HIGH IMPACT INTERVENTIONS ON QUALITY-OF-CARE IMPROVEMENTS IN FACILITIES FOR MATERNAL, NEWBORN AND CHILD HEALTH / SEXUAL AND REPRODUCTIVE HEALTH IN SUB-SAHARAN AFRICA

A review of literature

Commissioned by the Innovating for Maternal and Child Health in Africa (IMCHA) initiative

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The Innovating for Maternal and Child Health in Africa (IMCHA) initiative is a partnership between the Canadian Institutes of Health Research, Global Affairs Canada and the Canada's International Development Research Centre. The initiative seeks to improve maternal, newborn and child health outcomes in sub-Saharan Africa using primary health care as entry point. The initiative focuses on four key priority research themes: (i) high impact community-based interventions; (ii) quality facility-based interventions; (iii) policy environment; and (iv) human resources for health. Health equity and gender equality are cross-cutting themes.

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Acronyms and Abbreviations

AMTSL	Active Management of Third Stage Labor
ANC	Antenatal Care
ASDIT	Accessing Safe Deliveries in Tanzania
ASRH	Adolescent Sexual and Reproductive Health
BxTC	Bronx Teens Connection
BEmONC	Basic Emergency Obstetric and Newborn Care
CEmONC	Comprehensive Emergency Obstetric and Newborn Care
CDSS	Computerized Clinical Decision Support System
CHW	Community Health Worker
CS	Caesarian Section
CSE	Comprehensive Sexual Education
DALY	Disability Adjusted Life Year
EmONC	Emergency Obstetric and Newborn Care
EQUIPP	Equity and Inclusion in Policy Processes
FHCI	Free Health Care Initiative
GDP	Gross Domestic Product
HCW	Health Care Worker
IMCHA	Innovating for Maternal and newborn Health in Africa
IMR	Infant Mortality Rate
IMTeCHO	Innovative Mobile - phone Technology for Community Health Operations
IT	Information Technology
IUD	Intrauterine Device
KMC	Kangaroo Mother Care
LMIC	Low and Middle - Income Country
MNCH	Maternal Newborn and Child Health
NHIS	National Health Insurance Scheme
PE/E	Pre- Eclampsia/ Eclampsia
PNC	Prenatal care
PPC	Postpartum Care
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
QI	Quality Improvement
QoC	Quality-of-Care
QUALMAT	Quality of Prenatal and Maternal Care
RBF	Results-Based Financing
SBM-R	Standard-Based Management and Recognition
SDG	Sustainable Development Goal
SDH	Social Determinants of Health
SMGL	Saving Mother Giving Life
SRHR	Sexual and Reproductive Health and Rights
SSA	Sub-Saharan Africa
STI	Sexually Transmitted Infection
UHC	Universal Health Coverage
WHO	World Health Organization
YFS	Youth Friendly Services

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Executive summary

The sub-Saharan African (SSA) region has over two thirds of the global burden of maternal deaths and records high infant mortality rates. The region recorded an average of 534 maternal deaths per 100,000 live births in 2017 (WorldBank 2017). Further, one in 13 children died before their fifth birthday in 2019, a statistic that is 15 times higher than that of children born in high-income countries (UNICEF 2020). Additionally, a systematic analysis of mortality in 137 low-income and middle-income countries (LMICs) demonstrates that close to 56 percent of deaths that could be prevented by healthcare interventions are attributable to poor quality care. The proportion of deaths due to poor quality care exceeds those due to non-utilization of healthcare services (Kruk, et al. 2018).

The comparatively poorer health outcomes in SSA are attributable, at least in part, to poor quality-of-care (QoC) offered in health facilities which has in turn been associated with several health system-related factors including the lack of infrastructure and inadequate healthcare personnel, as well as poor governance at facility level. The impact of poor QoC on health outcomes is significant.

The impact of poor QoC on Maternal Newborn and Child Health (MNCH) and Sexual and Reproductive Health and Rights (SRHR) outcomes is further exacerbated by inequities in access to quality healthcare in SSA. While health equity and gender equality considerations are attracting attention in the global health ecosystem, they are yet to be fully integrated in initiatives aimed at improving health outcomes in SSA.

In keeping with its strategic intention to contribute to the body of knowledge on solutions to address MNCH and SRHR challenges, in particular in SSA, the Innovating for Maternal and Child Health in Africa (IMCHA) initiative commissioned this review of literature on high impact interventions that improve QoC. This literature review sought to: draw on global literature to identify high impact interventions that improve the QoC relevant to SSA; draw out successful interventions that have been implemented in SSA; highlight how gender and equity considerations have been addressed in interventions that improve QoC; draw on examples from IMCHA projects to document how interventions have been implemented in SSA; and identify research questions and opportunities to address QoC knowledge gaps in SSA.

The literature review employed a World Health Organization (WHO) framework for maternal and newborn care (WHO, Standards for improving quality of maternal and newborn care in health facilities 2016) to assess quality of care at the facilities, and the Equity and Inclusion in Policy Processes (EquIPP) to assess health equity and gender equality considerations therein.

Key findings

The review of literature found that the poor QoC in facilities has prompted actions by various institutions and actors in the health ecosystem. These actions, in the form of interventions and services, have been implemented within the SSA region with the aim to improve QoC for MNCH, SRHR, and promote health and gender equity.

For MNCH, various interventions and services at the various stages of a pregnancy were deployed. **Preconception care services** that have proven impactful in reduction of maternal deaths were accounted for in the review of literature, and include: birth spacing/family planning programs; optimization of pre-pregnancy weight and nutritional status including folic acid and multi-vitamin supplementation; infection control through tetanus vaccination; HIV/AIDS and sexually transmitted infections (STI) screening; mental health screening and the screening of chronic diseases such as diabetes and hypertension.

Postnatal care interventions are targeted at reducing newborn deaths and under-five mortality rates associated with pre-term births. Newborn resuscitation interventions, including the establishment of resuscitation teams,

have also been implemented and shown to improve health outcomes. Its uptake and utilization is lower in SSA compared to other countries globally. This is because, despite the need for privacy and enough space for the mothers and caretakers, the postnatal care interventions in SSA are carried out in limited spaces and lack of designated rooms (Vesel, et al. 2015).

Several **quality improvement interventions** that aim to evaluate and improve healthcare delivery process at health facilities have been implemented. Some of these interventions involved the training of doctors, midwives and other healthcare providers on communication skills while others focused on enhancing the competence of healthcare workers. While these training-focused interventions have been shown to improve health outcomes, the evidence gathered in the review of literature suggests that the integration of these interventions with provision of essential commodities enhances the effectiveness of these interventions in improving quality.

Comprehensively planned and implemented QoC interventions addressed **health equity and gender inequality** concerns in a variety of ways. Health inequities were addressed through the targeting of rural and vulnerable populations where access to quality care was limited and high facility maternal mortality rates were being recorded (Serbanescu, Goldberg, et al. 2017). Interventions which utilized health equity considerations had higher impact and better outcomes in SSA as evident in the significant reduction of maternal and newborn mortalities.

Published evidence shows that there is limited access to and poor **quality of SRHR services** globally and in SSA – an observation that has been attributed to three main factors: the absence of youth-friendly services (YFSs); healthcare workers' incompetence in SRHR service provision; and lack of the essential resources such as contraception commodities. The review of literature identified several interventions that improved SRHR outcomes. The training and supervision of procurement officers to enhance their competence on effective supply chain management has been shown to enhance the quality of contraception services and the management of sexually transmitted infections.

With regards to the **cost implication** of implementing interventions aimed at improving QoC, evidence from literature suggests that specific interventions such as safe motherhood interventions, as well as interventions aimed at addressing reproductive health such as safe abortion are comparatively more cost-effective. In light of this, there is merit in resource-constrained countries prioritizing and adopting these and similar cost-effective interventions in order to optimize MNCH and SRHR outcomes given the available finite resources.

While this review of literature identified a wide array of interventions, and studies, aimed at improving QoC for MNCH and SRHR, several **gaps in knowledge** were identified that merit further research. These include additional research on: the barriers and enablers to the deployment of each component of emergency obstetric and newborn care (EmONC) in LMICs in order to generate evidence for use in the QoC improvement for MNCH, and to effectively reduce newborn and maternal deaths; approaches that improve uptake of long-acting contraceptives; reliable and more effective ways of integrating the supply chain for health products into other health facility logistical systems so as to ensure constant supply of essential health products; and effective ways to enhance health equity and gender equality considerations within the health policy, knowledge translation and healthcare delivery ecosystem.

The report **recommends** the following to implementers of future interventions: Develop strategic partnerships and collaborations with the host governments, to enhance the success and sustainability of interventions aimed at improving QoC for MNCH and SRHR; Adopt a health systems approach to comprehensively address the multiple, and often interconnected, health systems deficiencies that result in poor quality care as opposed to focusing on singular challenges; Adopt a data-driven approach in the performance measurement and improvement of interventions; Leverage on technology to increase access to quality MNCH and SRHR services especially in rural areas.

To the policymakers, including those in government, the following recommendations are made: Invest in physical infrastructure, medical equipment and supplies, as well as increase supply of medicines at health facilities; Build the capacity of healthcare providers to deliver high quality MNCH and SRHR services using simulation enhanced MNCH and SRHR training programs.

To the funders, the following is recommended: Leverage on funding mechanisms to catalyze the incorporation of health equity and gender equality considerations in initiatives and projects aimed at improving QoC for MNCH and SRHR.

Résumé exécutif

La région de l'Afrique subsaharienne (ASS) représente plus de deux tiers du fardeau mondial des décès maternels et enregistre des taux élevés de mortalité infantile. La région a enregistré une moyenne de 534 décès maternels pour 100 000 naissances vivantes en 2017 (Banque mondiale 2017). De plus, un enfant sur 13 est décédé avant son cinquième anniversaire en 2019, une statistique 15 fois supérieure à celle des enfants nés dans des pays à revenu élevé (UNICEF 2020). En outre, une analyse systématique de la mortalité dans 137 pays à revenu faible et intermédiaire (PRFI) montre que près de 60% des décès qui pourraient être évités par des interventions de santé sont imputables à des soins de mauvaise qualité. La proportion de décès dus à des soins de mauvaise qualité dépasse celle due à la non-utilisation des services de santé (Kruk, et al. 2018).

Les résultats sanitaires comparativement plus faibles en ASS sont attribuables, au moins en partie, à la mauvaise qualité des soins (QDS) offerts dans des établissements de santé, qui à son tour a été associée à plusieurs facteurs liés au système de santé, notamment le manque d'infrastructure et des effectifs insuffisants du personnel de santé, ainsi que la mauvaise gestion au niveau des établissements de santé. L'impact d'une mauvaise QDS sur des résultats sanitaires est significatif.

L'impact d'une mauvaise QDS sur la santé de la mère, du nouveau-né et de l'enfant (SMNE) et sur la santé et droits en matière de sexualité et de reproduction (SDSR) est encore exacerbé par les inégalités d'accès à des soins de santé de qualité en ASS. Bien que les considérations d'équité en santé et d'égalité des sexes attirent l'attention dans l'écosystème mondial de la santé, elles ne sont pas encore pleinement intégrées dans les initiatives visant à améliorer les résultats sanitaires en ASS.

