Barriers And Facilitators For Implementing The WHO Safe Childbirth Checklist In Mozambique: A Qualitative Study Using The Consolidated Framework For Implementation Research (CFIR)

Anqi He
ANQI.HE@YALE.EDU

Follow this and additional works at: https://elischolar.library.yale.edu/ysphtdl

Recommended Citation
https://elischolar.library.yale.edu/ysphtdl/2263

This Open Access Thesis is brought to you for free and open access by the School of Public Health at EliScholar – A Digital Platform for Scholarly Publishing at Yale. It has been accepted for inclusion in Public Health Theses by an authorized administrator of EliScholar – A Digital Platform for Scholarly Publishing at Yale. For more information, please contact elischolar@yale.edu.
Barriers and Facilitators for Implementing the WHO Safe Childbirth Checklist (SCC) in Mozambique: A Qualitative Study using the Consolidated Framework for Implementation Research (CFIR)

Anqi He
Year Completed: 2023
Year Degree Awarded: 2023
Master of Public Health
Yale School of Public Health, Department of Health Policy
Primary Advisor: Rafael Perez-Escamilla
Secondary Advisor: Dong Xu
ABSTRACT

High maternal and neonatal mortality rates persist in Mozambique, with the issues of stillbirth remaining understudied. Most maternal and neonatal deaths in the country are due to preventable and treatable direct childbirth-related complications that often occur in low-resource settings. The World Health Organization (WHO) introduced the Safe Childbirth Checklist (SCC) in 2015 to reduce adverse birth outcomes. The SCC, a structured list of evidence-based practices, targets the main causes of maternal and neonatal deaths and stillbirths in healthcare facilities. Despite successful implementation in over 15 countries, the SCC has not been adopted in Mozambique. This study aimed to identify potential facilitators and barriers to SCC implementation from birth attendants’ and clinical administrators' perspectives, proposing future strategies.

A qualitative study using focus group discussions (FGD) with birth attendants (n=23) and individual interviews with clinical administrators (n=6) was conducted. The Consolidated Framework for Implementation Research (CFIR) guided interview and FGD question creation and qualitative data analysis. A mixed inductive-deductive thematic analysis of Portuguese-to-English translated transcripts was performed. CFIR constructs were mapped to the High-Quality Health System Framework to synthesize findings and make recommendations.

Three CFIR constructs were identified as facilitators (complexity, adaptability, and culture), while three other constructs and one emerging code were recognized as barriers (relative advantage, cost, available resources, and social recognition for birth attendants). Three CFIR constructs functioned as both facilitators and barriers (external policies and incentives, compatibility, knowledge, and beliefs about the intervention).

In Mozambique, most barriers to the SCC implementation are due to the inadequacy of the health system, highlighting the need for health system strengthening and capacity building. Participants’ dedication to improving childbirth practices and openness to SCC implementation were identified as facilitators. To improve the feasibility of SCC implementation and increase compatibility with the current childbirth work routine for birth attendants, the SCC should also be adapted to context-specific needs.
Key Messages

- Health system inadequacies and resource shortages present significant barriers to SCC implementation in Mozambique.

- Birth attendants and clinical administrators demonstrate dedication to improving childbirth practices and openness to the SCC implementation.

- Future research should prioritize large-scale implementation studies, combining resources and training to facilitate SCC-guided essential practices for sustainable improvements in childbirth practices.

Acknowledgment:

I would like to thank Dr. Elsa Kanduma, Dr. Rafael Perez-Escamilla, Dr. Dong Xu, Dr. Mayur Desai, Dr. Eusébio E. Chaquisse, Dr. Isaias Ramiro, Dr. Rosa M. Cuco, Dr. Donna Spiegelman, Dr. Lucian J. Davis, Dr. Nicola Hawley, Danícia Munguambeand, Sakina Reames, Devina Buckshee, and the staff at Comité para a Saúde de Moçambique for their guidance and support. This study was generously funded by the Wilbur G. Downs International Health Student Travel Fellowship, Lindsay Fellowship for Research in Africa, and Yale School of Medicine Fellowship for Medical Student Research.
Table of Contents

INTRODUCTION .................................................................................................................................................. 5

METHODS .......................................................................................................................................................... 6
  Study Design .................................................................................................................................................. 6
  Data Collection .............................................................................................................................................. 7
  Data Analysis .................................................................................................................................................. 9
  Conceptual Framework .................................................................................................................................. 10

RESULTS .......................................................................................................................................................... 10
  Intervention Characteristics ......................................................................................................................... 12
  Outer Setting ................................................................................................................................................ 14
  Inner Setting ................................................................................................................................................ 16
  Characteristics of Individuals ....................................................................................................................... 20
  Social Recognition of Birth Attendants ......................................................................................................... 22

DISCUSSION ..................................................................................................................................................... 24

CONCLUSION ............................................................................................................................................... 31

CONFLICTS OF INTEREST .............................................................................................................................. 32

APPENDICES .................................................................................................................................................... 37
  A: Clinical Administrator Interview Guide ...................................................................................................... 37
  B: Birth Attendant Focus Group Discussion Guide .......................................................................................... 41
  C: Pilot FGD question guide ............................................................................................................................ 44
  D: Codebook .................................................................................................................................................. 44
  E: WHO Safe Childbirth Checklist (SCC) ....................................................................................................... 44

REFERENCES ..................................................................................................................................................... 33

List of Tables

TABLE 1. CHARACTERISTICS OF THE CLINICAL ADMINISTRATORS (N=6) ................................................. 11
TABLE 2. BARRIERS AND FACILITATORS OF IMPLEMENTING SCC .............................................................. 23

List of Figures

FIGURE 1: NEGATIVE FEEDBACK LOOP OF THE HEALTH SYSTEM ................................................................. 26
FIGURE 2: MAPPING CFIR TO HIGH-QUALITY HEALTH SYSTEM FRAMEWORK ............................................ 30
INTRODUCTION

The global efforts towards achieving Sustainable Development Goal 3 have significantly reduced pregnancy-related deaths, especially in sub-Saharan Africa [1, 2], which remains among the regions most affected by maternal and neonatal mortality [3]. The government of Mozambique has substantially improved maternal and child health by expanding maternal care and services and enhancing their quality. Between 2015 and 2021, maternal mortality in Mozambique decreased by 75.8%, neonatal mortality by 8%, and stillbirth rates declined by 24.6% [4-8].

Despite these improvements, maternal and neonatal mortality ratios and stillbirth rates remain unacceptably high in Mozambique, with pregnancy and childbirth complications the leading causes: 86% of maternal deaths result from direct obstetric complications; 75% of newborn deaths are caused by prematurity, childbirth-related complications, and neonatal infections [9-12]. Most of these deaths are preventable and treatable; most of them occur in low-resource settings [13].

To address maternal and perinatal morbidity and mortality, the World Health Organization (WHO) developed the Safe Childbirth Checklist (SCC) in 2015 (see Appendix E) [13]. The SCC sets forth a structured list of evidence-based delivery practices which target the major causes of maternal deaths, neonatal deaths, and stillbirths in healthcare facilities, especially in lower- and middle-income countries (LMICs). The SCC streamlines the routine flow of childbirth delivery events into four pause points at which birth attendants ensure that they have completed essential birth practices: (a) before admission, (b) just before pushing (or just before a Caesarean-section), (c) within an hour after birth, and (d) just before discharge. The SCC prompts birth attendants to implement essential practices which have been shown to improve the quality of care delivered to mothers. A birth attendant’s omission of an SCC item can render the mother and her newborn vulnerable to severe, often lethal complications.

The SCC has been implemented and evaluated in over 15 countries, demonstrating varied levels of effectiveness in reducing childbirth complications [14]. The BetterBirth Trial, the largest study of SCC
implemented in India, finds that SCC implementation leads to more birth attendants adhering to essential birth practices, thereby increasing the quality of maternal care [13, 15]. The pilot implementation of the SCC in Ethiopia and Tanzania shows better inventory management of essential childbirth supplies and improved adherence to essential birth practices [16, 17]. A recent meta-analysis of the efficacy of the SCC shows that it significantly reduces stillbirths, improves pre-eclampsia management, and improves maternal infection management [18]. As more and more sub-Saharan countries adopt the SCC, many of these countries are providing fresh and valuable insights into local adaptations, facilitating factors, and barriers to successfully implementing the Checklist [19-21]. Nevertheless, the SCC has yet to be adopted in Mozambique.

This preliminary study aims to identify potential facilitators and barriers to implementing the SCC in Mozambique and to develop insights into current childbirth practices and conditions in the country. Specifically, we apply the approach of qualitative implementation science research, guided by the well-established Consolidated Framework for Implementation Research (CFIR), and we interpret feedback on the SCC from healthcare providers who work directly in maternity and Maternal and Child Health program management in Mozambique [22]. The insights gained from this study are expected to inform the Mozambique Ministry of Health's decision-making regarding the adoption and adaptation of the SCC for improving maternal and child health outcomes nationwide.

