



Using Mobile Big Data to Respond to the Pandemic

Use Cases During Covid-19

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Introduction

During the CovidCOVID-19 pandemic mobile operators worked together with governments and international agencies to design and implement mobile big data solutions to track, manage and predict the spread of the virus.

Mobile operators have worked with governments and international agencies in 40 countries to better understand and respond to the virus. For instance, Vodafone contributed to the response in twelve countries, Telstra in seven, MTN in at least three, with other operators contributing globally.

With the support of the UK Foreign, Commonwealth and Development Office, the GSMA responded to requests from 14 low- and middle-income countries (LMICs) and developed mobile big data products in the Democratic Republic of Congo, Benin, Rwanda and Burkina Faso.

DRC: Enhancing Government Response to Covid-19 Through Mobility Insights

When the first cases of Covid-19 were reported in DRC at the beginning of March 2020, the government was faced with a problem. The health system was already over stretched and the high level of informal employment meant that the economic impact of the pandemic would be hard to measure. To design effective response measures the government required up to date population data. However, the last census had been carried out 35 years ago.

CHALLENGE

In an environment lacking in accurate up to date data, mobile big data (MBD) insights could provide accurate real-time information. However, without any previous use of MBD by public agencies in-country, there was a lack of local expertise.

SOLUTION

The GSMA brought together key stakeholders; the Presidential Covid-19 Task Force, the Ministry of Health, Agence Nationale d'Ingénierie Clinique et d'Informatique de Sante (ANICiiS), Secrétariat Technique du Covid-19, Orange, Vodacom, Africell, Kinshasa Digital, Flowminder and World Bank.

Educational workshops helped strengthened understanding of MBD insights' potential and established the health authorities' needs.

Virtual "Technical Workshops" and a "Mobile Big Data Control Room" allowed partners to agree on indicators for population mobility, and explore multiple use cases and design options for a dashboard.

Three products were developed in parallel:

- A dashboard to provide insights on nation-wide population mobility patterns, as well as hospitals capacity and hotspots monitoring in Kinshasa.
- Reports on population mobility with preliminary indications on economic pressures created by the crisis.
- An epidemiological model based on population mobility and health indicators.

These products were adopted by various government agencies who are interested in identifying opportunities for enhancement and potential areas of replication.

IMPACT

The government used MBD insights to evaluate lockdown compliance, showing that Kinshasa's Gombe district saw a 70% drop in the total flow of mobile subscribers travelling to the district in the weeks after lockdown was enforced.

Locations with increased population mixing and potential future disease hotspots were identified, highlighting unintended consequences of lockdowns and border closures.

Visibility of population movement from Kinshasa's most affected districts to other parts of the city and other provinces in the country as mining activities resumed allowed the government to assess risk of disease spread on resumption of economic activity.

Rwanda: Assessing the Impact of Covid-19 On Public Transport

When the first cases of Covid-19 were reported, Rwanda's government acted swiftly to introduce a number of measures to contain the spread of the disease including a country-wide lockdown, prohibition of non-essential business and gatherings, and suspension of domestic travel between cities and districts. This had an immediate effect on public transport, as the public reduced their travel and switched from busses to private hire vehicles where possible. The government also limited capacity on public transport, which constrained availability to those still using the services and impacted the ability of the public transport operators to achieve financial sustainability.

CHALLENGE

As usage of public transport changed dramatically, the government needed to understand how to allocate resources and improve the efficiency of services.

SOLUTION

The GSMA convened stakeholders including the Ministry of ICT and Innovation, the Rwanda Utilities Regulatory Authority (RURA), Rwanda Transport Development Agency (RTDA) and MTN.

Educational workshops brought together key stakeholders from several different government agencies to build a foundational understanding of the scope of mobile big data (MBD) insights.

As part of weekly technical meetings, project partners established the need to understand the impact of the disease on the transport sector as well as how transport is contributing to the spread of the disease.

By combining aggregated and anonymised customer data from MTN with ticketing data, GPS data, and road network data this project established initial findings about which public transport routes require adjusted capacity, thereby improving efficiency and cost.

