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Causes and Prevention of Newborn Deaths in Nigeria: Narrative Literature Review

Adenike Adebola O. Olaniyi [1, 2], Busisiwe P. Ncama [2]
[1]*School of Nursing, University College Hospital, Ibadan, Oyo State, Nigeria*
[2]*School of Nursing and Public Health, College of Health Sciences, University of KwaZulu-Natal, Howard College, Durban, South Africa.*
Corresponding Author: Adenike Adebola O. Olaniyi

Abstract: *Nigeria's newborn mortality is among the highest in the world. It was estimated that 10% of all newborn deaths in the world happened in Nigeria [1]. The country was ranked 11th highest on newborn deaths in the world [2]. Therefore, knowledge of causes of death among newborns is significant to strategically plan an interventional programmes that will enhance newborn survival. Recognizing the extent of neonatal mortality is an essential requirement for policy setting, innovation testing, program design and implementation of evidence-based interventions. Studies have identified prematurity, intrapartum complication, birth asphyxia, infections as the common reported causes of death. Therefore ending preventable newborn deaths can be achieved by improving access to skilled health professionals during pregnancy and the time of birth as well as other lifesaving interventions like immunization against illnesses, breastfeeding , increase access to clean water and good sanitation, although these are currently beyond the reach of the world poorest communities and other public health measures. Global action plans will continue to measure progress to reduce the neonatal mortality. This narrative reviews, explores and describes the specific causes of newborn deaths in Nigeria and stipulates preventive approaches to reduce mortality in newborns. This review was conducted as part of a study on testing and refining neonatal resuscitation model in Nigeria.*

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I. Introduction

Globally 2.5 million children die in the first month of life, almost 7,000 newborn deaths occur every day with 1 million dying on the first day of life, while nearly 1 million died within 6 days of life in 2017 [3]. Also, a child's risk of dying is extremely high in the first 28 days of life, during the neonatal period [3]. Although, the world has made considerable progress in child survival since 1990. The number of neonatal deaths dropped from 5.0 million in 1990 to 2.5 million in 2017 globally, even though, the reduction in neonatal mortality from 1990 to 2017 has not been meaningfully low, compared to post-neonatal under-5 mortality [3]. Mortality among under-five was higher than neonatal mortality, even though there was decreased mortality in all regions globally. Generally, all over the world, the neonatal mortality rate fell by 51 per cent from 37 deaths per 1,000 live births in 1990 to 18 in 2017, a slighter reduction in mortality than among children aged 1-59 months (63 per cent). With the exclusion of the highly developed countries, neonatal mortality has fallen more rapidly since year 2000 than between years 1990-2000. Globally, neonatal mortality has dropped by 3.1 per cent yearly since 2000 compared to 1.8 per cent yearly from 1990 to 2000 [2]. Globally, as the neonatal mortality rate decreases over time, so the cause-specific risks decreases. The risk of death from each cause is higher in high-mortality settings, even for causes that dominate proportionally in low-mortality settings. The risks of death due to preterm birth, intrapartum complications, and sepsis are 10, 36, and 34 times greater, respectively, in settings with more than 30 neonatal deaths per 1000 live births compared to settings with less than 5 neonatal deaths per 1000 live births [4]. Preterm birth is the leading cause of neonatal deaths in every MDG region, with the highest risks in southern Asia (11.9 per 1000 live births) and sub-Saharan Africa (9.5 per 1000 live births) [4]. In Oza et al study, it was revealed that absolute risks of death as a result of preterm birth and intrapartum complications have been decreasing more in the early period than the late period [5]. Between 2000 and 2013, the largest absolute risk reduction in the overall neonatal period was estimated for intrapartum complications, it dropped from 7.2 deaths (4.8–9.5) to 4.7 deaths (3.4–6.1) per 1000 live births [5], and largest relative decrease in risk was predicted for neonatal tetanus, which dropped by 73% (from 1.1 deaths to 0.3 deaths per 1000 live births) between 2000 and 2013. The smallest relative decrease in risk was predicted for congenital disorders (13% decrease from 2.4 deaths to 2.1 deaths per 1000 live births [5].

The neonatal period i.e the first 28 days of life is the most vulnerable time for a child's survival. In 2017, many children confronted the utmost risk of dying in their first month of life at an average global rate of

18 deaths per 1,000 live births. The probability of dying after the first month but before reaching age 1 was 12 compared to after age 1 but before age 5 was 10 [2]. In 2017 alone, it was reported that 2.5 million children died in the first month of life, while approximately, 7,000 neonates died every day. Most of these deaths occurred in the first week with about 1 million dying on the first day and close to 1 million dying within the next six days [2]. Decreased under-five mortality is related to higher concentration of under-five deaths occurring during the neonatal period. While neonatal deaths accounted for 47 per cent of global under-five deaths in 2017, part of neonatal deaths among under-five deaths is still somewhat low in sub-Saharan Africa (37 per cent), and it remains the region with the utmost under-five mortality rates. In regions where under-five mortality rates are relatively low, more than half of all under-five deaths occur during the neonatal period. According to UNICEF, the only exception is South Asia, where the proportion of neonatal deaths is among the highest (60 per cent) despite a relatively high under-five mortality rate. It was reported that the decline in neonatal mortality was slower than the decline in post-neonatal mortality and among children aged 1-4 years for both 1990-2000 and 2000-2017 respectively [2]. Regionally, it was revealed that neonatal mortality was highest in sub-Saharan Africa and South Asia compared to other regions. It was estimated that 27 deaths per 1,000 live birth occurred in 2017 in both regions, therefore a child born in those two regions is nine times more likely to die in the first month of life than a child born in a high-income country [2].

