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LEARNING BRIEF

The Scale Journey: Lessons Learned from Scaling a Digital Health Tool in Benin

Introduction

Over the previous decade, there has been a huge increase in the introduction of digital tools in the global health space. While many of these tools are promising, a significant share do not make it past the pilot phase. In low- and middle- income countries, investment without sustainable returns can lead to a sense of disenchantment "pilot-itis." The concept of "scale", or deliberate efforts to increase the impact of innovations successfully tested in pilot or experimental projects to benefit more people and to foster policy and program development on a lasting basis[1], has become an increasing focus of the digital health community. However, there isn't yet a robust evidence base defining scale and showing what makes a scale journey successful that implementers can draw from, and no single approach will serve the needs of all digital health tool providers[2].

A shortage of health care workers (HCWs) with maternal and newborn competencies remains a critical challenge for the provision of quality care for mothers and newborns, particularly in low- and middle-income countries[3]. A recent systematic review explores the human resources challenges to quality newborn health at facility level. Poor health care worker (HCW) pre-service education and lack of HCW access to evidence-based guidelines, continuing education, and continuing professional development are among the ten main challenges identified. Bridging the traditional gaps of distance, resources for travel, and busy schedules, digital health tools such as the Safe Delivery App can help alleviate continuing professional development challenges for HCWs and broader health systems.

This brief provides an overview of how Maternity Foundation thinks about scale for the Safe Delivery App. By having a clear shared understanding of what we mean by scale, what the key enablers are, and how to measure scale we can design activities to maximize the likelihood of achieving scale while continuously assessing our progress towards it.

Designing for scale

To extract insights about key enablers of scale, we did a review of activities in Benin guided by the WHO MAPS Toolkit (mHealth Assessment and Planning for Scale). The MAPS toolkit is designed to guide users to think about scale across 6 axes during the three phases: planning, improving and, assessing.

By applying the toolkit on the Benin case, it became evident, that not all the axes are equally relevant for a tool like the Safe Delivery App.
The Safe Delivery App (SDA) has been used by a growing number of users globally since 2017. In the MAPS Toolkit, the area of **groundwork** specifically speaks to ability – or lack thereof – to move towards institutionalization. In the case of the Safe Delivery App, the groundwork was done in 2015 and the core components were developed based on needs in rural Ethiopia. A randomized clinical trial was conducted from September 1, 2013 to February 1, 2015 to determine the effectiveness of the SDA in increasing knowledge and skills in selected clinical areas and health outcomes[4].

The Safe Delivery App

The Safe Delivery App ("the App") is a well-establish mLearning tool developed by Maternity Foundation, the University of Copenhagen, and the University of Southern Denmark. The App enables HCWs to refresh or gain critical knowledge on global guidance around basic emergency obstetric and newborn care (BEmONC) as well as other critical topics in maternal and newborn service provision. The App contains topical modules containing WHO-aligned clinical guidelines that are regularly updated, free, and fully downloadable so that content is accessible even in remote and non-connected areas. The App also includes a self-directed learning platform ("MyLearning") that allows users to quiz themselves on clinical knowledge, pass to new levels, and eventually take a case-based certification exam within the App. Peer-reviewed research combined with monitoring and evaluation activities from implementation in more than twenty countries have repeatedly proven the relevance of the App for improving knowledge on key clinical topics.

Figure 1 Axes of Scale, WHO MAPs Toolkit[1]

In the case of the Benin partnership, formative research was not undertaken before launching the tool as Maternity Foundation relies on partner requests to move into a new setting and puts trust in on-the-ground stakeholder knowledge of existing gaps that the App would help ameliorate. However, a scientific basis for using the App was determined during the pilot period and encouraged further roll-out for which **operations** were taken on in partnership with government bodies and implementing partners with existing in-country presence.

