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Quality Improvement of Health Care in Belize: Focusing on Results

Abstract

Belize is participating in the *Salud Mesoamerica* 2015 Initiative (SM2015), a regional public-private partnership administered by the Inter-American Development Bank (IADB) and implemented by the eight Mesoamerican countries, which utilizes a results-based financing model with external verification of indicator values. Countries that reach their goals receive a portion of overall funding to apply in the health sector. The Ministry of Health of Belize and IADB have carefully aligned SM2015 country and local level goals through a Quality Innovation Fund (QIF), complemented by technical assistance for collaborative improvement, purchase of inputs and revitalization of the community health platform. Preliminary results from the QIF indicate an increase in coverage and quality of services achieved in as little of six months, through monthly monitoring and small, targeted investments designed by health facility staff. This experience has provided valuable qualitative and quantitative data regarding progress of the program, in addition to important lessons for future operations.

JEL Classification: I10, I18, I19
Keywords: results-based financing, quality improvement, incentives

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Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
AMTSL	Active Management of the Third Stage of Labor
BZD	Belize Dollars
CHW	Community Health Worker
DHT	District Health Teams
GAVI	Global Alliance for Vaccines and Immunization
GDP	Gross Domestic Product
HECOPAB	Health Education and Community Participation Bureau
HCW	Health Care Worker
HIV	Human Immunodeficiency Virus
IADB	Inter-American Development Bank
IUD	Intrauterine Device
MICS	Multiple Indicator Cluster Survey
MOH	Ministry of Health
NHI	National Health Insurance
ORS	Oral-Rehydration Solution
PCP	Primary Healthcare Provider
PDSA	Plan-Do-Study-Act
PFP	Pay for Performance
PP	Percentage Point
PPH	Post-Partum Hemorrhage
PSA	Prostate Specific Antigen
QI	Quality Improvement
QIF	Quality Innovation Fund
RBF	Results Based Financing
SLA	Service Level Agreement
SM2015	Salud Mesoamerica 2015
UNICEF	United Nations Children's Fund
WHO	World Health Organization

1. Introduction

The Inter-American Development Bank (IADB) designed and administers the *Salud Mesoamerica* 2015 Initiative (SM2015) that proposes to reduce equity gaps in reproductive, maternal and child health in the countries of Central America, southern Mexico and Panama. The Bill and Melinda Gates Foundation, the Carlos Slim Health Institute and the Spanish Agency for International Cooperation and Development provide financing for the Initiative that is allocated to individual country operations and cross-cutting activities such as regional technical assistance. Governments of the participating countries also contribute counterpart resources that must be additional to current spending in the targeted geographic areas. The Initiative supports the governments' efforts to achieve the health-related Millennium Development Goals as well as the regional priorities of the Mesoamerican Public Health System and the Council of Central American Health Ministers. It emphasizes improving the supply of services, increasing demand for them, implementing results-based financing schemes, and adopting evidence-based and cost-effective interventions in order to improve the health status of the poorest 20% of the population.

In the case of Belize, the SM2015 project has the objective of contributing to the reduction of maternal, infant and child mortality through interventions that strengthen primary health care services in terms of access, usage and quality. It contributes to quality improvement of services through technical assistance for improving norms, standards and practices; informing and assisting health professionals in their application; and developing the means for measuring compliance and performance. An important mechanism created by the project for increasing service provision according to certain quality criteria is the Quality Innovation Fund (QIF) that allows facilities to propose and receive in-kind awards for service improvement if they reach goals on a series of indicators after several months of supervision and feedback. In addition to quality, the project also focuses on extending the coverage of services through addressing weakness in the priority areas of neonatal care, reproductive health (including specialized services for adolescents) and the community health platform.

This technical note describes the project and highlights its initial results in quality improvement of services after 18 months of implementation. The following section summarizes key messages from the literature regarding results-based financing and quality improvement collaboratives to provide the conceptual framework in which the Bank designed the Belize SM2015 project. In the third section, the note presents information on the population health

status, the public system of health services and Ministry of Health (MOH) policy priorities. The fourth section explains the project and its principal interventions relating to quality improvement of services. A review of preliminary project results and findings concludes the note.

2. Results-Based Financing and Quality Improvement

Especially in health care, where there is a great need to control escalating costs, improve service quality and encourage the adoption of available evidence-based and cost-effective interventions, results-based financing (RBF) represents a possible tool to promote these objectives. RBF is any arrangement in which a principal rewards an agent through financial or other incentives upon verification that the agent has taken a measurable action or achieved a performance target previously adopted by both parties (see Oxman and Fretheim, 2009; Musgrove, 2011). In the health sector RBF can function in a hierarchy of levels among a wide array of actors including external donors, governments (national, state and local), service providers (public, private, group and individual) and beneficiaries (communities, households and individuals).

2.1 Donor-Country RBF

At the macro level of donors and national governments, RBF agreements have intended to ensure more "value for money" in global health aid. The application of RBF at this level is relatively newer and much less studied than at other levels.[1] Both the GAVI Alliance and Global Fund to Fight AIDS, Tuberculosis and Malaria, have applied some type of RBF with recipient countries, and their efforts have been subject to some rigorous analysis. GAVI's Immunization Services Support program initially paid countries $20 for each additional child with complete DTP vaccination,[2] but it relied on administrative data reported by the countries that led to over-reporting (Lim et al., 2008). As for the Global Fund, a study of the association between grant ratings and disbursements concluded that its complex and multistep performance-based financing system allows for subjectivity and discretion and provides only a weak link between grant performance and disbursement amounts, thereby reducing the opportunity to transmit performance incentives to its implementing partners (Fan et al., 2013).

As a result of the exposure of these deficiencies in donor-to-country RBF schemes, the donor agencies are adopting some reforms. GAVI recently modified its performance-based

[1] Many studies examine RBF directed at service providers or beneficiaries through conditional cash transfer programs.
[2] This consists of three doses of the diphtheria-tetanus-pertussis vaccine

funding scheme to establish a basic programmed payment related to country implementation progress and achievement of intermediate results (80% of funding) and convert the amount conditional upon improvements in immunization outcomes into an additional performance payment (20%). Although indicator measurement will still depend on country reporting using administrative data, GAVI will use WHO/UNICEF estimates and surveys for data verification.[3] In the development of its new funding model, the Global Fund appears to be adopting similar recommendations formulated by the Center for Global Development (Glassman, Fan and Over, 2013) in terms of reducing the number of key performance indicators by excluding input and output indicators that do not measure impact and depend on weak data systems, reserving funds for which payments are directly connected to performance without deference to discretionary or contextual factors, and using independent third-party measurement to verify self-reported results.

2.2 RBF with Service Providers: Financial Incentives

In contrast to RBF used by donor agencies with recipient countries, supply-side RBF from donor agencies or governments targeting sub-national governments and service providers (health care facilities or professionals) has been widely employed and studied. The literature identifies several outcomes incentivized by the RBF schemes, including cost containment, the supply of cost-effective interventions, improvement in the quality of health care, increases in health worker productivity, greater utilization of care, and expanded coverage, among others. Several recent literature reviews assert that due to the limited number of rigorous studies of RBF the evidence base is weak to draw broad conclusions (Gorter et al., 2013; Oxman and Freheim, 2008; Witter et al., 2012).[4] Nevertheless, several recent studies with a strong design and use of statistical methods (Basinga et al., 2010; Basinga et al., 2011; Soeters et al., 2011; Huntington et al., 2010) strengthen a growing body of literature suggesting that RBF directed at service providers can have positive effects on quality of care and other variables.

The success of RBF schemes likely relates to certain aspects of their design and implementation. In donor-country RBF arrangements, Fan et al. (2013) recommend that the payer link only a portion of the funding (perhaps up to 20%), but not the whole amount, to observed performance. In arrangements with service providers, authors have identified factors that likely contribute to positive results, including the provider engagement, functioning health

[3] Where discrepancies appear, GAVI will provide technical assistance to strengthen information systems and data quality improvement efforts.

[4] Distrutti (2013) provides a summary of these studies.

information systems, commitment from the Ministry of Health as regulator, monitoring at facility and district level, and investment in management capacities (Canavan, Toonen and Elovainio, 2008).[5] RBF systems may also benefit from complementary elements such as training, supervision, feedback and technical assistance (Witter et al., 2012). The use of contracts with clear conditions and the separation of functions among the purchaser, provider and regulator are additional factors that may promote improved provider performance (Toonen et al., 2009).

Monetary incentives and pay-for-performance schemes have also produced positive results at the community level. Greenspan et al. (2013) note that community health workers' (CHW) intrinsic desire to volunteer does not preclude interest in external rewards; but rather, adequate and formal financial incentives and in-kind alternatives allow already-motivated CHWs to increase their commitment. In programs implementing a paid model, CHW activities are more explicitly defined by the employing organization in terms of both content and dose; thus, paid CHWs may have more of an obligation to adhere to the organization's priorities (Cherrington et al., 2010). In terms of results, a program in Bangladesh that tied field-workers' pay to fast-cycle feedback on indicators related to teaching mothers to make oral-rehydration solution (ORS), resulted in improved CHW effectiveness as well as the mothers' ability to prepare ORS (Chowdhury, 2001). Similarly, in India CHWs are paid for their performance in community-based neo-natal care and distribution of antibiotics (Bang et al., 2005).

