

Kyrgyz Republic:  
Using MamaNatalie and NeoNatalie Anatomical Models to  
Improve Knowledge and Skills among Maternal and Neonatal Health Workers



Photo: World Bank

## 1. Background

In the Kyrgyz Republic, high rates of service coverage and utilization have not translated into improved maternal and neonatal health (MNH) outcomes. In 2012, while 99 percent of deliveries took place in a hospital and almost 84 percent of pregnant women attended four or more antenatal care visits, mortality rates remained high for the region, with an estimated 76 maternal deaths per 100,000 live births and 27 neonatal deaths per 1,000 live births<sup>i</sup>. This situation led the Government of the Kyrgyz Republic to spearhead a priority shift from MNH service availability to MNH service quality.<sup>ii</sup>

The Kyrgyz Health Results-Based Financing Project (2014-2019)<sup>iii</sup> directly supports this priority shift by testing the effects and building evidence on the impact of Results-Based Financing (RBF) and enhanced supervision in rayon (secondary) hospitals on the quality of care. It implements a randomized control study including 64 rayon (district) level hospitals and general practice centers distributed across three arms, namely hospitals<sup>iv</sup>

- i. Receiving both performance-based payments and enhanced supervision (i.e. hospitals contained in the pilot scheme);
- ii. Solely receiving enhanced supervision; and
- iii. Neither receiving performance-based payments nor enhanced supervision (i.e. pure control group).

Under the first arm, rayon hospitals are contracted and paid for results using a comprehensive balanced score card with an emphasis on maternal and child health. The hospital performance is verified quarterly by a team of experts<sup>v</sup> using a balance score card with performance metrics related to structure, clinical care and process quality, as well as client satisfaction. These are measured through a variety of methods including file review, direct observation, health worker knowledge tests, role plays, competency tests through MamaNatalie and NeoNatalie anatomical models and client satisfaction interviews. Resulting quality scores are used to trigger both quarterly incentive payments and immediate feedback in an effort to continuously boost quality performance. Importantly, MamaNatalie and NeoNatalie anatomical models are used on both arms but are only incentivized in the first arm. Further, they only represent one aspect of the balanced scorecard used to verify the attainment of pre-defined quality improvements and trigger payments.

## 2. MamaNatalie and NeoNatalie Tools

At the heart of the Kyrgyz Health Results-Based Financing Project are content of care and outcome quality measures. The program aims at imparting the clinical, interpersonal and decision-making skills required to

appropriately manage pediatric care, labor and delivery and surgical care. Within the balanced scorecard, the two competency test related weights were about 5% of the overall balanced scored cared value. Overall content of care measures which were a mix of file reviews, competency and knowledge tests contributed 55% of the weight.

The Kyrgyz Health Results-Based Financing Project introduced simulation-based training centered around MamaNatalie and NeoNatalie anatomical models in both arms to bridge the gap that exists in the Kyrgyz Republic between theoretical knowledge and real-life clinical experiences/exposure. MamaNatalie and NeoNatalie anatomical models support simulation-based training by realistically replicating birthing scenarios, including rare complications such as post-partum hemorrhage and neonatal resuscitation<sup>vi</sup>.

While MamaNatalie and NeoNatalie anatomical models were already being used as evaluation tools in the Kyrgyz Health Results-Based Financing Project, they were repurposed, streamlined and standardized to serve as training tools and improve the knowledge and competency of MNH health workers through “low dose high frequency training methodologies”. They were introduced through cascade training, which first focused on members of the RBF Secretariat – the Project Implementation Unit<sup>vii</sup> responsible for quarterly balanced score card assessments at facility level. This training both imparted the knowledge and skills required to appropriately and effectively relay acquired knowledge and skills to health facilities, as well as conduct quarterly quality assessments. Roll out was carried out through a series of small interactive workshops, and included the provision of related check-lists, protocols and guidelines.

#### *a. Simulation-Based Training*

MamaNatalie-supported trainings are typically carried out in a hospital delivery room. They involve an instructor acting as a standardized patient and placing the simulator on himself/herself to play the role of a mother in labor/experiencing delivery. The instructor can control bleeding volume and intensity as well as simulate a concerned mother and/or a mother suffering from severe blood loss or shock. During this process, health workers are expected to clearly communicate with the patient and other members of the labor and delivery team, respectively explaining and voicing the algorithm of clinical steps taken. MamaNatalie gives birth to NeoNatalie – a life-like manikin used to impart knowledge and skills for the timely diagnosis and management of a newborn’s condition, including resuscitation if necessary.



