



Vodacom's Mum & Baby service in South Africa

**A socio-economic
impact assessment**

February 2019

Document classification: KPMG Public

kpmg.com/uk



Important notice

This report has been prepared by KPMG LLP ("KPMG") solely for Vodafone Procurement Company S.a.r.l ("Vodafone" or "Addressee") in accordance with the terms of engagement agreed between Vodafone and KPMG.

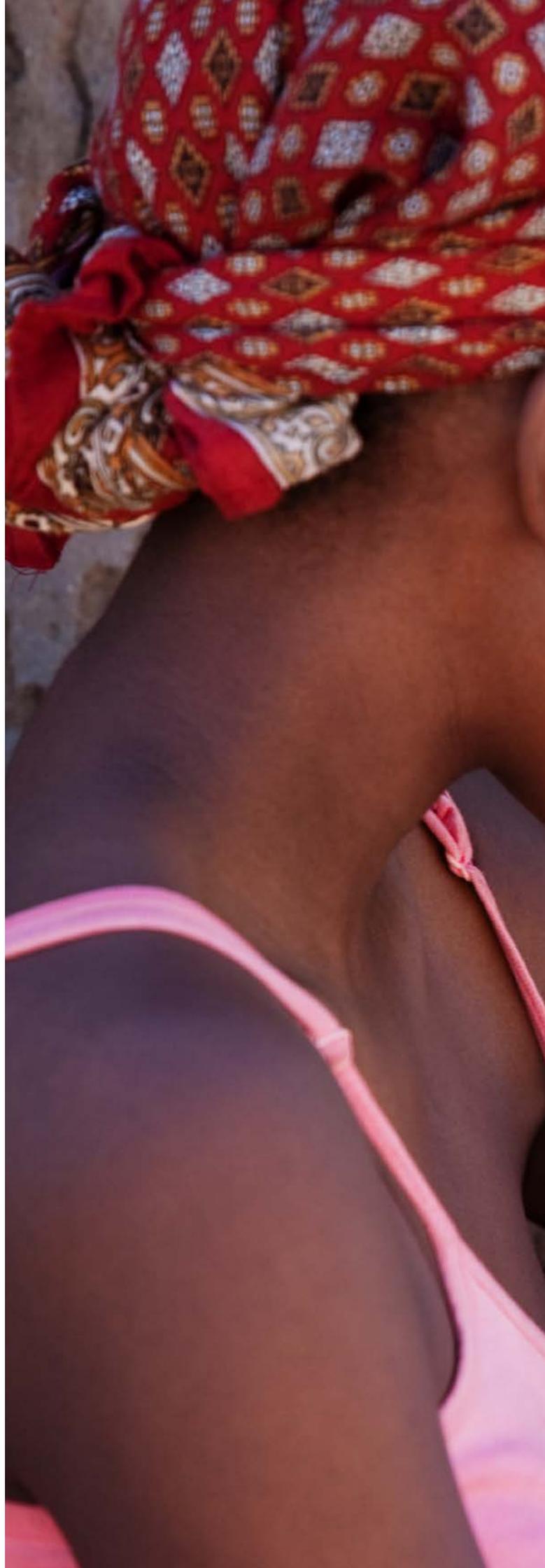
KPMG's work for the Addressee was performed to meet specific terms of reference agreed between the Addressee and KPMG and that there were particular features determined for the purposes of the engagement.

The report should not be regarded as suitable to be used or relied on by any other person or any other purpose. The report is issued to all parties on the basis that it is for information only. This report is not suitable to be relied on by any party wishing to acquire rights against KPMG (other than Vodafone) for any purpose or in any context. Any party other than Vodafone that obtains access to this report or a copy and chooses to rely on this report (or any part of it) does so at its own risk. To the fullest extent permitted by law, KPMG does not accept or assume any responsibility to any readers other than Vodafone in respect of its work for Vodafone, this report, or any judgements, conclusions, opinions, findings or recommendations that KPMG may have formed or made.

KPMG does not assume any responsibility and will not accept any liability in respect of this report to any party other than Vodafone.

KPMG does not provide any assurance on the appropriateness or accuracy of sources of information relied upon and KPMG does not accept any responsibility for the underlying data used in this report.

The opinions and conclusions expressed in this report are those of KPMG and do not necessarily align with those of Vodafone.





Contents

Executive summary	3
1. About the study	9
2. The Mum and Baby service	12
3. Methodology and research approach	19
4. Our assessment of the socio-economic impacts of the Mum & Baby service	23
5. Concluding remarks	47
6. Appendix	49

Executive summary

About the study

Vodafone has set a goal to connect an additional 50 million women living in emerging markets to mobile by 2025⁽¹⁾ and to “use [its] mobile technologies to enhance the quality of women’s lives through programmes that enable financial inclusion, improve health and wellbeing and build education, skills and entrepreneurship”⁽²⁾. To support the achievement of this, in partnership with Vodafone’s South Africa-based subsidiary, Vodacom Group (“Vodacom”), the Mum & Baby service was launched in March 2017. This is a free-of-charge mobile health (“mHealth”) intervention that provides subscribers to the service with maternal, neonatal and child health and wellbeing information.

Having been in place for over a year, Vodafone and Vodacom wanted to understand the extent to which the Mum & Baby service is contributing towards its Women’s Empowerment goal and the outcomes and impacts, both social and economic, that it is generating. Therefore, KPMG was appointed to conduct an independent study to assess the service’s socio-economic contribution, focussing on:

- the content that is available to all registered subscribers, rather than the premium service that was launched in January 2018;
- the geographic scope of South Africa (i.e. to the extent to which any outcomes/impacts are generated outside of the country they would not be assessed); and
- the outcomes and impacts generated since the launch of the service, including an assessment, where evidence permits, of any impacts that may be generated but are not fully observable at present.

Note: (1) Vodafone Group Plc. 2018, Sustainable Business Report, <https://www.vodafone.com/content/index/about/sustainability/womens-empowerment/index.html>

(2) Vodafone Group Plc. 2018, Sustainable Business Report, <https://www.vodafone.com/content/index/about/sustainability/womens-empowerment/index.html>





To assess the socio-economic contribution of the service, we collected evidence from a range of sources, including conducting primary evidence gathering. Specifically, we:

- conducted a computer assisted telephone interviewing (“CATI”) survey of Mum & Baby subscribers. We achieved a sample of 1,139 responses drawn from the mother, pregnant women and partner subscriber types, and distributed geographically across the provinces of South Africa, and age groups of subscribers, broadly in line with the overall subscriber population.
- facilitated six semi-structured focus groups⁽³⁾ with subscribers - for mothers and pregnant women in the provinces of Gauteng, Mpumalanga and Western Cape and for partners in KwaZulu-Natal and Limpopo.
- undertook a systematic literature review and wider data/information gathering to identify the existing literature relevant to Vodacom’s Mum & Baby service. This included studies of other similar mHealth interventions and wider evidence relating to the potential outcomes and impacts the service may generate.
- collaborated with Vodafone, Vodacom and their delivery partners for the Mum & Baby service (MobiStar and Mondia Media) to obtain data relating to the subscriber base, their characteristics and usage, and to gain an understanding of the content available and the selection approach.

Full details of our approach are outlined in section 3 of the report. It is based on good practice impact assessment and evaluation principles developed by organisations including the Organisation for Economic Co-operation and Development (“OECD”)⁽⁴⁾ and the UK Government⁽⁵⁾ and the Social Return on Investment (“SROI”) guidance provided by Social Value UK⁽⁶⁾.

The Mum & Baby subscriber base

As at 31 August 2018, the Mum & Baby service had 1.2 million registered subscribers⁽⁷⁾.

Based on the information provided to Vodacom when subscribers registered to access Mum & Baby, our analysis suggests that the subscriber base had the following key characteristics:

- **Geographic residence:** 81% of the subscriber population reside in Gauteng, Kwa-Zulu Natal, Limpopo and Mpumalanga. This is similar to the overall geographic dispersion of the South African population, as reported in the 2011 Census of South Africa⁽⁸⁾ which also indicates that the majority of the population resides in the provinces of Gauteng and KwaZulu-Natal.
- **Subscriber type:** 30% of subscribers registered as pregnant women, 27% registered as mothers, and 24% registered as partners (i.e. husbands or boyfriends).
- **Language medium:** 66% of the subscriber population registered to receive the content in English, while Zulu is the second most frequent language used for 22% of the subscriber population.
- **Age group:** 55% of the subscriber population registered as being between the ages of 18 and 24 years.
- **Mobile payment type:** 99% of registered users are Vodacom prepaid subscribers.
- **Registration channel:** 95% registered through prompts on their mobile phones rather than through the mobile optimised website (“mobsite”).

Note: (3) Details on the focus group selection process is found in Appendix 1.

(4) OECD 2010, DAC Guidelines and Reference Series: Quality Standards for Development Evaluation, <http://www.oecd.org/derec/guidelines.html>

(5) HM Treasury 2018, The Green Book: Central Government guidance on appraisal and evaluation, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf

(6) Social value UK 2012, A guide to social return on investment, <http://www.socialvalueuk.org/resources/sroi-guide/>

(7) Mondia Media registration data received on 7 September 2018.

(8) Statistics South Africa 2011, Census 2011, <https://www.statssa.gov.za/publications/P03014/P030142011.pdf>

Our assessment of the socio-economic impacts of the Mum & Baby service

Our findings in terms of the socio-economic contribution of the Mum & Baby service are predominantly based on the primary evidence gathered through the telephone survey and semi-structured focus groups conducted as part of the study. The findings of the survey are based on a sample size that is of sufficient size to be statistically significant and representative⁽⁹⁾ at a national level, across all subscribers, as well as for some specific subscriber types (e.g. mothers, partners, pregnant women)⁽¹⁰⁾. However, only more limited insights can be drawn when considering more granular subsections of the overall subscriber population (e.g. mothers in Western Cape) due to fewer respondents. It should also be noted that the selection of focus group participants was not designed to be statistically representative of all Mum & Baby subscribers across South Africa (or in the individual provinces) given constraints on the number of participants that could be contacted and interviewed within Vodafone's available budget and timeframe for the project.

Our findings are supplemented by evidence gathered through a systematic literature review. This was used to test our findings, provide more detailed insights, for example in relation to whether the outcomes observed for Mum & Baby subscribers could be attributed to Vodacom, and to provide evidence of the wider, longer-term impacts associated with health related outcomes.

The detailed findings of our study are set out in section 4 of the report and the key messages are summarised below.

Changes to access to reliable health information

Access to reliable health information plays an important role in improving maternal and child health as quality health information can provide women and partners with information relating to lifestyle risks and health advice throughout pregnancy stages and early years⁽¹¹⁾.

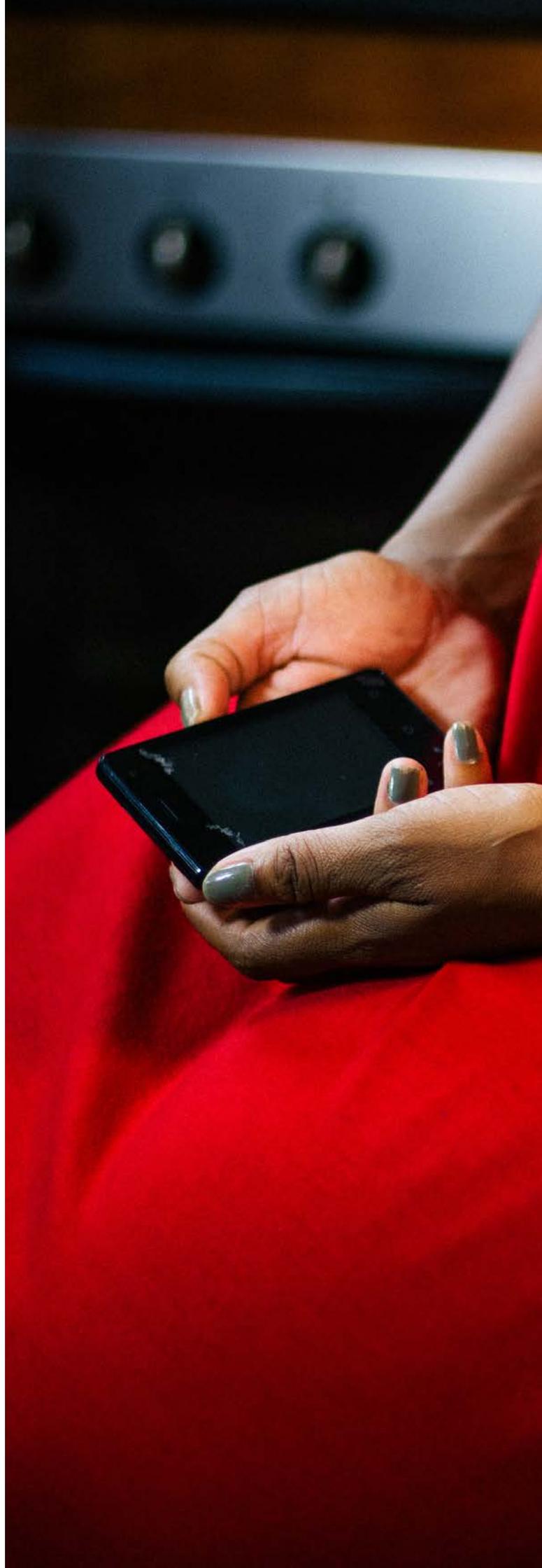
Through providing a wide range of health and wellbeing related content, tailored for subscriber types (e.g. pregnant women, mothers, partners, caregivers) and to the stage of gestation or the age of the child of the subscriber, our study found that Vodacom provided information (predominantly in SMS message form) that was considered useful by subscribers and allowed them to learn new information:

- Almost all survey respondents (over 95%) reported that they found the SMS messages received useful or very useful for learning new information about their and their child/children's health and wellbeing.
- The majority of participants within each focus group indicated that they had learned new information from the Mum & Baby service, with the exception of the focus group conducted in Western Cape where fewer participants agreed (see section 4.2.2. for more details regarding the divergence in views of Western Cape focus group participants).

Note: (9) At a 5% confidence level with a 5% margin of error.

(10) Responses from mothers, pregnant women and partners were considered statistically significant and representative of their respective subscriber type at confidence intervals of 95%, 90% and 88%, respectively.

(11) Africa Progress Panel 2010, Maternal Health: Investing in the Lifeline of Healthy Societies & Economies, http://www.who.int/pmnch/topics/maternal/app_maternal_health_english.pdf



Of survey respondents



found the SMS messages useful or very useful for learning new health information.

Of survey respondents



agreed or strongly agreed to have taken actions to improve their child's health.

Many survey respondents and focus group participants indicated that while they generally obtained health information from a wide range of sources, such as from health centres or clinics. However, if they did not get information through Vodacom's Mum & Baby service it would be difficult to get similar information from a single source. 68% of all survey respondents reported that it would be difficult or very difficult.

It should be noted that based on the survey responses and the usage data provided by Vodacom, use of the health information provided through Mum & Baby was generally limited to the SMS messages sent to subscribers. Data suggests that fewer than 5% of all subscribers accessed the mobisite that contains more detailed articles, tutorials and a range of tools, such as a medicine checker and immunisation calendar. The low levels of use of the mobisite are likely to constrain the overall socio-economic contributions of the service.

Outcomes and impacts associated with the use of the Mum & Baby service information

In order to realise the socio-economic outcomes and impacts associated with use of the health-related information, subscribers must use it and change their actions as a result. While attributing changes in behaviour to Vodacom specifically and ascertaining the service's level of influence is more difficult, we found that:

- Almost all respondents to the survey (98%) agreed or strongly agreed that they had taken actions to improve their child's health as a result of the information provided through the Mum & Baby service. Pregnant women were marginally more likely to strongly agree with the statement.
- Almost all pregnant women and mothers surveyed (98%) also agreed or strongly agreed that they had taken actions to improve their own health as a result of the information provided through the Mum & Baby service.
- Focus group participants indicated that the information provided through the service had been used to improve their own health or the health of their children less frequently. However, some examples were given by individuals, such as learning that smoking and drinking through pregnancy is harmful and learning about the importance of a healthy diet through pregnancy.

In the study, we sought to understand how the Mum & Baby service had influenced decisions related to specific areas of maternal and baby health, including breastfeeding and vaccination rates. This was based on the self-reported actions of the survey and focus group participants. We found that:

- Almost all (95%) mother and pregnant women survey respondents indicated that they agreed or strongly agreed that the information provided through the Mum & Baby service had influenced their decision to breastfeed their child. The remaining 5% of respondents to this question, did not support the view that it had influenced their decision (either disagreeing, disagreeing strongly or neither agreeing or disagreeing).
- A smaller proportion of focus group participants indicated that they had used the breastfeeding information (approximately half)⁽¹²⁾ and across the focus groups a small number of participants indicated that the information received had resulted in them breastfeeding for longer than 6 months.
- Approximately 62% of respondents agreed, and a further 34% of respondents strongly agreed, that the information received through the Mum & Baby service had influenced their decision to vaccinate their child. If this is representative of all Mum & Baby subscribers it would suggest that the service may have influenced the vaccination decisions for their children of approximately 650,000 individuals⁽¹³⁾ in South Africa.
- Findings from the focus groups suggested that while, in general, participants had used the immunisation related information and had learned new information through it, the majority of participants suggested that they would have taken their child for vaccinations in any case (i.e. having their children vaccinated could not be attributed to Vodacom's Mum & Baby service).
- Very high proportions of mother and pregnant women survey respondents reported that they agreed or strongly agreed that the information from the Mum & Baby service influenced their decision to visit a health centre for check-ups (97%).
- In general, focus group participants indicated that they had used the Mum & Baby service information about hospital check-ups and they served as a useful reminder. However, some focus group participants indicated that they already knew about visiting the hospital for check-ups without the information provided by Vodacom.

Of survey respondents



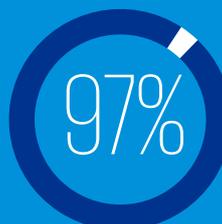
agreed or strongly agreed that the information received had influenced their decision to breastfeed their child

Of survey respondents



agreed or strongly agreed that the information received had influenced their decision to vaccinate their child.

Of survey respondents



agreed or strongly agreed that the information received had influenced their decision to attend a health centre for check-ups

Note: (12) We note that this may have been due to some of the participants having subscribed to the scheme when they had children past breastfeeding age.

(13) The value was calculated by multiplying the number of subscribers (1,235,637) with the percent of survey participants that agreed or strongly agreed (96%) when asked if the Mum & Baby scheme impacted their decision to vaccinate their child and the percent of survey participants that received and read the SMS messages at least a few times a week or more (55%). $1,235,637 * 96% * 55% = 652,416$ subscribers.

While some of the focus group findings suggest that subscribers may have breastfed their child, had the required vaccinations, and attended health centres for check-ups irrespective of whether the associated information was provided by Vodacom, the findings from the more wide-reaching telephone survey indicate that the information did have some influence on subscribers' behaviour. However, the extent of this influence cannot be inferred from our research.

Evidence from other studies of mHealth interventions⁽¹⁴⁾ also indicates that, when compared to control groups of individuals without access to the mHealth interventions, individuals being provided such information did exhibit improved attendance at health centre check-ups, increased infant feeding and increased medication adherence.

As part of our literature review we found evidence⁽¹⁵⁾ relating to potential improvements in overall health outcomes that could be attributed to rates of breastfeeding, immunisation and attendance at required health check-ups. Research⁽¹⁶⁾ highlights the role that each of these play in improving health outcomes for children, and in some cases their mothers, as well as the wider socio-economic effects⁽¹⁷⁾ arising from this. Such impacts include: extended life expectancy; enabling people to spend more time on productive activities⁽¹⁸⁾; increased family disposable income given a reduction in health costs (from lack of illnesses)⁽¹⁹⁾; and increased child attendance at school⁽²⁰⁾. There is also some evidence of a possible causal effect of maternal and child health outcomes on GDP⁽²¹⁾, economic stability and productivity⁽²²⁾. To the extent to which using the Mum & Baby service influenced subscribers' propensity to breastfeed their child, get the required vaccinations and visit health centres for check-ups, Vodacom likely would have played a role in generating some of these socio-economic impacts.



- Note: (14) WHO 2011, mHealth – New horizons for health through mobile technologies, <http://www.who.int/>
 Cheng et al 2008, Anxiety levels in women undergoing prenatal maternal serum screening for Down Syndrome: the effect of a fast reporting system by mobile phone short-message service
 Feroz et al 2017, Role of mHealth applications for improving antenatal and postnatal care in low and middle income countries: a systematic review
 Flax et al 2014, Integrating group counselling, cell phone messaging, and participant-generated songs and dramas into a microcredit program increases Nigerian women's adherence to international breastfeeding recommendations
 Jiang et al 2014, Effect of short message service on infant feeding practice: findings from a community-based study in Shanghai, China
 Khorshid et al 2017, The effect of SMS messaging on the compliance with iron supplementation among pregnant women in Iran: A randomized controlled trial
- (15) National Department of Health, Breastfeeding: investing in our children's future is everyone's business, <http://www.health.gov.za/index.php/niv-aids-tb-and-maternal-and-child-health/category/163-women-s-maternal-and-reproductivehealth?download=1200:fact-sheet-breastfeeding-investing-in-our-childrens-future>
 UNICEF 2015, See: https://www.unicef.org/nutrition/index_24824.html
 A. M. Kazi 2017, The role of mobile phone-based interventions to improve routine childhood immunisation coverage, [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(17\)30088-8/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(17)30088-8/fulltext)
- WHO 1999, Reduction of maternal mortality: a joint WHO/UNFPA/UNICEF/World Bank statement, <http://www.who.int/reproductivehealth/publications/monitoring/9789241561952/en/>
- (16) GAVI 2014, Economic benefits of vaccines, <https://www.gavi.org/library/audio-visual/presentations/economic-benefits-of-vaccines/>
- (17) Amiri A., Gerdtham, U. 2013, Impact of Maternal and Child Health on Economic Growth: New Evidence Based on Granger Causality and DEA Analysis, http://www.who.int/pmnch/topics/part_publications/201303_Econ_benefits_econometric_study.pdf
- (18) WHO, UNICEF, World Bank 2009, State of the world's vaccines and immunization, https://www.unicef.org/immunization/files/SOWVI_full_report_english_LR1.pdf
- (19) South African Medical Journal 2008, Accounting for the full benefits of childhood vaccination in South Africa, http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S0256-95742008001100011
- (20) GAVI 2014, Economic benefits of vaccines, <https://www.gavi.org/library/audio-visual/presentations/economic-benefits-of-vaccines/>
- (21) Amiri A., Gerdtham, U. 2013, Impact of Maternal and Child Health on Economic Growth: New Evidence Based on Granger Causality and DEA Analysis, http://www.who.int/pmnch/topics/part_publications/201303_Econ_benefits_econometric_study.pdf
- (22) GAVI 2014, Economic benefits of vaccines, <https://www.gavi.org/library/audio-visual/presentations/economic-benefits-of-vaccines/>

01 About the study

Section highlights:

- KPMG was appointed to conduct an independent study to assess the socio-economic contribution of the Mum & Baby service provided in South Africa by Vodafone, in partnership with its South Africa based subsidiary Vodacom.
- Launched in 2017, this is a free-of-charge mobile health intervention that provides subscribers to the service with maternal, neonatal and child health information, through weekly SMS messages and a mobile optimised website.
- Our study focuses on the outcomes and impacts of the Mum & Baby service for parents and their babies/children and considers the consequent impacts for the wider South African economy.



