Status and Projected Course of the HIV Epidemic in Uganda

Results of 2016/17 UPHIA and Other Surveillance Sources

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Introduction / Background

• We track the magnitude and dynamics of HIV to inform target setting, resource mobilisation / allocation, strategic planning and evaluation of programmes

• Involves triangulation of data from various sources:
  • We mainly use spectrum to triangulate demographic / population surveillance data, routine service, etc
  • We also project the future course of the HIV epidemic
  • We present highlights of estimates for 2018/19 and UPHIA, to keep it simple, present only national estimates

• UPHIA 2016/17
  • Cross-sectional household-based survey (approx 13,000 HH)
  • Nationally and regionally representative
  • Focused on measuring impact through HIV Incidence and VL
UPHIA Findings: HIV Prevalence Among Adults 15 – 64 yrs) was 6.2%, but highly heterogenous by covariates
HIV Burden: Estimates No PLHIV still expanding albeit at a reduced rate
88% of HIV infections appear to have been diagnosed, on treatment; but 5% long-standing infections not diagnosed and 5% long-standing, diagnosed, previously on treatment.

- Among adults, we estimate that:
  - Approx 90,000 HIV infections not yet diagnosed, one-third being incident infections
  - Approx 67,000 long-standing infections already diagnosed but disengaged from care
  - Prevalence of undiagnosed HIV infections may be <1%, so Uganda took a correct decision to go for highly targeted testing
UPHIA HIV Incidence Test Algorithm took into account the circulating sub-types, OD, VLS and plasma ARVs

- HIV Incidence estimates were based on LAg Assay where the MDRI was dependent on the sub-type of HIV in circulation
- Samples with plasma ARVs were excluded from recent infections

![UPHIA HIV-1 Subtype Distribution](image)

1. ODn: normalized optical density
2. LAg: Limiting Antigen
3. mL: milliliter
4. ARV: antiretroviral
**UPHIA HIV Incidence Estimate** was 0.4% or approximately 73,000 New HIV infections, close to Spectrum estimate.

![Graph showing new HIV infections and incidence estimates](image-url)

<table>
<thead>
<tr>
<th></th>
<th>PHIA</th>
<th>Spectrum 2016</th>
<th>Spectrum 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>New HIV Infections</td>
<td>0.4</td>
<td>0.3</td>
<td>0.26</td>
</tr>
<tr>
<td>Incidence estimates</td>
<td>73,000</td>
<td>60,000</td>
<td>50,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total 15-64 yrs</th>
<th>Male</th>
<th>Female</th>
<th>Urban</th>
<th>Rural</th>
<th>15-24</th>
<th>25-34</th>
<th>35-49</th>
<th>50-64</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-24 yrs</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
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<tr>
<td>25-34 yrs</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
</tr>
<tr>
<td>35-49 yrs</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
</tr>
<tr>
<td>50-64 yrs</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
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</tbody>
</table>
New HIV Infections declined during past decade but not sufficiently to meet Fast Track Targets

Correct to focus on AFYW
UPHIA - Viral Load Suppression Among Adults – Heterogenous Across Regions and by Age groups

VLS

- West Nile: 60.5%
- North East: 70.0%
- Mid-North: 54.6%
- Central 2: 56.9%
- Mid-West: 55.3%
- Kampala: 62.1%
- Mid-East: 52.9%
- East Central: 48.8%
- South West: 68.0%

Males  Females  Total
Achievement of 90-90-90 goals among HIV-positive adults by sex, UPHIA 2016-17

Diagnosed: awareness was defined as self-reporting HIV positive and/or having a detectable antiretroviral (ARV) in the blood.

On Treatment: being on ART was defined as self-reporting current use of ART and/or having a detectable ARV in the blood.
Spectrum Estimates of the Trends in HIV Testing – Treatment Cascade

In formulating this cascade, ART numbers for the period 2015 – 18 were discounted by 15% on account of data quality.
Age and Gender Specific HIV-Testing and Treatment Cascade 2019

Clinical Cascade

Number of People

Age

Number of People

130000
80000
50000
20000
70000
120000
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-80
80+
AIDS-Related Mortality Declined significantly during the past decade, possibly meet Tast Track targets.

