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# Current Trends in Perinatal Mortality in Developing Countries: Nigeria as a Case Study

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## 1. Introduction

On November 20, 1989, the United Nations General Assembly adopted the Convention on the Rights of the Child after about a decade of deliberations between major stakeholders, including other United Nations agencies and Heads of Government of member states as well as Non-Governmental organisations (United Nations, 1989). In the World Summit for Children, which held a year later in 1990, world leaders further affirmed the need to promote earliest possible ratification and implementation of the Convention on the Rights of the Child, work for optimal growth and development in childhood, devise methods to eradicate hunger and globally attack poverty among other commitments, irrespective of race, age, colour, language, religion, socio-economic class or other considerations (United Nations, 1990).

A decade later, following further attempts by the United Nations to boost child survival and optimal development, the Millennium Development Goals (MDGs) were introduced with one of them, the MDG 4 specifically dedicated to children while the others directly or indirectly promote it.

Perinatal mortality is simply one of the earliest indicators reflecting each countries effort at ensuring that these goals are actualised and that children are not only protected, but develop to their maximal potentials.

### 1.1 Definitions

Perinatal mortality is defined by the World Health Organization as the demise of a fetus in utero after the age of viability, during labour or within the first 7 days of extra-uterine life. Technically, this may be represented as Stillbirths + Early Neonatal deaths (WHO).

This definition allowed each country to supply its own data based on the nationally accepted age of viability in that country. This may result in loss of uniformity, thereby reducing the validity of international comparisons. While the World Health Organization, the International Stillbirth Alliance and some developed countries utilise 22 weeks as their age of viability (WHO, 2006). and may therefore report a loss at that gestational age as perinatal mortality, a country like Nigeria, with its age of viability as 28 weeks will simply report it as an abortion. For the purpose of eliminating ambiguity and ensuring uniformity,

the World Health Organisation had gone ahead to define live birth and stillbirth clearly as follows (WHO, 2004);

“Live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached” while a stillbirth on the other hand is defined as “death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles”.

These definitions are therefore irrespective of gestational age. Despite this however, many countries continue to report perinatal mortality relative to gestational age.

Perinatal mortality rate moves a step further to evaluate the absolute number of perinatal deaths relative to the total number of births. It is usually expressed as an annual figure and it is calculated as (WHO, 2006);

$$\frac{\text{Stillbirths} + \text{Early Neonatal deaths}}{\text{Total births}} \times 1000$$

The use of Perinatal mortality rate had however been criticised because many countries still report it based on their age of viability as stated earlier. Another criticism against it is that many developing countries either have incomplete or completely lack information on useful parameters such as stillbirth rates, necessitating estimation and extrapolation of National figures from surveys. This may make it grossly under-reported and inaccurate. It is however saddening that despite these disparities; developing countries still have perinatal mortality rates that are many folds of that reported by the developed countries.

Another challenge in the utilisation of perinatal mortality as an index of assessing health care status is that it completely ignores the birth weight of the newborn. It is also completely silent on the causes of death and therefore cannot be used solely on its own merit as a tool based on which specific measures will be planned. Despite these criticisms however, perinatal mortality rates still have the peculiar advantage of taking into consideration stillbirth rates, a very important index in maternal and newborn health care that even the Millennium Development Goals targets and indicators ignored. Specifically, it is an important indicator of the quality of obstetric and paediatric care available in any setting.

In an attempt to complement the utilisation of perinatal mortality rate, many classification systems had been put forward, such that each country can then review the causes of death in the perinatal period and institute local measures to tackle it appropriately. Some of these classification systems include; the Wigglesworth classification, Tulip classification, Whitfield classification, ReCoDe, CoDaC and the modified Whitfield classification systems (Froen et al, 2009; Gardosi et al, 2005; Korteweg et al, 2006; Chan et al, 2006; Whitfield et al, 1986; Wigglesworth et al, 1980).

The magnitude of innocent lives lost in the transition and early adaptation period to life is colossal. About 133 million babies are born alive each year with over 6.3 million perinatal deaths occurring worldwide. Of these perinatal deaths, 3.3 million are stillbirths while 3 million deaths occur in the first week of life (WHO, 2006). A total of 3.7 million deaths, accounting for almost 40% of under-five deaths occur in the neonatal period. This simply means that as much as 75% of neonatal deaths occur in the first week of life (early neonatal period)(WHO, 2004), an additional signal to the strength in perinatal mortality as an index for monitoring health care status. With 98% of these deaths occurring in developing countries and 27% in the least developed countries (Stanton et al, 2006), perinatal mortality in developing countries is obviously receiving far too little attention. Worse still, for every newborn baby that dies, at least another twenty newborns suffer birth injuries, complications arising from preterm birth or other neonatal conditions (Unicef, 2009).

