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FACTS Reports

Combining local resources and mobile telephony to increase resort to care and reduce child mortality in Mali

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Abstract. In Mali, 1 child out of 6 does not reach the age of five. Most of these deaths could be avoided: children die mostly from untreated benign pathologies that could be easily cured locally. Though medical treatments are available in the local primary health centers, people resort too little and too late to healthcare, for cultural, financial and geographical reasons.

Pesinet deploys an innovative health service that aims to drive prevention, detection and early-treatment of benign diseases. Agents make regular home visits to subscribed families in order to monitor the health of their children. They enter simple health data into a mobile phone and send it to the nearest medical center where the doctor reviews it and summons children at risk. This ongoing health monitoring system is combined with medical insurance at the local healthcare center. For a very affordable monthly fee, subscribing families benefit from the home visits, reductions on check-ups and medications, and education to prevention. This service is currently in operation in the city center of Bamako, and will be adapted for application in rural zones.

Pesinet focuses on recourse to care by populations rather than on supply of new medical resources. By helping under-used primary health centers connect with populations, its objective is to generate a cultural change in the behaviors of populations and give health centers the capacity to improve the quality of the health services they offer.

This paper intends to explain how this demand-driven approach could contribute to driving a sustainable change in the healthcare situation of Mali, and presents the promising results in terms of increase in resort to healthcare and local acceptability already encountered by the program.

Keywords. healthcare, proximity, prevention, m-health, technologies, Mali

1. Introduction

1.1 Overview of the healthcare context of Mali

Table 1. Primary demographic and health statistics for Mali

Population: 15.8 million. World Bank 2011	Fertility rate (live births / woman): 6.3%. UNICEF 2010
Rural population: 67%. World Bank 2009	Under-5 mortality rate: 178%. UNICEF 2010
Population living below national poverty line: 47%. World Bank 2006	Infant (under-1) mortality rate: 99‰. UNICEF 2010
Human Development index rank: 175. UNDP 2010	Per capita total spending on health (PPP): $66. WHO 2009
Adult literacy rate: 26%. UNICEF 2005-2010	Central gvt expenditure allocated to health: 2.6% World Bank 2009

1.1.1 In Mali, the majority of under-5 deaths are due to benign diseases

Mali is one of the poorest countries of the world, with one of the highest child mortality rates (178‰ in 2010).

As in many African countries, the main causes of child mortality are benign infectious diseases: malaria, pneumonia and diarrheal diseases account for 59% of deaths of children under 5 (figure 1). *Those pathologies could easily be avoided with good hygiene and sanitation practices.*

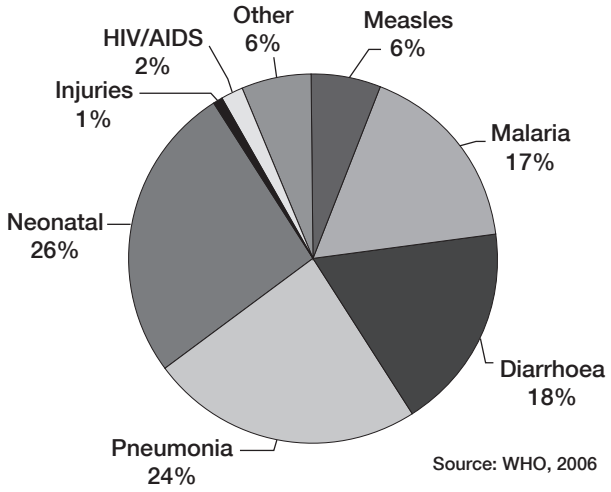

Figure 1. Causes of under-5 mortality in Mali

Malnutrition is directly or indirectly responsible for 50% of deaths of young children[1]. It is known to be a triggering or a worsening factor for other infectious diseases. In Mali, *«development of ( ) good [nutrition] practices could enable us to reduce child mortality by one third»,* Katrien Ghoos, Nutrition Manager for UNICEF in Mali, explains.

Overall, more than 50% of the deaths are due to simple preventable diseases that could be avoided with adequate prevention, efficient detection and provision of basic treatment in time.

1.1.2 Yet medical resources to cure those diseases are available locally

The problem does not lie so much in the lack of medical resources, as treatments are usually available in the local primary healthcare structures, the Community Healthcare Centers – in French Centres de Santé Communautaire (CSCOM).

In the last decades, the country has made great efforts to improve access to primary healthcare, despite dramatic cuts on health budgets imposed by international assistance and structural adjustment programs. In the wake of the Bamako initiative[2], the first CSCOM was set up in 1989.