**TRENDS IN AIDS RELATED MORTALITY 2010-18**

AIDS Mortality

- **Averted**

- **Percent**

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**AIDS Related Mortality By Popn Sub Groups**

- Males
- Females
- Percent

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**Agegroups**

- All
- 15 yrs+
- 15 - 49 yrs
- 50 yrs+
- 15-24 yrs
- 10-19 yrs
- 0-14 yrs

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**2010-2018**

- 2010: 9,717
- 2011: 7,001
- 2012: 5,833
- 2013: 1,168
- 2014: 1051
- 2015: 994
- 2016: 2,716
- 2017: 100%
- 2018: 76%

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**Percent**

- 2010: 100%
- 2011: 76%
- 2012: 60%
- 2013: 16%
- 2014: 9%
- 2015: 9%
- 2016: 24%
- 2017: 0%
- 2018: 10%
Vertical Infections – Persisting problem, but what are the causes

![Graph showing trends in MTCT and MTCT averted]

![Chromatic bar chart showing sources of new HIV child infections in Uganda]
Heterogenous Pattern of Vertical Infections Among Geographical Regions

- Estimates for three regions shown
- Different pattern of vertical infections in the various regions apparent
  - Defaulting on ART significant across all regions but more marked in Central 1&2
  - NE Region predominantly – not starting ART at all
  - Mid East having a higher proportion of incident infections in Pregnancy and during BF period
UPHIA 2016/17: Still High Proportion of PLHIVs with low CD-4

<table>
<thead>
<tr>
<th></th>
<th>&lt;100</th>
<th>100-199</th>
<th>200-349</th>
<th>350-499</th>
<th>≥500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previously diagnosed, on ART</td>
<td>4.0</td>
<td>17.5</td>
<td>23.6</td>
<td>50.9</td>
<td></td>
</tr>
<tr>
<td>Previously diagnosed, not on ART</td>
<td>4.5</td>
<td>8.3</td>
<td>15.4</td>
<td>22.5</td>
<td>49.3</td>
</tr>
<tr>
<td>Not previously diagnosed</td>
<td>2.77</td>
<td>18.3</td>
<td>23.0</td>
<td>48.9</td>
<td></td>
</tr>
</tbody>
</table>

**Sex**
- Male: 5.0, 6.1, 25.5, 25.1, 38.2
- Female: 2.9, 4.9, 13.2, 22.3, 56.8

**Residence**
- Rural: 3.3, 5.3, 18.3, 23.4, 49.7
- Urban: 4.3, 5.4, 16.2, 23.1, 51.1

The chart shows the distribution of CD-4 levels among PLHIVs in different statuses and regions.
Prevalence of Syphilis and Co-infection with HIV

<table>
<thead>
<tr>
<th>Region</th>
<th>% ever infected</th>
<th>% active infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Nile</td>
<td>1.6%</td>
<td></td>
</tr>
<tr>
<td>Mid North</td>
<td>2.3%</td>
<td></td>
</tr>
<tr>
<td>North East</td>
<td>1.8%</td>
<td></td>
</tr>
<tr>
<td>East Central</td>
<td>2.8%</td>
<td></td>
</tr>
<tr>
<td>Mid East</td>
<td>1.0%</td>
<td></td>
</tr>
<tr>
<td>Central 2</td>
<td>3.2%</td>
<td></td>
</tr>
<tr>
<td>Central 1</td>
<td>2.0%</td>
<td></td>
</tr>
<tr>
<td>Souh West</td>
<td>1.8%</td>
<td></td>
</tr>
<tr>
<td>Mid West</td>
<td>2.3%</td>
<td></td>
</tr>
<tr>
<td>Kampala</td>
<td>1.2%</td>
<td></td>
</tr>
</tbody>
</table>
Prevalence of Hepatitis B Infection and Co-infection with HIV

