

Maintaining the provision and use of services for maternal, newborn, child and adolescent health and older people during the COVID-19 pandemic

Nigeria: reducing the indirect causes of maternal morbidity and mortality: the RICOM3 Project

Background

Nigeria reported its first case of COVID-19 at the end of February 2020 and subsequently experienced four waves, with peaks in June 2020 and January, August and December 2021. The COVID-19 pandemic severely impacted the economy of Nigeria and caused disruption of health services nationwide. During the crisis, many Nigerians failed to access routine health services due to decreased income and lockdown restrictions. The most significant service disruptions were in maternal and newborn health, vaccination, sick childcare, family planning and noncommunicable disease treatment services (1). Pregnant women were anxious about contracting COVID-19 during 2020, and as a result, many avoided attending health facilities for antenatal (ANC) and postnatal care (PNC). Disruptions in the medical supply chain and diversion of resources to COVID-19 management impacted on essential health services. Health workers were often unable to go to work because of transport disruptions or illness. Women were uncertain about where to seek care and how to do so safely. In response to these circumstances, the Federal Ministry of Health took various actions to maintain essential reproductive, maternal, newborn, child, adolescent and elderly health and nutrition (RMNCAEH+N) services.

Before the COVID-19 pandemic, the scale-up of digital health interventions in Nigeria was planned with the implementation of the *National health information, communication and technology strategic framework (NHICTSF) 2015-2020*. The vision for health information, communication and technology (ICT) at that time was, "By 2020, health ICT will help enable and deliver Universal Health Coverage [UHC] in Nigeria" (2).

During the COVID-19 pandemic digital health tools became necessary, and with this, a proliferation of interventions arose. The need to develop overall guidance led to the rapid finalization of the *National digital health policy* and the roll-out of new policies that included provisions for the use of digital applications to support the continuity of essential services (1).



Group of nurses at Daughters of Charity Hospital in the Federal Capital Territory during a project ECHO session
Photo credit: Priscilla Ikparen – RICOM3 Project

The digital health landscape

Nigeria has prioritized the use of technology to accelerate the attainment of UHC. While the ICT environment has grown at a fast pace, the growth of digital health has not been as rapid, resulting in many missed opportunities. The NHICTSF was meant to fast-track provision of a favourable environment for sustainable application of digital technology in the health sector. An end-term evaluation of the NHICTSF in 2021 assessed progress in the attainment of objectives across the seven components of the health ICT-enabling environment. It noted the weak implementation, with many intended results not achieved (3,4).

Box 1 provides an overview of the national digital health landscape prior to COVID-19.

Box 1. Summary of the national digital health landscape prior to COVID-19 (5)

- Health area focus: 75% of projects were focused on maternal, newborn and child health, and fewer on malaria and nutrition projects (27%)
- State: every state had at least 20 digital health projects
- Geographical reach: 32% of projects had national coverage; call centres were the most common intervention with national reach
- Technology: 37% of projects used text messages
- Infrastructure: three out of eight operators (MTN, Airtel and Glo) comprised 83% of the telecommunications market
- Health system function: health information systems, communication and patient education were the most common digital health products; health financing and disease surveillance were the least common

These findings were the basis for the development of the *National digital health policy 2021*, and its strategic implementation framework - the *National digital health strategy 2021-2025*. The *Strategy* is aligned with other relevant health and non-health sector policies to help coordinate digital health and ICT investments for health systems strengthening (6,7).

ICT infrastructure

A field assessment conducted by the Federal Ministry of Health in 2015 showed that infrastructure - including electricity, connectivity and ICT equipment (computers, mobile phones, telephones, printers, etc.) - are sufficiently available at the federal, state and local government area (LGA) levels, but inadequate at the facility level. While electricity was available, frequent interruptions in the power supply were common (5). Despite 90% mobile network coverage, just 41% of the population owned a mobile phone. Only 7% were internet users; 8% had access to the internet at home, while 6% owned a home computer (8). According to a report by the Global System for Mobile Communications Association, there is a 7% gender gap in mobile phone ownership and 29% gap in mobile internet use in favour of men (9). The Federal Ministry of Health considers that the health system could leverage the growth in mobile

telephones and increased internet use to accelerate progress towards achieving UHC.