IMPACT

The insights generated in the first stage of the project revealed that travel bans, combined with people choosing to make journeys using different methods of transport, had led to lower usage of public transport in some areas, allowing the government to redirect public transport to routes which risked being too crowded to allow for social distancing. The project also showed how mobile data can be used to prioritise road infrastructure improvements, by identifying sections of road with high demand and slow travel times.

This project has resulted in increased interest in MBD insights in Rwanda, with the National Institute of Statistics of Rwanda (NISR) and other government agencies expressing interest in the project and asking to work more closely with data scientists at RURA. Minister of ICT and Innovation Paula Ingabire, and Minister for Infrastructure Claver Gatete, personally attended the closing workshop and showed great enthusiasm for extending the work. This could broaden the AI4I ecosystem in Rwanda, develop further local talents and explore new use cases.

Benin: Using Mobile Big Data Analytics To Strengthen Government Decision-Making

When Covid-19 reached Benin in March 2020 the country had an inadequate testing infrastructure¹ and any response measures were likely to have a significant impact on people's livelihoods. It was vitally important, therefore, that any response the government undertook was both necessary and effective.

CHALLENGE

The government in Benin implemented a number of policies aiming to reduce the spread of the virus but did not have timely or accurate data to base these policies on or to measure their efficacy.

SOLUTION

The GSMA brought together the Ministry of Communication and the Post, the Ministry of Health, the Regulatory Authority for Electronic Communications and Posts (ARCEP), AFRIA (the Francophone Agency for Artificial Intelligence in Africa) and its technical partner OTRIS, World Bank and MTN.

Educational workshops built foundational understanding across Ministries and established the potential use cases, the relevant and interested partners, and the technical specifications needed.

Four potential use cases were identified:

- To provide better understanding of population at risk
- To anticipate propagation of the virus at the national scale
- To inform logistical decisions (vaccination, tests) and hospital capacity
- To assess efficiency of social distancing measures ("cordon sanitaire", curfew), especially in hot spots locations and bordersCovid-19

A prototype dashboard was created to illustrate the power of mobile big data (MBD) insights to give insights into potential response measures and the privacy requirements of any solutions.

IMPACT

The project led to increased awareness and prioritization of projects which use MBD insights within the Ministry of Health, Ministry of Communication and Post and locally-based development institutions aiming to contribute to Benin's long-term development objectives.

This project laid the foundations for the development of a local MBD ecosystem by leveraging local partnerships. AFRIA were central to the initial partnership development and needs assessment, and are committed to the continued development of the ecosystem.

¹ <https://www.afro.who.int/news/benin-boosts-covid-19-response-increased-testing>

Burkina Faso: Improving Covid-19 Response and Preparedness For Other Epidemics

Burkina Faso was already facing a complex humanitarian and security crisis, a weak health system, and poor availability of data for decision-making when Covid-19 arrived in the country in early March 2020. The government needed accurate data in a short time-span to respond to the pandemic.

CHALLENGE

Creating an effective strategy to mitigate Covid-19 whilst dealing with existing challenges would require collaboration between the public and private sectors and development partners. The GSMA aimed to establish these partnerships to leverage mobile big data (MBD) insights to formulate and test responses.

SOLUTION

The GSMA convened project partners including the Ministry of Health, Emergency Response Operations or Centre Des Opérations De Réponse Aux Urgences Sanitaires (CORUS), Orange Burkina Faso and Orange Business Services, Cooper/Smith, and the World Bank. Additionally, the Data Protection National Agency (CIL) has been engaged to ensure necessary approvals for the use of MBD insights.

- Three use cases have been defined:
 - To provide better understanding of population mobility and evaluate the impact of the government's Covid-19 response measures
 - To build an epidemiological model to improve understanding of how epidemics spread in order to provide the required medical support in specific areas in the country
 - To explore how MBD insights can inform infrastructure placement, specifically health facilities

Orange Business Services created a dynamic dashboard for the Ministry of Health. This provided insights on population mobility patterns to aid decision making, and sparked discussion on how to include additional use cases.



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