



CONTRACTS  
FOR DATA  
COLLABORATION

# **USING MOBILE DATA FOR HEALTH MONITORING:** A Case Study of Data Sharing Between Ghana Statistical Services, Vodafone Ghana, and Flowminder Foundation

A Case Study by SDSN TReNDS for C4DC



## ABSTRACT

A data collaboration in 2018 between the Ghana Statistical Service (GSS), Vodafone Ghana, and Flowminder, enabled the GSS to access insights from mobile phone data to plan public health and sustainable development policies. This case study demonstrates how a government and a private company were able to work with an intermediary partner to gain insights from sensitive data. As part of the collaboration, Vodafone Ghana provided access to pseudonymized telecommunications data free of charge, and Flowminder aggregated and analyzed the data on behalf of GSS. Initially, the parties had planned to form a non-binding agreement, but national regulators requested a formal agreement that addressed various data concerns. From the initial draft of the agreement provided by Vodafone Ghana to the final approval, negotiations took some 13 months. The negotiations were made especially challenging because GSS did not have its own legal counsel, and the process overlapped with the introduction of the General Data Protection Regulation (GDPR). Among other issues, the agreement addresses how the data will be aggregated, the parameters for the exchange of the data between the parties, data use limitations, data deletion, and the publication of analysis results. After signing the agreement in December 2018, the parties have since enjoyed a successful collaboration, and the mobile data being used by GSS has proven especially valuable during the current Covid-19 pandemic to document the impact of restriction measures in Ghana.

## VIEW THE AGREEMENT

To view the associated data sharing agreement, please click [here](#). An analysis of the agreement is also available on the Contracts for Data Collaboration library [here](#).