Photos: Ha Nguyen

#### *b. Assessment of Clinical Knowledge and Skills*

MamaNatalie and NeoNatalie models are also used to measure knowledge acquisition and knowledge retention. During quarterly facility visits, the assessor/verifier selects two complex scenarios to appraise the clinical skills of a randomly selected provider from the labor and delivery team. While other hospital experts, including observers from other hospitals, can observe, the assessment is individual to ensure that each and every member of the labor and delivery team possess the right set of skills. In time, this will ensure that quality remains consistent, including during night and weekend shifts where quality of care often

plummets because of the usually weaker capacity of health workers assigned to these shifts in the Kyrgyz Republic.

### *c. Immediate Feedback*

Trainings and appraisals are immediately followed by a feedback session geared toward prompting (additional) quality improvements. The modus operandi is to emphasize positive aspects (e.g. what was done right) and provide timely recommendations to address potential gaps and further improve quality. It also provides health workers' the opportunity to ask questions and potentially provide additional recommendations. Post-assessment feedback also provides an opportunity for observers to ask questions and potentially provide additional recommendations.

## 2. Keys to Success

Interviews with RBF Secretariat members highlighted some key elements which are deemed to have fostered success.

### *a. Uptake Conditions*

- The **Ministry of Health** played a critical role in supporting transformative change. Fully engaged from the onset, it championed MamaNatalie and NeoNatalie providing the driving force necessary to ensure effective roll-out and rapid uptake in target health facilities. Its continued involvement in all aspects of the project – including training and verifications – is thought to have been instrumental in fostering ownership and in laying the foundations for sustainability, notably also supporting the use of MamaNatalie and NeoNatalie in the institutionalization of RBF in the Kyrgyz Republic.
- The formalization of **existing tools**, which had already galvanized interest and demonstrated their usefulness, is also deemed to have significantly contributed to facilitating and reinforcing uptake and ownership.

### *b. Learning Approach*

- The adoption of an **adult learning approach** – which contrasts with the prevailing authoritarian teaching culture – has been critical in engaging and empowering healthcare workers. Focused on reinforcing *good behavior* and promoting collaborative learning, this approach is perceived crucial to improve confidence, discipline and motivation, and instill a culture of continuous improvement.
- **Workshop size and interactivity** are also viewed as fundamental to minimize quality dilution, ensure full participation and strengthen knowledge retention. It is especially deemed important to build confidence among participants who might feel intimidated by role playing – a key component of MamaNatalie and NeoNatalie utilization
- **Individual learning** is emphasized to ensure that all members of the labor and delivery team individually possess the right set of skills. In time, this will ensure that quality remains consistent, including during night and weekend shifts where quality of care often plummets because of the usually weaker capacity of health workers assigned to these shifts in the Kyrgyz Republic.

### *c. Continuous improvements*

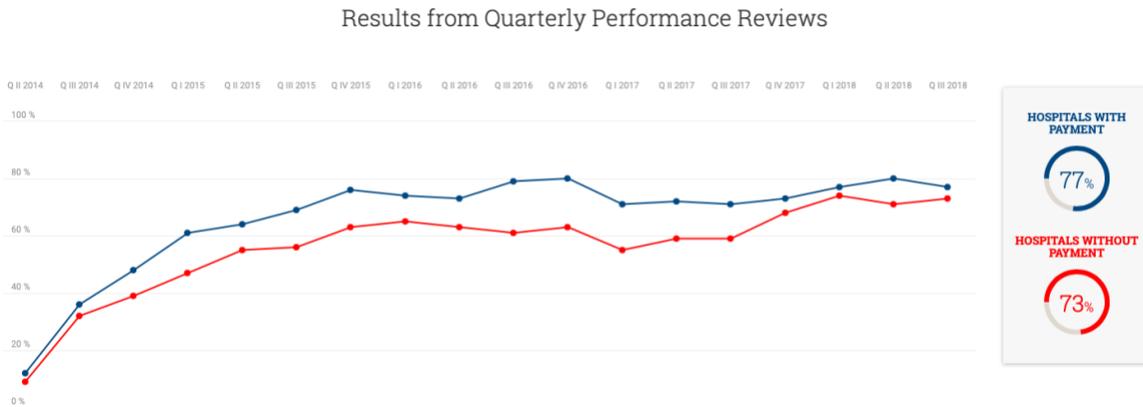
- MamaNatalie and NeoNatalie simulation models have proven to be **invaluable living instruments of the quality of care**, capable of adapting to prevailing needs and supporting continuous improvements. An example of this is the introduction in 2017 of a MamaNatalie scenario involving intrauterine balloon tamponade<sup>viii</sup> to help further strengthen the management of post-partum hemorrhage in remote and