**METHODS**

**Study Design**

This qualitative study consists of four focus group discussions (FGDs) involving a total of twenty three birth attendants and six key in-depth individual interviews with clinical administrators from Xinavane Rural Hospital in Manhiça District, Maputo Province, and Chamanculo General Hospital in Maputo City, Mozambique. The semi-structured interview and FGD guides are based on the CFIR, which include
questions related to four of five domains of SCC implementation: (a) individual characteristics, (b) SCC intervention characteristics, and the facility’s (c) outer and (d) inner settings [22]. The questions are designed to assess current childbirth practices and conditions as well as the feasibility of implementing SCC as a means by which maternal and perinatal outcomes in Mozambique can be improved. The interview and FGD guides are adapted to the professional backgrounds and responsibilities of the participants (see Appendix A & B). The transcripts have been translated from Portuguese into English and analyzed using a mixed inductive-deductive thematic analysis [23].

**Data Collection**

This study was conducted between August 2022 and January 2023 using convenience sampling methods. The focus group discussions with birth attendants and the interviews with clinical administrators were conducted at offices in two hospitals, Xinavane Rural Hospital in Manhiça District, Maputo Province, and Chamanculo General Hospital in Maputo City, Mozambique. The clinical administrators interviewed at each clinical site included the head of maternity, the head of the Department of Maternal and Child Health, and the clinical director. Each hospital’s head of maternity identified the birth attendants. Both facilities provide Emergency Obstetric Care in which birth attendants can observe the entire spectrum of patient circumstances and outcomes. Each focus group included five to six birth attendants who met the inclusion criteria of at least one year of working experience with maternity, availability, and willingness to participate, and the ability and capacity to consent. Clinical administrators were eligible for inclusion in the study if they had at least one year of working experience managing and monitoring maternity services, availability and willingness to participate, and the ability and capacity to consent. The clinical administrators were approached by the researchers (AH, DM, and EK) and obtained consent for interviews.

To evaluate the potential impact of various factors, such as the characteristics of the SCC and participants and the inner and outer settings of hospitals, on the SCC implementation, we selected four domains and nine constructs of the CFIR framework to design the FGD guide (Table 2). We created a pilot FGD guide
and tested it to ensure that study participants could adequately contribute to a rich discussion (see Appendix C). We adjusted the structure of the questions as needed and enhanced the moderating skills of the researchers through the pilot [24]. The pilot FGD was conducted at Malhangalene Centro De Saúde with seven birth attendants from five different health centers who did not work at the two selected clinical sites where formal data collection was to be conducted. The head of the Mozambique Midwives Association designated the birth attendants who participated in the pilot FGD. Each of them was representative of birth attendants at clinical sites, and each had rich prenatal-to-postnatal-care work experience from their maternity ward rotations.

Prior to data collection, all participants were given hard copies of the WHO SCC at least two days before the interview or FGD to familiarize themselves with its contents. After the interview or FGD, the SCC copies were collected to avoid any unintended consequences resulting from the use of the SCC without proper instruction and support. The purpose of the SCC was explained to study participants before the FGD and interview. Participants received a meal or snack during the interview or FGD worth USD $10 for their participation.

Each interview and FGD lasted approximately 60 minutes, and each was scheduled at the convenience of participants, most often during their lunch breaks. Participants signed written consent forms. To assure their anonymity, participants were identified with an anonymous participant ID instead of their names during data collection and analysis. All interviews and FGDs were conducted in Portuguese by two qualitative researchers, one of whom (EK) has a Doctor of Medicine degree from the School of Medicine at Eduardo Mondlane University in Mozambique and a Master of Public Health degree from Southern Medical University in China. The other researcher (DM) had a Bachelor's in Social Science from Eduardo Mondlane University in Mozambique and is a qualitative researcher by training. The researchers worked in pairs during the interviews and FGDs. One researcher (DM) served as the moderator and took detailed notes. The other researcher (EK) took comprehensive field notes and was also responsible for timekeeping. The field notes captured the behaviors and nonverbal cues of participants and, as complementary information
to facilitate later data coding and analysis, described the physical spaces in which the interviews and FGDs were conducted [25].

All interviews and FGDs were recorded using an audio recorder for later transcription, translation, and data analysis. Within 24 hours after each interview and FGD, the researchers also completed a summary report for each data collection session, including observations, personal reflections, memos, and key takeaways.

The audio recordings of the interviews and FGDs were uploaded to an online platform called HappyScribe and then transcribed and translated from Portuguese to English. To ensure their accuracy and integrity, the transcriptions and translations were then carefully reviewed by a researcher, EK.

**Data Analysis**

The data analysis was performed by a team of three researchers, AH, DB, and SR, from Yale University, using a mixed inductive-deductive thematic method [24]. This method facilitated a thorough analysis of the data and the development of a comprehensive codebook that captured both anticipated and unanticipated codes.

The pre-established domains and constructs of CFIR provided the basis of the initial codebook (see the conceptual framework described below) [26]. The coding process began with a deductive approach, using the initial CFIR codebook as a guide (see Appendix D). Each coder independently reviewed the transcripts and field notes to gain a comprehensive understanding of the content and identify data that could be coded into the initial codebook on a line-by-line basis. After coding each transcript, the three coders met to discuss the codes and resolve any discrepancies in order to achieve consensus. During this process, example quotes, enriched code definitions and descriptions, and detailed inclusion and exclusion criteria were added to the initial CFIR codebook to provide clear guidance for the ongoing coding process and contextualize the codebook for our study. The codebook was iteratively updated and enriched as the coding process progressed, with emerging codes added as needed to capture unanticipated themes as part of the inductive
component. Coding reliability was established through collaboration and consensus-building among the three coders. As no new codes emerged, we considered that the codebook was a valid representation of the data. At this point, the transcripts and codes were imported into the NVivo 14 software program for further systematic analysis of the connections and comparisons among the codes and to identify themes.

This study was approved by the Human Subjects IRB committee at Yale University in the United States in May 2022 (IRB protocol #2000032748) as well as the Comité Nacional de Bioética para a Saúde in Mozambique in September 2022 (IRB protocol #00002657).

**Conceptual Framework**

The CFIR consists of five domains, (a) intervention characteristics, (b) outer setting, (c) inner setting, (d) characteristics of individuals, and (e) process of implementation, by which the implementation environment of an intervention is assessed, and its effective implementation is facilitated. As this is a formative study to assess the feasibility of SCC implementation, we excluded the process of implementation domain as the SCC has not yet been implemented. Among the four domains, we identified nine constructs that are relevant to our study for analyzing the qualitative data: (a) intervention characteristics (1. complexity, 2. adaptability, 3. relative advantage, and 4. cost), (b) outer setting (5. external policies and incentives), (c) inner setting (6. compatibility, 7. available resources, and 8. culture), and (d) characteristics of individuals (9. knowledge and beliefs about the intervention). We further mapped the CFIR to the High-Quality Health System Framework to summarize the study findings and recommendations (Figure 2) [27].

**RESULTS**

Twenty-three birth attendants participated in the FGDs, and six clinical administrators took part in the individual interviews. The time of FGDs ranged from 39 min to 62 min, and interview time ranged from 26 min to 70 min. All birth attendants are female and work in maternity at two clinical sites. The detailed
sociodemographic characteristics of the clinical administrators are presented in Table 1. Of the 48 CFIR constructs assessed, 9 were determined to be relevant barriers and/or facilitators to implementing the SCC with one emerging code. Table 2 summarizes the barriers and facilitators to the implementation of SCC.

Table 1. Characteristics of the clinical administrators (N=6).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No. of the participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>6</td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
</tr>
<tr>
<td>Age, mean (SD)</td>
<td>38.2 (11.8)</td>
</tr>
<tr>
<td>Years of working experience, mean (SD)</td>
<td>13.6 (12.9)</td>
</tr>
<tr>
<td>Position</td>
<td></td>
</tr>
<tr>
<td>Chief of MCH Department</td>
<td>2</td>
</tr>
<tr>
<td>Clinical Director</td>
<td>2</td>
</tr>
<tr>
<td>Chief of Maternity</td>
<td>2</td>
</tr>
<tr>
<td>Education background</td>
<td></td>
</tr>
<tr>
<td>Nursing Program</td>
<td>4</td>
</tr>
<tr>
<td>School of Medicine</td>
<td>2</td>
</tr>
</tbody>
</table>
**Intervention Characteristics**

The intervention characteristics domain assesses the aspects of the SCC that could influence its implementation [28]. Four constructs in this CFIR domain were related to the implementation of the SCC: complexity, adaptability, relative advantage, and cost. Two facilitators and two barriers were identified.

*Complexity*

When participants were asked about the complexity of the SCC, they all felt that the content and format of the checklist were easy to understand and not complicated at all.

