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Mortality and Morbidity in Nigeria: The Relevance of Ageing Theories to Health and Demography of Ageing

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Abstract
Morbidity and mortality of all variants remain high in Nigeria despite various interventions by the government. This has affected the realisation of some of the sustainable development goals (SDGs) on maternal health. Data on mortality and morbidity are very essential in disease assessment, monitoring and evaluation of health policies in Nigeria. This study examined mortality and morbidity in conjunction with the relevance of aging theories to health and demography of aging in Nigeria through extensive review of literatures. Findings revealed that the high prevalence of morbidity and mortality in Nigeria has affected life expectancy rate of Nigerians and other human development indices (HDI), thereby reducing the rank of the country in terms of standard of living and achievement of the sustainable development goals (SDGs). It was concluded that to reduce the high rate of morbidity and mortality in Nigeria and achieve demographic dividend for sustainable development in the country, addressing the various socio-demographic factors that have accelerated morbidity and mortality rates will go a long way in reducing the high prevalence witnessed in Nigeria. Understanding the ageing theories will also help the government and other policy makers in formulating appropriate policies and implementing necessary programmes relating to monitoring mortality and morbidity trends for achieving demographic dividend in Nigeria.

Keywords: aging, health, morbidity, mortality, Nigeria

1.0 INTRODUCTION

Data on morbidity and mortality are very essential in disease assessment, monitoring and evaluation of health policies in Nigeria, and in any other country. Morbility and mortality are important statistical terms in demography and public health. Morbidity measures statistics related to the occurrence of sickness in a given population while mortality measures the rate of death in a

given population over a specific period (health.ny.gov). Both metrics affect our understanding of how diseases affect populations, thereby enhancing the formation of health policies aimed at improving the wellbeing and living condition of the populace (See *Table 1* for more on the differences between morbidity and mortality).

***Table 1*: Differences between Morbidity and Mortality**

FEATURE	MORBIDITY	MORTALITY
Definition	Refers to the state of being diseased or unhealthy	Refers to the state of being dead
Measure	Quantifies the prevalence or incidence of diseases	Quantifies the number of deaths due to a specific cause
Focus	Focuses on illness and its impact on health	Focuses on death and its causes
Outcome	Can lead to disability, decreased quality of life	Represents the ultimate outcome of severe illness
Timeframe	Can be short-term (acute) or long-term (chronic)	Typically considered as a one-time event
Impact	Affects individual health and well-being	Affects both individuals and public health
Data Collection	Involves medical diagnoses, symptoms, and health surveys	Involves death certificates, mortality statistics
Prevention	Targets risk factors, promotes healthy behaviors	Focuses on reducing mortality rates through interventions
Public Health	Used to assess the burden of diseases in populations	Used to monitor trends in causes of death
Research Focus	Investigates disease patterns, treatment effectiveness	Investigates causes of death, mortality trends
Intervention	Involves medical treatment, rehabilitation	Involves emergency response, public health measures
Importance	Critical for healthcare planning and resource allocation	Critical for understanding population health status

Source: https://www.examples.com/biology/morbidity-vs-mortality.htm

In Nigeria, most leading causes of death are parasitic disease, infectious disease and diseases of the circulatory system, which are often referred to as cardiovascular diseases that have accounted for about 13.7 percent mortality rate in the country. Infectious and non-communicable diseases are the main causes of mortality among adults while issues pertaining to perinatal/neonatal period are the major cause of disease among children. Some other causes of death among children in Nigeria are stroke, liver diseases, diabetics, tuberculosis, HIV/AIDs, and malaria. Most causes of mortality in Nigeria can

be prevented. Non-communicable diseases and communicable diseases are the two main burdens of morbidity in Nigeria (Okoroiwu *et al*., 2020).

Diabetics mellitus is a major cause of morbidity and mortality worldwide and Nigeria is not an exemption. Overall mortality rate with medical admissions in eastern Nigeria is 21.8 percent with diabetics accounting for over 6.7 percent deaths. Within the diabetics' cohort, mortality is 15.9 percent, which is significantly high, most especially with aged 65 years and above. The most common causes of mortality in diabetic cases in eastern region are complications associated with foot syndrome and cerebrovascular disease. Some other morbidity cases associated with high death rate of patients within the hospital are carcinoma of the cervix, hepatic encephalopathy and malaria. There is need for adequate health education. This is a critical factor that needs to be tackled in order to reduce mortality and morbidity in Nigeria (Eregie & Unadike, 2010). Old age is also an important determinant of increased risk of dying in hospitals.

