FONDAZIONE ONLUS
PIERO E LUCILLE CORTI
IN UGANDA, PER LA CURA E LO SVILUPPO

ST MARY'S HOSPITAL
LACOR

Fondazione
Dr. Ambrosoli
Memorial Hospital

RESULTS BASED FINANCING

AN ENGINE OF CHANGE FOR PAEDIATRIC SERVICES.

Intervention to strengthen the quality of care and empowerment of health personnel in the Acholi region, Northern Uganda.

Paediatric RBF approach impact evaluation
Lacor and Kalongo Hospitals –Uganda

2018••2021

AGENZIA ITALIANA
PER LA COOPERAZIONE
ALLO SVILUPPO

This study was carried out as one of the activities implemented within project AID 11495 Result Based Financing, an engine of change for Paediatric services. Intervention to strengthen the quality of care and empowerment of health personnel in the Acholi region, Northern Uganda Co-financed by the Italian Agency for Cooperation.

Scientific supervisor: Professor Luigi Greco, University Federico II, Naples

Coordination: Elisabetta D'Agostino (Fondazione Corti Onlus), Livia Colvin (Fondazione Ambrosoli)

Coordination of report preparation: Professor Luigi Greco (University Federico II, Naples); Elisabetta D'Agostino, Thomas Molteni, Carolina Laghi (Fondazione Corti Onlus); Livia Colvin (Fondazione Ambrosoli)

Statistical supervision: Professor Luigi Greco (University Federico II, Naples), Dr Emmanuel Ochola (St. Mary's Hospital Lacor), Dr Godfrey Smart Okot, Dr Carmen Orlotti, Jimmy Komalceh (Dr.Ambrosoli Memorial Hospital), Valentina Mozzi and Carmela Arcidiaco, data manager

Research Team: Professor Luigi Greco (University Federico II, Naples), Dr Emmanuel Ochola (St. Mary's Hospital Lacor), Dr Venice Omona (St. Mary's Hospital Lacor), Dr Godfrey Smart Okot (Dr. Ambrosoli Memorial Hospital), Valentina Mozzi.

The authors acknowledge all the professionals of the group of experts for their comments and suggestions: Dott.ssa Grazia Sgarra, Mariangela Pantaleo and Andrea Stroppiana (AICS), James Mwaka (Ministry of Health, Uganda), Dr Martin Ogwang (St. Mary's Hospital Lacor), Dr Tito Squillaci (Dr. Ambrosoli Memorial Hospital).

Graphic design: Nathalie Ospina
Cover Photo: Mauro Fermariello
Published on: September, 2021

RESULTS BASED FINANCING

AN ENGINE OF CHANGE FOR PAEDIATRIC SERVICES.

Intervention to strengthen the quality of care and empowerment of health personnel in the Acholi region, Northern Uganda.

Paediatric RBF approach impact evaluation
Lacor and Kalongo Hospitals –Uganda

2018••2021

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This research aims to analyse the impact of a specific Results Based Financing (RBF) approach implemented by the project "*Result Based Financing, an engine of change for Paediatric services. Intervention to strengthen the quality of care and empowerment of health personnel in the Acholi region, Northern Uganda* [1]" in the children wards of St. Mary's Hospital Lacor and Doctor Ambrosoli Memorial Hospital Kalongo in Uganda (from now on called Lacor Hospital and Kalongo Hospital). The three-year project, which began in April 2018, was financed by the Italian Agency for Development Cooperation (AICS) and implemented by the Corti Foundation in partnership with Ambrosoli Foundation, University of Naples and Gulu University.

The clinical and nursing charts from both wards were analysed by a consultant, Professor Luigi Greco from Federico II University of Naples, the Hospital directors, quality teams and medical staff in order to verify if, and to what extent, improvements in the quality of health services had occurred during the project implementation. The study results intend to highlight strengths and weaknesses of the RBF model that was implemented, and evaluate if it can be extended to other departments and replicated in highly vulnerable health, economic and social contexts. The study also intends to verify that the funding methodology ensured correct incentive mechanisms consistent with the quality improvement objectives, avoiding forms of moral hazard or perverse incentives. A literature review of past RBF and other performance-based approaches in East Africa was carried out in order to better evaluate the specific RBF approach implemented in this project and adequately compare valuable and critical aspects raised.

1 Result Based Financing, a change engine for Paediatric services. Intervention to strengthen the quality of care and empowerment of health personnel in the Acholi region, Northern Uganda.

The study of this RBF project's impact on the Children Wards of Lacor and Kalongo Hospitals, led by Prof. Luigi Greco of the Univ. of Naples, was carried out at the end of the three-year implementation and included:

1. **Analysis of the Quarterly Quality Verifications** by the Hospital Quality Teams, with the support of a representative from the Ministry of Health, during the three years of the project.

ii. The checklist for verification focused on 5 main domains:
iii. Basic infrastructures (special attention on cross cutting indicators such as presence of adequate drugs and support from laboratory and X-Ray departments);
iv. Hygiene & cleanliness;
v. Clinical & nursing processes (including adherence to international protocols for a list of 10 index-diseases);
vi. Emergency readiness;
vii. Training.

2. **Analysis of Clinical Procedures:** diagnosis and treatment registered in randomly selected clinical charts between March to August 2016 (a total of 120 charts registered before the start of the project) and March to August 2020 (a total of 120 charts registered after three years of implementation) were compared.

3. **Analysis of Nursing Procedures.** The same analysis as point 2 was carried out on nursing records from 2016 and 2020.

4. **Analysis of Hospital Acquired Infection (HAI)** The target was to survey 500/700 patients. Conducted by the Lacor Hospital Quality Team with the children ward staff, three times within 45 days, evaluated and investigated infections acquired within 48h of hospitalization. Unluckily, because of the Covid-19 pandemic it was not possible to reach the patients target and a restricted number of cases (163) has been analysed.

5. The study also recorded the opinions of the staff most involved in the project regarding benefits, challenges and changes that the project determined through personal interviews.

The main results of the research confirm the significant impact of this RBF approach on clinical and nursing processes, as well as on the general quality of health services provided. The few differences between the two hospitals were justified by the different context, services provided and the baseline quality level.

This study has been conducted with the support of the Italian Agency for Development Cooperation and the Cariplo Foundation, in the framework of the cited project.

RESULTS BASED FINANCING AND RESULTS BASED MANAGEMENT

Photo: Mauro Fermariello

RESULTS BASED FINANCING AND RESULTS BASED MANAGEMENT

Introduction from Italian Agency for Development Cooperation

Increasing the funding for sustainable development and improving the effectiveness of spending are a priority for all development actors facing the challenge of global poverty and the achievement of the Sustainable Development Goals (SDGs). These priorities have intensified in recent years, driven by the unceasing pressure on public budget and the growing attention to achieving measurable results. They become even more stringent in the evolving context of the Covid 19 pandemic.

BY RESTRICTING THE FOCUS TO THE HEALTH SECTOR, AND IN PARTICULAR TO CHILD HEALTH, WHICH IS THE OBJECT OF THE INTERVENTION DISCUSSED IN THIS PUBLICATION, THE LAST THREE DECADES' INVESTMENTS HAVE ACHIEVED SURPRISING PROGRESS IN REDUCING INFANT MORTALITY.

By restricting the focus to the health sector, and in particular to child health, which is the object of the intervention discussed in this publication, the last three decades' investments have achieved surprising progress in reducing infant mortality. Since 1990, under 5 mortality rate has decreased by 59%. However, in order to achieve the Sustainable Development Goal of ending infant and under 5 preventable deaths by 2030 (SDG 3.2.1), significant and targeted investments are needed, particularly in Sub-Saharan Africa and the South East Asia.

Much of the progress achieved worldwide so far is due to mobilization of internal resources and by development funding, but the landscape of health financing is changing. National financing is increasingly playing a role and this is raising the private sector's interest regarding social impact investments. In this scenario, international donors are pursuing new opportunities to bridge the need gaps and accelerate their commitment to implementing the sustainable development goals.

Two main funding approaches have emerged in recent decades which, to varying degrees, pursue the dual ob-

jectives of increasing funding for health programs beyond traditional funding mechanisms, and improving the efficiency and impact of public funding: **Blended Finance** and **Results Based Financing**.

Blended Finance is the strategic use of development finance to mobilize additional funding from both the private and public sectors in developing countries. Public and philanthropic organizations act as catalysts by improving the risk and yield profiles of investments, in order to achieve a more sustainable development. The objective of reallocating the risk and yield profiles between public and private actors is mainly to increase the volume of available funding. The promotion of an efficient use of public resources is only indirect, as the final objective is to produce a positive financial yield, which only presumes an efficient use of resources.

Results-based funding (RBF) approach aims at an efficient use of public resources as the funds are disbursed, at least in part, following achieving the previously agreed upon results. According to the World Bank Fund for Results Based Financing in Health[2], RBF is defined as "a non-monetary payment or transfer made to a government, manager, provider, or user of health services, national or sub-national, after predefined results have been achieved and verified. Payment is conditional on the measurable actions taken."

Results Based Financing is defined according to the subject who receives the incentive:

- **Performance-Based Aid**: the parties involved are a bi / multilateral donor and a national government; the donor pays for each additional unit of progress towards a pre-agreed objective; it can be financed as a grant (Cash on Delivery), or as a loan (Performance Based Loan);

- **Performance Based-Transfer**: the parties involved are a bi / multilateral donor and / or national government and a local government;

- **Performance Based Contract**: the parties involved are a bi / multilateral donor and / or national government and / or a non-government organization and a service provider. It is defined **Output Based Aid** when the supplier receives a subsidy to complement or replace the fee paid by the user when specific results are achieved; it is defined **Performance Based Financing** when it provides for the disbursement of a subsidy for pre-agreed services that have been provided, generally also conditional on specified quality standards.

- **Impact Bond**: social investments are mobilized from the private sector to allow the service provider to have the initial capital to carry out its program. The donors finance the services that have been provided only if the set objectives were achieved. The donor funds are used to pay back the social investors either partially, completely or

2 www.rbfhealth.org

even with an additional yield, based on the level of efficiency achieved by the service provider in carrying out the planned initiatives.

- **Conditional Cash Transfer**: the transfer benefits the end user and is conditional on completion of an action; it is used to incentivize the use of specific services (for example, to undergo a series of examinations or treatments).

Results-based financing can therefore be directed to the demand side, when aimed at improving the use of a provided health service, or it can be directed to the supply side, when aimed at creating incentives for service providers to provide good services.

Compared to traditional input-based financing, which anticipates the funds needed to produce the services, such as drugs, equipment and personnel, the RBF approach is based on the services actually provided by the facilities.

Generally, all outcome-based funding approaches have a number of common characteristics:

- creating incentives for achieving results;
- transferring part of the risk from the donor to the implementing partner;
- creating a higher degree of ownership on behalf of the executing partner;
- making room for flexibility and innovation on how to achieve sustainable results;
- need for an (independent) verification of results;
- ensuring transparency and clear lines of accountability.

Many of the features of RBF are consistent with the internationally agreed **principles on Aid Effectiveness** reaffirmed at the **Busan** Forum (2011); the RBF approach encourage greater **ownership** by the implementing partners, is oriented towards **results-based management**, calls for **inclusive partnership** through verification of shared indicators and encourages **transparency and mutual accountability** by the actors involved at all levels.

Over the past decade, results-based financing (RBF) has gained momentum as an innovative financing mechanism in the healthcare sector, as it combines both linking the funding to performance with greater autonomy and supervision by the implementing partners. These combined elements are expected to stimulate efforts to increase the quantity and quality of services on the supply side, and at the same time trigger a response towards a better use of services on the demand side.

Furthermore, the RBF approach has the ambition of extending its benefits beyond specific interventions to the entire health system through stimulating a reform of the structural problems that characterize public health services, such as improving the capacity to deliver services, empowerment, strengthening information systems, improving performance of health personnel.

Furthermore, one of the radical aims of the RBF is that the funds are disbursed directly to the beneficiary facilities, avoiding intermediaries and thereby changing standard practices in the public and development aid sector.

Several low and middle-income countries have experimented with performance-based health service contracts, with different institutional arrangements and incentive schemes. Many of these RBF schemes report a marked improvement in adoption and coverage of (typically) basic health care services.

However, some authors[3] have criticized the widespread introduction of RBF in light of limited evidence on efficacy, highlighting the unintended consequences and the need to assess the impact of RBF implementation. In poorly designed and / or implemented schemes, recipients of bonuses may focus excessively on achieving their goals, while neglecting other important responsibilities. Or they may focus exclusively on populations that are easier to reach, rather than on the more vulnerable ones. Performance indicators may prove unreliable as there is an incentive to over-report positive results. Furthermore, users and suppliers can collude in order to benefit from bonuses without improving performance.

3 Paul E, et al., Performance-based financing in low income and middle-income countries: isn't it time for a rethink? BMJ Glob Health 2018

Foto: Mauro Fermariello

Conversely, other practitioners involved in implementing RBF[4] schemes have pointed out that RBF is an evolving strategy with potential benefits to health systems, despite existing challenges. They agree on some critical issues, in particular the high administrative costs of implementation for verifying the results, and highlight the positive results observed in the schemes implemented in several countries in Africa. Some evidence points to the fact that specifically created national RBF management committees managed to bring the different actors –political representatives, technical and financial partners and sector managers- around the same table. This allowed, for example, improving information sharing and strengthening the culture of decision-making; the introduction of tools such as business plans and indicators increased transparency in management and accountability among health care workers and program stakeholders. Other positive aspects include strengthening the regulatory role of provincial / district actors in charge of supervision and monitoring, while the introduction of community satisfaction surveys allowed the beneficiaries to give their feedback on the quality and reliability of the provided services. Finally, there was an impulse to digitize health systems in order to promote interoperability between the PBF indicators and the national information systems.

Beyond the debates, however, most authors agree on the limited available evidence and on the need to better assess the impact of the different RBF schemes, on the basis of context-specific constraints. Understanding the heterogeneity of the different approaches and their impact in different contexts is considered essential in order to inform the decision on whether to adopt an RBF approach as a financing mechanism[5].

We wish to highlight that RBF is not an operational concept but rather a strategic one, which focuses on **results-based planning**. Attention should focus on "Results", rather than on "Funding"; RBF is not only about paying for results achieved, but also about how RBF can be organized in order to achieve results.

This is where Results Based Financing interlaces with Results Based Management. In order to operationalize the concept of RBF, it is essential to carry out an in-depth

4 Mayaka Ma-Nitu S, et al., Towards constructive rethinking of PBF: perspectives of implementers in sub-Saharan Africa, BMJ Glob Health 2018

5 Binyaruka P, et al. Evaluating performance-based financing in low-income and middle-income countries: the need to look beyond average effect BMJ Global Health 2020

analysis of the challenges that will be faced, a good diagnosis of existing problems and the choice of strategy to be pursued. In order to build a good Results Based Financing contract, the five-information level chain of desired results must be clearly identified, as described by EuropeAid's matrix of activities. The width of the term "results, which includes such an extensive range of meanings, is at the origin of the confusion that often characterizes the design of cooperation interventions and which complicates their evaluation.

"The term 'Result', according to the RBM approach, touches 4 different levels of the logic of intervention: *Impact* (or long-term General Objectives), *Outcome* (or Specific Objective), Intermediate Objectives and Outputs. Conversely, the term 'Result' in traditional approaches was limited to the level of goods and services which were required to achieve the Specific Objective". As the measurement of results, in an RBF scheme, is functional to the disbursements, we underline the importance of defining the payment at each level of the results chain according to the degree of risk sharing between the implementing and donor organizations.

But up to what level can the donor push his ambition? Activities bear the lowest level of risk, as they are easily measured both quantitatively and qualitatively. With respect to the three levels of objectives: General (*Impact*) Specific (*Outcome*) and Intermediate, the most ambitious level of risk sharing by the donor cannot go beyond the level of intermediate objectives, also defined as "strategic" or "operational", which by their nature are under the direct responsibility of the project activities[6].

The potential added value of an RBF approach can only be assessed after having identified the objectives and the chain of results that the project intends to achieve and having identified the constraints that characterize the context, thereby adapting the RBF tools appropriately.

In order to align with the "New European Consensus on Development" commitments, which require that development actions and planning be results oriented, the Italian Agency for Development Cooperation has introduced a results-based management approach. The Agency has recently reviewed and focused on Results Based Management all grant procedures, including management and reporting of initiatives promoted by public and private non-profit organizations involved in Development Cooperation. This is an important innovation for Italian cooperation in response to the recommendations by OECD 2014 and 2019 Peer Reviews.

The Italian cooperation participated for the first time to a Results-Based Financing mechanism within the Humanitarian Impact Bond (HIB) program, which is coordinated by the International Committee of the Red Cross (ICRC). In order to have the initial capital to extend its Physical Rehabilitation Program for victims of mines and unexploded devices and for the disabled in Nigeria (Maidiguri), Mali (Mopti) and the Democratic Republic of Congo (Kinshasa), the ICRC mobilized social investments from the private sector, especially from insurances. The donors of the program (Italy, Switzerland, Belgium, the United Kingdom and "La Caixa", a Spanish Bank Foundation) finance the services that are provided exclusively upon achievement of agreed objectives. The funds are used to repay corporate investors either partially, fully or with an added return, according to the degree of efficiency achieved by ICRC in carrying out the planned initiatives. Achieved results (Staff Efficiency Ratio) are calculated and monitored throughout the Program by an auditing firm. AICS joined the Program in 2017 with a contribution of up to 3 million euros.

The initiative described in this publication, on the other hand, represents an unusual combination between a traditional financing approach and an RBM approach. The Corti Foundation participated to the AICS call for CSOs and received a co-financing of 950,000 euros for implementing a project to strengthen the health system in Northern Uganda[7]. The AICS -Fondazione Corti funding is part of the traditional channel for projects proposed by CSOs.

6 For an in-depth examination of the levels of the chain of results and the importance of defining the intermediate objectives see: Stroppiana, Designing in difficult contexts. A new reading of the Logical Framework, Franco Angeli 2015.

7 The project is entitled "Results Based Financing. An engine of change for pediatric services. Intervention to strengthen the care and empowerment of health personnel in the Acholi region, Northern Uganda."

In implementing the project, Corti Foundation in part finances the inputs needed to ensure the delivery of paediatric care by Lacor and Kalongo Hospital (by supplying drugs and provision of medical and nursing staff) and partly applies an RBF contract which finances beneficiary hospitals on the basis of the quantity and the quality of paediatric care delivered to the most vulnerable population of Northern Uganda. A fixed subsidy is paid for each unit of service delivered by the paediatric departments of the beneficiary hospitals (defined in a set of quantitative indicators) to which is added a qualitative bonus linked to the score achieved within a different set of qualitative indicators. The design of the intervention is completely different from that traditionally deployed in development cooperation projects.

The Corti Foundation intervention is almost exclusively focused on activating the RBF mechanism (including the development and monitoring of quantitative and qualitative indicators) for the offer of paediatric care in the two hospitals' children wards. The empowerment of healthcare personnel and the improvement of the quality of services are pursued not, for example, through staff training, but as a result of introducing and adhering to the quality standards of the RBF contract. The Corti Foundation, however, promotes this intervention in continuity and complementarity with a much wider support to the beneficiary hospital and, furthermore, after having experimented this RBF approach within the NUHealth Program funded by World Bank in partnership with DFID in previous years.

In light of the recommendations expressed by the analysts, and given the centrality of the local contexts' constraints, as well as the importance of evaluating the impact of a RBF incentive well beyond the simple monitoring of the funding scheme's indicators, the Agency considers this study to be of particular interest. It will allow to evaluate the results that were achieved through this initiative, as well as to share the findings among actors involved in the health sector development cooperation.

Mariangela Pantaleo – Representative for the project "Results Based Financing. A change engine for paediatric services", AICS & external expert, Sogesid SpA

Andrea Stroppiana –RBM Expert – Representative for methodological tools for evaluating environmental sustainability within International Cooperation, Sogesid SpA

The views and opinions expressed in this article do not necessarily reflect the official position of the Italian Agency for Development Cooperation (AICS)

BIBLIOGRAPHY:

Binyaruka P, *et al*. Evaluating performance-based financing in low-income and middle-income countries: the need to look beyond average effect, *BMJ Global Health* 2020

Mayaka Ma-Nitu S, et al., Towards constructive rethinking of PBF: perspectives of implementers in sub-Saharan Africa, BMJ Glob Health 2018

Paul E, *et al*., Performance-based financing in low-income and middle-income countries: isn't time for a rethink? *BMJ Glob Health* 2018

Renmans D, *et al*, Opening the 'black box' of performance-based financing in low- and lower middle-income countries: a review of the literature, Oxford University Press in association with The London School of Hygiene and Tropical Medicine, 2016

SIDA, Results Based Financing Approaches (RBFA)–what are they? 2015

Stroppiana, Progettare in contesti difficili. Una nuova lettura del Quadro Logico, Franco Angeli 2015.

The Global Partnership on Output-Based Aid–The World Bank, A Guide for effective result-based financing strategies, 2018

RESULTS BASED FINANCING AS AN APPROACH TO DEVELOPMENT PROJECTS

Photo: Mauro Fermariello

RESULTS BASED FINANCING AS AN APPROACH TO DEVELOPMENT PROJECTS

Thomas Alessandro Molteni, Fondazione Corti,
Quality and Human resource management advisor for Lacor hospital.

The first RBF program in Healthcare started in Rwanda in 2002. Its success attracted widespread interest and RBF programs were later implemented in many other countries in the attempt to improve quality in Healthcare. During the last decade much attention in Research literature has focused on these programs. Many studies have highlighted positive effects on work force motivation and morale.

In 2018, however, an influential paper by Paul E, Albert L, et al., questioned RBF effectiveness and especially highlighted several adverse effects of the RBF mechanism. Few other articles on RBF were published subsequently.

UNLESS ONE BELIEVES THAT ALL PREVIOUS EVIDENCE ABOUT RBF EFFECTIVENESS WERE WRONG, IT IS REASONABLE TO SUPPOSE THAT THE RESULTS DEPEND LARGELY ON HOW THEY ARE DESIGNED AND IMPLEMENTED IN THEIR SPECIFIC CONTEXT. THEREFORE, POORLY DESIGNED RBFS WILL LIKELY LEAD TO ADVERSE EFFECTS, WHILE WELL DESIGNED ONES WILL PROMOTE QUALITY IMPROVEMENTS.

This is a pity, since many interesting issues remain to be explored regarding effectiveness of properly implemented RBF. Unless one believes that all previous evidence about RBF effectiveness were wrong, it is reasonable to suppose that the results depend largely on how they are designed and implemented in their specific context. Therefore, poorly designed RBFs will likely lead to adverse effects, while well designed ones will promote quality improvements.

The cases of the RBF program implemented in Lacor and Kalongo Hospitals are interesting because they were designed to minimize as much as possible the risk of adverse effects highlighted in the literature.

In particular, the “risk containment” elements of the RBF program included the following factors:

- Bonuses paid to the staff do not depend on individual performance but on the RBF performance of the hospital, thus promoting teamwork and cooperation.
- Bonuses are significant, but they are a minor part of the staff overall compensation, so the risk of losing it does not create excessive stress.
- Communication and involvement of staff is a key element of the process, the results are widely and openly shared more as a way to celebrate teamwork and continuous improvement, rather than to punish faults and errors.
- The two Hospitals do not depend on RBF for their survival, thus strongly reducing the effect of perverse incentives.
- The verification checklist was designed to be broad and to potentially cover all work areas; the verifier randomly choses which items are verified during each verification, thereby avoiding selective forewarned preparation by the staff.
- A hospital Quality Assurance Department participates in the RBF and regularly follows up on the findings.

