Financing the HIV response in sub-Saharan Africa from domestic sources: moving beyond a normative approach

Michelle Remme¹, Mariana Siapka¹, Olivier Sterck², Mthuli Ncube², Charlotte Watts¹ & Anna Vassall¹

¹ London School of Hygiene and Tropical Medicine
² Oxford University

Improving health worldwide
www.lshtm.ac.uk
Background

- Growing moral and fiscal obligations to maintain people on lifelong treatment represent up to 21% of GDP for SA and 80% of GDP for Malawi.
- Donor dependent responses: only 10–22% of HIV expenditures were domestically financed in 2013 in LIC and lower MICs.
HIV financing transition in SSA

- Public HIV spending per PLHIV (2013 USD)
- GDP per capita
- International HIV spending as % of total

Graph showing the relationship between public HIV spending per PLHIV and GDP per capita, with International HIV spending as % of total indicated by markers on the graph.
Less obvious trend in LICs/LMICs in SSA

- Benin
- Burkina Faso
- Burundi
- Cameroon
- Chad
- Côte d’Ivoire
- DRC
- Djibouti
- Eritrea
- Ethiopia
- Gambia
- Ghana
- Guinea
- Guinea - Bissau
- Kenya
- Lesotho
- Liberia
- Madagascar
- Malawi
- Mali
- Mauritania
- Mozambique
- Niger
- Nigeria
- Rwanda
- Senegal
- Sierra Leone
- South Sudan
- Sudan
- Togo
- Uganda
- United Republic of Tanzania
- Zambia
- Zimbabwe

\[ R^2 = 0.0901 \]

\[ R^2 = 0.1303 \]
Background

- Growing moral and fiscal obligations to maintain people on lifelong treatment represent up to 21% of GDP for SA and 80% of GDP for Malawi.
- Donor dependent responses: only 10 – 22% of HIV expenditures were domestically financed in 2013 in LIC and lower MICs.
- ‘Shared responsibility’ of HIV responses with greater domestication of financing to refocus external aid, but need to better understand countries ability to sustainably fund their HIV programmes.
- Previous studies have not considered all domestic financing options, and most have optimistically assumed normative targets can be met.
Applying two approaches to estimating the fiscal space for HIV

- **Normative approach**: How much can each country raise domestically if they meet international norms in terms of public financing and allocation to health/HIV within 5 years?
  - Where is there most potential to find domestic fiscal space in SSA countries?

- **Empirical approach**: If LMICs respond to fiscal policy levers, as they have in the past, how much fiscal space would be realised from reaching these norms?
### Standard Fiscal space framework

| Source 1 | • Conducive macroeconomic conditions (economic growth)  
|          | • Broad government revenue generation/tax base |
| Source 2 | • Reprioritisation of HIV and health in total government budget |
| Source 3 | • External and domestic borrowing |
| Source 4 | • Earmarked resources (taxes, insurance premiums, etc) |
| Source 5 | • Efficiency gains in HIV service delivery and broader development programmes (improvements in allocative & technical efficiency) |

Adapted from Heller, 2006 and Tandon & Cashin, 2010
## Standard Methods

<table>
<thead>
<tr>
<th>Source</th>
<th>Indicator</th>
<th>Modelled target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth</td>
<td>GDP per capita, constant $ (IMF)</td>
<td>Average forecasted annual growth (2014-2018)</td>
</tr>
<tr>
<td>Improved revenue generation</td>
<td>Government revenue, excluding grants, as % of GDP (World Bank)</td>
<td>25% (McIntyre &amp; Meheus, 2013)</td>
</tr>
<tr>
<td>Reprioritisation of health</td>
<td>General government health expenditure as % of Government expenditure (WHO)</td>
<td>15% (Abuja target)</td>
</tr>
<tr>
<td>Reprioritisation of HIV</td>
<td>Public HIV spending as % of Government health expenditure (UNAIDS, WHO)</td>
<td>0.5 x HIV DALYs as % of total DALYs (Resch et al, 2015)</td>
</tr>
<tr>
<td>Borrowing</td>
<td>Gross debt as % of GDP (IMF)</td>
<td>40% (IMF ‘sound’ level)</td>
</tr>
</tbody>
</table>
## Additional Methods

