

Repositioning Demography and Population Studies in Sub-Saharan Africa

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Preamble

Professor Martin Enock Palamuleni is a C3 rated researcher who holds a Bachelor of Science degree (B.Sc) with distinction from the University of Malawi, Master of Science degree (MSc) in Demography and a Doctor of Philosophy (PhD) in Demography from the London School of Economics and Political Sciences (LSE), University of London. He is the first child in a family of nine (9): seven boys and two girls. His late father worked for the then Malawi Railways Limited and his mother is a retired primary school teacher. As such, Martin Enock grew up along the railway line, which, he believes, was part of Cecil Rhodes' dream to build a road-rail from Cape to Cairo. He started his primary education at *Mpingwe* Primary School in Limbe, Blantyre before moving on to Blantyre Girls Primary School (at that time boys could attend the school up to Standard Four). He completed primary education at *Msalura* LEA Primary School before joining *Mchinji* Secondary School where he matriculated.

Upon entering Chancellor College, University of Malawi, he registered for English, Mathematics, Geography and Economics. In the second year, he dropped English and took up Sociology. In the third year, he registered for Computer Sciences, Economics and Statistics, eventually graduating with a Bachelor Science degree, majoring in Statistics and Computer Science. Little did he know that his exposure in these disciplines would



become useful in his adult life as a demographer. After completing undergraduate studies, he joined the teaching staff as a Staff Development Fellow and then a year later proceeded to the London School of Economics and Political Science (LSE), University of London, for his postgraduate studies in Demography.

After conferment of a PhD in Demography Professor Palamuleni taught at Chancellor College, University of Malawi, before joining the National Family Planning Council of Malawi (NFPCM) on leave of absence from the university (1996-1999). During his tenure at NFPCM, he was part of the team that established the Family Planning Association of Malawi (FPAM).

Professor Palamuleni serves as a reviewer to local and international journals including *African Population Studies (APS)*, *Southern African Journal of Demography*, *SAHARA*, *International Journal for Population Research*, *AIDS*, *BMC Women's Health*. He served as an Associate Editor for APS (2007-2017) and was a Guest Editor for a special issue of APS (2014). This special issue was in commemoration of the accreditation of the journal by the Department of Higher Education and Training (DHET). He has served on scientific committees and organized sessions at national and international conferences and as chairperson and rapporteur at academically prestigious conferences.

Professor Palamuleni is a member of the following professional bodies: Population Association of America (PAA), International Union for the Scientific Study of Population (IUSSP), Union of African Population Specialists (UAPS), South African Sociological Association (SASA) and Population Association of Southern Africa (PASA). At one time he served as a country representative and Southern African Representative for UAPS.

Professor Palamuleni has served as an external examiner for various local and international universities in Africa such as Witwatersrand, Kwazulu Natal, Venda, Free State, Cape Town, Western Cape, Makerere, Botswana, Namibia and his alma mater, the University of Malawi, College of Medicine. To his credit, he has examined 44 Masters' dissertations and 12 PhD theses.



Madam Executive Dean,
Deputy Deans,
Directors and Deputy Directors
Programme and Subject Leaders
Colleagues and students
Family and friends
All protocol observed

Introduction

Let me begin by distinguishing two terms that are sometimes used interchangeably: Demography and Population Studies. For Demography, I prefer the definition mooted by the United Nations [1]: ***“Demography is a statistical study of human populations particularly which respect to size, structure and development”***. Demographers are therefore interested in knowing how many people reside in a certain area (*population size*), how they are distributed in a certain characteristics such as age, sex, marital status and education (*population structure*) and how the size and structure change over time (*development or growth*). These changes are brought about by births, deaths and migration. ***Population Studies***, on the one hand, ***is the study of size, structure and development and how these are related to the social, cultural and economic environment***. In other words, population studies considers the relationship between demographic indices (population size and structure, fertility, mortality, migration) and non-demographic indices (education, health, unemployment, human rights, drought, floods etc.). Population studies focuses on the effect of a non-demographic index, for example, how changes in income or education can affect fertility or mortality, or vice versa. Population Studies is therefore broader than demography in that the latter is interested in calculating the size and structure of the population whereas the former links the size and structure to the spaces in which the population is found. The relationship between demography and population studies is shown in Figure 1.



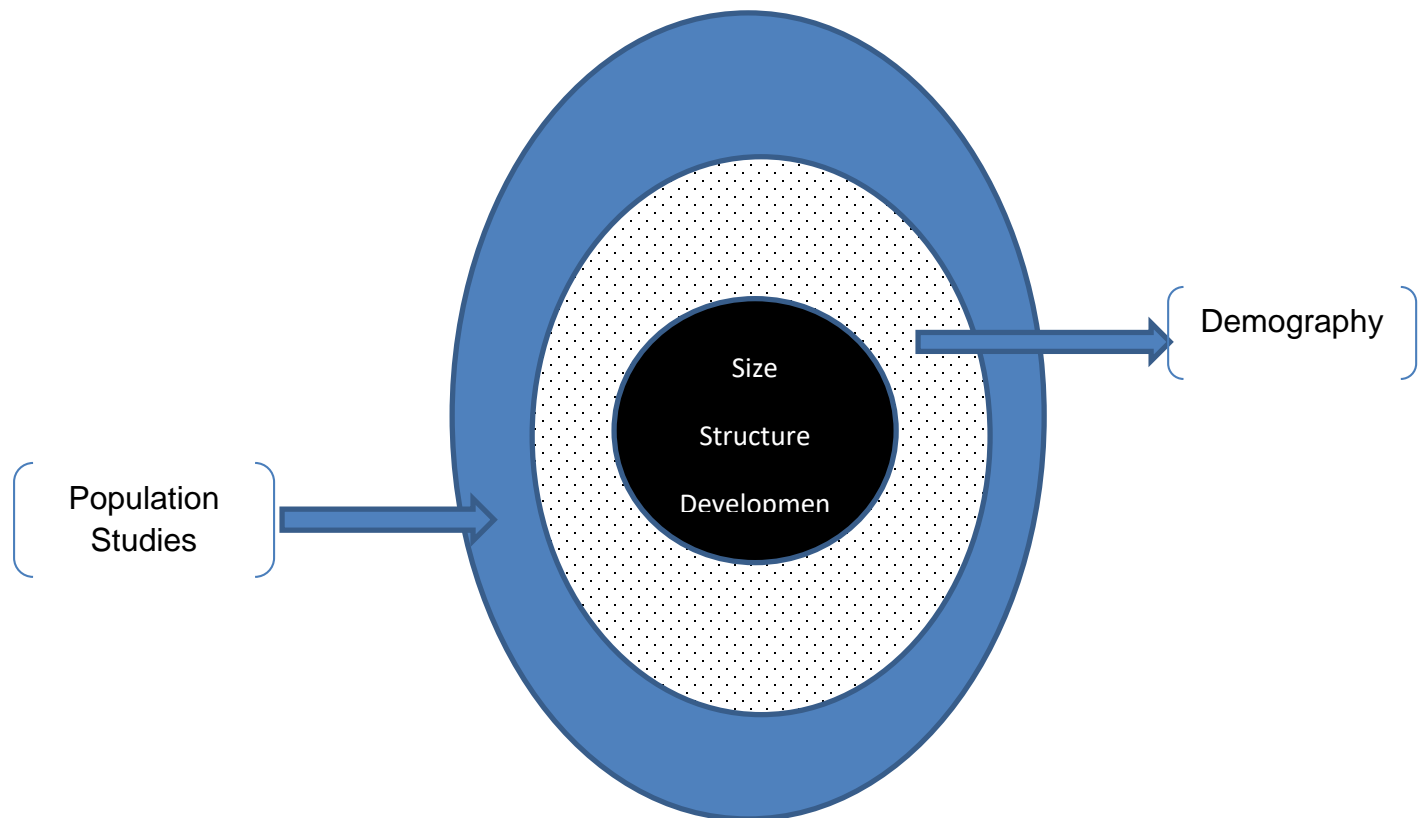


Figure 1: Relationship between Demography and Population Studies

It is important to understand from the onset that both demography and population studies are multi-disciplinary. As such throughout this lecture I shall draw upon other disciplines: statistics, economics, geography, religion, sociology, anthropology and history to consolidate my insight.

In order to understand the foci in demography and population studies, it is important to think about the **life cycle**. Life is a journey that begins with birth and ends with death. In between, as individuals grow, they engage in so many things **most of** which are a function of age. For instance, at age six (6), individuals are expected to enroll in school for grade one. For the next twelve years, these individuals move from one grade to the next. At each grade level, they graduate and acquire certificates. At age 18, they become eligible to register as a voter. After graduating, the individual commences working and sooner or later, they get married, start a family, become parents and later on when one reaches 65



years and one is expected to retire. All these are important events that demographers and population scientists are interested in. Crudely put, for a demographer the main interest is to determine how many births, marriages, divorce, remarriages, deaths occur over time, whereas a population specialist is interested in the causes and consequences of these life-shaping events.

Sources of Demographic Data

For demographers to do their job, they need access to data. In most cases, these data come from population censuses, sample surveys, vital registration systems and such administrative records as school registers, hospital records, employment bureaus, voters' register, etc. To date, South Africa has conducted three population censuses (1996, 2001 and 2011) whereas Malawi has had six population censuses (1966, 1977, 1987, 1998, 2008 and 2018). Both countries have conducted numerous demographic surveys. In South Africa, we have October Household Surveys, General Household Surveys, Labour Force Surveys whereas in Malawi we have Family Formation Survey, Demographic Survey, just to mention a few. Malawi conducted Demographic and Health Surveys (DHSs) in 1992, 2000, 2004, 2010, 2015/15 whereas South Africa carried out DHSs in 1998, 2003 and 2016. You will note in the subsequent segments that I have used some of these censuses and surveys to come up with demographic parameters that were used to study the population dynamics of these countries.

In addition, various national and international agencies carry out population projections. Population projections by the national department of statistics such as Statistics South Africa and National Statistical Office in Malawi represent the "official" national **estimates and projections**. In addition, individual demographers make projections for the country as a whole and sometimes at the sub-national level. The international agencies that make projections for the world as a whole and for individual countries are the United Nations Population Division, the World Bank and the United States Bureau of Census.



Societies have come up with systems of recording some of the significant population events. Vital or civil registration is the system by which a government records the vital events of its citizens and residents. As such, vital registration creates legal documents which may be used to establish and protect the rights of individuals as well as providing a source of data that may be compiled to give **vital statistics**.

Why Demography and Population Studies?

Madam Dean, ladies and gentlemen, throughout my life as a demographer, people I have met seek to know why study demography. I have a feeling that most people do not see the need of knowing the size and structure of the population. Allow me to offer my reflections on this question.

Demographic data is useful in social and economic planning. Some of the most critical problems that countries face in general, and developing nations in particular (South Africa included), call for the application of demographic skills. Some of the challenges include poverty, unemployment, domestic violence, child abuse, and HIV/AIDS. In all these situations, there is a need to know not only the number of people involved (size of the population) but also their characteristics in terms of distribution and structure. For instance, how many people are poor, what are their ages and sex composition, where are they located (distribution)? How many under-fives in future? How many very old people does a population have? How many households in future? What will be the composition of the population? Households? How large will the labour force be in the future? This will inform how many jobs will have to be created? Censuses and surveys will collect such information and there is need for people with demographic skills to organize and interpret such information in a way that ordinary people, including planners and decision makers, can use.

Theoretical Considerations

Population-Development Debate



There are three schools of thought that debate the population-development interrelations. The first school is advocated by such individual as Colin Clark, Julian Simon and Ester Boserup who argue that **population growth stimulates development**. The advocates of this school of thought are of the view that population growth in many third world countries is desirable and, in fact, will stimulate rapid development because the population growth will provide the labour required for the development of the natural resources of these countries or regions. The stance of this school of thought is predicated on the assumption that many third world countries are under-populated in relation to the potential wealth of their natural resources.

The second school of thought argues that **population growth is not related to development**. This school of thought which has its roots in the ideas propagated by Marx and Engels who contend that what hampers development is the exploitation of the poor (the proletariat) by the rich (the bourgeoisie) in a capitalist society, and not population growth. This school of thought argues that population problems will disappear if social inequality is eliminated from society since, according to them, every member of society is born with the means to provide for their subsistence. However, development which should normally benefit every member of society becomes impossible under an exploitative capitalist system because workers are deprived of the full share of their earnings by capitalists who take large profits.

The third school of thought argues that **population growth is detrimental to development**. The proponents of this school of thought include Reverend Thomas Malthus and contemporary scholars who have come to be identified as Neo-Malthusians. Prominent among them are Lester Brown and Paul Ehrlich. These proponents are of the view that even if the economy is growing quite rapidly, that growth will not be reflected in the development of that society because the rapid growth rate of the population wipes off the effect of the growth in the economy unless the population is growing much more slowly than the growth in the economy. The situation is worse in a society in which the economy is growing quite slowly while the population is growing quite rapidly as is the case in most



African countries. This school of thought argues that the principal cause of poverty, low standard of living, ill-health, malnutrition and environmental degradation is rapid population growth.