*Adaptability*

Participants suggested various ways to adapt SCC to their work routine and context, thereby making SCC implementation more feasible. Some of the proposed adaptations included using the SCC as a pocketbook instead of adding it to their current paperwork, displaying the SCC on the wall as a reminder for all staff, adding a section to the form to explain why the specific practice was not being followed, using SCC as an evaluation tool, and integrating the SCC to existing instruments.

“Now, stopping to write it down and then doing it can be a bit tricky… My suggestion would be that it should be in a format like these HIV flowcharts, for example. You don't make us waste time even opening a document and looking for how to do it. Then nail it on the wall, because if it is a person that is in that sector and knows where the flowchart X, Y, Z is, the person looks, sees the explanations and does it. It is easier to do than in the form of a list” (Clinical Administrator 2, Chamanculo General Hospital)

“Or maybe one could think of a decentralized instrument, which could perhaps feed into another instrument already at the central level... If we had an instrument that helps us to check what is the quality of the work of our maternity ward… And maybe to send the information to the central level as well, to see what is
happening, what is failing, which is to take the proper precautions.” (Clinical Administrator 2, Xinavane Rural Hospital)

As different countries and health facilities have their own unique contexts, needs, and challenges, previous SCC implementation experiences have shown that SCC can be integrated and contextualized in various ways to suit different clinical settings worldwide [14].

**Relative Advantage**

The majority of participants expressed that the SCC did not offer a significant advantage over their current work routine. They stated that the practices outlined in the SCC were already a part of their existing protocols. The participants perceived the SCC as redundant to current practices, viewing it as an additional form to fill out, adding to the workload of birth attendants, and taking valuable time from other critical clinical tasks.

“It would be one more instrument. It would be a repetition of what we already do… All these flowcharts that we have, they already exist. And that is exactly what we do. And it looks like we don't read it, because this, because that, but no. We already do that, so to be always reading the flowcharts is always the same… We end up having less time to do our activities, to exercise what is the technique. We stay longer, we have (to) read and write, which doesn't help us much either. It is very tiring.” (Birth Attendant, Chamanculo General Hospital)

“We are already used to it, since the checklist takes me to several books that we have here in the maternity ward to fill out. So it would be one more.” (Clinical Administrator 3, Xinavane Rural Hospital)
Cost

The cost of the SCC implementation poses another barrier. The health facilities in Mozambique have limited resources, and the costs of reproducing and completing the SCC, including expenses such as paper, toners, pens, and storage space, could add an additional financial burden on the clinics.

“The list is produced, and then it is the health unit's responsibility to reproduce it. And that doesn't go very far, because we will see that the health unit doesn't have the capacity to reproduce the form itself...It is already difficult for the health unit to continue because they are not all able to multiply their own records.” (Clinical Administrator 1, Xinavane Rural Hospital)

Outer Setting

The External Policies and Incentives construct under the Outer Setting domain was identified as related to the SCC implementation. This construct captures external factors beyond clinical settings, such as national policies, regulations, Ministry of Health (MoH) guidelines, and incentives that could affect the implementation of SCC. Two facilitators and one barrier were identified within this construct.

External Policy & Incentives

The participants did not identify any external policies that could potentially have a negative impact on the SCC implementation. In fact, they mentioned that the current MoH guidelines are consistent and reflected in the SCC requirements, indicating that the SCC implementation is aligned with the national maternal and child health agenda [12].

“In general, one (SCC) is applying what are practices according to the MOH guideline, which is humanized childbirth or humanization of childbirth... All nurses have this orientation.” (Clinical Administrator 2, Xinavane Rural Hospital)
However, the adoption of SCC may be limited by inequitable regional resource distribution that prioritizes higher-level reference health facilities without assessing the needs of each facility.

“As a matter of fact, the deficit or lack of antihypertensive drugs is a problem that is more or less global. I don't know how the logistics of these drugs, the prices, how they are. But we usually prioritize those health units that are of - I wouldn't say that they are very relevant, they are all relevant - but those that are the reference hospitals.” (Clinical Administrator 2, Xinavane Rural Hospital)

“If we look, maybe, at the deficiency in the acquisition… at the moment of distribution or at the moment of acquisition, look a little more at the situation of the hospitals. Because if we end up balancing, asking for support from the other health units, but maybe the others don't have that demand that a hospital has. And hospitals generally end up receiving very little… we should look more at our demand and try to make a distribution according to the calculation of the production of a hospital.” (Clinical Administrator 1, Xinavane Rural Hospital)

Participants expressed that monetary incentives are not necessary to encourage birth attendants to complete the SCC. Instead, they would appreciate more non-monetary incentives, such as awards, to recognize their work and importance. When the researcher asked for suggestions on how to incentivize the SCC implementation, one of the participants responded:

“How about taking us for a walk somewhere? Just kidding. But it could also be. Or it could be a small diploma of merit even. When filling out the checklist, after a certain period of time, you could check the lists to see who was the best at filling out the checklist and have a certificate of merit. It is an incentive. When I see someone getting a certificate of merit, I too am like, "I wish." It doesn't have to be price even or monetary value.” (Clinical Administrator 3, Xinavane Rural Hospital)
**Inner Setting**

Inner setting domain explores the characteristics of the implementing organization that could impact the SCC implementation [28]. Three constructs in this CFIR domain were related to the implementation of the SCC: compatibility, available resources (subconstruct of readiness for implementation), and culture. Three barriers and three facilitators were identified.

**Available Resources**

A major barrier to the SCC implementation is the limited availability of resources, including human resources, medicines, ambulance, materials, physical space, and professional training. Despite the perceived benefits of SCC, the severe shortage of resources makes it challenging to successfully implement the SCC in clinical settings.

“We are saying that there are times when you are short of gloves, there are times when you are short of catheters, there are times when you are short of syringes, short of antihypertensive medications, some medications like serums in general.” (Clinical Administrator 1, Xinavane Rural Hospital)

Participants expressed concern that there is typically only one nurse per shift in the maternity unit, responsible for caring for both mothers and newborns, leading to provider burnout. Using scarce time to fill in the SCC would add to staff workload. Participants highlighted the need for additional staff in the maternity unit to reduce the workload for current birth attendants, improve the quality of maternity services, and increase the feasibility of SCC implementation.

“The implementation of the list is not bad. But as we were just saying… the lack of human resources, I think that this list will be more of an overload, an extra work, where the staff at that moment are few… But the list is not bad. It is very good, it helps. It is the moment when someone can forget something, looking here, sees that here is something that can be done or should be done. But looking at the work you already
have in the maternity ward, it's a lot. There are many documents to be filled out. One more document, it's more overload.” (Birth Attendant, Xinavane Rural Hospital)

The limited availability of essential medicines in the maternity ward is another major obstacle to both the implementation of SCC and quality improvement in childbirth practices. Despite having the necessary knowledge to handle complications, birth attendants may not have access to appropriate medicines and equipment, resulting in the use of suboptimal treatments, avoidable maternal and newborn deaths, and overcrowding at higher-level hospitals due to the transfer of patients because of shortages of needed medicines and medical materials. Moreover, there is no guarantee that referral hospitals will have the necessary resources.

“For the maternity case, you are missing too many antihypertensives. Just talk about methyldopa, hydralazine, dihydralazine… and this has made our work very difficult. We have a considerable number of pre-eclampsia and eclampsia. And when it is time to medicate this patient, it is a problem… And I believe that there are situations that even end up in transfers that could be avoided purely and simply by the fact that there are medications available. Others end in cesarean sections that could have been avoided. Others that even end in maternal or neonatal death, which could have been avoided just by the simple fact of having these drugs available.” (Clinical Administrator 2, Xinavane Rural Hospital)

In some cases, maternity wards lacked running water, clean sheets, cotton, gloves, ultrasounds, blood pressure devices, or ambulances to transfer mothers and newborns, all of which are required to meet mandated essential practices in SCC.

“But nowadays it is known that vaginal touch has to be done, depending on the active stage of labor. But the lady is not touched because there are no gloves to see. There are no gloves. How will it go well? How will you take care of yourself? How will you comply with what the document asks for?” (Clinical Administrator 1, Chamanculo General Hospital)
“We are also missing the blood pressure device is a very fundamental instrument in the delivery room. During the shift, there are no batteries. … So, it is an instrument that cannot be missing, cannot have battery problems at any time.” (Birth Attendant, Chamanculo General Hospital)

The participants highlighted the importance of professional training for successful SCC implementation and requested refresher training to improve their knowledge and skills.

“I think that if the people who are to use the verification form are not very well trained, they can have a complication because it can be filled out not in the same standard way. The training of the people who are going to use the form itself needs to be common.” (Clinical Administrator 1, Xinavane Rural Hospital)

Without addressing the shortage of material and human resources in Mozambique, the implementation of SCC will be difficult due to insufficient resources and workforce support.