Description of the digital health intervention

The digital health intervention was delivered through the *Reducing the Indirect Causes of Maternal Morbidity and Mortality Project (RICOM3)*. The goal of the project is to reduce the indirect causes of maternal morbidity and mortality by applying a quality-of-care model to improve prevention, early detection and management of indirect causes along the continuum of maternity care. The project focuses on screening and managing conditions such as high blood pressure, diabetes mellitus, anaemia and obesity in women of reproductive age through ANC, family planning clinics and PNC services. The project is being implemented in 40 health facilities, in two LGAs in Lagos State, and two area councils in the Federal Capital Territory (FCT), cutting across general hospitals, primary health care facilities, and private and mission hospitals.

a. Project implementation

The project began in November 2018 and has been implemented in three phases. Phase 1 was an assessment of risk factor prevalence, women's knowledge, and health facility readiness to provide quality care in 20 health facilities. In Phase 2 (implementation phase), stakeholders including the Federal Ministry of Health, state ministries of health (FCT and Lagos), professional associations and women's groups were engaged to design a women-centred quality-of-care model. Phase 3 (pilot phase) started in October 2019 and continued until September 2020, to implement the model at the ANC clinics of the 20 health facilities. The project was scaled up to an additional 20 health facilities in Lagos and the FCT, starting in January 2021. It is expected to end in December 2022.

The key implementation approaches for RICOM3 include:

- working with health facility staff by providing quality improvement support, learning reviews, and virtual Extension for Community Health Outcomes (ECHO) training sessions;
- supporting women attending ANC in facilities to register on a digital health platform and providing them with virtual self-care support to prevent and manage risk factors;
- analysing costs and fiscal space for the quality-of-care model.

The virtual components of the RICOM3 Project aimed to optimize demand from women and improve the quality of care provided by health workers. The Complete Health Platform – a downloadable mobile application – provides virtual guidance on self-care and lifestyle changes for women of reproductive age. Once on the platform, women are connected to a nurse or midwife coach and a multidisciplinary team of experts to help them manage their health during pregnancy. As part of the registration process, the women complete a survey which is used to help identify their individual needs and connect them to relevant WhatsApp support groups. Women who are deemed high risk receive a call from a coach to

walk through a personalized action plan. The health platform also features a personal health record and dashboard which allows women to upload and track their progress in achieving their health goals. This secured information can be made available to any of their coaches at any time. Women also receive automated educational messages every day on simple healthy lifestyle habits to support their health goals.

To link self-care to facility-based care, tele-ECHO training sessions provide a learning system for health workers who provide ANC and PNC services. They receive onsite skills training and mentorship using the videoconferencing technology Zoom. Training topics are advertised through health facility WhatsApp groups, emails, Twitter and State Technical Advisory Groups. Health professionals, such as midwives, paediatricians, psychologists, obstetricians, endocrinologists, public health physicians, cardiologists and dieticians from various hospitals in the two states facilitate monthly sessions. Additionally, international professionals support local experts when there is high demand for training sessions. The sessions are also used as a platform for peer-to-peer learning; health facilities share case studies on care management experiences.

Project participants are required to have a phone (basic or smart) and internet to access the Complete Health Platform, tele-ECHO sessions and WhatsApp group discussions. In the RICOM3 Project, those with basic phones receive health education through text messages or voice calls. The project provides each facility with a stipend to acquire data for one device for the capacity-building sessions for health workers.

