

# Evaluation of the Effects of Rapid Urban Population Growth on the Health Infrastructures in Selected Urban Centers in Anambra State.

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## ABSTRACT

The aim of this study is to ascertain the effects of rapid urban population growth on the health infrastructures in selected urban centres in Anambra State. The study adopted survey research design, using the questionnaire as the main instrument of data generation. Considering the study area, the three major urban centers selected are incorporated into two local government each that is Nnewi north and south for Nnewi, Awka north and south for Awka and Onitsha north and south for Onitsha. A total of 405 persons were sampled, that is 135 each from Awka, Nnewi, and Onitsha. Stratified Random Sampling technique was employed in distributing the questionnaires, with the mean cut-off being applied on the 5-point likert scale questionnaire to analyse the responses. The research established that population growth in the selected urban centres (Awka, Nnewi and Onitsha) negatively affects social infrastructures such as health, recreational and educational facilities. That the effects of population growth on health infrastructure in the three urban centres are significantly the same. The study have been able to prove that health infrastructure are significantly affected on by population growth in the selected areas. The impact of population growth on social / health infrastructure is the same in Onitsha, Nnewi and Awka. In line with the findings, the following were recommended: There is need to plan and execute a strategic population census, to create a database with the actual population of the actual inhabitants of the urban centres as this is vital to population projections and planning of sustainable social infrastructure (like for today and a target future say next 20-50years). Existing health infrastructures should be expanded in the three urban centres while new ones be initiated to carter for present and future population. High quality/durable materials should be used for health infrastructure construction. More sound health infrastructures should be initiated in the rural areas to reduce population growth in urban areas. Implementation of high quality service delivery in rural areas will reduce population growth in urban centres. In the light of sustainable development it is pertinent that urban population growth is checked for the sake of the present and future generation.

**KEYWORDS:** Urban Population Growth, Effects on Health Infrastructure

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## 1.0 INTRODUCTION

### 1.1 BACKGROUND TO THE STUDY

PRB's projections show Africa's population will reach 2.5 billion by 2050, while the number of people in the America will rise from only 223 million to 1.2 billion. Asia will gain about 900 million to 5.3 billion, while Europe registers a decline from 740 million to 728 million. Oceania (which includes Australia and New Zealand) would rise from 40 million to 66 million (PRB, 2016). The world has about 7 billion people today. Resources can no longer cope with human population, hence economic recession. Among the continents of the world, Asia and Africa face population growth of uncontrollable proportion. If this phenomenon is unchecked, the whole world would definitely plunge into a catastrophe of greater magnitude (Richards, 2013).

In Nigeria, the inability of the government to cope with the tempo of population growth has resulted to the centre of cities decaying without any tangible programme for rehabilitation. New urban peripheries are emerging in

unplanned manner without the requisite infrastructure and this constitutes a serious obstacle to social and economic development.

The rise in population is likely to place greater strain on Nigeria's already strained physical and social infrastructure, and services, with increase in poverty, unemployment and political instability being inevitable. The case of Anambra state is pronounced as the three major cities (Onitsha, Nnewi and Awka) are crowded by consistent population growth as people migrate continually into these urban centers in search of better life. To contain this ever increasing population, these urban centers have sprawled into the surrounding towns, but the population pressure on social infrastructural facilities like markets, schools, hospitals and recreational facilities is a very serious challenge. Rapidly growing population necessitates large investments in social infrastructure and diverts resources from directly productive assets. The issue of urban population growth and its implication to health is very critical, hence this study.

## 1.2 STATEMENT OF THE PROBLEM

Most amenities in Nigeria are in sorry situation and we as a people have not stopped to think about what brought about these social woes. There is immense pressure on the land and resources can no longer cope no matter how well economic analysts may present it. Our social institutions are over-crowded and our infrastructures are stretched to the farthest limit. For instance, a sight of certain university teaching hospitals like the Nnamdi Azikiwe University Teaching Hospital Nnewi and the incidence of overcrowding is disheartening.