2.3 Alternative Supply-Side Incentive Schemes: Non-financial incentives

Although it appears that RBF has been associated with improved performance in some settings, financial incentives are only one factor that may influence health care worker practices at various levels of the system. Rowe et al. (2005) assert that factors such as knowledge and skills of the health worker, complexity and clarity of guidelines, health facility environment (attitudes of health workers, peer-pressure and levels of collaboration), and the administrative environment (salary, financial and non-financial incentives) may all affect performance. In one rigorous field experiment study in Zambia (Ashraf, Bandiera and Jack, 2012), agents (barbers and hairdressers) enlisted by a public health organization to sell condoms to customers in their shops were randomly assigned to different intervention and control groups, and those who were offered non-financial rewards ("stars" on a poster showing the extent of their sales and impact on HIV reduction) exerted more effort than either those offered small (10% of condom price) or large

[5] Ibid.

(90% of condom price) financial rewards or volunteer contracts. This may be due to the fact that non-financial rewards elicit effort by facilitating social competition among agents and by leveraging the agents' motivation to help their community. The findings showed that non-financial rewards were the most cost-effective way to increase motivation; however, they also revealed that financial incentives did not crowd out intrinsic motivation in this setting.

Especially when the health agents are volunteers, such as the case of many CHW programs, the issue of non-financial incentives is of great relevance. Studies reveal that the dedication, retention and productivity of CHWs can be improved through the use and variation of multiple non-monetary incentives, such as job aids, supplies, peer support, refresher training, communication systems, monitoring, supervision and recognition (Shakir, 2011). Even small incentives, such as identification badges, can produce a sense of pride among CHWs in their work and increase their status, and appropriate job aides and access to supplies can help ensure that they feel competent to do their jobs (Bhattacharyya et al., 2001). Rowe et al. (2005) found that supervision and audits with feedback were also an effective mechanism to maintain high-quality performance of health workers in a low-resource setting. Supervision visits can give CHWs opportunities to discuss problems and exchange information, and in Guatemala, supervised CHWs had attrition rates two to three times lower than those that were not supervised (Bhattacharyya et al., 2001). Training can provide CHWs with the opportunity to learn skills, which is one of the main reasons they volunteer.

2.4 Quality Improvement Collaboratives

In addition to RBF, a widely applied and consolidated approach to improve the quality of service provision is health care collaboratives.[6] Generally, quality improvement starts with the introduction of evidence-based standards and interventions that link specific care content or processes to a desired superior outcome as well as measurement of gaps between observed and desired practices. The collaborative incorporates a large number of teams from different facilities or sites to work in a structured way to improve a specific area of care and provides them with assistance in process analysis, systematic indicator measurement, job aid tools, training and coaching. A study of collaboratives in several countries (Catsambas et al., 2008) asserted that they produced important gains in compliance with standards (80% or above within 8-18 months)

[6] Since 1998 USAID has funded over 80 improvement collaboratives in 16 developing and middle-income countries through its Quality Assurance Project, Health Care Improvement Project and bilateral funding, which provides a substantial body of experience to assess the implementation and results of the approach.

in key technical areas[7] and proved effective in scaling up best practices.[8] Another evaluation of 27 collaboratives in 12 countries (Franco et al., 2009) found evidence of large increases in compliance with health care standards and improved health outcomes for maternal, neonatal and child health, HIV/AIDS care, family planning, and malaria and tuberculosis diagnosis and treatment, regardless of the baseline level of quality. In 135 time series charts indicator performance rose to at least 80% in 88% of cases and to 90%, in 76%, even though more than half started at 50% or below. Improvement collaboratives achieved these results within about a year and sustained them over periods of observation from 12 to 21 months.

3. Population Health Status and the Health Care System in Belize

This section provides an overview of some key population health indicators and information regarding coverage of specific services as well as equity gaps that are of interest to the *Salud Mesoamerica* 2015 Initiative. It then describes the public health care system and identifies some of its main challenges. Finally, in order to set the context for the presentation of the MH2015 Belize project in the following section, it highlights priority policy issues including quality improvement, expansion of coverage through human resource task-shifting to community health workers, and the wider use of results-based financing mechanisms.

3.1 Population Health and Health System Indicators

Similar to other countries in Latin America and the Caribbean, Belize is undergoing a demographic and epidemiological transition resulting in a higher prevalence of chronic, non-communicable disease alongside persistent infectious disease associated with social determinants such as poverty, sanitation, environmental conditions and malnutrition. Although chronic diseases tend to appear later in the life cycle, preventable conditions associated with infectious diseases and lack of access or usage of health services disproportionately affect women of reproductive age and children, limiting their human development potential. Therefore, the inequities in these conditions related to socioeconomic status are particularly pernicious, since they contribute to the perpetuation of the cycle of poverty. This is the case in Belize, for example, where the prevalence of chronic malnutrition (stunting) among children under five in

[7] These areas included essential obstetric and newborn care, prevention of mother-to-child transmission of HIV, AIDS treatment and care, pediatric hospital care, and pediatric AIDS care.

[8] New teams included in the phase of spreading the collaborative achieved results faster than the original teams had, perhaps because the new teams benefited from a tested model and the cumulative learning of the initial teams.

2011 was 19.3% at the national level, compared to 32.9% in the poorest 20% of the population. Another important indicator, the adolescent birth rate, shows that for poor families the rate is much higher (96 per thousand) than for the richest families (23 per thousand). Finally, the use of modern birth control methods among the wealthiest population quintile (57.3%) was around 40% higher than among the least wealthy quintile (40.8%).[9] Clearly, the equity gaps in maternal, reproductive and child health require targeting of the poorest groups.

3.2 The Public Sector Health Care System

The main provider of health services to Belize's total population of approximately 312,000 individuals[10] are the four regional health authorities of the Ministry of Health. The country has one national referral hospital located in Belize City, three regional hospitals and three community hospitals (one hospital in each of the country´s six districts, except Cayo, which has two). Primary health care, in addition to be handled by the hospitals, is addressed through a network of 3 polyclinics, 35 health centers, and 53 health posts, as well as through mobile units and community health workers.

Starting in 2002, Belize began to implement a health sector reform involving the establishment of the National Health Insurance (NHI) scheme to promote three objectives: 1) the separation of financing from provision and introduction of public contracting of private providers; 2) the strengthening of the technical, normative and regulatory capacity of the MOH; and 3) the decentralization of the sector through the creation of the four health regions with some administrative and decision-making autonomy.[11] The NHI began operations as a pilot project in Southside Belize City (the poorest area of the city), where it currently covers around 46,000 persons, and was expanded to the Southern Health Region (Stann Creek and Toledo districts) in 2006, with coverage presently at 44,500.[12] The NHI pays public and private primary care providers (PCPs) a monthly per capita, and the service package covers basic medical consultations, pre- and post- natal care, immunizations, family planning, deliveries, growth monitoring for children under five, detection and monitoring of hypertension, diabetes, HIV/AIDS, cancers, and tuberculosis, as well as laboratory, imaging and drugs.

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[9] Calculations from Multiple Indicator Cluster Survey (MICS) data (Statistical Institute of Belize and UNICEF, 2011).
[10] Statistical Institute of Belize, preliminary results from the 2010 Population and Housing Census.
[11] The reform was designed and implemented with the collaboration and financing of the Inter-American Development Bank (IDB) ($9.8 million), the Caribbean Development Bank ($4.7 million) and the European Union ($1.6 million).
[12] Based on these enrollment figures, total NHI coverage is around 29% of the population of Belize.

A supply-side pay-for-performance (PFP) incentive strategy is employed by the NHI to strengthen health prevention activities, boost primary care, improve service quality and efficiency, and increase worker productivity. Each month, the NHI pays the PCPs or clinics 70% of the member capitation payment upfront, and the remaining 30% of the payment depends on how the PCP performs on groups of indicators that lead to scores for efficiency (70% of the amount withheld), quality (20% of this amount), and administrative processes (10% remaining).[13] If an indicator is not fully achieved, then the proportional weight is deducted from the clinic's total potential payment for that month. Additionally, PCPs can receive an annual bonus based on their scores on performance indicators relating to promotion of prevention programs, quality of care, use of clinical protocols, patient satisfaction, and appropriate delivery of key services. Once a clinic meets the minimum score needed, the NHI determines the total bonus payment by applying each indicator´s weight against 10% of annual revenues generated.

