IMPACT EVALUATION OF PERFORMANCE BASED FINANCING

FOR GENERAL HEALTH AND HIV/AIDS SERVICES IN RWANDA

A collaboration between the Rwanda Ministry of Health, CNLS, and SPH, the INSP in Mexico, UC Berkeley and the World Bank
RWANDA general & health sector

- Total population: 9,720,694 (2009)
- 30 Administrative districts
- GDP per capita of $506 (2009)
- 33 District Hosp. and 369 Health centers
- HDI: ranked 167th (2007)
- MMR: 750 per 100,000 (DHS 2005)
- UMR: 103 per 1,000 (DHS 2007-2008)
- IMR: 62 per 1,000 (DHS 2007-2008)
- HIV: 3.1% (DHS 2005)
Relevance and Severity of the Health Issue Addressed

- **Diagnostic**
  - Shortage of human resources for health services
  - Low levels of productivity and motivation
  - High levels of absenteeism
  - Low user satisfaction & poor quality of service lead to low use.
  - Increase morbidity and mortality

- **Goal**
  - Increase number of trained medical personnel
  - Increase motivation
  - Improve quality of services
  - Increase personnel income of health staff

- **Policy Response**
  - Performance Based Contracting & Financing
RWANDA Performance Based Financing (PBF)

- Raises the quantity and quality of health services provided
- Increases health worker motivation through a system of incentives payments based on performance
- Operates through contracts between the government and other partners (providing the financing) and health facilities (providing services)
History of PBF in Rwanda

Three pilot schemes:

- Cyangugu (since 2001)
- Butare (since 2002)
- BTC (since 2005)
- National model implemented in 2006
National PBF model for Health Centers

- 14 Primary Health Care indicators, e.g.:
  - New Curative Consultation = $0.27
  - Delivery at the HC = $3.63
  - Completely vaccinated child = $1.82

- 10 HIV/AIDS indicators, e.g.:
  - One Pregnant woman tested (PMTCT) = $1.10
  - HIV+ women treated with NVP = $1.10
  - One client tested for HIV = $0.92
  - One couples/partners tested jointly = $4.59

- Separation of Functions between stakeholders
Implementing organizations

Ministry of Health (CAAC)  Ministry of Finance

Administrative districts

District hospital

Steering committee

Purchasers

Stakeholders

Provider: Health facilities

Head of the Health center ---- Management Committee

Purchase contract

Motivation contract

Employee
Hypotheses

For both general health services and HIV/AIDS, we will test whether PBC:

- Increases the quantity of contracted health services delivered
- Improves the quality of contracted health services provided
- Does not decrease the quantity or quality of non-contracted services provided,
- Decreases average household out-of-pocket expenditures per service delivered
- Improves the health status of the population
Evaluation Design

- Make use of expansion of PBC schemes over time
- The rollout takes place at the District level
- Treatment and control facilities were allocated as follow:
  - Identify districts without PBC in health centers in 2005
  - Group the districts based on characteristics:
    - rainfall
    - population density
    - livelihoods
  - Flip a coin to assign districts to treatment and control groups.
Roll-out plan

- **Phase 0 districts (white)** are those districts in which PBF was piloted
  - NOT part of the impact evaluation

- **Phase 1 districts (yellow)** are districts in which PBF was implemented in 2006, following the ‘roll-out plan’

- **Phase 2 districts (green)** are districts in which PBF was phased in later; these are the so-called ‘Phase 2’ or ‘control districts’ following the roll-out plan. PBF was introduced in these districts in 2008.
More money vs. More incentives

- Incentive based payments increase the total amount of money available for health center, which can also affect services
- Phase II area receive equivalent amounts of transfers
  - average of what Phase I receives
  - Not linked to production of services
  - Money to be allocated by the health center
  - Preliminary finding: most of it goes to salaries
The baseline has 4 surveys

- **December 2005-March 2006:**
  - General Health facility survey (166 centers)
  - General Health household survey (2,016 HH)

- **August – November 2006:**
  - HIV/AIDS facility survey (43 centers)
  - HIV/AIDS household survey (1650 HH)
Household Level: Research Hypotheses

- The core of the evaluation is designed to test the following hypotheses, namely performance based financing:
  - Improves the motivation and behaviors of the HIV/AIDS service providers
  - Increases the quantity of HIV/AIDS services provided
  - Improves the quality of HIV/AIDS services provided
  - Improves the health status of the HIV+ patients
  - Improves the mix of HIV/AIDS health services provided to infected patients

- Three additional research questions specifically designed to gather information on the impact of ART on patients, as well as their household members:
  - What are the socio-economic benefits of treatment for patients and their families?
  - What are the determinants of adherence to treatment?
  - What is the impact of the availability of treatment on prevention and on behavior of patients and family members (stigmatization, discrimination, risky sex, and willingness to be tested)?
Household Level: Data Collection