In the pilot phase, the project targeted five health workers from each of the 20 supported health facilities every month for the tele-ECHO sessions, and 1200 women for the Complete Health Platform for self-care. Advocacy work was carried out with state health leaders and individual health facilities to encourage participation in the project. By the end of the initial phase of the project in September 2020, 2950 health workers and 1117 pregnant women, nursing mothers and their caregivers had participated in the tele-ECHO sessions. There were also participants from beyond the supported health facilities, including some from outside Nigeria. A total of 6473 women were registered on the Complete Health Platform by September 2020.

b. COVID-19 adaptations of RICOM3

As part of the COVID-19 response, the RICOM3 Project expanded its work to support pregnant and lactating women, and capitalized on existing structures to equip health workers with tools to provide care in the context of the pandemic.

■ **Increased virtual tele-ECHO sessions for health workers**

The project adapted to the new realities of COVID-19 by increasing the frequency of the virtual tele-ECHO sessions for health workers from once to twice per month. The focus was on COVID-19 related. Health workers used quality improvement team WhatsApp groups to share COVID-19-related information and ideas on how to support women during the pandemic.

■ **Virtual tele-ECHO sessions for pregnant women and nursing mothers**

Virtual tele-ECHO sessions for ANC and PNC were introduced to provide support to pregnant women and new mothers during the lockdown period. Before initiation, a poll was conducted to select the most convenient day and time for women's tele-ECHO sessions. Zoom links were sent to all women registered on the Complete Health Platform and WhatsApp support groups. Extending the tele-ECHO sessions provided an avenue to inform and educate women on important ANC and PNC topics and address questions, fears and anxiety regarding COVID-19.

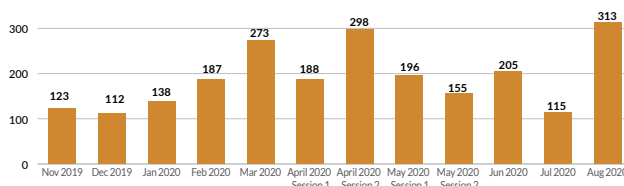
■ **Prioritization of high-risk pregnant women on the Complete Health Platform**

Coaches encouraged women to continue their blood pressure checks at neighbourhood pharmacies when health facilities were closed which helped in monitoring women's health and acting on high-risk cases.

Outcomes of the RICOM3 digital health intervention

According to the RICOM3 Project report 2020 (10), a total of 12 tele-ECHO sessions were held from November 2019 to August 2020 with 2307 health workers. An average of 192 health workers participated in each session, with a high of 313 in the session on "Hepatitis B virus: best practices in management of HBV during and after pregnancy". Figure 1 shows attendance during 2019 to 2020.

Fig. 1. Health care workers' attendance per tele-ECHO session before and during the peak of the COVID-19 pandemic, Lagos and FCT, 2019-2020*



* Two sessions were held in April and May 2020, but only one in other months.

Source: (10).

Tele-ECHO sessions attracting high attendance included:

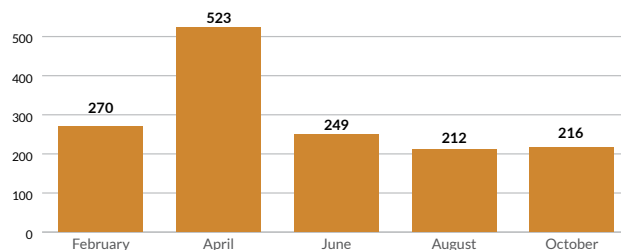
- preparing ahead, what do I do for a pregnant woman with COVID-19?
- managing hypertension in sub-Saharan Africa in 2020: what do I need to know?
- diabetes in pregnancy: is the bark worse than the bite?
- COVID-19 in pregnancy: everything I need to know
- what should I do for my obese female patients?

A test based on the topic area was administered before and after each session or case study, and feedback was provided at the end. Across all 12 sessions, there was a 15% average increase in knowledge with a peak gain of 35% during the first COVID-19-related topic, "COVID-19 and pregnancy: everything you need to know!". This peak may have reflected a lower baseline knowledge level than for other sessions.