In the health regions where the NHI does not operate (Northern, Western and Central Regions, except Southside Belize City),[14] the MOH maintains a standard system of input supply-side financing. It does utilize Service Level Agreements (SLA) with the health regions containing indicators relating to prevention, early detection and quality of care, but they do not involve an incentive mechanism that could lead to improvements in efficiency and in health outcomes, as occurs with the NHI PFP scheme. Evaluations of the NHI pilot suggest that its PCP model could provide greater efficiency in providing primary health care than public provision by the MOH, reflected in reduced outpatient visit costs. Moreover, there is evidence that the NHI reduces out-of-pocket payments by beneficiary households and improves performance on access and the quality of care (Cercone, Ortiz and Dini, 2002). Despite these results, after implementing the NHI model in poorer areas of the country, there is now reluctance to expand it due primarily to concerns regarding increased spending associated with growth in demand for services.

Although Belize has made efforts to maintain an adequate supply of human resources in the health sector, it currently faces a shortage of personnel, which can affect the availability and quality of services.[15] While Belize managed to reach the WHO minimum target of 25 health care providers (doctors, nurses and midwives) per 10,000 persons in the year 2000 and 2005, its

[13] See Vanzie, et al., 2010.
[14] The Northern Region covers Corozal and Orange Walk districts; the Western Region, Cayo district; and the Central Region, Belize district. The Southern Region contains Stann Creek and Toledo districts.
[15] Cameron Health Strategies Group, Ltd., 2009.

density of health care providers fell to 18.8 per 10,000 persons in mid-2009. Belize has no medical school, and the University of Belize has graduated an annual average of only 53 students, including 14 nurses and midwives, from all of its health training programs over the last decade.[16] Overall, this supply is far insufficient to reach the WHO target by 2015, which would require a total net growth of 58 physicians, nurses and midwives per year. Furthermore, although 55% of the population of Belize lives in rural areas, only 13.6% of health care providers reside there. Clearly, there is a need to provide incentives and adopt additional measures to improve the supply and capacities of the health sector workforce.

3.3 MOH Strategic Priorities

In light of the issues presented in the sectorial analysis in the previous section, the MOH is focusing on several strategic priority areas:

- **Quality improvement of services.** The MOH has begun to emphasize the quality of services and started its efforts in 2009 in the area of maternal and neonatal health. Hospitals in the Southern Region that adopted the quality improvement model have shown increased protocol compliance in the accurate completion of perinatal records, management of severe pre-eclampsia and eclampsia, active management of the third stage of labor, monitoring of women during immediate postpartum, immediate newborn care, and management of obstetric hemorrhage.[17] MOH has shown interest in expanding the quality improvement approach to other areas of service provision.
- **Coverage of primary health care.** As a strategy to expand primary, preventative health care, Belize established a CHW program in the 1980s, but it has declined over the years and is currently underutilized. In the context of the country's chronic human resource shortage in the health sector, the MOH would like to recover the CHW service delivery platform. This approach follows evidence indicating that "task-shifting," which involves sharing or transferring responsibility for delivering certain high impact interventions to lower cadres of skilled and unskilled workers, can be an effective strategy to optimize the accessibility and efficiency of health services under human resources constraints.[18] The

[16] Furthermore, only around 50% of nursing graduates who take the certification exam in any one year achieve a passing grade and only around 68% ever pass the exam.
[17] For a case study of using quality assessment to improve maternal care in Nicaragua, see Lin et al., 2003.
[18] See, for example, Nabudere et al., 2010.

CHWs also reach the most remote and disperse populations and help address the equity gaps in service use and health outcomes cited in section 3.1.

- **Results-Based Financing.** Since the NHI pay-for-performance scheme has shown promising results (section 3.2) but only operates in certain parts of Belize, the MOH would like to explore options to extend similar arrangements throughout the rest of the country. Given that cost is the principal factor limiting the NHI roll-out country-wide, the MOH has decided to test less expensive supply-side, non-financial incentives at the facility level principally as a means to increase the level of service quality.

4. The *Salud Mesoamerica* 2015 Initiative Project in Belize

The general objective of the SM2015 program in Belize, which consists of three consecutive 18-month operations, is to contribute to the reduction of maternal, infant and child mortality in the poorest populations of the country through interventions that strengthen primary health care services within the SM2015 results-based framework. The specific objective is to improve maternal and infant, child and reproductive health in terms of access, usage and quality. In order to achieve these objectives, the program emphasizes: (i) quality improvement of maternal, neonatal, child and reproductive health services, and (ii) strengthening health service delivery platforms. The quality improvement (QI) component includes an incentive arrangement through a "Quality Innovation Fund" (QIF), continuous monitoring and interactive feedback from the MOH to the health facilities and built-in technical assistance.[19] Part of the health platform investment intends to revitalize the community health worker program and follows the literature recommendations by integrating non-financial incentives for the CHWs.

4.1 Results-Based Financing in the Salud Mesoamerica *2015 Initiative*

The IADB's proposal to the SM2015 donors incorporated RBF as a central element to establish "system-wide" incentives for performance in the health sector while adopting current best-practice features of RBF. In the SM2015 RBF model, both the Ministry of Health and SM2015 contribute funds up-front (SM2015 Investment Tranche and Counterpart Funding), 50% each on average, to purchase project inputs that should contribute to obtaining mutually agreed upon goals. In the donor-country contract SM2015 has reserved a portion of overall resources (50% of

[19] Given the relevance of data gathering, processing and analysis for quality improvement, the project also has a subcomponent to assist in the consolidation of the Belize Health Information System.

counterpart funding, which corresponds to 25% to 33% of the total amount, depending on the country) to be paid conditional on achieving clear, pre-determined results.[20] In each country the IADB and Ministry of Health used the SM2015's Regional Performance Framework as the basis to select a limited number of project-specific indicators (moving progressively from input, output and process indicators to outcome and result indicators over a five-year period) and negotiated their respective targets. SM2015 has contracted a specialized agency for the independent measurement of progress on the indicators compared to a robust baseline and verification of goal attainment. This focus on objective criteria and data quality helps to promote investment in information and monitoring systems. Finally, since performance-based financing shifts attention away from inputs and conditions partial payment on results, SM2015 foresaw the need for separately-financed, demand-based technical assistance to country programs in order to help them rise to this new challenge.

The baseline survey (May-June 2013) revealed that many of the indicators in Belize were starting at "zero." In the first 18-month project, goals are related to providing inputs and strengthening the platform for service delivery (for example, "85% of health facilities have necessary inputs and equipment to provide quality pre-and-post natal care"). In the second and third operations, goals become more results-oriented (for example, "60 percentage point increase in deliveries for which a partograph was carried out and correctly interpreted according to the norms in the last two years for the most recent delivery"). Appendix Table 1presents results from the SM2015 Belize baseline study and the 5-year performance framework.

4.2 Quality Improvement of Services

The project proposes to develop a quality assurance platform for priority MOH services, focused on improving the functionality of key management mechanisms to measure and motive better performance. This involves establishing norms for quality of services, informing and assisting health professionals in their application, developing the means for measuring compliance and performance, incorporating indicators in management agreements, and providing for systematic data collection and processing.

The key element of the quality improvement effort is the Quality Innovation Fund (QIF), through which the Belize project puts into practice the recommendation from the literature and

[20] The performance "bonus" in addition to guaranteed base disbursements is a way to mitigate an "all or nothing" approach. Another way to do this is to pay on marginal progress, such as each additional child vaccinated, but this method may weaken the attention given to the effort required to achieve the overall partial bonus.

the SM2015 to promote RBF at the level of the service provider (section 2.2). MOH invited twenty facilities (regional and community hospitals and health centers, see Appendix Table 2) in the Northern and Western Regions[21] to apply to the QIF, which rewards local goal achievement and motivates facility teams through an incentive mechanism allowing teams to design a proposal to receive inputs for improving working conditions and increasing the quality of services.[22] To roll out this activity, the project team organized regional meetings with stakeholders to explain the innovation fund and the indicators and receive input from the health facility staff. Additionally, the project has supported the establishment of Quality Assurance Teams composed of technical and administrative staff from the MOH and regions, who conduct monthly visits to the facilities to monitor indicator performance, provide feedback to staff and offer guidance on a timely basis. In order to receive QIF incentives, at the end of a six-month period the facilities must meet or exceed targets established by the MOH on indicators[23] relating to the SM2015 performance matrix.

Although the SM2015 has contracted separately-financed regional technical assistance, Belize is not a beneficiary, and as a result the project directly incorporates this activity. The Bank and country teams chose the quality improvement collaborative approach (section 2.4) as the most appropriate means to complement the QIF. The scope of work of the firm hired for the technical assistance covers an assessment of the maternal and neonatal health care collaborative quality improvement model, identifying lessons learned and recommendations for expansion and improvement, as well as the development of collaboratives for sexual and reproductive health services, including adolescents, and child health and nutrition (for community health workers and facilities). The products consist of standards and indicators established to improve the process of care, monitoring and evaluation tools/instruments to measure effectiveness, and revised job manuals and job aide tools. Subsequent iterations of the QIF will incorporate the standards and indicators developed in the first phase of the project.