rural areas in the Kyrgyz Republic. Other scenarios, such as caesarian sections, anemia and diabetes, are also under considered. Counselling training is also recommended for inclusion.

### 3. Contribution to the Quality of Care

While impact evaluation results are underway and MamaNatalie and NeoNatalie models only represent one aspect of the balanced score card used in the Kyrgyz Health Results-Based Financing Project, composite quality scores show improvements in the overall quality of maternal and neonatal care from 9% at baseline level (2014) to an average of 75% at the end of the third quarter of 2018 (Graph1).

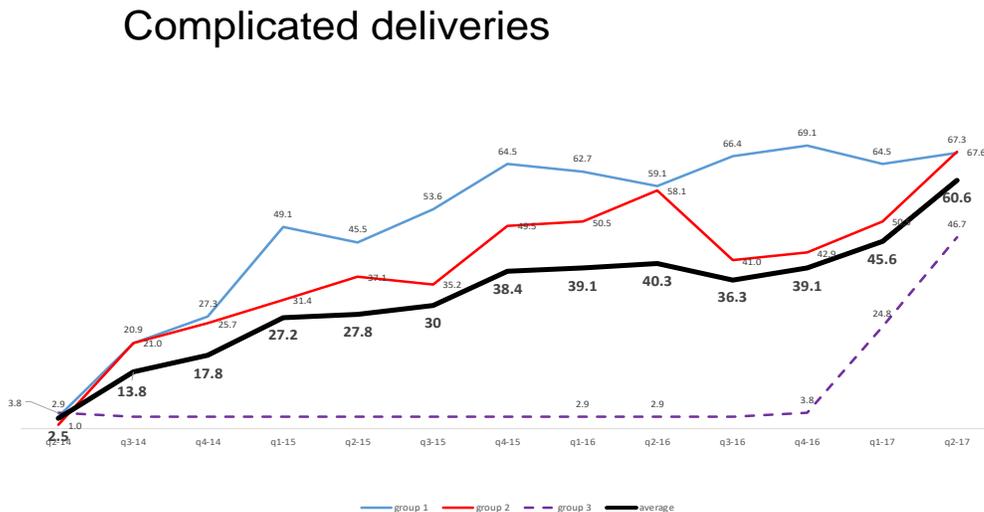
Graph 1: Overall Quality Scores Measured through the Balanced Score Card



Source: Health Results-Based Financing Dashboard, Kyrgyz Republic

Administrative evidence also suggests important gains in the management of complicated deliveries from 2.5% at the end of the second quarter of 2014 to 60.6% at the end of the second quarter of 2017.

Graph 2: Appropriate Management of Complicated Deliveries



Source: Health Results-Based Financing Indicators, Kyrgyz Results-Based Financing Project

Importantly, composite quality scores and administrative data indicate progress in the two treatment arms of the Project, namely hospitals receiving performance payments and enhanced supervision and hospitals solely receiving enhanced supervision.

While direct observation underlined significant changes in communication and team work and increased professional capacity and confidence, qualitative interviews with health workers indicate that health workers feel empowered to fully and proactively participate in quality improvements. This is emphasized by health workers qualifying MamaNatalie and NeoNatalie as “giving them drive” and “motivating them to compete better”. It is further underlined by Arsen Askerov, the Deputy Director of the Kyrgyz Health Results-Based Financing Project, who said: *“At first, participants expected authoritarian and punitive feedback. They were surprised and then pleased by our approach. Now, they are fully engaged and proactively take steps to continuously improve on their skills and on the overall quality of care.”*

Patient feedback also suggests enhanced patient experiences with reduced patient complaints and increased patient retention. For instance, when asked to comment about the quality of maternal and neonatal care, one patient said: *“I like how patients are treated here. I gave birth to my first child in this hospital. Everything went well so I decided to deliver my second child here too.”*<sup>ix</sup>

