



Neighbourhood differentials and environmental health interface in Lagos metropolis, Nigeria



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A B S T R A C T

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This paper investigates differentials in key socioeconomic attributes and environmental conditions and the resultant effects on environmental health in the Lagos Metropolis. A comparative study of Ikoyi, Dolphin Estate and Obalende, three contiguous neighbourhoods (low, medium and high density) is done.

Issues examined include housing and environmental conditions; socioeconomic characteristics such as age, gender, income, household size and level of education were also considered. The major similarities and differences were identified and their implications on public health within each subset were determined.

The study shows that socio-economic attributes and indeed aspects of the built environment tend to interact with and magnify health disparities; Average monthly income was US\$833, US\$500 and US\$150 in Ikoyi, Dolphin Estate and Obalende respectively. Household access to safe water was ranging from 71% in Ikoyi to 28% in Obalende hence the high incidence of sanitation ailments there.

The paper concludes by suggesting measures to mitigate identified disparities and aid the evolution of a more equitable and healthy Lagos. These include the integration of urban planning and public health and the enforcement of basic sanitation regulations in the study area.

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Introduction

Health is essential to building strong societies. The importance of a socially-based understanding of health, in the form of social determinants, social impacts, and social remedies is advanced by recent research (Hammer et al., 2006; Hardoy, Mitlin & Satterthwaite, 2001; Krieger & Higgins, 2002; Sheard & Powers, 2001).

Rising inequalities exist across a wide range of social and health dimensions. This is explained by differences in health, social structure and geography (Bloom & Sachs, 1998). Cities are more than the aggregation of people with individual risk factors and health care needs; hence factors beyond the individual, including the social and physical environment and systems of health and social services are the primary determinants of the health of urban populations (Vlahov et al., 2007). Environmental factors play a central role in human development. Human exposure to

hazardous agents in the air, water, soil, food as well as to physical hazards in the environment are major contributors to illness, disability, and death worldwide. Furthermore, deterioration of environmental conditions impedes sustainable development. Poor environmental quality is estimated to be directly responsible for approximately 25% of all preventable ill health in the world, especially among vulnerable populations (World Health Organization, 2002).

According to Satterthwaite (2005), the built environment to a great extent contributes to health. His submission is that environmental factors in less direct howbeit complex ways, weighs into the health of individuals residing in different neighbourhoods. Income inequality, for example, has emerged as a significant predictor of health outcomes, some researchers arguing that levels of health are related to the social environment within which people live, as well as to how rich or poor a society is. Rogers, Hummer, Nam, and Peters (1996) promoted the view that an egalitarian society may enjoy an average life expectancy 10 years higher than a non-egalitarian one. Freudenberg, Galea, and Vlahov (2005) submits that health outcomes are worse in slums than in surrounding or adjacent urban areas.

The World Health Organization (1996) identified four broad categories of urban determinants of environmental health. They are

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population composition, the physical environment, the social environment, and availability of and access to health and social services. This study investigates environmental health in the study area from these categories. The social-determinants approach emphasizes the role of factors that operate at multiple levels, including global, national, municipal, and neighbourhood level in shaping health. This approach suggests that improving living conditions in such areas as housing, employment, education, equality, quality of living environment, social support, and health services is central to improving the health of urban population. While this approach is not unique, it takes on a new meaning when viewed through characteristics that shape cities such as size, density and diversity (Bhargava, Jamison, Lau, & Murray, 2001; Frumkin, Frank & Jackson, 2004; Hardoy et al., 2001; Hood, 2005; Lund, 2005).

An increasing shortage of urban services and infrastructure characterize the urban areas of Nigeria, and these are only accessible to a diminishing share of the population. The *Human Development Report (2010)* rates Nigeria as the 24th poorest country in the world. More than 70% of the population lives below the United Nations Poverty cohort (US\$1 per day) and at least 45.9% of the 149.9 million strong population of Nigeria resides in urban centres. The prognosis is that by 2015, more than half of the nations population would be urban dwellers. According to *Mabogunje (2002)*, the 1991 National Population Census recorded 359 urban settlements of at least 20,000 people in the nation and estimated the figure to have increased to 450 by 2000. Wide variations exist in the quality of both environment and life across various neighbourhoods in Nigerian cities. The differentials are quite glaring, sometimes even when the neighbourhoods are located in the same municipality and are serviced by the same infrastructure and utility providers. Some examples include Apapa and Ijora Oloye in Lagos, D-Line and Diobu in Port Harcourt, Bodija and Agbowo in Ibadan, and Garki village and Garki District in Abuja to mention a few.

