

**CONCEPT NOTE FOR IMPACT EVALUATION
OF THE RBF PILOT IN BENIN**

SEPTEMBER 2010

TABLE OF CONTENTS

1. INTERVENTION: RATIONALE & DESCRIPTION	4
1.1. Why Benin is planning to implement RBF mechanisms ?	4
1.2. What is the RBF mechanism in Bénin and how it may improve the results achieved by the health system ?	6
1.2.1. The RBF mechanisms in Bénin: key features	6
1.2.2. The new RBF mechanism in Benin: how it will improve health outcomes ?	7
What are the targeted outcomes ?	7
How can the RBF mechanism contribute to the selected outcomes?.....	9
2. RESEARCH OBJECTIVES AND QUESTIONS	12
2.1. Measuring the impact of RBF on health outcomes	12
2.2.1. Indicators for quality and equity of maternal health care	12
2.2.2. Process and structural indicators	12
2.2.3. Indicators for other health care services	13
2.2. Understanding why RBF has (or has not) an impact.....	14
2.2.1. Through experimental control.....	14
What matters: paying for results or paying more ?	14
Does management autonomy strengthen the impact of RBF ?	14
2.2.2. Through statistical control.....	15
What is the relation between RBF and health workers' motivation ?.....	15
What is the relation between RBF and corruption?	16
Does RBF have an impact on health care seeking behaviors?.....	19
3. INSTRUMENTS FOR DATA COLLECTION AND IDENTIFICATION.....	20
3.1. District-level assessment	20
3.2. Health facility assessments.....	21
3.3. Health workers surveys	21
3.4. Patients surveys	24
3.5. Households surveys	24
3.6. Drug survey	25
4. TIMELINE	26
5. BUDGET	26
Bibliography	28
Annex 1: List of health districts in Benin.....	32
Annex 2: Description of the RBF mechanism.....	34
Annex 3: Methodology for measuring the amount of stolen drugs in health facilities	41
Annex 4: Power calculations	43

Abbreviations

ANC	Antenatal Care
BEmOC	Basic Emergency Obstetrical Care
BIA	Benefit Incidence Analysis
CD	<i>Crédits délégués</i> (budgetary allocation to health districts)
CEmOC	Comprehensive Emergency Obstetrical Care
COGES	<i>Comité de Gestion</i>
DCO	Direct Clinical Observation
DDS	See RDH
DDZS	<i>Direction du Développement des Zones Sanitaires</i> (Directorate for the Development of Health Districts)
DHA	District health Authority (<i>Bureau ou Equipe de Zone Sanitaire</i>)
DHO / MCZS	District Health Officer (<i>Médecin Coordonnateur de Zone Sanitaire</i>)
DHS	Demography and Health Survey
DPP	<i>Direction de la Programmation et de la Prospective</i> (Directorate for Planning and Prospective)
DRFM	<i>Direction des Ressources Financières et du Matériel</i> (Directorate for Financial and Physical Resources)
DSF	<i>Direction de la Santé Familiale</i> (Directorate for Family Health)
EMICoV	<i>Enquête Modulaire Intégrée sur les Conditions de Vie</i>
EPI	Expanded Program for Immunization
HEF	Health equity Fund (<i>Fonds Sanitaire des Indigents</i>)
IEC	Information, education and communication
IHP+	International Health Partnership +
INSAE	Institut National de la Statistique
IREEP	<i>Institut de Recherche Empirique en Economie Politique</i>
MBB	Marginal Budgeting for Bottlenecks
MCZS	See DHO
MDG	Millennium Development Goals
MoF	Ministry of Finance
MoH	Ministry of Health
MTEF	Medium Term Expenditure Framework
RBF	Result Based Financing
RDH / DDS	Regional Directorate for Health (<i>Direction Départementale de la Santé</i>)
SSA	Sub Saharian Africa
TTL or TL	Task Team Leader
UNFPA	United Nations Population Fund

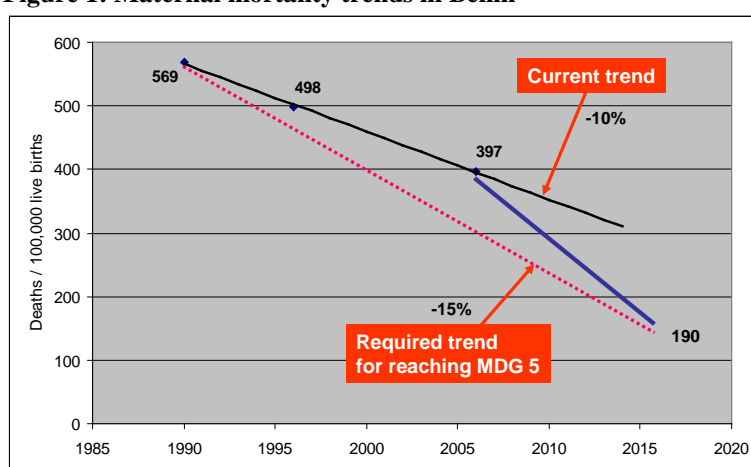
1. INTERVENTION: RATIONALE & DESCRIPTION

1.1. Why Benin is planning to implement RBF mechanisms ?

The government of Bénin has decided to implement Result Based Financing (RBF) mechanisms, on the grounds that (i) while it is still facing considerable challenges for achieving Millennium Development Goals (MDGs) (especially for maternal health), (ii) additional funds in the health system may not have a sufficient impact if the overall performance of health facilities and health workers is not radically improved.

Although maternal mortality is decreasing at a faster rate than child mortality, it is still high. With an estimated maternal mortality rate of 397 maternal deaths per 100,000 births in 2006 (DHS), Benin is off the MDG track (see figure 1 below). However, the efforts needed to reach the 2015 objective of 190 deaths are not out of range. Practically, the annual decreasing rate of maternal mortality should be boosted from -10% per year to -15% per year.

Figure 1: Maternal mortality trends in Bénin



While Benin has achieved one of the highest rates of assisted deliveries, its health system faces difficulties to provide an adequate quality of obstetrical care and to reach poor people. It is now widely acknowledged that improving intra-partum care is the best intervention for reducing maternal mortality¹. The main (but not the only one, as we will see later) indicator to measure improved intra-partum care is the rate of deliveries that are assisted by qualified staff, which is roughly equivalent to the rate of deliveries taking place in Basic Emergency Obstetrical Care (BEmOC) or Comprehensive Emergency Obstetrical Care (CEmOC) facilities². With 76% in 2006, Benin has already achieved one of the highest rates for assisted deliveries, across Sub Saharan African countries (SSA). However, this rate is much lower for the poorest quintile of the population: 55.8% versus 97.4% for the richest quintile (DHS 2006). In addition, when comparing maternal mortality rates and rates of assisted delivery across SSA countries, Benin should normally have reached a lower maternal mortality figure. As in other countries facing the same problem, this paradox can be explained by the **low quality of maternal care**³. A recent study (Saizonou 2006) has been carried out in 4 referral hospitals in Bénin. More than 50% of maternal deaths in the country occur in these 4 CEmOC hospitals. The study found that 60% of these deaths were caused by low quality of care and could have been avoided (see table below).

¹ See CAMPBELL Oona M R and Wendy J Graham, "Strategies for reducing maternal mortality: getting on with what works" Lancet 2006; 368: 1284–99, The Lancet Maternal Survival Series steering group

² For the distinction between BEmOC and Comprehensive Emergency Obstetrical Care (CEmOC), see Unicef/WHO/UNFPA "Guidelines for monitoring the availability and use of obstetric services" 1997.

³ For a similar situation, see Miller, "Quality of care in institutionalized deliveries: the paradox of the Dominican Republic", International Journal of Gynecology and Obstetrics 82 (2003) 89–103.

Table 1: Causes of maternal deaths in 4 referral hospitals in Benin (2003)

	Deaths		Deaths related to low quality of care		Main causes for low quality
	N	%	N	%	
Postpartum hemorrhage	55	23%	32	58%	- inadequate care by BEmOC level (diagnosis and treatment of complications) - blood shortage at the referral hospital
Infections (mostly due to abortion complications)	54	23%	34	63%	- shortage of drugs in the labor room (and drugs not affordable for patient's family)
Hypertension (including eclampsia)	36	15%	15	41%	- clinical guidelines not used (at BEmOC and referral care levels)
Complicated labor	18	8%	7	39%	
Other direct obstetrical causes	16	7%	12	75%	
Anemia	35	14%	24	68%	- blood shortage at the referral hospital
Other indirect causes	25	10%	19	76%	
TOTAL	239	100%	143	60%	

Source: Saizonou 2006

The latest health Country Sector Report (forthcoming 2009, World Bank) has found that non-quality was explained not only by a lack of resources but also by a low accountability of institutions and health workers. For instance:

- Regarding skills and knowledge: While many health workers have already been trained on management of obstetrical complications, they still do not comply with clinical guidelines (see Gbangbade 2003a). A study on maternal skills (in a referral hospital) found that only 54% of doctors knew how to manage eclampsia during maternal labor, whereas eclampsia is the second cause of maternal deaths.
- Regarding drug availability, another study (Gbangbade 2003b) has found that, while oxytocin was available 80% of the time in the pharmaceutical warehouse of health care facilities, it was available only 30% of the time in the labor rooms of these same facilities. How one can explain such a discrepancy if not by a very weak drug inventory management or by drug theft ?

One hypothesis (to be tested) is therefore that the overall quality of maternal care may be improved through a stronger accountability of health workers. For instance, if these health workers are incentivized according to indicators for drug availability (among other indicators), one may see a reduction in drug theft and a better management of drug inventory. As it will be explained in detail below, an RBF mechanism can provide this accountability mechanism and trigger the expected behavioral changes.

Progress on maternal health is also constrained by the difficulties faced by poor people to access maternal care. In the poorest quintile of the population, the assisted delivery rate is only 55% (DHS 2006). Reasons for this situation are trivial: (i) high user fees and informal payments, (ii) cultural obstacles, and (iii) fear to be neglected or insulted by health workers. Among these three obstacles, the affordability issue is a greater matter of concern as it could be easily overcome by health workers if they make an adequate use of the existing Health Equity Fund. This fund (*Fonds Sanitaire des Indigents*) has been created in 2005 and is managed by health care facilities. It should normally fund user fees exemptions for poor people. In fact, it is mostly used for friend and relatives of health workers. Poor people are thus victims of the lack of patient-focused mindset among health workers. For this reason, in Benin, the implementation of RBF is combined with the roll-out of a biometric card, so as to register the poorest households (see Component 2 of the IDA project). This will allow easily identification of the poorest patients and therefore to include in the RBF scheme indicators related to health care provided to the poorest. In other words, **when treating poorest patients, health facilities and their workers will receive higher RBF bonuses.**

Our second hypothesis (also to be tested) is that the three above-mentioned obstacles (that preventing the poorest to access maternal care) may be significantly reduced through the RBF mechanism:

- To be pro-poor, health facilities will have to overcome cultural obstacles that may explain reluctances of poor women. This will be addressed through more intensive IEC efforts, that can be funded with the RBF financial reward received by health facilities ;
- Poor women may be also exempted of user fees, through a better use of the existing HEF. Informal payments asked by health workers may also be reduced once they understand that achieving RBF objectives is financially more interesting than racketing patients.
- Finally, health workers will have to behave adequately with poor women if they want to reach their RBF objectives. Responsiveness of health workers may therefore increase.

1.2. What is the RBF mechanism in Bénin and how it may improve the results achieved by the health system ?

1.2.1. The RBF mechanisms in Bénin: key features

In 2007, a RBF pilot experiment was implemented in three health districts in Benin, but it appeared to be a failure. **Building on the lessons learnt in 2007, the Ministry of Health (MoH) has started to redesign the RBF contracts, in order to quickly launch a new experiment.** After the evaluation report was released in April 2008, the MoH decided to launch a fully redesigned experiment. Although new draft RBF contracts have already been prepared, the MoH is now putting an emphasis on building its own capacity on RBF. At this stage, the new RBF mechanism can be described the following way.

The MoH plans to pilot RBF in 8 health districts⁴ (out of the existing 34). Annex 1 describes these 8 districts as well as the criteria used for selecting them. These districts include about 280 facilities, although only 200 will be included (public and not-for-profit facilities).

Half of them will be randomly assigned in the treatment group, while the other half will be in the control group. In these selected districts, triennial RBF contracts will be prepared and signed with each of the health facilities.

Every 3 months, results achieved by each facility will be assessed by an independent organization (whose selection is underway).

