Quality improvement for integrated HIV, TB and Malaria services during antenatal and postnatal care

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BOOK OF ABSTRACTS

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Contents

Quality improvement for integrated HIV, TB and Malaria services during antenatal and postnatal care in 3 Counties in Kenya

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Introduction: Although significant progress has been made with increased global coverage of interventions to improve maternal and newborn health (MNH), further improvement in outcomes will depend on the ability to address the gap between coverage and quality. The 16 essential interventions for antenatal care and 12 for PNC are meant to be implemented as a continuum of integrated care, inclusive of the recognition and management of obstetric complications, as well as the burden of infectious disease (Syphilis, HIV/AIDS, Tuberculosis (TB) and malaria)[1]

Kenya has witnessed an increase in access to and utilization of RMNCAH (KDHS 2014). However, high rates of adverse outcomes persist. Poor quality MNH services remain a hindrance to ending preventable maternal and new-born deaths as envisioned in the SDGs and UHC. If all ANC and PNC services are offered as integrated care, the woman and her baby receive all the required care during the same clinic visit,

Objective: To improve the availability and quality of integrated HIV, TB and Malaria services provided at healthcare facilities as part of ANC and PNC and contribute to improved MNH outcomes.

Methodology: Working closely with the government, the programme will adapt, implement, document, and disseminate innovative approaches to improve the availability and quality of integrated HIV/TB and Malaria services in ANC and PNC in Kenya.

Specifically, the program will support the implementation of a quality improvement (QI) process via intervention packages focusing on capacity-building of healthcare providers in ANC-PNC and Implementation of standards-based audit for quality improvement.

Results: Following the project inception, the ANC-PNC and Quality improvement tools were reviewed and adapted to country context for use in capacity building of health care workers. A total of 41 trainers and 120 health care workers in the 3 counties were trained in ANC-PNC competencies. The programme has observed good practices that include implementation of the 8 contact ANC model, the number of women attending first ANC before 12 weeks has increased and midwives' competency in estimating gestation age has improved. Some health facilities are conducting 3 PNC visits.

challenges experienced include delays at project inception, administrative challenges in navigating government procedures at national and local levels and the small project geographic scope. The project is strategically placed to leverage opportunities including the Country momentum on UHC and MNH QOC and ongoing institutionalization of MPDSR.

Conclusion: All three Program Counties are fully sensitized and have signed MOUs on project implementation. The ongoing implementation research is expected to generate context specific evidence to inform policy and practice in MNH.

Quality improvement for integrated HIV, TB and Malaria services during antenatal and postnatal care, Tanzania

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Abstract
Tanzania has managed to improve coverage for key maternal and neonatal health (MNH) indicators across the board. Antenatal care improved from an average of 36 percent visits in 2014 to 64 percent in 2018. Births occurring at a health facility increased from 71 percent in 2017 to 80 percent in 2018. The average share of pregnant women receiving iron and folic acid at ANC visit increased from 57 percent in 2014 to 75 percent in 2018. Low quality of care remains a major bottleneck. This project aims to improve the availability and quality of integrated HIV, TB and Malaria services provided at healthcare facilities as part of antenatal and postnatal care (ANC and PNC) in Tanzania, and thus to improve health outcomes.

Twenty health care facilities will be selected from Dodoma region to participate. Three, main intervention packages will be employed. Improvement of quality of Care as one of the interventions will adapt international standards for Antenatal and postnatal care to fit country context. For the Integration of Malaria, HIV and TB care during ANC and PNC where In-service 'skills and drills' training and quality assurance checks will be conducted. Finally Monitoring and Evaluation will be done where Healthcare facility assessment, Competency assessment for Antenatal and Post Natal Care and quality Improvement progress review will be done.

At the end of the project, it is expected that tools and materials which has been used for similar assessments in other countries will be reviewed by Ministry of Health and other stakeholders and adapted for Tanzania specific context. Package covering essential components of care including integration of HIV, TB and malaria services, as well as respectful maternity care, communication, and emotional and mental health assessment, manuals and job aids for self-learning will be developed. Finally, culture of quality improvement in ANC and PNC while integrating three diseases (HIV, TB and Malaria) and building capacity for standard-based (clinical) audit in ANC and PNC will be strengthened.

This project will complement government efforts in improving quality of health services in Tanzania. Antenatal and postnatal care are the key areas for maternal and child outcomes.

Quality improvement for integrated HIV, TB and Malaria services during antenatal and postnatal care, Nigeria

Hauwa Mohammed, LSTM Nigeria

Background: Every year, 295,000 women die from complications of pregnancy and childbirth, Worldwide HIV/AIDS is the leading cause of death of women aged 15-44 years while malaria contributes 10-25% of all maternal deaths in endemic areas and tuberculosis linked to HIV infection, is among the five leading causes of death in LMIC.
Pregnant women represent the highest number of users of healthcare facility globally, over 80% of women attend Antenatal (ANC) at least once. Hence, ANC and Postnatal (PNC) is a logical entry point for integration of HIV TB and malaria services. The Global Fund to Fight AIDS Tuberculosis and Malaria and LSTM implemented Quality Improvement (QI) in Integrated HIV, TB and Malaria Services in ANC&PNC in Kaduna and Oyo States Nigeria, through QI packages for capacity building of Health Care workers (HCW) in ANC-PNC and QI specifically Standards Based Audit (StBA).

