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MINISTRY OF HEALTH - ETHIOPIA
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17. EFFECT OF QUALITY IMPROVEMENT INITIATIVE ON VIRAL LOAD TEST ACCESS OF CHILDREN AND ADOLESCENTS LIVING WITH HIV: THE CASE OF YEKA SUB-CITY IN ADDIS ABABA, ETHIOPIA

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Abstract

Background: In low- and middle-income countries, poor virological monitoring among children and adolescents living with HIV (CALHIV) continues to impede timely identification of treatment outcomes. This study aimed to evaluate the effect of a quality improvement (QI) initiative on increasing viral load test access for CALHIV in Yeka sub-city, Addis Ababa.

Methods: A QI initiative was implemented from January to April 2023 to improve viral load testing rates among CALHIV attending public health facilities in Yeka sub-city. Baseline viral load testing rate was 46% in December 2022. The QI initiative involved training of community health workers on QI methods, root cause analysis, development of key driver diagrams and testing of change ideas using PDSA cycles. The primary outcome was the proportion of eligible CALHIV receiving viral load testing. Run charts were used to assess changes over time.

Results: Following implementation of QI initiatives, viral load testing rates increased from 46% at baseline to 95% by April 2023. The run chart showed shift and trends on 13 consecutive data points, indicating a significant improvement.

Conclusion: The QI initiative resulted in substantial improvements in viral load testing rates among CALHIV in Yeka sub-city health facilities. QI approaches embedded within clinical settings can successfully improve quality of care and patient outcomes in resource-limited settings.

Keywords: HIV, quality improvement, viral load, children, adolescents, Ethiopia

Background

In Ethiopia, there are approximately 20,000 children and adolescents living with HIV (CALHIV) [1]. Ensuring effective HIV treatment and care for this vulnerable population is essential to reduce HIV-related morbidity and mortality as well as prevent further transmission [2].

A key component of HIV care is routine virological monitoring to assess treatment outcomes and detect potential treatment failure [3]. However, access to viral load testing remains limited in many low- and middle-income countries like Ethiopia [4]. Barriers such as inadequate laboratory infrastructure, shortage of trained staff, high costs and poor patient follow up contribute to sub-optimal viral load monitoring among CALHIV.

Inadequate viral load testing leads to delays in identifying patients failing therapy, resulting in accumulation of resistance mutations and disease progression. There is a clear need for targeted efforts to improve viral load access and treatment monitoring for CALHIV in resource-limited settings.

In Yeka sub-city of Addis Ababa, baseline data from December 2022 showed that only 46% of eligible CALHIV had received viral load testing, well below national targets. To address this gap, Mekdim Ethiopia National Association (MENA) collaborated with Yeka sub-city health authorities to implement a quality improvement (QI) initiative from January to April 2023.

Objective

The objective of this QI initiative was to improve viral load test access for children and adolescents living with HIV in Yeka sub-city, Addis Ababa from 46% to 95% over 4 months from January to April 2023.

Methods

Design and Setting

This was a QIP implemented using Model for Improvement (MFI) QI methods to improve viral load testing rates among CALHIV attending public health facilities in Yeka sub-city, Addis Ababa.

QI Team and Intervention

A QI team comprising of community health workers and health facility staff was formed. Team members were trained on QI methods, including root cause analysis, process mapping, PDSA cycles and use of run charts.

The QI initiative proceeded in phases:

- Root cause analysis: Fishbone diagrams and driver diagrams were used to explore reasons for low viral load testing rates
- Development of change ideas: Potential solutions were proposed based on identified barriers
- Testing and implementation: Change ideas were tested using iterative PDSA cycles and implemented if successful in improving testing rates
- Monitoring: Run charts were used to track viral load testing rates over time

Data Collection and Analysis

The primary outcome was the proportion of eligible CALHIV who received viral load testing. Testing data was extracted from patient records and charts. Run charts displaying monthly viral load testing rates were constructed. Special cause variation was defined as 8 or more consecutive data points above or below the median.

Measures:

Outcome measures

- Proportion of children and adolescent who viral load testing during this period

Process measures

- Number of community engagement facilitator assigned
- Proportion of health facilities which use reminder for tracing those children and adolescent who not yet come for viral load testing
- Proportion of children and adolescent who have changed their address and traced.

