Text Messages
Interventions
And Beyond

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Opinion

We’re Ignoring the Biggest Cause of the Measles Crisis

It’s not anti-vaxxers. It’s parents who create their own vaccine schedules.

The Paigham-e-Sehat study saw researchers from the AKU and the University of British Columbia partner with digital health and telecommunications specialists to develop a variety of mobile campaigns containing text messages.

These messages were then delivered through four different medium to generate evidence on the most effective means to boost demand for routine immunization.

Participants in the study were also Consequently divided into four different groups, one of which received a one-size fits all SMS messages providing information on the benefits of immunization.

The second group got an interactive sequence of SMS messages, mimicking and educational messages, as did the third group.

According to Dr. Kau, the study’s findings could be generalized to the value of voice messages, which is an innovating medium for health awareness campaigns.

The study’s findings, he said, were particularly useful in contexts where literacy is a challenge, where a variety of local languages and dialects are spoken.
Mobile phone usage across the world

7.7 billion Mobile phone subscribers globally

8.5 billion daily person to person SMS in 2018 globally

Average 32 SMS per mobile phone on a daily basis

However less than 1/3 of the population use Smart phone and hence Interventions that can be used in simple function phone is recommended for generalizability


"Your child [name] is due on [date] at [clinic] for vaccines."

[First name] is due for [vaccine or checkup or vaccine and checkup]. Reply 1 for us to call you to schedule, 2 if you will call us or STOP to end messages [practice name and phone number].

**BARRIERS TO IMMUNIZATION**

- **Vaccine Hesitancy**
- **Lack of knowledge**
- **Forgetting due date**
- **Lack of trust**
- **Adverse effects**
- **Religious and social barriers**

Immunization protects your child against killer diseases such as polio, whooping cough, diphtheria, measles, pneumonia and tuberculosis.

**Text Message Categories**

- Reminder/Recall
- Educational
- Interactive
<table>
<thead>
<tr>
<th>Type of Intervention</th>
<th>Details</th>
<th>Type of messages</th>
<th>Vaccines covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMS based</td>
<td>10</td>
<td>3 reminder messages only and 8 both reminder and educational messages</td>
<td>All childhood vaccinations, MMR, HPV, Influenza and MCV4 or TDAP</td>
</tr>
<tr>
<td>Emails</td>
<td>2</td>
<td>Both reminder and educational messages</td>
<td>Pneumococcal vaccine and HPV series</td>
</tr>
</tbody>
</table>

Increase in vaccine uptake and series completion – **1.18 (1.11-1.25)**

For parents of children aged 18 and younger – **1.22 (1.15-1.30)**

This study provided evidence that digital push technologies have a modest, positive impact on vaccine uptake and series

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<tr>
<td>SMS and Automated calls</td>
<td>3</td>
<td>Combination of SMS and phone call reminders</td>
<td>HPV, MCV, Tdap and Varicella, Influenza</td>
</tr>
<tr>
<td>Automated Call</td>
<td>1</td>
<td>Automated calls reminders</td>
<td>All childhood vaccinations</td>
</tr>
</tbody>
</table>

All types of messages as compared to control showed increase vaccine uptake - **1.23 (1.12-1.36)**

The review shows potential for mobile phone based interventions to improve immunization coverage for children and adolescents

Messages involving adolescents vaccine only - **2.05 (0.92-4.52)**

K.M. Atkinson et al. 2019

Kazi et al. personal communication
Conditional Cash Transfer through SMS

- Significant improvement in immunization in 200KES group (relative risk 1.09, 95% CI 1.02–1.16, p=0.014)

Phone calls or SMS reminders for vaccinations

- Significant improvement in proportions of children fully vaccinated
- Polio, pentavalent, and pneumococcal vaccines (<.001)
- Reduction in delay in receiving immunization (<.001)

*6 SMS, 1 phone call and one combined study

Oliver-Williams et al, 2017, Gibson et al, 2017
Monitoring of SIA campaigns - Phase 1 and 2

SMS Content - Urdu

**Urdu SMS 1**

آغا خان بونیورستی: کب پولیس کے قطر ہے بلندی؟ والی بھیجی بفتی ایک گھر آ یہ نہیں؟ reply کہو کریں P3 نہیں P2 نہیں P1 نہیں

