Health Results-based Financing at the World Bank –
What have we learned so far about Effects, Equity, and Spillovers?

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Outline

- Introduction
- RBF Main Effects
- Potential Unintended Consequences
  - Equity effects
  - Spillover (crowding out) effects
- Key Lessons & Implications
Results Preview

- RBF can improve coverage and quality...but does not always
- RBF is usually equity neutral
- RBF has had few instances of negative spillovers on other services
- RBF is complex; Effectiveness requires implementation fidelity

...BUT...

- This body of evidence is relatively new
- Will be tripled in the coming years
- Will be subjected to continued aggregation and meta-analysis
Results Based Financing—the Basics

- **Results-Based Financing (RBF)** is a cash payment or nonmonetary transfer made to a national or sub-national government, manager, provider, payer or consumer of health services after predefined results have been attained and verified.

- **RBF** is an umbrella term encompasses various types of interventions that target
  - beneficiaries (for example, conditional cash transfers),
  - providers (for example, performance-based financing), and
  - country governments (for example, cash on delivery).
The HRITF Portfolio: Where are we learning?

- 32 Country Pilot Grants doing RBF
  - 24 impact evaluations
- Baseline data has been collected from all impact evaluations.
- Completed IE results available from 7 countries
  - Afghanistan, Argentina, Cameroon, DRC, Rwanda, Zambia and Zimbabwe are available.
- Kyrgyzstan and Nigeria: Early results available soon
Completed Impact Evaluations

- **Afghanistan:** Engineer et al., 2016
  - NGO-implemented pay-for-performance in primary care centers and hospitals for 5 services and a Balance Score Card (BSC) capturing various dimensions of process quality. Comparison was business as usual.

- **Argentina (two studies):** Gertler et al., 2014; Celhay et al., 2015
  - Insurance for Maternal and Child Health (MCH) to uninsured families and pay-for-performance (P4P) for 80 services captured from admin data.
  - Second study focuses on a three-fold temporary increase in P4P for early initiation of prenatal care.

- **Cameroon:** de Walque et al., 2017
  - Performance-based financing (PBF) package for 6 services, and a quantity and quality checklist compared to (1) enhanced financing (not linked to performance) plus additional supervision and autonomy, (2) additional supervision, and (3) business as usual.

- **Haut-Katanga pilot in DRC:** Shapira et al., 2017
  - P4P based on 7 primary services and 3 secondary services; comparison group received funding based on staffing levels and composition.

- **Rwanda (two impact evaluations of two different programs):** Basinga et al., 2011; Shapira et al., 2017
  - The first PBF pilot provided bonus payments for 14 services directly to primary health centers.
  - Second pilot provided demand-side in-kind incentives for perinatal care utilization and institutional deliveries, PBF for community health workers (CHWs), and combined demand-side and CHW cooperative performance payments. A comparison group conducted business as usual.

- **Zambia:** Friedman et al., 2016
  - PBF package for 9 services and BSC compared to enhanced financing only and a pure comparison arm.

- **Zimbabwe:** Friedman et al., 2016
  - Contracting of health facilities for 16 services and a BSC. User fees are also waived for these services at the primary level of care and for six referral services at the secondary level. Comparison was business as usual.
2. RBF Main Effects
Evidence on Key Domains from these IEs

- Coverage/utilization of services
- Quality of care (QOC)
- Human resources


Coverage: In Most Countries, At Least Some Targeted Indicators Improved

- **Argentina:**
  - First IE: increase of <2 in prenatal care visits and 24.7% increase in tetanus vaccine coverage.
  - Second IE, on large temporary increase in the incentive in *Misiones*: sustained 34% increase in early initiation of PNC.

- **Cameroon:**
  - Increases in coverage of child vaccination and maternal immunization against tetanus.
  - Improvements in coverage of modern family planning

- **Rwanda:**
  - First IE: 23% increase in institutional deliveries and 56% increase in preventive care for young children.
  - IE of Community PBF: demand-side incentives increased timely ANC (9.6 pp) and PNC (7.2 pp); no effect of supply-side incentives.