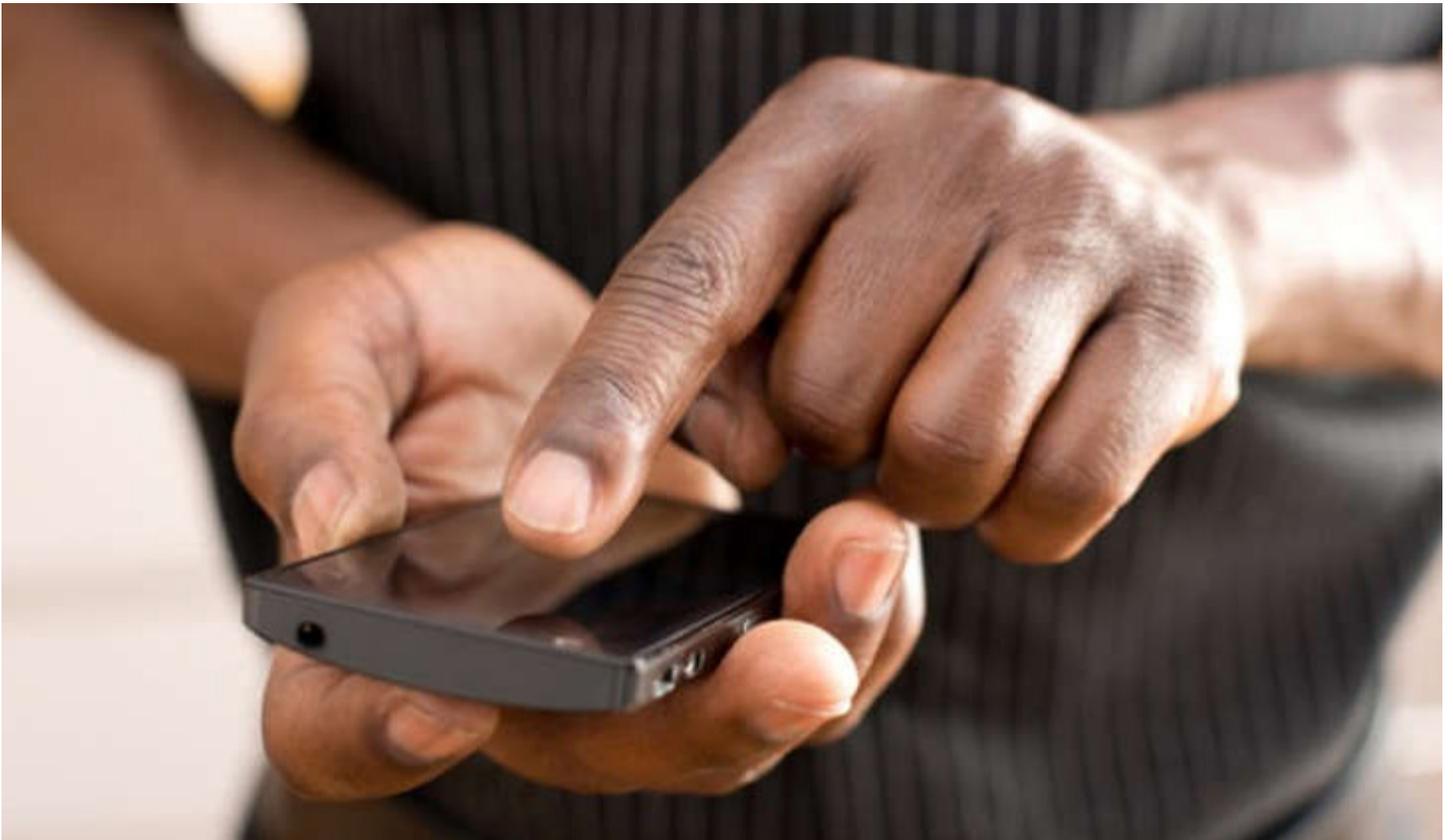


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# 1. INTRODUCTION

In December 2018, the Ghana Statistical Service (GSS) formed an agreement with the telecommunications company, Vodafone Ghana, and the Sweden-based nonprofit, Flowminder Foundation, to create a framework for integrating mobile network operator (MNO) data analysis to support its statistical efforts. According to Omar Seidu and Rachel Bowers of the GSS, the collaboration was motivated by a national capacity assessment for Sustainable Development Goals' (SDG) monitoring, which demonstrated weaknesses in the GSS's ability to provide disaggregated information and timely data. Additionally, in response to the 2014 - 2016 West Africa Ebola epidemic, the GSS was looking for data that could be used to address the spread of communicable diseases in relation to internal migration, and it identified MNO data as an option. There was also interest in using MNO data to measure citizens' access to social services, including healthcare, road networks, water, and educational facilities (Seidu and Bowers, 2020); this data can inform the government about which segments of the population are accessing services and how long it takes them to reach service locations. The resulting agreement and the sharing of timely data are now all the more relevant, as governments around the world consider how to leverage insights from mobile networks during the COVID-19 pandemic.

The partnership came out of the first UN World Data Forum (WDF), held in Cape Town in January 2017. After the GSS staff attended WDF presentations on MNO data and learned about potential applications, the Global Partnership for Sustainable Development Data (GPSDD) helped to facilitate an initial meeting with Flowminder. During this meeting, the GSS learned from Flowminder that Vodafone Ghana had previously tried to work with the Ghanaian Ministry of Health during the Ebola epidemic, but Ghana's Data Protection Commission had stopped the project due to privacy concerns. However, because the GSS has a broader mandate for collaboration than the Ghanaian Ministry of Health, the parties expected the project to be more feasible this time around. In an effort to streamline the process and to determine which types of data collaborations were possible, as well as discuss issues of data security and individual privacy, the GSS held conversations with the Data Protection Commission, Ghana's National Communications Authority, and Flowminder before connecting with Vodafone. Flowminder then facilitated an introduction between GSS and its contacts at Vodafone Ghana, who were enthusiastic about the collaboration.