1.1 Vodafone's Connected Women goal and the Vodacom Mum & Baby service

Vodacom recognises the important role that communications technology can play in supporting the growth and prosperity of individuals, communities, businesses and economies.⁽²³⁾ In particular, in low- and middle-income markets, where evidence shows that a significant gender gap in terms of mobile ownership and use still exists,⁽²⁴⁾ Vodafone has indicated that it aims to address this disparity.⁽²⁵⁾

As one of its three global transformation goals, Vodafone has set a Women's Empowerment goal to connect an additional 50 million women living in emerging markets to mobile by 2025.⁽²⁶⁾ It has stated an intent to "use [its] mobile technologies to enhance the quality of women's lives through programmes that enable financial inclusion, improve health and wellbeing and build education, skills and entrepreneurship."⁽²⁷⁾

To contribute toward the achievement of this goal, Vodafone, in partnership with its South Africa-based subsidiary, Vodacom Group ("Vodacom"), launched the Mum & Baby service in 2017. This is a free-of-charge mobile health ("mHealth") intervention that provides subscribers to the service with maternal, neonatal and child health information. The information is disseminated, in a language of each subscriber's selection, through weekly SMS messages. Additional health-related content, such as articles, videos and tutorials, is available through a mobile optimised website ("mobsite").

As at 31 August 2018, the service had 1.2 million registered subscribers.⁽²⁸⁾ The service, and the content provided to subscribers, was developed to address specific issues around maternal, neo-natal and child health in South Africa, as identified by organisations including UNICEF⁽²⁹⁾ and the African Progress Panel⁽³⁰⁾.

Approximately 45 million South Africans (82% of population) depend on public healthcare from government funded systems.⁽³¹⁾ According to UNICEF South Africa, "every year 4,300 mothers die due to complications of pregnancy and childbirth, 20,000 babies are stillborn and another 23,000 die in their first month of life".⁽³²⁾

Although many health services are offered free-of-charge, including government health services for children under the age of five, and for pregnant and breastfeeding women⁽³³⁾, some studies have found that the burden of travelling to a local clinic (both in terms of financial and time costs) can pose a significant impediment for vulnerable populations.⁽³⁴⁾ Furthermore, there are identified systemic access barriers to comprehensive maternal and neonatal healthcare, such as insufficient healthcare clinics, scarce medical staff, limited health information and insufficient communication between health service providers and patients.⁽³⁵⁾

Through the free provision of targeted health content to parents and caregivers on the different stages of pregnancy, neo-natal and child care, Vodafone and Vodacom have stated an intent to improve the health and wellbeing of mothers and their children, specifically targeting content at individuals on low incomes.⁽³⁶⁾

Further details of the Mum & Baby service and its content are included in section 2.

1.2 Understanding the impact of the Mum & Baby service

1.2.1 Scope of the study

A number of studies⁽³⁷⁾ have been conducted to assess the outcomes and impacts of mHealth interventions similar to the Mum & Baby service that are in place in South Africa, including Cell-Life's MAMA SMS⁽³⁸⁾ and South African National Department of Health's ("NDoH") MomConnect⁽³⁹⁾, as well as schemes in place in other parts of the world, such as Grameenphone's M4H⁽⁴⁰⁾ in Bangladesh.

Now that the Mum & Baby service has been in place for over a year, Vodafone and Vodacom wanted to understand the extent to which it is contributing toward its Women's Empowerment goal and the outcomes and impacts, both social and economic, that it is generating. Therefore, KPMG was appointed to conduct an independent study to assess the socio-economic contribution of the Mum & Baby service in South Africa, focussing on the outcomes and impacts for parents and their babies/ children and considering the consequent impacts for the wider economy.

The agreed focus of the assessment of the Mum & Baby service was limited to:

- the content that is available to all registered subscribers, rather than the premium service that was launched in January 2018;
- the geographic scope of South Africa (i.e. to the extent to which any outcomes/impacts are generated outside of the country they would not be assessed); and
- the outcomes and impacts generated since the launch of the service, including an assessment, where evidence permits, of any future impacts (such as longer term health impacts) that may be generated but are not fully observable at present.

Details of our approach are outlined in section 3. It is based on good practice impact assessment and evaluation principles developed by organisations including the Organisation for Economic Co-operation and Development (“OECD”)⁽⁴¹⁾ and the UK Government⁽⁴²⁾ and the Social Return on Investment (“SROI”) guidance provided by Social Value UK⁽⁴³⁾.

1.2.2 Sources of information

Our analysis is primarily based on data from Vodacom’s internal systems (including aggregated, anonymised subscriber information and content usage data) and data collected through fieldwork. This fieldwork included semi-structured focus groups, a telephone survey of Mum & Baby subscribers, and interviews with organisations that are involved in the delivery of the service with Vodacom. We also drew on evidence captured through a systematic review of relevant academic literature and studies. Additionally, we sourced data and information from a number of external public sources. This includes official statistics published by the World Health Organisation (“WHO”) and Statistics South Africa (“Stats SA”).

1.3 The structure of this report

The structure of the remainder of this report is as follows:

- Section 2 provides background information on the Mum & Baby service, including details of the delivery partners, approach to content development and the content dissemination approach. It also details usage-related information and descriptive statistics on Mum & Baby subscribers.
- Section 3 describes the research approach adopted for the study, including the evidence gathering approach. Further details are included in Appendix 1.
- Section 4 provides the “logic model” that outlines the potential routes to impact associated with Mum & Baby service and identifies the inputs, activities, outputs and potential outcomes and impacts associated with the service. It also includes our findings in relation to the socio-economic outcomes and impacts of the Mum & Baby service in South Africa, with the supporting evidence gathered through our study.
- Section 5 provides our concluding remarks.

02 The Mum and Baby service

Section highlights:

- As at 31 August 2018, the Mum & Baby service had 1.2 million subscribers, of whom:
 - 81% reside in the provinces of Gauteng, Kwa-Zulu Natal, Limpopo and Mpumalanga;
 - 30% are registered as pregnant women, 27% as mothers, and 24% as partners (i.e. husbands or boyfriends); and
 - 66% receive/view the content in English.
- The Mum & Baby service's content is developed in partnership with MobiStar. It is disseminated, free-of-charge to registered subscribers with Vodacom SIM cards, through SMS messages and the mobile optimised website. Premium content is also available free-of-charge to Vodacom Siyakha programme subscribers.
- The content is driven by global best practices and standards for maternal, neonatal and child care as developed by medical professionals and health organisations such as the World Health Organisation and South Africa's National Department of Health. It is also designed to align to the United Nations Sustainable Development Goals.



2.1 Overview of the service

In January 2017, Vodacom launched the Siyakha programme (“Siyakha”) for its prepaid customers. This provides free access to internet websites and content on topics such as education, jobs, health and social connectivity. The information and tools provided through Siyakha are available free-of-charge (i.e. does not consume airtime/data) and only requires connecting to the Vodacom network through a Vodacom SIM card. According to Vodacom⁽⁴⁴⁾, the Siyakha programme is designed for low-income customers in South Africa.

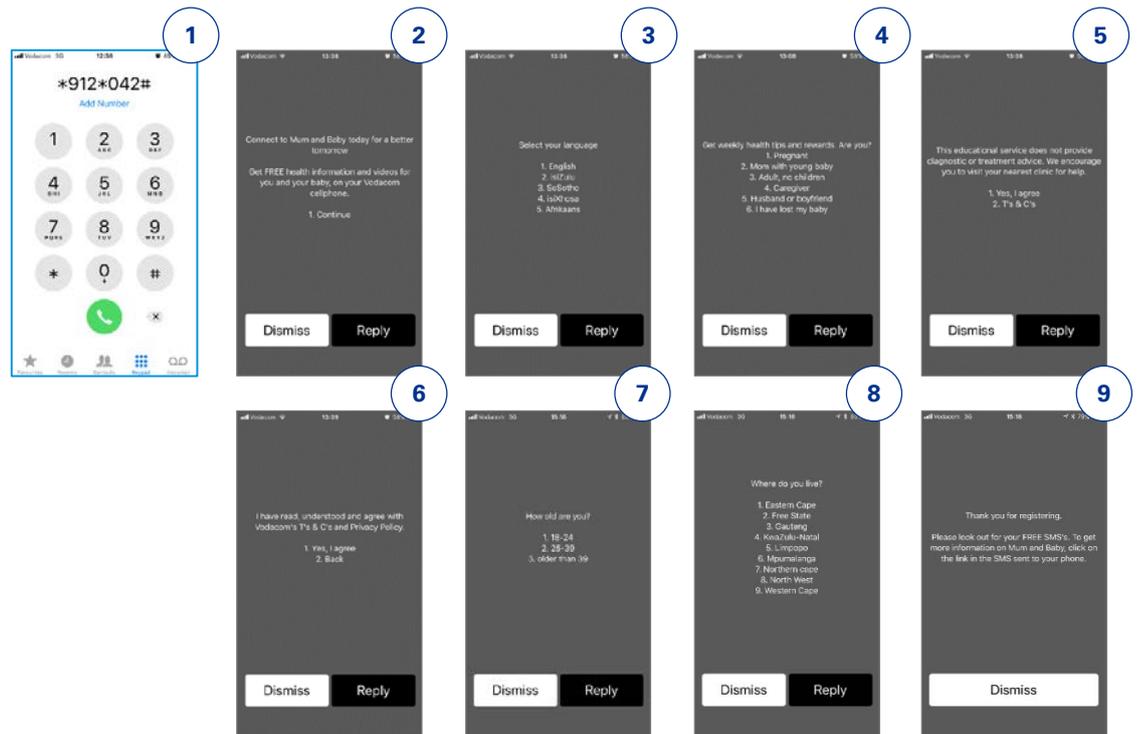
As part of the Siyakha offering, the Mum & Baby service was launched by Vodacom in March 2017 with its technology partner Mondia Media and the mobile content supplier MobiStar. It is an mHealth intervention that provides subscribers with stage-based information and advice on pregnancy, neonatal and child care in the form of educational articles, tutorials, videos and tools (e.g. a due date calculator that estimates the birth date of a child based on subscriber provided input).

Although a subset of the overarching Siyakha programme, the Mum & Baby service is free to every Vodacom SIM⁽⁴⁵⁾ card holder, even if they are not registered on Siyakha. A premium Mum & Baby service, with additional content, was launched in January 2018, and is provided free-of-charge only to those individuals registered in the Siyakha programme.

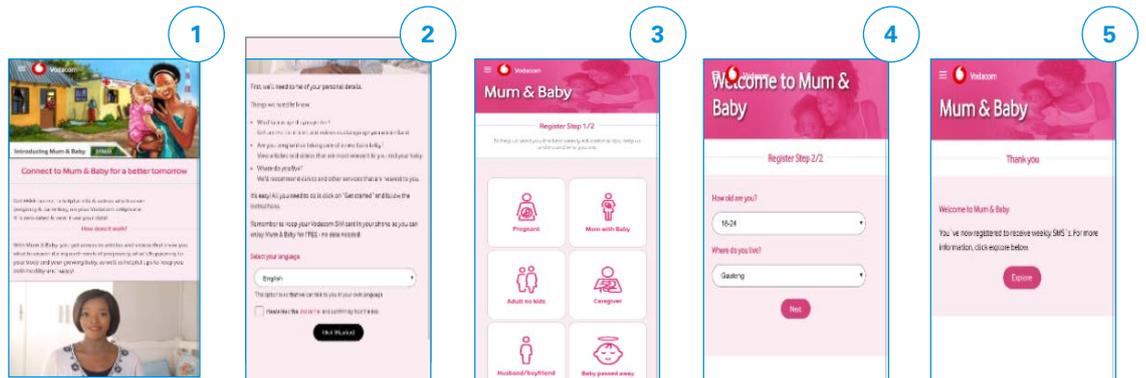
The Mum & Baby service is a profile-based tool, which means that when subscribers register they are prompted to select the characteristics that best represent them. Registration for the Mum & Baby service is available through unstructured supplementary service data (USSD⁽⁴⁶⁾) or the Mum & Baby mobisite. Both registration platforms are free, require the same subscriber information, and make available the same health content. In the registration process (see Figure 1), subscribers select their subscriber type (e.g. mother), age, geographic residence and language. The content is available in five languages⁽⁴⁷⁾, with plans to include an additional three in the future.⁽⁴⁸⁾

Figure 1: The Mum & Baby service’s registration process through USSD & mobisite⁽⁴⁹⁾

USSD registration steps



Mobisite registration



Source: Vodacom

The information provided during the registration process is used by Vodacom to provide Mum & Baby service subscribers with health content relevant to their individual characteristics. Upon successful registration, the Mum & Baby service will send three SMS messages per week generally related to the particular life stage (e.g. 8-weeks pregnant) of the subscriber’s child or the topics subscribers have selected they are most interested in.

The information disseminated through SMS messages to subscribers differs in content and length according to the following subscriber types:

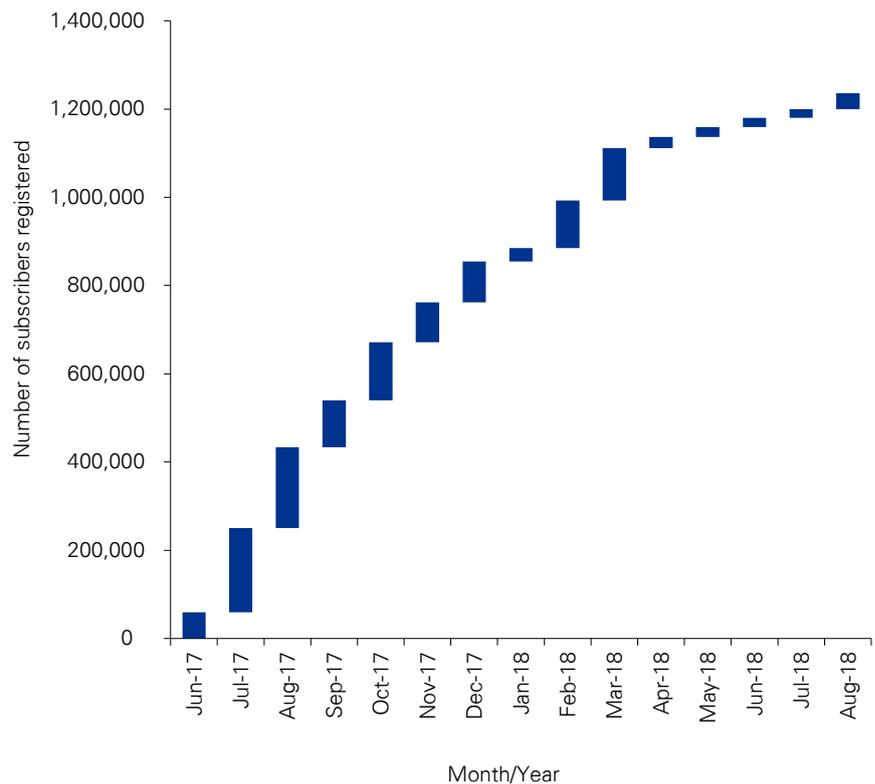
- **mothers:** the length of the programme is a maximum of five years and is based on the early childhood development milestones, from infant to 5-years old;
- **pregnant women:** the length of the programme is from 1 to 9 months according to when the subscriber has registered, given that the content is relevant and specific to the particular stage of pregnancy⁽⁵⁰⁾;
- **partners:** the length of the programme is a maximum of 12 months and includes content specific to the pregnancy stage of their pregnant partner (if pregnant) and general caring content of pregnant partner and newborn care;
- **caregivers:** the length of the programme is similar in length and content to that for mothers, but tailored to reflect a caregivers role; and
- **adults:** the content provides general health information (e.g. relating to high blood pressure).

In addition to the thrice weekly SMS messages, free health information is delivered to Mum & Baby subscribers in various forms, such as articles, videos and tutorials. Moreover, a range of tools is available on the mobisite, including tools that remind subscribers of the next appointment for their child’s vaccination (immunisation calendar), or provide an estimated date for when the baby is due (due date calculator). Through the platform, the subscribers can choose to access information on a range of health topics, including nutrition and diabetes. Further description of the content offered by the Mum & Baby service by channel is found in section 2.3, and additional discussion of the mobisite content and related usage is included in section 2.4.

2.2 Profile of Mum & Baby subscribers

As detailed in Figure 2, as of the 31 August 2018, the number of registered subscribers has increased to 1.2 million individuals.⁽⁵¹⁾

Figure 2: The registered subscribers of Mum & Baby service by month (June 2017-August 2018)

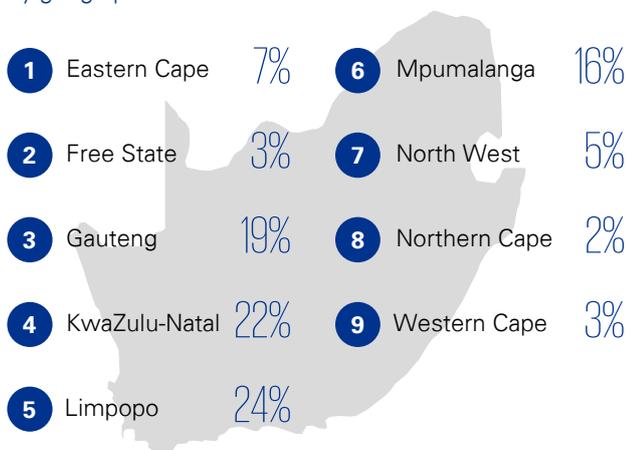


Source: Registration data provided by Mondia Media.

Figure 3 to Figure 6 show the Mum & Baby subscriber population by registration characteristics. Key characteristics and an overview of the subscriber base for each, include:

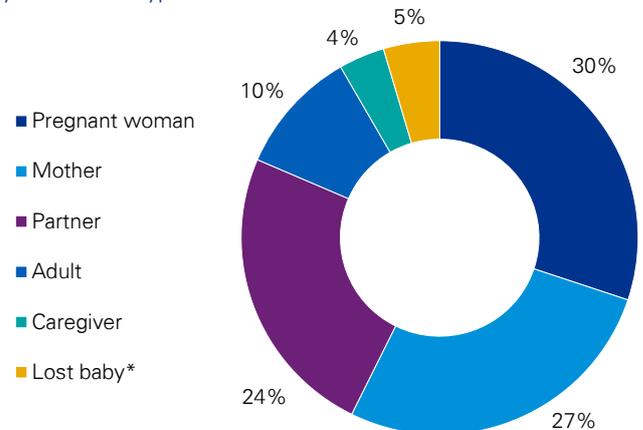
- **Geographic residence:** 81% of the subscriber population resides in Gauteng, Kwa-Zulu Natal, Limpopo and Mpumalanga. This is similar to the overall geographic dispersion of the South African population, as reported in the 2011 Census of South Africa,⁽⁵²⁾ which also indicates that the majority of the population resides in the provinces of Gauteng and KwaZulu-Natal.
- **Subscriber type:** 30% of subscribers are registered as pregnant women, 27% registered as mothers, and 24% registered as partners.
- **Language preference:** 66% of the subscriber population registered to receive the content in English. Zulu is the second most frequent language, used for 22% of the subscriber population.
- **Age group:** 55% of the subscriber population registered as being between the ages of 18 and 24 years.
- **Mobile payment type:** 99% of registered subscribers are Vodacom prepaid subscribers.
- **Registration channel:** 95% registered through USSD rather than through the mobsite.

Figure 3: Mum & Baby subscribers by geographic residence



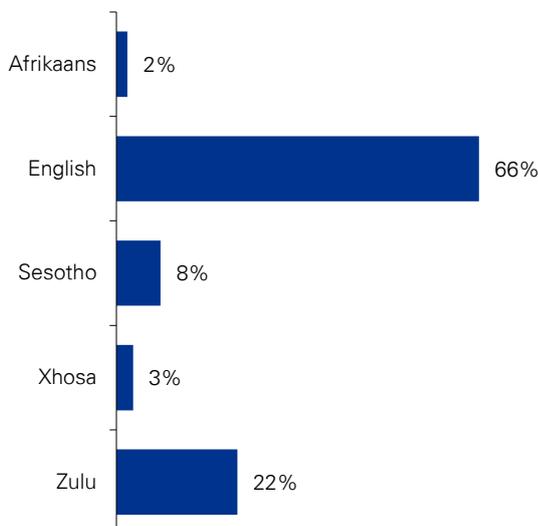
Source: Registration data provided by Mondia Media.

Figure 4: Mum & Baby subscribers by subscriber type



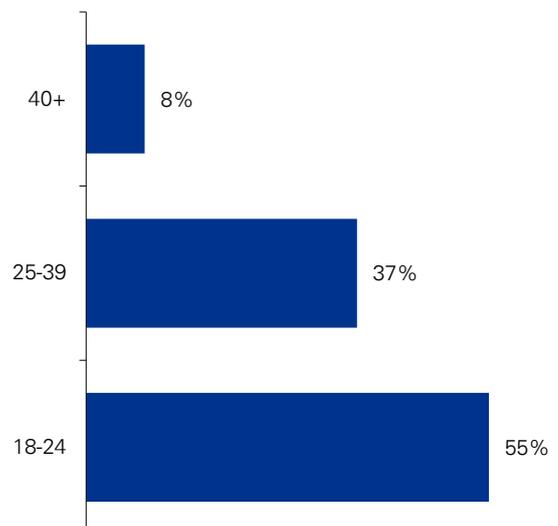
*Lost baby refers to women who reported to have experienced the loss of their child.
Source: Registration data provided by Mondia Media

Figure 5: Mum & Baby subscribers by registered language preference



Source: Registration data provided by Mondia Media

Figure 6: Mum & Baby subscribers by age group



Source: Registration data provided by Mondia Media

2.3 Mum & Baby service content development

Vodacom partnered with MobiStar, a mobile engagement specialist company, to create and develop the Mum & Baby service's health content.

In KPMG's interview with MobiStar, we were informed that the Mum & Baby content is driven by the United Nations Sustainable Development Goals ("SDG") and by global best practices and standards for maternal, neonatal and child care developed by medical professionals and health organisations such as the WHO and the NDoH. Although the Mum & Baby service is independent from the NDoH or other government entities, MobiStar indicated that it aims to ensure that the information provided by the Mum & Baby service is aligned with NDoH guidelines and policies. For example, the NDoH and WHO prepare a health calendar every year highlighting a key health topic for each month, which Vodacom then incorporates into its content delivery in the Mum & Baby service.

As noted above, the content is tailored for distinct population groups (e.g. pregnant women, mothers, partners, caregivers) and provides messages that are based on the stage of gestation or the age of the child of the subscriber. The health content provided by the Mum & Baby service includes stage-based health information through various channels, which include:

- **SMS messages:** Nine distinct life stages (e.g. 0-3 months, 1-2 years old) with 24 to 104 unique messages delivered to subscribers of different types depending on relevance and the child's life stage;
- **Articles:** 280 health articles of approximately 200 words that are disseminated following a seasonal calendar in line with national health initiatives;
- **Videos:** 94 videos less than a minute in length providing health information relevant to pregnancy, newborns and infant life stages; and
- **Health tools:** These include a due date calculator, an immunisation calendar, and a pregnancy medicine safety checker.

Table 1 provides a summary of the Mum & Baby content provided by channel.

We understand from MobiStar that the content is reviewed and updated on an ongoing basis. Before content is added, it is quality assured through an external advisory committee consisting of medical professionals. MobiStar has indicated that the role of this external advisory committee is to design and develop the content strategy; inform and update content based on public policy changes; and to suggest new content in alignment with national and global best practices, guidelines and standards.