[21] Due to poverty criteria and the Government's interest in introducing performance-based financing to non-NHI regions, the project targets the Northern and Western Regions (Cayo, Corozal and Orange Walk districts).
[22] This modality of providing incentives for innovation has been employed in previous projects financed by the IADB and found to show positive results (for example, CUANTO, 2006).
[23] The Western and Northern Regional Hospitals must meet targets on 7 of 8 indicators to be eligible to receive the incentive, while the Corozal and San Ignacio Community Hospitals must comply with 6 of 7 indicator targets, and the urban and rural health centers, 10 of 12.

4.3 Reaching the Poorest and Strengthening Supply of Key Services in Belize

As mentioned in section 3.3, the CHW platform needs to be revitalized to fulfill its role in extending primary health care services to the poor rural population in Belize, which is a priority goal for the MOH.[24] The District Health Teams (DHT) once provided important support for primary health care, community involvement and the CHW program, but now the only district in which a DHT still functions, reconstituted as a District Health Council, is Toledo. The project has helped to fill this gap by giving more formal structure to the program, starting with the application of an assessment tool[25] to provide a diagnosis of the current state of the CHW program and evaluate options to strengthen it. The MOH hired a Technical Advisor for the Health Education and Community Participation Bureau (HECOPAB) that has responsibility for the community health worker program and recruited two new district HECOPAB health education officers within the project framework.

The project has allowed for the introduction of different types of non-financial incentives reviewed in section 2.3. The HECOPAB Technical Advisor and district health education officers conduct regular supervision of the CHWs and offer orientation and feedback. Four of the 12 QIF indicators for health centers relate to enhancing CHWs' capabilities or service provision and collaboration with health facilities,[26] which involves the CHWs directly in the exercise to access the facility incentives that often benefit them. To assist the CHWs in their daily tasks and monitoring visits, the QIF developed new forms, including a Home Visit Record, Patient Register, Referral Form, Supervision Checklist and Supportive Supervision Notes. Project resources also finance training and technical assistance that CHWs and district health educators receive as well as the procurement of basic supplies (medical kit, educational material, backpack, boots and field clothes) to allow the CHWs to perform their expanded functions and also to increase their morale. In the future, MOH would like to add a more clearly defined packet of services to the CHW platform including interventions in basic maternal and child health, nutrition and sexual and reproductive health and potentially evaluate CHW performance using a

[24] The project also has sub-components for the reinforcement of neonatal care capacity, mainly through purchase of essential equipment identified in the Regional Master Plans, and the expansion of the coverage and complexity of reproductive health services in general and for adolescents.

[25] USAID has developed a methodology and tools for assessing CHW programs and protocols based on best practices (see Crigler et al., 2011).

[26] The indicators are as follows: (i) percentage of CHWs monitored on a monthly basis by the district HECOPAB officers; (ii) CHW visit at least three different homes per week and deliver one health education session per home visit; (iii) increase of CHW attendance to monthly meetings held by the District Health Educator; and (iv) percentage of counter-referred patient to origin of referral (CHW) for maternal and child health patients.

set of core indicators on the knowledge, attitudes and practices of community members, correct diagnosis and referral. It is also considering the greater formalization of financial incentives, such as the BZD100 monthly stipend for CHWs.

5. Preliminary Results of Project Interventions

The previous sections set forth the logic for the project design, and although implementation of the first operation has still not concluded, there is evidence regarding the results of certain project interventions. This section examines information from the monthly monitoring and final evaluation of the Quality Innovation Fund that reveals steady improvement on project indicators. It also extracts lessons from information collected through qualitative methods including focus groups, key informant interviews and the SM2015 learning tool. Some apparent cross-cutting issues are the benefits of consistent monitoring offered by the QIF, the strengthening of the CHW platform as seen in the corresponding indicators and participant statements, and the useful reinforcement given through the technical assistance for the quality improvement collaboratives.

5.1 Quality Innovation Fund Indicator Monitoring

For all MH2015 projects, the Initiative has contracted an independent agency to verify progress on project indicators at the end of each project using baseline and follow-up surveys on representative population and health facility samples (section 4.1). At the time of the baseline survey, many of these indicators had a value of "zero," signifying that the majority of health facilities did not have all of the items necessary for providing quality care (Appendix Table 1). Since during the first operation the indicators are related mainly to the availability of inputs necessary to provide certain services according to quality standards, and the project investment resources finance some of the missing inputs, the improvements on the indicators are likely highly attributable to the project activities. In the case of Belize, the project also incorporates the QIF, whose indicators are closely related to those of the overall performance based financing framework. The monthly monitoring of the QIF indicators provides valuable information regarding the response of health facility staff to the QIF incentive system in addition to Belize's progress towards the SM2015 goals.

All of the facilities participating in the project developed a QIF proposal using the procedures and standardized forms established in the project operating manual. A total of 20 facilities (two regional hospitals, two community hospitals, 12 rural health centers and four

urban health centers based in the hospitals, see Appendix Table 2) submitted proposals, which the MOH reviewed in order to determine compliance with guidelines and identify and necessary corrections. Table 1 presents a summary of the types of items requested by the health facilities. The individual value of a proposal could not exceed BZD 5,000 (USD 2,500), and the total budget for the first round of the QIF was BZD 100,000 (USD 50,000).

Table 1. **Types of Items Requested by Health Facilities in QIF Proposals**

Type of item	Examples
Items to improve clinical care (medical equipment):	Neonate aspiration pump, delivery table, goose-neck lamp, freezer, sphygmometer, portable pap-smear table, wheelchair, neonatal monitor, crash-cart, autoclave, fetal dopler, oximeter, electric breast pump
Items to improve maintenance and functionality of the facility:	Paint, lawn-mower, cabinets, ceiling fans, fences, curtains, bench, washing machine, book shelves, water dispenser, air conditioner, refrigerator
Items to improve patient experience in facilities:	DVD player, television for patient education in waiting room, projector
Items to improve health care worker record-keeping, etc. (office equipment):	Laptop, photocopy machine, scanner printer, digital camera
Items for CHWs and mobile clinics:	Tent for health fairs and mobile clinics, bicycles

Hospital Indicator Monitoring Results. The MOH Quality Improvement Officer and team conducted six months of monitoring in each facility before the final evaluation. This allowed for the health facility staff to become familiar with the QIF methodology, incorporate the indicators and goals in the facility planning, observe progress, and prepare for compliance. In the case of the four hospitals, five of the eight indicators relate to the quality of care; two, to inputs; and one, to training. Since caesarean-sections are not performed at the two community hospitals, MOH measured them on only seven indicators. At month one, large degrees of variation existed for indicator values among indicators and facilities (Appendix Table 3). On average only one indicator, "percentage of complicated or ill obstetric/neonatal treated as protocol," had met the target. This indicator measured interventions that had been started during previous rounds of quality improvement for the reduction of maternal and neonatal deaths through the collaborative improvement model. New interventions introduced through the project, such as the complaint boxes and counter-referrals from CHWs, understandably had initial zero values.

During the six months of indicator monitoring, on average, 7 of the 8 indicators improved, but the degree and rate of change depended on the indicator. Only one indicator, "percentage of complicated or ill obstetric/neonatal cases treated as per protocol," decreased over time. This may be due to the fact that complications are rare occurrences, and the small number of cases can result in great variation from month to month. Alternately, given that this indicator started with the highest baseline value, providers may have shifted their attention to other indicators that appeared to have required a more significant effort to improve. Table 2 shows the average indicator levels at the first month of the program compared to the evaluation (month six) and the average percentage point change per indicator. The two indicators reflecting new interventions (4 and 7) exhibit the largest changes (100 percentage points). Indicators 1 and 5 also demonstrate important changes, 52 and 84 percentage points, respectively; while indicators 2, 6 and 8 experienced smaller but important changes.

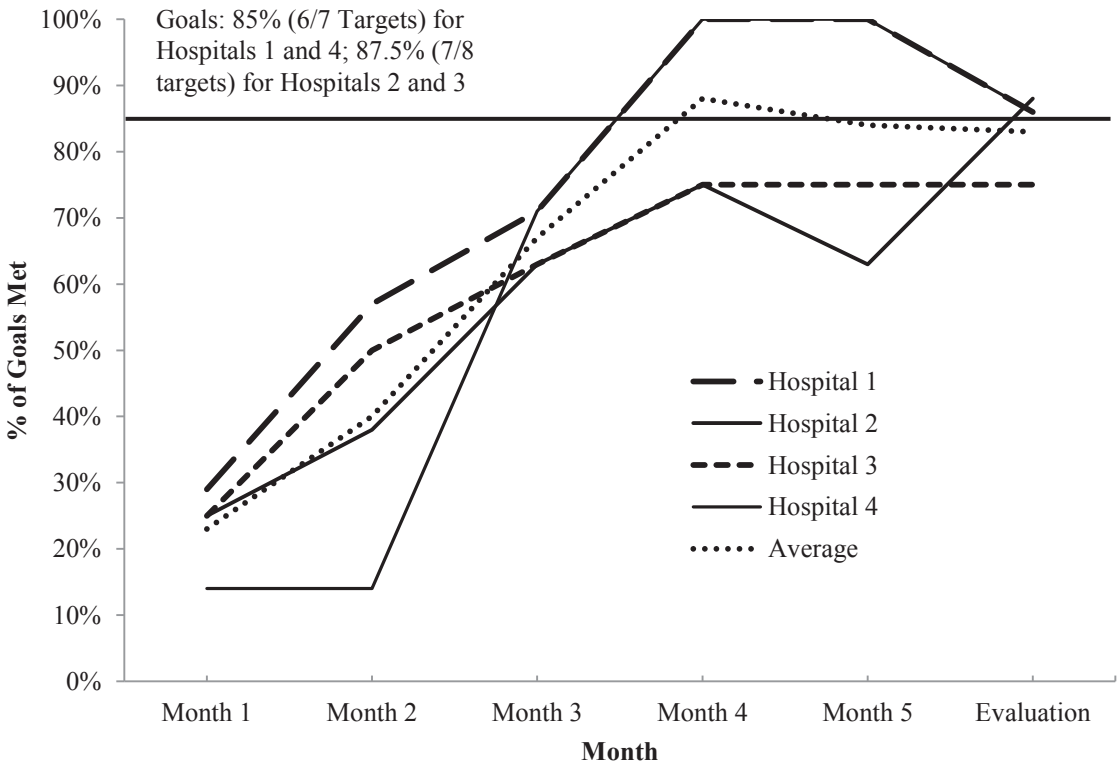
Table 2. Hospital Indicators: Average Month One, Final Result and Change

