Costs and Consequences of HIV Linkage-to-Care Strategies Implemented in Urban and Rural South African Settings

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BACKGROUND
COSTS AND CONSEQUENCES OF HIV LINKAGE-TO-CARE STRATEGIES
Life expectancy for people living with HIV (PLHIV) receiving early ART is similar HIV-uninfected counterparts.

Remaining life expectancy gap may be attributable to:
- Incomplete HIV testing coverage & late HIV diagnosis
- Delayed ART initiation & poor ART adherence

If potential of ART is to be realized:
- Reduce delays between infection, diagnosis, and entry-into-care
- Develop cost-effective entry-into-care systems
- Improve linkage into care and treatment
- Support adherence to treatment
PARENT STUDY DESIGN

Thol’impilo Study

◦ Unmasked, individually randomized pragmatic trial of 3 linkage-to-care interventions
◦ Conducted in urban and rural settings in South Africa

Outcomes: 90 day entry-into-care (self-reported and verified) & ART initiation at 180 days
OBJECTIVES

- Estimating the incremental costs to the health system of three linkage-to-care interventions

- Evaluating the comparative consequences of these interventions in terms of timely linkage into care and initiation of ART
METHODS

COSTS AND CONSEQUENCES OF HIV LINKAGE-TO-CARE STRATEGIES
## LINKAGE-TO-CARE INTERVENTIONS

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point of Care CD4 count (POC CD4)</td>
<td>Routine counseling plus POC CD4 testing using the PIMA Analyser</td>
</tr>
<tr>
<td>POC CD4 + Care Facilitation (CF)</td>
<td>Routine counseling plus POC CD4 testing + up to 5 sessions of standardized counseling</td>
</tr>
<tr>
<td>POC CD4 + Transport Assistance (TA)</td>
<td>Routine counseling plus POC CD4 testing + transport reimbursement for up to 3 clinic visits</td>
</tr>
<tr>
<td>Standard of Care (SoC)</td>
<td>Routine pre-/post-test counseling provided to everyone receiving HIV testing</td>
</tr>
</tbody>
</table>
METHODS: COSTING

Estimated costs using a bottom-up, “ingredients”-based approach
- Perspective of the healthcare system
- 2014 US Dollars

Data collected through time motion studies, interviews and structured observations with program staff, and a review of budget and expense information
RESULTS

COSTS AND CONSEQUENCES OF HIV LINKAGE-TO-CARE STRATEGIES
# RESULTS

<table>
<thead>
<tr>
<th>Arm</th>
<th>SOC (N=591)</th>
<th>POC CD4 (N=614)</th>
<th>POC CD4 + CF (N=603)</th>
<th>POC CD4 + TA (N=590)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>90 day entry into care (self-reported)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n (%)</td>
<td>298 (50)</td>
<td>316 (51)</td>
<td>331 (55)</td>
<td>49 (49)</td>
</tr>
<tr>
<td>HR (95% CI)</td>
<td>Ref</td>
<td>1.0 (0.9-1.2)</td>
<td>1.1 (0.9-1.3)</td>
<td>1.0 (0.9-1.2)</td>
</tr>
<tr>
<td><strong>90 day entry into care (verified)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n (%)</td>
<td>171 (29)</td>
<td>186 (30)</td>
<td>226 (38)</td>
<td>181 (31)</td>
</tr>
<tr>
<td>HR (95% CI)</td>
<td>Ref</td>
<td>1.0 (0.9-1.3)</td>
<td><strong>1.4 (1.1-1.7)</strong></td>
<td>1.1 (0.9-1.3)</td>
</tr>
<tr>
<td><strong>180 day ART initiation (verified)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n (%)</td>
<td>77 (13)</td>
<td>96 (16)</td>
<td><strong>108 (18)</strong></td>
<td>90 (15)</td>
</tr>
<tr>
<td>HR (95% CI)</td>
<td>Ref</td>
<td>1.2 (0.9-1.6)</td>
<td><strong>1.4 (1.1-1.9)</strong></td>
<td>1.2 (0.9-1.6)</td>
</tr>
</tbody>
</table>
RESULTS: Average per Participant Costs by Study Arm

- **POC CD4**
  - Staff: $11
  - Consumables: $8
  - Other*: $2

- **POC CD4 + CF**
  - Staff: $54
  - Consumables: $14
  - Other*: $8

- **POC CD4 + TA**
  - Staff: $14
  - Consumables: $17
  - Other*: $3

*Other includes equipment, overheads, and training costs
## RESULTS

*Per 1,000 participants in each arm:*

<table>
<thead>
<tr>
<th>Costs &amp; Effectiveness</th>
<th>SOC</th>
<th>POC CD4</th>
<th>POC CD4 + CF</th>
<th>POC CD4 + TA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Costs (2014 USD)</td>
<td>REF</td>
<td>$20,700</td>
<td>$77,300</td>
<td>$34,300</td>
</tr>
</tbody>
</table>

### Incremental number of individuals linked to care or ART

<table>
<thead>
<tr>
<th></th>
<th>SOC</th>
<th>90 day entry-into-care</th>
<th>180 day ART initiation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>REF</td>
<td>14</td>
<td>26</td>
</tr>
<tr>
<td>90 day entry-into-care</td>
<td>REF</td>
<td>86</td>
<td>49</td>
</tr>
<tr>
<td>180 day ART initiation</td>
<td>REF</td>
<td>18</td>
<td>23</td>
</tr>
</tbody>
</table>

### Incremental Cost per individual linked to care or ART

<table>
<thead>
<tr>
<th>Cost per additional entry-into-care</th>
<th>SOC</th>
<th>$1,480</th>
<th>$900</th>
<th>$1,910</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per additional ART</td>
<td>REF</td>
<td>$800</td>
<td>$1,580</td>
<td>$1,490</td>
</tr>
</tbody>
</table>
CONCLUSION

POC CD4 testing did not substantially improve timely entry into HIV care or initiation of ART in this study.

Only POC CD4 + CF significantly improved timely linkage to care & ART initiation compared to SoC.

- Most costly intervention to implement.

Cost-effectiveness ratios of POC CD4 alone and POC CD4 + CF were similar.

Additional research on cost-effective linkage interventions needed.
Acknowledgements
Any Questions?
Newly diagnosed PLHIV (N=2,398)

- Point-of-care CD4 count
  - N=614
  - 186 entered care
  - HR: 1.0 (95% CI: 0.9-1.13)

- POC CD4 + longitudinal care facilitation
  - N=603
  - 226 entered care
  - HR: 1.4 (95% CI: 1.1-1.7)

- POC CD4 + transport assistance
  - N=590
  - 181 entered care
  - HR: 1.1 (95% CI: 0.9-1.3)

- Standard of Care
  - N=591
  - 171 entered care
  - Ref