

Performance of a Large-Scale Implementation of a Participatory Influenza-Like-Illness Surveillance System in Guatemala

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Background

Public participation in surveillance of influenza-like-illness (ILI) symptoms could strengthen limited and delayed information from hospital- and laboratory-based surveillance in Latin America. In 2017, we validated and published results on the use of text messages and an app to collect ILI surveillance information (Prieto et al., 2017). In this study, we evaluate effectiveness of the approach during an influenza season in a large-scale implementation in Guatemala.

Methods

We created a system capable of capturing ILI reports from two sources, a mobile-accessible web-based survey and the smartphone app “Nuestra Gripe” (“Our Flu” in Spanish). Our ILI case definition was as follows: measured fever and cough or sore throat, with onset within the last 7 days. We sent 119,738 text-messages to invite people to submit weekly reports about: respondents’ location, age, symptoms of ILI, health-seeking behavior, and history of influenza vaccination. Half of participants were offered influenza prevention tips; the other half the chance to participate in ten lotteries of ~\$15 dollars of phone credit. We used descriptive statistics to characterize electronic reports and used the chi2 test to study the association between the number of participants who accepted to participate and study groups. We hypothesized that there would be a weak to moderate positive correlation between the number of electronically identified ILI cases and the number of reported, laboratory-confirmed cases of influenza. The study protocol was approved by UVG (protocol 149-09-2016), the Guatemalan Ministry of Health (resolution 03-2017), and the CDC (CGH HSR Tracking 2017-140).

