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The Role of ICT in reducing Maternal - Child Mortality in Nigeria

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Abstract- ***Nigeria is still striving to achieve the Millennium Development Goals (MDGs) four (4) and five (5) which calls for reducing maternal and child mortality. The excessive mortality is as a result of preventable and treatable diseases which are compounded by endemic failure in health system, socio economic factors, heterogeneous religion, diverse cultural and linguistic background among others. Past researchers have made a great effort to address these problems through the use of information and communication Technologies (ICT) in revolutionizing health sector. More so, the MDGs eight (8) calls upon the exploitation of benefits of the existing new technologies, especially those related to information and communication. With the advancement in ICT, many forms of eHealth have emerged to tackle these health challenges in maternal and child health services. The ICT- based solution enhances maternal delivery, minimize delay and cost effective as well as eliminate geographical barriers. The paper explores the role of ICT in reducing maternal-child mortality; existing solutions were carefully reviewed and necessary recommendations were provided.***

Keywords- ***Maternal, Child, Mortality, ICT, MDGs, Health services.***

I. INTRODUCTION

Nigeria is one of the countries in Sub Saharan that is lagging in achieving the Millennium Development Goals (MDGs) 4and5.Also, the Sustainable Development Goals three (SDGs) aimed at reducing child mortality to at least as low as 25deaths per1000 live births by 2030[1]. This implies that more than 97.5 of all new born would survive the first year of their life no matter where they are born. Despite of the devoted effort and significant progress, these goals were not actualized in 2026. Although there was improvement, it is not enough to satisfied either the standard requirement of MDG or the SDG.The United Nations and World Health Organization global report shows that approximately830 women die daily from preventable and treatable diseases such as severe bleeding or hemorrhage, pre-eclampsia and eclampsia, infections, obstetric labor and unsafe abortion [1, 2]. Key indicators are maternal mortality measured in deaths per 100,000. Nigeria loses almost 560 women daily due to socioeconomic factor, poor health personnel, poor staffing, poor logistics,poor infrastructure, proximity of the health center to the people, social-cultural differences, among others. In addition to inadequate health knowledge and poor awareness [4]. Furthermore, United Nations Inter Agency Group for Child Mortality Estimation (UNIGME) report in 2019, revealed that 56 million children of under five years (U5M) will die between 2018 and 2030[6]. Almost 5.4 million of children of under-five mortality died from preventable and treatable causes in sub–Saharan Africa. Out of 5.4 million deaths that occurred, an estimate of 2.9 million deaths occur in Nigeria [1][4][6]. This implies that Nigeria loses14,000 children every day. These deaths were due to preventable causes and treatable diseases such as preterm complications, pneumonia, acute respiratory infections, diarrhea, malaria among others [1][2][6]. Similarly, five millions children died before reaching their fifth birthday, 2.3 millions occurred among children aged 1-59 months while the remaining 2-3 million occurred in their first month of life (UN 2023).

With the advancement of Information and communication Technology (ICT), different form of electronic health (eHealth) has emerged and its potential has been seen globally. ICT refers to the use of portable, wireless digital devices usually supported by networked mobile or satellite communication infrastructures like cellphones, smartphones, satellite phones, tablet computer, laptops, personal digital assistant (PDAs) and so on [8].The ICT based

solution can be explored to improve maternal delivery system, minimized cost and optimize the quality of health care (Rivero, 2010). In addition, it helps in the exchange of clinical information, medical imagery laboratory results and physiological signals. To support the use of ICT in maternal delivery, the MDGs eight (8) calls upon the exploitation of benefits of the existing new technologies, especially those related to information and communication. These technology-based technology were very effective in reducing Maternal, Neonatal and Child health care in developed countries by improving access to skilled health workers and professional during the vulnerable period [8]. However, these are not culturally appropriate in Nigeria due to poor health facilities, lack of experts in internet development, network failure, low bandwidth, lack of standard policy among others. Furthermore, ICT has help to provide and support maternal health education, reliable and accurate information by providing health tips on the wellbeing of pregnant women, eliminate delays due to geographical and financial barrier as well as information relating to each and every phase of their pregnancy. In addition, nutrition and diet Information as well as sign of complications are sent to pregnant women inform of Short Message Services (SMS).

II. LITERATURE REVIEW

2.1 Existing ICT tools

Numerous studies have declared the potentiality of ICT in delivery quality health services. Some of the existing tools include;

Wired mothers was developed in Zanzibar aimed at linking pregnant women to health-care facilities through the use of mobile phones during the vulnerable period before, during and after childbirth [9].

The Information and Communication Technology for Maternal, Newborn and Child Health (ICT for MNCH) was developed in Malawi. It was implemented to address the barrier to MNCH information and improves the quality of their services by increasing knowledge of facility and home based maternal, newborn and child health practices [8].