Data For Good Showcase in Ghana, December 2019  
Photo Credit: Ghana Statistical Services

## 2. AGREEMENT NEGOTIATION

Discussions with Vodafone about the project began in earnest in April 2017, and the necessary funding was secured from the Vodafone Foundation and the Hewlett Foundation by the end of the year (Seidu and Bowers, 2020). Although Vodafone provided the data free of charge, there were costs associated with Flowminder’s services and training for the GSS staff.

Based on previous operations, Flowminder proposed a three-way structure for handling the data (Li, 2020). Vodafone Ghana would provide access to pseudonymized mobile data records (personally identifiable information fields within the data record are replaced by one or more artificial identifiers, or pseudonyms), Flowminder would then aggregate and analyze the data, and the GSS would incorporate the analysis from Flowminder into its statistics production. Initially, the partners had planned to sign a memorandum of understanding (Seidu and Bowers, 2020). Although such a document would have been legally non-binding, it still would have outlined the responsibilities and expectations of the parties, including Flowminder’s internal data governance policies, protocols, and standards (Li, 2020). After discussing with the Data Protection Commission, however, they realized that a more formal agreement would be required (Seidu and Bowers, 2020). According to Tracey Li, a Data Scientist at Flowminder, the agreement negotiations were driven primarily by Vodafone Ghana, because it was the data provider and could also bring in legal resources from the wider Vodafone corporation. Vodafone also had standard processes and protocols on what to include with agreements and prepared the first agreement draft. Reflecting a common capacity challenge across low-income countries, the GSS did not have its own legal department, and instead had to rely on Ghana’s Ministry of Finance’s legal department for assistance with reviewing drafts of the agreement (Seidu and Bowers, 2020).

Following some back and forth between Flowminder, Vodafone Ghana, and the Ministry of Finance’s legal department, the partners reconvened with the Data Protection Commission (Seidu and Bowers, 2020). The commission requested added clarity on the agreement terms, including the roles and responsibilities, as well as justification for Flowminder’s participation as a third party. The agreement was finally approved in December 2018 after a 13-month negotiating process, and the entire process from when general conversations were initiated to the final approval of the agreement took over a year and a half. The lengthy process was not a result of major disagreements on how to proceed, but was instead due to changes in government during the negotiation period, the difficulties inherent in international communications, and internal approval procedures (Seidu and Bowers, 2020). The negotiations also overlapped with the introduction of the EU’s GDPR, and the partners had to determine how to best respond to the new requirements (Li, 2020).



Flowminder and Ghana Statistical Services Trainees  
Photo Credit: Ghana Statistical Services

## 3. AGREEMENT TERMS

While the agreement addresses more general contracting issues – such as, liability ([clauses 4.5 and 10](#)), the funding commitments ([clauses 3.2 and 9](#)), and the termination of the agreement ([clause 7](#)) – it also deals with a number of issues specific to the sharing of mobile data. It should be noted that there are also multiple appendices integral to the agreement that SDSN TReNDS did not have the opportunity to access. From the available text and interviews with the key parties, though, we understand that the following points are especially important to the agreement.

### 3.1 Data Anonymization and Aggregation

The agreement specifically includes precautions on how data should be aggregated and which categories of data the GSS can access. Data anonymization through aggregation is laid out as a requirement in the project aims ([clause 1](#)) and in the section on data protection ([clause 4.2](#)). Among other points, this means that demographic data about the network users are not shared. The GSS had originally requested sex disaggregated mobile data so they could try to quantify differences in the experiences of men and women, but they later decided to remove this variable from their request due to data security concerns (Seidu and Bowers, 2020).

