# Fear in Somalia and the need for a remote and effective platform from which people can make their voices heard

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# Summary

Somalia has endured famine, conflict and terrorism for three decades and thus most Somalis have no political voice. Here, we explore a project which uses local radio and SMSs in order to provide a platform from which they can speak out. We show that 47% of Somalia and 70% of its population are reached. We find a positive correlation between the number of radio programmes in a district and its SMS response-rate. However, a district's radio coverage is negatively correlated with terrorist influence indicating that those most in need of a voice do not have access to the platform.

# Keywords

Terrorism citizen-voice R GIS mobile-phone

# 1. Introduction

Somalia (Figure 1.) has been plagued by armed conflict, drought, famine and terrorism for many decades (Maystadt and Ecker, 2014, Maxwell and Fitzpatrick, 2012). Against this backdrop, individual Somali women, men and children strive to survive and live their lives. Conditions in 2016 are equally brutal, with the UN reporting that 'the food security and malnutrition situation in Somalia is alarming' with nearly five million people acutely in need of humanitarian assistance (UN News Centre, 2016). More generally, UNICEF report that 38% of the population are food insecure, 73% of the population live below the poverty line and at least 5,000 children are working with armed militia groups (UNICEF, 2016). The majority of Somalis thus do not participate in administrative and governmental life and in this sense have no voice at either a national or local level.



Figure 1. Somalia, one of four countries comprising the Horn of Africa in Sub-Saharan Africa

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# 1.1. The importance of radio and mobile phones in Somalia

Radio is the most important channel of communication in Somalia (BBC World Service Trust, 2011). During the 1990s civil war in Mogadishu, many clan fighters would stop fighting for a set period in the afternoon so they could listen to the BBC Somali Service (infoasaid, 2012). Somalia is the most dangerous place in the world for humanitarian aid workers (Egeland et al., 2011). Radio is therefore a potentially powerful way in which aid agencies can reach the rural population remotely and ask the people what assistance they require.

In 2012, the African continent was the world's fastest-growing and second-biggest mobile phone market with approximately 750 million handsets for its one billion people (Abreu Lopes and Srinivasan, 2014). Mobile phones thus provide a cheap, efficient and optionally anonymous means by which the Somali population can respond.

# 1.2. UNICEF Somalia and the University of Cambridge's Africa's Voices

In 2016, UNICEF worked with Africa's Voices Foundation (AVF), a non-profit research organisation spun out of the University of Cambridge, to set up an interactive radio-SMS system involving 26 local radio stations. This study aims to identify district-level factors driving the Somalia people's SMS response rate to the questions asked as part of the AVF radio programmes (Table 1.). This is in order to optimise future study design and give the Somali people the loudest possible voice in a country where a multitude of factors conspire to silence them.

 Table 1. Variables identified as possible drivers of the Somali people's SMS response rate to the Africa's Voices radio programmes.

	Variable
1.	AVF radio programme coverage
2.	Number of AVF radio programmes
3.	Potential number urban listeners
4.	Potential number rural listeners
5.	Mean annual precipitation (as an indication of drought)
6.	Number of settlements within 4km of a healthcare facility
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7. Al Shabaab influence

#### 2. Method

#### 2.1 Software

All analyses were performed and figures produced using the open source statistical software R version 3.3.1. (R Core Team, 2016).

#### 2.2. Coordinate Reference System and Projection

All coordinates were received in WGS84 and projected to the Equatorial Lambert Azimuthal Equal-Area Projection (proj4string: +proj=aea +lon\_0=46.1865234375).

#### 2.3. Quantification of possible driver variables.

In order to quantify AVF radio programme coverage (**Table 1**, Variable 1), buffers around each radio station with width equivalent to their range were combined to form a single polygon (Polygon A) representing the geographical extent of participating radio stations. Polygon A was intersected with the Somalia shapefile (source: http://mapeastafrica.com/countries/east-africa-shapefiles/somalia-

shapefiles/) to create Polygon B, the area of overlap between the two. From Polygon B, the following was calculated:

• The proportion of Somalia covered by the radio stations:

coverage (%) = area covered by Polygon  $B(km^2)$  / Somalia area ( $km^2$ )

• the proportion of each district (km<sup>2</sup>) covered by the radio stations:

coverage (%) = area of district covered by a radio range  $(km^2) / district area (km^2)$ 

(Figure 2.).