Medical childhood mortality and morbidity in developing countries such as Nigeria is very high. The common diagnosis regarding morbidity is infectious diseases such as diarrhoea, malaria, sepsis and pneumonia, which accounted for a mortality rate of about 11.2 percent (Okoroiwu *et al.,* 2020; Sanya *et al.,* 2010). Diarrhoea, malaria, sepsis and seizure disorder are the most common causes of death among under-five children. Under-five children are most likely to die compared to over five years. Patterns on mortality and morbidity of children in Gusau are similar to what has been reported in other studies. There should be synergy of efforts from all stakeholders in the health sector towards provision of drugs and ensuring adequate vaccination of children geared towards improving the health conditions of children in the state (Garba *et al.,* 2014).

1.1Ageing Theories, Health and Demography of Ageing

Cause of death itself is a contemporary issue. Rosenberg (1999) identified four factors that are possible causes of death. These are poor health, public policy, aging and technology. For example, technology has been associated with economic development and has brought about increased standard of living of the people in general but advancement in technology has its associated effect in terms of accidents, terminal diseases such as cancer and so forth. This study examined aging as a contemporary issue in mortality. The topic is further discussed below.

1.1.1 Aging

Aging can be described as the continuous and gradual process of natural change that usually begins in early stages of adulthood. It also means growing older and

can be referred as an adjective that describes a process of growing older that occurs most especially as people approach the middle age and beyond. It is well known that during the early middle age, many of our bodily functions begin to gradually decline so that people do not suddenly become elderly or old at any specific age. Aging can be broken down into three categories and these are: psychological aging, biological aging and social aging. Aging can be caused by a combination of factors and some theories suggested that cells have a predetermined life span while other theories claim that aging is usually caused by damage or error. Other theories were of the opinion that aging is due to evolution, genetic or biochemical reactions. It is with this backdrop that this paper will examine some specific theories of aging: error theory of aging, wear and tear theory, connective tissue or cross-linking theory, free radical theory of aging, immune or immunological theory of aging, and programmed aging theory.

1.1.2 Error Theory of Aging

Leslie Orgel (1963) posited on error catastrophe theory of aging, asserting that errors in protein translation that reduce fidelity of protein-translating enzymes may lead to loop of increasingly inaccurate protein synthesis thereby resulting to death of the organism. This theory states that aging is a result of accumulation of errors in the cellular molecules that are essential for cellular functioning and reproduction and when this error reaches a catastrophe level that is incompatible with cellular survival, aging sets in. He stressed further that proteins serves variety of functions. Some serve in metabolic or structural processes while others serve as catalyst to cellular reactions. He concluded that there is need to maintain the accuracy of protein synthesis in our body as it as connection with our aging.

1.1.3 Wear and Tear Theory

This theory was proposed by a German biologist, Dr. August Wiesmann, in 1882 (Jin, 2010). The theory proposed that aging is a result of gradual deterioration of the body cells and tissues due to oxidative stress, wear and tear, accumulation of toxins, exposure to radiation or other deteriorative processes. Studies have discovered that increase in illness or stress has the possibility of lowering life expectancy of organisms and as such, concluding that aging is an accelerated result of increased stress. The theory asserted that living organisms wear out over time due to increased and repeated stress on the body. The concept is similar to the idea that objects such as machines, automobiles and so forth wear out or deteriorate as they are used repeatedly over time, and due to the ability to observe the deterioration with these objects, the theory fits in with human aging as well. Some of the examples of this theory in our body include skin changes that accrue over time, wrinkles, or arthritic in the joints that become stiffer and painful as age progresses.