Partnerships on the other hand, are paramount for the successful roll-out of the App and key to catalyze scale. Maternity Foundation strives to bridge the gap between the development of effective health innovations such as the App and the capacity to effectively implement them. We do this by supporting on-the-ground partner organizations to adapt, implement, monitor, and evaluate the App within their specific contexts and programs. Maternity Foundation works closely with partners to best integrate the App into existing programs and structures- bolstering achievements and increasing sustainability rather than building parallel systems. Roll out approaches vary, are tailored to the context, and include:

- **Partnership around App roll out as job aid for front line HCWs:**
  - **Global Language Versions:** These versions (currently Global Arabic, English, French) are fully aligned to WHO guidelines. Piloting these existing versions is often a first step towards confirming feasibility of App use in a country and can lead to development of a nationally adapted App version or further roll-out.
  - **National Adaptation:** In partnership with on-the-ground clinical experts, Maternity Foundation can adapt the App content to new languages and/or to meet national clinical guidelines.
- **Partnership around in-service clinical trainings with App as integrated add-on:** implementation is often tailored so that introduction of the App is integrated within remote or in-person clinical skills trainings and/or simulation drills . Maternity Foundation also works with stakeholders to certify the App as an avenue towards Continued Professional Development credit for in-service HCWs.
- **Partnership on integration into existing pre-service training programs and curricula:** The App has been introduced in nursing and midwifery schools as a teaching and study aid, or formally integrated into pre-service training curricula.

Consistently, a vital component of successful App roll out is identifying a strong champion or champions within the partnership in a specific area. Whether it is a government official, staff of a partner NGO, or front-line health care worker, champions emerge organically early in partnerships based on their interest in mLearning and appreciation of the specific tool. The support of a champion is often the key to overcoming barriers and ensuring local buy-in. In-country champions have expertise in not only their technical areas, but also local context and socio-cultural aspects which may influence dissemination of the App. They also often have pre-existing relationships with many stakeholders, some of whom may be wary of a new digital tool and can have important conversations grounded in knowledge of a country's health system, priorities, and the context overall.

At the global level, longer-term partnerships - such as our partnership with Merck for Mothers, the Gates Foundation, and UNFPA - allow for continued development of up-to-date content and creation of additional content according to clinical needs. Long-term partnerships with donors play into the axis of financial health and are key to sustaining the continued maintenance of the App as well as the development of new content and versions, free of charge to all users.

Technology and infrastructure are also closely linked to financial health, especially when scaling the App geographically through additional global language versions or national versions. The infrastructure is designed to support the rapid development of new versions, and the process for translating content and adapting clinical guidelines if needed is clearly mapped out and well-tested.

This means that at a low cost, the content of the App can be made available to users in their primary language. The Safe Delivery App source code is owned by Maternity Foundation and is not originally designed to integrate into other health information management systems, but rather to be a stand-alone App. Therefore, many of the challenges faced by other projects whilst developing mHealth tools have not been faced by Maternity Foundation. In our experience, the continuous expansion of users across an increasing number of global and national versions of the App increases the demand for technology support functions. More users identify bugs that will need fixing, more partners will be interested in accessing information through dashboards or via APIs and to retain users we need to be able to respond quickly.

Lastly, the **monitoring and evaluation** axis has also proven important in supporting the scale of the App. It is important for Maternity Foundation as well as partners to be able to track how many users are onboarding the app and where in the target areas they are located. M&E is also specifically critical to ensuring that the tool is having its desired effect among the target group – in our case, current and future HCWs working in the maternal and newborn areas - and verify whether efforts to scale an innovation are warranted. M&E also identifies successes and challenges, as well as the tool's reach, which is documented and shared with stakeholders. This keeps momentum high and helps identify areas where the additional focus can help reach more HCWs in new areas.

Maternity Foundation developed a set of standard M&E tools that partners can choose from and that can be adapted according to project needs. These tools cover proxy indicators for quality of care and include:

- an assessment of clinical knowledge of obstetric and newborn danger signs
- a tool to measure HCWs' self-reported confidence to handle obstetric emergencies
- an acceptability survey covering general use of the Safe Delivery App
- Objective Structured Clinical Evaluations (OSCEs) to measure a provider's skill.

