

**Background**

- Cross-sectional incidence testing will be used for Population based HIV Impact Assessments in Kenya and Uganda countries where a significant portion of the population is infected with HIV-1 subtype D
- Incidence testing is being performed using the Limiting Antigen Avidity Assay (LAg-Avidity). Manufacturer’s recommendation is to classify recent infections for those samples with a normalized optical density < 1.5 and a viral load (VL) > 1000 copies/mL
- Performance characteristics for this testing algorithm is characterized with a mean duration of recent infection (MDRI) and a false recent rate (FRR).

- Incidence is calculated as recent (FRR x total HIV+) x (365 days - MDRI) x 100 total HIV- in survey MDRI

**Methods**

- **Rakai Community Cohort Study (RCCS)**
  - Population based HIV incidence cohort in 10 parishes in Rakai District
  - Subjects recruited at health centers and in a school environment.
  - Subject eligibility criteria: All individuals 15 years and older were eligible to participate if they had resided in the study area for at least six months.

- **Ugandan FRR Estimates**

**Results**

- **Comparison of Cross-Sectional Incidence Testing to Observed Incidence**
  - **Round 13**
    - 9977 subjects with an R12 visit
    - 6748 subjects with an R14 visit

- **RCCS Samples Tested and Comparisons Made**

- **HIV subtype distribution**
  - 45% A, 55% D

- **HIV-** total 45% A, 55% D
- **HIV+** total 45% A, 55% D

- **Survey MDRI FRR Incidence (95%CI) Observed Incidence**
  - 2009 Survey Round 130 0.6 1.43% (0.97, 2.30) 1.05% (0.90, 1.23)
  - 2009 Survey Round 184 4.8 0.67% (0.00, 1.68) 0.66 (0.52, 0.83)
  - 2012 Survey Round 184 4.8 0.67% (0.00, 1.68) 0.66 (0.52, 0.83)
  - 2012 Survey Round 184 1.1 1.98% (1.65, 2.70) 0.66 (0.52, 0.83)
  - 2012 Survey Round 130 0.6 2.55% (1.51, 3.59) 0.66 (0.52, 0.83)

- **RCCS Point Estimates of Incidence**
  - **RCCS R13 2008-2009**
    - 6729 HIV+, 1244 HIV+ on ART
    - 84 LAg < 1.5
    - 69 LAg < 1.5 + VL>1000
    - 822/886 tested by LAg
    - 0.66 (95%CI 0.52, 0.83)
  - **RCCS R15 2011-2013**
    - 912 HIV+, 1244 HIV+ on ART
    - 423/985 HIV+ on ART
    - 8729 HIV-, 1244 HIV+
    - 49 LAg < 1.5 + VL>1000
    - 0.66 (95%CI 0.52, 0.83)

- **Per protocol LAg-Avidity + Viral Load MDRI and FRR assumptions greatly overestimated HIV incidence**
  - Nearly 4 fold excess incidence estimated in Round 15 survey
  - The change in incidence was opposite of observed
  - Big assumptions made on which MDRI and FRR to use
  - Using an MDRI proportional to the subtype distribution and a survey specific FRR, estimated incidence was close to observed incidence
  - The FRR varied greatly by survey

**Conclusions**

- **Per protocol LAg-Avidity + Viral Load MDRI and FRR assumptions greatly overestimated HIV incidence**
- **Nearly 4 fold excess incidence estimated in Round 15 survey**
- **The change in incidence was opposite of observed**
- **Big assumptions made on which MDRI and FRR to use**
- **Using an MDRI proportional to the subtype distribution and a survey specific FRR, estimated incidence was close to observed incidence**
- **The FRR varied greatly by survey**

**Acknowledgements**

- We thank the cohort participants, laboratory and clinical staff at RHSP, for their excellence and dedication to this study.
- This work was supported by a Division of Intramural Research, National Institute of Allergy and Infectious Diseases, National Institutes of Health. Additional support was provided by R21AI058548 and 2UM1 AI068613.
- The Rakai Community Cohort Study (RCCS) was provided by the National Institutes of Health (R0A134262), the National Institute of Allergy and Infectious Diseases (R01AI134383), and the National Institute of Child and Health Development [5P30HD06826].