Economic cost analysis of community-based distribution of HIV self-test kits in Malawi, Zambia & Zimbabwe (Submitted to JAIS)

Presentation outline

• Background
  • Global situation
  • Study setting
• Methodology
  • Overview of costing approach
• Results
  • Key setting characteristics
  • Costs per HIVST kit distributed
  • Key cost composition
  • Results summary
• Conclusions
Background

• Free HTS & ART have led to lower (42%) AIDS-related deaths
• 24% of PLHIV remain undiagnosed (testing “gap”)
  • Innovative approaches, new technologies + greater financial investment
• WHO recommends HIV Self-Testing to:
  • Complement conventional HTS approaches
  • Reach at risk & untested populations
• HIVST kit prices still twice that of standard rapid diagnostic
  • Declining - US$2/OraQuick® HIV Self-Test in 50 LMIC’s
• Impact analyses show important public health benefit & value for money
  • Targets based on prevalence of undiagnosed HIV & hard to reach populations
>1 million HIVST kits delivered since August 2016
  - Malawi, Zambia & Zimbabwe
  - VMMC, Key populations, Health facility & Community based

Impact evaluation + cost analysis of community HIVST delivery
  - Unit cost ($) per HIVST kit distributed
  - Establish key cost ($) drivers
  - Cost effectiveness modelling (ongoing)

to inform policy & contribute to evidence-base supporting:
  - Successful roll-out of optimal &
  - Cost-effective HTS delivery strategies
Setting - HIV-Self-Testing AfRica (STAR)

• CBDA model
  • Household distribution of OraQuick® HIV Self-Test kits
  • CBDAs trained & supported by PSI
  • Clients (aged ≥16 years) informed on HIV & self testing

• Self-test demonstration
  • HIVST kit for self/partner or to test with CBDA present
  • provision of self-referral card
  • Health facility linkage for confirmatory testing & care if HIV+
  • Referral for VMMC for men &
  • Information on HIV prevention services
Methods - Overview of costing approach

• Vertical programme allows detailed top down costing
  • Line-by-line review & allocation
  • Providers financial expenditure’s

• 3 major cost categories:
  • Start-up
    • Training & sensitisation,
  • Capital annualized over 2 years (3% discount rate) &
  • Recurrent (salaries & per diems, HIVST kits, stationery & other supplies)
    • use of current kit price (US$2) &
    • included observed shipping & handling costs
Methods - Overview of costing approach

- Supplemented by field observations to obtain:
  - Allocation factors/criteria by distribution model:
    - Direct expenditures; share of distance (in km); share of space (m²);
    - share of CBDA distributors (%) per site; share of HIVST kits (%) distributed;
  - Economic costs: donated goods & services

- M&E data
  - CBDAs trained & HIVST kits distributed (July 2016 - May 2017)

- Costs by site variation & across countries (economies of scale)

- Sensitivity & scenario analysis
  - Assess impact of key cost parameters
# Results - Key Setting Characteristics & Costs

<table>
<thead>
<tr>
<th></th>
<th>Malawi</th>
<th>Zambia</th>
<th>Zimbabwe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>National HIV prevalence among adults 15 to 49 years (%)</strong></td>
<td>10.0</td>
<td>12.3</td>
<td>14.6</td>
</tr>
<tr>
<td><strong>Number of districts &amp; sites</strong></td>
<td>4 (11)</td>
<td>4 (16)</td>
<td>8 (44)</td>
</tr>
<tr>
<td><strong>Catchment population of sites: Mean (range)</strong></td>
<td>27,439 (5,500–82,581)</td>
<td>18,266 (7673–50,094)</td>
<td>3,196 (549–6,699)</td>
</tr>
<tr>
<td><strong>Location: Rural (urban or peri-urban)</strong></td>
<td>9 (2)</td>
<td>16 (8)</td>
<td>44 (0)</td>
</tr>
<tr>
<td><strong>Total country HIVST kit distribution (CBDA)</strong></td>
<td>137,915</td>
<td>103,606</td>
<td>93,459</td>
</tr>
<tr>
<td><strong>Scale of current HTS - based on facility HTS</strong></td>
<td>16,921</td>
<td>27,888</td>
<td>44,727</td>
</tr>
<tr>
<td><strong>% distribution - Men</strong></td>
<td>49%</td>
<td>51%</td>
<td>43%</td>
</tr>
<tr>
<td><strong>Men attendance at HTS - % Men (PHIA)</strong></td>
<td>34%</td>
<td>37%</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Aggregate country program cost</strong></td>
<td>US$1,020,364</td>
<td>US$1,510,570</td>
<td>US$1,288,689</td>
</tr>
<tr>
<td><strong>Cost per HIVST kit distributed</strong></td>
<td>US$7.23</td>
<td>US$14.58</td>
<td>US$13.79</td>
</tr>
<tr>
<td><strong>Facility HTS cost per person tested (US$): Mean (range)</strong></td>
<td>US$5.03</td>
<td>US$4.24</td>
<td>US$8.79</td>
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<tr>
<td></td>
<td>($2.95-$8.33)</td>
<td>($2.49-$6.24)</td>
<td>($3.38-$21.51)</td>
</tr>
</tbody>
</table>
Unit costs by site and quantity