Conformément à son but stratégique de contribuer aux connaissances sur les solutions pour relever les défis de la SMNE et de la SDSR, en particulier en ASS, le programme Innovation pour la santé des mères et des enfants d'Afrique (ISMEA) a commandé cette revue de littérature sur les interventions à fort impact qui améliorent la QDS. Cette revue de littérature visait à: s'inspirer de la littérature mondiale pour identifier les interventions à fort impact qui améliorent la qualité des soins qui seraient pertinentes pour l'ASS; afficher des interventions réussies qui ont été mises en œuvre en ASS; souligner la manière dont les considérations de sexe et d'équité ont été prises en compte dans les interventions qui améliorent la QDS; s'inspirer d'exemples de projets d'ISMEA pour documenter la manière dont les interventions ont été mises en œuvre en ASS; et identifier les questions de recherche et les opportunités pour combler des lacunes dans les connaissances sur la QDS en ASS.

La revue de littérature a utilisé le cadre de l'Organisation mondiale de la Santé (OMS) pour les soins maternels et néonatals (OMS, Standards pour l'amélioration de la qualité des soins maternels et néonatals dans les établissements de santé 2016) pour évaluer la qualité des soins dans les établissements de santé, et l'équité et l'inclusion dans les processus politiques (EquIPP) pour évaluer les considérations d'équité en santé et d'égalité des sexes.

Principales conclusions

La revue de littérature a révélé que la mauvaise QDS dans les établissements de santé a incité diverses institutions et acteurs de l'écosystème de la santé à agir. Ces actions, sous forme d'interventions et de services, ont été mises en œuvre dans la région de l'ASS dans le but d'améliorer la QDS pour la SMNE, la SDSR, et de promouvoir la santé et l'équité entre les sexes.

Pour la SMNE, diverses interventions et services aux différents stades de la grossesse ont été déployés. **Les services de soins avant la conception** qui se sont avérés efficaces dans la réduction des décès maternels comprennent: programmes d'espacement des naissances/de planification familiale; optimisation du poids et de l'état nutritionnel avant la grossesse, y compris la supplémentation en acide folique et en multivitamines;

contrôle des infections grâce à la vaccination contre le tétanos; dépistage du VIH/sida et des infections sexuellement transmissibles (IST); dépistage de la santé mentale et dépistage des maladies chroniques comme le diabète et l'hypertension.

Les interventions de soins postnatals visent à réduire les décès des nouveau-nés et les taux de mortalité des enfants de moins de cinq ans associés aux naissances prématurées. Des interventions de réanimation néonatale, y compris la mise en place d'équipes de réanimation, ont également été mises en œuvre et ont montré qu'elles améliorent des résultats sanitaires. Son adoption et son utilisation sont plus faibles en ASS que dans d'autres pays du monde. En effet, malgré le besoin d'intimité et d'espace suffisant pour les mères et les gardiens, les interventions de soins postnatals en ASS sont effectuées dans des espaces limités et le manque de salles désignées (Vesel, et al. 2015).

Plusieurs interventions d'amélioration de la qualité visant à évaluer et à améliorer le processus de prestation des soins de santé dans les établissements de santé ont été mises en œuvre. Certaines de ces interventions impliquaient la formation de médecins, de sages-femmes et d'autres prestataires de soins de santé sur les compétences de communication tandis que d'autres se concentraient sur l'amélioration des compétences des professionnels de santé. S'il a été démontré que ces interventions axées sur la formation améliorent les résultats sanitaires, les données recueillies dans la revue de littérature suggèrent que l'intégration de ces interventions avec la fourniture de produits essentiels améliore l'efficacité de ces interventions pour améliorer la qualité.

Des interventions de QDS planifiées en détail et mises en œuvre ont abordé les problèmes **d'équité en santé et d'inégalité entre les sexes** de diverses manières. Les inégalités en santé ont été corrigées en ciblant les populations rurales et vulnérables où l'accès à des soins de qualité était limité et où des taux élevés de mortalité maternelle dans les établissements de santé étaient enregistrés (Serbanescu, Goldberg, et al.2017). Les interventions qui utilisaient des considérations d'équité en santé ont eu un impact plus élevé et de meilleurs résultats en ASS, comme en témoigne la réduction significative de la mortalité maternelle et néonatale.

Les données publiées montrent qu'il y a un accès limité à et une mauvaise **qualité des services de SDSR** dans le monde et en ASS - une observation qui a été attribuée à trois facteurs principaux: l'absence de services adaptés aux jeunes (SAJ); l'incompétence des professionnels de santé dans la prestation de services de SDSR; et le manque de ressources essentielles telles que les produits de contraception. La revue de littérature a identifié plusieurs interventions qui ont amélioré les résultats de la SDSR. Il a été démontré que la formation et la supervision des responsables des achats pour améliorer leurs compétences en matière de gestion efficace de la chaîne d'approvisionnement améliorent la qualité des services de contraception et la gestion des infections sexuellement transmissibles.

En ce qui concerne les **implications financières** de la mise en œuvre d'interventions visant à améliorer la QDS, les données de la littérature suggèrent que des interventions spécifiques telles que les interventions de maternité sans risque, ainsi que les interventions visant à aborder la santé reproductive comme l'avortement sécurisé sont comparativement plus rentables. Par conséquent, les pays aux ressources limitées devraient prioriser et adopter ces interventions rentables et des interventions similaires afin d'optimiser les résultats de la SMNE et de la SDSR compte tenu des ressources limitées disponibles.

Bien que cette revue de littérature ait identifié un large éventail d'interventions et d'études visant à améliorer la QDS pour la SMNE et la SDSR, plusieurs **lacunes dans les connaissances** ont été identifiées qui méritent des recherches supplémentaires. Celles-ci incluent des recherches supplémentaires sur: obstacles et catalyseurs au déploiement de chaque composante des soins obstétricaux et néonataux d'urgence (SONU) dans les PRFI afin de générer des preuves à utiliser dans l'amélioration de la QDS pour la SMNE et de réduire efficacement les décès néonatals et maternels; approches qui améliorent l'utilisation des contraceptifs à action prolongée; moyens fiables et plus efficaces d'intégrer la chaîne d'approvisionnement des produits de santé dans les autres systèmes logistiques des établissements de santé afin d'assurer un approvisionnement constant en produits de

santé essentiels; et moyens efficaces d'améliorer les considérations d'équité en santé et d'égalité des sexes dans l'écosystème de la politique de santé, de l'application des connaissances et de la prestation des soins de santé.

Le rapport **recommande** les suivants aux exécutants des futures interventions: créer des partenariats et collaborations stratégiques avec les gouvernements hôtes pour améliorer le succès et la durabilité des interventions visant à améliorer la QDS pour la SMNE et la SDSR; adopter une approche des systèmes de santé pour s'attaquer globalement aux déficiences multiples et souvent interconnectées des systèmes de santé qui entraînent des soins de mauvaise qualité au lieu de se concentrer sur des défis uniques; adopter une approche axée sur les données dans la mesure du rendement et l'amélioration des interventions; tirer parti de la technologie pour améliorer l'accès à des services de SMNE et de SDSR de qualité, en particulier dans les zones rurales.

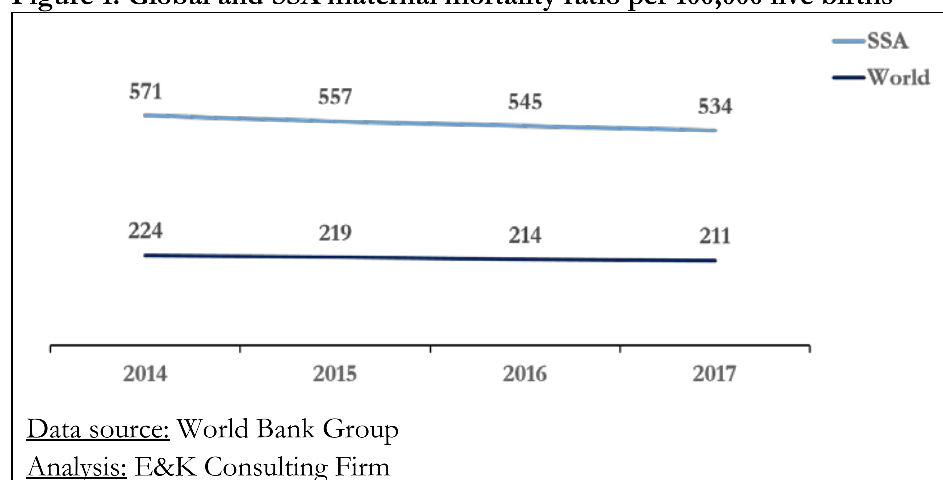
Aux décideurs politiques, y compris ceux du gouvernement, les recommandations suivantes sont faites: investir dans les infrastructures physiques, l'équipement médical et les fournitures, et augmenter l'approvisionnement en médicaments dans les établissements de santé; renforcer les capacités des prestataires de soins de santé à fournir des services de SMNE et de SDSR de haute qualité à l'aide de programmes de formation améliorés par simulation sur la SMNE et la SDSR.

Aux bailleurs de fonds, le suivant est recommandé: tirer parti des mécanismes de financement pour catalyser l'intégration des considérations d'équité en santé et d'égalité des sexes dans les initiatives et projets visant à améliorer la QDS pour la SMNE et la SDSR.

Chapter 1: Introduction

While sub-Saharan Africa (SSA) has recorded steady improvements in maternal, newborn and child health (MNCH) outcomes, the region still has over two-thirds of the global maternal mortality burden and records high infant mortality rates. In 2017, the SSA region recorded an average of 534 maternal deaths per 100,000 live births which compares poorly to the global average of 211 deaths per 100,000 live births (Figure 1) (WorldBank 2017). Further, in 2019, one in 13 children in SSA died before their fifth birthdays, a statistic that is 15 times higher than that of children born in high-income countries (UNICEF 2020).

Figure 1: Global and SSA maternal mortality ratio per 100,000 live births



The need to address sexual and reproductive health and rights (SRHR) is vital in the improvement of MNCH outcomes and its global aspiration is captured Sustainable Development Goal (SDG) 3.7 which seeks to attain universal access to reproductive health (WHO 2015). According to the World Health Organization (WHO), "SRHR encompass efforts to eliminate preventable maternal and newborn mortality and morbidity, to ensure quality sexual and reproductive health services, and to address sexually transmitted infections (STI) and cervical cancer, violence against women and girls, and sexual and reproductive health needs of adolescents", (WHO 2014). However, SRHR still remain a non-priority issue on the development agenda of many SSA countries due to limited political commitment and inadequate resource allocation towards the improvement of SRHR (Oronje, et al. 2011).

Maternal health is dependent, in part, to the level of quality of care (QoC) at health facilities (Dahab and Sakellariou 2020). WHO suggests six dimensions of quality that should be observed in order to positively impact health outcomes:

(i) **Effective;** delivering evidence-based care and results in improved outcomes based on needs;
(ii) **Efficient;** delivering care in a manner that maximizes resources and avoids waste;
(iii) **Accessible;** delivering timely and geographically reasonable care;
(iv) **Patient-centered;** delivering care that considers individual and community preferences;
(v) **Equitable;** delivering care that does not vary in quality due to individual attributes including gender, race, ethnicity and socio-economic status; and
(vi) **Safe;** delivering care that minimizes risks and harm to individuals (WHO, 2006).

In order to provide good quality services, "health facilities must have water, energy, sanitation, hand hygiene, and waste disposal facilities which are functional, reliable and safe" (WHO 2017). QoC also depends on the physical infrastructure, human resources, knowledge, skills and capacity to deal with both normal pregnancies and complications that require prompt, life-saving interventions (WHO 2016).

