Rapid Mobile Phone-based Surveys (RAMP) for evidence-based emergency response

Scott Chaplowe (IFRC) and Rose Donna (Datadyne)

Additional Contributors: Jason Peat, Senior Officer Public Health, IFRC; Amanda Mcclelland, Emergency Health Officer, IFRC; Joel Selanikio, CEO DataDyne Group; Mac Otten, Independent Consultant.

1. Introduction to RAMP

The rapid spread and use of mobile technology throughout the world offers new and promising means of digital data collection. The time and monetary costs of data collection can be substantially reduced if mobile phone-based questionnaires are used in place of the traditional paper and pencil method that has been the best practice in surveys for decades. This, in turn, can provide more timely reporting and use of data for decision making and accountability.

Over the past few years the International Federation of Red Cross and Red Crescent Societies (IFRC) has worked with partners to develop an innovative approach to designing surveys and improving the timeliness of the entire data collection cycle. This approach has been named Rapid Mobile Phone-based (or RAMP) survey.

A RAMP survey aims to provide a survey methodology and operations protocol that will enable Red Cross Red Crescent National Societies, governments, non-governmental organizations and other partners to conduct surveys at reduced costs, in a timely fashion and with limited external technical assistance. Initially developed and piloted in the area of malaria prevention, RAMP is intended to be scaled-up and utilized in other program areas and context. Using the RAMP approach, the IFRC will work with partners to build capacity in the Red Cross Movement to carry out high-quality health surveys that will give rapid results for programme managers.

2. Brief history

RAMP was developed by IFRC and partners (WHO, CDC) over several years. RAMP was initially based on Episurveyor (later to evolve into Magpi), which was developed by Datadyne, and was based upon Epi Info, a public domain statistical software for epidemiology developed by Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia (USA). Improvements were based on scientific

article published by Donna Brogan, professor of biostatistics at Emory University, (Atlanta), and Emory and CDC colleagues in 1994.

In 2011, the RAMP survey methodology was piloted by the IFRC, Red Cross National Societies and partners in three countries, Kenya, Namibia and Nigeria. Malaria was chosen to test the innovative approach, with surveys designed to find out about net coverage following a mass distribution of long-lasting insecticide-treated nets (LLINs).

In all three pilot countries, malaria was a major public health concern, and different types of malaria programmes were under way in each setting. Programme managers and other decision-makers were interested to know the extent to which their programme objectives were being reached. In addition to estimates on access to and usage of insecticide-treated bed nets, the surveys were intended to provide information on factors such as treatment of children suffering from suspected malaria, the use of indoor residual spraying and so on. Red Cross volunteers were trained to collect data using mobile phones and the survey results were available within days of the last interview.
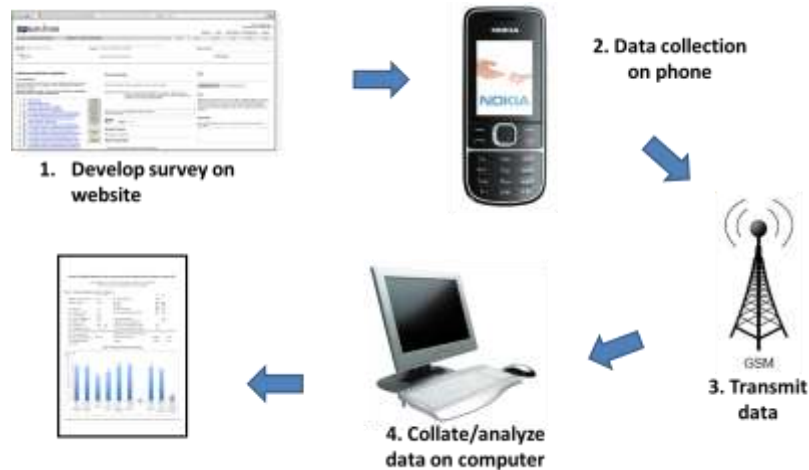
Each RAMP pilot led to further developments and improvements in the RAMP survey methods and tools. In 2012, the IFRC published the RAMP survey toolkit which provides field-friendly guidance in three volumes:

- **Volume 1**: *Designing a RAMP survey: technical considerations*
- **Volume 2**: *Implementing a RAMP survey: practical field guide*
- **Volume 3**: *Training a RAMP survey team: guide for trainers*

3. How RAMP works?

Health survey questionnaires can be created using web-based, freely-accessible mobile phone-based Magpi (previously EpiSurveyor) software. Once the software application is downloaded to compatible mobile phones via a 2G network connection, questionnaire forms can be downloaded to the phone via the same connection. In the field, data can be collected and stored on the phone without the need for a network connection. Following data collection and when in 2G range, data can be sent in real time to the secure server for storage. All parties with viewing access to the EpiSurveyor account can view the data at any time in any place in the world. Data can be exported for analysis in txt, xls or mdb format. Diagram 1 summarizes the RAMP process.

Diagram 1: How does RAMP work?