In the **treatment group**, the health facilities will receive a financial reward, to be strictly proportional to the obtained results on the above-mentioned indicators results.

This financial reward may be used in two ways:

- **At least 50% must be used for purchasing equipment (including ambulances), drugs, training programs or IEC actions.** Several randomly selected health care facilities with « increased management autonomy » will be free to decide how this amount is allocated across the possible purposes. In the other health care facilities, this allocation will be decided by the Health District Coordinator.
- **A maximum of 50% of the financial reward will be used for paying staff incentives.** The conditions for this payment have already been defined nationwide by the MoH and unions and therefore cannot be changed by health districts or health care facilities. This component of the financial reward will be paid to health workers in proportion of their base salary. Overall, the RBF bonus should amount to a proportion comprised between 40% and 80% of base salaries. This allocation principle is similar to some experiences observed in Rwanda. It is equivalent to a team-based incentive. As such, it does not take into account individual performance, but in Benin, it is considered as equitable and not prone to generate internal fights among health workers.

The facilities in the **control group** will also receive a financial amount every 3 months. It will be proportional to results achieved by all control group facilities. This rule has two consequences.

⁴ In Bénin, a health district has a catchment area covering about 200,000 inhabitants. Each district has at least one referral hospital (i.e. district hospital or « *hôpital de zone* ») and a dozen health care centers.

First, it guarantees that all facilities will receive similar levels of financial resources. Therefore, the two groups will be comparable, which makes easier the impact evaluation of the RBF mechanism. The RBF effect will not be influenced by a “resources increase” effect⁵. Note that, regarding the use of their received financial amount, the RBF control districts will follow the same rules as the treatment districts.

Secondly, while treatment group facilities will be incentivized according to their own (individual) performance, control group facilities will be incentivized according to the performance of all the 140 facilities⁶. In other words, in the control group, financial reward will have a weak relation with the actual performance of an individual facility and can be better considered as a lump-sum. This arrangement allows comparing an “RBF effect” (i.e. conditional reward) versus a “lump-sum effect” (i.e. unconditional or very weakly conditional reward).

The mechanics of the RBF pilot are described in details in Annex 2.

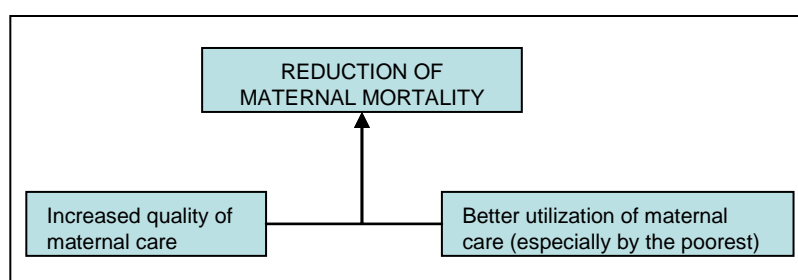
An Impact Evaluation of the new RBF mechanism will be conducted each year. The objectives of this evaluation are to measure the impact of RBF and to understand which factor contributes to this impact.

1.2.2. The new RBF mechanism in Benin: how it will improve health outcomes ?

What are the targeted outcomes ?

As indicated earlier, the RBF mechanism will strive to contribute to a reduction in maternal mortality, especially among the poorest people. As this indicator is almost impossible to measure over the period of the experiment, two proxies will be used, as illustrated on the figure below. The first one is the quality of maternal care. The second one is the utilization rate of maternal care services by poor people.

Figure 3: Outcomes targeted by RBF



For measuring progress on these two outcomes, three groups of output indicators have been selected. They will be used to determine the RBF financial reward to be transferred to health districts and their health care facilities.

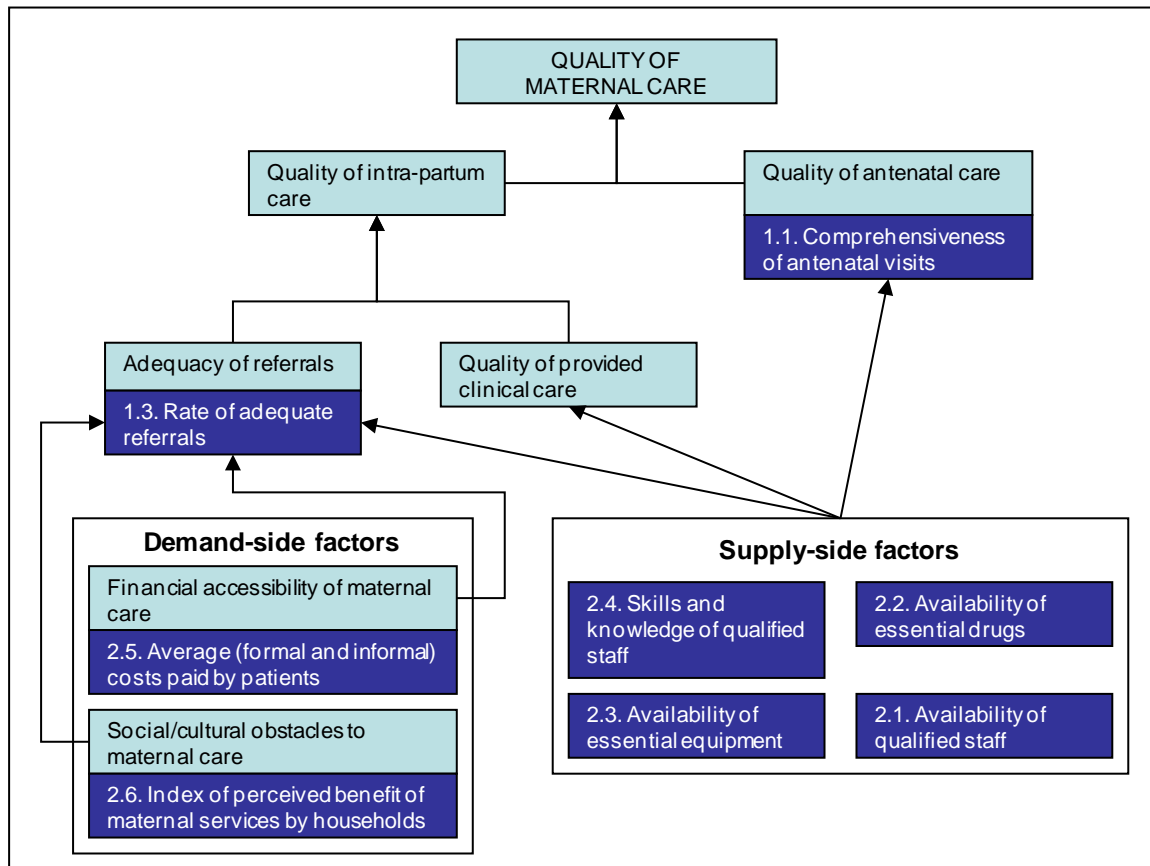
Before looking at the targeted indicators, one must bear in mind that data quality and accuracy will require very specific strategies. One reason is that, although Benin has roughly a good health information system, some important indicators are not routinely measured. Another reason is that RBF will create a huge incentive for “cooking the books”. For this reason, we are resorting heavily to third party monitoring and to triangulation of data sources.

1. The first group of indicators will focus on the first outcome: quality of maternal care. This outcome can be broken down in two main components: quality of antenatal care and quality of intra-partum care.

⁵ Indeed, in older RBF mechanisms in other countries, treatment districts were receiving a much bigger amount of money than control districts. It was therefore very difficult to distinguish which part of improved performance was due to the “additional resources effect” and which part to the “pure RBF effect”.

⁶ The reader may wonder why control group facilities are not simply given lump-sums. The reason behind this complicated design is that Result-Based Financing guidelines within the Bank (OPCS 2007) would not allow such a solution.

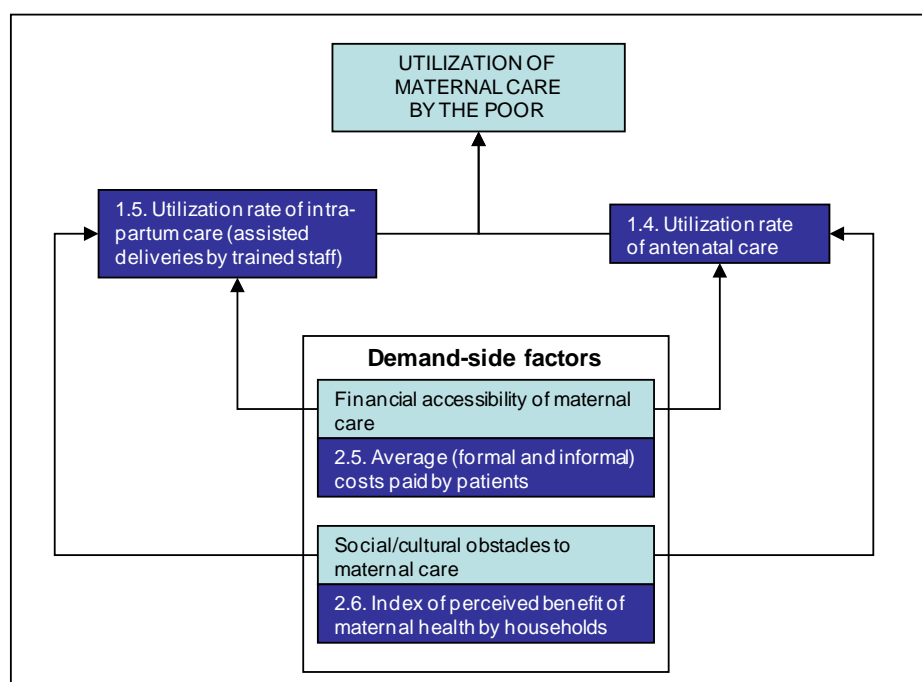
Figure 4: Factors and indicators for quality of maternal care



- The first component is related to quality of antenatal care. It is quite easy to measure, as an adequate antenatal visit requires a minimum set of procedures to be performed (blood pressure check, urine sampled...) and pieces of advice to be given (on nutrition, on danger signs...). This can be easily assessed through exit surveys and/or observation of medical records.
- The second component (quality of intra-partum care) is much more complex.
 - A widely acknowledged quality indicator is the case-fatality rate among women with complications. However, to avoid measurement errors with this indicator, different proxies of quality of intra-partum care will be used.
 - One is the rate of adequate referrals. By adequate, we mean that all women and only women with complications should be referred. This can be measured through medical records.
 - Another set of proxies corresponds to supply-side aspects, that is to say key inputs, such as: (i) availability of essential drugs and equipment, (ii) availability of qualified staff and (iii) skills, knowledge and responsiveness of qualified staff.
 - Regarding the demand side, two indicators will be measured. One is the average (formal and informal) costs paid by patients both for referral and for care. A second indicator is an index of the perception by households of the benefits of maternal health services.

2. The second group of indicators will target the second outcome: increased access of the poor to maternal care. There are only two direct indicators: (i) utilization rate of intra-partum care by poor people and (ii) utilization rate of antenatal care by poor people.

Figure 5: Factors and indicators for utilization of maternal care by the poor



While these indicators seem more straightforward, their measurement within RBF monitoring will be tricky, as they have to take into account income situation of patients. In the first year of RBF implementation (2011), the targets for these two indicators will be set high enough so that health care facilities will be able to reach them only in attracting more poor people than they usually do. They will be able to do so through (i) better targeting poor people with the Health Equity Fund (financial accessibility) and (ii) through advocacy or IEC efforts among communities (social/cultural obstacles). After 2011, a biometric card for registering the poorest should be available and it will then be possible to monitor these two indicators within RBF monitoring. The Impact Evaluation will of course measure the income status or wealth index of the patients through a household survey.

3. The third and last group of indicators covers utilization of other health services (i.e. non maternal health services). They are included only to avoid a possible adverse reaction of health care facilities, which could neglect services not related to RBF.

