Enhancing advanced HIV screening: Innovating with the ''Hub and Spoke'' testing model in Tanzania

891

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BACKGROUND

- Despite of global adoption of the World Health Organization ***'Test and Treat'*** policy the proportion of people living with HIV (PLHIV) presenting with advanced HIV disease (AHD) remains high at around **30%** in Tanzania.
- PLHIV with AHD face an elevated risk of mortality primarily due to opportunistic infections (OIs) such as tuberculosis and cryptococcal meningitis (CM).
- Tanzania Health Promotion Support (THPS) accelerated -AHD screening by improving access to CD4 testing and early detection of OIs, particularly cryptococcal infection (CI) to facilitate timely treatment.

METHODS

In 2019, Kigoma, Pwani, and Shinyanga regions, THPS collaborated with the local government health management teams to introduce new interventions:

- **Revived CD4 testing** for all newly diagnosed PLHIV along with reflex Cryptococcal antigen (CrAg) testing through sensitization of health care providers (HCP), developed standard operation procedure for AHD screening and weekly monitoring.
- The HCPs trained on AHD screening and management, including CD4 testing for all newly enrolled to care and laboratory reflex CrAg testing at the laboratory for all samples with CD4 counts of <200 cells/μL.
- Integrated CD4 testing within established HIV viral load sample transportation system using the ***'HUB and SPOKE' model.***
- THPS collaborated with the Ministry of Health to ensure **periodic preventive maintenance** of the CD4 testing machine at the 78 (32%) points of care (PoC) testing, and to maintain **constant availability of reagents.**
- Test results were documented in the client card and entered into the care and treatment database which captures all cascades.
- Extracted data from the HIV care and treatment clinic database, assessing the identification of AHD after the intervention through CD4 testing
- The analysis focused **only on newly enrolled PLHIV.**

RESULTS

-Integrating sample transportation led to 167 (68%) supported facilities without CD4 machines to access CD4 measurement and CrAg screening at the hub sites.

*-The proportion of newly enrolled PLHIV tested for CD4 at 245 supported facilities rose from **1,912 (7%)** in 2020 to 14,364 (94%) in 2023.*

-The proportion of samples with CD4 counts <200 undergoing laboratory-reflex CrAg testing increased from 169 (36%) in 2020 to 1,903 (82%) in 2023.

-In 2020, 55 (33%) PLHIV tested CrAg positive, 104 (20%) in 2021, 112 (11%) in 2022 and 110 (6%) in 2023.

-The identification of PLHIV with cryptococcal meningitis progressively increased from 15 in 2020 to 39 in 2023.

Figure 1: Integrated "Hub and Spoke" Sample Management & Transportation Model

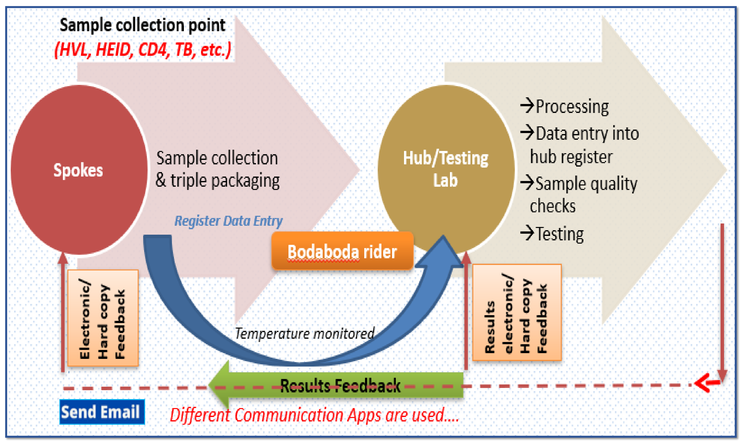


Figure 2: CD4 Testing Trend among People Living with HIV in three regions in Tanzania 2020 - 2023

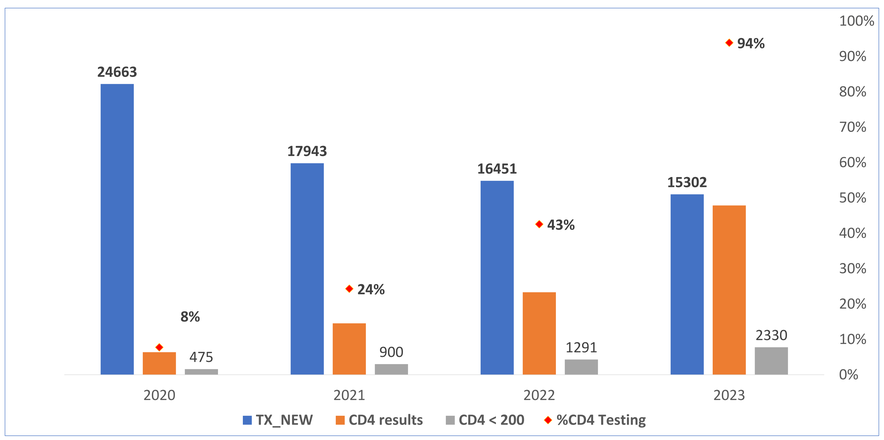
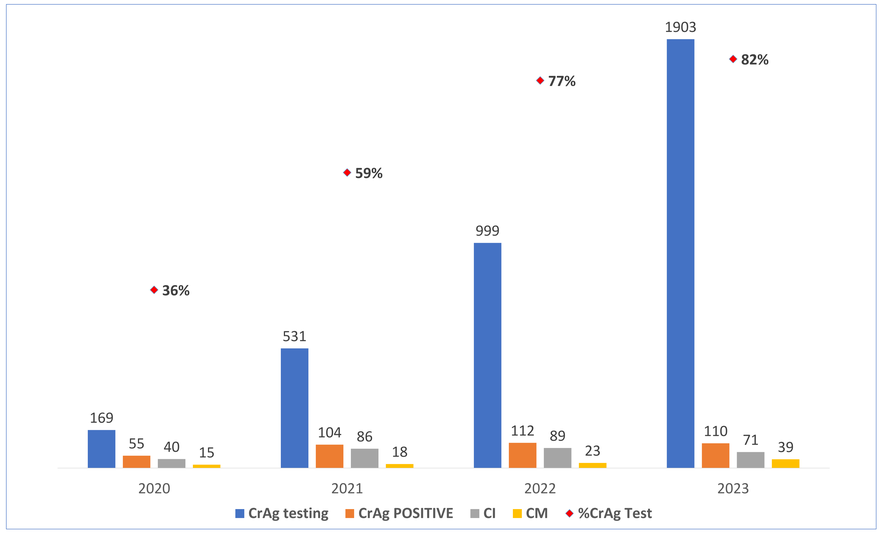


Figure 3: CrAg Testing Trend among People Living with HIV in three regions in Tanzania 2020 - 2023



CONCLUSIONS

- Improved access to CD4 testing among newly diagnosed PLHIV increased the detection of individuals with AHD and asymptomatic cryptococcal infection.
- Integrating sample transportation was a feasible approach to improve AHD screening among newly diagnosed PLHIV in resource-constrained settings.

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