

Rapid Development of Public Health Education Systems in Low-Literacy Multilingual Environments

Combating Ebola Through Voice Messaging

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Polly Information:
Polly/Game: 1-412-346-6014
Polly/Healthline: 1-413-200-8503



Overview

- We describe the development and deployment of a voice-based, multilingual phone application to spread reliable public health information via peer-to-peer sharing.
- We attempt to overcome mistrust and disseminate important health information via social learning.
- We launched several different phone services in Guinea which all enable message sharing. Each phone service supported several local Guinean languages.

Challenges for Public Health Education in Guinea

- Multilingual environment. No single dominant regional language.
- Fear and mistrust of government, as well as foreign health workers.
- Limited technological infrastructure.

Proposed Approaches

- Multiple language options.
 - Messages available in Guinean French, Fulani, Malinké, Susu, Kissi, Toma, Kpelle, Manon.
 - System language available in Guinean French and English.
- Utilization of endorsements and suggestions by friends, family, and local communities.
- Development of applications for mobile phones, which are prevalent in developing nations.

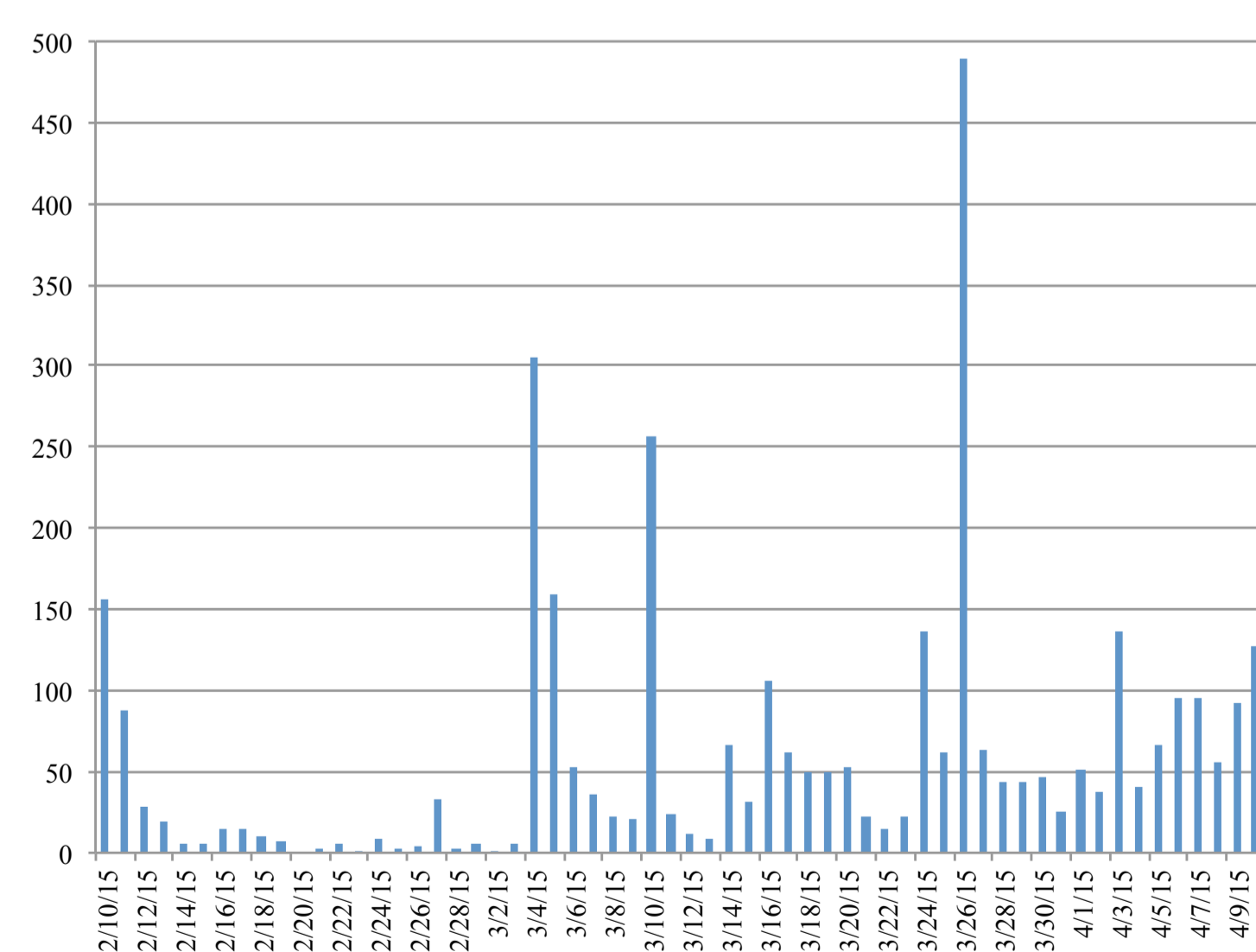


Figure 1: Number of Calls Answered By Polly Users Since February 10, 2015

Operation in Guinea

- System infrastructure deployed via GSM Gateway at US Embassy in Conakry, which communicates with our servers in Pittsburgh, USA.
- Partners on the ground: The US Embassy, the language and training staff from Peace Corps Guinea, and indirectly with the CDC.