#### 4. Other Quality of Care Improvements

Continuous quality of care improvements (CQI) are part and parcel of the Balanced Score Card approach in the Kyrgyz Republic. Four key departments have CQI activities, overseen by the central hospital CQI unit. Increased engagement is also reflected at hospital level where the presentation of overall quality results and recommendations is increasingly used to effectively support the acquisition of skills and strengthen the quality of maternal and neonatal care. For instance, in some hospitals, management regularly organizes tailored capacity building initiatives to respond to the specific (practical) needs of the labor and delivery team. Others have created learning videos to promote learning within and across hospitals, thereby compensating for the insufficient number and cost of medical trainers in the country. In this context, improvements in individual clinical skills are going hand in hand with improvements in supportive supervision. Furthermore, systematic knowledge tests (CPVs) have been started in April 2019 through an online software tool to strengthen knowledge of district doctors nationwide.<sup>iv</sup>



Photo: Ministry of Health

MamaNatalie and NeoNatalie simulation tools are contributing to the establishment and entrenchment of a culture focused on the quality of care driven by quality improvements.

During 2017, the Government of the Kyrgyz Republic recognized the Balanced Score Card approach which included the MamaNatalie and NeoNatalie anatomical models to improved quality of care. As a result, the Government decided to institutionalize results-based financing using public funding to further bridge the existing gap between theoretical knowledge and real-life clinical experiences in the Kyrgyz Republic.

<sup>i</sup> National Statistical Committee of the Kyrgyz Republic - NSC, Ministry of Health - MOH/Kyrgyz Republic, and ICF International. 2013. Kyrgyz Republic Demographic and Health Survey 2012. Bishkek, Kyrgyz Republic: NSC, MOH, and ICF International

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Comparatively, in 2012 in Tajikistan, 79% of deliveries occurred with a skilled birth attendant and over half of pregnant women attended four or more antenatal care visits, and the neonatal mortality rate was estimated at 19 deaths per 1,000 live births (Tajikistan Demographic and Health Survey, 2012) and the maternal mortality ratio was estimated at 34 deaths per 100,000 live births (World bank, 2012). In Turkmenistan, 82.8% of deliveries occurred with a skilled birth attendant and 99.5% of pregnant women attended four or more antenatal care visits. The neonatal mortality was estimated at 22 deaths per 1,000 live births and the maternal mortality ratio was reported to be 11.6 per 100,000 live births (UNICEF, 2008-2012).

<sup>ii</sup> Fritsche G, Soeters, G., Meessen, B. (2014) Performance -Based Financing toolkit. <https://doi.org/10.1596/978-1-4648-0128-0>

<sup>iii</sup> Funded by the Health Results Innovation Trust Fund, World Bank Group (2012-2018)

<sup>iv</sup> Fritsche G, Peabody J. Methods to improve quality performance at scale in lower- and middle-income countries. *J Glob Health*. 2018;8(2):021002. doi:10.7189/jogh.08.021002

<sup>v</sup> The expert team includes representatives from the Ministry of Health, the Mandatory Health Insurance, professional associations (e.g. Kyrgyz Alliance of Midwives; the Kyrgyz Association of Obstetricians, Gynecologists and Neonatologists) and peer hospitals.

<sup>vi</sup> MamaNatalie Birthing Simulator: [www.laerdal.com/us/products/simulation-training/obstetrics-pediatrics/mamanatalie/](http://www.laerdal.com/us/products/simulation-training/obstetrics-pediatrics/mamanatalie/)

NeoNatalie: <https://www.laerdal.com/us/products/simulation-training/obstetrics-pediatrics/neonatalie/>

<sup>vii</sup> The RBF Secretariat comprises experts from the Ministry of Health, the Mandatory Health Insurance; and professional associations such as the Kyrgyz Alliance of Midwives and the Kyrgyz Association of Obstetricians, Gynecologists and Neonatologists (KOAGN); etc.

<sup>viii</sup> Early use of intrauterine balloon tamponade is a way of limiting ongoing uterine blood loss while initiating other measures and can be readily implemented by providers with minimal training. It can be a life-saving intervention, especially in low-resource settings where blood transfusion and surgical facilities may not be available

<sup>ix</sup> Kyrgyz Ministry of Health, <https://www.rbfhealth.org/project/kyrgyz-republic>