IMPACT EVALUATION OF THE KYRGYZ REPUBLIC QUALITY OF CARE PBF PILOT PROGRAM: OVERVIEW AND SUMMARY FINDINGS
TEAM(S)

- Operational (WB):
  - Asel Sargaldakova, Gyuri Fritsche, Tamer Rabie, Son Nam Nguyen, Raj Ballal

- Implementation (govt. and partners):
  - Klara Oskombaeva, Arsen Askerov, Memeryan Shimarova

- Evaluative:
  - Jed Friedman, Eeshani Kandpal, Ha Thi Hong Nguyen, Aneesa Arur, Tamar Gotsadze
• Despite near universal obstetric coverage, key health outcomes lagged the region and KG republic missed MDG targets for MMR and IMR

• Financing reforms led to capitation payment at PHC and DRGs for hospitals, but growing interest in addressing quality of care
PROGRAM DESIGN

- MoH decision to pilot a PBF to hospitals with exclusive focus on quality of maternal and neonatal care
- Program only offered to rayon (district) hospitals and Centers of General Practice due to budget limitations, investment gradient in hospitals vis-à-vis PHCs
- Quality assessed quarterly, through balanced score card (BSC) with rotating peer-observation group (and counter-verified by external experts)
  - Results disseminated and reviewed with expert support
- Payment integrated within existing provider mechanism, made to entire facility, with a recommended 35% of payment to be spent on civil works and up to 50% on performance payment
- Maximum hospital payment can reach 15% of the annual consolidated budget
• **BSC score allocation:**
  
  - **35% structural quality** – drugs, blood products, functioning equipment, management processes, etc.
  
  - **55% process (content of care)** – record review focused on clinical protocol adherence, later patient simulations of PPH & newborn resuscitation introduced
  
  - **10% outcomes (patient satisfaction)** – interview of recently discharged OB patients
CHANNELS OF PROGRAM INFLUENCE ON QUALITY OF CARE

• Possible pathways of change for both PBF and ES include
  • Measurement and benchmarking – the BSC quantifies the concept of care quality, facilitates the management of care in the clinic
  • Supportive feedback from assessors – may encourage staff and introduce external accountability
• Possible additional pathways of change for PBF
  • Linking resources to benchmarks may enhance saliency of program emphasis on quality
  • Additional financing enables facilities to invest in structural quality dimensions and procure consumables
  • Performance payments may affect motivation (and effort) of staff to deliver high quality care
EVALUATION DESIGN

• 63 eligible Rayon hospitals were triplet matched and randomly assigned (public event) to one of three groups:
  1. Performance Based Payments package (including enhanced supervision)
  2. Enhanced supervision only, and
  3. Business-as-usual (Control)

• Differences-in-differences, with triplet/strata controls, used to make three comparisons between start and end of study period:
  1. PBF versus Business-as-usual
  2. Enhanced supervision (ES) versus Business-as-usual
  3. PBF versus enhanced supervision
GEOGRAPHIC SCOPE

Population per Square Mile
- 247.2 - 300
- 300 - 450
- 450 - 625
- 625 - 950
- 950 - 1228

Participating Hospitals
- PBP Hospital
- Reporting Hospital
- Control Hospital
THREE DATA SOURCES

- **Program data** from the Balanced Score Card used for regular peer verification (also used to assess the business-as-usual group at select times)
  - Begun in Q2 2014 and 14 quarters collected thereafter

- **Newborn Birth Registry Data** covers all institutionalized births in the country from 2013 to 2016, with info on infant deaths, maternal and neonatal complications, APGAR scores, etc.
  - Period: 18 months pre-intervention and 27 months after

- **Baseline and midline surveys** conducted in all 63 Rayon Territorial Hospitals in the Kyrgyz Republic
  - Baseline in Q3 2013 and follow-up in Q2 2017
SURVEY DATA MEASURES

- Instruments included:
  1. Health facility assessments: Hospital assessment and ANC checklist
  2. Interviews with health workers and their patients
  3. Health worker knowledge tests
  4. Simulated patients – mamanatalie and neonatalie
  5. Direct observations of deliveries and antenatal care visits
  6. Clinical record audits

- All components used structured (quantitative) questionnaires or checklists.
- Same tools, methods, training process, and outcomes measured at baseline and follow-up (midline).
THE BSC TALE OF CHANGE
## BSC Scores by Component

