The effects of migration and fertility on the age-sex structure of Lagos State, Nigeria

Efectele migraţiei şi a fertilităţii asupra structurii pe vârste şi sexe în statul Lagos, Nigeria

EJEKWUMADU Esther Ugomma
MADU Ignatius Ani
AJAERO Chukwuedozie Kelechukwu
University of Nigeria, Nsukka, Nigeria
e-mail: ajaerock@yahoo.com

Abstract

This research was carried out to appraise the influence of fertility and migration on the age-sex population structure of Lagos State, Nigeria. Respondents were randomly selected and given questionnaire to fill with regards to fertility and migration trends in the study area. Using partial correlation and multiple regression analyses, we determined the influence of migration and fertility on the age structure of the population. The combined effects of the partial correlation of fertility and migration were 0.66 (males) and 0.79 (females). The regression analyses yielded influence of fertility of 9.6 and 11.7 for males and females respectively, which far outstrips the influence of migration of 6.4 and 1.5 for males and females respectively on the age-sex structure. Also, the base constant was –5.1 for females and –3.2 for males i.e. the minimum change in age of male and female populations that would occur before the influence of fertility and migration become noticeable. Finally, the socio-economic implications of the age-sex structure were highlighted.

Keywords: *age-sex population structure; fertility; impact; Lagos State; migration; Nigeria*

Rezumat

Acest studiu a fost efectuat pentru a evalua influenţa fertilităţii şi migraţiei asupra structurii pe vârste şi sexe a populaţiei din statul Lagos, Nigeria. Respondenţii, cărora li s-au dat chestionare de completat cu date referitoare la fertilitatea şi tendinţele migraţiei în zona de studiu, au fost selectaţi aleator. Utilizând analiza corelaţiilor parţiale şi analiza de regresie multiplă am determinat influenţa migraţiei şi a fertilităţii asupra structurii pe vârste a populaţiei. Efectele combinate ale corelaţiilor parţiale ale fertilităţii şi migraţiei au fost de 0,66 (asupra sexului masculin) şi de 0,79 (asupra sexului feminin). Analiza de regresie arată o influenţă a fertilităţii de 9,6 şi 11,7 pentru bărbaţi şi respectiv femei, care depăşeşte cu mult influenţa migraţiei de 6,4 şi 1,5 pentru bărbaţi şi respectiv femei, asuppra structurii pe vârste şi sexe. De asemenea, constanta de baza a fost de -5,1 pentru femei şi -3,2 pentru bărbaţi, adică o schimbare minimă a vârstei populaţiei de sex masculin şi de sex feminin care ar avea loc înainte ca influenţele fertilităţii şi a migraţiei să devină

vizibile. În final, sunt subliniate implicaţiile socio-economice ale structurii pe vârste şi sexe.

Cuvinte-cheie: *structura populaţiei pe vârste si sexe; fertilitate; impact; statul Lagos; migraţie; Nigeria*

JEL Classification: J13, O15, R11, R23

Introduction

An age-sex structure refers to the distribution pattern of age and sex within a population: in other words, the number of males and females within every cohort of the population. It is built from the input of births at age zero and deaths, and migration at every age within the population. The age-sex structure constitutes a prominent point of focus among all the aspects of population. This is because of its significance in the definition of a society's reproduction potential, manpower supply, and development needs, and for these reasons the age-sex structure has significant policy implications (Population Reference Bureau, 2000).

The processes of fertility, mortality and migration together determine not only the current size of the population but also the distribution of age and sex. Conversely, to the degree to which other factors remain constant, the age-sex structure sets the future pace of population growth through its influence on fertility, mortality and migration. The meaning, measure, impact and dynamics of age-sex structure of populations have been evaluated exhaustively by Weeks (1999). The impact of the three population processes (migration, mortality and fertility) on age-sex structure has also been assessed (Russell, 1992; Kim & Shoen, 1997; Preston and Guillot, 1997).