CSCOM are healthcare structures addressing small catchment areas that encompass 5000 – 10 000 inhabitants, in a radius of approximately 15 km. They are private entities that fulfill a public service mission, with financial and technical support from public authorities (figure 2). They are managed by Community Health Associations – in French Associations de Santé Communautaire (ASACO) – elected by the local population. Though non-profit, they have an objective of financial balance and cost recovery. They have to provide a minimum healthcare package of curative, preventive and promotional services, at a price fixed by the community.

Thanks to a proactive government policy, almost all catchment areas are equipped with a CSCOM. 87% of the population lives less than 15 km from a CSCOM, and 51 % less than 5 km (National Institute of Statistics of Mali, 2006).

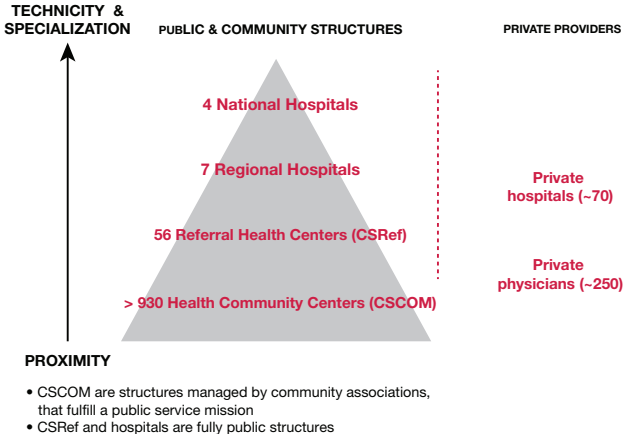

Figure 2. The Malian health system - a pyramidal organization based on a geographical approach

1.1.3 Primary health structures are under-used by the population

Less than 50% of people resort to medical care when sick. When it comes to children's health, the same behavior applies[3], with greater risks of complications.

Various factors can explain this situation. Important barriers for access include financial constraints, cultural habits, and lack of trust in medical supply.

For most of the population, healthcare is not free. With the exception of some specific items (malaria medication, vaccination campaigns), populations have to pay for medical treatment. A social protection scheme is currently being implemented by the government of Mali including a social security scheme[4] for employees of the formal sector and a social assistance scheme[5] that provides payment exemption for the poorest. All in all, 80% of families remain uncovered

1 In Mali in 2006, 38% of under-5 children suffered from stunting (chronic malnutrition) and 15% of them suffered from acute malnutrition (UNICEF, Country statistics, 2006)

2 The Bamako Initiative was a formal statement adopted in 1987 by African Health ministers, outlining three main objectives: accessibility of essential drugs, reinforcement of primary healthcare services, and participation of communities in the local management of health services, with the principle of cost recovery.

3 In 2006, only 38.1% of children under five with Acute Respiratory Infection symptoms were taken to a health facility, and 24.3% of children under five with diarrhea received Oral Rehydration Therapy (WHO, World Health Statistics, 2011)

4 Assurance Maladie Obligatoire (AMO)

5 Régime d'Assistance Médicale (RAMED)

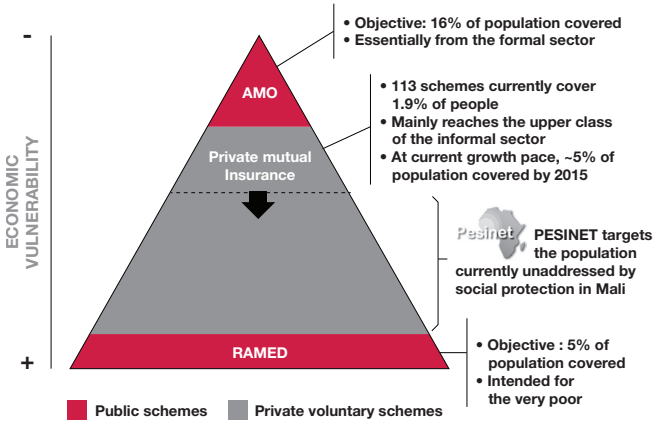

Figure 3. Overview of social protection in Mali

(figure 3), and tend to keep their health budget for emergency situations. Though the government actively supports the development of the private mutual insurance sector, it remains largely under-used and fragmented: in 2008, the existing 113 mutual health insurance schemes covered only 1.9% of the population (Malian Ministry of Social Protection, 2010). In a culture where prevention remains an underemphasized aspect of healthcare, mutual insurance and micro-insurance systems are far from mainstream.

Beyond the financial barrier, cultural practices also prevent families from seeking medical care. Many families self-medicate rather than go to the health center – a risky behaviour given the limited knowledge on medical treatment. People also very often resort to traditional medicine either by consulting traditional therapists or directly by buying traditional remedies at the market.

Last but not least, service quality is often poor in healthcare centers. Workers who welcome patients are often unpaid and lack motivation and training. This unwelcoming context appears to be one of the main obstacles to resorting to conventional care as it exacerbates families' existing mistrust in health facilities.

