Geo-spatial Analysis of Adolescents' Access to and Use of Contraceptives in Osun state, Nigeria

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ABSTRACT

This study analyzes the spatial pattern of adolescents' access to and use of contraceptives in Osun State, Nigeria. It analyses inter and intra-city variations in the distribution of contraceptive outlets and varying levels of access and use of contraceptives by Adolescents. Factors of access to and use of contraceptives are analyzed.

Primary and secondary data were used for the study. Primary data involved the use of handheld GPS to obtain the geographic coordinates of the contraceptive outlets. Also, a total of 1,440 questionnaires were administered to randomly selected adolescents to collect data on the socio-demographic characteristics of respondents, degree of access to contraceptives, and varying types and levels of use of contraceptives. Variation in the distribution of outlets and adolescents' use of contraceptive was analyzed using GIS tools. The pattern of outlets was mapped. The results further showed that there is concentration of contraceptive outlets in the high density residential areas (60%) than in the medium (30%) or low (10%) density residential areas. Forty-four per cent of adolescents claimed use of contraceptive devices, while 56% did not. Fifty percent of the adolescents stated that societal disapproval is a factor that hinders their use of contraceptives. Further result shows that there is a direct but weak relationship ($r = 0.449$; $p = 0.561$) between the pattern of outlets and use of contraceptive in the study area. The study concluded that to reduce the problems associated with adolescents' reproductive health, there is the need to improve access and right usage of contraceptives.

Keywords-Geo-spatial, Analysis, Adolescents, Contraceptives Usage

Sub-theme-(Emerging Patterns and Determinants of Contraceptive Use)

1 INTRODUCTION

Among the most perplexing public phenomena and a major concern to the society, is the increasing complexity of the socio-economic implications and health consequences of adolescents' sexuality and fertility behavior. The all-encompassing nature of issues such as teenage child bearing, teenage pregnancy and abortions, against the milieu of a generally poor knowledge of and societal negative mind-set towards contraceptive methods among adolescents, and their early exposure to unprotected sexual activities with its evident implications for the spread of STIs and HIV are recurrent themes in the literature (Adeniji et al, 1998;Adeboyejo et al, 2005; Makinwa, 1981, 1991; Nicholas, et al, 1986; Oringanje, et al, 2009, Nancy et,al 2013). This therefore suggests the need to articulate and assess adolescents' use of contraceptives in relation to the pattern of contraceptive's outlets in their immediate environment. (Adeboyejo et al, 2005; Erica et al, 2014).

Also, many problems associated with premarital and other interpersonal relationships are in no doubt directed towards sex and sexual practices (Myles, 1981; Okpani and Okpani 2000; Hassan and Creastas, 2000; Lisa et al, 2009; Cadelina (1998). For instance, Myles (1981) opined that in Hong Kong, it is illegal under the Sexual Offences Act of 1956 for a boy to have sexual intercourse with a girl under the age of 16 years. Also Okpani and Okpani (2000) observed that, out of six hundred and five respondents used for a study in Port Harcourt, Nigeria, 51% had been exposed to more than one sexual partner, while 21.5% admitted that they had been pregnant before and another 11.3% admitted that they had been pregnant more than once. Thus in order to improve reproductive health particularly maternal health and reduce child mortality and also eradicate extreme poverty, empirical based pragmatic policies should be geared towards ensuring that women (adolescents inclusive) have access to safe and effective methods of fertility control. This is more so important because observations revealed that, in developing countries, one quarter of the estimated 20 million unsafe abortions and 70,000 abortion related

deaths each year occur among women aged 15–19 years, and that this age group is twice as likely to die in childbirth as women aged 20 or above (WHO, 2010). Further estimates show that 90% of abortion-related and 20% of pregnancy-related morbidity and mortality, along with 32% of maternal deaths could be prevented by use of effective contraceptives, and also that, in sub-Saharan Africa, 14 million un-intended pregnancies occur every year, with almost half occurring among women aged 15–24 years. (WHO, 2010).

The point is, pre-marital exposure to pregnancy risk is increasing, with a widening gap between access and use of contraceptives and pre-marital sexual activity, placing adolescents at increased risk when they are most socially and economically vulnerable. Reported sexual activity among adolescents in developing countries is generally high, and data validity is often poor (Chandra-Mouli et al 2014). In sub-Saharan Africa, 75% of young women were reported to have had sex by age 20 (Guttmacher, 2007). Addressing the critical challenges facing the largest youth generation in history is an urgent priority if social and economic development efforts are to succeed and the reproductive health pandemic is to be reversed (UNEFPA,2013).