Figure 2. Geographic extent of the AVF radio programmes (Polygon A) and their extent in each of Somalia's 74 districts (Polygon B).

The number of radio programmes in each district (**Table 1**, Variable 2) was quantified by creating individual dataframes for each radio station buffer which specified the districts with which it intersected. These were combined to form a single data frame. Counts of each district in the composite single data frame then provided the number of radio stations available in each district.

Each district's urban and rural population size for 2016 was obtained from UNICEF (using predictions from the 2014 Population Estimation Survey Somalia (PESS, 2015)). In order to estimate potential listener numbers in each district (**Table 1**, Variable 3 and 4), two assumptions were made:

- 1. The entire urban population of a district was located in the district capital.
- 2. The rural population of a district was homogenously distributed throughout the district.

If the district capital lay within Polygon B, the district obtained a capital score of 1 (and if not, a score of 0). The potential number of listeners in a district was then calculated:

*Urban listeners* = *capital score* (1/0) \* *urban population* 

*Rural listeners* = *proportion of overlap of Polygon B* \* *rural population* 

Mean annual precipitation data for Somalia (**Table 1**, Variable 5) was downloaded in raster form from WorldClim.org (http://www.worldclim.org/current) with a single raster representing each month. It was clipped to the Somalia shapefile and projected. Mean annual precipitation for each district was calculated:

### *mean annual precipitation = sum of the raster stack / number of layers of the raster stack*

The number of settlements within 4km of a healthcare facility (HF) (Table 1, Variable 6) was quantified by clipping settlements to each district and, because Somalis are not restricted to HFs in their own district, district boundaries were then dissolved. The distance from each settlement within a district to every HF in Somalia was calculated. Somalis generally travel on foot in temperatures often exceeding 30 degrees. Thus, the number of settlements in a district within 4km of a HF was recorded.

The Somalia Newsroom (https://somalianewsroom.com) provides the only real-time resource attempting to document the constantly changing political landscape (**Figure 3.**). In order to quantify Al Shabaab influence (Table 1, Variable 7), their map was digitised and Voronoi polygons created around each point. Each was classified as being under Al Shabaab control or not. The proportion of each district under Al Shabaab control was then calculated:





Figure 3. Online Somalia Newsroom map documenting demonstrations of power with the relevant organisation's flag.

#### 2.4. SMS response rate

Participants were requested to state their district in their SMS responses to the AVF radio programmes. The number of responses per capita of each district was calculated.

# 3. Results

#### 3.1. Quantification of potential driver variables

AVF radio programmes cover 47% of Somalia with only 18 of 74 districts having no coverage. All but 16 Somali districts had access to at least one radio station broadcasting the AVF programmes. 70% of the Somali population were found to be potential listeners. 17 districts had no potential listeners and of

the remaining 57, all but Mogadishu (with 100% urban listeners) had both urban and rural listeners. Values for mean annual precipitation and the number of settlements within 4km of a HF varied across districts. Only Mogadishu had > 50% settlements within 4km of a HF. Al Shabaab influence varied across districts with 27 having 0% and five having 100%.

# 3.2. SMS response rate

The first radio programme received 7,676 SMSs, 1,333 of which could be assigned to district (**Figure 4.**). SMSs were sent from two districts with no radio programme coverage. One radio station elicited no SMS responses.



Figure 4. SMSs sent per 10,000 district population

# **3.3.** Correlation between variables and SMS response rate

There was a positive correlation between SMS response rate and the number of radio stations in a district (Pearson's Correlation, R = 0.4, p = 0.004). There was a negative correlation between the proportion of Al Shabaab influence in a district and proportion of AVF radio programme coverage (Pearson's Correlation, R = -0.48, p = 0.000014) (Figure 5.).



Figure 5. Relationship between Al Shabaab influence in a district and AVF radio programme coverage.

# 4. Discussion

Opportunity for public voice is a basic human right and a fundamental component of the democracy the Somali government is endeavouring to build (Newsweek, 2016). This right is denied to much of the Somali population through conflict, harsh environmental conditions, remote living and fear of terrorism. Local radio and mobile phone capacity harnessed by NGOs enables the Somali people's voice to be heard and their needs met. Optimising this system is of paramount importance both for the human rights of the Somali people and for setting up new systems in similarly remote locations. This study highlights the positive effect that a high density of radio stations within a district has on response rate. However, it also shows that those living under the most restrictive conditions do not have access to the AVF radio programmes at all.

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# 7. Biography

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