Beyond knowledge gains, tele-ECHO sessions contributed to improved adherence to recommendations made by session subject matter experts, including implementing tangible ways to change and improve local care processes. For example, referral registers were established at health facilities following the session on “What will it take to get the referral process right?”. In another session, the health facility management team who presented an active case study of a pregnant woman with chronic hypertension at 35 weeks gestation decided to admit the woman the day after the tele-ECHO session, based on the recommendations of the session subject matter experts.

The tele-ECHO sessions have continued during the scale-up phase of the project and are now held bimonthly. **Figure 2** shows the attendance of health workers by session in 2021.

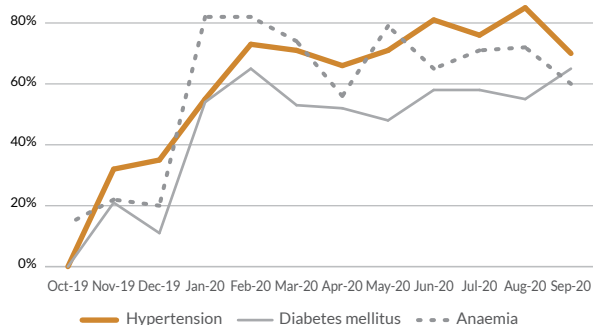
Fig. 2. Health worker attendance by tele-ECHO session, Lagos and FCT, 2021



Source: (11).

At the beginning of implementation, screening for and documentation of risk factors were very low but improved over time. **Figure 3** demonstrates an improvement for 26 712 women attending ANC in the 20 supported health facilities between October 2019 and September 2020. The tele-ECHO sessions with health workers contributed to this improvement (11).

Fig. 3. Hypertension, diabetes mellitus and anaemia screening of women attending ANC in Lagos and FCT, October 2019 to September 2020

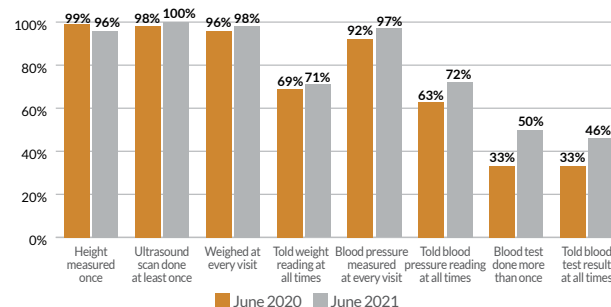


Source: (10) and health management information system registers in health facilities.

Randomly-selected beneficiaries from supported health facilities were surveyed in June 2020 and June 2021 to assess their satisfaction with the services received.

Figure 4 shows the responses corroborated with the information collected at the health facilities. Certain areas, such as providing tests results, need attention.

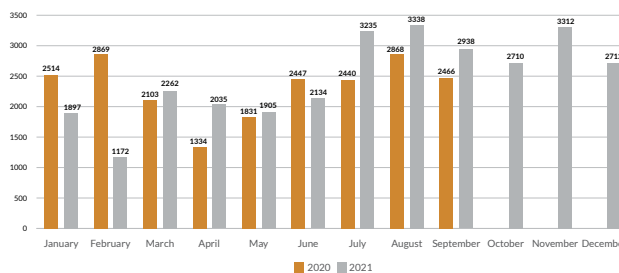
Fig. 4. Women’s experience at routine ANC visits at RICOM 3-supported sites^a in Lagos and FCT



Source: (10,12).

Figure 5 shows registration trends for first ANC visits from the beginning of 2020, just before the COVID-19 pandemic, through to the lockdown period from March to May 2020, and after. The tele-ECHO sessions which began during the lockdown period were reported to help allay fear and anxiety in women. The sessions also were reported to help restore confidence in women to register for ANC after the lockdown period.

