

**Table 1: Most Scientifically Robust Evidence**

	Type of Evidence	Strengths and Weaknesses	Intervention/Research	Results/Findings
 <p>Strength of Evidence</p>	Systematic or Meta-Reviews of Controlled Studies (Most robust)	Many studies are combined and analyzed using systematic methods	Review of behavior change interventions delivered through SMS	Of 9 randomized and quasi-controlled studies, <b>8 found evidence to support text messaging as a tool for behavior change</b> . Effects exist across age, minority status, and nationality. Nine countries are represented, only one is a developing country, which is unfortunate given potential benefits of such a widely accessible, relatively inexpensive tool for health behavior change. <sup>1</sup>
			Cochrane Database System Review, RCTs of SMS for ART in Kenya	Two RCTs reviewed found high-quality evidence that <b>mobile phone text-messaging at weekly intervals is efficacious in enhancing adherence to ART</b> , compared to standard care, and there is high quality evidence from one trial that weekly mobile phone text-messaging is efficacious in improving HIV viral load suppression as well. <sup>2</sup>
			Healthcare via Cell Phones: A Systematic Review	Review of 25 controlled studies in 13 countries evaluating mobile interventions, <b>8 out of 10 of the behavior change studies reported change in behavior after receiving informational intervention through mobile voice or text messaging</b> . Common qualities among these are: personalized messaging and support, goal specific prompts, and reminders for appointments. <sup>3</sup>
	Randomized Controlled Studies	Effects gathered in method includes random allocation of subjects to groups	Chipatala Cha Pa Foni, Malawi (N = 6,479)	Evaluation study demonstrates <b>increased uptake of home-based and facility-based practices</b> among the CCPF intervention group, including: increase in use of a bed-net during pregnancy and for children (25 percentage points higher than control group); attending four antenatal care (ANC) visits, starting ANC during the first trimester; giving birth in a facility; receiving a postnatal check-up within two days of birth; breastfeeding within one hour of birth (15 percentage points higher than control group), and exclusive breast-feeding through six months of age; and use of oral rehydration salts (ORS) to treat diarrhea. <sup>4</sup>
			Cell Life, South Africa (N =2,533)	Research illustrates that <b>SMS service influenced increased uptake of HIV testing</b> : the study found that participants who received 10 motivational-style SMS were more likely to go get an HIV test than: those who received 10 information only style SMS, those who received 3 motivational-style SMS and those in the control group. <sup>5</sup>
			Wired Mothers, Zanzibar (N =2,550)	RCT demonstrates <b>mobile service significantly increased proportion of women receiving recommended antenatal care</b> with more women receiving preventive health services, and more women with antepartum complications identified and referred <sup>6</sup> in the intervention group (44% versus 31% in the control group). In addition, <b>the intervention significantly increased the proportion of women delivering with a skilled birth attendant</b> (60% vs. 47% in the controlled group).
			SMS and Telephone Reminders vs. Standard of Care, China (N=1,859)	RCT shows that <b>clinic attendance rates were significantly higher in SMS and telephone groups</b> than in the control group. The advantages of SMS are: more private than voice calling and SMS does not require mobile phones to be active or within range and the messages can be held for a number of days. <sup>7</sup>
	Non-Randomized Controlled Studies (Includes Pre and Post-intervention Studies)	Effects gathered in scientific comparison method but not randomized	Text4Baby, USA (N = 939 and N=23,005)	<p><b>Increasing Health Knowledge and Preparedness:</b> 82% of total respondents reported Text4baby messages informed them of medical warning signs they did not know.<sup>8</sup> (N=939)</p> <p><b>Improving Access and Facilitating Interaction with Health Providers:</b> 64% of respondents reported they talked to their doctor or midwife about information they read on a Text4Baby message. (N=23,005)</p>

<sup>1</sup> Cole-Lewis, Heather and Kershaw, T. "Text messaging as a tool for behavior change in disease prevention and management." *Epidemiol Rev.* 2010 Apr;32(1):56-69.

<sup>2</sup> Horvath T, Azman H, Kennedy GE, Rutherford GW: Mobile phone text messaging for promoting adherence to antiretroviral therapy in patients with HIV infection. *Cochrane Database Syst Rev* 2012, 3:CD009756.

<sup>3</sup> Krishna, Santosh; Boren, Suzanne Austin; and Balas, Andrew E. "Healthcare via Cell Phones: A Systematic Review" *Telemedicine and e-Health.* April 2009, 15(3): 231-240

<sup>4</sup> Watkins, Susan Cotts; Robinson, Amanda and Dalious, Michael. "Evaluation of the Information and Communications Technology for Maternal, Newborn and Child Health Project" *Invest in Knowledge Initiative*, December 2013

<sup>5</sup> Katherine de Tolly, Donald Skinner, Victoria Nembaware, and Peter Benjamin. "Investigation into the use of short message services to expand uptake of human immunodeficiency virus testing, and whether content and dosage have impact" *Telemedicine and e-Health.* January/February 2012, 18(1): 18-23. doi:10.1089/tmj.2011.0058.