Objectives: To improve the availability and quality of integrated HIV, TB and Malaria services provided at healthcare facilities as part of ANC-PNC in Nigeria.

Methods: Stakeholder engagement and adaptation of the QI and ANC-PNC package by Oyo and Kaduna states. Baseline health facility Assessment of previous 3 months in 60 facilities per state. Competency-based ANC-PNC and QI (StBA) training for health workers focusing on essential components of care including integration of HIV, TB and malaria services, respectful maternity care, communication, and emotional and mental health assessment. Setting up QI teams in facilities and QI review meetings 3 months after training. Each facility was supported with 16 basic equipment for ANC-PNC.

Results: From 2020-2022, 822 HCW were trained in ANC-PNC, and 240 in QI (StBA). Results of baseline survey: Kaduna state there were 3516 HCW, with 26% working in ANC-PNC, there were 23601 ANC-PNC visits of which ANC 1 (31%), ANC 4 (15.2%), PNC first 48hrs (8.5%), HIV-RDT (31%), malaria-RDT (20%), TB test (0.4%) syphilis-VDRL (6.5%).
In Oyo state there were 2928 HCW 39% work in ANC-PNC, there were 13242 ANC-PNC visits of which ANC 1 (27%), ANC4 (17%), PNC first 48 hours (2.2%) HIV-RDT (28%) malaria-RDT (11%) TB test (1.2%), syphilis-VDRL (7%).

81% of trained facilities attended QI review meeting. All facilities had formed QI StBA teams and audited standards which led to re-organization of services like introduction of separate days for PNC, integration of HIV, TB, malaria screening services at booking clinic. Introduction of mental health screening into ANC-PNC, creating audit systems for emergency drugs and supplies and audit of other standards around management of obstetric complications in baby and mother.

Conclusion: The project is ongoing an end-line assessment is planned at the end of the project.

Quality improvement for integrated HIV, TB and Malaria services during antenatal and postnatal care, Togo

Dankom Bakusa, STO, Université de Lomé

Context: Maternal and neonatal mortality are still high in Togo. To improve maternal and child health, a programme for Quality improvement for integrated HIV, TB and Malaria services in Antenatal and Postnatal Care has been implemented since 2016, funded by the Global Fund. The partners of the program in charge of the design and implementation are the MoH, the Université de Lomé and the LSTM.

Objectives: The objective of the programme is to improve the availability and quality of integrated HIV, TB and Malaria services provided at healthcare facilities as part of antenatal and postnatal care (ANC and PNC) in Togo.

Methods:

The programme is implemented along 3 lines of action:

- improving capacity building of health care providers in ANC-PNC
- improving the quality of care through standards-based audits and formative supervision
- monitoring and evaluating and conducting operational research

In the first two phases (2016-2017 and 2019-2020), the programme was implemented in 62 health facilities in 3 regions. In the current third phase (2021-2023), the project has been extended to all 6 regions of Togo for a total of 112 health facilities.

Results: Since 2019, 18 facilitators provided ANC/PNC training to a total of 563 healthcare providers. 82.5% of the health care providers demonstrated improved knowledge and skills after the training. Nearly 250 providers were trained to conduct a standards-based audit and 69 facilities have a functioning Quality Improvement committee. All 112 facilities received formative supervision and 66 health workers and managers were trained in the collection, aggregation and use of routine antenatal and postnatal care data to inform practice. A randomized controlled study and two operational research have been conducted.

Conclusion: Partnership and complementarity with other projects/programmes are very important. For example, the ANC/PNC manuals developed with the support of LSTM serve as a national reference for all ANC/PNC training. The continuity/regularity of the implementation of the standards-based audit has been demonstrated. The consequences of the lack of additional allocation are considerable. The extension of the quality scheme by national authorities and the adaptation of the blended learning approach are opportunities that should be better exploited

Quality improvement for integrated HIV, TB and Malaria services during antenatal and postnatal care, Chad

Mindekem Rolande, CSSI-CRASH, MoH

Context: The use of antenatal and postnatal care is relatively limited in Chad and maternal and neonatal mortality are high. To improve maternal and child health, a programme for Quality improvement for integrated HIV, TB and Malaria services in Antenatal and Postnatal Care was implemented in 2018, funded by the Global Fund. The partners of the program in charge of the design and implementation are the MoH and the SRMNIAN platform, LSTM and the CSSI-CRASH Consortium.

Objectives: The objective of the programme is to improve the availability and quality of integrated HIV, TB and Malaria services provided at healthcare facilities as part of antenatal and postnatal care (ANC and PNC) in Chad.