As a result, health center attendance rates are very low: 0.41 per year in Mali on average (Lamiaux et al, 2011). This phenomenon fuels a vicious cycle that has dreadful consequences for populations as well as for facilities:

1. Benign diseases are not treated early enough and become lethal, while families end up paying high costs for emergency treatments;
2. Families' distrust in conventional medicine leads to an under-use of proximity healthcare facilities;
3. Low revenues impede the ability of centers to offer high quality service. Notably, they lack resources to supply preventative in addition to curative services, which fuels the vicious cycle.

Recent analyses on health issues in Sub-Saharan Africa state that development actions focused only on the supply-side are insufficient; and raise questions about the unsustainability of the free-of-charge solutions often brought by NGOs (de Keyser, 2010). Boosting the demand for conventional care is now seen as a key lever to sustainably improve the healthcare situation of these countries[6].

1.2 Pesinet's approach and its objectives

Pesinet[7] has developed its innovative child health program in order to address this situation.

Pesinet is a French organization whose main objective is to sustainably reduce child mortality. Its approach is to incite early access to existing healthcare systems by designing and deploying proximity health services for women and their children.

Specific objectives of the Pesinet program are to improve use of existing healthcare structures, to reduce the delay in resorting to healthcare, to improve education on prevention and key health practices, and to reduce the need for emergency treatments.

This paper is structured as follows: section 2 gives a detailed description of the Pesinet program, and explains how it was built. Section 3 focuses on the main challenges encountered during the implementation of the program and the solutions found to overcome them. Section 4 presents the results and impact assessment of the Pesinet project. Finally, the paper ends with an outline of the prospects for program scaling-up.

2. Project description

2.1 Pesinet intervention model in the current phase

2.1.1 Pesinet health service for children

Pesinet has designed and implements a healthcare service for children under 5 that allows for prevention, detection and early-treatment of benign diseases. The service combines frequent home-based health follow-up with affordable insurance cover and ongoing education on preventative health practices.

Delivered in partnership with CSCOMs, the service is based on the proximity work of health agents and on mobile and internet technologies. It is sold at a price of 500FCFA (0.75€) per month, and works as follows (figure 4): Several times per month, Pesinet agents visit the children at home and collect simple health data that they enter into a mobile phone and send to the doctor of the nearest CSCOM. Each day, the doctor reviews the data via a web interface, and summons children at risk. Families are then alerted by the agent and benefit from medical insurance at the CSCOM.

6 « The impact of (…) a deployment of mutual insurance would be significant for the health care system (increase in the contact rate and activity volume of the CSCOMs) and would allow an increase in demand for health care by alleviating the financial constraint on households (…). Systemic analysis concludes that the best way of improving Malian health is to strengthen the community & rural health system and expand mutual insurance. » (Lamiaux et al, 2011)