Thomas Malthus was the first to draw attention to the challenges of rapid population growth in his seminal work entitled, *An Essay on the Principle of Population*, published in 1798. He noted that while population grew at a geometrical proportion (i.e. 1, 2, 4, 8, 16, 32, 64, etc.), the means of sustenance (food) grew at an arithmetic proportion (i.e. 1, 2, 3, 4, 5, 6, 7, etc.) and that we cannot allow population to continue to grow at such a rate in a world in which resources are finite. The Malthusian theory posits that if population is not checked, it will be forced to check itself through what Malthus referred to as positive checks such as outbreaks of disease, famine and wars. Even though Malthus did not advocate the use of modern contraceptives (since he was a religious monk), he recommended some prudential considerations including delayed marriages and self-restraint such as having no concubines. He was, therefore, the first person to call for systematic attempts at stemming the rate of population growth. Even though the Malthusian theory was criticized, it draws attention to the dangers of a rapidly growing population.

Arising from the Malthusian theory is the concept of **optimum population**. Simply defined, the optimum population of a country is the right size of population that guarantees the maximum welfare to the members of that society, given its resources. It is the ideal size of population that will maximally utilize the resources of that country. When a country's population is at the optimum level, the population adequately and maximally taps the resources of the country thereby yielding maximum output and, consequently, there is high standard of living. A population problem arises when the size of the population is below or above the optimum level. When a country's population is below the optimum level, the country is said to be under-populated. Such a size of the population is inadequate to effectively and maximally utilize the country's resources. As such, there is no maximum output since the country's resources are not maximally tapped. Thus, the country suffers in the midst of plenty.



Conversely, when a country's population is above the optimum level, the country is said to be over-populated. Under the condition of over-population, the size of the population is beyond what the resources of the country can carry. As such, output is low. Some of the features of an over-populated society include overcrowding, high rate of unemployment, the development of slums and high rate of crime.

While an optimum population is an ideal towards which every society should strive, it is uncertain whether it is actually attainable. We do not know of any country in the world that has ever attained an optimum population, and it is doubtful whether any country shall ever attain it in the future. This is because it is not clear whether, resources in this case refer to only the resources that have been discovered or all the potential resources in a country since there may be some resources that are yet to be discovered; their discovery depends on the level of technological advancement. Therefore, it is possible for a country once described as over-populated to revert back to the condition of under-population when new resources are discovered. Let us, at this point, consider the effect of development on population growth and size.

Effect of Development on Population

The conventional wisdom that has tried to explicate the effect of development on population growth and size is the **demographic transition theory**. This theory which was originally put forward in 1929 by Warren Thompson was later developed in 1945 by Frank Notestein [2]. It is essentially the interpretation of the demographic histories of western industrialized societies as they experienced industrialization as well as economic and technological advancement. It identifies three main stages in the demographic histories of these countries.

The first stage which is the pre-transitional stage was characterized by high birth rates and high death rates. Death rates, though somewhat fluctuating, equated the high birth rates and consequently, population was stationary and also low. This was the pre-



industrial period in which the societies were mainly agrarian. Economic and technological advancement coupled with industrialization and urbanization ushered in the second stage which is the transitional stage. The economic and technological advancement with the concomitant improvement in health services and better nutrition resulted in a sharp decline in death rates, especially a decline in infant and child mortality, while birth rates remained high. The persistently high birth rates resulted in high and rapid population growth rate. As economic and technological development continued, birth rates eventually took a downward trend. This was the latter part of the transitional stage. At this stage, population growth became less rapid than it was at the early part of the transitional stage. Finally, there is the third stage which is the post-transitional stage (industrial stage) in which both births and deaths became equated, albeit at a much lower level than it was in the pre-transitional stage and again at which population became stationary although much larger than it was at the pre-transitional stage.

The overall understanding on the subject is that all countries will pass through these stages. It should also be mentioned that each country has its own unique pattern and each stage is marked with its own options, opportunities, challenges and vulnerabilities (see figure 2). Following the decline in mortality (Stage II), there is an increase in the population growth (a "population explosion"). As the gap between deaths and births grows wider so does the population. Another characteristic of Stage Two of the demographic transition is a change in the age structure of the population. In Stage One the majority of deaths are concentrated in the childhood ages, say the first 5 to 10 years of life. As such the decline in death rates in Stage Two entails the increasing survival of children. This means that the age-sex structure of the population becomes youthful. This trend is intensified as this increasing number of children enter into reproduction while maintaining the high fertility rate of their parents.

As an increasing number of young people become older and enter the productive age groups (15-64), the population reach a stage where there are more people in the working age groups than in the non-working age groups. This is what is commonly known as **demographic dividend** or **demographic bonus**. If countries/societies are able to put



these people to productive use then countries/societies will benefit. Otherwise the growing number of productive people will become a burden: **demographic curse**. In South Africa, we are supposed to be benefiting from this.

In the final stages of demographic transition when both fertility and mortality are low, the population tend to be characterized by an increasing number of older people (**Population Ageing**).

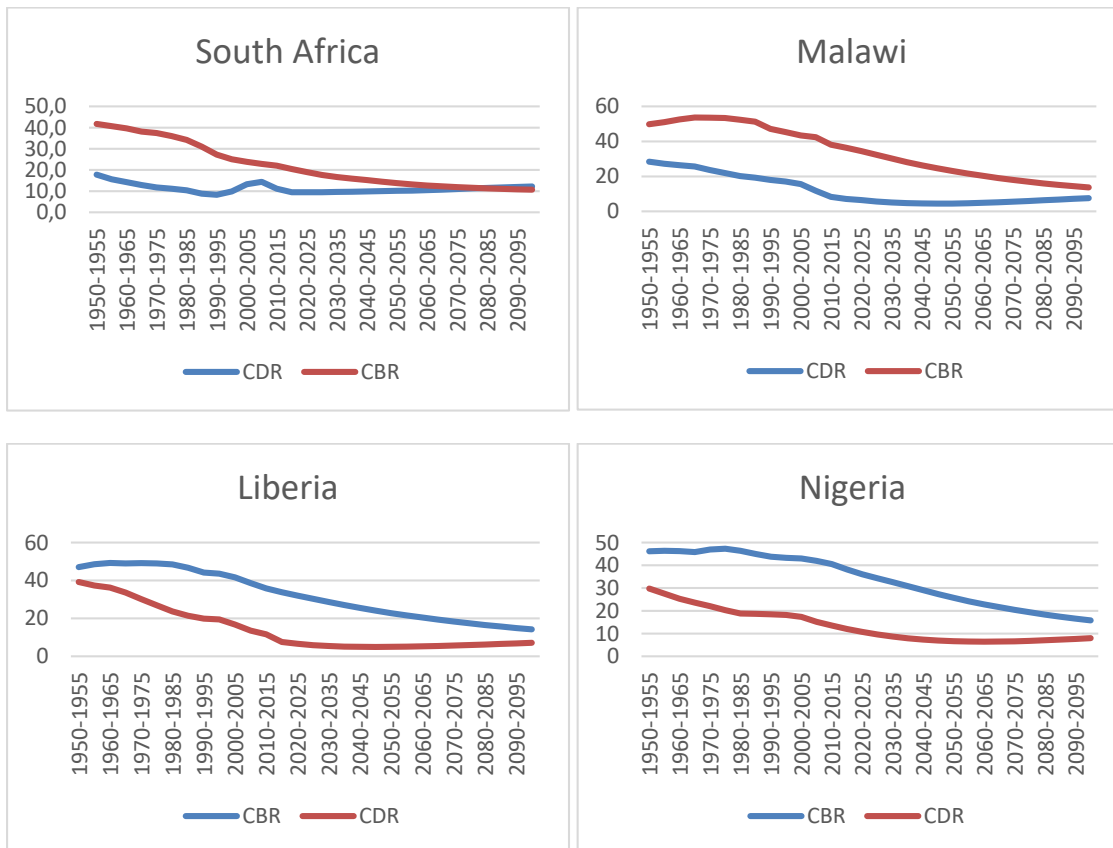


Figure 2: Trends in Crude Birth Rate (CBR) and Crude Death Rate (CDR) for selected African Countries, 1950-2100

Contributions to scientific knowledge

Madam Dean, ladies and gentlemen, let me now present very briefly on some of my humble contributions, as a demographer, to scientific knowledge. Whereas I started as a



demographer (1985-1996), and the focus of my research in the last two decades has been on population studies. Partly, that is why this inaugural lecture is entitled: “Repositioning Demography and Population Studies in Sub-Saharan Africa”.

Quality of Age-Sex Data

As I said before, demography deals with collecting, evaluating, analyzing and presenting data pertaining to human populations. As with other disciplines the data collected must be of good quality in order to produce reliable estimates of demographic parameters. One variable pertinent to demographic analysis is age.

Among the large volume of data gathered in a census, age and sex data play a vital role in population studies. The age-sex structure is one of the most fundamental characteristics of population composition. Past variations in the basic components of population change, i.e. fertility; mortality and migration are reflected in the age- sex structure. Conversely, the age-sex composition of a population affects its fertility behaviour, mortality and morbidity levels, migratory movements, labour force participation and a host of other factors. Further, the age-sex data are the basic inputs for making population projections both at national and sub-national levels. Age-sex data are therefore almost always essential for the analysis of population dynamics.

To some people, age is just a number but to a demographer age is beyond being a number and is extremely important demographic variable. This is the case because the estimates of most demographic parameters are a function of age. If we take South Africa for example, we start school at the age of 6, we are eligible to vote at the age of 18 and we retire at the age of 65. In addition, some diseases and health conditions are strictly age specific related. Unfortunately, for various reasons, the reporting and recording of age in demographic data is often fraught with many errors. These errors might take the form of coverage errors, content errors and sampling errors. In part, because of these challenges and the importance of age in demographic analysis, the evaluation and



adjustment of reported age statistics is an important aspect of demographic analysis. John Blacker [3] observes that

“One of the major problems of anyone concerned with African demography has been the widespread ignorance of age, more prevalent fifty years ago than now”

My argument has always been that it is not “ignorance of age” but the fact that in our African ontology what is important is knowing that this person is older than me.

In view of the importance of age-sex distributions, I have examined the quality of age-sex data in a number of African Countries. Two reasons keep on encouraging me to examine the quality of age-sex data. First, age being one of the most basic variables one would expect that most people would not have problems reporting their age. Mindful of the fact that ordinary members of the population still believe that “age is just a number”. However, to a demographer, age is a very important demographic variable. Age not only influences the three components of population change (fertility, mortality and migration) but also such social events as age at which an individual will start school, age at first sexual intercourse, age at marriage, age at first birth, vote age, age to buy cigarette, just to mention a few examples. Second, coming from an old school that assumes that age-sex data can be used to estimate other demographic parameters. I have this burning desire to estimate fertility, mortality from the reported age-sex distribution. I will share with you some of these estimates later in the lecture. For now, let me mention that I have published two papers on the quality of reported age-sex data [4, 5]. One paper is on Malawi [4] and the other one is on South Africa [5].

The paper I wrote on Malawi investigated the quality of the age-sex statistics in the country as reported in the 1966, 1977 and 1987 population censuses. The paper demonstrated that although the quality of age-sex data in Malawi remained poor there was improvement in the reported age-sex statistics since the first census in 1966. Following my migration to South Africa in 2002, the first thing that I did was to look at the

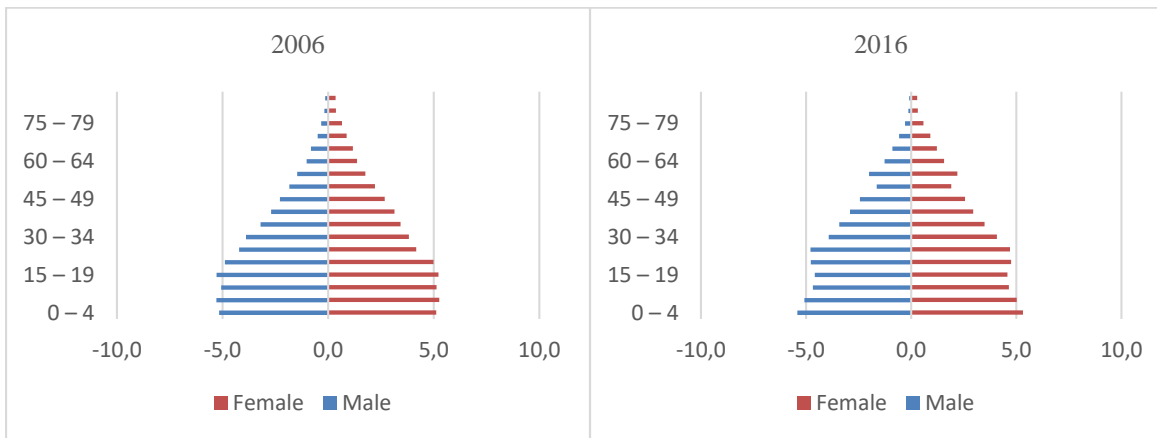
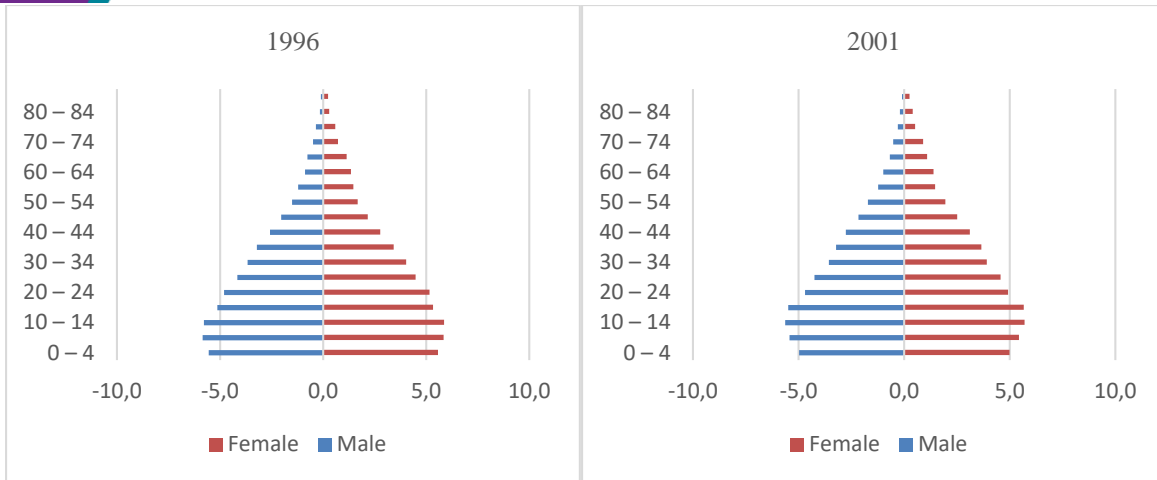


quality of age-sex data in the country. The initial draft was presented at a PASA annual conference that took place in Potchefstroom in 2003. A refined version of the paper was eventually published in 2017 [5]. The main finding of this paper was that the quality of age-sex data in South Africa is much better compared with what is found in most parts of sub-Saharan Africa. Furthermore, the reported age statistics show a preference of terminal digits 6, 4, 8, 0 and 2, implying a preference of ages ending in even numbers. Further research should establish the factors responsible for this pattern.

