

Impact Evaluation Endline Report: Totohealth

SPRING Monitoring and Evaluation – April 2019



Impact Evaluation Endline Report: Totohealth

Department for International Development
SPRING Monitoring and Evaluation
PO 7117

List of Partners

- Research Plus Africa

Authors

- Hind M'hamdi
- Kristen Cockburn
- Tate Lyverse

April 2019

Coffey International Development Ltd

The Malthouse 1 Northfield Road Reading Berkshire RG1 8AH United Kingdom
T (+44) (0) 1189 566 066 F (+44) (0) 1189 576 066 www.coffey.com
Registered Office: 1 Northfield Road Reading Berkshire RG1 8AH United Kingdom
Registered in England No. 3799145 Vat Number: GB 724 5309 45

This document has been approved for submission by Coffey's Project Director, based on a review of satisfactory adherence to our policies on:

- Quality management
- HSSE and risk management
- Financial management and Value for Money (VfM)
- Personnel recruitment and management
- Performance Management and Monitoring and Evaluation (M&E)

Heidi Ober, Programme Director

Signature:

ABBREVIATIONS AND ACRONYMS

ANC	Antenatal Care
BPE	Business Performance Evaluation
FGD	Focus Group Discussion
GSP	Girl Safety Protocols
IP	Implementing Partner
KDHS	Kenyan Demographic and Health survey
KSh	Kenyan Shillings
KII	Key Informant Interview
KPI	Key Performance Indicator
MCH	Maternal and Child Healthcare
NGO	Non-Government Organisation
NCD	Non-communicable diseases
PPI	Progress out of Poverty Index
REF	Relevant Explanation Finder
RPA	Research Plus Africa
SMS	Short Message Service
ToC	Theory of Change
ToR	Terms of reference
USAID	United States Agency for International Development
USD	United States Dollar

CONTENTS

	Executive Summary	i
1	Introduction	1
1.1	Purpose and structure	1
1.2	Introduction to Totohealth	3
1.3	Selection for Impact Evaluation	4
2	Methodology	5
2.1	Original Approach to Totohealth Impact Evaluation	5
2.2	Revised Approach to Totohealth Impact Evaluation	5
2.3	Impact Evaluation Questions	6
2.4	Data Analysis Tools	6
2.5	Data Collection Tools	7
2.6	Sampling Methodology	8
2.7	Data Collection Fieldwork	10
2.8	Data Coding and Analysis	11
2.9	Limitations and Mitigation Strategies	11
3	Results and Analysis	13
3.1	Mechanisms of change (ouputs)	13
3.2	Contribution to Maternal and Child Health outcomes	15
3.3	Contribution to Wellbeing and Confidence outcomes	22
3.4	Influencing Factors	24
3.5	Conclusion: Totohealth's Contribution Story	27
4	Learning	33
4.1	Programme limitations and opportunities	33
4.2	Unintended consequences	35
	Annexes	
	Annex A: SPRING Impact Evaluation Methodology	
	Annex B: Detailed Impact Evaluation Methodology	
	Annex C: Endline data Collection Tools	
	Annex D: Data Analysis Tools	
	Annex E: Totohealth Endline Concept Note	

Executive Summary

Purpose

This report presents the findings from the endline research for Totohealth, the second of eight grantee businesses selected for inclusion in the SPRING Impact Evaluation. This endline uses contribution analysis, a theory-based evaluation approach used for complex and dynamic settings, to draw conclusions about impact of and learning for the SPRING programme. The contribution analysis allows for measuring impact without the use of baseline data.

About Totohealth and SPRING Prototype

Totohealth is a Kenyan-based service provider of maternal and child health (MCH) advice and support to expectant and new mothers. Totohealth's overall goal is use mobile SMS technology to help reduce maternal and child mortality and detect developmental abnormalities in early stages of childhood. With the support from SPRING, Totohealth developed a new prototype (Totohealth SPRING prototype), with the aim of providing targeted MCH information to the most vulnerable population — adolescent girls. The core function of the Totohealth SPRING prototype was to provide adolescent-specific MCH information to young mothers during pregnancy and for the first two years¹ of their child's lives. The SMS¹ provided young girls with information on antenatal care, safe delivery, pregnancy, immunisation, nutrition and breastfeeding, and child health, with the primary aim that these young mothers would experience positive changes in their MCH knowledge, attitudes and practices. With SPRING funding and business development support, Totohealth developed the adolescent-specific SMS content as well as a formal helpdesk support. Additionally, SPRING supported Totohealth's general business development and provided technical assistance in the design and marketing of a maternity product (the Totobag).

Evaluation Questions

This Impact Evaluation is guided first, by the overall SPRING impact level evaluation questions outlined below, and by a set of more specific and detailed evaluation questions applicable to this study, outlined in Section 2.3.

To what extent has access to products, services, and business opportunities provided by SPRING businesses resulted in improved outcomes linked to economic empowerment for adolescent girls?

- To what extent have adolescent girls improved their health as a result of accessing products, services or business opportunities provided by SPRING businesses?
- To what extent have adolescent girls improved their well-being as a result of accessing products, services or business opportunities provided by SPRING businesses?
- How did SPRING contribute to this change, as opposed to other factors?

What have we learned about adolescent girls as end-users or beneficiaries in the value chain?

- What factors helped or hindered adolescent girls from using SPRING products, services, or engaging with business models?
- What have been the unintended consequences of adolescent girls accessing products, services, or engaging with business models provided by SPRING businesses?

Evaluation Methodology²

The overall design of this impact evaluation uses the principles of qualitative evaluation and contribution analysis to better understand the impact of Totohealth on adolescent girls.

To assess the SPRING impact of the Totohealth's prototype, a set of qualitative data collection tools were developed and administered. A detailed Theory of Change (ToC) and Relevant Explanation Finder (REF) were

² The design of the impact evaluation has changed over the course of the implementation of the SPRING Totohealth prototype. This is largely due to poor sampling data, loss of control group and overall reduction in sample size/attrition rates. Please see Section 2: Methodology of the report for full details.

used to map out and analyse mechanisms of change, potential influencing factors and alternative explanations that may influence outcomes.

Key Results

Conclusions about Totohealth’s impact — Totohealth’s actual contribution — on MCH and well-being outcomes for girl subscribers were drawn by critically analysing the results, including changes in MCH, well-being and confidence outcomes as well as the magnitude the influencing factors had on these outcomes, and assembling Totohealth’s ‘Contribution Story’.

Totohealth’s Contribution Story

We found varying degrees of impact across girls’ MCH knowledge, attitudes, proactive health-seeking behaviour and well-being and confidence, as illustrated in [Table 1](#). For the most part Totohealth had a positive impact on health seeking behaviour; however, this have been confounded by a number of internal and external factors, including:

- We found several barriers to girls’ improving knowledge, attitudes and health-seeking practicing behaviours. The young mothers and pregnant women that comprised Totohealth’s subscribers faced adverse circumstances, impediments and disadvantages in knowing about, forming attitudes regarding, and practicing proper MCH. The Totohealth operational context is likely to have affected its impact.
- Although most knowledge outcomes have been found to be directly attributable to Totohealth messaging, access to alternative sources of information presents a crucial alternative explanation, so that knowledge outcomes for certain MCH topics, such as safe delivery, should not be exclusively attributed to Totohealth messaging.

Despite these barriers and possible alternative explanations, this endline study shows that Totohealth contributed significantly to girls’ MCH knowledge. Through design of the prototype, including content of the Totohealth’s curriculum, the company was able to build a level of trust in the messaging service and consequently achieve a level of compliance with MCH advice provided, which in turn positively affected Totohealth’s level of contribution.

However, Totohealth’s impact was more fragmented in attitudes and behaviours towards MCH than in MCH knowledge. A main assumption of the Totohealth prototype was that providing knowledge to girls will result in behaviour change. However, Totohealth contributed most significantly to knowledge outcomes because the primary feature of Totohealth was providing information.

With regards to well-being outcomes, it was assumed that through the results chain if a girl improved her MCH outcomes, then other areas of her life, such as personal wellbeing and confidence would also be positively impacted. However, Totohealth’s impact on girls’ own well-being and confidence was limited to areas related to MCH.

Table 1: Assessment of overall impact across SPRING impact pathways³

	Health	Health	Health	Wellbeing
Areas	Direct benefit from Totohealth through increased knowledge and awareness of MCH	Direct benefit from Totohealth through a change in attitudes on MCH issues	Direct benefit from Totohealth through a change in health seeking behaviour	Direct benefit from Totohealth through increased well-being and confidence
Expected Impact				
Actual Impact				

³ Intensity of the shades of green indicate the level of impact, with darker shades indicating greater impact and lighter shades indicating limited impact.

Learning

Nevertheless, for Totohealth to have its optimal impact on desired outcomes, it should aim to address many of the challenges identified by the girls. The fragmented impact on changing attitudes and behaviours suggests that increasing knowledge is not always a sufficient measure to bring about behavioural change without additional complementary efforts, and consequently that Totohealth's SPRING prototype may not be the right intervention to elicit behaviour change on its own. This is consistent with behaviour change theories⁴ and literature⁵. Paired with other interventions like training health facilities in providing youth-friendly services, parent and peer education, mobile health services, etc. interventions such as Totohealth might possibly contribute to better MCH outcomes for the girls.

We found a number of opportunities for learning that present important considerations for future programming, particularly with regards to similar business prototypes.

- A greater level of personalisation, more interaction as well as real life interaction may be needed to effectively address MCH needs of adolescent mothers.
- More comprehensive approaches may offer potential to better address MCH needs of adolescent mothers – for instance provision of complementary forms of MCH through working more closely with local health care providers.

The above opportunities suggest that it may be necessary to expand the service through making it more interactive and personalised, and to expand it beyond its current scope to better address needs of adolescent mothers. Such diversification may not be feasible for a messaging service like Totohealth, but the findings do reveal potential opportunities to better address needs of adolescent mothers and some of the barriers discussed in Section 3.4, increase relevance and improve effectiveness and impact of similar interventions through more comprehensive approaches that include additional forms of MCH provision.

Additionally, with regards to girls as end-users in the value chain, we found a number of learning opportunities, of which the most crucial to the SPRING programme are the following:

- The assumption that an increase in knowledge will necessarily lead to a change in behaviour is flawed. Achieving behavioural change in this regard may be beyond the reach of a business like Totohealth without complementary MCH services. Through the provision of knowledge Totohealth offer a crucial first step, but more comprehensive approaches are needed to bring about behavioural change – for instance provision of additional MCH services through working more closely with local health care providers.
- Using mobile phones as a platform presents an efficient way to reach young mothers as well as provide easily accessible information but does come with several pitfalls that may limit potential reach.

Finally, the study found two positive outcomes outside of the prototype's intended impact:

- Although this does fall into SPRING's definition of well-being, it is important to highlight two ways Totohealth improved girls' lives beyond the MCH-specific content of their service. First, MCH knowledge helped two mothers juggle their role as provider (mother) as well as earner. Having more certainty on how to take care of a baby freed up attention and energy that they could instead allocate to employment. Secondly, one respondent said that knowledge gained through Totohealth made her opinions about her family more credible and authoritative within her home, whereas prior, her opinions had been marginalised.
- Another unintended consequence is the widespread distribution through sharing Totohealth messages with others. This impact is unmeasured by the business metrics but is important for the evaluation. In its own right, improved healthcare has a substantial multiplier effect. If Totohealth was able to generate this positive chain-reaction, the total impact of Totohealth's services on MCH extends beyond the subscribers themselves.

⁴ See: USAID. (2015). The Behaviour Change Framework: A template for accelerating the impact of behaviour change in USAID-supported MCH programs in 24 priority countries.

⁵ See: [Kelly, M & Barker, M. \(2016\). Why is changing health-related behavior so difficult. *Public Health*.](#)

1 Context

1.1 Purpose and structure of this document

This report presents the findings from the endline research for Totohealth, the second of eight SPRING businesses selected for inclusion in the SPRING Impact Evaluation⁶. This endline uses contribution analysis, a theory-based evaluation approach used for complex and dynamic settings, to draw conclusions about impact of and learning for the SPRING programme. The contribution analysis allows for measuring impact without baseline data. For more information about contribution analysis, see Section 2.

The report is structured as follows:

- **Section 1:** Introduces Totohealth, outlines its SPRING prototype and explain its selection for impact evaluation.
- **Section 2:** Provides an overview of the research methodology for the overall Impact Evaluation as well as the research methodology used to gather information to inform the report. A detailed methodology is presented in Annex B.
- **Section 3:** Presents findings and analysis around the prototype's impact and draws conclusions about its achieved impact.
- **Section 4:** Presents findings and draws conclusions pertaining to learning experienced from implementing the SPRING Totohealth prototype.
- Additionally, five Annexes are included that present the SPRING Impact Evaluation Methodology and a detailed Impact Evaluation Methodology specific to the Totohealth study as well as Endline data collection tools, data analysis tools and the Endline Concept Note.