> "The extent to which health care services provided to individuals and patient populations improve desired health outcomes."
>
> **-WHO, 2016**

A systematic analysis of mortality in 137 low-income and middle-income countries (LMICs) demonstrates that 56 percent of deaths that could be prevented by healthcare interventions are attributable to poor quality care (Kruk, et al. 2018). The proportion of deaths due to poor quality care exceeds those due to non-utilization of healthcare services (Kruk, et al. 2018). Sub-optimal QoC in SSA has been associated with several health system-related factors including the lack of infrastructure and inadequate healthcare personnel, as well as poor governance at facility level (Kruk, et al. 2018).

Health equity and gender equality, while attracting more attention in the global health ecosystem, are yet to be fully integrated in initiatives aimed at improving health outcomes in SSA**.** Their optimal integration in policy development is challenged, in part, by the complexity in their definitions. The seemingly low adoption and integration of health equity and gender equality in SSA may contribute to the existing inequities in access to quality healthcare. The low integration further exacerbates the adverse impact of health system-related deficiencies on QoC (AFRIC 2018). For instance, only 17.6 percent of all births in rural areas in SSA occur in a health facility compared with 35.1 percent in urban areas. The majority of healthcare facilities are found in urban areas, which limits accessibility to people living in rural areas (Doctor, Salimu and Abdulsalam 2018).

In keeping with the intention to contribute to the body of knowledge on solutions to address MNCH and SRHR challenges, in particular in SSA, the Innovating for Maternal and Child Health in Africa (IMCHA) initiative commissioned this review of literature on high impact interventions that improve QoC. The report presents insights from interventions at global and SSA levels. It also hones in on learnings from interventions implemented under the IMCHA initiative. The report is presented in five sections. Chapter one has presented the maternal and newborn indicators, SRHR indicators and the QoC landscape in SSA. This is followed by chapter two on the objectives and research approach used and chapter three on the key findings. Chapter four puts forward recommendations for different stakeholders and concludes with a rallying call on the need to improve MNCH and SRHR outcomes in SSA.

Chapter 2: Objectives and research approach

1.1 Objectives of the review

The objectives of this literature review are to: (i) draw on global literature to identify high impact interventions that improve the quality of care relevant to SSA; (ii) draw out successful interventions that have been implemented in SSA; (iii) highlight how gender and equity considerations have been addressed in interventions that improve QoC; (iv) draw on examples from IMCHA projects to document how interventions have been implemented in SSA, and (v) identify research questions and opportunities to address QoC knowledge gaps in SSA.

1.2 Research approach

1.2.1 Desk research

The publications included in this study were obtained through a systematic search in major repositories; PubMed, Cochrane Database, HINARI and Google Scholar. The search terms used were QoC (AND) MNCH (AND) interventions (AND) health facility (AND) high impact (AND) SSA (OR) global. A total of 49 articles were reviewed and are presented in this report. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and checklist for selecting studies was applied and a PRISMA flow diagram used to demonstrate the search strategy (see appendix 1 for details) (Moher, et al. 2009). In addition to the 24 studies on QoC interventions in relation to MNCH, 11 published journal articles on SRHR and cost effectiveness of QoC interventions, and 14 publications on MNCH/SRHR interventions implemented by IMCHA were reviewed and included in this report.

1.2.2 Analysis of MNCH and SRHR interventions

Interventions were assessed against relevant frameworks including the WHO standards for improving quality of maternal and newborn care in health facilities. The framework anchors QoC for MNCH on eight domains within the overall health system: (i) evidence-based practices for routine care and management of complications; (ii) actionable information systems; (iii) functional referral systems; (iv) effective communication; (v) respect and preservation of dignity; (vi) emotional support; (vii) competent, motivated human resources; and (viii) essential physical resources available (WHO 2016). While the scope of this literature review was not designed to collect exhaustive information about individual interventions in SSA, this report endeavors to highlight aspects of the framework that specific interventions considered or were successful in. Health equity and gender equality considerations were also assessed against frameworks including the Equity and Inclusion in Policy Processes (EquIPP) framework which argues that policy processes should create experiences of equity and inclusion for vulnerable groups. This includes children, young girls, victims of gender violence, women, minorities and the elderly (Huss and MacLachan 2016) (see appendix 2 for details).

Chapter 3: Findings

The relatively poor maternal and newborn health outcomes in SSA may be attributable to several **structural and functional gaps in health systems**. Some of the gaps identified from the studies and interventions reviewed include: (i) information and documentation gaps which affect the quality of data for decision making; (ii) unaffordability of healthcare services which limits access to QoC; (iii) delays in patients seeking care and lack of enough physical resources; (iv) inadequate staffing of healthcare facilities and unskilled health workers; (v) cultural beliefs and traditions that prevent women from seeking healthcare from facilities; (vi) governance issues including the lack of regulatory systems for healthcare providers.

The interventions reviewed in this analysis addressed at least one of the domains in the WHO QoC (2016) framework and the relevant interventions have been categorized in the appropriate standard of care.

2.1. QoC interventions for maternal and child health

2.1.1. Evidence based practices for routine care and management of complications

The aim of this standard is to ensure evidence-based management of labor, delivery and the postnatal period to mothers and newborns during the first few days of life. Women should receive routine care, early diagnosis of complications and their appropriate management. The standard is guided by a couple of quality statements including: (i) women are assessed routinely and given appropriate care; (ii) women with pre-eclampsia/ eclampsia (PE/E) receive appropriate interventions; (iii) newborns receive routine care after birth; and (iv) no woman or newborn is subjected to unnecessary or harmful practices during labor or child birth and the postnatal period (WHO 2016).

Appropriate care for women

Globally, maternal and newborn deaths have been associated with complications arising from poor quality healthcare services offered during the **preconception period of pregnancy**. Various interventions have been implemented to improve pregnancy outcomes and to reduce the preventable risks which emerge during this period (Hodgins, et al. 2016). According to Dean, 2013, preconception care services effective in the reduction of pregnancy complications include: the prevention of adolescent pregnancies; prevention of unintended pregnancies and optimal pregnancy spacing; optimization of pre-pregnancy weight and nutritional status including folic acid and multi-vitamin supplementation; infection control through tetanus vaccination; HIV/AIDS and sexually transmitted infections (STI) screening; mental health screening and the screening of chronic diseases such as diabetes and hypertension (Dean 2013).

Post-partum care (PPC) is vital to the survival of mothers. Puerperal sepsis, a complication arising from postpartum infections, is one of the leading causes of postpartum mortality (Nicholls 2016). In an attempt to improve QoC for mothers by managing postpartum complications resulting to puerperal sepsis, a qualitative study on puerperal sepsis gaps in Malawi was conducted through the IMCHA initiative that identified causes of delay in puerperal sepsis care. Reporting challenges, lack of human resources and medical supplies were highlighted as causes of delay in seeking quality care. Some of the recommendations given include: early diagnosis and timely access to care; appropriate medication; adherence to best practices; source control and referrals; and aggressive resuscitation (Chirwa, et al. n.d.).

Appropriate care for newborns

QoC interventions targeting **postnatal care** are mainly aimed at reducing newborn mortality and under-five disabilities which were majorly associated with preterm births and newborn asphyxia (Xu, et al. 2014). Approximately 20 million preterm births are reported annually in the developing world. Kangaroo Mother Care (KMC) is a globally implemented intervention that reduces mortality in pre-term neonates and shortens hospital stays (Vesel, et al. 2015). Uptake and utilization of this intervention remains low in SSA compared to other countries globally. Limited spaces and lack of designated rooms for KMC activities in various facilities in SSA has led to sub-standard KMC practices and low uptake of this life-saving intervention in the region. This is because, KMC practice requires privacy and enough space for the mothers and caretakers (Vesel, et al. 2015). However, the integration of KMC into national policy including health provider pre- and-in service training programs have been shown to increase the implementation and use of this intervention in various LMICs globally (Vesel, et al. 2015).

Newborn resuscitation is a clinical intervention that prevents newborn death due to asphyxia. Establishment of hospital-based resuscitation teams tasked with the responsibility of training and supervising service providers has been shown to lead to effective use of resuscitation protocols and guidelines and improvement in pre-term and newborn survival. In China, for instance, where this intervention was implemented in 2014, a decrease in asphyxia-related mortalities in delivery rooms from 27.6 to 5.0 deaths per 100,000 live births was observed (Otolorin, et al. 2015). As evident in the literature reviewed, hospital-based newborn resuscitation teams have not been widely established in SSA.

In Malawi, a **neonatal package** of care was implemented through the IMCHA initiative to reduce neonatal mortality (Kaweza, et al. 2020). The interventions included continuous airway support for breathing and managing respiratory distress among neonates. Specifically, this involved the adoption of continuous positive airway pressure (CPAP) at facilities which safely regulates air pressure and maintains volume of air in the lungs to support the newborn's breathing. As a result of its cost-effectiveness and efficacy, the use of CPAP should be adopted in low resource settings since it is cheaper and can reduce the need for mechanical ventilation by 30 to 50 percent (Kinshella, et al. 2020). In an attempt to reduce newborn mortality rates in Tanzania, the Helping Babies Breathe (HBB) intervention was implemented to give birth attendants skills on basic newborn resuscitation. The intervention resulted in a 47 percent reduction in first-day mortality and a 24 percent reduction in stillbirth (Dol, et al. 2019).

2.1.2. Actionable information systems

Health information systems are important in the provision of quality care to women and children since it enables the use of data to ensure early and appropriate action (WHO 2016). The standard aims to record all information and use it to improve care given to women and newborns. For QoC to be ensured, all women and newborns should have complete medical records during labor, childbirth and the early postnatal period and every facility should have a data collection mechanism (WHO 2016). Health information systems deal with any systems that captures, stores, transmits or manages health-related information.

Many countries, especially in SSA lack well-functioning information systems that can support health system strengthening. Lack of appropriate and accessible data has prompted the adoption of interventions such as quality improvement (QI) interventions that measure, analyze and control processes at facilities. Several QI approaches have been utilized in SSA to strengthen provider performance and quality service provision. For instance, a QI intervention implemented in Ethiopia using the standards-based management and recognition (SBM-R©) approach resulted in a significant positive impact on the providers' performance (Firew, et al. 2017). In Rwanda, the establishment of QI teams tasked with clinical training of healthcare providers on antenatal care (ANC), intrapartum care, prenatal care (PNC) and supervision resulted in an improvement in clinical outcomes (Werdenberg, et al. 2018).

Many facilities in SSA have not integrated **death audits** and review into routine care (Okonofua, et al. 2017). This has resulted in persistently high cases of maternal and perinatal deaths due to lack of data and use of data to inform quality improvement decision-making. Mortality audits and reviews to identify shortcomings in healthcare delivery at the facilities that can be targeted and addressed effectively may lead to improvements in maternal and newborn health outcomes. For instance, a maternal death review carried out in Nigeria in 2017 identified the main causes of maternal deaths as: delay in presentation to the facility; delay in management; lack of intensive care units; lack of blood products and essential medications and poor ANC (Okonofua, et al. 2017). A perinatal deaths audit carried out by an inter-disciplinary team in Uganda showed that the main causes of

perinatal deaths were: a delay in surgery for more than 30 minutes; poor use of partographs; poor resuscitation skills and poor management of diabetes and PE/E in pregnancy (Nakibuuka, et al. 2012). Addressing these factors in a contextualized manner would lead to a reduction in maternal deaths.