However, few sexually active adolescents in developing countries use modern contraceptive methods such as oral contraceptives and condoms, and although there is considerable variation between countries, uptake is generally much lower than in developed countries (Guttmacher, 2009). For example, 69% of adolescent women in a UK study were reported to use modern contraceptive methods during sex, compared with 12% in Mali, and in the US, 54% of 15–19 year old females reported condom use, compared with 21% in Tanzania. Overall, it is estimated that 37% of un-married, sexually active women aged 15–24 years in sub-Saharan Africa use contraceptive but only 8% used a non-barrier method. Hubacher et al, (2008) suggest that the choice of implant rather than oral or injectable contraceptives could have a big impact on un-intended pregnancy in this age group. However, greater promotion of any modern

method has to be informed by better understanding of why uptake is so low among adolescents in the first place.

Furthermore, Nigeria has a population of one hundred and forty million people (NPC 2006). One third of her population which is over 53 million constitutes young people between the ages of 10 to 24 years (UNEFPA, 2010). Thus issues of adolescents' health should be given intensive and comprehensive empirical attention, more so that the relationship between the pattern of contraceptives' outlets and adolescents' access to and use of contraceptives have not been given adequate research attention. Hence, this research focuses on the spatial pattern of access and contraceptives use among adolescents in the study area.

The study of adolescents' behaviour which has consequences on rapid social and economic changes in recent years in Nigeria and in Osun State in particular is important and necessary for many reasons. First, improving the reproductive health of young women in developing countries requires safe and effective methods of fertility control, but most rely on traditional rather than modern contraceptives (William et al 2009). Secondly, against the observed low uptake of contraceptives in developing countries, there is the need to unravel the mystery so as to evolve pragmatic policies for promotion of modern methods. Furthermore, the sheer size of the adolescents' population commands attention. The demographic impact of this large number of adolescents in a country with a tradition of early marriage is tremendous. The study of the spatial variation of the factors affecting the adolescents' use of contraceptives will help to determine what to do to solve existing problems. Finally, the use of GIS tools in this study will allow easy storage, analysis and display of both spatial and non-spatial data of the study.