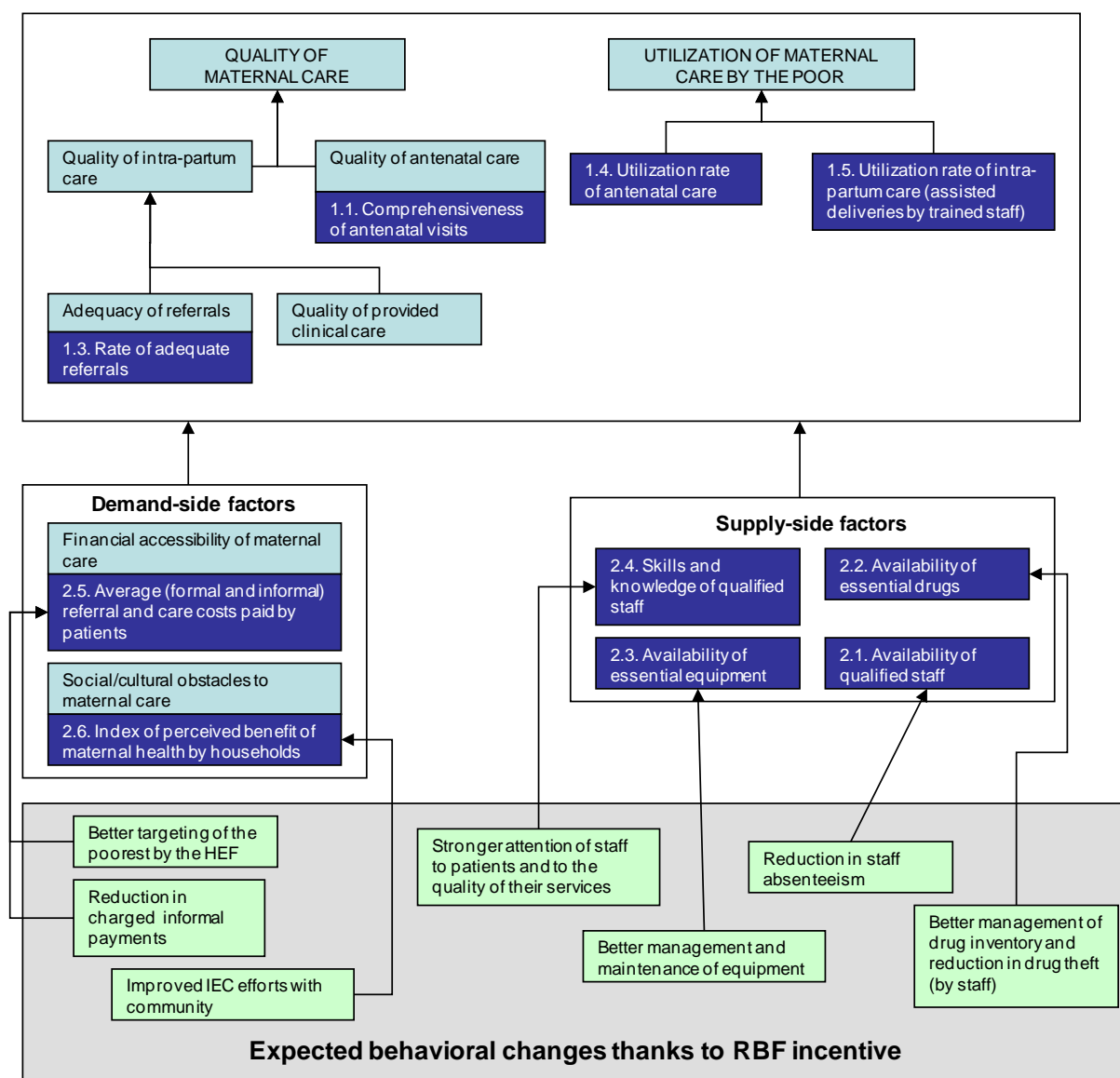
- 3.1. Rate of visits (child and adult)
- 3.2. Immunization rate of children
- 3.3. Growth check: child between 11 and 59 months visits
- 3.4. Number of tuberculosis cases detected
- 3.5. Number of tuberculosis cases fully treated
- 3.6. Bednets distribution (pregnant women)
- 3.7. Latrines build in the catchment area of the HC
- 3.8. Referral and patient arrived at the hospital
- 3.9. Hospital stays (medicine)
- 3.10. Hospital stays (surgery)

How can the RBF mechanism contribute to the selected outcomes?

As seen earlier, progress on maternal health in Bénin are constrained both by a lack of resources and by weak accountability of health care facilities and of health workers behaviors. RBF will indeed inject more resources in health districts (“additional resources effect”), but we expect that it will also foster stronger accountability of health care facilities and a more patient-focused mindset among health workers (“pure RBF effect”).

For the two targeted outcomes, the hypothesized causal chain is illustrated on the figure below.

Figure 6: Identifying possible effects of RBF on quality and utilization of maternal care: a causal chain



Overall, we expect the RBF incentives to trigger 7 behavioral changes, which can have an impact on quality and equity of maternal care.

1. Absenteeism of qualified staff will be reduced, as the RBF incentive may be higher than the revenues made by health workers outside health facilities (i.e. usually with illegal private practice). In other words, if the RBF incentive outweighs the opportunity cost of working full time in a health facility, health workers will come back.
2. RBF should improve the availability of essential drugs. Several studies have found that drug stockouts in Benin are sometimes related to a lack of financial resources but, more often, to a weak management of inventory and ordering process, or even theft by health workers. As one of the RBF indicators is the availability of drugs, it will create an incentive for reducing drug theft and for better managing drug inventories.
3. Similarly, there is evidence in Benin that, although medical equipment is usually available, there is no serious maintenance. This explains why many existing equipment are no longer functional. As the RBF incentive is partly determined by an indicator of “availability of functional equipment”, we expect that health workers will pay more attention to the maintenance of their existing equipment.
4. Although health workers have usually received significant training on maternal care, several studies suggest that they do not provide care at the level of their skills and knowledge. Lack of motivation and patient-focus seem to explain this discrepancy. Our hypothesis here is that, as the RBF incentive is partly determined by indicators of quality of care (i.e. rate of adequate referrals), it will push health workers to make a better use of their skills and knowledge.

5. Also, as referrals may be hindered by limited income of patients, we expect that health workers will use the local Health Equity Funds (HEF) for better targeting patients in need. It is important to note that the RBF performance of BEmOC facilities will be partly measured on adequate referral rates, which imply that referred women actually reached referral facilities. Our hypothesis here is that health workers in BEmOC facilities will try to improve this referral rate in providing funding to poor women they decided to refer.
6. Similarly, RBF incentive should reduce motivation to racket patients through informal payments. This effect would reduce the overall cost of care.
7. Finally, as experienced in Rwanda, health workers may spend part of RBF incentives for launching IEC sessions in communities regarding the benefits of institutionalized maternal care. These IEC sessions could reduce social or cultural reluctance of women (and their family) to deliver in maternities.

2. RESEARCH OBJECTIVES AND QUESTIONS

This Impact Evaluation (IE) has two main objectives: (i) measuring the impact of RBF on health outcomes and (ii) understanding the factors driving this impact.

2.1. Measuring the impact of RBF on health outcomes

For this purpose, several types of health outcomes indicators will be measured:

2.2.1. Indicators for quality and equity of maternal health care

As indicated earlier, we hypothesize that RBF will improve two health outcomes related to maternal health: (i) quality of maternal care and (ii) equity of maternal care utilization. For each of these two outcomes, we intend to measure the indicators in the table below. For each of these indicators, we mention the primary instrument for data collection and the secondary instrument (for data quality control). Indeed, several of these indicators are related to quality of health care, a variable that is not currently routinely monitored. Therefore to ensure data quality, we make an intensive use of triangulation.

Table 4: Detailed indicators for measuring the possible impact of RBF on quality and utilization of maternal care

Indicator	Primary instrument for data collection	Secondary instrument for data quality control	Comments
1.1. Completeness of antenatal visits (or antenatal care / ANC)	- Health facility survey / analysis of medical records (2.2)	- Health workers survey / Direct Clinical Observation (3.4) - Exiting patients survey (4.1)	This indicator reflects quality of antenatal care.
1.3. Rate of adequate referrals by BEmOC	- Health facility survey (BEmOC and CEMOC levels) / analysis of medical records (2.2)	- Exiting patient survey in BEmOC (4.3) for numerator - Exiting patient survey in CEMOC (4.2) for denominator	A referral is considered as adequate if the following conditions are met: (i) the women had a complication, (ii) the women actually went to the CEMOC facility, (iii) her record is comprehensive (e.g. including the description of identified complication) and (iv) she received an official letter from the BEmOC facility.
1.4. Rate of antenatal visits, by wealth index	- Household survey (5.1)		For assessing wealth quintile, the survey questionnaire should be similar to the one used for the Benin DHS 2006.
1.5. Rate of assisted deliveries, by wealth index	- Household survey (5.1)		

2.2.2. Process and structural indicators

A sub-hypothesis is that RBF will improve maternal outcomes in influencing (positively) several process and structural factors, all susceptible to lead to behavioral changes of health workers. The indicators for measuring these expected behavioral changes are given below:

Table 5: Process and structural indicators for measuring the possible impact of RBF

Indicator	Primary instrument for data collection	Secondary instrument for data quality control	Comments
2.1. Availability of health workers (Rate of absenteeism of health workers)	- Unannounced visits in facilities (3.1) for numerator - Health facility survey (2.1) for denominator	- Participating observation (3.5)	In addition, surveyors will look for reasons of absence of each health workers, through a specific survey of management
2.2. Availability of essential maternal drugs	- Health facility survey / observation of drug inventory (2.1)		
2.3. Availability and functionality of essential equipment	- Health facility survey / observation and test of equipment (2.1)		
2.4. Skills and knowledge of health workers (HW) (Quality of clinical procedures performed by HWs)	- Knowledge tests for health workers (3.3) - Direct clinical observation (DCO) of health workers (3.4)		Both analyses will cover three types of medical procedures: ANC, normal delivery and c-section
2.5. Average patient cost of maternal care services	- Exiting patients survey (4.1, 4.2 and 4.3)	- Household survey (5.1) - Participating observation (3.5)	
2.6. Index of perceived benefits of maternal care by household	- Household survey (5.1)		

2.2.3. Indicators for other health care services

The usual risk with RBF scheme is that services not targeted by RBF will be neglected by health workers. To measure this potential problem, utilization of other (non maternal) services will be assessed with the following indicators:

Table 6: Indicators for measuring the possible impact of RBF on other health services

Indicator	Primary instrument for data collection	Secondary instrument for data quality control	Comments
3.1. Rate of visits (child and adult)	- Health facility survey / observation of records (2.2)	- Household survey (5.1)	
3.2. Immunization rate of children	- Health facility survey / observation of records (2.2)		
3.3. Growth check: child between 11 and 59 months visits	- Health facility survey / observation of records (2.2)		
3.4. Number of tuberculosis cases detected	- Health facility survey / observation of records (2.2)		
3.5. Number of tuberculosis cases fully treated	- Health facility survey / observation of records (2.2)		
3.6. Bednets distribution (pregnant women)	- Health facility survey / observation of records (2.2)		
3.7. Latrines build in the catchment area of the HC	- Health facility survey / observation of records (2.2)		
3.8. Referral and patient arrived at the hospital	- Health facility survey / observation of records (2.2)		
3.9. Hospital stays (medicine)	- Health facility survey / observation of records (2.2)		
3.10. Hospital stays (surgery)	- Health facility survey / observation of records (2.2)		

2.2. Understanding why RBF has (or has not) an impact

There are many variables to control if one wants to attribute to RBF a significant impact on health outcomes. This “control” can be made (i) experimentally (through treatment and control groups) or (ii) statistically (through regressions including control variables).

2.2.1. Through experimental control

What matters: paying for results or paying more ?

A tricky aspect of an RBF impact evaluation is that RBF is more a bundle of interventions than a single intervention. Indeed, in a first view, RBF can be summed up as “result-based financial reward” + “external monitoring”. Going a bit further, one can see that the first component (“result-based financial reward”) can be itself broken down into two sub-components: “result-based” + “financial reward”.

In the economics literature, this is referred as the distinction between the “piece-rate effect” (i.e. being paid upon results) and the “additional income effect” (i.e. being paid more).

Such a distinction may seem too subtle and useless. In fact, some researchers are arguing that, in low-income countries, simply paying health workers more will boost their motivation (and consequently their performance), whether this additional income is related to their performance or not⁷. So far, this question has never been rigorously tested in low-income countries.

To test it, we are proposing to have:

- a treatment group, where financial rewards are based on results (“conditional reward”);
- a control group, where financial rewards are a lump-sum, independent from actual results (“unconditional rewards”).

Does management autonomy strengthen the impact of RBF ?

Another important question is usually discussed, but so far not widely tested. Is management autonomy necessary for RBF ? Does it increase the impact of RBF ?

By management autonomy, we mean a strong capacity allocated to facilities managers to take decisions about their budget. So far, only Leonard (2006) has explored this issue (finding a strong impact of management autonomy on performance). However, his design was strictly observational.