7 Pesinet stands for Pesée Infantile sur le Net – in English "Weighing Children on the Internet"

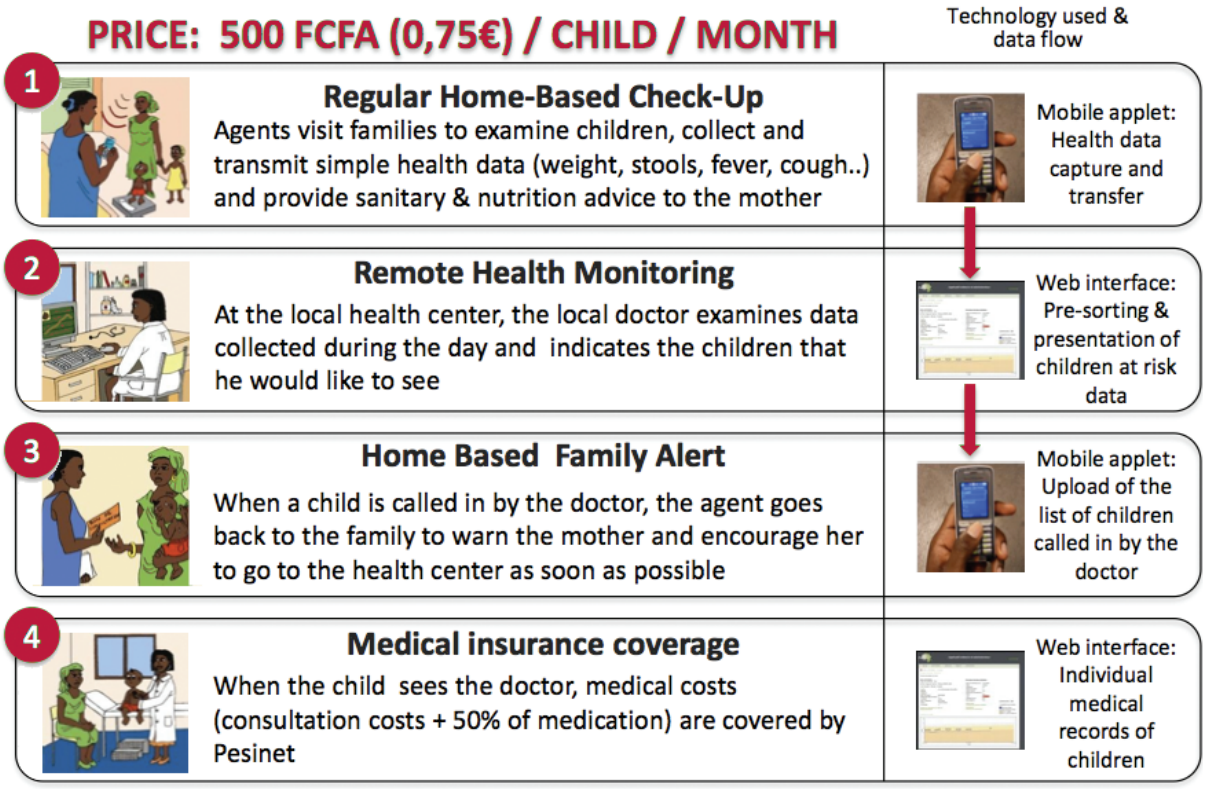

Figure 4. Pesinet's health service for children under 5

2.1.2 Organization

Activities are organized in small operational sites, aligned with the administrative health zoning. Each site is deployed on one catchment area. Each site is run by:

Pesinet agents, in charge of visiting families and weighing children, collecting and transmitting health data, alerting families when a child is detected as sick and prompting mothers to go to the doctor. They educate families on health, nutrition and prevention. They also collect monthly fees from families. To perform their work, they are equipped with a portable scale and a mobile phone. They do not require much qualification apart from literacy and receive initial and ongoing training on health and nutrition issues. They are women and act as agents of change in their own communities (figure 5).

A supervisor, responsible for the day-to-day operation of the program including interface with health centers, management of agents, administration and accounting. He/she is also in charge of promoting the program in the communities. He/she manages one or several sites depending on their size.

Medical teams of the CSCOM: In each partnering center, a referring doctor is assigned to Pesinet. Medical teams work for the centers and dedicate part of their time to Pesinet. They examine children's data daily, identify and summon children at risk, perform consultations and update medical files of children. They are in charge of ongoing agents' training on health and nutrition issues. Each health center is provided with a computer and internet connection.

Above those teams, a coordinator is in charge of supervising the proper functioning of programs and the development of activities, with assistance from the NGO management.

Figure 5. Pesinet agent weighing a child during a home visit

2.1.3 The technology

Pesinet has built its own technological tool. It leverages the quality mobile network in Africa and simple information technologies to record and transfer information and reduce

the amount of time a doctor needs to access and analyze it. It is composed of two applications, both linked to the same database:

1. A mobile application, used by Pesinet agents to keep a record of subscribers and transmit collected health data. Agents also receive the list of children summoned by the local doctor via this application. This JAVA application was designed to be easy to download, install and use. It can both send and receive data via transmission through the GPRS network.
2. A web application, used by doctors and program supervisors. Doctors at the local health center access children's data through a web interface, on which they can evaluate the state of health of children and summon those at risk. The software is designed to pre-sort abnormal cases so as to facilitate the work of the doctor. Doctors also use the interface to record information about the patient after their medical examination. Supervisors use the web application to oversee activities, generate reports and monitor impact statistics.

2.1.4 Partnership management

Pesinet designed an intervention model than can be fully integrated into local healthcare centers' activities and financing system.

Pesinet leverages existing human resources of the partnering healthcare center (medical teams, pharmacy manager) to carry out the service. The network of mobile health agents is recruited by the center and continuously trained by the local doctors. Pesinet provides the center with the equipment needed for running the program (computer, internet connection, small medical equipment), as well as initial training for their medical teams.

Pesinet signs a partnership agreement with each CSCOM defining the roles and responsibilities of each protagonist as well as the mode of remuneration. The NGO negociated innovative reimbursement conditions, so as to lower as much as possible the charges of the service, while ensuring that it would not imply a loss in revenues for the healthcare centers. Pesinet remunerates centers on a monthly-fee basis per subscribing child, whether the child consults or not, while medication is reimbursed at actual cost and at public price. This model helps to engage centers in the promotion of the service and to avoid unnecessary consultations. It also allows them to anticipate and better manage cash flows.

In 2011, a standard partnership agreement was defined during a broad consultation that brought together representatives of CSCOMs, local and national health authorities, and the National Federation of Community Health Associations (in French Fédération Nationale des Associations de Santé Communautaire – FENASCOM). The terms of this agreement will be applicable to all further service extensions in CSCOMs of urban areas.