Another interesting aspect is that it could allow connecting RBF studies with studies on Quality Improvement and HRM programs. At the moment, there seems to be little connection between the literature on RBF programs and the vast research being carried out on the effectiveness of Quality Improvement and HRM programs in Sub Saharan Hospitals. A wide Literature review in 2018 (Gile et al.) of such programs in Sub Saharian Africa included none of the several existing RBF programs. Lacor Hospital could be a good place to start promoting a constructive dialogue between these two areas of research, with the present research as a start to filling this gap.

Finally, sharing more detailed data about RBF programs, especially their design, would be useful. The vast majority of studies analyse the results of RBF programs, but few details are given on their exact design. We cannot understand from published papers, for example, which proportion of the funding the bonus constitutes. This is a key aspect, because if the bonus component is low, or non-existent, there is little difference between RBF and the traditional “activity based” funding, which is one of the most common financing mechanisms of Hospitals in Western Countries through Diagnosis Related Groups (DRG).

The same applies to other aspects of the RBF design (how broad the checklist, how the bonuses are paid to staff, etc.).

These design details are highlighted in this study to encourage further studies that compare the effectiveness of different RBF program designs.

Current RBF Programs in the Uganda Healthcare sector

The Uganda health system includes both government and private sector. According to the Ugandan Ministry of Health, 45% of health facilities are Government owned, 40% are private for profit, while 14% are Private non for profit (PFNPs)[8].

The vast majority of the PNFPs hospitals are coordinated by three faith-based organizations: the Uganda Protestant Medical Bureau (UPMB), the Uganda Catholic Medical Bureau (UCMB), and the Uganda Muslim Supreme Council (UMSC).

Despite the abolition of user fees in 2001, Orem, Mugisha et al (2011) reported an increase in out-of-pocket expenditures[9] over the period 2000 to 2006[10]. Since then, according to the data from the World Bank, out of pocket expenditures as percentage of the total healthcare expenditures has remained relatively stable at around 38-39%[11].

Most PNFP facilities use a fee-for-service payment model and often partly subsidize the costs, but this varies greatly according to the amount of external donations they receive.

Faith-based PNFPs have participated in several government sponsored RBF Programs (Reinikka and Svensson 2010) and have responded very positively in terms of increased outputs. The authors suggest that this may be attributed to an "intrinsic motivation" associated with this kind of organizations.

In this context, RBF pilots were financed mostly by donors in order to reduce user fees through vouchers or subsidies to private health providers. Donors such as the Global Fund and USA President's Emergency Plan for AIDS Relief, have often adopted RBF as a precondition for their support.

Following the success of RBF programs, the Ministry of Health adopted RBF as a tool to promote Quality Improvement (QI) in Uganda, both in Hospitals and Health Centers. The RBF approach has been scaled up, and the Ministry of Health has started its own RBF programs with the stated goal of "addressing underutilization of health services" and "improve quality of care".

In its Quality Framework Strategy, the Ministry of Health aims at using "*the RBF approach as a tool to facilitate implementation of the already established QI interventions, rather than a QI tool in itself. RBF incentives will not only be based on outputs in terms of numbers. There will be systematic verification of the quality of services and this will be included in the facility scores.*".

By June 2020 the Ministry of Health had rolled out RBF to a total of 1,249 health facilities in 131 districts. Of these facilities 83% are public and 17% PNFP[12].

The NUHealth Programme (which included Kalongo and Lacor Hospitals)

From 2011 to 2015 the Department for International Development (DFID) funded a three and a half year program to support the strengthening of health systems in the Acholi sub-region of northern Uganda, an area that was emerging from decades of conflict. The goal of the program was to improve access to effective health care services, particularly for the poorest and most vulnerable

8 https://www.health.go.ug/hospitals/

9 Out-of-pocket (OOP) payment has been defined as the summation of all kinds of direct expenditure by households on purchase of medical care. https://www.who.int/data/gho/indicator-metadata-registry/imr-details/4967

10 Nabyonga Orem J, Mugisha F, Kirunga C, Macq J, Criel B. *Abolition of user fees: the Uganda paradox*, Health Policy and Planning 2011;26:ii41–ii51

11 https://data.worldbank.org/indicator/SH.XPD.OOPC.CH.ZS?locations=UG

12 Annual Health Sector Performance Report–FY 2019/20, Ministry of Health of the Republic of Uganda, Page 123.

groups, through the implementation of a results-based financing (RBF) mechanism

The project design was the following:

- DFID was the Funding Agency.
- NUHealth, on behalf of DFID was the Purchaser of the health services, oversaw the transparency of the RBF system, and ensured the checks and balances. The system oversight in this sense rested at the NU Health Gulu office, under the supervision from the NU Health team based in Kampala.
- PNFP Hospitals (including Lacor and Kalongo Hospitals) and Health Centers were the health service providers. Each held a contract with the purchaser, with targets outlined in a business plan and contractually binding in terms of remuneration payments.
- Each District Health Office (DHO) was the Regulator/ Verifier, and had the responsibility of providing guidance and oversight to the PNFPs in implementing RBF and general troubleshooting, largely through feedback on HMIS reporting and planned supervisions. Initially NU Health supported the DHO in this role, whilst gradually building the capacity of the District to fulfil its supervision/verification role.

Implementation

RBF was implemented in the 21 Acholi PNFPs as follows:

- PNFPs and DHTs were sensitized on RBF;
- PNFPs developed business plans following provision of guidelines and tools by NU Health;
- PNFPs signed Memoranda of Understanding (MoUs) with NU Health defining performance targets (i.e. outcomes) against a set of core services and accompanying quality criteria;
- Performance was tracked and verified by the DHTs with support from NU Health;
- Funds were disbursed quarterly by the funder when performance triggers were achieved.

All facilities in the study, both the Acholi PNFPs undergoing RBF also received the following support:

- Access to a credit line through the Joint Medical Stores to ensure availability of essential medicines and health supplies;
- Focused capacity building support to ensure that PNFPs were able to deliver agreed business plans/ work plans.

- Strengthening of the DHTs in each of the districts through secondment of staff and provision of training in weak areas, including providing supportive supervision of PNFPs and using the HMIS.

Quantitative indicators and Standard Subsidy

The Program identified 16 services (quantitative indicators), that would be reimbursed according to a predefined Standard subsidy, which would then be adjusted according to a formula that would incorporate the result of the Quarterly Quality Verification.

The Standard subsidy to be paid for each service was based on an estimation of the "*cost and/or social value of the service, estimated using health facility information collected during the inception period and standard estimates based on the Standard Unit of Output (SUO) for the different levels of care*". The SUO is a measure first introduced by the Uganda Catholic Medical Bureau (UCMB) to compare effectiveness and efficiency of different Hospitals, then adopted by the Government of Uganda.

The following table shows the Standard Subsidy for each of the 16 identified services:

Indicator	Services provided by the Hospital	Standard Subsidy
1	First ANC visit before 4 months pregnancy and completed 4 +visits	$5.00
2	Pregnant woman receiving second dose of SP	$3.00
3	Pregnant woman receiving 2 or more doses of tetanus vaccinations	$1.00
4	Prevention of Mother Transmission Child Transmission (PMTCT): HIV+mother and child treated according to protocol	$30.00
5	Insecticide Treated Nets (ITN) distributed to pregnant women attending ANC	$5.00
6	Delivery at facility assisted by skilled staff	$20.00
7	Caesarian Section (CS)	$30.00
8	Post Natal Care (PNC) - seen within 7 days	$3.00
9	New users of modern FP methods	$8.00
10	Completely vaccinated Child <1 yrs (proxy: measles vaccination)	$5.00
11	New outpatient consultation (under-five years)	$3.00
12	Children 6-59 months receiving Vit A	$1.00
13	New outpatient consultation	$1.00
14	TB patient diagnosed	$35.00
15	TB patient completed treatment & cured	$60.00
16	STD treated	$15.00

Source: *NU Health project Work Presentation*

Qualitative indicators

The District Health Team would carry out a quarterly verification using a checklist that assessed the quality of the services in 11 areas which covered antenatal care (ANC), delivery, immunization, under-five consultations, Outpatient Department (OPD) consultations, general OPD quality, hygiene and infection prevention, laboratory facilities, pharmaceutical management, in-patient care and record-keeping. While most of the quality indicators focused on the quality of the health provision of Mother and Children, some of the indicators were cross cutting.

The Formula

In order to calculate the Quarterly payment, each quantitative indicator is multiplied by its specific subsidy. The result is then adjusted according to the result of the quality verification and to 2 other variables: the Base incentive variable and the Quality incentive variable; these were different for each provider in order to reflect the different operative contexts (ie, an Outpatient consultation in a minor health center vs an Outpatient consultation in a general Hospital).

The formula is illustrated below.

NU HEALTH RBF FORMULA

$$P = [S\ (x + yz)\ n]$$

Where:

- **P** Payment (made quarterly)
- **S** Standard subsidy for each care service
- **x** Base incentive variable by level care
- **y** Quality incentive variable by level of care
- **z** Multiplier determined by the quality score
- **n** Number of verified patients during the quarter

Base incentives and an example of the payment - source: *NU Health project Work Presentation*

Evaluation of the Program

Kalongo Hospital

Kalongo hospital management had an overall positive perception of the project. It allowed flexibility in the use of funds that were used to improve the quality of services. There were instances during which contingent difficulties encountered by the hospital, such as staff turnover and a void in key management roles, created difficulties in regular implementation of hospital activities. In such periods hospital quality performance dropped, as did allocated funds. The bonus acted as a motivating factor in a low-resource and post-war context in which motivation was very low, and participating to such an important project was a factor of pride for the hospital management. It must however be pointed out that during the period of NU Health project implementation, the RBF approach was very new and was being experimented for the first time in Kalongo hospital. It required a significant change of mindset that was extremely difficult to achieve in a 3-year period, particularly in an isolated, rural hospital which consequently suffers greatly from a very high staff turnover rate. Some staff members considered that the significant amount of funds earned by the Hospital for quality was due to their own commitment, but felt that the bonus they received did not adequately reflect their effort.

Lacor Hospital

The NU Health Programme was very well appreciated by the management. There was a strong feeling that the external quality verifications had promoted teamwork and a positive shared sense of purpose among staff when preparing the regular Quality verifications and agreed improvements.

The Hospital Management therefore decided to propose a continuation of the program to some of its established and potential donors. With the backing in particular of its dedicated support organizations, the Italian Corti Foundation and the Canadian Teasdale Foundation, a new RBF Program was proposed to a pool of private donors. The proposal was accepted and the program started in 2018.

The Lacor Hospital Internal Mother and Child RBF Program

This program was very similar to the NU Health Program in terms of Quantitative and Qualitative indicators, as well as for the Standard subsidy. The focus continued to be on outpatient services to children and mothers, as well as deliveries.

The focus of the project was on rewarding quality not quantity of patients, and therefore the quality component of the quarterly payment was higher than in the NU Health Project: if the Hospital reached the maximum quality score the quality component was nearly 75% of the total payment.

The qualitative indicators had minor modifications to adapt them to minor changes in the context.

The quantitative indicators and the standard subsidy of the new program are indicated in the table below.

Indicator	Services provided by the Hospital	Standard Subsidy
1	First Ante Natal Clinic (ANC) consultation for pregnancy before 4 months and completion 4 +visits	UGX 25,000
2	Pregnant woman receiving second dose of Intermittent Preventive Treatment (IPT) of malaria with sulfadoxine-pyrimethamine (SP)	UGX 7,500
3	Pregnant woman receiving 2 or more doses of tetanus vaccinations	UGX 3,000
4	Prevention of Mother Transmission Child Transmission (PMTCT): HIV+mother and child treated according to protocol	UGX 75,000
5	Insecticide Treated Nets distributed to pregnant women attending ANC	UGX 25,000
6	Delivery at facility assisted by skilled staff	UGX 50,000
7	Caesarian Section (CS)	UGX 200,000
8	Post Natal Care (PNC)–seen within 7 days	UGX 10,000
9	Completely vaccinated Child <1 yrs (proxy: measles vaccination)	UGX 25,000
10	New outpatient consultation (under-five years)	UGX 7,500
11	Children 6-59 months receiving Vit A	UGX 5,000

The new Formula

As this program was designed exclusively for Lacor Hospital's needs, the formula for calculating the Quarterly payment was simplified. The base incentive and the quality incentive were replaced by the Quality multiplier determined by the result of the Quality verification.

The Performance Bonus for the staff

One very significant change that was introduced with the new RBF Program was the parallel introduction, by the Hospital, of a Quarterly Performance Bonus to be paid to all hospital staff if the RBF Quarterly verifications was successful.

The Management decided not to tie this performance bonus to individual performances, nor to the results of the RBF indicators verified in each department undergoing the RBF program, but rather to the RBF result achieved by all the departments undergoing the RBF program and extend this bonus to the entire hospital staff, not just those undergoing the RBF program.

This decision was taken out of the belief that a Hospital-wide based bonus promotes Hospital wide teamwork, a sense of belonging, and improved collaboration among staff, while individual and departmental performance bonuses might more readily disrupt teamwork and promote conflicts and dysfunctional competition. These perverse negative consequences had already been experienced when the Hospital had previously attempted a few experiments in this sense, as indeed much literature highlighted[13].

It was also decided that:

- As for all other Hospital initiatives, this performance bonus was not tied to the duration of the project. It is important to underline that projects for any specific initiative are normally only considered and implemented if they align with the Hospital's Mission and Strategic Plan, and when the Hospital is relatively confident that it will be able to continue the initiative when the "project" ends and the donor funds are terminated. Rather, the bonus was introduced as a part of a general and permanent salary increase mechanism.
- The amount of the Quarterly Bonus paid to staff was never higher than 10% of the salary in order to avoid that staff might rely on it for essential and vital expenditures, and the ensuing risk of destabilization to the work atmosphere in case of reducing or not paying it.
- The RBF bonus would not be paid to the staff who had been identified as low performers, or to those who had disciplinary issues. Therefore, a clear definition of individual low performers was extensively discussed and agreed upon with the middle managers, in order to define it very clearly and identify only the few whose performance was widely recognized as impacting negatively on work and/or colleagues. Through this policy, the Hospital minimized potential negative consequences of pay for performance schemes, in particular the conflicts among staff, while at the same time avoiding to grant a bonus to the few staff who were perceived as undeserving by most colleagues.

---

13 https://ssir.org/articles/entry/10_lessons_from_health_care_on_quality_improvement, Austin B. Frakt, Ashish K. Jha, F*ace the Facts: We Need to Change the Way We Do Pay for Performance,* Annals of Internal Medicine; Donald M. Berwick, *The Toxicity of Pay for Performance,* Quality Management In Health Care/Fall 1995; Donald M. Berwick *Pay, Productivity, and Depression, The Toxicity of Pay for Performance,* SSIR

UGANDAN MINISTRY OF HEALTH RBF PROJECT AT KALONGO HOSPITAL

Photo: G. Kalokwera / S. Moro

UGANDAN MINISTRY OF HEALTH RBF PROJECT AT KALONGO HOSPITAL

Livia Colvin, Head of Projects, Fondazione Ambrosoli

The Ministry of Health under the Uganda Reproductive Maternal and Child Health services Improvement Project (URMCHIP) has signed Result Based Financing (RBF) grant agreements with 51 districts under Ministry of Local Government (District), with the aim of improving reproductive, maternal and child health.

Agago district is part of the 51 districts included in the above-mentioned programme, and within this scope Dr. Ambrosoli Memorial Hospital signed a grant agreement with the District local government of Agago on June 2021.

RBF has been adopted by the MOH as one of the financing strategies to improve efficacy of primary health care financing. The expectations are for the RBF financing to improve the management of human resources for health, addressing constraints facing frontline service providers, strengthening emergency services to ensure continuity of Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCAH) services, strengthening Maternal and Perinatal Death Surveillance and Response (MPDSR) services as well as enhancing quality of care.

RBF HAS BEEN ADOPTED BY THE MOH AS ONE OF THE FINANCING STRATEGIES TO IMPROVE EFFICACY OF PRIMARY HEALTH CARE FINANCING. THE EXPECTATIONS ARE FOR THE RBF FINANCING TO IMPROVE THE MANAGEMENT OF HUMAN RESOURCES FOR HEALTH

The facilities eligible for RBF are both public and private not for profit (PNFP) facilities receiving PHC grants from Government of Uganda. Based on the National RBF Framework, the RBF design for the project incentivizes district health teams and health facilities to expand the provision of quality and cost-effective services.

Within the specific agreement between DAMHK (Doctor Ambrosoli Memorial Hospital Kalongo) and

Agago district, the total amount of the subsidy to the Hospital over the Performance agreement period will be determined by the outputs of the Hospital against the RBF indicators and the quality score of the beneficiary hospital, as will occur also for the other facilities involved.

The duties of the District within this project framework are expected to be the following:

- Follow up of its sub-grants to the health facilities qualified for RBF funding.
- Coordinating RBF activities at district level.
- Organising RBF training and mentoring to develop and use Performance Improvement Plans (PIPs), financial management, etc.
- Conducting support supervision to ensure that the facilities implement all RBF related activities as agreed in the contract, as well as non-incentivized indicators so as not focus on RBF indicators only.
- Verifying the quantity and quality of services at the health facilities on a quarterly basis.
- Validation of the invoices submitted by the facilities before submitting them to the District RBF Steering Committee.
- Ensuring that any penalties and sanctions levied on the facilities under the RBF are implemented.
- Ensuring that health facility autonomy of utilization of RBF funds and implementation of the approved PIP is upheld.
- Evidence generation and sharing the lessons learned with various stakeholders.

Funds are transferred directly from the Ministry of Finance Planning and Economic Development (MoFPED) to the health facility's account on a quarterly basis, following a request for payment from the health facility. The District Health Management Team is responsible for the verification of the payment request. Jointly with the invoice, the health facilities are expected to prepare every quarter a narrative performance and financial report about the planning and implementation of the PIP, and at the end of the financial year the health facility must also submit an annual report and financial report for the RBF activities undertaken at the Hospital within 10 working days after the end of the financial year.

The focus of the RBF project within Kalongo hospital will be placed on 2 indicators:

1. proportion of maternal and perinatal deaths reviews conducted;

2. ambulance services provided.

For both indicators, responsibility for collection of primary data falls on the midwife or nursing officer.

Indicator n.1 considers all maternal and perinatal death reviews conducted at the health facility, and the rationale is that of assessing the quality of care of the maternal and perinatal services. The source of data collection is the maternity register, maternal death review form and perinatal death review form. The calculation for the payment will be based on number of maternal and perinatal deaths reviewed at the health facility during the quarter/

number of maternal and perinatal deaths at the health facility during the quarter. During the verification, all cases of maternal and perinatal deaths are selected from the Maternity register for the quarter under observation and the verification must check for the following:

- Is there evidence of MPDR Committee meetings? Check for minutes.
- Was maternal and perinatal death notification done within 24 hours?
- Were the maternal and perinatal death review done within 72 hours?
- Were all the maternal and perinatal death review forms filled within 7 days?
- Are the MPDR review forms completed submitted to the MOH by the 7th day of the following month?
- Was the final cause of death documented on the review forms?
- Were all the maternal and perinatal deaths reviewed by the MPDSR Committee?

Indicator n.2 considers all children under 5 and pregnant mothers eligible for ambulance transportation that were transported using the ambulance, with the aim of assessing functionality of the ambulance referral services. The source of data collection is the ambulance log book, outpatient and inpatient registers, referral forms, ambulance request form, patient monitoring/treatment charts. The calculation for the payment will be based on the quarterly number of ambulance trips made for the referral of children under 5, and pregnant women eligible for transportation by ambulance according to the Uganda clinical guidelines. During the verification, all cases of maternal and under 5 years referrals are selected from the Maternity and the paediatric inpatient register for the quarter under verification, and the following aspects are verified:

- Is there a functional ambulance or other vehicle for emergency transportation for clients that is stationed at and operates from the facility?
- Was the ambulance dispatched by a designated officer and was time of dispatch recorded?
- Were the patients transported in the ambulance escorted by a qualified health worker (nurse/midwife?)
- Were the patients monitored/treated as appropriate during transit and signed handover report submitted to the emergency team?
- Were all patients accompanied with a referral form/note?
- Was there prior communication to referral site and confirmation of readiness to receive the patient?
- Were the patients assessed by a medical doctor within the first 10 minutes upon arrival?
- Was the mother sent to labour with a copy of the partograph?
- If a caesarean section was sanctioned at admission, was the baby delivered within 1 hour of arrival?

Photo: Marco Mignani


Photo: Marco Mignani

AICS PAEDIATRIC RBF PROJECT: AN EXTENSION OF MOTHER AND CHILD RBF TO THE CHILDREN WARDS

Photo: Mauro Fermariello

AICS PAEDIATRIC RBF PROJECT: AN EXTENSION OF MOTHER AND CHILD RBF TO THE CHILDREN WARDS

Elisabetta D'Agostino, Head of projects at Fondazione Piero e Lucille Corti Onlus

> THE MAIN GOAL OF THE PROJECT WAS TO IMPROVE THE QUALITY OF PAEDIATRIC INPATIENT CARE THROUGH THE RBF SYSTEM. THE BASIC INCENTIVE WAS PROVIDED FOR EACH ADMITTED CHILD.

Considering the added value in term of health service quality gained through the RBF approach at Lacor and Kalongo Hospitals, the Corti Foundation, in partnership with Ambrosoli Foundation, Lacor Hospital, Kalongo Hospital, University of Naples and the University of Gulu, submitted a proposal to the Italian Agency for Development Cooperation (AICS) to extend the RBF approach to the paediatrics ward of the two hospitals. The project AID 11495 *"Result Based Financing, an engine of change for Pediatric services. Intervention to strengthen the quality of care and empowerment of health personnel in the Acholi region, Northern Uganda"* started in March 2018 and ended in July 2021. The main goal of the project was to improve the quality of paediatric inpatient care through the RBF system. The basic incentive was provided for each admitted child.

The main changes, with respect to the previous RBF experience that had focused on outpatient services, was the full involvement of an inpatient ward (previously only partly involved through cross cutting indicators and through deliveries). This required a re-definition of the RBF measures and tools for quality review, as well as for the basic fee and quality bonus calculation. A mission led by the University of Naples just before the start of the project assessed the needs in term of quality improvement of the two hospitals and agreed with the hospital specialists, the design and tools to be used for the verifications.

Quantitative indicators: due to the number and broad spectrum of general and specialized care both wards were providing, "admission" was defined as the only

quantitative indicator. The basic subsidy for a child admission, valued at 70.000 UGX for both hospitals, was calculated on the basis of (i) an evaluation of the "cost and/or social value of the service", estimated using health facility information during the inception period, and (ii) standard estimates based on the "Standard Unit of Output (SUO) for the different levels of care".

Quality Indicators: The quality checklist *(Annex 1)* included 5 verification *domains*: infrastructure, organization and cross cutting indicators, hygiene and cleanliness, clinical and nursing processes, emergency readiness, students trainings (nurses and medical doctors). Each domain had a list of *subdomains*, each with a maximum score adding up to a total score of 100 across the 5 domains.

The scoring system was simplified: each "subdomain" is composed of several items from which the evaluator randomly and without warning selects one, two or more items for evaluation. A global score from the specified range (0-3 or 0-8 etc) is assigned to the items within a subdomain. If, for any reason, no item can be evaluated in that specific subdomain, the evaluator has to readjust the TOTAL score of that domain according to the number subdomains that have been checked[1].

As the total sum of the 5 domains is 100, the quality multipliers for the RBF calculation are evidenced in the table (note: the multiplier was set higher because of the much greater complexity of children ward services).

Total Points scored	50-59,9	60-69,9	70-79,9	80-89,9	90+
Quality Score	1	2	3	4	5
Multiplier	x 1	x 1,10	x 1,5	x 1,20	x 1,25

The multiplier was then assigned to the quantitative indicator (the number of admitted cases).