Interventions aimed at critically analyzing the QoC to identify practice gaps and to improve all aspects of care including diagnostic methods, treatment, and resource allocation have been shown to result in perinatal and maternal death reductions (Nakibuuka, et al. 2012). QI interventions should therefore be integrated with mortality audits and reviews so as to develop QI modules which are able to address the root causes of poor health outcomes within the target facilities. Through the IMCHA initiative, a QI for Maternal and Newborn Health at District Level Scale in Mtwara Region, Tanzania (QUADS) aimed at strengthening health systems to improve both the quality of and demand for maternal and newborn health services was implemented. Some of the success stories drawn from this intervention are: (i) building the proper attitudes towards QI through training, coaching and mentorship; (ii) integrating supportive supervision & mentorship to the lower facilities; and (iii) strengthening the use of data at the point of collection to inform QI programming (Manzi, et al. 2017).

2.1.3. Effective communication

Another facet of the WHO framework for maternal and newborn care is effective communication. This is regarded as an essential component of the experience of care and requires that a patient should receive information about her care and be involved in all decisions taken regarding her treatment (WHO 2016). Effective communication is associated with reduction of anxiety and a better experience for the woman. Throughout the pregnancy and postpartum, there is a need for effective communication in order to ensure better delivery of services.

Globally, a couple of interventions have been employed that aimed at improving communication between health care providers and women. In Syria for instance, a specially designed training package in communication skills was provided to all doctors. The training content related to the principles of effective communication, how to overcome barriers to effective communication and improve interactions with women during labor and childbirth. As a result of the training, women were more satisfied with the services provided to them. In the United Kingdom, training was conducted on doctors and midwives on communication, respect and safety through various courses. This improved the perceptions of safety and communication during postpartum hemorrhage and consequently improved outcomes associated with QoC postpartum (Chang, et al. 2018).

Lack of infrastructure, necessary equipment and limited information technology (IT) knowledge by the healthcare providers hinder the application of IT in the implementation of QoC interventions in SSA. This was observed in the 'Quality of prenatal and maternal care: Bridging the know-do gap (QUALMAT)' study where lack of electricity and lack of IT skills by the Healthcare providers prevented the implementation and scaling up of the CDSS provision in primary healthcare facilities (Antje, et al. 2013). The mobile phone technology application in improving the ANC outcomes in Tanzania was adversely impacted by the limited availability of the mobile phones within the facility and high numbers of women lacking a mobile phone ownership. Illiteracy was also a limitation in the use of mobile phone technology as women were not able to interpret the short messages sent to them (Lund, et al. 2014). Improvement of IT infrastructure within healthcare facilities as well as raising the literacy levels of the target population can be utilized in the implementation of QoC interventions in SSA.

2.1.4. Respect and preservation of dignity

One of the quality domains requires that all women should be respected and their dignity preserved. This involves respecting their privacy and confidentiality as well as avoiding discrimination against them. Additionally, all women should be able to make informed choices about the services they receive and not be subjected to extortion of any kind (WHO 2016).

While extortion involves overcharging patients, interventions aimed at improving QoC may be implemented to completely shift the financial burden away from women. In order to reduce the barriers to provision of quality care due to inability to afford it and the lack of transportation to facilities, Sierra Leone rolled out a free health care initiative (FHCI) for pregnant women, lactating mothers, and children under five years. This project employed a comprehensive approach where capacity building for health personnel, facility renovations and the removal of financial barriers to healthcare were implemented thus improving QoC and uptake of services at the healthcare facilities (Witter, Brikci, et al. 2018). A free cesarean section (CS) policy in low-income settings rolled out in Mali led to a reduction in maternal deaths as an increase in CS operations from 0.25 percent to 0.15 percent was observed (Fournier, et al. 2014). These interventions removed financial barriers to a life-saving obstetric procedure whose unaffordability had resulted in low quality care offered at the health facilities.

Strong political will and supportive political leadership from the local and national levels promote QoC program ownership and sustainability. For instance, the FHCI project implemented in Sierra Leone was co-funded by the national government and Department for International Development-UK which also worked collaboratively to ensure successful implementation (Witter, Brikci, et al. 2018). Therefore, collaboration between international healthcare bodies and the local governments in SSA region led to successful implementation of QoC interventions.

2.1.5. Available competent, motivated human resources

Health facilities should have adequate competent, well-trained staff and skilled birth attendants to provide routine care and manage any complications that may arise. The standard requires that every woman and child have access to at least one skilled attendant at any given time (WHO 2016). To this end, interventions have been geared towards training and building the capacity of health workers at facilities in order to improve care offered to patients.

Primary healthcare providers display knowledge gaps and lack of access to up-to-date guidelines on important aspects of maternal care such as PE/E diagnosis and management (Otolorin, et al. 2015). QoC interventions should therefore be designed in a manner that it improves the healthcare provider's competence and access to standard and up to date guidelines.

In the literature reviewed for SSA region, improvement of the quality of MNCH has been implemented through competency based-trainings grounded in the principles of team-work and focusing on basic emergency obstetric and newborn care (BEmONC) and comprehensive emergency obstetric and newborn care (CEmONC). For instance, a program in Tanzania trained health care providers in BEmONC services. Over the two-year intervention period, there were notable achievements with regards to provision of essential newborn care. This included placing the newborn on the mother's abdomen immediately and helping to initiate breastfeeding within one hour (USAID 2012).

Accessing safe deliveries in Tanzania (ASDIT), through the IMCHA initiative, also introduced face-to-face training in CEmONC, e-learning modules and mentorship to clinicians to reinforce their knowledge and skills. Through these interventions, 22 clinicians were trained, six e-learning modules were developed and the health facility deliveries increased by 157 percent. There were notable decreases in referral rates as well as management of severe morbidities in women. Competencies of health workers were enhanced through the training which improved the QoC at the health facilities (TTCIH 2020).

The value of these trainings is enhanced by the provision of standard and up to date guidelines and protocols using electronic devices. This was evident in the quality of maternal and prenatal care (QUALMAT) study which was carried out in three African countries. The health care providers were given a computerized clinical decision support system (CDSS) with the aim of improving the quality of maternal care provided at the facility level. The CDSS was used at the clinical point of care where it provided access to WHO guidelines and algorithms and aided routine maternal and perinatal care provision and the detection of complications such as PE/E (Antje, et al. 2013). In rural and remote areas with limited access to electricity, printed job aids, protocols and standard guidelines have been utilized as evident in a PPC program implemented in a rural district in Burkina Faso. Provision of standard guidelines, protocols, checklists and job aids led to an improved work environment for the workers, increased motivation and resulted in an increased adherence to standard guidelines (Belemsaga, et al. 2018).

Train-the-trainer and on-the-job training approaches enhance training and mentoring programs for healthcare providers. Given the human resource shortages in many facilities in SSA and other LMICs globally, healthcare providers often lack time to attend trainings outside the facilities. Adoption of the train-the-trainer approach and on-the-job training where a trainer is placed at each facility or department allows for work continuity and learning to happen simultaneously. On-the-job training has also been shown to strengthen nurses' and midwives' clinical skills through demonstrations, bedside teaching, case sheet reviews, and case studies (Raney, et al. 2019).

Evidence from literature also suggests that training programs for healthcare providers that are complemented with the provision of essential commodities and equipment lead to an improvement in the QoC. The MAISHA program in Tanzania which focused on active management of third stage labor (AMTSL) training was complemented by pharmacy audits and the provision of the first and second line uterotonics which are critical in the prevention of postpartum hemorrhage. This resulted in an increase in the proportion of the deliveries which received proper active management of third-stage labor from 41 percent to 60 percent (Bishanga, et al. 2018). In Nigeria, capacity building for healthcare providers coupled with health facility renovations and the provision of essential equipment and supplies led to an improvement in availability, utilization and quality of emergency obstetric care services (Kabo, et al. 2019).

The shortage of health care providers especially at lower-level facilities impairs the implementation of high impact interventions. This is because a limited number of staff members in a facility with high patient volume results in high workload and limited time for engagement in activities aimed at introducing QoC improvement initiatives within a facility (Modi, et al. 2019). The implementation of the innovative mobile - phone technology for community health operations (ImTeCHO) program in India was precluded by high attrition of healthcare workers. The high attrition rates were exacerbated by the fact that attempts to involve more healthcare providers within the facility were dampened by potential recruits being put off by the high workload. The shortage of healthcare providers also leads to long waiting hours and delayed life-saving interventions during delivery. This has been shown to result in avoidable high maternal mortality evident in death audits and reviews which were carried out in Nigeria (Okonofua, et al. 2017).

Implementation of the IMCHA projects' interventions were also faced with health workers' shortages. The QI of maternal and newborn health in Tanzania aimed at providing evidence of implementation of system-wide quality improvement was faced with several challenges. At facility level, some of the challenges encountered included shortages of staff and lack of qualified health workers and difficulties in tracking interventions. At community level, the Tanzania-based project faced challenges with tracking interventions and capturing and sharing feedback from community mentors and poor attendance of volunteers and community health workers.

2.1.6. Essential physical and supply resources available

For the provision of quality care to mothers and newborns as well as effective management of complications, every facility should have basic infrastructure and amenities such as water, electricity, essential medicines and supplies as well as other necessary equipment. In addition to their availability, the resources should be functional, reliable, safe and sufficient.

Access to care is hindered by the lack of essential amenities such as ambulances to provide transport to health facilities. In an attempt to bridge this gap in Mozambique, the IMCHA initiative delivered an intervention which involved the use of community-owned motorcycles to scale up access to healthcare. The ambulances are reserved for pregnant women only but may be used for other health emergencies (Owens 2019). The ambulances have scaled up access to facilities and consequently increased facility deliveries in Mozambique.

Poor commodity management leading to frequent stock outs of essential products and lack of basic equipment prevents the realization of the full potential of interventions put in place (G. Sharma, M. Mathai, et al. 2015). Further, the utilization of skills acquired in training is impaired by stock outs of critical medications such as uterotonics drugs which are critical in the AMTSL and prevention of post-partum hemorrhage.

Other interventions such as the qualitative study of the results-based financing (RBF) project in Mali have also spurred greater participation by local authorities and health agents and increased commitment towards improving QoC. The assessment of the results-based financing mechanism led to reinforcements of monitoring and evaluation systems and increased service utilization for children (Seppey, et al. 2017).

2.2. Health equity and gender equality considerations in QoC

A study conducted across six different West African highlighted that equity, as a value, was implicit in interventions as seen through fee exemptions, community-based health insurance and national health insurance scheme (NHIS) policies that had been and were still being tried in several countries, to improve health access for the poor (Agyepong, et al. 2017).

QoC interventions for MNCH reviewed in this study integrated **health equity** considerations in their design, implementation, and evaluation of the interventions. These interventions promoted positioning of health facilities in underserved areas. Health inequities in facilities arise due to the lack of skilled personnel, limited access to standard guidelines and the lack of equipment and essential commodities. Through promoting the access to standard guidelines and job aids, QoC interventions allows the healthcare providers in the rural areas to provide standard care as seen in the QUALMAT study (Antje, et al. 2013) and the ImTECHO program (Modi, et al. 2019). Interventions which had a comprehensive approach, addressed health inequities through the health care facility renovations, equipment provision and funding to ensure the availability of the essential commodities within the healthcare facilities in rural areas (Serbanescu, Goldberg, et al. 2017).

Some interventions provided free healthcare services to women and children under five years, provided education on the importance of healthcare seeking as well as transportation subsidies to support referral activities (Witter, Brikci, et al. 2018). The QoC interventions reviewed addressed residence, economic status and level of education as the main social determinants of healthcare as stipulated in the EQUIPP framework. However, these interventions did not address all the aspects of the EQUIPP framework especially the promotion of cross-sectional and inter-governmental cooperation which are key in program sustainability.

