

## CONCEPT FOR OPERATIONAL RESEARCH IN CI – 6107

### Objectives

To carry out a comparative research on the impact of SMS reminders on utilization rates of routine immunization services as foreseen in the Côte d'Ivoire immunization calendar, including VAS first contact (children 0-9 months).

### Summary of the services targeted by the intervention

The project wants to measure the influence of a combination of SMS reminders sent to mothers and health staff on attendance of specific appointments for accessing key routine services. The routine services targeted, and thus its associated appointments, may be summarized as follows:

- 6 weeks after birth: 1<sup>st</sup> vaccination DTP+Polio+Hepatitis B+Hib;
- 10 weeks after birth: 2<sup>nd</sup> vaccination DTP+Polio+Hepatitis B+Hib;
- 14 weeks after birth: 3<sup>rd</sup> vaccination DTP+Polio+Hepatitis B+Hib;
- 6 months after birth: 1<sup>st</sup> VAS, growth monitoring, nutritional counseling, family planning;
- 9 months after birth: *measles and yellow fever*

### Study groups

Targets will be recruited progressively starting July 1, 2012. Targets will include a total of 700 “mother-child” pairs, including 350 cases for the intervention, and 350 controls to assess statistically the impact of the intervention.

Each pair will be recruited on the basis of the following criteria:

- a) new deliveries or mothers since less than 4 weeks, and
- b) owning a cell phone, and
- c) being located within coverage of constant mobile networks from the major operators in Côte d'Ivoire.

### Methodology

The mother-child pairs selected will be assigned in a random way to either cases or control groups, and their phone numbers will be recorded and associated at a central database to the following data:

- Mother's name
- Mother's age
- Child's name
- Child's birth date;
- Village of origin
- Health centre of reference
- Name of head nurse of the center of reference
- Phone number of the head nurse

The phone number of each case and each control will represent their reference client number.

The case pairs will receive reminder SMS for the 5 priority appointments, as well as regular general health promotion messages, with a system of follow-up more precisely defined in the annexed diagram, and which associates health workers and, as a last resort, HKI. The system should be as automated as possible to make it as HR-free as possible.

For cases, the system would work as follows:

1. Come the time of each appointment, the mother receives a reminder SMS with details; a similar SMS is sent to the health worker of reference with the client number, for follow-up.

2. The commonly used automated SMS receipt confirmation system certifies to the terminal that the mother received the message; in the case no confirmation is received, after a pre-established delay (say 2 days – delays in delivery may be due to the target being temporarily out of range) a 2<sup>nd</sup> SMS reminder is sent to the mother with the same modalities.
3. If the reception of the first SMS reminder is confirmed, the health worker is expected to confirm within a week to the terminal whether the couple showed up or not to the health centre, through an SMS which includes the number of file customer (client number) and the word YES or NO (example, if phone number is 7707700, and the couple showed up, the SMS will contain 7707700YES).
4. If the answer is YES, the terminal sends an SMS of confirmation of reception to the health worker, and an SMS congratulating the mother. If the answer is NO, a 2<sup>nd</sup> SMS is sent to the mother with the same reminder.
5. In the event that even after the 2<sup>nd</sup> reminder the couple mother-child does not show up (or reception of the SMS is not confirmed), the case is referred to HKI for follow-up; also, if the health worker does not confirm the positive or negative outcomes, the case will be referred to HKI for follow-up. In such event, the case pair will not be counted as a positive outcome, but as a loss to follow-up.

Control pairs will only be sent on a regular basis a “sensitization” SMS (on basic health and hygiene themes), but no specific date reminder for key events will be provided. The same SMS will be sent to cases as well. The reason of including general SMS for control is that it would allow targets to be blind with respect to what the SMS service is actually about. They would only know that the service will test a SMS communication strategy to keep mothers informed on health issues.