In sub-Saharan Africa, which remains the region with the highest under-5 mortality rate, the share of neonatal deaths is relatively low (37%). By contrast, in Europe, which has the lowest regional under-5 mortality rate, 54% of all under-5 deaths occur in the neonatal period [3]. Recognizing the importance and clinical causes of neonatal mortality is an essential prerequisite for explicit modification. Hospital-based information presents a generalised concept of resource for clinical and organizational quality improvement [6]. The close of the Millennium Development Goals (MDGs) by 2015, with a dividing under-five deaths, demonstrated that global targets are connected to national and global responsibility and can drive change [7]. Post Millennium Development Goal global action agendas such as the Sustainable Development Goals (SDGs), Every Newborn Action Plan (ENAP) and Ending Preventable newborn Mortality continue to measure global progress to reduce the newborns mortality ratio (NMR), the neonatal mortality rate, and now (under ENAP guidance) the stillbirth rate [8]. As the MDGs changed to the Sustainable Development Goals (SDGs), there remains an incomplete program for 2.7 million neonatal deaths, whom improvement has been much slower than advancement towards reducing the global under 5 mortality rate. Many developing countries do not have a well-functioning civil registration and vital statistics (CRVS) systems generating policy. Ensuring access to services which is associated with better health outcomes and counting births and deaths, especially the deaths around the time of birth and tracking vital events and measuring coverage are deficient [9].

The Every Newborn Action Plan (ENAP), was launched in 2014, and was aimed at ending preventable newborn deaths and stillbirths, with targets of ≤12 neonatal deaths per 1000 live births by 2030. Although, there are strategic objectives, goals and mortality targets by 2035 with intermediate targets for 2020, 2025 and 2030. The data on care at birth, and small/sick newborns needs influenced progress particularly in areas of tracking coverage quality and equity [10]. Every newborn action plan was centered on the epidemiology, evidence, and global and country learning, thereby setting a framework to end preventable newborn deaths and stillbirth by 2035. It was based on five (5) action plans namely: (i.) Infant mortality – prevention and control (ii.) Infant, Newborn (iii.) Stillbirth (iv.) Perinatal care (v.) Pregnancy outcome. Even though, it was revealed that significant progress has been made in recent decades to reduce the number of child deaths worldwide, still many newborns continue to die each year even with the availability of reasonable, evidence-based solutions [10]. Also, newborn survival and health as well as prevention of stillbirths were not precisely dealt with in Millennium Development Goal (MDG) framework and this received less attention and investment [11]. WHO effective interventions showed an exceptional prospects for improving newborn health as a result of researches done over some decades that have produced robust evidence on the burden and causes of neonatal mortality [10]. Validating effective interventions and service delivery, the framework identified ways to fast-track improvement and scale-up interventions to save lives of infants through high-impact, cost-effective interventions for newborn health [12]. This plan was built on the United Nations Global Strategies for Women's and Children's Health and Every Woman, Every Child movement and developed within the framework for the Every Woman, Every Child initiative. The ENAP aimed at improving, supporting coordinated, comprehensive planning and implementation of newborn-specific actions within the context of Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCAH) strategies and plans.

According to WHO, Nigeria, in the past few years has experienced some worsening of child mortality [13]. In 2003, the infant mortality rate was estimated at 100 per 1000 births while it was 87 in 1990 and two third of the births in Nigeria still occurred at home. This was identified to be as a result of persisting low numbers of births occurring in health facilities and the low number of births attended by trained healthcare service providers. Likewise, only little more than one-third of births are attended to by doctors, nurses, or midwives [13].

It is evident from the high mortality rates that the lack of access to or use of quality delivery services is an issue of immense significance in Nigeria. Problems such as getting money for health treatment, long distance to health facility and ineffective transportation system are some of the many difficulties stated by women in describing difficulty with accessing healthcare in Nigeria [13]. Lack of trained health care providers attended to births in Nigeria is complicated by the fact that only six in ten mothers receive antenatal care from a trained medical professionals. Nurses and midwives are the most frequently used source of healthcare in Nigeria but they are not enough. A good antenatal care for pregnant women can prevent the major causes of neonatal mortality in Nigeria - neonatal tetanus, sepsis, asphyxia, malaria, and maternal anaemia. However, as of 2003, according to WHO statistics, only 58 percent of pregnant women received iron supplements and only 39 received drugs to prevent malaria.

It is pathetic to know that many countries in South Asia and Sub-Saharan Africa including Nigeria still have high under-five mortality while some countries in East Asia, Pacific, Latin America, Caribbean, and Central/Eastern Europe have made significant progress in reducing their mortality rate [14]. Globally, emphasis is on childhood survival rather than neonates. According to reports from WHO and UNICEF, it was showed that between 2000 and 2010, the annual rate of reduction for neonatal mortality (2.1%) worldwide is lower than 2.9% recorded for under-five mortality with the proportion of under-five deaths in the neonatal period increasing from 37% in 1990 to 44% in 2013 [15]. Unfortunately, 39% of neonatal deaths worldwide are in Sub-Saharan Africa [14]. Nigeria provided 6% of the global neonatal deaths in 2005 and between 2000 and 2010 the country had moved from the third to the second position in terms of the highest number of neonatal deaths in the world [15]. The Nigeria Demographic and Health Survey (NDHS) 2013 estimated Neonatal Mortality Rate (NMR) as 37 per 1000 live births which constituted about 54% of infant mortality. In 2009, the liability of neonatal mortality in Nigeria was higher than that of the African region as a whole (36 per 1000). There was a significant improvement in infant and under-five survival with the former reducing from 100 per 1000 live births in 2003 to 67 per 1000 in 2013 [16], while the rate of reduction recorded for neonatal mortality (53 per 1000 to 37 per 1000) was lower than that for infant and under-five. In 2017, the infant mortality rate in Nigeria was 64.6 deaths per 1,000 live births, while it was 66.6% in 2016; 68.7% in 2015; 71% in 2014, 73.3% in 2013 and 75.7% in 2012 per 1000 live births [1].