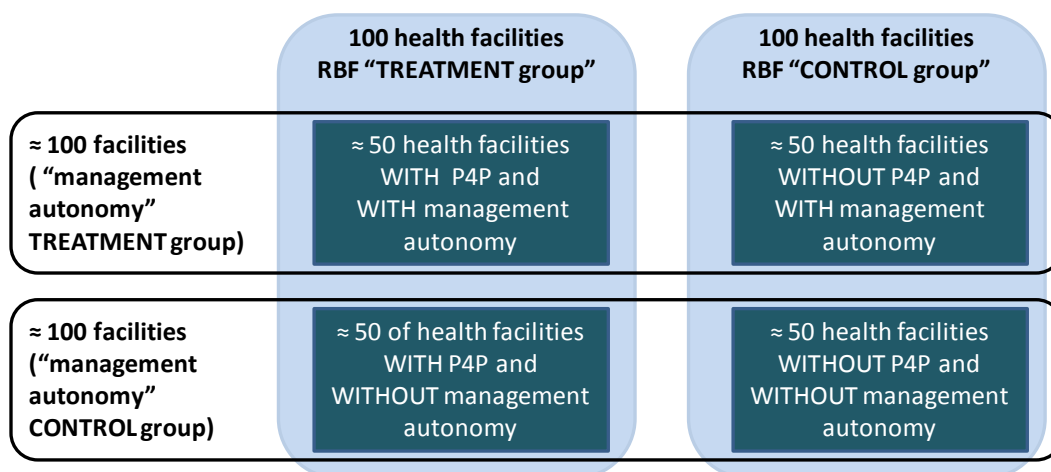
To overcome this weakness, we are proposing to control experimentally this variable. In a cross-over design, two groups will be randomly selected:

- a treatment group, where facilities are fully autonomous as for the use of the received RBF financial reward;
- a control group, where facilities will have to obtain approval for the district health team for deciding how to spend their received RBF financial reward;

Overall, the proposed experimental design is the following:

⁷ As long as there is external monitoring.

Figure 3-5: Proposed experimental design for the Impact Evaluation



2.2.2. Through statistical control

In collecting data to measure several variables, we intend to explore three additional issues.

What is the relation between RBF and health workers' motivation ?

We also expect that RBF will increase job satisfaction of health workers. We therefore plan to measure this variable.

To go further, it may be interesting to explore if RBF has also an impact on the structure of motivational factors. In other words, does RBF strengthen some motivational factors (such as extrinsic motivation) and weaken other ones (such as intrinsic motivation)?

Regarding extrinsic motivation, we would like to test what are the RBF-related changes on two factors: (i) peer pressure and (ii) manager supervision. As RBF is a group incentive (at least in Bénin), it may trigger a significant increase of peer pressure or team monitoring. Similarly, as health care facility managers are also incentivized by RBF, they may start to really manage their teams (something they did not do so far). In fact, some studies on pay-for-performance schemes (see Ketelaar 2007) have shown that pay-for-performance schemes are effective only when they reinforce this management function. In a nutshell, pay-for-performance schemes may "force" managers to manage.

Another growing debate on pay-for-performance is that these schemes can undermine intrinsic motivation (i.e. need for social recognition, professionalism, altruism...). While this phenomenon has been found in many experiments, empirical evidence is still very limited and sometimes conflicting. Therefore our study would try to test this hypothesis. This would be the first study of this kind in the health sector.

Overall, our hypotheses are the following:

1. does RBF increase job satisfaction ?
2. does RBF strengthen equally the various components of extrinsic motivation (peer pressure, manager supervision...) ?
3. does RBF undermine intrinsic motivation ?

All indicators used for testing these 3 hypotheses are described in the table below. Most of them will use specific health worker sub-questionnaires, based on scales that are the most widely accepted and validated by behavioral psychologists.

Table 9: Indicators for measuring job satisfaction and motivational factors of health workers

Table 9: Indicators for measuring job satisfaction and motivational factors of health workers			
Indicator	Data	Instrument for data collection	Comments
Job satisfaction			
8.1. Job Satisfaction	Job satisfaction along 5 components (task-specific motivation, pay, opportunities for promotion, supervision and colleagues)	- Health workers survey (3.2) / Job Descriptive Index	
Extrinsic motivation			
9.1. Peer pressure	Degree of supervision by peers as perceived and experienced by health workers	- Health workers survey (3.2)	
9.2. Manager supervision	Degree of supervision by the manager as perceived and experienced by health workers		
Intrinsic motivation			
10.1. Components of intrinsic motivation		- Health workers survey (3.2)	
10.2. Organizational commitment	Degree of commitment of health workers to their employer		

What is the relation between RBF and corruption?

In the previous part, we sketched out the hypothesis that RBF incentives would increase availability of drugs (through reduction of drug theft), decrease absenteeism and reduce informal payments. In other words, we are assuming that, thanks to RBF mechanisms, health workers (HWs) will now have an incentive to reduce the time they spend on “survival strategies” or corrupt behaviors.

These strategies are to increase revenues of health workers on top of the salary they receive from the government. Many studies (Ferrinho 1998 and Maestad 2007) have described the four main “survival strategies” used by health workers to increase their revenues.

- First, they can steal drugs in health facilities and resell them either to patients exiting these facilities or on illicit drug markets (strategy #1 – “drug theft”).
- Secondly, they can charge patients with informal payments, usually called tips or gifts, although they are obviously a form of racket (strategy #2 – “informal charges”).
- A third strategy consists in embezzling part of collected user fees (strategy #3 – “embezzlement of user fees”).
- Finally, health workers can also have a dual activity, with some private practice, usually illegal (strategy #4 – “private practice”). This activity is usually done outside health facilities, mostly at home or in a clinic.

A more precise definition of our hypothesis is that, (i) if adequate control of RBF results (especially on quality and utilization of care) are in place and (ii) if RBF incentive is higher⁸ than usual revenues drawn from these 4 “survival strategies”, health workers will logically prefer to (i) stay working at their health facility (i.e. reducing their absenteeism) and (ii) reduce practices scaring patients (such as informal charges or drug stockouts because of theft), in order to attract and treat more patients and therefore to improve RBF results (and their RBF-related revenues). In a nutshell, with RBF, health workers may “rediscover” the need to respect and to care for patients in the public sector if this is more profitable for them, financially speaking.

⁸ It is expected that health staff will receive an amount equivalent to 40% to 60% (depending on their category) of their salary with RBF bonuses.

It is therefore extremely important to measure revenues made from these “survival strategies”, as these estimates can help setting RBF incentives at the right level.

In addition, knowing the prevalence of these “survival strategies” will allow evaluating their evolution along the RBF experiment. Logically, as RBF is implemented, these “survival strategies” should become less prevalent.

Finally, data collected on these “survival strategies” can be used to test another hypothesis inspired by a study from McPake (1999). She argued that these strategies can be classified as either “internal” or “external”. For instance, “informal charges” (strategy #2) and “embezzlement of user fees” (strategy #3) are internal ones, as they can be implemented only within a government health facility and are more profitable when more patients are using this facility. Conversely, “drug theft” (strategy #1) and “private practice” (strategy #4) are rather⁹ “external” ones, as they are implemented outside the public health facility. That is why these external strategies imply absenteeism, whereas internal strategies tend to reduce absenteeism. McPake found some evidence suggesting that when, in a given government health facility, “internal” strategies are more prevalent than “external” ones, HWs will try (logically) to attract more patients, especially in providing better quality of care and in being more responsive with patients. Conversely, if external strategies are more prevalent, HWs will not care much about patients.

This interesting insight can be also tested with RBF: does the prevalence of “internal” VS “external” survival strategies have an impact on RBF results?

Overall, data on survival strategies will allow to:

1. set RBF incentives at an adequate level (baseline study);
2. test a first hypothesis that RBF will reduce the prevalence of “survival strategies”;
3. test a second hypothesis that RBF impact is influenced by the extent of “internal” VS “external” survival strategies in health facilities.

The table below describe how we plan to measure the revenues made from these 4 “survival strategies”.

Table 8: Indicators for measuring revenues earned through “survival strategies”

Indicator	Data	Instrument for data collection	Instrument for data quality control	Comments
Strategy #1 – drug theft				
4.1. Drug inventory stock	Beginning of period and end of period level of stocks for essential drugs	- Drug survey (7.1)		Annex 3 explains how the four mentioned indicators will be used for measuring theft and the prevalence of the various strategies for stealing drugs
4.2. Amount of prescribed drugs	Number of prescribed drugs over the period	- Drug survey (7.1)		
4.3. Average workload of the facility	Number of visits and hospital care in the previous period	- Health facility assessment (2.1)	- Participating observation (3.5)	
4.4. Drugs actually received by patients	Number of drugs received by patients (out of the prescribed drugs)	- Exiting patients survey (4.1)		
Strategy #2 – informal charges				
5.1. Informal charges paid by patients	Informal amounts paid by patients (for ANC visit, for normal delivery [with/without	- Exiting patients survey (4.1) ¹⁰	- Household survey (5.1) - Participating observation (3.5)	It will be important to collect data on (i) who asked for informal charges and (ii) for

⁹ It is not quite true for “private practice”. A health worker having dual jobs will still need to spend some time in the government facility, in order to (i) identify, in this government facility, the patients that can be diverted to his private office and (ii) to maintain his reputation (usually higher when a health worker holds a position in the government sector).

¹⁰ Interviews with exiting patients will be conducted outside of the health facility, in order patients to be more confident to tell the truth.

Indicator	Data	Instrument for data collection	Instrument for data quality control	Comments
	episiotomy] and for c-section)			which services
Strategy #3 – embezzlement of user fees				
6.1. Potential user fees revenues from average (or real) attendance	Average user fees * Average (or real if known) attendance	- Health facility assessment (2.1.) - Participating observation (3.5)	- Exiting patients survey (4.1)	
6.2. Potential user fees revenues from recorded attendance	Average user fees * Recorded attendance	- Health facility assessment (2.1.)	- Participating observation (3.5) - Exiting patients survey (4.1)	
6.3. Actual recorded user fees	Recorded total revenues from user fees	- Health facility assessment (2.1.)		
6.4. Actual total expenditures	Recorded total expenditures from user fees	- Health facility assessment (2.1.)		
Strategy #4 – private practice				
7.1. Revenues earned with private practice	Amount of revenues earned with private practice	- Health workers survey (3.1) ¹¹	- Participating observation (3.5)	

¹¹ A health worker survey was conducted in Benin in 2010 to measure the prevalence of dual job practice: health workers were asked about their private activity directly and also through a sensitive survey technique (item account which is a “truth telling method”). With the results of this study, we have an estimation of the percentage of health workers having a private practice in comparison with those who acknowledged it directly.

In addition, we will collect data for the following indicators:

Cost items	Instruments	Comments
3.6. Average time spent with patients per staff category	- DCO (for time spent by doctors with patients) (3.4) - Participating survey (for time spent by other health workers with patients) (3.5)	
	- Health facility survey (for salaries per category) (2.1)	
3.7. Average cost of prescribed drugs (per patient)	- Exiting patients survey (for number and type of prescribed drugs) (4.1.) - Health facility survey (for cost of drugs purchased by the facility) (2.1)	Drug cost is recorded at the cost paid by the facility (i.e. before mark-up)
3.8. Overhead costs (utilities, maintenance, non clinical staff and other costs)	- Health facility survey (2.1)	Overhead costs will be allocated to procedures costs on the basis of time total spent by health workers

Does RBF have an impact on health care seeking behaviors?

This objective is not specifically related to the IE, but it may nevertheless shed some light on the impact of RBF.

Indeed, although RBF is mostly targeting maternal health, it could have also an impact on indicators of other health care services, and more broadly on health care seeking behaviors. For instance, RBF can increase utilization of formal health care services. It may also induce patients to use more frequently government health facilities instead of private or traditional ones.

Therefore, the hypotheses to test are the following:

- does RBF have an impact on utilization of private health providers? If yes, for which symptoms and for which reasons?
- does RBF have an impact on utilization of traditional healers? If yes, for which symptoms and for which reasons?

For defining bypassing behaviors, we will follow Gauthier & Wane (2008). They advocate for using the “options perceived” by patients rather than “theoretical options”. Practically, *“a patient is said to have engaged in bypassing if and only if (i) she knows about other available providers and (ii) the facility she attended is not the closest from her household within the pool of providers available”* (ibid). Other studies were not based on the subjective knowledge of patients. This weakness can be overcome here.

For these tests, data will be collected during households’ survey.