## 2. Nigeria as a case study

Nigeria was chosen for this review because it is simply Africa's most populous country with about 150 million citizens. The country with a total fertility rate of 5.2 readily records over 6 million births annually (Unicef, 2009) and despite being just about 2% of the global population, contributes significantly to the perinatal, neonatal and under five mortality in the world. It is not surprising that Nigeria, with its buoyant population and high mortality rates single-handedly contributes about 8% of the world's annual mortality in neonates with an annual figure of 242,000 neonates' death ( WHO, 2006; Federal Ministry of Health, Nigeria, 2011), a feat for which the country comfortably leads the neonatal mortality chart in Africa (Lawn et al, 2010). The country, despite a per capital income of 1140 dollars and an annual growth rate of 1.7% in the last 20 years ( Unicef, 2009) had an under-five mortality rate of 230 per 1,000 live births in 1990, 207 per 1,000 live births in 2000 and 186 per 1,000 live births in 2009 ( WHO, 2010) and is currently ranked 18th on the under-5 mortality list (Unicef, 2009). With this scenario, Nigeria amazingly records a total under-five death of almost a million annually (Cousens et al, 2010).

The World Health Organization estimated perinatal deaths in Nigeria to be about 30 per 1000 live births in 1990, only for this figure to increase almost three-folds ten years later. This can be attributed to the short and long term consequences of the depressed economy of the country within this period, which became marked from about five years earlier – 1985. This led to the introduction of an economic revival programme under the acronym 'Structural Adjustment Programme' (SAP) by the Federal Government; a programme that led to partial and in some situations to the outright withdrawal of health subsidies in the country, leading to a rapid decline in the utilisation of maternal health services (Onwudiegwu, 1993, 1997). This high level of perinatal mortality in Nigeria means that the country's dream of achieving MDG-4 by the year 2015 may after all be a mirage unless decisive steps are taken.

At a national level, countries like Finland recorded the lowest stillbirth rate of 2.0 per 1000 births while Nigeria ranked second only behind Pakistan with a national stillbirth rate of 42 per 1000 deliveries. Nigeria is also among the top ten countries which together contribute 54% of total world births and unfortunately also account for 67% of all stillbirths (WHO, 2010).

Indigenous hospital-based reviews from the Northern part of Nigeria in 1993 reported a perinatal mortality rate of 58.6 per 1000 deliveries. The same study however reported an age-specific perinatal mortality rate of 375 per 1000 births among teenage mothers with birth trauma being the leading cause of perinatal death (Akpala, 1993). This study not only revealed the high perinatal mortality rate but also confirmed the significant contribution of teenage pregnancy to perinatal mortality. Nigeria's perinatal mortality rate may perhaps not be so surprising, considering the fact that the country has an adolescent fertility rate of 126 per 1,000 girls aged 15-19 years (WHO, 2010).

A five year retrospective study at the University of Nigeria Teaching Hospital, Enugu, south eastern Nigeria, between the periods of 1995 and the year 2000 (Adimora and Odetunde, 2007) revealed a perinatal mortality rate of 133.94 per 1,000 births, an unacceptably high rate while another study by Kuti et al (2003) at Obafemi Awolowo University Teaching Hospital, Ile-Ife, South-Western Nigeria, in the succeeding 5 year period between 1996 to 2000 reported a perinatal mortality rate of 77.03 per 1000 total births. This study also went on to report the causes of these deaths with asphyxia, accounting for 58% being the commonest cause. Other significant causes include prematurity and early neonatal infections. The high incidence of unbooked patients, multiple pregnancies and low birth weight babies were cited as major contributors to the high perinatal mortality rates in our environment.

Onwudiegwu (1994) on the other hand took a community-based approach to the challenges of perinatal mortality, and factors such as formal educational status of women, rural/urban dwelling, birth interval and birth order were the significant contributors identified in South-Western part of the country. Contrary to the academic causes of these deaths however, a critical evaluation revealed that the problems that contribute to perinatal mortality in Nigeria as well as other developing countries go way beyond the identified medical causes.

Some of these causes are peculiar to the policies in the country while others simply relate to the health of the mothers and their attitudes. In a country where 58% of pregnant women had only one antenatal clinic attendance and even fewer women (45%) had at least four clinic visits (Unicef, 2009; WHO, 2010), the effect is of course poor maternal and perinatal outcome. Even more worrisome as expressed by Onwudiegwu (1994) is the fact that a proportion of women who despite having received antenatal care in the hospital resorted to delivery in the traditional settings or spiritual homes because of economic or spiritual reasons, while some simply stated disapproval by their husbands as their excuse.

