

Fertility Behaviors and Social Media: Do they cluster together?

November, 2021

Jet Wildeman, Sandor Schrijner, Jeroen Smits

Radboud University, Nijmegen

The Global Data Lab

Corresponding author: jet.wildeman@ru.nl

Abstract

This paper examines the role of social media as potential determinant of sub-Saharan Africa's (SSA) contraceptive acceptance, usage and Crude Birth Rates (CBRs). Even though the connection between traditional information and communication technologies (ICTs) and fertility behaviors has been firmly established, the connection between social media and fertility remains understudied. This is surprising given the fact that the characteristics of social media are highly likely to influence fertility behavior; even more so than traditional ICTs. For example, social media has the potential to enlarge individual's social networks, which could lead to encounter new role models, different fertility preferences, and access to information. This could probably result in changes in fertility attitudes and behavior. As such, understanding subnational variation in contraceptive acceptance, usage, and CBRs in combination with subnational variation in social media usage, offers new opportunities for geographical targeting and prioritizing of policy. We conducted a subnational analysis with use of nationally representative cross-sectional data from the Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) which were collected between 2015 and 2019 for 32 countries in SSA. For measuring social media usage, we constructed a sub-national index of social media usage using digital trace data from Facebook. In this way, this paper aims to provide evidence that social media might be an effective tool to enlarge contraceptive usage and acceptance and to influence to CBRs which in turn will contribute to the achievement of the Sustainable Development Goals.

Introduction

Sub-Saharan Africa's (SSA) infrastructure is already for many years a hot and much debated subject. Many times it has been connected to the slow progress made in their development process. Both, citizens and political leaders, emphasize the importance of infrastructure development. The words of the President of South Africa Jacob Zuma perfectly illustrate the importance: "Africa's time has come, and without infrastructure, our dreams will never be realized" (New Partnership for Africa's Development, 2010). There is often made a distinction between five basic types of infrastructure: electricity, piped water, sewerage, roads, and information and communication technologies (ICTs). Where the progress in the first four types is on average very little, the exception is formed by the last type of infrastructure. In recent years, 93% of the Africans has access to a mobile phone (Mitullah, Samson, Wambua, & Balongo, 2016).

The rapid expansion of the mobile phone and Internet has paved the way for the digital revolution and this offers new opportunities for another urgent topic in SSA, their population development. According to the latest UN population predictions, the population size of sub-Saharan Africa (SSA) will rise tremendously in the coming decades (United Nations Department of Economic and Social Affairs, 2019). Their current fertility level and preferred family size are higher than those in developing regions in other parts of the world, like Latin-America and Asia (Alaba, Olubusoye, & Olaomi, 2017; Bongaarts & Casterline, 2013; United Nations Department of Economic and Social Affairs, 2020).

Where the connection between traditional information and communication technologies (ICTs) and fertility behaviors has been established, the connection between social media and fertility stays unclear. The characteristics of social media are likely to influence fertility behavior even more than traditional ICTs. Traditional ICTs are associated with contraception uptake and smaller ideal family size and lower parity through role modeling, preference change, and access to information (Billari, Giuntella, & Stella, 2019; Toffolutti et al., 2020). However, social media, for example, enlarges individual's social network and as such, might be more influential on those specific behaviors.

Problematic is, however, the deficiency in available data to measure the social media usage in SSA. To overcome this problem, this paper aims to use new digital traces from social media to create opportunities to measure the degree, and consequences, of the digital divide with regards to social media. In line with some earlier studies (Fatehkia et al., 2018; Zagheni, Weber, & Gummadi, 2017), this paper will use Facebook's advertising platform to examine how social media penetration relates to fertility behavior. However, where the previous study of Zagheni et al. (2017) and Fatehkia et al. (2018) used this new data source respectively for monitoring migrant stocks in the developed world, and measuring the digital gender gap at national scale worldwide, this study takes it one step further. In this study, we construct a sub-national index of social media penetration in SSA and we will combine it with three fertility outcomes: contraceptive usage and acceptance, and the crude birth rate (CBR). The

disaggregation of the national data to the sub-national level enables us to monitor in more detail the geographical variation in fertility behaviors and social media usage.

To examine how social media influences fertility behaviour and how this relates to the digital divide, the current paper aims to thoroughly examine the relationship between social media and women's fertility behaviour, by answering the following research questions:

- 1) *To what extent and in what ways are contraceptive usage, acceptance and the Crude Birth Rate (CBR) in SSA related to the usage of Social media?*
- 2) *To what extent and in which ways can this variation be explained by digital divides regarding to gender, degree of urbanization and education?*

By combining social media characteristics with data of the Global Data Lab with information of more than 300 regions in 32 SSA countries, we study the relationship between social media and fertility behaviour in more detail than is ever done before.