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Management (1)</th>
<th>Learning (2)</th>
<th>Patient Satisfaction (3)</th>
<th>Quality Assurance (4)</th>
<th>Maternal (5)</th>
<th>Neonatal (6)</th>
<th>Total BSC (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting</td>
<td>-0.098</td>
<td>-0.055</td>
<td>-0.233</td>
<td>-0.010</td>
<td>-0.122</td>
<td>0.047</td>
<td>-0.094</td>
</tr>
<tr>
<td></td>
<td>(0.180)</td>
<td>(0.189)</td>
<td>(0.197)</td>
<td>(0.183)</td>
<td>(0.171)</td>
<td>(0.172)</td>
<td>(0.155)</td>
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<tr>
<td>PBP</td>
<td>-0.003</td>
<td>-0.162</td>
<td>-0.017</td>
<td>0.072</td>
<td>0.059</td>
<td>0.006</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>(0.180)</td>
<td>(0.184)</td>
<td>(0.197)</td>
<td>(0.183)</td>
<td>(0.171)</td>
<td>(0.172)</td>
<td>(0.151)</td>
</tr>
<tr>
<td>Post</td>
<td>0.237</td>
<td>-0.172</td>
<td>1.296***</td>
<td>-0.051</td>
<td>-0.101</td>
<td>-0.358**</td>
<td>0.108</td>
</tr>
<tr>
<td></td>
<td>(0.180)</td>
<td>(0.184)</td>
<td>(0.197)</td>
<td>(0.183)</td>
<td>(0.171)</td>
<td>(0.172)</td>
<td>(0.151)</td>
</tr>
<tr>
<td>Reporting:Post</td>
<td>1.611***</td>
<td>1.322***</td>
<td>1.196***</td>
<td>1.355***</td>
<td>1.978***</td>
<td>1.638***</td>
<td>1.873***</td>
</tr>
<tr>
<td></td>
<td>(0.254)</td>
<td>(0.264)</td>
<td>(0.278)</td>
<td>(0.259)</td>
<td>(0.242)</td>
<td>(0.244)</td>
<td>(0.216)</td>
</tr>
<tr>
<td>PBP:Post</td>
<td>1.919***</td>
<td>2.266***</td>
<td>1.312***</td>
<td>1.501***</td>
<td>1.890***</td>
<td>1.974***</td>
<td>2.139***</td>
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<tr>
<td></td>
<td>(0.254)</td>
<td>(0.261)</td>
<td>(0.278)</td>
<td>(0.259)</td>
<td>(0.242)</td>
<td>(0.244)</td>
<td>(0.213)</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.322***</td>
<td>-0.860***</td>
<td>-2.040***</td>
<td>-0.833***</td>
<td>-1.129***</td>
<td>-1.225***</td>
<td>-1.445***</td>
</tr>
<tr>
<td></td>
<td>(0.127)</td>
<td>(0.130)</td>
<td>(0.139)</td>
<td>(0.129)</td>
<td>(0.121)</td>
<td>(0.122)</td>
<td>(0.106)</td>
</tr>
<tr>
<td>Observations</td>
<td>126</td>
<td>124</td>
<td>126</td>
<td>126</td>
<td>126</td>
<td>126</td>
<td>124</td>
</tr>
<tr>
<td>Akaike Inf. Crit.</td>
<td>228.916</td>
<td>232.148</td>
<td>252.216</td>
<td>233.710</td>
<td>216.924</td>
<td>218.523</td>
<td>181.829</td>
</tr>
</tbody>
</table>

*Note: *p<0.1; **p<0.05; ***p<0.01
• Significant decrease in volume of blood loss during delivery for PBF arm
OUTCOMES: BLOOD LOSS > 1000 ML

- Significant decrease in rate of PPH for PBF arm
• Increase in newborn APGAR score in both arms, but imprecisely estimated
• Decrease in low APGAR incidence in both arms, but precisely estimated only for PBF
KEY RESULTS ON OUTCOME MEASURES

• No impact on:
  • Infant death in first 48 hours
  • Fetal age (none expected)
  • Birthweight (none expected)

• Improvements in:
  • Rate of blood loss, especially for PBF
  • Rate of severe PPH, especially for PBF
  • Rate of low APGAR scores, especially for PBF
## SUMMARY
RESULTS FROM SURVEY MEASURES: MEDIATORS AND PATHWAYS