The UN Joint Age-Sex Score in the North West Province was 25 in 1996 declining to 23 in 2001 and increasing to 24.7 in 2011. For South Africa as a whole, similar values were 21.3, 21.2 and 22.6. The UN Joint Age-Sex Score for Malawi increased from 47.6 in 1966 to 49.5 in 1977 and declined to 36.7 in 1987. Thereafter, the score declined to 28.9 in 1998 and increased to 30.9 in 2008. The recent census indicates that a Joint Age-Sex score of 23.9. There is also a general improvement in the quality of reporting of the age-sex statistics.

In both Malawi and South Africa, and like in many other countries, age misreporting varies from one region or district to another. For instance, in South Africa, based on the Joint Age-Sex Score, the quality of the five-year age-sex statistics for the provinces can be ranked as follows: Northern Cape, Western Cape, North West, Gauteng, Kwazulu-Natal, Free State, Eastern Cape, Mpumalanga and Limpopo.





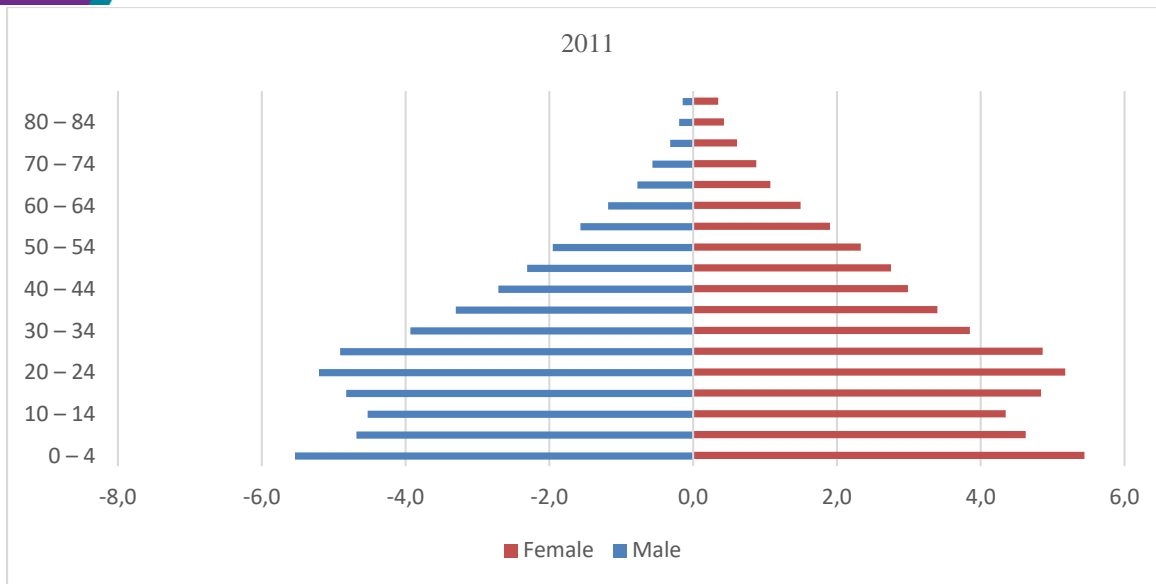


Figure 3: Population Pyramids for South Africa: 1996, 2001, 2011, 2016

Whenever new demographic data (in the form of population census and demographic survey) became available the first thing I look at is the age-sex distributions. All the other issues of demographic interest (such as fertility, migration and mortality) are dependent on age. As such, a good demographer is one who has an interest in age-sex statistics! As you will see later, I have used the reported age-sex distributions to study fertility and migration.

One thing that has encouraged me to get a special interest in the reported age-sex statistics is that age data depicts the country’s past demographic history in terms of fertility, mortality and migration. As such, distortions in the age distributions may either be real changes due to fluctuations in mortality, fertility and migration or arising from errors in data. This means that it is the duty of a demographer to distinguish between errors and real distortions.

Madam Dean, ladies and gentlemen, let me remind you that following the release of 2011 census in South Africa there was an interesting debate involving some leading demographers in the country. One group held the view that the results should not be released because there was need to critically examine the data quality whereas the other



group felt that the data was of good quality. Suffices to mention here that the debate hinged on the reported age-sex statistics. Although there was a cease fire, there was no adequate explanation of what exactly happened.

Fertility

South Africa is the first country to experience fertility decline in sub-Saharan Africa. Available statistics and literature indicate that fertility started declining in the sixties [6]. One of the factors associated with fertility decline in the country is higher prevalence of contraceptive use than any other countries in sub-Saharan Africa [6]. This is one of the reasons that motivated my interest in providing possible answer to the following question: why did South African women start using contraceptives in the sixties? In my modest way of contributing to the growing literature, I have done the following a) reviewed some of the major studies on fertility, b) estimated fertility based on the reported age statistics [7], c) decomposed fertility into such components as marital fertility, proportion married and age-sex composition [8].

In my paper published in 2013 [7], I used the 1996, 2001 and 2011 censuses and 2007 Community Survey to study levels, trends and differentials in fertility in South Africa using the Rele method that estimates fertility from the reported age distributions. At national level, Total Fertility Rate (TFR) remained constant at 3.3 children per woman between 1996 and 2001 but declined to 2.4 and 2.2 children per woman in 2007 and 2011, respectively. Variations in fertility were established by province and population group. Fertility is lower among the affluent provinces of Gauteng, Western Cape and Free State than the disadvantaged provinces of Limpopo, Mpumalanga, Eastern Cape and North West. Fertility has remained largely unchanged in Free State and Mpumalanga and has decreased in all the other provinces except Western Cape and Kwazulu-Natal which suggested a rise in fertility during the period under review.

Based on the successful application of the Rele method at national and provincial levels, I embarked on a project to estimate fertility at municipality level. Estimating fertility at the



municipality level ensures that relevant demographic parameters are available at these levels. Some of the preliminary findings of this project were presented at a conference that was held at the North-West University, Mafikeng Campus [9].

In order to understand the nature and patterns of fertility decline in South Africa, I also used decomposition method to decompose the changes in CBR into changes in the age structure, proportion married and marital fertility [8]. The study showed that the decline in CBR observed during the 1996–2001 period could be attributed to changes in proportion married (150%) and changes in marital fertility (10%) whereas changes in the age structure increased fertility by 60%. This finding demonstrates the importance of nuptiality as a factor influencing fertility in South Africa contrary to the belief that “marriage has lost its value as a determinant of fertility” in the country.

I have also used decomposition analyses to study the components responsible for fertility decline in Malawi [10]. It is believed that fertility in Malawi has been declining since the late 1980s. However, the decline in fertility in Malawi was not in line with the increase in contraceptive use. The decline in Total Fertility Rate from 5.7 in 2010 to 4.6 in 2015 implies a reduction of one child per woman in a period of five years. This suggests that Malawi is experiencing one of the fastest fertility declines on the continent. This paper uses Demographic and Health Surveys and decomposition techniques to reexamine fertility trends in Malawi. Fertility decline is concentrated within the younger ages. The contribution of changes in marital fertility was 65.0% and 89.8% between 1992-2000 and 2000-2004 respectively whereas changes in proportion married was the main contributor to fertility decline during the periods 2004-2010 (77.9%) and 2010-2015 (92.6%). The findings demonstrate the importance of changes in nuptiality as a factor influencing the level and patterns of fertility in Malawi.

Marriages in South Africa, like elsewhere in the world, are undergoing changes. Early and universal marriages, if they ever existed, are no longer the norm. Available statistics indicate that there is a) increasing proportion remaining single b) increasing proportion of couples separated and/or divorced b) increasing proportion of people who remarry and



increasing age at first marriage. I have examined the factors influencing age at marriage in Malawi [11] and explored the changing patterns of marriage in South Africa [12-14]. The study examined emerging marriage patterns in South Africa using the 1996 and 2001 population censuses and the 2007 Community Survey. The study established that mean age at marriage for men and women in South Africa is high and increasing and more men and women are staying single or not marrying at all. The percentage of the population in the childbearing age groups that has never married has increased from 53% in 1996 to 54% in 2001 and 58% in 2011. The percentage of married women has decreased from 35% in 1996 to 30% in 2001 and 27% in 2011 whereas the percentage living together has increased from 6% to 9% over the same period. These changes are attributed to social and economic conditions such as increasing education levels, employment of women, urbanization and modernization. More studies should be undertaken in order to understand the causes and consequences of the changing marriage patterns in South Africa.

Earlier studies in South Africa have shown that age at marriage has been rising gradually and that South Africa is characterized by late marriage as well as substantial numbers delaying marriage until they are in their 30s. Urbanization and educational development have been the key factors associated with the increase in age at marriage. This paper examines inter-provincial differences in age at marriage in South Africa. The measure of the timing of family formation used in this analysis is Singulate Mean age at Marriage (SMAM). The SMAM values are computed by applying Hajnal's technique to data obtained from the 1996 and 2001 population censuses and the 2007 Community Survey for each sex for South Africa's nine provinces and four population groups. The usefulness of Geographical Information Systems (GIS) in the presentation of spatially distributed differentials was also demonstrated in the paper. Results show that there is considerable variation in marriage patterns between provinces and population groups with Kwazulu-Natal having the highest mean age at marriage whereas Gauteng has the lowest mean age at marriage. Furthermore, mean age at first marriage was found to be very late among African and Coloured males and females (above 27 years), and a moderately high mean



age at first marriage among Indians and whites (24-27 years). These variations could be attributed to the wide regional variations in economy, culture and living conditions.

In an effort to understand the factors responsible for fertility decline, demographers came up with various frameworks. One of the commonly used frameworks is the Intermediate Variable Framework proposed by Davis and Blake and later modified and popularized by Bongaarts [15, 16]. I have used the Bongaarts framework to understand the nature and patterns of fertility in Malawi [17], South Africa [18] and Namibia [19]. The examination of the proximate determinants in Malawi revealed that the fertility suppressing effects of postpartum infecundability are more important than the effects of contraception and marriage patterns in explaining fertility levels and trends in the context of Malawi. Figure 4 illustrates the application of the method using South African data. In terms of South Africa and Namibia, the fertility suppressing effects of marriage are more important than the effects of contraception and postpartum infecundability in explaining fertility levels and trends in the context of Namibia; the indices of marriage and contraception and an increase in the index of postpartum infecundability. The change is greatest in contraceptive, moderate in marriage and least in breastfeeding.

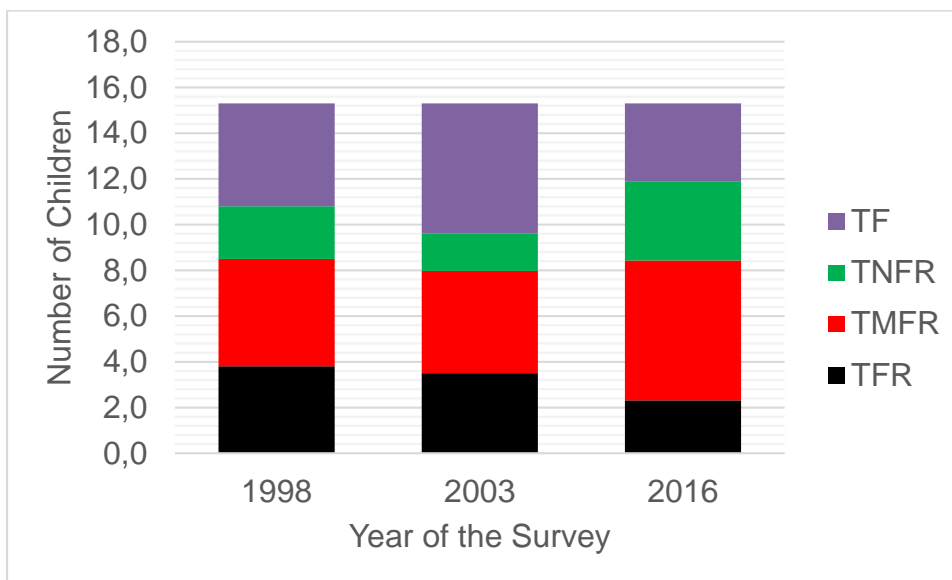


Figure 4: Proximate Determinants of Fertility, South Africa, 1998, 2003, 2018



Fertility varies from one individual to another, from one area to another. In order to understand fertility patterns in Malawi, I also looked at fertility differentials in Malawi by ethnic groups [20]. Although all ethnic groups in Malawi exhibit high fertility (TFR in excess of 5), the existing differentials are such that the *Chewa and Sena* (TFR in excess of 7) exhibit high fertility whereas the *Nkonde, Tumbuka, Tonga* and Lomwe could be categorized as having low fertility and the rest of the ethnic groups in Malawi could be categorized as moderate. The results of regression analyses are consistent with the cultural hypothesis since significant fertility differentials remain even after controlling for socioeconomic and demographic variables [21].