<table>
<thead>
<tr>
<th>Source</th>
<th>Indicator</th>
<th>Modelled target</th>
<th>HIV adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earmarked resources – Risk pooling mechanisms</td>
<td>Reduced out-of-pocket expenditure per capita through pooling (<em>WHO</em>)</td>
<td>20%</td>
<td>Additional resources for health then apportioned to HIV based on current % public HIV spend in public health spend</td>
</tr>
<tr>
<td>– Innovative domestic financing</td>
<td>Increased revenues from increase in excise tax on alcohol (<em>WHO</em>)</td>
<td>50%</td>
<td>Same as above. Minus reduction in sales due to tax assuming -0.3 price elasticity</td>
</tr>
<tr>
<td>Efficiency gains</td>
<td>Non-drug treatment spending per person retained in ART* (adjusted for GDP per capita) (<em>UNAIDS</em>)</td>
<td>Minimum by income group (Most ‘efficient’ country – production possibility frontier)</td>
<td>* Number of people receiving ARVs adjusted by 12 month retention rate</td>
</tr>
<tr>
<td>Efficiency gains</td>
<td>- Aggregate health personnel density (<em>WHO</em>)</td>
<td>- 2.3 per 1000 population (<em>WHO minimum level</em>) -11.7% (MDG1 target)</td>
<td>Regression model of PMTCT screening coverage</td>
</tr>
<tr>
<td>– Health system and non-health sector tech eff gains for PMTCT</td>
<td>- Proportion of undernourished in total population (<em>FAO</em>)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Potential fiscal space from various sources for 14 selected SSA countries (in million US$)

<table>
<thead>
<tr>
<th>Income level</th>
<th>Current public HIV spend</th>
<th>Eco growth</th>
<th>Govt rev</th>
<th>Ext borrow</th>
<th>Health Priority</th>
<th>HIV Priority</th>
<th>Health-earmarked sources</th>
<th>Risk-pooling</th>
<th>Alc tax</th>
<th>Tech HIV eff gains</th>
<th>Max</th>
<th>Average HIV savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>LICs</td>
<td>131</td>
<td>10</td>
<td>64</td>
<td>28</td>
<td>43</td>
<td>149</td>
<td>51</td>
<td>11</td>
<td>71</td>
<td></td>
<td></td>
<td>968</td>
</tr>
<tr>
<td>LMICs</td>
<td>367</td>
<td>25</td>
<td>14</td>
<td>247</td>
<td>383</td>
<td>152</td>
<td>224</td>
<td>45</td>
<td>208</td>
<td></td>
<td></td>
<td>2,785</td>
</tr>
<tr>
<td>UMICs</td>
<td>2,537</td>
<td>85</td>
<td>0</td>
<td>612</td>
<td>625</td>
<td>1,379</td>
<td>0</td>
<td>114</td>
<td>915</td>
<td></td>
<td></td>
<td>7,348</td>
</tr>
</tbody>
</table>
| **TOTAL**    | **3,036**                 | **120**    | **79**   | **888**    | **1,052**       | **1,680**    | **275**                  | **170**      | **1,193** |                    | **11,101** | **417**              | **653**
Potential fiscal space from various sources

**Malawi**

- ART eff gains
- Alcohol tax
- Risk-pooling mechanism
- HIV priority
- Health priority
- Ext borrowing
- Govt revenue
- Economic growth

**Uganda**

- ART eff gains
- Alcohol tax
- Risk-pooling mechanism
- HIV priority
- Health priority
- Ext borrowing
- Govt revenue
- Economic growth

**Nigeria**

- ART eff gains
- Alcohol tax
- Risk-pooling mechanism
- HIV priority
- Health priority
- Ext borrowing
- Govt revenue
- Economic growth

**South Africa**

- ART eff gains
- Alcohol tax
- Risk-pooling mechanism
- HIV priority
- Health priority
- Ext borrowing
- Govt revenue
Willingness to pay

• Normative fiscal space assumes that when a particular lever is changed, the increase flows through to HIV (e.g. health spending increases by 1%, HIV spending will also increase by 1%).

• Is this assumption correct? Which levers in the past have influenced HIV expenditure?

• How does the maximum amount that can be domestically financed change taking this into account?

• What does this tell us about the feasible approaches to optimising HIV financing?
Empirical model specification

- **Dataset:** Cross-sectional data from 92 LMICs
- **Dependent variable:** Public HIV spending per PLHIV
- **Control variables:** GDP per capita, HIV prevalence, control of corruption, International HIV spending per PLHIV, Time dummy (year of spending data), Regional dummies
- **Explanatory Fiscal Space variables** (modelled separately):
  - GDP per capita
  - Government revenue, excluding grants as %GDP
  - Gross debt to GDP ratio
  - Out-of-pocket spending per capita
  - Non-drug cost of ART per person on ART
  - Government Health Expenditure as % General Government Expenditure
  - Public HIV spending as % Government Health Expenditure
- **Estimation methods:** (i) OLS, (ii) Quantile (median, 25th, 75th), (iii) Neighbourhood fixed effects
## Summary results