<table>
<thead>
<tr>
<th>Outcome (scored as all or nothing)</th>
<th>PBF versus control</th>
<th>ES versus control</th>
<th>PBF versus ES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structural Quality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug Availability and Storage</td>
<td>+</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Medical Equipment Availability and Condition</td>
<td>No difference</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Blood Availability, Storage, and Staffing of Blood Bank</td>
<td>+</td>
<td>+</td>
<td>No difference</td>
</tr>
<tr>
<td>Ability to Attend to Medical Emergencies</td>
<td>No difference</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Laboratory Functioning—Key Tests</td>
<td>No difference</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Hygiene Supplies in Exam Rooms, Delivery Rooms, and Operation Theaters</td>
<td>+</td>
<td>+</td>
<td>No difference</td>
</tr>
<tr>
<td>Communication and Transportation Infrastructure</td>
<td>+</td>
<td>+</td>
<td>No difference</td>
</tr>
<tr>
<td>Staffing</td>
<td>No difference</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td><strong>Process Quality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Worker Knowledge</td>
<td>No difference</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Patient Record Audits for Normal and Complicated Delivery</td>
<td>No difference</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Newborn Resuscitation Simulation (NeoNatalie)</td>
<td>+</td>
<td>+</td>
<td>No difference</td>
</tr>
<tr>
<td>Post Partum Hemorrhage Simulation (MamaNatalie)</td>
<td>+</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Newborn Resuscitation (Direct Observation)</td>
<td>No difference</td>
<td>+</td>
<td>No difference</td>
</tr>
<tr>
<td>Observation Index</td>
<td>No difference</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Teamwork in the Delivery Room</td>
<td>+</td>
<td>+</td>
<td>No difference</td>
</tr>
<tr>
<td>Delivery Care Index</td>
<td>No difference</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><strong>Patient and Practitioner Outcomes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Satisfaction</td>
<td>No difference</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Health Worker Motivation</td>
<td>+</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Health Worker Satisfaction</td>
<td>+</td>
<td>+</td>
<td>No difference</td>
</tr>
</tbody>
</table>
• Significant increase in facility-level hygiene score in both program groups
• Significant increase in facility-level drug availability and quality score in both program groups, but particularly PBF
• Significant increase in blood availability and quality score in both program groups, but particularly PBF
KEY RESULTS ON STRUCTURAL QUALITY

• No changes in:
  • Laboratory capacity/equipment
  • Obstetric/neonatal care equipment

• Improvements in:
  • Facility hygiene
  • Drug availability and storage quality, especially for PBF
  • Blood availability and storage quality, especially for PBF
Relative improvement in skill assessment for both program groups, but only precisely estimated for ES
CLINICAL QUALITY:
DIRECT CLINICAL OBSERVATION: ORDERLY DELIVERY ROOM

- Significant differential in organization of care both arms
**HEALTH WORKER SATISFACTION AND MOTIVATION**

<table>
<thead>
<tr>
<th>Variables</th>
<th>PBP vs. Control</th>
<th>ES vs. Control</th>
<th>PBP vs. ES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motivation (Total)</strong></td>
<td>0.044*** (0.018)</td>
<td>0.014 (0.015)</td>
<td>0.030 (0.020)</td>
</tr>
<tr>
<td><strong>Satisfaction (Total)</strong></td>
<td>0.108*** (0.040)</td>
<td>0.061 (0.040)</td>
<td>0.046 (0.042)</td>
</tr>
</tbody>
</table>

Relative changes are a combination of increases in PBP and ES and a decline in the controls.
KEY RESULTS ON PROCESS QUALITY

• No changes in:
  • Staffing qualification or levels
  • Health worker knowledge scores
  • Skills for PPH management as measured by Mamanatalie

• Improvements in:
  • Skills for newborn resuscitation measured by NeoNatalie, at least for ES
  • Partograph use during active labor and delivery
  • Orderliness of delivery room
A QoC PBF showed improvements along selected dimensions of quality of care:

- **Structural quality**: improvements in hygiene, drug availability, blood bank
- **Process quality**: skills (newborn resuscitation), partograph use, order in delivery room
- **Outcomes**: APGAR scores, blood loss and decreased likelihood of severe PPH

Impacts identified with survey despite confounding of BSC introduction to control facilities which would affect survey measures.

Enhanced supervision alone also showed select gains, although generally not as large in magnitude (or as precise).
MECHANISMS IDENTIFIED BY QUALITATIVE WORK

- Parallel qualitative research suggest important role of
  - Enhanced teamwork, renewed joint-decision making, and improved accountability
    - Switch from command and control approach to all staff assigned to quality improvement teams
  - Revitalized Hospital Quality Assurance Committees (QAC)
    - Internal monthly performance supervision benchmarked against BSC
  - Effective external supportive supervision
    - “Staff enjoy simulation exams and record review. Supervisions.. Shares with us new approaches towards clinical practice”
• By some metrics, supervision arm performs as well as PBF arm
  • But not for some of the most critical: blood loss during delivery, structural quality, satisfaction and motivation of health workers

• PBF costs are obviously higher – our preliminary estimate is 2 – 2.5 times higher

• While PBF “bought more health”, ES may still be cost-effective
  • Interpretive worry: anticipation effects of ES hospitals joining PBF program