Ethical issues

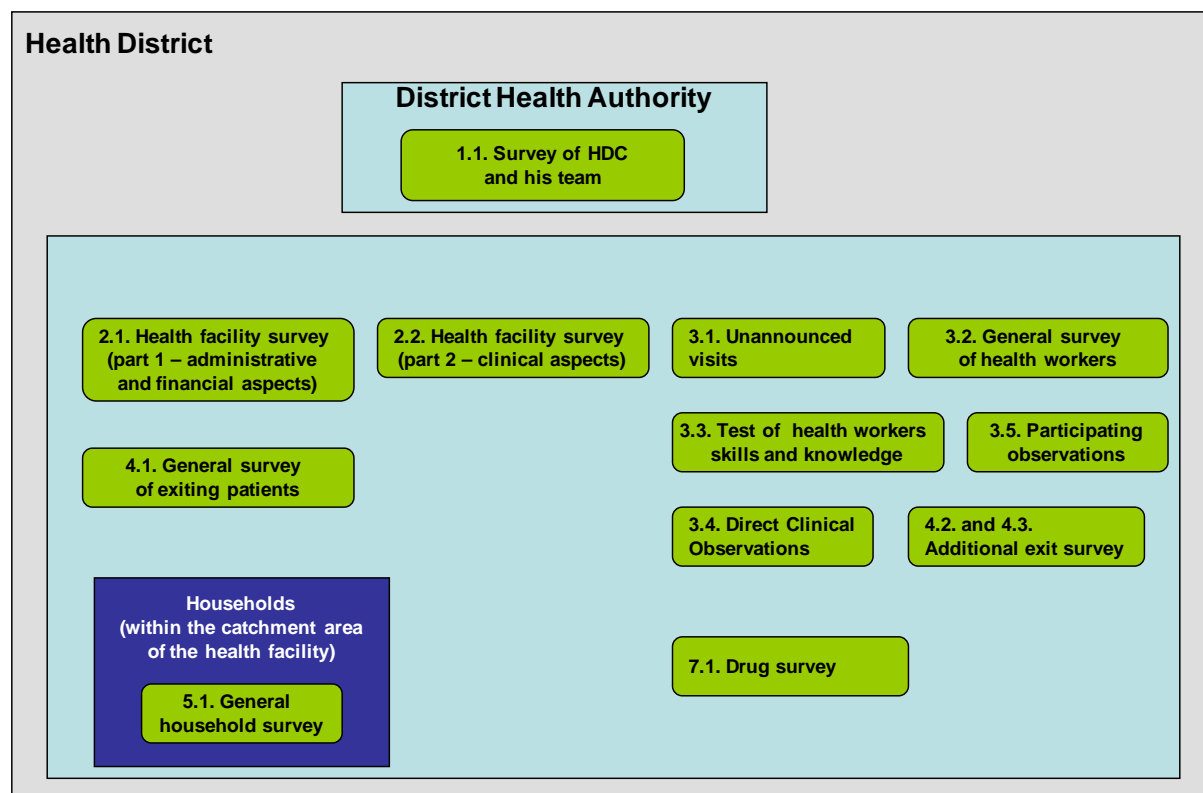
The objectives of the survey and its research protocol have been submitted to the Beninese Ethical Committee and the Scientific Council for approbation. Protocols sent to these committees describe purpose, methodology and procedures of the study. They also include the “consent form” for interviewees and information notes for DCO and households which explain notably principles of voluntary participation to the survey and withdrawal, confidentiality of collected data, benefits and risks to participate.

3. INSTRUMENTS FOR DATA COLLECTION AND IDENTIFICATION

The following instruments will be used in all the 8 selected districts.

As several different types of instruments will be used, their relationships can be illustrated on the figure below:

Figure 7: Relationships between the various survey instruments (in one district)



3.1. District-level assessment

1.1. Survey of Health District Coordinator (HDC) and his/her team

A general assessment will be performed at district level, through a survey of the Health District Coordinator (called “*Médecin Coordonnateur de Zone Sanitaire*” or MCZS) and his/her team.

Most of the data to be collected cover the following topics:

- general characteristics of the district;
- resources of the District Health Authority (“*Bureau de Zone*” or “*Equipe Elargie de Zone Sanitaire*” or EEZS);
- functions performed by this DHA, especially regarding supervision of health care facilities;
- decision space of HDC on managers of health care facilities.

This assessment will be carried out in every selected district.

3.2. Health facility assessments

This instrument will include 2 components.

2.1. Health facility survey (part 1: administrative and financial aspects)

Surveyors will first have to collect **administrative and financial information** through:

- A questionnaire to the manager(s) of the facility;
- A quick observation of the premises;
- An inspection of the drug inventory;
- Observation and analysis of various administrative and accounting documents.

These instruments will mostly serve to collect information on the existing resources in the facility. These resources are financial (revenues obtained from the MoH and from user fees), physical (functionality of premises, such as access to water and electricity, and functionality of equipment) and human (number of employed staff).

In addition, data will be collected on costs.

2.2. Health facility survey (part 2: clinical aspects)

Surveyors will then collect **clinical data**. For this part of the health facility assessment, the instruments to use are:

- A questionnaire to the manager(s)
- A questionnaire to health workers with significant clinical activity;
- Observation of medical records and clinical rooms (especially labor room).

All facilities in the 8 selected districts should be surveyed (with both questionnaires 2.1 and 2.2), except small private for profit clinics (i.e. by an individual). A letter will be prepared by the Bank for requesting approval from AMCES (representing nonprofit facilities) for this survey. Overall, the sample frame includes 201 facilities.

3.3. Health workers surveys

Five different kinds of health workers' surveys will be administered.

3.1. Unannounced visits

Unannounced visits will be carried out in all health care facilities, so as to record absent health workers¹². Two visits will be made (on the same day): one at 8:00 am and another one at 3:00 pm. These proposed times can be modified, if field testing gives good reason for it. Exact names of absent health workers have to be recorded. The day of the week of the unannounced visit should be randomized and unknown to the interviewers until the last moment.

In addition, during these visits, management and colleagues must be interviewed to obtain a possible explanation for absence. Reasons for absence should follow the list proposed by Chaudhury (2003):

- training (organized by a donor or by the MoH);
- authorized leave;
- sickness;
- official duties (i.e. meeting outside the facility);
- official travel (i.e. medical outreach);
- other (non justified).

¹² Surveyors should visit each facility a few days before, in order to carry out surveys 2.1 and 2.2 and to obtain a detailed roster of employed personnel.

3.2. General survey of health workers

A general questionnaire will also be administered to health workers. This survey will strive to measure a wide number of topics, including: private practice, total revenues, job satisfaction, perceived degree of supervision and motivational factors.

According to our estimates, there is approximately an average of 100 qualified health workers per district:

Table 11: Number of qualified health workers per district

	Per district	Total (for the 8 districts)
Nurses	60	480
Midwives	25	200
Doctors (non surgeons)	8	64
Doctors (surgeons)	4	32
Total	97	776

Source: Annuaire statistique 2006

In each facility, five (5) qualified health workers (doctors, midwives and nurses) will be randomly selected and will be surveyed.

3.3. Test of skills and knowledge

This test will strive to measure the *theoretical capacity* of health workers. The specific questionnaire to be used is the module #7 from UNFPA.

For the knowledge test (3.3) and the DCO (3.4), administering the surveys make sense only with health workers regularly involved in maternal care (i.e. nurses, midwives and doctors).

For the **skills and knowledge test** (3.3), 3 qualified health workers per facility will be randomly selected.

3.4. Direct Clinical Observations (DCO)

In order to measure *actual capacity* of health workers in providing quality care, a series of DCO will be performed among qualified health staff. In every major PHC centers¹³ (“CSC” in Benin) and district hospital (about 32 facilities are in this situation), two (2) qualified health workers will be selected and will be observed through DCOs.

The medical procedures to be evaluated by these DCOs are antenatal care (ANC) visits. The **DCO survey** (3.4) is very demanding on surveyor time, as at least 10 visits (i.e. patients) per day and per health worker must be observed, in order to avoid a possible Hawthorne effect (see Leonard 2006).

It must be noted that the DCO checklist will also have to be used with the exiting patients’ surveys, in order to assess quality of care from the patient point of view (“perceived quality”).

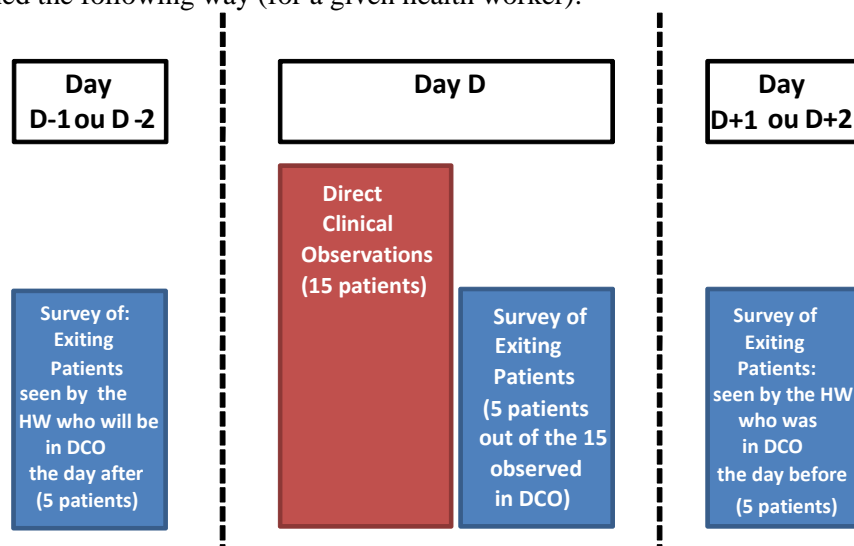
This double survey on quality of care will also serve to measure the importance of a probable Hawthorne effect. For this reason, it will be important that the survey on exiting patients (described hereafter) be carried out during a significant period **before** and also **after** DCOs are done¹⁴.

¹³ DCO will be conducted only in major health centers in order to be sure to have at least 2 qualified health workers for the observation and enough patients to avoid a Hawthorne effect.

¹⁴ Leonard (2006) found that, with DCOs, a Hawthorne effect can occur. In other words, when they feel observed, doctors are improving the quality of their services.

Leonard also found that this effect is short-lived. On a given day, after about 10 or 15 visits (i.e. observed with DCO), efforts by doctors – and therefore quality of care – diminish quickly and come back to their pre-DCO level. In using data on quality of care collected before and after DCO (through a survey with exiting patients), Leonard has also been able to show that this pattern was really a Hawthorne effect and was not caused by other factors (e.g. the fact that doctors could get tired at the end of the day). Our survey design will allow replicating Leonard’s analyses.

To ensure control of DCO results through exit patient surveys, DCOs and exit surveys will be combined the following way (for a given health worker):



3.5. Participating observation

Finally, additional data on health workers will be collected through “**participating observation**”. This type of observation means that a separate team of surveyors will have to spend a significant period (probably one month) in the selected facilities. The objective is to have these surveyors accepted and trusted by health workers. Once they reached this situation, they will have to collect information on the following topics:

- productivity of health workers;
- extent and earned revenues with private practices;
- earned revenues with drug theft, user fees embezzlement and informal payments.

An outline of the minimum set of data to collect through this instrument is given in appendix L.

This specific component will be sub-contracted to a research center or a university with experience in conducting anthropological studies in Benin (preferably in the health sector).

In each district, two facilities will be randomly selected for this analysis.

Overall, for the 5 health workers surveys, the estimated sample sizes are the following.

Table 1: Sample sizes for the health workers surveys

3.1. Unannounced visits	1000	Whole population of health workers
3.2. General questionnaire	800	Random selection of qualified health workers (5 per facility)
3.3. Skills and knowledge test	600	Random selection of qualified health workers (3 per facility)
3.4. DCO	64 qualified health workers, with 15 patients/visits for each	Random selection of qualified health workers (2 per major health facility)
3.5. Participating observation	200	Random selection of qualified health workers (2 health facility per district)

3.4. Patients surveys

4.1. General survey of exiting patients

A general questionnaire will be administered to **patients exiting the health care facility**.

Most of the questions to ask them are addressing the following topics:

- health care seeking behavior,
- perceived quality of care,
- prices paid...

Specific information will be collected for women after an ANC visit. Additional questions will also be asked to women leaving the facility for being referred in another facility (see 4.2 and 4.3. below).

For exiting patients' interviews, two kinds of facilities will be selected:

- facilities where a drug survey is carried out;
- facilities where DCOs are conducted.

In both cases, per facility, about 30 exiting patients will be surveyed, leading to an estimated total of 1,920 observations.