Anambra state is not an exception to the dangerous impact of uncontrolled population growth. The availability of land and other exhaustible environmental resources is largely being threatened leading to the high cost of land as the population density increases within the state over time. Majority of the urban centres in the state has the public health facilities being over stressed. This has been buttressed by the findings of Birdstal, (2007), who highlighted series of problems due to the inadequacy of resources and amenities to equate with the growth rate of our urban population. According to him, people clash with each other over farm land, forest resources, watershed, war also sometimes occurs over annexation of some communities lands which usually result to destruction of lives and properties.

Earlier researchers as exposed by the literature review tried to tackle other areas, but tend to be silent on the area of effects of urban population growth on health infrastructure. Oduwaye (2009), Awe (2009), Oduwina (2010), Adewole (2012) and Nwosu (2013); tried to handle the health effects of urban population growth, but the effects on urban infrastructure was not considered and none treated the case of Anambra State.

In order to explore the possibilities of achieving the provision of sustainable health infrastructure to adequately cater for the growing population in these urban centres, this study became important.

## 1.3 AIM

The aim of this study is to ascertain the effects of rapid urban population growth on the health infrastructures in selected urban centres in Anambra State, with a view to making recommendations to better control urban population growth and reduce the negative effects on health infrastructure.

### Hypothesis:

H<sub>0</sub>: Population growth in the study areas does not have significant effect on health infrastructures.

## 2.0 LITERATURE REVIEW

A lot of literature have discussed effects of population growth. Ehrlich (1968) in his book "Population control or race to oblivion", likened over population to cancer. According to him, cancer is an uncontrolled multiplication of cells, while population explosion is an uncontrolled multiplication of people. Treating only the symptoms of cancer may make the victim comfortable at first, but eventually he dies-often horribly. A similar fate awaits a world with population explosion, if only the symptoms are treated. He offers some solution to population problem in the way of outright sterilization and compulsory birth regulation through the addition of temporary sterility to water supplies or staple food. These may be extreme measures, but still, we need to apply control to our teeming population or things may get out of hand.

Oduwaye (2009), also affirmed that high competition due to high rate of population increase also results in health hazards as spread of diseases is high and there is pressure on the available health infrastructure.

Awe (2009), reviewed the place of population growth, family planning and HIV/AIDS in sub-Saharan Africa. He noted that in a country like Nigeria where population is playing an adverse role in all spheres of life, it has contributed in deteriorating the quality of lives of the masses thereby resulting into severe poverty, loss of value for life, various diseases, high rate of crime and slow development. These problems led many researchers to posit that a large population is a liability for most countries, especially one dependent on one source of income that offers limited employment. In his words, "why would any right thinking person want to bring children up into a country with Nigeria's problems? You have but of control poverty, unemployment, mega corruption in all spheres of government, very serious security problems, serious diseases, hatred in all spheres of life, be it political, religious or ethnic... for sure, it would not be a world I would want to bring a child into".

Odusina (2010), in his review paper also stated that another effect of a rapidly increasing population is the low level of income per head. There will be fewer income or resources per head. The result of this is a lower standard of living or general fall in the standard of living. The consumption of goods and services per head will be low. This can lead to consumption of substandard goods and inferior commodities. Moreover, this can as well generate a situation whereby many people live in ghetto or slump areas. Such areas are conducive for contagious diseases and epidemics. This is the case in many places in Nigeria especially in Lagos, and many parts of the Northern Nigeria.

Adewole (2012) also noted that rapid population growth affects the health and welfare of the masses and the quality of environment in which people live. In the findings of Nwosu (2013), he affirmed that as long as the population increases and the community retain certain pull factors which are stronger than the push factor, the community will grow and expand its geographical coverage. The housing conditions, drainage and sewage system is in a deplorable state and therefore calls for an engineered effort to remedy the existing situation. In an effort to meet the housing needs and demands of the increasing population, inhabitants end up settling in overcrowded areas, these are regions that are too small to support them, this affects their state of health and livelihood.