With the urban poor constituting a major percentage of those living in urban areas, it is necessary to investigate the issues that are key to their survivals. This study therefore seeks to investigate key differentials in environmental conditions and socioeconomic attributes in selected low, medium and high density neighbourhoods, being serviced by the same municipal government in the Lagos Metropolis. The paper will consider the influence of governance on these key indices. Other studies on environmental health and environmental conditions have not studied the phenomenon on the basis of income differentials, while holding the governance structure constant. They have basically considered the study area in its entirety or focused on low income settlements as it were, without considering the strong influence governance structures have on urban development.

Study area

The study is set in Eti-Osa, Lagos Nigera. It is located in the south-eastern part of the Lagos metropolis. According to the *National Population Commission (2006)* census, Eti-osa Local Government Area has a total population of 287,785 people. It has 818 people per km² and 2121 people per square mile.

Eti Osa local government has a mix of residential, commercial, institutional, recreational (beaches) and agricultural uses but has a higher percentage of residential uses. Residential neighbourhoods are in the form of housing estates and small communities. Primary health centres exist in Obalende and Igbo Efon. The Federal Medical Centre at 1004 is the only government hospital in the study area. However, there are many private hospitals, clinics and pharmacies in Eti Osa. Herbalists and Itinerant medicine peddlers are quite visible in the low income communities.

Eti Osa Local Government, with 10 administrative wards is divided into 4 local council development areas. The Ikoyi East Local

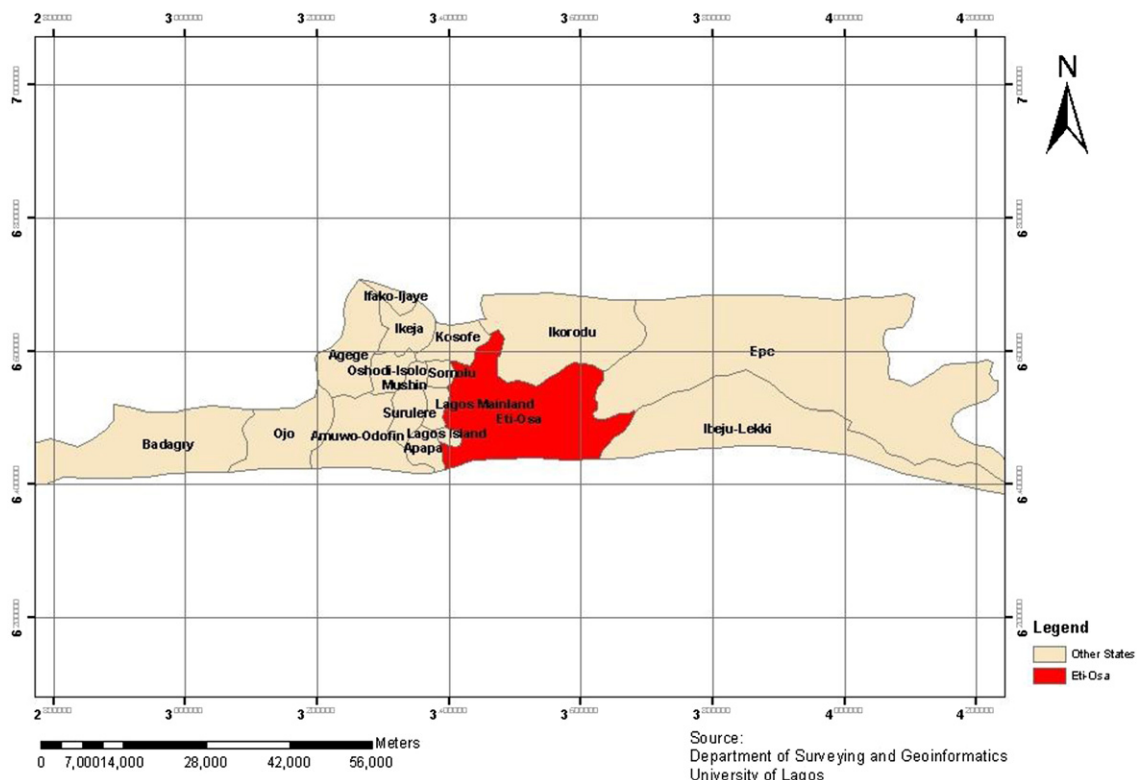


Fig. 1. Map of Lagos state highlighting study area: Eti Osa local government area.