QoC interventions aimed at promoting the provision of quality healthcare to women while maintaining respect and dignity promoted gender equality. For instance, the QoC program implemented in Kenya aimed at addressing health concerns as raised by women (Mwaniki, et al. 2014). QoC interventions should prioritize women's needs so as to promote gender equality in healthcare experiences. In Nigeria, an IMCHA research team implemented an intervention aimed at scaling up care for perinatal depression. Perinatal women in LMICs are at a higher risk of being denied quality care, in part due to absence of skilled professionals and pervasive stigma associated with mental illness. In order to improve outcomes for the women, the intervention involved the training of community midwives to better care for women with perinatal depression (Ayinde, et al. 2018). Another study conducted in Zambia and Uganda identified fear of harassment by health care providers as one of the deterrents of seeking healthcare especially for women who had home deliveries. In South Sudan, fear of discrimination based on social and economic barriers prevented women from seeking healthcare during pregnancy and postpartum. Healthcare providers also discriminated against neonates that had been delivered at home by traditional attendants compared to those delivered in facilities (Bayo, et al. 2020).

A qualitative study in Uganda through the IMCHA initiative addressed strategies to overcome gender-based constraints impacting community health worker (CHW) performance. The study highlights a number of constraints faced by female CHWs including; (i) lack of economic empowerment; (ii) lack of career advancement and leadership opportunities; (iii) risks to personal safety; and (iv) lack of social support and networking opportunities. Through the findings of this study, recommendations to improve performance and enhance QoC for mothers and children have been suggested. These include ensuring safety of health workers and incentivizing them through monetary incentives or otherwise.

A gender integration continuum for health social enterprises has also been developed which is a useful tool for guiding gender equality efforts. The framework categorizes approaches by how they treat gender norms in the implementation of the programs. The tool categorizes community health worker programs as either gender blind, gender accommodating or gender responsive. Gender blind policies are designed without analysis of factors such as rights, entitlements and power relations associated with being female. Gender accommodating programs address the set of rights and entitlements associated with being women (Mckague and Musoke n.d.).

Comprehensively planned and implemented QoC interventions addressed health inequity and gender inequality concerns in a variety of ways. Health inequities were addressed through the targeting of rural and vulnerable populations where access to quality care was limited and high facility maternal mortality rates were being recorded as observed in the SMGL initiative (Serbanescu, Goldberg, et al. 2017). Interventions which utilized health equity considerations had higher impact and better outcomes in SSA as evident in the significant reduction of maternal and newborn mortalities.

2.3. Interventions for improving the quality of SRHR

The limited access to and poor quality of SRHR services reported globally and in SSA have been associated with three main causes: the absence of youth-friendly services (YFSs); healthcare workers' incompetence in SRHR service provision; and lack of the essential resources such as contraception commodities (O'Uhuru, et

al. 2017). These have been associated with the limited HCW training on SRHR and poor supply chain management skills.

2.3.1. Youth-friendly services

The integration of new interventions into existing facility programs enhances uptake and program sustainability. This review demonstrates that new interventions can be successfully integrated into pre-existing ones. For instance, YFS were successfully integrated into the existing primary healthcare services in Nigeria through capacity building and supply chain support (Ogu, et al. 2018). Child immunization programs can be utilized by integrating PNC programs such as family planning and sexual health education into the immunization schedules. Integration of new programs into existing programs reduce the cost of establishing new programs while enhancing uptake and sustainability (Belemsaga, et al. 2018).

In areas where low uptake and inconsistent healthcare seeking behaviors have been observed, comprehensive sexual education (CSE) with an emphasis on the importance of contraceptives use and behavioral change towards safe sexual behaviors including condom use have been carried out. The provision of CSE at the facility level led to an improvement in adolescent knowledge in SRHR and an improved attitude towards sexual health, contraceptive use, sexual health rights understanding and confidentiality in healthcare seeking (Renju, et al. 2010). However, limited space and lack of privacy has led to provision of poor quality SRHR services including contraceptives as workers lack private spaces where they can carry out patient education on the services offered. This is because youth especially adolescent girls require privacy while taking up these services (Muchabaiwa and Mbonigab 2019). Establishment of extra rooms which can enable the provision of YFS is therefore needed in healthcare facilities in SSA.

2.3.2. Training healthcare workers

Competency-based training of the healthcare providers in the provision of YFSs enhance uptake of SRHR services. For instance, the Bronx Teens Connection (BxTC) program which was implemented in the Bronx, New York City resulting in an increased contraceptive uptake and effective teen pregnancy reduction (O'Uhuru, et al. 2017). Similarly, in India, a training program focusing on quality Intra-uterine device (IUD) services led to increased uptake of IUDs and a reduction of the unmet need for IUD services. The intervention was enhanced through close supervision to ensure strict adherence to the laid-out protocols for IUD use. Furthermore, capacity building was extended to the public health administrators who provided leadership and close monitoring of the program ensuring that the set objectives were met (Gehani, et al. 2019).

The capacity building of healthcare providers implemented in SSA focused on providing technical assistance on teenage pregnancy prevention methods (O'Uhuru, et al. 2017). Focusing on the provision of quality SRHR service to teen girls promotes gender equality and leads to a reduction in teenage pregnancy.

Other interventions in the SSA region involved equipping healthcare providers with the skills necessary in the provision of information, quality sexual health and family planning services to women regardless of age and financial status. This was evident in some of the SRHR QoC interventions including the BxTC program (O'Uhuru, et al. 2017), and the YFSs strategies carried out in Nigeria (Ogu, et al. 2018), Tanzania (Renju, et al. 2010) and Zimbabwe (Muchabaiwa and Mbonigab 2019). The knowledge provided to the healthcare providers enables them to effectively provide CSE thus enabling women to understand their sexual health needs, rights and how to access services. Other social determinants of health (SDH) such as political support, and health policy context which have impacts on QoC have not been extensively addressed in the interventions reviewed.

2.3.3. Supply of contraceptives

Procurement, distribution, and management of contraceptive commodities and other related supplies and equipment is an important aspect of the provision of quality SRHR services. In this literature review, SRHR QoC interventions on a global scale improved commodity availability through the training of procurement officers on effective supply chain skills and funding. The service providers and service provision within the facilities were regularly supervised and monitored on a regular basis. This led to effectiveness in the offering of SRHR services and an improvement in the quality of contraceptives services and the management of STIs including HIV/AIDS in various countries: Pakistan, Djibouti, Mali and the Democratic Republic of Congo (Curry, et al. 2015). Interventions aimed at supporting and improving the existing supply chain systems dealing with SRHR commodities within facilities have the potential of improving the quality of SRHR services.

2.4. Cost implications

The WHO's choosing interventions that are cost effective (WHO- CHOICE) project provides insights on the definition of cost-effectiveness. Interventions that, per disability-adjusted life-year (DALY)[1] avoided, cost less than one gross domestic product (GDP) per capita can be termed as highly cost-effective while those costing less than three times the GDP per capita are considered to be low on cost-effectiveness (Marseille, et al. 2015). At global and regional level, most of the interventions assessed did not document the cost implications for implementing the initiatives, making it difficult to assess cost-effectiveness.

For reproductive health, evidence suggests that contraceptives and safe abortion were highly cost-effective. However, safe abortion methods were hardly available in LMICs. Interventions that used new modest-cost health inputs have costs per DALY averted in the range of US$20 to US$100 e.g. devices for oxytocin delivery during labor, delivery kits for in-home birth and skin emollients for newborns etc. Additionally, the cost-effectiveness of participatory women's groups and training initiatives for village health workers and midwives on health outcomes was in the range of US$ 150 to US$ 1,000 per DALY. (Horton and Levin 2016).

Safe motherhood initiatives (a package combining antenatal and postpartum care with trained birth attendants) fell in the same range of US$ 150 to US$ 1,000 per DALY averted and safe motherhood interventions including facility-based delivery are estimated to cost US$ 1.15 per person and caesarian sections for obstructed labor have a wider range from US$ 200 to US$ 4,000 with a median of US$ 400. Outreach and community-based strategies that delivered a package of health interventions such as bed nets, malnourishment and training traditional birth attendants were cost-effective at less than US$ 100 per DALY averted (Horton and Levin 2016).

2.5. Barriers to implementation of QoC interventions

As much as the QoC interventions were aimed at addressing gaps with regards to maternal and newborn health outcomes, the role of **policy makers** still remains vital to the cause. In Nigeria, the increasing women's access to skilled pregnancy care initiative faced the risk of possible failures of the political system to address factors responsible for non-use of primary healthcare facilities for pregnancy and child care. Some of the reasons highlighted that hindered access to healthcare include: (i) poor roads; (ii) long distances to facilities; (iii) poor QoC; (iv) inadequate drugs and supplies; (v) abusive care; and (vi) introduction of informal payments by staff. This was due to the unwillingness or inability of policy makers to scale up supply of primary healthcare services,

[1] One DALY can be thought of as one lost year of a healthy life. The sum may be used as a measurement of the gap between current health status and an ideal health situation.

(Yaya, et al. 2018). Improving QoC through addressing these barriers would be most impactful for increasing access to skilled pregnancy care.

Poor documentation and record-keeping limit **program monitoring, evaluation, and assessment** of intervention outcomes have been identified as barriers to implementation. Interventions that promote YFS for SRHRs report the inability to follow up clients due to the lack of documentation and low client return (Muchabaiwa and Mbonigab 2019). The lack of centralized human resource records in some countries makes provider training assessment and monitoring difficult thus leading to the inability to measure the extent of the training and its effects on MNCH and SRHR (Curry, et al. 2015). The QI intervention implemented in Rwanda, faced data collection challenges which impaired performance measurements and implementation of change ideas (Werdenberg, et al. 2018). Therefore, documentation and record keeping should be enhanced in SSA to aid in the identification of practice loops and implementation of quality improvement interventions.

Through the analysis of interventions reviewed, a myriad of opportunities has been identified for scaling up access to facility care and enhancing quality to improve maternal and newborn health outcomes in the region. Education, motivational incentives to healthcare providers, promotion initiatives and gender and equity considerations have been highlighted as areas that would benefit from increased focus and investment. Data collection and use for decision making and QI programs has also been highlighted as one of the gap areas.

2.6. Areas for further research

Through the literature review, a number of areas were identified with regards to the provision of quality MNCH and SRHR services that merit further research. These include the following:

(i) **Barriers and enablers of EmONC**. The key barriers and enablers of each of the components of EmONC such as newborn resuscitation in LMICs need to be studied further so as to generate evidence for use in the QoC improvement for MNCH, and to effectively reduce newborn and maternal deaths. This will promote the adoption of evidence-based practices recommended for quality care to be provided to mothers and newborns.

(ii) **Long-acting contraceptives**. On SRHR, methods which improve uptake of long-acting contraceptives need to be investigated further, identified and adopted. These methods will be essential in improving uptake of contraceptive in SSA especially in the rural areas where uptake is comparatively lower. This will enable facilities to improve QoC by making essential commodities, in this case contraceptives, available to women.

(iii) **Supply chain for medical products.** Research into the reliable and more effective ways of integrating the supply chain for health products into other facility logistical systems so as to ensure constant supply needs to be undertaken**.** Supply chain improvements will enhance service delivery since essential supplies will be available.

(iv) **Identification of specific maternal health needs**. Evidence from literature suggests a general approach to maternal care is more prevalent than targeted interventions. Therefore, maternal health interventions are generalist, resulting in reduced efficiencies. There is merit in identifying the specific maternal health needs, and developing an intervention that meets their needs.

