



HIV DRUG RESISTANCE

GLOBAL REPORT ON EARLY WARNING INDICATORS OF HIV DRUG RESISTANCE

JULY 2016

TECHNICAL REPORT

**GLOBAL REPORT
ON EARLY WARNING
INDICATORS OF HIV
DRUG RESISTANCE**

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WHO Library Cataloguing-in-Publication Data

Global report on early warning indicators of HIV drug resistance: technical report, July 2016.

1. Drug resistance, Viral. 2. Anti-HIV Agents – therapeutic use. 3. HIV Infections. I. World Health Organization.

ISBN 978 92 4 151117 9

(NLM classification: WC 503.2)

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Layout L'IV Com Sàrl, Villars-sous-Yens, Switzerland.

Printed in South Africa.

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ACRONYMS

ART	Antiretroviral therapy
ARV	Antiretroviral (drugs)
CI	Confidence interval
DRC	Democratic Republic of the Congo
EWI	Early warning indicator of HIV drug resistance
GEE	Generalized estimating equation
GAP	Global Action Plan
HIVDR	HIV drug resistance
LMIC	Low- and middle-income countries
LTFU	Loss to follow-up
NNRTI	Non-nucleoside reverse-transcriptase inhibitor
NRTI	Nucleoside reverse-transcriptase inhibitor
PI	Protease inhibitor
PrEP	Pre-exposure prophylaxis
UNAIDS	Joint United Nations Programme on HIV/AIDS
WHO	World Health Organization

ACKNOWLEDGEMENTS

This report was written by Michael R. Jordan (Consultant, HIV/AIDS Department), Natalie Dean (Consultant, HIV/AIDS Department), David Maradiaga (Consultant, HIV/AIDS Department), and Silvia Bertagnolio (HIV/AIDS Department), who coordinated the overall report development with Meg Doherty (HIV/AIDS Department). We are grateful for the contributions of Judith Van Holten (Consultant, HIV/AIDS Department), Hiwot Haile-Selassie (Consultant, HIV/AIDS Department), and Jhoney Barcarolo (Consultant, HIV/AIDS Department). This work would not have been possible without the collaboration of national HIV programme managers and staff, who supplied the data underpinning the report.

Funding to support this work came from the Bill & Melinda Gates Foundation and the United States President's Emergency Plan for AIDS Relief.

EXECUTIVE SUMMARY

With increasing global use of antiretroviral therapy (ART) to both treat and prevent HIV, and increasing global trends in HIV drug resistance (HIVDR), efforts to improve HIV programme quality and prevent the emergence and transmission of drug-resistant HIV must be strengthened. In many low- and middle-income countries (LMIC), HIVDR testing is neither routinely available nor recommended for individual patient management. However, monitoring patient and clinic factors associated with the emergence of preventable HIVDR is comparatively inexpensive, and can be used to identify gaps in the quality of ART service delivery favouring the emergence of HIVDR. Several ART programme and clinic factors are associated with the emergence of HIVDR or with successful population-level viral load suppression. These factors, or early warning indicators (EWIs) of HIVDR, include: the prescribing of ART according to national or international guidelines; loss to follow-up (LTFU) and retention on ART 12 months after treatment initiation; on-time pill pick-up; on-time appointment keeping; pharmacy stock outs; and viral load suppression. Monitoring and the site level quality improvements in response to EWIs form the foundation of HIVDR prevention, and link WHO-recommended surveillance of HIVDR to programmatic interventions designed to minimize it. EWI definitions and targets follow an international standard, and the World Health Organization (WHO) recommends that countries monitor them on an annual basis through the implementation of the *Consolidated strategic information guidelines for HIV in the health sector*.¹

This global report is based on 59 countries that reported data from more than 12 000 clinics from cohorts of patients receiving ART between 2004 and 2014. The report includes the most recent clinic-level data reported to WHO in 2015–2016 and reflects a lag due to the 12 month cohort reporting period. Globally, amongst the clinics reporting data, high levels of appropriate antiretroviral (ARV) drug prescribing were observed, with over 99% of people prescribed regimens according to national or international HIV treatment guidelines. Global levels of LTFU at 12 months during the same period averaged 20%, exceeding the WHO-recommended target of 15%. Moreover, global levels of LTFU among clinics reporting data increased significantly over time, from 11.9% in 2004 to 24.5% in 2012 ($p < 0.001$). Globally, retention on ART at 12 months averaged only 73.5% amongst clinics reporting data, falling short of the WHO-recommended target of 85% or above. Estimates of retention varied considerably across regions. Adherence, as estimated by on-time pill pick-up and on-time appointment keeping, fell below global targets. On-time pill pick-up was a strong predictor of clinic-level viral load suppression ($p < 0.001$) suggesting that identifying clinics with less-than-desirable pill pick-up, then targeting their patient populations for adherence interventions, may lead to improvements in overall population-level outcomes. Amongst 1150 clinics monitoring drug stock outs, 35.7% had at least one drug stock out of routinely dispensed ARV drugs during their respective reporting year, thus failing to attain the WHO-recommended target of no ARV drug stock outs.

This report examines national and regional EWI prevalence estimates to compare performance over time within and across regions. In general, significant variability of clinic performance within countries was noted. EWI methods use colour-coded score cards (performance strata) to visualize clinic performance, which facilitate identification of gaps in service delivery. From a country perspective, understanding clinic-level variability of EWI results is critical to improving overall programme performance. Variability should be explored to characterize best practices to improve quality and facilitate their application in clinics not achieving global EWI targets.

Depending on the nature and extent of the problems identified, countries have responded to EWI results through various policy changes, both at the ART programme and clinic levels. Examples of documented actions include: strengthened record-keeping systems; training of providers in optimal ARV prescribing practices; operational research on defaulter tracing to identify suitable approaches to early identification and re-engagement to care; increased resources for patient tracing given to clinics struggling with retention; implementation of SMS reminders to improve adherence; and changes in record-keeping

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