Polly Telephone System

Polly is a collection of telephone applications designed to spread virally and disseminate information:

- Polly/Game
 - Designed to attract new users and motivate via entertainment to interact with the system, forward to others, and discover the other secondary systems.
 - Features lighthearted interaction which prompts users to record themselves and modify their voices with funny modulation and sound effects.
- Polly/Spread:
 - Designed for members of the general public to spread Ebola messages as many times as possible.
 - Plays Ebola messages one at a time, stopping each time asking the user to spread it on to others.
- Polly/Browse:
 - Designed for community health workers needing occasional reminders and the ability to send messages if needed.
 - Plays Ebola messages, with easy browsing and optional spreading.

Seeding Techniques

To encourage usage of Polly several seeding events were held, as either in-person demonstrations or as cold seeding attempts.

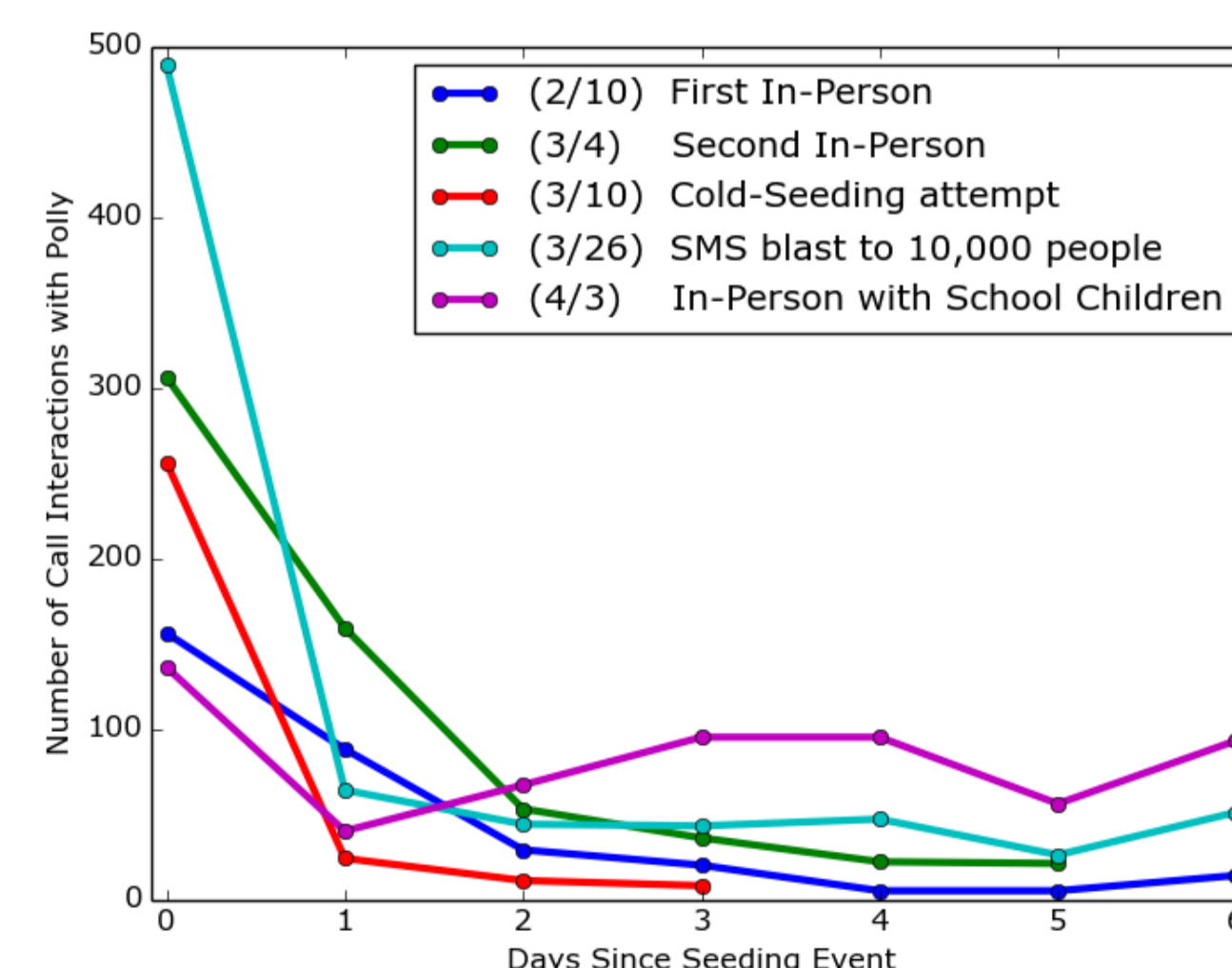
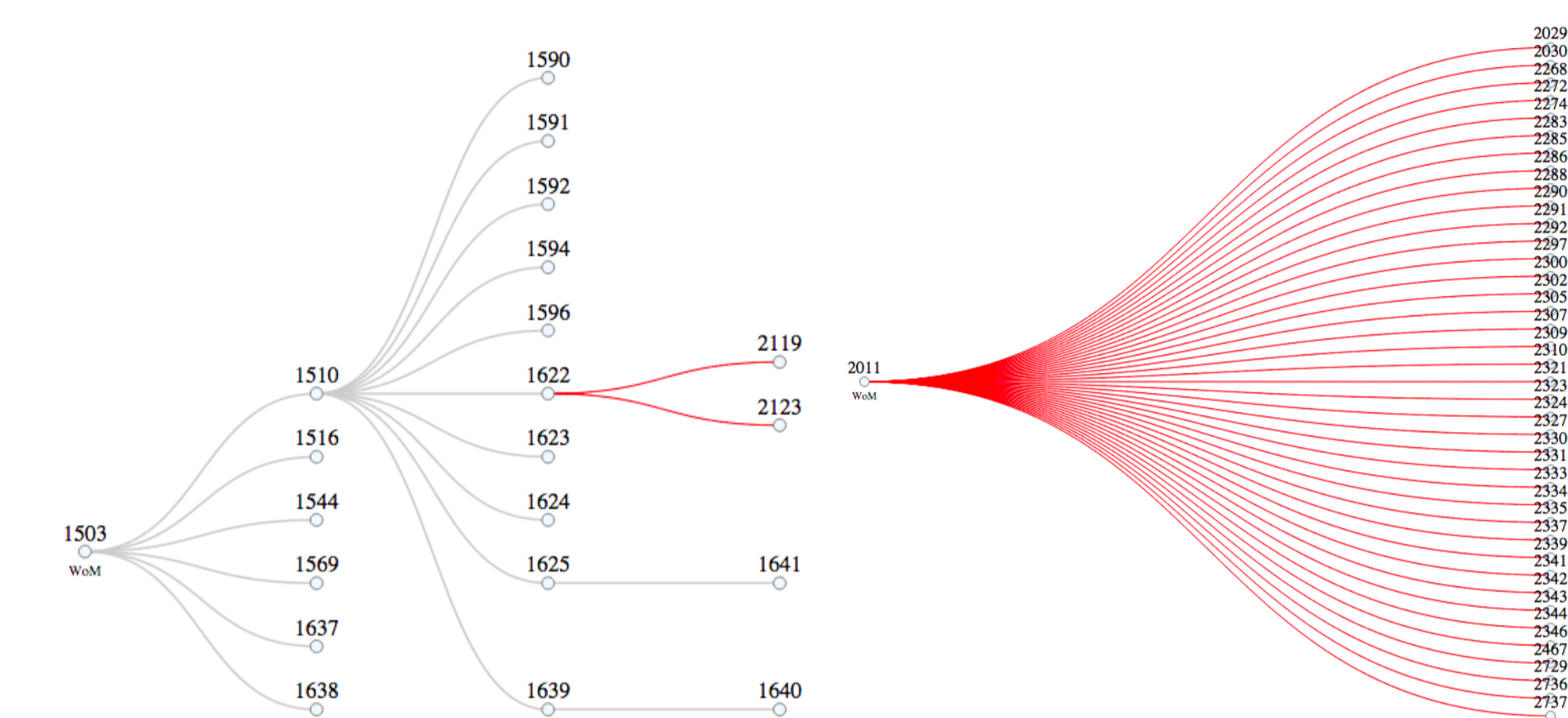


Figure 2: Usage of Polly after different seeding events. Each plot is drawn up to a week or up to the start of another event.

User Behavior

Polly experiences consistent usage every day, many whom are new users. In the first week after the deployment of each separate application, roughly 78.4% users each day were new.



Example of Organic Spread. Example of Single User Super Spreading

Most Popular Messages

The most popular message listened to was the first one on the list. After this, users listened to messages pertaining to what to do when exhibiting Ebola symptoms, how to find treatment centers, and how to bury the dead.