Council Development Area was selected purposively because its wards are clearly segregated on the basis of population density and the 3 densities that make up the framework for this study exist contiguously. They are Ikoyi 1 (old Ikoyi), Ikoyi II (Dolphin Estate) and Obalende which are low, medium and high density wards respectively. The low density neighbourhood of Ikoyi is arguably the most expensive piece of real estate in Nigeria and is inhabited by the extremely wealthy. Dolphin Estate, is a relatively young medium density residential estate and is the first set of pre-fabricated buildings in Nigeria. The high density neighbourhood of Obalende is experiencing obsolescence as it is quite old and was the first settlement for returnee soldiers from the Burma War Fig. 1.

Methods

Data collection for this study was by the administration of structured questionnaires. Data concerning socioeconomic and environmental factors that affect human health were collated. The environmental variables considered were water quality measured by the sources of water; sanitary conditions measured by condition of drainage, toilet types and refuse disposal methods as well as source of food preservation and location of kitchen facilities. Pollution is measured by type of energy for cooking. Other physical environmental factors are predominant building use, type of housing and use of open space around building.

Eti Osa Local Government, with 10 administrative wards is divided into 4 local council development areas. The Ikoyi East Local Council Development Area was selected because its wards are clearly segregated on the basis of population density and the 3 densities that make up the framework for this study exist contiguously. They are Ikoyi 1 (old Ikoyi), Ikoyi II (Dolphin Estate) and Obalende which are low, medium and high density wards respectively. Structured questionnaires were administered on 452 household heads within these communities using simple random sampling technique. They were administered as follows: 98, 168 and 171 in Ikoyi, Dolphin Estate and Obalende respectively. The

questionnaires were analysed using simple descriptive statistics and these were critically considered alongside data captured on the governance structures in the respective neighbourhoods.

Results

Socioeconomic profile of respondents

The respondents are household heads in the three neighbourhoods. Male respondents made up 66.3%, 58.9% and 65.7% in Ikoyi, Dolphin Estate and Obalende respectively. 44% of the respondents are aged between 30 and 45 years while 37.6% are aged between 46 and 60 years. The remaining 19% are aged over 60 years old, though they are still active. 57.7% of the population is married. Single people make up 43.2%. Casual observation revealed that most of the female headed households are headed by widows and divorcees.

The socioeconomic variables considered were household size and occupancy, educational level, occupation and monthly income of household head as well as possession of health enhancing household appliances as shown in Table 1.

From Table 1, average household size is 3 in Ikoyi, 4 in Dolphin Estate and 5 in Obalende. Interestingly, 19.3% of households in Obalende belong to households of between 7 and 10.

A preponderant number of the respondents (81.874%) are literate according to UNESCO standards; i.e. having undergone at least secondary school education. Over 85% of the respondents in both Ikoyi and Dolphin Estates have tertiary education, compared with only 32% in Obalende.

Table 1 also shows that about 56.3% of the respondents are either employed in government offices or private corporations. Only 43% are employed in business. 39% of the respondents of Obalende are employed in the informal economy either as artisans or petty traders.

Monthly income of households ranges between ten thousand and one hundred and fifty thousand Naira. Average monthly

Table 1
Socioeconomic variables of respondents.

		Ikoyi		Dolphin estate		Obalende	
		N = 98	%	N = 168	%	N = 181	%
Household size	1–3	57	58.2	104	61.9	101	55.8
	4–6	40	40.8	57	33.9	45	24.9
	7–10	1	1.0	7	4.2	35	19.3
Number of rooms for exclusive household use	1	12	12.2	13	7.7	57	31.5
	2	11	12.2	20	11.9	79	46.6
	3	44	44.9	103	61.3	24	13.3
	More than 4	31	31.6	32	19.0	21	11.6
Educational attainment	None	1	1.0	3	1.8	16	8.8
	Primary	3	3.1	7	4.2	51	28.2
	Secondary	10	9.8	11	6.5	56	30.9
	Tertiary	84	85.71.7	147	87.5	58	32.0
Occupation of head of household	Public/civil servant	41	41.8	48	28.6	20	11.1
	Privately employed	31	31.6	74	44.0	38	21.0
	Business	23	23.5	44	26.2	52	28.7
	Informal economy	0	0	2	1.2	71	39.2
Monthly income of head of household in Naira (₦)	₦ 10,001–₦ 50,000	17	17.3	38	22.6	152	84.0
	₦ 50,001–₦ 100,000	12	12.2	61	36.3	17	9.4
	₦ 100,001–₦ 150,000						
	Greater than ₦150,000	28	28.6	43	25.6	8	4.4
Possession of household appliances		41	41.8	26	15.5	3	1.7
	Electric kettle	88	89.8	133	79.2	88	48.6
	Refrigerator/freezer	96	98.0	153	91.1	155	85.6
	Electric fan	74	75.5	157	93.5	165	91.2
	Air conditioner	66	67.3	106	63.1	71	39.2
	Generator	93	94.9	146	86.9	119	65.7
	Water filter/dispenser	98	100.0	142	84.9	39	21.6