Compatibility

The practices outlined in the SCC were found to be mostly consistent with current practices in the maternity unit according to the majority of participants. For instance, the requirement for a companion during childbirth, which is included in the SCC, is already a common practice in the maternity unit.

“We want the birth not to be one that can put a trauma on a woman, but that she can feel the pleasure. With the presence of a companion, we would say a mother-in-law, she has experience… Passing more affection, more strength, in one way or another, the person feels more comfortable in that moment of pain that she is going through.” (Clinical Administrator 1, Xinavane Rural Hospital)

Filling out the SCC, however, is likely to impede existing workflows due to human resource shortages and time constraints. Participants expressed concerns about how to allocate time for other clinical activities and fill out the SCC, as there may be competing priorities that they do not know how to resolve.
“Because of the overload of work, one or another thing ends up slipping away… We have gynecology, maternity, normal c-sections, pathological pregnancy, gynecology, admission, delivery room, it's for one nurse… So, everything that happens there ends up exhausting your knowledge, and your strength, you don't know what to do….It's not because she is unwelcome (the SCC), she is welcome, yes. But treating the person himself, the work, it becomes difficult to follow the form.” (Birth Attendant, Xinavane Rural Hospital)

Moreover, participants expressed concern about the workload related to paperwork. They already had a significant amount of paperwork to fill out, and the addition of SCC might increase their workload. Some participants suggested simplifying the current paperwork instead of introducing a new one.

“It is complicated because we already have many instruments. If the list doesn't come to remove anything, it comes to add, it's another job… Now, if the list comes and reduces the work for us, and summarizes a lot of things, it is welcome. If it is to add to it, it will not make us comfortable.” (Clinical Administrator 1, Xinavane Rural Hospital)

**Culture**

Despite the significant challenges posed by the shortage of human resources and materials, the participants displayed a strong commitment to improving the quality of maternity services and childbirth practices. They regularly held internal meetings to discuss the current challenges and explore solutions, where the SCC and the issues identified by the SCC could also be discussed as a part of the quality improvement program.

“We do meetings, yes, grassroots councils, study a particular instrument, if we have one. For example, this one I am answering. But if I have it with these questions, I will sit down with colleagues to look at it together and answer it.” (Clinical Administrator 1, Chamanculo General Hospital)

Meanwhile, some participants expressed concerns about the introduction of a new instrument, stating that it might be intimidating.
“We get blinded in front of a document. Many times we get scared just by looking at the document. Do this, we have to fill it out like this. Sometimes we fill it out, but not properly as it should be.” (Birth Attendant, Xinavane Rural Hospital)

The majority of the birth attendants displayed a high level of professionalism and dedication to improving the quality of childbirth practices. They were open to updating their knowledge using SCC despite the resource shortages and acknowledged the importance of continuously learning and keeping themselves informed.

“As my colleague was saying, science is dynamic. There are things that are being abolished and things that are being introduced. So I try to say you should implement this study, while one thing or another could be abolished, so as we are here the council, we are here today to learn…. Let's give progress to this study.” (Birth Attendant, Xinavane Rural Hospital)

**Characteristics of Individuals**

This CFIR domain assessed individuals' beliefs, knowledge, and personal attributes that may affect SCC implementation. Knowledge & belief about the intervention construct with two facilitators and two barriers were identified.

*Knowledge & belief about the intervention*

At the beginning of the focus group discussions, the interviewers asked birth attendants to describe their current experience and their work routines related to childbirth. The participants demonstrated a strong understanding and wealth of knowledge regarding childbirth practices, which could serve as a solid foundation for the implementation of SCC.
In terms of their beliefs about the SCC, some participants expressed confidence that its implementation would lead to positive changes in current practices and result in improved quality of maternity services.

“I think that every instrument that exists that aims to make people more aware of everything that has to be done in the work environment is welcome. It would have a lot of value. It would also help the management itself and the quality of the work they are doing in the health unit.” (Clinical Administrator 2, Xinavane Rural Hospital)

On the other hand, most participants expressed concern that the implementation of SCC would further increase their overwhelming workload and viewed it as just another bureaucratic paperwork with no additional motivation to complete it.

“We would feel overwhelmed. From the moment you introduce the checklist, it's because at the end of the day, at the change of shift, you're going to demand whether we're performing correctly or not. So, it's going to be the case that the nurse didn't manage to (complete the SCC). She couldn't fill out… By being required, that to her is going to be overload. How is it? She will even ask herself, ‘but can't you see? Because I am all alone.’ ” (Birth Attendant, Xinavane Rural Hospital)

Some participants expressed concerns that failure to fill out the SCC could result in penalties or other negative consequences.

“It would be possible (to implement the SCC). It would help some, but it could also penalize us for things that are not our level of competence to resolve, such as the issue of lack of medicines, lack of running water, at some point in the anesthesia machine, a shortage of operating room staff.” (Clinical Administrator 2, Xinavane Rural Hospital)
Social Recognition of Birth Attendants

In addition to the codes in the CFIR framework, social recognition of birth attendants emerged as a theme during data analysis. Many participants reported experiencing stigma and misunderstanding from pregnant individuals and the community, which limited their motivation to implement SCC or other protocols.

Some participants mentioned that the requirement for a companion with the pregnant person was not solely for quality improvement but rather a demand from birth attendants for a witness to prove that they did not mistreat the pregnant person.

“The moment of childbirth is not easy, it is very difficult, especially at the time of the baby's expulsion. Many women do not cooperate at that moment. You have to sometimes get a little aggressive with her, because you say "push," the woman turns the other way. "Sleep on your back," she turns another position. Maybe with a companion, he/she will witness what is happening there with the woman, because then when the baby suffocates, when she (the mother) gets up from there, she (the mother) will say, "It was the nurse who left my baby like that”. But with a companion, he/she will be able to witness everything that is happening to that woman.” (Birth Attendant, Xinavane Rural Hospital)

However, there were also cases in which the companion accompanying the pregnant person misunderstood the practices of the birth attendants, leading to the spreading of negative comments about the birth attendants in the community.

“Even being a woman, a companion doesn't understand what happens inside the maternity ward. Even the techniques that the nurse will perform, she thinks you're mistreating that person… She starts talking bad about us in the community.” (Birth Attendant, Xinavane Rural Hospital)

The participants also expressed that the social recognition of birth attendants was low, and this lack of recognition was a demoralizing factor in their work. Despite their strong desire to improve their work and adopt SCC, they felt that their efforts were not valued or recognized by the community.
“Because if we look at the media, they are against us. Just for someone to be born outside, we are already on television. But if I attend childbirth outside without gloves to help, I won't be on television. But if someone is born outside, even five meters from the hospital, we are going to be smeared with all of this. ‘Chamanculo is negligent, there was no emergency room.’ So, motivation factor.” (Birth Attendant, Xinavane Rural Hospital)

<table>
<thead>
<tr>
<th>CFIR Domain/Constructs</th>
<th>Barrier &amp; Facilitators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Complexity</td>
<td>Facilitator</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Adaptability</td>
<td>Facilitator</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative Advantage</td>
<td>Barrier</td>
</tr>
<tr>
<td>Cost</td>
<td>Barrier</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Outer Setting</strong></td>
<td></td>
</tr>
<tr>
<td>External Policies and Incentives</td>
<td>Facilitator</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Facilitator</td>
</tr>
<tr>
<td></td>
<td>Barrier</td>
</tr>
<tr>
<td><strong>Inner Setting</strong></td>
<td></td>
</tr>
<tr>
<td>Compatibility</td>
<td>Facilitator</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Barrier</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Barrier</td>
</tr>
<tr>
<td>Available Resources (Readiness for Implementation sub-construct)</td>
<td>Barrier</td>
</tr>
<tr>
<td>Culture</td>
<td>Facilitator</td>
</tr>
</tbody>
</table>
### DISCUSSION

This qualitative formative study aimed to identify potential facilitators and barriers to implementing the SCC in Mozambique and sought to gain insight into current childbirth practices and conditions in the country. Three CFIR constructs were identified as facilitators (complexity, adaptability, and culture), and three CFIR constructs and one emerging code were identified as barriers (relative advantage, cost, available resources, and social recognition of birth attendants). Three other CFIR constructs were identified as both facilitators and barriers (external policies and incentives, compatibility, and knowledge and beliefs about the intervention).

Due primarily to the inadequacies of the overall health system, the implementation of SCC faces multiple obstacles in Mozambique. Regional resources are inequitably distributed, prioritizing high-level reference hospitals without assessing the needs of each facility. This limits the resources available for the adoption of SCC. Moreover, the national shortage of medications, materials, and healthcare professionals burdens current birth attendants with too much work, making it impossible to provide high-quality childbirth practices. Given that there is often only one birth attendant per shift in the maternity ward, implementing

<table>
<thead>
<tr>
<th>Characteristics of Individual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facilitator</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Knowledge &amp; Beliefs about the Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facilitator</strong></td>
</tr>
<tr>
<td><strong>Facilitator</strong></td>
</tr>
<tr>
<td><strong>Barrier</strong></td>
</tr>
<tr>
<td><strong>Barrier</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emerging Code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Barrier</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Recognition of Birth Attendants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Barrier</strong></td>
</tr>
</tbody>
</table>
and completing the SCC may compete with other clinical activities for the limited time, resources, and attention of the birth attendant.

