

Title: Immunological Treatment Failure Among Adult Patients Receiving Highly Active Antiretroviral Therapy in East Africa: A Systematic Review and Meta-Analysis

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Abstract

Background: Minimizing antiretroviral treatment failure is crucial for improving patient health and for maintaining long-term access to care in low-income settings such as eastern Africa. To develop interventions to support adherence, policymakers must understand the extent and scope of treatment failure in their programs. However, estimates of treatment failure in eastern Africa have been variable and inconclusive.

Objective: This systematic review and meta-analysis sought to determine the pooled prevalence of immunological failure among adults receiving antiretroviral therapy in eastern Africa.

Methods: We performed a systematic search of the PubMed, Google Scholar, Excerpta Medica Database, and the World Health Organization's Hinari portal (which includes the Scopus, African Index Medicus, and African Journals Online databases) databases. Unpublished studies were also accessed from conference websites and university repositories. We used Stata version 14 for data analysis. The Cochrane Q test and I^2 test statistic were used to test for heterogeneity across the studies. Due to high levels of heterogeneity, a random effects model was used to estimate the pooled prevalence of immunological failure. Begg and Egger tests of the intercept in the random effects model were used to check for publication bias.

Results: After removing duplicates, 25 articles remained for assessment and screening. After quality screening, 15 articles were deemed eligible and incorporated into the final analysis. The average pooled estimate of immunological treatment failure prevalence was found to be 21.89% (95% CI, 15.14-28.64). In the subgroup analysis conducted by geographic region, the pooled prevalence of immunological treatment failure in Ethiopia was 15.2% (95% CI, 12.27-18.13) while in Tanzania it was 53.93% (95% CI, 48.14-59.73). Neither the results of Egger test or Begg tests suggested publication bias; however, on visual examination, the funnel plot appeared asymmetric. The large heterogeneity across the studies could be explained by study country.

Conclusion: Immunological treatment failure among patients receiving antiretroviral therapy in eastern Africa was high, and greater than previously reported. The relatively low rates of treatment failure found in Ethiopia suggest that its health extension program should be studied as a model for improving adherence in the region. (*Curr Ther Res Clin Exp.* 2021; 82:XXX-XXX)
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