Main results and discussion

Figure 1. Project workflow

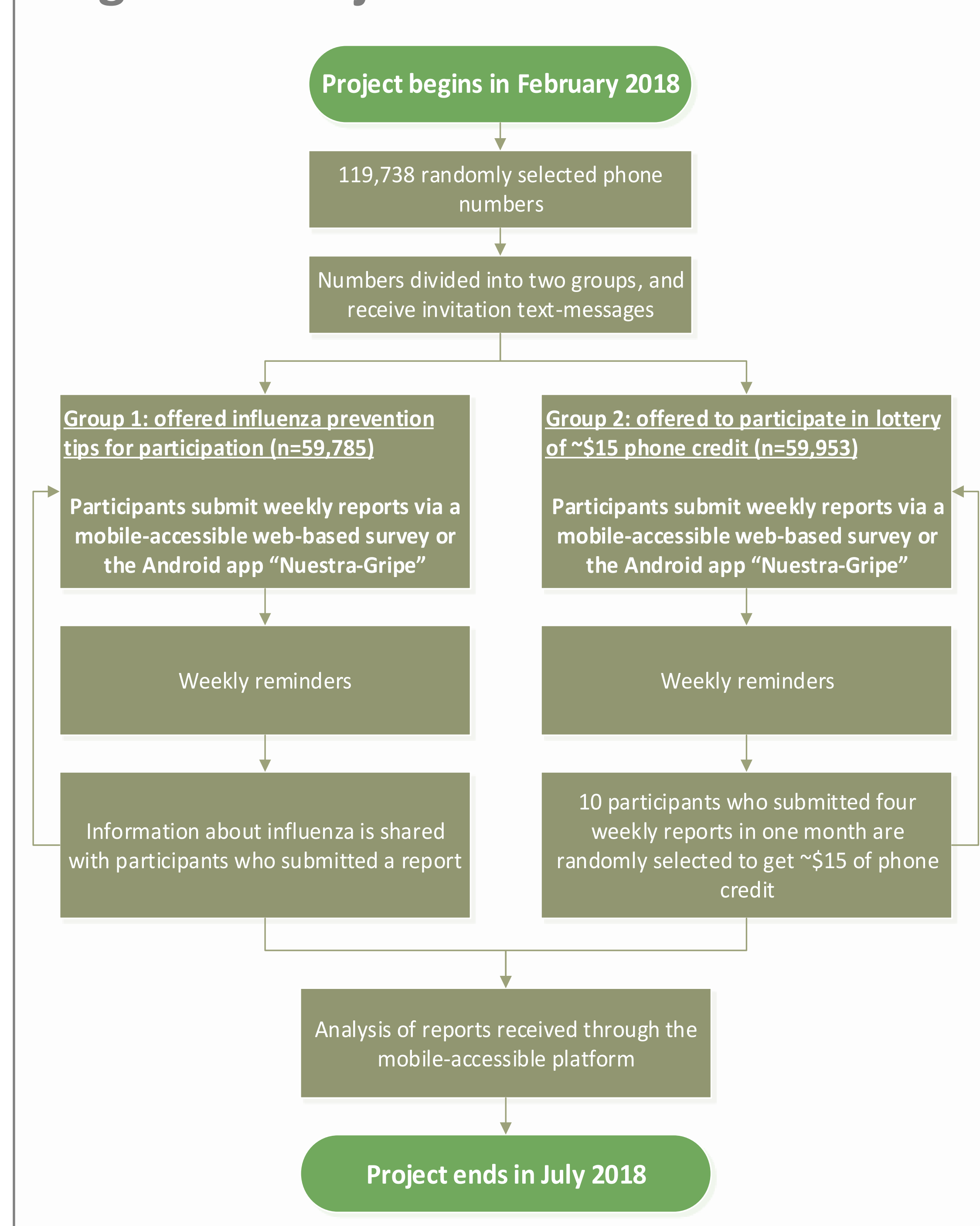
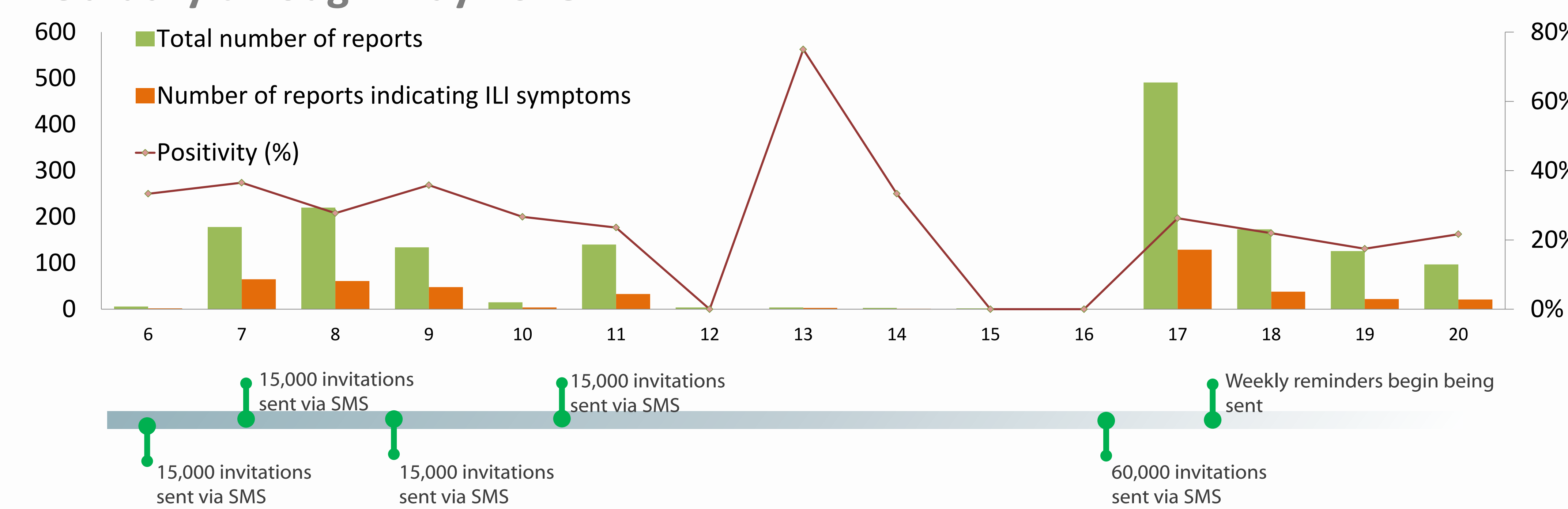