As a result, maternal and child health outcomes are compromised, and there are many deaths that could be forestalled with appropriate and timely treatment. Birth attendants are often forced to provide suboptimal treatment or to transfer mothers and newborns to higher-level reference hospitals in the hope that they will receive better care, but the availability of resources in these hospitals is also uncertain.

The compromising of maternal and child health outcomes creates tension between patients, the community, and healthcare providers. The blaming and mistrust directed by mothers to birth attendants result in low motivation among birth attendants, and negative comments from the community further undermine their social recognition. Participants highlighted poor morale, weakened motivation, and low recognition among the primary reasons for their reluctance to adopt another protocol like the SCC, given their already overwhelming workload. Additionally, the tensions between patients, the community, and healthcare providers are not confined to the maternity ward and potentially discourage the improvement of service quality across the entire healthcare system. This can further hinder the implementation of quality improvement initiatives like SCC. This negative feedback loop hinders the health system’s implementation of the SCC, due to (a) a weak health system, (b) availability of resources, (c) birth attendant workload, (d) patient treatment outcomes, and (e) social recognition of birth attendants, is described and visualized in Figure 1.

Despite these obstacles, many birth attendants remain committed to improving the quality of childbirth practices and adopting SCC. They recognize the dynamic nature of science and the need to continue cultivating themselves. Birth attendants did not express the need for pay-for-performance for filling out SCC but suggested that allocating more financial resources towards creating better working conditions and strengthening the healthcare system would be helpful. Additionally, they would appreciate non-monetary
incentives such as awards to recognize their work and importance. Moreover, altering SCC’s formality and contents to match the context could further facilitate its implementation.

Figure 1: Negative feedback loop of the health system

Despite these obstacles, many birth attendants remain committed to improving the quality of childbirth practices and adopting SCC. They recognize the dynamic nature of science and the need to continue improving themselves. Birth attendants did not express the need for pay-for-performance for filling out SCC, but they did suggest that allocating more financial resources towards creating better working conditions and strengthening the healthcare system would be helpful. Additionally, they would appreciate non-monetary incentives such as awards to recognize their work and importance. Moreover, altering SCC’s formality and contents to match local context and practices could further facilitate its implementation.

Because many barriers to SCC implementation are rooted in the inadequacies of Mozambique's health system, we mapped the CFIR to the high-quality system framework to summarize the implications of this study and the recommendations for future SCC implementation. Because the High-Quality Health System
Framework identifies population, governance, platform, workforce, and tools as the foundation for an equitable, resilient, and efficient health system, we accordingly matched the four CFIR domains (outer setting, inner setting, individual characteristics, and intervention characteristics) and one emerging social recognition theme to the framework.

First of all, SCC as a tool to improve the quality of childbirth practices could be integrated into the existing medical record and current work routine. One way to do this is by consolidating and summarizing clinical activities related to childbirth in the SCC to reduce overwhelming paperwork and workload. The SCC could also take the form of a convenient pocket reference book to which new and even experienced birth attendants could turn to verify essential childbirth practices amidst the hectic workflow in the maternity ward. Furthermore, participants suggested that the SCC could serve as an evaluation tool to identify potential challenges in the maternity ward and as a guide to solutions to shortcomings and problems, solutions which also could be developed through meetings among hospital staff or by seeking help from technical support visits from the MoH. Due to its simplicity and flexibility, the SCC could potentially be repurposed to provide templates of medical care that would help to meet the varied needs and relieve the pressures that beset Mozambique’s hospital system. It must also be emphasized that the High-Quality Health System Framework underscores the importance of material resources such as equipment, supplies, and medicines. Due to the current severe shortages of even basic medical supplies in Mozambique’s clinics and hospitals, accelerated implementation of SCC is likely to be challenging.

The High-Quality Health System Framework naturally identifies the workforce as an essential component of a high-quality health system. This certainly is echoed in the concerns expressed by the birth attendants. Captured in the individual characteristics domain of CFIR, the birth attendants were so often fearful that the implementation of SCC would increase their workload and lead to potential penalties for failure to complete the SCC. These concerns are rooted in the limited workforce. All participants emphasized the need to increase the workforce in the maternity ward: *one nurse per shift is not enough*. The birth attendants also hopefully suggested that companions of mothers could serve as extra helpers. Additionally, while the
clinics in the study were often staffed with experienced midwives and nurses serving as birth attendants, the birth attendants whom we interviewed often expressed their strong wish to have the services of well-trained OB-GYNs and lab technicians to help manage maternal and newborn complications and to enable the timely and correct diagnoses which would meet the requirements of the SCC.

The platform component highlighted by the High-Quality Health System Framework emphasizes the connective and referral systems among the health facilities, which is related to the inner setting of the CFIR. Birth attendants identified the unclear transfer criteria for mothers and newborns as the "Achilles heel" of the health facility, and the timely transfer was an important item on the SCC. Although primary health facilities often refer and transfer patients to reference hospitals due to the lack of materials and medicine, the reasons for transfer are sometimes unclear due to poor documentation in the medical record and communication among providers. This results in overcrowding at high-level reference hospitals and confusion at the time of reception. Improving collaboration and communication among the providers and health facilities can strengthen the referral systems and therefore enhance the ability of health systems to handle complex and emerging complications identified by the SCC.

The governance component of the High-Quality Health System Framework is closely related to the outer setting domain of the CFIR. Strong political commitment and leadership are essential for building and strengthening overall health system capacity. This is especially important for the successful implementation of SCC. Participants also acknowledged that SCC implementation is not solely the responsibility of the health sector but requires government support and involvement to ensure good delivery outcomes and quality of care: “This instrument is a challenge for all levels, because it doesn’t only affect health. In order to have a good delivery, a good admission, the government also comes in, because the support for health does not come only for health. It goes from the knowledge of the government itself.” (Clinical Administrator 1, Chamanculo General Hospital). This highlights the interdependence of various sectors and the importance of collaboration for successful implementation. For example, it demands equitable allocation of sufficient resources to all health facilities, as well as expanded and equitable opportunities in higher
education for healthcare professionals, to address the widespread material and human resource shortages which are identified as major barriers to the SCC implementation.

Finally, the population component of the High-Quality Health System Framework focuses on the health needs and expectations of the population. This is related to the issue of social recognition that too often besets birth attendants. People not only benefit from the health system but are also essential partners in providing health care and improving health outcomes. Although the birth attendants received negative comments from patients and the community, the various feedback from patients do highlight the potential issues in the maternity ward, such as nurses falling asleep or insulting patients: “But there are companions who leave with the report, who instead of talking about what happened, try to talk about the negative part - or because we called the nurse, the nurse was asleep; or the nurse insulted. A lot of it talks about the nurse.” (Clinical Administrator 1, Chamanculo General Hospital). These comments should be taken seriously. They can be usefully recorded in patient satisfaction surveys to identify areas for improvement in the quality of the childbirth process and can urge ever closer conformity to the high standards of the SCC.
Figure 2: Mapping CFIR to High-Quality Health System Framework
CONCLUSION

Identifying barriers and facilitators using the CFIR is crucial for successfully implementing the SCC in a local context. In Mozambique, most barriers stem from an inadequate health system, emphasizing the need for health system strengthening and capacity building, as highlighted in the High-Quality Health System Framework. Despite these challenges, the participants' commitment to enhancing childbirth practices and their willingness to adopt new changes from the SCC are considered facilitators. To improve the feasibility of SCC implementation and increase compatibility with the current work routine for birth attendants, the SCC should be adapted to context-specific needs.

The largest SCC implementation study, BetterBirth Trial, was conducted in Uttar Pradesh, India, from 2014 to 2016, involving 120 facilities across 24 districts and 157,689 participants [29]. This trial did not offer material support to the health facilities, providing only 2-day training for facility staff to launch the BetterBirth Program at each clinical site. After two months of intervention, there was a significant decrease (ranging from -1 to 62 percentage points) in the completion of SCC practices, indicating poor adherence to the SCC.