<table>
<thead>
<tr>
<th>Region</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Nile</td>
<td>3.8%</td>
</tr>
<tr>
<td>Mid North</td>
<td>4.6%</td>
</tr>
<tr>
<td>North East</td>
<td>4.4%</td>
</tr>
<tr>
<td>Central 2</td>
<td>2.0%</td>
</tr>
<tr>
<td>East Central</td>
<td>2.7%</td>
</tr>
<tr>
<td>Mid East</td>
<td>2.1%</td>
</tr>
<tr>
<td>Kampala</td>
<td>1.9%</td>
</tr>
<tr>
<td>South West</td>
<td>0.8%</td>
</tr>
<tr>
<td>Central 1</td>
<td>1.6%</td>
</tr>
<tr>
<td>Uganda</td>
<td>4.1%</td>
</tr>
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<table>
<thead>
<tr>
<th>HIV Status</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV positive</td>
<td>6.3</td>
<td>3.8</td>
<td>4.7</td>
</tr>
<tr>
<td>HIV negative</td>
<td>3.0</td>
<td>1.8</td>
<td>2.4</td>
</tr>
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<table>
<thead>
<tr>
<th>Residence</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>2.8</td>
<td>1.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Rural</td>
<td>3.1</td>
<td>1.9</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Is Uganda on Course to Meet Fast Track Targets for HIV Epidemic Control?

- New HIV Infections
- AIDS Mortality

Targets - New Infections
Target - AIDS Mortality

Incidence: Mortality Ratio

Target
What will it take for Uganda to Attain HIV Epidemic Control
Cost effective / High Impact interventions: We are already focussing on CE and Impactful interventions

- SMC – cost saving
- ART for Males and Females
- Condoms – cost saving
- HCT
- PMTCT
- PREP for HR and MR not LR
- Cash Transfers

The other interventions appear to either have the potential for reduction of few infections, or do so at high cost
Achieving Fast Track target could potentially avert 670,000 new HIV infections during 2018-30 (70% of projected infections for this period).
Meeting Fast Track targets could potentially avert 230,000 AIDS-related mortality during 2018-30 (60% of projected mortality)
The super-fast track i.e. meeting triple 95 targets by 2020, and meeting 80% coverage targets for SMC, condoms among high risk groups, BCC, etc will potentially avert up to 665,000 new HIV infections during 2018-30.
Plans for UPHIA2020

• Plans underway to conduct another Population-based Survey in 2020 – UPHIAlite – UPHIA2020,
  • aim to provide results by 1st Dec 2020 in order to assess achievement of 2020 targets

• Primary Objectives
  • To estimate national and sub-national viral load suppression of people 15 years and older

• Secondary Objectives: To estimate the following in people 15+ years
  • Prevalence (%) and number of HIV-infected people
  • The number of new HIV infections (incidence)
  • The behaviors of HIV infected people
  • Other programme coverage and outcome indicators
Plans for UPHIA2020

- Only HIV biomarkers: HIV prevalence, CD-4 counts, VL, HIVDR, plasma ARVs
- Smaller sample size, approximately 25,000 adults
- No estimates for children
- Protocol already cleared by UVRI SEC, awaiting clearance by CDC and University of Columbia – IRBs and also to UNCST
- Training of field workers already commenced in November / December 2019
- Field work expected February – June 2019
- Preliminary results expected by 1st December 2020
Summary / Conclusions

• Uganda significantly reduced new HIV infections and AIDS-related mortality during the past decade

• Meeting Fast-track HIV epidemic control targets could potentially to avert 665,000 new HIV infections and 230,000 AIDS-related deaths during 2018 – 20

• HIV incidence decline during 2010-20 appears to fall short of the Fast Track targets; AIDS-related mortality appears to be on track.

• HIV Epidemic control will perhaps require increasing coverage and uptake of efficacious intervention with strategic balance between HIV prevention and efficient HIV treatment services
Summary / Conclusions

• Gender differences in HIV incidence and mortality - disproportionate HIV incidence among females especially AGYW and AIDS mortality among adult males and children

• Apparent shift of HIV burden to older individuals calls for focus on management of HIV in the elderly involving strengthening the integration of HIV treatment and other NCDs

• Vertical infections remain high, driven mainly by women LTFU, women not enrolled on ART, and incident infections during pregnancy and BF, but with significant regional heterogeneity in these patterns of transmission
Acknowledgement

• Uganda HIV estimates Interest Group
  • MoH, UAC, UBOS, UNAIDS, UNICEF, CDC, USAID, WHO, USAID-SITES

• Technical Assistance Partners
  • Avenir Health (formally Futures Institute); UNAIDS; UNAIDS Reference on Estimates and Projections, WHO, CDC, USAID-SITES

• UPHIA Partners
  • MoH/ACP, UVRI, UBOS, UAC, CDC-Uganda, CDC Atlanta, USAID, USAID-SITES, ICAP,