Studies on age composition and the consequent fertility trends have been carried out by Blacker (2000), Lean (2000), Bongaarts (2000), and in charting the progress of populations (United Nations, 2000). The trends in the age structure of world populations has been shown as a stimulant of growth rate with countries like Nigeria, Bangladesh, Brazil, India, and Pakistan already beyond the 100million population mark (United Nations, 1999). The age-sex structure has also been shown to affect fertility rates of societies and future rates of population growth (Bulatao & Ross, 2003; Hakim, 2003; Angeles & Guilkey & Mroz, 2004; United Nations, 2004b). There has been contrasting scenarios between the developing countries of the world and their developed counterparts. In the 1990's, half of the populations of Africa were under age 15 as against less than one-fifth for Europe. On the other hand, the population above age 65 in Western Europe was five times that of sub-Saharan Africa (Ashfort, 1995; United Nations, 2004a).

In Nigeria, a number of researches have been carried out on population structure and related issues as concerns of national economic growth and development. Adegbola (1975) correlated educational attainment and work force

participation between males and females in Lagos. He observed that there is a tendency towards low sex ratio in cities of developed world and the countries of Latin America. This he claims contrasts with the situation in the developing countries of Africa and Asia, raising a fundamental question of whether the urban sex ratio in these developing countries is a demographic anomaly considering the fact that all of them tasted European influence. Other works on population of Nigeria include Olaore (1975,), Udo (1981), Feyisetan & Bankole (2000). Adepoju (1999) claims that a thorough understanding of the rate, and characteristics of migration is indispensable to urban planning. This he asserts stems from the fact that migrants are selective of age and sex, and as such will affect the age-sex structure of both the source region and the destination.

Age-sex structure has been assessed as a determinant of the limits of a society's reproductive potential. It is also the demographic stimulant of a nation's manpower supply. The age structure of Nigeria's population is broad-based (National Population Commission, 2002) and has future implications for fertility and migration trends within the country, as well as on socio-economic development. This contrasts with the structure of European populations (Okereke, 2002). Against this background, Adonri (2003) has stated that since people are the ultimate beneficiaries of development, any developmental planning process should of necessity take the age and sex structure of a population into consideration among other population variables. Despite the obvious implications of the age-sex structure of any population on socio-economic development, there has been a dearth of information and research in the area in Nigerian Urban cities. Specifically, very little attention has been given to the effects of migration and fertility on age-sex composition irrespective of its importance in the determination of current and future rates of population processes in Nigerian urban areas. Hence the interest in this research work is aimed at evaluating the influence of migration and fertility on the age-sex structure of the Lagos state population and the consequent socio-economic implications.

This research was focused on Lagos State because the population of Lagos state constitutes a pivotal point for national growth and development in the country and the West African sub region at large. Of the 88.5 million people shown to live in Nigeria in 1991; approximately six million were resident in Lagos state while about 9 million out of 140 million of the Nigerian population live in Lagos in 2006 (National Population Commission, 2002; FGN, 2009). These figures represent over 6 percent of the total national population. Considering that were the national population to be evenly distributed among the 36 states of the federation, each would have just 2.78 percent of the national total, 6 percent is quite enormous for just one state. Lagos state is incidentally the smallest state in the country in terms of landmass and also the most urbanized state in Nigeria. It is hoped therefore, that this research work will serve as a milestone in the study of the Nigerian urban population age-sex structure with regards to the influence of migration and fertility.

Materials and methods

Study Area

Lagos state is one of the southwestern states of Nigeria. It is located within latitude 6° 34' and 6° 00' North and longitude 3° 19'and 3^0 59' East of Greenwich. The state is bounded in the north and east by Ogun state, in the west by the Republic of Benin, and in the south by the Atlantic Ocean. Population is the most unique feature of Lagos state and the state is the most urbanized state in Nigeria. The population size is large and the growth rate is estimated at 300,000 per annum making up about 6.43% of the projected population of Nigeria between 1998 – 2005 and 6.49% of Nigeria in 2006 based on the 2006 population census (Table.1). The population is very heterogeneous and that makes Lagos a center for cultural mix. The economic activity sector is highly diversified with more concentration of people in secondary and tertiary sectors.