1.2 Introduction to Totohealth

Description of the Business

Every day, nearly 830 women die from preventable causes related to pregnancy and childbirth. Ninety-nine percent of all maternal deaths occur in developing countries, of which more than half in sub-Saharan Africa.⁷ Young adolescents face a higher risk of complications and death as a result of pregnancy than other women. Skilled care before, during and after childbirth can save the lives of women and new born babies.⁸

Totohealth is a Kenya-based start-up company providing products and services to mothers and fathers during pregnancy and the first five years of their children's lives.⁹ The company has two main business lines. The first is an SMS-based service that provide health and child development advice based on the stage of the mother's pregnancy or the age of the child. This includes a series of questions that aim to detect health conditions that the child or mother might have to help reduce maternal mortality, child mortality and detect early stage developmental abnormalities. The second business line is focused on the sale of products (in bags/packs) needed for safe childbirth and essential items for baby care after delivery.

Description of the SMS Technology and Content

Totohealth developed their own technology platform for distribution of SMS and voice services. Subscribers receive messages during pregnancy as well as once a child is born. Messages are sent twice a week during pregnancy and less frequently once a child is born.

⁶ Details of the overarching framework of impact evaluation for the SPRING programme detailing: grantee selection, methodology are provided in Annex A.

⁷ See; WHO (2015) [Maternal Mortality Factsheet](#), No. 348.

⁸ See; WHO (2015) [Maternal Mortality Factsheet](#), No. 348.

⁹ Totohealth has recently changed their focus from the first five years to the first two years of children's lives. It is unclear when exactly this was introduced.

SMS content is a mix of informative messages as well as 37 so called 'detection triggers', i.e. messages which are YES/NO questions with the objective to detect problems and issues. Examples of these issues include behaviour challenges, clubfoot, speech development, motor developmental issues, epilepsy or visual impairment.

SMS content for pregnant teenagers has a greater emphasis on psychological support and nutritional advice. According to Totohealth, the latter aspect is a focus due to the risk that pregnant teenagers start dieting to hide their pregnancy.

The Totohealth customer help desk¹⁰ complemented the SMS system. It monitored customer replies, sent individual follow-up questions and encouraged parents to go to a nearby clinic or hospital if they consider an issue to be serious. Totohealth then follows up after two weeks to see if parents sought help and/or if the problems persisted.

Totohealth's SPRING Journey

Totohealth Kenya is one of 18 businesses from East Africa (Uganda, Kenya, and Rwanda) in SPRING's first cohort (Cohort 1). From June 2014 until March 2015, Totohealth participated in SPRING's nine-month business accelerator programme. The accelerator programme uses a combination of technical assistance (including on investor readiness, human-centred design principles (HCD), and understanding girls) to support businesses to prototype and develop products, services, and business models that benefit girls.

The programme began with a two-week Bootcamp, in which businesses worked to refine their business models with advisers, mentors, coaches and peers; identify barriers to growth and how to overcome them; identify ways of creating products, services, opportunities for adolescent girls; create plans and strategies.

Following this, entrepreneurs returned home to research, refine and test ideas from bootcamp to their begin prototype development. Following this, businesses were coached in how to pitch their prototype, and were linked with potential investors locally and globally. Lastly, as part of the programme, in Cohort 1 businesses were provided with grant funding of approximately \$80,000USD to support various business activities.

Description of Prototype

Totohealth has received a wide array of support from donors in different areas (including financial assistance, technical assistance in the areas of investor readiness and HCD), which have broadly supported both the business and the development of the prototype. Therefore, for the purposes of this impact evaluation, the evaluation will focus on particular elements of Totohealth's activities.

For the purposes of this impact evaluation, we have defined Totohealth's prototype as the **development and integration of targeted voice and SMS content for adolescent girls**.

- **Prototype girl impact problem:** Young mothers, with a secondary school education and below, make up the greatest numbers of maternal and child deaths. They often live in marginalised and hard to reach communities, affected by the lack of access to health information. In particular, these adolescent mothers are often neglected by families and communities.
- **Prototype description:** With SPRING support, Totohealth developed content targeted towards adolescent mothers for its Health SMS and voice services on feature phones which the subscribers to monitor their pregnancy and the health of their children under five¹¹. The content was not only aimed at adolescent mothers, but also for those living in marginalised communities who were unable to access other sources of health information. The newly developed messages were integrated into the existing platform ready to be sent to them.

By providing an accessible voice and SMS messaging service with targeted content, Totohealth anticipated having an impact on adolescent girls according to the following Girl Impact pathways.

- **Impact on adolescent girls' health:** Adolescent girls (those who are pregnant or are already mothers) who subscribe to Totohealth's Health SMS Service will increase their knowledge (health literacy) and awareness of MCH issues¹², which will encourage them to change their attitudes towards MCH issues.

¹⁰ Due to financial and regulatory challenges, Totohealth had to terminate the Helpdesk feature of the service. For more details, see Table 2.

¹¹ Totohealth has recently changed their focus from the first five years to the first two years of children's lives. It is unclear when exactly this was introduced.

¹² This includes pregnancy, ante, and post-natal health, and child nutrition and development.

This in turn will increase their practice of health-seeking behaviours (such as accessing health services) and lead to an improvement in their health and their child’s health outcomes.

- **Impact on adolescent girls’ well-being:** Through the increased knowledge and awareness of MCH issues, adolescent girls will become more confident in making decisions on their and their child’s health, allowing them to learn to prioritise health and increasing their well-being and self-awareness on MCH issues.

Table 2: Timeline of Totohealth’s prototype rollout

Date	Description of Activities
Jul 2015	SPRING Boot Camp in Nairobi
Sep 2015	Developed the Interactive Voice Response platform; developed adolescent girl SMS and voice content
Dec 2015	Integrated new content and voice system, and maintenance Tested SMS/Voice; reduced time of voice messages from 1min to 20sec. Created gendered content (male voice for male subscribers, female voice for female subscribers)
Mar 2016	Rolled out new dashboard interface
Jun 2016	Piloted in Garissa Built and tested Version 2 of the Totohealth platform; new platform can handle over 200,000 subscribers Added two counties (Samburu and Makueni) and rolled out to Turkana county A total of 18000 parents subscribed
Mar 2017	Introduction of a charge for the helpdesk of 250KSH per annum. Amendment to all trigger questions to direct subscribers to healthcare professionals and not back to Totohealth helpdesk. Paid for subscriptions (those sponsored by Governments or NGOs) are provided free for a year under a new standard contract. Thereafter, subscribers are required to pay for the service.
Jun 2017	Introduction of charge of KES200/year for SMS and KES500 for use of the helpdesk; USD3000 revenue generated from paying users. A total of 1651 parents paying for the service directly through MPESA. However, pricing has negatively impacted the number of new girl subscribers. Reached of total of 2006 adolescent parents for this period (total 21,000 parents) Sent out a total of 600,000 messages (highest ever sent) Content translated to 2 additional local languages (Turkana and Luo) Acquired an ethical approval for carrying out monitoring and evaluation amongst the teenage mothers; another additional approval letter from the Ministry of Health for the content developed for teenage mothers. Girl content revised after 1 year of testing. Conducted active recruitment of parents in Turkana, Homa Bay County and Siaya County
Jun 2017 – Nov 2018	Totohealth now fully operates on a commercial model, with 80% of subscriptions coming in through partnerships with governments or NGOs. Individual counties have shown a great interest in rolling out campaigns in which Totohealth The remaining 20% of subscriptions are done through self-registration.

	<p>Due to challenges with signing up to the service, Totohealth has had to simplify the registration process by drastically shortening the subscription form and consequently limiting the amount of data it collects. It currently only collects data on: age of mother (and child), name, length of pregnancy and language preference.</p> <p>Paid for subscriptions (those sponsored by Governments or NGOs) are provided free for a year under a new standard contract. Thereafter, subscribers are required to pay for the service. At the time of reporting, renewal rates were around 96%.</p> <p>Teen specific content has not been changed significantly since the SPRING prototype as it was given approval from Minister of Health and changing it would be arduous</p> <p>Although the Helpdesk still exists as a supplementary paid service for old subscribers, Totohealth is slowly phasing this out due to financial and resourcing challenges. Because Totohealth employed only one medical professional, it was unable to respond to the huge demand of the Helpdesk service. Hiring a full-time medical professional was financially not possible. Furthermore, the helpdesk exposed Totohealth to a host of regulatory issues pertaining to the provision of medical advice. Since changing it to a supplementary paid service, demand has been limited and fewer girls have been using the Helpdesk feature so that it no longer is a fundamental feature of the SMS service.</p>
--	--

1.3 Selection for Impact Evaluation

In consultation with SPRING, Totohealth was selected for impact evaluation on the basis that it appeared to provide a product that was proven to work in other geographies, could be easily scaled-up and had the potential for longer-term sustainability. On the basis that it already had 15,000 subscribers, it was also deemed to have the biggest potential reach of the first cohort BPE grantees, and a good ability to generate data. Additionally, Totohealth’s digital component of SMS messaging was identified as a source of interesting lessons.

Although consumer health and well-being are generally difficult to attribute, Totohealth’s model revolves around collecting health information for its customers, so its impact on girls’ health and well-being is evaluable and customers will be straightforward to identify and track. Totohealth also provides learning by enabling girls to understand more about their own health and their child’s development.

2 Methodology

This chapter outlines the methods used for conducting the Impact Evaluation. For a detailed description of the methodology, please refer to Annex B.

2.1 Original Approach to Totohealth Impact Evaluation

The design of the impact evaluation has changed over the course of the implementation of the SPRING Totohealth prototype. The original design included a mixed methods approach of qualitative semi-structured interviews and quantitative telephone surveys that followed an intervention and control group of Totohealth adolescent girl subscribers at baseline, midline and endline. Unfortunately, over the course of implementing the Totohealth prototype, a number of issues arose that ultimately required us to abandon the original impact evaluation design:

- **Poor sampling data:** We had difficulty reaching girls to participate in the evaluation because many were over 21 years old, incorrect and unreachable numbers, and poor recruitment practices.
- **Loss of control group:** In February 2017, Totohealth informed us that there had been internal confusion and that the targeted SMS content had been introduced in December 2015 for all subscribers 20 years and under. This meant that all of our research participants (both intervention and control) had been receiving the same SPRING funded content and we no longer had an accurate comparison group.
- **Overall reduction in sample size/attrition rates:** Due to changes in the prototype, specifically the introduction of charges for the service and the changes in HelpDesk support, Totohealth reported a decrease in active Totohealth subscribers, resulting in our overall sample size being reduced by 56% (N=46).

Because of this, it was decided that it would not be possible to draw quantitative and attributable conclusions regarding the impact of Totohealth. Instead, a revised approach to the Totohealth impact evaluation analysis was decided, which would more accurately measure the overall contribution of Totohealth on the adolescent girl subscribers. For full details on the change in design, please see *Endline Concept Note* in Annex E.

2.2 Revised Approach to Totohealth Impact Evaluation: Contribution Analysis

The overall revised design of this impact evaluation uses the principles of qualitative evaluation and contribution analysis to better understand the impact of Totohealth on adolescent girls. Contribution analysis is a theory-based approach used in complex and dynamic settings where the programme cannot be measured using an experimental or quasi-experimental design. Contribution analysis is designed to test an intervention's Theory of Change (ToC) by: analysing evidence collected on an intervention's primary outcomes and impacts as well as identifying if that the evaluated programme is one of several influencers, and helping to reduce uncertainties around the observed impacts and influencing factors.¹³

Box 1: Contribution Analysis Terminology

These definitions (adapted from Lemire, 2012)¹⁴ are commonly used terms for conducting contribution analysis. We will use these terms throughout the report, specifically in relation to data analysis tools and results.

Mechanisms:

- The underlying pathways, processes or structures that connect intervention activities and outcomes.

Primary mechanisms:

- The primary mechanisms are the most likely mechanisms to explain how and why the programme worked.

¹³ See: Mayne, J (2008) "Contribution Analysis: An approach to exploring cause and effect" *ILAC Brief 16*

¹⁴ See: Lemire, S. et al. (2012). "Making contribution analysis work: A practical framework for handling influencing factors and alternative explanations." *Evaluation*.

Influencing factors:

- Internal or external conditions that might enhance or inhibit an intervention from leading to its desired outcome.

Alternative explanations:

- A competing mechanism that connects intervention activities and outcomes, separate (external) to the intervention.

The overall design of the Totohealth's impact evaluation followed Mayne's step-by-step methodology¹⁵ for contribution analysis:

1. Identifying and analysing the cause-effect relation between Totohealth and its impact on adolescent girl subscribers.
2. Developing and gathering evidence on Totohealth's ToC as well as its associated risks.
3. Assembling and assessing the Totohealth contribution story and identifying challenges to it.
4. Seeking out additional evidence (endline qualitative data collection).
5. Revising and strengthening the contribution story (Results).