Conducting evaluation activities and assessing the learning and skills outcomes of using the App at the local level in initial projects has also been an important step of further integration in various countries. Through the experience of rolling out the Safe Delivery App in over 20 countries through 3 global language versions and 29 national adaptations, we have come to learn, that some keys steps to reaching scale can only be reached through longer-term engagements to support integration and institutionalization of the App (e.g., into pre- or in-service midwifery curricula, or by accrediting continued professional development points upon completion of the Safe Delivery Champion certification exam). This type of institutionalization can support a continuous flow of new users, who are motivated to explore all the content of the App and not only specific modules. Based on this insight we have developed a framework for assessing progress towards scale inspired by the Map and Match Scale Framework by Digital Square[5].

Tracking progress towards scale across multiple countries

Developing meaningful indicators of scale is important to track progress over time. At the early stages of country roll-out Maternity Foundation paid close attention to the number of downloads in roll-out countries, but, although very important, downloads alone are not sufficient to understand the level of scale in roll-out countries. To develop a scale framework for the App we looked to the WHO's mHealth Assessment and Planning for Scale (MAPS) Toolkit which is a self-assessment and planning guide designed to support the development of strategies that will increase the likelihood of reaching scale. We learned that the MAPS Toolkit is very detailed, and considers many areas that are beyond the scope of the Safe Delivery App. Therefore, we also consulted the Map and Match Scale Framework developed by Digital Square which has a broader framework and more easily adapted to our needs.

Finally, realizing that many aspects of both frameworks were relevant to our scale journey - while others did not fit our partner-driven operations model - Maternity Foundation embarked on developing a bespoke scale framework based on the scale framework developed by Digital Square[5].

This framework is developed specifically for the Safe Delivery App and covers three dimensions of scale outlined in the Map and Match Framework, adapted for the Safe Delivery App. Below we have outlined the three dimensions and their relevancy to the Safe Delivery App and included areas from the MAPS toolkit framework that speak to "success" in each of these domains. For each of the indicators in the three domains of the Safe Delivery App scale framework thresholds for "scaling" and "at scale" have been defined and these form the basis for the final scale score, which indicates if a country is not scaling, scaling or at scale.

Reach of Usage

Under this dimension we track the number of healthcare workers (HCWs) using the App. We assess this against the number of midwives in the country provided by partners or via the WHO National Health Workforce Accounts. Additionally, we look at where in the country users have been active, to get an indication of the geographical coverage of the App. This is used to calculate the proportion of states or regions in which the App is being used.

Reach of usage	Number of HCW users
	Geographical coverage
	% of SBAs reached

Breadth of tool use

The App is designed to allow for country or regional adaptations of visuals, audio, and text to ensure a recognizable and culturally relevant user experience. There are options for the addition of new features and content based on user feedback and demand from HCWs and stakeholders. The flexibility and ease of customization is paramount for the continued roll-out at regional and country level.

How the users engage with the App is important for the ability to learn from the content. Therefore, we track several indicators to understand the breadth of the usage of the tool:

- How many HCWs have used content features 5 times or more?
- How many HCWs have accessed at least 5 modules?
- How many HCWs have started the MyLearning journey?
- How many HCWs have achieved at least expert level in all the modules of the Safe Delivery Certification in MyLearning, or become a Safe Delivery Champion?

Breadth of tool use among users	% of HCWs engaged (at least 5 content sessions)
	% of HCWs users who accessed at least 5 different modules
	% HCWs who have started MyLearning
	% of HCWs MyLearners at Expert and Safe Delivery Champion level

Institutionalization of the tool

Labrique et al. suggest one definition of successful scale as "when a digital solution is not seen as a separate activity but is incorporated seamlessly within the healthcare system."[6] Institutionalization of digital health tools in terms of inclusion into national digital health or other relevant strategies, national or regional budgets, and maintenance or resources in the form of staff hours dedicated to support are all indicators of institutionalization which have found to be key to scale digital health tools and are outlined in the WHO's Draft Global Strategy on Digital Health (2020-2024)[7]. For the Safe Delivery App, we look at whether the government has contributed to the development of the tool, whether any long-term partner or donor has been identified to support the implementation and sustainability of the tool and whether the tool has been written into relevant national strategies. Relevant strategies can include national midwifery training guidelines, continued professional development accreditation of the Champion certificate and other relevant guidelines identified for partner countries.