The quarterly verifications were conducted, as for the Mother and Child RBF, by the Hospital Quality Assurance Department, in cooperation with a representative of the Ugandan Ministry of Health.

The mid-term project evaluation clearly showed how some of the project indications triggered virtuous mechanisms both within the work team and between individuals. For example, in order to better coordinate work, the nurse in charge created a poster with a list of tasks, each with an identified person responsible for its accomplishment. In addition, the nurse in charge of the children

ward proposed and introduced weekly revision of duties with each staff responsible for them.

The significant improvement of the quality of services in the two paediatric departments was confirmed by the quarterly reviews. The table below shows the regular quarterly improvement, although with different trends, that both hospitals achieved in all five domains. The impact was most impressive in Kalongo Hospital, which had started from a less structured condition but managed to achieve meaningful changes and investments thanks to the RBF approach.

LACOR HOSPITAL - SCORE VERIFICATION												
	April June 2018	July September 2018	October December 2018	January March 2019	April June 2019	July September 2019	October December 2019	January March 2020	April May June 2020	July August September 2020	October November December 2020	January February March 2021
Infrastructure, organization and cross cutting indicators	**20.5** /24	**20** /24	**19.5** /24	**21** /24	**20.5** /24	**22** /24	**21** /24	**21** /24	**21** /24	**22.7** /24	**21.9** /24	**23.9** /24
Hygiene and Cleanliness	**20** /23	**22.5** /23	**21** /23	**22** /23	**22** /23	**22.5** /23	**23** /23	**20** /23	**19.5** /23	**21.5** /23	**21.5** /23	**23** /23
Clinical and nursing processes	**26** /33	**27.9** /33	**28.5** /33	**26** /33	**30.2** /33	**28.5** /33	**31.6** /33	**29.7** /33	**31** /33	**31.5** /33	**31** /33	**28.9** /33
Emergency readiness	**7** /8	**8.0** /8.0	**7.0** /8.0	**7.0** /8.0	**6.0** /8.0	**7.0** /8.0	**8.0** /8.0	**7.0** /8.0	**8.0** /8.0	**5.5** /8.0	**7.0** /8.0	**7.0** /8.0
Training	**5.0** /6.0	**5.0** /6.0	**3.0** /3.0	**1.0** /3.0	**2.0** /3.0	**6.0** /6.0	**5.0** /6.0	**0** /0	NA	**3.0** /3.0	**9.0** /9.0	**9.0** /9.0
Score totale	**78.5** /94 **=83.5%**	**83.4** /94 **=88.72%**	**79** /91 **=86.8%**	**77** /91 **=84.6%**	**80.7** /91 **=88.7%**	**86** /94 **=91.5%**	**88.6** /94 **=94.3%**	**77.67** /88 **=88.26%**	**79.5** /88 **=90.34%**	**84.2** /91 **=92.5%**	**87.9** /94 **=93%**	**91.82** /97 **=94.7%**

KALONGO HOSPITAL - SCORE VERIFICATION												
	April June 2018	July September 2018	October December 2018	January March 2019	April June 2019	July September 2019	October December 2019	January March 2020	April May June 2020	July August September 2020	October November December 2020	January February March 2021
Infrastructure, organization and cross cutting indicators	**15** /24	**20.5** /24	**20** /24	**22** /24	**20.5** /24	**17** /24	**20.7** /24	**21.7** /24	**19** /24	**20.55** /24	**21** /24	**21** /23
Hygiene and Cleanliness	**18.25** /26	**18** /26	**24** /26	**25** /26	**25** /26	**20** /26	**26** /26	**26** /26	**26** /26	**24.4** /26	**23** /26	**23** /26
Clinical and nursing processes	**15.25** /36	**18.5** /36	**27** /33	**8.5** /33	**16** /33	**16** /33	**36** /36	**31** /36	**33** /36	**26** /36	**33** /36	**33** /36
Emergency readiness	**8.0** /8.0	**3.5** /8	**6.0** /8.0	**6.0** /8.0	**6.0** /8.0	**8.0** /8.0	**8.0** /8.0	**8.0** /8.0	**8.0** /8.0	**8.0** /8.0	**8.0** /8.0	**8.0** /8.0
Training	**7.0** /9.0	**3.0** /9.0	**2,0** /3,0	**2.0** /3.0	**2.0** /3.0	**3.0** /3.0	**3.0** /3.0	**0** /0	NA	**0** /9.0	**0** /9.0	NA
Score totale	**63.5** **/103** **=61.7%**	**64.5** **/97** **=66.4%**	**79** **/94** **=84%**	**63.5** **/94** **=68%**	**69.5** **/94** **=73.9%**	**65** **/94** **=69.1%**	**93.7** **/97** **=96.6%**	**86.7** **/94** **=92.2%**	**86** **/94** **=91.5%**	**78.95** **/94** **=84.99%**	**79** **/91** **=86.8%**	**79** **/91** **=86.8%**

In consideration of the quarterly reviews and the project evaluation[14], the main results achieved by the AICS AID 11495 project through the implementation of the RBF approach in the children wards of Lacor and Kalongo Hospitals are:

i. The RBF approach, as designed in this project, appears capable of triggering positive processes and motivation among the staff. The verification mechanisms and tools, as well as the spaces provided for discussion, are highly appreciated and are considered an opportunity for continuous improvement of the health care service that the hospitals provide.

ii. The incentive system, designed to favour a collective perspective, is highly appreciated as it is felt to motivate the staff towards individual and collective improvement, both in terms of economic and professional advantage, as well as in terms of involvement and pride in seeing one's work recognized and appreciated. The economic incentive is thus an important and collective factor, rather than a central and individual element.

iii. Following the quarterly verifications there was a noticeable resolve towards accepting and adapting the recommendations that had emerged.

14 In the framework of the project AID 11495 *Result Based Financing, an engine of change for Paediatric services. Intervention to strengthen the quality of care and empowerment of health personnel in the Acholi region, Northern Uganda*, two external evaluation have been conducted by Punto Sud, at the end of the first and third year of the project. Unluckily, because of the third wave of COVID-19 pandemic in Uganda from May 2021, it has not been possible to hold the evaluation in the two hospitals, thus the final evaluation has been conducted by remote.

The staff appreciate the specific health training and the methodology that promote the development of cross-cutting skills and sharing of practical knowledge and procedures. The highly collaborative and inclusive modality of engagement and involvement of the staff was considered to be of particular significance.

Challenges have also emerged, indicating the need to continue upgrading and improving the present RBF approach.

One main challenge was an excessive overload imposed on the ward top management roles due to the high turnover of staff: this entails giving each newcomer an extensive and broad range introduction to the RBF approach and its requirements, and adapting these to each new wave of seasonal diseases. These difficulties could be overcome with a greater involvement of the ward middle management staff and greater empowerment of each ward quality team.

Some difficulties were observed in Kalongo Hospital during the first phase of the RBF implementation, which was more complex than at Lacor hospital. This was mainly due to specific difficulties of a rural hospital in an isolated area, such as the lack of specialists and high staff turnover rate, or the poor state of infrastructure in particular WASH facilities, for which renovation efforts required more time to achieve the quality standards identified in the checklist. Despite this initial challenge, the subsequent work achieved significant infrastructural improvement in terms of equipment and materials, as well as in nursing and clinical processes, as evidenced by the scores achieved during the last two years of the project. This confirms that the essential and founding elements for a coherent and complete implementation were present.

Internal RBF extension to other in-patient departments at Lacor Hospital

The effectiveness achieved by the RBF mechanism in the M&C project and, more especially, in the leap to in-patient departments thanks to the AICS Paediatric RBF, both in terms of results achieved and challenges met, was such that the Hospital management decided to continue the approach and to define an action plan for extending the RBF program to other departments and services, starting with the Gynaecology department (for out-patient consultations and for admissions) and Medicine (for admissions). In both departments the system was defined in analogy to the Mother and Child RBF for out-patient consultations (for Gynaecology), and according to the AICS children ward for admissions (Gyn and Med admissions).

The basic fee for admissions (the quantity indicators) were fixed at the same basic subsidy as the paediatric one, while dedicated checklists were designed for Gynaecology and Medicine wards.

The ward heads and in charge nurses were fully involved in the design of the checklists, together with the Hospital Quality Assurance Department, in order to promote the wards' ownership of the RBF approach. A first quarter pilot was conducted, without assigning any score, to test the ward preparedness and support them in implementing the RBF approach. The two wards also benefitted from the best practices and the management solutions identified during the implementation of the AICS paediatric project which resulted in a quicker set up of the system and in achieving better results from the very first quarters.

AICS paediatric RBF follow up at Kalongo hospital

In Kalongo hospital 35% of the bonus was assigned to the paediatric department staff and to the staff of the ancillary services to paediatric care, such as laboratory, radiology, etc. The remaining 65% was used to address shortcomings highlighted during the quarterly assessments, and to support general hospital expenses. All paediatric staff received the same amount (1st category staff), regardless of their qualifications, duties and seniority, while the staff of the ancillary services to paediatrics (2nd category staff) received a lower amount, again regardless of their qualifications, duties and seniority. During the final project year, management decided to downgrade to 2nd category those staff members who received a negative evaluation from medical direction or whose lack of commitment determined a low score in one of the items measured during the quality as-

sessment. This measure generated some conflict and management is currently working on establishing more objective and broader criteria for the determination of bonus distribution amongst eligible staff.

Conclusions

Both hospitals benefitted from the project through implementation of this particular RBF approach and management. The greatest achievements were in defining better processes to monitor the health service quality and in involving and empowering the ward staff within these processes.

At the same time, it is important to consider the RBF approach as an open process liable to further redefinitions and evolutions to better respond to the context specific needs and challenges.

In this case, the exchange and sharing of information among the different actors, each with their own specific needs a management system, was a great opportunity to learn from each other, to discover how to overcome the limits of the current system and to experiment new solutions for improvement and for future extension of the RBF approach.

Photo: G. Kalokwera / S. Moro

Photo: Mauro Fermariello

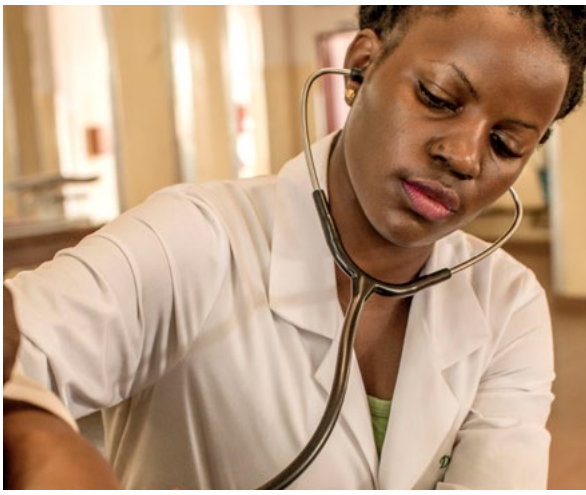


Photo: Mauro Fermariello

Photo: Mauro Fermariello

STUDY ABOUT THE IMPACT OF THE RBF APPROACH IN LACOR AND KALONGO CHILDREN WARDS FROM 2018 TO 2020

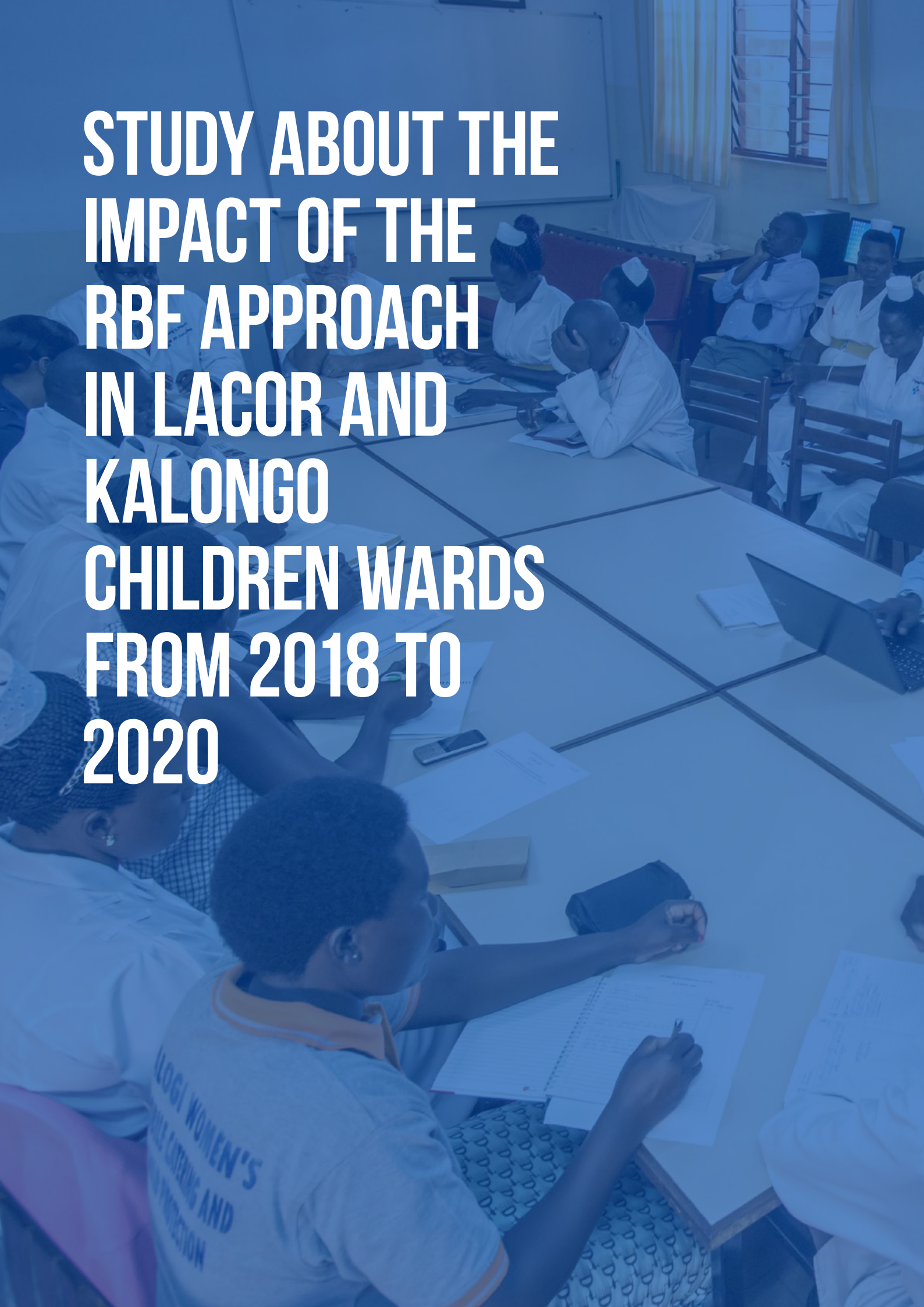


Photo: Mauro Fermariello

STUDY ABOUT THE IMPACT OF THE RBF APPROACH IN LACOR AND KALONGO CHILDREN WARDS FROM 2018 TO 2020

Prof. Luigi Greco, University of Naples Federico II and Teams of St. Mary's Hospital Lacor and Doctor Ambrosoli Hospital Kalongo

OBJECTIVE OF THE PROJECT

To evaluate the impact of Result Based Financing project in Northern Uganda on process and health indicators in the two locations involved in the intervention.

STUDY DESIGN

- Prospective observational study.
- Process and health indicators in the years prior to the intervention.
- Process and health indicators at the end of the intervention.
- Progress of quality scores over time.

Photo: Mauro Fermariello

FIRST SECTION: Analysis of the quarterly quality assessment forms at the Children's ward from 2018 to 2020 (See Annex 1)

OBJECTIVES

To assess, every three months, the quality of the structures, facilities, provisions and practices in the children's ward.

METHODS

At the start of the project a quality assessment form (Annex 1) was developed to estimate the gaps and the actions to encourage improvement in the quality of services offered to sick children. Care was taken to foster teamwork and ownership by health staff and to contain distortions and perverse effects that have been observed in poorly designed RBF programs[15]. The quality items were shared with the staff of the hospital and, especially, with the staff of the children's ward.

At St. Mary's Hospital Lacor (Lacor Hospital) and Kalongo Ambrosoli Hospital the Hospital Quality Team together with an external verifier from MOH visited the Children's wards every three months (quarter) and scrupulously examined structures, management and procedures within each of these domains to be evaluated and to which assign the relevant numeric scores.

The forms listed each item (for example: *Prevention of Infections,* which included:

1. **Facilities to wash hands.**
2. **Alcohol available.**
3. **Reduce cross contamination, then the evaluation criteria were listed, the max possible score and the critical points.**

For each item the commission assigned a score from 0 to 3 (where 0 = no improvement or not done, 3 = well done, fully functional, available to care). (see Annex 1)

The quality control checklist that were filled in during these quarterly verifications were transposed into an Excel spreadsheet and translated for a statistical analysis (SPSS vers. 26).

Time 0 is the status before the start of the RBF project as estimated and reported by the in-situ evaluation in Jan 2018.

15 Paul E, Albert L, Bisala BN'S, et al. Performance based financing in low income and middle-income countries: isn't it time fora rethink? BMJ Glob Health 2018

Time 12 is 12th quarter, the end of the RBF project financed by AICS (Dec. 2020) when the maximum achievable score for each item could have been reached.

Individual items of the checklist were grouped into the respective domains, by summing up the scores within each domain:

- Infrastructure & Management: Items from 1 to 8; max = 24
- Hygiene: items from 9 to 18; max = 23
- Clinical: Items from 19 to 24; max = 33
- Emergency: items from 25 to 26; max = 8
- Training: items from 27 to 29; max = 9

The percentage of the maximum score was estimated by: score observed for the domain /maximum score for that domain*100.

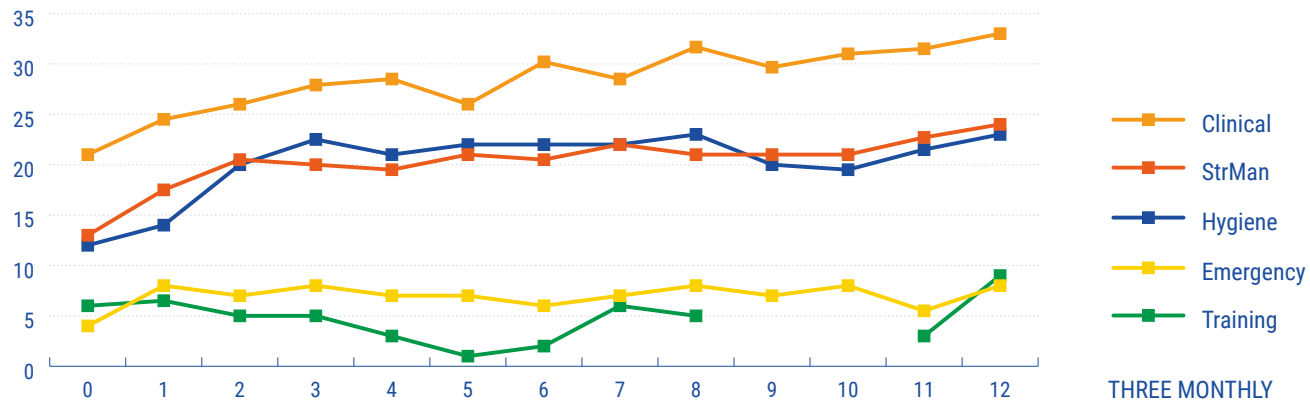
A Global Score was computed by summing the 5 domains.

RESULTS

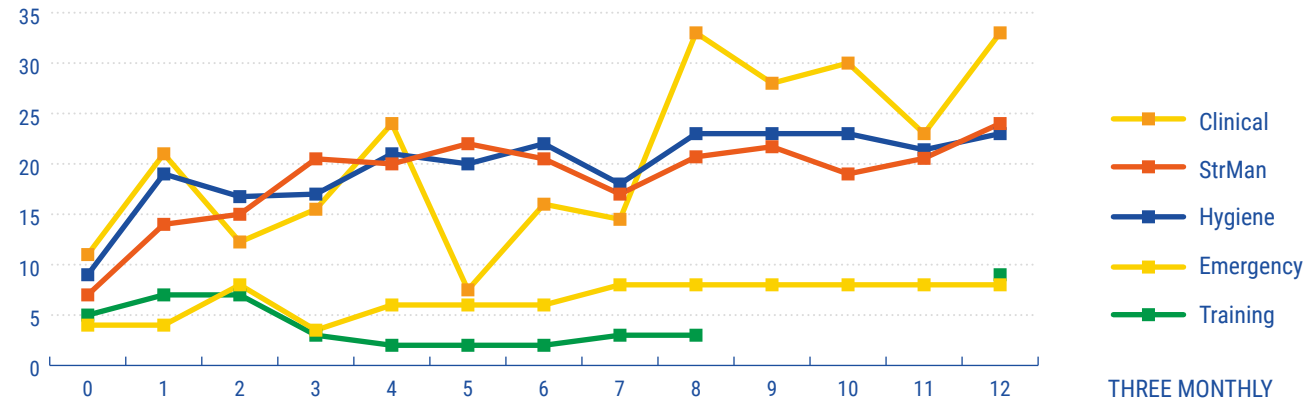
Statistical Analysis: The following graphs show the trend over time from Time 0 (2018) to quarter 12 (2021).

Score for each domain over Time, where 0 = starting time 2018 and 12 = Last quarter analysed March 2021.

SCORES BY TIME AT LACOR



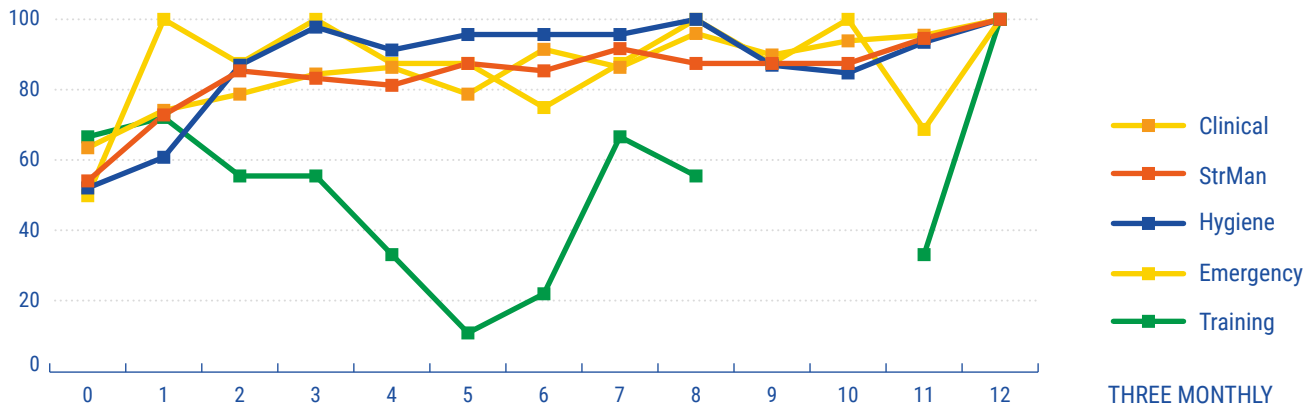
SCORES BY TIME AT KALONGO



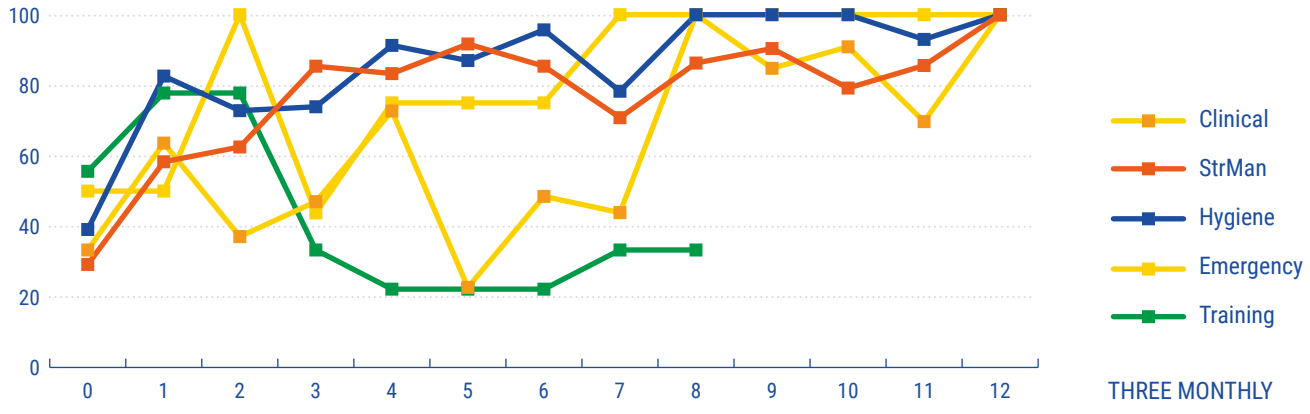
IMPROVEMENT OF QUALITY SCORES FOR EACH DOMAIN OVER TIME

The improvement of the score for each domain was obtained from the ratio between the observed score and the maximum score possible for the respective domain. Expressed as a percentages.

