiation, and then annually thereafter.[14] A flagging system was introduced to identify patients with VL above 1000 copies/ml and in need of EAC. Furthermore, mobile phones for tracking patients with high VL who defaulted their review dates were provided. Mentor counsellors worked closely with mentees to track patients with high VL and conduct EACs. EACs are specific counselling sessions offered to patients with high VL over a 3-month period to identify possible adherence barriers before making the decision to switch the patients to a more potent antiretroviral (ARV) regimen. While second-line ART initiation was only possible through the MoHCC referral system by physicians, the MSF mentoring sought to build capacity in the HF staff to enable second-line ART switch among non-complicated cases in HFs.

DSD models of ART refills were implemented, and included facility and community-based models. Mentorship also covered pharmacy management to minimise medicine stock-outs. In case of ARV supply challenges, gap filling was provided, mainly on second-line ART. The HFs were also provided with laboratory VL sample collection kits (DBS/plasma kits).

Laboratory support for HIV VL implementation and scale up efforts were focused on infrastructural upgrades, acquisition of VL testing equipment, procuring of testing commodities and ensuring continued quality management support to the provincial laboratory (Mutare Provincial Hospital Laboratory). One MSF laboratory specialist, one APHL laboratory mentor and one FHI360 Quality Officer mentored Mutare Provincial Hospital (MPH) laboratory staff. The MPH laboratory conducted VL testing for seven districts in the province on five platforms. Nearer HFs (<20 km from the laboratory) submitted whole blood samples, while distant HFs submitted DBS and a centralised sample transport system was used.

Study design

This was a retrospective data review of routinely collected VL monitoring data. The two main data sources used were the '2017 MSF quarterly reports' and the '2017 MSF HIV viral load cascade reports' for Manicaland Province. Secondary aggregate data from these reports were reviewed and lessons learnt from VL monitoring are shared below.

Data variables and analysis

In the HIV VL cascade analysis, the 40 MSF-supported HFs were grouped into small (0–399 active patients), medium-sized (400–699 active patients) and large (>700 active patients) facilities. All the six large HFs and the four medium-sized HFs were purposively chosen for the VL cascade analysis, as mentoring had commenced in these HFs and patients had the highest chance to have progressed furthest along the 'expected' continuum of patient care at a HF after VL test results.

2017 VL cascade report data were collected between 1 January 2016 and 31 August 2017 using physical patient folder reviews in 10 of the 40 MSF-supported HFs in Manicaland Province. All folders of active patients (of all ages) in the selected HFs who initiated ART before 30 September 2016 were reviewed. Data on loss to follow-up (LTFU), death or transfer out was not included in the folder review, as their folders had already been removed from the files of the active cohort.

Ethics

Ethical approval for the study was obtained from the Medical Research Council of Zimbabwe, Harare, Zimbabwe (MRCZ/E/212). As the study data were based on pre-existing routine information (from established programmes), requirement for patient consent was waived. However, patient confidentiality was respected, as no individual patient identifiers were revealed.