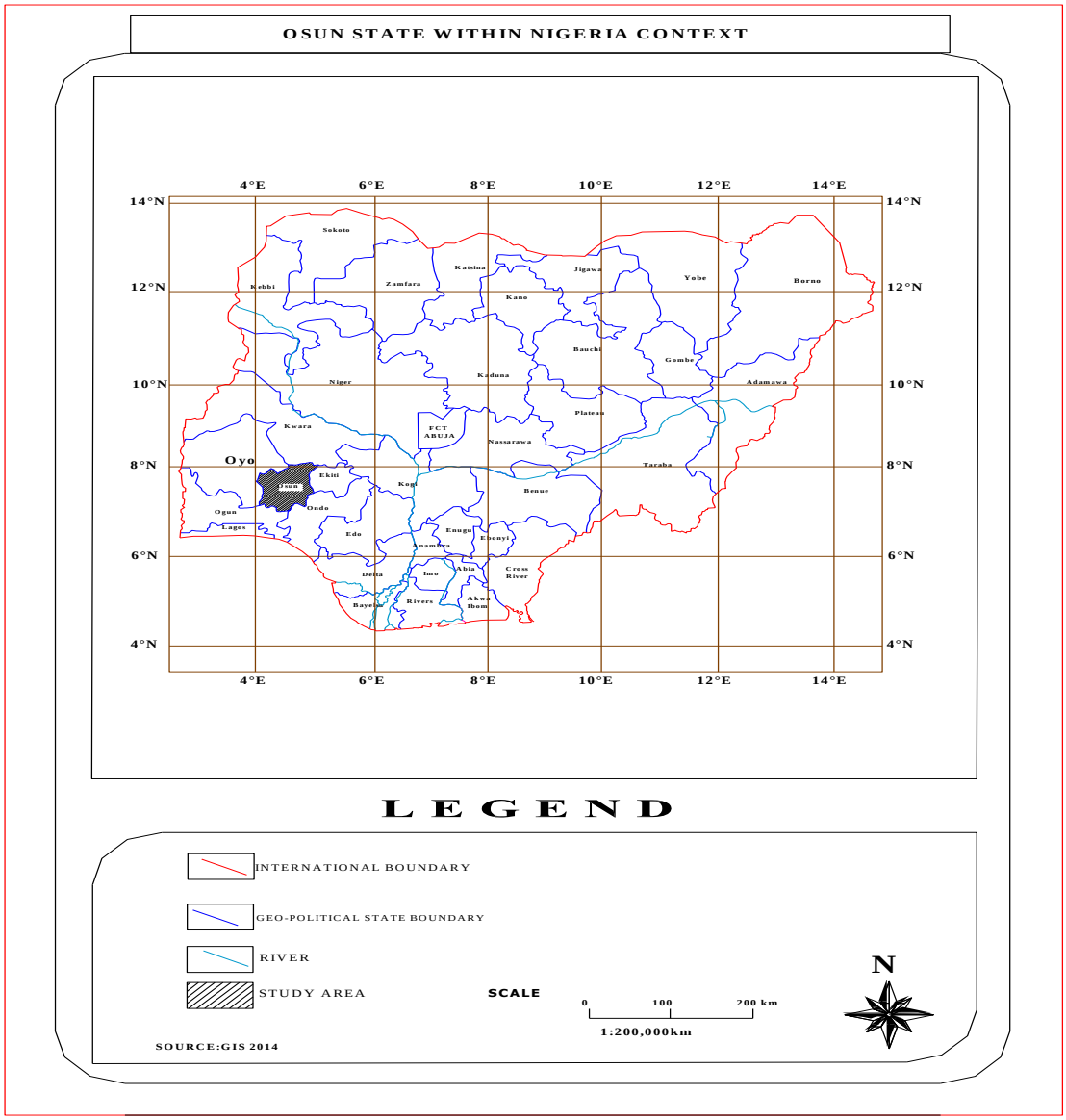
2 STUDY AREA

Osun State came into being on August 27, 1991, along with eight other States. The State is located in the South Western part of Nigeria, within the Tropical Rain Forest, covering an area of approximately 14,875 square kilometers between longitudes 4º03´E and 5º05´E and latitudes

7º00N and 8º10´N. It is bounded by Ogun, Kwara, Oyo, Ondo and Ekiti States in South, North, West and East respectively (Fig. 1).

The 2006 National Population Census puts the population of the State at 3,416,959. Osun State is made up of 30 Local Government Areas. The indigenes of the States are Yorubas who comprises of Ifes, Ijesas, Igbominas and Oyos. Education in Osun State, just like in other States in South Western Nigeria, is a major industry. This therefore, leads to elongation of period adolescents spend in school with obvious effects on the reproductive behaviour of their adolescents. The State is divided into three senatorial districts namely: Osun Central, Osun West, and Osun East Senatorial Districts. Each Senatorial district is made up 10 Local Government Areas.

Figure 1: Map of Nigeria showing Osun State



3 RESEARCH METHODOLOGY

Both primary and secondary data were used for the study. First, the list of contraceptives outlets were compiled and their geographic coordinates obtained with a handheld Garmin GPS Map 76CSX with 3metre accuracy. The analogue map of the State was obtained from the State's Ministry of Lands and Physical Planning, Osogbo, scanned and added to views in Arcview 3.3a software, where it was geo-referenced using the Universal Transverse Mercator, Zone 31N (Minna). Thereafter, layers of spatial entities (Local Government Areas boundaries, roads, rivers, railway tracks) of the map were created through onscreen digitizing, while attribute tables were also created for each spatial entity. GIS analysis (in the form of spatial and non-spatial

queries) was carried out to determine the relationship between the adolescents' use of contraceptives and contraceptives outlets. The relationship between pattern of outlets and location of schools was analysed using High order Nearest Neighbour Analysis. Also correlation analysis was carried out to analyse the nature of relationship between the use of contraceptives and the contraceptives outlets available in the study area.

Multi Stage sampling was employed in selecting respondents to the questionnaire. First, the three existing Senatorial districts, were used as spatial units or strata. Secondly, two LGAs were purposively selected from each Senatorial district; one rural and one urban (see figure 2). Thirdly, two schools -one public and one private were selected randomly from the selected LGAs, using the list of schools as data frame (fig.2). Also, in each selected School, 5% of the population of students from each level of the Senior Secondary Schools (SSS 1-3) was selected using the school register as data frame. In all, 1440 questionnaires were randomly administered to obtain attributes of the adolescents such as age, sex, parental background, sexual behaviour including access to and use of contraceptives. Table 1 shows the population of students and the number selected in each school.

Table 1: Distribution of Respondents.

Name of school	Students' Population	No selected (5% of Pop)
Islamic Comprehensive High School Osu	1680	84
Apara Memorial School,Atakumosa	2000	100
Fakunle Comprehensive High School	4560	228
O.A.U International School,Ife	2320	116
Moremi High School,Ife	2880	144
Vico Hope International College,Kuta	1200	60
Divine Int'l Group of School,Osogbo	1120	56
Royal Ambassador Int'l College	1120	56
Kuta Community High School	3920	196
Muslim Comprehensive School,Iwo	1040	52
Iwo Grammar School, Iwo	4240	212

Community High school, Eripa	2720	136
Total	28800	1440

Source: Authors' Field Survey, (2012)