income is ₦125,000(US\$833) in Ikoyi; ₦75,000(US\$500) in Dolphin Estate and ₦22,500(US\$150) in Obalende.

Possessions of basic health enhancing household appliances were 100%, 85% and 21% for water filter and dispenser in Ikoyi, Dolphin Estate and Obalende respectively. The wide margin between the values for Obalende and the other neighbourhoods was ascribed to the sale of cheap locally sachet water. Most of the respondent possessed the other appliances though values for electric kettle and air conditioners were less than 50% in Obalende. Generators were owned by 80% of the respondents who consider it to be an essential commodity. The capacities of the generators also varied across the residential neighbourhoods with Obalende having mini petrol powered ones while Dolphin Estate and Ikoyi had a large number of diesel powered generators of various sizes.

Housing and environmental conditions

There is a sharp contrast between Ikoyi, Dolphin Estate and Obalende. Most residential buildings in Ikoyi and Dolphin estate are characterized by adequate setbacks, vegetation and street light, that of Obalende is quite different. The roads are not wide enough, no setback and no vegetation.

Table 2 shows that the major sources of water for the Obalende is the surface hand dug well which service 48.6% of the respondents, and the itinerant water vendors on which 22.6%. Casual investigation reveals that most public taps are dry with their distribution pipes lying within dirty drainage channels, therefore one can infer that water quality is compromised. The residents of Dolphin estate rely on water from the public mains (48.8%), boreholes (38.1%) and water tankers (8.3%) respectively.

Waste disposal is mainly by municipal collection in the three neighbourhoods. This may be because of the proximity of the area

to the Lagos state dumpsite and the fact that the waste disposal services are run by public private partners of the municipal council. 89.9% of all respondents have access to water closet toilets with septic tanks and only about 25% of those in Obalende, especially those residing in the rooming houses use pit latrines.

One noticeable flaw in the study area is the absence of public open spaces though provisions were made but most have been replaced by residential land uses. The only organized open space present in the study area is the Ikoyi club which is privately owned and managed and has a sizeable stretch of open spaces which is primarily used for the golf course. The residential areas within and outside the neighbourhoods and major driveways in the entire study area have trees, shrubs, flowers and grasses. This not only beautifies the environment but also has environmental benefits. General drainage condition is free flowing, though flooding is experienced during the rainy season, especially in Ikoyi and Obalende which are older settlements than Dolphin estate.

Kitchen facilities are located indoors in over 90% of cases in Ikoyi and Dolphin Estate; while this occurs only in 55% of cases in Obalende. Predominant cooking fuel is kerosene in Obalende (65%), and gas/electricity in Ikoyi (90%) and Dolphin estates (83%) respectively.

The respondents in Ikoyi in 98% of cases preserve their food in refrigerators and freezers. 85% of those in Dolphin estate do the same, while only 54% use this method of food preservation in Obalende. 28.7% of the respondents store their food in cupboards while 17% do not employ any food preservation method.

Access to health care

For most of the respondents, the hospital is the most frequently visited health facility, though about 10% of those in Dolphin and 5% of respondents in Obalende also visit Spiritual houses for medical

Table 2
Housing facilities and environmental conditions of respondents.