MAMA (Mobile Alliance for maternal action) was aimed at engaging and empowering expecting mothers and women who had delivered their baby newly to make healthy decisions during pre, post-natal care.

Safe delivery; this gives simple and vital instructions to local health care workers in form of animated videos to educate. The app help to strengthen the quality of care, and services to maternal and newborn mortality rate by increasing a birthing attendant`s knowledge in time of crisis.

Rutgers; this is a free mobile app designed to promote to educate parents and healthcare professionals on the steps family can take to protect newborns as they slumber. These include placing babies on their backs – not their bellies, placing the baby in a crib without toy or pillow, no smoking among others.

Zero Mother Die; This was developed in African countries like Nigeria, Ghana, Gabons among others. It was designed to give information that can improve maternal, newborn, child health and pregnant mothers living in an isolated area (Haux 2006).

2.2 The use of websites

The website is considered powerful in delivery vast amount of information at a time within a short period. It is a a digital platform for maternal and Newborn health stakeholders to be informed, educated and empowered.

2.3 The use of mobile phone

The global proliferation of mobile Technology has produced a novel approach to fight maternal health challenges. The growing ubiquity and penetration of mobile phones has help to facilitate the use of mobile health (mHealth), the integration of mobile and wireless health care delivery system [10][11]. Also, mobile phone has help to remove the traditional, geographic and financial barrier to health care especially emergency situation that is life threatening.

III. METHODS

An electronic literature review was conducted in August 2018 of six databases: Google, Google Scholar, PubMed, Web of Science, and Science Direct. Both authors contributed to selecting search terms that would incorporate maternal and child topics, including keyword combinations of ‘‘maternal,’’ ‘‘mobile,’’ ‘‘technology,’’‘‘informatics,’’‘‘health,’’‘‘eHealth,’’‘‘ ICT,’’‘‘newborn,’’‘‘neonatal,’’‘‘antenatal,’’and‘‘pre natal.’’The authors limited the review to English language peer reviewed articles, presentations and institutional reports published between 2018 to 2024 which yielded a total number of forty possible document for review. The primary author reviewed all document titles based on inclusion/exclusion criteria pre-determined by both authors. Eligible articles were included for review only when abstracts contained explicit information about the role of ICT in maternal and child health or in reference to the MDGs.

IV. RESULTS AND DISCUSSION

The total number of articles that satisfied the intrusion criteria were fourty. The findings shown an improvement on maternal and child mortality but it is not adequate to achieve either the Millennium Development Goal of 4 & 5 targets or Sustainable Development Goal. ICT has been considered to be very effective in reducing maternal-child mortality. Numerous studies have declared the potential of ICT in delivering quality health service delivery. Researchers reveals that with the affordability and mobility of mobile phones in areas with poor infrastructure, mobile innovation may help in improving health in developing countries Several interventions have exploited the advantages of mobile phone in delivery MNCH. Some of the merits of using mobile phones include; portability, mobility, cost effective. A high usage is being identified in developing countries. Studies have shown that mobile phones have been used to improve MNCH in different areas such as; Emergency Medical response, health promotion, point of care support and data collection and management in developed countries. [10, 14]

Emergency medical response involves the use of mobile health tools and technologies such as walkie talkie, telephone and mobile phones to minimize time barriers and facilitate urgent care during emergency obstetric referral. However, the financial implications discourage both the health care officers and the users to continue with mHealth services. Implementing and maintaining ICT systems can be costly, especially in resource-constrained settings. Costs associated with hardware, software, infrastructure, training, and maintenance can pose financial challenges. Ensuring the long-term financial sustainability of ICT initiatives, including funding for upgrades and system maintenance, is essential.

mHealth promotes and support exchange of information among the health workers and volunteers, health professionals as well as health providers and pregnant women in form of short message service(SMS) as a text message to pregnant mothers. mHealth is used address the poor and limited coverage of qualified health personnel and alleviate professional healthcare delivery standard in an underserved area with minimal guidance.

Data collection; the development and use of mobile health has improved mechanism for data collection management.

To enjoy the benefit of ICT in delivery quality health services in developing countries like Nigeria, Government should provide adequate funds to sponsor and sustain the project. Also should ensure free digital literacy skills and training to people. Moreso, quality medical equipment and adequate staffing should provided in accordance with WHO standard. In addition Government should also provide a standard policy that will support the implementation of the project in health sector.Furthermore, ensuring full collaboration among different stake holders.

V. CONCLUSION.

To achieve the Millennium Development Goals 4 and 5, effective collaboration linkage among different stakeholders is very important to address maternal–

child mortality. ICT intervention is an effective way in delivering quality maternal–child health services.
To significantly escalate the sustainability, productivity and scalability of mHealth, the Government should institute favorable polices that is culturally appropriate for easy dissemination of information. Also Information on MCHS should also be extended to adolescent boys and girls as a potential target for future.

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