For a more detailed description of this methodology, please refer to Annex B.

2.3 Impact Evaluation Questions

The endline data collection is guided first, by the overall SPRING impact level evaluation questions (E1 and E2), and by a set of more specific and detailed evaluation questions applicable to this study. Due to the revisions in the design of the Totohealth impact evaluation (see the *Endline Concept Note* in Annex E), instead of asking "To what extent can the impacts to health and well-being be attributed to Totohealth?" this evaluation explores:

- What are the ways in which adolescent girl subscribers have experienced impact to their health and well-being?
- Has Totohealth contributed to the impact to the health and well-being of adolescent girl subscribers? How, and in what ways, has Totohealth contributed to the impact on their health and well-being?
- How and in what ways has SPRING contributed to the impact of Totohealth?
- For a detailed outline of the revised evaluation questions and their judgement criteria, please refer to Annex B.

2.4 Data Analysis Tools

The data analysis tools were designed during the first three stages of the contribution analysis. Totohealth validated the analysis tools during fieldwork in November 2018.

The tools were designed to:

- Operationalise the mechanisms from intervention to outcomes.
- Identify any programme assumptions about the Totohealth intervention and its desired outcomes.
- Develop indicators to measure outcomes, mechanisms and influencing factors.
- Inform the design of the data collection tools and guide analysis and reporting.

¹⁵ See: Mayne, J (2008) "[Contribution Analysis: An approach to exploring cause and effect](#)" *ILAC Brief 16*.

Theory of Change

The purpose of the ToC was to establish the full picture of the Totohealth prototype and map out each of the mechanisms that would be responsible for the changes in health and well-being outcomes for adolescent girl subscribers. A detailed ToC was developed to support data collection, analysis and reporting (see Annex B for the full methods used to develop the ToC). It outlines the activities, mechanisms, outcomes and assumptions of Totohealth in detail and maps their relationships to each other (see Annex D for the full ToC).

Relevant Explanation Finder

The purpose of the REF was to provide a practical framework to support systematically examining influencing factors and alternative explanations in a contribution analysis. For the purpose of this evaluation, we adopted and expanded on Lemire's framework¹⁶ to not only examine the most relevant influencing factors and alternative explanations, but also the primary mechanisms that most accurately explain the overall outcomes (see Annex B for the full methods used to develop the REF). The Totohealth REF outlines each primary mechanism, influencing factor and alternative explanation in detail including: their connection to impact level (e.g., output, outcome), assumptions and identifiers (i.e., specific indicators used for measurement (see Annex D for the full REF).

2.5 Data Collection Tools

We designed a series of newly developed qualitative endline data collection tools, which can be found in Annex C, to collect information to determine the observed changes in outcomes for adolescent girls, and to provide explanations of how and why the intended changes have, or have not, happened. For all data collection involving adolescent girl subscribers: tools were translated into Kiswahili and administered by a female enumerator in the language preference identified by the girl.

Qualitative Key Informant Interviews

The purpose of the Key Informant Interviews (KIIs) was to assess a girl subscriber's overall change in knowledge, attitudes and practices across different MCH and well-being outcomes. The KIIs also explored the different primary mechanisms set out in the REF, specifically looking at a girl's overall experiences using Totohealth. The KII was made up of two components: a knowledge assessment followed by a series of interview-style questions which explore the following topics: access and use of Totohealth, trust and awareness of Totohealth, awareness and practice of health-seeking behaviours and overall confidence and well-being. For details on how the KIIs were developed and piloted, please see Annex B.

Focus Group Discussions

The purpose of the Focus Group Discussions (FGDs) was to better understand the challenges that adolescent girls face and how they might impact a girls' decision when accessing MCH information and services. The FGDs' primary focus was on assessing the influencing and alternative explanations outlined in the REF. The FGDs were designed to include a combination of techniques and was split into four parts: (1) introductory activity, (2) focus group question period, (3) risk assessment, and (4) experiences with Totohealth. For details on how the FGDs were developed and piloted, please see Annex B.

Interview with Executive Director of Totohealth

The interview with the Executive Director of Totohealth expands on the tools developed for the Business Performance Evaluation. The purpose of the interview was to:

- Explore how and in what ways SPRING has contributed to the impact of Totohealth.
- Clarify the Totohealth prototype and identify if there were any additional changes.
- Validate the contents of the ToC and REF.

For a breakdown of the interview and sample questions, refer to Annex B.

¹⁶ See: [Lemire, S. et al. \(2012\). "Making contribution analysis work: A practical framework for handling influencing factors and alternative explanations." *Evaluation*.](#)

2.6 Sampling Methodology

We used a purposive sampling approach¹⁷ for endline sampling. The following minimum sampling criteria was applied:

- **Age of mother:** participants are adolescent mothers (the age of 19 or under at the time of registration);
- **Location:** based in and around Nairobi;
- **Subscription:** must have received messages for a minimum of six months during their subscription. If girls are no longer receiving messages, must not have stopped receiving messages more than two years ago;
- **Date of registration:** girls registered prior to May 2016 and those registered between May – December 2016 (after Totohealth received SPRING support);
- **Stage of pregnancy at time of registration:** girls who registered while pregnant and girls who registered after they had given birth. This was to ensure we captured the child's ages and pregnancy duration as targeted by the Totohealth service, as SMS content and messaging sequence was dependent on the stage of pregnancy and age of child; and
- **Dosage:** in addition to our six-month mandatory registration requirements, we also sampled girls who had been registered for Totohealth for more than 12 months.

A screening survey was created that outlined the above criteria and used to sample for both the KIIs and FGDs; please see Annex C for the survey tool.

KII Sampling

Our main target was to interview 24 adolescent girls who fit within our sampling criteria and was based off an assessment of anticipated minimum population from baseline. Of these interviews, one was conducted with the subscriber and her mother, who chose to participate for some questions. Minimum quotas were also set against each of the sampling criteria. We used a list of subscribers provided by Totohealth and continued calling until we reached our total of 24 respondents and minimum quotas were met (see Annex B for more details on KII sampling design and quotas).

Table 3: KII Achieved Sample

Sample Characteristics	Values
Age Category	
15-19 years	1
20 to 24 years	22
25 years +	0
Unknown	1
State of pregnancy at time of registration	
Pregnant at time of registration:	
0 to 4 months	4
5 month +	5
Not pregnant and child aged:	
0 to 5 months	6

¹⁷ See: Oliver, P (2013). "Purposive Sampling" in V. Jupp, *The SAGE Dictionary of Social Research Methods*.

Sample Characteristics	Values
6 to 12 months	5
over 12 months	4
Length of registration	
Registered for 6 – 12 months	10
Registered for 12+ months	13
Unknown	1
Still receiving Totohealth messages	
Yes	1
No	23

FGD Sampling

Our original aim was to conduct a total of four FGDs with adolescent girl subscribers (6-8 participants per group), who fit our sampling criteria. However, due to some field challenges experienced by our local research partner such as girls not being reachable (outlined in section 2.7), we were unable to find enough girls to reach our FGD quota. As a result, we adjusted our original FGD sampling to include four FGDs with Totohealth subscribers (intervention) who fit our sampling criteria (See Text Box 2) and added in two additional control FGDs with non Totohealth subscribers. For more details on changes in FGD sampling, please see Annex B. A total of six FGDs were administered to 29 girls (14 Totohealth subscribers and 15 control).

Box 2: Update to Minimum Sampling Criteria: Location

We encountered an unexpected challenge of not being able to find enough girls in the Nairobi area that were willing to come in for a FGD. Therefore, we were not able to reach our minimum number quotas. Conversations with the Executive Director from Totohealth indicated that they had a large subscription base out in Homabay County, a rural county 7 hours east of Nairobi. We decided that we would expand the location criteria to sample and conduct in-person FGDs in Homabay County. This did not have any impact on our analysis as location in and around Nairobi was set as a sampling criterion as well as being able to interview the girls in person.

Table 4: FGD Achieved Sample

FGD Type	Location	No. Girls	Age Range
Intervention 1	Nairobi	3	22
Intervention 2	Nairobi	2	17 - 22
Intervention 3	Homabay	5	21 – 23
Intervention 4	Homabay	4	18 – 22
Control 1	Nairobi	9	15 – 20
Control 2	Nairobi	6	15 – 20

2.7 Data Collection Fieldwork

Local Research Partner

Coffey sub-contracted Research Plus Africa (RPA), a local research organisation that specialises in market and social research. The primary RPA team for this evaluation was comprised of:

- One female project manager, who oversaw the evaluation and was also the FGD moderator.
- Three female enumerators, who conducted the KIIs and supported with FGD note taking and observation.

Other members of the RPA research team that supported the evaluation included: one translator, who translated all of the tools from English to Kiswahili and three transcribers. There was also a calls team, who was responsible for completing the screening calls and recruiting participants.

Enumerator Training and Piloting

- A four-day training for the primary RPA research team took place from November 19 to 23, 2018 at RPA's offices in Nairobi, Kenya. The first two days of training involved getting to know the RPA team and their research facilities, overview of the evaluation and field methodology and qualitative research techniques.
- The third day of training included an overview of the qualitative KII and FGD tools and supporting resources, a question-by-question review of each of the tools, as well as a mock KII and FGD. This allowed us refine the language and validate the tools. The tools were then sent for translation in preparation for piloting.
- The fourth day of training was piloting the KIIs and FGDs with a selected sample of girls. Each of the enumerators had the opportunity to complete a KII. One pilot FGD was also conducted (see Annex B for more details on piloting the tools). The pilot sessions were followed up by a debrief and a discussion on girl safety protocols.

Data Collection

Endline data collection took place between November 2018 and January 2019. The majority of the KIIs were completed in the girl's home or a selected location within the girl's neighbourhood. All FGDs were completed in a central venue either at the RPA offices or at a venue easily accessed by the girls. As noted earlier, due to challenges with recruitment, a couple of the FGDs were completed in Homabay County. KIIs and FGDs were conducted in Kiswahili or English, depending on the participants' preferences, and recorded. Recordings were anonymised, transcribed and safely stored with RPA. The transcripts were translated, quality checked and validated by RPA and then sent to Coffey as they were completed. Audio recordings and transcripts are stored on the cloud as well as on a physical server and are password protected.

Box 3: Fieldwork challenges reported by RPA

- Sampling: subscription list provided by Totohealth was poor quality, which made it difficult to meet the original sampling criteria.
- Dropouts or no-shows: Many girls would agree to participate in an interview or FGD and then change their minds. The girls often cancelled last minute or would not be reachable when the team tried to contact them in the field.
- Most of the data collection was done in December when many of the girls would say they had travelled to their rural homes to spend the holidays.
- Travel to Homabay County was unexpected.

Ethics and Safeguarding

All of our research complied with our Girl Safety Protocols (GSP) and to Coffey's Ethical Research Guidelines. The GSP are based on the ethical guidelines set out in [DFID's ethics principles for research and evaluation](#), [ESOMAR's International Code on social research and data analytics](#), as well as [ESOMAR's guidelines for working with Children and Young People](#). Context-specific variations were discussed developed in collaboration with RPA.

Research Permissions

As with previous data collection, the research permissions process was led by our local research partner, RPA. They ensured that they have the appropriate permits from the National Commission for Science, Technology and Innovation (NACOSTI) for data collection. In addition, permissions to conduct research with Totohealth beneficiaries was covered by the existing permissions granted to Totohealth to conduct research with adolescent girls by the Ministry of Health at the time of the rollout of the adolescent teen content (2016).

Consent

The process for obtaining research consent followed a two-stage process. The first was a customer opt-out process, where Totohealth removed anyone from their list of subscribers who had opted out of participating in research related Totohealth. The second was consent at time of research, where participants confirmed their interest in participating during the screening survey and again at the time of completing the KII or FGD.

2.8 Data Coding and Analysis

A two-stage coding framework was created (see Annex D):

- Level 1: SPRING coding. This stage examined the qualitative data along indicators specified by the SPRING analysis framework.
- Level 2: Totohealth coding. This stage involved a deeper examination into the ways Totohealth contributed to changes in MCH outcomes for Totohealth subscribers, as well as possible influencing factors and alternative explanations.
- All interview transcripts were coded and analysed using ATLAS.ti to identify primary themes mapped to the REF. The evidence collected was systematically analysed to determine the most accurate contribution story and to identify barriers and possible rival explanations for outcome knowledge, attitudes and practices. Each of the mechanisms in the REF were assessed based on certainty, robustness, range and prevalence (see Annex B for information on designing the coding framework).
- The contribution story was assembled by answering the following questions based on each of the results and indicators presented in the REF:
 - How credible was the story?
 - Did the pattern of observed results validate the results chain?
 - How similar or different were the outcome's across respondents?
 - What were the main weaknesses in the story?

