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RESEARCH LETTER

Blast SMS Text Messaging to Facilitate Enrollment for Cleft Lip and Palate Surgery in Zimbabwe

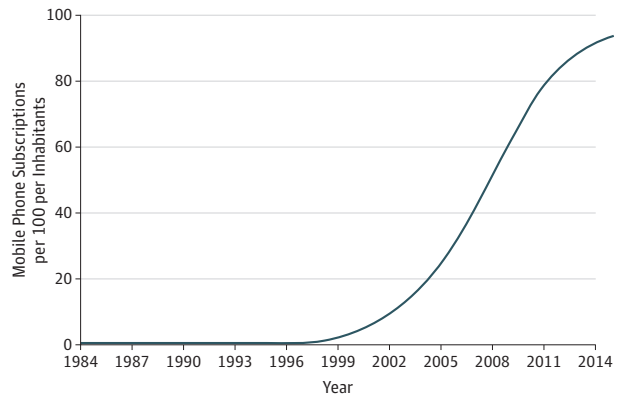
A majority (58.2%) of patients with cleft lip and/or cleft palate in Sub-Saharan Africa cite “lack of awareness” as a major barrier to receiving surgical care.¹ Mobile phones are expanding communication possibilities in health care in a burgeoning field referred to as *mobile health*.² Low- and middle-income countries (LMICs) have demonstrated rapid growth in mobile phone penetration rates over the last decade (Figure 1).³ This presents an opportunity to expand access to surgery for the 5 billion individuals who lack surgical access.^{4,5} The purpose of our study was to test the effectiveness of a short message service (SMS) text message sent via an automated system to multiple phone numbers—ie, a “blast” SMS text message—to facilitate enrollment with a visiting surgical team in Zimbabwe and to test for a difference in age of presentation or distance traveled for potential cleft surgery. We hypothesized that older patients who live closer may be more able to receive SMS messages and travel to the clinic.

Methods | One week prior to a recurring visit from a cleft lip and palate surgical team, a mass SMS text message was sent to 25% of subscribers to the largest cellular service provider in Zimbabwe (Figure 2). The message provided the date and location for the surgical screening clinic. Upon arrival at the screening clinic, patient information was collected with a standardized form,⁶ which included how they learned about the surgical team, diagnosis, age, and home village. Descriptive statistics and *t* tests were obtained using Stata 15 (StataCorp LLC). Geospatial mapping of home villages was performed for surgical patients using Google Earth version 7.1.1.1888 (Google Inc). Distance from home village to the surgical screening clinic in Harare was calculated in kilometers as the crow flies.

Institutional review board approval was obtained from the University of Zimbabwe College of Health Sciences, and a patient’s willingness to fill out the standardized form implied informed consent.

Results | There were 53 surgical patient records queried for 2017 surgical data, all of which had access to mobile phones. Overall, 73% of patients ($n = 37$) learned of the surgical team through SMS text message. Mean (SD) [range] age of patients who underwent surgery was 8.6 (9.5) [0.3-46.0] years (standard error [SE], 1.3 years). There was no difference in age of patients who underwent surgery and were informed by the blast text message (mean [SD] [range] age, 9.5 [10.2] {0.6-25.0} years [SE, 1.7 years]) compared with those who were informed by other methods (mean [SD] [range] age, 6.48 [7.3] {0.6-25.0} years [SE, 1.83 years]) ($P = .23$).

Figure 1. Mobile Phone Penetrance in LMICs



According to data from the World Bank,³ there has been a rapid increase in mobile phone penetrance in LMICs in the past decade. LMICs indicates low- and middle-income countries.

Figure 2. Blast SMS Message



A parent’s mobile phone displays a blast short message service (SMS)—an automated text message sent to multiple phone numbers to notify them of upcoming cleft lip and palate surgery services offered.

The mean (SD) [range] distance traveled for all patients was 159.7 (106.9) [5.7-495.6] km (SE, 14.7 km). Those patients informed by blast SMS texting traveled shorter distances to clinic (mean [SD] [range], 137.7 [95.9] [5.7-398.1] km [SE, 15.7 km]) compared with those informed by other methods (mean [SD] [range], 214.0 [116.6] [18.6-495.6] km [SE, 29.2 km]) ($P = .03$).

Discussion | Blast SMS text messaging offers a powerful mobile health method to communicate with a large population in LMICs that may otherwise be unaware of surgical services. Overall, SMS messaging influenced 73% of patients in 2017 who presented for surgical care and with a similar age distribution as previously reported.⁶ More study is needed to confirm the decreased travel distance seen in the SMS group. The ubiquitous penetrance of mobile phones shows great potential in expanding surgical access. As mobile phone technology expands, innovative applications using mobile photo and video services will offer further interaction. Short message service messaging offers an inexpensive method of disseminating information about surgical services, and addresses a key barrier of patient awareness.

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Study concept and design: Shaye, Tollefson.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Shaye, Tollefson.

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