Method

Our study seeks to estimate to what extent the penetration of social media relates to fertility behavior in sub-Saharan Africa using online Facebook-derived indicators in combination with offline, sub-national level development indicators coming from the Global Data Lab (www.globaldatalab.org). The online data that we are using comes from Facebook's advertisement audience estimates that come from Facebook's marketing application programming interface. These data are publically and freely accessible and allow users with a Facebook account to query the number of active Facebook users last month disaggregated by various geographic and demographic characteristics (detailed information can be found at: <https://developers.facebook.com/docs/marketing-apis>).

The degree of spatial autocorrelation was measured by using Moran's I , and the degree of spatial clustering by using the Getis-Ord G_i^* local statistic

Main variable

The main dependent variable is the crude birth rate of sub-national regions in SSA. We retrieved this data using different data sources, such as the Demographic Health Surveys, Multiple Indicator Cluster Surveys and Ipums-International data. Combining these data sources enables us to use the most recent contraceptive usage, acceptance and Crude Birth Rates for each region.

Variable of interest: Facebook indices

Facebook makes its profits from their advertisements. They enable advertisers to use advanced targeting options by creating detailed profiles of their users, which includes demographic characteristics like age, gender and geographic location. Before launching an advertisement campaign and thus, before costs are

made, Facebook provides audience sizes for the specified target criteria. For example, if you want to reach women in Benin aged 20+, Facebook provides you the number of active accounts last month that fulfill these criteria. As such, these data can be used as a kind of digital census with a questions as: “How many female users are aged 20+ in Benin?”

Results

As is shown in figure 1 and 2, fertility clusters

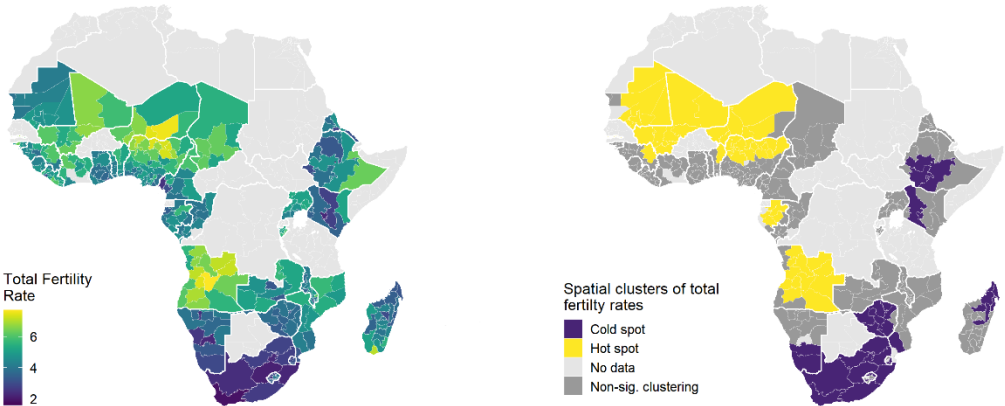


Fig. 1. Subnational total fertility Rates for some countries in SSA (left) and the results of a spatial-cluster analysis on the total fertility rates (right).

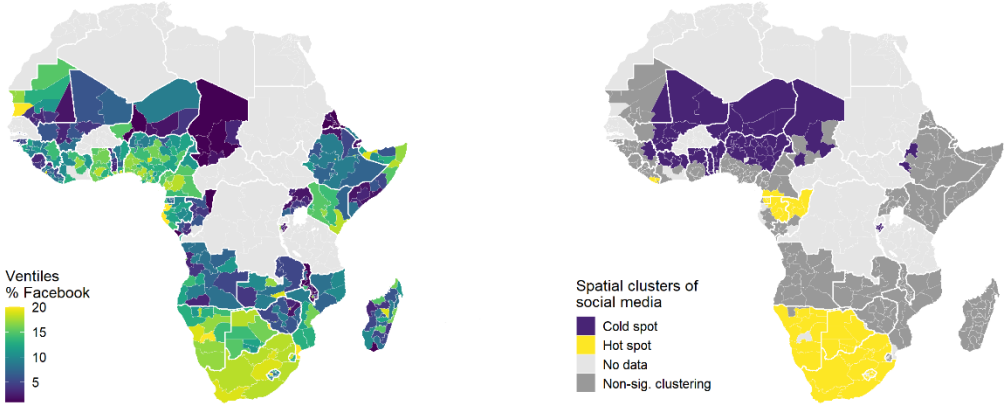


Fig. 2. Subnational ventiles of Facebook usage for some countries in SSA (left) and the results of a spatial-cluster analysis on the social media usage (right).