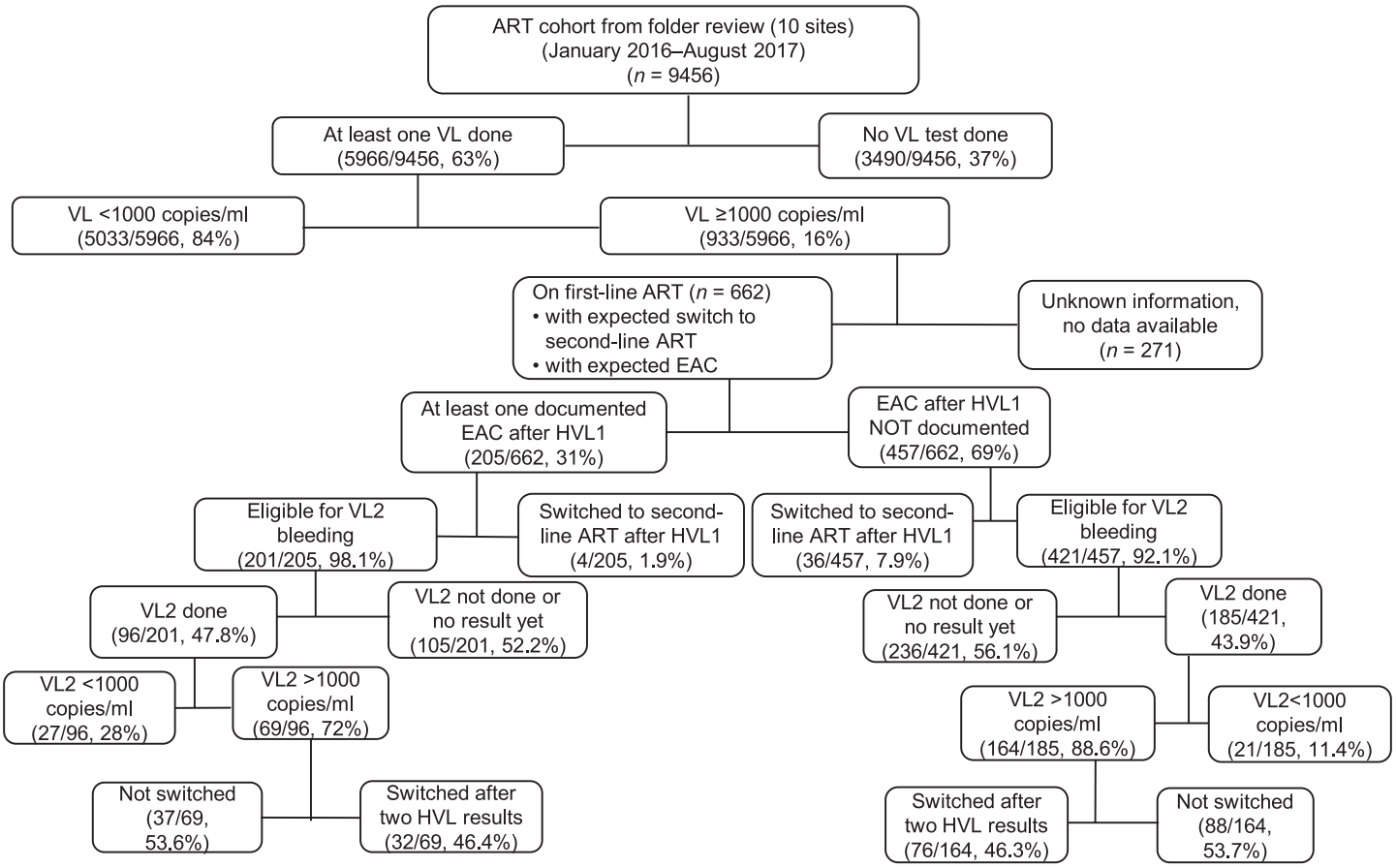

FIGURE 2 HIV VL cascade of the 10 selected sites in Manicaland Province. ART = antiretroviral therapy; VL = viral load; EAC = enhanced adherence counselling; HVL = high VL; HIV = human immunodeficiency virus.

RESULTS

Mentoring

The collaborative-multidisciplinary mentoring approach enabled four MSF teams to provide support to five districts and one provincial laboratory (MPH). A total of 130 professional nurses in 40 health facilities, 50 counsellors, 7 pharmacy technicains, 3 dispensary technicians and 6 laboratory technicians at the MPH laboratory were mentored over a period of 2 years.

Following improvements in the patient folder filling and triaging systems, clinician mentees were able to identify patients needing HIV VL, manage patients with high VL and conduct EACs. Regular scheduled HF visits by the mentors, together with constant availability on telephone, led to improved mentee knowledge, attitudes and skills. Communication and feedback to all stakeholders contributed to strengthening the programme and improved demand for DSD. Difficulties in obtaining laboratory results, and sometimes long turnaround times, were some of the barriers identified to the successful implementation of the scale up programme.

Achieving viral load testing coverage in hospitals and clinics undergoing mentorship

Routine HIV viral load cascade analysis

A total of 9456 patients from 10 selected HFs were eligible for VL, and only 5966 (63%) received at least one VL test (Figure 2). Of the 5966 patients with a VL test, 933 (16%) had detectable VL; however, only 662/933 (70%) were considered for the high VL cascade analysis, as they were on first-line ART regimen, had expected EACs or had switch to a second-line regimen during 1 January 2016 to 31 August 2017. The median age at high VL of the 662 patients was 32 years (interquartile range [IQR] 15–43). The majority of the patients were female (n = 409, 62%). The median time from ART initiation to high VL result was 4.8 years (IQR 2.5–6.1), and the median high VL result was 16 636 copies/ml (IQR 4146–56 109).