<table>
<thead>
<tr>
<th>Fiscal space policy options</th>
<th>OLS</th>
<th>Quantile regressions</th>
<th>Neighbour(hood) models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Health Expenditure as % Government Expenditure</td>
<td>0.400* (0.251)</td>
<td>0.189 (0.466) 0.419*** (0.337) 0.675*** (0.223)</td>
<td>0.199 (0.206) 0.284 (0.222) 0.229 (0.197)</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>1.091*** (0.153)</td>
<td>1.207*** (0.290) 1.102*** (0.183) 0.754*** (0.172)</td>
<td>1.168*** (0.174) 1.190*** (0.170) 1.246*** (0.150)</td>
</tr>
<tr>
<td>Government revenue, excl. grants as % GDP</td>
<td>0.443 (0.350)</td>
<td>0.312 (0.677) 0.242 (0.452) 0.486 (0.411)</td>
<td>0.850** (0.421) 0.845** (0.355) 0.825** (0.395)</td>
</tr>
<tr>
<td>Gross government debt as % GDP</td>
<td>-0.162 (0.207)</td>
<td>-0.065 (0.301) -0.022 (0.358) -0.074 (0.436)</td>
<td>-0.0758 (0.194) -0.00471 (0.162) -0.145 (0.182)</td>
</tr>
<tr>
<td>Out-of-pocket health expenditure per capita</td>
<td>-0.071 (0.181)</td>
<td>-0.002 (0.332) 0.035 (0.220) -0.144 (0.197)</td>
<td>-0.157 (0.165) -0.107 (0.159) -0.107 (0.168)</td>
</tr>
<tr>
<td>Non-drug cost per person on ART</td>
<td>0.105 (0.118)</td>
<td>0.045 (0.165) -0.024 (0.166) 0.146 (0.127)</td>
<td>0.182 (0.127) 0.124 (0.108) 0.233** (0.116)</td>
</tr>
<tr>
<td>Public HIV spending as % of GHE</td>
<td>0.757*** (0.058)</td>
<td>0.851*** (0.068) 0.783*** (0.074) 0.812*** (0.088)</td>
<td>0.715*** (0.111) 0.688*** (0.117) 0.758*** (0.0767)</td>
</tr>
</tbody>
</table>
Potential fiscal space with normative capacity to pay and revealed willingness to pay

- **Potential Public HIV spending per adult living with HIV (2014 US$)**

**Legend:**
- Additional normative fiscal space available
- Fiscal space available from empirical approach
- Fiscal HIV commitments

Countries: Malawi, Ethiopia, Uganda, Zimbabwe, Tanzania, Mozambique, Kenya, Zambia, Lesotho, Nigeria, Swaziland, Namibia, South Africa, Botswana*
Limitations

• Unreliable quality of HIV spending data

• Feasibility of achieving aspirational normative targets, and assumption of immediate policy change, no transaction cost or absorptive capacity constraints

• Use of global analyses to draw conclusions for SSA sub-group

• Endogeneity bias of cross-sectional dataset in empirical approach
  – Omitted variable bias: Neighbourhood fixed effect models
  – Bidirectional causality bias would attenuate impact of fiscal adjustments
  – Insignificant relationship with OOP exp and non-drug ART cost per person does not rule out relationship in either direction
Discussion

- Countries may have more options to increase HIV financing, but have not used many of their domestic fiscal levers for HIV
- Modest potential from growth, more from borrowing if willingness to borrow for non-assets, esp. in resource-rich countries
- Interdependence and adjustment between levers preventing additionality: when one lever changes, governments may be adjusting others
  - Focusing on reprioritisation targets and earmarking may not be enough
  - Need for credible commitment mechanisms to ensure any measure is additional
- Despite measurement challenges, our findings support global policy emphasis on improving HIV programme efficiency
- HIV budget holder may see value in investing in complementary investments in health systems and social development, but will require coordination mechanisms
Conclusion

• Most HIV-affected lower-income countries in SSA will not be able to generate sufficient public resources for HIV in the medium-term, even if they take very bold measures

• Considerable international financing will be required for years to come, which may encourage domestic financing

• Domestic and international HIV funders will need to engage with broader health and development financing to improve government revenue-raising and efficiencies

• Need for a financing approach that examines:
  – Willingness (Incentives; Institutional resistance to change)
  – Capacity to change and support for building new financing mechanisms
  – Goes beyond HIV only response
Acknowledgements

This work was funded by the RUSH Foundation (RethinkHIV) and UKaid (STRIVE).

This paper is part of RethinkHIV, a consortium of senior researchers, funded by the RUSH Foundation, who evaluate new evidence related to the costs, benefits, effects, fiscal implications and developmental impacts of HIV interventions in sub-Saharan Africa.