- **Zambia:**
  - Institutional deliveries increased by 13 percentage points and skilled birth attendance increased by 10 pp but the enhanced financing arm was even more effective in both instances (17.5 pp and 14.2 pp).
  - Full vaccination coverage generally remained constant in RBF districts while decreasing in the two other arms.

- **Zimbabwe:**
  - Significant increases in skilled birth attendance (14.7 pp) and institutional delivery (13.4 pp).

- **Afghanistan:** no significant changes on any of the targeted indicators.

- **Haut-Katanga pilot in DRC:** No measurable impact on utilization despite some evidence that providers organized more preventive sessions.
Quality of Care: Generally Positive, but Some Mixed Evidence

- **Argentina:** First IE shows a 74% fall in-hospital neonatal mortality in larger facilities, but the second IE shows no improvement in birth outcomes.

- **Afghanistan:** More complete physical assessment and clinical counseling (7 pp) and more time spent with clients (~14.5 minutes relative to 8.6 mins).

- **Cameroon:** Better availability of necessary equipment for delivery and neonatal care. More qualified workers present on site; out-of-pocket expenditures decreased.

- **Haut-Katanga pilot in DRC:** Process quality and patient satisfaction did not change.

- **Rwanda:** First IE: 0.16 sd improvement in the quality of prenatal care. Second IE: no change in many dimensions of QoC.

- **Zambia:** Completeness of ante-natal care (ANC) counseling improved but not testing and supplement provision. Time spent with patients increased.

- **Zimbabwe:** 10-15 pp increases in availability of equipment and improvements in many process measures for ANC
Mixed Evidence on Impact on Human Resources, Specifically Worker Motivation

- **Afghanistan and Rwanda**: no impact

- **Haut-Katanga**:  
  - Large decreases in intrinsic motivation, but perhaps not surprising given the 42% decrease in facility-level resource availability.

- **Cameroon and Zimbabwe**: Mixed evidence  
  - Cameroon: Positive impacts on satisfaction with infrastructure and availability of equipment and supplies, but not on intrinsic or extrinsic motivation and job satisfaction  
  - Zimbabwe: Satisfied staff (increase of 3.26 pp relative to comparison group), but lower motivation (decrease of 5.29 pp), which is driven by the size of the incentives and unit prices.

- **Zambia**: Significant exception  
  - Large increases in HW satisfaction with remuneration (8 pp).
Findings From Complementary (Qual) Evaluations

From Key Informant Interviews and Client Satisfaction Surveys

- PBF arguably enhanced fiscal decentralization and financial autonomy. PBF facilities performed better than control facilities in terms of health facility governance and managerial autonomy (Zambia, Zimbabwe). For example, RBF districts were more likely to allocate their facility budget according to their needs.

- PBF credits invested in infrastructure, supplies, and equipment, improved sanitation and hygiene. Facilities appeared well-kept and attractive to patients.

- Verification visits have led to greater transparency and accountability by promoting more accurate self-reported information systems (in Zambia).

- Clients report improvements in quality of care proxied by client satisfaction (in Zimbabwe).

- Health workers exerted more effort to attain results; incentives were boosted their morale.
UHC Day! What about Equity?
Exploring Equity Implications of RBF

- Eight Countries:
  - Argentina
  - Afghanistan
  - Cameroon
  - Kyrgyzstan
  - Nigeria
  - Rwanda
  - Zambia
  - Zimbabwe

- Five Outcomes along the RMCH continuum of care:
  - Modern Contraceptive Prevalence Rates
  - Antenatal Care visits
  - Skilled Birth Attendance
  - Postnatal Care visits
  - Children who are fully Immunized

- Depending on data availability, not all outcome estimates are presented for all countries
### Zimbabwe results