Methods:

The programme is implemented along 3 lines of action:

- improving the quality of care through standards-based audits
- improving capacity building of health care providers in ANC-PNC
- measuring and sharing "what works, why and how" to support policy and decision-making in the health system.

During the first phase of the programme in 2018, health facility assessment, adaptation of tools and standards, demonstration workshops and master trainers training were conducted. In 2020-2021, during the second phase, health care providers were trained in ANC/PNC and Audits and research were conducted.

Results: Between 2018 and 2021, 18 facilitators provided QI training to a total of 120 healthcare providers. Two audit review and implementation support workshops were organized for 60 participants. Nine ANC/PNC training workshops were conducted by national master trainers and involved 288 providers. A randomized trial was conducted to evaluate the effectiveness of ANC/PNC training on quality of care, and operations research was conducted at the national level.

Conclusion: The implementation of the programme in Chad was affected by certain hazards (Covid19, safeguarding issues or political events) and adaptation were made. Implementation at NFM3 is currently suspended but the need to extend the programme to other structures is identified.

Engaging Communities in Improving the Quality of Antenatal Care and Postnatal Care in Africa Podcast

Charles Ameh, Lucy Nyaga, Uzoh Egere, Kim Ozano, Clare Littlewood, Gillian Kyalo,

Introduction: The Emergency Obstetric and Quality of Care Unit (EmOC & QoC) of the Liverpool School of Tropical Medicine (LSTM) research focus includes evaluation and implementation research aimed at strengthening health systems for women and newborns. The Unit's specific areas of research include Antenatal Care (ANC) and Postnatal Care (PNC), Emergency Obstetric Care (EmOC), Quality of Care (QoC) and Obstetric clinical care monitoring tools. In line with LSTM's Vision and Mission, the EmOC & QoC Unit aims to contribute to improved maternal and newborn health outcomes by; i) conducting operational research, ii) combining research with capacity strengthening and technical support, iii) ensuring research is relevant to local needs and informs policy considerations by working in partnerships .

The EmOC&QoC Unit disseminates research findings through a variety of ways. Key ones include publications in peer reviewed scientific journals, scientific conferences, organizational website and the Unit's microsite and through social media platforms. These avenues however have limited reach. In the recent past, podcasts have gained prominence as communication and dissemination platforms that reach a wide variety of audience. Recognizing this, the LSTM has developed the Connecting Citizens to Science podcast. This is a platform that offers opportunity to wide range of stakeholders to discuss ways in which people and communities connect with research and science. To enhance coverage of dissemination of research findings, methods and approaches employed to improved MNH outcomes, the EmOC&QoC Unit has partnered with Connecting Citizens to Science podcast to produce its first series of podcast. This first series is dubbed *Engaging Communities in Improving the Quality of Antenatal Care and Postnatal Care in Africa Podcast*. The series is developed against the background of the Global Fund project *Implementing Quality Improvement (QI) for integrated HIV, TB and Malaria services in ANC and PNC.* This project is implemented in five countries in Africa.

Objective: To enhance coverage of dissemination of research findings, methods and approaches employed to improved MNH outcomes of the EmOC&QoC Unit.

Methodology: The podcast series is developed by holding on-line 'round table' discussions with various project stakeholders. The series has four episodes. Each episode focusses on a topical issue covering different components of the project. A host and co-host lead discussions with the project stakeholders pre-identified for each episode. They explore how the project components connect communities to implementation and to research. The discussions are recorded and disseminated through the Unit's and Connecting Citizens to Science podcast platforms.

Results: The EmOC&QoC Unit has recorded four episodes in its first series. These episodes provide information on the scope of Implementation research under the project, institutional research collaborations and capacity strengthening opportunities under the programme, benefit and opportunities of the programme to the host institutions and countries, and programme approach & impact, implementation challenges and mitigation. The episodes cover Nigeria Kenya and Tanzania.

Conclusion: Podcasts are an effective way to reach a broad range of audience. The EmOC&QoC Unit's podcast will be promoted through various platforms for a wide reach. The effectiveness of podcast in disseminating project information will be monitored to further inform the Unit's research dissemination strategies.

Effective Coverage of ANC/PNC in Tanzania: A Situational Analysis and Evaluation of Specific Package of Intervention

Maria Angelica Rweyemamu, Uzochukwu Egere, Charles Ameh, Alice Ladur, Aleksandra Torbica, Leonard Katalambula

Background: In Tanzania, the lifetime risk of death during pregnancy, childbirth and the puerperium is 1 in 36 compared to 1 in 8400 in the United Kingdom. Tanzania has struggled to meet global and national maternal health targets in the last 20 years. The maternal mortality ratio (MMR) in Tanzania is 524/100, 000 live births. The Government of Tanzania (GOT) has recommended high impact, innovative, integrated, quality interventions to meet current global MMR target of 70/100, 000 life births. This includes high coverage of interventions such as quality Antenatal Care (ANC), Post Natal Care (PNC) and quality improvement initiatives. However, Tanzania has partially adopted the 2016 WHO ANC guidelines in 2018. It is unclear what the extent of implementation of these guidelines are.