No.	Indicator	Target	Month 1	Final	Change
			(percentage)		(percentage point)
1	At least 90% of the General Practitioners and nurses presently working at the hospital have received training on protocols in the last year (sexual and reproductive health, obstetric care).	90	47	99	52
2	Percentage of complicated obstetric/ neonatal cases where labor was monitored with partograph.	95	83	88	5
3	Percentage of complicated or ill obstetric/ neonatal cases treated as per protocol.	100	100	63	(38)
4	Percentage of counter-referred patient to origin of referral (CHW) for maternal and child health patients.	50	0	100	100
5	Percentage of first cesarean section managed as per standards (only Hospitals 2 and 3).	95	14	98	84
6	Percentage of necessary inputs available for the provision of basic emergency obstetric and neonatal care.	95	92	97	5
7	Percentage of suggestions/complaints addressed appropriately within two weeks.	90	0	100	100
8	Permanent availability of all five types of modern family planning methods (injectable, barrier, oral, IUD, permanent) according to the norms.	100	75	100	25

At the six-month evaluation, three of the four hospitals had reached their respective targets, making them eligible to receive the QIF incentive. One hospital reached only 6 of its 8 targets (75%) and thereby did not qualify for the award. The two indicators the facility missed were "percentage of complicated obstetric/neonatal cases where labor was monitored with

partograph" (evaluation value 90%, target 95%) and "percentage of complicated or ill obstetric/ neonatal cases treated as per protocol" (evaluation value 75%, target 95%), both which measure rarely occurring events. Still, this facility demonstrated great improvement from the first month (2 of 8 targets reached) to the evaluation (6 of 8 targets reached). Figure 1 illustrates the percent of the targets each hospital reached every month. The largest improvements are noted by months three and four of the project.

Figure 1. Hospital Performance on Goal Compliance



Health Center Monitoring Results. Sixteen health centers (four urban and 12 rural) participated in the first round of the QIF. The quality improvement teams used 12 indicators to measure the performance of the primary health care services provided by these health centers (Appendix Table 4). Five indicators focused on processes; three, on the quality of care; two, on coverage; and one each, on inputs and training, respectively. As observed with the hospitals, for health center indicator values there was also large variation among facilities and indicators at month one of measurement. One-third of the indicators related to CHWs, and all of them stared at zero value given that the project intended precisely on revitalizing the CHW platform for service

provision. The other indicators with initial zero values referred to health education activities for community groups and "customer" quality feedback through the implementation of the complaints and suggestions mechanism, which were also neglected interventions prioritized by the project. On average, only one indicator, "health facility patients of reproductive age that are given family planning counseling according to the norms," met the indicated target. All other indicators were measured at less than 80% in the first month of monitoring.

Although each health facility made great improvements, the average change observed for each indicator varied (Table 3). The indicator with the smallest amount of change was the "percentage of pregnant women with at least one antenatal care visit during their first trimester;" although month one coverage values were low, urban health facilities only improved by two percentage points and rural health facilities by seven percentage points. However, indicators relating to processes for CHWs made vast improvements, in some cases, from 0% to 100%. For the majority of indicators, improvements occurred in the same magnitude in both urban and rural facilities, and only for the indicator "percentage of complicated or ill obstetric/ neonatal cases treated as per protocol" did they differ by more than 15 percentage points, given that the baseline in rural facilities was much higher (25 percentage points) than in urban facilities.

Table 3. Health Center Indicators: Average Month One, Final Result and Change

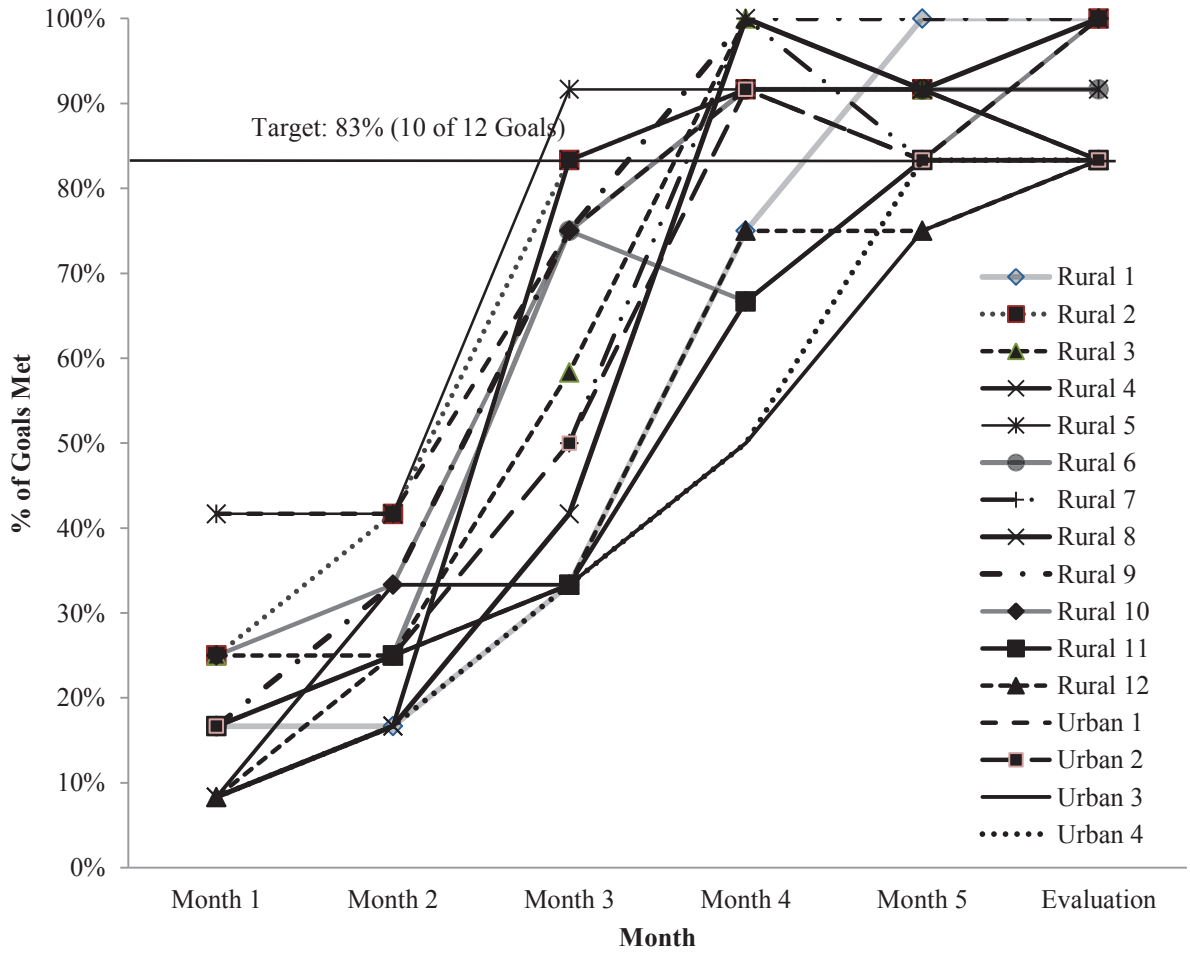
Indicator	Target	Month 1 Urban	Final Urban	Change	Month 1 Rural	Final Rural	Change
	(percentage)			(PP)[1]	(percentage)		(PP)[1]
Percentage of pregnant women with at least one antenatal care during the first trimester.	50	34	35	2	47	54	7
Percentage of women 20 to 55 years who receive care from the health facility with at least one pap smear result within the last year.	50	27	58	31	27	65	38
Percentage of necessary inputs available for the provision of pre and post natal care services.	95	87	98	11	83	98	14
Percentage of CHWs monitored on a monthly basis by the district HECOPAB officers.	20	0	77	77	0	71	71
CHWs visit at least three different homes per week: one health education session provided per home visit.	80	0	95	95	0	97	97
Increase of CHW attendance to monthly meetings held by the District Health Educator.	75	0	99	99	0	89	89
Percentage of suggestions/complaints addressed appropriately within two weeks.	80	0	100	100	0	100	100
Provide health education to community groups (one per month).	100	0	100	100	0	100	100

Health facility patients of reproductive age that are given family planning counseling according to the norms.	50	70	96	26	63	90	27
Percentage of complicated or ill obstetric/neonatal cases treated as per protocol.	100	67	89	22	93	100	7
Percentage of counter referred patient to origin of referral (CHW) for maternal and child health patients.	50	0	65	65	0	78	78
Percentage of General Practitioners and nurses presently working at the health centers who have received training on protocols in the last year (sexual and reproductive health, prenatal care).	90	24	100	77	0	88	88

[1] PP = percentage point

As illustrated in Figure 2, over the six months of the program, each of the rural and urban health centers made great process towards their goals. Most facilities made the largest changes between the second and third monitoring visits. By the evaluation, all 12 facilities had reached at least 10 of the 12 goals (the 83% target), which made them eligible to receive the QIF incentive.