- Labor market and household socioeconomic indicators
- Anthropometrics of all patients
- CD4 counts of all patients
- Patient biomarker data collection (Anemia, malaria)
- Self-reported and perceived adherence to treatment
- Attitudes and perception regarding anti-retroviral treatment
- Activities of daily living of all patients
- Mental health questions of all patients
- Sexual history, knowledge regarding risk for HIV/AIDS and STD’s: females 15-49 years old and males 15-59 years old
Household Level: Sample Size

- Total sample consists of 1,961 households and 7,494 individuals
- Original sample of 1,487 patients from health facilities and associations

<table>
<thead>
<tr>
<th>Patient Treatment: Distribution</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Treatment</td>
<td>196</td>
<td>13.18%</td>
</tr>
<tr>
<td>Cotrimoxazole</td>
<td>439</td>
<td>29.52%</td>
</tr>
<tr>
<td>ARV</td>
<td>852</td>
<td>57.30%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1487</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
Follow-up surveys

- February-August 2008

- 3 surveys:
  - Combined health facilities survey for General Health - HIV/AIDS
  - Household survey for General Health (panel data)
  - Household survey for HIV/AIDS (panel data)
Impact Evaluation Results

- Results on general health have been published (Basinga, Gertler et. al, 2010):

  - PBF had a large and significant positive impact on institutional deliveries and preventive care visits by young children, and improved quality of prenatal care.
  - No effect on the number of prenatal care visits or on immunization rates.
Impact Evaluation Results

- On HIV/AIDS: Preliminary results on voluntary counseling and testing (VCT)
- Additional results on HIV, especially on anti-retroviral treatment will come later after completing the collection of AIDS patients’ biomedical records in the health facilities (ongoing).
Information obtained from household surveys in the catchment areas of the facilities.

All regressions control for socio-demographic variables (age, gender, education, marital status, asset values) and health facility fixed effects. Standard errors clustered at the facility*wave level.

Individual voluntary counseling and testing (IVCT): “Have you ever been tested for HIV?”
Table 1: Comparison of treatment and control: all adults

<table>
<thead>
<tr>
<th>Variable</th>
<th>Not married</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Married</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment</td>
<td>Control</td>
<td>Treatment</td>
<td>Control</td>
<td></td>
<td></td>
<td>Treatment</td>
<td>Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.63</td>
<td>0.04</td>
<td>0.61</td>
<td>0.04</td>
<td>0.671</td>
<td></td>
<td>0.59</td>
<td>0.04</td>
<td>0.52</td>
<td>0.04</td>
</tr>
<tr>
<td>Age, years</td>
<td>28.63</td>
<td>1.92</td>
<td>29.09</td>
<td>1.66</td>
<td>0.861</td>
<td></td>
<td>37.84</td>
<td>0.85</td>
<td>40.92</td>
<td>0.87</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No education</td>
<td>0.25</td>
<td>0.01</td>
<td>0.19</td>
<td>0.02</td>
<td>0.037</td>
<td></td>
<td>0.33</td>
<td>0.06</td>
<td>0.36</td>
<td>0.05</td>
</tr>
<tr>
<td>primary</td>
<td>0.67</td>
<td>0.05</td>
<td>0.68</td>
<td>0.04</td>
<td>0.984</td>
<td></td>
<td>0.57</td>
<td>0.05</td>
<td>0.54</td>
<td>0.05</td>
</tr>
<tr>
<td>secondary or higher</td>
<td>0.07</td>
<td>0.05</td>
<td>0.13</td>
<td>0.04</td>
<td>0.374</td>
<td></td>
<td>0.11</td>
<td>0.03</td>
<td>0.09</td>
<td>0.03</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>divorced/widow</td>
<td>0.31</td>
<td>0.07</td>
<td>0.27</td>
<td>0.06</td>
<td>0.683</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>never married</td>
<td>0.69</td>
<td>0.07</td>
<td>0.73</td>
<td>0.06</td>
<td>0.683</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Log household asset value</td>
<td>11.64</td>
<td>0.38</td>
<td>11.57</td>
<td>0.32</td>
<td>0.884</td>
<td></td>
<td>11.93</td>
<td>0.25</td>
<td>12.05</td>
<td>0.22</td>
</tr>
<tr>
<td>Ever been tested</td>
<td>0.42</td>
<td>0.06</td>
<td>0.38</td>
<td>0.05</td>
<td>0.679</td>
<td></td>
<td>0.69</td>
<td>0.03</td>
<td>0.65</td>
<td>0.03</td>
</tr>
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</table>
### Results on individual VCT

#### Table 2: Regression analyses on IVCT

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>All</th>
<th>Not Married</th>
<th>Married</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBF * Time (Phase I &amp; Follow-up)</td>
<td>0.052*</td>
<td>0.001</td>
<td>0.075**</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.053)</td>
<td>(0.030)</td>
</tr>
<tr>
<td>Follow-up (2008)</td>
<td>0.137***</td>
<td>0.169***</td>
<td>0.103***</td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.052)</td>
<td>(0.023)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,049</td>
<td>1,238</td>
<td>811</td>
</tr>
<tr>
<td>Number of health facilities</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
</tbody>
</table>
Partner and couple’s testing

- Respondents who had sexual intercourse in past 12 months prior to the survey. Look at most recent partner.