Defining parameters of scale looks different for a tool such as the App, as detailing health outcomes is difficult with an add-on learning tool. The direct effects are largely on learning outcomes in terms of clinical knowledge, skills, and confidence to handle emergencies, which we assume lead to improved quality of care.

However, the health system constraints that the mHealth product targets are well articulated and include increasing the availability of in-service training opportunities and facilitating knowledge sharing and communication between cadres and health zones. Both are important focus areas of workforce development and retention, a building block of overall health systems strengthening. The metrics for measuring scale-up have been defined, especially given that the priority scale-up area is within the pre-service sector as well as avenues for continuing professional development.

Institutionalization of tool	Government contribution to funding for implementation of the tool
	Long-term implementation partner or donor contributed to implementation and sustainability of the tool
	Integration into relevant strategies (incl. CPD)

Case study – implementation of the Safe Delivery App in Benin

Collaboration In Benin began in 2017 through a partnership with Danish NGO BØRNEfonden (now PlanBørnefonden). From April 2017 to January 2018, a pilot project was conducted in the departments of Ouémé and Zou to test the use of the Safe Delivery App as a job aid for health care workers in the Benin context. The pilot began with a validation meeting led by the Ministry of Health, where the App was reviewed and approved for use in Benin by leading national BEmONC experts and key international partners. Following the validation, 15 champion trainers were identified and trained by Maternity Foundation staff on best practices for introducing the App to skilled birth attendants on the job in rural areas of the country. These 15 champion trainers then provided cascade training to 82 HCWs within the two project departments. Surveys to measure clinical knowledge and confidence to handle obstetric emergencies were completed at baseline, four, and six months of using the App with 82 HCWs. Data revealed a significant improvement in the level of knowledge and confidence of the HCWs regarding the correct care of the most frequent complications related to pregnancy and childbirth. A complimentary WhatsApp group including App users, trainers, and supervisors proved to be an effective added value to the application itself, creating a virtual community of practice that continues to be used alongside the App long after the pilot project closed.

The pilot demonstrated clear effectiveness within the Benin context of the App on improving health care worker knowledge and confidence in BEmONC - both proxy indicators for improved quality of care. The strong results, coupled with the support of the Maternal and Child Health Directorate of the Benin Ministry of Health (MOH), generated interest from the country's pre-service institutions as well as interest for a version of the App that is adapted to Benin's national guidelines and directives. Throughout 2021, Maternity Foundation worked with Plan International and a team of clinical experts from Benin to adapt the content of the App to adhere to national guidelines and directives. Through this successful collaboration, a Benin national version of the Safe Delivery App was finalized and published end of 2021.

Since 2019, Maternity Foundation and Plan International have supported the integration of the Safe Delivery App into the pre-service training program at the *Institut National Medico Sanitaire (INMES*), the country's Cotonou-based nursing and midwifery school. The App is actively used by both professors and students in the INMES classrooms as a teaching tool, as well as a self-learning course for credit for third year students. In 2021, training extended to the country's second national midwifery school located in the northern city of Parakou – effectively ensuring introduction of the App for all midwifery students in the country. Maternity Foundation will continue to collaborate with INMES and IFSIO to identify and provide necessary support to ensure that the SDA continues to be a tool for teaching, learning, and a resource that graduating students can carry with them to their first placement after graduation.

In Benin, a baseline knowledge and confidence survey were conducted prior to the cascade trainings, along with a self-reported confidence survey to measure how confident the health care workers would be to handle specific emergency situations. After 4 months of use, these surveys were repeated and revealed a significant improvement in the level of knowledge and confidence of the HCWs regarding the correct care of the most frequent complications related to pregnancy and childbirth. This trend was confirmed by an evaluation conducted six months after the start of the project, which included qualitative data collection where HCWs shared that using the App led them to trust their abilities in cases that previously caused them to panic, and effectively handle cases they would previously refer without treatment. The ability to demonstrate clear effectiveness of the App within the specific context, coupled with MOH buy-in, clearly opened doors to move past pilot stage into the next level of scale in the country.