Figure 2. Health Center Performance on Goal Compliance



5.2 Focus Groups, Interviews and SM2015 Learning Tool

In addition to the quantitative component of the QIF, during a project supervision mission in October 2013, the IADB project team and the Belize country team conducted a series of informal focus groups, site visits and key informant interviews and piloted the MH2015 Learning Tool,[27] to collect qualitative information from the regional authorities, health facility managers and front-line service providers (involving facility-based and community health workers). The teams visited a total of 12 facilities, 9 in the Northern and three in the Western regions of the country, including health posts, health centers, poly-clinics, community hospitals and regional hospitals. The teams also organized two learning sessions with the Northern and Western Quality Assurance Teams. In these encounters, the participants presented challenges and achievements during project implementation.

Participants consistently identified several key issues (see also Box 1) during the focus groups and interviews and through the Learning Tool questionnaire:

- **Initial frustration, eventual satisfaction.** The QIF scheme generated additional pressure, workload, and demand for inputs and staff resourcefulness that caused discontent among some health workers. For example, of greatest concern was the perception that the QIF strained health facility operational budgets in order to finance inputs required to meet the goals.[28] On another note, some CHWs felt overwhelmed using the new job aid tools and data entry forms to comply with program indicators; although at the same time they also expressed gratitude for the project's support of their work through the provision of medical kits and supplies, personal use kit (rain jacket, boots, backpack, identification card, etc.), reference material and procedures/manuals (see Appendix Table 5 for summary of CHW program initial challenges and improvements). Despite the preliminary challenges, by the end of the QIF cycle all but one of 20 participating facilities (section 5.1) reached their goals and became eligible for the QIF reward, revealing that staff had encountered viable solutions to obtain required inputs and

[27] The SM2015 learning tool is an online or paper tool used to capture experiences from country operations, systematize lessons learned and highlight areas for future improvements and interventions. Participants shared either a short positive or negative experience and answered a series of related questions. In the Belize pilot, a total of 25 experiences were collected during October and November 2013. The IADB has shared the tool and guide with the MOH for its continued use during the program.

[28] The project resources financed the purchase of some of the inputs, mainly equipment, but did not cover all of the obligatory supplies, for whose procurement complementary government counterpart funds would be needed (for example, family planning methods, drugs, clinical supplies, etc.).

implement established activities. Many participants credited the QIF with helping them improve service quality through greater application of proven cost-effective interventions as well as by allowing access to additional in-kind resources (QIF incentive).

- **New opportunities for collaboration.** It appears that the need to innovate in order to perform well on the indicators and the QIF's emphasis on certain policy elements (such as CHW strengthening) stimulated more interaction among different actors in the health system. The focus and alignment of health workers from distinct levels and functional units around the desired results led to more intense coordination, for example, between regional staff and MOH central stores staff regarding supplies[29] or between facility staff and CHWs as related to the corresponding CHW indicators. Participants noted that they had needed to coordinate and work together to make significant progress towards their goals.
- **Improving the QIF.** Although the QIF mechanism generally received quite positive feedback, participants also presented suggestions intended to strengthen its operability. One proposal related to the allocation of additional resources (or reallocation of existing resources to priority items) to facilitate the availability of inputs used in the delivery of services according to quality-based standards. Other ideas concerned design features of the fund such as allowing the introduction of monetary incentives for health workers or pooling incentives among several facilities. Health sector workers felt the monthly monitoring was a crucial component of the QIF implementation, but they requested further guidance through supervision visits and more "hands-on" technical assistance to install internal capacity for integrating quality improvement methods.

Box 1. Testimonials Regarding Project Interventions

"I was disappointed that we didn't have all the resources to fulfil some of the objectives. We had to be searching to see where we would get the instruments to make IUD [inter-uterine device] sets for the public health department and the rural clinics. It was challenging but in the end we were able to meet the objective."

[29] The QIF involved the evaluation of health facilities on availability of all necessary inputs for providing quality care even though facility staff may not be responsible for procuring all of their own medical equipment/instruments or they may rely on cooperation from pharmacy or regional supervisors to acquire certain medications and supplies.

"Reminiscing Meso-America: During the period the only challenge was cooperation from pharmacy in terms of providing emergency drugs to maternity ward…on a positive note, it did enhance involvement of CHWs and relationships between FCH [Family and Community Health] and Hospital."

"The Miracle of the QIF: At the commencement of the project, one rural health nurse in particular was unwilling to work with the community health worker in her village. Upon learning about the QIF and that being successful depending on the nurse and community health worker working together, the nurse's attitude toward the CHW immediately changed."

"Successful Situation: When the meaningful collaboration with community health workers and health care providers began. This was a very successful moment."

"Yeah, We Did It!!: In reviewing and analyzing contents of suggestion boxes, all nurses were referred to as doctors. They were referred to as being very professional and courteous and were even commended on their effort and hard work."

"Suggestion Box Up and Running: Having the complaint/comment policy fully functional…[we] received good feedback and were able to have QI Teams address issues appropriately."

5.3 Technical Assistance

In consonance with the recommendations mentioned in sections 4.1 and 4.2, the project also provided technical assistance to complement other project activities. In the Belize project these specialized consulting services focus specifically on the quality improvement collaborative approach (section 2.4). The scope of work includes the review and expansion of the maternal and neonatal collaborative to the Northern and Western health regions, as well as the development and implementation of new collaboratives for adolescent reproductive health and child health.[30]

[30] The two new collaboratives are the following: "Improvement of Family Planning Activities Aimed at Adolescents" and "Improvement of Nutrition Activities for Children under Three in the Context of Integrated Management of Childhood Illness (IMCI)."

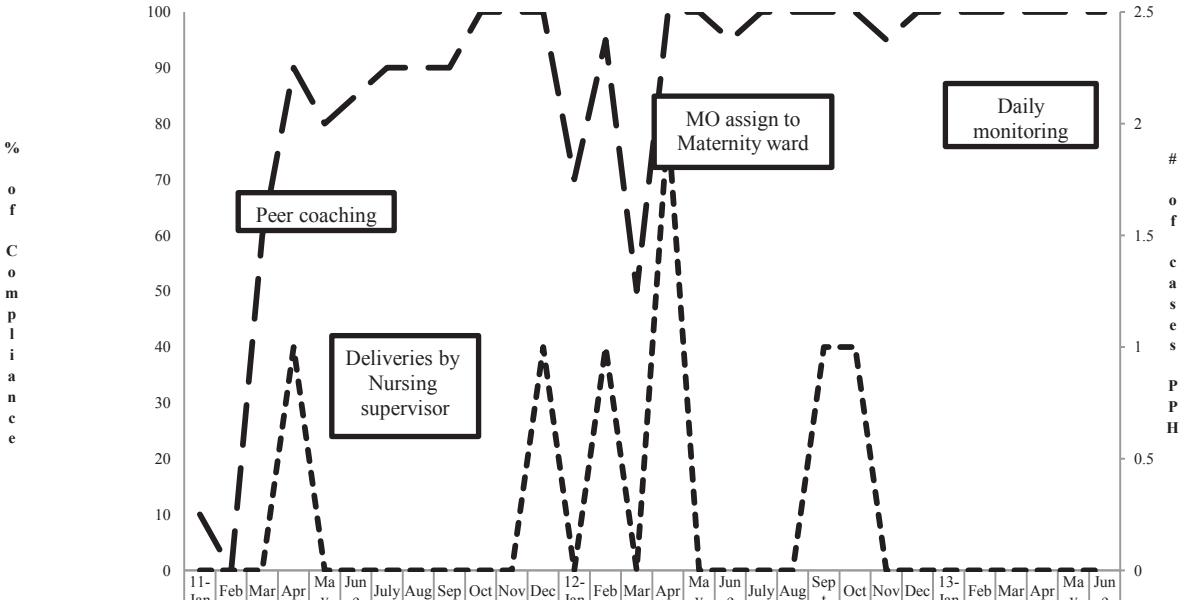
During 2013 the technical assistance team organized a series of workshops to implement the quality improvement approach. The first workshop organized participants such as medical officers, public health nurses, rural health nurses, health educators and community health workers into multi-disciplinary quality improvement teams for each of the facilities participating in the project. It also introduced the quality improvement methodology as well as the concepts, standards, indicators and evidence-based changes needed in order to meet the objectives of the two new collaboratives. A second workshop with the QI teams introduced the Plan-Do-Study-Act (PDSA) approach, and the teams reviewed the data collection tools, standards and indicators and conducted role playing and group exercises focused on the data collection methodology, planning and construction of the baseline for the two collaboratives.

