Impact on child vaccination completion rates of short message services (SMS) reminders in developing countries

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Abstract

Introduction: the Expanded Programme on Immunization has, since its inception, struggled to achieve high completion rates for child immunizations. The introduction of 2YL (second year of life) immunizations presents the programme with fresh challenges to assuring high completion rates.

Methods: using the same procedures as those employed in the 2017 article on SMS reminders, of which this is an update, I searched the NLM database for all recent articles from developing countries on SMS reminders for reduction of vaccination dropout rates. I summarized these and earlier articles in tabular form.

Results: the freshly reviewed articles are confirmatory of earlier studies which show an improvement in vaccination completion rates when SMS reminders are sent to mothers and other caregivers.

Conclusion: all of the studies reviewed were based on pilot projects. It is time, and past time, to go to scale with SMS reminders, perhaps stand alone, or as part of a larger system of electronic immunization registers. There may be potential for use of WhatsApp in dropout reduction, thus far documented only in other public health applications.
likely to be effective at improving the proportion of the target populations who receive immunizations."

**Methods**

The present article is an update of a 2017 article, published in this journal, on the impact of SMS reminders on child vaccination completion rates, with specific reference to sub-Saharan Africa [2]. We have followed the methodology of Manakongtreecheep, described in his article, and have included studies published since 2017 and articles from outside Africa. The present review complements a systematic review by Mekonnen and colleagues, who found from their meta-analysis that SMS reminders had a significant impact on child vaccination coverage [3]. There are two from Kenya [4, 5], two from Nigeria [6,7] and one each from Zimbabwe [8], Burkina Faso [9], Guatemala [10], China [11], Bangladesh [12], India [13] and Pakistan [14]. Neither the current study, nor the much more comprehensive Cochrane update, has looked at nationwide SMS reminder systems.

**Results**

The five additional studies, summarized in Table 2, have added to our understanding of SMS messaging. The Guatemala study is cautionary: when completion rates are already very high, the marginal benefit from SMS reminders may be less than in underperforming countries. The China study shows an additive impact of mobile phone app and texting, compared to the impact of the mobile phone app alone. The Indian study summarized in Table 2 shows the compliance linked group achieved higher results than the SMS reminders. This confirms the results of the first Kenyan study, which also showed a positive impact of cash incentives. Both these studies raise issues about long term financial sustainability of cash incentives. The Pakistan study showed a 10 percent difference in coverage, based on the per protocol analysis, confirming the positive results of the studies reviewed in 2017. The Bangladesh study is also confirmatory of the earlier African studies, showing significant coverage improvements associated with SMS reminders.

**Discussion**

The studies reviewed showed a positive impact on routine vaccination coverage of SMS reminder systems. All were of pilot projects. Further work in this area is important as more countries move to a 2YL (second year of life) approach, with more demanding requirements for sustained high coverage over the first two years of life. Without improved MCV2 coverage, most developing countries (Rwanda is a remarkable exception) will continue to need measles campaigns every two or three years, with all which this implies in terms of demands on human resources at the national and subnational levels. It would be useful for governments and donors in countries with successful SMS projects to go to scale. Countries which have not yet launched SMS projects may wish to do so, especially if they have poor completion rates.

SMS reminders are but one of several approaches to vaccination reminders. The most recent Cochrane review, cited above, lists telephone calls, letters, postcards, text messages, and autodial messages as among reminder/recall methods. However, many of these rely, for example, on efficient postal systems for implementation. Some are labour intensive, whereas health workers in developing countries are often short of time. When part of a larger system including birth registration, SMS reminders have the potential to work without heavy time inputs and wherever mothers or other caregivers have access to mobile telephones. Combining SMS reminders with an electronic immunization register, as in Burkina Faso, places the SMS reminder in a larger, comprehensive health management information system. Such registers, in addition, present economic advantages in terms of savings on printing. Voice reminders, only feasible in places with stable network signals, are an alternative to SMS messaging.

**Conclusion**

Like its 2017 forerunner, this review covers only pilot projects, since no pilots have been scaled up. For scale-up, both management capacity and costing need careful analysis. The costs of SMS messaging and of other methods need careful assessment. Will reminders using WhatsApp, not yet well documented, emerge as a less expensive reminder method? There may be potential for use of WhatsApp, but the 303 publications listed on WhatsApp in the National Library of Medicine (NLM) database (consulted at end October 2019) cover such topics as clinical medicine and, for developing countries, such activities as bed net use and smoking cessation. So WhatsApp use for immunization remains in posses rather than in esse. As of this writing (2019), SMS messaging is certainly among the best documented and most promising technologies for improving childhood vaccination completion rates.

**What is known about this topic**

- No pilots review have been scaled up.

**What this study adds**

- SMS messaging is certainly among the best documented and most promising technologies for improving childhood vaccination completion rates.

**Competing interests**

The authors declare no competing interests.
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