<table>
<thead>
<tr>
<th>Category</th>
<th>Population</th>
<th>Equity--Education</th>
<th>Equity--Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>modern Contraceptive Prevalence Rates</td>
<td>0.049</td>
<td>0.123**</td>
<td>0.042</td>
</tr>
<tr>
<td>p-value</td>
<td>0.213</td>
<td>0.043</td>
<td>0.471</td>
</tr>
<tr>
<td>Antenatal Care</td>
<td>0.422</td>
<td>0.295</td>
<td>0.44</td>
</tr>
<tr>
<td>p-value</td>
<td>0.124</td>
<td>0.359</td>
<td>0.154</td>
</tr>
<tr>
<td>Skilled Birth Attendance</td>
<td>0.147***</td>
<td>0.201***</td>
<td>0.135**</td>
</tr>
<tr>
<td>p-value</td>
<td>0.002</td>
<td>0.003</td>
<td>0.025</td>
</tr>
<tr>
<td>Post-natal Care</td>
<td>0.124</td>
<td>0.15</td>
<td>0.135</td>
</tr>
<tr>
<td>p-value</td>
<td>0.173</td>
<td>0.189</td>
<td>0.154</td>
</tr>
<tr>
<td>Immunizations</td>
<td>0.003</td>
<td>0.14</td>
<td>0.45</td>
</tr>
<tr>
<td>p-value</td>
<td>0.978</td>
<td>0.289</td>
<td>0.705</td>
</tr>
</tbody>
</table>

Education: Completed primary education or less  
Wealth: Below median on asset index  

**positive effect**  
**null effect**
## RBF Equity Effects on Health Coverage

<table>
<thead>
<tr>
<th>Health Service</th>
<th>Afghanistan</th>
<th>Cameroon</th>
<th>Kyrgyzstan</th>
<th>Nigeria</th>
<th>Rwanda</th>
<th>Zambia</th>
<th>Zimbabwe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>modern Contraceptive Prevalence Rates</strong></td>
<td>0.131</td>
<td>-0.053</td>
<td></td>
<td>0.037</td>
<td>0.076</td>
<td>0.022</td>
<td>0.042</td>
</tr>
<tr>
<td>P-value (se)</td>
<td>0.229</td>
<td>(0.079)</td>
<td></td>
<td>(0.033)</td>
<td>0.474</td>
<td>0.552</td>
<td>0.471</td>
</tr>
<tr>
<td><strong>Antenatal care</strong></td>
<td>0.119</td>
<td>0.014</td>
<td>-0.040</td>
<td>0.365</td>
<td>0.012</td>
<td>0.079***</td>
<td>0.44</td>
</tr>
<tr>
<td>P-value (se)</td>
<td>0.421</td>
<td>(0.032)</td>
<td>(0.144)</td>
<td>(0.238)</td>
<td>0.909</td>
<td>0.008</td>
<td>0.154</td>
</tr>
<tr>
<td><strong>SBA / facility delivery</strong></td>
<td>0.323**</td>
<td>-0.093**</td>
<td></td>
<td>0.036</td>
<td>0.101</td>
<td>0.138***</td>
<td>0.135**</td>
</tr>
<tr>
<td>P-value (se)</td>
<td>0.021</td>
<td>(0.042)</td>
<td></td>
<td>(0.051)</td>
<td>0.577</td>
<td>0.007</td>
<td>0.025</td>
</tr>
<tr>
<td><strong>Postnatal care</strong></td>
<td>0.245*</td>
<td>0.002</td>
<td>-0.252*</td>
<td>-0.065</td>
<td>-0.151</td>
<td>0.155***</td>
<td>0.135</td>
</tr>
<tr>
<td>P-value (se)</td>
<td>0.077</td>
<td>(0.054)</td>
<td>(0.087)</td>
<td>(0.091)</td>
<td>0.221</td>
<td>0.006</td>
<td>0.154</td>
</tr>
<tr>
<td><strong>Immunizations</strong></td>
<td>-0.349*</td>
<td>0.165</td>
<td></td>
<td>0.033</td>
<td></td>
<td>0.082</td>
<td>0.450</td>
</tr>
<tr>
<td>P-value (se)</td>
<td>0.096</td>
<td>(0.131)</td>
<td></td>
<td>(0.091)</td>
<td></td>
<td>0.451</td>
<td>0.705</td>
</tr>
</tbody>
</table>