1.1.4 Connective Tissue or Cross-Linking Theory

Johan Bjorksten proposed this theory in 1942. The theory is also referred to as the glycosylation theory of aging (Bjorksten, 1990). The theory proposed that accumulation of cross-linked proteins in the body has the tendency of damaging body cells and tissues with the attendant effect of slowing down bodily process, thereby resulting to aging. This theory is often associated with stiffening of blood vessel walls, loss of elasticity in skin and muscle tissue, delayed wound healing, changes in eye lenses, reduced joint mobility and the overall effect of aging of affected individuals. According to this theory, aging is a result of accumulation of intra- and inter-molecular covalent bonds between muscles, which is referred to as "cross-links", so that over time, the cross-links result to alteration of the biological and chemical properties of the body cells and these cellular changes eventually translate to dysfunction of the body system.

1.1.5 Free Radical Theory of Aging

Denham Harman (1956) first proposed this theory. The theory proposed that aging is a result of oxidative damage to the body cells and tissues, which are as a result of aerobic metabolism. The term 'free radical' is a chemical reaction that takes place in a cell; an unstable molecule that is made during normal cell metabolism. This chemical reaction or unstable molecule when built up in the cell can lead to damage of other molecules such as Lipids, DNA and Proteins, thereby increasing the affected victim's risk of contracting cancer and other diseases, with the end result of aging of the affected victim. According to this theory, radical reaction is in three phases: initiation, propagation and termination. Examples of free radicals include hypochlorite, hydrogen peroxide, superoxide anion radical, nitric oxide radical and pyroxenite radical.

1.1.6 Non-Stochastic Theories of Aging

Non-stochastic theories of aging tend to view aging as a certain predetermined and timed phenomenon when compared to the stochastic theories that viewed aging as an event that occur randomly and are accumulated over a period of time. Examples of non-stochastic theories of aging are immune or immunological theory and programmed aging theory. The immune or immunological theory of aging (Walford, 1969) asserts that aging involves a series of complex processes that are controlled by the immune system which are programmed. The theory proposed that aging in human beings is a form of prolonged autoimmune process or phenomena; so that functions of the immune system decreases with age thereby increasing health risk such as infections of flu or cold and chronic inflammatory diseases. Elderly individuals do not respond to challenges of immune system robustly as the young people. Effects of aging on the immune system include reduction of diminished functioning or maturity of the lymphocytes of the secondary lymphoid tissues.

The theory was of the opinion that as we age, changes in all essential physiological functions occurs which include the immune system. The theory also holds that immune responses decreases with age thereby leading to increased incident of several chronic diseases that are inflammatory and, as such, affect the longevity of the affected victims. Aging is usually accompanied by impairment of the physiological systems, which include the immune system. The age-related changes associated with functions of the immune system are often dominated by immune-senescence, which are often the major causes of increased vulnerability of affected victims to inflammatory diseases and infections. Individual life strategies such as administration of adequate antioxidants have the tendency of improving the functioning of the immune system, decreasing oxidative stress; thereby increasing the longevity of the affected victims (Monica, 2008).

Programmed aging theory is the idea that senescence in organisms including humans are caused by evolution. Programmed theories of aging asserted that organisms age and die due to evolution that is programmed into their genetic code to do so. Examples of programmed theories are immunological theory, programmed senescence theory and endocrine theory. The endocrine theory was developed by Vladimir Dilman (1992). The theory states that effectiveness of the body homeostatic adjustments declines as aging increases thereby leading to failure of the adaptive mechanisms, leading to ageing and death. This theory is also referred to as pacemaker theory or aging clock theory. Endocrine theory states that biological processes act through the hormone system to control the pace of aging. This theory is similar to immunological theory stating that immune system is programmed to decline over time thereby resulting to increased vulnerability of the affected patient to infectious disease thereby leading to ageing and death.

2.0 METHODOLOGY

This study employed extensive review of scholarly articles as methodology. Meaning and definition of concepts relating to mortality, morbidity, aging theories, health and demography were accessed from the internet and other electronic search devices. Discussion was made based on the theme of the study. The author's personal conclusion formed the last chapter of this study.