2.1.5 Core principles

The pillars of Pesinet's action are:

1. Let's not reinvent the wheel: Pesinet leverages approaches that have proven efficient (mutual insurance schemes, home-based health education and monitoring) and combines them in an innovative way to build win-win partnerships for all stakeholders and trigger a long-lasting impact in the healthcare system;
2. Work in partnership with Malian health structures and authorities: activities are implemented in the framework of a strategic agreement with the Malian Ministry of Health and the FENASCOM. Pesinet thus ensures that its programs are in line with the country's strategy for healthcare policy;
3. Adopt a market-based approach: Pesinet adopts a paying service, with the triple aim of building a sustainable financial model, staying in line with the principle of cost recovery that rules health financing in Mali, and giving families a sense of responsibility through a voluntary decision to enroll their children.

An average of 522 subscribing children per month between August and December 2010
12.7% new subscribers per month on average
4.4% of cancellations per month on average (33% of them due to relocations and 23% who passed the age limit)
On average, 25% of subscribers seen by the doctor each month
720 medical examinations in total during the period
438 doctor or agent summons due to disease presumption in total
8 members of Pesinet staff (incl. 5 agents) trained on Behaviour Change Communication (NCC) and Essential Family Practices (EFP)
5 employees of the partner health center trained on BCC, EFP and Training methods

Figure 6. Key activity outputs on a 5-month period (August to December 2010)

2.1.6 In practice

The project is currently implemented on 3 sites in Bamako, in the neighborhoods of Bamako Coura, Dravela and Ouolofobougou, located in District III of the capital city. The first site was launched late 2009, in Bamako Coura. The service was extended to Dravela and Ouolofobougou on January 2012, after an agreement was reached with the ASACO of those 2 areas in September 2011. 900 children are currently active in the service (figure 6).

2.2 Key lessons learned from the experimental phase

The founding concept of Pesinet - detecting simple childhood diseases by tracking children's weight - was initially developed by a French philanthropic venture capital firm, Afrique Initiatives. A pilot experiment was implemented in Senegal in 2000, but was forced to stop due to the lack of a sustainable economic model and robust local operational team.

In late 2006, a team of French engineering and business students took it on as their project to design a refined version

of the service, including use of Information and Communication Technologies and a self-sustaining economic model based on health insurance.

The NGO was founded in September 2007. First activities were launched in 2008 in partnership with a local organization in order to test the theoretical model in the field. It gave the team better insight into the health eco-system, clinical pathways, cultural habits, and put the business model to test. Lessons learned led to a redefinition of several aspects of the project.

2.2.1 Finding the right partners

The program was first implemented in partnership with a local association. After 8 months of service deployment, Pesinet NGO realized that it should be integrated into the healthcare system within the network of Community Healthcare Centers. This was the only way to ensure that the program could be sustainably deployed at a large scale while also avoiding competition of the Pesinet service with existing healthcare activities developed by the communities and the public authorities.

2.2.2 Mobilizing populations

Increased insight into Malian cultural habits, understanding of decision-making processes within families and identification of barriers to the concept of prevention and insurance led Pesinet to reinforce significantly its sensitization and communication efforts.

«[Reaching their market is challenging for organizations which] offer goods and services that are 'push' categories like preventative healthcare, which require high levels of awareness building and education, as compared to 'pull' categories like mobile phones that consumers at the bottom of the pyramid already know they want and are hoping to find at affordable prices. To do so, companies must engage in large-scale demand stimulation to educate their target customers about the benefits of their offerings» (Kubzansky et al, 2011).

In 2011, Pesinet implemented a community mobilization plan, comprised of monthly group meetings for subscribers. These gatherings aim to sensitize beneficiaries on health issues and prevention (figure 7), as well as educate them on effective use and value of the service, and solicit feedback (figure 8).

Figure 7. Mothers discussing acute respiratory infections during a health briefing

Figure 8. Supervisor explaining the Pesinet service to families

2.2.3 Business model: still the stumbling block

Above all, the experiment revealed that some of the theoretical hypotheses on which the original business model was built were unrealistic. Based on figures obtained from the field, operational self-financing is unachievable if Pesinet wants to maintain a good quality of service while remaining affordable to low-income populations.

As was shown in recent studies, "to serve the poor sustainably, it is often necessary to target a broader segment. (…) By so doing, Market Based Solutions can buffer the volatility and risk that enterprises have to assume when dealing with the very poor. Few ventures succeeded when selling to just the $1 per day and below segment" (Kubzansky et al, 2011).

Several potential solutions to complement the self-financing of the service are currently under study, including cross-subsidization through development of a health service targeting higher segments; partnerships with mutuals and insurance companies; and financial implication of public national or local authorities.

