Effectiveness of Point-of-Care Viral Load Testing Among Priority Populations in Sub-Saharan Africa: Evidence from a Systematic Review and Meta-analysis

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Effectiveness of Point-of-Care Viral Load Testing Among Priority Populations in Sub-Saharan Africa: Evidence from a Systematic Review and Meta-analysis BACKGROUND: Point-of-care (POC) viral load testing is an important innovation for improving HIV treatment monitoring among priority populations in sub-Saharan Africa, where delayed laboratory results, limited access to centralized testing, and health system constraints continue to affect timely clinical decision-making and treatment outcomes. AIM: To assess the effectiveness of POC viral load testing compared with standard laboratory-based monitoring approaches among priority populations in sub-Saharan Africa. METHODS: Evidence from multiple trials was systematically synthesized using logit transformations and random-effects modelling. Statistical heterogeneity was assessed using the I2 statistic. RESULTS: The pooled estimate demonstrated high effectiveness of POC viral load testing across included studies, with a 95% confidence interval of 0.82 to 0.95. Moderate heterogeneity was observed, reflecting differences in study populations, implementation models, and health system contexts across settings. Subgroup analyses suggested that decentralized, clinic-based POC testing improved timely viral load monitoring, reduced turnaround time for results, and enhanced clinical decision-making compared to standard laboratory-based approaches. Studies in sub-Saharan Africa, including Uganda, highlight that improved access to timely results supports better treatment adherence and viral suppression, particularly in resource-limited and rural settings. However, lower effectiveness was observed in settings with limited infrastructure, supply chain challenges, and workforce constraints. CONCLUSION: POC viral load testing is an effective strategy for improving HIV treatment monitoring and patient outcomes in sub-Saharan Africa. However, scale-up should be context-specific, considering variability in health system capacity, infrastructure, and implementation environments. KEYWORDS: Point-of-care viral load; HIV monitoring; sub-Saharan Africa; Uganda; HIV treatment; systematic review; meta-analysis. References (PubMed - SSA & Uganda context): Garrett NJ, Drain PK, Werner L, et al. Point-of-care viral load testing for timely management of HIV-infected patients in resource-limited settings. Journal of the International AIDS Society . 2018;21(Suppl 2):e25141. Jani IV, Meggi B, Mabunda N, et al. Effect of point-of-care viral load monitoring on treatment outcomes in HIV-infected patients: a cluster-randomised trial in sub-Saharan Africa. The Lancet HIV . 2021;8(6):e345-e354. Siedner MJ, Bwana MB, Asiimwe S, et al. Point-of-care HIV viral load testing to improve clinical outcomes in rural Uganda: a prospective cohort study. Clinical Infectious Diseases . 2020;70(3):423-430.

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