Fig. 5. Trends in ANC attendance, RICOM3-supported health facilities, Lagos and FCT, January to September 2020 and January to December 2021



*Data is not available from October to December 2020 as the pilot phase ended in September 2020.
Source: (13).

Challenges

The project reached more women than originally planned which resulted in a high workload for the coaches on the Complete Health Platform. To address this problem, the project relied on the platform’s automated features to identify and prioritize high-risk cases for in-person coaching.

Despite the overall growth in ICT in Nigeria, digital literacy remains low. In RICOM3, 79% of the women owned smart phones (10); however, many did not know how to use more than a few basic features.

^a Facilities where women were surveyed include, in 2020: Alimosho General Hospital, Ikorodu General Hospital, Ipaja Primary Health Centre, Ita Elewa Primary Health Centre, Mobonike Private Hospital, Bwari General Hospital, Kubwa General Hospital, Lugbe Primary Health Centre, Mpape Primary Health Centre and Saffron Private Hospital; in 2021: Ijeda General Hospital, Akonwonjo Primary Health Centre, Rauf Aregbesola Primary Health Centre, Oke Eletu Primary Health Centre, Odonla Primary Health Centre, Nyanya General Hospital, Gwarinpa General Hospital, Gidan Mangoro General Hospital, Dutse Alhaji Primary Health Centre, Daughters of Charity Mission Hospital.

The project supported health workers and women with in-person and virtual training on how to use smart devices and access the virtual self-care and learning platforms.

The lack of adequate internet data and digital devices was another challenge; groups of health workers had to access the tele-ECHO sessions together in a health facility using one device.

Staff turnover is a common challenge in most health facilities across Nigeria. The project continues to engage the facility heads and quality improvement team leaders to ensure that new staff are oriented on the quality-of-care model.

Lessons learned

Digital health applications hold the potential to maintain access, efficiency and quality of care, and were a necessity during the COVID-19 crisis. Health workers were able to use platforms, tele-ECHO sessions and facility WhatsApp groups to mitigate service disruptions. They leveraged these platforms to relay critical information to women about COVID-19, support self-care, counter misinformation, and learn about providing quality care and support in the context of the pandemic.

Strong state leadership and commitment played a vital role in maintaining maternal and newborn health services; existing management structures contributed to project implementation and the quick roll-out of adaptations in response to the pandemic.

Participants' willingness to learn and use new technology contributed to the success of this project. Even though RICOM3 supported only 20 facilities with data stipends for the tele-ECHO virtual learning sessions, health workers from other facilities used their own data to join the sessions. Health workers are keen to learn and adapt to innovations but need to be supported with the right working tools. This eagerness to engage promotes the sustainability of this approach.

Engaging with women was a critical element of RICOM3, as it facilitated advocacy and encouraged participation. Engaging with women to learn about the most convenient times for tele-ECHO sessions during COVID-19 likely contributed to the high turn-out. Women's satisfaction with their experience motivated them to refer others to the virtual platforms. This also may have contributed to the project exceeding the coverage target and demonstrated that word of mouth is a powerful tool for reaching a wider audience in this setting.

Adoption of artificial intelligence and machine learning is important in high-demand, low-resource settings. Using automated processes to respond to questions and identify high-risk women on the Complete Health Platform allowed the project to reach more women and to focus in-person coaching on high-risk patients, helping to manage a high workload.

Digital literacy is essential. Training the many women who did not know how to use many smart phone features helped to build their digital literacy and enabled them to fully access and benefit from RICOM3's

virtual components. If health systems are to retain added value from greater use of digital health tools, active strategies are needed to ensure that the growth in ICT is coupled with increases in digital literacy.

The use of reward systems facilitates behavioural change. Women and health workers were rewarded through non-monetary methods for positive change, such as recognition of women who consistently recorded their blood pressure measurements on their personal pages. Health workers were recognized with either individual or team certificates for making changes in facilities to support quality service provision or presenting case studies during the tele-ECHO sessions.