Each case and control pair will be followed up until the last appointment, after which the analysis of data will start. Data on patients are stored automatically on the central terminal and must be easily accessed by HKI. Use of EpiSurveyor or an EpiSurveyor-like tool for the monitoring tasks assigned to health workers may be envisaged, with creation of appropriate follow-up electronic forms. One HKI focal person (PHD intern) will be responsible to follow up on lost cases, including qualitative analysis on the reasons of lack of attendance.

#### **Diagram of communication circuit**

The diagram is available in the annex, and has been discussed for feasibility testing with the engineers of a local operator. It may change at the preparatory phase according to eventual functioning or logical issues.

#### **Geographical coverage**

The potential pilot district is Khorogo, a major district with access issues, poverty, a mix of urban and rural populations.

Korhogo covers a relatively wide area of around 12,000 km<sup>2</sup>, and the estimated population for 2012 is 684,027 people, including:

- 10,802 children 0-6 months
- 11,866 children 6-11 months
- 22,667 children aged 0-11 months
- 105,430 children 0-59 months
- 179,658 Women in Reproductive Age
- 26,021 expected pregnancies
- 24,782 expected births

The district has a regional hospital and 60 health centers, with around 260 health staff, including around 90 paramedics. Korhogo is located in the northern part of the country, where the prevalence of acute malnutrition varies between 4.8% and 8.4% with an average of 6.4%, while chronic malnutrition prevalence ranges between 38.1% and 49.3%, with an average of 43%. From January to June 2012, about 855 acutely malnourished children were treated, but data completeness is estimated to be at just 8% so it may represent an underestimation. This shows a major problem of data management.

The district has excellent mobile network coverage, which is likely to facilitate efficient data transmission by mobile phone as well as SMS delivery for this pilot.



*NOTE: This may change deepening on actual network coverage and advice from mobile operators.*

### **Rational for local operator choice**

The idea is to collect also process outcomes (cost, time, HR engagement) and provide information on how scalable is the pilot and how feasible it would be for local government to use local means and services to implement it to scale, if successful. Involving government officials (specifically MoH, such as Child Health National Program, EPI Program) in the set-up may boost ownership at a later stage. The pre-selection phase resulted in the choice of the IT company *Ivocarte*, specialized in digital cartography and telecommunications for health. *Ivocarte* has already a service relationship with the MoH with the goal to improving new technologies-based services for health (data management, EPI, supervision etc.), and is currently implementing a pilot on SMS reminders for adults vaccinations (including internet monitoring and creation of electronic immunization cards), in collaboration with the National Institute of Hygiene of Côte d'Ivoire. The already existing technical capacity and the privileged relationship with the MoH convinced HKI to opt for this company after unfruitful discussions with traditional mobile operators.

### **Expected costs**

The terminal set-up service will be the most expensive component of the project, with around 11,000 USD forecasted for the design and maintenance of the system and associated databases, as well as the overall SMS delivery chain.

HR will stay basically the same for HKI, with the provision for a PHD student possibly attached to the Institute of Public Hygiene or the Institute of Statistics through a research internship. Small stipend, transport, and training to follow up refusals and get qualitative data.

HKI's own monitoring forms and data analysis (possibly supported by external, or HKI's non Côte d'Ivoire-based technical staff with solid skills in research and statistical analysis) is expected to bear some limited cost, while field monitoring in the target area will also involve a cost for HKI's staff transport, as the area is situated north of the country far from Abidjan. Fuel, lodging etc. are to be accounted for.

Material inputs are likely to be limited, mainly concerning the purchase of Nokia smartphones for health workers.

The estimated budget is reported below:

<b>ITEM</b>	<b>COST</b>
SMS service + software and database creation / maintenance (contractor)	11,000
Telephone follow-up	500
Training (20 health staff)	3,000
Logistics	3,600
Mobile Smart-phones	1,600
SIMs and monthly fees	5,400
PHD intern	360
LOE staff (Mian 2%)	720
<b>TOTAL DIRECT</b>	<b>26,180</b>
Core	11,712
<b>SUB-TOTAL Direct + Core</b>	<b>37,892</b>
<i>Overheads</i>	<i>4,661</i>
<b>TOTAL</b>	<b>42,553</b>