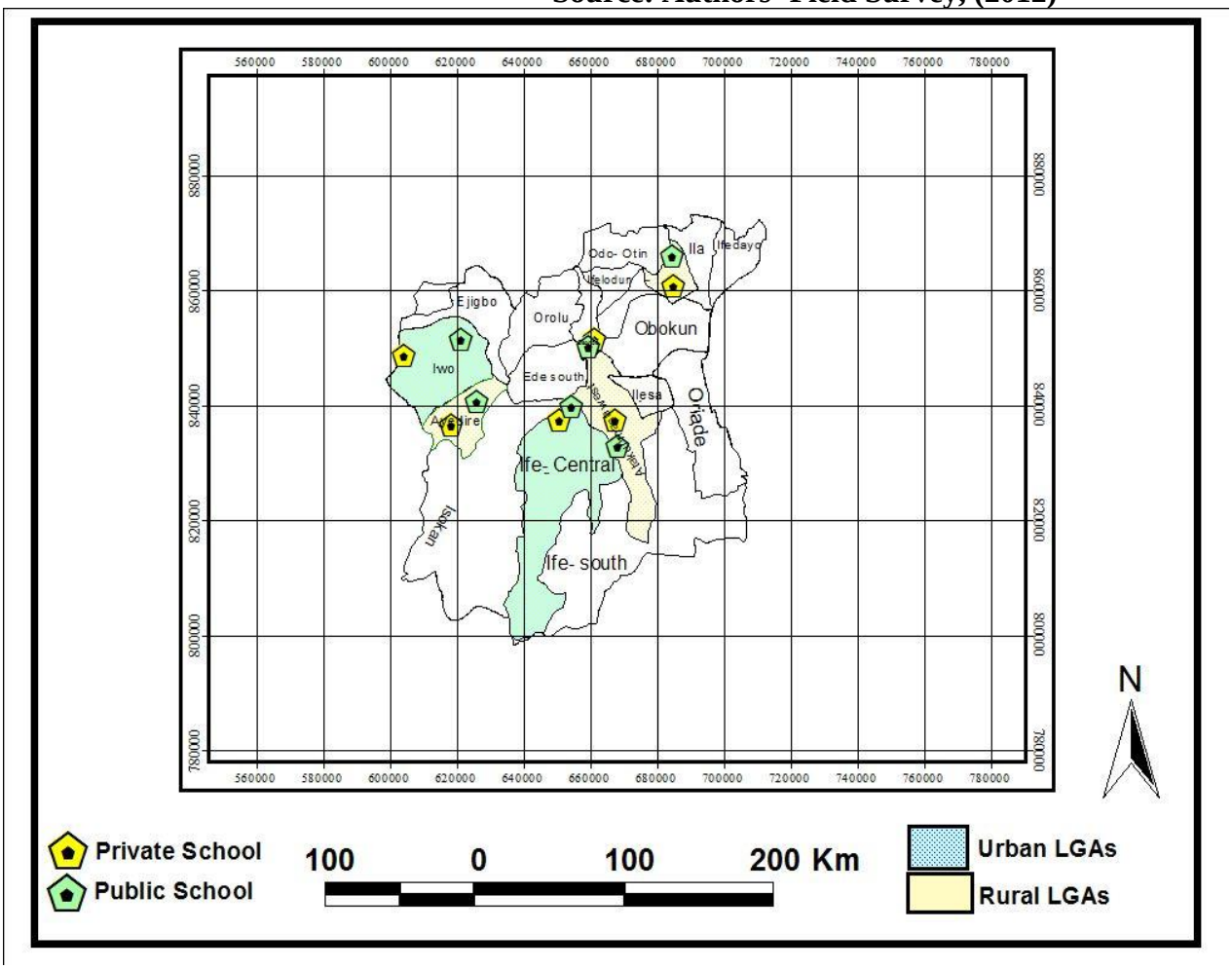


Figure 2: Selected Local Government Areas and Schools

4 RESULTS AND DISCUSSION

4.1 Socio-Demographic Characteristics of Adolescents

The socio-demographic characteristics of the respondents as summarized in Table 2 shows that there were almost equal proportion of female (45.8%) and male (54.2%) respondents. Consequently, differences in access and use of contraceptives, if any, should not be significantly affected by gender differences.

The percentage distribution of the respondents by age showed that the bulk of the secondary school students were between 16 and 18 years (45%), followed by those between ages 14-15 (40.3%). Significant proportions (10% and 4.2%) of the respondents belonged to the older adolescents (19- 20 and 20-22 yrs). Also there were few respondents (8 or 0.5%) older than secondary school age. The presence of older adolescents 19 years and above suggests the presence of a group that are most probably more experienced on issues of sexuality and reproductive behavior who could also be role models and opinion builders to the younger students on issues being investigated. Further result as summarized in Table 2 also shows that more than half of the respondents (52.5%) were adherents of Christian religions and close to half (45.6%) were Muslims. The study area is sparsely populated by traditionalists (1.9%). The above implies that construction of sexuality, particularly access to and use of contraceptive may have religious colouration as the two largest religious bodies, Christianity and Islam teach chastity and have puritanican view on boy/girl relation as well as negative mindset on use of contraceptives. The varying levels of access and utilization of contraceptive, if any is expected to be influenced by the degree to which adherents of the two religions are obedient to the tenents of their religion.

The respondents are almost equally distributed among the three levels of study covered (38.9 % in SSS2, 33.1% in SSS3, 28.1% in SSS1). The decrease in number of respondents in the final year SSS3, may be due to the fact that many students dropped out and were unable to complete secondary school education apparently because of finance or fertility and reproductive related problems.