Of the 662 patients, 205 (31%) received at least one EAC session after first high VL, 185 (27.9%) received two sessions and 30 (3.6%) received all three sessions. Only 281/622 (45.2%) patients provided blood samples for a second VL and had results available. Of the 341 who did not undergo a follow-up VL testing, only an estimated few (20%) were awaiting for results from the laboratory, while for the majority of the patients, no reasons for the lack of follow-up VL testing was provided.

Of the 281 patients who provided blood samples for a second VL, only 23/281 (8.1%) had a follow-up VL within the recommended 3-month interval with EAC, while the majority (n = 153, 56%) had a repeat VL bleeding time within 91–180 days (average 170 days) from the first high VL results. The average second VL resuppression rate on the first-line regimen was 17% (48/281), and ranged from 4% (Mutare Provincial Hospital) to 100% (Rimbi Clinic).

Among the 10 HFs, 46.4% (108/233) of the patients with unsuppressed follow-up VL were switched to second-line ART after at least two EACs and two consecutive high VLs. Overall, a total of

148/662 (22.4%) patients had their first-line treatment switched to second-line after at least one high VL result (Figure 2).

Maintaining viral load laboratory operations

A total of 55 327 HIV VL tests were conducted in 2017 at the MPH laboratory, with an estimated average machine use of 68%. The overall sample rejection rate at the MPH laboratory was 3.8%, and laboratory technicians worked on a day shift system to increase testing volumes. HIV VL testing volumes increased exponentially, as from the last quarter of 2016 (Q3, 3227 to Q4, 9844). However, the open source Laboratory Information Management Systems (LIMS) used at the MPH laboratory negatively impacted on the turnaround time, as it required internet availability for entering VL testing results and report generation was a challenge.

DISCUSSION

This study indicates that mentoring is possible and effective even with few mentoring teams. The mentorship programme was well-received by mentees as a critical strategy for improving their skills and knowledge in providing quality HIV care to patients across a range of demographic and clinical scenarios, which is in line with other studies.[15,16]

The four-phased mentoring approach plus goal setting and tracking progress using dashboards helped to create HF-level ownership of HIV VL programme scale-up. Regular feedback was important and this helped to identify gaps in performance. The VL coverage (of 63%) achieved in 2017 was higher than the national coverage of 27%,[7] and close to the national intended coverage of 70% by end 2017.[7,8]

The implementation of differentiated ART delivery models helped in decongesting HFs from the ever-increasing ART cohorts, as the package of care for stable individuals involved less frequent HF visits. Other studies have also shown that this reduces the number of clinical visits required by stable patients to not more than once a year.[12,17] However, data on effective models for unstable clients with advanced HIV disease (who comprise nearly a third of people initiating ART) remain limited.

In this review, the second VL detectability rate after EAC sessions was high (83%), and a number of reasons could explain this. First, performance of EACs was low, and if done, they were of poor quality, especially in HFs with few or no lay counsellors. In addition, most HFs initially focused on targeted VL testing of patients who were already failing treatment. Nonetheless, the switch rate (of 46.4%) to second-line ART after two EACs and two consecutive VLs was relatively modest, mainly due to the mentoring support provided that helped simplify the multistage switching process. However, the majority of the patients failed to switch to second-line regimens even after two high VL (53.6%) test results due to the hierarchical nature of the switching process. Nonetheless, the switch rate from this study is comparable to a recent study by Etoori et al. in Swaziland.[18] Furthermore, 40 targeted patients with elevated VL on first-line ART with imminent clinical and immunological failure were also switched to second-line ART. The performance of EAC, including the documentation of EAC undertakings for HIV clients, remained a challenge and there is a need to improve these, together with assessments of the quality of EAC sessions. Nonetheless, with the introduction of dolutegravir,[19,20] there is a need to further explore optimal EAC sessions, as well as the relevance of VL testing, as more patients are expected to be virally suppressed.

In this study, nursing staff at many HFs often had heavy workloads, and this resulted in mentees having multiple responsibilities during mentorship, which partly hindered effective scale-up. Regular meetings and easy accessibility of the mentors enabled the establishment of close relationships with mentees that created a safe space for sharing lessons learnt. In addition, regular thematic meetings chaired by the MoHCC to harmonise implementation strategies and share experiences proved crucial, as partners initially worked on conflicting strategies for the same beneficiaries.

To ensure sustainability of the intervention, autonomy was given to high-performing HFs while bringing MoHCC mentors on board. Furthermore, this VL monitoring project was integrated with MoHCC work at the district, provincial and national levels in terms of capacity building and information sharing.