Despite the rapid increase in contraceptive use, until recently fertility decline in Malawi has been very slow. This motivated me to explore the socioeconomic and demographic factors associated with fertility levels at regional level in Malawi [22]. Using the 2010 Malawi Demographic and Health Survey data and Poisson Regression Model, the correlates of fertility across regions were estimated. The study found that Central Region had the highest fertility levels followed by Northern Region. Nationally, this was attributed by women's age, education, wealth status and year of marriage. On behaviour perspectives, it was observed that living number of children and ideal number of daughters influenced fertility position.

I have also examined the factors associated with high fertility in Nigeria [23, 24]. Nigeria ranks among the high-fertility countries in sub-Saharan Africa. Studies that examine the relationship between fertility dynamics and education are important to improving maternal and child health. This study used 2008 Nigerian DHS dataset on births history of married women of childbearing age. Data were analyzed using ANOVA, Kaplan-Meier and Cox-proportional hazard models. Mean CEB were 6.72 and 4.31 among women with no formal education and higher education respectively. The majority of the women (38.6%) left 24-35 months births-interval. Women with lower education exhibited shorter births-interval and higher completed fertility than more educated women. The Births Progression Hazard Ratio from marriage to 1 birth was higher among highly educated women than those with



no education, but the reverse pattern was observed at higher order births. This pattern barely changes after controlling for other socio-demographic variables. Education remains an important factor in fertility dynamics in Nigeria; therefore, existing policies addressing female's education should be sustained.

Another important variable which has been identified and consistently reported in the literature as an important predictor of fertility is child's gender preference (GP). However, in the African context the link between women's fertility intention, GP and Living Children's Sex Composition (LCSC) as found in one of my studies is less explored. Using data extracted from the 2010 Malawian DHS and focusing on married women aged 15-49 years (n=1739) in stable unions who currently have at least 5 living children, we found that 39.7% of the women have GP and a higher proportion (23.3%) has preference for females [24]. Age, region, wealth-quintile, religion, residence and family planning programmes were significantly associated with fertility intention. Women who have GP and same LCSC were 1.35 and 2.4 times significantly more likely to have intention to bear more children than those who have no GP and different sexes composition respectively. These odd ratios changed to 1.38 for GP and 2.44 for LCSC after adjusting for other socio-demographic variables. These results indicate that GP and LCSC significantly influence women's intention to bear more children. Women should stop childbearing after attaining their desired number, irrespective of the LCSC.

Mortality

Exodus 15:26

And He said, "If you will give earnest heed to the voice of the LORD your God, and do what is right in His sight, and give ear to His commandments, and keep all His statutes, I will put none of the diseases on you which I have put on the Egyptians; for I, the LORD, am your healer."



In the area of mortality my contribution has been in estimating infant and child mortality rates [25, 26]. Mortality rates in Malawi are high though they have declined in recent decades. Mortality at the beginning of life has always attracted the attention of demographers, policy and decision makers. One of my classmates in the Master's class at LSE commented: "I must count myself lucky to have survived the scourge of high infant morbidity and mortality in Malawi". This encouraged me to undertake a study on "Estimates of Infant and Childhood Mortality in Malawi". As such, one of my early publications was on the "Mortality Levels, Trends and Differentials in Malawi". This study confirmed the existence of high infant and childhood mortality in Malawi, though it was declining [26]. The study also established that there were differentials by regions. Infant and child mortality being highest in the Central Region, followed by the Southern Region and lowest in the Northern Region. The observed levels, trends and differentials were attributed to poor social and economic conditions.

Another one of my contribution in the area of mortality is the calculation of "Working Life Tables for South Africa, 1996-2001". This was the first ever attempt in Southern Africa to apply the life table methodology to the analysis of the working population/labour force [27]. In most cases, demography lecturers, always tell their students that the lifetable approach is used in studying other events such as labour force.

Migration

Leviticus 19:33-34 "When a stranger sojourns with you in your land, you shall not do him wrong. You shall treat the stranger who sojourns with you as the native among you, and you shall love him as yourself, for you were strangers in the land of Egypt: I am the Lord your God."

Another important component of population change is migration. Although most demographic models tend to assume that net migration is zero, in certain countries, such as South Africa, migration is an important component of population change. In the past, at national level, one could safely assume that net migration is zero. The same cannot be



said at sub-national levels (province/regions and districts). In modern times, as a results of globalization, migration is on the increase at all levels. Migration is complex and sensitive. My work in this area has been in generating estimates of net migration. I have been particularly interested in estimating net migration from the reported age-sex distribution using census survival ratio method. This method has been under-utilised in demographic research in South Africa, but it has the potential to be of much help in estimating migration at sub-provincial levels (district, municipalities). I have applied this method to Malawi [28], Nigeria [29] and South Africa [30, 31]. The results are encouraging and am currently advocating the use of the method to estimate net migration.

When the method was applied to South African data [31], the results indicated that during the inter-censal periods 1996-2001 and 2001-2011, Gauteng and Western Cape were the major receiving provinces, whereas the other remaining provinces were the sending provinces in the country. These results are consistent with findings based on other estimation procedures and correspond to the nature of social and economic development in the country. The method was also applied to study the nature and patterns of net internal migration at sub-provincial levels. For North West Province, the use of the method indicated that during the inter-censal period 1996-2001 North West province experienced net out-migration [30]. There are migration differentials by region, municipalities and gender. Bojanala and Dr. Kenneth Kaunda regions experienced net in-migration whereas Ngaka Modiri and Dr. Ruth Mopati municipalities experienced net out-migration. One policy implication of the study is that efforts should continue being made to make the sending municipalities more attractive so as to reduce the inflow of people to the crowded and more affluent municipalities.

The application of the method to Malawian data enabled me to study migration patterns for the periods 1967-1977, 1988-1998 and 1988-2008. The results depicted in figure 5 indicate a changing pattern of internal migration in post independent Malawi. Northern Region has moved from being a net sender to a receiver whereas Southern Region has remained to experience net out migration and Central Region continues to experience net



in-migration. The observed migration patterns are consistent with the nature of social and economic development in the regions. At the time of independence in 1964, Southern Region was the most developed region in the country. The establishment of Lilongwe as an administrative capital saw an influx of the people from other regions.

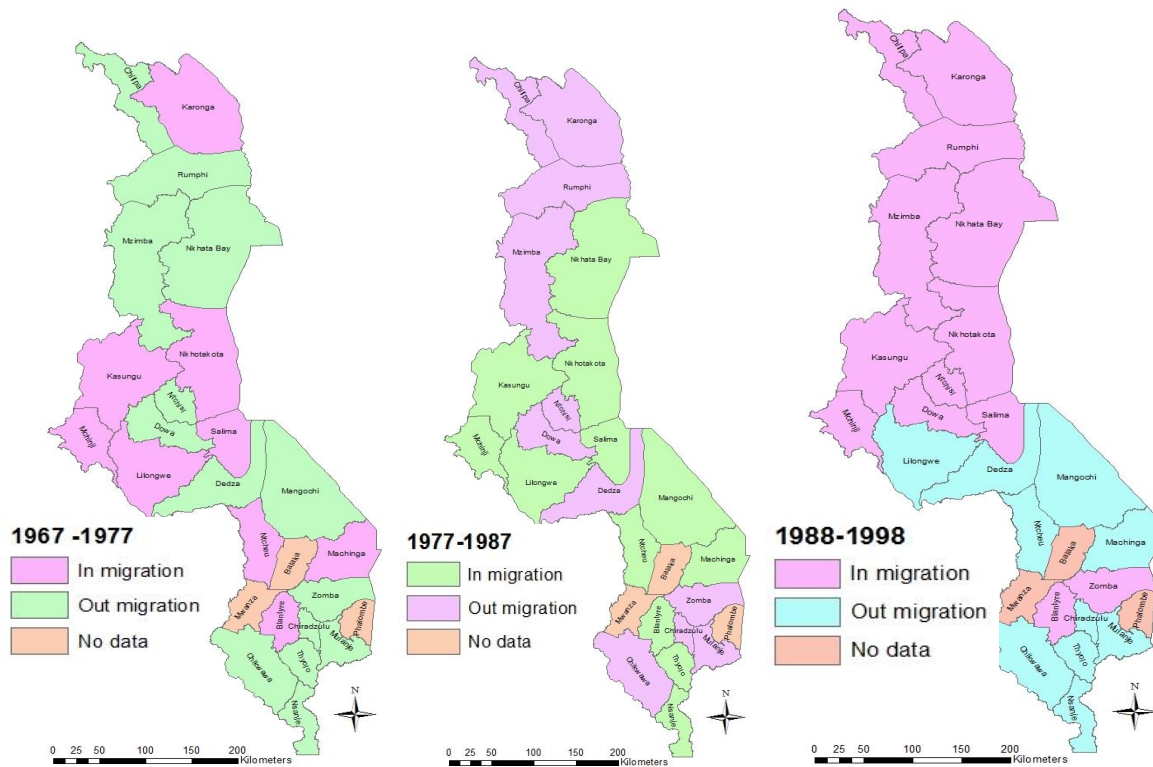


Figure 5: Migration Patterns in Malawi, 1967-77, 1977-1987, 1988-1998

In the case of Nigeria, application of this method indicated that North Central, South East, South South and South West experienced net- in migration whereas North East and North West experienced net out migration [29]. The above migration patterns resemble the nature of social and economic development in the country.

Population Projections



After evaluating and adjusting age-sex data and estimating the demographic parameters (fertility, mortality, migration), the most logical thing a demographer does is to describe the characteristics of the population and estimate the future size and structure of the population. In a paper that was published in 1996, I described the population of Malawi at that time as a young population, experiencing high fertility and a declining mortality [32]. Following the release of the 1998 census, this paper was refined and updated in 2000 [33]. At that time, the population of Malawi could safely be said to be in stage two of the demographic transition. I have also done the same for South Africa [21].

Estimating the future size and structure of the population is commonly known as population projections and involves making assumptions about how demographic parameters could be like in future. I carried out this study for Malawi [34]. The results indicate that the population of Malawi is likely to continue to grow despite the negative impact of the HIV/AIDS epidemic. The population of Malawi is expected to increase from 9.92 million in 1998 to 13.52 in 2010 and to 16.84 million in 2020. The population projections presented in this study are not about predicting the future as much as they are about exploring the consequences of today's trends. These are intended to show what the future could look like if today's trends continue for the next decade or two. As in the case of Malawi, the predicted future is sufficiently undesirable that it should serve to focus our attention on implementing programmes today that will protect people from HIV infection and promise a brighter future.

It is also worth mentioning that in most countries, one of the end products of a census operation is to carry out population projections. With the exception of the 1998 population census of Malawi, each subsequent census has an associated population projection. Comparing the 1998 population projections produced by the National Statistical Office to my projections, I note with appreciation that my projections were closer to the 2008 population than the official forecast.

Reproductive Health



Following the International Conference on Population and Development (ICPD) that was held in Cairo, Egypt, in 1994, there has been a shift in my niche from a purely demographic research to population research

Family Planning

Madam Dean, ladies and gentlemen, my interest in family planning was ignited in the early 1990s. After completing my doctoral studies, I was part of the national steering committee tasked with the development of the first national population policy in Malawi (1994-2002). The committee organized several workshops at which various position papers were presented and discussed. The official position at that time was to support **child spacing** and not **family planning**. In the course of the various workshops, it emerged that what was needed in Malawi to address the challenge of rapid population growth was a national family planning programme.

In 1996, I joined the National Family Planning Council of Malawi (NFPCM), an organization that was responsible for coordinating, supporting and advocating family planning and other reproductive health programmes in Malawi. In that position I facilitated the establishment of the Family Planning Association of Malawi (FPAM), an affiliate of International Planned Parenthood Federation (IPPF). I was a part of the team that carried a number of research projects in the area of family planning.

It was also in the early 1990s that Malawi participated in the Demographic and Health Survey programme. In fact, the first round of DHS was conducted in 1992. This was supposed to be followed by another DHS, but officials at that time decided to call it “Knowledge, Attitudes and Practices in Health Survey 1996”. Unlike in other countries, at that time, there was very little further analysis of the existing DHS data. In part, this was due to the limited number of individuals with the necessary skills to conduct further analyses of the data. In addition, it appeared to me that most officials involved in the DHS were not interested in further analyses. I approached USAID to assist interested researchers like me get access to DHS data and conduct additional analysis of the data. USAID told me that they worked with government departments and it would be prudent if



I channeled my request through the relevant government department. A meeting was hurriedly convened to hear my request. All members who attended the meeting were government officials and they saw nothing wrong with the way things were being done. Disappointed by the outcome of this meeting, I resolved that I would embark on the secondary analysis of the existing DHS data.