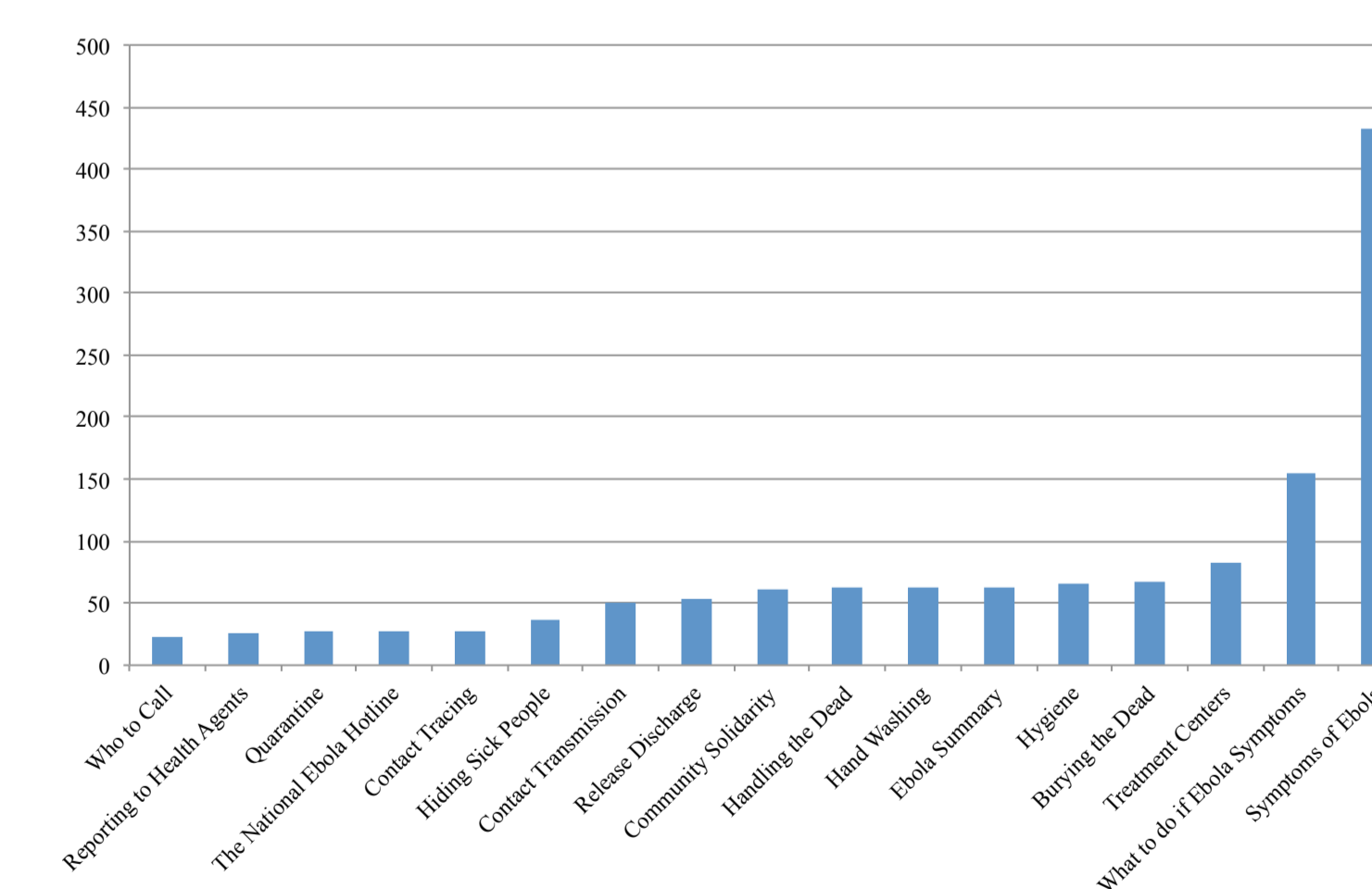


Figure 3: Content vs. Number of Times Message Played

Multilingual Usage of Polly

The relative frequency of languages chosen to be forwarded correlates with the distribution of speakers for each language.

Language	Messages Played	Messages Forwarded
French	973	133
Pular	150	81
English	87	5
Susu	58	36
Malinké	23	16
Kissi	21	5
Kpele	12	6
Manon	1	1
Toma	1	0

Figure 4: Messages Played in Each Language

Conclusions

- Ebola messages were forwarded in different available languages by users. Multilinguality was a feature that was actively used.
- We introduced a telephone system to address challenges associated with public health outreach in a multilingual low literacy environment.
- After different seeding approaches, Polly enjoys a small but steadily growing audience of regular and new users.

Future Work and Applications Beyond Ebola

- Polly can be refocused to aid community workers in efforts to rebuild Guinea in the aftermath of the Ebola outbreak.
- Polly can be used to address other diseases such as Malaria and Yellow Fever.
- Due to upcoming presidential elections in Guinea, the US Embassy has expressed interest in using Polly to spread messages encouraging people to vote.

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