Table 1. Summary of preliminary results

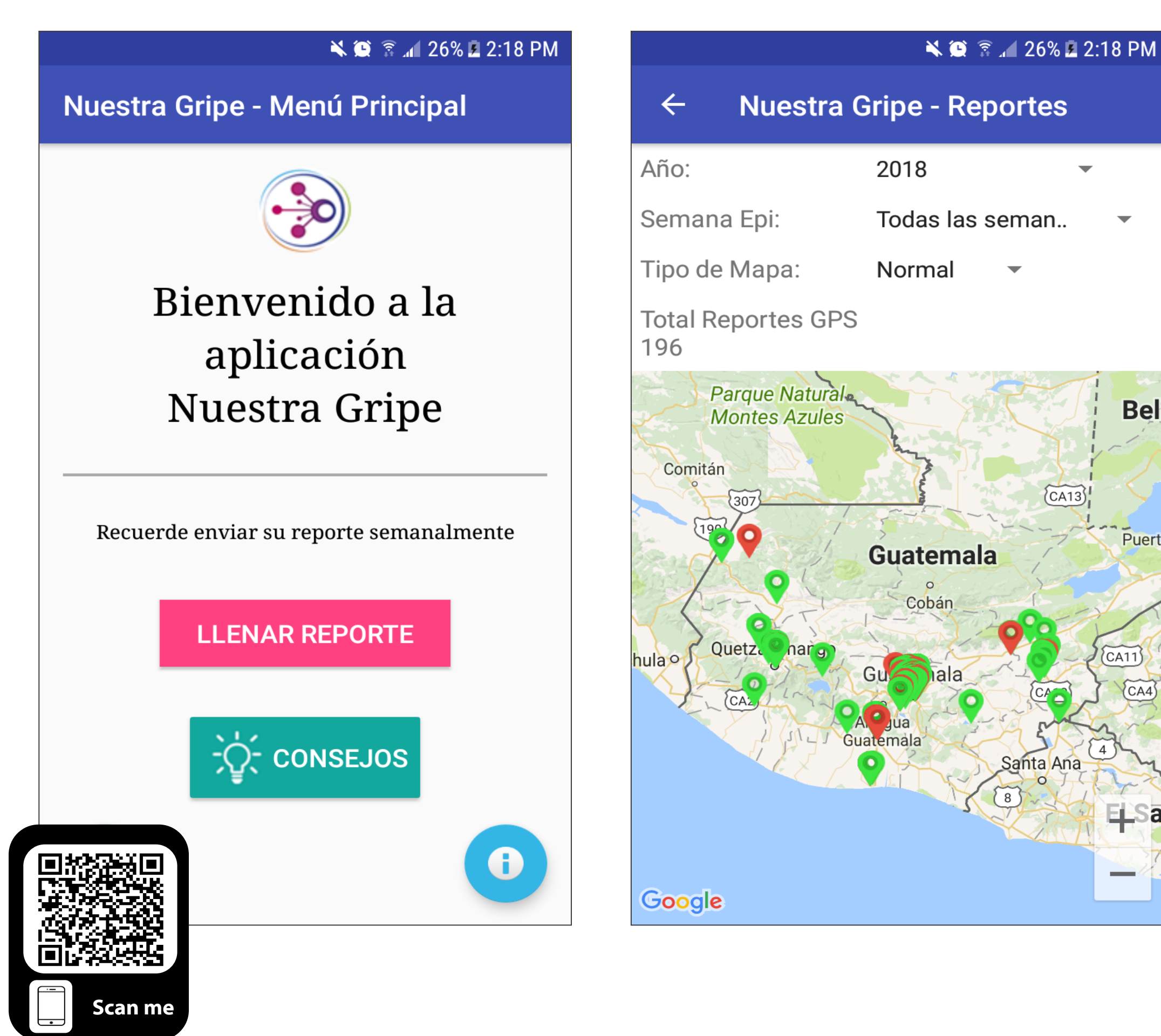
Result	Group 1	Group 2	Both groups
Participants who clicked on the survey link in the SMS invitation	416	729	1,145
Participants who accepted to participate	398	677	1,075
Total number of reports	580	1,014	1,594
Reports indicating ILI symptoms	149	278	427
Reports indicating ILI symptoms & history of flu vaccination in 2018	11	46	57
Number of departments in Guatemala (there are 22 in total) where participants live	19	19	21
Median (min; max) age of respondents with ILI symptoms	32 (14;59)	29 (15;71)	30 (14;71)

Figure 2. Electronically-identified influenza-like illness (ILI) in Guatemala by week, February through May 2018



Discussion

- Crowdsourced ILI data could strengthen surveillance of influenza in Guatemala.
- No correlation has been found ($r < 0$) between electronically-identified ILI and the number of laboratory-confirmed cases of influenza in Guatemala, up to week 17 of 2018 (more recent data not yet available from FluNet).
- The fact that we received reports originating in almost all ($n=21/22$) of the country departments shows promising representativeness of the system.
- Acceptability was low (~1%, $n=1,075/119,738$) as anticipated during the study design, but participating in a monthly lottery of phone credit was significantly more attractive ($p < 0.001$) than receiving health-promoting information for participants.



The Android App “Nuestra Gripe”

Android smartphones dominate Central and South American markets with approximately 80% of the market share; in Guatemala, the leading telecom—with 54.5% of active mobile lines—reported that the four most used smartphones in 2016 ran on the Android operating system.

The app “Nuestra Gripe” allowed participants to complete a weekly report by answering a set of questions. A reminder popped up every week to remind users to complete the weekly report. Participants could not skip questions in the app because data entry validation required them to answer questions before moving to the next one. A message was displayed if the report for the week had been sent. Reports were sent if and when the mobile device found connectivity to the Internet.

Between February 10 and May 25, the app had been installed 180 times. As of May 25, 79 Android devices with the app were active in the last 30 days. Over 100 individuals sent a report through the app. We collected 381 reports, 87 of them indicating symptoms of ILI.

Principal reference

Prieto, Jara, Kaydos-Daniels et al. (2017). Will Participatory Syndromic Surveillance Work in Latin America? Piloting a Mobile Approach to Crowdsource Influenza-Like Illness Data in Guatemala. JMIR public health and surveillance, 3(4).

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