Public Health Problems associated with Informal Settlements around Waterfront Communities in Port Harcourt, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author DNO designed the study, while author JOO performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript managed the analyses of the study and literature searches under the strict supervision of authors DNO, SAN and AA. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Port Harcourt municipality, southern Nigeria, is faced with environmental problems with slums and informal settlements communities, ranging from use of poor and overstressed facilities and inadequate water and electricity supplies and lack appropriate garbage disposal facilities and good drainage systems resulting in perennial flooding due to blocked drainage systems resulting in a number of diseases, such as malaria, diarrhea, cold and cough. Communities are densely populated, with more than five people living in a room. Therefore this study was carried out to assess the public health status of slums/ informal settlements in Port Harcourt Municipality in Rivers state. The study utilized a mixed-method approach. A cross-sectional survey questionnaire and in-depth interview were used to collect data. A total of 180 Questionnaires were distributed across the five (5) selected waterfronts communities in the survey and key informants were

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interviewed to obtain detailed information about the status of the various communities in the Informal settlements studied. The results of the study revealed that the most prevalent illnesses in all Slums/Informal Settlements were malaria, typhoid, dysentery, diarrhea, coughing, worm infestation, and skin infection. The prevalence rate of infectious disease recorded for all slums/Informal settlements show that Malaria had 15-17%; Typhoid fever14-16%, Diarrhea 11-13%, Dysentery 12-14%, Cough 5-10%, Worm infestation 8-11% and Skin infections 2-4%. However, Malaria remains the foremost killer disease in Nigeria. It accounts for over 25% of under 5 mortality, 30% childhood mortality and 11% maternal mortality. These results suggest that people living in slums are predisposed to severe outbreak of epidemics, therefore requires an urgent attention for comprehensive interventions from the government and other organizations to strengthen existing programs to improve the public health and quality of life of this vulnerable population.

1. INTRODUCTION

Slums are unplanned, densely populated and neglected parts of cities where living conditions are extremely poor (CAVES, 2004). Environmental problems in urban informal settlements exert serious impact on public health. The residents of these settlements have very poor income and assets and therefore tend to be vulnerable; and with greater levels of exposure to environmental problems they are more likely to get sick and remain ill (Gichuki, 2005). The quality of dwellings in such settlements varies from the simple shack to permanent structures, while access to water, electricity, sanitation and other basic services and infrastructure tends to be limited [1]. Slum dwellers occupy irregular settlements, squatter housing, unauthorized land developments, rooms and flats in dilapidated and uncompleted buildings and decreased human welfare level [2], (Ortega et al*.,* 2011). The neighborhoods are characterized by polluted and degenerated housing conditions in the form of makeshift houses otherwise called shanties or shacks typically made of materials such as mud and wood showing features of poverty, lack of facilities and infrastructures, lack of access to safe drinking water sources, high population density, limited access to health services, malnutrition, and exposure to communicable diseases (Chowdhury and Nrulamin, 2006; Lall et al., 2008; Semba et al*.,* 2009; Ozener, 2010). However, due to the informal nature of slum settlements, and cultural, social, and behavioral factors unique to slum populations, little is known about the challenges they face in terms of health and quality of life.

Rapid urbanization, and excessive migrations to urban centres in recent decades have resulted in growth of urban population and this has caused increased informal settlements with very poor life facilities (Ibrahim et al., 2002; Han et al., 2009). This has caused, beside wide environmental and urban landscapes changes (Hedblom et al., 2008; Catalan et al., 2008), many demands for underlying and basic infrastructures (Schouten and Mathenge, 2010). It is associated with increasing environmental problems, threatened vitality and quality indicators, limited access to entertainment facilities, poor planning of urban and primary health facilities and ultimately poor access to the dominant paradigm of sustainable development resulting in poverty among residents coupled with lack of socioeconomic status in their income (Chakraborty et al., 2009, Mahdi, 2011) .In this case, people's quality of life, vitality, exhilaration and environmental health conditions are subjected to increasing danger due to apparent lack of access to required facilities and basic services (Sohel-Rana, 2006). Therefore this study was aimed to evaluate the environmental and public health problems in some prominent Informal Settlements in Port Harcourt Waterfront Communities in Rivers State, Nigeria.