Table 2: Socio-demographic Characteristics of the Respondents

Characteristics	No	%
Sex of Respondents		
Male	780	45.8

Female	660	54.2
Age Group of Respondents		
14-15	580	40.3
16-18	648	45
19-20	144	10
20-22	60	4.2
>22	8	0.5
Respondents Religion		
Christianity	756	52.5
Islam	656	45.6
Traditional	28	1.9
Level of study of Respondents		
SSS1	404	28.1
SSS2	560	38.8
SSS3	476	33.1

4.2 Relationship between patterns of Contraceptive Outlets and Location of Schools

In line with expectation, an heuristic view of pattern of contraceptive outlets in the study area shows a higher concentration in the urban Local Government Areas (70%) than the rural areas (30%). In order to evaluate the relationship between distribution of outlets and schools, the study employed Nearest Neighbor Analysis (Rn1…n) where values ranged from 0 for a perfectly clustered distribution to 2.15 for a perfectly dispersed distribution. The results of analysis is summarized in Table 3.

Table 3: Result of Nearest Neighbour Analysis

SN	Observations	R values
1	Mean Nearest Neighbour Index of Contraceptive Sales Points	1.5km
2	Mean Random Distance of Contraceptive Sales Points	1.74km
3	First Order Nearest Neighbour Index of Contraceptive Sales Points	0.86
4	Second Order Nearest Neighbour Index of Contraceptive Sales Points	1.5
5	Mean Nearest Neighbour Index of Schools	2.8km
6	Mean Random Distance of Schools	1.88km
7	First Order Nearest Neighbour Index of Schools	1.48
8	Second Order Nearest Neighbour Index of Schools	1.16

Source: Author's survey, 2015

From Table 3, First Order Rn value of 0.86 reveals that contraceptive sales point were clustered in the study area while the First Order Rn value of 1.48 informs that schools were randomly distributed though with a tendency towards dispersion in the study Area. The diverging spatial characteristics of these phenomena (Contraceptives sales point and schools) informs that there is no spatial causation between the two phenomena. This is to be expected since locational factors of outlets is market orientation or population concentration where threshold population is required to sustain sales, whereas for schools, availability of space in less populated areas is a major consideration. Hence, contraceptive sales points are at spatial proximity to each other in areas of population concentration, while schools can evolve randomly without cognizance of the former.

4.3 Analysis of Efficiency of Service provision

Further analysis of distribution pattern of outlets, computes efficiency of service provision, which relates total number of outlets to the total population to be served. This is because it is not only the adolescents' population that the outlets cater for, but the entire Local Government area population, under the assumption that, clients would patronize nearest outlets to their school or home in the local government. The result of as summarized in Table 4 shows high

level of inadequacy of service provision as on the average the efficiency ratio was 1:21,431 population. This implies one outlet serves about 21,431 population. The rural/urban differential shows similarly high ratio of about 1: 3000 even though there was great differentials in their population distribution.

The profile of the local government areas on the relationship between population size and number of outlets shows that level of inefficiency in the distribution of Oulets was highest in Iwo with a ratio of 1:6000, followed by Aiyediire and Ife Central local governments with a ratio of 1:4219 and 1:3888 respectively. The implication of low level of service availability is possible high cost of service and resort to non-conventional sources or methods of fertility control.

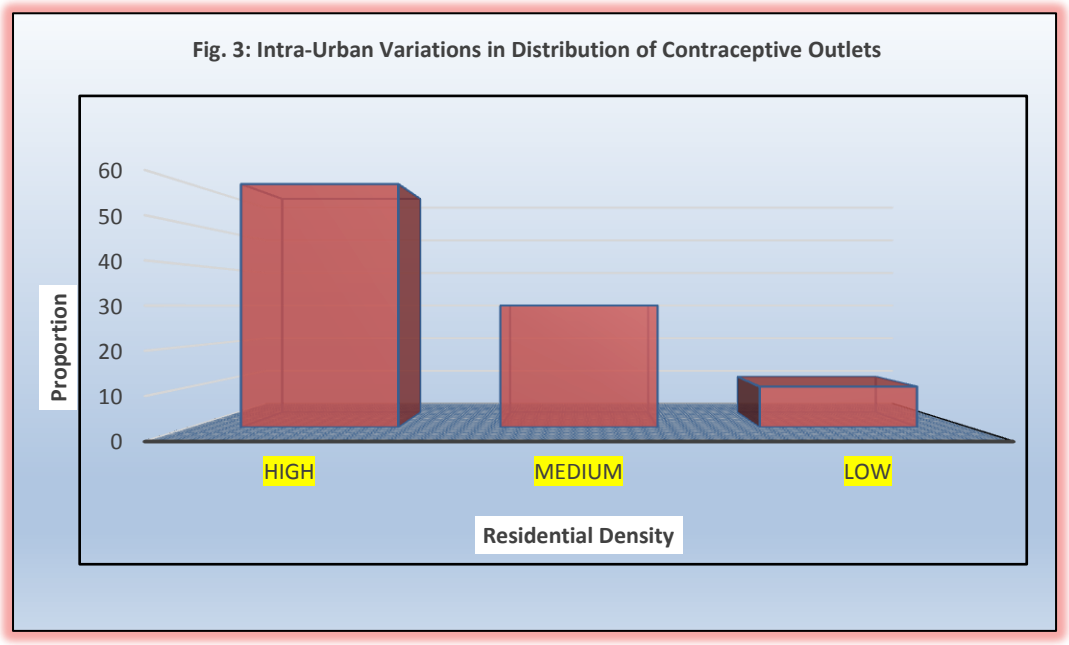
Table 4: Relationship Between Population size and number of Contraceptive outlets