It was stated that Nigeria, in the last few years have experienced some deteriorating child mortality. This mortality can be partly due to the persisting low numbers of births occurring in health facilities as well as the low number of births attended to by trained healthcare service providers. It was recorded that in 2003, two third of the births in Nigeria still occurred at home [18]. Similarly, only slightly more than one-third of births are attended to by doctors, nurses, or midwives. Although, in year 2000, the maternal mortality ratio in Nigeria was 800 per 100 000 live births. Even through it is obvious that the higher mortality rates are as a result of lack of access to or use of quality delivery services which is an issue of immense importance in Nigeria. Some of the many difficulties stated by women in describing difficulty with accessing healthcare in Nigeria are problems of obtaining money for treatment, distance to health facility and having to take transport [18]. Also, lack of trained health care professionals attending to births in Nigeria is complicated by the fact that only six in ten mothers receive antenatal care from a trained medical professional. Nurses and midwives are the most frequently used source of healthcare. Meanwhile, good antenatal care can prevent the major causes of neonatal mortality in Nigeria as well as other conditions like neonatal tetanus, malaria, and maternal anaemia. In addition, as of 2003 only 58 percent of pregnant women received iron supplements and only 39 received drugs to prevent malaria. Similarly, Nigeria is the African country with the lowest vaccination rate with 13% immunization rate for children between 12-23 months [18]. The repercussions of the poor state of pregnant women in Nigeria are several and influence maternal as well as child mortality greatly. The under-five mortality ratio in Nigeria is 201 per 1000 live births meaning that one in five Nigerian children never reach the age of 5 and infant deaths, which account for half of child mortality have also increased from what they were in 1990 [18].

Significant reduction in the global burden of neonatal mortality was achieved through the millennium development goals, but in Nigeria, only a marginal reduction was realized. Postnatal care is an aspect of child survival that has received limited attention in the country. This situation is tragic, especially as most of these babies die from preventable causes, such as: intrapartum- related injury, infections, and prematurity [19].

Nigeria is situated in West Africa. It occupies approximately 923,768 sq. kilometres of land and shares borders with Republic of Benin in the West, Chad and Cameroon in the East, and Niger in the North while in the south it lies on the Gulf of Guinea on the Atlantic Coast [20]. It is a federal constitutional republic comprising of 36 states and a Federal Capital Territory, the country is grouped into six geopolitical zones: north central, north east, north-west, south-east, south-south, and south-west, and there are 774 constitutionally recognized local government areas with six area councils (of the Federal Capital Territory). It is the most populous nation in Africa and the seventh most populous in the world with an estimated population of 182.2 million as at 2015 [20]. Nigeria was estimated with 45,000 maternal deaths annually and a maternal mortality ratio of 576 deaths per 100,000 live births in 2013 [21].

II. The state of the newborns in Nigeria

Each year in Nigeria over 7 million babies are born out of whom 240,000 die during their first month of life and 94,000 die on the day of birth [5]. According to Nigeria Demographic and Health Survey (DHS) of 2013, the neonatal mortality rate was 37 per 1000 live births, post-neonatal death was 31 per 1,000 live births and infant death was 69 per 1,000 live births [16]. According to the survey, neonatal mortality was utmost in rural Nigeria (44 per 1,000 live births) compared with urban setting (34 per live births). There are zonal differences in neonatal and infant mortality. While neonatal mortality was highest in North-west (44), North-east (43), South-west (39), South-east (37), North-central (35) and lowest in South-south (32) region. Infant mortality was still highest in North-west (89), followed by South-east (82), North-east (77), North-central (66), South-west (61) while South-south still remained lowest region (58) per 1,000 live births.

Mother's education was inversely related to risk of dying. Risk of neonatal death was higher (44 per live births) in mothers with no education compared with mothers that were educated [16]. In addition, there were nearly 314,000 stillbirths [17] (Blencowe, H. et al. 2016). Nigeria has a high burden of newborn deaths and stillbirths [17, 20]. Maternal mortality is also high in Nigeria, with an estimated 45,000 maternal deaths annually and a maternal mortality ratio of 576 deaths per 100,000 live births in 2013 [16].

Causes of neonatal mortality

Neonatal mortality accounts for almost 40 percent of under-five child mortality globally and this could be associated with a complex chain of factors including but not limited to socio-economic, biological and healthcare-related factors. Consequently, deaths of children within the first 28 days of birth usually occur as a result of conditions and diseases associated with lack of quality care at birth or skilled care and treatment immediately after birth or in the first days of life [3]. Similarly, preterm birth, intrapartum-related complication (birth asphyxia), infections and birth defects cause most neonatal deaths. According to WHO in 2018, it was reported that majority of all neonatal deaths which account for 75%, occur in the first week of life and about 1 million newborns die within the first 24 hours of life [3].In a study conducted in Brazilian city with high human development, it was found out that teenage mothers, gestational age <32 weeks, birth weight < 1.5kg and present of congenital abnormalities were the main risk factors for infant mortality [22]. In a study conducted in Zambia, it was reported that low birth weight, place of delivery, level of mothers education, insufficient ANC attendance were the factors associated with newborn death [23].