		Ikoyi		Dolphin estate		Obalende	
		N = 98	%	N = 168	%	N = 181	%
Predominant building use	Residential	85	86.7	134	79.8	58	32.0
	Residential and commercial	13	23.3	34	20.2	123	66.0
Type of housing	Traditional housing	0	0	0	0	19	10.5
	Rooming house	8	8.2	11	6.5	38	21.0
	Single room apartment	4	4.1	54	32.1	47	26.0
	Flat	39	39.8	56	33.3	73	40.3
	House/duplex	47	48.0	47	28.0	4	2.2
Source of water	Public tap	19	9.2	82	48.8	28	15.5
	Borehole	63	64.3	64	38.1	24	13.3
	Surface well	2	2.0	4	2.4	88	48.6
	Water vendor/tanker	14	14.3	18	10.7	41	22.7
Toilet facilities	Water closet	98	100.00	168	100.00	136	75.1
	Pit latrine	0	0	0	0	35	19.3
	Bucket latrine	0	0	0	0	10	5.5
Method of waste disposal	Public/municipal collection	96	98.0	149	89.0	126	69.6
	Private/cart pusher	2	2.0	19	11.3	31	17.1
	Dumping/burning	0	0	0	0	24	13.3
Use of open space around building	Recreational	34	34.7	68	40.5	72	39.8
	Commercial	13	13.3	37	22.0	94	51.9
	Gardening	51	10.2	63	37.5	15	8.3
Condition of drainage	Covered and free	95	96.9	114	67.9	38	21.0
	Open and free	2	2.0	35	17.8	95	52.5
	Blocked	1	1.0	19	11.3	39	21.5
	No drainage	0	0	0	0	9	5.0
Kitchen facilities	Indoors	94	95.9	161	95.8	101	55.8
	Outdoors	4	4.1	7	4.2	80	44.2
Energy for cooking	Gas/electricity	89	90.8	139	82.7	53	29.3
	Kerosene	9	9.2	27	16.1	118	65.2
	Firewood/coal	0	0	2	1.2	13	7.2
Source of food preservation	Fridge/freezer	94	95.9	145	86.3	68	37.6
	Cupboard	4	4.1	13	7.7	42	23.2
	Open air	0	0	10	6.0	71	39.2

intervention. Average monthly expenditure on health care is less than ₦ 5000 for those in the low density area and increases to about ₦ 8000 for those in the medium density area and about ₦ 13,000 for respondents in Obalende. However, this figure corroborates the general assumption that those with health insurance spend less on medical issues. This may be because the most prevalent disease recorded for those in Ikoyi and Dolphin Estate is the common cold, while malaria, which requires hospitalization in some instances is the most prevalent ailment in Obalende. As shown in Table 3

Community development activities

The study has revealed clear differentials in the environmental conditions as well as socioeconomic status and health behaviour in the study area. This may be due in part to the activities of the community development associations.

Victoria Island-Ikoyi Residents Association as well as the Dolphin Estate residents association are able to achieve more because of the commitment of residents (68% in Ikoyi and 73% in Dolphin Estate) who donate funds, technical support and mobilize sponsors for their projects. Incidentally, the situation in Obalende is that in which the community development association was formed by the local authorities and usually rely on government and sponsors for intervention. Membership is usually by political affiliation hence only 36.1% of respondents participate. Funds for community infrastructure projects are usually through levies, and donations in Ikoyi and Dolphin Estate, while in Obalende, it is usually through aids and grants.

The three communities carried out various urban infrastructure improvement projects between 2008 and 2011. Ikoyi adopted volunteerism in nine projects, sponsored twelve through their corporate affiliations and contracted out four projects, while eight projects were government implemented. Dolphin Estate residents carried out sixteen projects in the same period. Ten were by volunteerism while two were sponsored by resident corporate affiliates and three were contracted out. Only one was a government project. The situation in Obalende was quite different with thirty

Table 4

Success rates of community projects in study area.

Project	Ikoyi	Dolphin estate	Obalende
Potable/piped water	1	2	2
Waste management	3	2	2
Road repairs	2	1	1
Environmental sanitation	3	2	2
Drainage clearing/deflooding	2	2	2
Street lighting	2	1	0
Medical interventions	2	1	1
Neighbourhood beautification	3	0	0
Security	3	3	2
Total	21	14	12

one government projects, five contracted out and only six via neighbourhood volunteerism. The residents of Obalende were able to attract corporate sponsorship for eleven community development projects. Analysing these values on Arsteins ladder of public participation shows that the residents of Ikoyi are fully involved in their communities and prefer partnerships. Dolphin Estate Residents tend to be more active when they are in control of the projects while those in Obalende prefer a passive involvement in the affairs of their community. The low value for sponsored projects in Dolphin estate may be because it is a gated community.

Table 4 shows the levels of success achieved in each of the neighbourhoods on a scale of 0–3 with 0 being no success achieved, 1 for project initiated, 2 for project implemented, 3 for project maintained. An assumption that a final ranking of 0–10 connotes poor, 11–20 fair, 21–30 good.