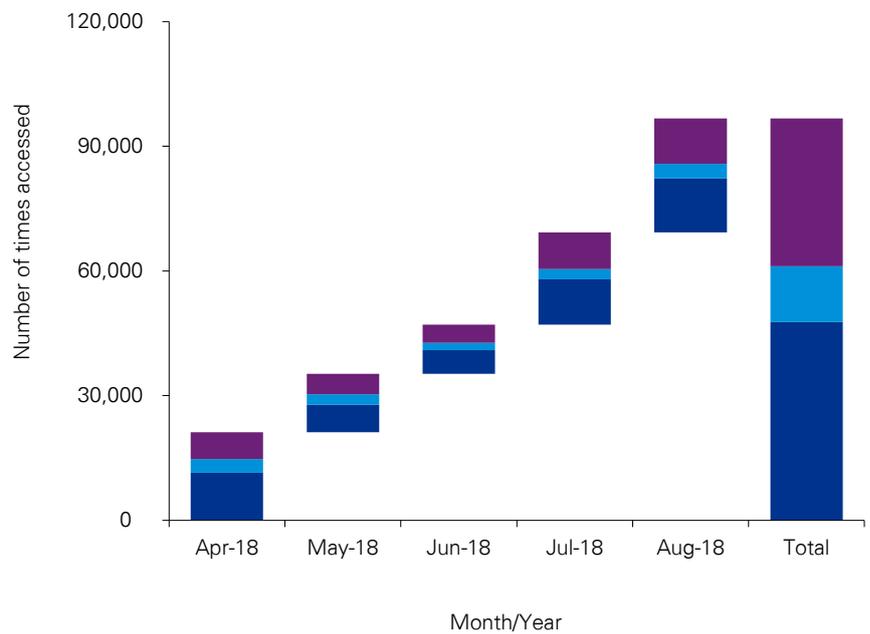
2.4 Service usage

Mondia Media manages the Mum & Baby service technology platform from a functionality perspective, and collects the registration and usage data by tracking the online content accessed. It manages the dissemination of SMS messages, oversees the lifecycle of the subscriber and provides reports and analytics relating to mobisite usage.

In general, the usage data presented below is only representative of the subscribers who access the mobisite (approximately 4% of subscriber population based on registration data provided by Mondia Media) and not the subscribers that only interact with the Mum & Baby service through SMS messages; although these subscribers do have access to the content on the mobisite. The low usage of the mobisite may be a result of subscribers incorrectly believing that use of the mobisite will result in incurring a costs, whether data or subscription. Figure 7 shows the content accessed on the Mum & Baby service’s mobisite by subscribers from April 2018⁽⁵³⁾ to August 2018. Based on the service usage data up to 31 August 2018, the most accessed tool for all mobisite subscribers is the immunisation calendar, followed by the due date calculator. The Mum & Baby service also offers health information on 24 different health topics that can be accessed through articles and tutorials. The health topic most accessed by mothers was information on teething.

Figure 7: Mum & Baby service mobisite usage by content

- News
- Tools
- Topics



Source: KPMG analysis of content data provided by Mondia Media

Table 1: Mum & Baby content by channel

Channel	Life stage	Description
 SMS messages	0-3 months; 4-6 months; 7-9 months; Newborn (0-6 weeks); Infant (0-1 years); Toddler (1-2 years); Toddler (2-3 years); Young child (3-4 years); Young child (4-5 years)	<ul style="list-style-type: none"> — Subscriber receives three SMS messages per week — Available in all 5 languages
 Articles	Pregnant woman; New mother; Partner; Caregiver.	<ul style="list-style-type: none"> — Mobisite based — Follows a structured health and seasonal calendar — Includes Q&A with ability to track progress over time — Available in all 5 languages — Tailored to the 4 profile types and language preference — Searchable archive — A full list of articles is available to subscribers on request
 Videos	0-3 months; 4-6 months; 7-9 months; Newborn (0-6 weeks); Infant (0-1 years); Premium content only: pregnancy and toddler specific videos	<ul style="list-style-type: none"> — Subscriber receives 1 promotional SMS and 1 video per week for the duration of life stage — Available in all 5 languages
 Tutorials ⁽⁵⁴⁾	Premium content only (example topics noted below): Pregnancy; Your baby’s first year; Asthma in children & adults; Hypertension; Cancer; Depression; Diabetes type1/2; HIV/Aids; Heartburn; Cholesterol; Backache; Smoking cessation; Osteoporosis; Urinary inconstinence; Allergy; ADHD; Alcohol abuse; Arthritis; Enviro-health; Menopause; Weight loss; Stress; Workplace issues.	<ul style="list-style-type: none"> — Informative, interactive 5 week deep dive into a specific health area — Available as either mobisite or SMS tutorial — Available in all 5 languages — Includes Q&A with ability to track progress over time
 Tools	Due date calculator; Immunisation calendar; Medicine checker (safety in pregnancy and breastfeeding); Premium content only: Am I Sick?; Medicine reminder; Health Directory	<ul style="list-style-type: none"> — Interactive mobisite tools

A photograph of a woman holding a young child on a beach. The woman is wearing a black patterned top, and the child is wearing a colorful, striped dress. The background is a bright, sandy beach with the ocean visible in the distance.

03 Methodology and research approach

Section highlights:

- Our approach to analysing the socio-economic contribution of the service is based on good practice principles and methodologies for impact assessment and evaluation including: The OECD's Quality Standards for Development Evaluation; the HM Treasury Magenta Book: Guidance for evaluation; and the Social Return on Investment Network's 'A guide to Social return on Investment.'
- We adopted an "impact mapping" approach to identify the inputs and activities associated with the delivery of the Mum & Baby service and the resultant outputs, outcomes and impacts for individual subscribers, their babies/children and wider society.
- To gather evidence for the study we adopted a multi-methods research approach, including conducting: a systematic literature review and wider desk based research; a telephone survey; semi-structured focus groups with samples of Mum & Baby service subscribers; case study interviews; and discussions with Vodacom, Vodafone and its Mum & Baby service delivery partners.

3.1 Overarching approach

KPMG was commissioned to assess the socio-economic contribution of the Mum & Baby service in South Africa, focussing on the outcomes and impacts for parents and their babies/ children and considering the consequent impacts for the wider economy. A socio-economic impact evaluation considers the extent to which a policy or intervention has made a difference, in line with its objectives⁽⁵⁵⁾ and taking account of any wider, intended or unintended, effects.

Our approach to analysing the socio-economic contribution of the service is based on good practice principles and methodologies for impact assessment and evaluation detailed by established organisations including:

- the OECD's⁽⁵⁶⁾ Quality Standards for Development Evaluation, which was developed by the Network on Development Evaluation (a subsidiary body of the OECD's Development Assistance Committee) to increase the effectiveness of international development programmes by providing a guide to good practice in development evaluation;
- the HM Treasury Magenta Book: Guidance for evaluation⁽⁵⁷⁾, which is the recommended UK central government guidance on evaluation, setting out best practice and covering topics including how evaluations should be designed and managed; evaluation options; and how evaluation results should be interpreted and presented; and
- the Social Return on Investment ("SROI") Network's 'A guide to Social return on Investment'⁽⁵⁸⁾, which is a framework that was developed by a consortium of UK organisations, to update UK government Cabinet Office guidance on how to measure and account for social impact.

Having agreed the scope of the assessment (described in section 1.2.1), an "impact mapping" approach was used to identify:

- **Inputs:** The Vodacom and delivery partners' resources required to develop and to deliver, on an ongoing basis, the Mum & Baby service;
- **Activities:** The activities supported by these inputs to convert them into outputs to be used for subscribers, for example, the activities around developing the platform and content, both initially and on an ongoing basis;
- **Outputs:** The direct results of the activities in the short-term, for example the number of SMS messages received and the content accessed on the mobisite;
- **Outcomes:** The results in the medium-term of the service, including both intended and unintended consequences; and
- **Impacts:** The longer-term effects of the service, for individual subscribers, their children and wider society.

An initial "logic model"⁽⁵⁹⁾ was developed based on our review of the literature, collection of data from Vodacom and its delivery partners in relation to key inputs, activities and outputs, and discussions with key stakeholders. Drawing on this initial evidence we developed hypotheses of the potential outcomes and impacts that may be generated through the Mum & Baby service and these were then tested through our evidence gathering.

Our evidence gathering approach is detailed below and the final logic model is set out in section 4.1.

3.2 Evidence gathering approach

3.2.1 Approaches adopted, objectives and types of evidence gathered

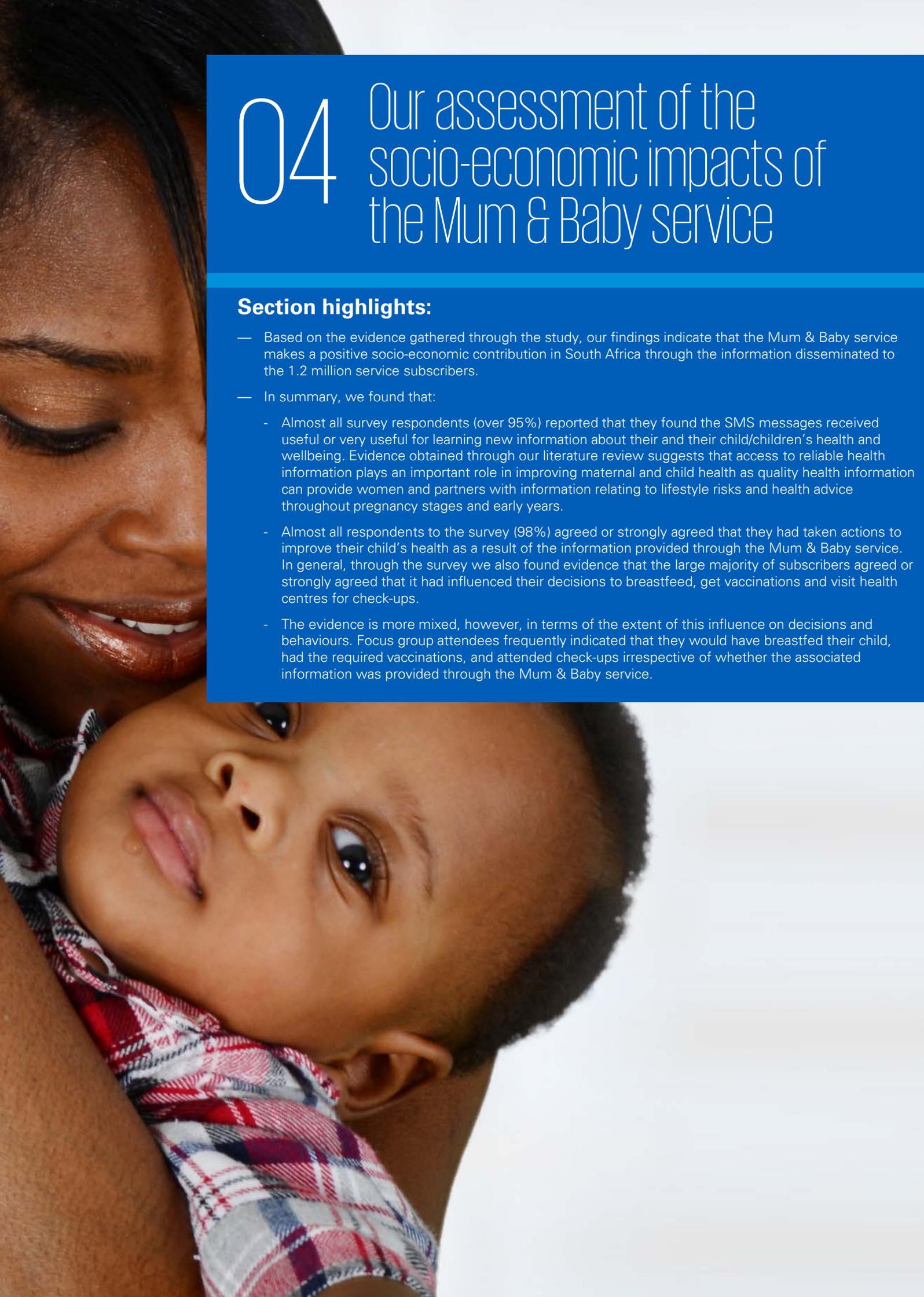
To inform our socio-economic impact assessment we gathered information from a wide range of sources to facilitate as comprehensive and objective an analysis as possible of the outcomes and impacts of Mum & Baby service for different groups. Table 2 provides a description of the data/ evidence gathering approaches.

Table 2: Mum & Baby service evidence gathering approach

Evidence gathering approach	Objectives of approach	Description of approach
 <p>Conducted a systematic literature review and wider evidence gathering</p>	<ul style="list-style-type: none"> — To identify the existing literature relevant to Vodacom’s Mum & Baby service — To identify evidence relating to potential outcomes and impacts of the service 	<ul style="list-style-type: none"> — We conducted desk-based research on demographics & statistics relevant to South Africa, including health landscape (e.g. vaccination rates) — We reviewed the relevant literature on mobile health interventions in developing countries
 <p>Engaged with service provider (e.g. Vodafone & Vodacom) and delivery partners (e.g. MobiStar)</p>	<ul style="list-style-type: none"> — To identify the characteristics of the service’s participants — To obtain data to inform the analysis — To gain an understanding of the content selection & usage 	<ul style="list-style-type: none"> — We accessed the Mum & Baby service’s mobisite and browsed the content — We submitted data and information requests to Vodacom to obtain information on subscribers, this included: <ul style="list-style-type: none"> - Information containing the characteristics (e.g. subscriber type, age group, geographic residence, language spoken) of subscribers registered in the service — We had teleconference and email-based discussions with MobiStar on content creation & development <ul style="list-style-type: none"> - Information received from MobiStar containing the content of the stage-based SMS messages — We had teleconferences and email-based exchanges with Mondia Media on usage data, including: <ul style="list-style-type: none"> - Information containing utilisation related metrics on the Mum & Baby service content, split by subscriber type, age group, and geographical province
 <p>Conducted telephone surveys of service subscribers</p>	<ul style="list-style-type: none"> — To collect insight on the outcomes & impacts of the service from the participants’ perspective 	<ul style="list-style-type: none"> — Through a third-party vendor, we conducted computer-assisted telephone interviewing surveying that focused on surveying pregnant women, mothers & partners with respondents distributed across provinces to broadly reflect the subscriber population — We agreed to target approximately 400 responses per subscriber type
 <p>Facilitated semi-structured focus groups of service subscribers</p>	<ul style="list-style-type: none"> — To collect insight on usage & the outcomes & impacts of the service from the participants’ perspective 	<ul style="list-style-type: none"> — We agreed to conduct six focus groups, with a target of 15 participants, in the following provinces and languages: <ul style="list-style-type: none"> - Gauteng with pregnant women in English - Limpopo with partners in English - KwaZulu-Natal with mothers & pregnant women in Zulu - KwaZulu-Natal with partners in Zulu - Mpumalanga with mothers & pregnant women in English - Western Cape with mothers & pregnant women in English — Organisation of the focus groups, including the logistics and recruitment of participants was conducted by a third party vendor appointed by Vodacom.
 <p>Conducted one-on-one interviews of two service subscribers</p>	<ul style="list-style-type: none"> — To obtain more in-depth insights of outcomes & impacts of the service realised by two specific individuals 	<ul style="list-style-type: none"> — We interviewed a mother and a partner from the focus groups that expressed interest in sharing more insights. These individuals were selected by Vodacom

Summary of evidence gathered

- We obtained social health demographic information the WHO, Stats SA, and the OECD
 - We reviewed research articles & identified mobile health literature relevant to the Mum & Baby service
 - We found that a common theme centred around health information as a key resource to help people self-diagnose and the necessity for readily accessible health information
 - We also found two comparable mHealth programmes similar to that of the Mum & Baby service (MAMA SMS and MomConnect)
-
- We analysed the Vodacom-provided subscriber data and ascertained the following about the 1,235,637 subscribers:
 - Majority are pregnant women, mothers, & partners
 - Majority in Gauteng, KwaZulu-Natal, Limpopo, &
 - Mpumalanga
 - Majority receive information in English, followed by Zulu
 - We discussed with MobiStar the content development and health topic selection process and received the complete repository of SMS content messages
 - We discussed with Mondia Media the usage data collection process and obtained usage-related metrics for 15 months of the service's operation
-
- Over 22,000 calls were made, with:
 - 17% willing to participate in survey
 - 4% completion rate of surveys
 - 1,139 surveys were completed, for the following subscriber types:
 - 240 pregnant women
 - 478 mothers
 - 311 partners
-
- Six focus groups were conducted in the following geographic provinces:
 - Limpopo with 11 partners
 - Gauteng with 4 women
 - Gauteng with 13 women
 - KwaZulu-Natal with 5 partners
 - Western Cape with 7 women
 - Mpumalanga with 7 women
-
- We interviewed a mother from Gauteng and a father from Limpopo
-



04 Our assessment of the socio-economic impacts of the Mum & Baby service

Section highlights:

- Based on the evidence gathered through the study, our findings indicate that the Mum & Baby service makes a positive socio-economic contribution in South Africa through the information disseminated to the 1.2 million service subscribers.
- In summary, we found that:
 - Almost all survey respondents (over 95%) reported that they found the SMS messages received useful or very useful for learning new information about their and their child/children's health and wellbeing. Evidence obtained through our literature review suggests that access to reliable health information plays an important role in improving maternal and child health as quality health information can provide women and partners with information relating to lifestyle risks and health advice throughout pregnancy stages and early years.
 - Almost all respondents to the survey (98%) agreed or strongly agreed that they had taken actions to improve their child's health as a result of the information provided through the Mum & Baby service. In general, through the survey we also found evidence that the large majority of subscribers agreed or strongly agreed that it had influenced their decisions to breastfeed, get vaccinations and visit health centres for check-ups.
 - The evidence is more mixed, however, in terms of the extent of this influence on decisions and behaviours. Focus group attendees frequently indicated that they would have breastfed their child, had the required vaccinations, and attended check-ups irrespective of whether the associated information was provided through the Mum & Baby service.

4.1 The logic model for the Mum & Baby service

In this section of the report, we details our findings in relation to the socio-economic contribution of the Mum & Baby service in South Africa. This draws on findings from the survey and focus groups, data and evidence collected from Vodacom and its service delivery partners and evidence from a review of relevant literature, primarily associated with other mHealth interventions.

While there is a body of evidence relating to the role mHealth interventions can play in being complementary to health systems (including quality and access to care⁽⁶⁰⁾), the interventions vary, for example depending on the issue they are aimed at addressing and their reach to individuals. Therefore, the impacts which may be realised as a result of these interventions can be of differing natures.

To provide a framework for assessing the socio-economic contribution of the Mum & Baby service, a “logic model” (alternatively referred to as a “theory of change model”) was developed. This is a systematic and visual way of presenting the interactions between inputs, activities and outputs, outcomes and impacts. An explanation of inputs, activities, outputs, outcomes and impacts is set out in section 3.1.

In Figure 8, we present the logic model developed for the Mum & Baby service by KPMG. This was initially developed to identify the impact evaluation objectives and research questions and to inform the types of data and information that were collected. The initial logic model was developed based on our review of the literature regarding the impacts of mHealth interventions targeting mothers and pregnant women, and through stakeholder discussions with Vodafone, Vodacom and MobiStar. The final logic model, shown in Figure 8, also incorporates evidence on the outcomes and impacts of the service gathered through our survey and focus groups.

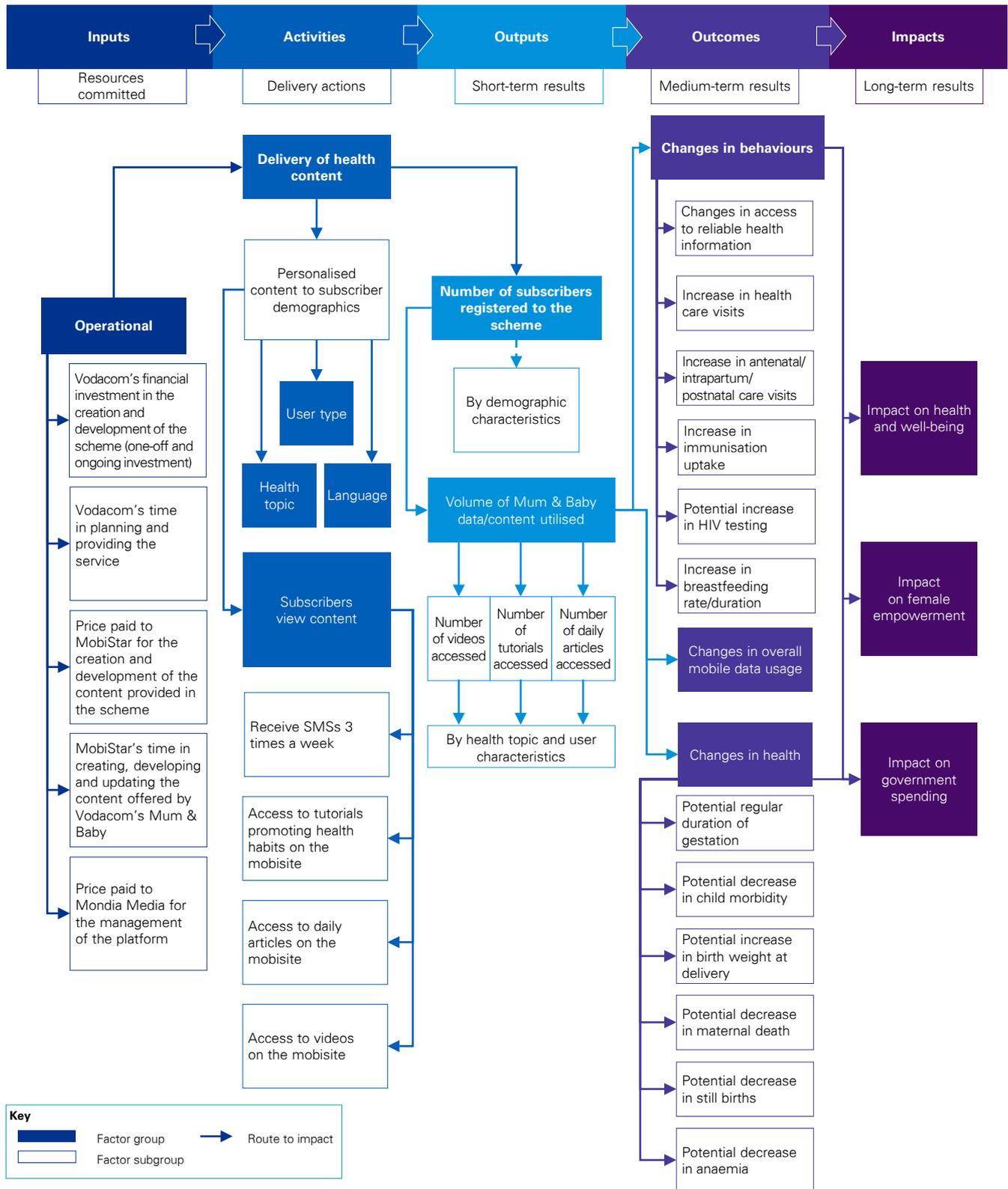
The visualisation of the logic model shows the flow of inputs through to impacts and the routes through which they are realised. As can be seen, this captures the key socio-economic outcomes and impacts of the service that we then assessed as part of the study. Due to the resources available to undertake the study and the need to focus on the most material areas of outcomes and impacts when collecting primary evidence through the survey and focus groups, our assessment primarily focussed on the following areas:

- changes in access to reliable health information;
- changes in health⁽⁶¹⁾;
- increase in breastfeeding rate/duration;
- increase in immunisation uptake; and
- increase in clinic visits (e.g. antenatal/ intrapartum/ postnatal care).

Our findings in relation to each of these areas are set out in section 4.2 and 4.3. They relate specifically to the changes in outcomes and impacts associated with the Mum & Baby service compared to a counterfactual scenario in which subscribers would not have access to the information through this channel.



Figure 8: The Mum & Baby service's Logic Model



Source: KPMG.

4.2 Access to reliable health information

Through the Mum & Baby service, subscribers are provided with access to a wide range of information in the form of SMS messages, articles, videos, tutorials and tools, relating to the health and wellbeing of mothers and babies, both pre- and post-natal as well as information relevant to fathers and other caregivers.