In a study conducted by Jechan et al, it was reported that, preterm birth, interpatum complications [24]. Others are immaturity-related (prematurity), birth asphyxia or hypoxia and infection [4]. In Indonesia, the associated factors include neonatal complications during birth, maternal lack of knowledge of danger signs for neonates, delivery at home and history of complications during pregnancy and complications during delivery [25]. Similarly, in a study on cause-specific neonatal mortality conducted by Fottrell et al where analysis of neonatal death from Nepal, Bangladesh, Malawi and India were studied, it was revealed that neonatal mortality was unacceptably high and birth asphyxia, infections and prematurity accounted for most neonatal deaths, although, birth asphyxia was a the leading cause of death in urban India. There was high rate of home births, unhygienic deliveries and lack of essential newborn care [26].

Similarly, in a study conducted by Oza et al [5] on neonatal cause of death estimates for the early and late periods for 194 countries between 2000-2013, it was reported in their result on cause-specific death and risks that the leading causes of neonatal death globally were preterm birth (35.7%), intrapartum complications (23.4%) and sepsis (15.6%). These accounted for 2.1 million of 2.8 million neonatal deaths in 2013. In the early period, it was the preterm birth (40.8%) and intrapartum complications (27.0%) that accounted for the majority of deaths while in the late neonatal period nearly half of all deaths occurred from infectious causes (47.6%) [5]. In their study, the proportion of deaths resulting from congenital disorders was found to be relatively stable across the periods. Higher neonatal mortality rates and lower national income levels were associated with a higher proportion of deaths attributable to intrapartum complications and infectious causes, while in low-mortality settings, injuries accounted for less than 1% of neonatal deaths [5].

III. Causes of neonatal deaths in Nigeria

In an effort to reduce under-five mortality in Nigeria, there has been biased in favour of childhood mortality to the neglect of neonatal mortality. Many literatures are short of sufficient evidence on the causes of neonatal mortality. However, studies have shown that about half of infant deaths occur in the neonatal period and knowledge about the causes are vital and necessary for planning interventional programs that will augment neonatal survival [27]. The Nigeria Demographic and Health Survey (NDHS) 2013 estimated its Neonatal Mortality Rate (NMR) as 37 per 1000 live births which constituted about 54% of infant mortality. The burden of mortality was higher than that of the African region as a whole in 2009, where it was 36 per 1000 [28]. Although, there have been some improvements in neonatal and infant survival but the rate of reduction recorded for neonatal mortality (53 per 1000 to 37 per 1000) was lower than that for infants and under-five [16]. Nigeria

contributes the largest number of global neonatal deaths (261,549, 12.5% of 2,100,000) [29, 30]. The national neonatal mortality rate (NMR) was 37/1,000 livebirths, (NPC, 2014), with a stillbirth rate of 43/1000 births [17]. Unfortunately, the highest rates occur in the deprived North-west region of the country, where efforts to improve health care and survival are faced with severe challenges. Poor access and transportation to reach health care, and where about 90% of women deliver at home still exist [21].

The main causes of neonatal mortality in Nigeria according to UNICEF Data of 2015, as reported include complications of preterm birth, adverse intrapartum events such as birth asphyxia, and neonatal infections which includes sepsis, pneumonia, and tetanus [31]. In a study edited by Howson, Kinney and Lawn, 2012 [32], it was revealed that preterm babies' risk of death is 12 times higher than that for full-term babies and have an increased risk of disability [32]. Even though, prematurity is principally an influencing condition, which occurs in severe immaturity, death if occurred is as a result of complications which account for about one third of all neonatal deaths [32]. As documented by USAID, adverse intra-partum events (birth asphyxia) account for about 31 percent of neonatal deaths in Nigeria. The cause is very much associated with quality of care during childbirth. Infections (sepsis, pneumonia, tetanus, and meningitis) result in over 26 percent of neonatal deaths [33]. Some complications of prematurity as highlighted are also related to infections which may cause neonatal mortality to a greater extent. A social and verbal autopsy report carried out in Nigeria in 2014 by USAID, revealed sepsis as the leading (31.5%) cause of neonatal deaths [33].

Other causes of mortality in newborns in Nigeria include poor quality of care. Health services are provided through both public and private sectors with primary healthcare being a primary significant. But, the accessibility of this services does not equate to good quality of care. Private health care service is poorly incorporated into Nigerian's health system even though it plays a significant role in rending care. Other challenges to optimal health care services include the distance to be covered to reach health facilities, especially in rural areas, the cost of services, disruption of services, poor quality of care, inadequate implementation of the standard guidelines, and attitudes of health workers to care of patients [34].There are intense disparities in coverage and quality of care at birth, where the majority of births take place in a health facility and with a skilled attendant but still, the quality of care remains low with poor outcomes for mothers and babies. According to DHS, 2013, rural and less educated women who are less likely than others to attend ANC, have assistance from a skilled health provider during delivery, and give birth in a health facility [16]. Infection during and after childbirth is high in Nigeria as a result of high occurrence of home births; therefore, prevention is extremely important. In view of this, FGON provides through the FMOH clean home delivery kits (Mama Kits) and in addition, use of 4 percent chlorhexidine gel has been approved for cord care by the FMOH at the community as well as facility levels, and implementation is planned at scale [34].