Results

Root Cause Analysis

The fishbone diagram (Figure 1) outlines the key factors contributing to low viral load testing rates. These included health system issues like inadequate staff training, poor patient tracking and supplies shortage. Patient-related factors like stigma, lack of awareness and transportation costs also impacted access.

Baseline data were collected before the intervention using COMMCARE (mobile database) and client charts, observation and HEWs and health workers were interviewed and pictures have been taken before and after applying model for improvement.

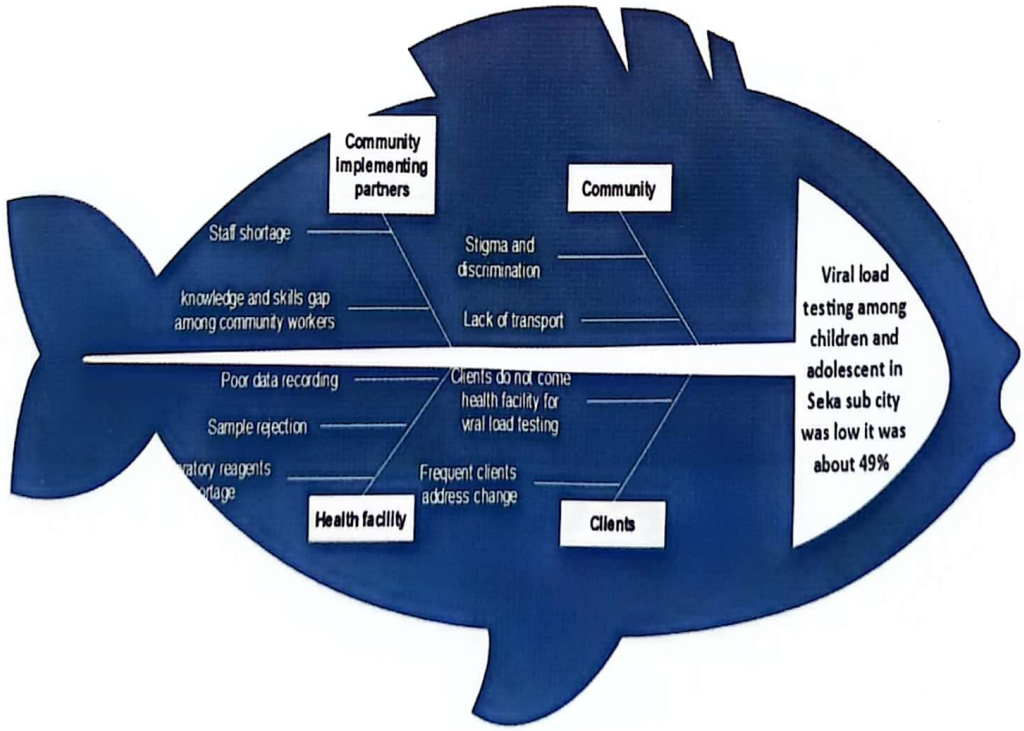


Figure 1. Root cause analysis for viral load testing at Yeka sub-city

Key Change Ideas

Based on the root cause analysis, three change ideas were prioritized for testing (Table 1).

Table 1. Key change ideas tested in the QI initiative

Change Idea	Description	Intended Impact
1. Assign community engagement facilitator	Dedicated facilitator to track patients and improve documentation	Improve patient follow-up and data quality
2. Use calendars as reminders	Provide calendars marked with VL testing dates	Improve patient appointment attendance
3. Physical tracing of defaulting patients	Home visits and calls for patients missing appointments	Increase testing rates for high-risk patients

PDSA Cycles

After prioritizing change ideas using focusing matrix, the QI team directly started to implement the change ideas. The change ideas being considered were: assigning community engagement facilitator will improve recording, use reminder and tracing for viral load testing the community engagement facilitator identified those children who either have either viral load test result and who do not. Then, she updated the clients medical record and also mobile database she uses. The QI team also oriented the facilities' ART focal person to make sure those clients whose viral load is approaching. Social case worker traces those clients who frequently change their address onsite. Then, the QI team got update on the implementation of those change ideas and the run chart updated.

The change ideas were tested using a series of PDSA cycles from January to April 2023. Modifications were made based on lessons learnt in each cycle.

