Introduction
The World Health Organization (WHO) recommends that patients taking antiretroviral therapy (ART) for HIV have routine viral load (VL) monitoring to identify patients with poor adherence or viral resistance. Several MSF projects are assisting ministries of health with implementing VL monitoring in settings where it has been unavailable previously. The purpose of this analysis was to identify factors associated with a high VL in order to identify groups that should be prioritised for VL testing.

Methods
Using retrospectively-collected data of 21,909 patients in MSF-supported ART programmes in Kenya, Malawi, Swaziland, and Zimbabwe, we did a multivariate analysis of cross-sectional data of the first ever VL test results of patients tested between October 2011 and May 2013 according to local testing protocols, and measured using Biocentric (Swaziland), bioMérieux (Malawi and Zimbabwe), or Roche (Kenya) analyzers. Adjusted risk ratios (aRR) were used to determine factors associated with a high VL (≥1,000 copies/ml).

The analysis met the MSF-ERB criteria for an exemption, from full ethics review.

Results
Of the patients, 6.9% were aged <15 years, and 5.5% had suspected treatment failure. Of those aged 15 to 60 years, the median time on ART was 33 months, and 68.7% were female.

Overall, 12.8% had a high VL, ranging from 10.1% in Malawi, to 14.3% in Zimbabwe (Figure 1). VL was undetectable or <1,000 copies/ml in 87.1%, 1,000 – 5,000 copies/ml in 4.4%; and ≥5,000 copies/ml in 8.6%.

The risk of a high VL (Figure 2) was higher among children (<10 years), adolescents (10 – 20 years) and young adults (20 – 25 years) those aged ≥25 years, higher among males than females; and higher among patients with suspected treatment failure than those having routine monitoring, but there was no trend by time on ART.

Conclusion and Recommendations
A substantial proportion of patients without suspected treatment failure had a high VL, demonstrating the importance of routine VL monitoring. However, programmes phasing-in routine VL monitoring should prioritise testing of those with suspected treatment failure or aged <25 years, and should also provide interventions to improve ART adherence among patients with a high VL in order to avert treatment failure.

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