Strategies to improve newborn health and reduce neonatal deaths in Nigeria

Since greater percentage of newborn deaths takes place in low and middle-income countries such as Nigeria, enhanced improvement for neonatal survival and promotion of health and wellbeing involves strengthening quality of care and ensuring accessibility of quality health care services for the newborn. It is pertinent to improve survival and health of newborns to end preventable death by reaching high coverage of quality antenatal care, skilled care at birth, postnatal care for mother and baby, and care of small and sick newborns [3]. Other action plan to reduce neonatal mortality is to adhere to essential newborn care as emphasized by WHO and UNICEF. These include:

1. Thermal protection

Warmth is one of the basic needs of a newborn and is critical to the baby's survival and well-being. Neonatal hypothermia often occurs as a result of lake of attention by health care providers and this is a very important cause of neonatal deaths [35]. A neonate is prone to develop hypothermia because of large surface area of unit body weight while low-birth weight babies have decreased thermal insulation due to less subcutaneous fat and decreased heat production. A newborn who is wet at birth, immediately losing heat, and if proper care is not taken instantly to prevent heat loss, hypothermia will develop [36]. Again, the temperature of the environment during delivery, especially the delivery room and the postnatal period has a considerable effect on the risk to the newborn developing hypothermia [36]. Thermal protection of the newborn is the series of measures that are taken at birth and during the first days of life to ensure that the newborns do not become either too cool (hypothermia) or too hot (hyperthermia), but maintaining their body temperature. Hypothermia is a core temperature $< 36^{o}$ C to 36.5^{o} C [36],and it increases mortality and morbidity in many neonates and preterm babies. Therefore, maintaining an appropriate environmental temperature in the delivery room and baby care unit is critical in preventing hypothermia.

Improving thermal protection and preventing hypothermia are very important; therefore WHO recommends that the delivery room temperature be at least 25 -28^{o} C, and that neonates should be dried immediately and placed skin-to-skin contact with the mother and covered. However, as simple as skin-to-skin

care is, it is not consistently practised in most resources-limited setting [37]. At the time of birth, babies should be dried and swaddled in a warm blanket to prevent evaporative, conductive and convective losses. For neonates on observation or resuscitation, they should be placed under radiant warmer to prevent radiant losses [37]. Other strategies proposed by WHO to minimize the risk of hypothermia include, early and exclusive breastfeeding to promote close warm contact with mother (this provides energy to produce heat), postponing bathing, put on an appropriate clothing and bedding and placing mother and baby together as much as possible [35].

2. Prevention of infection and hygienic umbilical cord care

Bacterial infections are major cause of morbidity and mortality among newborns in developing countries of the world [38]. It was reported that globally, 717,000 newborns die as a result of severe infections and this accounts for approximately one-third of the total burden of newborn deaths [39]. These deaths can be prevented through some preventive measures which include improving hygiene and ensuring that curative care is accessible. The risk of congenital and newborn infections can be averted, while protecting the health of mother through preventive measures during antenatal and intrapartum periods. Identifying and treatment of newborn infection appropriate is critical, since most infections develop at home. Therefore, recognizing severe infection and initiating applicable treatment early can increase a newborn's chance of survival [38]. Malaria is endemic in Nigeria, the risk associated with complications of pregnancy and child birth can be reduced through intermittent treatment throughout the period of pregnancy and consistent use of bed nets. Also, screening and treatment of syphilis, and immunization against diseases like tetanus in pregnant women are necessary. Cleaning birth practices, including hand washing before, during and after delivery decrease the rate of infections in newborns both at homes and facility settings [40]. An important strategy for preventing infection-related newborn deaths is to ensure optimal cord care immediately after birth and through the first week of life as clean, dry cord is highly important in infant care. Hygienic umbilical cord care helps in preventing infection through use of sterile instrument to cut the cord at birth, cleaning with methylated spirit and applying Chlorhexidine to the stump. Chlorhexidine is used for cord cleaning in settings with high mortality like Nigeria [38].

3. Initiation of early and exclusive breastfeeding

Provision of mother's breast milk to infants within one hour of birth is referred to as Early Initiation of Breast Feeding (EIBF) which is an important strategy to reduce perinatal and infant morbidities and mortality [41]. Many studies have shown that early introduction of breast milk to newly-born babies immediately after delivery is capable of giving the babies the required immunity against diseases through mother's antibodies and lowers the risks of early childhood deaths [42]. Breastfeeding is a basic practice for suitable care and feeding of newborn. It has a nutritional benefit as well as immunological, developmental, psychological, social, economic and environmental benefits for infants, mothers, families and society [43]. Appropriate breastfeeding practice ensures that the infant receives colostrum which is rich in immunoglobulin (Ig), growth factors that are important for nutrition, growth and development of newborn infants and also for passive immunity [44]. EIBF is beneficial to mothers as it decreases postpartum haemorrhage and help with rapid uterine involution as a result of increase concentrations of oxytocin [45]. The United Nations Children's Fund (UNICEF) and World Health Organisation (WHO) have promoted EIBF as an important strategy to reduce perinatal and infant morbidities and mortality through programmes such as the Baby Friendly Hospital Initiative (BFHI), Community Integrated Management of Childhood Illness (C-IMCI) and Infant and Young Child Feeding (IYCF) [45-47].