PERCENTAGE OF MAXIMUM SCORE - LACOR

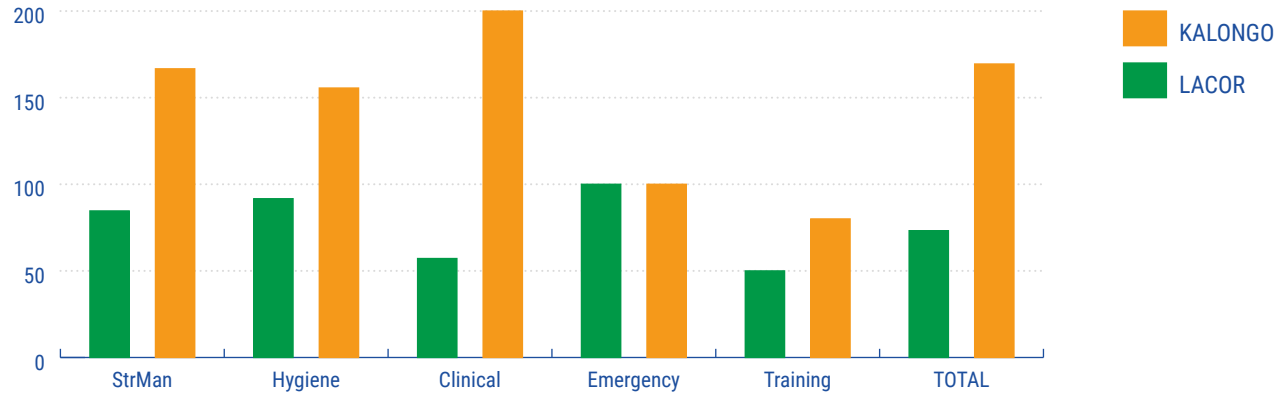


PERCENTAGE OF MAXIMUM SCORE - KALONGO



INCREASE IN THE SCORES FROM 2018 TO 2020

AS % OF BASELINE



COMMENTS

LACOR: It is clear that, soon after the start of the project, the actions put in place to improve the structure, the management and the procedures at the Children's ward, allowed a steep rise in the achieved percentage of the maximum score. It should be considered that the starting status at Lacor was already quite acceptable in 2018, so dramatic changes could not be expected. After the first year (Time 3 = 3rd quarter) minimal changes were observed for most items.

The exception was training, where the rotation of medical students and the occasional presence of expatriates did not allow to estimate ad adequate performance in the training domain.

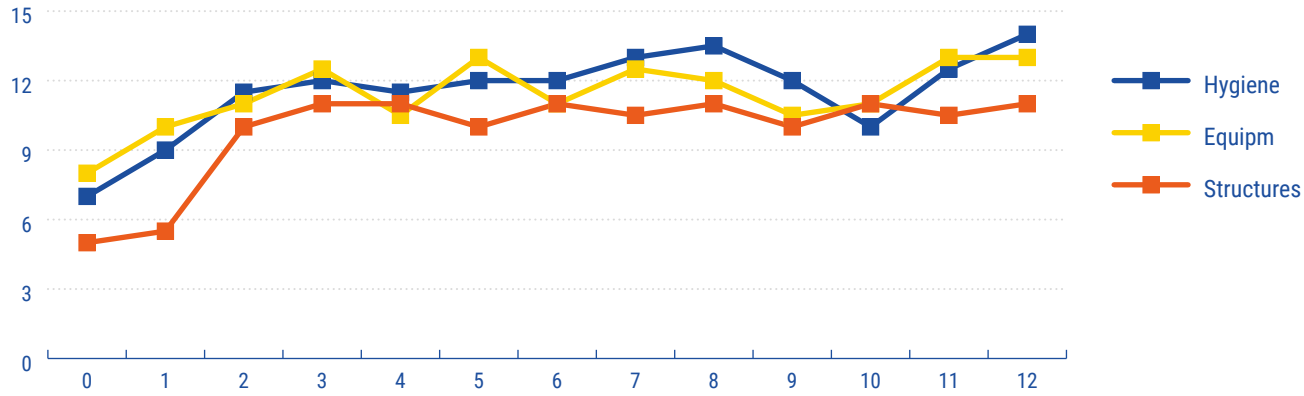
KALONGO: The starting status at Kalongo suffered in 2018 from several gaps, so the scores of each domain improved gradually over the first 5 quarters. The children's ward was completely re-structured in 2018-2019; this allowed a significant catch up in the scores achieved. The erratic presence of a paediatric specialist was related to the several gaps observed in the Clinical Procedures.

As at Lacor the training domain suffered from the absence of supervision and the occasional presence of trainees.

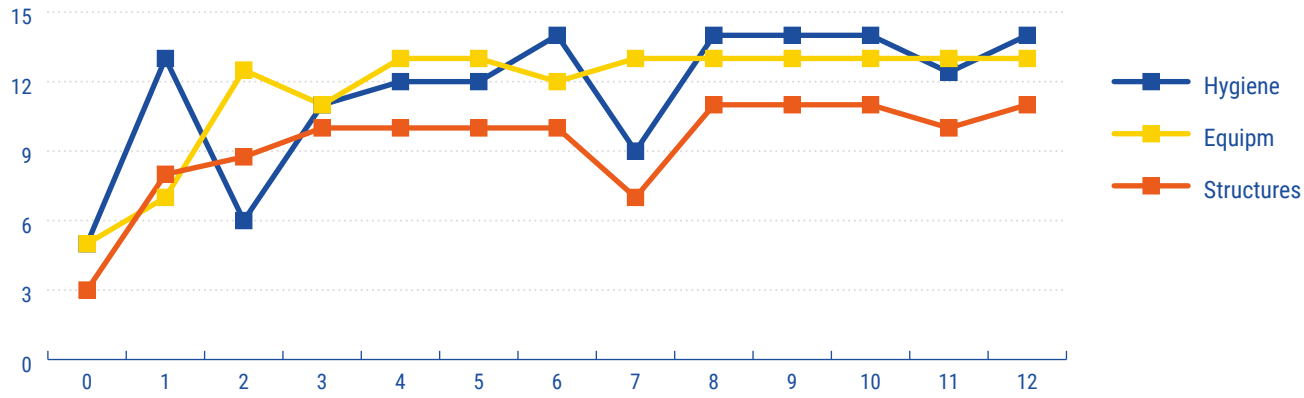
TRENDS OF THE QUALITY CONTROL SCORES FOR EACH DOMAIN

Structures sum of items: Structure, Beds, Rooms, Latrines
Equipment sum of items: Equipment, Safety, Dispensers, Stock, Uniform
Hygiene sum of items: Hygiene, Infections, Clean, Water, Sterile

STRUCTURES, EQUIPMENT AND HYGIENE - LACOR



STRUCTURES, EQUIPMENT AND HYGIENE - KALONGO



COMMENTS:

The effort to improve structures, equipment and hygiene in both hospitals during the first year (1-3 quarters) of the RBF project was remarkable.

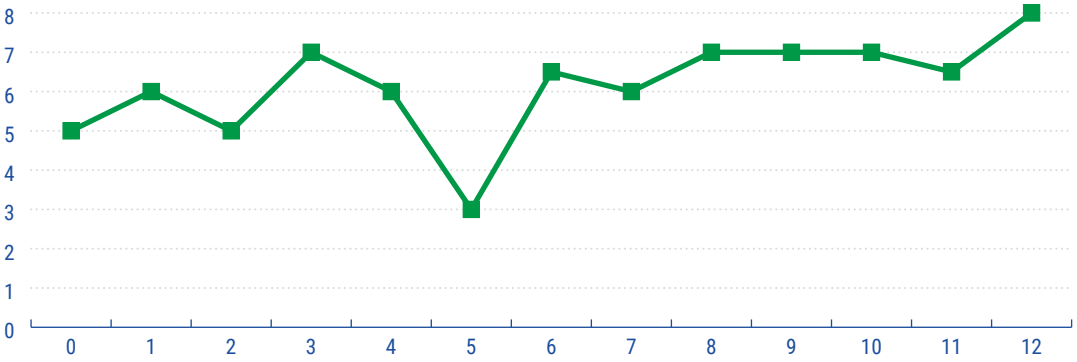
CLINICAL MANAGEMENT (Items 19 to 24)

- Proper diagnosis of 10 admitted cases.
- Proper prescription of therapy of at least 10 admitted cases.
- Proper administration of therapies to 10 admitted cases.
- Deaths properly reviewed.
- Appropriate supervision and mentorship by Specialists and Head of Department.
- Nice and caring communication to Patients and attendance.

SCORES OF CLINICAL MANAGEMENT AT LACOR

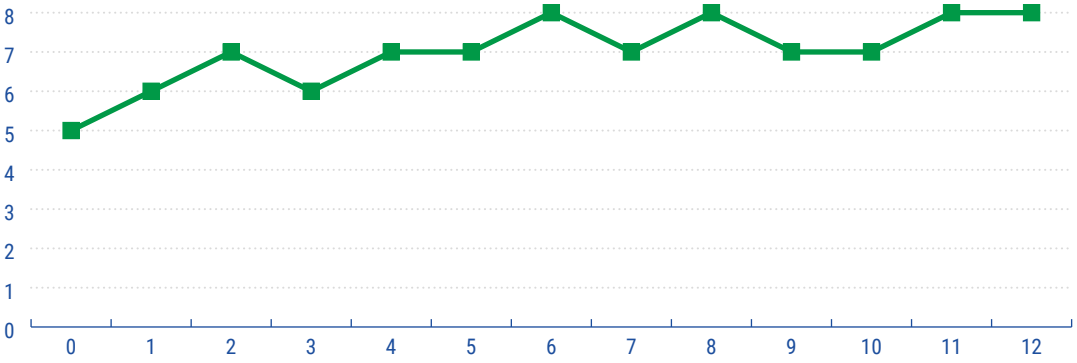
DIAGNOSIS

QUARTER



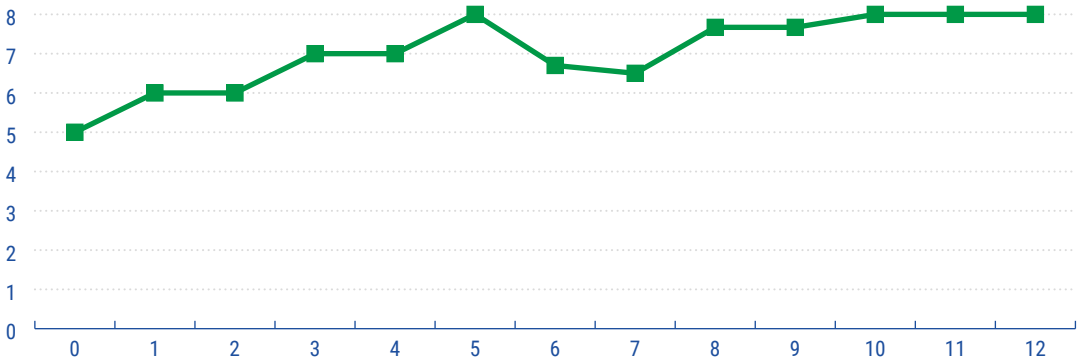
THERAPY

QUARTER



TREATMENT

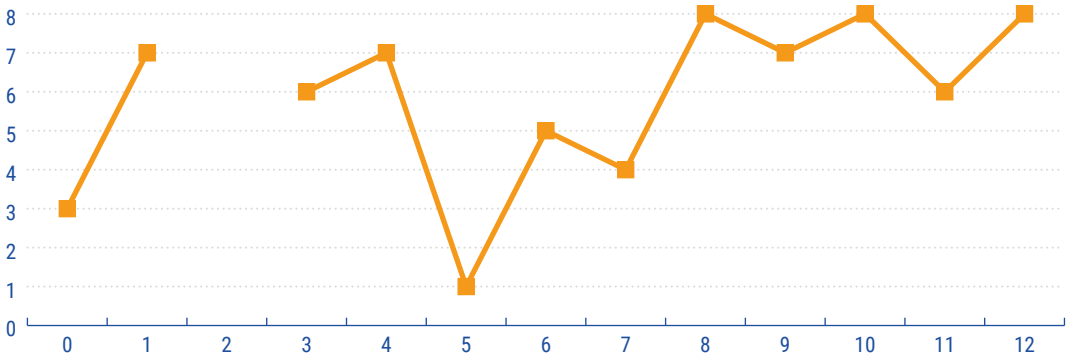
QUARTER



SCORES OF CLINICAL MANAGEMENT AT KALONGO

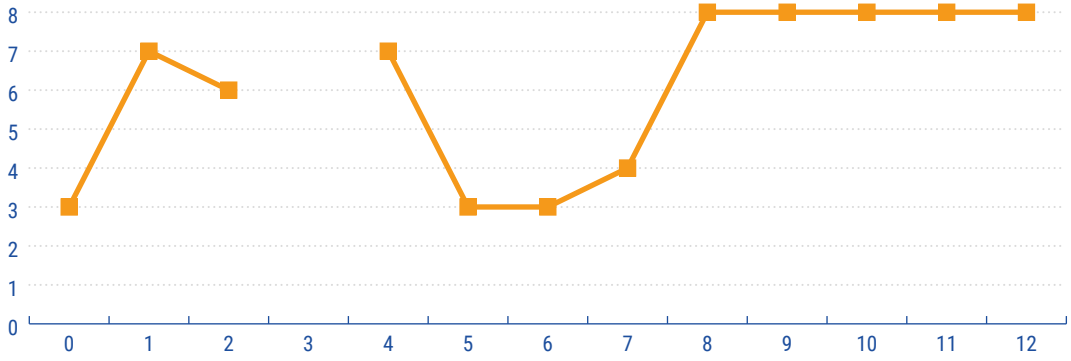
DIAGNOSIS

QUARTER



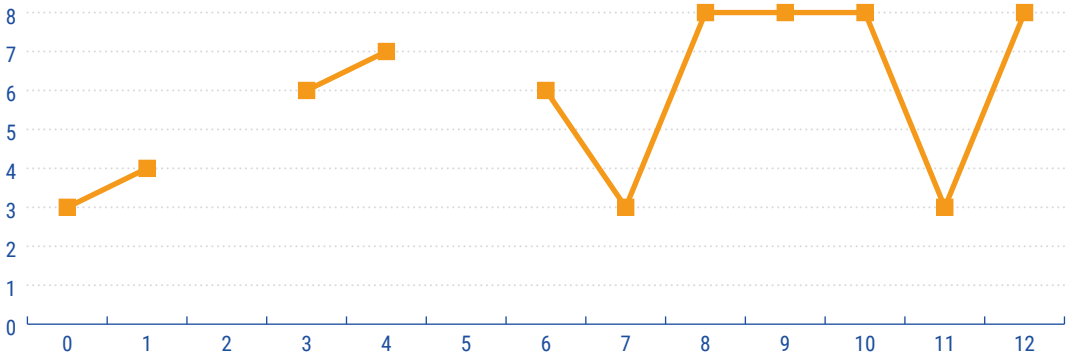
THERAPY

QUARTER



TREATMENT

QUARTER



COMMENTS:

It is clear that the constant presence of specialists and Italian residents at Lacor allowed to maintain an acceptable level of performance in all the three items related to clinical diagnosis, prescription of therapies and administration of the prescribed therapies.

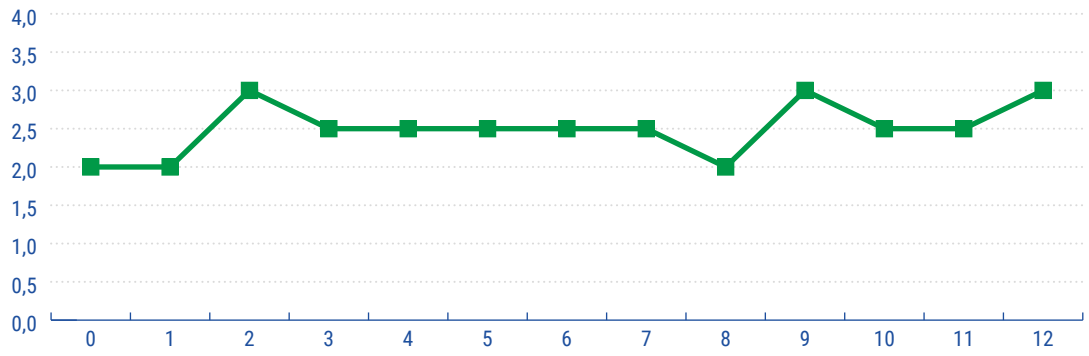
The sporadic presence of the Italian specialist in Kalongo is reflected in the performance gaps in the three clinical items.

HOSPITAL SERVICES:

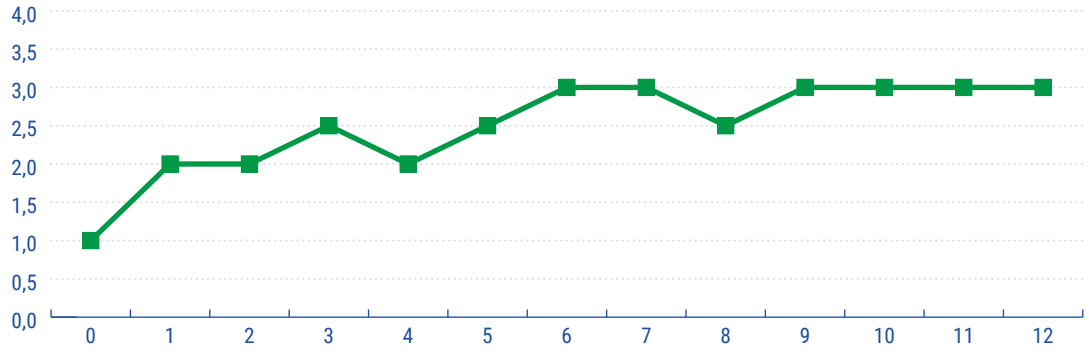
- Adequate support from the Radiology Department?
- Adequate support from the laboratory?
- Are the right Drugs available when needed?

RX LAB AND DRUGS AT LACOR

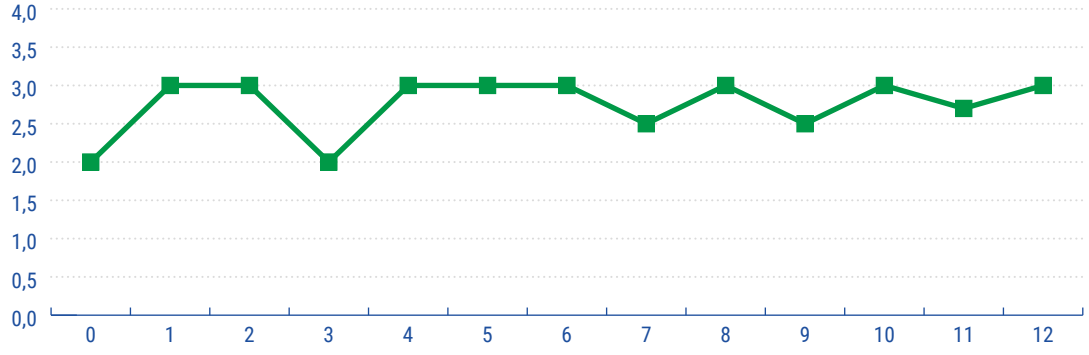
RX



LAB

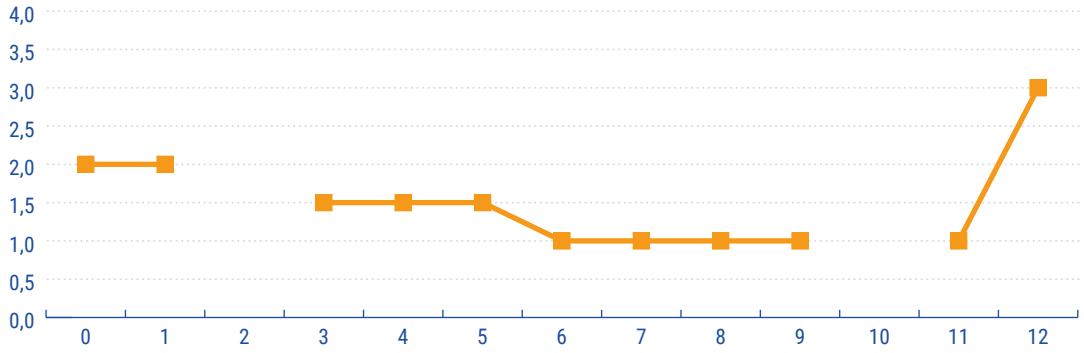


DRUGS

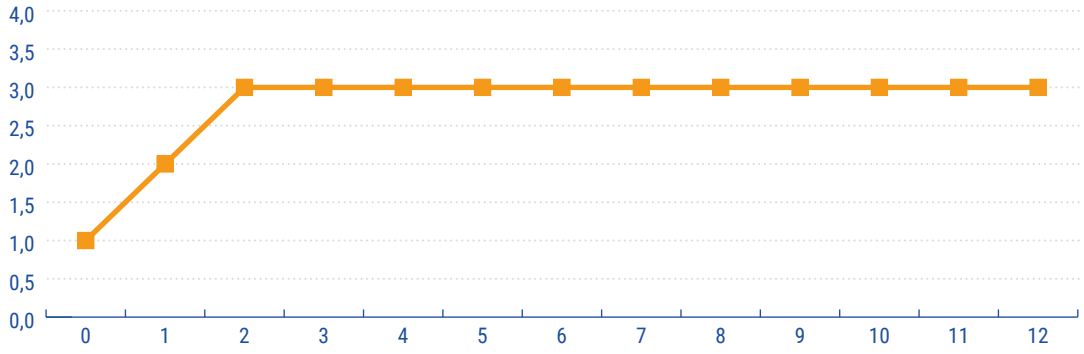


RX LAB AND DRUGS AT KALONGO

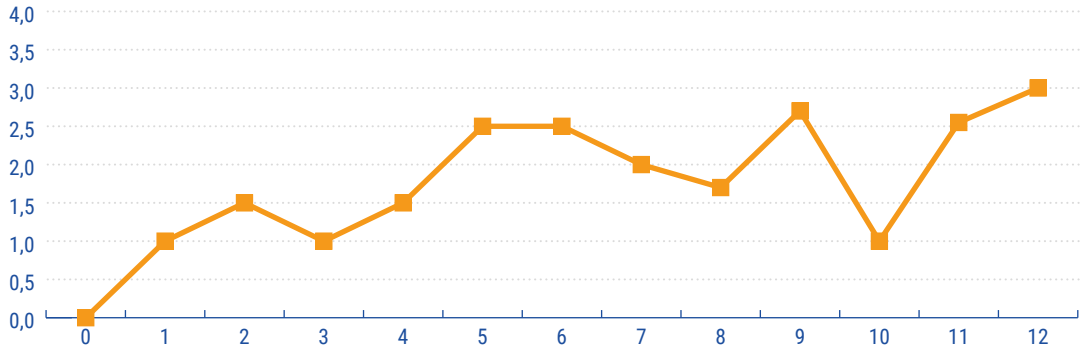
RX



LAB



DRUGS



COMMENTS:

The services at Lacor offer an acceptable level of quality. In Kalongo, only the Laboratory has a stable performance, while the services related to RX and provision of Drugs are erratic.