Mid Year Population of Nigeria 1998-2006

Table 1

Year	National Population	Lagos State Population	% of Lagos State
1998	108,466,556	6,978,559	6.43
1999	111,788,448	7,192,294	6.43
2000	115,224,312	7,401,880	6.43
2001	118,800,699	7,643,391	6.43
2002	122,443,748	7,877,809	6.43
2005	133,711,926	8,593,039	6.43
2006	140,431,790	9,113,605	6.49

(Source: National Population Commission, 2002; FGN, 2009)

Sample Selection

A total of 4 local government areas (LGAs) were selected at random for this study. They were used based on their population size as delimited below from the results of the 2006 population census.

    i.   Lagos Island LGA represents LGAs with populations less than 200,000 persons.

    ii. Badagry LGA represents LGAs with populations > 200,000 but < 400,000 persons.

    iii. Surulere LGA represents LGAs with populations > 400,000 but < 600,000 persons.

    iv. Ojo LGA represents LGAs with populations greater than 600,000 persons.

Each of these LGAs has the largest population size in their subgroups. The selection criterion was to ensure that relatively-sparsely and relatively-densely populated areas were used for the research.

Data Collection

Questionnaire and interviews formed the sources of primary data while published literature formed the sources of secondary data. Population data showing age and sex records of LGAs in Lagos State for the 1991 census were collected from the National Population Commission. The questionnaire was structured and utilized to generate data on fertility and migration rates of Lagos State. From each of the 4 LGAs, 360 respondents were randomly selected and given questionnaire to fill. This number is made up of 180 males and 180 females from each of the LGAs and based on these major age groupings as used in population analysis (NPC, 2002; Ajaero, 2006).

    i.   11-24 years (Adolescents and Youths).
    ii.   25-59 years (The Adults).
    iii. Above 60 years (The Elderly).

Data Analysis

Partial correlation analyses were used to determine the extent of the variations within the age structure explained by fertility and migration. The partial correlation of age structure and fertility holding migration constant is of the form:

$$r_{12.3} = \frac{r_{12} - r_{13} \cdot r_{23}}{\sqrt{(1 - r_{13}{}^2)(1 - r_{23}{}^2)}} \tag{1}$$

The partial correlation of the age structure and migration holding fertility constant is of the form:

$$r_{13.2} = \frac{r_{13} - r_{12} \cdot r_{23}}{\sqrt{(1 - r_{12}{}^2)(1 - r_{23}{}^2)}} \tag{2}$$

While the partial correlation of the combined effects of migration and fertility on the age structure is of the form:

$$1 - R^2{}_{1.23} = (1 - r_{12}{}^2)(1 - r_{13.2}{}^2) \tag{3}$$

where R = the combined effects of migration and fertility on the age structure,
    1 = dependent variable age,
    2 = fertility,
    3 = migration.

Also, multiple regression analyses were carried out using data derived from the questionnaire. These analyses were done in order to determine the relative

strength of the influences of fertility and migration (as dependent variables X1 and X2) on the age structure (the dependent variable Y). The regression was done differently for the male and female populations using SPSS (version 11) running under MS Windows. The multiple regression equation is of the form:

$$Y = a + b \, X1 + c \, X2 \qquad (4)$$

where *a* is the base constant representing change in **Y**, **b** is the co-efficient of *X1*, *c* is the co-efficient of *X2, X1* is fertility and *X2* is migration.

Results

The results of the intermediate correlation values are: $r_{12} = -0.62$, $r_{13} = -0.29$ and $r_{23} = -0.74$(for the males) and $r_{12} = -0.78$, $r_{13} = -0.43$ and $r_{23} = 0.69$(for the females). Using these values, the correlation coefficients of the age structure and fertility holding migration constant are 0.64(males) and –0.73(females) while the correlation coefficient of the age structure and migration holding fertility constant are 0.32 (males) –0.13 (females). The R values were 0.66(males) and 0.79(females). This means that the combined effects of fertility and migration account for 66% and 79% of the variations in the age structure of males and females in the population respectively. The 34% and 21% in each case not accounted for could be explained by the mortality factor not considered in this paper due to data generation constraints.