**Urdu SMS 2**

آغا خان بونیورستی: کب (بہت لاکھا) کو پولیس کے قطر ہے بلندی؟ والی بھیجی بفتی reply اس بفتے P3 نہیں P2 نہیں P1 نہیں کہو کریں کریں

**eSurveillance through Tower Coverage - Pilot**

Kazi et al 2014
To evaluate the role of mobile phone SMS messages and automated calls in improving vaccine coverage among children in certain districts of Pakistan - Mixed method

1. Literature Search
2. Content Categorization
3(a). Literature Translation
3(b). Back Translation
4. Validation of content through In Depth Interviews (IDIs)
5. Discussion regarding content with stakeholders
6. Focused Group Discussion (FGFD)

<table>
<thead>
<tr>
<th>INTERVENTION ARM</th>
<th>WEEKLY AUTOMATED SMS TEXT AND AUTOMATED CALLS FROM ENROLMENT TILL 20 WEEKS OF LIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARM 1 (INTERVENTION)</td>
<td>Parents/caregivers will receive one way educational/reminder/proactive SMS messages related to routine immunization once a week till 20 weeks of age.</td>
</tr>
<tr>
<td>ARM 2 (INTERVENTION)</td>
<td>Parents/caregivers will receive two way (interactive) educational/reminder/proactive SMS messages related to routine immunization once a week till 20 weeks of age- parents will have the option to reply and receive more information related to immunization through text messages.</td>
</tr>
<tr>
<td>ARM 3 (INTERVENTION)</td>
<td>Parents/caregivers will receive one way educational/reminder/proactive automated phone call related to routine immunization once a week till 20 weeks of age.</td>
</tr>
<tr>
<td>ARM 4 (INTERVENTION)</td>
<td>Parents/caregivers will receive two way (interactive) educational/reminder/proactive automated phone call related to routine immunization once a week till 20 weeks of age- parents will have the option to reply and receive more information related to immunization through phone call.</td>
</tr>
<tr>
<td>CONTROL GROUP</td>
<td>NO INTERVENTION</td>
</tr>
</tbody>
</table>
Pigham-e-Sehat Cloud

Personalize Messages according to Arm and barriers

Baseline Monitoring Portal

Message Sending and Content Management Portal

Baseline Data Collection

Baseline Data Collection Portal

Community

Telecom network

Message Gateway

Scheduled Messages on weekly basis

Educational

Religious

Adverse Effect

Reminder

Combo
Key Findings (n=3383)

- 98% of the study participants had access to mobile phone
- 79.1% of the respondents used a simple function phone
- Around 50% and 38.4% of the mothers and fathers respectively had no formal education
- 54.5% and 13.8% fathers and mothers respectively owned a mobile phone

- In the final PP model IVR risk ratio was 1.26 (p-Value 0.037) with Confidence Interval 1.01-1.52

Information regarding families’ perceptions of vaccination and the daily life challenges helped to develop personalized mobile phone messages

IVR based intervention personalized according to barriers for immunization should be scaled up

The Intervention is useful but too many families did not get the message
Conclusion

• Personalized mobile phone messages (barrier based) interventions should be scale up at the program level

• Connected with electronic immunization registries for engagement in care with caregivers of children for routine immunization

• Mobile phone based interventions should be adapted to AI and ML models
Thank you

Study team and staff

THE AGA KHAN UNIVERSITY

AKDN eHRC
AGA KHAN DEVELOPMENT NETWORK eHEALTH RESOURCE CENTRE

UBC University Of British Columbia

Grand Challenges Canada Grands Défis Canada

NIH Fogarty

World Health Organization
REFERENCES


5. Google images
Effect of Mobile Phone Text Message Reminders on Uptake of Routine Immunization in Pakistan: A Randomized Controlled Clinical Trial (n=300)

Key Findings

• Automated simple one-way SMS reminders in local languages might be feasible for improving routine vaccination coverage

• Whether SMS reminders alone alter parental attitudes and behavior needs to be further explored

Assessing Mobile Phone Access and Perceptions for Texting-Based mHealth interventions among Expectant Mothers and Caregivers in Remote North Kenya:

Study Finding

• Majority of participants had access to mobile phone

• Agreed to receive weekly text messages from their healthcare provider

• mHealth may be an innovative way for engaging women in care for improved maternal and newborn child health outcomes