CONCLUSIONS

The Figures illustrate the scores obtained for each domain in each quarter: summary scores are also computed by aggregating items of the same domain to improve data readability.

Both hospitals showed an increase in the scores for all domains in the first year (quarters 0-3).

In Lacor the levels achieved for most domains did not require greater improvement: the graphs show that high scores were kept throughout the project. Lacor hospital staff and management showed a remarkable capacity to keep a stable and sustainable high-quality profile over time, suggesting that the RBF project became mostly ordinary routine practice, rather than an occasional effort to improve the service in order to be rewarded.

In Kalongo the facilities that were starting this methodology from scratch/zero suffered from several gaps: hence a longer time, the first 6 quarters, was required to establish a higher level of quality of the services.

Graph. 2.3 shows that the improvement from start to end of the project was considerably higher in Kalongo than in Lacor, due to the enduring effort of the hospital staff and management. Kalongo had to face a considerable critical lack of human and structural resources, due to the difficulty to recruit technicians and specialist in a more deprived area.

SUGGESTIONS

As already clearly shown by the trend of the quality scores over the last 6 quarters of the RBF project, the RBF Quality Assessment System starts to be incorporated into the routine practices in both hospitals.

Our recommendation is to support the permanent implementation of this practice. Data collection forms should be simplified and an independent internal quality assessment team should be established for each ward.

Unfortunately, efforts to reach a target do not continue for ever, as fatigue and complacency set in. Hence, management should systematically review the process in order to reinforce the improvement of the quality of services, possibly by stimulating the staff's enthusiasm, though the proposal, in each quarter, of a selected domain of items with specific topic and challenges to focus on.

Dissemination of results to all levels of staff is a must. The process of dissemination, if carefully designed and inclusive, can greatly foster team building and ownership of processes, which may be as rewarding as the compensation.

SECOND SECTION: Comparison between clinical management of cases before the RBF project and after 3 years of implementation

OBJECTIVES

Comparing clinical management of children admitted for more than 48 hours to both hospitals before (year 2014-2016) and three years later (year 2020) of the RBF project implementation.

METHODS (Form enclosed Annex 1)

Over 100 randomly selected clinical records for each of the two time periods from each hospital were scrutinized by an independent quality officer for the purpose of comparing indicators from the RBF checklist regarding proper diagnosis & therapy (Annex 1).

From each clinical record we also recorded the date of admission and discharge, the age of the child, the final diagnosis. For each of the checklist items (Annex 1) a score was assigned according to the fulfilling of the single item (presence of information, complete and clear information, done according to WHO protocol).

0 = N.A. (missing or not applicable)

-1 = Absent, not done, not according to guidelines

1 = present, done, but unclear

3 = present, done, done according to guidelines

A total 'Clinical management' score was obtained by summing History + Examination + Weight + Treatment + Antibiotics

Since the items are correlated among themselves, we may offer an overenthusiastic view of the achieved results. For this reason, a multivariate analysis was required in order to find which variable more efficiently differentiated the management of patients between year 2016 (before RBF) and three years later (2020). A stepwise Canonical Discriminant analysis model was fitted to the data, in order to select the best items that could discriminate between the two periods. Wilk's Lambda estimates the capacity of each variable to differentiate the two years, where 1 = complete overlap and 0 = complete distance.

RESULTS

DISCHARGE DIAGNOSIS OF CASES ADMITTED IN THE TWO HOSPITALS

Table 1 shows the distribution of Diagnosis examined in the two periods

KALONGO	YEAR	
	2016	2020
Abscess	0	1
Allergy	2	0
Anemia	2	8
Asthma	1	1
Bronchiolitis	2	0
Cerebral Malaria	0	2
Convulsion	2	0
Diarrhea	38	10
Hepatitis	0	1
Hypoglycemia	0	1
Malaria	40	27
Malnutrition	3	0
Measles	0	6
Meningitis	4	0
Nephritis	0	4
Otitis	1	1
Pneumonia	50	21
Sepsis	45	9
Sickle	24	13
URTI	4	6
TOTAL	**218**	**111**

LACOR	YEAR	
	2016	2020
Anemia	10	7
Asphyxia	0	9
Asthma	1	1
AWD	0	1
Bronchiolitis	0	3
Candida	1	0
Cellulitis	0	1
Cerebral Malaria	4	0
CHD	1	2
Convulsions	1	2
Diarrhea	29	2
Encephalitis	0	1
Hemorrage	1	0
Hepatitis	2	0
Icterus	1	2
Ileus	2	0
Linfoma	1	1
Malaria	33	34
Megacolon	0	1
Meningitis	4	0
NeonatalSepsis	7	13
Nephritis	0	2
Pericarditis	0	1
Pneumonia	13	5
Poison	1	0
PTB, RHD	0	1
Pyloricstenosis	0	1
Sepsis	34	4
Sickle	11	15
URTI	5	2
TOTAL	**162**	**111**

CLINICAL MANAGEMENT AT AMBROSOLI HOSPITAL-KALONGO

The number of clinical records scrutinized was 218 for the time before RBF (2014-16) and 111 three years later (2020).

Distribution of the Quality Assessment Scores in 2016 and 2020.

Table 2 shows the distribution of scores for the quality items: Clinical Management.

For each score we report the numbers and the % on the total number of records screened below (on the line 'TOTAL'). Chi Square is calculated to compare the differences between 2016 and 2020, with first degree error (p) below. The measure by which the score increased/multiplied, from 2016 to 2020, is shown in the last line (for example for the collection of 'Clinical History' (first column) the % of the maximum score of '3' was 10,6% in 2016 and improved to 82% in 2020 with an increase of 7,77 folds the level of 2016.

Scores	Clinical History		Clinical examination		Malaria managed		Weigth checked		Anemia diagnosed		Sepsis specific diagnosis	
	2016	2020	2016	2020	2016	2020	2016	2020	2016	2020	2016	2020
-1	159	3	149	2	29	1	25	15	9	0	56	3
%	73	2,7	68,3	1,8	17,8	0,9	11.5	13,5	5,9	0	76,7	23,1
1	36	17	36	8	18	1	0	0	26	0	14	5
%	16,5	15,3	16,5	7,2	11	0,9	0	0	17	0	19,2	38,5
3	23	91	33	101	116	104	193	96	118	107	3	5
%	**10,6**	**82,0**	**15,1**	**91,0**	**71,2**	**98,1**	**88,5**	**86,5**	**77,0**	**100,0**	**4,1**	**38,5**
TOTAL	218	111	218	111	163	106	218	111	153	107	73	13
χ2	182		179		31,3		0,88		28		20,4	
p	0,00001		0,0001		0,00001		0,5		0,0001		0,0001	
Fold Changes		**7,77**		**6,01**		**1,38**		**0,98**		**1,3**		**9,36**

Table 3 shows the distribution of scores for the required quality items: Treatment

Scores	Treatment proper		Antibiotics only if required		URTI appropriate		LRTI appropriate	
	2016	2020	2016	2020	2016	2020	2016	2020
-1	39	0	50	4	5	2	16	0
%	17,9	0	23,3	3,7	45,5	27,2	27,6	0
1	51	5	53	8	2	0	5	1
%	23,4	4,5	24,7	7,3	18,2	0	8,6	6,3
3	128	106	112	97	4	7	37	15
%	**58,1**	**95,5**	**52.1**	**89,0**	**36,4**	**77,8**	**63,8**	**93,8**
TOTAL	**218**	**111**	**215**	**109**	**11**	**9**	**58**	**16**
χ^2	49,2		43,4		3,94		6,1	
p	0,00001		0,00001		0,139		0,047	
Fold Changes		**1,62**		**1,70**		**2,14**		**1,47**

Percent of the maximum score achieved in 2016 and 2020

Fig. 1: Shows the % maximum scores (=3) reached in the year 2016 (first bar) and year 2020 (second bar).

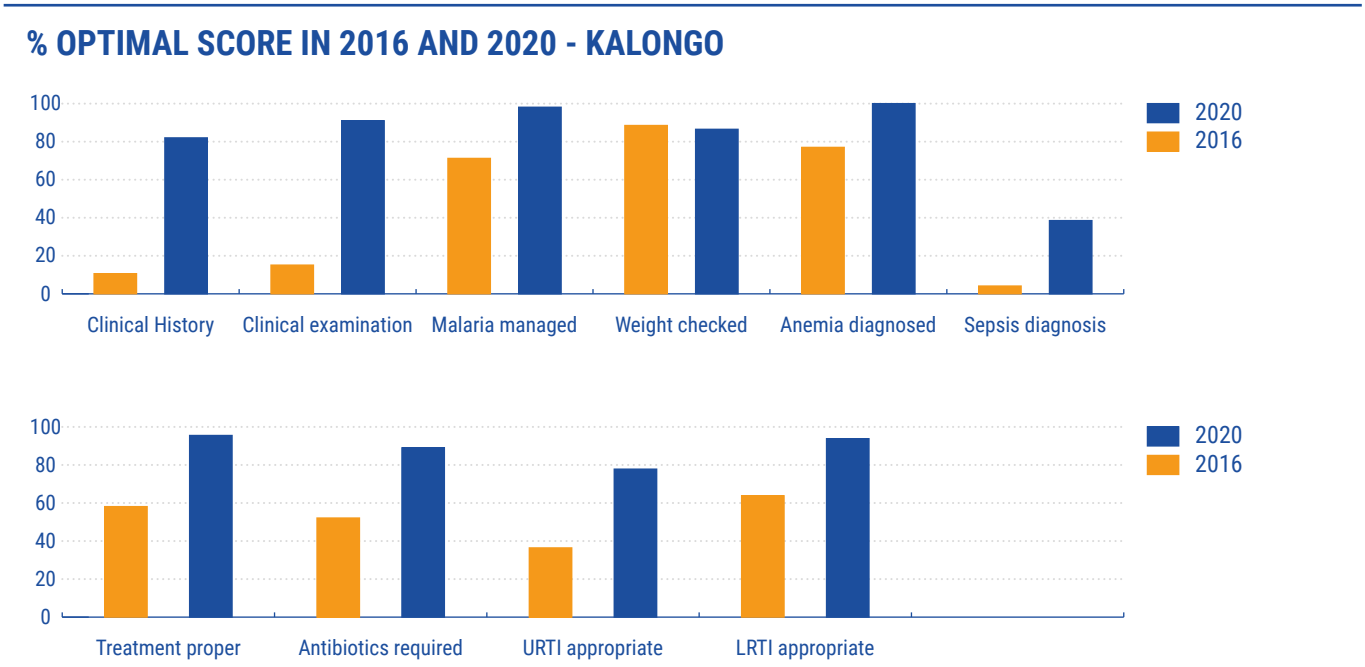
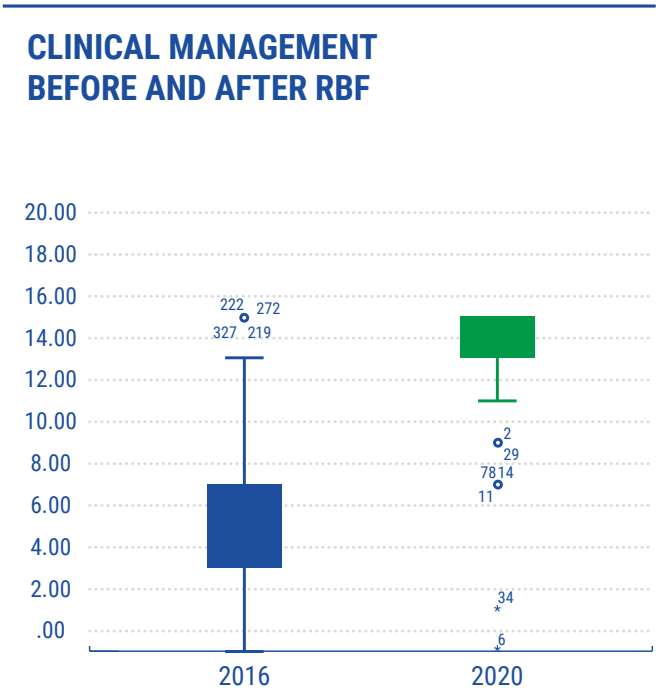


Fig. 2 shows the Mean and Interquartile Range of the sum of scores: History + Examination + Weight + Treatment + Antibiotics



MULTIVARIATE ANALYSIS

Selection of the best items who contribute to improvement from 2016 to 2020

Since most of the observed items are correlated between themselves, we may offer an overenthusiastic view of the achieved results. For this reason, a multivariate analysis was required to find which variable more efficiently differentiates the management of patients between year 2016 (before RBF) and year 2020 (three years later).

A stepwise Canonical Discriminant analysis model was fitted to the observed data by the screening of clinical records in order to select the best items able to discriminate between the two years 2016 vs 2020. Wilk's Lambda estimates the capacity of each variable to differentiate the two years, where 1 = complete overlap and 0 = complete distance.

Table 4: Items selected to discriminate between year 2016 and year 2020 in Kalongo

Step	Items	Wilk's lambda	Anova F	p
1	Symptom	,407	384,119	,000
2	Treatm	,382	212,335	,000
3	Exam	,369	149,217	,000

We can observe that the *symptoms based on clinical history*, the *appropriate treatment* and the *clinical examination* are the best discriminators: no other variable contributes significantly to the model.

If we apply the discriminant score obtained by this analysis we could blindly predict, for all the dates, each clinical records' year. The Discriminant Model fits adequately the observed data and allows to predict correctly to which year the record belongs in 90% of cases.

The correct prediction of 90% of cases in the year they belong provides a robust estimate of the adequacy of the model. ***The practical indication is that that these 3 items should be reinforced in order to improve the quality of the service***.

CLINICAL MANAGEMENT ST. MARY'S HOSPITAL LACOR

The number of clinical records scrutinized was 162 for the year before RBF (2016) and 111 for the year after RBF 2020

For each score we report the numbers and the % on the total number of clinical records screened below. A Chi Square is calculated to compare the differences between 2016 and 2020, with first degree error (p) below. The measure by which the score increased/multiplied, from 2016 to 2020, is shown in the last line (see details for Kalongo Table 2).

Table 5 shows the distribution of scores for the required quality item: Clinical Management.

Scores	Clinical History		Clinical examination		Malaria managed		Weigth checked		Anemia diagnosed		Sepsis specific diagnosis	
	2016	2020	2016	2020	2016	2020	2016	2020	2016	2020	2016	2020
-1	32	0	29	0	7	0	72	11	2	0	39	10
%	19,9	0,0	18,2	0,0	6,6	0,0	44,7	9,9	2,0	0,0	70,9	37,0
1	38	5	36	2	2	0			1	6	6	6
%	23,6	4,5	22,6	1,8	1,9	0,0	0,0	0,0	1,0	6,4	10,9	22,2
3	91	106	94	109	97	85	89	100	99	88	10	11
%	**56,5**	**95, 5**	**59,1**	**98,2**	**91,5**	**100,0**	**55,3**	**90,1**	**97,1**	**93,6**	**18,2**	**40,7**
TOTAL	**161**	**111**	**159**	**111**	**106**	**85**	**161**	**111**	**102**	**94**	**55**	**27**
χ2	51		53,6		7,57		37,6		5,36		8,66	
p	0,00001		0,00001		0,023		0,0001		5,36		0,013	
Change		**1,69**		**1,66**		**1,09**		**1,63**		**0,96**		**2,24**

Table 6 shows the distribution of scores for the required quality items: Treatment

Scores	Treatment proper		Antibioticsrequired		URTI appropriate		LRTI appropriate	
	2016	2020	2016	2020	2016	2020	2016	2020
-1	35	5	52	10	1	0	0	2
%	21,9	4,5	33,8	9,1	14,3	0,0	0,0	7,7
1	14	15	7	18	0	1	10	11
%	8,8	13,5	4,5	16,4	0,0	20,0	50,0	42,3
3	111	91	95	82	6	4	10	13
%	**69,4**	**82,0**	**61,7**	**74,5**	**85,7**	**80,0**	**50,0**	**50,0**
Total	**160**	**111**	**154**	**110**	**7**	**5**	**20**	**26**
χ2	16,18		27,6		2,12		1,68	
p	0,0001		0,0001		0,34		0,194	
Fold Changes		**1,18**		**1,21**		**0,93**		**1,00**

Fig. 1: Shows the % maximum scores (=3) reached in the year 2016 (first bar) and year 2020 (second bar).

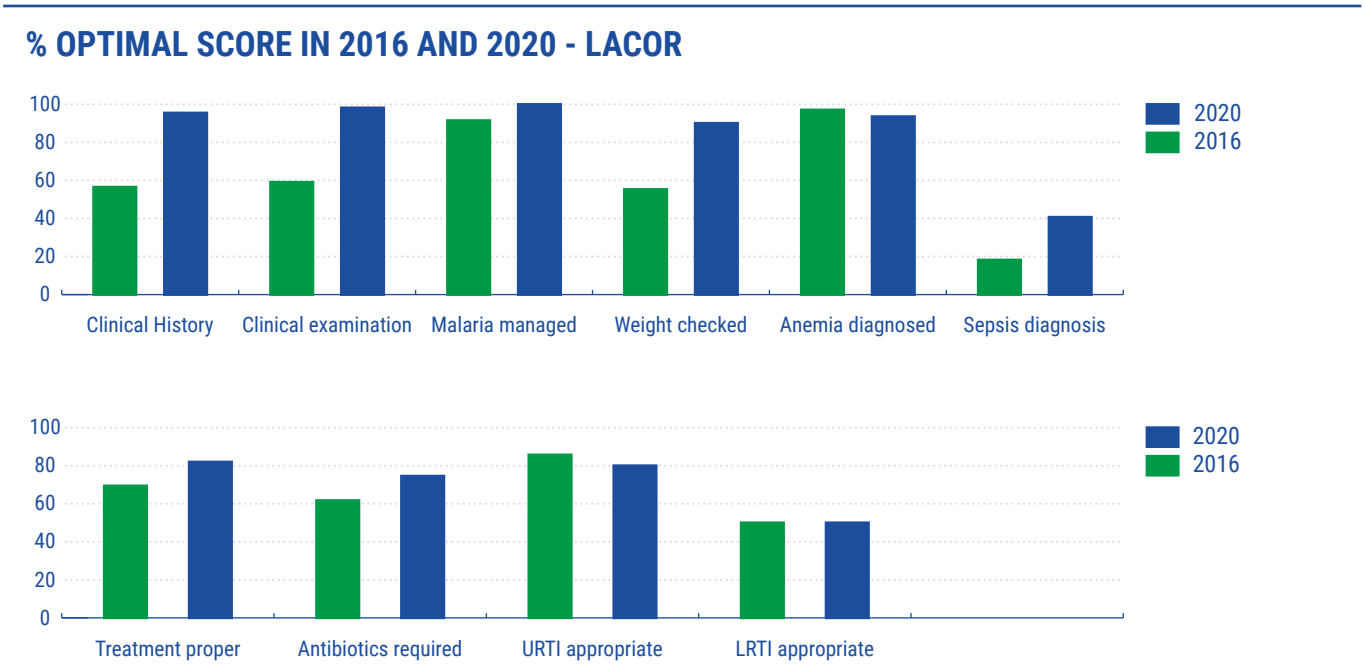
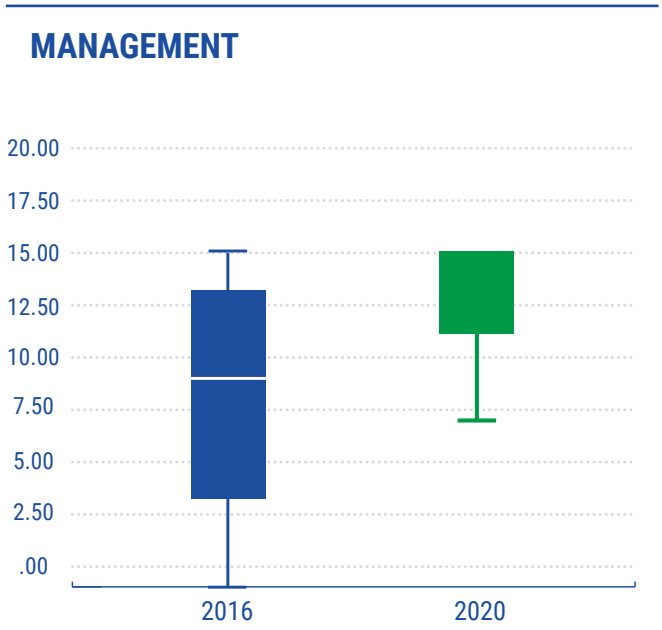


Fig. 2 shows the Mean and Interquartile Range of the sum of scores: History + Examination + Weight + Treatment + Antibiotics before and after RBF at Lacor



MULTIVARIATE ANALYSIS

Selection of the best items who contribute to improvement from 2016 to 2020

Since most of the observed items are correlated among themselves, a multivariate analysis was required in order to find which variable more efficiently differentiate the management of patients between year 2016 and year 2020. A stepwise Canonical Discriminant analysis model was fitted to the observed data by the screening of clinical records in order to select the best variables able to discriminate between the two years. Wilk's Lambda estimates the capacity of each variable to differentiate between the two years, where 1 = complete overlap and 0 = complete distance.

Table 7: Items selected to discriminate between year 2016 and year 2020 Lacor

Step	Item	Wilks Lambda	F ANOVA	p
1	Symptom	,816	58,451	,000
2	Weigth	,731	47,521	,000
3	Exam	,711	34,865	,000

We can observe that the *symptoms based on clinical history*, the *measuring of weight* and the *clinical examination* are the best discriminators: no other variable contributes significantly to the model. The acceptable correct prediction of 75% of cases in the year they belong provides a sufficiently robust estimate of the adequacy of the model. **The practical indication is that these 3 items should be reinforced in order to improve the quality of the service.**

LIMITATIONS:

The blind evaluation of clinical notes, far from the health care facility, on one side, it reduces any interfering bias but, on the other side, does limit the interpretation of the unclear handwriting scripts by very busy doctors.

The item 'test required necessary/un-necessary' is not due to medical choice but, more often, by the availability of the service. We presume that, especially in Kalongo, many tests are actually done (for ex. XRay) but are not reported in the clinical notes. For this reason, this item was excluded from the analysis.

For the Neonates Kalongo did not include the forms, which are in a different ward archive. For Lacor a specific analysis is required.

CRITICAL POINTS:

Unfortunately, the weight of the child is not reported in all cases, inasmuch there is no space on the forms to report the weight centile, which is essential to estimate the health of the child. Screening for malnutrition is very occasional and a specific query is not present on the medical chart. The main reason for this is that the assessment is done in the outpatient department, but is not often reported in the medical chart.

Similarly, the immunization status of the child is erratically, since there is no specific query marked on the forms.

The diagnosis of 'Sepsis' is applied extensively, without the appropriate search for a cause of the infection. A specific diagnosis would be much facilitated by availability of a simple marker of infection, like the C Reactive Protein (CRP).

ACHIEVED RESULTS

Clinical management of the sick child has been very significantly improved from 2016 (before RBF) to 2020 (after RBF) both in Lacor, where the average level of care was already at a good standard, but more evidently in Kalongo, where the lack of human resources limited the quality of care in the years 2014-2016.