However, in Nigeria, the Federal Ministry of Health in collaboration with UNICEF and WHO launched the BFHI in 1992 to protect, promote and support breastfeeding [48]. The exclusive breastfeeding initiative believes that mothers would come in contact with these specially designated hospitals and be exposed to better education on breastfeeding [49]. Unfortunately, the reported pattern of maternal health service utilization in Nigeria is low [50], and serves as a major impediment to the initiative. There are other programmes promoting EIBF in addition to the BFHI in Nigeria such as the national policy on IYCF and the C-IMCI [51]. Even though breastfeeding is almost universal in Nigeria, with 97.9 % of all children breastfed for certain period of time [52], prevalence from national studies done reported low figures for EIBF with just about 31.9 and 38.4 % of mothers initiating breastfeeding within 1 h of birth in 2003 and 2008 respectively [53]. According to Nigeria Health Watch, exclusive breastfeeding rates in Nigeria still remain dismally low and unsteady between 17 - 25 percent nationally [54]. Breastfeeding initiation within 1 hour after birth is not at its best as revealed by Berde & Yalcin [41]. Therefore, EIBF programmes and policies should focus on encouraging, assist, support and reassure:

- rural mothers,
- working mothers,
- primip mothers,
- mothers with ceasarean deliveries,
- mothers with home deliveries
- poor mothers.

It is also important that this intervention programmes and policies cut across geopolitical zones with more emphasis to zones with lower rates of EIBF [41].

4. Assessment for signs of serious health problems or need of additional care

Assessment for signs of serious health problems or need of additional care in infants including timely identification and treatment of infection is very essential. Since most infections occur at home, the current standard of treatment should be followed. Prompt identification of severe illness, initiating appropriate medication early and preventive treatment can increase a newborn's survival [55]. However, considerable difficulties to early identification of infections and instituting appropriate treatment regime are numerous. This includes poor access to health facilities as a result of financial challenges, especially on part of the mother [38]. Poor quality care, shortage of trained staff and out-of-stock essential drugs contribute significantly to infant mortality. Parents, mostly mothers have insufficient knowledge to recognise danger signs in the newborn especially when at home. Many are deficient in accepting healthy referral for hospital treatment of their babies while health care-seeking behaviours outside the home for danger signs are inadequate or hindered. There is unwillingness by family to stay in hospital for the full duration of treatment [55]. Therefore, strategies to tackle the challenges should be instituted. Health education and behavioural changes and strengthening the health system are crucial. Family should seek prompt medical care if necessary and immunization against childhood illness should be advocated.

Nigeria Every Newborn Action Plan

In 2017, the Federal Ministry of Health launched the Nigeria Every Newborn Action Plan to end preventable deaths in the country in Abuja, the nation's capital. The aim was the plan to serve as a framework for each of the 36 state and Federal capital territory (FCT) and collaborate with many stakeholders and partners to develop their own action plans but adapting the NiENAP as need to their unique contexts [56].

The Minister for Health reiterated that as the world transitions to achieving sustainable development goals, it is obvious that Nigeria should as a matter of necessity, speed up effort to improve outcomes for its newborns. Nigeria every newborn action plan (NiENAP) sets forth specific actions required to achieve significant mortality and coverage targets by 2030 [56].

The plan presented the Nigeria's vision of a nation with:

- no preventable deaths of newborns and stillbirths
- where every pregnancy is wanted
- every birth celebrated and women
- babies and children survive, thrive, and reach their full potential

This plan has a set of intervention packages adapted to the 10 key areas of the National Health policy 2017-2021 and follow a four-extended approach of:

1. Promotion of facility-based deliveries at the scale addressing equity issues
2. Strengthening of community-based interventions
3. Strengthening of facility readiness for providing quality care for the newborn
4. Provision of quality care for the newborn with focus on labour, birth, and immediate care after birth during the first week of life

This package also describes a set of preliminary, national-level landmark and steps taken to recognise essential indicators that should be discovered to determine progress towards meeting the targets [56].

IV. Recommendations

It is pertinent for Nigeria government to increase the allocated resources for Federal, State and Local government levels of Maternal, Neonatal and Child Health. The strategic and specific implementation plans of national MNCH should be developed, and this can be achieved with support from partners.

The government through the Ministry of Health should reinforce and invest in care, especially, throughout the period of birth and first week of life, because most newborns die during this time. There should be an improved quality of maternal and newborn care, particularly from pregnancy to postnatal period in its totally, as well as strengthen midwifery. Similarly, there should be an improved and expanded quality services for small and sick newborns, thereby, strengthening the neonatal care. People should have access to clean water and disinfectants. Mothers should be encouraged to initiate breastfeeding within the first hour after delivery, skin-to-skin contact, and proper cord care as well as good nutrition should be encouraged.

As reported, majority of Primary Health Care centres in Nigeria do not have Medical doctor, and PHCs are the first level of care in the country. Therefore, it is important for the government through the Ministry of Health to appoint a Medical Officer with Public Health background to PHCs in all the Local government Areas. Since these deaths can be prevented, it is important to improve access to well-trained midwives during antenatal and postnatal visits. Maternal and newborn deaths could be prevented if proper care is received from skilled

birth attendants during pregnancy, at the time of delivery and shortly after birth. The health facilities in Nigeria need to be equipped and skilled health providers including doctors, nurses and midwives available at all time. The government should encourage involvement of families and communities in quality newborn care. There is also need to encourage commitment of communities to demand for quality care and empower mothers and families to contribute to newborn care. Finally, there is need for aggressive awareness drive on maternal and newborn health in the rural areas of the country.