4.2.1 Evidence relating to the importance of access to the types of information provided through the Mum & Baby service

As set out in the logic model above, access to the reliable health information itself is a key dependency in the route to realising the outcomes and impacts associated with the service. This is shown as the activity of subscribers viewing content and the resultant output of the volume of content utilised.

Additionally, in line with the European Commission guidance on monitoring and evaluation⁽⁶²⁾, it is important to determine both whether there has been an observed change and whether the service was responsible (i.e. if it can be attributed back to the Mum & Baby service). Therefore, the overall socio-economic contribution of the service depends on the extent to which subscribers are able to, and otherwise would, access the same or similar information, including in terms of content coverage, ease of access and quality/reliability, from other sources.

According to our discussions with Dr Friderichs from MobiStar, access to reliable health information plays an important role in improving maternal and child health as quality health information can provide women and partners with information relating to lifestyle risks and health advice throughout pregnancy stages⁽⁶³⁾. Health information is usually obtained through family, friends, media (e.g. television broadcast) or health workers (e.g. nurses, doctors) at healthcare centres; however, the consistency and quality in information and advice received varies by source.⁽⁶⁴⁾

Furthermore, according to the Global Health Observatory (“GHO”) data repository, as of 2016, in South Africa there were on average 5.2 nursing and midwifery personnel for every 1,000 people available to offer quality health information⁽⁶⁵⁾. This compares to 8.4 in the UK.⁽⁶⁶⁾ Reports suggest that the shortage in healthcare workers is exacerbated by the variations in the numbers of doctors and nurses that operate in urban and rural areas.⁽⁶⁷⁾ According to WHO, as of 2010, 46% of the South African population lived in rural areas of the country, however just 12% of all doctors and 19% of all nurses operate in rural areas.⁽⁶⁸⁾

The Mum & Baby service’s objective is to complement existing channels of health information provision and offer valuable health content that is reliable and in line with medical best practices to its subscribers. It aims to do this by leveraging its existing telecommunications capabilities (i.e. Vodacom’s mobile network) that allow for mobile interaction with a wide range of vulnerable populations.⁽⁶⁹⁾ An overview of the service content is described in section 2, and an example of the SMS messages delivered is below.

Figure 9: Example of SMS message delivered to Mum & Baby subscribers



“Baby’s spine and brain are growing fast. Folic acid is essential for this development. Dark green vegetables like broccoli and spinach are rich in folic acid.”

– Sent to pregnant women during their first trimester

Source: MobiStar.

The first issue of importance when understanding the extent to which the service has improved subscribers' access to reliable health information, and thus the impact of this information, is the evidence in relation to the scope and volume of information accessed. We sought to understand this through questions asked in the survey and focus groups as well as based on usage data provided by Vodacom and its delivery partner Mondia Media.

4.2.2 Findings in relation to the extent to which the Mum & Baby service has improved subscribers' access to reliable health information

At the end of August 2018, the total number of registrations to the Mum & Baby service was 1,235,637. Of these, only 5% registered through the mobisite and the remainder (95%) of subscribers registered through a USSD channel.

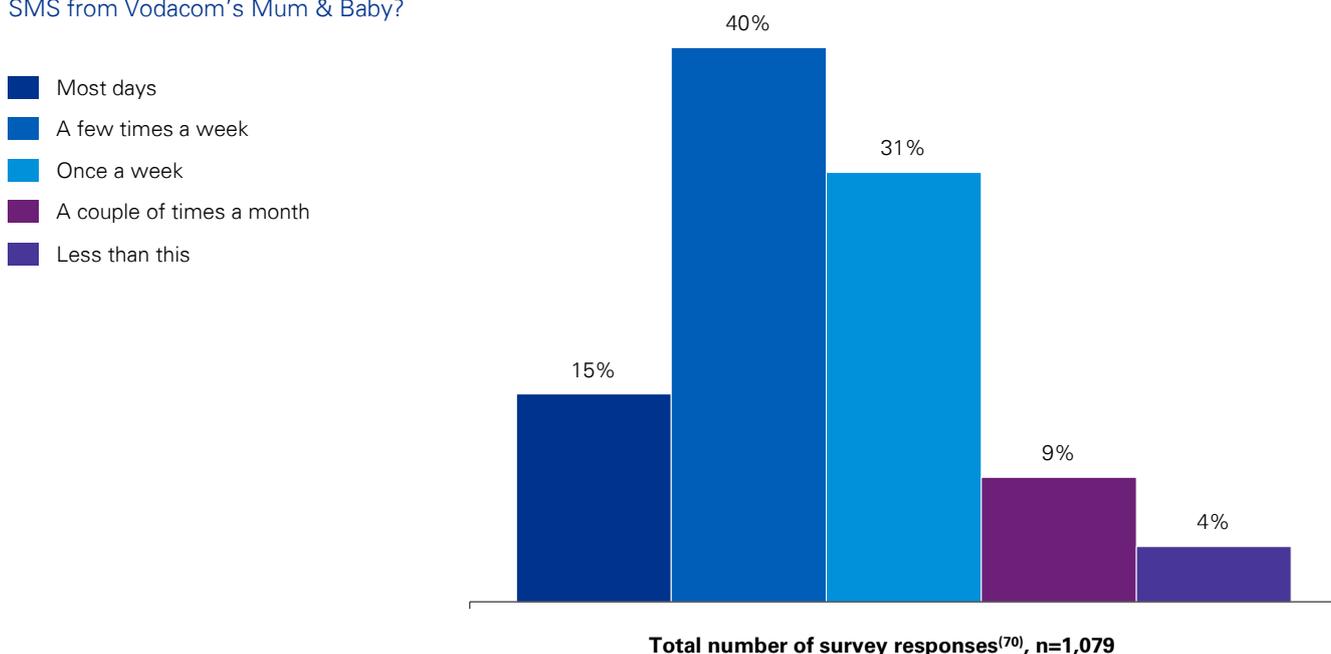
The telephone survey found that 96% of participants indicated that they access and receive Mum & Baby service information only by SMS, while only 4% receive it from the mobisite. This indicates that approximately 49,000 subscribers access the mobisite.

While there is a large volume of information available to subscribers on the Mum & Baby mobisite, given that it is not accessed by the majority of service subscribers, the outcomes and impacts associated with this health and wellbeing information is limited. Based on the telephone survey responses and insights from the focus groups we understand that many subscribers (approximately 65% of the survey participants) do not know that accessing to Vodacom's Mum & Baby mobisite is free with no extra charge for the content or the data used to access it.

We understand from Vodacom that Mum & Baby subscribers receive three SMS messages per week containing health information pertinent to their child's particular life stage (e.g. 3-months pregnant) for the duration of the programme (see section 2.1). However, in the focus groups some participants indicated that they either receive SMS messages at lower frequencies (e.g. once a week) or have stopped receiving messages altogether. To understand how often the population access the information sent via SMS messages by the Mum & Baby service, survey participants were asked to state the frequency with which they received and read the SMS messages sent by the service. Using the information received through the SMS messages is a key dependency in the pathway to realising the socio-economic impacts of the Mum & Baby service.

As shown in Figure 10 below, 40% of survey participants indicated that they received and read the information received by SMS messages a few times a week. Interestingly, partners were statistically more likely to access the information received by SMS message more often than mothers. This finding was echoed in the focus groups with partners, conducted in Limpopo and KwaZulu-Natal, where participants indicated that it was convenient to have the health information available in the SMS messages and it allowed for future ease of access to the information.

Figure 10: Survey question – How often do you receive and read the SMS from Vodacom's Mum & Baby?



Source: KPMG analysis of telephone survey responses.

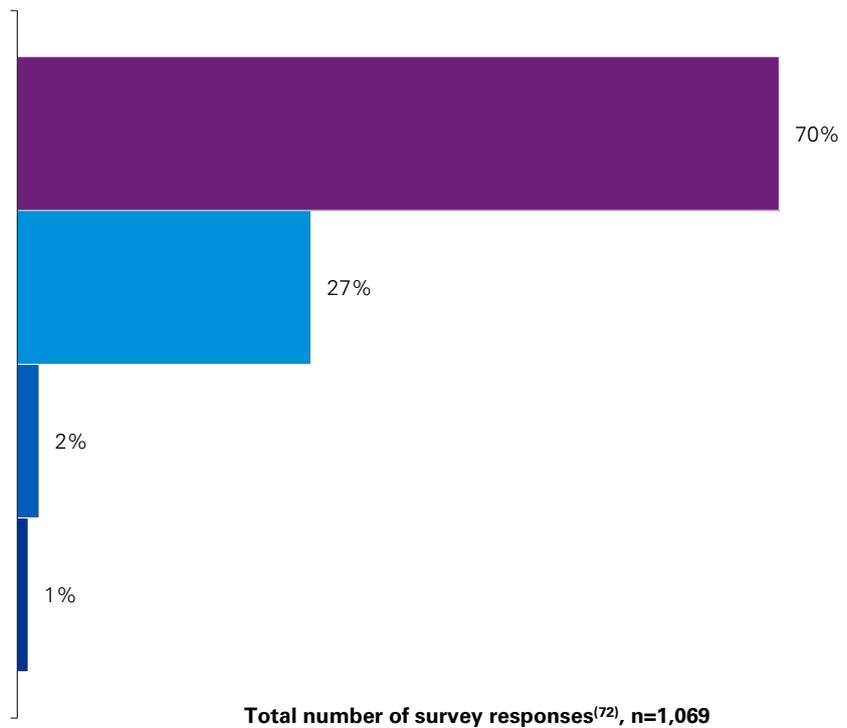
The socio-economic contribution of the Mum & Baby service depends not only on the volume of information provided to/accessed by subscribers but also the relevance and usefulness of the information (as the outcomes and impacts depend on subscribers taking actions/altering their behaviour in response to this information). The extent to which it is new information provided, and whether subscribers learned something from it, is also important to attribute any changes in behaviour to the Mum & Baby service.

As shown in Figure 11, almost all survey respondents (over 95%) reported that they found the SMS received useful or very useful for learning new information about their and their child's/children's health and wellbeing.

These results were broadly consistent across different subscriber types and provinces, with no statistical differences⁽⁷¹⁾ in responses found. However, respondents that indicated they would find it very difficult to access similar health information from a single source in the absence of the Mum & Baby service (see Figure 13), were more likely than other respondents to report that the SMS messages were very useful for learning new information.

Figure 11: Survey question – How useful are the SMS received from Vodacom's Mum & Baby for learning new information about your and your children's health and wellbeing?

- Very useful
- Useful
- Somewhat useful
- Not useful



Source: KPMG analysis of telephone survey responses.

Focus group participants were also asked about the extent to which they felt that they had learned new information through the Mum & Baby service. The majority of participants within each focus group (42 of 47 total focus group participants) – with the exception of the majority of participants at the focus group conducted in Western Cape – indicated that they had learned new information from the Mum & Baby service. The divergence in views of the participants at the focus group in Western Cape may be explained by the fact that participants in this focus group tended to have children over the age of two. Therefore, they may have been more experienced with child care and pregnancy whereas the participants at the other focus groups had younger children or were going to be first time mothers. In terms of the type of information garnered from the Mum & Baby service, focus group participants noted that information on heart burn during pregnancy and explanations on loss of appetite were particularly useful. Other participants pointed to facts about HIV transmission through breastfeeding being useful as well as other health suggestions in relation to diet.

Focus group participants were asked to specify which information they found most useful and why. Figure 12 provides a summary of the examples provided by individual focus group participants.

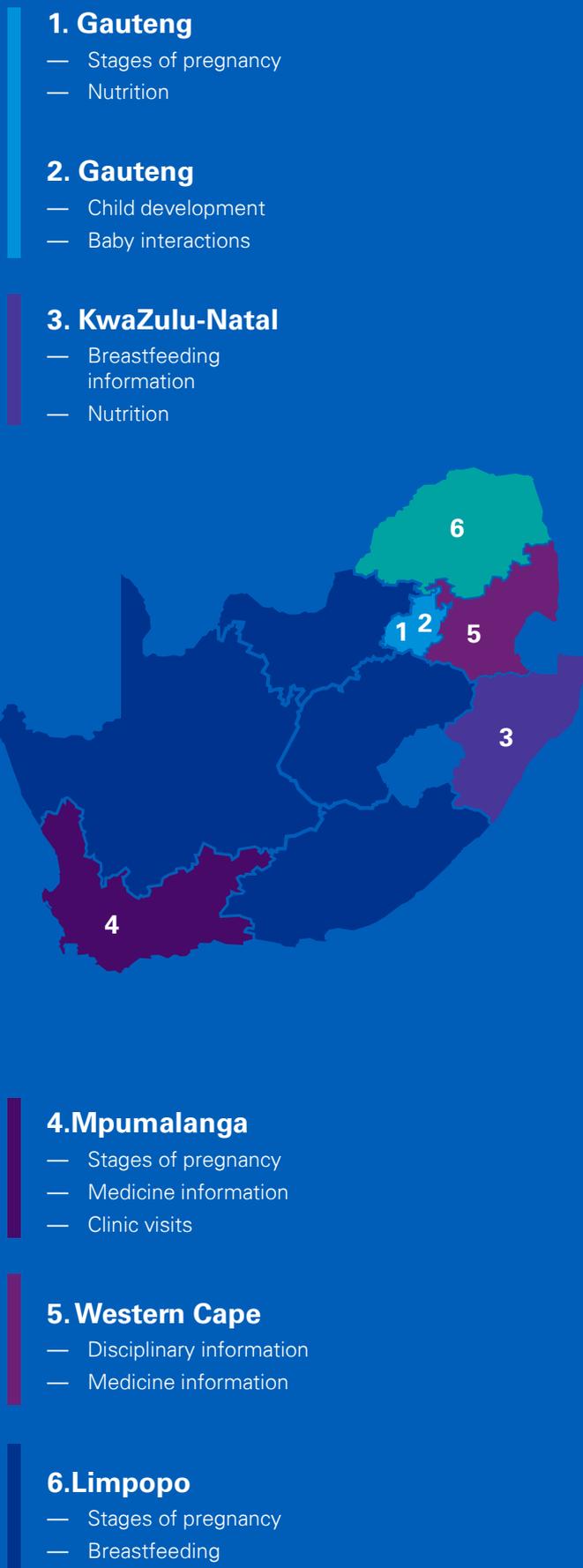
Two of the examples noted by women in the first Gauteng focus group were the information on the stages of pregnancy and what is occurring at each stage and information around nutrition, specifically, what food to eat and what food to avoid.

The focus group with mother and pregnant women with younger children (i.e. Gauteng #1, Gauteng #2 and Mpumalanga) noted information revolving around pregnancy and/or baby development milestones whereas the two participants in Western Cape (who had older children) found the information on discipline more useful. Interestingly, participants from both partner focus groups (KwaZulu-Natal and Limpopo) indicated that they found the breastfeeding information helpful, an insight that is further discussed in section 4.3.2.

A focus group participant (mother in Gauteng focus group #2) indicated that receiving information through the Mum & Baby service was useful because it was convenient and the information was accessible all the time and did not require a taxi trip to the local clinic. Another mother indicated that she began receiving SMS messages during pregnancy with her second child, and was made aware of hernia symptoms through the service.

The focus group participants were asked if they used the tools on the mobisite, but only one participant in the focus group held in Mpumalanga indicated that the due date calculator and immunisation tool were used. In three of the focus groups participants thought that the mobisite required payment, rather than being free, and so they did not use it.

Figure 12: Summarised insights from focus group participants



Having established whether subscribers derived value from the information provided through the Mum & Baby service, we also sought to obtain further information to determine the extent to which any subsequent changes in subscribers actions based on this information (the outcomes and impacts observed – reported in section 4.3 below) could be attributed back to the Mum & Baby service. Therefore, we sought to understand the “counterfactual”, i.e. if, and where, the subscribers would alternatively access the information.

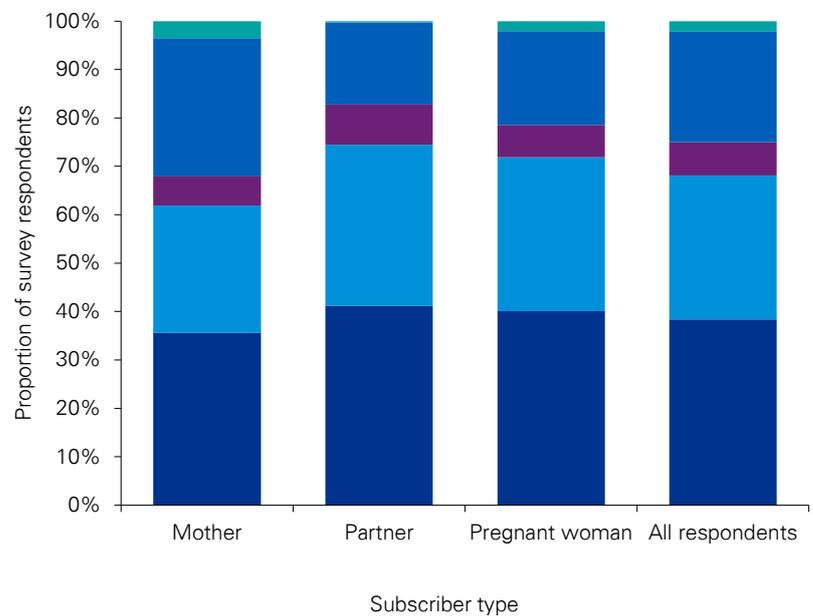
As shown in Figure 13, the majority of telephone survey respondents (68%) indicated that they would find it difficult or very difficult to access similar information from a single place if they did not receive Mum & Baby SMS messages. The distribution of responses did not vary across pregnant women and partner subscribers, but there was a statistical difference between responses from mothers when compared to both partners and pregnant women. We found that mothers were less likely to express difficulty in obtaining similar health information when compared to partners and pregnant women.

Survey respondents indicated that other than through the Mum & Baby service they obtain similar health information from a variety of sources. The majority of respondents (63%) indicated that they received health information from health centres or clinics.

The focus group participants also reported receiving similar health information from a range of sources including from clinics, the internet, magazines, and friends and family. The women participating in the focus group in Western Cape indicated that it would not be difficult to access similar information as that offered by the Mum & Baby service from other sources, while women at the focus group in Gauteng generally stated that it would be difficult as when they are visiting a clinic there is not sufficient time to ask and gather the information they would like to receive. Moreover, focus group participants did suggest that there are some specific types of information that it would be difficult for them to access without the Mum & Baby service.

Figure 13: Survey question – If you did not get Vodacom’s M&B SMS messages, how difficult would it be for you to get similar information from a single place?

- Very difficult
- Difficult
- Neither difficult nor easy
- Easy
- Very easy



**Total number of survey responses⁽⁷³⁾, n=1,050;
 Mother n=483; Partner n=325; Pregnant woman n=242**

Source: KPMG analysis of telephone survey responses.

For example, the female participants in the Mpumalanga focus group indicated that it would be difficult to access information on high blood pressure and pregnancy matters (e.g. feeling the baby kicking).

Overall, while the evidence collected through the study indicates that the information provided through the Mum & Baby service is valued by subscribers and, in general, is considered useful, the evidence is more mixed in terms of the net impact of the service in terms of improving access to information (i.e. the additional value it adds over and

above other information sources). Approximately a quarter of survey respondents considered it easy or very easy to access similar information in a single place and this was echoed by focus group participants who generally reported similar views. However, for those subscribers with difficulty accessing the information (around 68% of telephone survey respondents), the outcomes and impacts associated with use of the Mum & Baby service can be more clearly attributed back to Vodacom, given they would have been less likely to obtain this information in the counterfactual.



Case study No.1

Hlengiwe is a mother from Soweto, Gauteng, who subscribed to Vodacom's Mum & Baby service when her baby was 3 months old. Her child is now a healthy 2 year old and Hlengiwe has indicated that the Mum & Baby service has been there to support her every step of the way as she journeys through motherhood for the first time.

In an interview with KPMG, Hlengiwe said that the information from the Mum & Baby service has made her feel more in control of her and her child's health.

She indicated that before she made use of the Mum & Baby service, she feared things she did not know but now feels more empowered to look after herself and her son. For example, she told KPMG that it has taught her how to establish a routine with her baby, particularly with regards to sleeping.

Hlengiwe used the Mum & Baby service to help her care for her son, as well as to look after her sister's children, who she often babysits. Although her sister is a nurse and can share healthcare information, she works long hours and is often not home. Hlengiwe also said that clinics are a good source of information, can involve queuing for long periods of time and in her experience there can be "overworked nurses, who do not have time to answer multiple questions from a new, anxious mom". She also felt that nurses focused on the task at hand, for example, if they were giving vaccines they would focus on getting that done as quickly as possible rather than be available to answer developmental questions about her child. Hlengiwe stated that going to private clinics was a possibility but this was expensive. The Mum & Baby gave her similar information for free and she told us that some of the information she received through the service would have been very difficult for her to source elsewhere.

4.3 Outcomes and impacts associated with the use of Mum & Baby service information

The Mum & Baby service provides stage-based health and wellbeing information as well as some general health information, for example relating to high blood pressure, HIV and TB, and the dangers of smoking and drinking excessive amounts of alcohol.

4.3.1 Subscriber utilisation of Mum & Baby information

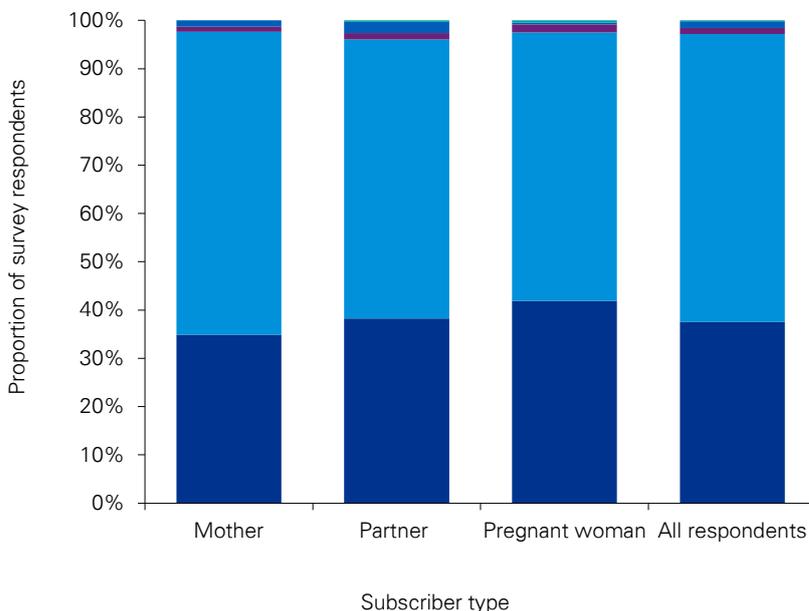
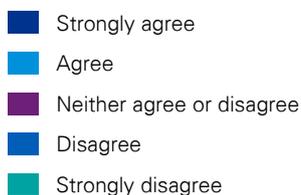
In terms of the pathway to realising socio-economic outcomes and impacts, the use of the information and understanding how this changes subscribers' behaviour is important. This is shown in the logic model. By taking actions as a result of viewing the information provided through the Mum & Baby service, there is the potential for subscribers to have an impact on their own, and their baby's health and wellbeing as well as generating wider socio-economic impacts as a result of this.

Through the study, we sought to understand the self-reported changes in behaviour as a result of the information provided to subscribers through the Mum & Baby service. We considered this in general terms, as reported below, in addition to specific areas of maternal and baby health, such as breastfeeding and vaccination rates. This is based on the behavioural changes/actions taken that were self-reported by survey respondents and focus group participants. We note that the findings may be limited as a result of this compared to if there were evidence comparing the behaviours of Mum & Baby service subscribers to a control group of non-subscribers. It was not possible to do this in our study, however, we draw on some studies gathered through the literature review that adopt this approach.