Nwosu (2013) studied the socio-economic and developmental problems of Oshodi-Isolo Local Government area, Lagos in southwestern Nigeria with a high population distribution of 1045 people per square kilometer. He adopted questionnaire survey method and physical inventory for generation of data. In his findings, the area under investigation was plagued with incidence of environmental decay and deterioration while supporting a large population irrespective of its small landmass of 9km<sup>2</sup>. Nwosu (2013), while agreeing with Ehrlich (1967) and Awe (2009) also noted that population growth creates unfavorable circumstances for economic development and puts pressure on available environmental resources. This was also supported by Nwosu et al. 2014.

### 3.0 STUDY AREA

Anambra state in the southeastern Nigeria forms boundaries with Delta State to the west, Imo State and Rivers State to the south, Enugu State to the east and Kogi State to the north. Anambra State is located within latitude 6° 48' N and Longitude 6°37'E on the North and Latitude 5°40'N and longitude 7°27'E on the South. It has a total land area of 4,416sqkm (Geological Survey Awka, 2000).

According to the 1991 national population census, the state has a total population of 2,796,475 in a land area of 4,416 sq. km, giving an average density of 633 persons per sq. km. The state is therefore one of the most densely populated states in Nigeria. The distribution of the population by local government areas. The following LGAs Onitsha (3,771 persons per sq. km), Idemili (1,448), Aguata (1,420), Njikoka (1,379), and Nnewi (738) have more than average population densities for the state. They are also the major commercial centres and areas of growing industrial development.

Conversely, Anambra East (167), Awka North (170), Oyi (216), Ogbaru (360), and Orumba (488) have less than average density. These local government areas are located on the flood plains, where farming and fishing are dominant occupations. Because dry land for settlement is limited to the undulations and narrow ridges above the flood plains, such areas have small settlement nucleations. On the cuestas, especially the dip slopes, the settlement pattern is essentially dispersed; but increasing urbanization as well as population growth have given rise to large cities such as Onitsha, Nnewi, Okpoko, Obosi, Nkpor and Awka. The "northern part of the dip slope of the higher cuesta is a region of large, closely spaced merging settlements. But based on the 2006 census figure, the population of Anambra State rose to 7,821,858 with a density of 863km<sup>2</sup> (NPC, 2006).