3.0 POLICY RESPONSE TO MORTALITY AND POPULATION GROWTH

Mortality reduction is very central to the sustainable development goals (SDGs). The sustainable development goals (SDGs) on maternal and new-born health in Nigeria was directed towards reducing maternal fatalities in Nigeria by reducing the number by more than 90 percent to less than 3,000 per year. Maternal and child health (MCH) and Subsidy Reinvestment and

Empowerment Programmes in Nigeria were introduced in order to reduce maternal mortality through increase in skilled maternal health care services. The programmes were intended on increasing availability and affordability and improving accessibility of quality health care services in Nigeria. The strategies for implementation were based on the availability of primary health cares (PHCs) at entry level which was about 34,000 covering all the health wards and hard-to-reach communities in the country, with the objective of reducing the high rate of maternal and neonatal mortality rate in Nigeria. Further programmes towards strengthening political support for maternal health through policies in areas of using new-born screening in detecting hidden conditions, creating safe infant sleep environment, prenatal and pre-pregnancy care, addressing low birth weight, preterm birth and preventing birth defects need to be embarked upon. Human rights perspective in strengthening health care systems, increasing state accountability for maternal health, increasing women's access and entitlement and integrating rights perspective into aid instruments need to be holistically implemented (NPP 2004).

The 2021 national population policy on fertility in Nigeria employed several strategies in addressing the country's rapid growth in population and addressing its negative effects on development. Some of the strategies employed include:

- funding and resource allocation by ensuring that sufficient funding on commodities and family planning services are available, focusing on making them accessible at little or no cost through various health care providers at various levels with insurance offerings;

- multi-sectoral approach by implementing a coordinated approach across various levels and sectors of the government in order to effectively manage population growth rate and harness the country's demographic dividend;

- effective communication by leveraging on social media in raising public awareness in ensuring wide dissemination of the policy and engagement, bridging communication gaps between end-users and implementers;

- capacity building by building the capacity of community workers, health care providers, and other key stakeholders in delivering family planning and other reproductive health care services in the country;

- establishing national council for population management which is a high-level council chaired by the president of the federation in providing strategic direction and support for policy implementation;

- data driven implementation by utilising reliable, credible and timely data in guiding policy implementation with the forth coming censuses

which are expected to provide necessary information;

- investing in quality education by emphasizing the importance of quality education most especially for young adult girls in order to achieve human capital development and significant demographic transition in Nigeria;

- reproductive health and family planning by expanding access to modern contraceptive methods of family planning, counselling on family planning, providing family planning commodities in order to improve birth spacing and reduce high fertility levels in the country.

These strategies are aimed at improving the quality of lives and standard of living of Nigerians through promoting sustainable development and harnessing the country's demographic potential.

The Nigerian 2021 national population policy has several merits and strengths in addressing the country's rapid growth in population and assessing its impacts on national development. Some key benefits of the policy are: reduction in fertility rate as the policy emphasized expansion in access to modern contraceptive methods, commodities and family planning counselling in order to promote birth spacing thereby enabling the country to achieve rapid control on fertility. The policy was aimed at improving health outcomes in the country through focus on reproductive health and family planning, geared towards improving the health conditions of adolescents, women, children and newborns with the ultimate goal of enhancing the overall wellbeing of the citizens. The policy has a focus in investing in quality education, as the policy underscores the importance of quality education, most especially of the young girls, towards achieving significant development in human capital and demographic transition and promoting sustainable development through addressing population growth and its negative consequences. The policy aims at facilitating sufficient demographic transition, harnessing the nation's demographic endowment and realizing sustainable development in the country.

The national council on population management was established through this policy, which was chaired by the president of the country in providing strategic direction and support for policy implementation. The policy is data-driven as it recognizes the need for reliable, credible and timely data that will be needed in guiding implementation regarding forthcoming censuses; hence, the policy was expected to provide the needed and necessary information. In all, the 2021 national population policy marked significant sustainable and national development with potential implications for positive outcomes in maternal health, adolescent and youth rights and women empowerment. Despite these merits, the policy has its own flaws and weaknesses, which had hindered its effectiveness and impact. The policy is confronted with insufficient funds as the

success of the policy lies heavily on adequate funding most especially regarding family planning services and Nigerian budgets lacks line item on family planning implementation, which has raised concerns on the government's commitment on resource allocation regarding this purpose.