Limitations

The study was based on routinely collected programme data, which were of suboptimal quality and not complete. Data from patients who transferred out or were LTFU or dead were excluded from the cascade analysis; as their folders had been removed from the files of the active cohort, unaccounted for leakages in the cascade may have biased our findings. Also, since we purposively selected 10 out of the 40 supported sites, the study findings should be generalised to all other sites with caution.

CONCLUSIONS

Despite the small number of clinical mentoring teams, a high VL monitoring coverage was achieved; coordinated efforts among partners were pivotal. The key enablers for the successful implementation of routine VL scale-up include competent and motivated staff, reliable sample and result transport, quality-assured testing laboratories and strong demand creation initiatives. However, the identification and management of patients failing ART needs to be further improved.

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Contexte : La demande de suivi de la charge virale (VL) du virus de l'immunodéficience humaine (VIH) devrait augmenter, mais la mise en œuvre du test multiforme VL pose de nombreux défis. Nous rapportons les expériences de Médecins Sans Frontières (MSF) et de leurs partenaires dans l'expansion de la VL du VIH en collaboration avec le ministère de la santé et des soins aux enfants (MoHCC) du Zimbabwe.
Méthode : Une revue rétrospective des données des rapports de routine des structures de santé soutenues par MSF dans la province de Manicaland (Zimbabwe), a été réalisée. Ces données secondaires agrégées ont été triangulées et les thèmes émergeant des leçons apprises grâce au suivi du VL, ont été partagés.
Résultats : Une couverture du test VL de 63% (5966/9456) a été obtenue dans les 40 structures de santé, avec un taux de passage au traitement antirétroviral (TAR) de deuxième ligne de 46,4% (108/233). Les éléments clés de l'expansion du suivi de la VL ont été, un laboratoire VL bien équipé et soutenu, l'opérationnalisation du mentorat clinique dans le service et le sevrage systématique des structures de santé les plus performantes. Des efforts concertés des différents partenaires de mise en œuvre et des financeurs du programme VIH et une collaboration étroite avec le MoHCC ont été cruciaux.
Conclusion : Les expériences démontrent que le mentorat clinique est efficace; il a abouti à une couverture élevée du test de VL et il a accru les compétences des travailleurs de santé primaire en matière de suivi de la VL. L'attention doit se porter sur les innovations visant à améliorer l'utilisation des résultats du VL, particulièrement l'identification et la prise en charge des patients en échec du TAR.

Marco de referencia: Se prevé un aumento en la demanda de seguimiento de la determinación sanguínea del virus de la inmunodeficiencia humana (VIH); sin embargo, la ejecución de la prueba de la viremia por múltiples participantes plantea numerosas dificultades. En el presente artículo se presenta la experiencia de Médicos Sin Fronteras (MSF) y sus asociados en la ampliación de escala de la práctica de la viremia del VIH, en colaboración con el Ministerio de Salud y Atención de la Infancia (MoHCC) de Zimbabwe.
Método: Se analizaron de manera retrospectiva los informes corrientes de los establecimientos respaldados por MSF en la provincia de Manicaland (Zimbabwe). Se analizaron estos datos secundarios agregados y los temas que surgieron sobre las enseñanzas aprendidas en el seguimiento de la viremia se comentan en el artículo.
Resultados: Se alcanzó una cobertura de la viremia (VL) de 63% (5966 de 9456) en los 40 establecimientos de salud, junto con un índice de cambio hacia medicamentos antirretrovirales (ARV) de segunda línea de 46,4% (108 de 233). Los principales factores facilitadores de la ampliación de escala del seguimiento de la VL fueron la presencia de laboratorios de VL bien equipados y respaldados, la puesta en práctica de tutoría clínica durante el servicio y la concesión sistemática de la autonomía a los centros de atención con mejor desempeño. Los elementos primordiales en los resultados fueron los esfuerzos coordinados entre los diferentes asociados en la ejecución y las entidades financiadoras del programa del VIH y la colaboración estrecha con el MoHCC.
Conclusión: Las experiencias referidas ponen de manifiesto que la tutoría clínica es eficaz, da lugar a una cobertura alta de la VL y consolida las competencias de los trabajadores de la atención primaria en materia de seguimiento de la VL. Es necesario prestar una atención especial a las innovaciones a fin de mejorar la utilización de los resultados de la VL, sobre todo con relación al reconocimiento y la atención de los pacientes con fracaso del tratamiento antirretroviral.

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