1.1 Area of Study

The study was carried out at the following waterfronts communities in Port Harcourt Municipality namely Bundu along the Correctional centre/Industry Road, Egede/ Iloabuchi Street in Diobu, Ibadan behind Town Central Market, Enugu at old Township and Etche in Borikiri waterfront communities in Port Harcourt Local Government area of Rivers State. Fig. 1 shows the map of the study areas.
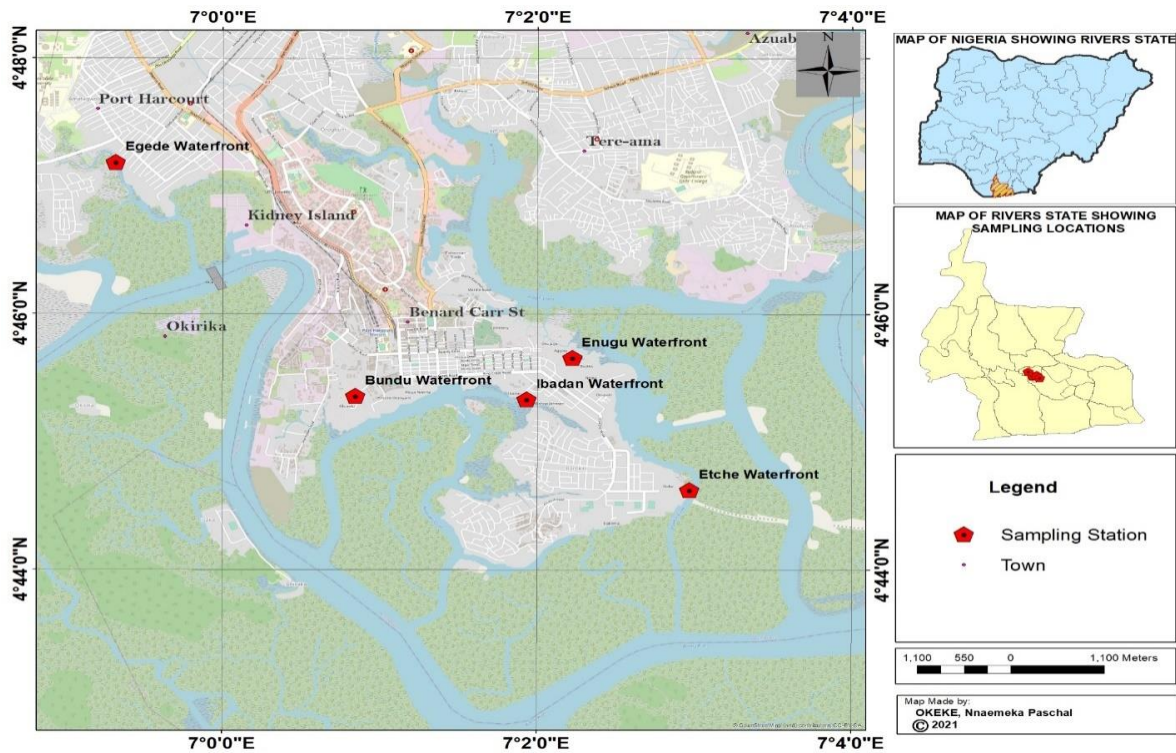
Fig. 1. Map of Port Harcourt showing the study locations
Source: Researcher's Field Survey 2021

2. MATERIALS AND METHODS

2.1 Sampling Method

As slums typically exhibit very substantial spatial heterogeneity, it is desirable that the sampled locations span the whole of the site. A geometrically simple way to achieve this is to sample the households or as close as possible to the points of a regular lattice overlaid on the mapped site. A simple random sample was chosen from each stratum within the slum and combined to form the full sample because population within the study locations embraces a number of distinct categories and is divided into sub-populations. Questionnaires was used to collect primary data from the residents of slum waterfronts sampled. A total of 180 Questionnaires were distributed across the five (5) selected waterfronts communities in the survey and key informants were interviewed to obtain detailed information about the status of the various communities in the Informal settlements studied.

2.2 Research Design

Research design as asserted by Creswell (2003) is a master plan specifying the methods and procedures used to guide and conduct a research work. The design of a research covers the outline and key features of the study to be undertaken, including the method of data collection and analysis to be employed (Tayobo and Oyeniyi, 2012).

