

# Opportunistic infections in HIV: diagnostics, management & outcomes in rural Ethiopia

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## Introduction

Human immunodeficiency virus (HIV) prevalence in Ethiopia is 1.0 (95% credibility interval 0.7-1.4) per 100,000 population; ten-fold higher than the UK (1). In Amhara region, north-eastern Ethiopia, 1.2% (95%CI 0.7-1.4) of people had HIV in 2016 (2). While antiretroviral therapy (ART) has improved outcomes in most countries; economically deprived rural areas still struggle with treatment retention and viral suppression. Thus immunocompromised patients suffer from infections they otherwise would not; contributing to a higher rate of mortality. Lalibela hospital in Amhara has some diagnostic laboratory capacity and an outpatient HIV department delivering ART. It is unclear whether there are facilities for opportunistic infections in advanced HIV infection (CD4 cell count <200/ml) (3). This project aims to understand local hospital capacity in addressing diagnosis and management of opportunistic infections among HIV infected people, as well as patient outcomes.

## Objectives

1. Describe HIV patient care pathway in the Lalibela healthcare system.
2. Describe diagnostic and management facilities in Lalibela hospital.
3. Describe outcomes among patients in care.

## Methods

This project involved a mixed methods approach, incorporating qualitative and quantitative aspects. The qualitative approach involved guideline review and semi-structured interviews with local health care providers. The qualitative approach involved gathering health system indicators in the form of aggregate counts. This indicator data was gathered during the semi-structured interviews and included:

- Total catchment population
- Number HIV cases in hospital cohort
- Number cases with advanced HIV (CD4 cell count < 300 cells/mm<sup>3</sup>)
- Number of patients with laboratory tests for opportunistic infections
- Number of patients testing positive for opportunistic infections
- Number of patients virally suppressed

## Results

### Patient care pathway

A decentralised healthcare system serving an ~350,000 catchment population; with 5 community health centres reporting to Lalibela hospital and 25 health posts reporting to each health centre, Figure 1.

- All hospital departments offer HIV RDT (high suspects tested)
- Health posts also have HIV RDT testing
- Initial and annual follow-up at hospital
  - CD4, Viral load, malnutrition screening
- Medication dispensed at health centres
  - Ease of access leading to better continuity of care
- All health care free under national insurance
- National HIV programme supported by the Global Fund for HIV, TB and Malaria

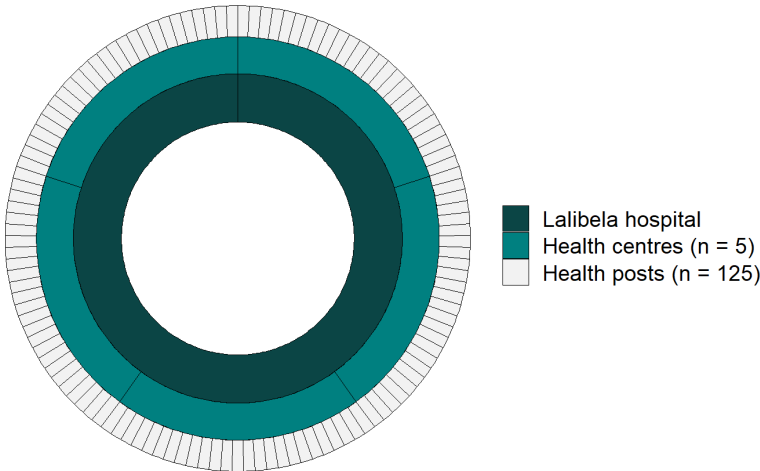


Figure 1: Visualisation of the health system in the Lalibela hospital catchment area

### Diagnostics & management

There is a clear patient management pathway defined by a national programme. The hospital has well resourced laboratory capacity, which is supported by the US Centre for Disease Control and Prevention as well as Tulane University. The available lab test and management at the hospital level are displayed in Table 1.

- Viral load and HIV resistance testing sent to capital lab (25 days for results)
- CD4 count tests available at hospital
- All patients presenting with CD4 count <350 prophylactically given broad spectrum ABx against diarrhoea and fungal infections

Table 1: Diagnostic and management facilities for HIV associated OIs

Disease	Diagnostics	Management
Tuberculosis	Microscopy PCR	Negative: prophylatic Isoniazide Positive: Tripple therapy
Sexually Transmitted Infections	ELISA	Broad spectrum ABx
Cryptococcal Meningitis	Culture	Appropriate ABx
Viral Hepatitis (B & C)	PCR ELISA	Patient pays privately for test, managment privately in capital

### Outcomes

With the national pharmacy association supplying hospitals, there are infrequent ruptures. However there are shortages of second line ARV. Despite this there are quite impressive outcomes as seen in Figure 2.

- 88% of those in the cohort are virally suppressed
- Among those with OIs: 55 had diarrhoea or skin infections, only 1 patient with extrapulmonary TB

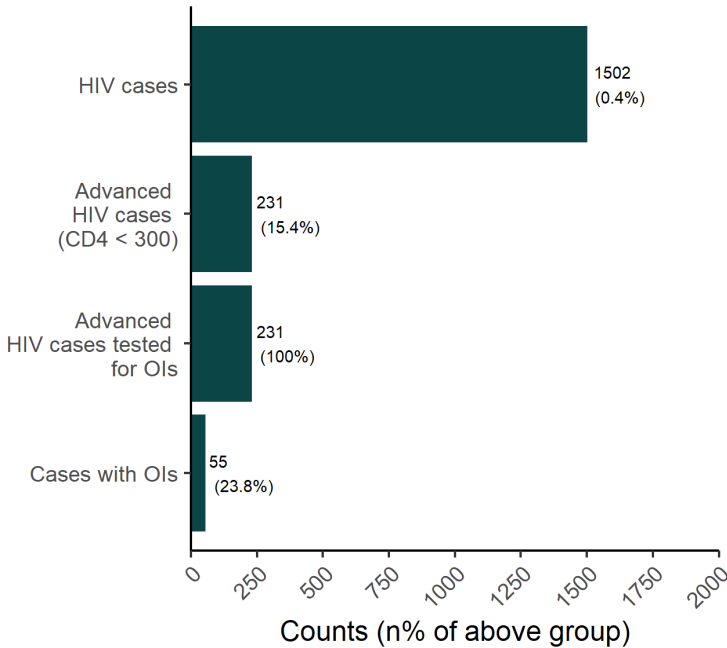


Figure 2: Cascade of care for opportunistic infections among HIV infected patients (N = 350,000)

## Discussion / Conclusion

The estimated HIV prevalence based on the hospital catchment population is much lower than literature described values for the region. This along with the anecdotal reasoning that Lalibela prefecture is better off than the surrounding region may explain the very impressive outcomes. Nevertheless this appears to be a well structured and resourced health system for addressing opportunistic infections in HIV patients. Future studies should consider the impact on TB monotherapy on antimicrobial resistance prevalence, as well as the potential impact of making viral hepatitis testing and management locally available free of charge.

## References

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