

UNAIDS/WHO WORKING GROUP ON  
GLOBAL HIV/AIDS AND STI SURVEILLANCE

WHO WORKING GROUP ON HIV  
INCIDENCE ASSAYS MEETING REPORT

# ESTIMATING HIV INCIDENCE USING HIV CASE SURVEILLANCE

10–11 DECEMBER 2015  
GLION, SWITZERLAND



### **UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance**

Global surveillance of HIV and sexually transmitted infections is a joint effort of the World Health Organization (WHO) and the Joint United Nations Programme on HIV/AIDS (UNAIDS). The UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance, initiated in November 1996, is the main coordination and implementation mechanism for UNAIDS and WHO to compile the best information available and to improve the quality of data needed for informed decision-making and planning at the national, regional and global levels.



HIV/AIDS Programme

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# CONTENTS

<b>ABBREVIATIONS</b>	<b>iv</b>
<b>1. BACKGROUND</b>	<b>1</b>
<b>2. OBJECTIVES, METHOD OF WORK AND EXPECTED OUTCOMES</b>	<b>2</b>
<b>3. UPDATES ON HIV INCIDENCE ASSAY WORK</b>	<b>3</b>
3.1 Highlights from the 2015 technical update on HIV incidence assays for surveillance and monitoring purposes	3
3.2 Target product profiles update: case-based surveillance and HIV incidence assays	3
3.3 Incorporation of HIV incidence assays into population-based surveys: crossover issues for case-reporting systems	4
3.4 Development of WHO guidance on case-based surveillance and patient monitoring systems	5
<b>4. INCORPORATING HIV INCIDENCE ASSAYS INTO PROGRAMMES AND CASE-BASED SURVEILLANCE SYSTEMS</b>	<b>7</b>
4.1 Incorporating HIV incidence assays into genitourinary medicine clinics in England	7
4.2 Considerations for incorporating HIV incidence assays into case-based surveillance systems in central Asia	7
4.3 Potential contributions of assays for estimating HIV incidence in the prevention of mother-to-child transmission programme, Democratic Republic of the Congo	8
4.4 Opportunities for incidence assay validation and estimation in the ALPHA Network	9
4.5 MeSH support for HIV surveillance case-reporting guidelines and tools: measuring impact	9
4.6 Developing recommendations for incorporating HIV incidence assays into HIV case-based and programme surveillance	10
<b>5. EXPERIENCES IN ESTIMATING NEW HIV INFECTIONS IN HIV CASE-BASED SURVEILLANCE SYSTEMS</b>	<b>11</b>
5.1 Estimation of HIV incidence in the United States	11
5.2 Estimation of HIV incidence in Australia	12
5.3 Estimation of HIV incidence in France	13
5.4 Estimation of HIV incidence in the United Kingdom	13
5.5 Estimation of HIV incidence in Canada	14
5.6 Estimation of HIV incidence in ECDC	15
5.7 Estimation of HIV incidence in Brazil	16
5.8 Estimation of HIV incidence through UNAIDS country support	16
<b>6. GENERAL DISCUSSION ON METHODS PRESENTED AND PARAMETERS NEEDED AND APPLICABILITY; DATA REQUIREMENTS FOR COUNTRIES</b>	<b>18</b>
<b>7. DRAFT MATRIX: HIV INCIDENCE ESTIMATION MODELS USING CASE-BASED SURVEILLANCE DATA: DATA REQUIREMENTS, ASSUMPTIONS, EXISTING TOOLS AND OUTPUTS</b>	<b>19</b>
<b>ANNEX 1 AGENDA: MEETING AGENDA</b>	<b>24</b>
<b>ANNEX 2 LIST OF PARTICIPANTS</b>	<b>26</b>
<b>REFERENCES</b>	<b>27</b>

# ABBREVIATIONS

<b>AIDS</b>	acquired immunodeficiency syndrome
<b>ALPHA</b>	Analysing Longitudinal Population-based HIV-AIDS data on Africa
<b>ANC</b>	antenatal clinic
<b>ART</b>	antiretroviral therapy
<b>ARV</b>	antiretroviral
<b>CASCADE</b>	Concerted Action on SeroConversion to AIDS and Deaths in Europe
<b>CDC</b>	Centers for Disease Control and Prevention
<b>CEPHIA</b>	Consortium for the Evaluation of the Performance of HIV Incidence Assays
<b>CI</b>	confidence interval
<b>DBS</b>	dry blood spot
<b>DHS</b>	Demographic Health Survey
<b>DRC</b>	Democratic Republic of the Congo
<b>ECDC</b>	European Centre for Disease Prevention and Control
<b>EIA</b>	enzyme immunoassay
<b>EPP</b>	Estimation and Projection Package
<b>FIND</b>	Foundation for Innovative New Diagnostics
<b>FRR</b>	false recent rate
<b>GUM</b>	genitourinary medicine
<b>GUMCAD</b>	genitourinary medicine clinic activity dataset
<b>HIV</b>	human immunodeficiency virus
<b>ID</b>	identity document
<b>LA<sub>g</sub></b>	SEDIA HIV1 Lag-Avidity enzyme immunoassay
<b>MDRI</b>	mean duration of recent infection
<b>MeSH</b>	Measurement and Surveillance of HIV Epidemics
<b>MPES</b>	Multi-Parameter Evidence Synthesis
<b>MSM</b>	men who have sex with men
<b>PEPFAR</b>	President's Emergency Plan for AIDS Relief (United States)
<b>PLHIV</b>	people living with HIV
<b>PMTCT</b>	prevention of mother-to-child transmission
<b>PHE</b>	Public Health England
<b>PrEP</b>	pre-exposure prophylaxis
<b>PWID</b>	people who inject drugs
<b>RITA</b>	recent infection testing algorithm
<b>SOP</b>	standard operating procedure
<b>SWOT</b>	strengths, weaknesses, opportunities and threats
<b>TPP</b>	target product profile
<b>UNAIDS</b>	Joint United Nations Programme on HIV/AIDS
<b>UNSW</b>	University of New South Wales
<b>VL</b>	viral load
<b>WB</b>	western blot