(v) **Incorporation of gender and equity considerations in policy making**. There is need for research on effective ways to enhance health equity and gender equality considerations within the health policies and healthcare delivery system.

Chapter 4: Recommendations and conclusion

Recommendations to the implementers of interventions aimed at improving QoC

A. **Develop strategic partnerships and collaborations with host governments, to enhance the success and sustainability of interventions aimed at improving QoC for MNCH and SRHR.** In order to enhance the sustainability of interventions aimed at improving QoC, implemented of such interventions should develop sustainability strategies including strategic partnership with host governments. These partnerships will enhance the uptake of the interventions by host governments thus enhancing their sustained implementation and scale up even beyond the life of the funding mechanisms that have financed the initial phases of the interventions.

B. **Adopt a health systems approach to comprehensively address the multiple, and often interconnected, health systems deficiencies that result in poor quality care as opposed to focusing on singular challenges.** Interventions that adopt a comprehensive health system-wide approach to improving QoC such as the SMGL initiative in Uganda and Zambia, and the YFS program in Nigeria seem to be associated with better outcomes compared to interventions focusing on a singular health system issue. Underpinned by this observation, and the often multiple and interconnected health system deficiencies in most countries in SSA, it is recommended that future interventions adopt a comprehensive health system-wide approach to improve QoC and realize better MNCH and SRHR outcomes.

C. **Adopt a data-driven approach in the performance measurement and improvement of interventions.** Evidence from the literature reviewed here demonstrates the value of the use of data and evidence to routinely review and iterate interventions aimed at improving QoC in order to objectively inform their improvement.

D. **Leverage on technology to increase access to quality MNCH and SRHR services especially in rural areas.** This literature review brings to bear the potential of technology to increase access to quality MNCH and SRHR. The utilization of mobile phones to send reminders for ANC appointments in Tanzania, for instance, deployed to reach women in vulnerable populations, leveraged on technology to increase ANC visits and improve QoC. Underpinned by this observation and the relative ubiquitous availability of mobile technology in SSA, there is merit in future interventions leveraging on technology to catalyze access to high quality MNCH and SRHR services.

Recommendations to policy makers and government

E. **Invest in physical infrastructure, medical equipment and consistent supply of medicines and other essential commodities at health facilities.** The WHO framework for quality of care emphasizes the need for availability of essential medical equipment and supplies. In the literature reviewed, medicine stock-outs and lack of necessary infrastructure has been cited as factors that preclude access to quality healthcare services. Therefore, there is merit in increasing investments towards the enhancement of physical infrastructure, medical equipment and supply of medicines and other essential commodities at health facilities.

F. **Strengthen the capacity of healthcare providers to deliver high quality MNCH and SRHR services.** Capacity building and opportunities for career enhancements ought to be considered in future efforts aimed at improving QoC in SSA.

Recommendations to funders

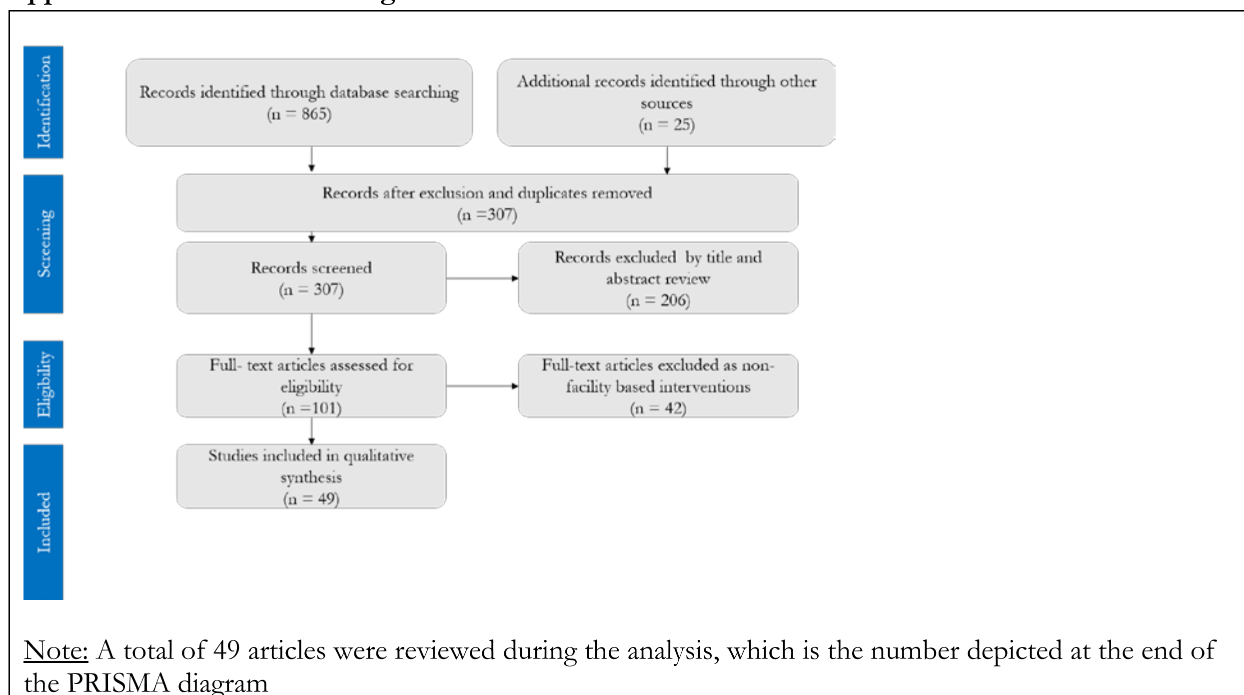
G. **Leverage on funding mechanisms to catalyze the incorporation of health equity and gender equality considerations in initiatives and projects aimed at improving QoC for MNCH and SRHR.** Funders should utilize their funding mechanisms to stimulate the incorporation of health equity and gender equality considerations by intentionally designing funding opportunities to be contingent on prospective grantees, incorporating health equity and gender equality in the interventions they propose to implement.

Conclusion

Interventions aimed at improving the QoC for MNCH and SRHR in SSA and other LMICs globally are anchored majorly on promoting the provision of evidence-based practice and capacity building of the healthcare providers. However, the impact of such interventions is precluded by wider health system challenges which include: limited infrastructure, unavailability of essential physical resources, ineffective leadership and client inability to afford care. Comprehensive interventions addressing various factors in the health system and WHO QoC domains including actionable information systems, effective referral systems and availability of essential physical resources have proven to be more effective. Interventions utilizing the establishment of self-sustaining mechanisms and long-term investments have resulted in sustained improvement in the quality of MNCH including reduction in maternal and neonatal mortality. Going forward, facility improvement interventions should consider contextualizing their interventions to meet the needs of the target population; fostering strategic partnerships with the key decision makers in government; focusing on education to showcase importance of healthcare at facilities; and scaling up of clinical audits and reviews to identify risk factors driving causes of maternal and perinatal deaths. The implementation of the recommendations put forward here portend significant potential in the improvement of MNCH and SRHR outcomes in SSA. Given that the region, and the globe, has only 10 years to realize the noble aspirations of the SDGs, the time to act is now!

Appendices

Appendix 1: PRISMA flow diagram



Note: A total of 49 articles were reviewed during the analysis, which is the number depicted at the end of the PRISMA diagram

Appendix 2: Analysis frameworks adopted for the analysis

Framework	Description
EquiFrame	EquiFrame identifies the degree of commitment of a given policy to specified vulnerable groups and to core concepts of human rights. The framework considers social inclusion and human rights as key components of equity in the context of service provision (Mannan, M.Amin. and Maclachlan 2011).
Health Equity Measurement Framework (HEMF)	The HEMF incorporates SDH and guides quantitative analysis for public health surveillance and policy development. The framework measures the effects of SDH to support measurement of health equity (Dover and Belon 2019).
Intersectionality-Based Policy Analysis Framework (IBPA)	The IBPA Framework provides guidance and direction for researchers, civil society, public health professionals and policy actors seeking to address the challenges of health inequities across diverse populations (Hankivsky, et al. 2014).
WHO Framework	The framework has eight domains of QoC within the overall health system and was designed to assess, improve and monitor care in health facilities (WHO, Standards for improving quality of maternal and newborn care in health facilities 2016).
Quality, Equity, Dignity: The network to improve QoC for maternal, newborn and child health	The approach to improving QoC in this framework in anchored in four strategic objectives: i) leadership, ii) action, iii) learning, and iv) accountability. The strategic objectives and outputs describe what should be done at county level in order for improvements in QoC to be realized (WHO n.d.).

Bibliography

AFRIC. 2018. "Poor health systems and lack of infrastructure paralyses health care in Africa." *Association for Free Research and International Cooperation.* https://afric.online/5626-poor-health-systems-and-lack-of-infrastructure-paralyses-health-care-in-africa/.

Agyepong, Irene Akua, Aku Kwamie, Edith Frimpong, Selina Defor, Abdallah Ibrahim, Genevieve Aryeetey, Virgil Lokossou, and Issiaka Sombie. 2017. "Spanning maternal, newborn and child health (MNCH) and health systems research boundaries: conducive and limiting health." *Health Research Policy and Systems.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5516848/pdf/12961_2017_Article_212.pdf.

Ahmed, Prof Saifuddin, Yoonjoung Choi, Jose G Rimon, Souleymane Alzouma, Peter Gichangi, and Georges Guiella. 2019. "Trends in contraceptive prevalence rates in sub-Saharan Africa since the 2012 London Summit on Family Planning: results from repeated cross-sectional surveys." *The Lancet Global Health* 7 (7). Accessed 2020. https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(19)30200-1/fulltext.

Antje, Blank, Helen Prytherch, Jens Kaltschmidt, Andreas Krings, Felix Sukums, Nathan Mensah, and Alphonse Zakane. 2013. ""“Quality of prenatal and maternal care: bridging the know-do gap”(QUALMAT study): an electronic clinical decision support system for rural sub-saharan Africa." *" BMC medical informatics and decision making* 1-16. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3637082/pdf/1472-6947-13-44.pdf.

Ayinde, Olatunde, Bibilola Oladeji, Jibril Abdulmalik, Keely Jordan, Lola Kola, and Oye Gureje. 2018. "Quality of perinatal depression care in primary setting in Nigeria." *BMC Health Services Research* 879. Accessed November 2020. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6249726/.

Bayo, Pontius, Loubna Belaid, Elijo Omoro Tahir, Emmanuel Ochola, and Alexander Dimiti. 2020. "Midwives do not appreciate pregnant women who come to the maternity with torn and dirty clothing”: institutional delivery and postnatal care in Torit County, South Sudan: a mixed method study." *BMC Pregnancy and Childbirth.* Accessed November 2020. https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-020-02910-2.

Belemsaga, Danielle Yugbaré, Anne Goujon, Aristide Bado, Seni Kouanda, Els Duysburgh, Marleen Temmerman, and Olivier Degomme. 2018. ""Integration of postpartum care into child health and immunization services in Burkina Faso: findings from a cross-sectional stud." *Reproductive health 15, no. 1* 171. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6180606/pdf/12978_2018_Article_602.pdf.

Bergen, Nicole, Abebe Mamo, Shifera Asfaw, Lakew Abebe, Jaameta Kurji, and Getachew Kiros. 2018. "Perceptions and experiences related to health and health inequality among rural communities in Jimma Zone, Ethiopia: a rapid qualitative assessment." *International Journal for Equity in Health.* Accessed 2020. https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/57153/IDL-57153.pdf.