2.9 Limitations and Mitigation Strategies

Design Limitations and Mitigation Strategies

As a result of the changes to the Totohealth prototype, large attrition rates and loss of comparison group, we no longer were able to quantitatively evaluate the extent of impact of Totohealth's message on subscribers. This triggered a re-design of the study from a phone-based quantitative study to a qualitative-based study using contribution analysis. Also in the re-design was the addition of understanding and analysing the individualised influencing factors and alternative explanations to understand the ways in which involvement in Totohealth has contributed to certain MCH outcomes for the girls.

Data Limitations and Mitigation Strategies

Robustness of the data was limited by the low numbers of girls who participated in the impact evaluation KIIs and FGDs. Using the contact details provided to us by Totohealth, we sought to maximise the number of participants by making multiple attempts to contact each girl and where necessary, arranged convenient times to call the girls back to take part in the interview if she was unable to at the time of the original call. We also expanded our location selection criteria to include Homabay County to ensure that we were able to recruit our quota of girls for the evaluation.

Response Bias and Mitigation Strategies

The range of time that had elapsed as well as high attrition rates meant that the girl respondents likely experienced difficulties in recalling information from SMS messages. As such, we did not seek to measure the quantitative extent of knowledge acquisition or SMS recall, but instead designed a new knowledge assessment that determined if knowledge increased, and the ways it had contributed to further outcomes such as increases to awareness, health-seeking behaviours and overall well-being.

Additionally, evidence gathered from this evaluation was self-reported by the girls, therefore it was subject to recall and positive response bias. To help identify any bias in our results we systematically assessed the influencing factors and alternative explanations.

3 Results and Analysis

This chapter outlines findings from data collected as part of the Totohealth endline study.

Section 3.1 presents findings around the mechanisms of change (outputs), while Sections 3.2, 3.3, and 3.4 outline outcome findings around primary MCH mechanisms as well as Totohealth's contribution to the girl's overall health and well-being outcomes, including MCH knowledge, attitudes and practices.¹⁸ Section 3.5 presents adolescent girl's health and well-being outcomes in relation to possible influencing factors (barriers and enhancers) and alternative explanations for Totohealth contribution. Finally, Section 3.6 brings together the findings and presents the Contribution Story to explain the prototype's impact.

Blue text boxes at the end of each subsection are aimed at highlighting key takeaways for the Contribution Analysis.

3.1 Mechanisms of Change (outputs): Reaching Adolescent Girls

This section presents findings around the prototype, its implementation and its outputs (as described in the ToC). It specifically outlines how successful Totohealth was in reaching adolescent girls, specifically through: subscription rates, prototype design thereby developing initial levels of trust. This section also outlines some of the challenges associated with reaching girls as well as considerations and implications for Totohealth's contribution story.

Subscription Rates

The majority of Totohealth participants were not subscribed for the complete duration of Totohealth's SMS campaign. Roughly half of the girls received SMS messages for less than one year, while the other half received messages for one to two years. While no one girl received the entirety of Totohealth information — from antenatal through early childhood — girls registered at staggered stages in their pregnancies/motherhood so that between them, all of Totohealth's curriculum was transmitted.

Prototype Design

In general, mobile phones, were an effective way to reach young mothers in Kenya. Nearly every respondent confirmed that the messages were easily accessible and relevant. Because these mothers often kept their phones with them at all times, they felt that Totohealth's advice was very proximate and, consequently, very trustworthy. Mobile phones offered a reliable, unmediated source of information to pregnant young women who faced barriers to accessing information elsewhere. One interview with two respondents, an adolescent mother and her own mother, explained this phenomenon:

"[At] that time she was very afraid that she was pregnant, so she was not free to ask me questions. So, I would give her the phone and she would ask the questions herself. What she felt uncomfortable asking me, I told her to ask them, so it guided her until she delivered." KII19

Findings suggest that Totohealth is perceived to offer an objective, informed voice amongst the dissonance of confusing opinions, advice, and hearsay circulating around a young pregnant girl.

The design of Totohealth's SMS prototype, as a product oriented toward adolescent girls, was successful. First, girls' motivation for subscribing to the service matched the intended purpose of the service: to learn about MCH to improve their childrearing preparedness and abilities. Thus, expectations from users were met by the service.

While there were a few reported disruptions to the transfer of messages to the user, the majority of these were beyond Totohealth's control. For example, some girls lost their phones and changed numbers, or registered on a family members phone, disrupting their immediate access to Totohealth's messages. Besides these incidental interruptions the overwhelming majority of interviewed users did not experience any issue receiving Totohealth's SMS messages.

Next, 21 interviewees confirmed that the messages were actually received by the users, were comprehensible to them, and were relevant to their needs. For both English and Kiswahili subscribers, there was no issue with user comprehension reported across all 24 informant interviews. It is clear that Totohealth effectively communicated complicated MCH topics in a language adolescent mothers could understand and practice. Lastly, Totohealth's

¹⁸ Knowledge levels were assessed and scored using a 'knowledge assessment'. For full details, please refer to Annex B and C.

automated schedule for publishing user-specific SMS messages was extremely accurate. Only two informants reported instances of texts arriving after their babies had passed the referenced milestones. Even then, this was not a chronic, repeated error. The majority of interviewed mothers were completely satisfied with content and timeliness of Totohealth’s SMS service, testifying that Totohealth’s messages often arrived when most useful to the users.

Trust

Totohealth was an unanimously trusted source of information amongst interviewed subscribers. Girls lauded Totohealth’s contribution to their own knowledge, attitudes and practices and gave several reasons for why they trusted the SMS messages so much.

One reason was ‘performance legitimacy’. Once subscribers saw for themselves the relevance and usefulness of Totohealth’s messages, they began to engage with the service more seriously. Some were so surprised with the accuracy of Totohealth’s incremental child development messages that they thought Totohealth must have some way of observing their life. Furthermore, Totohealth was valued because of its clear and understandable language. These features of Totohealth’s product were so effective that it even converted some sceptics. One mother said that, initially, she did not see the utility of the message system, however once she began receiving them, she changed her mind entirely.

Interviewed subscribers overwhelmingly valued Totohealth’s services. Three separate interview questions provide three distinct dimensions for measuring subscribers’ valuation of Totohealth. These are willingness to subscribe for advice on a subsequent pregnancy and child, willingness to pay, and saving/sharing received messages.

First, every single interviewed subscriber stated that they would be willing to subscribe to Totohealth’s SMS messaging service for subsequent pregnancies, suggesting that Totohealth produced a material improvement to the health of the children monitored. If it had not been effective in this way, mothers would presumably not be interested in the service for future pregnancies.

Next, every respondent reported that she was willing to pay for the service. When asked to explicitly appraise the usefulness of Totohealth, all mothers said that they would be willing to pay for the service in the future. This is particularly telling because roughly 95% of interviewed mothers did not pay for their prior subscription as it was part of a pilot.

Third, the ways in which mothers used their subscriptions demonstrate a clear appreciation for the service. A great majority of interviewed mothers saved the messages for future reference or shared the messages with friends. This behaviour highlights how useful subscribers found the SMS messages, for if mothers had not found the information helpful, or at the very least novel, they would have had no reason to save or share the messages. Their efforts to preserve messages strongly suggest that the information contained within them were helpful to the mothers. The distribution of messages amongst friends presents a large, positive externality to Totohealth’s services; that subscribed mothers shared the messages with family and friends suggests that Totohealth’s information reached beyond its total subscription audience.

“Yes, I would recommend clinic and Totohealth (..) yes I have recommended Totohealth to my friends and they tell me their experience has been great”. KII 4

Challenges in Reaching Adolescent Girls

As mentioned above, various challenges in reaching girls were present. A few interviewees lost their mobile phones and were not able to reconnect with Totohealth to resume their subscription, while others did not have a mobile phone themselves and thus registered with a family member’s phone. In these circumstances, they had only intermittent access to the Totohealth messages. This suggests that Totohealth was unable to make its services fully accessible or anonymous to these girls and therefore less successful than intended in reaching the most marginalised girls most affected by a lack of information, as it had set out to do.

None of the three interviewed subscribers that lost connection to Totohealth, were able to re-establish their subscription. These findings suggest this is an area where Totohealth could improve its service and make it more accessible for those that are enrolled.

Box 4: Contribution Outputs and Influencing Factors**Contribution Outputs: Reaching adolescent girls**

- Totohealth's prototype design using mobile technology seems to be an effective method for providing objective and stigma-free information to young mothers.
- Findings suggest that girls were receiving relevant adolescent-specific content at the right time. The content of the SMS was easy to understand.
- Overall, Totohealth was valued as a trusted source of information across all girls.
- It was unanimous among the girls that they valued and trusted the information so much that they would be willing to pay for the service, share the information with others, as well as sign up for the service for future pregnancies.

Influencing Factors

- As trust was one of the primary factors throughout all of the mechanisms, Totohealth being a trusted source of credible information is a primary contributor to the outcomes experienced by the girls: knowledge, attitudes and practices.
- No girl received the full package of SMS content: including pregnancy both and child health. There were significantly more girls registered after giving birth than during pregnancy. This may influence the observed outcomes as Totohealth's optimal impact would be with girls starting from the beginning of the programme.
- There were some challenges with reaching some of the subscribers due to intermittent access to the messages because of phone sharing or lost subscriptions. This may influence the degree of outcomes we are seeing as the girls might not have received all of the information during their subscription.

3.2 Contribution to Maternal and Child Health Outcomes

This section presents findings of Totohealth's contributions to the short-term, intermediate and long-term outcomes experienced by adolescent girl subscribers (as described in the ToC and REF). It specifically outlines Totohealth's contributions to the importance of prioritising health as well as its impact on the knowledge, attitudes and practices of specific MCH behaviours: antenatal care, safe delivery, pregnancy health, immunisation, breastfeeding and child nutrition, and child health.

Prioritising Health

Overall, Totohealth subscription seems to have motivated mothers to prioritise healthcare in their everyday lives. Of the 24 informant interviews with young mothers who received Totohealth messages, 15 stated explicitly that the messages made MCH a main priority in their concerns and duties. Of the 11 that did not adjust their priorities, nine reported that they were already prioritising their own and child's health prior to their Totohealth subscription. The findings strongly suggest that Totohealth made mothers apportion more of their energy and attention to MCH,

"[Before Totohealth I would have prioritised a] roof over my head, financial stability, then education. It [Totohealth] helped to see that your health and the child's health are the most important things. They emphasised taking care of your health and the baby's health." K111

Box 5: Outcome Contribution: Prioritising health

- Findings suggest that Totohealth affected girls' attitudes towards prioritising health.

Influencing Factors

- Other sources may have played an ongoing role in influencing MDH prioritisation, as is evident from the girls that were prioritising their own and child's health prior to their Totohealth subscription

Antenatal Care

Knowledge and Attitudes

The first category of MCH covered by Totohealth’s messages is antenatal care. Knowledge outcomes on this topic are high among mothers that subscribed with Totohealth early in their pregnancies, but lower for mothers who did not receive messages on this topic. An interview with a mother that began her subscription after childbirth exhibits this uncertainty:

“It [antenatal care] helps to know the conditions of the child. I also know my condition. I am not sure of that [how often to visit the clinic]. It depends when you started. Somebody goes monthly, and it depends when you started (...) Yeah [I only started receiving messages after giving birth].” KII 22

Those with strong knowledge of antenatal care correctly identified the numerous ways antenatal care contributes to healthy pregnancies: blood tests, monitoring mother’s health, testing for abnormalities, testing for HIV prior to transmission to baby. These mothers also said that antenatal visits were important sources of information for all subsequent stages in their pregnancies. Girls that did not receive Totohealth messages about antenatal care also appreciated that it was important to attend all appointments but could not identify why, suggesting that Totohealth affected their attitudes but not necessarily their knowledge in this regard.

Roughly a third of the respondents with current poor knowledge of antenatal care, retrospectively, saw its importance. One mother, who was motivated to sign up for Totohealth in the future to help her change her behaviour, said:

“I will register, because I didn’t get knowledge during my pregnancy so that I get to learn and so that I stop this bad habit of commencing ANC at 7 months”. KII5

The findings suggest that Totohealth raised girls’ sensitivities as to MCH in general and the importance of antenatal visits, more specifically.

Practices

As mentioned above, girls who did not register for Totohealth early in their pregnancies did not have good antenatal knowledge and practice. From this population, some attended fewer than the minimum recommended number of antenatal appointments. Others did not begin antenatal clinics until late in their pregnancies and thus, did not practice proper antenatal care until just a few months prior to birth.

Mothers that received Totohealth messages from the beginning seem to be much more likely to exhibit health-seeking behaviour throughout their pregnancies, suggesting that adequate exposure to the content of the SMS messages is required to bring about a change in health seeing practice, but also that Totohealth had significant impact on health seeking behaviours.