Moving forward in Nigeria

As part of the development of this brief, stakeholders met in January 2022 to discuss the way forward and prioritize lessons learned for digital health in Nigeria. The discussion aligned to the recommendations from the end-term evaluation report of the NHICTSF 2015–2020 (14). Reviewing the implementation of the RICOM3 Project, the challenges of implementing digital health were not necessarily only technical, but also lay in facilitating required institutional changes to accommodate and sustain digital health applications. Digital health can help make health systems more efficient and sustainable, enabling them to deliver services for RMNCAEH+N during crises. The Government of Nigeria has demonstrated commitment to scaling up and mainstreaming digital health to help deliver and achieve UHC in Nigeria. To accelerate progress towards this goal, the government continues to work towards developing a systematic process, directing investments and ensuring that they contribute to effective systems aligned with national digital architecture, country readiness and health system goals.

The stakeholders offered the following suggestions for individual, organizational and system-level changes.

Leadership and governance

- A national digital health programme that is adequately funded and staffed, with a steering committee to provide oversight, is recommended.

Strategy and investment

- A high-level dialogue on the *National digital health policy 2021* would be useful to sensitize stakeholders and help mobilize resources for implementation.
- Further dissemination of the *National digital health policy 2021 and National digital health strategy 2021 to 2025* at all levels of the health system would be useful.
- The integration of digital health interventions into annual health plans and budgets is needed.
- The Nigeria Digital Health Atlas, a global web platform, should be updated to guide governments, donors, technology experts, investors and implementers to map, monitor and foster digital health investment planning to meet government strategic health goals.

Legislative, policy and compliance

- States should be supported to adopt/adapt the *Digital health policy* to improve awareness of the role of digital technology in accelerating progress towards UHC.
- Standard operating procedures should be developed for the registration, certification, issuance of and compliance with digital health applications.
- The ongoing revision of the National Health Act should consider regulations on digital health interventions and innovations.

Architecture, standards and interoperability

- A national technical committee should be established to facilitate advocacy programmes on adopted standards, build the capacity of stakeholders on the standards and implementation process, and issue a certificate of standards with other relevant regulatory bodies.
- Guidelines on the minimum functional requirements to ensure interoperability of digital health systems at the national, state and LGA levels should be developed.
- The Nigeria Health Information Exchange architecture should be defined and implemented in collaboration with stakeholders.

Capacity-building

- A needs assessment for digital health literacy and infrastructure should be conducted.
- A national curriculum for the training of the digital health workforce should be developed.
- Partnership should be sought with the National University Commission to facilitate seamless integration of a digital health curriculum for pre-service training programmes.
- The creation of positions and career pathways in the Federal Civil Service scheme for the digital health workforce should be promoted.

Infrastructure

- Strong collaboration with the energy and ICT sectors and the National Digital Health programme should be established to include health facilities in current and future national plans and strategies for ICT.
- Advocacy with the Global System for Mobile Communications operators should continue to support digital health infrastructure as part of their corporate social responsibility initiatives.

Solutions (services and applications)

- The National Digital Health Programme should provide an electronic portal listing prioritized services and applications that will deliver UHC as well as publish on a regular basis best practices on digital health implementation in the country.
- Assessments should be conducted to ensure that the digital health solutions being implemented are appropriate and effective for the health system challenges in Nigeria.

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Acronyms

ANC	antenatal care
ECHO	Extension for Community Healthcare Outcomes
ICT	information, communication and technology
FCT	Federal Capital Territory
LGA	local government area
NHICTSF	National health information, communication and technology strategic framework
PNC	postnatal care
RICOM3	Reducing the Indirect Causes of Maternal Morbidity and Mortality Project
RMNCAEH+N	reproductive, maternal, newborn, child, adolescent and elderly health and nutrition
WHO	World Health Organization



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