2.3 Sampling Size

Sampling Size for this study was determined based on the estimation of the population (Cochran, 1977). The formula is as given below was used to estimates the sample size for this study:

$$n = \frac{z^2 \ (pq)}{e^2}$$

Where:

N = Sample size
Z = Standard Error associated with the chosen level of confidence (typically 1.96)
p = Variability/Standard Deviation (it be taken from pilot study)
q = 1-p
e = Acceptable sample error
Hence, the required sample size for this study was 383 for a population with a 5% margin of error and a 95% confidence level.

2.4 Data Analysis

The analysis of the data also include the use of Spearman's Correlation for bivariate data, specifically to compare relationship between communities and industries environmental sustainability practices in the industrial zone. Lobo & Guntur (2018) stated that Spearman's correlation formula can be used as follows;

$$\text{Spearman Correlation} \quad p = 1 - \frac{6\Sigma d^2}{n(n^2 - 1)}$$

3. RESULTS

Table 1 shows the common illnesses prevalent in the slums. Seven illnesses were observed as Malaria, Typhoid, Diarrhea, Dysentery, Coughing, Worm and Skin infection. The most prevalent illness in Bundu settlement was malaria, followed in decreasing order by coughing, typhoid, worm infestation, diarrhea, dysentery and skin infection. In Etche settlement, coughing was the most prevalent, then followed by malaria, skin infection, typhoid, diarrhea, worm infestation dysentery and others. The most prevalent illness in Ibadan was malaria, followed by coughing, typhoid, diarrhea, worm infestation, skin disease, dysentery etc. In Egede, the most prevalent illness was malaria, followed by coughing, typhoid, worm infestation, skin infection, diarrhea, dysentery and others. Finally in Enugu, the most prevalent illness was malaria, then followed by coughing, typhoid, diarrhea, skin infection, worm infestation, dysentery and others. Fig. 2 shows the proportion of the respondents that seek for medical treatment during health crisis. Generally, a greater proportion of the respondents seek for medical attention in all the settlements under investigation.

Figs. 3 to 7 shows the sources of medical treatment that are sort after by the slum residents during times of health crisis. These sources include Government-Owned Health Centres, Private clinics, Pharmacy/Chemist shop, drug dispenser kiosk/shop and Government Mission Hospital.

The respondents in Bundu patronizes mostly the drug dispenser kiosk/Chemist shop, then followed by the pharmacy, government health centers, private clinics and finally, government mission hospitals (Fig. 3) while the respondents in Etche patronizes mostly pharmacy shop, followed by drug dispenser kiosk/ chemistshop, Government mission hospital, Government-owned health centers and then private clinics (Fig. 4).

Table 1. Common illnesses in the study area

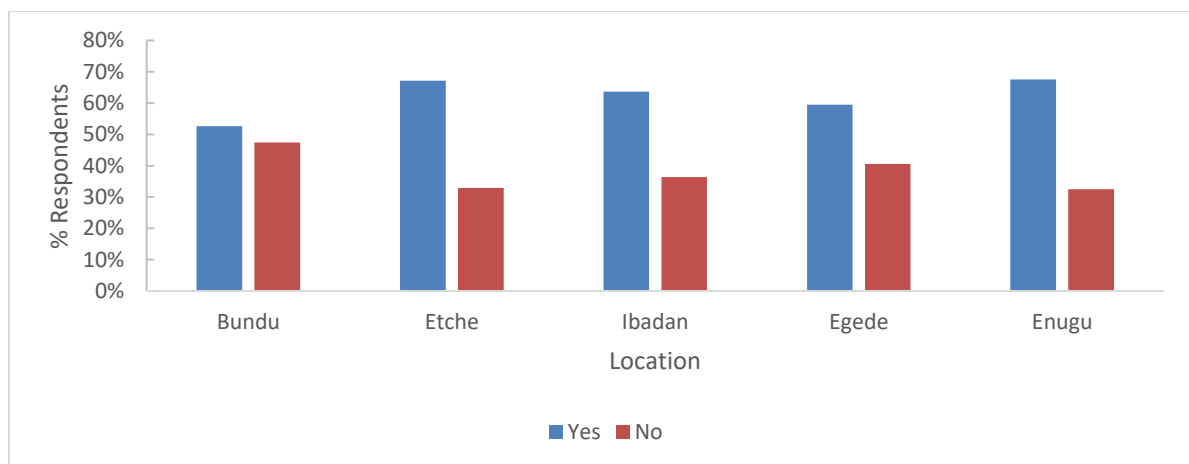| Location	Malaria %	Typhoid %	Diarrhoea %	Dysentery %	Coughing %	Worm %	Skin infection %	Others %
Bundu	24(71)	16(47)	11(34)	6(18)	19(57)	15(46)	6(19)	3(9)
Etche	19(51)	15(41)	11(30)	6(17)	21(57)	6(16)	16(44)	6(15)
Ibadan	19(70)	16(59)	12(45)	9(34)	18(64)	11(40)	10(37)	4(15)
Egede	19(61)	18(55)	11(34)	6(19)	18(56)	12(36)	12(36)	5(16)
Enugu	22(65)	16(45)	11(32)	6(16)	19(55)	11(32)	12(35)	3(10)