Telephone survey respondents were asked whether they had taken actions using the information from Vodacom's Mum & Baby service to improve their own health/the health of the mother of their child. Separately they were asked about any actions taken to improve their child's health.

Almost all respondents to the survey agreed or strongly agreed that they had taken actions to improve their child's health as a result of the information provided through the Mum & Baby service, with pregnant women marginally more likely to strongly agree with the statement. No respondents strongly disagreed with this statement and only a small proportion (less than 3% of total survey respondents) either disagreed or neither agreed nor disagreed.

Figure 14: Survey question: "I have taken actions using information from Vodacom's M&B to improve my child's health"

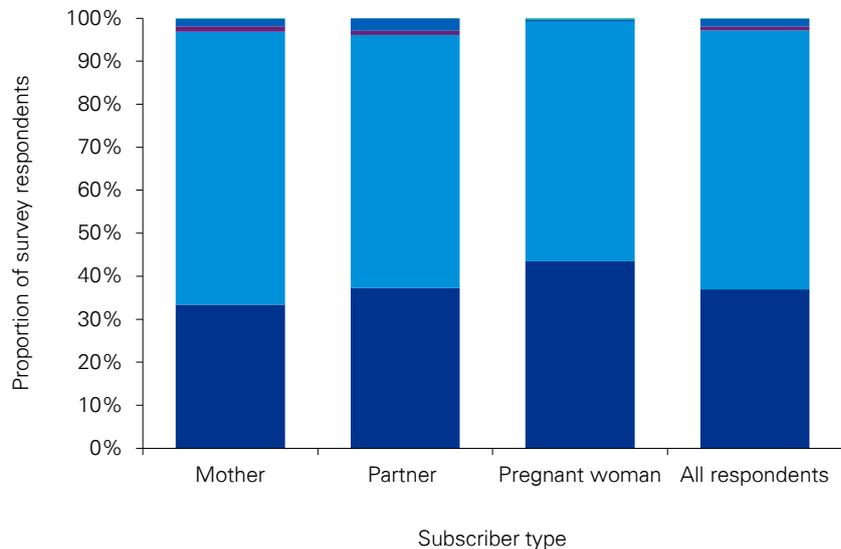
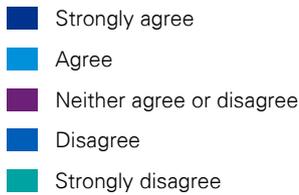


**Total number of survey responses⁽⁷⁴⁾, n=1,017;
 Mother n=470; Partner n=306; Pregnant woman n=241**

Source: KPMG analysis of telephone survey responses.

In terms of actions taken by mothers and pregnant women to improve their own health as a result of the Mum & Baby service information, and by partners to improve the health of the mother of their child, we found that almost 60% of survey participants agreed that they had taken actions to improve their health using the information provided to them through the Mum & Baby service. Pregnant women were slightly more likely to strongly agree with the statement.

Figure 15: Survey question: “I have taken actions using information from Vodacom’s M&B to improve my (the mother of my child’s) health”



**Total number of survey responses⁽⁷⁵⁾, n=1,024;
 Mother n=476; Partner n=309; Pregnant woman n=239**

Source: KPMG analysis of telephone survey responses.

Some different insights were shared by focus group participants when asked if, and how, they used the information received through the Mum & Baby service, and if they changed anything in relation to their lifestyle and health as a result of it.

None of the attendees of the focus groups held in KwaZulu-Natal or in Limpopo reported that the Mum & Baby service information had improved their own health or the health of their baby. Both of these focus groups were for partners. However, some of the participants had indicated that they had changed the way they looked after their child based on the information received, giving examples such as changing the sleeping position of the baby and adopting methods of burping the baby that they had learned. The KwaZulu-Natal focus group participants also all indicated that they felt the information provided had helped them to improve the health of the mother of their child, giving examples of learning about healthier eating through pregnancy and the importance of getting enough fluids for breastfeeding.

At the remainder of the focus groups – all with pregnant women or mothers – almost all participants reported that they felt the information provided through Mum & Baby had improved their health and the health of their baby. This is in line with the telephone survey findings. Although the focus group responses cannot be considered representative of all subscribers to the service, they provide some more detailed insights in to the types of behavioural changes resulting from use of the information. Examples given, included:

- A mother in Western Cape shared she stopped smoking and drinking during pregnancy as a result of learning that it was harmful.
- A pregnant women in Gauteng indicated that she had learned what she should do in the first trimester of pregnancy and acted on this.
- A mother in Gauteng stated that she had learned which fruits and vegetables provided nutrients and incorporated these in to her diet.
- A mother in Gauteng indicated that she was taught how to better interact and play with her child.
- Two mothers in Gauteng spoke about how they learned ways to better communicate with their children during stressful periods.



Case study No.2

Isaac is a father of one, soon to be two, from Mokopane, Limpopo. He has a five year old son and his partner is about to give birth to his second child.

Isaac is an SMS message user of the Mum & Baby service. Because he is soon to be a second time father, Isaac told us in the interview we conducted that he is able to compare his experience of information relating to impending fatherhood before and after he had access to the Mum & Baby service.

This is the first time he has accessed healthcare information through his phone. He told us that he values that you are able to refer back to the SMS messages when you have a query about the health of your baby and how your baby is developing, or the health of your partner. While he is sure his partner would have been able to get some of this information at a health centre, or from family members, Isaac said that the Mum & Baby service has made him feel more involved and empowered to get the information directly. It serves as a useful reference for both him and his partner.

While his partner has always gone for her check-ups (she does not use the Mum & Baby service), Isaac told us that he now has a better understanding of why it is important for men to accompany their partners to the health centre when they go for antenatal check-ups. This has also helped him understand his wife better and how she is feeling, as well as the milestones his growing baby should be reaching.

In terms of how the Mum & Baby service information might support him and his partner after their new baby is born, Isaac gave some examples. Isaac said that his partner would have ensured that their baby was vaccinated, but he felt that the SMS message reminders would be helpful to them to ensure that they do not forget. The Mum & Baby service had also taught him about breastfeeding and why this is important for his child as he now understands the nutritional benefits of breastfeeding in comparison to formula, as well as how it helps the mom and baby to bond.



Our primary research did not provide us with evidence on the scale and scope of any changes in health and wellbeing outcomes for individuals and their children resulting from the overall reported changes in their behaviour due to receiving information through the Mum & Baby service. However, as detailed in the following subsections of the report, we explored the outcomes and impacts associated with the use of Mum & Baby service information relating to specific health and wellbeing topics for which there is more detailed evidence both from the primary research and relevant academic literature. In more general terms, linked to overall health and wellbeing impacts, evidence gathered through our literature review indicates that mHealth interventions tend to support education and behavioural change, and that SMS-based interventions may reduce anxiety levels of mothers(76), improve antenatal care and postnatal services(77), improve infant feeding(78) and increase medication adherence.(79)

To the extent to which there are any improvements in health and wellbeing associated with the Mum & Baby service information, as our study suggests there are likely to be, this will have wider social and economic benefits for the South African economy.

The inclusion of goals relating to child mortality and

improving maternal health in the Millennium Development Goals (MDGs 4 and 5) reflect the role they play in economic development.(80) And there is evidence of a relationship between maternal and child health outcomes and GDP. For example, in a study(81) examining this relationship and its direction and magnitude, Amiri and Gerdtham (2013) found, "in general that the relationships between maternal and child health outcomes and GDP run in both directions, with the majority running from maternal and child health to GDP". They also found evidence that the causal effects of GDP on maternal and child health outcomes are stronger in low income countries and lower-middle income countries compared to high income countries and upper-middle income countries. We note that in 2018, South Africa was classified as an upper-middle income country by the World Bank.(82) Therefore, based on the findings of this study the impact of changes in the maternal and child health outcomes on GDP is likely to be lower compared to in lower income countries. The study authors suggest that this finding may reflect that "the effect of marginal health investments on health outcomes is stronger at low GDP levels, i.e. in countries where generally the level of health is lower."(83)

4.3.2 Impacts on breastfeeding rates and duration

Breastfeeding is a unique form of nutrition which is promoted universally as the most effective way to improve a child's development and health.⁽⁸⁴⁾ It provides the vitamins, minerals and nutrients a newborn needs in the first six months of life and antibodies that help the baby to combat diseases.⁽⁸⁵⁾

4.3.2.1 Breastfeeding information provided through the Mum & Baby service

According to the 2016 South Africa Demographic and Health survey⁽⁸⁶⁾, the proportion of babies who are exclusively breastfed in the first six months of their lives in South Africa was 32%. Although this proportion has increased over recent years (up from 7% in 1998), it remains substantially lower than the proportions recorded for OECD countries (ranging from 70% to almost 100%)⁽⁸⁷⁾. The Demographic and Health survey found that "contrary to the recommendation that children under age 6 months be exclusively breastfed, 14% of infants consume plain water; 1% consume non-milk liquids; 11% consume other milk; 18% consume complementary foods in addition to breast milk; and 25% of infants under age 6 months are not breastfed at all."⁽⁸⁸⁾

To address the importance of breastfeeding, a range of related information is provided to subscribers through the Mum & Baby service. The mobisite hosts a medicine checker that provides information on the safety of taking medication while breastfeeding, as well as articles on breastfeeding topics. However, the usage data⁽⁸⁹⁾ for the mobisite indicates that the use of this information has been very limited⁽⁹⁰⁾:

- medicine checker for breastfeeding was accessed 1,716 times;
- breastfeeding was the 13th most accessed topic with 1,055 total views; and
- articles such as 'breastfeeding basics' and 'breastfeeding and your diet' were accessed 251 and 22 times, respectively.

As explained in section 4.2.2, the majority of subscribers partaking in our research suggested that they only utilised the SMS messages received rather than accessing the content on the mobisite. The Mum & Baby service disseminates a series of stage-based SMS messages relating to breastfeeding. Partners, pregnant women and mothers receive 6, 3 and 49 messages relating to breastfeeding, respectively, throughout their subscription. Some examples are shown in Figure 16.

We detail our findings in relation to the extent to which this breastfeeding related information was used, and influenced subscriber's decisions to breastfeed, below.

Figure 16: Example of SMS messages about breastfeeding sent to Mum & Baby subscribers



"Breastfeeding is certainly the best form of nutrition for your baby. Advise your partner that it is recommended for her to exclusively breastfeed for 6 months."

– Sent to partners



"We still recommend offering breast milk first before the solid foods. Breast milk is packed with all the goodness baby needs to grow and learn."

– Sent to mothers

Source: MobiStar.

Pregnant women and mothers participating in the telephone survey were asked about the extent to which they agreed that the information provided through the Mum & Baby service had influenced their decision to breastfeed their child.

4.3.2.2 Findings in relation to the extent to which the Mum & Baby service has impacted breastfeeding rates and duration

Almost all respondents indicated that they agreed or strongly agreed that it had. Of all the respondents to this question, 5% did not support the view that the breastfeeding information had influenced them (either disagreeing, disagreeing strongly or neither agreeing or disagreeing).

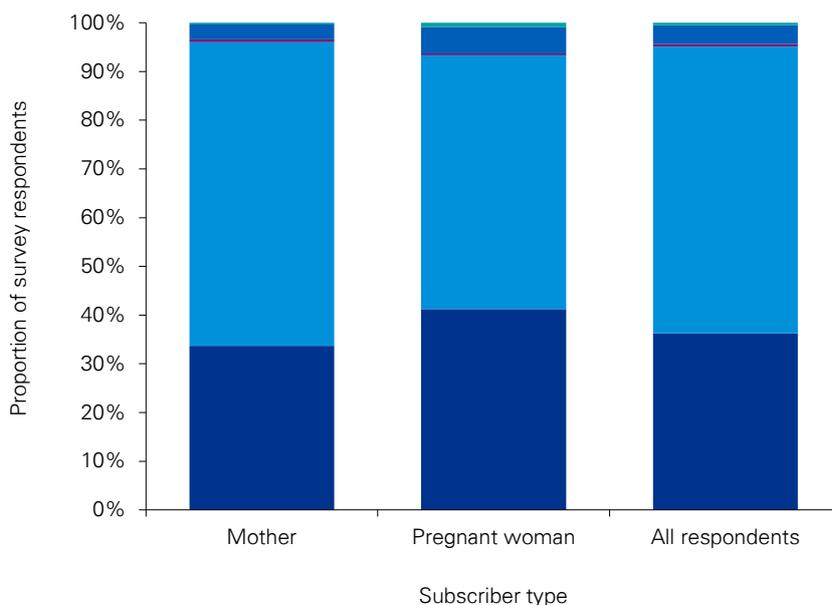
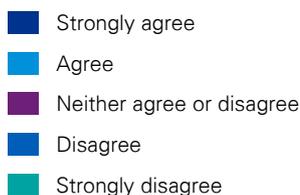
While partners were not asked in the telephone survey about whether the SMS messages about breastfeeding had influenced decisions for their child, this was covered in the focus groups. Given that they accounted for a very small proportion of overall partners in the Mum & Baby service, their views cannot be considered representative, but there were some examples of how the information had made them more informed about breastfeeding and in some cases had directly influenced breastfeeding decisions for their child:

- A father participating in the focus group in KwaZulu-Natal said that one of the most useful areas of information received through Vodacom’s Mum & Baby was about breastfeeding.
- A partner also participating in the focus group in KwaZulu-Natal stated that the information received has encouraged his partner to breastfeed their child until 8 months of age and that they did not buy the baby formula prematurely.
- Another partner participating in the focus group in KwaZulu-Natal stated that the information helped him and his partner change her diet to improve milk production and also taught them about the positions to hold the baby in while breastfeeding.
- A partner participating in the focus group in Limpopo stated that he now knows that breastfeeding is healthier than baby formula and that it strengthens the bond between child and mother.

Overall, the partners indicated that the SMS messages helped to encourage their partners to breastfeed for a longer period.

As shown in Figure 17, the mothers and pregnant women survey respondents generally agreed that the breastfeeding information from the Mum & Baby service influenced their decision to breastfeed. This was explored in more detail in the focus groups with these type of subscribers.

Figure 17: Survey question: “Information from Vodacom’s Mum & Baby has influenced my decision to breastfeed my child”



**Total number of survey responses⁽⁹¹⁾ , n=715;
Mother n=475; Pregnant woman n=240**

Source: KPMG analysis of telephone survey responses.

The findings differed to the telephone survey findings in that fewer focus group participants indicated that they had used the breastfeeding information (approximately half). This may have been associated with the age of the children of the attendees and therefore, whether they had received the stage-based SMS messages and had the opportunity to put the breastfeeding information in to practice. For example, two of the seven mothers attending the focus group in the Western Cape had children over the age of 5, therefore information about breastfeeding may have not applied to them. However, across the focus groups a small number of participants indicated that the information received had resulted in them breastfeeding for longer than 6 months. One mother also indicated that the information provided had influenced her decision not to breastfeed her child as she learnt that it was unhealthy for the child as she smokes and drinks alcohol.

Collectively through the survey and focus groups there is evidence that the Mum & Baby service plays a role in encouraging breastfeeding, both in terms of rates and duration. These findings are in line with studies⁽⁹²⁾ of the impact of other similar mHealth applications in developing countries⁽⁹³⁾ which have shown that they increase the rate of breastfeeding among mothers. For example, evidence from a study of a mHealth intervention in Nigeria⁽⁹⁴⁾ aimed at pregnant women aged 15 to 45 years old showed that the rate of exclusive breastfeeding for three or four months was higher for those accessing the mHealth intervention compared to women in a control group who did not use it.

If the telephone survey respondents are representative of all mothers and pregnant women subscribing to the Mum & Baby service, it suggests that the information may have influenced the breastfeeding decision of approximately 300,000 women⁽⁹⁵⁾ in South Africa.

It is unclear from the evidence gathered what proportion of these individuals would have breastfed in any case (i.e. in the counterfactual scenario where they would not get the information through the Mum & Baby service), but based on the relatively low breastfeeding rates in South Africa for the first full six months of a baby's life (see section 4.3.2.1 above), and evidence cited above from other mHealth interventions, there is evidence to suggest that many may not have done.

To the extent to which any increases in breastfeeding rates and duration can be attributed to the Mum & Baby service, there are likely to be significant social and economic impacts, linked to the health benefits.

Medical evidence suggests that breastfeeding has numerous benefits for both the baby and the mother. For example, breastfeeding in the first six months of life reduces morbidity and mortality of the child⁽⁹⁶⁾. Studies also suggests that it helps to prevent conditions like gastroenteritis and respiratory infections, the two major causes of death among infants.⁽⁹⁷⁾ Moreover, early and exclusive breastfeeding has been shown to reduce mother to child HIV transmission, an issue of importance in South Africa where the HIV rate is estimated at 13% of the overall population.⁽⁹⁸⁾

Some of the impacts associated with breastfeeding, for both babies and their mothers, reported in studies analysed as part of our literature review are summarised below:

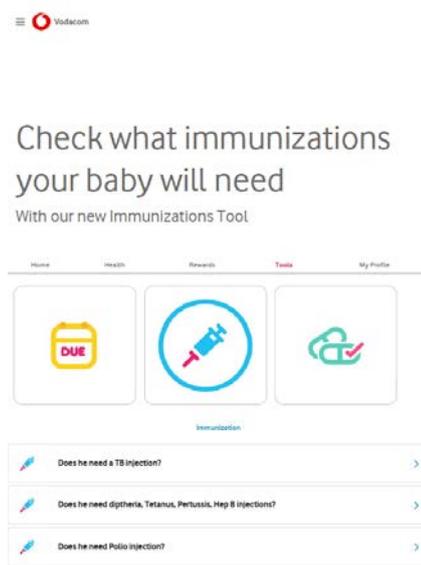
- According to the 2008 Lancet Nutrition Series⁽⁹⁹⁾, there are significant health benefits associated with breastfeeding. Children who are exclusively breastfed are 14 times more likely to survive bouts of diarrhoea and pneumonia when compared with non-breastfed children⁽¹⁰⁰⁾, and in the developing world optimal breastfeeding of children under the age of two has the potential of preventing over 800,000 deaths (13% of all deaths) in children under five.⁽¹⁰¹⁾
- A meta-analysis conducted by the WHO⁽¹⁰²⁾ reported the long-term effects of breastfeeding and concluded that breastfeeding is associated with an increase in intelligence tests and a reduction of obesity.
- Evidence from research shows that children who have been breastfed have a lower probability of suffering from diabetes⁽¹⁰³⁾, child asthma⁽¹⁰⁴⁾ and childhood leukaemia.⁽¹⁰⁵⁾
- UNICEF reports that breastfeeding has both short-term and longer term benefits to mothers. Short-term impacts include reduction of post-partum bleeding and a delay of the return of menstruation, which acts as a natural form of birth control. In the long-term, evidence suggests that it reduces the probability of contracting ovarian and breast cancer and heart diseases.⁽¹⁰⁶⁾



4.3.3 Impacts on vaccination rates

Childhood immunisation is considered to be one of the most successful public health interventions that has decreased the rate of global child morbidity and mortality.⁽¹⁰⁷⁾

Figure 18: Mum & Baby mobisite immunisation tool



Source: Vodacom’s Mum & Baby mobisite

Figure 19: Vaccination coverage for children under the age of one by province (2016/2017)

4.3.3.1 Vaccination/immunisation information provided through the Mum & Baby service

The NDoH advises mothers to vaccinate their children from birth to when they are 12 years old, to safeguard from infectious diseases⁽¹⁰⁸⁾. It also runs immunisation campaigns where health workers visit schools to offer free immunisations to children.⁽¹⁰⁹⁾ In 2012, the Global Vaccines Action Plan (“GVAP”) was endorsed by 194 member states of the World Health Assembly, including South Africa, and aimed to deliver universal access to immunisation to meet vaccination coverage targets.⁽¹¹⁰⁾ Currently, South Africa’s national expanded programme on immunisation (“EPI”) schedule includes, but is not limited to the following vaccines against polio, measles, tuberculosis, diphtheria, pertussis, tetanus, haemophilus influenzae type B, hepatitis B, and rotavirus.⁽¹¹¹⁾

The full immunisation coverage rate⁽¹¹²⁾ in South Africa currently stands at 82% nationally⁽¹¹³⁾, 10 percentage points lower than the national target of 92%.⁽¹¹⁴⁾ Data from the South African Government data indicates that 30 of the 52 districts in South Africa did not achieve the national target of vaccination coverage for children under the age of one.⁽¹¹⁵⁾ Figure 19 shows the immunisation coverage rate for children under one⁽¹¹⁶⁾ at the province level.

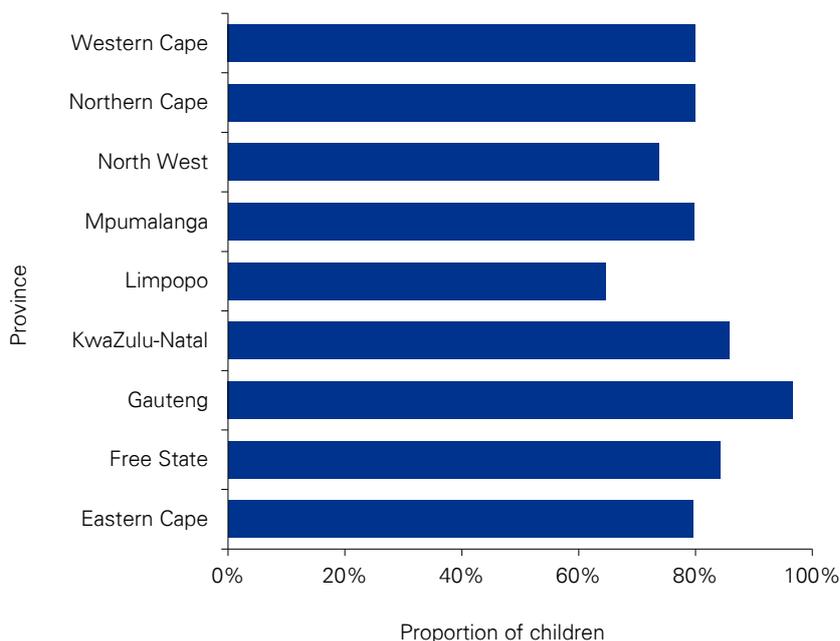
The WHO⁽¹¹⁷⁾ estimates that in 2017 19.9 million infants worldwide did not obtain routine vaccinations and that around 60% of these children live in 10 countries⁽¹¹⁸⁾, of which South Africa is one.

Given the importance of childhood vaccinations, the Mum & Baby service provides a range of information to highlight the importance of vaccination both for the subscriber and for the child. This includes vaccination reminders and general vaccination information sent to subscribers through SMS messages and the mobisite includes an immunisation calendar tool which subscribers can use to keep a record of, and be reminded of, vaccination appointments and to understand what vaccinations the child needs.

In addition to immunisation information being provided to subscribers on an ongoing basis at the relevant stage of pregnancy/child development, Vodacom has informed us that during ‘World immunisation week’⁽¹¹⁹⁾ there is a specific focus on the importance of vaccinations. SMS messages, articles and videos reflect this in their content.

The Mum & Baby service usage data from June 2017 to August 2018 indicates that the:

- immunisation calendar tool was accessed 6,146 times; and
- articles related to world immunisation week were viewed 160 times.



Source: Health System Trust

SMS messages related to immunisation will have reached a wider number of subscribers, with mothers receiving at least 8 message relating to immunisations throughout their subscription. Some examples of the SMS messages sent are included in Figure 20.

Figure 20: Example of SMS message delivered to Mum & Baby subscribers



“Your baby’s injections (immunisations) are really important for his health. Make sure you visit the clinic for these FREE injections on the right dates.”