**Legend**
- not estimated
- null result
- marg sig pos
- progressive
- marg sig neg
- regressive
Evidence on RBF and equity?
- Very few cases where the impacts of PBF are exclusively pro-rich, i.e. negative effect on health care equity
- But also few cases where PBF improves equity in being significantly and solely pro-poor (Zambia excepted)

As a first pass, PBF, as a reform focusing on the supply-side of health care, seems to be roughly equity “neutral”.

However, the PBF programs themselves have often been targeted towards disadvantaged groups and areas.
RBF Crowding out Outcomes?
Persistent Concern:

If you’re paying for some results, will other parts of health service delivery suffer?

Answer:
Spillovers & Unintended Consequences of RBF

- Common Concern:

If you’re paying for some results, will other parts of health service delivery suffer?

- Answer:

  Maybe.
RBF interacts with the health system in complex ways.
Producer Theory

Production Possibility Frontier:
Theoretical limit at which, for a given level of factors of production (inputs), you cannot produce more of output X without giving up some of output Y.
- Negative Effect: If facilities are already at the edge of the Production Possibility Frontier, then they can’t get more of one outcome without giving up some of another.
  - Extramarginal Effect: Substitute time out of non-incentivized services
  - Inframarginal Effect: Substitute time out of quality of incentivized services

Outcome X: Incentivized
- Number of Antenatal Care Visits
- Institutional Delivery

Outcome Y: (Not incentivized)
- Iron Tablets (extra-marginal)
- Time with patient (infra-marginal)

Production Possibility Frontier for health
Spillovers & Unintended Consequences of RBF

+ **Positive Effect**
If facilities are NOT at the edge of the PPF (D), then improving some parts of the system—as through RBF—may improve other parts, too. (D→A)

~ **Neutral Effect**
At a minimum, it is possible to improve the incentivized outcomes without negatively affecting the non-incentivized outcomes. (D→C)

- Ultimately, this is an empirical question. Let’s explore the data!
Summary of Findings of Spill-over Effects from Existing IEs

- Cameroon (de Walque et al., 2017)
  - No negative effects on quality of antenatal care and under-5 child consultations (completeness of service and advice provided)

- Argentina (Gertler, Giovagnoli & Martinez, 2014)
  - Small negative spillover effects on prenatal care utilization of non-beneficiary populations in program clinics
  - No significant effect on birth outcomes (birth weight/low birth weight).

- Zimbabwe (Friedman et al., 2016)
  - Potential positive effect on quality and quantity of non-incentivized services without measurable changes in process quality, based on administrative data trends (ARI, diarrhea, skin disease, diabetes).

- Democratic Republic of Congo (Shapira et al., 2017)
  - Quality of care (technical quality & patient satisfaction) did not change despite an increase in the provision of preventive sessions for targeted services.

- Here, we further explore data from Afghanistan and Rwanda (reduced form estimation)
### RBF, Targeted Indicators