Drawing from the BetterBirth Trial and our findings in Mozambique, providing the SCC alone is insufficient for sustainable quality improvement in childbirth practices. As one participant stated, "The form alone is not going to change anything. It is one more piece of paper." The success of SCC implementation and the enhancement of maternity services hinge on the availability of materials and human resources, as well as a high-quality health system backed by the political will to improve maternal and health outcomes. Informed by lessons learned from this formative study and SCC implementation experiences worldwide, future research should focus on large-scale implementation science research, encompassing the provision of material, human resources, and professional training to facilitate the completion of essential practices guided by the SCC. This comprehensive approach has the potential to pave the way for meaningful and lasting improvements in childbirth practices.
CONFLICTS OF INTEREST

The authors have declared that no competing interests exist.
REFERENCES


19. Tolu LB, Jeldu WG, Feyissa GT. Effectiveness of utilizing the WHO safe childbirth checklist on improving essential childbirth practices and maternal and perinatal outcome: A systematic review and meta-analysis. PLOS ONE. 2020Jun12;


APPENDICES

A: Clinical Administrator Interview Guide

The interviewees will receive physical copies of the WHO Safe Childbirth Checklist 2 days before the interview to go through the Checklist content. The investigators will elaborate on the purpose of the Checklist and how to use the Checklist before the interview. The interview will take place after the respondents have consented to participate.

I. Overview of current childbirth practice in the facility (2 questions)

To begin our conversation, I would like to learn more about the current birth practices in your setting.

Q1. What has been your experience with the current childbirth practice guidelines in your clinics, if any?

   a. Can you describe the childbirth practice guidelines which have been used in your setting?

   b. What kind of mechanisms have been used to ensure the current guidelines are well followed?

   c. How do the current guidelines help with the practices?

Q2. How do you feel about current childbirth practices in your facility?

   a. Do you have adequate support, such as financial, material, and human resources, coordination, and management, for childbirth practices?

   b. What are the gaps, issues, or problems related to the current childbirth practices?

   c. What are the components of the current work routines that could be altered? Why?

   d. What are the supplies or equipment that are routinely missing? Why?
II. **WHO Safe Childbirth Checklist Characteristics (5 questions)**

First, we will discuss some of your overall impressions of the WHO Safe Childbirth Checklist. We will use “Checklist” to refer to it in the following parts.

Q1. How complicated is the Checklist?

Q2. How does the Checklist compare to the current childbirth practices in your clinic?

Q3. If you would implement the Checklist, what kinds of changes do you think you will make to the Checklist to make it work effectively in your setting?

Q4. What kinds of additional support would help you implement and use the Checklist?

Q5. What additional costs were considered when deciding to implement the Checklist?

III. **Inner setting (3 questions)**

Now, we are going to focus on factors within your setting that can influence the Checklist implementation.

Q1. How do you think implementing the Checklist would meet the current needs of childbirth practices in your setting?

   a. Probe for how & why.

Q2. How do you think the Checklist could integrate into the existing organizational structures and work procedures in your setting?

   a. What kinds of changes will be needed in the hospital to accommodate the implementation of the Checklist?

   b. Can you describe how the Checklist will be integrated into current processes?
c. Will the Checklist replace or complement a current program or process?

Q3. What are likely issues or complications that may arise from implementing the Checklist?

a. Probe for costs, resources, training, and workload, asking for examples

IV. Outer setting (2 questions)

Now, we will explore factors within the broader context that can possibly influence the Checklist implementation. The influence could be positive or negative.

Q1. What kind of local or national performance measures, policies, regulations, or guidelines influenced the implementation of the Checklist?

a. Probe for any reporting and/or monitoring mechanisms

Q2. What kind of financial or other incentives influenced the implementation of the Checklist?

V. Process (1 question)

Next, let’s discuss what could be the potential implementation process for the Checklist.

Q1. If you would implement the Checklist, what future steps would you be taking?

a. Probe for how and why

b. Who are the key stakeholders to get on board to help with the Checklist implementation?
VI. **Ending Questions (2 questions)**

Here are some ending questions regarding your professional roles and experience.

Q1. Do you have any questions for us?

Q2. Demographic Questions

   a. What’s your professional background?

   b. What are your specific roles in the hospital?

   c. How many years of working experience do you have?

   d. How long have you been working in this management position?

   e. How old are you?

   f. What’s your gender?
B: Birth Attendant Focus Group Discussion Guide

A Focus Group will include four to five participants. The participants will receive physical copies of the WHO Safe Childbirth Checklist 2 days before the discussion to go through the Checklist content. The investigators will elaborate on the purpose of the Checklist and how to use the Checklist before the discussion. The interview will take place after the respondents have consented to participate.

I. Opening Questions (1 question)

Introduction of the investigators and participants.

Q1. Do you have questions about the Checklist?

II. Introduction Question (1 question)

To begin our conversation, we would like to learn

Q1. What has been your experience using the childbirth practice guidelines in your clinics, if any?

   a. Can you describe the childbirth practice guidelines which have been used in your settings?

   b. What kind of mechanisms have been established to ensure that the current guidelines are well followed?

   c. What kind of changes have been made to the current childbirth practice guidelines? If any, why?

   d. How did/do the guidelines help with the practices?

III. Transition Question (1 question)

Q1. What is your experience with the current childbirth practices?
a. What kinds of support did you have for the childbirth practices?

b. What gaps, issues, or problems were related to the current childbirth practice?

Probe for more examples.

IV. Key Questions (8 questions)

Next, we will discuss some of your overall impressions of the WHO Safe Childbirth Checklist. We will use “Checklist” to refer to it in the following parts.

Q1. How complicated is the Checklist?

Q2. How does the Checklist compare to the current childbirth practices?

Q3. How well does the Checklist fit with existing work routines in your setting?

   a. Can you describe how the Checklist will be integrated into current processes?

   b. Will the Checklist replace or complement a current program or process?

Q4. How do you think your workplace culture will affect the implementation of the Checklist?

   a. How do you feel if you are being asked to make new changes to your current childbirth process?

   b. How do you feel if you are being asked to set aside your original work routines?

Q5. What kind of local or national performance measures, policies, or regulations would influence the implementation of the Checklist?

   a. Probe for any reporting and/or monitoring mechanisms
Q6. What are likely issues or complications that may arise from implementing the Checklist?

   a. Probe for costs, resources, training, and workload, asking for examples

Q7. What kind of additional support would help you implement the Checklist?

Q8. What kinds of changes do you think you will make to the Checklist to make it work effectively in your setting?

V.  **Ending Questions (4 questions)**

Q1. How do you think implementing the Checklist would meet the current needs of childbirth practices in your setting?

   a. Probe for how & why.

Q2. Is there anything else you would like to add?

Q3. Do you have any questions for us?

Q4. Demographic questions

   a. What’s your professional background?

   b. What are your specific roles in the hospital?

   c. How long have you been working in the maternity ward?

   d. How old are you?

   e. What’s your gender?
C: Pilot FGD question guide (see attachment)

D: Codebook (see attachment)

E: WHO Safe Childbirth Checklist (SCC) (see attachment)
<table>
<thead>
<tr>
<th>CFIR Domains</th>
<th>Constructs</th>
<th>Constructs Description</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics of</td>
<td>Knowledge &amp; Beliefs about the Intervention</td>
<td>Individuals’ attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.</td>
<td>Q1. What has been your experience using the childbirth practice guidelines in your clinics, if any?</td>
</tr>
<tr>
<td>Individuals</td>
<td>Knowledge &amp; Beliefs about the Intervention</td>
<td>Individuals’ attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.</td>
<td>Q1. What is your experience with the current childbirth practices?</td>
</tr>
<tr>
<td>Inner Setting</td>
<td>Implementation Climate - Tension for Change</td>
<td>The degree to which stakeholders perceive the current situation as intolerable or needing change.</td>
<td>Q1. What is your experience with the current childbirth practices?</td>
</tr>
<tr>
<td>or</td>
<td>Knowledge &amp; Beliefs about the Intervention</td>
<td>Individuals’ attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.</td>
<td>a. What kinds of support did you have for the birth practices?</td>
</tr>
<tr>
<td>Characteristics of</td>
<td>Knowledge &amp; Beliefs about the Intervention</td>
<td>Individuals’ attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.</td>
<td>b. What gaps, issues, or problems were related to the current childbirth practice?</td>
</tr>
<tr>
<td>Individuals</td>
<td>Knowledge &amp; Beliefs about the Intervention</td>
<td>Individuals’ attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.</td>
<td>Q1. How complicated is the Checklist?</td>
</tr>
<tr>
<td>Intervention Characteristics</td>
<td>Complexity</td>
<td>Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement.</td>
<td>Q2. How does the Checklist compare to the current birth practices?</td>
</tr>
<tr>
<td>Intervention Characteristics</td>
<td>Relative Advantage</td>
<td>Stakeholders’ perception of the advantage of implementing the intervention versus an alternative solution.</td>
<td>Q3. How well could the Checklist fit with existing work routines in your setting?</td>
</tr>
<tr>
<td>Inner Setting</td>
<td>Implementation Climate - Compatibility</td>
<td>The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals’ own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems.</td>
<td>a. Can you describe how the Checklist will be integrated into current processes?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Will the Checklist replace or complement a current program or process?</td>
</tr>
<tr>
<td>Inner Setting</td>
<td>Culture</td>
<td>Norms, values, and basic assumptions of a given organization.</td>
<td>Q4. How do you think your workplace culture will affect the implementation of the Checklist?</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
<td>---------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Outer Setting | External Policies & Incentives | A broad construct that includes external strategies to spread interventions including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting. | a. How do you feel if you are being asked to make new changes to your current birth process?  
b. How do you feel if you are being asked to set aside your original performance routines? |
| Inner Setting | Implementation Climate - Compatibility | The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals’ own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems. | Q5. What kind of local or national performance measures, policies, regulations, or guidelines would influence the decision to implement the intervention? |
| Inner Setting | Readiness for Implementation (Available Resources) | Tangible and immediate indicators of organizational commitment to its decision to implement an intervention. (The level of resources dedicated for implementation and on-going operations including money, training, education, physical space, and time.) | Q6. What are likely issues or complications that may arise from implementing the Checklist? |
| Intervention Characteristics | Adaptability | The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs. | Q7. What kind of support would help implement the Checklist? |
| Inner Setting | Tension for Change | The degree to which stakeholders perceive the current situation as intolerable or needing change. | Q8. What kinds of changes do you think you will make to the Checklist to make it work effectively in your setting? |
| V. Ending Question | | |  
Q1. How do you think implementing the Checklist would meet the current needs of birth practices in your setting?  
Q2. Is there anything else you would like to add?  
Q3. Do you have any questions for us? |
## Research Question:

CFIR Domains | Constructs | Constructs Description | Example Quote | Notes (can include examples of things to include or exclude)
---|---|---|---|---
1 | Self - Efficacy | dual belief in their own capabilities to execute courses of action to achieve implementation goals. | "Yes, developing an instrument and appropriating it to different realities. I don't see difficulties that big. I don't see an impasse for the implementation of the instrument." | Confidence in executing the SCC implementation
2 | Knowledge & Beliefs about the Intervention (Checklist) | Individuals’ attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention. | Positive Belief: "I think I would feel very good, because there are so many things, there are so many norms that are formulated, that sometimes we are not consulted. Usually that instrument arrives, and we have to comply with it. They are orders, and we have to follow them. It would be very good if we really had the chance to participate. It would be very good." | Familiarity of technical skills & knowledge that related to the SCC (when describing work routine before the interview/FGD touched on the Checklist) & the positive/negative belief about the SCC implementation
3 | Complexity | Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement. | “Now, stopping to write it down and then doing it can be a bit tricky… My suggestion would be that it should be in a format like these HIV flowcharts, for example. You don't make us waste time even opening a document and looking for how to do it. Then nail it on the wall, because if it is a person that is in that sector and knows where the flowchart X, Y, Z is, the person looks, sees the explanations and does it. It is easier to do than in the form of a list.” | Inclusion Criteria - content Code statements regarding the complexity of the innovation. Exclusion Criteria Code statements regarding the complexity of implementation and code to other appropriate CFIR codes, e.g., code difficulties related to space to Available Resources and code difficulties related to engaging participants in a new program to Engaging: Innovation Participants.
4 | Adaptability | The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs. | “No relative advantage: "I think that's exactly what my colleague was talking about here. It would be one more instrument. It would be a repetition of what we already do. It is as if it were All these flowcharts that we have, they already exist. And that is exactly what we do. " | Inclusion Criteria Include statements regarding the (in)ability to adapt the innovation to their context, e.g., complaints about the rigidity of the protocol. Suggestions for improvement can be captured in this code When birth attendant request/demand new changes for/because of the SCC implementation, code for adaptability, such as requiring newborn complication transfer management, personnel training, etc & When the current technical practices (#amount, dosage) is different from the SCC, code for adaptability (adapt the Checklist to Mozambican standard) Exclusion Criteria
5 | Relative Advantage | Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution. | No relative advantage: "I think that's exactly what my colleague was talking about here. It would be one more instrument. It would be a repetition of what we already do. It is as if it were All these flowcharts that we have, they already exist. And that is exactly what we do. " | Inclusion Criteria Include statements that demonstrate the innovation is better (or worse) than existing programs. “We evaluated a lot of systems and this one is clearly better for our clinic.” Encounter statements that SCC is almost identical to the current work routine, DOUBLE CODE for Low relative advantage & Low tension for change Exclusion Criteria Exclude statements that do or do not demonstrate a strong need for the innovation and/or that the current situation is untenable, e.g., statements that the innovation is absolutely necessary or that the innovation is redundant with other programs, and code to Tension for Change.
<table>
<thead>
<tr>
<th>Implementation Climate</th>
<th>Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals’ own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems.</td>
<td></td>
</tr>
<tr>
<td>&quot;If it is to add, the formulation of the content is very good. But if it is to add another work, it gets complicated. It is complicated because we already have many instruments. If the list doesn't come to remove anything, it comes to add, it's another job.&quot; &quot;But I want the health unit to move forward, because that is already introduced. It is already difficult for the health unit to continue, because they are not all able to multiply their own records.&quot;</td>
<td></td>
</tr>
<tr>
<td>the compatibility with current work routine and conception - The degree of fit between the SCC and the clinic’s values, norms, needs, and existing workflows and systems. Logistic-wise complexity (e.g. add more work on top of the current workload, replication); In terms of the complexity of the context, not so much</td>
<td></td>
</tr>
<tr>
<td>Inclusion Criteria - routine</td>
<td></td>
</tr>
<tr>
<td>Include statements that demonstrate the level of compatibility the innovation has with organizational values and work processes. Include statements that the innovation did not need to be adapted. Encounter requiring companion statements that's not related to the social pressure, coded for compatibility &amp; when the needs match the SCC, code for compatibility &amp; mention that the SCC will be most easily implemented at which stage/pause point &amp; when the gap between current work and SCC is too large to proceed the SCC practices, code for compatibility &amp; the complexity of implementation</td>
<td></td>
</tr>
</tbody>
</table>

| Readiness for Implementation (Available Resources) |
| Tangible and immediate indicators of organizational commitment to its decision to implement an intervention. (The level of resources dedicated for implementation and on-going operations including money, training, education, physical space, and time.) |
| "For the maternity case, you are missing too many antihypertensives. Just talk about methyldopa, hydralazine, dihydralazine… and this has made our work very difficult. We have a considerable number of pre-eclampsia and eclampsia. And when it is time to medicate this patient, it is a problem… And I believe that there are situations that even end up in transfers that could be avoided purely and simply by the fact that there are medications available. Others end in cesarean sections that could have been avoided. Others that even end in maternal or neonatal death, which could have been avoided just by the simple fact of having these drugs available." |
| material resources & human resources & training - immediate indicator & coping mechanism |

| Culture |
| Norms, values, and basic assumptions of a given organization. |
| "If we look, maybe, at the deficiency in the acquisition… at the moment of distribution or at the moment of acquisition, look a little more at the situation of the hospitals. Because if we end up balancing, asking for support from the other health units, but maybe the others don't have that demand that a hospital has. And hospitals generally end up receiving very little… we should look more at our demand and try to make a distribution according to the calculation of the production of a hospital." |
| generally describing the current work routine, methods, and attitudes towards the SCC |

| Outer Setting |
| External Policies & Incentives |
| A broad construct that includes external strategies to spread interventions including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting. |
| "If we look, maybe, at the deficiency in the acquisition… at the moment of distribution or at the moment of acquisition, look a little more at the situation of the hospitals. Because if we end up balancing, asking for support from the other health units, but maybe the others don't have that demand that a hospital has. And hospitals generally end up receiving very little… we should look more at our demand and try to make a distribution according to the calculation of the production of a hospital." |
| Inclusion Criteria |
| Include evidence of pre-implementation diagnostic assessments and planning as well as refinements to the plan. Note: The example below may also be interpreted as the synthesis and evaluation of evidence to determine the formality of planning and if any planning activities were done. When encounter the 'laws', 'MoH guidelines', 'the policy priorities', etc |

| Emerging Codes |
| Social pressure for birth attendants |
| Birth attendants facing the social pressure coming from the blame of the pregnant women as well as the low motivation and recognition from the society |
| "Because if we look at the media, they are against us. Just for someone to be born outside, we are already on television. But if I attend childbirth outside without gloves to help, I won't be on television. But if someone is born outside, even five meters from the hospital, we are going to be smeared with all of this. 'Chamanculo is negligent, there was no emergency room.' So, motivation factor." |
| generally describing the current work routine, methods, and attitudes towards the SCC |
**WHO Safe Childbirth Checklist**

