



Training in the use of HIV incidence assays to estimate HIV incidence at population level

In collaboration with the Centers for Disease Control and Prevention (CDC), Family Health International (FHI), South African Centre for Epidemiological Modeling and Analysis (SACEMA,) and other institutions, the HIV incidence Working Group has produced a guidance document on "*How to estimate HIV incidence at the population level using HIV incidence assays in cross-sectional studies*".

http://www.who.int/diagnostics_laboratory/links/hiv_incidence_assay/en/.

To further disseminate these guidelines and how to use them a three days training program has been design by SACEMA, WHO and CDC to increase capacity for countries that are going to use HIV incidence tests.

Purpose: to train participants in the basic tools of estimating HIV incidence at population level using HIV incidence assays.

Methods of work

The agenda and presenters are listed in Annex 1. The first two days of the training will dedicated to the discussion of statistical approaches to estimate the mean duration of recency and statistical issues around estimating HIV incidence using cross-sectional surveys.

Each session consists of:

- Formal theory presentation
- Training on spreadsheet or R based tools
- Interactively worked examples
- Assignments for off-site self-study

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Post-workshop support:

- Free email and phone support for participants
- Available for formal collaboration or in-country consultancies

Expected results

Upon completion of the course, participants should be able to:

- Define incidence and explain the main methods of incidence estimation
- Explain definitions of core concepts associated with incidence estimation
- Understand and implement simple cohort-based incidence point estimates and confidence intervals
- Understand and implement simple cross sectional incidence point estimates and confidence intervals
- Test hypotheses that incidence at a site is below or above a threshold
- Test Hypothesis that incidence at two sites is equal
- Assess power of a study design through type two error rate and coefficient of variation
- Determine sample size requirements from epidemiological context
- Interpret and follow up 'unexpected' results of calculations
- Provide elementary training on the tools to country based colleagues

Participants: Maximum of 20 people

Countries that are conducting or planning to use HIV incidence assays. WHO and CDC will announce the course and participants will cover their own cost for travel and hotel. SACEMA will facilitate the booking and logistics.

Participants should have:

- working laptop with a spreadsheet application and R statistical software (easy to download)
- Basic knowledge of HIV epidemiology
- basic knowledge of bio statistical concepts such as sampling, measurement/counting uncertainty, distributions, etc.

Date and Place: three working days in Stellenbosch, South Africa **May 2-4, 2012**

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Annexe 1:

Draft Agenda

Session 1 - Preliminaries

- Defining Incidence and Prevalence
- Contrast incidence *rate* with weekly/annual risk of infection
- Measuring Incidence and Prevalence – samples and cohorts
- Kinds of measurements (PE's, CI's, P values, errors, posteriors)
- Examples

Session 2 – Cross sectional Incidence in an ideal world

- imagine you can perfectly test for “infection time < w”
- imagine have an FRR=0 test
- View mean duration of recent infection in different ways: (individual trajectories of response, distribution of times, survival curve)
- Does it matter whether incidence is constant (compare to cohort)

Session 3 – when the false recent rate is not zero

- Unusual progression on biomarkers – examples
- problems with defining ‘recent infection’
- defining ‘false recent’ results

Session 4 – Statistical considerations - calculating sample size, power etc

- What determines the size of a confidence interval?
- How to evaluate evidence for an incidence trend
- How to choose a cross sectional survey size.
- What is, and what determines ‘power’?
- How to use the simple spreadsheet tools

Session 5 – Estimating properties of the recent infection test

- How to estimate an FRR
- How to estimate mean duration of recent infection
- Issues with designing studies for estimating test properties

Session 6 – Putting it all together

- Establishing the properties of potential recent infection tests

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- Choosing a recent infection test for your study
- Choosing a sample size for your question
- Presenting results

Session 7 – Trouble shooting

- How to find evidence that there is trouble with the results
- What if spreadsheets or other tools give nonsensical results (silly sample sizes, confidence intervals including values below zero, etc)
- Resources for theory
- Resources for collaboration