Effective health service coverage adds a measure to the quality of health intervention and health benefits that the target population receives. WHO and Lancet Think tank have suggested quality adjusted coverage as measures for the effective coverage of ANC/PNC services.

The GF ANC/PNC quality improvement programme aims to improve effective coverage in selected HCFs from 2022-2024.

Objectives: Main objective: to determine the extent of adoption of the WHO 2016 recommendation in Tanzania 2018 ANC guideline; situational analysis of ANC/PNC health service implementation and effective coverage of the specific intervention packages

Specific objectives:

1. To determine the extent to which the Tanzanian ANC guideline has adopted the WHO recommendations
2. To perform a situation analysis of the ANC/PNC health system including the cost needed for implementation of the Tanzania 2018 ANC guideline at various levels of care
3. To determine the ANC effective coverage since the implementation of the Tanzania 2018 ANC guideline
4. To determine the change in effective coverage of ANC/PNC since the implementation of the GF program in Tanzania

Methods: The Tanzania 2018 ANC guideline will be mapped against the WHO recommendations to determine the adopted recommendations; health care providers will be involved to analyze additional components of the recommendations that can be adopted in ANC care. The WHO standards and measure of quality of care will be used to assess the effective coverage of the Tanzania ANC guideline and the change since the implementation of the GF program in Tanzania.

Improving Reproductive Health In-Service Capacity Strengthening Programs: A Comparison of 2 Training Approaches

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Background: Globally, approximately 295,000 maternal deaths occur worldwide, and every day 810 women die from avoidable factors related to pregnancy and childbirth. Around 99% of maternal deaths occur in low-resource settings and most can be prevented with timely interventions. Antenatal Care and Post-Natal Care (ANC and PNC) have an important role in the reduction of maternal mortality and can help to prevent maternal and neonatal death by improving quality care. Capacity strengthening of health care workers tends to improve the quality of maternal and newborn health services. Blended learning and face-to-face approaches have been used for capacity strengthening of health care providers in low resources settings. This study aims to compare 2 approaches of in-service capacity strengthening (that is face-to-face and blended learning approaches) to improve the quality of ANC and PNC services in Kenya and Tanzania.

Methods: A prospective mixed-methods study design will be used. This will include a quantitative, qualitative, and cost-effective methodology to answer key research questions. Study sites will include high-volume health facilities in Zanzibar, Tanzania mainland, and Kenya. The target population will comprise all ANC and PNC care providers, facility managers, and policymakers in the study areas. The objectives of this study are 1) To conduct a systematic review on the effectiveness of in-service reproductive, maternal and newborn health capacity strengthening approaches in Low and Middle-Income Countries. 2) To compare the effectiveness of face-to-face learning and blended learning approaches in in-service reproductive, maternal, and newborn health capacity strengthening in the study countries, and 3) To determine the cost-effectiveness of blended learning versus face-to-face learning.

The systematic review will be registered with PROSPERO. A pilot study on the blended learning package is currently ongoing. A full study protocol will be completed and ethical approval will be sought before commencing this study.

Conclusion: A pilot study on the feasibility of the blended learning approach including cost analysis will be completed by Q4 2022. The systematic review is ongoing, some of the preliminary results will be presented, and the detailed protocols for the other objectives are being developed. Ethics approval will be obtained by Q1 2023 and data collection will commence in Q1/Q2 2024.

Keywords: Reproductive health, maternal, maternal death, Antenatal care, postnatal care, capacity strengthening, face-to-face, and blended learning

Economic Evaluation of Integrated Multi-Disease Screening within ANC/PNC Delivery Platforms in Kenya – Research Protocol

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Background: Antenatal care (ANC) and post-natal care (PNC) constitute a potentially valuable platform for integrated delivery of additional health services for pregnant women. Interventions promoting integrated care, including services for Malaria, HIV and tuberculosis (TB) may contribute to reduce indirect adverse pregnancy outcomes for the mothers, new-born and infants. However, evidence on the cost-effectiveness of such interventions is still limited and poorly generalizable to date. Filling this gap is of paramount importance to inform policy making and prioritization of healthcare resources in low– and middle–income countries (LMICs).