Conflict of interest
None

Ethical Consideration
Not applicable

References

[1]. Statista. Nigeria – Infant mortality rate 2007-2017. 2019. Retrieved from https://www.statista.com/statistics/807079/infant-mortality-in-nigeria/
[2]. UNICEF. Neonatal mortality. 2018. Available from https://data.unicef.org/topic/child-survival/neonatal-mortality/
[3]. WHO. Newborns: Reducing mortality. 2018. Retrieved from http://www.who.int
[4]. WHO. Neonatal cause-of-death estimates for the early and late neonatal periods. Bulletin of World Health Organization. 2015; 93:19-28. Retrieved from http://dx.doi.org/10.2471/BLT.14/
[5]. Oza, S., S. N. Cousens, and J. E. Lawn. 4. Neonatal Cause-of-Death Estimates for the Early and Late Neonatal Periods for 194 Countries: 2000–2013. Lancet Global Health. 2014: 2 (11): e635–44. Retrieved from http://doi:10.1016/S2214–109X(14)70309–2
[6]. Bailey, P.E, Andualem, W, Brun, M. et al. Institutional maternal and perinatal deaths: a review of 40 low and middle income countries. BMC Pregnancy and Childbirth.2017:17:295. Available from https://doi.org/10.1186/s12884/
[7]. Requejo JH, Bryce J, Barros AJ, Berman P, Bhutta Z, Chopra M. Countdown to 2015 and beyond: fulfilling the health agenda for women and children. *Lancet*. 2014, 385 (9966): 466-476.
[8]. Moxon SG, Ruysen H, Kerber KJ, et al. Count every newborn; a measurement improvement roadmap for coverage data**.** BMC Pregnancy Childbirth. 2015:15 Suppl 2:S8. http://doi:10.186/1471-2393-15-S2-S8/
[9]. Cousens S, Blencowe H, Stanton C, Chou D, Ahmed S, Steinhardt L. National, regional, and worldwide estimates of stillbirth rates in 2009 with trends since 1995: a systematic analysis. Lancet. 2011: 377 (9774): 1319-1330.
[10]. World Health Organization. Every Newborn: an Action Plan to End Preventable Deaths (ENAP). 2014. Available from http://www.who.int/maternal_child_adolescent/topics/newborn/
[11]. Darmstadt GL, Kinney MV, Chopra, M, Cousens, S, Kak, L, Paul, VK. Who has been caring for the newborn? Lancet. 2014. Retrieved from http://doi:10.1016/S0140-6736(14)60458/
[12]. United Nation Commission on Life-Saving Commodities for Women and Children. Every Woman Every Child. United Nations Foundation. 2012.Retrieved from http://everywomaneverychild.org/resources/un-commission-on-life-saving/
[13]. World Health Organization. Compilation of WHO recommendations on maternal, newborn, child and adolescent health [website]. Geneva: 2014 http://www.who.int/maternal_child_adolescent/documents/
[14]. UNICEF, WHO, World Bank, United Nations. Levels and Trends in Child Mortality: report. United Nations Children's Fund; 2014. Levels and Trends in Child Mortality: Report 2014.
[15]. Lawn JE, Kinney MV, Black RE, Pitt C, Cousens S, Kerber K. Newborn survival: a multi-country analysis of a decade of change. Health Policy Plan. 2012; 27:6–28. Available from http://doi:10.1093/heapol/czs053
[16]. National Population Commission [Nigeria] Nigeria Demographic and Health Survey 2013. Calverton MD: National Population Commission and ORC Macro International; 2014.
[17]. Blencowe, H., Cousens, S., & Jassir, F. B., et al. (2016). National, regional, and worldwide estimates of stillbirth rates in 2015, with trends from 2000: a systematic analysis. The Lancet Global Health. 2016:4(2), e98-e108. Available from https://doi.org/10.1016/S2214-109X(15)00275-2/
[18]. WHO Nigeria. Access from http://www.who.int/pmnch/activities/countries/nigeria/en/index/
[19]. Federal Ministry of Health (FMOH). A Directory of Health Facilities in Nigeria. 2011. Abuja
[20]. WHO. World Health Statistics 2016: Monitoring health for the SDGs. Maternal and newborn deaths. Retrieved fromwww.who.int/gho/publications/world_health_statistics/2016/en/
[21]. National Population Commission, Federal Republic of Nigeria. Nigeria Demographic and Health Survey 2013. https://dhsprogram.com/pubs/pdf/
[22]. Kropiwiec, M.V, Franco, S.C, Randuz do Amaral. A. Factors associated with infant mortality in Brazilian city with high human development index. Rev. Paul Paediatrics Journal.2017, 35(4): 391-398. Available from http://doi:10.1590/1984-0462/;2017;35;4;00006/
[23]. Lukonga, E and Michelo, C. Factors associated with neonatal mortality in the general population: evidence from the 2007 Zambia Demographic and Health survey (ZDHS); a cross sectional study. Bulletin of World Health Organization
[24]. Jechan, I, Harris, H, Salat, S, Zeb, A. Neonatal mortality, risk factors and causes: a prospective population-based cohort study in Urban Pakistan for WHO 2009.
[25]. Abdullah, A, Hort, K and Simpsom, L. Risk factors associated with neonatal deaths: a matched case-control study in Indonesia. Global Health Action Journal. 2016: 9.
[26]. Fottrell, E, Osrin, D, Alcock, G, et al. Cause-specific neonatal mortality: analysis of 3772 neonatal deaths in Nepal, Bangladesh, Malawi and India. BMJ Journals. Arch Dis Child Neonatal Ed 2015:100(5):F439-F447
[27]. Akinyemi, J.O, Bamigboye, E.A, Ayeni, O. Trends in neonatal mortality in Nigeria and effects of bio-demographic and maternal characteristics. BMC Paediatrics. 2015:15:36
[28]. Oesterggaard MZ, Inoue M, Yoshida S, Mahanani WR, Gore FM, Cousens S. Neonatal mortality levels for 193 countries in 2009 with trends since 1990: A systematic analysis of progress, projections, and priorities. PLoS Med. 2011; 8.doi:10.1371/journal.pmed.1001080
[29]. World Health Organization. Nigeria: Neonatal and child health profile. Available from http://www.who.int/mat/