I have looked at the levels, trends and determinants of contraceptive use in Malawi [35-38] and factors influencing non-use of contraceptives in Burkina Faso [39]. Although Malawi is a newcomer in the terrain of family planning the country has registered an impressive increase in contraceptive use. Contraceptive prevalence rate (CPR) for all the methods for currently married women rose from 13.0% in 1992 to 24.6% in 2000, 25.5% in 2004, 45.8% in 2010 and 58.8% in 2015 [40-44]. These statistics suggest that contraceptive use in Malawi quadrupled in less than two decades after the reintroduction of family planning. Despite the increase in contraceptive use, Total Fertility Rate (TFR) has not declined as much, especially during the period 1992-2010. This observation has been a constant source of discussion among researchers [45-47].

Apart from the increase in contraceptive prevalence, a marked change has also occurred in the array of methods used for contraception. In 1992, the most commonly used methods were Pills (2.2%), Rhythm (2.2%), female sterilization (1.7%), male condom (1.6%), injectable (1.5) and withdrawal (1.5%). By 1996, the uptake of all contraception with the exception of traditional methods increased. Use of injections more than doubled during 1992-96 period. In 2004, the most commonly used methods were injections (13.9%), female sterilization (4.8%), male condom (1.7%), pill (1.5%) and withdrawal (1.5%). The same pattern is observed in 2010. The most preferred method of family planning in 2015, is injectable, followed by implants and then female sterilization. These statistics indicate that at the time of initiation of the family planning programme in Malawi in 1994, the pill was the most popular method of family planning, which was overtaken by injections, implants and female sterilization as the most preferred methods. The results show that the major determinants of contraceptive use are age, respondents' and partners' approval of family planning, family planning discussion with partner, number of



living children, work status, education and visit to a health centre. As a policy measure, information, education and communication programmes on family planning should be intensified, particularly in rural areas and targeting men.

Another one of my papers on contraceptive use in Malawi focused on the contraceptive choices [48]. In this paper, I used data from the 2000 and 2004 Malawi Demographic and Health Surveys to examine the factors explaining the contraceptive method choice in Malawi. The overall proportion of users relying on female sterilization rose from 1.7% to 7.5% whereas the proportion of users relying on injectables increased from 1.5% to 19.2% between 1992 and 2010. The proportion of married contraceptive users relying on the pill remained unchanged at 2% and the proportion using condom increased slightly from 1.6% to 2.7% over the same period. Use of traditional methods declined from 5.7% to 3.2%. Multinomial logistic regressions were used to study the determinants of the contraceptive method-choice. The results show that the major factors influencing the use of injectable, sterilisation, pills, condoms and other methods are age, partners' approval of family planning, family planning discussion with partner, number of living children, work status, education and visit to a health centre. As a policy measure, information, education and communication programmes on family planning should be intensified, particularly in rural areas and targeting men.

Disappointed with the little progress in terms of decline in fertility vis-a-vis increased contraceptive use. I further explored the topic of Long Acting and Permanent Contraceptives (LAPCM) [37]. The study revealed the prevalence of current use of LAPCM was 20.0%. Use of LAPCM is positively associated with increasing empowerment level ($p < 0.001$). Mean age and empowerment score of women who are currently using LAPCM were 38.53 ± 6.2 years and 6.80 ± 2.9 respectively. Urban women (22.2%) were currently using LAPCM more than rural women (19.4%) $p < 0.001$. Women who belong to the Seventh Day Adventists/Baptist were 1.51 (C.I.=1.058-2.153; $p = 0.023$) more likely and Muslims were 0.58 (C.I.=0.410-0.809; $p = 0.001$) less likely to use LAPCM than Catholic women. Being in the richest wealth quintile (OR=1.91; C.I.=1.362-2.665; $p < 0.001$) promotes current use of LAPCM than poorest. The likelihood of currently using



LAPCM was higher among women who have access to FP programmes on media and increases consistently with increasing women empowerment level even when other potential confounding variables were used as control.

I have also examined the factors influencing contraceptive use in Burkina Faso [39]. Burkina-Faso (TFR=6.0) is among the top-ten high fertility countries world-wide and CPR (15%) among women is low. This study examined the factors associated with non-use of modern contraception among married women residing in the rural areas of Burkina-Faso. The study used 2010 Burkina Faso DHS data-set and focused on married women aged 15-49 years (n=7,191). Chi-square and logistic regression techniques were used for the analysis ($\alpha=5\%$). Mean number of living children was significantly higher among women who have UNMC (3.92) than those with met need (3.01). Modern CPR and UNMC among married women was 12.7% and 40.7% respectively. The multivariate analysis reveals that being married more than once increases the likelihood of UNMC (OR=1.304;C.I.=1.082-1.571, $p<0.05$). Husband's approval of FP is a protective factor of UNMC (OR=0.858;C.I.=0.756-0.975, $p<0.05$). Husband's approval and health education on benefits of FP are important factors to consider in strategies aimed at reducing UNMC in Burkina-Faso.

Given that African countries exhibit high fertility and wide inequality in wealth distribution, my colleagues and I wanted to explore the gap in modern contraceptive use and fertility between women in the richest and poorest wealth quartiles [38]. Using 2010 Malawi DHS, we demonstrated that fertility was higher and the use of modern contraceptive was lower among women in the poorest quartile than their counterparts in the richest quartile. The main recommendation that emerged from this paper is that availability of modern contraceptives at little or no cost may bridge the gap in contraceptive use between women in the poorest and richest quartiles in Malawi.

In order to understand the factors influencing contraceptive use, I and one of my post-doctoral fellows looked at contraceptive use among women with no fertility intention in Nigeria [49]. The motivation for this study was that high fertility (HF) remains a public



health problem and the intention to reduce fertility is a global phenomenon. In addition, the health hazards and economic burden of HF on women are enormous. Contraception is a widely known fertility reduction method. Achieving desirable MDGs and PoA of 1994 ICPD would be an illusion if research on the relationship between fertility intention and contraceptive use is marginalised. The study focused on 2,257 women of childbearing age who do not have any intention to bear more children and utilized the Nigeria Demographic Health Survey, 2008 dataset. Data were analyzed using Chi-square, binary and multinomial logistic regression ($\alpha=5.0\%$). The mean ages of the women and children ever born were 40.91 ± 5.73 years and 6.28 ± 2.62 respectively. The prevalence of Current Use of Any Contraceptive Method (CUACM) was 37.6%, with 12.4% and 25.2% currently using natural and modern family planning methods respectively. About 7.0% of women in the poorest wealth quintile are CUACM compared to 61.8% of those in the richest wealth quintile. The current use of modern contraceptive prevalence rate was strikingly higher among *Yorubas* (41.8%) than Hausas (3.6%). Multivariate analysis identified age, region, residence, education, ethnicity and family planning media exposure as significant predictors of CUACM. In addition, religion and decisions on how to spend family income were identified as predictors of current use of modern contraceptive methods ($p<0.05$). The revelation from this study is that the use of contraceptives is not adequately practiced in Nigeria. The identified predictors of contraceptive use in this study should be considered while designing strategies to improve the adoption of contraceptives in Nigeria

Unwanted pregnancies

Available statistics indicate high levels of unintended pregnancies in Africa. Unintended pregnancies are associated with many social ills that are prevalent in our society. Some of these social problems include unsafe abortion and child abandonment. My study on unwanted pregnancy examined the prevalence and determinants of unintended pregnancies in Malawi based on 2,144 pregnant women extracted from the 2010 Malawian Demographic and Health Survey [50]. Data were analyzed using univariate, bivariate and multinomial logistic regression models. Nearly 43% of the pregnancies were unintended of which 25% were mistimed. Multivariate analysis indicated that mistimed



pregnancies are significantly influenced by the age of the respondent, fertility preference and number of children ever born. Among the variables that significantly increased the likelihood of unwanted pregnancies are age of respondent, wealth status, fertility preference and region of residence. The study recommends the strengthening of family planning services in order to reduce the level of unintended pregnancies. Focus should be on couples in Central Region and those with a large number of children.

In another study where I, in collaboration with other African academics, attempted to document the relationship between early child bearing and early marriage and educational attainment in Africa [51]. Early childbearing (EC) and Child Marriage (CM) are harmful demographic practices that often limit girls' opportunities in life including education. We examined the independent and joint influence of Age at First Birth (AFB) and Age at First Marriage/Cohabitation (AFMC) on educational attainment. The study utilized Demographic and Health Survey datasets on women aged 25-49 years from 16 countries in sub-Saharan Africa. Data were analyzed using linear and logistic regression ($\alpha=.05$). The results indicate that mean AFB ranges from 18.66 ± 4.0 years in Uganda through 21.31 ± 3.8 years in Burundi. Also, the mean AFMC was highest in Namibia (23.58 ± 6.1) and least in Burkina Faso (17.76 ± 3.0). The highest proportion of women attaining At Least Secondary Education (ALSE) was found in Zambia (62.2%) and least in Burkina-Faso (5.9%). Independently and jointly, EC and CM hinder educational advancement. In Burundi, as the case for other 15 countries, the likelihood of attaining ALSE was higher (OR=2.76; C.I=1.82-4.18, $p<0.001$) among women who had first birth at ages ≥ 18 years than their counterparts who had theirs at ages < 18 years. In Nigeria, the likelihood of attaining ALSE was 7.52(C.I=6.97-8.10; $p<0.001$) more than that of those who married earlier than 18 years. Interaction of the influence of AFB and AFMC also produce positive effect on number of years of schooling in all the studied countries. The study concluded that EC and CM have strong negative influence on educational advancement of women in sub-Saharan Africa. As such we recommended that policies targeting these harmful practices should be enacted in the region.

Adolescent Reproductive Health



Adolescents are children between ages 10 and 19. As a non-homogeneous group, adolescents are embedded in a complex societal matrix (as shown below) which also tends to influence their behaviours. Adolescence is a transition period that is highly challenging and accompanied by bio- physical, emotional and psychosocial changes some of which require personal and social adjustments. It involves periods of stress, innovation, experimentation and disorganization. It is a period when the adolescent, though largely dependent on parents, would prefer to be perceived as an adult. However, from this phase of life to adulthood, there are five major transitions which the adolescent has to go through. These include the transitions of learning, work, marriage, family and citizenship.

High adolescent fertility is recognized as a global challenge given, its adverse consequences. In this regard, understanding the factors that influence adolescent fertility is critical to addressing this challenge. This study aims at examining the causes of adolescent fertility in Malawi using the 2010 Malawi Demographic and Health Survey[52]. Bivariate analyses and logistic regressions were used to identify the determinants of adolescent fertility while Bongaarts model was used to determine proximate determinants of adolescent fertility. The study revealed that 20% of the adolescents had ever given birth. The most important factors influencing adolescent fertility in Malawi are age, region, type of residence, marital status, education level and knowledge and use of family planning. Bongaarts model revealed that the suppressing effects of marriage are significant followed by the effects of postpartum infecundability and contraception. These determinants of adolescent fertility as revealed in this study should be the center of adolescent sexual and reproductive health interventions.

Adolescent childbearing in sub-Saharan Africa remains high, while access to and use of contraception is low. I am interested in determining the factors influencing non-use of contraception among young people. I have published two studies in this area [53, 54]. The aim of the study was to examine the trend and demographic determinants of contraceptive use among female adolescents in Malawi [53]. The analysis was based on



the data from the 2000, 2004 and 2010 Malawi Demographic and Health Surveys and the study population comprised of female adolescents aged between 15 and 19 years. Bivariate and multivariate logistic regression analyses were used to establish the relationships between socioeconomic variables and current use of contraception. The results indicate that majority of the female adolescents never used contraceptives. The use of contraceptive among female adolescent increased from 8.3% in 2000 to 8.5% in 2004 and 9.6% in 2010. The most commonly used contraceptives among female adolescents are injectables, male condoms and pills. Logistic regression results indicated that age, marital status, education, number of living children, sex of household head and told family planning at health centre predict female adolescent's use of contraceptives. This study therefore recommended that programmes and policies should pay attention to the significant predictors of contraceptive use in this study in order to increase contraceptive use among female adolescents.

The second paper examined factors associated with teen mothers' use of modern contraceptives after giving birth. This study is based on a sample of 12,911 teen mothers aged between 10 and 18 years extracted from the 2010 Malawi Demographic and Health Survey and logistic regression model was employed to estimate the correlates of contraceptive usage. The study found that 54.8% of the teen mothers are still at a risk of having a repeat teenage pregnancy due to their non-use of contraceptives. This implies that less than 50% of teen mothers use contraceptives after experiencing teen birth. It is noted that health care factors such as use of antenatal care, awareness of pregnancy complications, attainment of primary education and exposure to media predict teen mothers' use of modern contraceptives.

As I have been working on Adolescent Fertility, I came across certain patterns that I would like to explore further. The journey to womanhood and childbearing patterns vary from one country to another and within Africa from one region to another region (see Figure 6). I was particularly fascinated by the pattern in Southern Africa. The typical Southern African journey to womanhood is as follows: a woman reaches menarche, becoming sexually active, give birth, then marries, gives birth to the second child, reaches



menopause. For the rest of the regions in Africa this journey is as follows: a woman reaches menarche, becoming sexually active, gets married, then gives birth to the first child, second child and reaches menopause.

