Background: Undetectable viral load (VL) is a key measure of successful antiretroviral therapy (ART). Having 90% of patients on ART and achieving an undetectable VL is one of the 90:90:90 by 2020 targets. In this global analysis, we investigated the proportions of adult and paediatric patients with VL suppression in the first three years after ART initiation. Factors associated with VL suppression after one year of ART initiation were then evaluated.

Methods: Adult and paediatric patients from the International Epidemiological Databases to Evaluate AIDS cohorts who initiated ART between 2010 and 2014 were included. We estimated the proportion with VL suppression (<1000 copies/mL) at one, two and three years from ART initiation using two methods: (i) strict intention-to-treat (ITT) – loss to follow-up (LTFU) and dead patients counted as having detectable VL; and (ii) modified ITT – LTFU and dead patients were excluded. Logistic regression was used to identify factors associated with viral suppression using modified ITT.

Results: A total of 35561 adults from 38 sites in 16 countries and 2601 children from 18 sites in 6 countries were included. When comparing strict ITT with modified ITT methods, the proportion achieving VL suppression at three years from ART initiation changed from 45.1% to 90.2% in adults, and 60.6% to 80.4% in children. In adults, older age, higher CD4 count pre-ART, homosexual/bisexual HIV exposure compared to heterosexual exposure were associated VL suppression at one year after ART initiation. In children, older age and higher CD4 percentage pre-ART were factors associated with VL suppression.

Conclusions: Major improvement in treatment outcomes can be achieved through earlier ART initiation. Reaching the 90/90/90 targets is more challenging for children and require additional resources and effort compared to adults. Greater emphasis should be made to minimise LTFU and maximise patient retention in HIV-infected patients of all age groups.

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