Fig. 2. Those that seek medical treatment for ailment

Fig. 5 show that Ibadan residents preferred medical treatment from pharmacy/chemist shops, followed by drug dispenser kiosk/ chemist shop, Government-owned health centres, private clinics and then government mission hospitals.

In Egede, the most preferred source of medical treatment is pharmacy shop, followed by drug dispenser kiosk/ chemist shop, Government Mission hospitals, government-owned health centres, and then private clinics (Fig. 6) while in Enugu slum residents preferred medical treatment from pharmacy shop, followed by drug dispenser kiosk/ chemist shop, Government mission hospitals, Government health centers, and then private clinics (Fig. 7).

4. DISCUSSION

Nigeria faces many public health problems and challenges due to poor sewage disposal, water supply, air pollution, noise pollution, environmental degradation, indiscriminate solid waste disposal, maternal mortality, infant mortality, health financing, poor sanitation and hygiene, environment degradation etc resulting in infectious diseases [3,4,5] Slum settlements are highly characterized by poor housing conditions and inadequate services, and are associated with an increased risk of disease and ill-health. Slums mostly are situated in marginal or less valuable urban lands such as riverbanks, steep slopes, dumping grounds, abandoned or unexploited plots, market places and in low lying areas or wetlands. According to Chandramoulis [6] and Lukeman et al. (2014) slums are areas with dilapidated and informal housing structures, poor ventilation, acute overcrowding, faulty alignment of streets, inadequate lighting, poor safe drinking water, clogging of drains during rains, absence of toilet facilities and non-availability of basic physical and social services.
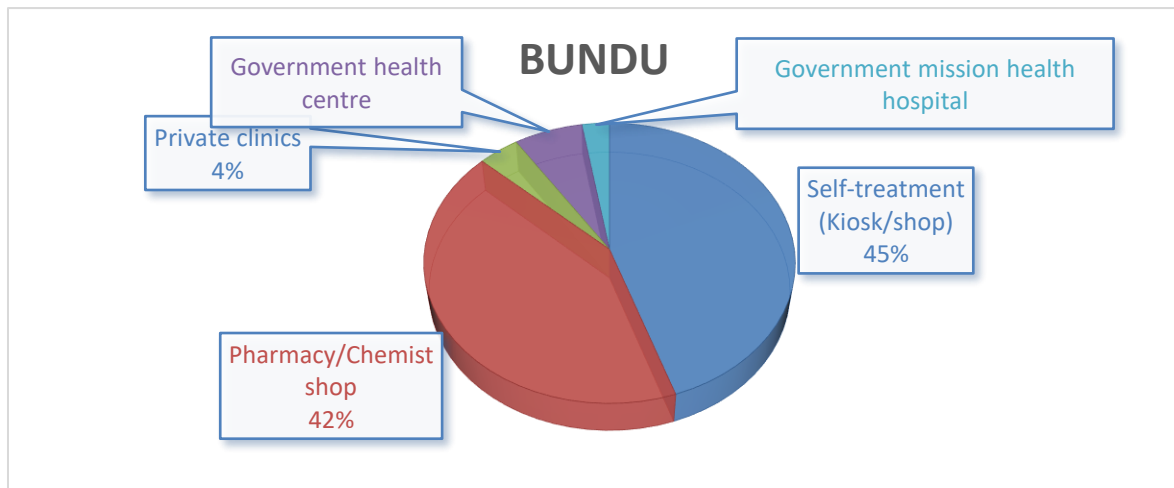