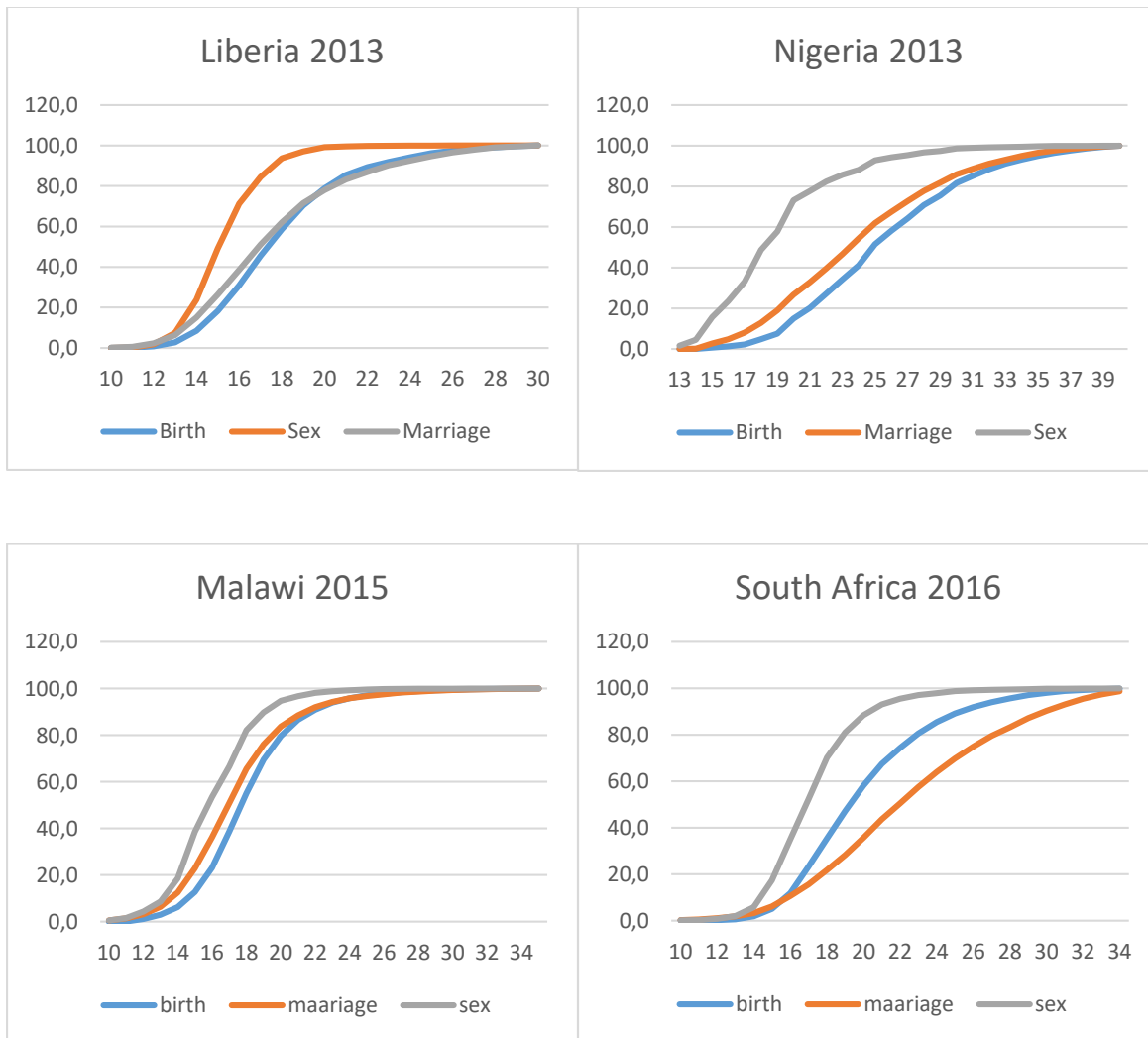


Figure 6: The relationships among age at first sex, age at first marriage and age at first birth in selected African countries

Maternal health

Giving birth is supposed to be a happy occasion in African context, but, unfortunately, during the childbearing process a number of women lose their lives. In South Africa,



maternal mortality is a reportable cause of death, implying that whenever a maternal death occurs it has to be reported to the National Department of Health. The Maternal Mortality Ratio (MMR) of 138/100000 in South Africa (in 2015) is one of the lowest in sub-Saharan Africa.

At one point in time, Malawi had one of the highest Maternal Mortality Ratios in the world. However, in the recent times, MMR has declined tremendously. Available evidence indicate that MMR almost doubled between 1992 (620 maternal deaths per 100000 live births) and 2000 (1120/100000) in 2000), declining to around 984/100000 in 2004, 675/100000 in 2010 and 475/100000 in 2015 [40-44]. Despite this commendable decline, MMR remains unexpectedly high in Malawi compared to what is obtainable in some countries in sub-Saharan Africa and developed countries. One factor associated with maternal mortality is non-use of maternal health services. In order to understand the factors responsible for high maternal mortality in Malawi, I conducted several studies in this area [54-58].

Given that most studies tend to focus on institutional delivery, one of the early studies I conducted in this area was on understanding the factors responsible for non-institutional deliveries in Malawi [58]. Using data from 2004 Malawi Demographic and Health Survey, I explored the association between place of delivery and selected socio-economic factors. The study revealed that in 2004, nearly 58% delivered at a health facility, 29.4% delivered at home and 12.6% delivered at the home of a traditional birth attendant. Multivariate analysis suggests that region (OR = 1.29 for Central Region), place of residence (OR=0.319 for urban areas), wealth status (OR=6.289 for poor, OR=4.683 for middle), education (OR=3.823 for no education, OR=2.265 for primary education), number of prenatal visits (OR=4.732 no visits, OR=1.696 1-3 visits) and ever use of family planning (OR=1.29 for never used) showed significant association with non-institutional deliveries.

A follow up study investigated the factors influencing women's utilization of public health care services during childbirth in Malawi Public health facility utilization [55]. The study revealed that of the 23020 women respondents in 2010 MDHS, 8454(36.7%) chose to



give birth in public health facilities. Multivariate logistic regression analysis showed that the frequency of antenatal care (ANC), birth order, women's education, wealth status and quality of care were major predictors increasing women's choice to use public health facilities at childbirth. It was therefore concluded that there is need to use multimedia approach to engage women on the significance of utilizing public health facilities during childbirth and promote quality of care in facilities if their health outcome is to improve in Malawi.

One aspect that has emerged in various studies on maternal health utilisation is rural-urban differences. Most studies reveal higher use of maternal services in urban areas than in rural areas. In addition, in most countries, there is underutilisation of postpartum care services. Low use of post-care maternal services also contributes to high maternal mortality and morbidity. As a result of these factors we conducted a study to examine the factors associated with women's use of postpartum care services in urban areas as compared to the rural areas in Malawi using data extracted from the 2010 Malawi Demographic and Health Survey [57]. Of the 13776 women that constituted the sample, 7018 (50.9%) reported using postpartum care services. Caesarean delivery in both urban [odds ratio (OR)=3.98; 95% confidence interval (CI): 2.27– 6.98] and rural settings (OR=3.56; 95% CI: 2.91–4.36) greatly increased women's likelihood of using postpartum care. On the contrary, problems of availability of health services decreased women's likelihood of using postpartum care services in both urban (OR=0.75; 95% CI: 0.57–0.97) and rural settings (OR=0.87; 95% CI: 0.80–0.93). Further, pregnancy complications, low levels of women's education, difficulties in accessing available healthcare facilities and low media exposure were significantly associated with women's delay in using postpartum care services in rural Malawi compared to their counterparts who used the services within 24 hours after childbirth. The study concluded that in both urban and rural settings, women's use of postnatal care services remains low. The influence of low socioeconomic and service quality factors was prominent in rural areas more than in urban areas. This information is significant to health policy stakeholders to understand the ways that could be adopted in order to enhance quality and use of postnatal care services. Therefore, there is need to promote women-centred and community-based



awareness in enhancing the use of postnatal care in urban and rural areas, if maternal health outcomes are to improve in Malawi [57].

Despite promotion by many stakeholders to improve maternal health outcomes in many developing countries, including Malawi, many analysts agree that maternal health would succeed if maternal health care services are of good and acceptable quality. As such, many health advocates claim that even though maternal services are provided, women's utilization of such services has not been ascertained. We conducted a study to explore women's perspectives on the quality of health care service delivery in Malawi. The study identified that erratic availability of medical resources and unethical practices among health workers adversely affected quality of maternal health care service delivery. We concluded that the expensive routine operational audits of medical resources and service delivery across health facilities are imperative if women's health outcomes are to be enhanced in Malawi [59].

Another study was conducted with the aim of examining the influence of women's knowledge of maternal death on their health seeking behaviour during pregnancy and childbirth [60]. The study extracted and utilized respondents who had childbirth within three years prior to 2013 from the Nigeria Demographic and Health Survey. Bivariate analysis and logistic regressions were used to assess the association between knowledge of maternal death, selected socio-economic factors and health seeking behaviour. The results suggest that 34% did not attend antenatal visits, 27% of the respondents initiated antenatal care in the first trimester of pregnancy and 63% had birth deliveries outside the health facility. This confirms that non-use of health facilities during pregnancy and delivery contributes to the high maternal mortality in Nigeria. The multivariate analysis indicates that the odds ratio of good health-seeking behaviour is significantly generally low among women who had poor knowledge about the causes of maternal death than those who had good knowledge. Other factors influencing maternal-health seeking behaviour are region, education and wealth status. Poor maternal health-seeking behaviour was high among women in the Northern region, the poor women and



women who had low educational background. These factors should be considered in designing strategies to improve the maternal health care system in Nigeria.

Gender Based Violence

Gender Based Violence (GBV) is any harm that is perpetrated against a person, as a result of power or inequalities that are based on gender roles. Although both men and women face a variety of gender-based violence as they carry out their daily activities, the problem is more pronounced when perpetrated against women. It is estimated that between 33% and 50% of all women have experienced some form of domestic violence in their lifetime [61]. Since the 1994 ICPD in Cairo, violence against women has emerged as another popular area of population research.

A growing number of studies show that violence by partners negatively affects demographic and health outcomes. For instance, violence against women may lead to high fertility, high infant mortality, non-use of maternal health services and non-use of contraceptives, just to mention a few. I conducted a study to show the relationship between spousal violence and unwanted fertility in Malawi [62]. The study revealed that the overall prevalence rate of spousal violence and unwanted fertility among ever married women who gave birth within the last 12 months and/or who were currently pregnant as at the time of the survey in Malawi are 36.2% and 50.7% respectively. Spousal violence was found to be a significant predictor of unwanted fertility among the respondents in Malawi ($\chi^2 = 6.981$; $p\text{-value} = 0.005$).

In another paper, we looked at the interplay between family setting, domestic violence and under-five deaths in Nigeria using data from the 2013 Nigeria Demographic and Health Survey [63]. The study concludes that women who belong to polygyny family setting and who ever experienced sexual domestic violence are highly susceptible to experience under-five children mortality than their counterparts.



Female genital mutilation

Female genital mutilation (FGM), also known as **female genital cutting** or **female circumcision**, is practiced in parts of Africa, Asia and the Middle East. It is estimated that nearly 200 million girls and women alive today have undergone some form of FGM [64]. Some of the countries with the highest prevalence among girls and women aged 15 to 49 are Somalia 98 per cent, Guinea 97 per cent and Djibouti 93 per cent [64]. It is widely acknowledged that FGM/C is a violation of the human rights of girls and women. As such the Sustainable Development Goals adopted in 2015 calls for an end to FGM/C and all other harmful practices by 2030 (Goal 5).

The elimination of harmful practices including FGM/C requires active participation of all stakeholders including men. Men's roles in any patriarchal society and the influence of their religious beliefs cannot be overemphasized especially in a culturally encrypted practice such as FGM/C. We conducted a study to determine the religious perceptions and attitudes of men towards FGM/C in Nigeria in order to establish the extent of this practice [65]. The study sample consisted of 8,111 men who had previous awareness of FGM/C from a cross-sectional nationally representative survey in Nigeria. The data took into cognizance the religious beliefs of the respondents as well as their attitudes towards FGC among others. Bivariate and multivariate ordered logistic estimates for FGC discontinuation were considered for the study. Of the total respondents, 29% reported that their religion required FGC for female children. A significantly higher proportion (89.4%; $p < 0.01$) of men whose religion did not require FGC subscribed to its discontinuation. Significantly lower odds of FGC discontinuation exist among those whose religious beliefs require FGC practice. Religious teachings and beliefs are crucial correlates of men's attitudes towards FGC. There is therefore a need to consider the religious beliefs of men when engaging them in strategies to fight FGC [65].

As with all other demographic parameters, it is important that from time to time we estimate the levels and trends in demographic parameters. In a study that we conducted in Nigeria, we strove to find out whether or not FGM/C is increasing [66]. The study



revealed that FGM/C has a higher prevalence among the older generation (mothers) (39.3%) than what was obtainable among the younger generation (daughters) (14.2). The likelihood of daughters being circumcised was higher among mothers who were themselves circumcised, among women who supported continuation of FGM/C and those who believed that FGM/C was a religion injunction. The findings of this study made us believe that there is evidence that FGM/C in Nigeria is declining and that there are more prospects of this age long practice plummeting in the future

One of the factors associated with high maternal morbidity and mortality is anaemia which generally results from nutritional inadequacy (particularly iron deficiency) and malaria, among other factors [67]. This study, among women in Malawi, examined factors determining intake of supplemental iron for at least 90 days during pregnancy. The study revealed that thirty-seven percent of the women adhered to the iron supplementation recommendations during pregnancy. Multivariate analysis indicated that young age, urban residence, higher education, higher wealth status, and attending antenatal care during the first trimester were significantly associated with increased the odds of taking iron supplementation for 90 days or more during pregnancy ($P < 0.01$). The results indicate low adherence to the World Health Organization's iron supplementation recommendations among pregnant women in Malawi, and this contributes to negative health outcomes for both mothers and children [67].