- Partner’s voluntary counseling and testing (PVCT) “Do you know if your partner has ever been tested for HIV? “.

- Couples’ voluntary counseling and testing (CVCT) : combines IVCT and PVCT. A couple is considered tested for HIV if the respondent reported that he/she had ever been tested AS WELL AS his/her most recent partner.
### Partner and couple’s testing: balance at baseline

<table>
<thead>
<tr>
<th>CONTROL VARIABLES</th>
<th>Treatment (N=208) mean</th>
<th>Treatment (N=208) SE</th>
<th>Control (N=202) mean</th>
<th>Control (N=202) SE</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>0.5721</td>
<td>0.0546</td>
<td>0.5198</td>
<td>0.0495</td>
<td>0.4943</td>
</tr>
<tr>
<td>Age, years</td>
<td>34.7951</td>
<td>1.1904</td>
<td>37.7811</td>
<td>1.0862</td>
<td><strong>0.0936</strong></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No education</td>
<td>0.2637</td>
<td>0.0520</td>
<td>0.3041</td>
<td>0.0469</td>
<td>0.5765</td>
</tr>
<tr>
<td>primary</td>
<td>0.6219</td>
<td>0.0420</td>
<td>0.6186</td>
<td>0.0402</td>
<td>0.9554</td>
</tr>
<tr>
<td>secondary or higher</td>
<td>0.1144</td>
<td>0.0333</td>
<td>0.0773</td>
<td>0.0301</td>
<td>0.4271</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>married</td>
<td>0.8829</td>
<td>0.0419</td>
<td>0.8469</td>
<td>0.0375</td>
<td>0.5365</td>
</tr>
<tr>
<td>divorced/widow</td>
<td>0.0634</td>
<td>0.0214</td>
<td>0.0765</td>
<td>0.0207</td>
<td>0.6688</td>
</tr>
<tr>
<td>never married</td>
<td>0.0537</td>
<td>0.0205</td>
<td>0.0765</td>
<td>0.0199</td>
<td>0.4418</td>
</tr>
<tr>
<td>Log household asset value</td>
<td>11.9168</td>
<td>0.2617</td>
<td>11.803</td>
<td>0.2315</td>
<td>0.7514</td>
</tr>
<tr>
<td>Relationship with intimate partner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>spouse</td>
<td>0.8510</td>
<td>0.0580</td>
<td>0.8020</td>
<td>0.0503</td>
<td>0.5380</td>
</tr>
<tr>
<td>domestic partner</td>
<td>0.0288</td>
<td>0.0228</td>
<td>0.0644</td>
<td>0.0207</td>
<td>0.2751</td>
</tr>
<tr>
<td>partner not living in the household</td>
<td>0.0529</td>
<td>0.0309</td>
<td>0.0891</td>
<td>0.0276</td>
<td>0.4024</td>
</tr>
<tr>
<td>casual acquaintance</td>
<td>0.0240</td>
<td>0.0069</td>
<td>0.0149</td>
<td>0.0081</td>
<td>0.4072</td>
</tr>
<tr>
<td>others</td>
<td>0.0433</td>
<td>0.0105</td>
<td>0.0297</td>
<td>0.0116</td>
<td>0.4071</td>
</tr>
<tr>
<td>IVCT</td>
<td>0.7308</td>
<td>0.0382</td>
<td>0.6485</td>
<td>0.0368</td>
<td>0.1517</td>
</tr>
<tr>
<td>PVCT</td>
<td>0.7500</td>
<td>0.0573</td>
<td>0.6634</td>
<td>0.0508</td>
<td>0.2846</td>
</tr>
<tr>
<td>CVCT</td>
<td>0.6442</td>
<td>0.0441</td>
<td>0.5545</td>
<td>0.0415</td>
<td>0.1691</td>
</tr>
</tbody>
</table>
Results on IVCT, PVCT and CVCT among sexually active individuals

Table 4: Regression analyses on PVCT and CVCT

<table>
<thead>
<tr>
<th>CONTROL VARIABLES</th>
<th>IVCT</th>
<th>PVCT</th>
<th>CVCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBF * Time (Phase I &amp; Follow-up)</td>
<td>0.058**</td>
<td>0.073</td>
<td>0.104**</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.051)</td>
<td>(0.038)</td>
</tr>
<tr>
<td>Follow-up (2008)</td>
<td>0.099***</td>
<td>0.046</td>
<td>0.078***</td>
</tr>
<tr>
<td></td>
<td>(0.025)</td>
<td>(0.030)</td>
<td>(0.028)</td>
</tr>
<tr>
<td>Observations</td>
<td>857</td>
<td>857</td>
<td>857</td>
</tr>
<tr>
<td>Number of health facilities</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
</tbody>
</table>
Conclusions

• We found that PBF increased voluntary counseling and testing at the individual level in Rwanda.
• This effect is mainly found among married individuals.
• We also found that PBF increased testing among couples, as reported by one of the 2 partners.
• PBF encouraged individual VCT (0.92 USD), but encouraged couples testing even more (4.59 USD).