Box 6: Outcome Contribution: Antenatal Care Knowledge, Attitudes, and Practices

- Findings suggest that Totohealth affected girls’ knowledge around and attitudes towards ANC. Where it did not affect knowledge levels, it seems to still have affected attitudes.
- Findings indicate that Totohealth raised girls’ sensitivities as to MCH in general and the importance of antenatal visits, more specifically.
- Findings also suggest that Totohealth had significant impact on ANC health seeking behaviours.

Pregnancy Health

Knowledge and attitudes

Knowledge on general Pregnancy Health — the third component of Totohealth’s messaging — was strong. In certain cases, the findings strongly suggested that Totohealth generated this knowledge, but in others, it was hard to isolate Totohealth’s impact from the knowledge derived from experiencing pregnancy. Presumably girls would have, at the very least, had a basic understanding of pregnancy health. However, findings do suggest that Totohealth helped reinforce knowledge and perhaps provided some new knowledge. Those with good knowledge on this topic knew how to identify symptoms of complications during pregnancy: bleeding, chronic nausea, pains, fatigue. They also knew the length of pregnancy, listed the signs of labour, and shared healthy behaviour while pregnant. The quarter of respondents that had minimal outcome knowledge about pregnancy health were unable to

identify as many symptoms of possible complications. Five out six of these respondents did not begin their Totohealth subscriptions until after giving birth, suggesting that Totohealth messages did contribute to knowledge of pregnancy health.

The knowledge provided from Totohealth’s messages raised girls’ awareness to the importance of managing stress during pregnancy. Nine interviewees reported that stress is unhealthy for pregnancies, and that stress-mitigating methods should be employed.

“When pregnant, you need to avoid a lot of stress because it could cause pressure and possibly miscarriage, so you need to be stress free.” KII12

Mothers learned of the harmfulness of stress during pregnancy and recounted, in roughly 38% of interviews, that it should be avoided as best as possible. Findings suggest that these improvements in knowledge of psychological health were accompanied by behavioural benefits as well, the latter will be discussed below.

Practices

The pregnancy health SMS messages were particularly helpful in dispelling misinformation about behaviour during pregnancy. Often young mothers would, prior to receiving the messages, have certain attitudes regarding MCH that were not necessarily beneficial to their own and child’s health. For example, four subscribers previously thought it was appropriate to eat whatever foods their pregnancy cravings demanded, which typically, was junk food.

The findings show that 75% of interviewed mothers had adequate or more than adequate dietary health during pregnancy. However, Totohealth not only taught girls that having a healthy diet while pregnant is essential to the development of the unborn child, it also made girls feel more comfortable in their pregnancies, allowing them to maintain the appropriate habits during pregnancy, like exercising, performing mild work and cooking.

Finally, women that might had taken to bed due to the normal fatigue of pregnancy summoned the energy to increase their overall activity by going for walks or moving around the house. Roughly one-third of respondents explicitly attributed these changes in their practices to Totohealth.

“Yes, I am [putting into practice what I have learned from Totohealth]. I remember they used to tell me that I should exercise my body even if you are pregnant, you don’t just sit down and do nothing, you should exercise by walking and doing other works... I used to walk”. KII 8

Box 7: Outcome Contribution: Pregnancy Health Knowledge, Attitudes, and Practices

- Findings suggest that outcome knowledge on pregnancy health was strong, but only approximately one-third of respondents directly attributed this to Totohealth.
- Totohealth’s effect on knowledge levels is not always clear, particularly in areas where girls had prior knowledge.
- However, comparisons of knowledge levels in late subscribers suggest that Totohealth messages did contribute to knowledge.
- Findings also indicate that the Totohealth messaging was useful in dispelling misinformation.

Safe Delivery

Knowledge and attitudes

Every mother knew that it is safer for a baby to be born in a hospital in case complications arose during labour. As explained below, this did not always translate into practice. However, it is not clear, whether girls received information that babies should be delivered in hospitals from Totohealth, school education, or family member especially since this safe delivery knowledge is assumed to be elementary and widespread.

Findings from the KIIs suggest that Totohealth messages changed the attitudes of some women regarding delivery that subscribed. When it was most effective, Totohealth alleviated some of the nervousness mothers felt before giving birth by providing them with preparatory information.

“They helped me by preparing my psychologically. I was ready [to] look out for signs of delivery. They had also told me when the times comes I should go to hospital. They had also told me what to pack when going for delivery, so I was ready.” KII 4

For those cases where Totohealth was not responsible for the alleviation, the reason was because most women already knew hospitals facilitate safe delivery. However, for one mother the information was particularly revealing.

“Yes, it [Totohealth] taught me more (...) [I remember] to save your life and your baby’s life, you need to deliver at the hospital (...) I didn’t know [that before].” KII11

For the girls who scored lowest on the knowledge assessment for Safe Delivery Practices, Totohealth delivered the fundamental knowledge of safe delivery. However, from the KII findings it cannot be determined that this knowledge was ‘new’ to some of the more informed subscribers. The findings do however suggest that Totohealth may have reinforced the messaging around safe delivery.

Practices

While the vast majority of mothers actually delivered in a hospital, at least two gave birth at home. These instances were not due to a lack of knowledge but rather a lack of access to medical facilities, (one respondent had actually been at a hospital but had been refused service or otherwise returned to her home to give birth) suggesting that increasing knowledge is not always a sufficient measure to bring about behavioural change on its own. Again, because this component of MCH is elementary and widespread, it is difficult to determine the extent of Totohealth contribution.

Box 8: Outcome Contribution: Safe Delivery Knowledge, Attitudes, and Practices

- Findings suggest that the knowledge did not always translate into changed practice.
- Findings indicate that interventions may need more comprehensive approaches to bring about behavioural change.
- It is not possible to conclusively state that Totohealth has improved knowledge and attitudes regarding safe delivery practices, however findings do suggest that Totohealth at the very least reinforced the messaging around safe delivery.

Immunisation

Knowledge and attitudes

Immunisation was the weakest area of outcome knowledge. Most mothers either did not know or were unable to recall the specific illnesses vaccines protect against. Some misidentified illness as being preventable by vaccines. Another area of weakness was in recounting the appropriate schedule for administering vaccines. Almost half of all interviewees missed one, or both, of these elements.

Subscribers with a high level of outcome knowledge— roughly a quarter— recalled that children receive vaccines immediately after birth or within two weeks, followed by additional vaccines at six, 10 and 14 weeks, then at nine and 18 months.

As the content in immunisation specific messages was much more specific than in the other SMS messages (it provided great detail into vaccine schedules and disease), there are a few possible factors that may have confounded the knowledge results, including education levels of the respondents and recall bias.

The majority attitude towards immunisation was positive. Mothers considered vaccination important even if they were not entirely able to describe why and sought vaccinations for their children. Respondents often identified SMS messages about immunisation as the most helpful of all texts received.

“The one that was more important to me was the one reminding me about immunisation, giving me the importance of immunisation (...) Because we have other people who will just ignore some things like immunisation, they think it’s like immunisation give children diseases and they just ignore but Totohealth gave me the importance of immunisation and I was pleased with that. (sic)” KII 10

However, common prejudices against vaccines were present in a few interviews as well, owing to vaccine’s ‘invisible efficacy’.¹⁹ This scepticism suggests that there is an area of opportunity for Totohealth to place greater emphasis on dispelling immunisation myths and not only on prompting girls to seek immunisation for their children.

Practices

Despite these challenges intrinsic to immunisation, many women followed the proper vaccine regime and lauded Totohealth for helping them remember to do so. Because one complete course of childhood vaccinations occurs over a few years, mothers valued the reminders Totohealth would send them. Roughly a quarter of mothers with ‘good’ immunisation practice explicitly stated that Totohealth’s calendar-keeping improved their compliance with the immunisation practice prescribed by doctors.

For this component of Totohealth’s messaging, improvements to outcome practice exceeded outcome knowledge. This reveals some of the user-behaviour impact of the SMS messages. In this case, is perhaps mothers simply followed the instructions given to them by Totohealth but did not engage with the accompanying content. Nevertheless, Totohealth was very effective in following-up with young mothers, prompting them to vaccinate their children.

Box 9: Outcome Contribution: Immunisation Knowledge, Attitudes, and Practices

- Findings show that despite a relative lack of knowledge, health-seeking behaviour may still have been affected through messaging. This may be because messaging focused a lot on prompting and less on dispelling myths.
- Totohealth’s behavioural prompting messages (i.e., immunisation reminders) contributed to better immunisation practices.

Influencing Factors

- As the content in immunisation specific messages was much more specific and directional than in the other SMS messages, there are many possible factors (education levels, recall bias, etc.) that may have confounded the knowledge results.

Breastfeeding and Child Nutrition

Knowledge and attitudes

Totohealth significantly improved Breastfeeding and Child Nutrition outcome knowledge among subscribers. Interviewees demonstrated a clear understanding of proper breastfeeding techniques, schedules and purpose. They listed the frequency a baby should eat during a given day, how and when to wean baby off breastfeeding, and the nutritional importance of the soft foods they introduce into the baby’s diet. All such topics were detailed in Totohealth’s SMS messaging. Much of the knowledge regarding breastfeeding and nutrition was completely new to the subscribers and so they described the counter-factual: what they would have fed their baby if they had not received any messages. For example, many young mothers would not have known that their own diet has ramifications on that of the baby through the nutrients transferred via breastmilk had it not been for Totohealth’s SMS messages. Indeed, fifteen interviews explicitly attributed the knowledge they gained on child nutrition to Totohealth’s messages. All of these fifteen respondents had adequate or above adequate knowledge on the topic. Contrarily, three interviewees with an equivalent level of outcome knowledge on breastfeeding and child nutrition identified alternate sources of information, such as doctors and school.

“[Totohealth helped improve my knowledge by send[ing] the messages reminding me how important it is to breastfeed the baby exclusively for six months then I can start feeding her now and also introducing one type of food a time. So, I got a lot knowledge and when she started eating I did not mix her foods because I knew. I would monitor how the food reacts on her before introducing a next.”

KII 4

¹⁹ When a vaccine is working, there is no tangible proof that it has; the absence of a disease can either be due to immunisation or simply good luck.

The degree of impact Totohealth had on this cohort of fifteen girls' knowledge can be measured free of any cofounding sources of information. It is evident from these interviews, that Totohealth is directly responsible for vastly improved knowledge and practice for breastfeeding and nutrition. This is discussed in greater detail in the practices section of this category below.

Subscribers' attitudes relating to breastfeeding and nutrition were improved by the SMS messages. Of all outcome areas, breastfeeding and nutrition had the second largest impact on mothers' overall confidence in themselves. Numerous interviewees explained that these messages were instrumental in raising their confidence as mothers, because they could relate Totohealth's messaging to their immediate life.

“Okay. For one you need to be sincere for once that time when my child wasn't eating when I go to messages from total health. I dint know there was more responsibility once the child starts to eat. I need to wake up very early to prepare porridge for him. That time, I used to breastfeed him when he cries. When you started sending me those messages, he was also starting to feed. So it dawn to me that so am a mother. I now to wake up early.”

As every meal presented an opportunity for mothers to literally provide for their children, many Totohealth subscribers were continuously 'rewarded' with the feeling that they were, indeed, taking care of their children, which in turn greatly improved confidence.

Because keeping a proper breastfeeding routine and maintaining proper nutrition is a continuous practice occurring every day, mothers were particularly attuned to lessons about it. As part of the interviews, subscribers were asked which information was most useful to them. Breastfeeding and child nutrition were the most common answer.

“[The most useful information was on] complementary feeding because compared to my first child I cared about the types of food that I gave my child, I used to give the child even ugali, so this was useful.” KII 5

Practices

Again, the continuous relevance of SMS messaging about breastfeeding and nutrition amplified the applicability of the information contained therein. This also meant that mother's breastfeeding and nutritional outcome practices changed most dramatically as well. Much of the information on this topic was new to the mothers, so they had previously been practicing non-Totohealth sanctioned childcare. After receiving the messages, and learning the significance of proper diet and nutrition, many mothers changed their behaviour accordingly.

“They [Totohealth] used to send the messages reminding me how important it is to breastfeed the baby exclusively for 6 months then I can start feeding her now and also introducing one type of food a time. So I got a lot knowledge and when she started eating I did not mix her foods because I knew. I would monitor how the food reacts on her before introducing a next.” KII 4

The findings suggest that mothers implemented their newly acquired knowledge in 'real-time', or in other words, as they received the messages. Totohealth helped with what specific foods should be included in child's diet and in what sequence they should be introduced. This complex topic was effectively taught to the majority of interviewed subscribers, with material, emotional and physical benefits as a result.