There is limited public awareness regarding effective communication and public awareness and these are very crucial for the success of this policy. The national orientation agency (NOA) and national population commission need to work in hand in bridging communication gaps between end-users and implementers of the policy. Challenges in implementation need to be approached on a multi-sectoral dimension that will involve joint participation of government agencies, civil society groups, and other private sector organisations. Coordination of these efforts need to be achieved in order to ensure effective collaboration. The success of the policy also had a shortcoming in heavy reliance on commitment from the national government for sustainable development and population management so that any defect in government's political will or prioritization could lead to adverse effect on the effectiveness of the policy. The policy is also confronted with religious and cultural barriers as diversity in religious and cultural norms of the country posed huge challenge on success of the policy, most especially in areas where family planning is not widely accepted. While the policy relied on reliable and credible data, ensuring access to and availability of the data posed serious challenge most especially in rural areas. In all, addressing the potential shortcomings of this policy will be very crucial towards accelerating its effectiveness in promoting sustainable development and managing the country's population growth.

4.0 DISCUSION

Maternal mortality rate, and other mortality variants, is very high in sub-Saharan Africa and in developing countries such as India and Nigeria. Hypertensive diseases of pregnancy and post-partum haemorrhage have been the major causes of maternal deaths in south-eastern part of Nigeria in the last five years. Hypertensive diseases of pregnancy and post-partum haemorrhage have been the major causes of maternal deaths in south-eastern part of Nigeria in the last five years. Over the last ten years, there has been improvement in maternal mortality rate and this can be attributed to reduction in leading causes of maternal deaths in hypertensive diseases of pregnancy, septic abortion, post-partum haemorrhage and puerperal sepsis. There is need to sustain government effort in reducing maternal mortality in order to attain the sustainable development goals (SDGs) through improvement in the provision of maternal health services (Thomas *et al.,* 2018). Attempts towards liberating the girl child from shackles of early marriage have been resisted continuously due to religion, culture and traditions of some parts of Nigeria. Current age, level of education, household decision and age at first marriage poses significant influence on

maternal health risks of women in the study area.

Regionally, maternal mortality is high in all regions including south-east. As at 2020, it was reported that in south-east Nigeria, the maternal mortality ratio was 902.7 per 100,000 live births and Ebonyi state was among the leading states with high maternal mortality rates, recording over 7,014 deaths in just 40 health facilities within an unspecified period of time. In northern Nigeria, there is high level of maternal mortality which was estimated between 1,152-1,445 per 100,000 live births which is also very high. The major cause of this high rate in northern Nigeria can be attributed to low access to reproductive health care services coupled with low level of women education and early age of entry into reproduction. There are several factors that lead to maternal deaths in Nigeria. These factors include unsafe abortion, inadequate human resources in various health centres, obstructed labour, delay in seeking health services by women, haemorrhage infection, inadequate equipments in many Nigerian clinics, delay in referral services, inadequate ambulance services for transportation, and hypertensive diseases; most especially, complications of unsafe abortion. Underutilisation of efficient and effective reproductive healthcare services and poor access to health care facilities have also been identified as other causes of high maternal mortality rate in Nigeria.

Community-based organisations need to rise up towards this challenge through advocacies and awareness programmes by educating mothers and the public in general on maternal health and causes of maternal mortality, encouraging birth spacing and family planning, discussing and recognising potential signs that may necessitate emergency intervention. Nigerian government need to strengthen measures towards reducing infant mortality and maternal mortality. Policies towards preventing maternal and infant deaths in Nigeria need to pursued with a view to supporting states in their duties towards saving and sustaining maternal health during postpartum period, and during pregnancy and child birth. There is need to work towards the goal of eliminating disparities in maternal health outcomes on deaths associated with pregnancy and identifying solutions towards improving quality of health care in Nigeria in order to achieve the sustainable development goals (SDGs) on maternal and new-born health (MNH) in Nigeria by 2030.

5.0 CONCLUSION

The high prevalence of morbidity and mortality in Nigeria has affected life expectancy rate of Nigerians and other human development indices (HDI), thereby reducing the rank of the country in terms of standard of living and achievement of the sustainable development goals (SDGs). Reducing the high rate of morbidity and mortality rate in Nigeria and achieving demographic dividend for sustainable development in the country and addressing the various socio-demographic factors that have accelerated high morbidity and mortality

rate will go a long way in reducing the high prevalence witnessed in Nigeria. Understanding the ageing theories will also help the government and other policy makers in formulating appropriate policies and implementing necessary programmes relating to mortality and morbidity for achieving demographic dividend in Nigeria.

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