1. Develop survey on website
2. Data collection on phone
3. Transmit data
4. Collate/analyze data on computer

4. Comparing data collection methods

Since a RAMP survey has low cost and simplicity as two of its main objectives, the first pilots used non-commercial mobile phone software. The Magpi (previously EpiSurveyor) software system was the non-commercial software chosen to implement the RAMP pilot surveys because it was a fully functioning system. However, RAMP surveys can be implemented with other types of software (commercial or non-profit) or paper/pencil systems. Commercial software and paper/pencil systems may work better for some types of surveys, for example for very long and complex surveys.

Non-commercial software is usually free or very low cost, but may not have robust relational database management and relational error-checking capabilities. Commercial software usually has both, but is costly and technical support may be needed to establish relational questionnaires and relational error-checking. Surveys with a single database do not need relational database capabilities. Paper-based systems do not have the advantages of immediate and simple data acquisition and immediate data cleaning of mobile phone-based methods.

5. Benefits of digital data collection

There are multiple benefits that IFRC has identified in its experience with RAMP and digital data collection:

Benefits – decision making

- ✓ Data rapidly available for dissemination and decision-making
- ✓ Scalable solution for studies of varying sizes
- ✓ Shared, electronic database to compare responses across contexts and with partners to build a body of evidence related to impact

Benefits - management

- ✓ More cost effective (reduced costs associated with paper/copy usage, data entry, transportation and associated costs
- ✓ Do not have to reinvent the wheel - RAMP toolkit adaptable to different contexts
- ✓ No consultants needed
- ✓ No software licensing or subscriptions

- ✓ Manage/upload surveys in multiple languages
- ✓ Export data for custom analysis using any statistical analysis package
- ✓ Online library of survey forms that can be rapidly adjusted to the context for immediate use by volunteers in the field.
- ✓ Collect and aggregate data form multiple areas and implementing partners
- ✓ Ease of creating and changing analyses/reports
- ✓ Efficient reporting: generate daily bulletin and complete reports, accessible via direct emails or posted on dedicated website

Benefits - Fieldworkers

- ✓ Builds local capacity for monitoring and evaluation
- ✓ Use standard and familiar mobile phones
- ✓ No more paper to collect, transport or return
- ✓ Automated submission of data when network reception is available

Benefits - Quality Assurance

- ✓ Real-time error analysis and field correction to improve data quality
- ✓ Utilize skip patterns, custom logic and validation
- ✓ Enables monitoring of survey team work rate, productivity and quality
- ✓ Monitor times/location of data collection (time/date data stamps)
- ✓ Provide feedback remotely
- ✓ Easier to back-up forms/data
- ✓ Reduced error of repetitive data entry and re-entry
- ✓ Easier to change and update forms

6. RAMP in emergency contexts

The challenge of timely data collection, data management and rapid data analysis continues to be a challenge in emergency contexts. The large number of emergency operations that are being implemented at any one time within the Red Cross movement can be close to 100. Many of these are small local incidents utilizing volunteers and communities in response and recovery activities but include large scale disasters that involve multiple movement partners. In this complex environment there is a growing need to demonstrate impact, improve performance and deliver quality activities across a broad range of contexts and a variety of scale but with consistent quality. Part of this process includes improving assessments, ensuring baselines are conducting, regular monitoring occurs and operations are critical evaluated to ensure improvement and dissemination of best practice.

A trial of the RAMP methodology and Magpi platform was tested in a recent field based training of the Community Health Module and Psychosocial Support component of the ERU system in rural Zimbabwe. The system were tested in a number of contexts including performance of Knowledge, Attitude and Practice surveys (KAP) and use of SMS system for community based disease surveillance system. The results of the trial were extremely positive. The system was easy to use, provided rapid data collection and management of information, and most impressive real time analysis.

The RAMP has the potential to address four key areas in the context of emergencies, forming an emergency digital data gathering kit:

- Baseline and site/need assessments
- Beneficiary registration
- Distribution of emergency and (non-emergency) items
- Community-based disease surveillance
- Health Management Information Systems (HMIS)
- Monitoring of programme outputs
- Beneficiary communication/monitoring
- Disaster preparedness – EWS monitoring

By providing a common digital based platform for all Red Cross Red Crescent partners as well as providing a low cost effective tool for data collection at the field level, RAMP has significant potential to support the Red Cross/Red Crescent in overcoming challenges related to data and analysis in emergency contexts.

7. SMS Disease Surveillance Systems

The versatility of the RAMP allows for weekly and monthly reporting by community health workers (CHWs)/Red Cross volunteers using SMS. This model is highly cost effective and scalable because it uses the simple cell phones already in the hands of CHWs/Red Cross volunteers. The process by which diseases are tracked is that CHWs/Red Cross volunteers will report at a fixed schedule (daily, weekly, monthly) on a very limited number of diseases. This allows for real time diseases surveillance and data management, allowing managers of health programs to share the data with Ministries of Health and other local authorities and make decisions on triggering a response.

8. Datadyne (Magpi) and industry trends

Magpi has improved its software dramatically in the last 12 months allowing for additional features such as mass SMS messaging from a central point, data collection by SMS to a central point, simple automated reporting on frequencies and percentages, and the linking of data based forms.

Trends are showing us that software that is free to sign up to and use will become increasingly accessible, allowing community health workers in all settings to generate and analyse data free of charge and with no external support.