<table>
<thead>
<tr>
<th></th>
<th>Unit Cost</th>
<th>Min Unit Cost</th>
<th>Max Unit Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malawi</td>
<td>$7.23</td>
<td>$5.86</td>
<td>$12.76</td>
</tr>
<tr>
<td>Zambia</td>
<td>$14.58</td>
<td>$5.30</td>
<td>$40.63</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>$13.79</td>
<td>$10.19</td>
<td>$54.44</td>
</tr>
</tbody>
</table>
Results – Cost composition

- Other recurrent
- Waste management
- Recurrent training
- Building operation & maintenance
- Vehicle operation & maintenance
- Supplies
- HIV Self-Test Kits
- Personnel & Per diems
- Equipment
- Building & storage
- Start-up other
- Sensitization
- Startup training

Unit cost breakdown per kit distributed

Malawi:
- $1,58
- $2,35
- $1,58

Zambia:
- $2,55
- $7,13
- $0,61

Zimbabwe:
- $2,24
- $2,35
- $5,92

Results – Cost composition
Results – Sensitivity & scenario analysis

• Variation of key cost parameters
  • HIVST kit price (base case = US$2)
    • US$1 (average price of a Determine test kit) to US$3.40
  • Salaries +/-10% &
  • Kit quantity +/-10%

• Cost per kit distributed remain robust despite variation
  • Highly responsive to:
    • Personnel & HIVST kit prices

• Excluding above site level & start-up costs
  • Generates almost comparable estimates to facility HTS costs
    • HIVST - US$5.61, US$10.42 & US$10.18 respectively vs;
    • HTS - US$5.03, US$4.24 & US$8.79 (Mwenge et al)
Results summary

• CBDA delivered HIVST reached more individuals
  • 43% - 51% distributed to men (primary contributor to HTC gap) vs;
  • 26% - 37% for facility HTS (Mwenge et al)

• Potential for lower future costs of distribution
  • Economies of scale can clearly be optimized
    • Critical to target populations efficiently
  • Lower cost community-led distribution models
    • Staff costs contribute substantial portion of costs
    • Less training, community sensitization & campaign style distribution
  • 10-20% of costs are start-up & initial capital - decrease with service maturity
Conclusions

• To achieve impact (meet global testing & treatment targets)
  • CBDA HIVST complements existing HIV testing approaches
  • Particularly if targeted to populations:
    • Those not coming to facilities (not leaving anyone behind)
    • i.e. settings with high undiagnosed HIV or remote communities, &
    • Key populations, men & adolescents & other hard to reach

• To reduce costs further requires;
  • Focus on economies of scope & scale, &
  • Ensure efficiencies in personnel & transportation costs

• Explore alternative cost-minimisation approaches
  • Integrate HIVST into existing facility & community health services;
  • Secondary distribution (partner delivered & peer-network approaches)
STAR Africa Partners

- Centre for Sexual Health, HIV and AIDS Research, Harare, Zimbabwe
- Zambart, Lusaka, Zambia
- Malawi-Liverpool-Wellcome Trust Clinical Research Programme, Blantyre, Malawi
- Faculty of Public Health and Policy, London School of Hygiene and Tropical Medicine, London, UK
- Population Services International, Washington DC, USA
- Society for Family Health, Lusaka, Zambia
- Ministry of Health and Child Care, Harare, Zimbabwe
- Faculty of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, London UK
- Department of HIV/AIDS, World Health Organization, Geneva, Switzerland
- Liverpool School of Tropical Medicine, Liverpool, United Kingdom
- Institute of Psychology, Health and Society. University of Liverpool, Liverpool, UK
MURAKOZE / THANK YOU
Questions? Comments?

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