Objectives: To describe the protocol of a full economic evaluation of a capacity-building intervention, aiming to integrate HIV, TB, and malaria services within ANC and PNC delivery in Kenya

Methods/design: A static decision decision-tree model will be designed to predict how the capacity-building intervention will affect proximal outputs and relevant health outcomes for the mothers and the babies through improved care for Malaria, HIV and TB. The analysis will take the perspective of the health care system, regardless of the payer (e.g., local government, or international donors) and a life-time horizon. Different adverse pregnancy outcomes for the babies and the mothers will be considered, including maternal and neonatal mortality, as well as the rate of stillbirth and low-birth-weight, and other disease-specific outcomes (e.g., congenital malaria or mother-to-child transmitted HIV). The model will be constituted of two different sub-models, specific for either the mother or the babies. Disease- and country-specific disability weights will be used to calculate disability adjusted life years (DALYs) and the lifelong impact of integrated care in ANC/PNC clinics. Extensive deterministic, probabilistic and scenario analyses will be conducted to explore both parameter and structural uncertainty in the model. Input parameters for the model will be derived from primary data collected at 60 ANC clinics in Kenya before and after the deployment of the intervention, and from published and grey literature. Outcomes will be expressed in terms of the incremental cost needed to avert one added DALY and the probability of the intervention to be cost-effective at several cost-effectiveness thresholds.

Conclusion: This economic evaluation will contribute to fill the existing evidence gap on the cost-effectiveness of interventions to promote integrated care during ANC/PNC services and inform relevant decision-makers about the cost-effectiveness of capacity-building in this area.

Effectiveness of Sexual and Reproductive Health Blended Learning Approaches for Capacity Strengthening of Healthcare Practitioners in Low- and Middle-Income Countries: A Systematic Review

Elizabeth Kumah, LSTM

Background: Although the use of blended learning approaches in healthcare capacity strengthening has gained momentum in recent years, there is limited evidence of systematic reviews that have evaluated the effectiveness of sexual and reproductive health blended learning approaches in low-resource settings. We undertook a systematic review to assess the effectiveness of blended learning approaches that have been used in delivering sexual and reproductive health training packages to healthcare practitioners in low-and-middle income countries.

Objective: To evaluate and synthesise the literature on the effectiveness of sexual and reproductive health blended learning approaches for capacity strengthening of healthcare practitioners in low-and-middle income countries.

Methods: Databases and search engines including MEDLINE, EMBASE, ERIC, CINAHL, CENTRAL, SCOPUS, Web of Science, Global health PsycInfo, Google and Google scholar were searched to identify published literature. Other sources, including OpenGrey, reference lists of included studies, and the website of WHO and UNICEF were searched to identify unpublished articles. The search results were first screened for title and abstracts and then full text, using pre-specified selection criteria. Methodological quality of included studies was assessed using the mixed methods appraisal tool developed by Hong et al. (2018).

Findings: A total of 12,965 articles were screened for eligibility, out of which 17 articles were included in the review. Included studies originated from Sub-Saharan Africa (42%), East Asia and Pacific (21%), South Asia (16%), Middle East and North Africa (16%), and Latin America and the Caribbean (16%). Included studies were published from the year 2012, with over 88% of the studies published between 2017 and 2022. 41% of the studies employed a non-randomised controlled design; 29% used a randomised controlled design, and 24% used a mixed methods design. Only one study employed a qualitative design. All the included studies reported on two or more outcomes. 53% of them reported knowledge as outcome and 41% reported on skills. Other outcomes measured include attitude (12%), patient outcomes 12%), and cost-effectiveness (6%). A meta-analysis of the results is currently underway to determine the overall effect of blended learning interventions compared to other methods of training.

Conclusion: Preliminary synthesis of individual included studies indicates that blended learning (that combines both e-learning and face-to-face training modalities**)** may lead to improved outcomes of healthcare providers in low-and-middle-income countries and may be as effective as the conventional face-to-face learning.

Key words: Blended learning, effectiveness, sexual and reproductive health, low and middle- income countries

A blended learning approach for health professionals to improve the quality of integrated HIV, TB, and Malaria services during antenatal and postnatal care in LMICs: A feasibility study

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Background: The blended learning approach to training for health care professionals is increasingly adopted in many countries because of high costs and disruption to service delivery when healthcare providers are pulled away from health facilities to attend face to face training. With the Covid-19 pandemic, there is an urgent need to change from the traditional face-to-face education approach. The EmOC&QoC unit at LSTM has repackaged the antenatal care (ANC) and postnatal care (PNC) training course that had been previously implemented as a standalone face-to-face training into a blended learning package in Nigeria, Kenya, and Tanzania. The blended learning course was repackaged into three parts consisting of; 1) self-directed learning; 2) zoom sessions and face-to-face sessions. This training approach shortened the duration of face-to-face training from 4 to 2 days which may have provided economic benefits of saving on human and material resources. This pilot study sought to assess the feasibility and acceptability of implementing a blended learning course for quality improvement of integrated HIV, TB, and Malaria services during antenatal and postnatal care in Nigeria, Tanzania, and Kenya. Results are expected to design a blended learning package for health care providers.

Objectives

- To explore the acceptability and feasibility of implementing ANC and PNC blended learning course to healthcare providers in Nigeria, Tanzania, and Kenya.
- To assess the knowledge of healthcare providers before and after implementation of the ANC and PNC blended learning course.