The multiple regression equation for males was calculated as:

$$Y = -3.2 + 9.6 \, X1 + 6.4 \, X2 \qquad (5)$$

This means that any unit increase in the influence of fertility will lead to a 9.6 increase in the age structure of males in Lagos State holding migration constant. Furthermore, a unit increase in the influence of migration will lead to a corresponding 6.4 increase in the age structure of males in Lagos State holding fertility constant.

The multiple regression equation for females was calculated as:

$$Y = -5.1 + 11.7 \, X1 + 1.5 \, X2 \qquad (6)$$

This means that any unit increase in the influence of fertility will lead to an 11.7 increase in the age structure of females in Lagos State holding migration constant. On the other hand, a unit increase in the influence of migration will lead to a corresponding 1.5 increase in the age structure of females in Lagos State holding fertility constant.

The threshold value or the base constant of –5.1 for females is much lower than the –3.2 for males (i.e. the minimum change in age of male and female populations that would occur before the influence of fertility and migration become noticeable). It is negative in both cases while the regressions co-efficient are

positive. Of the two independent variables however, fertility (9.6 and 11.7 for males and females respectively) exerts more influence on the age-sex structure than migration (6.4 and 1.5 for males and females respectively).

Discussion

The Migration Factor

In Lagos state, migration is one factor that has largely affected the distribution of population in terms of age and sex both at the state level and between the various local government areas. At the state level, there exists a male surplus at ages 0 to 4 years and ages 25 to 59 years and a surplus of females from ages 60 upwards. The male surplus at ages 0 to 4 years is explained by the fertility fact that more males are born than females in any population while the female surplus from age 60 years upwards is explained by some other factors such as high mortality for males and the resultant low life expectancy at birth. Lagos state is the economic nerve center of Nigeria and economic activities are at their peaks within the state. Thus the state presents numerous pull factors such as job opportunities, investment opportunities, educational facilities, social amenities and recreational facilities (Odumosu, 1992). These pull factors over the years have ensured the constant inflows of population especially those within the economically active ages of 15 to 59 years into the city centers. Lagos state has therefore remained a major destination point of migrants from all over the country, hence the male surplus at ages 25 to 59 years at the state level.

The Fertility Factor

Fertility is one of the most potent forces of age-sex structure after migration and mortality but the most consistent of the three. It ensures the input of population at age zero and the level of these input influences the future population distribution of all other cohorts within the population. The population of Lagos state has grown tremendously through migration no doubt; fertility has however ensured the continuous input of young children into the population. Migration alone introduces young adults in the population who in turn contribute to increase the fertility level of the state. The last census estimated that the birth rate of the population in Lagos state was 46.5 per 1000 population and natural increase 3.3 per cent per annum. These values were generally higher than the national averages of 44.5 per 1000 population and 2.8 per cent respectively. The populations 0 to 14 years were 39.6 percent of the state total; hence the broad base of the age-sex pyramids. The fertility factor therefore has been a major factor determining the shape of the age-sex population pyramid of the state at all times.

Lagos state as every other state in Nigeria is still at the second stage of the demographic transition. As the death rate decline through improvement in health care delivery, more people survive to the reproductive ages and beyond. The births they have further widen the base of the age-sex pyramid. This is a common age

structure found in most African cities that have experienced improvements in life expectancy but continued to have high birth rates. It reflects both a history of rapid population growth and the potential for future rapid growth.

Socio-economic implications of the age-sex population structure of Lagos State.

Population Growth and Momentum

The effect of the youthful population of Lagos state has over the years been felt in the continued growth of the city irrespective of serious family planning programmes the various governments of Nigeria have introduced. This is because at the turn of the last decade, the population of the state is predominated by children aged between 0 and 14 years. These children today constitute the population of the state aged 15 to 28. Since they are in the active reproductive ages, the population has witnessed a resurgence of the last decade's fertility rates. The current total fertility rate of 5.4 children per woman estimated for Lagos state and a doubling time of 24 years, will ensure that the process of population momentum will remain at work for several decades to come even if a zero population growth rate policy is adopted now for the city. The current high fertility conditions within the state will also be continually fuelled by rural urban migration that will keep introducing immigrants into the reproductive cohorts of the state's population.