SN	LGAs	LGAs Identity	Population	No of Outlets	Outlet/ Population Ratio	Rural/ Urban differentials
1	Ayedire	Rural	76,309	18	4,219	1:3013
2	Boluwaduro	Rural	70,775	25	2,831	
3	Atakunmosa West	Rural	68,643	22	3,120	
4	Osogbo	Urban	155,507	75	2,073	1:3427
5	Ife Central	Urban	167,204	43	3,888	
6	Iwo	Urban	191,348	32	5,980	
	Total		729,786	140	21,431	1:21431

4.4 Intra-Urban variations in Distribution of Outlets

As illustrated in figure 3, the high density residential areas has the highest concentration of contraceptive outlets (60%), followed by the medium (30%) and low density areas (10%). This is in line with the general pattern of urban population distribution and the fact that contraceptive outlets are market oriented services .since patronage is not limited to students

only, it is only logical for the distribution to be concentrated in highly populated areas, where products distributors can maximize sales.



4.5 Varying Levels and Patterns of Usage of Contraceptives

Generally, more than half of the adolescents (56%) claimed they had never used any contraceptives before. This shows a low level of usage as only 44% of respondents had used one commodity or the other before. This observation confirms the findings that uptake of modern contraceptives was much lower in developing than developing countries (Guttmacher, 2009). Further observation in Table 5 shows that the highest proportion of users were found in Ayediire Local government with 24%, followed by Osogbo with 22%. Boluwaduro and Ife central each had 15% of users.

Table 5: Variations in Level of usage of contraceptives by Local Government Area

S/N	LGA	Pop Sampled	Yes Used before	No Never used	% Usage
1.	Boluwaduro	188	96	92	15
2.	Osogbo	284	136	148	22
3.	Atakunmosa West	184	68	116	11
4	Ife Central	260	96	164	15
5	Ayedire	252	150	102	24
6	Iwo	272	88	184	13
	Total	1440	634	806	
	%	100	44.0%	56.0%	

Source: Authors' Field Work (2012).

The spatial pattern of usage as mapped in figure 4 shows a generally high level of non-usage but the level was highest in Iwo, Ife Central and Osogbo local Government areas. While Iwo is a strong Islamic enclave, it has equally strong Christian population. The influence of religion in promoting non-usage of contraceptives is suggested. Also while Ife is regarded as the cradle of the Youruba race (One of the three major ethnic groups in Nigeria), in the three cities, urbanism as a way of life predates European colonisation of Nigeria. Consequently the cities are epitomes of Yoruba socio-cultural heritage with strong puritanican tradition as far as premarital relationship is concerned. Also the belief in orthodox practices is as strong as the new forms of religion (Islam and Christianity) in these cities. ($r = 0.449$; $p = 0.561$)

Figure 5 shows the relationship between the level of service provision and pattern of usage within the spatial framework of local Government areas. The following observations emerged

(1) In all the LGAs, except Osogbo, the state capital, levels of contraceptive usage was higher than that of service provision.

(2) In Rural Ayediire and Boluwaduro LGAs, the level of usage was higher than that of service provision

(3) Relatively, usage level was higher than service provision only in Iwo, an urban LGA even though it is a predominantly Muslim community. This implies that services were procured from areas outside the local government

(4) The implications of the above is possible shortage of service where it was required. The threshold population required for the sustenance of service provision may be responsible for the low availability of services in the rural Local Government areas, apart from the fact of homogeneity of rural population which makes it possible for providers and adolescent customers to be familiar with each other.

(5) A quantitative evaluation of the relationship using correlation technique shows a low and non-significant correlation between pattern of service provision and usage of contraceptives with $r = 0.449$ and $p = 0.561$