Box 10: Outcome Contribution: Breastfeeding and Child Nutrition Knowledge, Attitudes, and Practices

- Findings strongly suggest that Totohealth messaging significantly affected knowledge levels around breastfeeding and nutrition.
- Findings also show that Totohealth is directly responsible for improved practice for breastfeeding and nutrition and correct incorrect behaviour.
- Immediately and regularly applicable information (breastfeeding and child nutrition are presumably more day-to-day functions compared to other factors like antenatal care and immunisation) may have amplified interest and contributed to the change in behaviour.
- The ease of applicability greatly improved confidence of mothers.

Influencing Factors

- It is evident from fifteen interviews, that Totohealth is directly responsible for improved knowledge and practice for breastfeeding and nutrition. For these interviews, the degree of impact Totohealth had on girls' knowledge on this topic can be measured free of any cofounding sources of information.

- Findings indicate that there was more of a knowledge gap in breastfeeding and child nutrition knowledge than other areas, such as antenatal care and pregnancy health, which may make Totohealth’s contribution seem greater than on other topics.

Child Development

Knowledge and attitudes

Young mothers explicitly mentioned Totohealth’s contribution to their own abilities as mothers to understand, identify and practice good child development. Information on this topic is inherently complicated, early child health and development is multi-faceted and specific to each individual child, yet equally broad. This broad topic often made the qualitative data general, even after probing.

Totohealth helped its subscribers be more certain of what they must do as mothers of newborn children, however the details of how it did that are difficult to determine. Regardless, Totohealth’s messages explained these topics and communicated them in an intelligible way to its subscribers. Girls learned the value of keeping the environment around the child clean and clear of danger—a particular challenge in poorer areas without formal waste systems. They also learned that child activity exploration, and experimentation (supervised) is healthy for the child’s mental development.

Subscriber’s attitudes relating to child development changed significantly with the assistance of Totohealth. SMS messages about child development were identified as ‘most useful’ with the second highest frequency by interviewed subscribers.

“[The most useful messages, to me, were] on child growth. Being a young mother, I did not know anything about children. I would hear people saying you are supposed to do this and that, but I was not sure but with Totohealth they followed me up and they have really helped me in taking care of this baby.” KII6

Because of the all-encompassing nature of the child development SMS messages, they had a generalised impact on the mother’s overall attitude and stress levels relating to childcare in beyond those directly related to child development. The assistance and assurance Totohealth’s messages provided young mothers on child development did a lot to assuage the worry of having a young child.

Practices

In a practical sense, Totohealth SMS subscribers benefitted greatly from receiving information on child development. In most cases, women who had ‘average’ or ‘good’ scores on the knowledge assessment had high rates of compliance with proper childcare practices. Also, they typically put their newfound knowledge into practice immediately and corrected past behaviour. The most commonly identified changes in practices were as follows: how to properly support the baby while holding him/her, how to maintain a clean environment for the child, the significance of hygiene for the baby, and encouraging babies to explore and interact with their environment. Often, mothers did not know how essential it is for babies to play outside and be active. This can be observed in the quote in the previous section. Mothers, understandably, were over-cautious with their new-borns, but adopted freer behaviour after learning from Totohealth.

Furthermore, subscribers consulted Totohealth throughout their child’s development as one would consult a standard medical professional.

“Yes, there was a time they really helped me. The baby had diarrhoea. It was about 10am and I just heard a message come through and it was talking about diarrhoea and vomiting and they said I should buy him ORS and Zinc and I did that. I even sent them a message after that. (..) I told them that the baby was sick with diarrhoea. They replied and told me to give him a lot of water and the Zinc tablets.” KII 16

Because Totohealth was responsive and authoritative, subscribers complied with the SMS directives. In a few cases, Totohealth overrode the dispositions of the mothers, so that they went against their intuition and followed Totohealth’s advice instead. For example, one subscriber was hesitant to let her daughter play with water because she believed that she would get sick. However, Totohealth encouraged her to let her daughter play in the sun and exercise her curiosity, to which the mother complied, but very cautiously. After seeing how this aided in her daughter’s development, the mother concluded:

“I had challenges because I did things according to my knowledge, I did not like introducing new things but sometimes I would just try... [Totohealth] reduced my fears. I think I was too careful with my child, for example... I thought she would get sick from the cold air outside. But I started feeling free with the child, I would take her out to play with other children. This was because of Totohealth”. KII 1

The findings demonstrate just how influential Totohealth was amongst subscribers. Given accurate information, mothers were willing to completely alter their own behaviour to the benefit of the child’s health.

Overall, many interviewees felt supported by Totohealth and reinforced in a way that was evocative of a real human relationship. Mothers turned to Totohealth when they needed help, when they were unsure or when they simply wanted to know more.

However, the topic is broad and yet, very specific to the individual child and respective family. For this reason, improvements in child development, while robust, were more ambiguous than those seen in breastfeeding and child nutrition. Thus, it is difficult to determine the precise parameters of Totohealth’s influence in this area; alternative sources of information are prevalent. Lastly, this stage of childrearing happened most recently in relation to the interview, so the accessibility of such memories may cause child development messages to stand out in the minds of the interviewees.

Box 11: Outcome Contribution: Child Development Knowledge, Attitudes, and Practices

- Findings strongly suggest that Totohealth messaging contributed to their own abilities as mothers to understand, identify and practice good child development.
- Findings suggest a high level of relevance as child development messages were identified as most useful.
- Attitudes relating to child development matured significantly with the assistance of Totohealth.
- Findings show that a greater level of knowledge is associated with higher rates of compliance with proper childcare practices, suggesting Totohealth messaging contributed to improving practices.
- Mothers had great level of trust in Totohealth, with messages sometimes overriding the dispositions of mothers.

Influencing Factors

- The degree of impact Totohealth had on girls’ knowledge can be measured free of any confounding sources of information. It is evident from the interviews, that Totohealth is directly responsible for vastly improved knowledge and practice for child development.
- However, as the topic is broad, with alternative sources being prevalent, and at the same time specific to each mother and her child, it is difficult to attribute improvements in child development knowledge, attitudes and practices to Totohealth alone.
- Potential response bias pertaining to the proximity of the stage of childrearing, with greater accessibility of such memories.
- The topic of child development was the main focus of Totohealth messaging, with 148 out of 257 messages containing child development content. This may have affected perceived contribution.

3.3 Contribution to Well-Being and Confidence Outcomes

This section presents findings of Totohealth’s contributions to a girl’s overall well-being and confidence (as described in the ToC and REF). It specifically outlines more generalised impacts to well-being in other areas the girl’s lives. (e.g., self-care, earnings and savings). This section also outlines Totohealth’s contribution to a girl’s confidence in themselves as decision-makers for their and their children’s health.

Findings from our research suggest that Totohealth’s contribution to impact was largely discrete to MCH and the immediate practices. More generalised improvements to well-being in other areas of subscribers’ lives—self-care, earnings and savings, keeping a home, and education—were minimal. More than two-thirds of all interviewees stated that Totohealth helped them with MCH only. There were, however, two respondents that stated that Totohealth helped them balance their life and find better employment as a result. From the interviews, it is evident

that the circumstances of many of subscribers’ lives are so adverse, that it is reasonable that Totohealth’s SMS messages would be unlikely to yield major improvements. Many interviewees cited financial insecurity, absent fathers, community stigma as major problems in their lives, and in light of such multi-faceted hardship, the tangible improvements Totohealth made in MCH well-being is a substantial accomplishment.

With regards to girls’ confidence in themselves as decision-makers for their and their children’s healthcare, outcome confidence was unanimously high. Nearly every mother reported feeling more confident in her ability to be agent in MCH decisions in her and her child’s life. Roughly a third of these directly attributed their improved confidence to Totohealth’s SMS messages, while the other two-thirds were unable to identify the sources of their greater confidence. Presumably, a significant amount of confidence in MCH was gained through experiencing motherhood for the first time.

Where Totohealth improved confidence among its subscribers, subscribers’ mothers said:

“It reduced the worries I had about the child because I would ask people about everything but then with Totohealth, I came to know a lot on how to raise my child just from the comfort of my home.” KII1

“The biggest help was to my husband because husband do not agree to take us to the clinics so that they can understand some of the challenges that we go through. So, when I get the message they also send it to your husband if you have one.” KII9

The findings suggest that Totohealth’s messages achieved their aim of increasing confidence among its subscribers. This greater self-assurance also improved some girls social-standing within their communities. The quote above illustrates how Totohealth enabled that particular subscriber to have greater authority in decisions relating to the family. Armed with reliable information, Totohealth’s subscribers could assert their agency in their lives and those of their children.

Box 12: Outcome Contribution

- Totohealth’s contribution to a girl’s overall well-being was low. Impacts were limited to MCH related outcomes with very few girl’s mentioning impacts in other areas of well-being (e.g., self-care, earnings and savings, keeping a home, and education).
- Totohealth’s contribution to a girl’s confidence was significant for decision-making on MCH issues, as also seen in MCH outcomes, particularly around child development. However, the research yielded few results around confidence in other areas of a girl’s life.

Influencing Factors

Well-being

- Limited contribution to well-being outcomes is likely because Totohealth’s SMS curriculum was targeted on MCH content and did not provide information to specifically help develop other areas of general well-being.
- Findings suggest that without providing the right tools and support to help facilitate changes in other well-being outcomes, it would be difficult to see any major improvements in these other areas, especially with the majority of these girls reporting additional life challenges.

Confidence

- The evaluation could have taken more time to explore and better understand the potential residual impacts of Totohealth on other areas of a girl’s life.
- It is possible that a significant amount of confidence in MCH was gained through experiencing motherhood for the first time.

3.4 Influencing Factors

This section presents findings on influencing factors, conditions that might enhance or inhibit Totohealth from achieving its short-term, intermediate and long-term outcomes (as described in the REF). It specifically outlines the different types of barriers a girl faces when accessing MCH information and services: knowledge, decision-making, health facility and cultural. This section also outlines possible enhancing factors or alternative explanations such as design of the prototype and other sources of information.

Barriers

The young mothers and pregnant women that comprised Totohealth's subscribers faced formidable impediments and disadvantages in knowing about, forming attitudes regarding, and practicing proper MCH. Adverse circumstances presented numerous complications for them to overcome. This was the context in which Totohealth worked to provide young mothers with direct access to medical advice and consultation.

Of the many challenges this section addresses the four most significant categories: knowledge barriers, decision-making barriers, health facility barriers and cultural barriers. These categories affected different subscribers in different ways. To determine the extent to which these present influencing factors affecting Totohealth's contribution, the respective sections will explore their relative frequency and size of disruption.

Knowledge Barriers

The foremost issue preventing girls from accessing credible information regarding their pregnancies or motherhood is a simple lack of guidance. Due to the fragile position—social, emotional and educational—of young mothers, many lacked basic information on MCH and had no one to consult. Confusion resulting from conflicting advice, the lack of information or trustworthy advice was raised as a 'main challenge' to young mothers in four of six FGDs and determined to be 'somewhat likely' in five of these. Although there was no consensus on it being a 'very likely' challenge, findings suggest it to be a widespread issue. The severity and likelihood of this issue varied between focus group discussions. Where reported in the Totohealth subscribers focus group discussions, it was explicitly noted that Totohealth helped address this very issue.

This situation has the familiar predicament where girls are doubly disadvantaged because they may be unaware of the knowledge they are missing. Mothers will often turn their back on their daughters after they find out they are pregnant because of the shame or burden it has precipitated. In this case, girls are especially vulnerable to misinformation.

Next, young girls lacking adequate exposure to proper MCH are unshielded from confusion when they are inevitably confronted with conflicting information regarding pregnancy and childcare. Qualitative data occasionally chronicled the bewilderment young mothers may face when inundated with conflicting information, advice, or guidance on MCH from their community. One interviewee explained one such time:

- *"Maybe outside you may go to someone and tell that my child has a problem they might direct you to the wrong place, you must be kin with those you talk to and who to ask information about your child. Like me this one was sick, and I was told ooh take the child home to be washed with herbs, others say she has plastic teeth, all that so there is a doctor here in Kariobangi who just rub some medicine and she was okay, so it depends on who you listen to". KII7*

In some cases, subscribers may find that members of their immediate community may lack the same information they do. An interview with an 18-year-old mother revealed a particular example when asked about sources of information other than Totohealth:

"Friends can advise you, but you cannot trust them completely (..) Because you can be misled by friends, it's not 100% sure or reliable". KII19

This uncertainty about sources of information is prohibitive to proper MCH practice. To reiterate, the findings show that many mothers similar to Totohealth's subscribers suffer a dearth of reliable, accessible sources of information. Even if they wish to improve their understanding of pregnancy and motherhood, they are unable to do so. These findings suggest that improving access to sources of information may significantly empower young mothers to be more agent in topics intimately related to their own and child's health.