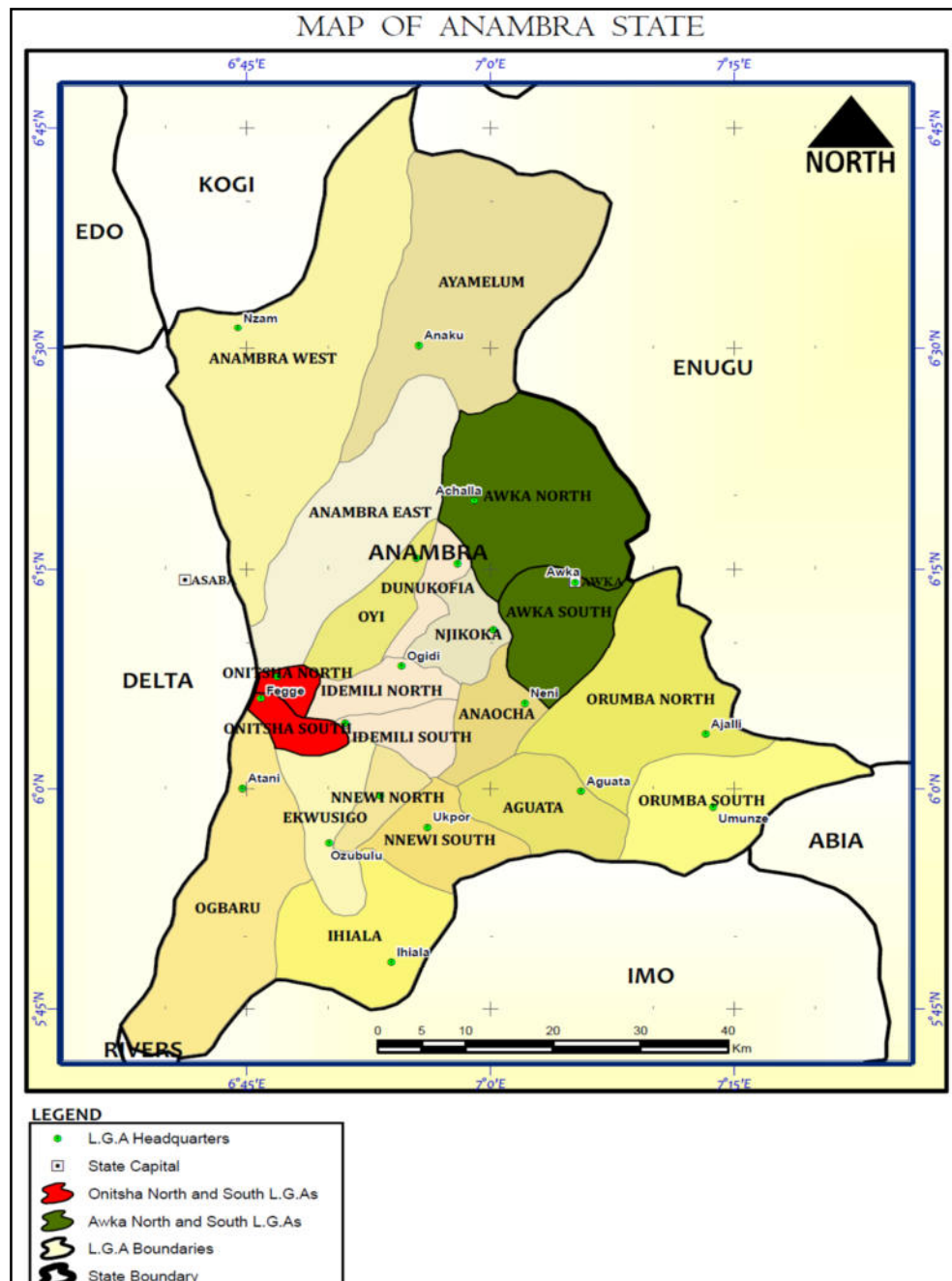


Fig. 1: Anambra State Showing the Onitsha (N & S), Nnewi (N & S) and Awka (N & S) Local Governments (Source: Excel Research Centre, Awka ).

With an annual population growth rate of 2.21 percent per annum, Anambra state has over 60 percent of its people living in urban areas making it one of the most urbanized place in Nigeria (N.P.C.2009). The major urban centres of Anambra state are Onitsha, Nnewi and Awka.

#### 4.0 METHODOLOGY

The study adopted survey research design, using the questionnaire as the main instrument of data generation. Considering the study area, the three major urban centers selected are incorporated into two local government each that is Nnewi north and south for Nnewi, Awka north and south for Awka and Onitsha north and south for Onitsha.

The population of these six local government area as projected by NPC from 2006 census figure to 2017 is 1,356,152; with Awka North (159,526); Awka South (269,669); Nnewi North (221,024); Nnewi South (331,818); Onitsha North (179,043) and Onitsha South (195,072).

The population of the six local government areas which form part of Onitsha, Nnewi and Awka as projected by NPC from 2006 census figure to 2017 is 1,356,152. The sample size was drawn, using Taro Yamaine formulae, to be = 399.8820 which is approximately 400. The researcher thus decided to sample 405 persons, that is 135 each from Awka, Nnewi, and Onitsha.

Stratified Random Sampling technique was employed in distributing the questionnaires; this was necessitated by the fact that Awka, Nnewi and Onitsha were further divided to give a wider spread of distribution and proper representation.