Table 2. Surveys led for the external evaluation of the Pesinet program

TYPE OF SURVEY	DATA SOURCES	EVALUATION OBJECTIVES
Quantitative analysis	Data from medical records: #child examinations; diagnoses… Data from Pesinet database: #subscribed children; #summons; # and causes of subscription cancellations Period: August – December 2010	Impact on healthcare center attendance Efficiency of health monitoring system Service adoption
Longitudinal control-group survey	88 subscribing families / 88 non-subscribing families Period: mothers surveyed every 2 weeks during 4 months (Nov 2010- Feb 2011)	Impact on health behaviors of populations (clinical pathways, resort to care, self-medication, traditional medicine…)
Satisfaction survey	91 subscribing families interviewed (incl. the 88 of the control-group survey) Date: November 2010	Satisfaction for the service Areas for improvement
Socio-economic survey	84 subscribing families / 86 non-subscribing families (from the control-group survey sample) Date: November 2010	Socio-economic spread of surveyed samples
Semi-standardized interviews	Individual interviews of 12 stakeholders of the project by external evaluator Date: November 2010	Perception of Pesinet impacts Local buy-in Potential for replication and sustainability

3. Key challenges

The following section highlights key challenges the project is currently facing. Interestingly enough, the main issues relate to cultural and economic barriers rather than technological ones.

3.1 Ensuring trustful and sustainable relationships with Community Health Associations

One of the biggest challenges is maintaining stable relationships with CSCOMs, as their management team is elected for 3-year mandates. Newly elected committees might have another view on the benefit of investing time and resources in a preventative service. To overcome this challenge, Pesinet works with the National Federation of Community Health Associations to facilitate buy-in of the affiliated Healthcare Centers.

3.2 Addressing the question of health supply quality

Because the Pesinet service is meant to be integrated into the daily activities of the partnering healthcare centers, it has to deal with the potential weaknesses of its partners in terms of health supply. Internal surveys carried out late 2010 among 91 subscribers of the pilot site show that the level of satisfaction is negatively affected by poor service quality of the healthcare provider. If subscribers see great value in the home-based monitoring service (98% satisfaction), satisfaction levels on the quality of service and care provided as well as on the availability of medication at the healthcare center pharmacy are much lower (66% and 64% respectively). The risk is that distrust in the health provider leads to distrust in the program as a whole.

By focusing on improving the demand for early-care, Pesinet expects to help healthcare centers to improve their revenues and thus the quality of care that they can provide. However, this virtuous mechanism operates in the long run. In the meantime, Pesinet needs to reinforce the capacity of the healthcare center management through training and continuous monitoring on key indicators (% of prescribed medication actually bought at the healthcare center, feedback from subscribers on service quality…). Before each new partnership, an evaluation is carried out to measure the situation of the healthcare center and identify areas where improvement is needed. This enables Pesinet to determine whether quality is appropriately high for integration into its network.

3.3 Ensuring partners' empowerment

Although key actions have been taken to ensure partner buy-in, there are still challenges inherent in building a model that can be fully transferred to the local partners.

The first step is to strengthen the economic model, which would need to be complemented by local funding sources to be sustained in the long run.

The second step is to transfer the financial and technical management of the service. To do so, Pesinet and its partners need to identify which local organization is best positioned to take on this role.

Finally, even though the Ministry of Health in Mali created a National e-health Agency, there is still a need to increase

technical capacities in maintaining the technological infrastructure before it can be fully managed by the National Health Administration.

4. Evaluation

An impact assessment study was carried out from August 2010 to February 2011 under the supervision of an external evaluator, Marie-Pierre Gagnon, Professor at the Faculty of Nursing Sciences at the University of Laval in Quebec and an international expert in evaluation of e-health projects and community healthcare.

4.1 Evaluation objectives

The aim of this first independent evaluation was to verify the actual impact of Pesinet's approach after 2 years of experimentation, before expanding activities. The scope of the evaluation was the pilot program in Bamako Coura.

In particular, the evaluation aimed at measuring the impact of the service on Pesinet subscribers' health behaviors and treatment, and on the attendance rate of the partnering healthcare center.

The evaluation also aimed at understanding the perception of the service by involved parties and its potential for sustainability and replication.

4.2 Evaluation methodology

The evaluation was based on a combination of methodologies of quantitative and qualitative analyses (table 2).

4.2.1 Description of sampling methods

3 groups were surveyed as part of the evaluation: a sample of families subscribed in Pesinet; a sample of non-subscribing families; key stakeholders of the program.

The same sample of subscribing families was used for satisfaction surveys and for the longitudinal Control-Group Survey. The sample of non-subscribers was used for the Control-Group survey. Both sample populations responded to a socio-economic questionnaire[8] at the beginning of the evaluation period[9].

A first list of subscribers was extracted based on the duration of their enrollment in the program[10]. Randomized tables were then generated to come up with a list of 91 subscribers.