In the first case (facilities with drug survey), it is assumed that all exiting patients will be surveyed. For this reasons, only small facilities (with about 10 patients per day) will be selected. 32 of these small facilities ("CSA" in Benin classification) will be selected.

In this second case (facilities with DCOs), the facilities are big ones. Therefore, a sample of exiting patients will be selected (see above in the DCO section).

As mentioned earlier, there will be a relation between exit surveys (4.1) and DCO (3.4). To be able to spot a possible Hawthorne effect, it will be necessary to assess quality of care (as provided by qualified health workers) before and after DCOs. Exit surveys will provide the instrument for this control. Naturally, exit surveys will to be performed when the health worker on duty is the same as for DCO.

In addition, an exit survey will be also carried out the same day as the DCO, so as to compare perceived and objective quality of care.

NOTE: The selected firm will have to provide with enough enumerators, so that patients do not have to wait before being interviewed. Typically, a consultation will last much less than an interview. Bottlenecks due to the exit survey could produce discouragement in the arriving patients. They might leave without consulting anybody. This could create a serious selection bias.

4.2. Additional questionnaire for women having delivered

For women exiting after delivery (vaginal delivery or c-section), an additional questionnaire will be administered. Among these women, those who have been referred will be asked specific questions.

4.3. Additional questionnaire for women being referred

For women leaving a facility because they are referred to another one, a specific exit survey will be conducted.

3.5. Households surveys

5.1. General household survey

A household survey will be conducted in each district. Data to be collected will mostly relate to:

- socio-demographic characteristics;
- health seeking behaviors.

A total of 2,000 households will be surveyed.

To select the households to be surveyed, a stratification of the 200 health facilities will be carried out. A catchment area will be established for each of them. These areas correspond to the geographical “attractiveness” of the main health facilities (CSA “*Centre de Santé d’Arrondissement*” or Arrondissement Health Center). Once these catchment areas have been defined, “enumeration areas” (EA) will be assigned to each one, then 2 EA will be randomly selected and 5 households will be randomly sampled in each of these enumeration areas. An eligibility criterion for households’ selection has been defined: households with a birth or a pregnancy in the last three years.

Each of these facilities has a catchment area, which is defined by the geographical origin of the outpatients of a given CSA (“*Centre de Santé d’Arrondissement*” or Arrondissement Health Center), the lowest level of care. Given that there are, on average, 25 CSA per district, it is expected that 25 catchment areas can be defined in each district. Defining precisely these areas will be possible using the average distance to reach a health center (DHS 2006). This distance will be 5 km for 6 districts and 15km for the 2 larger districts in the north of the country (Banikoara and Kouandé), in order to have at least 80% of the population in the catchment areas. These catchment areas (roughly equivalent to “*arrondissement*”) will be the unit of analysis as they are, by construction, related to a specific facility.

As indicated earlier, RBF and “increased management autonomy” are facility-based interventions. For these interventions, there are 100 clusters (i.e. 2 enumeration areas per health facility and we have 50 HF in each of the 4 groups of health facilities).

With Optimal Design ©, the parameters are therefore the following:

- number of clusters (i.e. EA) = 100
- number of observations by cluster (i.e. number of HH by EA) = 5
- intra-class correlation = between 0.05 and 0.10
- alpha = 0.05

At 80% power, the minimum effect size we can detect is 0.30, which is quite precise (see Cohen).

3.6. Drug survey

7.1. A specific drug survey will be conducted (i) for assessing the percentage of drug inventory that has been pilfered by health workers and (ii) for analyzing drug purchasing behaviors of patients. The methodology for this survey is outlined in annex 3.

A specific survey on drugs will be conducted in 32 health facilities (not the ones where DCO is conducted). As explained earlier, small facilities will be selected in order to be able to survey all exiting patients (with about 10 patients per day).

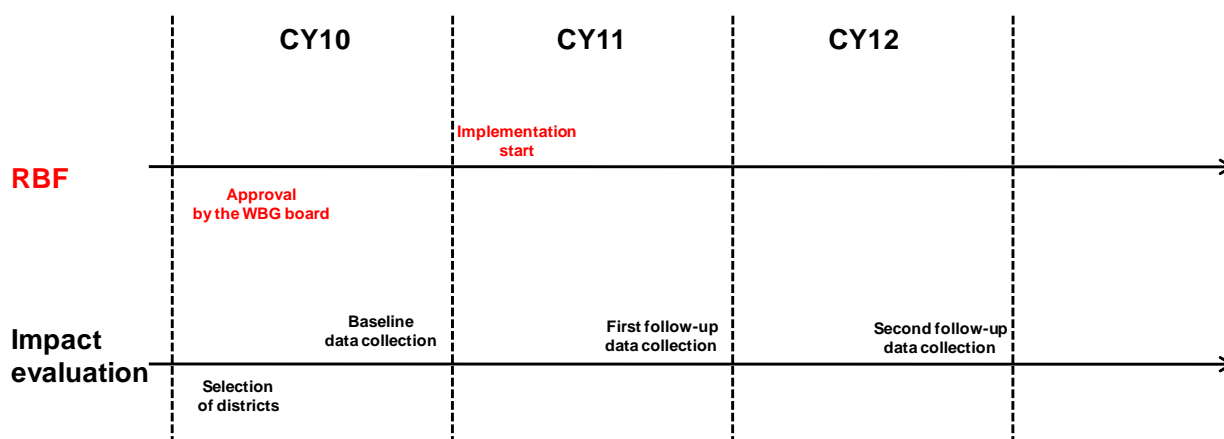
A specific team of surveyors will study each selected facility for three days. The survey will consist in unannounced visits, during three days, at two different time of the day (at the opening time of the health facility and at its closing time). Surveyors will measure the physical inventory for each drug (about 1 hour) and will check the various prescriptions for the day (2 hours).

4. TIMELINE

The Impact Evaluation (IE) will include:

- one baseline survey;
- two follow-ups.

The tentative timeline is the following:



For the baseline, the detailed timetable is the following:

Tasks (ENG)	Aout				Septembre				Octobre				Novembre				Decembre			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Translation of questionnaires																				
Workshop for validation and finalization of questionnaires																				
Finalization of questionnaires																				
Elaboration of the survey protocol (for Ministry)																				
Elaboration of survey manuals																				
Purchase of materials																				
Recruitment of surveyors																				
Field testing																				
Finalization of survey manuals																				
Elaboration of the DEP																				
Training of surveyors on HH and HF																				
Training of data entry staff																				
Supervision of survey																				
Data collection for HH																				
Data collection for HF																				
Data entry																				

5. BUDGET

This IE will use several sources for funding, including:

- HRITF fund;
- GAVI HSS fund, and
- SIEF.

The breakdown of expenses and resources is the following:

Budget - All figures in US\$	Estimated Costs					Sources of funding				
	FY10	FY11	FY12	FY13	TOTAL	FY10 - FY13				
	USD	USD	USD	USD	USD	BB	GAVI	HRITF Benin	HRTIF Anchor	SIEF
TOTAL COSTS (I+II)	60,000	600,000	540,000	540,000	1,740,000	184,000	150,000	1,000,000	110,000	296,000
I. Impact evaluation (Baseline and follow-up)	60,000	580,000	520,000	520,000	1,680,000	164,000	150,000	970,000	100,000	296,000
A. Staff salaries	30,000	30,000	30,000	30,000	120,000	114,000				6,000
B1. Consultant fees (firm in charge of data collection)	10,000	470,000	450,000	450,000	1,380,000	30,000	150,000	960,000		240,000
B2. Consultant fees (technical support)	10,000	60,000	20,000	20,000	110,000			10,000	100,000	0
C. Travel & Subsistence	10,000	20,000	20,000	20,000	70,000	20,000				50,000
SUB-TOTAL 1 Impact evaluation	60,000	580,000	520,000	520,000	1,680,000	164,000	150,000	970,000	100,000	296,000
A. Workshops (during implementation)	-	15,000	15,000	20,000	60,000	20,000	-	30,000	10,000	-
SUB-TOTAL 2 Dissemination	0	20,000	20,000	20,000	60,000	20,000	0	30,000	10,000	0
TOTAL COSTS (I+II)	60,000	600,000	540,000	540,000	1,740,000	184,000	150,000	1,000,000	110,000	296,000

NOTE:

- SIEF = Spanish Impact Evaluation (trust) Fund
- In line B2, consultant fees refer to technical support provided by the RBF team (including data quality control, sampling, cost-effectiveness and health measurement)
- estimates

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- UNFPA – Enquête 2009 santé maternelle – module 3 (drugs and equipment)	Health facility / general
- UNFPA – Enquête 2009 santé maternelle – module 4 (clinical workload of the facility)	Health facility / general
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- UNFPA – Enquête 2009 santé maternelle – module 7 (BEmOC and CEmOC activities)	HRH / knowledge in maternal and neonatal care
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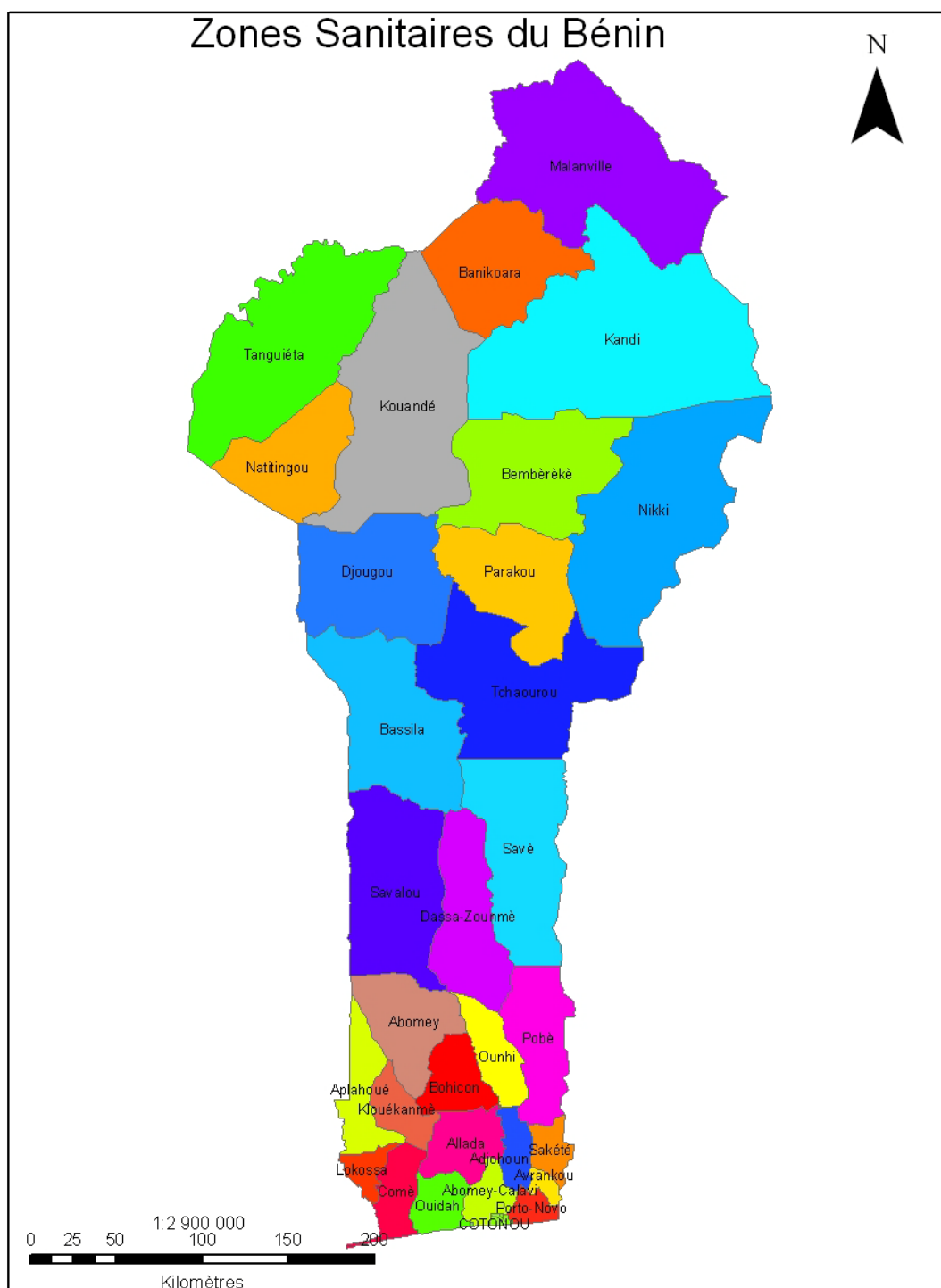
ANNEXES

Annex 1: List of health districts in Benin

On the following table, districts selected for RBF have been highlighted. The table also shows that the selected districts were mostly the poorest and/or those without support from a donor.