It is sufficient to see the measures of increase changes from 2016 to 2020 (% max score achieved in 2020 / % max score achieved in 2016), to estimate the dramatic changes observed at Kalongo (Tables 2 and 3).

The reporting of a detailed clinical history and the accurate examination of the child improved more than 6 times (=600%!). Similarly, good management of sepsis increased 9 times. The appropriateness of the treatment and use of antibiotics improved much less (1,6–1,7 times) because it was already often appropriate in 2016.

At Lacor the improvements from 2016 to 2020 appeared less impressive for a good reason: they were starting from an adequate quality of care. But the improvement was very significant indeed when considering clinical management and treatment of the sick child.

SUGGESTIONS

A simple and inexpensive action should be taken to improve the quality of clinical records in order to stimulate doctors and nurses to pay a greater attention to items that are often missing:

Photo: Marco Mignani

- The daily report should have adequate space.
- The number of previous admissions should be reported (children who appear to require special care).
- Appropriate recording of daily weight.
- Assessment of the growth percentiles (at least weight, length, arm circumference) at the time of admission.
- Every attempt should be made to verify the immunization status.
- International nomenclature of diseases should be used to report first, second and third diagnosis.
- In case of a child suspect for malnutrition, a small space to report the observed feeding is needed.
- For the many 'infected' children with possible 'Sepsis' the availability of CPR assay (C reactive Protein) would significantly support a more specific diagnosis.

EVALUATION OF THE MANAGEMENT OF NON-COMMUNICABLE 'SPECIAL' CASES

Screening of the Medical Records in the Children's Wards of the two hospitals allowed a thorough comparison of the clinical management before the RBF project (2016) and at the end of the three years project (2020). Each record was scrupulously examined using a pre-determined form in order to collect comparable data. We obtained a realistic picture of the average management of sick babies in these wards. Robust statistics allowed to estimate the significant changes which occurred over the project's three years. Nevertheless, tables and graphs do describe the complexity of clinical management, but do not allow to explore management of the single individual. The large number of clinical records examined were, as expected, largely biased toward common communicable diseases, although some stratification for the ten-diagnosis proposed in the project was applied.

In order to understand the procedures, the actions and the limitations of the management of the sick child in each hospital, we selected **kidney disorders,** a non-communicable disease of sufficient complexity to allow monitoring the capacity of dealing with unusual and severe diseases. We scrutinized the Records of 2020, at the end of the project, to estimate the actual level of manpower performance and general management of these conditions.

We analysed 10 cases of children with a diagnosis of ***nephritis or nephrotic syndrome*** in each of the two hospitals, Kalongo and Lacor.

The age range of these children was 2-12 years, and the hospital stay was 5 to 11 days. Clinical features were accurately reported in all cases upon admission (puffiness, oedema, general status, abdomen, ascites). Unfortunately, daily weight was not recorded in all cases. Similarly pulse, heart, respiratory rates were not recorded in all charts examined, as well as blood pressure repeatedly measured. Fluid intake and output was estimated in 100% of cases, despite the expected difficulties of collecting urine in small children.

Urine analysis was available in multiple occasions during the hospital stay, and serum electrolytes together with BUN were analysed both in Kalongo and in Lacor. Treatment included reduction of salt intake, use of diuretics (Lasix and Nifedipine), Prednisone as indicated for nephrotic syndrome as well as Captopril. Glomerular Filtration rate was often reported in Kalongo's records. Antibiotics were prescribed in the usual Ampicillin-Gentamicin association to all cases except for one case in Lacor. Other antibiotics, such as Nitrofurantoin, Ciprofloxacin, Ceftriaxone, were also administered (more often at Kalongo, compared to Lacor). Two cases in Kalongo were protected with Omeprazole. Appropriate treatment with Artesunate was given in case of Malaria.

In conclusion, management of these complex non-communicable diseases cases was carried out according to international standards. Both diagnosis and treatment followed the most appropriate guidelines for the respective diseases.

Unfortunately, the future outcome (prognosis) of many children affected by nephrotic syndrome could be seriously limited by the lack of causal classification of their disease, which requires, in most cases, kidney needle biopsy histological assessment, which should be organized with a specific referral system in the country.

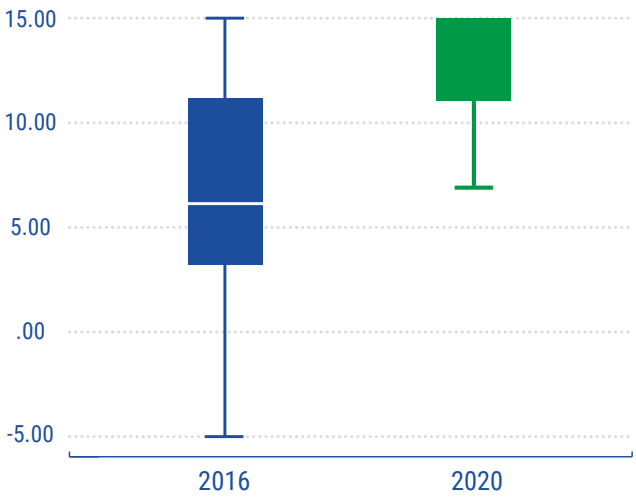
NEONATES AT LACOR HOSPITAL

Cases selected by Age <= 1 month (neonatal age)

		YEAR		
		2016	2020	Total
Diagnosis	URTI	1	0	1
	Sepsis	19	11	30
	Pyloricstenosis	0	1	1
	Pneumonia	1	0	1
	Meningitis	1	0	1
	Megacolon	0	1	1
	Icterus	0	2	2
	Diarrhea	1	0	1
	CHD	0	2	2
	Asphyxia	0	6	6
	Anemia	1	0	1
Total		**24**	**23**	**47**

Average score of 'Management' (=History + Examination + Weight + Treatment + Antibiotics) of Neonatal Cases in 2016: 6,6 versus in 2020: 12,5 Student t-test = 4,55 p = 0,0001: The score improved by 100%.

MANAGEMENT



COMMENTS

A very significant improvement was observed before/after the RBF project for the care of neonates.

The unspecific diagnosis of 'Sepsis' decreased from 79% in 2016 to 46% in 2020. At the same time, the complexity of diagnosis was significantly more frequent in 2020 compared to 2016: in 2020 more diagnosis of single neonatal diseases were reported compared to 2016, where most sick neonates were labelled with a diagnosis of 'sepsis'. **A Clinical record dedicated to the Neonates could significantly help simplifying and improving the service**.

QUALITY ASSESSMENT OF NURSING PROCEDURES IN ST. MARY'S HOSPITAL LACOR AND IN AMBROSOLI MEMORIAL HOSPITAL, KALONGO

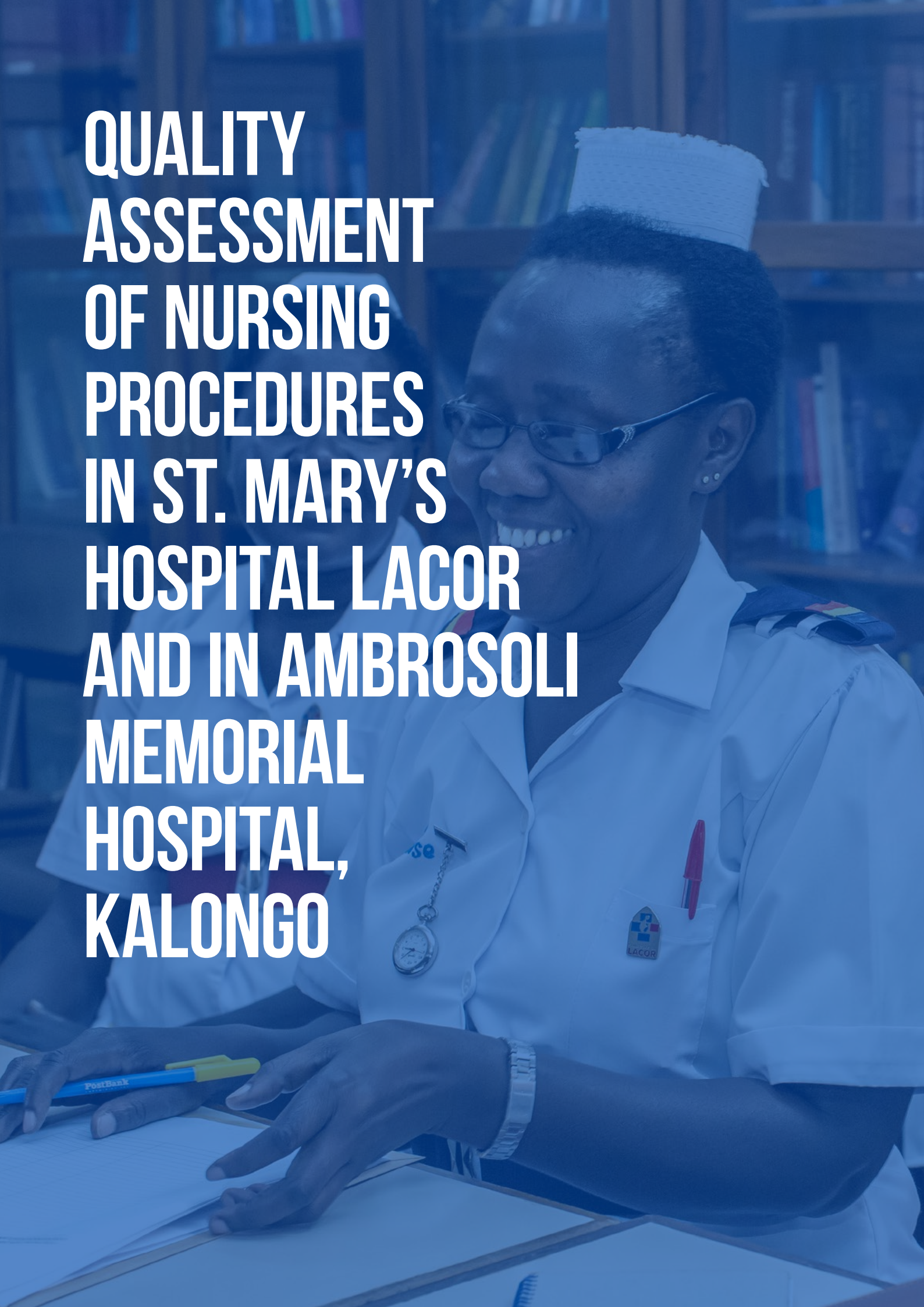


Photo: Mauro Fermariello

QUALITY ASSESSMENT OF NURSING PROCEDURES IN ST. MARY'S HOSPITAL LACOR AND IN AMBROSOLI MEMORIAL HOSPITAL, KALONGO

Valentina Mozzi & Nursing Teams

As part of the AICS project *"Results Based Financing, a change engine for paediatric services"–Intervention to strengthen the quality of care and empowerment of health personnel in the Acholi region, Northern Uganda"*, a final study was planned to evaluate quantitative parameters and qualitative indicators to show if the project had actually achieved the expected effectiveness; the evaluation of nursing indicators is a part of the study design, much broader, and aims to compare 5 indicators in the children wards of the two hospitals in 2016 and 2020, based on the selected records.

NURSING PROCEDURES REVIEW FORM

CASE ID _____ **Admitted** |__|__|____| **Discharged** |__|__|____| **Age mo** |_____|

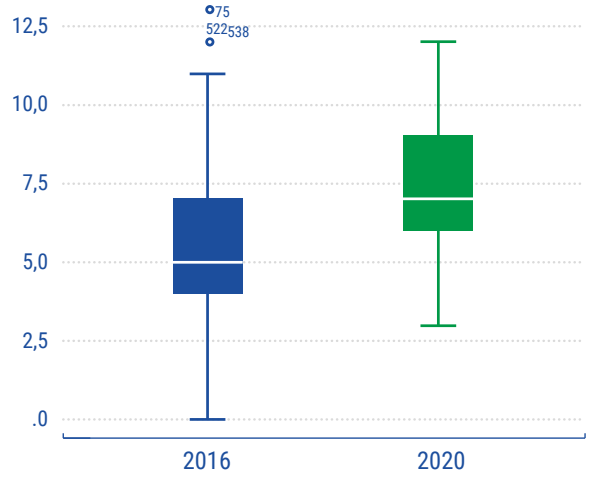
DIAGNOSIS: _____

Proper administration of therapies to admitted cases	
Q1) Therapies have been given properly (Oral, injection, IV line, fluids)	N.A. 0☐ NO -1☐ Unclear 1☐ YES 3☐
Q2) Charts correspond to the correct patients	N.A. 0☐ NO -1☐ Unclear 1☐ YES 3☐
Q3) Weight and vital signs recorded (Wt, Temp, Resp Rate etc)	N.A. 0☐ NO -1☐ Unclear 1☐ YES 3☐
Q4) Fluid balance chart is present, when applicable	N.A. 0☐ NO -1☐ Unclear 1☐ YES 3☐
Q5) Bowel events recorded in case of diarrhoea–dehydration	N.A. 0☐ NO -1☐ Unclear 1☐ YES 3☐
TOTAL SCORE	

N. of Clinical Records evaluated

		Hospital		
		Lacor	Kalongo	Totale
YEAR	2016	220	123	343
	2020	46	163	209
Total		**266**	**286**	**552**

MEAN TOTAL SCORE OF NURSING CARE IN BOTH HOSPITALS



Q1- Therapies have been given properly

Note on methodology: we did not consider fluid administration because it was the object of a further specific question.

NA	No record/chart available
NO	No recording for at least one day and 50% less is documented and signed.[16]
Unclear	50% of medication recordings are not clearly readable Treatment marked in the observation chart but not clearly signed Some doses of antibiotic administration are not marked
YES	Over 80% of administrations are correctly documented

Therapies Given Properly	LACOR		KALONGO	
	2016	2020	2016	2020
Inadequate	16 (7,5%)	0 (0,0%)	3 *(2,4%)*	4 *(2,5%)*
Uncertain	89 (41,6%)	9 (19,6%)	73 *(59,3%)*	47 *(28,8%)*
Perfect	109 (50,9%)	37 (80,4%)	47 *(38,2%)*	112 *(68,7%)*
Total	**214**	**46**	**123**	**163**
		Chi Sq **14 p = 0,001**		Chi Sq **27 p < 0,0001**

16 The lack of signature in the therapy documentation raise up some doubts about the fact that the therapies has been properly administered.

Q2- Charts correspond to the correct patients

Note on methodology: in Lacor in 2016 patient treatment charts had no specific space for the patient's name, which was consequently never marked, although it was present in other attached forms, such as the observation chart. We therefore decided to check the patient's identity in the other attached forms.

NA	No record/chart available
NO	Chart bears another patient's name
Unclear	Name on the chart not completely readable Name of the patient written only on one /record/chart
YES	Correct

Charts correspond to the correct patient	LACOR		KALONGO	
	2016	2020	2016	2020
Inadequate	10 (4,5%)	1 (2,2%)		
Uncertain	28 (12,7%)	2 (4,3%)	59 *(48,0%)*	2 *(1,2%)*
Perfect	182 (82,7%)	43 (93,5%)	64 *(52,0%)*	161 *(98,8%)*
Total	**220**	**46**	**123**	**163**
		Chi Sq **3 p >0,1**		Chi Sq **91 p < 0,00001**

Q3- Weight and vital signs recorded (Wt, Temp, Resp Rate etc.)

NA	No record/chart available
NO	No weight or other vital sign recorded
Unclear	Weight or at least one sign is monitored
YES	Weight or observations are regularly monitored

Weight and Vital signs reported	LACOR		KALONGO	
	2016	2020	2016	2020
Inadequate	72 (34,6%)	0 (0,0%))	2 (1,6%)	7 (4,3%)
Not Available			0 (0,0%)	1 (0,6%)
Uncertain	108 (51,9%)	34 (73,9%)	27 *(22,0%)*	98 *(60,1%)*
Perfect	28 (13,5%)	12 (26,1%)	94 *(76,4%)*	57 *(35,0%)*
Total	**208**	**46**	**123**	**163**
		Chi Sq **23 p = 0,0001**		Chi Sq **48 p < 0,0001**

In Kalongo most of the children were regularly weighed and temperature frequently monitored in both 2016 and 2020. In Lacor, children were sometimes weighed in 2016, but regularly weighed in 2020 as well as observations sometimes recorded.

Q4- Fluid balance chart is present, when applicable

Note on methodology: we did not assess the prescription of oral rehydration solution (ORS) because mothers or attendants are required to administer it and would not be able to record it. We considered prescription of IV fluids and consequent administration by the nurses. We also considered and assessed blood transfusion, when the given amount (in mls) was recorded.

NA	No fluid prescription in place
NO	Prescription present but administration is not recorded
Unclear	Prescription present and partial administration is recorded (e.G. Recorded partially in treatment sheet or when at least blood transfused amount is recorded)
YES	When the prescription is in place and administration is recorded

Fluid balance	LACOR		KALONGO	
	2016	2020	2016	2020
Inadequate	13 (43,3%)	1 (10,0%)	10 (47,6%)	16 (25,0%)
Uncertain	9 (30,0%)	2 (20,0%)	7 (33,3%)	26 (40,6%)
Perfect	8 (26,7%)	7 (70,0%)	4 (19,0%)	22 (34,4%)
Total	30	10	21	64
		Chi Sq **6,4 p = 0,041**		Chi Sq **4 p = 0,1**

There is no fluid sheet/chart in Kalongo Hospital: fluids are prescribed on the observation and treatment sheet/chart, where nurses sign when they administer. We therefore assessed infusion according to the chart.
In Lacor a specific fluids sheet has been introduced and is now regularly used by doctors to prescribe IV fluids and by nurses to document starting time, rate and amount of infusion given.

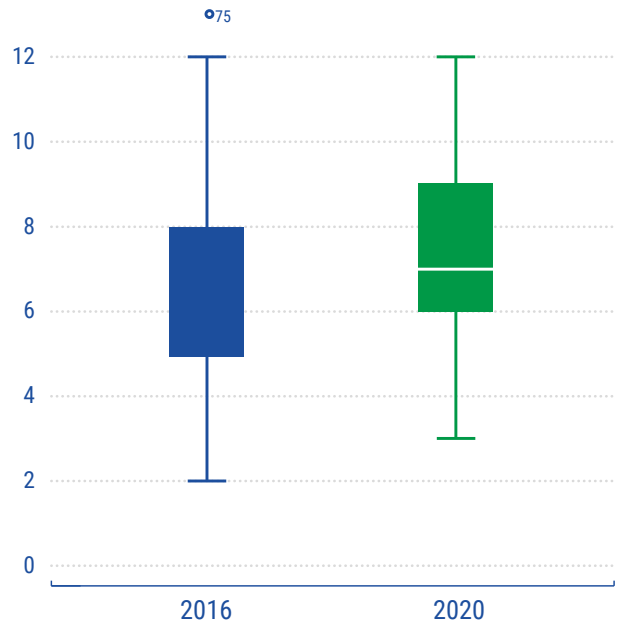
Q5- Bowel events recorded in case of diarrhea – dehydration

NA	Diagnosis different from diarrhea-dehydration
NO	Diagnosis is diarrhea-dehydration but no bowel events have been recorded
Unclear	Diagnosis is diarrhea-dehydration and at least one bowel event has been recorded
YES	Diagnosis is diarrhea-dehydration and two or more bowel events have been recorded

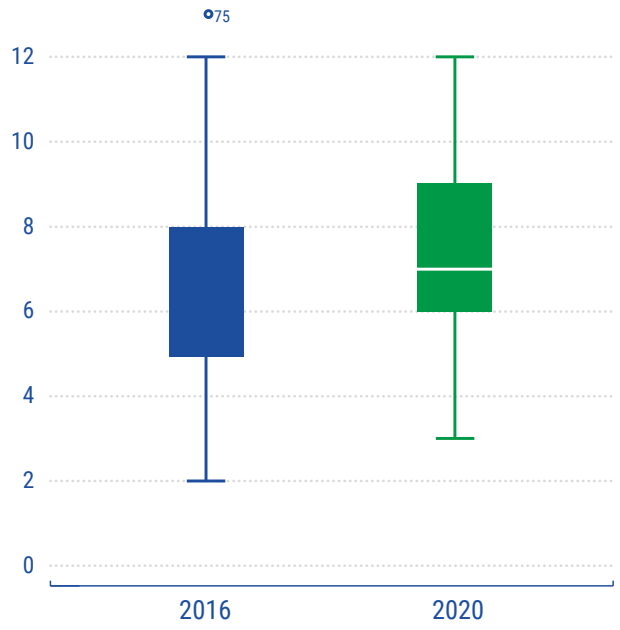
Bowel events recorded	LACOR		KALONGO	
	2016	2020	2016	2020
Inadequate	22 (64,7%)	0 (0,0%)	26 (96,3%)	10 (90,9%)
Uncertain	6 (17,6%)	0 (0,0%)	1 (3,7%)	1 (9,1%)
Perfect	6 (17,6%)	2 (100,0%)		
Total	34	2	27	11
		Chi Sq **7,4 p = 0,025**		Chi Sq **0,4 p >0,5**

Both in Lacor and in Kalongo Hospital scores remain very low even in 2020, because nurses do not usually record bowel events on the chart; these are usually recorded by doctors in the Progress note during ward round.

TOTAL SCORE KALONGO HOSPITAL



TOTAL SCORE LACOR HOSPITAL



FINAL COMMENTS ON NURSING INDICATORS

The indicators presented in this report were chosen during the planning phase of the study as indicative of intervention for which nurses are responsible.

The box plot clearly indicates a general improvement of scores for both hospitals. The average score increased in 2020 demonstrating a general improvement in clarity and the completeness of documentation. The files with very low scores also decreased, bringing the minimum values higher in 2020.

Treatment chart indicators.

Correct documentation of administration for Lacor Hospital increases from 50.9% in 2016 to 80.4% in 2020; Kalongo Hospital also recorded a good improvement from 38.2% to 68.7% in 2020. Statistical tests are significant in both hospitals, which means that the improvement in the observed data was not random.

Completeness of vital signs documentation also presents statistically significant results. Due to the scoring methodology, there is a considerable increase in the category "Unclear": from 51.9% to 73.9% at Lacor and from 22.0% to 60.1% in Kalongo. These results might look negative, as both hospitals have rather low percentages in the "Perfect" category (indeed, the "Unclear" category actually increases in Kalongo Hospital if compared to the "Perfect" category in 2020). Results were penalized by the strict methodology adopted (all patient vital signs should be regularly checked, even if within a normal range), which assigned "Unclear" when weight and at least one vital sign was monitored.

Important considerations related to the context must be considered to have a clear representation of results:

- The acuteness and complexity of diseases, the large number of patients and the intense workload can make it very difficult to regularly and accurately record data; this does not mean that the patients are not monitored and regularly checked.
- At Lacor, the treatment sheet/card remains at the patient's bedside, while the complete folder, including the observation chart, is usually kept elsewhere and consulted mainly during the ward round, and is therefore not immediately available when a specific vital parameter is checked. This makes registration of observations a time-consuming activity for nurses.
- Patients do not remain at their bedside all the time. When the medication round bell rings, not all mothers come back from the courtyard with their sick child, thereby compromising correct administration.
- In conclusion, the study captures an overall improvement in document completeness.

However, some areas remain where further improvement can be achieved; these are mainly related, in our opinion, to the high complexity of the context under study.