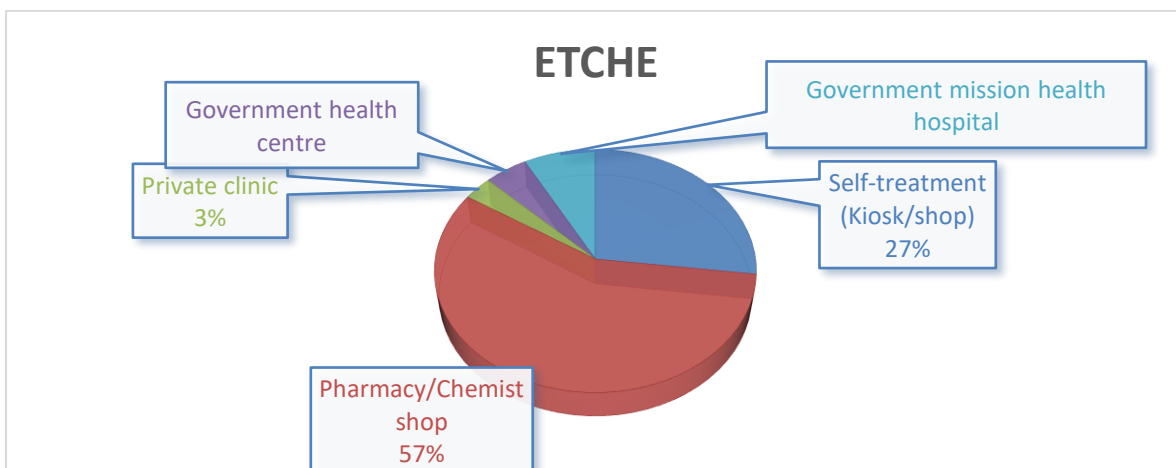**Fig. 3. Bundu residents**

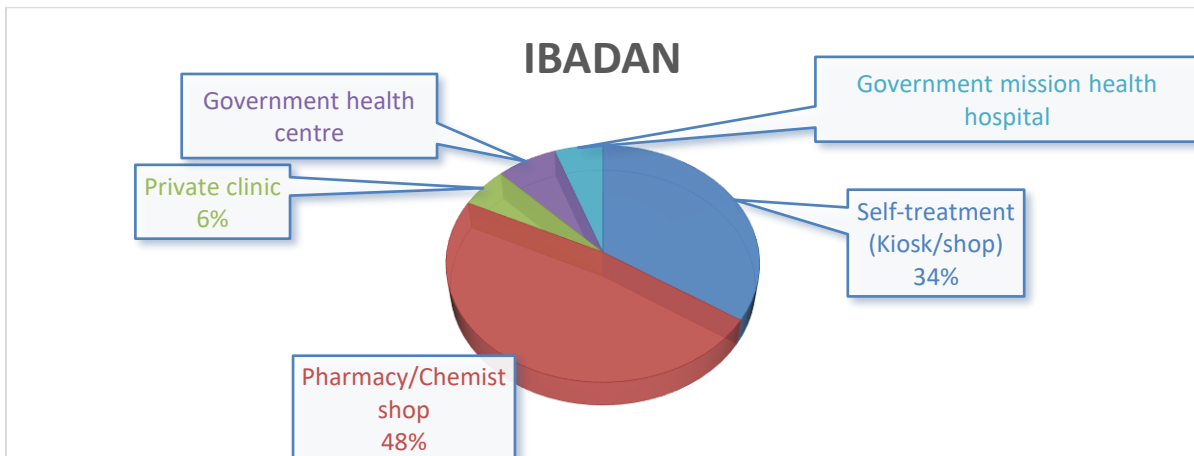**Fig. 4. Etche residents**
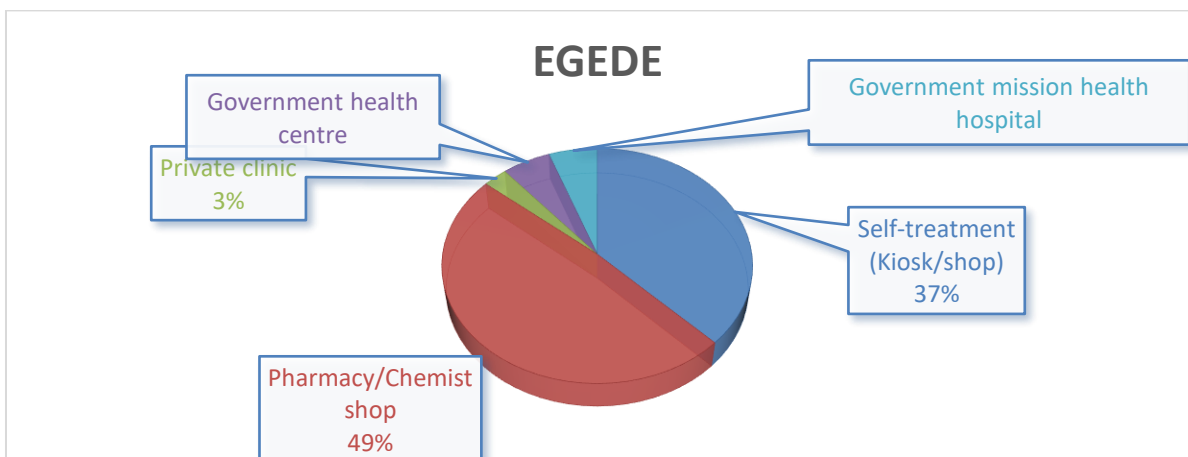
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Fig. 5. Ibadan residents