Focusing on education interventions that target populations with low rates of iron supplement intake, including campaigns to increase the number of women who attend antenatal care clinics in the first trimester, are recommended to increase adherence to iron supplementation recommendations.

Another study explored the relationship between poverty and nutritional Status in Burkina Faso and Democratic Republic of Congo [68]. Burkina Faso (BF) and Congo Democratic Republic (CDR) are among the top-ten poverty and hunger stricken countries globally. The influence of poverty and hunger on health is enormous. The objectives of the study are two-fold: to examine the association between poverty and nutritional status, and to



identify socio-demographic and health related mediating factors that contribute to the relationship between poverty and poor nutritional status. The study focused on married or cohabiting women aged 15–49 years and utilized 2010 and 2007 DHS dataset from BF and CDR respectively. The mean age of the women in BF and CDR were 34.4 ± 9.3 and 34.7 ± 9.0 years respectively. About 19.4% and 18.4% of the poor were malnourished as opposed to 7.7% and 9.7% of the rich women in BF and CDR respectively. Obesity and overweight were more prominent among the rich than the poor. Higher prevalence of under-nourished women was found among the elderly than the younger women in BF. In the countries, the prevalence of malnutrition was significantly higher among women; in the rural areas, with no formal education, anaemic and those who are not working. Multivariate analysis revealed that in the countries, the risk of under-nourishment was significantly higher among poor and middle class than the rich women despite controlling for confounding variables. Undernourished women were more common among the poor and those with no formal education. Programs that target nutrition of women of reproductive age should be strengthened in BF and CDR.

Conclusion

In conclusion, I would like to underline that this lecture has presented three things. First, it has provided a clear difference between demography and population studies, presented two main theories that are used in population studies and outlined the three main hypothesis on population and development interrelationships. Second, I have illustrated all these aspects using my own work. In the process, the lecture has also described the shift from formal demography to substantive demography. Substantive demography or population studies as is commonly called appears to have gained more ground than the former. This growing increase of population studies at the expense of demography is a concern among population specialists.

The shift from demography to population studies is a big blow to some of us who call ourselves demographers. I continue to argue that the shift is not in the best interest of the subject particularly from Africa.



Looking back, one can trace this shift to the ICPD that was held in 1994 in Cairo, Egypt. Following the ICPD there has been a shift from purely demographic analyses to much broader discussions of population issues. This saw the increasing focus on Sexual and Reproductive Health to the detriment of technical demography. Studies on such aspects as family planning, adolescent sexuality, maternal and child health, among other areas have gained more attention in demographic research. As a result of this, demographic training changed to population training. This has led to near-static or dwindling numbers of demographers at the same time population specialist have increased. In addition, this change has contributed to the decrease in professionals with skills to analyze and interpret demographic data. One consequence of this is the continued reliance of experts in demographic analysis of census and survey data.

Recently some demographers have complained that this state of affairs and has called for strengthening, if not rejuvenating demographic training. I share these views and am collaborating with demographers from some African countries and India to reposition demographic training and research particularly in Africa.

At a conference in India in February 2017, Prof Prem C. Saxena of IIPS complained that at the absence of a purely demographic paper dealing with demographic rates. This view is summarized by Prof Prem C. Saxena in the following manner:

“Let me share my experience as to how this change has damaged the discipline. Having a research and teaching career spanning over four decades in various academic institutions in India and abroad, I find the understanding of technical subjects of recent graduates in population studies exceedingly poor when I compare it with that of graduates of earlier times. In fact, some courses of technical demography have been dropped from the curriculum. To name a few, in most universities, topics on appraisal of quality of demographic data and interpolation and graduation are not taught. Hardly any recent population graduates would know what oscillatory interpolation is, how the



number of primary and secondary school-going children can be estimated from a five-year age-sex distribution, and how to adjust/graduate age-sex distribution for age-reporting errors” [69].

Other population specialist share the same view and have argued that there is need to strengthen the training of demographers who should play a critical role in the monitoring of post 2015 development goals [70].

At a seminar that was held to celebrate the 21st birthday of Max Planck Institute of Demographic Research (*MPIDR*) in December 2017, James Vaupel, warned “ that the future of demography is anything but secure, and that the discipline is in danger. ... (and) argued that demography will have to fight for recognition going forward, and that demographers will have to put extra effort into educating their successors. Other population specialist hold a more optimistic view and have noted with interest that “population studies is attracting more and more scientists from various disciplines”. Frans Willekens of Netherlands Interdisciplinary Demographic Institute (NIDI), The Hague, argued that “formal or mathematical demography represents the core of demography, ... (and) stressed that demography is defined by the population figures it deals with. He predicted a bright future for the discipline if it goes back to its roots in formal demography, and further develops them.

The position argued in this lecture is that African countries in general, sub-Saharan African countries in particular would benefit if they adopt an approach that would train more demographers. Demographers would be able to analyze, interpret and integrate demographic data in the development planning. Such skills are necessary if Africa is to meet the global, continental and national targets as spelt out in the Sustainable Development Goals, AU Agenda 2063 and National Development Plan 2030.

One problem with these target is that they are stated at national levels. There is need to translate these goals and target to sub-national levels (regional, district and local levels). For instance, the National Development Plan aims at increasing life expectancy at birth



to 70 years. Does this mean that all provinces and municipalities should aim at having a life expectancy at birth of 70 years by 2030? How do we translate the global and national targets to sub-national populations (province, municipalities and districts). With this in mind, there is a growing interest to focus on providing demographic parameters for small areas.

As a demographer, I intend to continue with estimating demographic parameters focusing on sub-national populations, that is **Demographic estimation for small areas**. Fertility, mortality and migration measurements are necessary for both updating demographic indicators and preparing population projections. Projections are critical in integrating population variables into development. In my opinion, there has been a limited success in integrating population variables into development in Africa. Partly this has been due to the focus at national and regional levels with limited involvement of small areas.

Increased life expectancy, reduced fertility rates and increased migration are severely changing the size and structure of the population. These demographic changes are considered as the greatest challenges of the modern society. Amongst the consequences are elongation of the working life, increasing need of long-term care and problems of financing pensions. Understanding these aspects require an interdisciplinary and multi-disciplinary team of researchers. Demographers are an integral part of such a team.

Furthermore, demographers should not shy away from engaging in topical issues: gender based violence, climatic change, migration, demographic dividend, unemployment, poverty reduction, fees must fall, decolonization etc. In all these, their starting point is the size, structure and development; then percentages, proportion, rates, ratios.



Acknowledgement

Madam Dean, before I end this lecture, I want to thank the Almighty God who has brought me to the zenith of my academic career, for it is not my might nor my power but the spirit of God. I appreciate the Pastors and members of Discipleship Ministries in Mafikeng for instilling in me a culture of fearing GOD and always reminding me that God's time is the best.

My relationship with North-West University began towards the end of 2002 when I was appointed as a Lecturer to join the teaching staff at the then University of North-West. I must say that my life has been greatly influenced by the various people – staff and students - ever since I stepped in here and I am eternally grateful for that.

My gratitude also goes to the then Vice-Chancellor of the University of Malawi, late Professor David Rubadiri, for allowing me to proceed on unpaid leave and Professor Takalo for welcoming me at the then University of North-West. Professor Dan Kgwadi has been a source of inspiration in many ways. Since joining North-West University, I have served under various Deans and Directors. Allow me to mention Dr. Manyane, Dr Thiba, Professor Qalinge, Professor Botha and Professor Marilyn Setlalentoa. It was during the tenure of Professor Qalinge that I was promoted to Senior Lecturer. I was promoted to Associate Professor when Professor Botha was the Dean of Faculty of Human and Social Sciences. I was then promoted to Full Professor during the tenure of Professor Setlalentoa. I am aware of the motivations and the words of support that are required to push through an application for academic promotion. I shall forever remain grateful to all of you. *Kealoboga*.

I also salute all my teachers: Primary school (Mrs. *Njunga*/Mrs. Yalaukani, Mrs. Maganga, Mrs. Nsodoka, Mr. Nyirenda, Mrs. Akule, Mr. Laisi, Mr. Ngaunje. In Secondary School: Mr. Kapindu, Mr. Nkona, Mr. Mkandawire, Mr. Chikhasu, Mr. Phikani, Mr. Chiona, Mrs. Sikazwe, Mr Kapindu, Mr. Nkupasha and Mr. GR Phiri. From the University, I acknowledge Dr. Kurtz, Professor Mlia, Mr. Kadzombe, Dr. M Mkwzalamba; Dr.



Kanyuka, Dr. Dolozi, Professor Jonathan Kydd, Professor Ben Kalua, Professor Kandawire, Father Reverend Amanze, Terry Ogden, Mrs. Kumwenda, Professor Overton Jenda, Professor Kandoole, Professor Nyovani Madise, Dr. Paddy Ewer, Dr. Nicholson, Dr. PP Kalua, Mr. Caple, Mr. Miles Emerson, Dr. Kaonga. To all my teachers at all educational levels, I say thank you. I am sure wherever you are you are proud of your product. I appreciate you all for giving me a solid education.

Let me mention some of teachers and lecturers who have left an indelible mark in my life. The late Professor Mlia, my Lecturer in Human Geography, who at an early age saw potential in me and wanted to groom me to become a Geographer. Mr. Miles Emerson who introduced me to Social and Official Statistics and encouraged me to join Demographic Unit where I would be dealing with population statistics. Mr. Caple, my Lecturer in Mathematical Statistics and who gave me another meaning of Matthew 6 verse 33. My classmate Sumani Kalitera and I used to write the verse on the blackboard. One day Mr. Caple came to class and recited the verse as follows: *“You seek first the ways of a Statistician and everything else shall be given to you”*. To the late Dr. Paddy Ewer my mathematics lecturer who made me believe that I was a genius like him.

I am grateful to Mr. Miles Emerson, my Statistics Lecturer, who informed me of the advert from the Department of Geography and Earth Sciences concerning a Staff Associate in Demography. I applied, was shortlisted, interviewed and offered the position. When I joined the University of Malawi, I was under the mentorship of Professor ML Srivastava a graduate of Australian National University. He explained to me what demography is, the difference between demography and population studies, showed me the work he did at the National Statistical Office, what needed to be done to open up the demography of Africa in general and Malawi in particular and introduced me to various “classical” books in demography. He literally exposed me to everything I needed to know as a demographer! He secured fellowships for me to pursue postgraduate courses in demography and that is how I ended up at LSE, where I was in the able hands of Chris Langford, the coordinator of the Demography Programme; Tim Dyson, Mike Murphy and John Hobcraft.



All my colleagues at the University of Malawi: Professor ML Srivastava, Dr. Chiweni Chimbwete, Mr. Sunil Acharya, late Mr. Jeke, Mr. Mandele and Mr. Jana. I also remember with fondness all friends, colleagues and acquaintances I interacted with while working at the National Family Planning Council of Malawi. My sincere appreciation goes to Professor Kalule-Sabiti who welcomed me when I joined the Population Studies and Demography programme at NWU, Professor Moses Kibet for being understanding and supportive to my ideas; Dr. Karabo Mhele and Dr. Veronica Rampangane for being there when I needed them. I also acknowledge all colleagues in the programme, past and present, for making me who I am today.

I also thank the following who have made sure that I enjoy working at NWU: GS Sebolai, J Motabogi, Lorraine Motlhabane, Precious Peme, Phumolo Dimpe, Margie Smith, Thabang Mmokonyana, Matlhodi Rehlampfu, Florence Kgokane, Granny Mogotsi, Kgomotso Bosilong.

I appreciate my friends and classmates, especially Patrick Mhango and Elvis Njoka and their families who have always been there for me. I should also mention Fred Friday Masumbu whom I met in standard four (4) but remains one of my trusted friends. **Best Friends Forever.** The laughter and joys shared all these years has made me the person I am today.

I am grateful to all my Doctoral, Master's and Honours students. I have enjoyed working with you all even though a few of you gave me some challenges. I thank my post-doctoral fellows, Dr.. Stephen Adebawale of University of Ibadan (UI), Nigeria and Dr. Tililayo of Obafemi Awolowo University (OAU), Ile-Ife, Nigeria. Before I met these two post-doctoral fellows, I single-handedly wrote most of my publications but meeting these two I learnt the beauty of collaborating and co-authoring. As one Malawian saying goes: *aliyekha ndi nyama, ali awiri ndi anthu* (one who is alone is an animal, those who are two are human beings). Thank you very much.



I am profoundly grateful to my family - my wife, Professor Lobina Getrude Palamuleni, and daughters Dr. Tadala Palamuleni and Tamanda Palamuleni, parents, brothers, sisters, cousins, nephews, nieces and in-laws scattered all over the globe: Malawi, Zambia, Zimbabwe, Botswana, South Africa, China, United Kingdom and United States of America. I appreciate your understanding and co-operation in the course of my education and career.

Lastly, I thank you all and may God bless you.

*Kealeboga
Zikomo Kwambiri
Yewo chomene
Tutogolere
Asanteni nyote.*



Psalm 23

1. The LORD *is* my shepherd; I shall not want.
2. He maketh me to lie down in green pastures: he leadeth me beside the still waters.
3. He restoreth my soul: he leadeth me in the paths of righteousness for his name's sake.
4. Yea, though I walk through the valley of the shadow of death, I will fear no evil: for thou *art* with me; thy rod and thy staff they comfort me.
5. Thou preparest a table before me in the presence of mine enemies: thou anointest my head with oil; my cup runneth over.
6. Surely goodness and mercy shall follow me all the days of my life: and I will dwell in the house of the LORD for ever.