Methods: A total of 90 healthcare professionals were purposively selected to participate in the mixed methods study. Quantitative data will be collected through an online questionnaire administered through google forms. Descriptive analysis will be carried out using frequency distributions, means, and proportions. Inferential statistics will include t-test statistics to assess the differences in knowledge before and after participating in the blended learning training package. Qualitative data will be collected through key informant interviews, focus group discussions and participant evaluation forms analysed using the six-step criteria for thematic analysis by Braun and Clarke.

Results: Preliminary data will be presented on differences in knowledge before and after participating in the blended learning training package. In addition, participant perceptions and experiences upon engaging with the ANC-PNC blended learning course will be reported.

Conclusion: The ANC-PNC blended learning approach is expected to shorten the duration of face-to-face training and provide economic benefits of saving on human and material resources.

Estimating costs of integrated ANC/PNC services in 30 healthcare centres in Kenya

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Background: Kenya is contributing to the high maternal and neonatal mortality that characterizes the sub-Saharan region to date. Integrating care services, including HIV, tuberculosis (TB), and malaria services during Antenatal care (ANC) and post-natal care (PNC) visits may contribute to improve maternal, newborn and infant health and progress towards the achievement of the Sustainable Development Goals (SDGs). Yet, there is still limited evidence on the costs of ANC models targeting multiple diseases.

Objectives: The aim of this study was to estimate the direct healthcare costs of supplying integrated ANC/PNC services in a selected sample of clinics in Kenya

Methods: Using time-driven activity-based costing we estimated the economic costs of ANC and PNC among care providers and service users of 30 clinics in Kenya. Questionnaires were administered to providers to elicit information on the times and resources spent on 20 components of care associated with different conditions including pre-eclampsia, anaemia, malaria, HIV and TB, or recommended best-practices during ANC/PNC care. Questionnaires to 120 service users also collected data on the time spent, out-of-pocket expenditures and earnings lost to attend the clinics.

Results: Coverage of services varied across conditions and visit and was generally lower during the second or later ANC visits, or the first PNC visit. The overall costs per visit were USD26.8 (SE 2.27) and 18.66 (SE=3.26) respectively for ANC and PNC visits. During ANC and PNC visits, respectively 84% and 81% of this cost was spent in supplies, equipment and services, about half of which was attributable to the costs for TB due to the high coverage of TB screening and the fact that most facilities referred to other centres with GeneXpert equipment. Other relevant costs related to management of Anaemia (23.7%) and Malaria (13%) during ANC visits, and to the provision of anti-retroviral drugs for prevention of mother-to-child HIV transmission during the first PNC visit (33.7%). Very few clients (6%) experienced out-of-pocket expenditures. Travel costs or any other expense were also generally small. Only 30% of women attending the clinics had a paid occupation, of which 40.7% reported losing earnings to attend the clinic (average loss USD 4.5).

Conclusion: Results outlined a potential for improvement in the degree of integration of services during ANC/PNC visits. This baseline economic analysis will serve as the basis to conduct a full economic evaluation of the implementation of a capacity-building intervention promoting the integration of HIV, TB and malaria services during ANC/PNC visits.

Effectiveness of standards-based audit and HCP training on the availability and quality of ANC and PNC in Togo

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Background: Baseline assessment of 62 healthcare facilities in three regions of Togo in 2017 showed there were multiple opportunities to improve the delivery of integrated care to women and babies. Two interventions to improve the quality and availability of integrated care were of interest: the introduction of the process of standards-based audits and capacity building training on the provision of antenatal and postnatal (ANC-PNC).

Objectives

1. To evaluate the effectiveness of implementing standards-based audits for improvement of the quality of ANC-PNC as assessed by compliance with standards.
2. To evaluate the effectiveness of in-service competency-based ANC-PNC training of health care providers (HCPs) for the improvement of the availability of ANC-PNC as assessed by signal functions.
3. To evaluate jointly and independently the effectiveness of both interventions.

Methods: Two stepped-wedge cluster randomised trial designs (SW-CRT), each with 12 steps, were crossed and implemented in 18 HCFs in Togo between July 2019 and November 2020. A six-dimensional incomplete cross-sectional SW-CRT focused on standards-based audit, with six audit cycles per facility. HCPs from each facility selected which 6 (of 29) ANC-PNC standards to audit at their facility; standards were audited in a randomised sequence. An incomplete closed cohort SW-CRT used the proportion of 20 defined signal functions available each month to assess the impact of ANC-PNC training. For each outcome data analysis used logistic regression models, in a generalised linear mixed model framework, including fixed effects for month and random effects for facility.

Results: Fourteen of the facilities completed six audit cycles; the other four facilities each completed between 2 and 5 cycles. ANC-PNC training was delivered for all 18 facilities. There was a statistically significant improvement in compliance with standards following action within audit cycles, with the OR (95% CI) of compliance estimated to be 3.5 (2.1-5.7). The increase from 16.6 to 18.4 in the mean number of signal functions available was not statistically significant, with an OR (95% CI) of 1.3 (0.8-2.1).