The technical assistance also provided continuity for the Maternal and Neonatal Quality Improvement Collaborative started in Southern Belize in 2009 and expanded subsequently to the rest of the country. A final workshop had the aim of "harvesting" experiences and best practices from the QI teams participating in this collaborative in the Northern and Western regions (see Appendix Table 6 for results). Another objective was to obtain inputs to systematize the collaborative and QI model and to communicate improvements to other regions. Participants presented cases relating to the monitoring of labor using partograph (obstructed labor) to reduce perinatal asphyxia, active management of third stage of labor (AMTSL) involving application of oxytocin to prevent post-partum hemorrhage (PPH) and management of obstetric complications (severe preeclampsia and eclampsia). Figure 3 presents an actual example in which a collaborative effort with specific activities to increase compliance with AMTSL in a community hospital seems to be clearly related to a decline in the number of PPH cases.

Pairing technical assistance with the QIF has resulted in reinforcement of the QI approach. Since indicators measured in the collaboratives are also part of the QIF, through these complementary efforts the service providers receive technical assistance, indicator monitoring, consistent supervision, and an incentive when goals are met. The technical assistance team has also aided the Technical Advisors from the Ministry of Health with the revision of quality of care job aid tools and sexual and reproductive health education materials targeted for health care personnel and adolescents. These are key inputs that will be considered as part Belize 18-month payment indicator related to updated norms and community platform guidelines. As of December 2013, providers were collecting baseline data for adolescent and child health

indicators, which will be monitored throughout the subsequent QI cycles as part of the expansion of the model through the SM2015 project.

Figure 3. Relationship between Compliance with AMTSL and PPH in a Community Hospital (January 2011 – October 2013)



	11-Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	12-Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	13-Jan	Feb	Mar	Apr	May	June
num	2	0	12	18	16	17	18	18	18	20	20	20	14	19	10	20	20	19	20	20	20	20	19	20	20	20	20	20	20	20
dem	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
% compli	10	0	60	90	80	85	90	90	90	100	100	100	70	95	50	100	100	95	100	100	100	100	95	100	100	100	100	100	100	100
# cases PPH	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0

5.4 Summary of Findings and Conclusions

Alignment of SM2015 indicators with QIF indicators that strengthen community platforms, complementary technical assistance in structuring QI teams and collaboratives, and constant self-monitoring and external supervision through these mechanisms have proven to be an effective intervention package for the first SM2015 operation in Belize. The qualitative and quantitative results shown in this report, although preliminary, are consistent with the findings found in the literature. In Belize, RBF directed at service providers has generated positive effects on quality of care, process and coverage indicators (Basinga, 2010; Basinga, 2011; Huntington, 2010; Soeters, 2011); 19 of 20 facilities met their QIF goals, and 19 of the 20 indicators measured all improved over the six-month period. Moreover, RBF alone was not responsible for the change as training, supervision, feedback and technical assistance complemented RBF improvements (Witter et al., 2012). Health facility workers in Belize also emphasized factors indicated by

Rowe et al. (2005)[31] and Catsambas et al. (2008)[32] as being important to performance, many of which appear in their own recommendations for improving quality of care with collaborative health models (Appendix Table 6).

The improvements in the CHW model in Belize are notable, and the findings coincide with those from other experiences. Indicators related to CHWs have improved in some cases by 100% (see Table 2), in agreement with results from other studies (for example, Shakir, 2011), where productivity of CHWs rose through the use of multiple non-monetary incentives, such as job aids, supplies, refresher training, monitoring, supervision and recognition. The Belize project provided an additional direct incentive for health facility workers to collaborate with CHWs, which has fostered changes in activities and practices, as noted in the qualitative experiences shared by participants and changes in the QIF indicators. Even simple interventions, such as identification signs on CHW houses produced positive changes (Appendix Table 5), as found by Bhattacharyya et al. (2001). The 18-month follow-up survey, planned for May 2014, will reveal progress on the indicators of the first operation compared to the baseline.

Based on these findings, SM2015 plans to continue using the QIF model in the second Belize operation and align its indicators with those negotiated with the government in the development framework at 36 months. In a similar fashion, the QI collaboratives will incorporate the second-phase indicators and goals to provide additional support toward their achievement. SM2015 is also exploring additional incentive schemes that could be applied at the individual and regional levels of the program. The second operation will also address continued obstacles, such as lack of transportation for health providers to the communities and time requirements for QI/QIF record-keeping and reporting.[33] Until the government is willing and able to scale up its comprehensive NHI model, the QIF offers a pay-for-performance alternative for the Northern and Western Regions that the MOH implemented quickly with positive results on a relatively small investment and low administrative burden.

[31] Factors include knowledge and skills of the health worker, complexity and clarity of guidelines, health facility environment (attitudes of health workers, peer-pressure and levels of collaboration), administrative environment (salary, financial and non-financial incentives), and supervision.

[32] Collaborative models produced important gains in compliance with standards (80% or above within 8-18 months) in key technical areas and proved effective in scaling up best practices.

[33] In the case of reporting, SM2015 is contracting additional consulting services to develop data entry software on mobile devices.

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Appendix Table 1. Belize *Salud Mesoamerica* 2015 Initiative Performance Framework

Indicator	Estimated Baseline[34]	Measured Baseline	18 mo. target	36 mo. target	54 mo. target
Health facilities that have the necessary inputs for providing emergency obstetric and neonatal care according to the norms	60%	0%	75%		
Health facilities that have the necessary inputs for providing pre- and post natal care according to the norms	75%	0%	85%		
Health facilities that have submitted a Quality Improvement Fund (QIF) proposal to the national quality audit team	0	0%	75%		
Health facilities that have the necessary inputs to provide child health care according to the norms	*	0%	85%		
Health facilities that have implemented Quality of Care job aid tools for reproductive health	*	0%	85%		
Health facilities that can submit and receive data from the Belize Health Information System (BHIS)	*	0%	85%		
Health facilities that have permanent availability of all 5 types of modern family planning methods (injectable, barrier, oral, IUD, permanent) according to the norms	*	68.4%	85%		
Health facilities that have sexual and reproductive health (SRH) educational materials specifically targeted at adolescents	0	0%	85%		
Norms for improving the quality of reproductive and child health and nutrition services and for the establishment of a community platform of services adopted	0	No	Yes		
Community health workers (CHW) trained in the community platform	*	0%	85%		
District HECOPAB[35] Officers that are currently monitoring the CHWs	*	0%	85%		
Health facilities with a mechanism in place for carrying out patient satisfaction surveys	*	0%	85%		
Institutional deliveries for which oxytocin was administered immediately following birth as part of Active Management of the Third Stage of Labor (AMTSL) in the last two years for the most recent delivery	80%	34.1%		15 PP[36] (49.1%)	15 PP (49.1%)
Pregnancies for which the woman attended at least one antenatal care visit during the first trimester for the most recent pregnancy in the last two years	26%	22.8%		7 PP (29.8%)	14 PP (36.8%)
Institutional deliveries for which immediate (within 24 hours) neonatal care was provided to the infant according to the norms in the last two years	50%	19.4%		20 PP (39.4%)	40 PP (59.4%)
Neonatal complications (prematurity, low birth weight, asphyxia and sepsis) managed according to norms in the last two years	15%	7.5%		30 PP (37.5%)	75 PP (82.5%)
Obstetric complications (sepsis, hemorrhage, severe pre-eclampsia and eclampsia) managed according to the norms in the past two years	20%	2.6%		35 PP (37.6%)	70 PP (72.6%)

[34] The baseline data were estimated in consultation with program staff and/or using the estimates produced by the model created by Institute of Health Metrics and Evaluation (IHME).

***** Initially unavailable; to be updated with survey baseline data.

[35] Health Education and Community Participation Bureau.