# 1. BACKGROUND

In 2008, WHO established a Working Group on HIV Incidence Assays to look into the issues and challenges involved in assay-based estimation of HIV incidence (i.e. the number of new infections that occur in a population per period of time). The Working Group comprises epidemiologists, laboratory specialists and public health officials, and has worked to standardize terminology in the areas of assay calibration and validation.

Several meetings to advance the agenda have been held, and copies of reports are available on the Working Group's webpage.<sup>1</sup> The meetings have successfully brought together a wide group of assay users (in particular, from countries affected by the epidemic who may consider using HIV incidence assays in the future) and key experts in the field who apply laboratory-based methods for estimating HIV incidence. They have also highlighted the importance of HIV incidence as a key indicator of national programme success or failure. Clearly, ministries of health need to be aware of the complexities of producing estimates based on data generated by the currently available assays.

In collaboration with the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, the Working Group has:

- produced a guidance document on how to estimate HIV incidence at the population level using HIV incidence assays in cross-sectional surveys; and
- provided technical updates in the use of HIV incidence assays.

This information has been incorporated into the updated guidelines on monitoring the impact of the HIV epidemic using population-based surveys (1). In addition, UNAIDS/WHO have produced regular technical updates.<sup>2</sup>

In many countries, surveillance of HIV infection relies mostly on HIV or AIDS case-based surveillance. Such surveillance is currently defined as a reporting system through which all new cases of HIV infection detected (i.e. diagnosed) at any stage are reported over time. HIV case notification makes reference to the methods used to capture information at the individual level about those diagnosed with HIV infection. However, the variable and often long time between infection and diagnosis means that HIV case surveillance does not directly reflect current patterns of virus transmission or incidence. Trends in the number of reported cases can result from changing

patterns in HIV incidence, uptake of HIV testing or both. This limitation in the interpretation of diagnosis data underscores the need to measure HIV incidence to monitor HIV transmission.

Several methods for estimation of HIV incidence have been used in both developed and developing countries, including cohort studies, back calculation, modelling of repeated cross-sectional measures of prevalence, and cross-sectional use of biomarker assays for recent infection. The use of data from HIV case-based surveillance poses a new challenge to HIV-estimation methodology.

The United States and some European countries have developed and applied methods that use data from routine case-based surveillance to estimate HIV incidence. These approaches are promising and their implementation could be expanded to other developed countries.

An overview of the development of guidance for estimating HIV incidence with a recent infection testing algorithm (RITA) using case-based surveillance data was presented at the Working Group meeting in Barcelona in 2014. Consensus was reached during the meeting that the guidance should continue to be developed, because case reporting is becoming increasingly common in middle- and lower-income countries. In addition, WHO and partners are developing a guide to case surveillance and patient monitoring, to promote and improve HIV case reporting and the HIV national response in the health sector. These systems develop and link different databases; therefore, the UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance is exploring how these new information sources could be used in estimating incidence.

<sup>1</sup> [http://www.who.int/diagnostics\\_laboratory/links/hiv\\_incidence\\_assay/en/](http://www.who.int/diagnostics_laboratory/links/hiv_incidence_assay/en/)

<sup>2</sup> [http://www.who.int/hiv/pub/me/tech\\_update\\_0513/en/](http://www.who.int/hiv/pub/me/tech_update_0513/en/)

## 2. OBJECTIVES, METHOD OF WORK AND EXPECTED OUTCOMES

Incidence assays and other data collected in a case-surveillance system are used for two purposes: to identify new infections among diagnosed cases and to estimate HIV incidence at population level. The objectives of the workshop were to:

- review the different approaches used to estimate new infections and incidence in countries;
- agree on the inputs needed and the assumptions for new HIV infection cases, and how to estimate incidence using data collected by HIV case-reporting systems;
- agree on the methods and conditions for the application of the HIV incidence testing; and
- develop final recommendations on the methods and requirements for using HIV case-reporting data to estimate HIV incidence.

The 2-day meeting was dedicated to discussion of how to estimate HIV incidence using case reporting, and the methods used in some countries to achieve this. Expected outcomes were to:

- share progress on application of HIV incidence assays on HIV case reporting in different countries, and other methods such as CD4 count and back calculation; and
- provide a matrix of methods that can be used for HIV incidence estimation, with the parameters needed and the conditions under which to use such methods in countries with HIV case-reporting systems.

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