

# Mobile Money & Gender in Uganda

DALBERG DATA INSIGHTS

data2x<sup>o</sup>

## Introduction

Women across the world face social and legal barriers to accessing financial services. Mobile money and other phone-based applications can help, but sex-disaggregated mobile phone data is critical to understand how such applications can effectively address women's financial needs. Such data, however, is rare. Even when available, the information is often unreliable because of sharing of SIM cards, restrictions to women registering accounts in their own name, and other social and cultural factors.

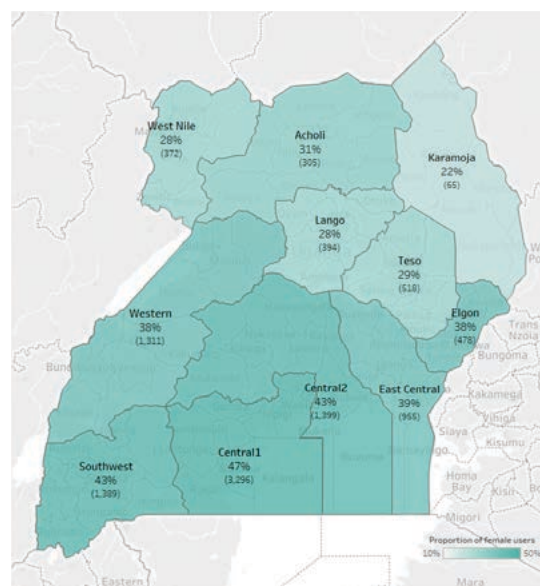
In this study, we outlined the differences in mobile phone and mobile money usage between men and women in Uganda. The research was comprised of three activities. First, we implemented a survey to obtain reliable demographic information about 10,500 subscribers in a major mobile network. Second, we fed this data into a machine learning algorithm, which computes more than 200 phone usage indicators and utilizes machine learning algorithms to predict the sex of subscribers. Finally, we use the algorithm to describe sex-specific patterns in phone and mobile money usage. We found that women tend to be engaged in fewer calls, the majority of their calls are incoming, and their incoming calls have longer average duration. Women also top-up (buy credit for calling and messaging) less frequently and in smaller amounts, have fewer contacts, and travel less.

## Our Approach

We obtained information on sex, age, phone sharing, and occupational status from a random sample of 10,500 subscribers of a major telecom operator in Uganda. Nearly 41% of the subscribers in this survey were women, though this varied by region of the country (Figure 1). Validation work

found that about one-third of the respondents did not have a correct sex label in the operator's database. For the main analysis, we characterized usage patterns among this sample from 60 days of anonymized call detail records (CDRs), which contain the logs of all phone activity during the period. We analyzed voice and text CDRs, data CDRs, airtime credit recharges, and mobile money transaction records. Overall, we used 201 indicators, spanning phone usage, mobility patterns, users' social networks, top-up patterns, and mobile money usage.

**Figure 1.** Representation of women in the ground-truth survey, expressed as percentage of total within each region.



Absolute numbers in parentheses.

## Results

The model reached an accuracy of 72% in predicting subscribers' sex. Average top-up value, the number of unique contacts per active day, average call duration during the week, the size of the geographic area in which users moved, and the duration of incoming calls were all important predictors of sex.

With respect to the gender analysis, we found that women have longer calls and a smaller proportion of outgoing phone activity. Men overall connect with more people on a daily basis, and top-up in larger amounts and more frequently. Elderly men travel longer distances in both urban and rural settings than women, though distances are generally longer in rural areas for all groups. However, these differences disappear when considering young women. Young women in both urban and rural settings have a larger network of contacts than their elderly male counterparts, and elderly men typically top up less frequently (though with still higher value) than young and adult women.

Urban residency plays a strong role, with urban women topping up as frequently as their rural male counterparts. In addition, no major differences of data usage between men and women exist—surprising given that gender inequality in mobile internet usage is generally thought to be greater than the gap in phone ownership and usage. Figure 2 summarizes gender differences in a few key indicators: average duration of calls, proportion of calls that are outgoing, unique contacts per day, and the number of total top-ups.

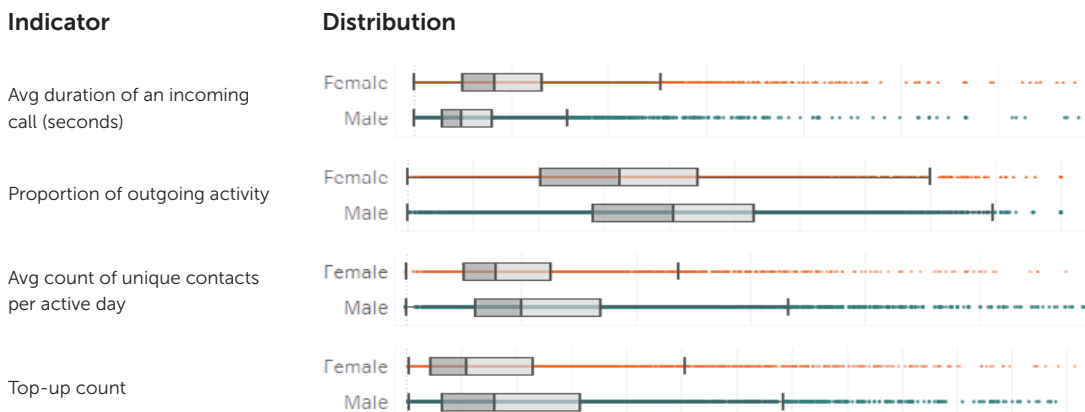
We also found that more women use mobile money than men, but men both deposit and withdraw higher amounts of money, and transact more overall. However, men and women do not differ in their average account balance, the number of accounts they interact with, or the number of

withdrawals they make. Interestingly, women pay on average a higher fee per transaction.

## Implications

Increasing financial inclusion among women depends on a better understanding of gendered phone and mobile money usage. The above analysis suggests improving access to digital technologies will not, by itself, fully leverage the power of these technologies to equalize social opportunity. Policymakers and private companies need to consider the barriers that constrain the size and structure of women’s social networks, limit their mobility, and determine the differentials in use of voice, text, and data services. At the same time, young women—especially those living in urban areas—do use mobile phone services almost as much as men, and this represents an important opportunity for network operators, governments, and other actors to collaborate for social gender equality. Cell phone data can help describe all these phenomena, and similar analyses in other countries would provide a detailed portrait of women’s economic and social lives. Mobile operators that wish to generate accurate estimates of their subscribers’ gender can access the Gender Analysis and Identification Toolkit (GAIT), developed in partnership with the GSMA.<sup>1</sup> Complementary research, especially using qualitative interview and focus group methods, would help elucidate the cultural and economic factors that determine women’s agency in the uptake and use of technology.

**Figure 2.** Boxplots of selected phone usage indicators, by sex. The boxes show the range of the middle 50% of users, with the line inside the box indicating the median user.



1. Further details can be found at <https://www.gsma.com/mobilefordevelopment/resources/the-gsmas-gender-analysisand-identification-toolkit-gait/>