Decision-Making Barriers

Numerous factors interrupted or otherwise restricted girls' agency or independence in making decisions regarding their or their child's health. The most apparent was financial difficulty. This was also a very common issue raised in the FGDs, however, it was not necessarily the most likely to occur. When focus group participants recounted common challenges mothers faced, they focused on more specific issues that came to mind. While financial difficulties likely compound many of the other challenges identified, it is evident that mothers were more concerned with more material challenges like the poor quality of medical services. In this way, the opportunities available to the average interviewee were largely determined by their wealth. For poorer subscribers, this restriction was more severe.

Further, the young age of the mothers themselves put them in a subordinate position in decision making to that of their own mothers. Subscribers' mothers sometimes made decisions about the baby's health unilaterally, without consulting the mother. It should be noted that while this was a barrier to some, others found it helpful. Two interviewees had experienced trauma relating to their pregnancy and thus, were relieved to relinquish some responsibility to their mothers.

The fathers responsible for the pregnancies also affected the options available to a young subscriber, usually negatively. It was evident from the qualitative data that it is common for men to abandon their 'girlfriends' once they become pregnant. This jeopardised the girls greatly, generating stigma as 'single mother' and limited what choices they had. Furthermore, this burdens the mother and her family with the whole financial responsibility of child rearing, which in turn, made girls more vulnerable to the whims of her family and the adversity in her life.

Health Facility Barriers

Accessing health facilities was a major barrier to proper MCH for most of all interviewed subscribers. Issues with health facilities/services were the first and second most significant challenges young mothers faced in both unanimity and frequency.

The foremost challenge was accessing quality medical facilities. Some iteration of this issue was present in every FGD. It was thus, the single greatest barrier to MCH that mothers faced, and consistently identified as 'very likely'. FGDs explored various components of this: the cost of accessing distant hospitals, accessing hospitals at night, lack of equipment/medicine at hospitals, long queues for service.

Health facilities were often located far away from the users, and thus required long and expensive travel. For others however, roughly a third of interviewees, this did not pose any barriers to accessing health facilities. Another component was the actual cost of medical treatment. Among the poorer subscribers, this greatly restricted MCH opportunities available to them. Those who could afford private treatment were often exempt from the issues with health facilities in general, but those that could not had to attend public health facilities which were usually further from their homes.

The poor quality of some hospitals and clinics moderately discouraged some interviewees from receiving formal medical care, particularly at government institutions. Totohealth subscribers complained of long queues to even been seen by a preliminary doctor, lazy or absent staff, and insufficient medical equipment and supplies.

The second largest issue identified was beratement or other verbal abuse by medical staff. Roughly half of the informant interviews, and the majority of FGDs identified mistreatment by the medical staff as a significant deterrent to using health facilities. This was a commonly identified challenge; five of six FGDs raised this issue. However, it was more polar in how likely it was perceived to be. While one FGD of seven participants unanimously voted for it as 'very likely', other FGDs found it to be 'somewhat likely'. Regardless, abuse from medical staff was a significant challenge to the average Totohealth user.

Subscribers recounted times when medical staff would shout at them for minor errors in childcare or for not knowing something. Instead of correcting behaviour and improving MCH practices among patients, it seemed that this chastisement only discouraged some mothers from frequenting medical facilities. A critical issue with this behaviour at the hands of medical staff is that it impeded consultation and advice-seeking through formal pathways. If young mothers were not comfortable with the medical staff and worried about possible verbal abuse, they were unlikely to ask questions to their doctors. For this reason, beratement was also a primary knowledge barrier.

In this respect, and arguably not surprisingly, no FGD reported that Totohealth directly helped them with their issues with access and quality of healthcare. They did, however, explain that Totohealth gave them knowledge on

how to better take care of their children but did not explain how this interacted with the disutility of poor medical provision.

Cultural Barriers

The last category of impediments to proper MCH knowledge, attitudes and practice constitute cultural barriers. Challenges of this variety were raised in four of six FGDs with varied likelihood. On average, it was assessed to be slightly below ‘somewhat likely’. It was explained that traditional beliefs govern the homestead and they must be obeyed. Even if the mother may be against such practices, because others—husbands or relatives—believe them, so must they.

While the presence of traditional beliefs practices—only some of which are contrary to Totohealth’s messages—were present in qualitative data, it is hard to measure the degree to which they interrupted Totohealth-suggested MCH practices. FGDs spoke extensively about traditional beliefs and their role in healthcare, but while the qualitative data suggests that the public is certainly aware of traditional beliefs practices, they do not seem to determine primary MCH responses. Traditional medicine is typically reserved for cases of last resort. For all the participants in the FGDs, traditional medicines were used either when their mothers/grandmothers made unilateral decisions about the baby’s health or, out of desperation when modern medicine did not have the desired results.

Box 13: Influencing factors: barriers

- Only FGD comprised of non-subscribers (‘control groups’) raised ‘access to information’ as major barrier young mothers face, suggesting that Totohealth subscribers are less likely to experience a lack of access to information.
- Other knowledge barriers, such as a lack of guidance and conflicting information are widespread and may significantly affect girls’ ability to increase their knowledge, improve their attitudes and increase their health-seeking behaviours.
- Decision-making barriers pertaining to financial hardship, family involvement and stigmatisation negatively impact girls’ ability to engage in MCH practices.
- Health facility barriers, such as limited access to youth-friendly and quality MCH services, present a major barrier to girls seeking health-practices and influencing factor to Totohealth’s contribution to this.
- Financial concerns were responsible for the majority of decision-making barriers and health facility barriers.
- While cultural barriers to Totohealth-sanctioned MCH were present, their interaction with MCH behaviour or practice seems to be marginal.

Enhancing Factors/Alternative Explanations

As mentioned in Section 3.2, some of Totohealth’s efficacy was because it worked in conjunction with other sources of information, namely doctors and clinic staff. Not only did Totohealth corroborate information the girl’s received from health care staff, it also supplemented, professional medical care. One salient reason that subscribers with good outcome knowledge valued Totohealth was because the SMS messages helped explain complicated concepts that their doctors either passed over or gave a rushed, insufficient explanation about. Because medical facilities are commonly short-staffed, their staff may be unable to spend a long time explaining necessary MCH information to young mothers. Totohealth mitigated this issue by providing more detailed information. Furthermore, the SMS messages are physical, meaning that mothers could go back and reference a certain topic if they did not understand it the first time.

More importantly, the messages reiterated the same information doctors provided. All interviewees stated that there was ‘no difference’ between the information given doctors and from Totohealth. Presumably, receiving the same information from various sources increased compliance with proper medical advice as it increased overall exposure to correct information. For this reason, along with medical professionals, Totohealth was the most trusted source of information to those subscribed. In this sense, alternative sources of information may have enhanced trust in Totohealth and likelihood of it affecting MCH knowledge, attitudes and practices.

Furthermore, four respondents explained that their knowledge of pregnancy and MCH was learned in school. Mothers as well as radio/internet were major sources of information and advice for adolescent mothers. This

suggests that the outcome knowledge, attitudes and practices measured in the qualitative data cannot be solely attributed to Totohealth's SMS messages.

Other potential confounding factors may be present too; the experience gained by having a first child is significant, and second pregnancies are usually much more informed.

Box 14: Influencing factors: enhancing factors and alternative explanations

- Design of the prototype, including content of the Totohealth's messages allowed for a great level of trust in the service and compliance with advice. At the same time, alternative sources of information may have enhanced trust in Totohealth and likelihood of it affecting MCH knowledge, attitudes and practices.
- Access to alternative sources of information, such as school, prior experience and family, present a crucial alternative explanation, suggesting that knowledge outcomes should not be exclusively attributed to Totohealth messaging.

3.5 Conclusion: Totohealth's Contribution Story

This section presents the final, overall conclusions — Totohealth's actual contribution — to improvements in MCH outcomes for girl subscribers. It draws its conclusions after critically analysing the results presented above including: changes in MCH, well-being and confidence outcomes as well as the magnitude the influencing factors had on these outcomes.

Introduction

Totohealth's overall goal is to use mobile SMS technology to help reduce maternal and child mortality and detect developmental abnormalities in early stages of childhood. To reach this goal, Totohealth, with support from SPRING, aimed to reach the most vulnerable population — young pregnant girls — with targeted MCH information. The Totohealth SPRING prototype was developed to provide MCH information to young mothers during pregnancy and for the first two years of their child's lives. It was expected that by providing young girls with information on antenatal care, safe delivery, pregnancy, immunisation, nutrition and breastfeeding, and child health, that young mothers would experience positive changes in their MCH knowledge that would improve their attitudes and ultimately their result in greater health-seeking behaviours.

Contribution Outputs

In order for these outcomes to occur, some underlying assumptions and outputs needed to be met, including:

- Girls received the messages as planned;
- The content of the messages relevant;
- The content of the message was easy to understand; and
- Totohealth was seen to be a trusted source of information.

Findings presented in the text box below summarise the main output findings of an assessment of these as well as Totohealth's contribution to them.

Box 15: Contribution outputs

- The majority of interviewed subscribers registered after giving birth. Thus, Totohealth was unable to reach pregnant adolescent girls, as it had set out to do.
- Overall, mobile phones were an effective and preferred method of communication as identified by 21 subscribers, even taking the small number of subscriber initiated challenges into account.
- Totohealth was unanimously trusted as a source of information and provided clear, highly relevant information.
- Totohealth's messages contained the same information as that provided by professional medical staff, which improved Totohealth's credibility among its subscribers.

- Interviewees unanimously valued relevance and accuracy of Totohealth’s SMS service, measured by a willingness to subscribe for subsequent children, a willingness to pay, and a proclivity to save and share received messages.
- Despite this, Totohealth was unable to make its services fully accessible to its subscribers. Technical issues and issues pertaining to phone sharing resulted in Totohealth being unable to make its services fully accessible or anonymous to these girls and therefore less likely to reach marginalised and hard to reach girls most affected by a lack of information, as it had set out to do.

Contribution Outcomes

Next, the MCH outcomes that Totohealth was anticipated to achieve with the prototype were measured as well as Totohealth’s contribution to those through carefully assessing subscribers’ knowledge, attitudes and practices on MCH issues. The outcomes measured include:

- Girls have more awareness and knowledge on MCH issues;
- Girls have a positive attitude on MCH issues;
- Girls are more confident in making decisions about their child’s health;
- Girls are practicing positive health seeking behaviours for them and their child; and
- Girls have improved well-being and confidence.

Box 16 summarises outcome findings around primary MCH mechanisms and wellbeing and confidence, as well as Totohealth’s contribution to those outcomes.

Box 16: Contribution Outcomes

- Majority of girls began prioritising their own and child’s health after receiving messages from Totohealth.
- Overall, Totohealth substantially improved maternal and child healthcare of subscribers across all three metrics of impact: knowledge, attitudes and practice. Principally, many girls felt empowered to be better mothers after receiving SMS messages from Totohealth. Equipped with greater knowledge and awareness about their and their child’s health, girls’ self-perceptions and confidence as young parents improved. However, these outcomes varied by specific indicators.
- Girls’ knowledge was greatly expanded through their subscription to Totohealth. Those that registered with Totohealth early in their pregnancies had much better knowledge of early-stage MCH than mothers that registered after completing such stages, such as after having given birth. Put simply, knowledge was observably better on topics covered by Totohealth SMS messages.
- Furthermore, girls’ attitudes relating to MCH were also positively influenced by Totohealth subscription, however less robustly than knowledge. Almost all girls said that they are ‘better mothers’ because of what they learned from Totohealth. The findings also suggest that girls now pay more attention to healthcare and well-being in general.
- Findings suggest that Totohealth’s impact on MCH practices was significant, however more fragmented than the improvements to knowledge. Changes in MCH practice mostly focused on later stage topics, such as breastfeeding and nutrition, and child development. In both cases Totohealth had great impact in teaching mothers the appropriate methods of childcare, many of which were completely new to them.
- A main assumption of the Totohealth prototype was that providing knowledge to girls will result in behaviour change. However, Totohealth contributed most significantly to knowledge outcomes because the primary feature of Totohealth was providing information.
- Equipped with reliable information, Totohealth subscribers felt more self-confident in their daily lives and asserted their influence in decision-making relating to MCH more actively.
- It was assumed that through the results chain if a girl improved her MCH outcomes, then other areas of her life, such as wellbeing and confidence would also be positively impacted. However, Totohealth’s impact on girls’ well-being and confidence was fairly limited to areas related to MCH.

Influencing Factors

Additionally, to critically examine Totohealth's contribution to MCH outcomes among young mothers, it was necessary to understand if any potential influencing factors such as barriers to accessing MCH information and services or enhancing factors such as other programs providing the same information existed and influenced the Totohealth subscribers. We also tested the following anticipated mechanisms to measure Totohealth's contribution:

- Girl's confidence in making decisions on MCH issues is influenced by other sources of information.
- Girls do not access MCH services because they are not comfortable and have negative attitudes
- Girls do not access MCH services because of their status within the household and society.
- Girls are practicing positive health seeking behaviours for them and their child as a result of MCH offered by alternative sources of health care.
- Girls have improved well-being and confidence as a result of other knowledge and skill-building programmes.