– Sent to mothers



“Now is a good time to check whether your child’s immunisation record is up-to-date. Visit your closest clinic and speak to a nurse if they are not up to date.”

– Sent to mothers

Source: MobiStar.



Evidence gathered through the study suggests that the information disseminated to subscribers through the Mum & Baby service has influenced parents' decisions over vaccinations, both for themselves and their children.

4.3.3.2 Findings in relation to the extent to which the Mum & Baby service has impacted vaccination rates

Subscribers questioned in the telephone survey were asked about the extent to which they agreed that the information provided through the Mum & Baby service had influenced their decision to get vaccinated themselves and whether it had influenced their decision to get their baby vaccinated. Approximately 62% of respondents agreed, and a further 34% of respondents strongly agreed, that it had influenced their decision to vaccinate their child. If this is representative of all Mum & Baby subscribers it would suggest that the service may have influenced the vaccination decisions of approximately 650,000 individuals⁽¹²⁰⁾ for their children in South Africa.

The survey participants' responses were not statistically different among the three subscriber types, and were generally similar across provinces. However, given the small number of responses at a province level we are unable to make definitive statistical distinctions at the province level.

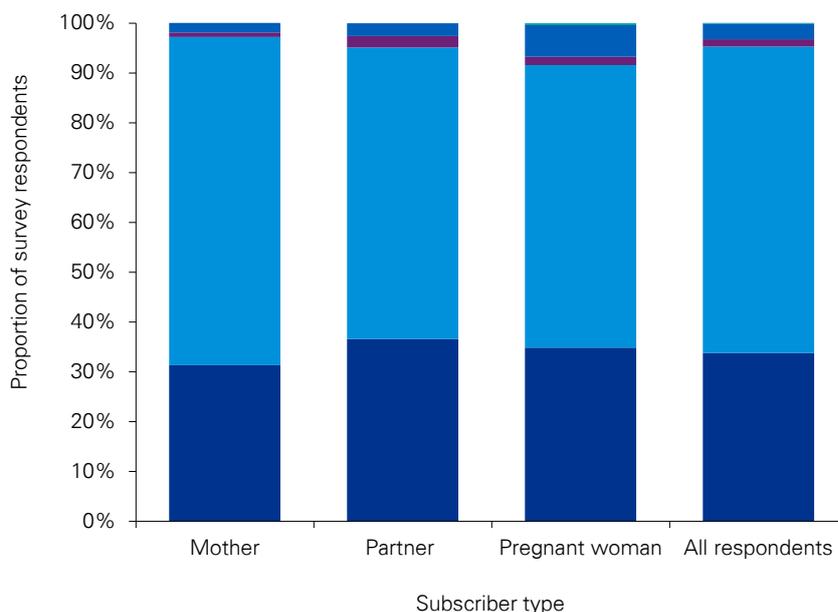
In terms of the extent to which the information provided through the Mum & Baby service had influenced subscribers' decisions to get vaccinated themselves, the mothers and pregnant women asked this in the survey largely agreed it had, although approximately 7% did not (either disagreeing, strongly disagreeing or neither agreeing or disagreeing). Although, a greater proportion of pregnant women strongly agreed to the statement when compared with mothers in numerical terms, the differences were not statistically significant.

In the survey, the majority of respondents indicated that the Mum & Baby service information had influenced their vaccination decisions. However, when this was explored in more detail in the focus groups, participants indicated that while, in general, they had used the immunisation-related information and had learned new information through it, the majority of participants suggested that they would have taken their child for vaccinations in any case. An individual did state, however, that when she was made aware of the risks for not vaccinating the child, she was encouraged to go to the clinic for vaccinations.

As explained in section 4.2.2, it is important to understand what actions individuals would have taken in the counterfactual scenario in which they did not obtain the information through the Mum & Baby service. If individuals would have had their child immunised anyway, the outcomes and impacts associated with vaccinations cannot be attributed to the Mum & Baby service. And although the telephone survey findings indicate that there is some degree of attribution to the service, the extent of this may be limited based on the responses from the focus group participants (albeit the focus group participants cannot be considered statistically representative of all subscribers due to their limited number).

Figure 21: Survey question: "Information from Vodacom's Mum & Baby has influenced my decision vaccinate my child"

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree



**Total number of survey responses⁽¹²¹⁾, n=1,016;
Mother n=472; Partner n=308; Pregnant woman n=238**

Source: KPMG analysis of telephone survey responses.

The results obtained through our study are broadly consistent with wider evidence gathered through our literature review. A study on the effect of the mHealth South African initiative MomConnect – an mHealth educational intervention of the NDoH that sends health information through SMS messages – found that MomConnect users had slightly higher vaccination rates for their children when compared to individuals that did not receive the MomConnect service (97%, compared to 94%).⁽¹²²⁾ However, it is important to note that although there was a difference in rate, the difference was not statistically significant.⁽¹²³⁾

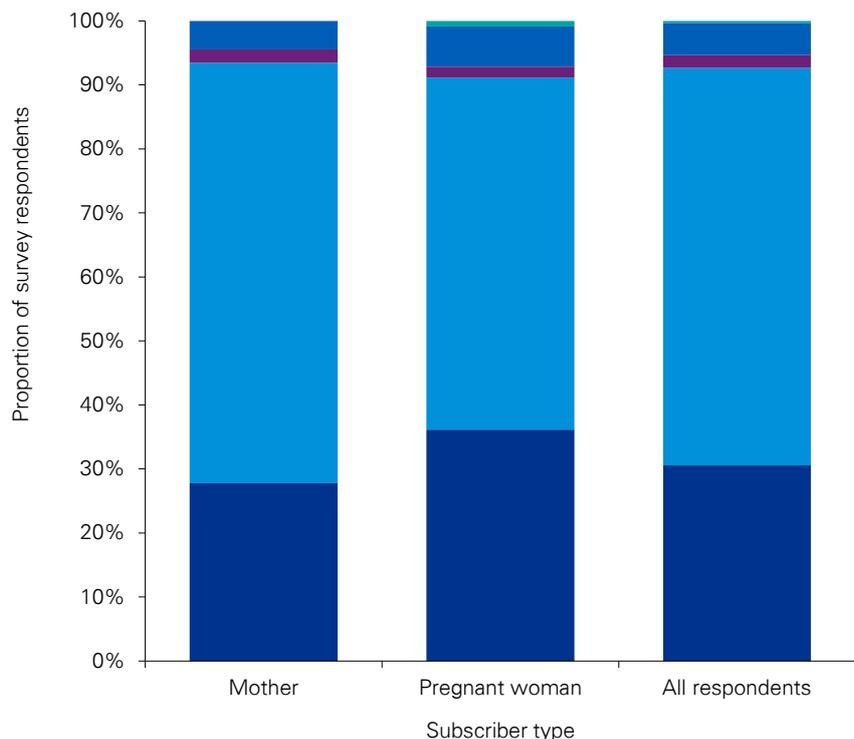
Even if only a small proportion of child and parent immunisation can be attributed to the Mum and Baby service specifically, there is evidence that it would generate important social and economic benefits. Immunisation prevents illnesses, disabilities and death from vaccine-preventable diseases including cervical cancer, diphtheria, hepatitis B, measles, mumps, pertussis (whooping cough), pneumonia, polio, rotavirus diarrhoea, rubella and tetanus.⁽¹²⁴⁾

The benefits of vaccination also extend beyond disease prevention, with immunisation considered by WHO to “make good economic sense” as it reduced inequities and poverty.⁽¹²⁵⁾ Immunisation reduces child mortality and morbidity, and it helps extend life expectancy as well as enabling people to spend more time on productive activities.⁽¹²⁶⁾ The Global Alliance for Vaccines and Immunisations (“GAVI”) describes the routes of impact⁽¹²⁷⁾ (see Figure 23) that vaccinations can have on improving living standards, health and the economic outlook. Specifically, GAVI notes that children that are vaccinated are more likely to have healthier lives with less risk of serious illnesses, which in turn may reduce the cost associated with receiving healthcare services (and from health system to deliver care). Improved health also supports families to have more disposable income and children are able to obtain further schooling (given their lack of illnesses), both of which contribute to economic stability and increase productivity, thus impacting the economy.

A study in the South African Medical Journal explores the benefits associated with childhood vaccination in South Africa. It states that “It is highly likely that coverage of children with the two vaccines will not only reduce child morbidity and mortality, but will also lead to significant productivity gains, contributing to South Africa’s economic development, and benefit unvaccinated South Africans.”⁽¹²⁸⁾

Figure 22: Survey question: “Information from Vodacom’s Mum & Baby has influenced my decision to get vaccinations myself”

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree



**Total number of survey responses⁽¹²⁹⁾ , n=710;
Mother n=472; Pregnant woman n=238**

Source: KPMG analysis of telephone survey responses.

Figure 23: GAVI's cycle of impacts of vaccinations



Source: GAVI 2014, The economic benefits of vaccines

4.3.4 Impacts on attendance at health check-ups

Medical check-ups are important for the detection and treatment of illnesses, as well as for the prevention and communication of health best practices.⁽¹³⁰⁾ A study based on data from the NDoH found that 90% South Africans live within seven kilometres of a health centre and two-thirds live less than 2 kilometres away; however, the study also found that 15% of Black African adults live more than five kilometres from the nearest health centre compared to 4% of whites.⁽¹³¹⁾

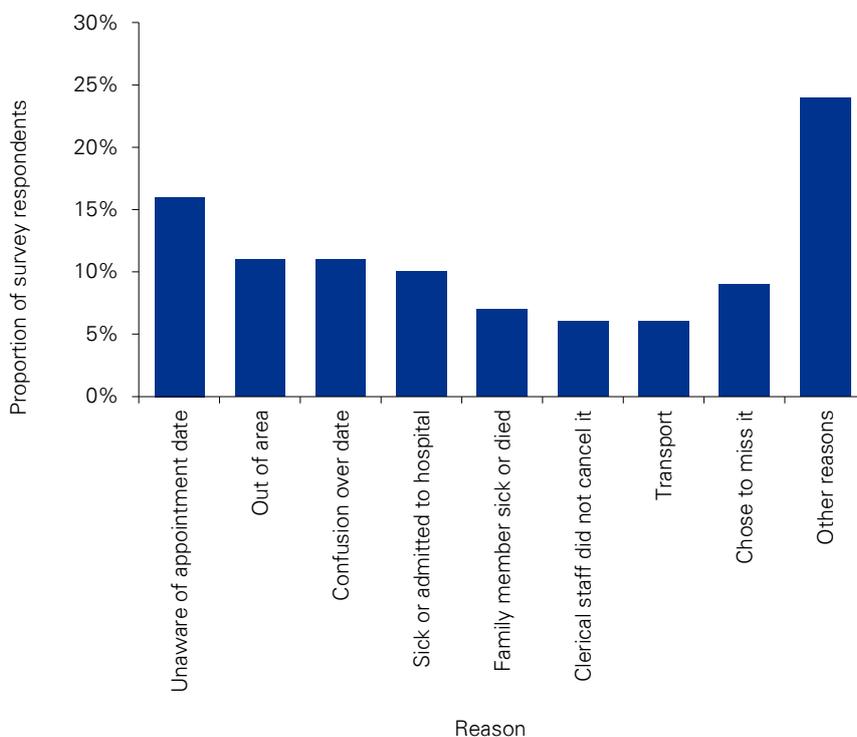
4.3.4.1 Health centre check-up attendance related information provided through the Mum & Baby service

Access to health services is one of the South African government's Batho Pele ('people first') values and principles⁽¹³²⁾, which aims to provide equitable healthcare services to its population. A study of George Hospital outpatients in rural South Africa assessed the reasons for not attending health centre appointments check-ups (see Figure 24) found that, other than 'other reasons', the primary reason for non-attendance was due to being unaware of the appointment date.⁽¹³³⁾

South Africa has a maternal mortality rate of 138 deaths per 100,000 live births, far higher than the rate of 9 per 100,000 live births in the UK.⁽¹³⁴⁾ The National Committee on Confidential Enquiries into Maternal Deaths ("NCCEMD") has suggested that 57% of all the maternal deaths in South Africa were avoidable⁽¹³⁵⁾ and further explored the avoidable factors that were under the control of patient. It found that the delay in accessing medical help and the receipt of no antenatal care were the primary factors.⁽¹³⁶⁾

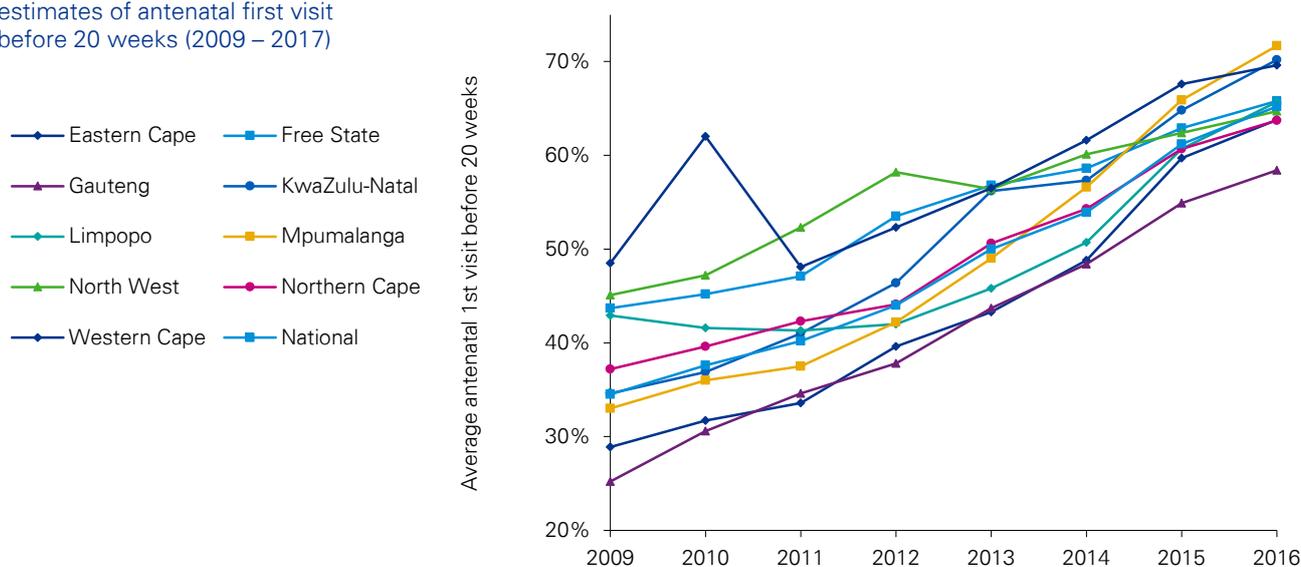
Figure 25 provides estimates of the proportion of pregnant women that attend at least one antenatal check-up before their 20th week of pregnancy, at the national and province level. The overall rate is 65% for all of South Africa, although this varies by province.⁽¹³⁷⁾

Figure 24: Main reasons for non-attendance to health centre appointments



Source: African Journal of Primary Health Care & Family Medicine

Figure 25: National and provincial estimates of antenatal first visit before 20 weeks (2009 – 2017)



Source: Health Systems Trust

The WHO recommends⁽¹³⁹⁾ that the first antenatal check-up occurs before 12 weeks of pregnancy and that pregnant women receive at least a total of 4 antenatal check-ups. Given the current rates of antenatal visits, and as an effort to further increase the rates in particular regions, the NDoH has set a manual⁽¹³⁹⁾ for health centres that describes the guidelines for maternity care in South Africa and provides national strategies for promoting basic antenatal care through health centre visits. In line with this, as described in section 4.3.3.2, MomConnect aims to increase health centre visits by providing programme participants with information on the importance of such visits. Similarly, the Mum & Baby service provides subscribers with educational messages that reinforce the importance of health centre visits. In discussion with MobiStar, we were informed that the Mum & Baby service intends to complement existing services provided by health centres and recognises the importance of seeking out advice from medical professionals.⁽¹⁴⁰⁾

Figure 26 provides examples of SMS messages that the Mum & Baby service sends to its subscribers to remind them to visit health centres.

Figure 26: Examples of SMS message delivered to Mum & Baby subscribers



Check that your partner has booked her clinic visit while she is pregnant as well as once the baby is here. These visits are very important.

– Sent to partners



Your baby is the size of a small bean! It's a good time to visit the clinic if you haven't already. Ask for a confidential HIV test.

– Sent to pregnant women



Have you been to the clinic recently? It's a good idea to visit the clinic with your Road to Health card and ask about the Vitamin A baby needs from 9 months.

– Sent to mothers

Source: MobiStar

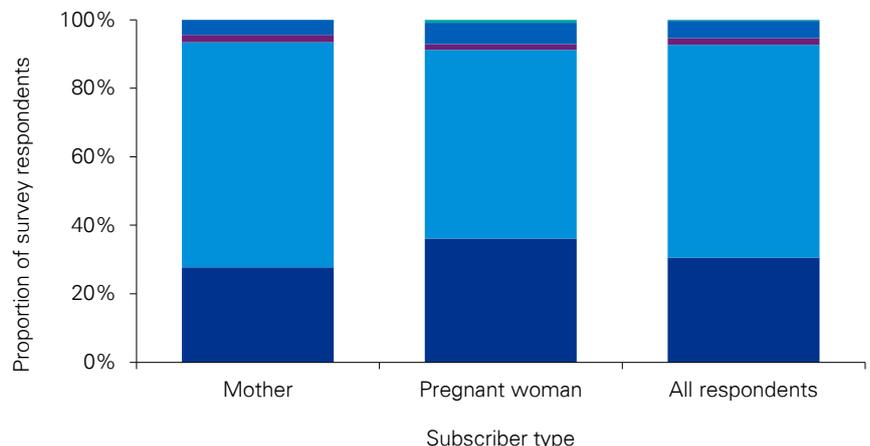
Additionally, the mobisite includes content to further reinforce the importance of health centres.

4.3.4.2 Findings in relation to the extent to which the Mum & Baby has impacted health centre check-up attendance rates

As shown in Figure 27, our telephone survey results indicate that 61% of all mother and pregnant women respondents (63% and 55% respectively) agreed that the information from the Mum & Baby service influenced their decision to attend a health centre for check-ups. A further 36% of these respondents (33% of mothers and 42% of pregnant women) strongly agreed with this. Notably, pregnant women were more likely to agree that the information provided by the Mum & Baby service had impacted their decision to attend a health centre when compared to women. This may be driven by the fact that antenatal visits are more numerous when compared to post-natal check-ups.

Figure 27: Survey question: "Information from Vodacom's M&B has influenced my decision to visit a health centre for check-ups"

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree



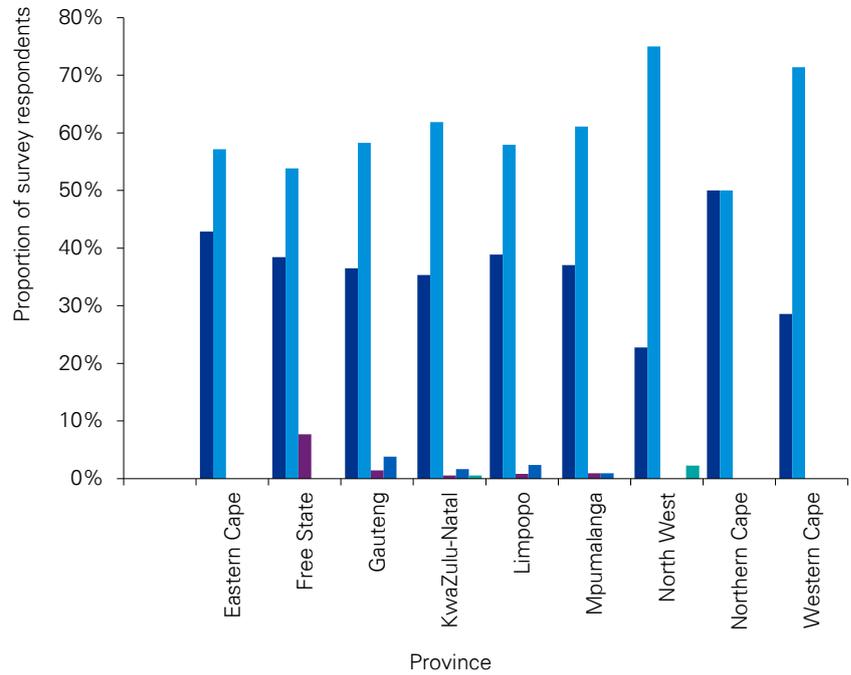
**Total number of survey responses⁽¹⁴¹⁾, n=712;
Mother n=474; Pregnant woman n=238**

Source: KPMG analysis of telephone survey responses.

Figure 28 below shows the responses across provinces in South Africa. We found no statistically significant variation in responses, however, it is important to note that this is largely due to the low number of completed surveys for some provinces, particularly those that account for a small proportion of overall Mum & Baby subscribers.

Figure 28: Survey question:
 “Information from Vodacom’s Mum & Baby has encouraged me to visit a health centre”

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree



Total number of survey responses⁽¹⁴¹⁾, n=712⁽¹⁴²⁾

Source: KPMG analysis of telephone survey responses.

Additional insights in terms of the usefulness of the information provided in relation to health centre check-ups and antenatal visits were obtained through the focus groups. Participants at the focus group in Gauteng largely indicated that they had used the information reminding them about hospital check-ups. This was also the case for the participants at the focus groups in Western Cape and Mpumalanga, although Western Cape focus group participants generally said that they already knew about visiting the hospital for check-ups without the information from the Mum & Baby service. Also, none of these participants had used the information about antenatal care visits, although similar to the information about breastfeeding, this is likely to be due to the age of their children and the relevance of the information to them when they had already passed this stage.

Similar to the findings noted in previous sections, if individuals would have attended check-ups without having received the reminders from the Mum & Baby service, the outcomes and impacts associated with this attendance cannot be attributed to the Mum & Baby service. While some of the focus group findings suggest this may be the case, the findings from the more wide-reaching telephone survey indicate that the information did have some influence on attendance, although the extent of this influence cannot be inferred from our research.

There is strong empirical evidence⁽¹⁴³⁾ from a number of studies that health centre check-ups have positive health impacts. Specifically, mHealth interventions with features such as check-up reminders may raise the number of health centre check-ups. For example, findings from a study of the Mom Connect programme⁽¹⁴⁴⁾ (an mHealth intervention with similar-type of offerings to the Mum & Baby service) also in place in South Africa, which compared the utilisation of antenatal care visits for registrants of the Mom Connect programme with non-programme participants found that the intervention may have played a role in increasing higher health centre check-up rates.

If the Mum & Baby service also increases utilisation of mother and baby health checks, as the evidence from our research points to, there are likely to be wider social and economic impacts associated with this. These are likely to include improved health outcomes in a range of areas. For example, according to the WHO⁽¹⁴⁵⁾, health centre check-ups facilitate the opportunity to discuss health issues with healthcare professionals and seek remediation for issues that impact pregnant women and mothers.⁽¹⁴⁶⁾

Additionally, there is evidence that antenatal care visits are vital for mothers and pregnant women, as visits in the early months of pregnancy can help detect HIV and treatment can be started, therefore reducing the probability for babies to contract the illness.⁽¹⁴⁷⁾ Early attendance to health care visits allows doctors to detect and treat other health conditions which pregnant woman may develop, including anaemia and high blood pressure.⁽¹⁴⁸⁾

Similar to the impacts associated with increased immunisation rates (discussed in section 4.3.3.2), to the extent to which health outcomes are improved for the mother and/or child as a result of utilisation of these consultations and check-ups, there will similarly be wider socio-economic impacts. For example, there may be reduced dependency on health care resources to treat illnesses and the subsequent time and monetary savings associated with a healthier population can result in an increase in economic benefits (e.g. greater employment productivity and earnings).⁽¹⁴⁹⁾



05 Concluding remarks

Section highlights:

- This study provides strong evidence of the usefulness of the Mum & Baby service in South Africa, in terms of providing subscribers with new information relevant to their, and their children's, health and wellbeing.
- It also indicates that the content provided has influenced, to some extent, the behaviours of subscribers, resulting in them taking actions to improve their own and their child's health.
- However, as the large majority of subscribers only receive the content through the SMS messages, and do not access the more detailed information and tools available on the mobile optimised website, the potential socio-economic impacts of the scheme are not currently being maximised.