The contraceptive prevalence in the country is also at an unbelievably low level of 15% in 2009, about 50% less than the contraceptive utilisation prevalence in the neighbouring country Cameroun (WHO, 2010; National population commission 2008). This ultimately results in high fertility rates and reduction in birth interval with the overall effect manifesting as high fetal wastages.

## 2.1 What about the mothers?

It is very difficult and extremely negligent to consider perinatal health without relating it to the state of health of mothers. This is another benefit that the use of perinatal mortality confers as it not only considers the babies but also reflects the state of health of the mothers delivering them as well. Women in developing countries generally tend to have many



pregnancies. Their lifetime risk of dying in pregnancy therefore reflects the overall burden on these women. Nigeria, with a maternal mortality ratio (WHO, 2010) of 1,100 per 100,000 is one of the fourteen countries worldwide with a maternal mortality ratio of at least 1000 per 100,000 deliveries. A woman's lifetime risk of dying in pregnancy in developing countries is many folds that of the developed countries but the difference is more marked when countries like Nigeria with a 1 in 18 maternal risk of dying is compared with 1 in 48,000 for Ireland! (WHO, 2007). With Nigeria recording a staggering 33,000 maternal deaths each year and with about 4 stillborns and seven newborns dying for each maternal death, the perinatal mortality rate in the country is not so surprising after all (Federal Ministry of Health, 2011, WHO, UNFPA, 2010).

The health status of the mother and that of the newborn are very intimately related: death of the mother automatically spells doom for those newborns that are fortunate enough to survive the condition that caused the demise of the mother. With so many women dying in pregnancy in Nigeria, the resulting colossal effect on perinatal mortality cannot be overemphasized. Complications during birth, such as obstructed and prolonged labour are established risks for perinatal mortality, yet they are common sights in our everyday practice. Current obstetric practices such as the use of partographs in monitoring labour had proven so effective in preventing these conditions (Orji et al, 2007; Fatusi et al, 2008), yet, this simple and inexpensive practice eludes many Nigerian parturients.

Lack of maternal health care is causing a large proportion of perinatal deaths by two unique mechanisms other than the commonly listed medical causes of perinatal mortality. These include the deaths resulting as a complication of the condition that killed the mother and the second one is lack of maternal care for the newborn post partum owing to the death of the mother.

Intrapartum death rate is a very important indicator enabling health personnel to take the most appropriate measures to prevent such deaths. An estimated 24- 37% of babies born as stillbirths in developing countries actually die intrapartum. In Nigeria, intrapartum fetal death is estimated to be about 25% (FMOH, 2011). The main factors responsible for these intrapartum deaths are simply poor maternal health, suboptimal care during pregnancy and medical conditions which had not been diagnosed or was inappropriately treated before or during pregnancy, coupled with the peculiarity of the travails of a pregnant woman labouring in Nigeria where only 39% of them benefit from skilled attendance at delivery and 35% actually had institutionalised deliveries (Unicef, 2009; National Population Commission, 2008). In women who receive good care during childbirth, intrapartum deaths are due to unexpected severe obstetric complications and it accounts for less than 10% of stillbirths (WHO, 2003).

The intrapartum deaths are directly related to the place of delivery, which is at home in about 62% of cases in Nigeria and this also reflects why many of these cases may not be reported, while delivery in health facilities were reported in only 35% of cases (FMOH, 2011; NPC, 2008). Even some of workers in these health facilities lack appropriate knowledge in the use of partograph for monitoring the progress of labour (Orji et al, 2007; Fatusi et al, 2008).

The "three delays" model ( Thaddeus and Maine, 1994) can also be adapted to explain the high proportion of intrapartum deaths, either singly or in combination. Onwudiegwu et al

(1999) identified type 3 delay as an important contributor to perinatal and maternal mortality and went on to report a mean decision-caesarean delivery interval of four hours in women with indications for emergency caesarean section as a cause of some of the perinatal deaths. Another report (Omo-Aghoja et al, 2010) from Benin, South-South Nigeria also identified associated type three delay in 61.9% of the maternal deaths. Type three delay could not be better exemplified!