It is interesting to note that for most of the projects, issues of maintenance were not well addressed as only 5 projects out of 47 have been maintained. These are all located in Ikoyi, except for the security project of Dolphin estate which is being maintained based on resident subscriptions. Four other projects in Dolphin Estates have been implemented but not maintained, while the road repairs, street lighting and medical interventions have been initiated but not completed yet.

Table 3
Respondents access to health care.

		Ikoyi		Dolphin estate		Obalende	
		N = 98	%	N = 168	%	N = 181	%
Health Facility Frequented	Hospital/health centre	77	78.6	135	80.4	112	61.9
	Patent medicine store	17	17.4	22	13.1	54	29.8
	Herbalist	0	0	2	1.2	5	2.8
	Spiritual houses	4	4.1	17	10.1	10	5.5
Average monthly expenditure on medicare	Less than ₦ 5000	58	59.2	32	18.5	39	21.5
	₦ 5001–₦ 10,000	23	23.5	50	29.8	41	22.7
	₦ 10,001–₦ 15,000	9	9.2	33	19.6	40	22.1
	Over ₦ 15,000	8	8.2	53	31.5	61	33.7
Health insurance	None	58	59.2	61	36.3	68	37.6
	NHIS	20	20.4	49	29.2	88	48.6
	Private	26	26.5	58	34.5	25	13.8
Common ailment in the last six months	Cold and catarrh	70	71.4	116	69.0	131	72.4
	Chest pain/asthma	9	9.2	14	8.3	35	19.3
	Fever/headache/malaria	64	65.3	110	65.5	134	74.0
	Typhoid fever	31	9.2	12	7.1	48	26.5
	Worms	16	31.6	10	6.0	27	14.9
	Diarrhoea	0	16.3	13	7.7	23	12.7
	Cholera	15	0	4	2.4	31	17.1
	Ulcer	0	15.3	31	18.5	21	11.6
	Okada accident	21	0	15	8.9	46	25.4
	Rashes	2	21.4	14	8.3	58	32.0
	Home injury/burns		2.0	16	9.5	32	17.7
	Household deaths in past year	None	83	84.9	149	88.7	148
One		15	15.3	19	11.3	31	17.1
Two		0	0	0	0	2	1.1

Five out of 12 projects in Obalende have been implemented. These are basically water and sanitation projects and include the water and waste management projects, drainage clearance and environmental sanitation. The inference would be that health outcomes, especially for sanitation diseases should improve. However, this may be farfetched as the projects do not have any effective long term sustainability plans.

Discussion

With average household size of 3, 4, and 5 in Ikoyi, Dolphin Estate and Obalende respectively and diminishing average monthly income in the same order, it is obvious that environmental health conditions and the consequent responses will vary significantly as evident in this study.

Access to safe potable water is highest in Dolphin Estate (88.6%), while it is quite low in Obalende (28.6%). Household access to good toilet facilities across the study area is also good with only 25% of respondents in Obalende lacking such. Waste disposal is effective in the study area, with more than 70% of the study area being served on a weekly basis by the municipal waste management contractors.

The respondents of Obalende are vulnerable to air pollutants as 29% of them do not use sustainable energy sources. They rely on kerosene and firewood for cooking and petrol generators for electricity generation.

Residents' access to medical services was 78% for Ikoyi, 80% for Dolphin Estate and 61% for Obalende. Neighbourhood cooperation is important in the study area as those in Ikoyi and Dolphin Estate who adopted Volunteerism in Community development projects recorded a higher level of success and sustainability than the residents of Obalende who relied exclusively on government intervention for Environmental Health Improvement projects i.e. sanitation, drainage, waste management and medical care. This may also be the reason why health challenges are higher in Obalende, than in Ikoyi and Dolphin Estates.

Conclusion

A broad overview of the study shows that clear differentials exist across the neighbourhoods. Residents of Obalende for instance earn less, pay more for Medicare, have less access to safe water and sanitation and rely on government for community development. These indices tend to improve as the income level of the neighbourhood increases. Furthermore, the maintenance structures in the different neighbourhoods produce different results with that of Ikoyi and Dolphin Estates which are largely self-help community projects achieving higher success than the government sponsored ones in Obalende.

Current urban development and public health policies do not consider the effect of governance on their outcomes. It is therefore

imperative that strategies for upgrading the environmental health status of these neighbourhoods take into cognizance urban governance and community engagement strategies. The study revealed the importance of citizen participation in improving the health and environment of their neighbourhoods. A clear case is that of Ikoyi and Dolphin estates whose self help infrastructure and sanitation programs helped to improve the general environmental conditions as well as the health status of her residents.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.habitatint.2012.12.001>.

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