Bishanga, Dunstan, Charles John, Tibaijuka Gaudiosa, Mutayoba Rita, and Drake Mary. 2018. ""Improvement in the active management of the third stage of labor for the prevention of postpartum hemorrhage in Tanzania: a cross-sectional study."." *BMC pregnancy and childbirth* 1-10. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5998542/pdf/12884_2018_Article_1873.pdf.

Chang, Yan-Shing, Kirstie Coxon, Anayda Gerarda Portela, Marie Furuta, and Debra Bick. 2018. "Interventions to support effective communication between maternity care staff and women in labor: A mixed-

methods systematic review." *Elsevier* 59: 4 - 16. https://www.sciencedirect.com/science/article/pii/S0266613817306599?via%3Dihub#bib13.

Chirwa, Ellen, Janet Mambulasa, Patrick Patterson, Zubia Mumtaz, Madalitso Tolani, and Fannie Kachale. n.d. "Providing quality health services in Malawi addressing puerperal sepsis in Malawi." Accessed 2020. https://aphrc.org/wp-content/uploads/2020/05/Peuperal-sepsis-Policy-brief-Final.pdf.

Curry, Dora Ward, Jesse Rattan, Jean Jose Nzau, and Kamlesh Giri. 2015. ""Delivering high-quality family planning services in crisis-affected settings I: program implementation."." *Global Health: Science and Practice 3, no. 1* 14-24. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4356272/pdf/014.pdf.

Dahab, Rana, and Dikaios Sakellariou. 2020. "Barriers to Accessing Maternal Care in Low Income Countries in Africa: A Systematic Review." *International Journal of Environmental Research and Public Health* 8.

Dean, Sohni V., Elizabeth Mary Mason, Christopher P. Howson, Zohra S. Lassi, Ayesha M. Imam, and Zulfiqar A. Bhutta. 2013. ""Born Too Soon: Care before and between pregnancy to prevent preterm births: from evidence to action."." *Reproductive health.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3828587/pdf/1742-4755-10-S1-S3.pdf.

Dettinger, Julia, Stephen Kamau, Kimberly Calkins, Susanna Cohen, John Cranmer, Minnie Kibore, Onesmus Gachuno, and Dilys Walker. 2018. ""Measuring movement towards improved emergency obstetric care in rural Kenya with implementation of the PRONTO simulation and team training program."." *Maternal & child nutrition.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6866198/pdf/MCN-14-e12465.pdf.

Doctor, Henry, Sangwani Salimu, and Maryam Abdulsalam. 2018. "Health facility delivery in sub-Saharan Africa: successes, challenges, and implications for the 2030 development agenda." *Bio Med Central.* Accessed 2020. https://bmcpublichealth.biomedcentral.com/track/pdf/10.1186/s12889-018-5695-z.

Dol, Justine, Marsha Campbell-Yeo, Janeth Bulemela, Douglas McMillan, Zabron Abel, and Angelo Nyamtema. 2019. "Knowledge acquisition after helping babies survive training in rural Tanzania." *International Health* 11 (2): 136-142. Accessed November 2020. https://academic.oup.com/inthealth/article/11/2/136/5106596.

Dover, Douglas, and Ana Paula Belon. 2019. "The health equity measurement framework: a comprehensive model to measure social inequities in health." *International Journal for Equity in Health.* Accessed 2020. https://equityhealthj.biomedcentral.com/track/pdf/10.1186/s12939-019-0935-0.

Firew, Ayalew, Gizachew Eyassu, Negash Seyoum, Jos van Roosmalen, Eva Bazant, Young Mi Kim, Alemnesh Tekleberhan, Hannah Gibson, Ephrem Daniel, and Jelle Stekelenburg. 2017. ""Using a quality improvement model to enhance providers' performance in maternal and newborn health care: a post-only intervention and comparison design."." *BMC pregnancy and childbirth* 1-9. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5389001/pdf/12884_2017_Article_1303.pdf.

Fournier, Pierre, Alexandre Dumont, Caroline Tourigny, Aline Philibert, Aliou Coulibaly, and Mamadou Traore. 2014. ""The free caesareans policy in low-income settings: an interrupted time series analysis in Mali (2003–2012)."." *PLoS One 9, no. 8* e10513. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4138145/pdf/pone.0105130.pdf.

Gehani, Manish, Manoj Pal, Anupama Arya, and and Shobhana Singh. 2019. ""Potential for Improving Intrauterine Device (IUD) Service Delivery Quality: Results from a Secondary Data Analysis."." *Gates Open Research 3.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6784301.3/pdf/gatesopenres-3-14295.pdf.

Hankivsky, Olena, Daniel Grace, Melissa Giesbrecht, Alycia Fridkin, Sarah Rudrun, and Olivier Ferlatte. 2014. "An intersectionality-based policy analysis framework; critical reflections on a methodology for advancing equity." *International Journal for Equity in Health.* Accessed 2020. https://equityhealthj.biomedcentral.com/track/pdf/10.1186/s12939-014-0119-x.

Hodgins, S., Tielsch, J., Rankin, K., Robinson, A., Kearns, A., & Caglia, J. 2016. "A new look at care in pregnancy: simple, effective interventions for neglected populations." *PloS one.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4990268/pdf/pone.0160562.pdf.

Hodgins, Stephen, James Tielsch, Kristen Rankin, Amber Robinson, Annie Kearns, and Jacquelyn Caglia. 2016. "A new look at care in pregnancy: simple, effective interventions for neglected populations." *PloS one.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4990268/pdf/pone.0160562.pdf.

Horton, Susan, and Carol Levin. 2016. *Reproductive, maternal, newborn and child health: Disease control priorities.* Vol. 2, chap. 17, by Susan Horton and Carol Levin. Accessed 2020. https://www.ncbi.nlm.nih.gov/books/NBK361909/#part4.ch17.sec8.

Huss, Tessy, and Malcom MacLachan. 2016. *Equity and Inclusion in Policy Processes (EquIPP).* The Global Health Press. Accessed November 2020. https://www.tcd.ie/medicine/global-health/assets/doc/The%20EquIPP%20manual%2013th%20April%202016.pdf.

IMCHA. n.d. *Innovating for Maternal & Child Health in Africa.* Accessed 2020. http://ea-imcha.com/index.php/en/.

Kabo, Ibrahim, Nosa Orobaton, Masduk Abdulkarim, Emmanuel Otolorin, and Toyin Akomolafe. 2019. "Strengthening and monitoring health system's capacity to improve availability, utilization and quality of emergency obstetric care in northern Nigeria." *PLOS.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6364938/pdf/pone.0211858.pdf.

Kaweza, Kondwani, Mai-Lei Woo Kinshella, Tamanda Hiwa, Jenala Njirammadzi, and Mwai Banda. 2020. "Assessing quality of newborn care at facilities in Malawi." *BMC Health Services Research* (1472-6963). Accessed November 2020. https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-020-5065-2#citeas.

Kinshella, Mai-Lei Woo, Celia Walker, Tamanda Hiwa, Marianne Vidler, and Alinane Linda. 2020. "Barriers and facilitators to implementing bubble CPAP to improve neonatal health in sub-Saharan Africa: a systematic review." *BMC.* Accessed November 2020. https://publichealthreviews.biomedcentral.com/articles/10.1186/s40985-020-00124-7.

Kruk, Margaret E, Anna D Gage, Naima T Joseph, Goodarz Danaei, Sebastian Garcia- Saiso, and Joshua A Salomon. 2018. "Mortality due to low-quality health systems in the universal health coverage era: a systematic analysis of amenable deaths in 137 countries." *Lancet.* Accessed 2020. https://www.thelancet.com/action/showPdf?pii=S0140-6736%2818%2931668-4.

Lund, Stine, Birgitte B. Nielsen, Maryam Hemed, Ida M. Boas, Azzah Said, Khadija Said, Mkoko H. Makungu, and Vibeke Rasch. 2014. "Mobile phones improve antenatal care attendance in Zanzibar, a cluster randomized controlled trial." *BMC pregnancy and childbirth* 29. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3898378/pdf/1471-2393-14-29.pdf.

Maluka, Stephen Oswald, Chakupewa Joseph, Sian Fitzgerald, Robert Salim, and Peter Kamuzora. 2020. "Why do pregnant women in Iringa region in Tanzania start antenatal care late? A qualitative analysis." *Bio Med Central.* Accessed 2020. https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-020-2823-

4#:~:text=Key%20individual%20and%20social%20factors,and%20cultural%20beliefs%20about%20 pregnancy.

Mannan, H., M.Amin., and M. Maclachlan. 2011. *The EquiFrame Manual.* The Global Health Press. Accessed 2020. https://www.sintef.no/globalassets/upload/samfunn/equiframe-manual_isbn-version_final_may19_2011-2.pdf/.

Manzi, Fatuma, Aifello Sichalwe, Nadia Akseer, Claudia Hanson, and Tara Tancred. 2017. *Quality Improvement for Maternal and Newborn Health At District-level Scale in Mtwara Region, Tanzania (QUADS).* https://www.slideshare.net/ea-imcha/day-2-panel-4-quality-improvement-for-mnh-tz-108020.

Marseille, Elliot, Bruce Larson, Dhruv Kazi, James Kahn, and Sydney Rosen. 2015. "Thresholds for the cost-effectiveness of interventions: alternative approaches." *Policy & Practice.* https://www.who.int/bulletin/volumes/93/2/14-138206.pdf?ua=1#:~:text=Under%20this%20approach%20%E2%80%93%20which%20has,capita%20is%20considered%20cost%E2%80%93effective%2C.

Mckague, Kevin, and Jenipher Musoke. n.d. "Strategies to overcome gender-based constraints impacting community health worker performance." Accessed 2020. http://ea-imcha.com/index.php/en/resources/publicationss/item/79-gender-and-chws-policy-briefs-uganda-audience.

Modi, Dhiren, Nishith Dholakia, Ravi Gopalan, Sethuraman Venkatraman, Kapilkumar Dave, Shobha Shah, and Gayatri Desai. 2019. ""mHealth intervention "ImTeCHO" to improve delivery of maternal, neonatal, and child care services—A cluster-randomized trial in tribal areas of Gujarat, India."." *PLoS medicine 16, no. 10.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6812744/pdf/pmed.1002939.pdf.

Moher, David, Alessandro Liberati, Jennifer Tetzlaff, and Douglas Altman. 2009. "Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement." *Los Medicine.* Accessed 2020. https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1000097.

Moses, Stephen. 2015. "Fischer, Elizabeth A., Krishnamurthy Jayana, Troy Cunningham, Maryann Washington, Prem Mony, Janet Bradley, and "Nurse mentors to advance quality improvement in primary health centers: lessons from a pilot program in Northern Karnataka, India"." *Global Health: Science and Practice* 660-675. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4682589/pdf/660.pdf.

Muchabaiwa, Lazarus, and Josue Mbonigab. 2019. ""Impact of the adolescent and youth sexual and reproductive health strategy on service utilisation and health outcomes in Zimbabwe."." *PloS one 14, no. 6.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6592535/pdf/pone.0218588.pdf.

Muchabaiwa, Lazarus, and Josue Mbonigaba. 2019. "Impact of the adolescent and youth sexual and reproductive health strategy on service utilisation and health outcomes in Zimbabwe." *PLoS ONE.* Accessed 2020. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6592535/pdf/pone.0218588.pdf.