Through the Maternity Foundation data dashboard, we can see that there are 721 HCW users in Benin; as the WHO NHWA directory states there are 905 midwives in Benin, this means that 79% have been reached by the Safe Delivery App (assuming that midwives are recorded within the nursing category)[8]. Additionally, 29% of users are based in a nursing college and 24% frontline at a primary health care facility. We can also see that usage is concentrated in the South where the initial pilot was conducted and where the largest nursing college is located. When mapping out continued scale of the newly finalized Benin national version of the App, user data such as this has allowed us to build in plans for more focused dissemination in the north of the country to bridge gaps.

Benin currently has two national midwifery schools – one in the south and one in the north of the country. Therefore, the target for scale-up is 2 of 2 pre-service institutions using the Safe Delivery App; metrics will include an increase in usage data (e.g. number of downloads, number of engaged users), as well as an increase of geographic coverage of App usage for in-service midwives. The endgame has been specified for key stakeholders' current priority area of pre-service integration, which is adoption into pre-service institutions and accreditation of effort through education credits. The endgame for in-service midwives will continue to be refined with the MOH and key stakeholders.

According to the Safe Delivery App scale framework Benin has achieved a score of 1.22 and is considered in process of scaling. As the table illustrates there is room for improvement and further scale especially when it comes to MyLearning. To achieve scale more learners must start a MyLearning journey and achieve expert or champion status. More work remains to be done in the domain of institutionalization where focus will be on strengthening partnerships further to support the sustainability of the app as well as have the App integrated into relevant national strategies.

Benin - scale score 1.22 - in process of scaling	
Number of HCW users (all HCW app users)	721
Geographical coverage score	2
% of SBAs reached	2
% of HCWs engaged	2
% of HCWs users who accessed at least 5 different modules	2
% HCWs have started MyLearning	1
% of HCWs MyLearners at Expert or Safe Delivery Champion level	0
Government contribution to funding for implementation of the tool	1
Long-term implementation partner or donor contributed to implementation and sustainability of the tool	1
Integration into relevant strategies (incl. CPD)	0

Key Lessons Learned and Next Steps

- Investing time to understand what scale is for your specific tool is worthwhile. Various existing frameworks can help build a strong foundation for discussing scale, but digital tools are designed with different means in end, and the scale framework should reflect the design and goals of the tool to make sure it is relevant and actionable.
- For the Safe Delivery App, strong partnerships are key to catalyze scale. Our ambition is to integrate into existing strategies, curricula, and activities to ensure solid institutional support for usage of the Safe Delivery App. This can only be achieved through strong partnerships and identifying "champions" in country who can facilitate stakeholder relations and troubleshoot barriers as they arise.
- Providing the necessary support to partners and champions, including training, M&E, and documentation of results, has been an important step to equip them to successfully advocate for further App uptake.
- While institutionalization has been reached in Benin through integration within nursing and midwifery training programs, we have not yet identified where it fits within the national health and national HMIS systems – important components of sustainability in terms of the contextual environment.
- If context allows, conducting a small pilot with a Global language version of the App is helpful before investing time and financial resources in the creation of a version adapted to national guidelines and directives. This can also provide a snapshot of results of App use that encourage a sense of ownership of the national version, ensuring that it moves past the launch stage and into successful uptake.
- The M&E domains walk through points to a need for further development of the M&E framework for the Benin scale project and highlights the importance of having defined the key audience and dissemination strategy from the project outset. A clear idea of key recipients of pilot M&E results can help guide the M&E protocol and tool refinement and deserves extra attention from the project team.

Guided by the scale framework and lessons learned from countries well on their way to reach scale status we continue to refine our approach to partnerships and roll-out.

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