## 5.0 DISCUSSION OF RESULTS/FINDINGS

In order to ascertain the effects of rapid population growth on the health infrastructures in the selected study area, the questionnaire was structured on a 5-point likert scale of strongly disagree (SD=1), disagree (D=2), no opinion (NO=3), agree (A=4) and strongly agree (SA=5). With the scales, the mean cut-off point was calculated thus:

$$\bar{x} = \frac{1 + 2 + 3 + 4 + 5}{5} = \frac{15}{5} = 3.0$$

Where  $\bar{x}$  is the mean.

This implies that all responses whose mean is 3.0 and above will be regarded as agree, while less than 3.0 is disagree.

**Table 1:** Weighted mean response for population growth impact "on health infrastructures

S/N	ISSUE RAISED	Awka	Nnewi	Onitsha
	<b>IMPACTS OF RAPID POPULATION GROWTH ON THE HEALTH INFRASTRUCTURE</b>			
1	Rapid population growth caused overcrowding of health facilities in the area.	2.98	3.37	3.69
2	Increase in health service charge arose as a result of population growth	3.86	3.55	3.50
3	Population growth caused reduced accessibility to health facilities.	2.84	3.57	3.70
4	The rapid deterioration of health facilities resulted from population growth.	3.93	3.58	3.18
5	The high cost of maintenance of health facilities in the area is as a result of increase in population.	3.34	3.21	3.36
6	There is high migration in search of healthcare infrastructure outside immediate environment as a result of increase in population.	3.70	3.18	2.65
7	Population growth has encouraged government intervention in initiating more health infrastructural facilities.	3.11	2.86	2.82
8	Population growth has enhanced entrepreneurship through increase in establishment of private health facilities.	3.24	3.24	3.13
9	There is high problem of waste generation and management due to increase in the population of the area.	3.21	3.31	3.68
10	Increase in population has contributed to the decrease in the quality of healthcare service delivery.	3.10	3.37	3.34

**Source:** Researcher's Statistical Analysis

**Hypothesis:** Population growth in the study areas does not have significant effect on health infrastructure.

**Statistical tool:** One sample T - Test.

**Reason for choice of tool:** One level of observations was compared.

**Degrees of freedom:** 29.

**Decision Rule:** Accept the null hypothesis if the p - value is greater than or equal to 0.05, otherwise, reject the null hypothesis.

**Table 2:** T-test table for health impact One-Sample Statistics T-Test

	N	Mean	Std. Deviation	Std. Error Mean
Data on health infrastructure	30	3.3200	.31640	.05777

**Table 3: One-Sample Test Table**

	Test Value = 0					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Data on health infrastructure	57.472	29	.000	3.32000	3.2019	3,4381

**Decision, Conclusion and Reason:** From the table, since the p - value is 0.000, less than 0.05, it will be concluded that urban population growth in the study areas have significant effect on health infrastructure.

After the overall analysis on the effects of rapid population growth on the health infrastructure facilities in Onitsha, the result revealed that population growth has affected the health infrastructural facilities in Onitsha. The null hypothesis is therefore rejected and the alternate accepted. Ogujiuba (2005) also affirmed that high and rapid population growth without corresponding social and economic growth will lead to over use and misuse of inadequate social services and misuse due to heavy pressure on social infrastructural facilities and health facilities amongst other.

#### PCA Test for Health Infrastructures

**Table 4: KMO and Bartlett's Test for Health infrastructures**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.705
Bartlett's Test of Sphericity	Approx. Chi-Square
	148.551
	df
	45
	Sig.
	.000

The Bartlett Test of Sphericity compares the correlation matrix with a matrix of zero correlations (technically called the identity matrix, which consists of all zeros except the 1's along the diagonal). From this test we are looking for a small p-value indicating that it is highly unlikely for us to have obtained the observed correlation matrix from a population with zero correlation.

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO MSA) does not produce a P-value, but we are aiming for a value over 0.8 and below 0.5 is considered to be miserable.