[36] PP = percentage point

Indicator	Estimated Baseline[34]	Measured Baseline	18 mo. target	36 mo. target	54 mo. target
C-sections as proportion of childbirths in the last two years[37]	30%	36%		-10 PP (26%)	-20 PP (16%)
Female health facility patients of reproductive age that are given family planning counseling according to the norms in the last two years	25%	(1)		50 PP	50 PP
Children 0-23 months with low weight-for-age managed according to norms in the last two years	*	1.4%		75%[38]	
Diarrhea cases in children 0-59 months presenting in health facilities that were treated with Oral Rehydration Solution (ORS) and zinc during their last visit	0	20%		90 PP (100%)	
Deliveries for which a partograph was carried out and correctly interpreted according to the norms in the last two years for the most recent delivery	30%	(1)		60 PP	
Newborns enrolled for child health services within seven days of birth in the last two years	75%	25.3%		10 PP (35.3%)	
Live births for which the women received post-partum care before the first 7 days of birth in the last two years for the most recent pregnancy	28%	22.8%		32 PP (54.8%)	
Women of reproductive age[39] (15-49 years) who were not using/unable to obtain contraception during last year	31%	47.4%			-5 PP (42.4%)
Infants 0–5 months of age who were fed exclusively with breast milk the previous day	23%	43.1%			10 PP (53.1%)
Mothers with a child 0-23 months that that can recognize 3 out of 5 signs of danger[40]	20%	15.8%			40 PP (55.8)
Percentage of children aged 6-23 months that consumed 60 sachets of micronutrients in the last 6 months	0	0%			30 PP (30%)
Mothers who gave their children (0-59 months) ORS and zinc supplements during the last episode of diarrhea in the two weeks	0	5.3%			40 PP (45.3%)

(1) Baseline will be calculated considering the 18-month follow-up surveys.

[37] The Optimal Range for C-sections as a proportion of childbirths is between 10-15%.
[38] Percentage point change target is not available because the baseline is unknown.
[39] Excluding those who report any of the following: no sexual relations, virgin, menopausal, hysterectomy, pregnant, or wants to become pregnant.
[40] Danger sings include feeding problems, or if the newborn has reduced activity, difficult breathing, a fever, fits or convulsions, or feels cold.

Appendix Table 2. Health Facilities Participating in the Quality Innovation Fund

	Northern Region	Classification
1	Corozal Hospital (operating theater and maternity ward)	Community Hospital
2	Orange Walk Hospital (operating theater and maternity ward)	Regional Hospital
3	Corozal (maternal child health/family-community health)	Urban Health Center
4	Orange Walk (maternal child health/family-community health)	Urban Health Center
5	Libertad	Rural Health Center
6	San Narciso	Rural Health Center
7	Caledonia	Rural Health Center
8	Sarteneja	Rural Health Center
9	Progresso	Rural Health Center
10	Genovia Meggs	Rural Health Center
11	August Pine Ridge	Rural Health Center
12	San Felipe	Rural Health Center
13	Guinea Grass	Rural Health Center
	Western Region	**Classification**
1	Cayo Hospital (operating theater and maternity ward)	Community Hospital
2	Belmopan Hospital (operating theater and maternity ward)	Regional Hospital
3	Cayo (maternal child health/family-community health)	Urban Health Center
4	Belmopan (maternal child health/family-community health)	Urban Health Center
5	Mopan	Rural Health Center
6	Georgeville	Rural Health Center
7	Valley of Peace	Rural Health Center

Appendix Table 3. Hospital Indicators: Targets and Month-One Average and Individual Values
(percentage)

No.	Indicator	Type	Target	Average	Hospital			
					1	2	3	4
1	At least 90% of the General Practitioners and nurses presently working at the hospital have received training on protocols in the last year (sexual and reproductive health, obstetric care).	Training	90	47	0	94	0	93
2	Percentage of complicated obstetric/ neonatal cases where labor was monitored with partograph.	Quality of Care	95	83	83	65	90	94
3	Percentage of complicated or ill obstetric/ neonatal cases treated as per protocol.	Quality of Care	100	100	100	100	100	100
4	Percentage of counter-referred patient to origin of referral (CHW) for maternal and child health patients.	Quality of Care	50	0	0	0	0	0
5	Percentage of first cesarean section managed as per standards (only Hospitals 2 and 3).	Quality of Care	95	14	n/a	12	15	n/a
6	Percentage of necessary inputs available for the provision of basic emergency obstetric and neonatal care.	Inputs	95	92	93	91	91	93
7	Percentage of suggestions/complaints addressed appropriately within two weeks.	Quality of Care	90	0	0	0	0	0
8	Permanent availability of all five types of modern family planning methods (injectable, barrier, oral, IUD, permanent) according to the norms.	Inputs	100	75	40	80	100	80

Appendix Table 4. Health Center Indicators: Target and Month-One Average Values for Urban and Rural Facilities

(percentage)

No.	Indicator	Type	Target	Urban (4)	Rural (12)
1	Percentage of pregnant women with at least one antenatal care during the first trimester.	Coverage	50	34	47
2	Percentage of women 20 to 55 years who receive care from the health facility with at least one pap smear result within the last year.	Coverage	50	27	27
3	Percentage of necessary inputs available for the provision of pre and post natal care services.	Inputs	95	87	83
4	Percentage of CHWs monitored on a monthly basis by the district HECOPAB officers.	Process	20	0	0
5	CHWs visit at least three different homes per week: one health education session provided per home visit.	Process	80	0	0
6	Increase of CHW attendance to monthly meetings held by the District Health Educator.	Process	75	0	0
7	Percentage of suggestions/complaints addressed appropriately within two weeks.	Process	80	0	0
8	Provide health education to community groups (one per month).	Process	100	0	0
9	Health facility patients of reproductive age that are given family planning counseling according to the norms.	Quality of Care	50	70	63
10	Percentage of complicated or ill obstetric/neonatal cases treated as per protocol.	Quality of Care	100	67	93
11	Percentage of counter referred patient to origin of referral (CHW) for maternal and child health patients.	Quality of Care	50	0	0
12	Percentage of General Practitioners and nurses presently working at the health centers who have received training on protocols in the last year (sexual and reproductive health, prenatal care).	Training	90	24	0

Appendix Table 5.
Community Health Worker Program: Initial Challenges and Improvements

(each row corresponds to a district)

Initial Challenges	Improvements
• Not enough financial support • Need for equipment • Lack of budget to reproduce educational material • Outdated reporting forms and service level agreements • CHWs unclear on their functions and responsibilities • CHW not qualified and competent to carry out certain duties expected from them in the community	• Formal orientation for Health Educators into the HECOPAB system • New CHW manual produced • Revised CHW roles and responsibilities • Production of training curriculum along with visual aid tool • Partial funding for the CHW national training • Revision of reporting forms and development of new forms for monitoring and evaluation • Revision of Service Level Agreements
• Political influence on CHW in their communities • Lack of pharmaceuticals for CHWs • Insufficient training • Some CHWs not receiving stipend • Some villages without CHWs • No transport for Health Educator to carry out her	• Monthly stipend for CHWs • Pharmaceuticals for CHWs • Identification of CHWs' houses (visible sign) • Formal CHW training for certification • Identification of CHW to be trained in all villages

duties • Lack of supplies and equipment for Health Educator	
• Some CHWs not receiving stipend • Some villages without CHWs • Insufficient training • Political influence on CHW in their communities • No transport for Health Educator • Lack of supplies and equipment for Health Educator for production of health education materials	• Identification of CHWs' houses (visible sign) • Formal CHW training for certification • Identification of CHW to be trained in all villages
• Some villages without CHW • Some CHW without English language skills • Some CHW without formal training • No transportation for Health Educator • Lack of office space and equipment/supplies for Health Educator	• Formal CHW training for certification • Identification of CHW to be trained in all villages

Source: Community Health Worker Monthly Report, May 2013

Appendix Table 6. Lessons Learned from Harvesting Session, November 2013

Key Finding/Lesson Learned during QI Cycle	Recommendation
Adherence to protocols improves outcomes for both the mother and newborn: When protocols are applied, the number of undesirable outcomes is reduced; potential complications can be better managed for example, early referrals.	Increase vigilance of adherence to protocols by assigning staff to Maternity Ward and early notification of potential complicated cases.
Peer coaching and supervision reduces the risk of complications secondary to non-adherence to protocols: Nursing supervisor and other trained staff, sharing the responsibility of continuous monitoring of adherence to protocols in patient care, allow for early identification of gaps in the application of Active Management of the Third Stage of Labor (AMTSL)	All trained personnel can supervise the application of AMTSL and identify early areas that need strengthening.
Management as per protocols improves the outcome of patients with post-partum hemorrhage (PPH): Having a system in place for monthly auditing of the management of patients with PPH allowed the identification of weakest criteria to be addressed during the following month; to define activities to increase compliance, for example, in- service training by group of professionals or individual training sessions.	Adhere to established protocols for better outcome and avoid further complication of patients with PPH.
Continuous multidisciplinary and individual training in new procedures is necessary to accomplish full compliance: The midwives and physicians have different schooling that may not have included training in the use of partograph; training in the plotting and interpretation of the parameters on the partograph improved the surveillance of potential complications.	Include the training in partograph in orientation session curricula and conduct individual training for staff as per need identified.
Team approach makes implementation easier: All team members in critical route have to be fully aware of QI activities as cooperation from all is key to positive outcomes for mother and baby; they should share results of monthly audits.	Involve all stakeholders from the inception of the strategy to ensure buy in and sustainability of the intervention.