Mobile phone surveys to measure mortality. The experience of MSF and Epicentre from the field

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Why using mobile phones?

Classic survey designs were unfeasible due to different reasons:

**Liberia:**
Due to the Ebola outbreak there was an increase risk for surveyors to be infected

**Cameroon:**
Insecurity due to the conflict:
=> Reduce access to healthcare
=> MSF has a restricted access
Why using mobile phones?

Still, in both contexts the survey was important to:

• Estimate the different options to access healthcare in the area,
• Assess the health situation of the population.

=> in order to define operational priorities
Objectives

Liberia

• 2014
  • To estimate the medical services available before and during the epidemics, to describe the safety measure taken and to estimate the attack rate of Ebola among staff in health care facilities.
• 2016
  • To estimate reported morbidity, mortality, health care seeking behavior and suspected cases of Ebola in Monrovia between 14th of May 2014 and the day of the survey
Objectives

**Cameroon (2017)**

- Describe medical services available before the conflict and day of the survey through mobile phone interview of health facilities.
- To estimate retrospective mortality rates and access to health care of the population by mobile phone interview and access to food by SMS.
- To compare mobile phone interview and home visit in an accessible urban area.
Methods – Liberia 
(2014)

• **Design**
  * Cross-sectional surveys of all health facilities identified by phone call.

• **Study setting and period**
  * The study was conducted in Monrovia.
  * The surveys covered every health facilities identified that was not closed before the epidemic (May 2014)

• **Participants**
  * All respondents of the phone call were eligible for the survey if they belong to the staff of the health care facilities.

• **Sampling**
  A list of mobile phone number was kindly provided by the Liberian Medical and Dental Council (LMDC). The list was created in 2012 for a program of infection control training. The List include 168 facilities, all this facilities will be included in the survey.
Methods – Liberia (2016)

- **Design**
  - Population-based cross-sectional phone based survey.

- **Study setting and period**
  - The study was conducted in Monrovia.
  - All owners of SIM cards from the different network providers living in Monrovia from the 15th of May 1st June or at the date of the survey.

- **Participants**
  - All respondents were eligible for the survey if they were living in Monrovia and if they were over 18 years old.

- **Sampling**
  - List of phones that was connected during the past 30 days to an antenna located in Greater Monrovia
  - From this list we randomly chose any phone number until we reached the sample size
Methods – Cameroon (2017)

• **Design**
  - Populations-based cross-sectional phone & SMS + home visits based survey

• **Study setting and period**
  - Urban context in Mora (cell phone and home visit)
  - Logone and Charri (locations in Waza, Makary and Fotokol) and Mayo Sava (Tokombéré and Kolofata) *(cell phone and SMS)*
Methods – Cameroon (2017) (cont.)

- Sensibilization message in the national and local radios
- **Telephone:**
  - Collection of lists of phone numbers in the villages selected through PPS by community health workers
  - Random selection of households according to the list of phone numbers
  - Urban zone in Mora, systematic sampling from the lists
- **Home visit:** Selection through random spatial sampling
- **SMS:** Send a message to subscribe to the survey to all the phone numbers of the three phone operations in the areas concerned by the survey. A random selection was done among the people who subscribed.
### Results: mobile phone / Home visits

<table>
<thead>
<tr>
<th></th>
<th>Home visit</th>
<th>Mobile Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refusal</td>
<td>10.3% (n= 41)</td>
<td>18.7% (n=100)</td>
</tr>
<tr>
<td>Internally Displaced People</td>
<td>28.2% (n=778)</td>
<td>48.5% (n=1711)</td>
</tr>
<tr>
<td>1st dose Measles Vaccine Coverage</td>
<td>91% n= (314)</td>
<td>90% (n=438)</td>
</tr>
<tr>
<td>CMR (10000 pers.day)</td>
<td>0.16 [0.05-0.27]</td>
<td>0.3 [0.16-0.43]</td>
</tr>
<tr>
<td>U5MR (10000 child.day)</td>
<td>0 [0-0]</td>
<td>0.33 [0.00-0.73]</td>
</tr>
</tbody>
</table>

### Results: text messages

Over 600,000 push messages were sent, of which 2,255 responded (<1% response rate)

- 1,836 questionnaires were sent,
  - 878 responded to the 1st question
  - 789 responded to the 2nd question
Benefits of phone-based surveys

- They are cheap and quick to implement
- *Maybe the only option for specific contexts?*
- Current cell-phone coverage in LMIC increase representativeness of samples
- Similar framework methodology can be replicated in different contexts
Limitations of phone-based surveys

- Dependence on a network provider for random sampling created some delay and contributed to a lack of full transparency in the process.
- Coverage of the network unknown -> uncertainties regarding the representativeness of the sample for location's whole population.
- Respondents’ environment can have an influence on the quality of data gathered from mobile phone surveys.
- Initial response was much lower than expected by the provider.
Conclusions

- Phone survey possible when access is limited but inherent selection biases
- SMS surveys need improvement (very low response rate)
- Health facility interview easy, fast and useful
Thank you very much

To the colleagues of MSF and Epicentre who made these surveys possible

To the people and the authorities in Liberia and Cameroon who allowed us and were part of these surveys.
References