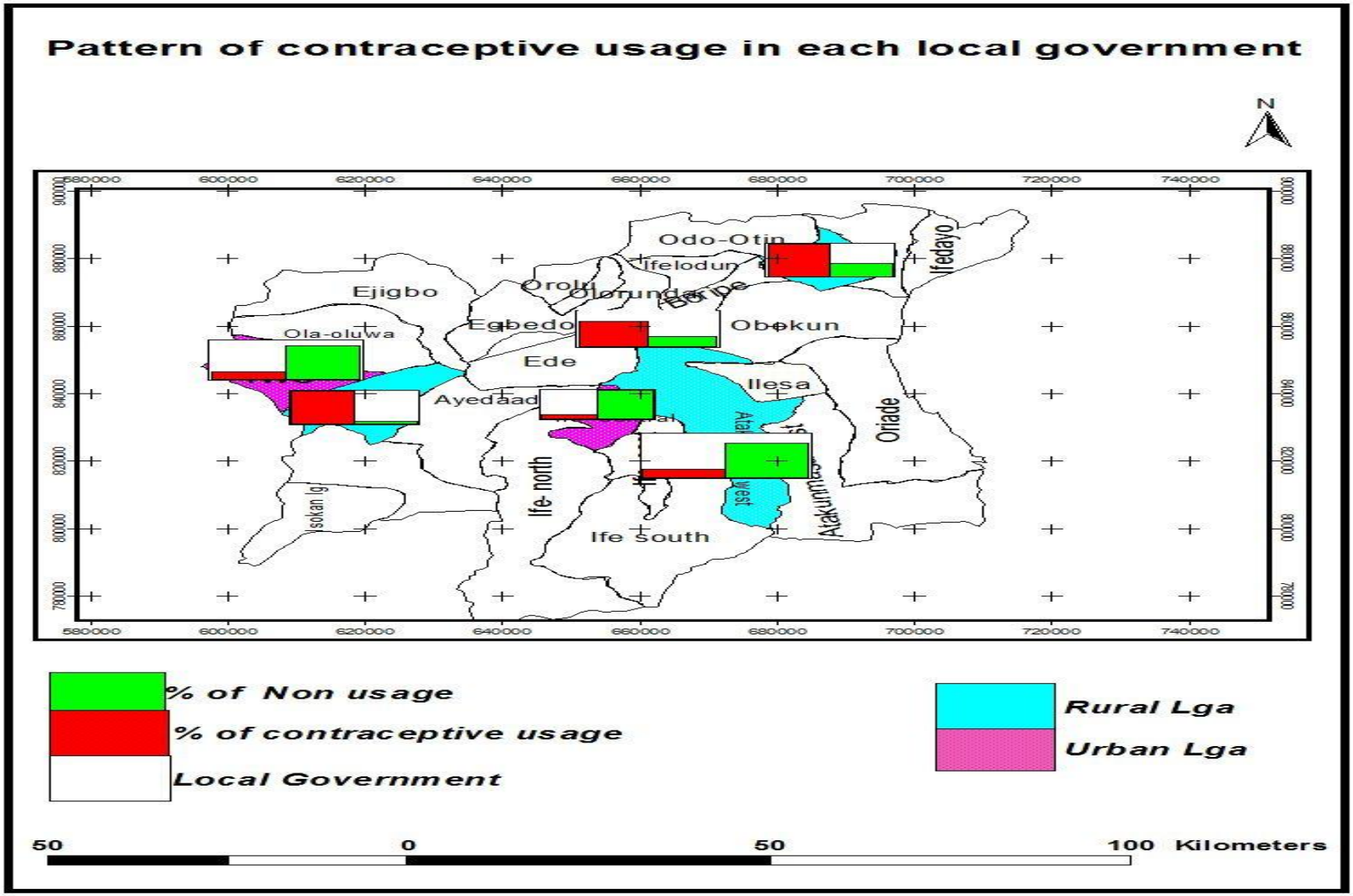


Figure 4: Pattern of Contraceptive Usage in Urban and Rural Local Government Areas

