Bridging data sets: a GIS response to the HIV/AIDS epidemic in Zambia

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Disclaimer

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This map includes all HIV/AIDS activities funded through the following USG agencies: Department of State, U.S. Agency for International Development, Department of Defense, Department of Commerce, Department of Labor, Department of Health and Human Services, and Peace Corps. This does not include activities funded through the U.S. Department of Agriculture.
Zambia

Life expectancy at birth, men and women, 40

Estimated population: 11,668,000

Adults aged 15 to 49 HIV prevalence rate: 17.0 [15.9 - 18.1]%

Sources: Zambia MODIS and UNAIDS
Population and facility-level data

- Population surveys
  - Mortality, morbidity, natality
  - Service utilization
  - Change over time
- Facility surveys
  - Capacity
  - Service throughput
  - Change over time
# Large-scale health surveys in Zambia 2001-2006

<table>
<thead>
<tr>
<th>Organization</th>
<th>Data</th>
<th>Timeframe</th>
<th>Scale</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japanese International Cooperation Agency</td>
<td>Health Facility Census</td>
<td>Ongoing</td>
<td>Health facility location</td>
<td>Full census with GPS</td>
</tr>
<tr>
<td>World Health Organization</td>
<td>Service Availability Map</td>
<td>2004</td>
<td>District</td>
<td>District with GPS ground-truthing</td>
</tr>
<tr>
<td>MEASURE/DHS</td>
<td>Service Provision Assessment</td>
<td>Ongoing</td>
<td>Province</td>
<td>Province with GPS ground-truthing</td>
</tr>
<tr>
<td>MEASURE/DHS</td>
<td>Demographic Health Survey</td>
<td>2001-2002</td>
<td>Household sample cluster</td>
<td>Nationally representative sample with GPS</td>
</tr>
</tbody>
</table>
Service Availability Mapping

• Purpose: Overview of what is available and where

• Scale: District, with sample of GPS point data

• Attributes:
  – Location of health service delivery points (public and private);
  – Availability and location of physical infrastructure;
  – Availability of health services (maternal and child health, HIV/AIDS, TB, malaria);
  – Availability of health workers.
Service Provision Assessment

• **Purpose:** Information on quality of health services

• **Scale:** Regional or national, with sample of GPS point data of government and non-government health facilities

• **Attributes:**
  – Availability of infrastructure;
  – Facility-level systems to support quality services and maintenance;
  – Staff qualifications, training, and supervision;
  – Adherence to standards in practice;
Health Facility Census

• Purpose: Comprehensive snapshot of physical infrastructure, services, and human resources

• Scale: GPS point data of public and semi-public health facilities

• Attributes:
  – Availability and condition of physical infrastructure;
  – Location of health service delivery points (health facilities and outreach points);
  – Availability and condition of equipment;
  – Availability of health services;
  – Headcounts of health workers.
Demographic and Health Survey

• Purpose: Large nationally representative population-based health survey

• Scale: Sample cluster GPS point data

• Attributes:
  – Population
  – Health
  – HIV
  – Nutrition
Barriers to data fusion

• Level of representativeness
• Text versus code
• Inconsistent indicators
• Irresolvable discrepancies
• Confidentiality
Barriers to data fusion

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### Table 3.1.3: Kapiri-Mposhi District

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Type</th>
<th>Owner</th>
<th>Total</th>
<th>Beds</th>
<th>Command</th>
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<tbody>
<tr>
<td>Kapiri-Mposhi</td>
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<td>Government</td>
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<td>Government</td>
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<td></td>
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<td>Chilumba</td>
<td>RHC</td>
<td>Government</td>
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<td>RHC</td>
<td>Government</td>
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<td>6</td>
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<tr>
<td>Lunsemfwa Power Station</td>
<td>RHC</td>
<td>Private</td>
<td></td>
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<tr>
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<td>RHC</td>
<td>Mission</td>
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<tr>
<td>Mukumbwe</td>
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<td>Government</td>
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<td>2</td>
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<tr>
<td>Mulungushi Power Station</td>
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<tr>
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Analyses

- Absolute number of people infected by district (DHS and Census)
- Correlation between access and outcomes (DHS and HFC)
- Correlation between quality and utilization (DHS and SAM or SPA)
- Identification of high prevalence areas with low service availability (DHS and SAM)
- Validation of GPS points (HFC, SAM, SPA)
HIV Prevalence by Gender in Zambia, 2002
Data Aggregated to First Order Administrative Divisions

**Percent HIV Positive**
- Less than 2%
- 2-5%
- 5-10%
- 10-15%
- More than 15%

★ Capital

Note: Source years are not concurrent. Boundaries are not necessarily authoritative. Source: Zambia DHS 2002
Presence of condom marketing programs, by district
Policy recommendations

- Normative standards for geographic data collection
- Metadata
- Coordination among partners
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