For the approximately 1.2 million⁽¹⁵⁰⁾, Vodacom subscribers to the Mum & Baby service in South Africa, this study provides strong evidence that the maternal, neo-natal, child, and general health and wellbeing information that they access, predominantly via SMS messages, is generally considered valuable, in terms of its usefulness and teaching subscribers new information.

The large majority of subscribers we surveyed, be they mothers, pregnant women or their partners, reported taking actions to improve their own and their child's health as a result of the information received via the Mum & Baby service. The survey responses, in some case supported through the more in-depth information gathered in semi-structured focus groups with a small total number of participants, indicated that the information provided through the SMS messages had influenced decisions for the majority of subscribers in terms of breastfeeding, immunisation and attendance at health centre check-ups. Wider evidence⁽¹⁵¹⁾ obtained through our literature review highlights the role that each of these play in improving health outcomes for children, and in some cases their mothers, as well as the wider socio-economic effects they can generate. Such impacts include extending life expectancy and enabling people to spend more time on productive activities⁽¹⁵²⁾, increasing families' disposable income given a reduction in health costs (from lack of illnesses) and increasing child attendance at school⁽¹⁵³⁾ and possible causal effects of maternal and child health outcomes on GDP⁽¹⁵⁴⁾ economic stability and productivity⁽¹⁵⁵⁾.

The evidence from the study is limited in terms of the extent to which any increase in immunisation rates, breastfeeding rates and duration, and attendance at check-ups can be directly attributed to Vodacom and the Mum & Baby service, as subscribers may have taken these actions in any case without receiving the information from the service. However, there is evidence to suggest that it did play a role in the decisions made by at least some parents. And the survey indicated that this was particularly likely to be the case for those subscribers who reported that they would find it difficult to access similar information to that provided by Vodacom, from a single source (some 68% of overall survey respondents).

The study did point to areas where the outcomes and impacts arising from the Mum & Baby service could be enhanced going forward. For example, while the mobisite provides a wealth of additional content for subscribers, only a very small proportion (less than 5%) reported accessing this. The evidence gathered suggests that this could be increased by highlighting that it is free for subscribers to access. By increasing the scope and reach of the health and wellbeing information shared with subscribers, the value of the Mum & Baby service to subscribers, as well as its socio-economic contribution could be enhanced.



06 Appendices



Appendix 1

6.1 Additional details on primary evidence gathering

Our main approach to gathering evidence on the outcomes and impacts of the Mum & Baby service was to conduct a telephone survey of a sample of subscribers across South Africa.

Over the survey period
(31 July – 27 August 2018)

1,139 complete questionnaire
responses were obtained

6.1.1 Approach to gathering evidence through telephone surveys

This survey was developed based on:

- a review of the type of content made available to service subscribers;
- a review of the literature relating to the types of outcomes and impacts that have been generated by other comparable schemes; and
- the potential drivers of different outcomes and impacts that could be attributed to the Mum & Baby specifically, including content accessed, availability of alternative sources of information, and evidence on behavioural changes.

We collaborated and agreed the survey questionnaire with Vodafone and Vodacom so that it was designed to meet their information requirements for the study, prioritising the areas of focus to reflect that there would be a trade-off between the number of questions asked and response rates. We also followed good practice surveying approaches⁽¹⁵⁶⁾ to help to ensure that the insights gained were balanced and objective and the way in which the questions were asked would help to minimise response bias.

As the survey was designed to seek insights from different types of subscribers of the Mum & Baby service, the surveys were tailored to mothers, pregnant women and partners and some question routing was used to reflect how the survey respondents accessed information – through SMS only or also through the mobisite – and the type of content they accessed/used. Additionally, the survey questionnaire was reviewed by KPMG SA and Vodacom so as to account for any local sensitivities around health topics and dialectal/linguistic nuances (e.g. sentence structure). Furthermore, minor modifications to the survey questionnaire were made after the pilot stage of 1,000 calls were conducted to facilitate clearer understanding of the questions e.g. changing some words. No substantive changes were made that would invalidate the initial responses.

The telephone survey was conducted by Interact RDT (“Interact”), a South African-based customer experience and research consultancy and a member of the Southern African Marketing Research Association (“SAMRA”), which was appointed by Vodafone.

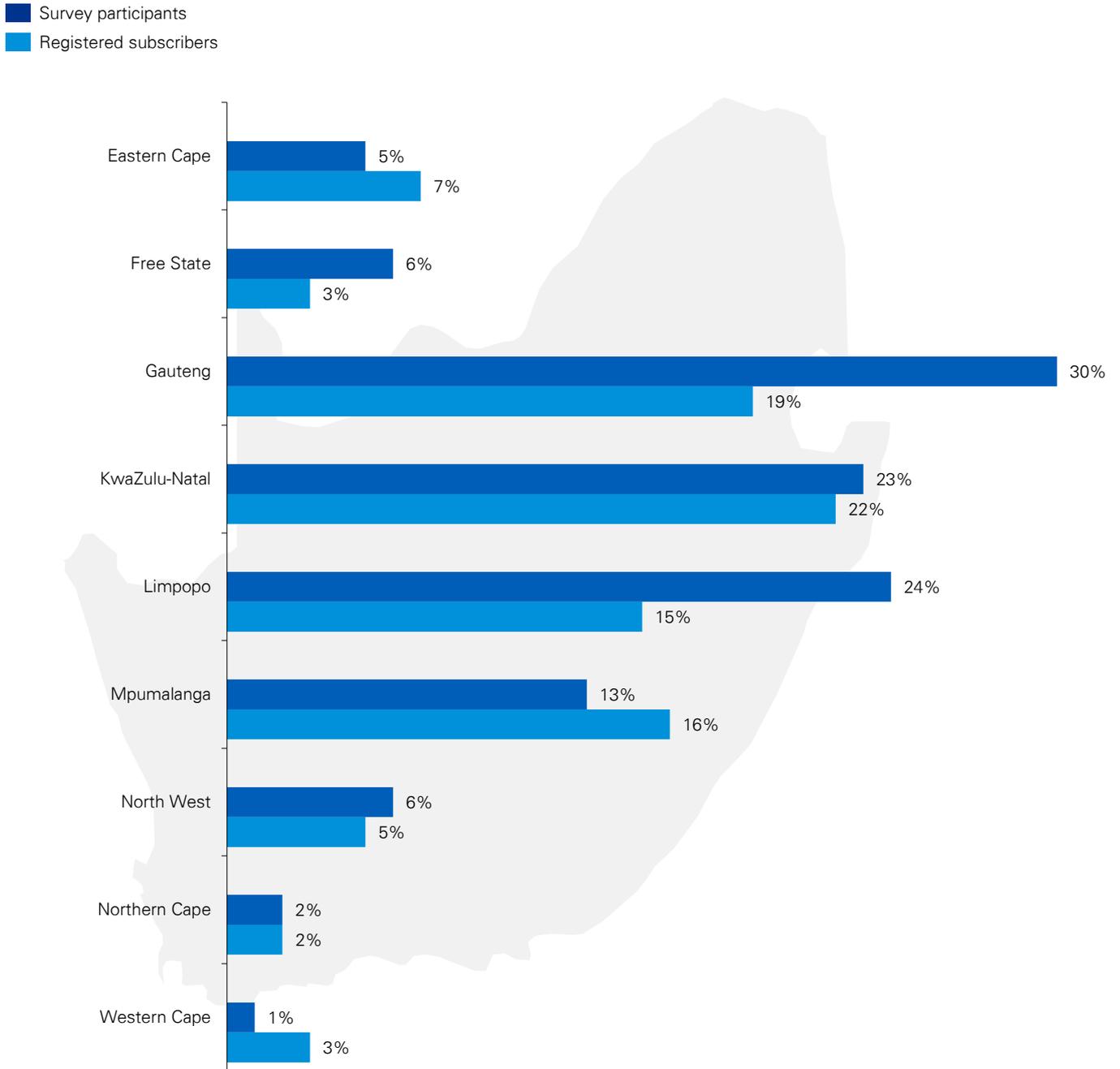
In terms of the target population of respondents to the survey, to reflect the budget and time constraints for the project and to take a proportional approach to gathering evidence, we agreed with Vodafone and Vodacom that the survey should focus on obtaining responses from the largest segments of the overall subscriber population. Based on the Mum & Baby subscriber population, as detailed in section 2.2, we agreed that Interact should target pregnant women, mothers and partners (i.e. husbands and boyfriends) with a cross section of respondents within these groups in terms of geographic location, registered language for content provision and age group. In order for a representative analysis, the survey respondents were broadly distributed to reflect a comparable subscriber distribution (i.e. we aimed to have the number of survey respondents distributed according to the overall population distribution).

Vodacom’s internal research team selected a random sample of subscribers within the agreed subscriber segments, based on the descriptive statistics of the population of the Mum & Baby service subscribers and provided the subscriber details to Interact for them reach out to the subscribers to survey. Interact subsequently made calls to pregnant subscribers in the most populated areas aiming to obtain a representative number of responses prior to continuing to survey other subscriber types and other provinces.

Individuals participating in the surveys were advised at the start of the call that participation in the survey was completely voluntary and would not affect their Vodacom services. Moreover, it was noted to the interviewees that the responses would be anonymised and aggregated. Individual responses would not be reported or shared with Vodacom. The aggregated findings would be reported in a published KPMG report. Individuals were asked to confirm that they understood and consented to this before the survey commenced.

Over the survey period (31 July 2018 – 27 August 2018), 1,139 completed responses to the questionnaire were obtained. The breakdown of survey participants by subscriber characteristics are shown in the Figures below.

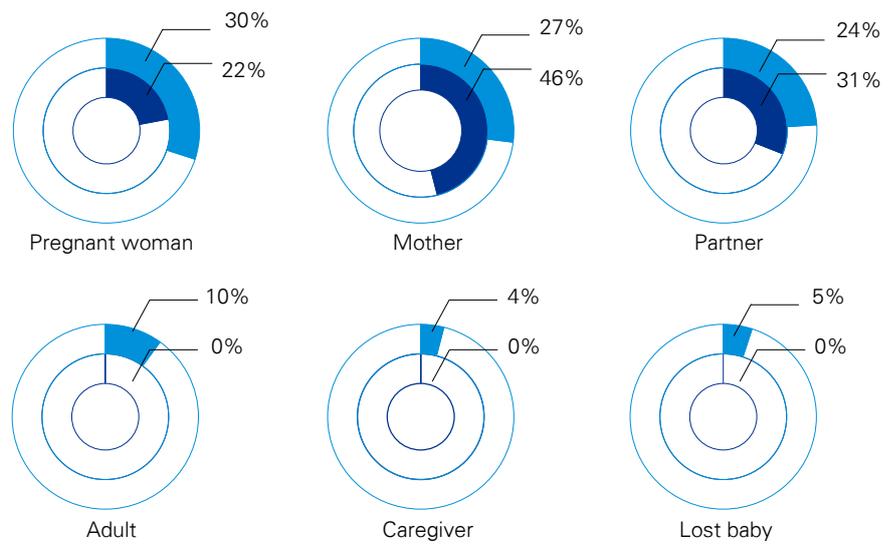
Figure 29: Survey participants and registered subscribers by geographic residence



Source: KPMG analysis of survey responses.

Figure 30: Survey participants and registered subscribers by subscriber type

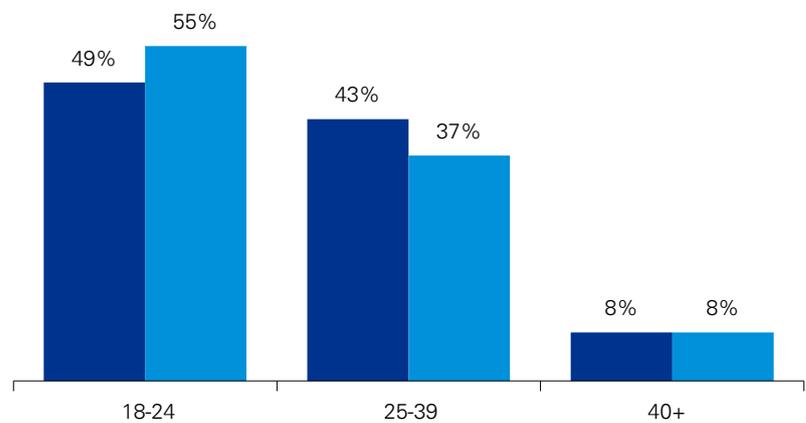
■ Survey participants
■ Registered subscribers



Source: KPMG analysis of survey responses.

Figure 31: Survey participants and registered subscribers by age group

■ Survey participants
■ Registered subscribers



Source: KPMG analysis of survey responses.

Sikwetfulela iMum & Baby ye Vodacom Siyakha

Cala kuyisebentisa mahhala Dayela *117*6862#
(be Prepaid kuphela) noma uvakashele
ku Vodacom/mobi/mumandbaby

Vodacom
Power to you

Kunemigomo nemibanzela



LUS
LWAKHO NE
ONKHE M

The survey achieved an overall response rate of approximately 4%. The number of responses varied across questions given that only specific subscriber types were asked certain questions (e.g. breastfeeding related questions were asked only to pregnant women and mothers). The response rate for questions relating to the mobisite and its content, where only 38 participants (3% of the survey population) responded to such questions were particularly low, reflecting that the remaining 97% of respondents indicated that they did not use the mobisite. Therefore the results gathered from the mobisite questions were not considered as representative of the potential impacts that may result from the Mum & Baby mobisite.

As can be seen from Figure 29 to Figure 31, the responses that we received do not fully align with the overall Mum & Baby subscriber population, across subscriber types, provinces in South Africa, language and age group. This is a direct result of the targeting plan agreed with Vodafone, which adopted a proportional approach to focus survey resources on collecting information from mothers, partners and pregnant women (the subscriber types that account for the largest share of the overall subscriber base).

The distribution across languages and age groups between the subscriber population and the survey respondents were generally similar. However, in terms of the distribution of survey respondents across provinces, we note that there is an over-representation of people from Gauteng and under-representation of people from Limpopo and Mpumalanga.

When analysing the survey responses we tested whether the results were affected by geographic location of the subscriber and whether the profile of respondents may bias the overall results.

The overall sample of 1,139 completed surveys provides statistically significant and representative results at the 5% confidence level with a 5% margin of error, at a national level, across subscribers. However, given that the outcomes and impacts are likely to be driven by subscriber characteristics, such as subscriber type, we also assessed the statistical representativeness of responses at a more granular level e.g. by subscriber type and province. In terms of subscriber types, the following levels of statistical significance of results were achieved:

- responses from mother survey participants can be considered statistically significant and representative of the overall mother subscriber population at the 95% confidence level;
- responses from pregnant women survey participants are only statistically significant and representative of the overall pregnant subscriber population at an 88% confidence level; and
- responses from partner survey participants can be considered statistically significant and representative of the overall partner subscriber population at the 90% confidence level.



While we note that the statistical significance of the responses from pregnant women are only statistically significant at a lower confidence level than for other subscriber types, this may be a result of inaccuracies in the overall subscriber population data. A proportion of mothers (47%) interviewed in the telephone survey registered to the Mum & Baby service when pregnant (so would have registered and been captured in the population data as pregnant) but as they had subsequently had their baby, for the survey they identified themselves as mothers and were captured in the results as this subscriber type.

It is also important to note that we do not have survey results that are statistically representative of the Mum & Baby subscriber population for granular-level sub-sets of subscribers (e.g. pregnant women that speak Xhosa and reside in Limpopo).

6.1.2 Approach to gathering evidence through focus groups

In addition to the telephone survey of Mum & Baby subscribers, we conducted semi-structured focus groups with a sample of subscribers to supplement our survey findings and to provide more in-depth, qualitative information to inform our study.

The focus groups were designed to gather qualitative insights from different types of Mum & Baby service subscribers on the types of content they access, its usefulness and the outcomes and impacts associated with it, both for themselves and for their babies/children.

Ahead of the focus groups being conducted, discussion guides were prepared to align each of the discussions and to collect the relevant information in a systematic and consistent way. Given that different subscriber types (e.g. pregnant women) receive different content via SMS messages and may be expected to be impacted in different ways, similar to the telephone survey, we designed the focus group questions to draw out the outcomes and impacts for different subscriber types. We sought to understand the specific outcomes and impacts that could be attributed to the service and understand how it may have changed their behaviours compared to if the Mum & Baby content was not available to them (i.e. counterfactual scenario). In line with our survey design, for the focus group discussion guides we also followed good practice primary research gathering approaches in designing and conducting focus group interviews, including moderator roles, suggested guidelines, structure of interviews, questions probing, and systematic analysis of qualitative insights.⁽¹⁵⁷⁾

The selection of focus group participants was not designed to be statistically representative of all Mum & Baby subscribers across South Africa (or in the individual provinces) given constraints on the number of participants that could be contacted and interviewed within Vodafone's available budget and timeframe for the project. However, efforts were made to interview a cross section of subscribers, focussing on the largest segments of the overall subscriber population in terms of subscriber type and geographic residence (i.e. province).

Through discussions with Vodafone and Vodacom, we agreed that the following focus groups were to be conducted:

- in Gauteng with mothers and pregnant women to be conducted in English;
- in Limpopo with partners to be conducted in English;
- In KwaZulu-Natal with mothers and pregnant women to be conducted in Zulu;
- in KwaZulu-Natal with partners to be conducted in Zulu;
- in Mpumalanga with mothers and pregnant women to be conducted in English; and
- in Western Cape with mothers and pregnant women to be conducted in English.

The logistics and participant recruitment (e.g. calling participants, venue selection) was undertaken by Foshizi, a South African based market research and strategy company, appointed by Vodafone. Vodacom's internal research team provided Foshizi with a group of subscribers matching the characteristics noted above to recruit focus group participants.

To facilitate recruitment and address an initial lack of interest in participating in the focus groups, Vodacom's internal research team provided Foshizi with information regarding the town where subscribers mostly accessed the Vodacom network (i.e. peak province of mobile use) so as to reduce the potential travel time to focus groups. This provided Foshizi with the information to target subscribers that were likely to reside within a similar geographic area. Additionally, to incentivise Mum & Baby subscribers to attend the focus groups, an initial monetary compensation of R150 South African Rand (i.e. GBP8.74⁽¹⁵⁸⁾) was offered to participants, subsequently increased to R200 South African Rand (i.e. GBP11.65⁽¹⁵⁹⁾) in an effort to further increase participation after conducting the first focus group.

In total we conducted 6 focus groups, lasting for around 90 minutes each, with a total of 42 participants, over the period of 13 July 2018 – 02 August 2018.

Similar to the phone survey, participants were advised at the start of the session that responses to questions were completely voluntary, responses would be anonymised and they were free to remove themselves from the discussion at any time or contact the lead researcher to request responses to be withdrawn from the study.

As with the telephone survey, we note that there may be bias in the evidence gathered through the focus groups, for example sample selection bias, as a result of willingness to participate in the focus groups, and self-reporting bias. Our interpretation of the evidence gathered, detailed in section 4, reflects on this.



Appendix 2

Table 3: Survey question – How often do you receive and read the SMS from Vodacom’s Mum & Baby?

	Most days	A few times a week	Once a week	A couple of times a month	Less than this
All respondents	15%	40%	31%	9%	4%

Source: KPMG analysis of survey responses.

Table 4: Survey question – How useful are the SMS received from Vodacom’s Mum & Baby for learning new information about your and your children’s health and wellbeing?

	Very useful	Useful	Somewhat useful	Not useful
All respondents	70%	27%	2%	1%

Source: KPMG analysis of survey responses.

Table 5: Survey question – If you did not get Vodacom’s M&B SMS messages, how difficult would it be for you to get similar information from a single place?

	Very difficult	Difficult	Neither difficult nor easy	Easy	Very easy
Mother	36%	26%	6%	29%	4%
Partner	41%	33%	8%	17%	0%
Pregnant woman	40%	32%	7%	19%	2%
All respondents	38%	30%	7%	23%	2%

Source: KPMG analysis of survey responses.

Table 6: Survey question - "I have taken actions using information from Vodacom's M&B to improve my child's health"

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Mother	35%	63%	1%	1%	0%
Partner	38%	58%	1%	2%	0%
Pregnant woman	42%	56%	2%	0%	0%
All respondents	38%	60%	1%	1%	0%

Source: KPMG analysis of survey responses.

Table 7: Survey question: "I have taken actions using information from Vodacom's M&B to improve my (the mother of my child's) health"

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Mother	33%	63%	1%	2%	0%
Partner	37%	59%	1%	3%	0%
Pregnant woman	44%	56%	0%	0%	0%
All respondents	37%	60%	1%	2%	0%

Source: KPMG analysis of survey responses.

Table 8: Survey question: "Information from Vodacom's Mum & Baby has influenced my decision to breastfeed my child"

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Mother	34%	62%	1%	3%	0%
Pregnant woman	41%	52%	0%	5%	1%
All respondents	36%	59%	1%	4%	0%

Source: KPMG analysis of survey responses.

Table 9: Survey question: "Information from Vodacom's Mum & Baby has influenced my decision vaccinate my child"

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Mother	31%	66%	1%	2%	0%
Partner	37%	59%	2%	3%	0%
Pregnant woman	35%	57%	2%	6%	0%
All respondents	34%	62%	1%	3%	0%

Source: KPMG analysis of survey responses.

Table 10: Survey question: "Information from Vodacom's Mum & Baby has influenced my decision to get vaccinations myself"

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Mother	28%	66%	2%	4%	0%
Pregnant woman	36%	55%	2%	6%	1%
All respondents	31%	62%	2%	5%	0%

Source: KPMG analysis of survey responses.

Table 11: Survey question: "Information from Vodacom's M&B has influenced my decision to visit a health centre for check-ups"

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Mother	33%	63%	1%	3%	0%
Pregnant woman	42%	55%	1%	0%	1%
All respondents	36%	61%	1%	2%	0%

Source: KPMG analysis of survey responses.

Table 12: Survey question: "Information from Vodacom's Mum & Baby has encouraged me to visit a health centre"

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Eastern Cape	43%	57%	0%	0%	0%
Free State	38%	54%	8%	0%	0%
Gauteng	36%	58%	1%	4%	0%
KwaZulu-Natal	35%	62%	1%	2%	1%
Limpopo	39%	58%	1%	2%	0%
Mpumalanga	37%	61%	1%	1%	0%
North West	23%	75%	0%	0%	2%
Northern Cape	50%	50%	0%	0%	0%
Western Cape	29%	71%	0%	0%	0%

Source: KPMG analysis of survey responses.