Mwaniki, Michael, Sonali Vaid, Isaac Mwamuye Chome, Dorcas Amolo, and Youssef Tawfik. 2014. ""Improving service uptake and quality of care of integrated maternal health services: the Kenya Kwale District improvement collaborative."." *BMC health services research 14, no. 1* 1-9. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4179240/pdf/12913_2013_Article_3504.pdf.

Nakibuuka, Victoria Kirabira, P Okong, P Waiswa, and Romano Nkumbwa Byaruhanga. 2012. ""Perinatal death audits in a peri-urban hospital in Kampala, Uganda."." *African health sciences 12* 435-442. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3598282/pdf/AFHS1204-0435.pdf.

Nicholls, Emma. 2016. *Parenthood.* November. Accessed November 2020. https://www.healthline.com/health/puerperal-infection.

Ogu, Rosemary, Omosivie Maduka, Folusho Alamina, Obelebra Adebiyi, Vetty Agala, Gracia Eke, and Ibimonye Porbeni. 2018. ""Mainstreaming youth-friendly health services into existing primary health care facilities: experiences from South-South Nigeria."." *International journal of adolescent medicine and health 1.* https://sci-hub.se/10.1515/ijamh-2017-0151.

Okonofua, Friday, Donald Imosemi, Brian Igboin, Adegboyega Adeyemi, Chioma Chibuko, Adewale Idowu, and Wilson Imongan. 2017. ""Maternal death review and outcomes: An assessment in Lagos State, Nigeria."." *PloS one 12.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5730145/pdf/pone.0188392.pdf.

Oronje, Rose Ndakala, Joana Crichton, Sally Theobald, Nana Oye Lithur, and Latifat Ibisomi. 2011. "Operationalising sexual and reproductive health and rights in sub-Saharan Africa: constraints,dilemmas and strategies." *Bio Med Central International Health & Human Rights* 11. Accessed 2020. https://bmcinthealthhumrights.biomedcentral.com/articles/10.1186/1472-698X-11-S3-S8#citeas.

Otolorin, Emmanuel, Patricia Gomez, Sheena Currie, Kusum Thapa, and Blami Dao. 2015. ""Essential basic and emergency obstetric and newborn care: from education and training to service delivery and quality of care."." *International Journal of Gynecology & Obstetrics* 46-53. https://obgyn.onlinelibrary.wiley.com/doi/epdf/10.1016/j.ijgo.2015.03.007.

O'Uhuru, Deborah, Vivian Santiago, Lauren E Murray, Madeline Travers, and Jane F Bedel. 2017. "Bronx teens connection's clinic linkage model: connecting youth to quality sexual and reproductive health care."." *Journal of Adolescent Health 60, no. 3.* https://reader.elsevier.com/reader/sd/pii/S1054139X16309545?token=B6185BE255FC664AE2398895D18F288AADD91942D618C8FDD41837B81149F221D6BA111EA3C39F43893A016E23DC0905.

Owens, Brian. 2019. *How a Mozambican expat in Sakatchewan designed a motorcycle ambulance to help improve maternal health in his homeland.* Accessed November 2020. http://idrc.canadiangeographic.ca/blog/designed-canada-deployed-mozambique.asp.

Raney, Julia, Melissa Morgan, Amelia Christmas, Mona Sterling, Hilary Spindler, and Rakesh Ghosh. 2019. ""Simulation-enhanced nurse mentoring to improve preeclampsia and eclampsia care: an education intervention study in Bihar, India."." *BMC pregnancy and childbirth* 41. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6344989/pdf/12884_2019_Article_2186.pdf.

Renju, Jenny, Bahati Andrew, Kija Nyalali, Coleman Kishamawe, Charles Kato, John Changalucha, and Angela Obasi. 2010. ""A process evaluation of the scale up of a youth-friendly health services initiative in northern Tanzania."." *Journal of the International AIDS Society 13, no. 1* 32. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2944311/pdf/1758-2652-13-32.pdf.

Seppey, Mathieu, Valery Ridde, Laurence Toure, and Abdourahmane Coulibaly. 2017. "Donor-funded project's sustainability assessment: a qualitative case study of a results-based financing pilot in Koulikoro region, Mali." *Globalization and Health.* Accessed 2020. https://globalizationandhealth.biomedcentral.com/track/pdf/10.1186/s12992-017-0307-8.

Serbanescu, Florina, Howard Goldberg, Isabella Danel, Tadesse Wuhib, Lawrence Marum, and Walter Obiero. 2017. ""Rapid reduction of maternal mortality in Uganda and Zambia through the saving mothers,

giving life initiative: results of year 1 evaluation." *BMC pregnancy and childbirth 17, no. 1* 42. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5247819/pdf/12884_2017_Article_1222.pdf.

Sharma, Gaurav, Mathews Mathai, Kim E Dickson, Andrew Weeks, Tina Lavender, Louise Day, and Jiji Mathews. 2015. "Quality of care during labor and birth: a multi-country analysis of health system bottlenecks and potential solutions." *National library of medicine.* Accessed 2020. https://pubmed.ncbi.nlm.nih.gov/26390886/.

Sharma, Gaurav, Matthews Mathai, Kim E. Dickson, Andrew Weeks, G. Justus Hofmeyr, Tina Lavender, and Louise Tina Day. 2015. ""Quality care during labour and birth: a multi-country analysis of health system bottlenecks and potential solutions."." *BMC pregnancy and childbirth 15, no. S2.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4577867/pdf/1471-2393-15-S2-S2.pdf.

Steenland, Maria, Paul Jacob Robyn, Philippe Compaore, Moussa Kabore, Boukary Tapsoba, Aloys Zongo, Ousmane Diadie Haidara, and Günther Fink. 2017. ""Performance-based financing to increase utilization of maternal health services: evidence from Burkina Faso."." *SSM-population health* 179-184. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5769027/pdf/main.pdf.

Thorsteinsdottir, Halla, Jennifer Mary Bell, and Nandinee Bandyopadhay. 2018. "Innovating for Maternal and Child Health in Africa: A Mid-Term Formative Evaluation." *Research for Innovation and Equity.* Accessed 2020. https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/57540/IDL-57540.pdf?sequence=2&isAllowed=y.

TTCIH, Tanzanian Training Center for International. 2020. "Accessing Safe Deliveries in Tanzania Fact Sheet." Accessed 2020. http://ea-imcha.com/index.php/en/resources/publicationss/item/76-asdit-fact-sheet.

UNICEF. 2020. *Under-five mortality.* https://data.unicef.org/topic/child-survival/under-five-mortality/.

USAID. 2012. "MAISHA Quality of maternal and newborn care study." Accessed November 2020. https://www.mchip.net/sites/default/files/TZ%20QOC%20Briefer%20ENC.pdf.

Vesel, Linda, Anne-Marie Bergh, Kate J. Kerber, Bina Valsangkar, Goldy Mazia, Sarah G. Moxon, and Hannah Blencowe. 2015. ""Kangaroo mother care: a multi-country analysis of health system bottlenecks and potential solutions."." *BMC pregnancy and childbirth 15,* 15. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4577801/pdf/1471-2393-15-S2-S5.pdf.

Wamoyi, Joyce, Gerry Mshana, Aika Mongi, Nyasule Neke, Saidi Kapiga, and John Changalucha. 2014. "A review of interventions addressing structural drivers of adolescents' sexual and reproductive health vulnerability in sub-Saharan Africa: implications for sexual health programming."." *Reproductive health 11, no. 1* 88. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4290135/pdf/12978_2013_Article_340.pdf.

Werdenberg, Jennifer, Francois Biziyaremye, Merab Nyishime, Evrard Nahimana, Christine Mutaganzwa, David Tugizimana, Anatole Manzi, Shalini Navale, Lisa R. Hirschhorn, and Hema Magge. 2018. ""Successful implementation of a combined learning collaborative and mentoring intervention to improve neonatal quality of care in rural Rwanda."." *BMC health services research* 941. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6280472/pdf/12913_2018_Article_3752.pdf.

WHO. 2017. *10 ways to improve the quality of care in health facilities.* February 17. Accessed November 2020. https://www.who.int/news-room/feature-stories/detail/10-ways-to-improve-the-quality-of-care-in-health-

facilities#:~:text=Health%20facilities%20must%20have%20water,the%20provision%20of%20qualit y%20services.

WHO. n.d. *Maternal, newborn, child and adolescent health.* https://www.who.int/maternal_child_adolescent/topics/quality-of-care/definition/en/.

—. 2019. *Newsroom/Fact sheets/Detail/ Maternal Mortality.* September 19. Accessed November 2020. https://www.who.int/news-room/fact-sheets/detail/maternal-mortality.

WHO. 2006. *Quality of care: A process for making strategic choices in health systems.* Geneva: WHO press. Accessed November 2020. https://www.who.int/management/quality/assurance/QualityCare_B.Def.pdf.

WHO. n.d. "Quality, Equity, Dignity, The network to improve quality of care for maternal, newborn and child health." Accessed 2020. https://apps.who.int/iris/bitstream/handle/10665/272612/9789241513951-eng.pdf?ua=1.

WHO. 2015. *SDG 3: Ensure healthy lives and promote wellbeing for all at all ages.* https://www.who.int/sdg/targets/en/.

WHO. 2014. *Sexual and reproductive health and rights: a global development, health, and human rights priority.* https://www.who.int/reproductivehealth/publications/gender_rights/srh-rights-comment/en/.

WHO. 2016. "Standards for improving quality of maternal and newborn care in health facilities." Accessed 2020. https://apps.who.int/iris/bitstream/handle/10665/249155/9789241511216-eng.pdf?sequence=1.

—. 2015. *Sustainable Development Goal 3: Health.* Accessed November 2020. https://www.who.int/topics/sustainable-development-goals/targets/en/#:~:text=The%20goals%20within%20a%20goal%3A%20Health%20targets%20for%20SDG%203&text=3.2%20By%202030%2C%20end%20preventable,25%20per%201000%20live%20births.

Witter, Sophie, Nouria Brikci, Tim Harris, Richard Williams, Sarah Keen, Ana Mujica, and Alex Jones. 2018. ""The free healthcare initiative in Sierra Leone: Evaluating a health system reform, 2010-2015."." *The International Journal of Health Planning and Management 33, no. 2.* 434-448. https://onlinelibrary.wiley.com/doi/epdf/10.1002/hpm.2484.

Witter, Sophie, Nouria Brikci, Tim Harris, Richard Williams, Sarah Keen, Ana Mujica, and Alex Jones. 2016. "The Sierra Leone Free Health Care Initiative (FHCI): process and effectiveness review." Accessed 2020. https://www.researchgate.net/publication/303234918_The_Sierra_Leone_Free_Health_Care_Initiative_FHCI_process_and_effectiveness_review.

WorldBank. 2017. *Maternal mortality ratio (modeled estimate, per 100,000 live births)- Sub-Saharan Africa, World.* https://data.worldbank.org/indicator/SH.STA.MMRT?locations=ZG-1W.

Xu, Tao, Huishan Wang, Limin Gong, Hongmao Ye, Renjie Yu, Danhua Wang, and Lixin Wang. 2014. ""The impact of an intervention package promoting effective neonatal resuscitation training in rural China."." *Resuscitation 85, no. 2* 253-259. https://sci-hub.tw/10.1016/j.resuscitation.2013.10.020.

Yaya, Sanni, Friday Okonofua, Lorretta Ntoimo, Bernard Kadio, Rodrigue Deuboue, and Wilson Imongan. 2018. "Increasing women's access to skilled pregnancy care to reduce maternal and perinatal mortality

in rural Edo State, Nigeria: a randomized controlled trial." *Bio Med Central.* Accessed 2020. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5883415/.