The sample of non-subscribers was made-up of people living in the district near the pilot zone, a district equidistant from the healthcare center, who were of average socio-economic level and education level. Community health workers from the local healthcare center collected 150 names of families who agreed to take part in the survey. Randomized tables were then generated to come up with a list of 89 non-subscribers.

Only participants for whom data was available for at least 5 measurement periods were kept in the final sampling of the Control-Group Survey. The final sample for this study was thus 88 participants for the intervention group and 88 participants in the control group.

10 people did not answer the socio-economic questionnaire. The final sample for this questionnaire was 84 participants for the intervention group and 86 for the control-group.

The external evaluator interviewed 12 key stakeholders: 2 Pesinet agents, 2 doctors, the healthcare center's managing director and pharmacy manager, a Ministry of Health representative, the president of the CSCOM of the neighboring district, the president of the women's committee of the neighboring district, a PhD student who had carried out an initial satisfaction survey in 2009, and 2 members of the Pesinet project team.

4.2.2 Description of population surveyed

Questionnaires were administered to mothers, on data related to their children and family. Differences between the 2 surveyed groups were identified:

- Children in the control group were older on average than in the intervention group;
- The proportion of boys in the control group was slightly higher than in the intervention group (but a statistical test showed that the gap was not significant);
- Families surveyed in the control-group had a higher socio-economic level on average than those from the intervention group.

4.3 Evaluation results

An exhaustive report on the independent evaluation is available on the organization's website.[11]

4.3.1 Increase in health facility use by populations

Doctors involved in the program perceive that Pesinet facilitates a change in health behaviors and raises awareness on the value of resorting to healthcare structures early. Moreover, the lower cost of healthcare via Pesinet encourages families to seek care more often. When interviewed by the evaluator, Pesinet agents noted the insurance scheme allows families to reduce their health spending. 80% of families say they subscribed to the service because of the cheap price.

Behavior change and improved access

8 To measure the socio-economic level of Survey participants, the PPI questionnaire developed by Grameen Foundation for Senegal was used. The one developed for Mali was not relevant for urban population. The objective was not to measure the absolute socio-economic level of the population but rather to measure socio-economic discrepancies within each sample and between the 2 samples.

9 A statistical test done based on public data on healthcare centers' use rate in the pilot zone indicated that a sample of minimum 80 people in each group was necessary to measure impact on care seeking behaviors.

10 The objective was to have about 50% of the sample enrolled in the program more than 3 months before the survey, and another 50% of the sample enrolled between 1 and 3 months before the survey

11 Evaluation report : http://www.pesinet.org/wp/wp-content/uploads/2012/04/Rapport-evaluation-PESINET_mars-2012_qualite-web.pdf

significantly increase the rate at which subscribers resort to health facilities. Indeed, a Pesinet subscriber resorts to the healthcare center at least 3 times per year on average, whereas the average user rate in the district is 1.05.

This has a significant impact on the health center's activity, as only 50% of the subscribers were using this healthcare center before. Of all recorded medical examinations of under 5 children, 51% were of Pesinet subscribers.

4.3.2 Improvement in child health status

The evaluation highlighted the efficiency of the detection system: 93% of children examined by the doctor following an alert are actually sick. According to the satisfaction survey, 85% of families are satisfied with the speed of disease detection.

In case of illness, the survey showed that a Pesinet subscriber seeks care twice as often as non-subscribers. This gap is observed when controlling for the influence for age, sex and socio-economic criteria. In fact, it appeared that the increase in resort to care is even higher for low-income populations.

4.3.3 Service acceptability and sustainability

All stakeholders involved in the service say they are convinced of its value for child healthcare.

94% of subscribing families say they are satisfied with the service and 98% of families are happy with the home-based visits. Medical teams say they want to see the program expand as it helps to change families' behavior towards preventative healthcare. Ousmane Ly, the CEO of the e-Health Agency of the Ministry of Health in Mali explains: "We refer to Pesinet as the model that worked… For me, they have initiated what is now being developed in the system".

4.3.4 Analysis of evaluation results and identification of improvement areas

The evaluation enabled identification of needed corrective actions where the service lacks effectiveness:

1. **Improve patient welcoming at the health facility:** the satisfaction survey showed that some families were unhappy with the way they were welcomed at the health facility. To address this situation, Pesinet developed a new training module for healthcare centers' staff and managing committees on the benefit of developing a culture of empathy and patient service.
2. **Continue to raise awareness on the need to seek care:** even though Pesinet subscribers resort to care twice as much as non-subscribers when sick, there is still a long way to go before all parents bring their child to the health facility. Indeed, only a third of families actually go to the doctor when they see that their child is sick or when the doctor or the agent asks them to. Awareness raising efforts must be pursued and reinforced. In addition, doctors are now asked to indicate the reason why they summon children so that agents can relay information about complication risks if the parents do not seek care.
3. **Improve the fee collection rate and timing:** 30% of subscription cancellations are from families who defaulted on payment. Further efforts need to be made to educate subscribers on the benefits of mutual insurance systems and on the importance of paying on time for proper functioning of the service.