<sup>6</sup> Lund et al, "Mobile phones improve antenatal care attendance in Zanzibar: a cluster randomized controlled trial" *BMC Pregnancy and Childbirth* 2014, 14:29 (17 January 2014)

Lund S, Hemed M, Nielsen B, Said A, Said K, Makungu M, Rasch V. "Mobile phones as a health communication tool to improve skilled attendance at delivery in Zanzibar: a cluster-randomised controlled trial." *BJOG* 2012;119:1256–1264.

<sup>7</sup> Zhou-wen, Chen; Li-zheng, Fang; Li-ying, Chen and Hong-lei, Dai. "Comparison of an SMS text messaging and phone reminder to improve attendance at a health promotion center: A randomized controlled trial" *Journal of Zhejiang University SCIENCE B* January 2008, Volume 9, Issue 1, pp 34-38

<sup>8</sup> Martinez, K. and Uekusa, S. 2013 National Survey of Text4baby Participants. California State University San Marcos (CSUSM). Available from: <http://www.csusm.edu/anthropology/docsandfiles/Text4baby.pdf>.

## Evidence Hierarchy of Mobile Messaging for Improved MNCH

**Table 2: Least Scientifically Robust Evidence – Data from MAMA Country Programs**

	Type of Evidence	Strengths and Weaknesses	Intervention/Research	Results
 <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Strength of Evidence</p>	Focus Group Discussions, Phone and User Surveys	Effects gathered in a structured and systematic method but no scientific comparisons	MAMA Bangladesh Phone Surveys (N = 120)	<b>Higher levels of adoption</b> of key behaviors and practices when the <b>woman and another family member both receive the MAMA messages</b> , as indicated in these responses: 83% of respondents attended the recommended four <b>antenatal care</b> visits, 63% of respondents gave <b>birth in a health facility</b> , 100% of respondents who gave birth at home reported using a <b>safe delivery kit</b> , 77% of respondents received <b>post-natal care within 48 hours</b> of giving birth, 95% of respondents <b>exclusively breastfed</b> their babies up to 6 months, 95% of respondents completed their babies' <b>Pentavalent vaccinations</b>  90% rated the service as "Excellent" and the average satisfaction and usability rating was 4.9 out of 5.
			MAMA South Africa Mobi Polls (N ranges 341 – 2,530)	<b>Vulnerable mothers using the mobisite:</b> 77% are unemployed (N=1,701), 52% receive a social grant (N=341), 47% live in a household with a combined monthly income of \$180 USD or less (N=2,530), 44% live in a village or rural area (N=374).
			MAMA South Africa Focus Group Discussions on SMS Service (42 participants)	<b>Most participants</b> received <b>information that was new</b> to them and made them <b>change their behaviour</b> . The MAMA SMS service calmed and prepared mothers for their baby's arrival; highlighted causes of concern that they would otherwise have ignored as petty or normal; and increased their appreciation for why they should continue taking HIV treatments when pregnant. The information exceeded that of other sources like pregnancy magazines and clinic consultations – "it was so simple and direct".  The service <b>empowered subscribers</b> to oppose unhealthy cultural practices, ask questions at the clinic, and to talk about health related issues with their partners.  Subscribers liked the privacy of the platform – especially that it wasn't face-to-face, awkward and uncomfortable. Almost all women passed on sign-up details to others they felt could benefit from the service.
	Enrollment Data	Number and type of people reached, no data on effects of the intervention	MAMA Bangladesh IVR and SMS Service (N ranges 118,922 – 170,302)	<b>Vulnerable mothers subscribed to service:</b> 35% of subscribers have a primary school education or less (N = 118,922), and 77% of subscribers have a combined household income of \$130 USD or less per month (N=170,302)
			MAMA South Africa SMS Service (N=10,163)	<b>Vulnerable mothers subscribed to SMS service:</b> 44% live in a household with a combined income of \$126 USD or less per month  <b>Interesting details about SMS subscribers:</b> 58% request the HIV+ specific content, 99% have their own phone and 34% can access the internet on their phones
	Anecdotal User Stories  (Lowest level of evidence)	Effects discussed informally - using unstructured and unsystematic method, no comparisons	<p>Stories from MAMA subscribers that span the spectrum of results – <b>change in knowledge, confidence, assertiveness, behaviors, practices, health status, and phone ownership:</b></p> <ul style="list-style-type: none"> <li>• Different and improved health practices and healthier mother and baby compared to previous pregnancies and births (without the MAMA service)</li> <li>• Able to distinguish between when to go to a clinic and when not to go (thus saving valuable time and money that would have been spent on unnecessary trips to the clinic)</li> <li>• Messages saved on phones to show to partner, improved household communication, support and involvement of partner and health-related decision-making</li> <li>• Mothers are more confident of what they need to do during pregnancy, for baby and for themselves; and are more comfortable asking others for help</li> <li>• Mothers challenging healthcare providers when they are turned away from clinics or did not receive a service or commodity that they learned they are entitled to</li> <li>• MAMA service makes mothers feel like someone cares about them</li> <li>• Change in cell phone ownership, mothers now have a valid reason to own their own cell phone to receive their MAMA text messages</li> </ul>	

**For more information, please contact:**

Josie Mangxaba, Research Manager, MAMA Global

[jmangxaba@mobilemamaalliance.org](mailto:jmangxaba@mobilemamaalliance.org)

<http://www.mobilemamaalliance.org>