Appendix 3

- Note: (23) Vodafone Group Plc. 2018, Sustainable Business Report, <https://www.vodafone.com/content/index/about/sustainability/womens-empowerment/index.html>
- (24) Global System for Mobile Communication 2018, Connected Women: The Mobile Gender Gap Report 2018, <https://www.gsma.com/mobilefordevelopment/connected-women/the-mobile-gender-gap-report-2018/>
- (25) Vodafone Group Plc. 2018, Sustainable Business Report, <https://www.vodafone.com/content/index/about/sustainability/womens-empowerment/index.html>
- (26) Vodafone Group Plc. 2018, Sustainable Business Report, <https://www.vodafone.com/content/index/about/sustainability/womens-empowerment/index.html>
- (27) Vodafone Group Plc. 2018, Sustainable Business Report, <https://www.vodafone.com/content/index/about/sustainability/womens-empowerment/index.html>
- (28) Mondia Media registration data received on 7 September 2018
- (29) UNICEF South Africa, See: https://www.unicef.org/southafrica/survival_devlop_759.html
- (30) Africa Progress Panel 2010, Maternal Health: Investing in the Lifeline of Healthy Societies & Economies, <http://www.who.int/>
- (31) Statistics South Africa 2017, Public Healthcare: How much per person?, <http://www.statssa.gov.za/?p=10548>
- (32) UNICEF South Africa, See: https://www.unicef.org/southafrica/survival_devlop_759.html
- (33) UNICEF South Africa 2011, Saving children and mothers, https://www.unicef.org/southafrica/SAF_overview_survival.pdf
- (34) BMC Health Services Research 2014, Distance decay and persistent health care disparities in South Africa, <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-014-0541-1>
- (35) Africa Progress Panel 2010, Maternal Health: Investing in the Lifeline of Healthy Societies & Economies, http://www.who.int/pmnch/topics/maternal/app_maternal_health_english.pdf
- (36) Vodafone Group Plc. 2018, Sustainable Business Report, <https://www.vodafone.com/content/index/about/sustainability/womens-empowerment/index.html>
- (37) MEASURE2017, Gauging the Impact of MomConnect on Maternal Health Service Utilisation, https://www.measureevaluation.org/resources/publications/tr-17-210/at_download/document
- Journal of Global Health 2016, Effectiveness of mHealth interventions for maternal, new-born and child health in low- and middle-income countries: Systematic review and meta-analysis, <http://www.jogh.org/documents/issue201601/jogh-06-010401.pdf>
- BMH Health Services Research 2017, Role of mHealth applications for improving antenatal and postnatal care in low and middle income countries: a systematic review, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5678803/>
- (38) WHO 2013, Supporting pregnant women and new mothers in South Africa, <http://www.who.int/>
- (39) NDoH, See: <http://www.health.gov.za/index.php/mom-connect>
- (40) Telenor 2012, mHealth partnership supports mother-infant health, <https://www.telenor.com/mhealth-partnership-supports-motherinfant-health/>
- (41) OECD 2010, DAC Guidelines and Reference Series: Quality Standards for Development Evaluation, <http://www.oecd.org/derec/guidelines.htm>
- (42) UK HM Treasury 2011. The Magenta Book: Guidance for evaluation, <https://www.gov.uk/government/publications/the-magenta-book>
- (43) Social value UK 2012, A guide to social return on investment, <http://www.socialvalueuk.org/resources/sroi-guide/>
- (44) Vodacom 2018, Siyakha, Strategy and comp review, received from Vodacom on 26 April 2018.
- (45) SIM refers to the subscriber identify module that serves to house information to identify and authenticate subscribers by mobile network providers.
- (46) USSD is a communications medium through which mobile telephones interact with the mobile network operator's system (e.g. Vodafone). Unlike SMS messages, USSD messages connect in real-time with the network operator's system during the USSD session, and remains open thus allowing a two-way exchange of information.
- (47) Afrikaans, English, Sesotho, Xhosa, Zulu.
- (48) Setswana, Sepedi, Xitsonga.
- (49) Vodacom 2018, Mum & Baby presentation on content across mobi & USSD, received from Vodacom on 06 July 2018.
- (50) Following the birth of their child pregnant women receive pertinent content of mothers at the appropriate life stage.
- (51) Mondia Media registration data received on 7 September 2018.
- (52) Statistics South Africa 2011, Census 2011, <https://www.statssa.gov.za/publications/P03014/P030142011.pdf>
- (53) Data Data were not available for the initial period of the service. Mondia Media indicated that the ability to track the number of times a mobisite resource (e.g. article) was accessed only became available from March 2018.
- (54) The Mum & Baby service tutorials are only available to premium subscribers.
- (55) UK HM Treasury 2011, The Magenta Book: Guidance for evaluation. <https://www.gov.uk/government/publications/the-magenta-book>
- (56) OECD 2010, DAC Guidelines and Reference Series: Quality Standards for Development Evaluation, <http://www.oecd.org/derec/guidelines.htm>
- (57) UK HM Treasury 2011, The Magenta Book: Guidance for evaluation. <https://www.gov.uk/government/publications/the-magenta-book>
- (58) Social value UK 2012, A guide to social return on investment, <http://www.socialvalueuk.org/resources/sroi-guide/>
- (59) This is a systematic and visual way of presenting the interactions between inputs, activities and outputs, outcomes and impacts.
- (60) WHO 2011, mHealth – New horizons for health through mobile technologies, <http://www.who.int/>
- (61) The changes in health presented in our study are self-reported by the telephone survey participants and focus group participants.
- (62) European Commission 2014, Guidance document on monitoring and evaluation: Concepts and recommendations, http://ec.europa.eu/regional_policy/sources/docoffic/2014/working/wd_2014_en.pdf
- (63) KPMG 2018, Notes from discussion with MobiStar on 17 July 2018
- (64) KPMG 2018, Notes from discussion with MobiStar on 17 July 2018
- (65) WHO, See: <http://www.who.int/>
- (66) In the UK there are on average 8.4 nursing and midwifery personnel for every 1,000 people.
- (67) Africa Progress Panel 2010, Maternal Health: Investing in the Lifeline of Healthy Societies & Economies, http://www.who.int/pmnch/topics/maternal/app_maternal_health_english.pdf
- (68) WHO 2010, Increasing access to health workers in remote and rural areas through improved retention, <http://www.who.int/>
- (69) KPMG 2018, Notes from discussion with MobiStar on 17 July 2018.
- (70) Note that the number of survey responses may vary by question and from the total number of completed surveys (1,139) as a result of certain questions being asked to a subset of the population (e.g. only pregnant women and mothers were asked about breastfeeding) or unanswered questions.
- (71) That is, there was no statistical difference when comparing the respective distributions. This was conducted using T-test and a Mann-Whitney test, to account for non-parametric distributions in responses.
- (72) Note that the number of survey responses may vary by question and from the total number of completed surveys (1,139) as a result of certain questions being asked to a subset of the population (e.g. only pregnant women and mothers were asked about breastfeeding) or unanswered questions.
- (73) Note that the number of survey responses may vary by question and from the total number of completed surveys (1,139) as a result of certain questions being asked to a subset of the population (e.g. only pregnant women and mothers were asked about breastfeeding) or unanswered questions.
- (74) Note that the number of survey responses may vary by question and from the total number of completed surveys (1,139) as a result of certain questions being asked to a subset of the population (e.g. only pregnant women and mothers were asked about breastfeeding) or unanswered questions.
- (75) Note that the number of survey responses may vary by question and from the total number of completed surveys (1,139) as a result of certain questions being asked to a subset of the population (e.g. only pregnant women and mothers were asked about breastfeeding) or unanswered questions.

- Note:
- (76) Cheng et al 2008, Anxiety levels in women undergoing prenatal maternal serum screening for Down Syndrome: the effect of a fast reporting system by mobile phone short-message service.
 - (77) Feroz et al 2017, Role of mHealth applications for improving antenatal and postnatal care in low and middle income countries: a systematic review.
 - (78) Flax et al 2014, Integrating group counselling, cell phone messaging, and participant-generated songs and dramas into a microcredit program increases Nigerian women's adherence to international breastfeeding recommendations.
 - Jiang et al 2014, Effect of short message service on infant feeding practice: findings from a community-based study in Shanghai, China.
 - (79) Khorshid et al 2017, The effect of SMS messaging on the compliance with iron supplementation among pregnant women in Iran: A randomized controlled trial.
 - (80) WHO 2018, Millennium Development Goals 4 and 5, <http://www.who.int/>
 - (81) Amiri A., Gerdtham, U. 2013, Impact of Maternal and Child Health on Economic Growth: New Evidence Based on Granger Causality and DEA Analysis, http://www.who.int/pmnch/topics/part_publications/201303_Econ_benefits_econometric_study.pdf
 - (82) The World Bank 2019, World Bank Country and Lending Groups, <<https://datahelpdesk.worldbank.org/knowledgebase/articles/906519>>
 - (83) Amiri A., Gerdtham, U. 2013, Impact of Maternal and Child Health on Economic Growth: New Evidence Based on Granger Causality and DEA Analysis, <http://www.who.int/pmnch/topics/part_publications/201303_Econ_benefits_econometric_study.pdf>
 - (84) National Department of Health, Breastfeeding: investing in our children's future is everyone's business, <http://www.health.gov.za/index.php/hiv-aids-tb-and-maternal-and-child-health/category/163-women-s-maternal-and-reproductivehealth?download=1200:fact-sheet-breastfeeding-investing-in-our-childrens-future>
 - (85) UNICEF 2015, See: https://www.unicef.org/nutrition/index_24824.html
 - (86) Statistics South Africa 2016, South Africa Demographic and Health Survey 2016: Key Indicator Report, <https://www.statssa.gov.za/publications/Report%2003-00-09/Report%2003-00-092016.pdf>
 - (87) OECD 2009, Breastfeeding rates, <https://www.oecd.org/els/family/43136964.pdf>
 - (88) Statistics South Africa 2016, South Africa Demographic and Health Survey 2016: Key Indicator Report, <https://www.statssa.gov.za/publications/Report%2003-00-09/Report%2003-00-092016.pdf>
 - (89) Mondia Media usage data from June 2017 to August 2018.
 - (90) The usage related information is cumulative and does not account for the number of times a mobile site resource was accessed at a unique subscriber level (e.g. a pregnant woman accessing an article four times would be counted all four times).
 - (91) Note that the number of survey responses may vary by question and from the total number of completed surveys (1,139) as a result of certain questions being asked to a subset of the population (e.g. only pregnant women and mothers were asked about breastfeeding) or unanswered questions.
 - (92) Flax et al 2014, Integrating group counselling, cell phone messaging, and participant-generated songs and dramas into a microcredit program increases Nigerian women's adherence to international breastfeeding recommendations
 - Jiang et al 2014, Effect of short message service on infant feeding practice: findings from a community-based study in Shanghai, China
 - sellen et al 2013, A randomized controlled trial indicates benefits of cell phone based peer counselling to support exclusive breastfeeding in Kenya
 - (93) Journal of Global Health 2016, Effectiveness of mHealth interventions for maternal, new-born and child health in low- and middle-income countries: Systematic review and meta-analysis, <http://www.jogh.org/documents/issue201601/jogh-06-010401.pdf>
 - (94) Flax et al 2014, Integrating group counselling, cell phone messaging, and participant-generated songs and dramas into a microcredit program increases Nigerian women's adherence to international breastfeeding recommendations
 - (95) The value was calculated by multiplying the number of pregnant women and mothers subscribers (708,131) with the percent of pregnant women and mothers survey participants that agreed or strongly agreed (95%) when asked if the Mum & Baby service impacted their decision to breastfeed and the percent of pregnant women and mothers survey participants that received and read the SMS messages at least a few times a week or more (45%). 708,131 subscribers * 95% * 45% = 302,726 subscribers.
 - (96) WHO 2013, Long-term effects of breastfeeding: a systematic review, <http://www.who.int/>
 - (97) United Nations Children's Fund (UNICEF) June 2012
 - (98) Statistics South Africa 2017, Mid-Year Population Estimates, <https://www.statssa.gov.za/publications/P0302/P03022017.pdf>
 - (99) The Lancet 2008, Maternal and Child Undernutrition: global and regional exposures and health consequences
 - (100) Lancet 2013, Maternal and child undernutrition and overweight in low-income and middle-income countries, https://www.unicef.org/ethiopia/1_Maternal_and_child_undernutrition_and_overweight_in.pdf
 - (101) Lancet 2013, Maternal and Child Undernutrition, <https://www.thelancet.com/pb/assets/raw/Lancet/stories/series/nutrition-eng.pdf>
 - (102) WHO 2013, Long-term effects of breastfeeding: a systematic review <http://www.who.int/>
 - (103) American Journal of Clinical Nutrition. 2006, Does breastfeeding influence risk of type 2 diabetes in later life? A quantitative analysis of published evidence
 - (104) A. Bener et al 2007, Role of breast feeding in primary prevention of asthma and allergic diseases in a traditional society
 - (105) M. Karimi et al 2016, Breastfeeding as a Protective Effect Against Childhood Leukaemia and Lymphoma, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5253205/>
 - (106) WHO 2018, Immunization Coverage, <https://www.unicef.org.uk/babyfriendly/about/benefits-of-breastfeeding/>
 - (107) A. M. Kazi 2017, The role of mobile phone-based interventions to improve routine childhood immunisation coverage, [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(17\)30088-8/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(17)30088-8/fulltext)
 - (108) Fedhealth, Vaccine schedules for South Africa, <https://www.fedhealth.co.za/healthy-living-tips/httpwww-fedhealth-co-zawp-contentuploads2016042016-vaccine-schedule-for-sa-01-jpg/>
 - (109) Department of Health (Western Cape Government) 2016, Immunisation, <https://www.westerncape.gov.za/service/immunisation>
 - (110) Health System Trust, Immunisation, [http://www.hst.org.za/publications/District%20Health%20Barometers/8%20\(Section%20A\)%20Immunisation.pdf](http://www.hst.org.za/publications/District%20Health%20Barometers/8%20(Section%20A)%20Immunisation.pdf)
 - (111) Centre for vaccines and immunology 2016, Vaccine information for parents and caregivers, http://www.nicd.ac.za/assets/files/NICD_Vaccine_Booklet_D132_FINAL.pdf
 - (112) This is defined as the proportion of children that receive immunisations as recommended by a country's immunisation schedule.
 - (113) UNICEF South Africa, Immunization+, https://www.unicef.org/southafrica/health_nutrition_759.html
 - (114) Health System Trust, Immunisation, [http://www.hst.org.za/publications/District%20Health%20Barometers/8%20\(Section%20A\)%20Immunisation.pdf](http://www.hst.org.za/publications/District%20Health%20Barometers/8%20(Section%20A)%20Immunisation.pdf)
 - (115) UNICEF 2011, Facts on children, https://www.unicef.org/southafrica/SAF_resources_factschildrens22.pdf
 - (116) The immunisation coverage rate for children under one reports the proportion of children under one year who completed the primary course (i.e. recommended set of vaccinations) of immunisation compared to the overall population of children under one.
 - (117) WHO 2018, Immunization coverage, <http://www.who.int/>
 - (118) List of countries include: Afghanistan, Angola, the Democratic Republic of the Congo, Ethiopia, India, Indonesia, Iraq, Nigeria, Pakistan and South Africa
 - (119) The last week of April each year is marked by WHO and partners as World Immunization Week. It aims to promote the use of vaccines to protect people of all ages against disease.
 - (120) The value was calculated by multiplying the number of subscribers (1,235,637) with the percent of survey participants that agreed or strongly agreed (96%) when asked if the Mum & Baby service impacted their decision to vaccinate their child and the percent of survey participants that received and read the SMS messages at least a few times a week or more (55%). 1,235,637 * 96% * 55% = 652,416 subscribers.

- Note: (121) Note that the number of survey responses may vary by question and from the total number of completed surveys (1,139) as a results of certain questions being asked to a subset of the population (e.g. only pregnant women and mothers were asked about breastfeeding) or unanswered questions.
- (122) MEASURE2017, Gauging the Impact of MomConnect on Maternal Health Service Utilisation, https://www.measureevaluation.org/resources/publications/tr-17-210/at_download/document
- (123) MEASURE2017, Gauging the Impact of MomConnect on Maternal Health Service Utilisation, https://www.measureevaluation.org/resources/publications/tr-17-210/at_download/document
- (124) WHO 2008, Vaccination greatly reduces disease, disability, death and inequity worldwide, <http://www.who.int/>
- (125) WHO 2008, Vaccination greatly reduces disease, disability, death and inequity worldwide, <http://www.who.int/>
- (126) WHO, UNICEF, World Bank 2009, State of the world's vaccines and immunization, https://www.unicef.org/immunization/files/SOWVI_full_report_english_LR1.pdf
- (127) GAVI 2014, Economic benefits of vaccines, <https://www.gavi.org/library/audio-visual/presentations/economic-benefits-of-vaccines/>
- (128) South African Medical Journal 2008, Accounting for the full benefits of childhood vaccination in South Africa, http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S0256-95742008001100011
- (129) Note that the number of survey responses may vary by question and from the total number of completed surveys (1,139) as a results of certain questions being asked to a subset of the population (e.g. only pregnant women and mothers were asked about breastfeeding) or unanswered questions.
- (130) WHO 1999, Reduction of maternal mortality: a joint WHO/UNFPA/UNICEF/World Bank statement, http://www.who.int/D._Maine_1991_Safe_motherhood_programs_options_and_issues, https://www.researchgate.net/publication/295010065_Safe_Motherhood_Programs_Options_and_Issues
- (131) Southern Africa Labour and Development Research Unit 2013, Distance as a barrier to health care access in South Africa, <http://www.opensaldru.uct.ac.za/handle/11090/613>
- (132) Republic of South Africa 2007, Report on the Evaluation of the Implementation of the Batho Pele Principle of Consultation, https://www.gov.za/sites/default/files/eval_implementation_consult_0.pdf
- (133) African Journal of Primary Health Care & Family Medicine 2017, Improving access to health care in a rural regional hospital in South Africa: Why do patients miss their appointments?, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5387369/>
- (134) WHO, See: <http://www.who.int/>
- (135) National Department of Health South Africa 2014, Saving Mothers: Annual report and detailed analysis of maternal deaths due to non-pregnancy related infections, <http://www.health.gov.za/index.php/shortcodes/2015-03-29-10-42-47/2015-04-30-08-18-10/2015-04-30-08-24-27?download=1825:saving-mothers-report-2014-fxd>
- (136) National Department of Health South Africa 2014, Saving Mothers: Annual report and detailed analysis of maternal deaths due to non-pregnancy related infections, <http://www.health.gov.za/index.php/shortcodes/2015-03-29-10-42-47/2015-04-30-08-18-10/2015-04-30-08-24-27?download=1825:saving-mothers-report-2014-fxd>
- (137) Health Systems Trust 2018, Section A: PMTCT, <http://www.hst.org.za/publications/District%20Health%20Barometers/5%20Section%20A%20PMTCT.pdf>
- (138) WHO 2016, WHO recommendation on antenatal care contact schedules, <https://extranet.who.int/rhl/topics/improving-health-system-performance/who-recommendation-antenatal-care-contact-schedules>
- (139) http://www.health.gov.za/tender/docs/tenders/2018-19/NDOH_07_2018-2019_Maternal-Care-Guidelines-2015_FINAL-21.7.15.pdf
- (140) KPMG 2018, Notes from discussion with MobiStar on 17 July 2018
- (141) Note that the number of survey responses may vary by question and from the total number of completed surveys (1,139) as a results of certain questions being asked to a subset of the population (e.g. only pregnant women and mothers were asked about breastfeeding) or unanswered questions.
- (142) Note that the number of survey responses may vary by question and from the total number of completed surveys (1,139) as a results of certain questions being asked to a subset of the population (e.g. only pregnant women and mothers were asked about breastfeeding) or unanswered questions.
- (143) Eastern Cape 14, Free State 13, Gauteng 211, KwaZulu-Natal 181, Limpopo 126, Mpumalanga 108, North West 44, Northern Cape 8, Western Cape 7.
- (143) J. Hollowell et al 2009, A systematic review of the effectiveness of antenatal care programmes to reduce infant mortality and its major causes in socially disadvantaged and vulnerable women, <https://www.npeu.ox.ac.uk/downloads/files/infant-mortality/Infant-Mortality-Antenatal-Care-Report.pdf>
- BMJ Open 2017, Antenatal care services and its implications for vital and health outcomes of children: evidence from 193 surveys in 69 low-income and middle-income countries, <https://bmjopen.bmj.com/content/7/11/e017122>
- Journal of Family and Reproductive Health 2014, Quality of Antenatal Care in Primary Health Care Centers of Bangladesh <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4266789/>
- (144) MEASURE2017, Gauging the Impact of MomConnect on Maternal Health Service Utilisation, https://www.measureevaluation.org/resources/publications/tr-17-210/at_download/document
- (145) WHO 2006, Antenatal Care, <http://www.who.int/>
- (146) WHO 2006, Antenatal Care, <http://www.who.int/>
- (147) WHO 2006, Antenatal Care, <http://www.who.int/>
- (148) WHO 2006, Antenatal Care, <http://www.who.int/>
- (149) GAVI 2014, Economic benefits of vaccines, <https://www.gavi.org/library/audio-visual/presentations/economic-benefits-of-vaccines/>
- (150) Mondia Media registration data received on September 2018
- (151) National Department of Health, Breastfeeding: investing in our children's future is everyone's business, <http://www.health.gov.za/index.php/hiv-aids-tb-and-maternal-and-child-health/category/163-women-s-maternal-and-reproductivehealth?download=1200:fact-sheet-breastfeeding-investing-in-our-childrens-future>
- UNICEF 2015, See: https://www.unicef.org/nutrition/index_24824.html
- A. M. Kazi 2017, The role of mobile phone-based interventions to improve routine childhood immunisation coverage, [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(17\)30088-8/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(17)30088-8/fulltext)
- WHO 1999, Reduction of maternal mortality: a joint WHO/UNFPA/UNICEF/World Bank statement, <http://www.who.int/reproductivehealth/publications/monitoring/9789241561952/en/>
- (152) WHO, UNICEF, World Bank 2009, State of the world's vaccines and immunization, https://www.unicef.org/immunization/files/SOWVI_full_report_english_LR1.pdf
- (153) GAVI 2014, Economic benefits of vaccines, <https://www.gavi.org/library/audio-visual/presentations/economic-benefits-of-vaccines/>
- (154) Amiri A., Gerdtham, U. 2013, Impact of Maternal and Child Health on Economic Growth: New Evidence Based on Granger Causality and DEA Analysis, http://www.who.int/pmnch/topics/part_publications/201303_Econ_benefits_econometric_study.pdf
- (155) GAVI 2014, Economic benefits of vaccines, <https://www.gavi.org/library/audio-visual/presentations/economic-benefits-of-vaccines/>
- (156) OECD 2012, Measuring Regulatory Performance: A Practitioner's Guide to Perception Surveys, https://www.oecd-ilibrary.org/governance/measuring-regulatory-performance/good-practices-in-survey-design-step-by-step_9789264167179-6-en
- (157) R. Krueger 2002, Designing and Conducting Focus Group Interviews, <https://www.eiu.edu/hec/Krueger-FocusGroupInterviews.pdf>
- R. Krueger 1994, Focus groups: a practical guide for applied research, https://books.google.co.uk/books/about/Focus_Groups.html?id=yrQOQAAMAAJ&source=kp_book_description&redir_esc=y
- (158) From World Bank exchange rate, See: <https://data.worldbank.org/indicator/PA.NUS.FCRF>: R1=\$13.33 and £1=\$0.78. Therefore: (150/13.33) * 0.78=£8.74
- (159) From World Bank exchange rate, See: <https://data.worldbank.org/indicator/PA.NUS.FCRF>: R1=\$13.33 and £1=\$0.78. Therefore: (200/13.33) * 0.78=£11.65

Contact us

Heather Sharp

Director, Economics

T: +44 (0)7917 267216

E: heather.sharp@kpmg.co.uk

Erik Gomez

Manager, Economics

T: +44 (0)7468 751027

E: erik.gomez@kpmg.co.uk

kpmg.com/uk



© 2019 KPMG LLP, a UK limited liability partnership and a member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity. All rights reserved.

Designed by CREATE | CRT106152