Table 18-1: Criteria used for selecting the 8 RBF pilot districts

Region	District	Population (2007)	Incidence of monetary poverty (2006)	Incidence of non monetary poverty (2006)	Major donor in the district ?
Atacora	Tanguéta-Cobly-Matéri	237,603	33.7	73.0	Yes
Atacora	Natitingou-Boukoubé-Toucountouna	199,619	33.1	73.0	Yes
Alibori	Malanville-Karimama	188,539	41.1	60.1	Yes
Ouémé	Adjohoun-Bonou-Dangbo	180,139	30.0	54.1	No
Zou	Covè-Ouinhi-Zangnanado	126,649	35.4	52.7	No
Mono	Comè-Bopa-Houéyogbé-Grand-Popo	133,642	30.1	52.3	Yes (BTC)
Atlantique	Allada-Toffo-Zè	492,564	43.9	52.0	No
Borgou	Nikki-Kalalé-Pèrèrè	300,691	43.8	51.7	Yes
Couffo	Aplahoué-Djakotomè-Dogbo	357,037	34.8	49.6	Yes (BTC)
Plateau	Pobè-Kétou-Adja-Ouèrè	309,853	34.8	48.7	No
Couffo	Klouékanmè-Toviklin-Lalo	287,330	36.0	47.3	Yes (BTC)
Atacora	Kouandé-Ouassa-Péhunco-Kérou	222,119	32.5	45.9	No
Borgou	Tchaourou	132,675	43.9	44.2	Yes
Mono	Lokossa-Athiémè	279,209	22.8	43.4	No
Borgou	Parakou-N'Dali	269,687	29.9	43.3	Yes
Alibori	Kandi-Gogounou-Ségbana	282,582	41.3	42.2	No
Zou	Bohicon-Zakpota-Zogbodomey	315,063	31.4	41.8	No
Zou	Djidja-Abomey-Agbangnizoun	251,980	33.1	40.9	Yes
Borgou	Bembèrèkè-Sinendé	196,125	42.4	40.9	No
Donga	Djougou-Copargo-Ouaké	327,510	34.0	40.6	Yes (BTC)
Plateau	Sakété-Ifangni	166,283	35.9	36.2	Yes (BTC)
Alibori	Banikoara	175,122	49.0	35.3	No
Collines	Savalou-Bantè	227,104	31.2	33.6	No
Collines	Savè-Ouèssè	200,073	32.7	31.8	No
Atlantique	Ouidah-Kpomassè-Tori-Bossito	228,688	34.4	31.8	No
Donga	Bassila	84,081	32.0	30.2	Yes
Ouémé	Porto-Novo-Aguégués-Sèmè-Podji	432,619	24.0	25.2	No
Littoral	Cotonou 6	194,353	31.9	23.8	No
Collines	Dassa-Zoumè-Glazoué	224,139	30.0	20.7	No
Atlantique	Abomey-Calavi-Sô-Ava	306,896	32.6	18.5	No
Littoral	Cotonou 2 et 3	229,639	24.0	18.3	No
Ouémé	Avrankou-Adjarra-Akpro-Missrété	252,352	24.5	17.7	No
Littoral	Cotonou 1 et 4	114,783	23.4	14.9	No
Littoral	Cotonou 5	195,647	24.1	10.2	No



Annex 2: Description of the RBF mechanism

1. Selection of Health Districts and Facilities to benefit from RBF credits

1. In Benin, the implementation of RBF takes place within an experiment. It should allow determining if RBF improves health system performance. In order to answer this question, an ideal experiment has to be randomized, controlled and prospective, as for a clinical trial.

2. RBF will be implemented in 8 health districts, out of the 34 existing. As the government wanted to keep control of the selection of districts, they have not been chosen randomly. Rather, three (3) criteria have been used to select these districts. A given district had more chance to be chosen if:

- 1. Its indicators of maternal health (antenatal care and assisted deliveries) were lagging behind the national average;
- 2. Prevalence of poverty is high;
- 3. There are no major donors supporting the health district.

3. The 8 selected districts are:

Table 15-1: Selected districts for RBF

Region	District
Alibori	Banikoara
Atacora	Kouandé-Ouassa-Péhunco-Kérou
Zou	Covè-Ouinhi-Zangnanado
Zou	Bohicon-Zakpota-Zogbodomey
Mono	Lokossa-Athiémè
Ouémé	Adjohoun-Bonou-Dangbo
Ouémé	Porto-Novo-Aguégués-Sèmè-Podji
Atlantique	Ouidah-Kpomassè-Tori-Bossito

4. Within these 8 districts, “RBF treatment” will be assigned randomly to the 200 facilities (health care centers and hospitals). Thus, the “control” dimension is also completely ensured, given that there will be two kinds of facilities in the experiment:

- about 100 facilities will be fully integrated in the scheme and be called “RBF treatment facilities”;
- the remaining 100 facilities will also benefit from RBF credits, but the amount of these RBF credits will be related to the groupwide performance and therefore weakly based on performance achieved by facilities. These facilities will be called “RBF control facilities”.

5. The experiment will also be prospective, given that a baseline study will be conducted before implementation of RBF. Follow-up studies will take place each year.

2. Elaboration of the RBF framework document

6. As will be seen, RBF will be implemented through contracts between General Secretary (GSM) and health facilities. Before this contracting process begins, an RBF framework document will be elaborated by the GSM (in coordination with the DPP) and approved by the Steering Committee and the Bank. It will be a condition for disbursement.

7. This framework document will be valid for the duration of the project, but could be revised each year. It should include the following elements:

- Maximum amounts for RBF credits for each year of the project and for each district;
- Outputs to be subsidized by RBF;
- Unit costs and subsidization level for each RBF output;
- A template for an "RBF facility contract"

8. Although the final list of outputs to be related to RBF has to be confirmed (in the RBF framework document), the agreed list for a primary health facility is so far the following:

Table15-2: Quantitative indicators for RBF and RBF credits

QUANTITATIVE INDICATORS	RBF CREDITS (FCFA)	RBF CREDITS (US\$)
MATERNAL CARE SERVICES		
1. Fourth Antenatal care visit	3 000	5,82
2. Fourth Antenatal care visit for a woman identified as poor (additional credit)	3 000	5,82
3. Assisted delivery	7 500	14,55
4. Assisted delivery for a woman identified as poor (additional credit)	6 000	11,64
5. Postnatal visit	1 500	2,91
6. Family planning: number of previous and new acceptors at the end of the month	1 500	2,91
7. Pregnant women VAT fully immunized (2-5)	3 000	5,82
8. Second dose of Sulfadoxine	150	0,29
9. Referral for delivery	3 600	6,98
OTHER HEALTH CARE SERVICES		
10. Rate of visits (child and adult)	300	0,58
11. Immunization rate of children	3 000	5,82
12. Growth check: child between 11 and 59 months visits	150	0,29
13. Number of Tuberculosis cases detected	15 000	29,10
14. Number of Tuberculosis cases fully treated	27 000	52,38
15. Bednets distribution (pregnant women)	300	0,58
16. Latrines build in the catchment area of the HC	15 000	29,10
17. Referral and patient arrived at the hospital	4 500	8,73
18. Hospital stays (medicine)	45 000	87,30
19. Hospital stays (surgery)	45 000	87,30

9. The RBF credits obtained from these quantitative outputs will be adjusted with the quality of care. Quality will be measured every 3 months through a check-list (different for health centers and hospitals) which includes different components of quality: for example clinical processes, technical quality of care delivered, drug management, equipment, financial management...The final list of items for measuring quality of care will be included in the RBF framework document. A preliminary list agreed with the Steering Committee is the following:

Table15-3: Qualitative indicators for RBF (check-lists)**Health Centers**

CATEGORY	Number of indicators	Number of points available	Weight
1. General activities	9	300	11%
2. Monitoring and evaluation/ SIS	8	195	7%
3. Hygiene, environment and sterilization	11	220	8%
4. Outpatient visits and hospital stays	14	350	13%
5. Maternity	5	235	9%
6. Antenatal care	14	150	6%
7. Family Planning	10	110	4%
8. Immunization and children follow-up	10	130	5%
9. HIV/Aids	11	270	10%
10. Tuberculosis and Leprosy	4	150	6%
11. Laboratory	6	71	3%
12. Minor surgery	5	53	2%
13. Drug management	8	205	8%
14. Financial management	10	200	8%
Total	125	2 639	100%

Hospitals

CATEGORY	Number of indicators	Number of points available	Weight
1. General indicators	9	350	13%
2. Patient management	4	150	6%
3. Action Plan	3	40	1%
4. Budget, accounts and assets management	6	400	15%
5. Drug management	9	400	15%
6. Hygiene and sterilization	8	200	7%
7. Outpatient visits/ Emergency	21	420	16%
8. Family Planning	9	50	2%
9. Laboratory	14	115	4%
10. Hospitalization rooms	7	80	3%
11. Maternity	12	240	9%
12. Operating room	10	220	8%
13. Drugs		30	1%
Total	112	2 695	100%

10. As can be seen, several specific outputs (e.g. targeting the poorest) will benefit from a higher subsidization by RBF. Conversely, other outputs will receive a lower RBF subsidization. For instance, given that immunization rates are already high in Benin, this item will have a low RBF subsidization.

3. Measurements and controls of the results

11. As mentioned earlier, to measure the achieved results in each facility and therefore to determine the amount of RBF credit it can receive, several indicators will be monitored.

12. All indicators will be first measured by health facilities managers and then controlled by various entities (see below), including:

- District health teams (called EEZS in Benin);
- “District controllers”, who are independent technical assistants permanently based in each district and paid by the “M&E” third party (an international RBF firm, to be selected at the beginning of the Project);
- Community-based organizations (CBOs), which are contracted by the “M&E” third party (international firm) during years 1 and 2. In subsequent years (3 and 4), they will be funded directly by the MoH (through Component 2A of the Project), as they are expected to gradually replace “district controllers” (for the sake of sustainability).

13. Timing and responsibilities for measurement and control can be described the following way:

Table 2: Measurement and controls for RBF indicators

	Measurement		Control	
	When?	By who?	When?	By who?
Quantitative indicators (19)	Monthly	Health facilities teams	Monthly	Consistency check: EEZS and “district controllers”
			Quarterly	Verification: CBOs
Qualitative indicators	Quarterly	For HC: EEZS and “district controllers” For hospitals: “district controllers” and peers (other hospitals and directorate for hospitals)	Every 6 months (random sample and unannounced visits)	Verification: “District controllers” and CBOs

14. For control, several instruments will be used. Whenever possible, each indicator is controlled through at least 2 different sources of data. One of these sources is the local community.