**BEFORE BIRTH**

### On Admission

<table>
<thead>
<tr>
<th>Task</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Does mother need referral?</strong></td>
<td>Check your facility's criteria</td>
</tr>
<tr>
<td><strong>Partograph started?</strong></td>
<td>Start plotting when cervix ≥4 cm, then cervix should dilate ≥1 cm/hr</td>
</tr>
<tr>
<td><strong>Does mother need to start:</strong></td>
<td>Ask for allergies before administration of any medication</td>
</tr>
<tr>
<td><strong>Antibiotics?</strong></td>
<td>Give antibiotics to mother if any of:</td>
</tr>
<tr>
<td>No</td>
<td>Mother's temperature ≥38°C</td>
</tr>
<tr>
<td>Yes, given</td>
<td>History of foul-smelling vaginal discharge</td>
</tr>
<tr>
<td><strong>Magnesium sulfate and antihypertensive treatment?</strong></td>
<td>Give magnesium sulfate to mother if any of:</td>
</tr>
<tr>
<td>No</td>
<td>Diastolic BP ≥110 mmHg and 3+ proteinuria</td>
</tr>
<tr>
<td>Yes, magnesium sulfate given</td>
<td>Diastolic BP ≥90 mmHg, 2+ proteinuria,</td>
</tr>
<tr>
<td>Yes, antihypertensive medication given</td>
<td>and any: severe headache, visual disturbance, epigastric pain</td>
</tr>
<tr>
<td></td>
<td>Give antihypertensive medication to mother if systolic BP &gt;160 mmHg</td>
</tr>
<tr>
<td></td>
<td>Goal: keep BP &lt;150/100 mmHg</td>
</tr>
<tr>
<td><strong>Confirm supplies are available to clean hands and wear gloves for each vaginal exam.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Encourage birth companion to be present at birth.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Confirm that mother or companion will call for help during labour if needed.</strong></td>
<td>Call for help if any of:</td>
</tr>
<tr>
<td></td>
<td>Bleeding</td>
</tr>
<tr>
<td></td>
<td>Severe abdominal pain</td>
</tr>
<tr>
<td></td>
<td>Severe headache or visual disturbance</td>
</tr>
<tr>
<td></td>
<td>Unable to urinate</td>
</tr>
<tr>
<td></td>
<td>Urge to push</td>
</tr>
</tbody>
</table>

This checklist is not intended to be comprehensive and should not replace the case notes or partograph. Additions and modifications to fit local practice are encouraged. For more information on recommended use of the checklist, please refer to the “WHO Safe Childbirth Checklist Implementation Guide” at: www.who.int/patientsafety.

© WHO 2015

WHO/HIS/SDS/2015.26

WHO Safe Childbirth Checklist

Completed by ____________________________
## Just Before Pushing (Or Before Caesarean)

### Does mother need to start:

<table>
<thead>
<tr>
<th>Antibiotics?</th>
<th>Magnesium sulfate and antihypertensive treatment?</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Yes, given</td>
<td>Yes, magnesium sulfate given</td>
</tr>
<tr>
<td>Yes, given</td>
<td>Yes, antihypertensive medication given</td>
</tr>
</tbody>
</table>

- **Antibiotics?**
  - Ask for allergies before administration of any medication.
  - Give antibiotics to mother if any of:
    - Mother’s temperature ≥38 °C
    - History of foul-smelling vaginal discharge
    - Rupture of membranes >18 hrs
    - Caesarean section

- **Magnesium sulfate and antihypertensive treatment?**
  - Give magnesium sulfate to mother if any of:
    - Diastolic BP ≥110 mmHg and 3+ proteinuria
    - Diastolic BP ≥90 mmHg, 2+ proteinuria, and any: severe headache, visual disturbance, epigastric pain
  - Give antihypertensive medication to mother if systolic BP >160 mmHg
    - Goal: keep BP <150/100 mmHg

### Confirm essential supplies are at bedside and prepare for delivery:

**For mother**
- Gloves
- Alcohol-based handrub or soap and clean water
- Oxytocin 10 units in syringe

**For baby**
- Clean towel
- Tie or cord clamp
- Sterile blade to cut cord
- Suction device
- Bag-and-mask

- **Prepare to care for mother immediately after birth:**
  - Confirm single baby only (not multiple birth)
  - 1. Give oxytocin within 1 minute after birth
  - 2. Deliver placenta 1-3 minutes after birth
  - 3. Massage uterus after placenta is delivered
  - 4. Confirm uterus is contracted

- **Prepare to care for baby immediately after birth:**
  - 1. Dry baby, keep warm
  - 2. If not breathing, stimulate and clear airway
  - 3. If still not breathing:
    - clamp and cut cord
    - clean airway if necessary
    - ventilate with bag-and-mask
    - shout for help

- **Assistant identified and ready to help at birth if needed.**

---

This checklist is not intended to be comprehensive and should not replace the case notes or partograph. Additions and modifications to fit local practice are encouraged.

For more information on recommended use of the checklist, please refer to the “WHO Safe Childbirth Checklist Implementation Guide” at: [www.who.int/patientsafety](http://www.who.int/patientsafety).
Soon After Birth (Within 1 Hour)

Is mother bleeding abnormally?
- No
- Yes, shout for help

If bleeding abnormally:
- Massage uterus
- Consider more uterotonic
- Start IV fluids and keep mother warm
- Treat cause: uterine atony, retained placenta/fragments, vaginal tear, uterine rupture

Does mother need to start:
Antibiotics?
- No
- Yes, given

Magnesium sulfate and antihypertensive treatment?
- No
- Yes, magnesium sulfate given
- Yes, antihypertensive medication given

Ask for allergies before administration of any medication
Give antibiotics to mother if placenta manually removed or if mother's temperature ≥38 °C and any of:
- Chills
- Foul-smelling vaginal discharge

If the mother has a third or fourth degree of perineal tear give antibiotics to prevent infection

Give magnesium sulfate to mother if any of:
- Diastolic BP ≥110 mmHg and 3+ proteinuria
- Diastolic BP ≥90 mmHg, 2+ proteinuria, and any: severe headache, visual disturbance, epigastric pain

Give antihypertensive medication to mother if systolic BP >160 mmHg
- Goal: keep BP <150/100 mmHg

Does baby need:
Referral?
- No
- Yes, organized

Antibiotics?
- No
- Yes, given

Special care and monitoring?
- No
- Yes, organized

Give baby antibiotics if antibiotics given to mother for treatment of maternal infection during childbirth or if baby has any of:
- Respiratory rate >60/min or <30/min
- Chest in-drawing, grunting, or convulsions
- Poor movement on stimulation
- Baby's temperature <35 °C (and not rising after warming) or baby's temperature ≥38 °C

Arrange special care/monitoring for baby if any:
- More than 1 month early
- Birth weight <2500 grams
- Needs antibiotics
- Required resuscitation

☑ Started breastfeeding and skin-to-skin contact (if mother and baby are well).

☐ Confirm mother / companion will call for help if danger signs present.

Responsibility for the interpretation and use of the material in this checklist lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use. For more information visit www.who.int/patientsafety.
Before Discharge

Confirm stay at facility for 24 hours after delivery.

Does mother need to start antibiotics?
- No
- Yes, given and delay discharge

Ask for allergies before administration of any medication
- Mother’s temperature ≥38 °C
- Foul-smelling vaginal discharge

Is mother’s blood pressure normal?
- No, treat and delay discharge
- Yes

Give magnesium sulfate to mother if any of:
- Diastolic BP ≥110 mmHg and 3+ proteinuria
- Diastolic BP ≥90 mmHg, 2+ proteinuria, and any: severe headache, visual disturbance, epigastric pain

Give antihypertensive medication to mother if systolic BP >160 mmHg
- Goal: keep BP <150/100 mmHg

Is mother bleeding abnormally?
- No
- Yes, treat and delay discharge

If pulse >110 beats per minute and blood pressure <90 mmHg
- Start IV and keep mother warm
- Treat cause (hypovolemic shock)

Does baby need to start antibiotics?
- No
- Yes, give antibiotics, delay discharge, give special care

Give antibiotics to baby if any of:
- Respiratory rate >60/min or <30/min
- Chest in-drawing, grunting, or convulsions
- Poor movement on stimulation
- Baby’s temperature <35°C (and not rising after warming) or baby’s temperature ≥38°C
- Stopped breastfeeding well
- Umbilicus redness extending to skin or draining pus

Is baby feeding well?
- No, establish good breastfeeding practices and delay discharge
- Yes

Discuss and offer family planning options to mother.

Arrange follow-up and confirm mother / companion will seek help if danger signs appear after discharge.

Danger Signs

Mother has any of:
- Bleeding
- Severe abdominal pain
- Severe headache or visual disturbance
- Breathing difficulty
- Fever or chills
- Difficulty emptying bladder
- Epigastric pain

Baby has any of:
- Fast/difficult breathing
- Fever
- Unusually cold
- Stops feeding well
- Less activity than normal
- Whole body becomes yellow

Responsibility for the interpretation and use of the material in this checklist lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use. For more information visit www.who.int/patientsafety.