Fig. 6. Egede residents

The living conditions in slums are usually unhygienic and contrary to all norms of planned urban growth and vulnerable to all forms of pollutions and water borne disease. The environment generally pose health risks particularly to vulnerable populations such as children, the elderly, and people with suppressed immune systems, and are likely to aggravate gender-related inequalities. They also lack appropriate garbage disposal facilities and good drainage. Personal hygiene habits are very poor; open defecation in ditches and the lagoon is widely practiced. Residents are faced with perennial flooding due to blocked drainage systems resulting in a number of diseases, such as malaria, diarrhea, cold and cough as observed in this study. These conditions pose serious threat to the health of the residents and contribute to the spread of infectious diseases due to poor sanitation and hygiene [7], (Golubchikov and Badyina, 2012); [8], (WHO 2016), thereby increasing the burden of acute

and chronic infectious [9,7,10]. However, it was recorded that the most common ill-health were due to the state of the environment with several illnesses such as malaria, typhoid, diarrhea, dysentery, coughing, worm and skin infection. The prevalence rate of infectious disease recorded for all slums/Informal settlements show that Malaria had 15-17%; Typhoid fever14-16%, Diarrhea 11-13%, Dysentery 12-14%, Cough 5-10%. Worm infestation 8-11% and Skin infections 2-4%. However, Malaria remains the foremost killer disease in Nigeria. It accounts for over 25% of under 5 mortality, 30% childhood mortality and 11% maternal mortality [11,5]. These situations pose grave threats to the health of the inhabitants, stemming from poor-quality housing, lack of infrastructure and minimal access to refuse collection, health care or other essential services. The studies do suggest that there is urban health inequalities around the slums and may be vulnerable due to climate change, lack of sanitation facilities, housing
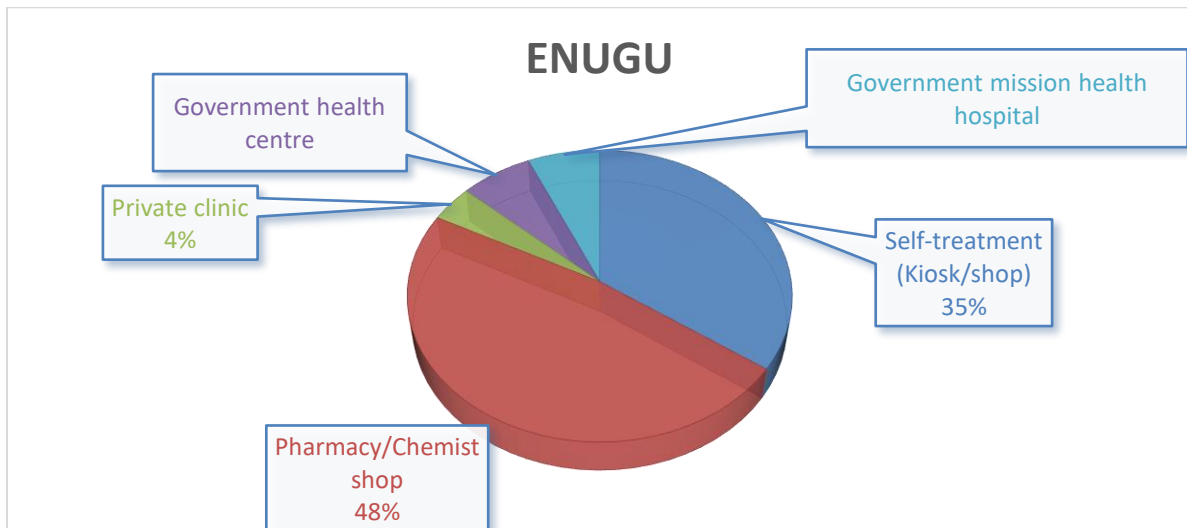
Fig. 7. Enugu residents