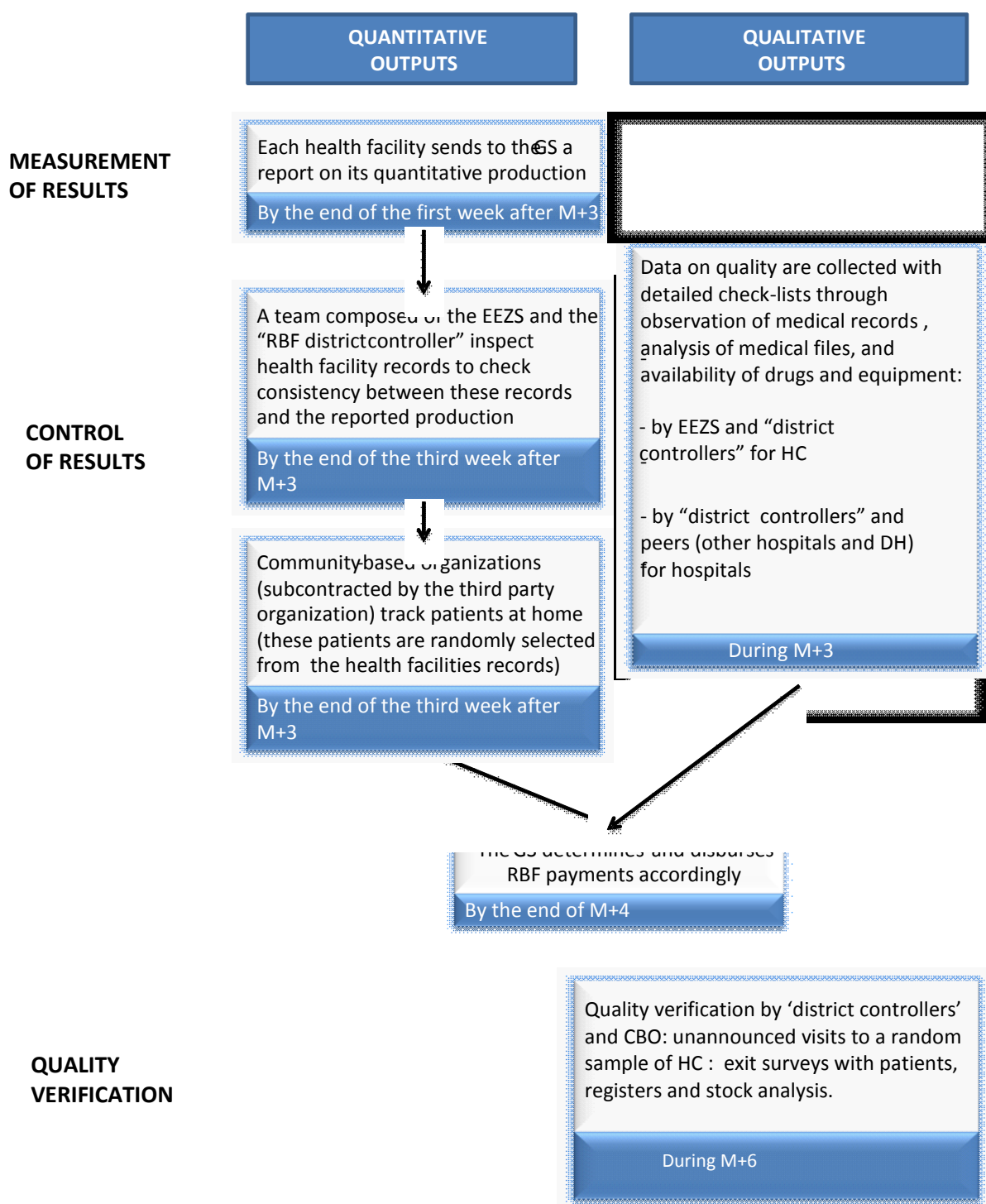
15. The instruments are the following:

Table 3: Instruments for measuring RBF indicators

Instrument for data control	For which indicator (as an example) ?	By who?
Consistency check between reported indicators and facilities records	Number of 4 th antenatal care visits	EEZS and “district controllers”
Survey of patients at home (these patients will have been randomly selected from the list of patients mentioned in the facilities records)	Number of 4 th antenatal care visits	Community-based organizations
Direct observations	Availability of drugs	“District controllers”
Exit patients survey	Quality of antenatal care visits	“District controllers”
Unannounced visits in health facilities	Absenteeism of staff	“District controllers”
Test of staff skills and knowledge	Staff skills and knowledge	“District controllers”

16. Overall, the process for **measuring and controlling results** is the following:

Figure 1: Processes for measuring RBF indicators



17. Note that the results of these monitoring activities will be presented to the facilities during districts meetings (every six months).

4. Determination of RBF credit amounts

18. As explained earlier, health facilities will report their quantitative production to the GSM. A team composed of district health officers (EEZS) and the external “district controller” will first check the consistency of these results with the health facility records. In addition, a random sample of patients mentioned in the health facility records will be contacted at home by a community-based organization, so as to verify that these results (outpatient visits and deliveries) are not fake ones.

19. With these information, the GSM will calculate the RBF credit for each health facility.

5. Payment of RBF credits

20. Payment of the RBF credit will take place every 3 months, when the GSM has defined the amount of this credit for each facility (according to the process previously described in part 6 of this annex).

21. This payment will be directly sent to the health districts (ZS) and facilities accounts (if financial management capacities of facilities have been deemed by the Bank as appropriate). Designated accounts will be created.

6. Utilization of RBF credits by the facilities

22. The precise rules to be followed for using RBF credits has been defined with the Government in the Operational Manual of the Project. Note that “control” facilities will comply with the same rules.

23. Some key principles have already been agreed and are described below:

(a) Health facilities will have to spend a minimum portion of the RBF credit on equipment (including ambulances), drugs, training sessions, IEC actions or outreach.

(b) Expenditures on (even minor) works (including rehabilitation or new construction) will not be eligible and cannot be funded with RBF credits.

(c) Also, following discussions with the Government and with unions, staff recruitment with RBF credits will not be allowed.

(d) As for how RBF credits are spent (in compliance with the above-mentioned principles), decision making will depend on the type of facility.

24. Some facilities will be granted “increased management autonomy” (c.f. box below for details). Practically, for these facilities, the facility manager will decide the allocation, after discussions with workers (according to modalities to be defined).

25. For the other facilities, the health district officer (MCZS) will decide the allocation.

Box: Facilities with more management autonomy

During the first 3 months of RBF implementation, all the facilities included in the RBF districts will be randomly assigned in 2 groups of equal size.

The first group will include the facilities being granted “increased management autonomy” (i.e. they can freely decide of the allocation of the RBF credit, in compliance with some principles).

The second group will be for the other facilities.

The objective of the scheme is to test the impact of increased management autonomy. Studies suggest indeed that RBF mechanisms are fully efficient when they are associated with increased management autonomy of the facilities. The breakdown of the RBF facilities in 2 groups allows answering this question.

26. Out of the RBF credits, a limited portion (5% maximum) will be used to provide incentives to managerial units related involved in RBF implementation. These entities will be the following: District

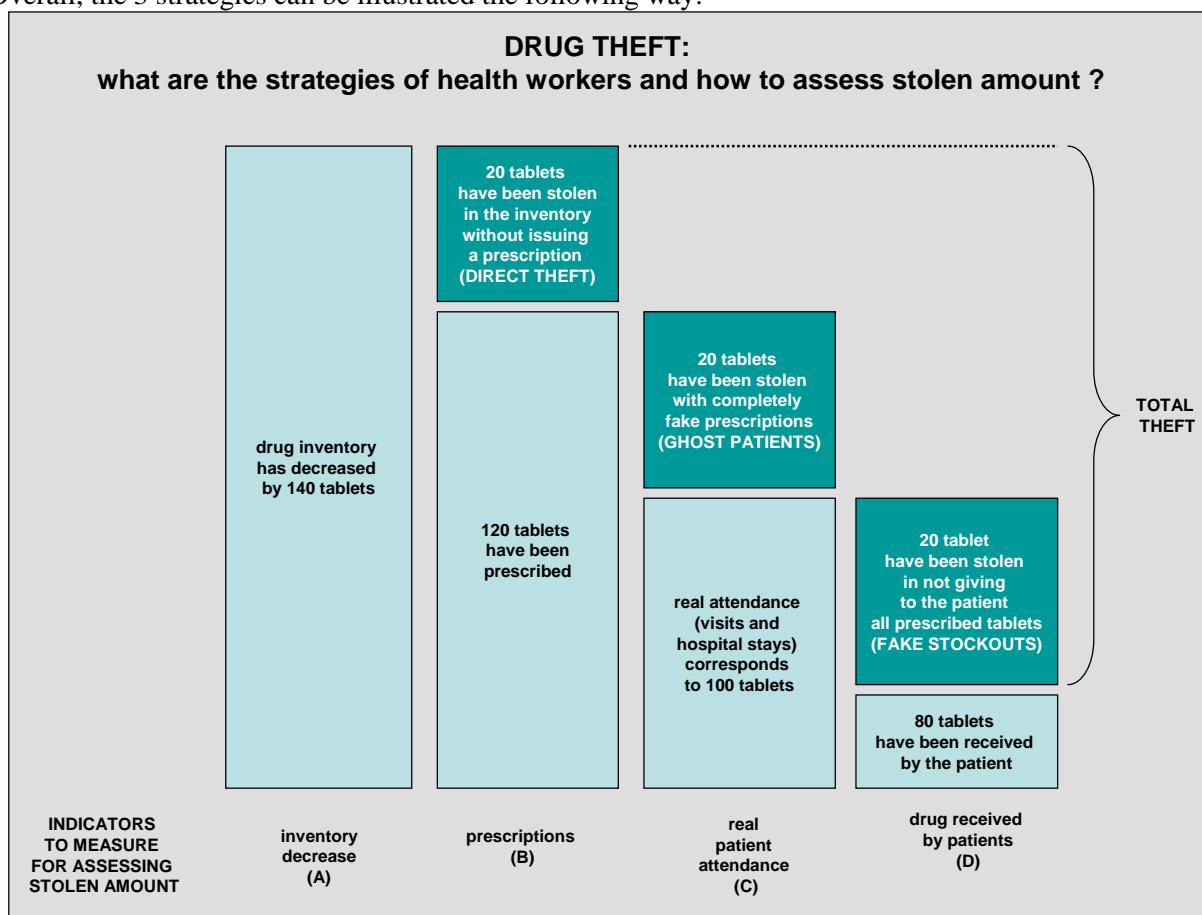
Health Teams (EEZS), Regional Health Teams (DDS), DPP, DSF, DH, DRFM, CPMP and IGM. Results achieved by these entities will be controlled by the GSM, on the basis of outputs to be defined with the Government (and mentioned in the RBF framework document).

Annex 3: Methodology for measuring the amount of stolen drugs in health facilities

As found by McPake (1999), several strategies can be used by health workers to steal drugs in inventories of their health care facility:

1. The first strategy is the simplest one and consists in directly removing drugs from the inventory, without even preparing a prescription for justifying this stock outflow. This can be noticed in comparing (i) the decrease in total drug inventory (A) and (ii) the amount of drugs that have been prescribed (B).
2. A second strategy, slightly more sophisticated, is to issue a fake prescription, not corresponding to any patients. This “ghost patient” strategy can be assessed in comparing (i) the amount of drugs that have been prescribed (B) and (ii) the normal activity in terms of visits and hospital stay for the period (C).
3. The final strategy (“fake stockouts”) is to tell patients that drugs are not available, while they are indeed. The patient has to buy drugs elsewhere, but the health worker will remove the total amount of drugs from the inventory. This can be measured in comparing (i) the normal activity in terms of visits and hospital stay for the period (C) and (ii) the amount of drugs received by patients.

Overall, the 3 strategies can be illustrated the following way:



Consequently, to assess the amount of drugs that has been stolen one must collect data on the 4 above-mentioned indicators (A, B, C and D).

Three important points must be kept in mind by surveyors.

- First, it is important that data collection takes place over a significant period. McPake spent 2 months with her team in the facilities. We recommend at least 2 or 3 weeks of continuous observation. It means that, everyday during this period, drug inventory and prescriptions must be recorded, as well as patients surveyed when they exit the facility. The main reason for this long duration is to avoid a Hawthorne effect. If survey takes place for only a few days, health workers will probably stop stealing drugs by fear of being denounced. As time goes by, they will get used to surveyors and they also will have to return to “business as usual”, that is to say stealing drugs.
- Secondly, one must be very careful with two indicators: recorded prescriptions (B) and recorded attendance (C). Both indicators can be easily manipulated by health workers. For instance, regarding attendance (C), it may be safer to compare recorded numbers with the average ones in the previous period (preferably 12 months ago to offset possible seasonal effects). Given that usually health care utilization does not change much, the average data from the previous year are probably closer to reality than recent numbers (which may be “cooked”). In any case, an exploratory study is necessary for assessing how these indicators are currently filled in and used.
- Finally, prescriptions do not always mention the number of tablets to be purchased by patients. It may be therefore necessary (as McPake did in 1999) to estimate an average amount of tablets for each drug prescribed.

Annex 4: Power calculations

As explained earlier, we are testing the effect of a combination of 2 interventions:

- RBF (“condition reward”) vs no RBF (“unconditional reward”);
- management autonomy vs no management autonomy.

We therefore have 4 groups of health facilities (and households):

	RBF treatment (100 HF)	RBF control (100 FS)
Management autonomy treatment (100 HF)	500 HH (100 EA: 5HH per EA) (50 HF)	500 HH (100 EA: 5HH per EA) (50 HF)
Management autonomy control (100 HF)	500 HH (100 EA: 5HH per EA) (50 HF)	500 HH ((100 EA: 5HH per EA) 50 HF)

Legend:

EA: Enumeration Area HF: health facility HH: household

With Optimal Design ©, the parameters are therefore the following:

- J = number of clusters (i.e. HF) = 100
- n = number of observations by cluster (i.e. number of HH by HF) = 5
- intra-class correlation = between 0.05 and 0.10
- alpha = 0.05

At 80% power, the minimum effect size we can detect is 0.30, which is quite precise (see Cohen).