HOSPITAL ACQUIRED INFECTION SURVEY 2020, LACOR HOSPITAL

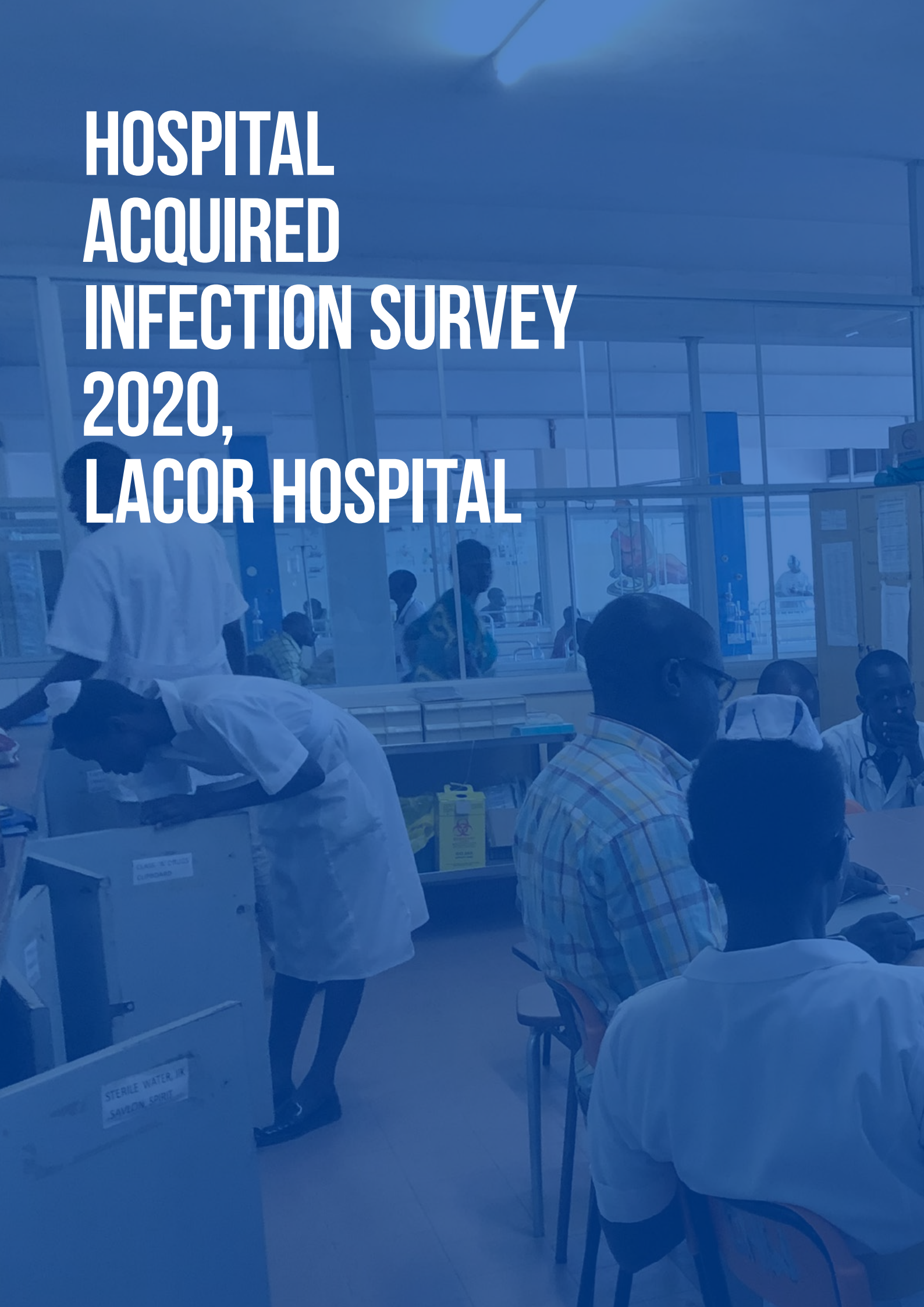


Photo: G. Kalokwera / S. Moro

HOSPITAL ACQUIRED INFECTION SURVEY 2020, LACOR HOSPITAL

Investigative team: Dr. Kansiime Jackson, Jacinta Otine, Mary Kitale, Dr.Amos Zia, Dr. Ronald Achidri, Sr. Apio Anyai Angioletta, Valentina Mozzi, Dr Emmanuel Ochola

Data entered by Valentina Mozzi and Dr. Achidri, analysed by Dr. Emmanuel Ochola.

Table 1. Participants by ward

Ward	Freq.	Percent
Pediatrics	41	25.15
Medicine	25	15.34
Surgery II	16	9.82
Maternity	8	4.91
Gynaecology	5	3.07
Surgery I	37	22.7
Burns Unit	8	4.91
Trauma/Orthop	23	14.11

Children ward had the highest number of respondents, males comprised 60% of the respondents

Table 2: Participants by gender

Gender	Freq.	Percent
Male	100	61.36
Female	63	38.64
Total	163	100

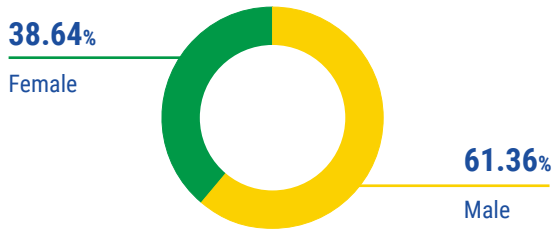


Table 3: Age and some characteristics

Variable	Patients Assessed	Mean	Median	Range
Age	163	31.13	27	0-89 years
Catheter days	38	7.97	3.5	1-41 days
Iv-line days	132	3.17	3	0-10 days
Drainage days	7	8.14	10	2-13 days

Average age was 31.1 years, median 27, rage 0-89years. All patients under 1 year were considered to be 0 years.
Urinary catheters stayed in situ on average 8 days, mainly skewed by the few staying longer (median was 3.5). IV lines stayed in situ on average 3 days. Surgical drainage remained on average 8 days.

HOSPITAL ACQUIRED INFECTION (HAI) PREVALENCE

Table 4: Prevalence of HAI

HAI present	Freq.	Percent
Yes	32	19.63
No	131	80.37
Total	163	100

The overall prevalence of HAI in Lacor hospital was 19.63% in 2020.

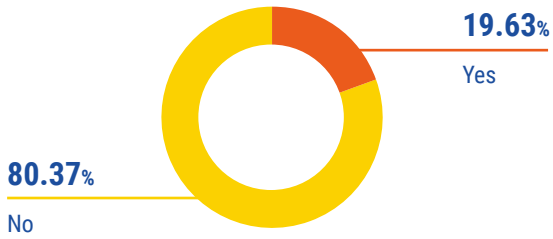


Table 5: Hospital Acquired Infection by ward, and ward contribution to HAI

Ward	HAI Yes	HAI No	HAI Percentage (denom = ward total)	Ward HAI contribution (denom 32)	Total	Specific HAI in ward
Pediatrics	4	37	9.76%	12.50%	41	3 IV lines and 1 pneumonia
Medicine	3	22	12.0%	9.38%	25	2 UTI, 1 diarrhoea
Surgery II[i]	4	12	25.0%	12.50%	16	2 UTI, 3 IV lines, 1 drainage site
Maternity[ii]	1	7	12.5%	3.13%	8	1 diarrhoea
Gynaecology	0	5	0	0%	5	0
Surgery I	11	26	29.73%	34.38%	37	6 surgical site infections, 4 UTI, 4 IV lines, 4 drainage sites, 2 pneumonia
Burns unit	2	6	25.0%	6.25%	8	1 UTI, 1 surgical site, 1 diarrhoea
Trauma/Orthop	7	16	30.43%	21.88%	23	4 surgical site, 2 IV lines, 2 pneumonia
Total	**32**	**131**	**19.63%**	**100%**	**163**	

Note: due to multiple infections in some patients, the specific HAI count is more than the total number of patients with HAI.

The HAI percentage indicates the prevalence of HAI at ward level. The Orthopaedic Ward at 30.4% had the highest HAI % prevalence, followed by Surgery I at 29.73%, Surgery II and Burns Unit both at 25%, followed by the other units. This percentage is affected by the denominator, which is the total number of patients surveyed, which was rather low this year due to COVID restrictions.

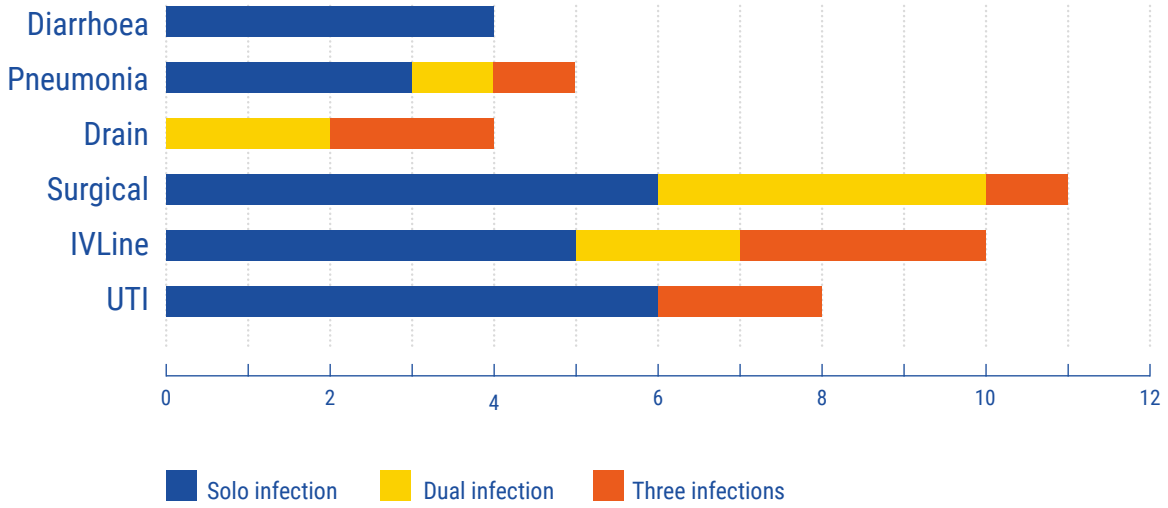
Surgery 1 contributes to 34.38% of HAIs, followed by Trauma ward, Paediatrics and Surgery II. Over the years, most HAIs have tended to occur in Surgery I.

Table 6: Hospital Acquired Infection by type among those having HAI.

Type of HAI	Number	% OF HAI (denom=33)	% of patients (denom=29)	Comment/ward
Urinary Tract Infection (UTI)	8	18.60%	25.00%	4 in Surg I, 2 in Surg II, 1 in Burns, 1 in Medicine
Blood stream infection/iv-line	9	20.93%	28.13%	4 in Surg I, 3 in Paed, 2 in Orthop
Surgical site infection	13	30.23%	40.63%	6 in Surg I, 4 in Orthop, 2 in Surg II, 1 in Burns
Drain infection	4	9.30%	12.50%	4 in Surg I
Hosp acquired pneumonia	5	11.63%	15.63%	2 in Orthop, 2 in Surg1, 1 Paed
Hosp acquired diarrhoea	4	9.30%	12.50%	2 Medicine, 1 Maternity, 1 Burns
no of HAI	**43**	**100.00%**		
no of patients	**32**		**100.0%**	

HAI occurred in 32 patients. However, some patients had multiple types of HAI, or coinfecting HAI, bringing the total to 43.

COINFECTIONS



Multiple coinfections occurred in several patients. Whereas 24 of 32 patients (75%) had only one infection, 3 patients (9.4%) had a combination of three hospital acquired infections, and 4 (12.5%) had two hospital acquired infections.

RISK FACTORS

Table 7: Hospital acquired infections and risk factors

Variable	Risk	n. at risk	n. infected	HAI %
IV line infection	having an IV line	129	9	6.98%
Urinary Tract Infection (UTI)	having a catheter	33	8	24.24%
Surgical site infection	operated	49	13	26.53%
Surgical drain infection	drain inserted	6	4	66.67%

The risk of a blood stream infection was 7% in patients with an IV line. The risk of UTI was 24% in patients with a catheter, while the risk of a surgical site infection was 27% in operated patients, and risk of drain site infection was 67% in patients with a drain.

Any statistically significant risk factors?

A quick bivariate analysis: increase in age determined a slight increase in probability of acquiring a HAI, or 1.020 (CI= 1.004-1.035), p value= 0.013.

There was no statistically significant correlation between HAI and sex.

A patient admitted to Surgery I and to Trauma/Orthop had a significantly higher risk of HAI (3.9 times higher in Surgery I and 2 times higher in Trauma/Orthop ward) compared to admission to Paed Ward.

Table 8: logistic regression of ward and hospital acquired infection.

Ward	Number positive	Odds Ratio	P value	[95% Conf. Interval]	
Children ward	4	1	ref	Lower limit	Upper limit
Medicine	3	1.26	0.774	0.26	6.16
Surgery II	4	3.08	0.150	0.76	14.26
Maternity	1	1.32	0.815	0.13	13.66
Gynaecology	0	omit			
Surgery I	11	3.91	0.032	1.12	13.65
Burns	2	3.08	0.246		
Trauma	7	4.05	0.044	1.04	15.79

GENERAL COMMENTS

1. Due to a very brief orientation, there were some variations in definitions. E.g. 1-2 cases where some considered IV line infection retrospectively, or based on a history of swelling. Some clinical parameters were not confirmed, e.g. pneumonia based on history of cough. Again, the tool stating "diarrhoea 2 days after admission" misled some collectors to register a potential past HAI event as if it was **current**.
2. We excluded UTI as cause of HAI in some patients with Benign Prostatic Hyperplasia (BPH), who were considered to have UTI at admission.
3. As there were fewer admitted patients compared to pre-Covid years, a repeat HAI survey is recommended when numbers increase, preceded by proper orientation.

HAI 2021: QUICK SUMMARY

Ward	negative	positive	HAI%	
Surgery II + ICU	46	2	4%	One had both UTI and surgical site infection
Medicine	20	0	0%	
Surgery I + Burns Unit	17	11	39%	Multiple instances of HAI (5 surgical site infections, 4 drain site infections, 2 UTI, 2 IV line infections, 2 pneumonia, 1 diarrhoea)
OBS/GYN	17	2	11%	1 surgical site infection, and one IV line infection
Paediatrics	45	0	0%	
Overall HAI	**145**	**15**	**9.38%**	

Second Survey: 30th July 2021 in children's ward only.
HA1/27 = 3.7%, a case of IVline infection, swelling, induration.

Photo: G. Kalokwera / S. Moro

IMPACT OF RBF APPROACH ON WARDS AND CLINICS: CHALLENGES AND OPPORTUNITIES

Photo: G. Kalokwera / S. Moro

IMPACT OF RBF APPROACH ON WARDS AND CLINICS: CHALLENGES AND OPPORTUNITIES

Dr Martin Ogwang
Senior Consultant Surgeon.
Institutional Director,
St. Mary's Hospital Lacor.

Do you think the RBF approach gave a contribution to improving the quality of services at the Children's Ward?

Totally, **the RBF helped a lot to improve the quality in the ward** and had an impact also on the RBF approach within the hospital. First of all, with the RBF paediatrics we did a step forward in detailing the elements that need to be checked and allowing to better analyse the quality process. Then, some new elements have been introduced that have helped the staff to be more aware of the quality. One is the attention given to the infrastructures and the ward environment to be sure it is safe and healthy for the children and the patients in general. Looking at electric installations, the door conditions, the equipment, gives the staff a sense of responsibility as now, knowing the connection between these elements and the wellness of patients, they don't neglect to check and to ask for intervention in case of need. So, we can say we used the RBF to reinforce the attention on this element, while before people were focusing just on treatments.

The other element introduced by the RBF AICS project, was the attention to trainings. Now, the medical doctors are aware they need to train nurses and students on the different aspects of quality. This is a huge improvement in sharing the sense of responsibility with the students and nurses. Unfortunately, there is still a challenge linked to the staff and student rotations. Not being in the ward during the quality verification or the quality verification feedback meeting is a great loss for the students and the nurses who may not benefit from the lessons on quality that are raised during these occasions. To overcome this problem, the next step for the hospital will be the involvement of the St. Mary's Hospital training school tutors. This will allow to train nurses and students on the RBF approach and the quality domain, verifications and processes to which they should pay attention. Involving the school tutors will allow the students to be more prepared and to fully benefit from this working experience.

Which domain do you think benefitted the most from the application of RBF?

I think the most of the domains, from medical to nursing processes, benefitted from the RBF system. The main improvement is the general attention to quality of care that has currently spread among the staff. At the same time, there are areas which are still having some difficulties, and in which the improvement did not proceed at the same pace as other domains. One of these is data collection. In the past, completeness of the data was not really good; now they are trying to work on this aspect but there is still a lot to be done. The second aspect is behaviour changes. For example, segregation of medical waste still needs a lot of attention and reminders, otherwise the staff continue to mix waste without paying attention to the risk that could come from mismanagement. On this regard, there is probably the need to proceed with more specific training involving also the lower cadres of ward staff and reinforce this aspect during the verification. Finally, there are some issues related to the staff which move from one ward to another, and for the students. These continuous changes create pressure on the ward teams, who are forced to repeat the trainings on areas that have been identified as those which need focus. In conclusion, I think that in the current RBF system waste segregation, data completeness and staff rotations still represent problematical areas with a lot of room for improvement.

Probably we could better focus on these aspects in the verification checklists, but for sure also during staff training. Also, staff training at all levels should reinforce the overall meaning and mechanisms of the RBF approach.

Do you think that RBF has changed the way of working for the staff or did it have an impact at the beginning but has now lost its motivational effect?

I believe the staff is now following the RBF process and the quality standard it defines. It becomes routine in a positive way: people have changed their way of working. For example, with regard to waste segregation, which was a huge problem when we started, and despite improvements that are still needed, today it is managed completely differently. It became part of their way of working, even though it must still be checked once in a while. Good improvement has also occurred with the death reviews, which were done very roughly and without data registration (such as administration of drugs, involvement of the specialist). Now, because these are measured in the RBF system, they are done in a much more programmed way: they know they have to do the meetings, they have to take the minutes, and the specialist know that they need to check and supervise for their area of competence.

Which were the main challenges observed during the initial phase of the RBF implementation in the Children Ward?

At the beginning, probably, the staff thought that it was an unnecessary additional and unwelcome work and were a bit worried because of the overload due the high number of patients. They also thought that their work was already good enough. But, once the quality assessment started and they were shown how many things they could have been done better, and small things that were

missing, they came to realize that the system was really helpful for the recovery of their patients.

Do you think the quality bonus is a trigger for staff motivation or has it become merely an expected component of their salary?

For the lower cadres it is really significant and important, and these are the greater part of the hospital staff. I see them following the points achieved during the verifications with a great attention. The fact that the bonus it is linked to team performance, and not to the single staff, is also a help. In the RBF system promoted by the Government at Health Centres level, the staff, even when they are very few, need to be assigned areas of improvement so they need to check each other's performing of assigned tasks to make sure they achieve the results that will secure the bonus. When this fails, the situation can become very dramatic.

On the contrary, for the higher cadres such as medical doctors and specialised staff, the bonus is not so significant. What really matters to them is the quality score obtained by their ward. Their real motivation is to have top quality within the hospital.

Are there any aspects you would like to change?

I think the first objective, before even revising the checklist and the system, is to extend the system to all units. For example, surgery is not yet included, but it could benefit a lot. Then I think we should focus more on training including the Lacor schools. We should include aspects of RBF in their training, with indicators to verify this.

Would you suggest the RBF approach as way to improve quality to other hospitals?

Yes, for sure. I would suggest it for hospitals and other health facilities, as it is a system that helps you intentionally check the quality of the services you are providing, and improve them. It is a really useful process.

Any other consideration?

I would like to do a small comparison with the Government health system applied in the Health Centres, which focuses on administrative processes for the 6 WHO Health Systems Framework[17] building blocks. The main problem with it is the significant bureaucratic and documentation work required, which risks moving the clinician away from the wards to do all this work. There are a lot of meetings scheduled every week which require to be well documented and this adds too much work for health structures that were already understaffed. Focusing instead on a participated and documented quarterly meeting, as for the paediatric RBF, would facilitate the job for the health centre teams. On the other side, one aspect on which the Government RBF is focusing a lot of attention, and which I think is really valuable, is the perinatal and maternal death review, or the death reviews in general. This exercise of searching for adverse events or for near accidents, is really important for medical doctors or surgeons as they can learn a lot from these situations. Looking for, and examining, the errors that occurred during each quarter and documenting them, could really help avoid repeating them in the future. Another area on which the Government RBF is deeply focusing is drug administration. All these areas should be crosscutting, as they are of paramount importance to ensure a system that ensures access to the right treatment for all patients.

17 The **WHO Health Systems Frameworks** consider 6 areas as determinant for the quality of the health systems. They are the following: service delivery, health workforce, health information system, access to essential medicines, financing, leadership and governance.

Dr Emmanuel Ochola
Clinical Epidemiology & Biostatistics, Head, Department of HIV, Research and Documentation, St. Mary's Hospital Lacor

Do you think that the RBF approach gave a contribution to improve the quality of services at the Children's Ward?

Yes, there is a clear belief that **Children's ward can now lead the light of in-patient care improvement**, since they started first and have slowly found working solutions to some of the key challenges. Quality improvement is continuous and every time they relax, there can also be a drop in marks, which for now, happily, can easily be explained.

In which domain do you think the project contributed more?

I think the biggest improvement is the increase in scores, but also the actual feel and attitude on the ward shows, given the impetus from the RBF project. **There is more nursing/clinical team collaboration in meetings,** death reviews and clinical care. Documentation of minutes and reviews, as well as consent, is now better. Clerkship has been generally better and adherence to protocols also improved over time.

The same happened for aspects such as basic infrastructures, hygiene and their follow-up, among others.

Generally, there were gains in all the sectors assessed.

The assessment team has also improved: they were engaged from multiple departments; that helped them to do some introspection (personal, unit, department), but also empowered them to give good feedback, whether positive or negative.

Do you feel that the RBF project increased the motivation and commitment of the staff?

Yes, absolutely. There was a rediscovery of "my role in getting funds for my salary", and "my point must be scored", as well as the ability to do better. Receptivity and acceptance of negative feedback also improved. Many staff look forward to the assessment and none dodges the team any more. Blame has reduced, as people owned gaps as a challenge.

Which are the problems, pitfalls, gaps of the 2018-2021 project?

I can quote a few:

- there was an initial perception of "investigation", as if the object of the assessment was to look for trouble or gaps, which was later abandoned. Members were later happy and surprised at some negative findings, usually quickly understanding the root cause.
- Some occasional staffing gaps during some high attendance seasons tended to overwhelm the staff. On assessment days, some patients tend to wait longer as a big team is engaged.
- Documentation was initially poor, but continues to require attention: if the team relaxes, they fail.
- Assessments usually happened when intern doctors have just been rotated, thus sometimes the clerkship has glaring documentations gaps.

Which were the main challenges you had to face in the RBF system implementation?

Here again, I can quote some challenges:

- Ward Quality Improvement (QI) Teams were not yet functionalised. The general ward meeting tends to handle key issues, but specific quality teams have yet to handle measurable QI projects.
- Speaking about motivation, some staff would be happier to get similar amounts, not tiered by salary structure.
- The possibility of "setting up" for the purpose of the assessment is always feared. However, this is under looked when we consider good gains even on "impromptu" internal assessments. There is a sense of real improvement.
- Students were not very consistent on ward (some assessments happen during school holidays), and additionally, with COVID-19, many schools were closed. Therefore, a maximisation of benefit for the students was not achieved. However, students who participate always highly appreciated the exercise.
- Occasional repeat of some gaps, e.g., infection prevention, hygiene, or sterilisation, medical history and examination, show us the need to continually engage existing and new teams.
- The rate of drug administration seems to be a challenge when patients are many, for example drugs to be administered in 3 minutes may take a shorter time.
- Involvement of nurses in patient care meetings/ continuous professional development took quite a long way to improve, but it is now a common practice.

Do you think that a kind of RBF approach should become a routine practice in the near future?

For Lacor, this is already a routine practice. It has been extended to the Gynaecology and Medical wards, and will soon be taken to the Surgical wards and critical care wards (neonatal, ICU, Burns).