conditions, poor waste disposal practices, non-potable water supplies. As health inequalities are recreated over their life-course, low-income urban residents are consistently denied the chance of improved health. This is the case of residents who live in slum communities in Port Harcourt city. According to Moser (2011) and Sverdlik (2011) low-income urban residents also suffer from non-communicable diseases (NCDs) such as cancer, diabetes and stroke, which are increasingly creating a "double burden" in these households. Most of the causes of these infectious diseases could be due to poor personal hygiene habits and open defecation in ditches widely practiced in slum areas while poor environment causes a number of diseases (e.g. malaria, diarrhea, cold and cough). Unfortunately these residents lack appropriate health care from successive governments irrespective of the fact that they are considered as stakeholders in electioneering processes where they are tuned to cast their votes at elections but are forgotten at the end of such process. It has been reported by several workers that urban populations in slums have no access to safe drinking water and adequate sanitation and therefore suffer unacceptable levels of hygiene and health, because of the absence of essential basic social amenities [12,13]. This situation predisposes people living in such conditions particularly persons in informal settlements vulnerable to infectious diseases such as diarrhoea, cold and cough and high rate of mortality are recorded while infections such as pneumonia and diarrhoeal are among the leading causes of death in such communities [8,14,15], (Sverdlik, 2011).

Most worrisome in Nigeria is that successive governments have on many occasions neglected the urban slums populations when it comes to provision of social services but take into account slum populations during elections where they are approached during campaigns to cast their votes, but unfortunately, this rhetoric is not met with tangible and enduring actions, particularly in the area of health system financing. There is a window of opportunity available for initiatives aimed at enhancing the emergence of an integrated approach to public health problems in Nigeria, taking into account the social, cultural and economic determinants of health and also structuring the health system as an efficient channel for health services delivery. The current national health policy have concise statements on policies of health programs such as HIV/AIDS, Malaria, Immunization, Population, Reproductive Health, Control of Onchocersiesis, Tuberculosis and Leprosy, Blood Transfusion, Elimination of Female Genital Mutilation, Adolescent health, Food and Nutrition, Child Health, Drug and Food hygiene and safety [16]. The primary health care on which the Nigerian health care system is based has not helped in effectively solving the numerous health problems in Nigeria. Every year, Nigeria records an outbreak of different diseases which kill innocent Nigerians in their thousands [16]. Despite this yearly occurrence of outbreak, there has not been an effective and efficient emergency response and disease prevention system in Nigeria. Effort at improving public health and quality of life, basic health indicators have remained poor as hygiene and sanitation-related diseases still play a huge role in propagating ill

health and poverty across the country [17]. Effort towards combating issues of poor urban sanitation through wider planning while at the same time exploring other opportunities that could ameliorate its adverse impact and also provide mutual gain for the development of sustainable cities in Nigeria (Egunjobi, 1999).

5. CONCLUSION AND RECOMMENDATION

Economic growth in Nigeria is not as fast as the rate of growth of its urban populations, and this has given rise to an increasing growth of the populations that have out-paced the country's health and social services. The result of which is increasingly high rates of unemployment, poverty and poor health outcomes especially among the urban poor who live below the poverty line with limited access to social and health care services. In such circumstances, slum living is an unavoidable reality. It is therefore recommended that provision of intervention packages by government and private sector participation that will address health service provision, environmental sanitation, personal hygiene, health care and livelihood opportunities will most likely have greater impact on the slum population. Therefore, there is an urgent need for comprehensive interventions from the government and other organizations to strengthen existing programs to improve the health and quality of life of this vulnerable population.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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