Dependency Ratio

The population 0 to 14 years in Lagos state is approximately 40 per cent of the entire state total with an old population of 3.3 per cent of the total. The dependency ratio calculated for the 15 local government areas of the state, which are 76.4 on the average is rather a very big burden on the working population especially when considered along side the current trend of unemployment in the country and Lagos state in particular. This excess of young dependants has thus put a strain of all facilities meant to cater for the needs of children such as schools and medical services.

Investment

The current upsurge of population at the younger age brackets and at the working age cohorts presents a vibrant market for goods and services both at present and in the future. Investments are therefore most likely to yield more profit within the Lagos environment as a result of its ever-increasing market than in any other part of the country. The production of goods and services are thus expected to remain at very high levels within the state and further perpetuate the undue concentration of commercial and industrial activities, which has led to increased rural-urban drift in the country with Lagos state as a major target destination.

Manpower Demand and Supply

Labour or manpower supply has been another area of serious implication for the age-sex structure of the state. Human capital has remained the most

important production asset in Lagos state. Migration is very selective of age and sex, and involves most of the time economically active populations. Since migration is a major factor of population growth in Lagos state, the state has consistently had a labour supply potential incomparable with any other part of the country. However, sequel to uncontrolled migration rate into the city centers of Lagos state unemployment has taken an unprecedented toll in the state in recent times. The proportion of the population of the state within the economically active ages has outnumbered the level of labour availability resulting in hardship and increased dependency burden on the working population, which is higher than what would be otherwise calculated. So the proportion of the population that forms the denominator in the calculation of dependency burden in the state is far greater than the number within the economically active age groups that are actually working. This erroneous assumption has over the years therefore painted a less bizarre picture of the dependency problem in Lagos state.

High Cost of Living

The cost of living in the city of Lagos is very high in relation to the rest of the country. In Lagos state the cost of housing is very high. The limited land area and a host of housing inadequacies have ensured an exorbitant cost of rent within the city. This problem is further heightened by the immigration of young families into the state. The accommodation inadequacies can be observed in the over crowded living spaces and household numbers of residences within the sate. Ghettos, slums and shanty settlements have also sprouted in several parts of the state to house the families of especially young and low-income immigrants.

Taxation Burden

Taxation is a major source of government revenue upon which development projects are established. The higher the number of economically active population within an area, the less the taxation burden on each individual. The age sex structure of the population of Lagos state has not encouraged the reduction of this tax burden. This is because of the predominance of the dependent age population and the high rate of unemployment prevalent in the state that has reduced the number of taxable adults. The tax burden within the state is therefore a very heavy one especially for those employed either by the government or by an organized private sector to the advantage of those who are self employed and can afford to avoid or evade tax payment.

Conclusion

In Lagos state, efforts to invest in human resources, reduce poverty and protect the environment must have been hampered by the imbalance in the population processes of migration and fertility that has given rise to a very young age-sex structure within the state. The predominance of children within the age cohorts of 0 to 14 years must have constituted a bane of economic development in the state. The populations in the economically active bracket of which a large

number are unemployed are grossly over stretched in a bid to provide the basic needs of these children who are dependent on them either as parents, relatives or as tax payers who contribute to fund government projects.

The current trend in the population structure of Lagos state stemmed specifically from previous fertility and migration conditions, which could have been controlled through the formulation and strict implementation of necessary population policies. Once initiated, a trend in population growth takes several decades to be changed and this can only be achieved through conscious efforts by governments, corporate bodies and individuals.

If left unchecked the population momentum that has started in Lagos state as a by product of the combined effect of the baby boom (which followed the oil boom that occurred in Nigeria in the late 1970's and early 80's) and the several streams of migration into the city since its rapid urbanization will continue to ensure the yearly input of population at the base of the age-sex pyramid in large numbers. This of course will be accompanied by a number of socio-economic challenges.

Population momentum can be reduced by investments in educational opportunities especially for women, reproductive health and family planning information and services, and by reducing maternal and child mortality. The timing of these investments is critical to offsetting the momentum. Slowing population growth sooner than later could reduce the future population size of the state and stabilize the age-sex population structure. Delaying such investments will only add to the ultimate cost of poverty reduction in the state.

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