Conclusion: Introduction of the standards-based audit process substantially improved compliance with the standards selected for audit. The improvement was consistent across the different standards. Limited investment is required to achieve a substantial improvement with HCPs empowered to implement the approach without further resources required, to further improve the quality of care. For some signal functions supply chain issues need to be addressed to improve the availability of equipment and consumables required.

Effectiveness of healthcare provider training on the availability and quality of Antenatal (ANC) and Postnatal Care (PNC) in Chad: Randomised stepped wedge trial

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Background: Antenatal and postnatal care (ANC-PNC) offered in healthcare facilities (HCFs) by trained healthcare providers (HCPs) is an essential platform during and after pregnancy. However, commonly used tests for evaluating training do not assess whether there is behavioural change in clinical practices. This study aimed to assess the impact of competency-based ANC-PNC training to improve the delivery of integrated services of ANC and PNC. The study hypothesis was: "Training of HCPs will improve the proportion of essential components (ECs) delivered by HCPs during ANC and PNC visits.

Objectives: To estimate the effectiveness of training on professional practice in the delivery of ANC-PNC essential components during:

1. ANC visits
2. PNC visits

Methods: An incomplete stepped wedge cluster randomised controlled trial design was conducted in 18 healthcare facilities in N'Djamena. Steps were at 6–7-week intervals with 3 facilities undertaking a 'Skills and drills' competency-based training in ANC-PNC per step. Delivery of EC was assessed through observation of ANC-PNC delivery by at least two HCPs per facility in alternate steps. The primary outcome was the proportion of ANC-PNC ECs provided per client. A generalized linear mixed model framework was used to examine the evidence of intervention effects.

Results: ANC-PNC training was delivered, and 566 visits were observed (287 ANC and 279 PNC). Analysis of the primary outcome did not detect significant impact of the intervention (training in ANC-PNC) on the overall proportion of essential components delivered during observation of ANC and PNC care. The adjusted mean percentage of essential components attained in the control and intervention phases was 27.1% and 26.5% respectively.

Conclusion: The study did not evidence an overall significant improvement in the provision of ANC-PNC essential components following 'Skills and drills' competency-based training during observation of antenatal and postnatal care
The absence of a benefit may reflect the difficulties faced by HCPs and programmes alike to improve quality of care in the Chadian setting, especially at a period impacted by the Covid-19 pandemic and serious political events. Reinforcement of the intervention with supportive supervision and peer-support mechanisms, such as mentoring, involvement of all stakeholders, increased flexibility of training modalities to favour retention of new skills should be explored.

Keywords: Effectiveness, Health care providers, antenatal care, postnatal care, capacity strengthening.

Quality improvement for integrated HIV, TB and Malaria services during antenatal and postnatal care: baseline assessment findings in Kenya, Nigeria and Tanzania

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Background: Despite efforts, gaps at the level of availability and quality of care for mothers persist in low- and middle-income settings leading to missed opportunities to implement essential components of antenatal and postnatal care. We carried out a health facility assessment in Kenya, Nigeria, and Tanzania to understand context and support implementation of interventions to improve quality of integrated antenatal and postnatal care services.

Methods: This was a cross sectional survey of purposively selected health facilities in Kenya (61), Nigeria (120) and Tanzania (30) using survey tool developed at LSTM and adapted to country contexts. Data collection covered availability of infrastructure, utilities and specific ANC/PNC services, availability of drugs, diagnostics, equipment and essential supplies, and quality of care. Descriptive analysis was done using percentages and proportions to characterize readiness of health facilities to provide services. Only limited analysis was done on Tanzania mainland and Zanzibar data, as only preliminary data was available.

Results: Low volume facilities were the predominant health facilities surveyed, comprising at least 70% of all facilities in Kenya, Zanzibar and Tanzania mainland. Of all available healthcare providers, 54.8% vs. 32.1% provided ANC and PNC services in Kenya and Nigeria respectively. Nurses and nurse midwives were the predominant providers of ANC and PNC services. No essential ANC equipment was available in up to 50% of health facilities in Kenya and pregnancy EDD wheel was the least available equipment in Nigeria and Kenya (16% vs, 24% respectively). The most available equipment were stethoscope (75% in Nigeria) and blood pressure equipment and adult weighing scale (49% each in Kenya). Training in ANC and HIV, TB and Malaria was generally low in both countries, but the least training was in mental health (5% vs. 13% in Kenya and Nigeria respectively). Only HIV training was performed in up to 50% of facilities and this was in Nigeria. On the other hand, all guidelines for ANC and management of TB, HIV and Malaria were available in at least 77% of the facilities in Kenya. PNC guidelines were the least available (51% vs. 40% in Kenya and Nigeria respectively). Availability of ANC and PNC rapid testing kits was generally high, the lowest being hemoglobin testing in Nigeria (65%) and malaria testing in Kenya (64%). First ANC attendance in first trimester was very low (18% vs 9% in Kenya and Nigeria respectively).

Conclusion: Gaps remain in the readiness of health facilities to deliver integrated HIV, TB and Malaria services in antenatal and postnatal care in Kenya and Nigeria. Sustainable interventions are needed to address these gaps and make lasting impact.