<table>
<thead>
<tr>
<th>Afghanistan</th>
<th>Objectives</th>
<th>Performance Indicators (Incentivized Services)</th>
<th>Quality component</th>
</tr>
</thead>
</table>
|             | • To increase key MCH service coverage (by addressing low motivation of providers and poor quality of patient-provider interactions)  
• Make services more equitable  
• Improve the motivation of health workers,  
• Raise patient satisfaction and the technical quality of basic services. | Quarterly payments based on volume of the following:  
✓ Antenatal care visit (1\textsuperscript{st}, 2\textsuperscript{nd}, 3\textsuperscript{rd}, 4\textsuperscript{th})  
✓ Skilled birth attendance cases  
✓ Postnatal care visit (1\textsuperscript{st} & 2\textsuperscript{nd})  
✓ Pentavalent3 vaccination  
✓ Tuberculosis detection  
✓ Contraceptive prevalence rates (CPR) in health facility catchment areas | Annual payments to facilities based on:  
✓ Balanced scorecard that addresses quality of services covering 5 domains: Client and community perspectives, Human resources, Physical capacity of HF inputs, Quality of service provision, Management systems  
✓ Equity of institutional deliveries  
✓ Equity of children’s utilization of outpatient services |
### RBF, Targeted Indicators

<table>
<thead>
<tr>
<th>Rwanda</th>
<th>Objectives</th>
<th>Performance Indicators (Incentivized Services)</th>
<th>Quality Component</th>
</tr>
</thead>
</table>
|        | • Improve the quality of data reported at the sector level  
      • Increase utilization of key maternal and child health services  
      • Improve the motivation and behavior of CHWs | Utilization of targeted maternal and child health services:  
• Growth monitoring of children 6-59 months old  
• Antenatal care provided to women in the first four months of their pregnancy  
• In-facility deliveries  
• Family planning consultations for new users  
• Family planning consultations for regular users. | Timely completion of quarterly reports of data the CHWs collected on their communities |
Unincentivized Coverage (Extra-marginal) outcomes

<table>
<thead>
<tr>
<th>Variables</th>
<th>Afghanistan</th>
<th>Rwanda</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Population</td>
<td>Equity-Wealth</td>
</tr>
<tr>
<td>At least one tetanus injection in pregnancy</td>
<td>Coefficient</td>
<td>-0.253**</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>(0.110)</td>
</tr>
<tr>
<td>Given or bought iron tablets during pregnancy</td>
<td>Coefficient</td>
<td>0.713</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>(0.397)</td>
</tr>
<tr>
<td>Child under 5 given ORS during diarrhea</td>
<td>Coefficient</td>
<td>0.017</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>(0.100)</td>
</tr>
<tr>
<td>Sought advice/treatment for child’s diarrhea</td>
<td>Coefficient</td>
<td>0.053</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>(0.172)</td>
</tr>
<tr>
<td>Sought advice/treatment for child’s fever/cough</td>
<td>Coefficient</td>
<td>-0.313</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>(0.225)</td>
</tr>
<tr>
<td>Sought advice/treatment for child’s illness (diarrhoea, fever &amp; cough)</td>
<td>Coefficient</td>
<td>0.167</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>(0.610)</td>
</tr>
</tbody>
</table>

Equity-Wealth: Comparing ITT above vs below the median on a wealth index; p<0.10; ** p<0.05; *** p<0.01; standard errors adjusted for multiple hypothesis testing using ‘Benjamini, Krieger, Yekutieli (2006)’ sharpened q-vals approach as described by Anderson (2008)

null effect

negative effect
### Rwanda

<table>
<thead>
<tr>
<th>Variables</th>
<th>Population Coefficient</th>
<th>Equity-Wealth Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction scale</td>
<td>-0.023 (0.045)</td>
<td>-0.012 (0.081)</td>
</tr>
<tr>
<td><strong>Satisfaction with:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>facility staff being knowledgeable</td>
<td>-0.034 (0.087)</td>
<td>-0.078 (0.157)</td>
</tr>
<tr>
<td>facility staff being responsive and respectful</td>
<td>-0.008 (0.077)</td>
<td>-0.060 (0.145)</td>
</tr>
<tr>
<td>facility staff’s respect for privacy and confidentiality</td>
<td>0.042 (0.085)</td>
<td>-0.173 (0.158)</td>
</tr>
<tr>
<td>availability of facility staff to attend to you</td>
<td>-0.060 (0.077)</td>
<td>-0.029 (0.136)</td>
</tr>
<tr>
<td>facility Cleanliness</td>
<td>-0.015 (0.092)</td>
<td>0.022 (0.168)</td>
</tr>
<tr>
<td>facility capacity to accommodate all patients</td>
<td>-0.046 (0.069)</td>
<td>-0.109 (0.121)</td>
</tr>
<tr>
<td>availability of pharmaceutical products at the health facility</td>
<td>-0.080 (0.077)</td>
<td>0.142 (0.132)</td>
</tr>
</tbody>
</table>