The major contributors to maternal mortality in Nigeria include haemorrhage (23%), infection (17%), unsafe abortion (11%), obstructed labour (11%), eclampsia/hypertensive disorders of pregnancy (11%), malaria (11%) and anaemia (11%) (FMOH, 2007). All these are causes that could readily be taken care of by a well co-ordinated Emergency Obstetric Care (EmOC), a collection of services with the aim of reducing maternal mortality by improving the availability, accessibility, quality and use of services for the treatment of complications that arise during pregnancy and childbirth. The recommendation of this programme is to ensure at least five EmOC facilities, including at least one comprehensive facility per 500 000 population. Seven services are expected to be rendered by the Basic EmOC facilities while the Comprehensive centres will render additional two services to make a total of nine (WHO, UNICEF et al, 2009). The unfortunate challenge in many countries however is that many of these facilities, albeit established, were not functioning. In Nigeria, a random survey of 12 out of the 36 states in the country revealed that only 4.2% of the available public facilities in those states met the criteria for EmOC! (Fatusi and Ijadunola, 2003).

Nigeria's health status definitely appears deplorable from all the aforementioned but things would have been worse than they are if the Government, Non Governmental organisations and individual stakeholders in the country had not been taking active and drastic measures to combat the trend. These are the reasons why the under- five mortality rate declined by 22% between the five year period of 2003 and 2008 (NPC, 2008).

The urban-rural dissociation in health care is perhaps best demonstrated in no other country than Nigeria. Factors such as teenage pregnancies, lack of health care facilities and human resources are extremely common in these rural areas where as stated earlier, at least 51% of Nigerians reside (Unicef, 2009). Presently, despite the associated adverse outcome, 29% of teenage girls aged 15-19 years are married and at least 28% of them reported giving birth to their first child before the age of 18 years, most of these in rural areas (Unicef, 2009; NPC, 2008).

The Society of Obstetrics and Gynaecology of Nigeria further supported this by reporting an all time high maternal mortality ratio of 7, 523 per 100,000 deliveries in Kano, a rural state in Northern Nigeria (Society of Gynaecology and Obstetrics of Nigeria, 2004).

In an attempt to promote improvement in equity and access to care, the Nigerian Midwives Service Scheme (MSS) was introduced. Women who deliver in rural areas have been documented to have an increased risk of perinatal mortality and other adverse outcome in pregnancy compared with their counterparts in urban areas, yet 51% of Nigeria's population live in the rural communities. In order to bridge the gap of human resources and improve the health status of rural community dwellers, the Federal Government initiated this programme which involves deploying newly qualified, unemployed and retired midwives to rural areas to render their services after they had been trained to proficiency in basic

obstetrics life saving skills and integrated management of childhood illnesses. The programme is currently recording great success in the country (FMOH, 2011).

Contraceptive usage, though universally agreed to be at a lower prevalence rate in Nigeria than the regional average has also definitely impacted some benefits and that probably account for the progressive fall in total fertility rate in Nigeria from 6.6, where it had remained stagnant for the 20 year period preceding 1990 to the present figure of 5.7 (FMOH, 2011; NPC, 2008).. It is expected that with progressive fall in the number of children a woman delivers, the total burden of morbidity and the cumulative risk of dying from the reproductive process also reduces.

At the local level, people are also making efforts to ensure a safe transition from in utero to life for these newborn by intensifying efforts at reducing the burden of intrapartum deaths from obstructed and prolonged labour by educating health workers on the partographic monitoring of labour. The benefit from this was clearly demonstrated in South west Nigeria where training programmes conducted on the use of partographs in labour resulted in a significant reduction in perinatal mortality (Orji et al, 2007; Fatusi et al, 2008).

Poverty was identified as the main barrier to accessing health services in about 56% of Nigerian women in 2008 (NPC, Nigeria, 2008). Poverty alone could not have been responsible for the ordeals in Nigeria as other countries in Sub-Saharan Africa who are not as wealthy as Nigeria, including Botswana, Eritrea and Malawi are already adjudged to be on track to achieving MDG 4. Nigeria on the other hand had recorded an average annual reduction rate of 1.2% and presently needs a miraculous 10% annual reduction if it is to meet the two-third reduction in under-five mortality by the year 2015 ( FMOH, 2011)

The country is wealthier on the average than these other countries in Africa with better indices, some of whom are even adjudged to be on track to achieving the health related MDGs. The country is just yet to commit and co-ordinate its human and material resources in adequate proportions to this course. In 2001, the country pledged to progressively increase budgetary allocations to health. This increment in budgetary allocation has improved minimally from less than 5% to its present rate of 6.5%,<sup>16</sup> which is not sufficient to achieve its goals. In a bid to sustain this however, the country further affirm its commitment at the last United Nations Summit held in New York in September 2010, pledging to increase its budgetary allocation to health to as much as 15% by 2015 (United Nations, 2010). This is a most welcome development.

