Pay-for-Performance (P4P) for Health Services in Rwanda

A collaboration between the Rwanda Ministry of Health, CNLS, SPH, INSP Mexico, UC Berkeley and the World Bank

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Our team...

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The 2005 starting point

- Professionally assisted births: 40%
- Maternal Mortality: 750 per 100,000 live births
- Infant Mortality: 86 per 1,000
- HIV: 3.1%

Why a pay reform?

- Ineffective reward system
- Shortage of human resources
- Low productivity & motivation
- Poor quality of service
- Low user satisfaction & low usage
- High mortality & morbidity
P4P for Health in Rwanda

- **Objectives**
  - Focus on maternal and child health (MDGs 4 & 5)
  - Increase quantity and quality of health services provided
  - Increase health worker motivation

- **What?**
  - Financial incentives to providers
  - For more quantity
  - And more quality

- **How?**
  - Contracts between government & health facilities

- **When?**
  - Piloted in 2001-2005, full scale from 2006
## Table 1: Output Indicators (U’s) and Unit Payments for PBF Formula

<table>
<thead>
<tr>
<th>Visit Indicators: Number of ...</th>
<th>Amount paid per unit (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 curative care visits</td>
<td>0.18</td>
</tr>
<tr>
<td>2 first prenatal care visits</td>
<td>0.09</td>
</tr>
<tr>
<td>3 women who completed 4 prenatal care visits</td>
<td>0.37</td>
</tr>
<tr>
<td>4 first time family planning visits (new contraceptive users)</td>
<td>1.83</td>
</tr>
<tr>
<td>5 contraceptive resupply visits</td>
<td>0.18</td>
</tr>
<tr>
<td>6 deliveries in the facility</td>
<td>4.59</td>
</tr>
<tr>
<td>7 child (0 - 59 months) preventive care visits</td>
<td>0.18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content of care indicators: Number of ...</th>
<th>Amount paid per unit (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 women who received tetanus vaccine during prenatal care</td>
<td>0.46</td>
</tr>
<tr>
<td>9 women who received malaria prophylaxis during prenatal care</td>
<td>0.46</td>
</tr>
<tr>
<td>10 at risk pregnancies referred to hospital for delivery</td>
<td>1.83</td>
</tr>
<tr>
<td>11 emergency transfers to hospital for obstetric care</td>
<td>4.59</td>
</tr>
<tr>
<td>12 children who completed vaccinations (child preventive care)</td>
<td>0.92</td>
</tr>
<tr>
<td>13 malnourished children referred for treatment</td>
<td>1.83</td>
</tr>
<tr>
<td>14 other emergency referrals</td>
<td>1.83</td>
</tr>
</tbody>
</table>
Evaluating P4P in Rwanda: Evaluation design
Conceptual framework for quality

What They Do (Quality)

What They Know (Ability/Technology)

Productivity Gap Conditional on Ability

Actual Performance

Production Possibility Frontier
Evaluation Questions

Did P4P improve...

... the quality and quantity of maternal and child health services?

... the health of the population?
History of P4P in Rwanda

Three pilot schemes:

- Cyangugu (since 2001)
- Butare (since 2002)
- BTC (since 2005)

- National model implemented in 2006
Evaluation Design

- Phased roll-out at district level
  - Identified districts without P4P in 2005
  - Group districts into “similar pairs”
    - based on population density, location & livelihoods
  - Randomly assign one to treatment and other to control

- Unit of observation is health facility
A few challenges

- The decentralization “surprise”
  - MOH reallocated some districts to treatment
  - A few new districts had some facilities with P4P—must be treatment
• Rollout of P4P
• 2001-2005
• 2006 – 2008
Sample

- Out of 30 districts
  - 12 Phase I (treatment)
  - 7 Phase II (comparison)
- 165 health facilities
  - All rural health centers located in 19 districts
- 2156 households in catchment areas
  - Power calculations based on expected treatment effect on prenatal care visits, institutional delivery
- Panel data: 2006 and 2008
Econometric model

- Basic difference-in-differences model specified as a two-way fixed effect cross-sectional time-series regression models.

\[ Y_{ijt} = \alpha_j + \gamma_{2008} + \beta \cdot PBF_{jt} + \sum_k \lambda_k X_{kit} + \varepsilon_{ijt} \]

where:
- \( Y_{ijt} \) is the outcome of interest for individual \( i \) living in facility \( j \)'s catchment area in year \( t \);
- \( PBF_{j,2008} = 1 \) if facility \( j \) was paid by PBF in 2008 and 0 if otherwise;
- \( \alpha_j \) are facility fixed effects;
- \( \gamma_{2008} = 1 \) if the year is 2008 and 0 if 2006;
- \( X_{itk} \) are time varying individual characteristics;
- \( \varepsilon_{ijt} \) is a zero mean error term.
Evaluation design challenges