Equity-Wealth: Comparing ITT above vs below the median on a wealth index;  

* Null effect:  
  - * p<0.10; ** p<0.05; *** p<0.01;  
  - p-values adjusted for multiple hypothesis testing using ’Benjamini, Krieger, Yekutieli (2006)’ sharpened q-vals approach as described by Anderson (2008)
Conclusions-Crowding Out

- **ANC quality (infra-marginal effects)**
  - Wealth Equity: No differential spillover effects for Rwanda, Afghanistan
  - Some Positive Effects: Zimbabwe positive effect on quality of ANC, postnatal, child care
  - A Few Negative Effects: Afghanistan tetanus, Argentina prenatal care on non-beneficiary populations
  - Lots of Null results: Afghanistan, Argentina, Cameroon, Rwanda, DRC

- **Client/Patient Satisfaction (extra-marginal effects)**
  - Lots of Null Results: Cameroon, Rwanda, DRC
  - No Negative Effects (so far)
  - Wealth Equity: No effects detected for either Rwanda or Afghanistan

- Interventions appear to have very few negative crowding effects and these effects are generally equity “neutral”.

- Early evidence that these systems are operating within the PPF (that is, they are not productively efficient *ex ante*), and that RBF will not necessarily cause substitution away from non-incentivized outcomes or from quality of incentivized outcomes
Lessons and Implications (thus far)
Key Lessons on Implementing RBF

- RBF programs are not always easy to implement or even understand.
  - Health systems need to be ready to absorb such a complex reform.
  - Mid-course corrections, based on learning from IEs and implementation, are vital.

- Demand- and supply-side incentives work on different margins and may work best when combined. (see example in Rwanda and focus of systematic review and meta-analysis).
  - May be especially true for making equity improvements.
Design of incentive payments should be given serious consideration as:

- Uncompensated price reductions can reduce motivation and effort.
- Team incentives play a positive role.
- Too low of an incentive can lead to an inadequate nudge to provider behavior.
- And yet, incentives cannot be unsustainably priced (unless intended to be temporary as in Misiones in Argentina).
- If coverage indicators are high, target or coverage based performance incentive frameworks might be better suited rather than fee-for-service.
- Equity improvements may need strong targets.
Big Takeaways on Results

- RBF can successfully improve coverage and quality indicators in a wide range of contexts
  - RBF has *not* improved all outcomes everywhere
  - Mega meta-analysis in the offing

- Unintended Consequences—largely neutral, proceed with caution
  - Equity may be difficult to achieve through supply side, except by geographic targeting
  - Limited evidence of crowding out unincentivized activities

- RBF approaches can be cost-effective at increasing utilization and quality of care.
  - But more evidence is needed on cost-effectiveness.

- We are roughly 1/3 of the way through the IE stream of results.
  - Lots more to come
  - These results are instructive but *not* conclusive

- Large remaining learning agenda [www.rbfhealth.org](http://www.rbfhealth.org)
Implications for UHC

- Of the three dimensions of UHC, RBF has demonstrated an ability to improve coverage of services, but not coverage of people. Coverage of costs has yet to be explored.
- RBF is a useful system component to improve strategic purchasing and autonomy. It is not a replacement for the health system, and should not be designed (or implemented) in isolation.
- How to leverage PBF and design its payment methods to improve strategic purchasing?
- How to link PBF and strategic purchasing to other health system reforms?
Thank you