[30]. Liu, L., Johnson, H. L., & Cousens, S. et al. Child Health Epidemiology Reference Group of WHO and UNICEF. Global, regional and national causes of child mortality: An updated systematic analysis. Lancet. 2012:379(9832), 2151–2161.
[31]. NICEF Data. 2015. Monitoring the Situation of Children and Women, 2015. Retrieved from http://data.unicef.org/topic/child-survival/under-fivemortality/
[32]. WHO (Eds CP Howson, MV Kinney, JE Lawn). 2012. March of Dimes, PMNCH. Save the Children: Born Too Soon: The Global Action Report on Preterm Birth. Geneva: World Health Organization. Retrieved from www.who.int/pmnch/media/news/
[33]. USAID, National Population Council, Federal Ministry of Health, and Johns Hopkins Bloomberg School of Public Health. 2014. Verbal/Social Autopsy Study: To Improve Estimates of the Causes and Determinants of Neonatal and Child Mortality in Nigeria. Retrieved from www.healthynewbornnetwork.org/hnn-content/uploads/
[34]. Federal Ministry of Health. 2016. National Health Policy for 2016–2021: Promoting the Health of Nigerians to Accelerate Socio-Economic Development
[35]. WHO. Maternal and Newborn Health/ Safe motherhood. Thermal protection of the newborn: a practical guilde. 1997. Retrieved from http://who.int/document/
[36]. Healthy Newborn Network. Thermal protection of the Newborn: a practical guide. 2013. WHO Publications. Retrieved from http://www.healthynewbornnetwork.org/
[37]. Kinney MV, Kerber KJ, Black RE, Cohen B, Nkrumah F. Sub-Saharan Africa's mothers, newborns, and children: where and why do they die? PLoS Med. 2010: 7: e1000294
[38]. Healthy newborn network. Newborn infection Briefer. 2013. Retrieved from http://www.healthynewbornnetwork.org
[39]. Liu L, Johnson HL, Cousens S, et al. Global, Regional, and National Causes of Child Mortality: An Updated Systematic Analysis for 2010 with Time Trends since 2000. Lancet. 2012:379: 2151-2161.
[40]. Bhutta ZA, Darmstadt GL, Hasan BS, Haws RA. Community-based Interventions for Improving Perinatal and Neonatal Health Outcomes in Developing Countries: A Review of the Evidence. Pediatrics. 2012:115: 519–617.
[41]. Berde, A.S & Yalcin, S.S. Determinant of early initiation of breastfeeding in Nigeria: a population-based study using the 2013 demographic and health survey data. BMC Pregnancy and childbirth. 2016:16:32.
[42]. Edmond, K. M, Zandoh, C, Quigley, M. A, Amenga-Etego, S, Owusu-Agyei, S, Kirkwood, B.R. Delayed breastfeeding initiation increases risk of neonatal mortality. Pediatrics. 2006:117(3), pp. e380–e386.
[43]. Anatolitou F. Human milk benefits and breastfeeding. Journal of Pediatr Neonat Individual Med. 2012:1:11–8.
[44]. Godhia ML, Patel N. Colostrum - its Composition, Benefits as a Nutraceutical - A Review. Curr Res Nutr Food Sci. 2013:37–47.
[45]. American Academy of Pediatrics. Workgroup on Breastfeeding. Breastfeeding and the Use of Human Milk. Pediatrics. 1997:100:1035–9.
[46]. United Nations Children's Fund (UNICEF). Infant and Young Child Feeding: Programme Guidance. 2011. New York (UNICEF).
[47]. *World Health Organization and UNICEF. Handbook IMCI Integrated Management of Childhood Illness. 2005. Geneva.*
[48]. Oche MO, Umar AS, Ahmed H. Knowledge and practice of exclusive breastfeeding in Kwara, Nigeria. Afr Health Sci. 2011:518–23.
[49]. Ogunlesi TA, Dedeke IO, Okeniyi JA, Oyedeji GA. The impact of the baby friendly hospital initiative on breastfeeding practices in Ilesa. Niger J Paed. 2005:32:46–51.
[50]. Idris SH, Sambo MN, Ibrahim MS. Barriers to utilisation of maternal health services in a semi-urban community in northern Nigeria: The clients' perspective. Niger Med J. 2013:54:27–32.
[51]. UNICEF. Infant and Young Child Feeding Programming Status, Results of 2010–2011 assessment of key actions for comprehensive infant and young child feeding programmes in 65 countries. Retrieved from: http://www.unicef.org/nutrition/files/IYCF_65_country_assessment_report_UNICEF
[52]. National Population Commission (NPC) [Nigeria] and ICF International. Nigeria Demographic and Health Survey 2003. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF International; 2004.https://dhsprogram.com/pubs/pdf/
[53]. National Population Commission (NPC) [Nigeria] and ICF International. Nigeria Demographic and Health Survey 2008. Maryland: NPC and ICF International; 2009. https://dhsprogram.com/pubs/pdf/
[54]. Nigeria Health Watch. 2018. Nigeria: From Zero to six – Can breastfeeding our babies accelerate Nigeria's development?. 2018. Available from https://www.nigeriahealthwatch.com/
[55]. Newborn Infection Briefer. 2017. Causes of newborn deaths: Infections. Healthy newborn network. 2017. Retrieved from: https://www.healthynewbornnetwork.org/resources/newborn-infection-briefer/
[56]. Federal Ministry of Health. 2016. Every Newborn Action Plan: a plan to end preventable deaths in Nigeria. Abuja. Retrieved from http://www.healthynewbornnetwork.org/resource/nigeria-every-newborn-action-plan/

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