Development of a Risk Scoring System to Support Maternal and Child Health Planning in Chad

Ana Krause

Background: The Republic of Chad faces many serious health challenges, including high maternal and under-five morbidity and mortality. Pragmatic planning solutions are needed to maximize the impact of scarcely available resources. Health planning and prioritisation in low- and middle-income countries (LMICs) is often more ad-hoc than evidence-based, and can be especially challenging for policy makers. There is currently no formally validated tool to support priority setting in Chad. The research aim was to identify regions in Chad with a greater aggregate risk for maternal and child health (MCH). We developed a simple risk score (RS) and complementary maps to support planning decisions and optimise the targeting of limited resources.

Methods: MCH indicators with a significant impact on mortality in LMICs were selected. Eleven maternal health indicators were included: adolescent births, skilled birth attendance (SBA), tetanus vaccination, contraception, postnatal care, insecticide treated net (ITN) use, intermittent preventive treatment in pregnancy, poverty, education, anaemia, and emergency obstetric care (EmOC). Thirteen child health indicators were included: acute malnutrition, exclusive breastfeeding, pentavalent-3, tetanus and full immunization coverage, ITN use, SBA, postnatal assessment, EmONC, and access to appropriate diarrhoea, pneumonia, and fever management. Regional data for selected indicators were drawn primarily from Chad's 2019 Multiple Indicator Cluster Survey, and indicator targets from national policy documents. RS were determined by calculating the difference between the regional indicator coverage and corresponding national target (target-coverage=risk). Aggregate RS were determined by adding individual indicator RS together. Aggregate MCH RS were calculated for all regions and combined with Quantum GIS to build risk maps. Interviews (n=11) and focus group discussions (n=6) were conducted with key stakeholders in Chad to provide greater context around regional variations in risk and to understand current health planning.

Results: Both the secondary analysis and primary qualitative data revealed regional variation in MCH risk and across different indicators in Chad. N'Djamena had the lowest maternal RS (154.3) followed by Moyen-Chari (238.6), whereas Borkou (491.4) and Tibesti (475.2) had the greatest calculated risk. Existing planning and prioritisation in Chad differs at various levels of the health system. The current centralised approach may benefit from a more in-depth understanding of regional differences.

Conclusion: The proposed risk scoring system for MCH offers a simple tool to support health planning and prioritisation in Chad. This tool may be of particular benefit as existing prioritisation processes are ill-defined. Further research is needed to test this tool and its impact in Chad.

An exploratory analysis of factors associated with institutional maternal mortality in Nigeria

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Background: Maternal mortality rate (MMR) remains unacceptably high in Nigeria at 512 deaths per 100,000 live births and far from the target of 70 deaths / 100,000 by 2030 set in the UN sustainable development goal 3. Training of healthcare providers in ANC and PNC is expected to lead to improvements in maternal outcomes but the effect on maternal mortality of training in TB, HIV and Malaria is not well documented. This exploratory secondary data analysis was conducted to document the impact of training in TB, HIV and Malaria on institutional maternal mortality from a baseline health facility assessment data collected in January 2020 in Kaduna and Oyo states, Nigeria.

Methods: Three sets pf explanatory variables – level of facilities, training in each of HIV, TB and Malaria in the past 12 months, and numbers of clinical healthcare providers – were selected based on their potential impact on maternal outcomes. The association between maternal mortality ratios and these explanatory variables was explored using poisson regression. Similar analysis was performed with stillbirth rate as outcome variable. Association was measured using incidence rate ratios (IRR). Results for levels 1 (primary) and 2 (secondary) health facilities are reported.

Results: Over the study period, there were 2440 and 1102 total births of which 2394 (98.1%) and 909 (82.5%) were live births in Kaduna and Oyo respectively. There were 46 still births in Kaduna and 21 in Oyo. Over the same period, there were 14 maternal deaths in Kaduna and 1 in Oyo. No maternal deaths occurred in level 1 facilities. Maternal deaths did not vary significantly with facility type. The IRR for maternal death was statistically significantly lower for those trained in TB and Malaria in the last 12 months [(IRR 0.18 (95% CI 0.04-0.88) and 0.22 (95% CI 0.06 – 0.81)] respectively. When all three sets of variables were included in analysis, training in TB was the only statistically significant variable with an IRR (95% CI) of 0.08 (0.01 – 0.55). Similarly, higher numbers of nurses were associated with significantly reduced maternal mortality [(IRR 0.94 (95% CI 0.89-0.998) but not higher numbers of midwives [IRR 1.09 (95% CI 1.04-1.15)].

Conclusion: Training of healthcare providers in TB and Malaria, and additional numbers of nurses, are associated with significantly lower maternal mortality in selected health facilities in Nigeria and should remain key areas of focus in tackling high maternal mortality in Nigeria. More in-depth analysis is required to understand how training interventions and healthcare providers interact to impact maternal mortality.