### 3.2 Data Handling

The agreement outlines the responsibilities of the different parties for analyzing data. Vodafone Ghana makes pseudonymized versions of data available to Flowminder, who then aggregate the data before the GSS can have access ([clause 3](#)). This ensures that the GSS can only view data at the sub-district aggregated level, rather than data from individual devices. These considerations were built into the agreement to protect the security data of network user data (Seidu and Bowers, 2020). Additionally, the agreement outlines that the pseudonymized data can never leave Vodafone's servers, and Flowminder is only allowed to process data on Vodafone's internal system without transferring non-aggregated data ([clause 4.2.2](#)). This restriction partly came out of Vodafone's own requirements, but transferring data across international borders to Flowminder would have also raised a host of complex legal questions. In practice, Vodafone also filters out unnecessary data entries and de-identifies the remaining data before sharing with Flowminder (Li, 2020).

### 3.3 Data Use Limitations

In addition to restricting the levels of data access, the agreement limits the potential applications for the shared data. The GSS had to commit to use Vodafone Ghana's data only for the stated purposes of measuring internal migration and in support of producing SDG indicators for national statistics ([clause 3.4.1](#)).

### 3.4 Data Deletion

Under [clause 6.3.1](#), each of the parties is required to return or delete all confidential information of the other parties when the agreement is terminated, unless they are given express permission by the other parties to retain the information.

### 3.5 Publishing Results

Flowminder emphasizes making its work as open, transparent, and accessible as possible, and has a particular interest in agreement terms with regard to intellectual property and ownership of final outputs (Li, 2020). While the original agreement drafted by Vodafone had a strong focus on data privacy, security, and governance, Flowminder negotiated for added language on the publication of results. The final agreement states that Flowminder and the GSS are to release outputs under an open source license ([clause 8.6](#)). At the same time, Vodafone has the right to review and approve documents and datasets before publication ([clauses 11.2 and 12.1](#)).

### 3.6 GDPR Requirements

Since Flowminder is an EU-based organization, the agreement also had to be GDPR compliant (refer to the section on [Dispute Resolution and Governing Law](#)). One of the most important steps for achieving compliance was establishing procedures under Data Processing Agreements (DPAs), included in Appendix 2 of the wider agreement. This appendix makes clear the relationship between different parties with regards to data governance (Li, 2020). Although we do not have access to the DPA itself, it is referenced in the body of the text. The DPA is cited in [clause 3.3.1](#) on how Vodafone Ghana will provide access to data, and in [clause 4.2.1](#), with regard to limitations on how Flowminder and the GSS can process the data.



Photo Credit: Unsplash

## 4. OUTCOMES AND CONCLUSIONS

The agreement has been the basis for a continued and successful partnership between the three parties. In December 2019, Flowminder held a project showcase event in Accra, Ghana that highlighted ways that mobile data can be combined with surveys and other sources of traditional data for humanitarian and development applications (Flowminder, 2019). In particular, they presented initial results from an analysis for Ghana's National Disaster Management Organization (Li, 2020). Their work with the GSS and Vodafone Ghana is also now being extended to address Covid-19 response efforts. For example, Flowminder and the GSS have analyzed the mobile data to assess the impact of different restrictions on population movement in Ghana during the pandemic (GSS, 2020). The mobile data can provide timely and relevant insights, and the analysis has documented reductions in movement between districts and fewer fluctuations in the number of mobile subscribers in individual districts, a proxy measure for population change.

The experience in Ghana offers several lessons that may be of use to others considering similar collaborations:

- **Having the right conversations in advance is important.** *The GSS worked with partners and regulators to determine what the collaborative framework would be before it engaged with a data provider.*
- **Concerns about government access to sensitive data can be addressed by having a trusted third party assist with the data analysis.** *Academic partners or research institutes can be useful in this capacity.*
- **Having a formal agreement can address concerns about both the confidentiality of data and the availability of results.** *This example lays out terms for anonymization, aggregation, and limits on data access, while also allowing for openness and publication that is subject to review.*
- **An additional measure for protecting confidentiality is to require that individual-level data can only be accessed on the data provider's servers** *by approved members of staff from approved third parties.*
- **Forming an agreement in advance can be valuable when facing an emergency.** *Thanks to the existing partnership, the GSS has been able to proactively use mobile data in its COVID-19 response efforts.*

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