Monitoring of Outcome

At the implementation site level, there was monthly QIT meeting. During the meeting, QIT members discussed the overall QIP implementation status of the project and direction had been provided to the CEFs, SSWs through a QIT focal person. Furthermore, focused mentorship and couching for QIT members were conducted. The data quality checks had also been conducted at all level (SNU to HF level).

We started this QI project by starting to implement the change ideas simultaneously. Thus, the findings of this QI project is a cumulative effect of all change ideas tested.

The run chart (Figure 2) shows the impact of the QI initiative on viral load testing rates. Testing rates improved from 46% at baseline to 52% in the first month. A spike to 82% was seen in February although this dipped to 75% in March. Testing rates increased steadily from March onwards, reaching 95% in April, meeting the target.

The run chart shows special cause variation with 13 consecutive data points above the median, indicating significant improvement attributable to the QI initiative.

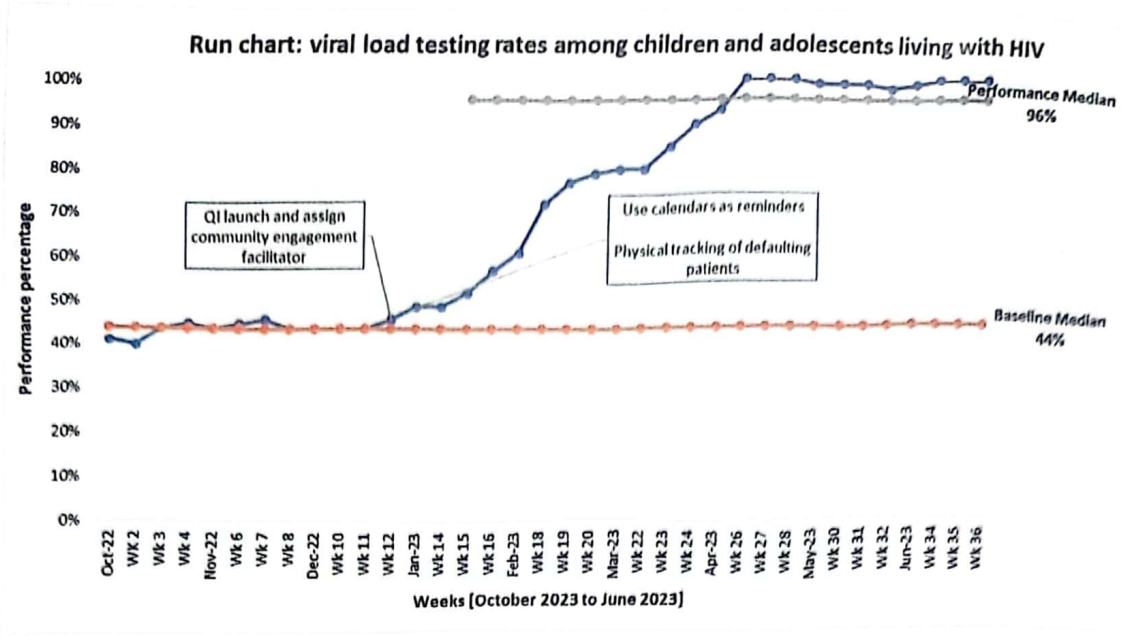


Figure 2. Run chart showing performance of the QI project

Lessons Learnt

Several important lessons were learnt during implementation of this QI project:

- QI tools like root cause analysis and PDSA cycles were easy to apply in this setting and helped guide appropriate solution development
- Consistent mentoring and coaching of team members were essential for successful execution of the change ideas
- Periodic data quality audits were needed to ensure accuracy of reported metrics
- Support and engagement of facility managers and staff were crucial for uptake and sustainability of changes
- Run charts provided a simple yet robust method to track improvements

Conclusion

This QI initiative demonstrated that a relatively short-term, focused intervention using QI methods can substantially improve viral load testing rates for CALHIV in urban Ethiopian health facilities. The project provides an example of how quality of HIV care can be improved in resource-limited settings through application of QI approaches. The change ideas and implementation strategies can be translated to other facilities and contexts to further strengthen treatment monitoring for this vulnerable population. Continuous QI efforts will help consolidate and sustain these initial gains.

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