References

1. United Nations, ***Multilingual Demographic Dictionary***. 1958, United Nations. New York.
2. Notestein, F.W., *Population—The long view, in food for the world*. T. Schulz, Editor, 1945.
3. Blacker, J., *William Brass*. Proceeding of the British Acadameny, 2001. **111**: p. 413-426.
4. **Palamuleni, M.E.**, *Age Mis-reporting in Malawian Censuses and Sample*. ***Southern African Journal of Demography***, 1996. **5**(1): p. 11-17.
5. **Palamuleni, M.E.**, *Age Reporting in North West Province, South Africa, 1996-2011*. ***Transylvanian Review***, 2016. **25**(1).
6. Caldwell, J.C. and P. Caldwell, *The South African fertility decline*. Population and Development Review, 1993: p. 225-262.
7. **Palamuleni, M.E.**, *Estimates of Fertility for South Africa based on Rele Method, 1996-2011*. ***Journal of Human Ecology***, 2013. **43**(3): p. 257-265.
8. **Palamuleni, M.E.**, *Decomposition of South African crude birth rates, 1996-2001*. Southern African Journal of Demography, 2011. **12**(1): p. 37-62.
9. **Palamuleni, M.**, *Nature and Patterns of Demographic Changes in North West Province, South Africa: Issues and Implications*. paper presented at North West Research Show Case, Mafikeng, 20-23 October 2014., 2014.
10. **Palamuleni, M.E.** and M.L. Palamuleni, *A decomposition Analyses of Fertility Decline in Malawi*. paper presented at Population Association of America (PAA) Annual Meeting, Denver, Colorado, USA, 26-28 April 2018., 2018.
11. **Palamuleni, M.E.**, *Socioeconomic determinants of age at marriage in Malawi*. ***International Journal of Sociology and Anthropology***, 2011. **3**(7): p. 224-235.
12. **Palamuleni, M.**, *Recent Marriage patterns in South Africa 1996-2007*. ***Bangladesh e-Journal of Sociology***, 2010. **7**(1): p. 47-70.
13. Kalule-Sabiti, I., et al., *Family formation and dissolution patterns*. Families and households in post-apartheid South Africa: Socio-demographic perspectives, 2007: p. 89-112.
14. Palamuleni, L. and **M. Palamuleni**, *Spatial variation of age at marriage in South Africa*. ***Journal of Social Sciences***, 2011. **29**(1): p. 39-46.
15. Bongaarts, J., *A framework for analyzing the proximate determinants of fertility*. Population and development review, 1978: p. 105-132.
16. Bongaarts, J., *How exceptional is the pattern of the fertility decline in sub-Saharan Africa*. UN Population Division, Expert paper, 2013(2013/4).
17. **Palamuleni, M.**, *Fertility decline in Malawi: an analysis of the proximate determinants*. ***Journal of social development in Africa***, 2010. **25**(1): p. 9-38.
18. **Palamuleni, M.**, I. Kalule-Sabiti, and M. Makiwane, *Fertility and childbearing in South Africa*. ***Families and Households in Post-Apartheid South Africa***, 2007: p. 113-133.
19. **Palamuleni, M.E.**, *Determinants of Fertility Decline in Namibia: An analysis of the Proximate Determinants*. ***Bangladesh e-Journal of Sociology***, 2017. **14**(2): p. 41-63.



20. **Palamuleni, M.E.**, *Social and economic factors affecting ethnic fertility differentials in Malawi. **International Journal of Development and Sustainability***, 2014. **3**(1-2): p. 70-88.
21. **Palamuleni, M.E.**, *Demographic Changes in South Africa, 1996-2007*, VDM publishing Company, Germany. 2008.
22. Machira, K. and **M. Palamuleni**, *Fertility Differentials in Malawi: Any Lesson Learnt from Regional Socio-economic and Demographic Variations? Fertility Differences in Malawi. **Journal of Human Ecology***, 2017. **58**(1-2): p. 88-97.
23. Adebowale, S.A. and **M.E. Palamuleni**, *Childbearing dynamics among married women of reproductive age in Nigeria: re-affirming the role of education. **Etude de la Population Africaine***, 2014. **27**(2): p. 301-318.
24. Adebowale, S.A. and **M.E. Palamuleni**, *Influence of gender preference and sex composition of surviving children on childbearing intention among high fertility married women in stable union in Malawi. **African Health Sciences***, 2015. **15**(1): p. 150-160.
25. **Palamuleni, M.**, *Infant and child mortality in Malawi: levels, trends and differentials*. 1987, London School of Economics and Political Science, London, GB.
26. **Palamuleni, M.E.**, *Mortality level, trends and differentials in Malawi. **Eastern and southern Africa Geographical Journal***, 1993. **5**(1): p. 68-74.
27. **Palamuleni, M.E.**, *Working life tables for South Africa, 1996-2001. **African Population Studies***, 2007. **22**(2): p. 233-256.
28. **Palamuleni, M.E.**, Palamuleni LG, *Changing patterns of Internal Migration in Malawi, 1966-2008*. poster presented at the International Population Conference, Busan, South Korea, August 26-30, 2013., 2013.
29. **Palamuleni, M.E.** and A. Titilayo, *Estimates of Inter-reional net migration in Nigeria 1991-2006. **Ife Social Sciences Review***, 2016(Supplement): p. 378-390.
30. **Palamuleni, M.E.**, *Some patterns of internal migration in North West Province, South Africa, 1996-2001. **TD: The Journal for Transdisciplinary Research in Southern Africa***, 2010. **6**(1): p. 225-240.
31. **Palamuleni, M.E.**, *Estimates of Inter-Provincial Migration in South Africa, 1996-2011. **eBangi - Journal of Social Sciences and Humanities***, 2019. **16**(7): p. 1-13.
32. **Palamuleni, M.E.**, *Salient Features of the Population of Malawi. **Southern African Journal of Demography***, 1999. **6**(2): p. 21-32.
33. **Palamuleni, M.E.**, *Some notes on the preliminary results of the 1998 Malawi population and housing census. **Journal of Population***, 2000. **6**(1).
34. Palamuleni, M.E., *Population projections for Malawi and its regions, 1998-2023. **African Sociological Review***, 2007: p. 16-28.
35. Palamuleni, M., *Contraceptive use among Malawian women 1992–2004. **Malawi Medical Journal***, 2008. **20**(3): p. 78-79.
36. **Palamuleni, M.E.**, *"Socio-economic and demographic factors affecting contraceptive use in Malawi". **African Journal of Reproductive Health***, 2013. **17**(3): p. 91-104.



37. **Palamuleni, M.E.** and A.S. Adebowale, *Women empowerment and the current use of long acting and permanent contraceptive: Evidence from 2010 Malawi Demographic and Health Survey*. **Malawi Medical Journal**, 2014. **26**(3): p. 63-70.
38. Adebowale, S.A., et al., *Differential effect of wealth quintile on modern contraceptive use and fertility: evidence from Malawian women*. **BMC Women's Health**, 2014. **14**(1): p. 40.
39. Adebowale, S.A. and **M.E. Palamuleni**, *Determinants of unmet need for modern contraception and reasons for non-use among married women in rural areas of Burkina Faso*. **African Population Studies**, 2014. **28**(1): p. 499-514.
40. NSO and Macro International, *Malawi Demographic and Health Survey 1992*. Zomba, Malawi: National Statistical Office (NSO) and ICF International., 1994.
41. NSO and Macro International, *Malawi Demographic and Health Survey 2000*. Zomba, Malawi: National Statistical Office (NSO) and ICF International., 2002.
42. NSO and Macro International, *Malawi Demographic and Health Survey 2004*. Zomba, Malawi: National Statistical Office (NSO) and ICF International., 2005.
43. NSO and MacroInternational, *Malawi Demographic and Health Survey 2010*. Zomba, Malawi: National Statistical Office (NSO) and ICF International., 2011.
44. NSO and Macro International, *Malawi Demographic and Health Survey 2015/16*. Zomba, Malawi: National Statistical Office (NSO) and ICF International., 2017.
45. **Palamuleni, M.E.**, *Socio-economic and demographic factors affecting contraceptive use in Malawi*. African journal of reproductive health, 2013. **17**(3): p. 91-104.
46. Jain, A., et al., *Inconsistencies in the total fertility rate and contraceptive prevalence rate in Malawi*. Washington, DC: Futures Group, Health Policy Project, 2014.
47. Chintsanya, J., *Trends and Correlates of Contraceptive Use among Married Women in Malawi: Evidence from 2000-2010 Malawi Demographic and Health Surveys*. 2013, Calverton, Maryland, USA: ICF International.
48. **Palamuleni, M.E.**, *Determinants of contraceptive choices in Malawi*. **Romanian Journal of Population Studies**, 2015. **9**(1): p. 50-79.
49. Adebowale, S.A., I.A. Adeoye, and M.E. Palamuleni, *Contraceptive use among Nigerian women with no fertility intention: interaction amid potential causative factors*. **Etude de la Population Africaine**, 2013. **27**(2): p. 127-139.
50. **Palamuleni, M.E.** and A.S. Adebowale, *Prevalence and determinants of unintended pregnancies in Malawi*. **Etude de la Population Africaine**, 2014. **28**(1): p. 551-563.
51. Adebowale, S.A., et al., *Women Educational Advancement in Sub-Saharan Africa: Situation Analysis of Consequence of Double Harmful Socio-demographic Practices*. **British Journal of Education, Society & Behavioural Science**, 2016. **18**(4): p. 1-16.
52. **Palamuleni, M.E.**, *Determinants of adolescent fertility in Malawi*. **Gender and Behaviour**, 2017. **15**(4): p. 10126-10141.
53. **Palamuleni, M.E.**, *Trends and Determinants of Contraceptive Use among Female Adolescents in Malawi*. **Transylvanian Review**, 2017. **xxv**(20): p. 5239-5250.
54. Machira, K. and M.E. Palamuleni, *Health Care Factors Influencing Teen Mothers' Use Of Contraceptives in Malawi*. **Ghana Medical Journal**, 2017. **51**(2): p. 88-93.



55. Machira, K. and **M. Palamuleni**, *Factors influencing women's utilization of public health care services during childbirth in Malawi Public health facility utilization. **African Health Sciences***, 2017. **17**(2): p. 400-408.
56. Machira, K. and **M. Palamuleni**, *Perceived barriers associated with maternal health care service delivery in Malawi: health personnel perspectives. **Studies on Ethno-Medicine***, 2017. **11**(1): p. 49-54.
57. Machira, K. and **M. Palamuleni**, *Rural–urban differences in the use of postnatal care services in Malawi. **The Journal of the Egyptian Public Health Association***, 2017. **92**(1): p. 1.
58. **Palamuleni, M.**, *Determinants of non-institutional deliveries in Malawi. **Malawi Medical Journal***, 2011. **23**(4): p. 104-108.
59. Machira, K. and **M. Palamuleni**, *Women's perspectives on quality of maternal health care services in Malawi. **International Journal of Women's Health***, 2018. **10**: p. 25-34.
60. Titilayo, A., **M.E. Palamuleni**, and O. Omisakin, *Knowledge of Causes of Maternal Deaths and Maternal Health Seeking Behaviour in Nigeria. **African Population Studies***, 2016. **29**(2).
61. Organization, W.H., *Global and regional estimates of violence against women: prevalence and health effects of intimate partner violence and non-partner sexual violence*. 2013: World Health Organization.
62. Titilayo, A. and **M.E. Palamuleni**, *Spousal Violence and Unwanted Fertility in Malawi. **African Population Studies***, 2015. **29**(2): p. 2031-2047.
63. Titilayo, A., O.O. Anuodo, and **M.E. Palamuleni**, *Family type, domestic violence and under-five mortality in Nigeria. **African Health Sciences***, 2017. **17**(2): p. 538-548.
64. Unicef, *Female Genital Mutilation/cutting: a Global Concern. UNICEF's Data Work on FGM/C*. 2016: Unicef.
65. Titilayo, A., et al., *Religious perceptions and attitudes of men towards discontinuation of female genital cutting in Nigeria: evidence from the 2013 Nigeria Demographic and Health Survey. **African Journal of Reproductive Health***, 2018. **22**(1): p. 20-28.
66. Titilayo A, P.M., Anuodo OO *Female genital mutilation/cutting: Any abandonment yet? **Ife Social Sciences Review***, 2015. **25**(1): p. 110-127.
67. Titilayo, A., **M. Palamuleni**, and O. Omisakin, *Sociodemographic factors influencing adherence to antenatal iron supplementation recommendations among pregnant women in Malawi: Analysis of data from the 2010 Malawi Demographic and Health Survey. **Malawi Medical Journal***, 2016. **28**(1): p. 1-5.
68. Adebowale, A.S., **M.E. Palamuleni**, and C.O. Odimegwu, *Wealth and under-nourishment among married women in two impoverished nations: evidence from Burkina Faso and Congo Democratic Republic. **BMC Research Notes***, 2015. **8**(1): p. 34.
69. Saxena, P.C., *COMMENTARY: The dying art of technical demography. Asian Population Studies*, 2011. **7**(1): p. 1-2.
70. Akinyemi, J.O. and S.A. Adedini, *Is technical demography becoming less relevant? Two decade review of published articles in selected demography journals. African Population Studies*, 2018. **32**(2): p. 4396-4404.