Are there any changes you would introduce in the RBF process?

- I would start objective assessment of Ward QI Team functionality and assess the projects they have implemented.
- Plus, I would include reviews and audits of some death charts (we have been reviewing admissions of the past few days who were on ward, to help the Interns appreciate real time gaps).
- It would be good to measure and ensure that the team on ward actually does a self-assessment and acts on the gaps or issues raised, before the general assessment.
- Moreover, I think we need to find ways of assessing things that happened in the quarter in question (e.g. for now we assess today and assume that it was the quality score for the quarter). That is, for example, reviewing some charts from that period or particular documentation during that time, which would also avert some of the perceived "set up".
- RBF does not cover all the vital functions of the units, but if there are ways to do so, we should now start to focus on improving timeliness of response to the client, team integration/coordination/flow, and systems problem-solving approaches as well as engagement in quality specific activities.
- Introduction of Key performance indicators would be great.
- Focusing on motivation, it might be good to have a standard bonus package, equal for all, not related to the salary structure, which tend to give rise to some complaints.
- Enhancing the skills of the Ward QI Teams to do QI projects will go a long way and finally, engaging more health workers in assessments (more doctors should take interest) will help.

Would you suggest the RBF system to other structures and hospitals? Why?

I really would suggest it and think it was important that we related with Kalongo hospital in this project, although the interactions could have been more engaging.

RBF forces staff to objectively do what they were supposed to do in the first place, to follow guidelines, and provide care with basic equipment and documentation and processes, while reviewing their practices and improving on what is not yet optimal.

Dr Venice Omona

Head of Children ward at St. Mary's Hospital Lacor, Gulu

Do you think that the RBF approach gave a significant contribution to improve the quality of services at the Children's Ward? Which one?

Since when we implemented RBF, **everyone in the department became more responsible and accountable** for the services rendered to the patients but also for the resources allocated to the department.

Broken down equipment were restored where possible and there has been sustained maintenance of these.

Infrastructure-wise, we had broken facilities like doors, windows, toilets, and waste disposal facilities restored and maintained.

In which sector you think the project contributed more?

I believe the main improvements have been in infrastructure, clinical and nursing procedures. Actually, it's not been very easy to appreciate the improvements in the nursing and clinical procedures during the routine assessments due to the high turnover rate of the staff in the department.

Moreover, I feel I personally became a better leader owing to the extra responsibilities that came with the RBF project.

Do you feel that the RBF project increases the motivation and commitment of the staff?

I think it does; every time the feedback is given out, **there is acknowledgement and appreciation of the effort of the staff in the department** by the hospital administration which was motivational.

Moreover, tying some of these assessment parameters to performance-based bonuses also got staff motivated and seeing this extended to the other departments has also been motivational.

There has been a sense of ownership built over time which made the whole process clearly about improving what we do rather than fault-finding as it had seemed to be.

Which were the main challenges you had to face in the RBF system implementation?

In my opinion the main challenges are the high staff turnover, both for the actual work and for the implementation of the assessment process, the inconsistent presence of students in the process and an inadequate interdepartmental collaboration.

Some changes required administrative input and have since persisted (e.g., human resource constraints, lack of certain equipment); basically, Covid-19 pandemic caused a lot of disorganization.

Another challenge I saw it is the difficulty of getting the nurses to participate in other departmental activities beyond the usual nursing duties.

Finally, I think that where there are gaps, we need hold every responsible individual including those in administration accountable. Most times there's a preoccupation to fix all the problems at the department level which is not always possible.

May you give some practical examples of changes in the staff behaviours and work management introduced thanks to the RBF?

I have assisted to more than one behavioral change:

- All individual deaths are reviewed and subsequently all deaths are audited.
- More holistic patient evaluation, even if there is room for improvement.
- Better patient identification and maintaining continuity
- Improved attendance of departmental meetings and CPD sessions.
- Improved communication and interpersonal relationship.
- Better communication to patients and caretakers
- Better time keeping and management.
- People are more open to criticisms, corrections and are open to voice their opinions.

Is it there any changes you would introduce in the RBF process?

I think we need to make some of the assessed parameters more practical and reflective of a retrospective evaluation.

I believe we need to pay more attention to such parameters as clinical and nursing parameters as these are less likely to be manipulated for the sake of the assessments.

Would you suggest the RBF system to other structures and hospitals and why?

Yes, I will definitely suggest RBF with dwindling finances in a majorly donor-funded facility; I think it's ideal to set measurable targets that can, in the long run, earn some much-needed resources for the hospital.

Dr Godfrey Smart Okot

Surgeon and CEO, Doctor Ambrosoli Memorial Hospital, Kalongo

Do you think that the RBF approach gave a significant contribution to improve the quality of services at the Children's ward?

Before the project inception 3 years ago, clinical and moral practices in the care for the sick child in the hospital was rooted more on the routines; i.e., diagnosis and prescription of medications. Subsequently, the approached evolved. **More emphasis is now put in learning about the sick child**, communicating eloquently to the sick child attendant, and ensuring that the treatment environment is holistic enough (clean, safe and calm).

The project preparation involved taking staff through best practices and their benefits. Staff therefore realize that it not only ensures that the sick child recovers from the ailment but also impacts their professional ability positively. The ultimate outcome is that, the overall quality of care improved significantly compared to the period before the project.

In which domain do you think the project contributed more?

- The overall clinical care of patients (diagnosis, treatment and monitoring) improved.
- The hospitals' QI team were able to developed very well-structured medical forms for patient care (and orient users) out of the specific needs of the project.
- The treatment environment is very clean; perception to cleaning regularly and continuously reminding users to be more responsible improved.
- Human resource capacity was built.
- The need to train a paediatrician was identified and funded by the Ambrosoli Foundation, to be able to continue with the good works started.
- The project also led to infrastructure transformation of the Children's ward: the ward will be transformed to a more modern setting with an ICU and increased space.

Do you feel that the RBF project increased the motivation and commitment of the staff?

Yes. This could be related to the feeling that very good performance is rewarded, but also the fact that the positive performance is a result of their hard efforts. **The sense of ownership and responsibility was reinforced;** even outliers worked to be a part of the team.

Which are the problems, pitfalls, gaps of the 2018-2020 project?

- The pitfalls are mainly related to implementation of the project.
- The project assessment identified gaps, but did not provide for mechanisms to track implementation of interventions. It focuses more on real time status (purely cross sectional).
- The project emphasized the curative aspect of the quality of care, leaving out the preventive community aspect.
- The tendency of staff to work hard because they know that they will be rewarded cannot be ruled out. And yet the idea is to make best practice become part of routine practice.
- The project scope was narrow, to only the paediatrics ward, leaving a gap in improvement of quality of services in the other areas of the hospital.
- The idea that only Paediatrics ward staff were awarded incentives, created a sense of negativity among staff from other parts of the hospital.

Which were the main challenges you had to face in the RBF system implementation?

The beginning was hard, it was very difficult to get everybody involved instantly and have them appreciate the concepts of RBF. RBF requires a coordinated involvement of different sectors to achieve a common purpose.

Lack of the required resources affected staff ability to execute duties as expected. This would subsequently be addressed during the project period.

High staff turnover meant always starting again with new people. This drags every good work already started backwards.

Do you think that a kind of RBF approach should become a routine practice in the near future?

As evidenced from this project and other published findings from elsewhere, **RBF as a mode of healthcare financing drastically improves services delivery and staff motivation/retention.**

Having the RBF activity as routine practice would promote the culture of team work and strengthen managerial supervision.

Are there any changes you would introduce in the RBF process?

- Tracking implementation of interventions from previous assessment.
- Involving more parts of the hospital.

Would you suggest the RBF system to other structures and hospitals?

Yes, I do. **It would be great to have every hospital having similar performance targets/indicators**. Ultimately the population served by these hospitals would benefit more; moreover, the hospitals will have the opportunity of growth (personnel and infrastructure).

James Mwaka

Official from the planning Unit of Ugandan Ministry of Health

The Ugandan Ministry of Health has been actively involved in the implementation of AICS funded AID 11495 project, via the participation of James Mwaka, an official from the Ministry's planning unitof Health.

James Mwaka has participated with the key role of leading and coordinating quarterly qualitative and quantitative project verifications in Lacor and Kalongo hospitals, according to the checklist defined by the project partners.

Throughout the 3 years of project implementation he has witnessed significant changes in the quality of services, and has linked such improvements to the RBF system.

The Ministry of Health has supported and implemented directly a number of RBF projects, including the URMCHIP focussed on mother and child health implemented also in Kalongo hospital.

The Ugandan Third National Development Plan (NDPIII) 2020/21 – 2024/25 mentions RBF as one of the main tools that are necessary to achieve Uganda's strategic health and development goals.

RBF is also mentioned in the document "*MOH–Strategy For Improving Health Service Delivery 2016-2021–Presidential Directives For Health Sector Service improvements To attain Middle Income Status by 2020*" as an instrument that is necessary to reduce corruption and improve efficiency and effectiveness of the health system, particularly regarding aspects of planning and implementation of approved budgets.

The participation of James Mwaka in the AICS AID 11495 project has thus provided useful inputs to both the MOH and project partners, allowing the exchange of experiences in implementation of RBF projects.

Below we present the views of James Mwaka on RBF experiences in Uganda and in particular on the AICS AID 11495 project.

One of the main strengths of the RBF system is an increase in the utilisation of health services, which is brought about by the improvement in quality of services and increased confidence by the public that their needs will be met in the health facilities.

The second aspect of great importance is the conditionality of financing, which has brought about an improvement in the quality of care. On the side of health workers, there has been positive change in behaviour, health workers have been more responsive with patients and more motivated. It has impacted their level of morale and improved productivity thanks to the performance bonus: **the more you serve the more you are rewarded.**

There has also been a very satisfactory level of accountability to the community, the health care workers are able to meet the expectations of the community members,

the community is able to demand for what they need and health workers can engage community members to address the issues that emerge from the community.

The RBF approach has also strengthened leadership and management. One of the principles of this approach according to the MOH is to allow managers to plan based on their need and invest funds coming from RBF into financing their immediate priorities. RBF demands that there is productivity at work, therefore managers are more in control of their team and resources. This approach promotes leadership and management. Another key aspect on management is that RBF has minimised incidence of lack of commodity and supplies.

RBF is not a solution to all health problems, it is just a financing mechanism and there are some issues that it cannot solve, for example community perception and health responsiveness. Facility based RBF can only address quality of care for patients coming to the hospital, anything that happens in the community cannot be addressed, it can only be solved by community-based approaches. The RBF currently handled is supply side facility-based RBF, payments and incentives go to health care providers, suppliers of health services. There is another approach, which is called demand sided and could have the potential to address community issues, for example the USAID maternity voucher programme. Only when health providers go beyond and outside their facility it can affect the community, like when they go out for outreach or for community dialogue.

The RBF also cannot solve the actual technicalities of providing health services, for example delay in seeking health care, how children are handled, what should be done, etc. RBF looks at the result it does not have a lot of varying on the processes. In this relation, the checklist used for the AID 11495 project has made a major step in addressing clinical processes but so far it has just been verifying if something has been done well or not, without too much focus on monitoring subsequent action. The suggestion from Dr Mwaka is that the assessment should go ahead and more in depth in terms of checking whether there is a current plan to improve the status of current health care provision where a gap has been identified. If there is a gap for example in diagnosis, it could help in giving bonus when there is a quick action implemented to address the problem of poor diagnoses. The suggestion is to have an ingredient of providing more bonus to action that comes after the observations that were made in the previous assessment period. Another area that RBF cannot solve is related to investment. Reimbursements can only serve in terms of handling operational costs but in terms of major investments or changes it cannot help, unless it is saved over a period of time, but this could affect outputs in terms of utilisation and quality.

Overall the current AID 11495 project has contributed greatly to improvement in Lacor and Kalongo hospitals. There have been many changes happening in particular concerning quality of care and great improvements in infrastructure, especially in Kalongo. It is important that such initiatives are maintained so there is space for better and long-lasting improvements. **The RBF programme has created a sense of ownership amongst staff and administrators.** Whatever happens in children ward is something that everybody identifies with. When there is a positive mark everybody feels they have contributed, when there is a bad score everybody has failed. It is very important in terms of team ownership and productiveness.

The client satisfaction surveys have also improved in both hospitals. When the project started, the clients felt that expectations were not met, along the way the situation has been improving due to the RBF programme because there is emphasis on listening and addressing issues that come as feedback from the patients. Amongst the staff the morale has improved, which makes the team work better. In terms of overall management there is a concise and real focussed monitoring of work at the units in children ward and all the units related, there is a system to monitor what everybody does to make sure the focus is on provision of quality care. Because there is a demand in looking at quality improvement initiatives, both hospitals can identify their quality gaps and plan improvements so that they can be monitored over time.

CONCLUSION

The 2018-2020 RBF Project was actually and undoubtedly **a change engine for paediatric services** at St. Mary's Hospital, Lacor and Dr. Ambrosoli Memorial Hospital in Kalongo. A strong and constant effort to improve the quality of services was adopted by the staff of the two children's wards and by all the hospital services, beyond expectations. In the first-year structural changes have been brought forward in both locations: noteworthy at Kalongo the bonus gained by the hospital was used to improve the infrastructures of the children's ward, in order to be able to reach a better score in the next year, as regularly happened.

The area of hygiene and prevention of infections considerably improved over the time of the project. The previous common sharing of beds and equipment, with serious risk of hospital acquired infections, was strongly contained: fixed oxygen lines reduced the common use of oxygen concentrators at Lacor.

A very significant effort to improve preparedness for emergency was also undertaken, with appropriate in field training of the staff.

Clinical management for 10 most common and severe diseases of children was also significantly improved by the efforts of the specialist and the daily discussion of cases, including the accurate revision of fatalities.

The request for lab and Xray test became more appropriate and the use of antibiotics appeared to adhere more frequently to international standards of care.

While the training of nursing students and medical post-graduate was a constant daily task, the participation of Medical Students from the Faculty of Medicine of the University of Gulu, was erratic and did not allowed to include students into the evaluation procedures.

The revision of a considerable sample of clinical records before the project (2016) and at the end of it (2020) showed a very significant improvement in all examined items at Kalongo, where the starting point had several gaps, while at Lacor, where appropriate clinical management was already in place, the improvement was smaller, but significant.

Nursing procedures, evaluated on key points, did significantly improve in both locations, but still showed some gaps, mainly related to the existing procedures of record keepings.

Hospital Acquired Infections were present in the whole hospital at a considerable rate, possibly increased by the strong limitations imposed by the current epidemic. But in the children's ward, where the RBF project was running, the rate of HAI was below 10%, a rate considered acceptable ever in resources rich hospitals.

In conclusion this RBF project produced an improvement in the quality of care of sick children that is objectively very significant, actually much above what could have been expected with relatively small amount of resources included in the bonus for the staff. Everybody worked with more enthusiasm, staff felt to participate to the construction of a better working environment and developed a nicer attitude to children and their guardians.

ANNEX 1

QUALITY IMPROVEMENT IN THE CHILDREN WARDS–CHECKLIST

1. BASIC INFRASTRUCTURES AND SAFETY/CROSS CUTTING ELEMENTS

CKECKLIST ITEMS 1.	CRITERIA	SCORES	Your Priority 1 to 5	CRITICAL
Basic infrastructures working and in acceptable condition **1)** Doors and windows regularly checked, **2)** Beds and ward facilities repaired when required, **3)** Mattress changed when required, **4)** Baby and children height and weighing scales available and in working condition	3-4 items controlled	0-3		
Hygiene conditions appropriate **1)** Cleanliness of the ward, **2)** Accurate disposal of sick children vomit/feces, **3)** Disposal of remains of foods	Bad, moderate, good, optimal	0-3		
Safe environment **1)** Electrical safety for children (covers etc.), **2)** Children do not have access to drugs, **3)** Fire readiness	1. % safe electric 2. =100% 3. Accept- good- excel	0-3		
Prevention of infections **1)** Facilities for handwashing, **2)** Alcohol available, **3)** Reduce cross-contamination among children (beds?)		0-3		
Available and functional equipment and supplies: Oxygen tester, Infusion pump, Suction machine, O2 concentrator		0-3		
Are the right Drugs available when needed? Essential Medicine and Health Supplies are available Timely provision of drugs after requests	1. % on a list 20 of drugs 2. Check 3 request-time	0-3		
Adequate support from the laboratory? Lab is functional every day of the week Scheduled time kept as planned (delivery of samples and provision of results)	1.OK 2.Check 3. request-time	0-3		
Adequate support from the Radiology Department? RX is functional every day of the week Scheduled time kept as planned (delivery of samples and provision of results)		0-3		
TOTAL SCORE		**24**		

2. HYGIENE AND CLEANLINESS

CHECKLIST ITEMS	CRITERIA	SCORES	Your priority 1 to 5	CRITICAL
Presence of cleaning products: Supply record cards indicating amounts in and out correspond to physical supplies (soap, bleach, chloramine, chlorhexidine, and at least one detergent)	Monthly record card of supplies on ordering-requisition book once a wk Thursday	0-3		
Stock Management. Reserve of disinfectants, used equipment soaked in disinfectant in the treatment rooms,	Requisition book	0-3		
All beds have mattresses covered with intact impermeable plastic	Check monthly	0-2		
Cleanliness of rooms, halls, and grounds: **1)** presence of trash receptacles (in waiting room and corridor) **2)** no loose trash; **3)** receptacles for syringes present in treatment rooms	N. trash bins N. special dispensers Containers for sharps	0-3		
No organic waste, syringes, or dangerous products in any location that is easily accessible to the public	Inspection 1 to 3 score	0-3		
Availability of water source (running water or well, pump, or water tower/tank)	Yes/not	0-2		
Water dispensers available in service rooms where there is no tap water	Yes/not	0-2		
Presence of latrines and showers 1) usable; **2)** no organic matter within or outside; **3)** door that closes from the inside; **4)** covered pit (for latrines)	To be checked	0-3		
Available and functional sterilization materials: cocotte, autoclave, or heat sterilizer	Check transport of drums from ward to sterilization Centre	0-3		
Clean, neat uniforms worn by all staff	Inspection 1-3	0-2		
TOTAL SCORE		**26**		

3. CLINICAL AND NURSING PROCESSES

CHECKLIST ITEMS	PROTOCOLS	YOUR SUGGESTIONS	Your priority 1 to 5	CRITIC
Proper diagnosis of 10 admitted cases (analysis of randomly selected hospitalization records): **1)** identification of patient, **2)** complaints or symptoms on admission are reported, **3)** clinical examinations are guided by anamnesis, **4)** no unnecessary diagnostic tests prescribed, **5)** Malaria is excluded or treated in patients with fever, **6)** Malnutrition diagnosis according to WHO–(Check sub-liminal malnutrition), **7)** Percentile charts available and in appropriate use, **8)** Anaemia diagnosed according to guidelines, **9)** Sepsis: Increasing the percentage of specific diagnosis (origin)	1. Triage of sick child 2. Paediatric Life Support 3. Malaria 4. Dehydration 5. Convulsions 6. Anaemia 7. LRTI-Pneumonia 8. Urinary Tract Infection 9. Meningitis 10. Sepsis	0-8		
Proper prescription of therapy to at least 10 admitted cases (analysis of selected hospitalization records): **1)** proper treatment according to evidence from anamnesis and accepted protocols, **2)** no unnecessary prescriptions, especially antibiotic, **3)** Appropriate prescription of drugs in children with **URTI, 4)** Appropriate use of Oxygen, & Antibiotics for children with **LRTI**, **5)** Appropriate request of blood transfusions, **6)** Checking regularly the vaccination record and recommend accordingly	According to previous protocols	0-8		
Proper administration of therapies of 10 admitted cases **1)** Therapies have been given properly (Oral, injection, IV line, fluids), **2)** Charts correspond to the correct patients, **4)** Fluids have been changed and are dropping correctly **5)** IV lines changed correctly **6)** doctor check and nurse check x24 hours for Gastroenteritis	OK 1 to 5. N 6 important: give 500ml plastic bottle with rehydration dose for the night	0-8		
Deaths properly reviewed **1)** Death reviews regularly carried out **2)** staff informed about findings of death reviews, **4)** evidence of consistent follow up of findings from death reviews	In daily morning meeting, not ready for 3 & 4	0-3		
Appropriate supervision and mentorship by Specialists and Head of Department **1)** Clinical Audits carried out on a regular basis, findings shared and followed up, **2)** death reviews regularly carried out, findings shared, and followed up, **3)** Evidence of effective specialist supervision and mentoring, **4)** Evidence of proper consultation and referral with specialists **5)** evidence that staffs are encouraged to consult with Specialists and consultants	Audit in the daily morning meeting, Distribution of responsibilities between specialist and medical officer	0-3		
Nice and caring communication to patients and attendance	Talk with mothers at discharge, explain problems and therapy	0-3		
TOTAL SCORE		**33**		

4. EMERGENCY READINESS

CHECKLIST ITEMS	CRITERIA FOR SCORING INDICATORS	SCORE	SCORE OBTAINED	SCORING JUSTIFICATION
Emergency CUPBOARD ready **1)** Emergency equipment checklist filled and signed correctly at each shift **2)** emergency drugs and equipment present on the box in the shelf, not expired, functioning, clean, dust free and easily accessible	Kalongo: not a trolley but a BOX with drugs & Equipment Are preparing basic guidelines for emergency according to international standards	0-4		
Emergency protocols available and known **1)** staff trained on the protocols **2)** Students know them and are trained **3)** updated and consistent National and International Standards **4)** key parts hanging on the wall close to emergency trolley	Refer to Lacor-made booklet Updated WHO guidelines available in Kalongo.	0-4		
TOTAL SCORE		**8**		

5. TRAINING

CHECKLIST ITEMS		SCORE
Student Nurses Give basic written guidelines at entry, Students are exposed to basic nursing procedures, Students actively collaborate to keep the objectives	Acquire basic nursing skills, manage nursing report, sit with mothers also in overtime	0-3
Medical Students Instruction of students about their task at entry, Students are exposed to basic protocols (locally available and listed), Students participate to reaching objectives, Students participate to scheduled verification	Sit at bedside, collect anamnesis, survey therapies, learn basic nursing procedures	0-3
Post-Doc Residents acquire responsibility of medical objectives, Regular audit on clinical forms to comply with 'Outcome' listed items, Resident participate to data collection and reporting, Residents interact regularly with nursing staff	Presentation of cases at morning meeting Participate to the application of protocols	0-3
TOTAL SCORE		**9**

The evaluator will select, among each group of items in the same row within each of the 5 domains, one, two or more items to evaluate at random, without previous communication. He will assign a global score to the items in the row, within the range assigned (0-3 or 0-8 etc). If, for any reasons, it is not possible to evaluate one of the items in the same row, the evaluator has to weight the TOTAL score according to the number of rows that have been checked. For example, in training domain n.5: if it is not possible to evaluate the presence of Medical Students because they are on rotation elsewhere, but Nurses get a score of 2 and the Residents get a score of 3, the evaluator must adjust the total score of the domain from 9 to 6 and compute the total corresponding score (2+3)/6 = 8,33.

The sum of the total scores of the 5 domains is 100, the quality multiplier to be used in the RBF calculation are:

Total Points	50-59,9	60-69,9	70-79,9	80-89,9	90+
Quality Score	1	2	3	4	5
Multiplier	x 1	x 1,10	x 1,5	x 1,20	x 1,25

Paediatric RBF approach impact evaluation
Lacor and Kalongo Hospitals –Uganda

2018··2021

Photo: G. Kalokwera / S. Moro

UNIVERSITY FEDERICO II, NAPLES
DR. AMBROSOLI MEMORIAL HOSPITAL
FONDAZIONE DR. AMBROSOLI
ST. MARY'S HOSPITAL LACOR
FONDAZIONE CORTI ONLUS

SEPT/ 2021