- Organizational
  - Managing expectations
    - The John Henry effect in practice
  - Building capacity
  - Time commitments

- Technical
  - Small sample size (clusters at district level = unit of operation!)
  - Reconciling provider and client data
Facilitating factors

- Government leadership
- Integration
- Government coordination of partners
# Baseline, health facilities

<table>
<thead>
<tr>
<th></th>
<th>Treatment</th>
<th>Control</th>
<th>Difference</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Observations</strong></td>
<td>75</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Expenditures and Budget Shares</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log Total Expenditures (2006)</td>
<td>15.81 (1.04)</td>
<td>15.61 (1.01)</td>
<td>0.200</td>
<td>0.418</td>
</tr>
<tr>
<td>Log Total Expenditures (2008)</td>
<td>16.91 (0.71)</td>
<td>16.99 (1.08)</td>
<td>-0.083</td>
<td>0.568</td>
</tr>
<tr>
<td>Personnel Budget Share</td>
<td>0.46 (0.23)</td>
<td>0.49 (0.26)</td>
<td>-0.031</td>
<td>0.555</td>
</tr>
<tr>
<td>Medical Supplies Budget Share</td>
<td>0.22 (0.19)</td>
<td>0.20 (0.19)</td>
<td>0.013</td>
<td>0.705</td>
</tr>
<tr>
<td>Non-medical Budget Share</td>
<td>0.32 (0.25)</td>
<td>0.30 (0.22)</td>
<td>0.018</td>
<td>0.726</td>
</tr>
<tr>
<td><strong>Staffing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Doctors</td>
<td>0.05 (0.23)</td>
<td>0.05 (0.27)</td>
<td>0.003</td>
<td>0.940</td>
</tr>
<tr>
<td>Nurses</td>
<td>6.31 (6.90)</td>
<td>5.48 (3.30)</td>
<td>0.826</td>
<td>0.409</td>
</tr>
<tr>
<td>Other Clinical Staff</td>
<td>4.13 (3.09)</td>
<td>4.47 (4.05)</td>
<td>-0.335</td>
<td>0.554</td>
</tr>
<tr>
<td>Non-clinical Staff</td>
<td>5.25 (3.56)</td>
<td>5.33 (5.09)</td>
<td>-0.076</td>
<td>0.901</td>
</tr>
<tr>
<td><strong>Structural Quality (Baseline 2006)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curative Care</td>
<td>0.80 (0.07)</td>
<td>0.81 (0.07)</td>
<td>-0.01</td>
<td>0.575</td>
</tr>
<tr>
<td>Delivery</td>
<td>0.78 (0.11)</td>
<td>0.79 (0.10)</td>
<td>0.00</td>
<td>0.840</td>
</tr>
<tr>
<td>Prenatal Care</td>
<td>0.96 (0.15)</td>
<td>0.97 (0.11)</td>
<td>-0.01</td>
<td>0.285</td>
</tr>
<tr>
<td>Immunization</td>
<td>0.94 (0.17)</td>
<td>0.94 (0.15)</td>
<td>0.00</td>
<td>0.897</td>
</tr>
<tr>
<td>Laboratory</td>
<td>0.49 (0.32)</td>
<td>0.43 (0.32)</td>
<td>0.06</td>
<td>0.402</td>
</tr>
</tbody>
</table>

*P-values are for cluster-adjusted t-test (continuous variables).

All of the data, except Log Expenditures 2008, are measured at baseline prior to the intervention. Data are n (%) or mean (SD). Sample size varies slightly according to characteristic measured.
Evaluating P4P in Rwanda: Evaluation results
Kernel Non parametric regression practice-competency at baseline
Kernel Non parametric regression practice-competency at follow up
Impact on institutional delivery

7.3% increase due to PBF
What our results tell us

- You get what you pay for!
- Returns to effort important
  - Bigger effects in things more in provider’s control
  - Patient or community health workers for prenatal care/Immunization
- Provide incentives directly to pregnant women? (conditional cash transfer program).
- Financial incentive to community health workers
- Low quality of care: additional training coupled with P4P
- Need to get prices “right”
- Evaluation feedback useful
Thank you!