It is clear that we have good values for all variables for the MSA but the overall value is 0.705, then the Bartlett's Test of Sphericity has an associated P-value (Sig. in the table) of 0.001 (0.000). So from the above results we know that we can now continue and perform valid principal components analysis (PCA) for the impacts of rapid population growth on the health infrastructure in the area.

**Table 5: Commonalities**

	Initial	Extraction
Rapid population growth caused overcrowding of recreational infrastructures in the area.	1.000	.855
Increase in recreational service charge arose as a result of population growth.	1.000	.566
Population growth caused reduced accessibility to recreation infrastructures.	1.000	.912
The rapid deterioration of recreational infrastructures resulted from population growth.	1.000	.815
The high cost of maintenance of recreational infrastructure in the area is as a result of increase in population.	1.000	.960
There is high migration in search of recreational infrastructure outside immediate environment as a result of increase in population.	1.000	.815
Population growth has encouraged government intervention in initiating more recreation infrastructural facilities.	1.000	.713
Population growth has enhanced entrepreneurship through increase in establishment of private recreational facilities.	1.000	.850
There is high problem of waste generation and management by recreation centres due to increase in the population of the area.	1.000	.838
Increase in population has contributed to the decrease in the quality of service delivery in recreational facilities.	1.000	.778

Extraction Method: Principal Component Analysis



**Table 6: Communities**

	Initial	Extract ion
Rapid population growth caused overcrowding of health facilities in the area.	1.000	.855
Increase in health service charge arose as a result of population growth	1.000	.566
Population growth caused reduced accessibility to health facilities.	1.000	.912
The rapid deterioration of health facilities resulted from population growth.	1.000	.815
The high cost of maintenance of health facilities in the area is as a result of increase in population.	1.000	.960
There is high migration in search of healthcare infrastructure outside immediate environment as a result of increase in population.	1.000	.815
Population growth has encouraged government intervention in initiating more health infrastructural facilities.	1.000	.713
Population growth has enhanced entrepreneurship through increase in establishment of private health facilities.	1.000	.850
There is high problem of waste generation and management due to increase in the population of the area.	1.000	.838
Increase in population has contributed to the decrease in the quality of healthcare service delivery.	1.000	.778

**Table 7: Total Variance Explained**

Comp orient	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	%of Variance	Cumulati ve%	Total	%of Variance	Cumulati ve%	Total	%of Variance	Cumulative %
1	6.884	68.836	68.836	6.884	68.836	68.836	4.152	41.521	41.521

Here, only two components were extracted; the first component extracted 41.521% while the second extracted 39.514% of the total, then the total variance explained is 81.035%. All the variables extracted in the first component have higher contributions than those extracted by the second component.



**Table 8: Component Matrix<sup>a</sup>**

	Component	
	1	2
Rapid population growth caused overcrowding of health facilities in the area.	.793	-.476
Increase in health service charge arose as a result of population growth	.689	.303
Population growth caused reduced accessibility to health facilities.	.774	-.560
The rapid deterioration of health facilities resulted from population growth.	.882	.194
The high cost of maintenance of health facilities in the area is as a result of increase in population.	.980	.005
There is high migration in search of healthcare infrastructure outside immediate environment as a result of increase in population.	.693	.579
Population growth has encouraged government intervention in initiating more health infrastructural facilities.	.746	.396
Population growth has enhanced entrepreneurship through increase in establishment of private health facilities.	.913	-.125
There is high problem of waste generation and management due to increase in the population of the area.	.892	-.205
Increase in population has contributed to the decrease in the quality of healthcare service delivery.	.882	.031

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

**Table 9: Rotated Component Matrix'**

	Component 123	
	1	2
Rapid population growth caused overcrowding of health facilities in the area.	.901	.208
Increase in health service charge arose as a result of population growth	.285	.696
Population growth caused reduced accessibility to health facilities.	.946	.135
The rapid deterioration of health facilities resulted from population growth.	.500	.752
	.702	.684
The high cost of maintenance of health facilities in the area is as a result of increase in population.	.096	.898
There is high migration in search of healthcare infrastructure outside immediate environment as a result of increase in population.	.262	.803
Population growth has encouraged government intervention in initiating more health infrastructural facilities.	.744	.544
Population growth has enhanced entrepreneurship through increase in establishment of private health facilities.	.784	.472
There is high problem of waste generation and management due to increase in the population of the area.	.613	.635
Increase in population has contributed to the decrease in the quality of healthcare service delivery.		