Feedback of families and stakeholders also brought suggestions for service improvement:

1. **Provide nutrition advice:** some mothers explained that they would like Pesinet mobile health agents to provide nutrition advice. For this purpose, a training program was developed to continuously build their capacity on child health and nutrition issues.
2. **Broaden the scope and availability of reimbursed medication**: both medical teams and families considered that the list of medication covered by the insurance scheme should be expanded. A list was extended in cooperation with the medical teams of the health center. Monitoring tools were put in place to follow up on medication shortages at the health facility pharmacy to help the management team of the health facility gain visibility on the issue.

As a whole, the evaluation work helped Pesinet to significantly improve its processes and impacts. Further work needs to be done around morbidity and mortality indicators as well as the cost/benefit of investing in this service for public institutions in Mali.

5. Development perspectives

5.1 Replication in Mali and in other Sub-Saharan countries

The current operating model requires a high density of population around the Health Center to enable home visits by walking agents, as well as the GSM network. It is very well adapted to urban settings, where access to healthcare is a crucial issue given the ongoing unstructured urbanization process and the increasing vulnerability of urban populations in most African countries[12].

Pesinet intends to adapt its service for implementation in rural areas, where attendance rates of healthcare structures are particularly low, and where avoiding complications of diseases is particularly critical given the distance of hospitals.

Given the political instability that prevails in the North of Mali, the Pesinet team will focus on deployment in Bamako and in the southern and western parts of the country. Pesinet could also be rolled out in any country suffering from high child and maternal mortality where an operational network of primary healthcare services exists. The system would need to be adapted to meet particularities of the country in terms of culture, healthcare system, mobile network, etc.

12 Bamako is estimated to be the 6th fastest growing city from 2006 to 2020 in the world (City Mayors)

5.2 Partnerships with mutual insurance enterprises and micro-finance institutions

Another project currently under study is the development of partnerships with existing mutual insurance companies and microfinance institutions. Integration of Pesinet's home monitoring system would enable them to develop their reach in the communities, while improving their business models through mitigation of health risks and spending among families.

Such partnerships would also bring benefits to Pesinet: facilitated development in new zones, increased insurance cover, commercial & operational synergies (notably for fee collection).

5.3 Development of a pregnancy care service

Maternal mortality is an endemic burden in Sub-Saharan Africa. Yet most cases of maternal and neo-natal mortality are due to complications during pregnancy and delivery that could be avoided by detection and proper medical care of risky pregnancies, periodic check-up, monitoring and awareness-raising.

Pesinet is willing to leverage the approach developed for child health monitoring to tackle this issue. A service model based on the same three key pillars - home-based follow-up, affordable insurance, and use of simple information and communication technologies – could be applied to the design of a pregnancy care service.

6. Conclusions

It is currently too early to precisely measure the impact of Pesinet on the health of populations as 1. the number of beneficiaries is still too limited to be representative and 2. the benefits of prevention must be observed in the long run.

Nevertheless, the first two years of activity have demonstrated that the intervention model is able to efficiently achieve pursued objectives, is acceptable to stakeholders (populations, healthcare centers, local and national authorities), and can be integrated into the existing health system. First results also show that the service brings benefits to all actors involved in the health system.

Several organizations expressed an interest in the model or used it as an inspiration to develop similar systems. As further acknowledgement of Pesinet's relevance, UNDP referenced the program as a promising market-based solution for reaching the Millennium Development Goals.

References

de Keyser, V., (2010) "Report on Healthcare Systems in Sub-Saharan Africa and Global Health (2010/2070(INI))", Committee on Development, European Parliament

Lamiaux, M., Rouzaud, F., Woods, W., (2011) "Private Health Sector Assessment in Mali, The Post-Bamako Initiative Reality", World Bank Working Paper n°212

Mali Ministry of Finance, (2009) "Second Millenium Development Goals Progress Report"

Mali Ministry of Social Protection (2010), "National expansion strategy for medical coverage by mutual health insurance schemes in the agricultural and informal sectors in Mali"

Kubzansky M., Cooper A., Barbary V., (2011) "Promises and Progress, Market Based Solutions to Poverty in Africa", Monitor Group

Mali Planning and Statistics Unit of the Ministry of Health (CPS/MS), National Department of Statistics of the Ministry of Economy, Industry and Trade of Mali (DNSI/MEIC), Macro International Inc. (2007), "Demographic and Health Survey 2006", Calverton, Maryland, USA