The Birth, Death compulsory registration decree was established in 1992 in order to establish a child's legal status and enhance the appropriate planning and provision for such children by producing a formidable data base. Presently however, only about 30% of live births in Nigeria are registered, with deliveries in urban areas being twice as likely to be registered compared with rural settings (Unicef, 2009; FMOH, 2011; NPC, 2008). Stillbirths, majority of which occur at home are even less likely to be reported. This ultimately deprives the country of appropriate and accurate data for planning. It is advised that the Government and citizens of the country make extra effort to report these vital statistics.

A woman's educational status goes a long way in influencing her health seeking behaviour and this reflects most in no other place than perinatal, neonatal and maternal mortality. These indices decline by about 50% or more as the woman's educational status increases.



This has been explained by the fact that she is likely to delay her marriage, use contraception and health services appropriately as well as utilise her knowledge to establish the best rational decisions for herself and her family members. Nigeria, with a net female primary and secondary school enrolment ratio ( Unicef, 2009) of 58% and 33% respectively definitely has a long way to go if the country hopes to adopt female education as one of its strategies to reduce perinatal mortality. Promoting education of the girl child to at least secondary school level is therefore recommended for the countries administrators.

Lastly, HIV/AIDS has been a most unfair burden on the country. 1.8 percent of the population of Nigeria was infected with HIV in 1991. Subsequent reports revealed HIV prevalence rates of 3.8% in 1993, 4.5% in 1998 and presently 3.6% of the Nigerian population have the disease (Unicef, 2009; UNGASS, 2010). This prevalence may appear low compared to what obtains in other African countries but considering the large population of Nigeria, the absolute number of people affected is actually enormous, translating to 3.3 million individuals. Out of this figure, 1.7 million are women and as much as 360,000 children are aged 0-4 years. Currently, the World Health organization reported that 6.2% of maternal deaths are directly attributable to HIV/AIDS in Africa ( Khan, 2006). Various efforts by the Nigerian Government in response to this challenge include the formation of The President's Committee on AIDS (PCA) in 1999 and the National Action Committee on AIDS (NACA) in the year 2000. Further efforts include the establishment of a three-year HIV/AIDS Emergency Action Plan (HEAP). Presently, a National strategic framework that will span a period of 5 years (2010-2015) is being executed as one of the activities of NACA (National Agency for Control of AIDS, 2009). Nigeria currently also benefits from partnering with other donor agencies such as the President's Emergency Plan for AIDS Relief (PEPFAR), Global Funds and the World Bank.

### 3. Conclusion

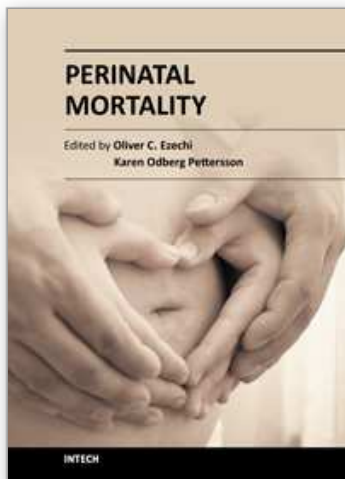
Finally, it is essential to state that there is no short-cut to the desired improvement in perinatal mortality rates for Nigeria and other developing countries. Nigeria has been used as a case study in this article, but the situation is not so different in many developing countries. The identified medical and socio-economic causes of perinatal mortality are closely linked to the causes of maternal mortality. Developing countries are therefore encouraged to desist from merely being attendees at International Summits and signatories to all United Nations declarations to actually executing the recommendations at their homestead. The recent introduction of the Integrated Maternal, Newborn and Child Health (IMNCH) strategy, an accelerated plan of action which aims to provide a continuum of care for mothers, newborns and children in a single package while ensuring universal coverage of these interventions by the Federal Ministry of Health of Nigeria is a welcome idea in this direction (FMOH, 2007). The Millennium Development Goals are feasible, but only with adequate mobilization, sustained dedication and commitments of material and human resources to the cause of our women and newborns. The Millennium Development Goals are not invincible!

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This book is a compendium of important topics related to perinatal mortality. It has been written for anyone who is interested in perinatal medicine and wishes to be part of the global strategy for prevention and control of perinatal mortality. It covers variety of subjects using simple language that can easily be understood by most health workers and those interested in quality health care. Postgraduate students in midwifery, obstetrics and paediatrics will also find it a very useful companion.

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