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Interpretation of the principal components is based on finding which variables that have high values (values greater than or equal to .5), that is variables that are most strongly correlated with each component; we want to know which of these numbers are large in magnitude, the farthest from zero in either positive or negative direction. These are determined from the rotated component matrix as presented. The results were rotated because more than one component was extracted. We will now explain the loading of the PCA as contained in the rotated component matrix.

The first principal component is strongly correlated with five of the original variables. That is, first principal component increases with reduced accessibility to health facilities, overcrowding of health facilities in the area, high problem of waste generation and management due to increase in the population of the area, enhanced entrepreneurship through increase in establishment of private health facilities, and high cost of maintenance of health facilities in the area. This suggests that these five issues vary together. If one of the issues increases, then others tend to increase as well. This component can be viewed as a measure of the quality of the variables; reduced accessibility to health facilities, overcrowding of health facilities in the area, high problem of waste generation and management due to increase in the population of the area, enhanced entrepreneurship through increase in establishment of private health facilities, and high cost of maintenance of health facilities in the area.

The second principal component increases with the other five of the variables; high migration in search of healthcare infrastructure outside immediate environment, encouragement of government intervention in initiating

more health infrastructural facilities, rapid deterioration of health facilities, increase in health service charge and the decrease in the quality of healthcare service delivery. This component can be viewed as a measure high migration in search of healthcare infrastructure outside immediate environment, encouragement of government intervention in initiating more health infrastructural facilities, among other issues.

## 5.1 CONCLUSION AND RECOMMENDATION

The research established that urban population growth in the selected urban centres (Awka, Nnewi and Onitsha) negatively affects social infrastructures such as health, recreational and educational facilities. The negative effects include but not limited to: overcrowding, rapid deterioration of facilities, increased waste generation, and decrease in quality of service delivery.

That the effect of population growth on health infrastructure in the three locations are significantly the same. That is, the effects of population growth on health infrastructure are the same in Awka, Nnewi and Onitsha

PCA test for Health Infrastructures showed that the principal component is strongly correlated with five of the original variables which are: reduced accessibility to health facilities, overcrowding of health facilities in the area, high problem of waste generation and management due to increase in the population of the area, enhanced entrepreneurship through increase in establishment of private health facilities, and high cost of maintenance of health facilities in the area. This suggests that these five issues vary together, if one of the issues increases, then others tend to increase as well and these can be viewed as a measure of the quality of the variables. The study also found that:

1. The study have been able to prove that health infrastructure are significantly affected by population growth in the selected areas.
2. The effect of population growth on social / health infrastructure is the same in Onitsha, Nnewi and Awka. Although a Post-HOC test ranked Nnewi to be the city with the highest level of impact among the three selected. Thus any intervention to these impacts of population growth on social/health infrastructure should start with Nnewi, followed by Onitsha, then Awka.

The study therefore recommends as follows:

1. There is need to plan and execute a strategic population census, to create a database with the actual population of the actual inhabitants of the urban centres as this is vital to population projections and planning of sustainable social infrastructure (like for today and a target future say next 20-50years).
2. Existing health infrastructures should be expanded in the three urban centres while new ones be initiated to cater for present and future population.
3. High quality/durable materials should be used for health infrastructure construction.
4. More sound health infrastructures should be initiated in the rural areas to reduce population growth in urban areas.
5. Implementation of high quality service delivery in rural areas will reduce population growth in urban centres.
6. In the light of sustainable development, it is pertinent that urban population growth is checked for the sake of the present and future generation.

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