We found significant barriers, but only a few enhancing factors and alternative explanations that may have influenced Totohealth's contribution to MCH outcomes. We also determine the extent to which these present influencing factors affecting Totohealth's contribution. The findings are summarised below.

Box 17: Influencing factors: barriers

- Findings suggest that Totohealth subscribers were less likely to experience a lack of access to information. Other knowledge barriers, such as a lack of guidance and conflicting information were widespread and may have significantly affected girls' ability to increase their knowledge, improve their attitudes and increase their health-seeking behaviours.
- Decision-making barriers pertaining to financial hardship, family involvement and stigmatisation negatively impact girls' ability to engage in MCH practices.
- Common health facility barriers, such as a limited access to youth-friendly and quality MCH services, present a major barrier to girls seeking health-practices and influencing factor to Totohealth's impact.

Influencing factors: enhancing factors and alternative explanations

- Design of the prototype, including content of the Totohealth's messages allowed for a great level of trust in the service and compliance with advice. At the same time, alternative sources of information may have enhanced trust in Totohealth and likelihood of it affecting MCH knowledge, attitudes and practices.
- Access to alternative sources of information, such as school, prior experience and family, present a crucial alternative explanation, suggesting that knowledge outcomes should not be exclusively attributed to Totohealth messaging.
- It is possible that a significant amount of confidence in MCH was gained through experiencing motherhood for the first time.

Overall contribution of Totohealth

Findings show varying degrees of impact on a girl's attitudes and proactive health-seeking behaviour, well-being and confidence, as illustrated in Table 5. For the most part Totohealth had a positive impact on a girl's health seeking behaviour; however, the extent of the outcomes may have been confounded by a number of internal and external factors. We found several barriers to girls' improving knowledge, attitudes and health-seeking practicing behaviours. The young mothers and pregnant women that comprised Totohealth's subscribers faced formidable impediments and disadvantages in knowing about, forming attitudes regarding, and practicing proper MCH. Adverse circumstances presented numerous complications for them to overcome. This was the context in which Totohealth worked to provide young mothers with direct access to medical advice and consultation.

Although most knowledge outcomes have been found to be directly attributable to Totohealth messaging, access to alternative sources of information presents a crucial alternative explanation, so that knowledge outcomes for certain topics, such as safe delivery, should not be exclusively attributed to Totohealth messaging.

Despite these barriers and possible alternative explanations, this endline study shows that Totohealth contributed significantly to girls’ MCH knowledge, mostly through providing them with relevant, comprehensible and trustworthy information and, consequently, improving their knowledge on MCH. Through design of the prototype, including content of the Totohealth’s curriculum, the prototype was able to build a great level of trust in the messaging service and consequently achieve a great level of compliance with MCH advice provided, which in turn affected Totohealth’s level of contribution.

However, Totohealth’s impact was more fragmented in attitudes and behaviours towards MCH than in MCH knowledge. A main assumption of the Totohealth prototype was that providing knowledge to girls would result in behaviour change. However, Totohealth contributed most significantly to knowledge outcomes because the primary feature of Totohealth was providing information.

With regards to well-being outcomes, it was assumed that through the results chain if a girl improved her MCH outcomes, then other areas of her life, such as personal wellbeing and confidence would also be positively impacted. However, Totohealth’s impact on girls’ own well-being and confidence was limited to areas related to MCH.

Nevertheless, for Totohealth to have its optimal impact on desired outcomes, it should aim to address many of the challenges identified by the girls. The fragmented impact on changing attitudes and behaviours suggests that increasing knowledge is not always a sufficient measure to bring about behavioural change on its own, and consequently that Totohealth’s SPRING prototype may not be the right intervention to elicit behaviour change on its own. This is consistent with behaviour change theories²⁰ and literature²¹. Paired with other interventions like training health facilities in youth-friendly services, parent and peer education, mobile health services, etc. Totohealth would presumably contribute to better MCH outcomes for the girls

Table 5: Assessment of overall impact across SPRING impact pathways²²

	Health	Health	Health	Wellbeing
Areas	Direct benefit from Totohealth through increased knowledge and awareness of MCH	Direct benefit from Totohealth through a change in attitudes on MCH issues	Direct benefit from Totohealth through a change in health seeking behaviour	Direct benefit from Totohealth through increased well-being and confidence
Expected Impact				
Actual Impact				

Contribution of SPRING

Totohealth has received a wide array of support from donors in different areas (including financial assistance, technical assistance in the areas of investor readiness and HCD), which have broadly supported both the business and the development of the prototype. As part of SPRING, Totohealth started to focus particularly on teen pregnant girls and young moms by adapting SMS content and introducing specific teen content.

Although it has gone onto working with other donors and broader target groups, it has continued to use the specific teen content developed with SPRING support for its adolescent girl subscribers. Further, the SPRING experience has equipped Totohealth with the right tools to apply HCD to all its content design, which it continues to do.

The business also reported that feedback from subscribers indicates that SMS messages are more relevant to their needs since Totohealth’s SPRING journey, with a 96% renewal rate (subscribers who renew their subscription).

In light of the findings outlined in this report, Totohealth’s contribution to MCH outcomes can be seen as directly attributable to its participation in the SPRING programme. The design of the prototype, including content of the

²⁰ See: USAID. (2015). The Behaviour Change Framework: A template for accelerating the impact of behavior change in USAID-supported MCH programs in 24 priority countries.

²¹ See: Kelly, M & Barker, M. (2016). Why is changing health-related behavior so difficult. *Public Health*.

²² Intensity of the shades of green indicate the level of impact measured, with darker shades indicating greater impact and lighter shades indicating limited impact.

Totohealth messages allowed for a great level of trust in the service and compliance with advice, which was found to be a significant enhancing factor to Totohealth's impact on MCH amongst adolescent girls.

4 Learning

This chapter outlines the overall learning experienced from implementing the SPRING Totohealth prototype. Section 4.1 presents potential program implications including prototype design, implementation and service area, while Section 4.2 outlines unintended consequences of the prototype.

Blue boxes throughout the chapter are aimed at highlighting key lessons learned.

4.1 Programme limitations and opportunities

The findings outlined in this section present important considerations for future programming, particularly with regards to similar business prototypes.

Totohealth prototype – content

Research tools for this endline report were designed in such a way that they allowed for collecting data on potential gaps and pitfalls of the intervention. Findings suggest that a number of gaps exist in the content of Totohealth messaging and a potential for better addressing the MCH needs of adolescent girls through more comprehensive messaging, including more interaction and personalisation. While keeping in mind that addressing individual needs is challenging in such interventions, as these will inherently be general without personalisation, the following suggestions were identified to fill gaps in the content of the messaging:

- Increase frequency of receiving messages.
- Extend length of service²³ - e.g. extending subscription to 5 years after birth, from the current 2 years.
- Diversify content of messaged to include family planning.
- Revisit some of the content, particularly the immunisation content. As outlined in Section 3.2, the messaging for immunisation may have been too focused on prompting girls to seek immunisation and too little on increasing knowledge and dispelling myths.

“I would love every two weeks they ask a question about the child as like women we might be busy till at times you forget other things, so I would like they put something like a reminder they send SMS all through they know how you are doing”.

Totohealth prototype – service

We also found several unaddressed needs with regards to the service Totohealth provides, on a broader level. Subscribers identified several elements to better address their MCH needs through the messaging service:

- Expand service to provide home visits for check-ups.
- Expand service to include information campaign on TTH services, particularly how to use it.
- Expand service to provide to physical locations that can be visited.
- The identified suggestions did not only include ways to expand the service through making it more interactive and personalised, but also ways to expand the service beyond its current scope. Such diversification may not be feasible for a messaging service like Totohealth, but the expressed needs do reveal potential opportunities to better address needs of adolescent mothers and some of the barriers discussed in Section 3.4, increase relevance and improve effectiveness and impact of similar interventions through more comprehensive approaches that include additional forms of MCH provision.

Box 18: Key takeaways

- A greater level of personalisation, more interaction as well as real life interaction may be needed to effectively address MCH needs of adolescent mothers.

²³ Used to be 5, limited to 2

- More comprehensive approaches may offer potential to better address MCH needs of adolescent mothers – for instance provision of additional forms of MCH through working more closely with local health care providers.

Totohealth prototype features that worked for reaching girls

- As expanded upon in Section 3.1, due to widespread use, mobile phones presented an efficient and centralised way to reach young mothers in Kenya. The design of Totohealth's SMS prototype, as a product oriented toward adolescent girls, was highly successful.
- Girls' motivation for subscribing to the service matched the intended purpose of the service: to learn about MCH to improve their childrearing preparedness and abilities. Thus, expectations from potential users were met by the service itself.
- The prototype design ensured that messages were actually received by the users, were intelligible to them, and were largely relevant to their needs.
- Additionally, because most of the girls did not pay for their subscription, but were willing to pay for future subscriptions, it is possible that exposure to Totohealth's content before purchasing is necessary for the girls to gain confidence and trust in Totohealth's services. This is important for sustainability of Totohealth as a business.
- Other features that worked for reaching girls and are crucial findings with regards to sustainability, are referrals from satisfied customers, with girls sharing the information and its usefulness with friends and family; representatives at hospitals, where girls were introduced to Totohealth.
- Mothers that received Totohealth messages from the beginning seem to be much more likely to exhibit health-seeking behaviour throughout their pregnancies, suggesting that adequate exposure to the content of the SMS messages is required to bring about a change in health seeing practice.

Totohealth prototype features that did not work for reaching girls

- While the main assumption of the prototype was that providing knowledge to girls will result in behaviour change, Totohealth's limited impact on MCH practices was more fragmented than the improvements to knowledge, suggesting a flaw in the theory behind the prototype.
- Although mobile phones were an efficient way to reach adolescent girls, the use of mobile phones as a platform inherently comes with technical issues as well as access issues. New or lost phone numbers and a lack of access to individual mobile phones limited potential reach of the prototype.
- Visibility of Totohealth's service was low, with women also reporting that people simply did not know of Totohealth and suggested that they raise their visibility through ads and radio.
- Findings suggest that adequate exposure to the content of the SMS messages is required to bring about a change in health seeing practice. More efforts should have been put at recruiting girls while they were pregnant. There was no targeted promotion or marketing of Totohealth to adolescents girls.

Box 19: Key takeaways

- The assumption that an increase in knowledge will necessarily lead to a change in behaviour is flawed and should be revisited. Achieving behavioural change in this regard may be beyond the reach of a business like Totohealth, but more comprehensive approaches may offer potential to do so – for instance provision of additional forms of MCH through working more closely with local health care providers.
- Using mobile phones as a platform presents an efficient way to reach young mothers as well as but does come with several pitfalls that may limited potential reach.
- Although some improvements could be made to make the messaging content more relevant to girls' needs, the current content is relevant enough to reach adolescent girls and meet their expectations.
- Significant improvements can be made with regards to marketing or promotion of the service.

- Totohealth may benefit from exploring the introduction of fee rates only after exposure to the content.
- More efforts in recruiting girls in early stages of their pregnancy to ensure adequate exposure and greater impact on health-seeking behaviours.

4.2 Unintended Consequences

This section presents some potential unintended consequences of Totohealth. It specifically looks at outcomes experienced by the girl subscribers outside of the prototype's intended impact.

Our findings suggest the intervention resulted in two main unintended consequences, both positive. One unintended consequence is related to well-being, however not related to maternity and child healthcare. Although this does fall into SPRING's definition of well-being, it is important to highlight the in which ways Totohealth improved girls' lives completely beyond the purview of their service. A number of girls reported that they found it easier to balance employment and their responsibilities at home due to Totohealth's suggestions, or that it improved their credibility in the eyes of their husbands.

Another identified unintended consequence is the widespread distribution sharing Totohealth messages with others. Frequently, girls saved Totohealth's messages with the purpose of sharing them with friends and family, which would presumably not be desirable for Totohealth's business model. A majority of interviewed mothers saved the messages for future reference or shared the messages with friends. That subscribed mothers shared the messages with family and friends suggests that Totohealth's information reached beyond its total subscription audience.

This additional, unintended impact is unmeasured by the business metrics. In its own right, improved healthcare has a substantial multiplier effect. This means that when one person practices better MCH, this decreases the overall risk to the population as a whole. For example, when a child is vaccinated, it not only helps that specific child but reduces the risk of transmission to unvaccinated babies in the community. If Totohealth was able to generate this positive chain-reaction, the total reach and impact of Totohealth's services on MCH extends beyond the subscribers themselves.

Annexes