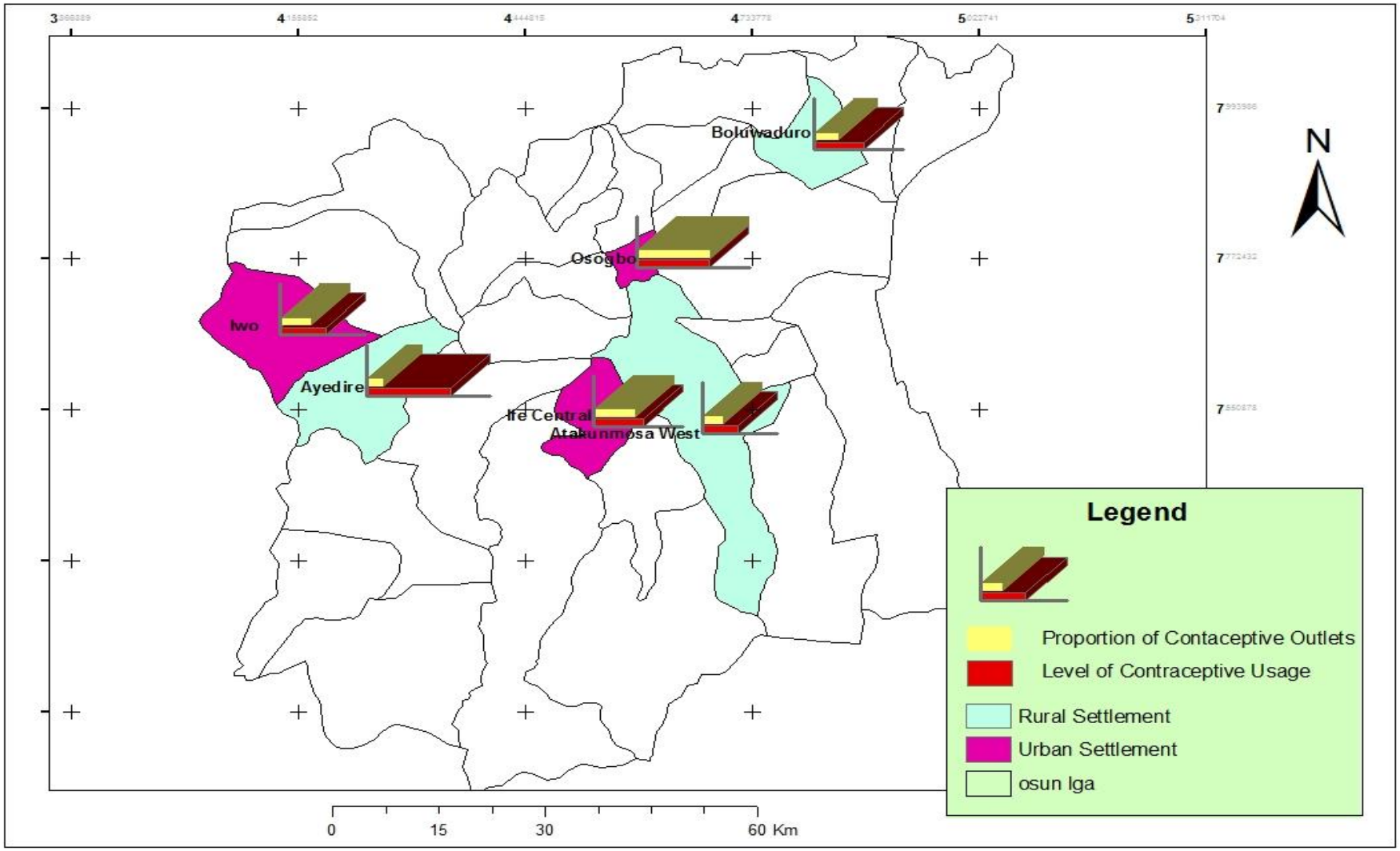
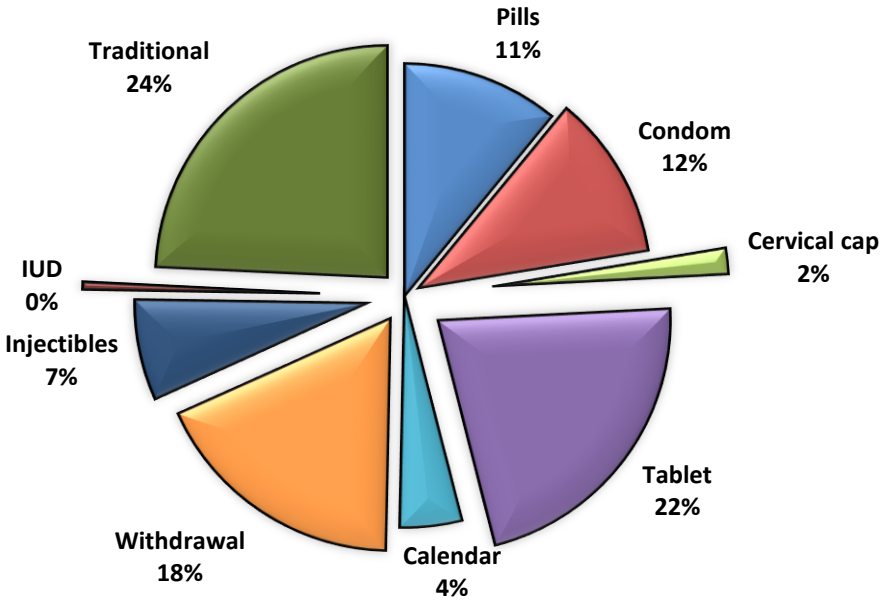


Figure 5: Relationship between Distribution of Outlets and Pattern of Usage

4.6 Types of contraceptives used by Adolescents

The result as illustrated in figure 6 shows that the largest percentage (24%) of the adolescents adopted traditional method of contraception. This is in line with observations by Williams et al,(2009) that most women in developing countries rely on traditional rather than modern contraceptives. This could be as a result of the problem of societal disapproval of use of modern method purchased through the outlets or high cost arising from low level of service provision. Further investigations revealed that Adolescents used such traditional methods as spiritual rings worn on fingers or beads tied around their waists. The traditional materials and objects were considered to be cheap, readily available and very reliable, apart from the fact that, they can be purchased without anybody suspecting the motive of the buyer. The issue is the objects are in most cases multipurpose in nature and functioning. About 22% claimed use of withdrawal method, which carries high risk of unwanted pregnancy and contracting of STIs.

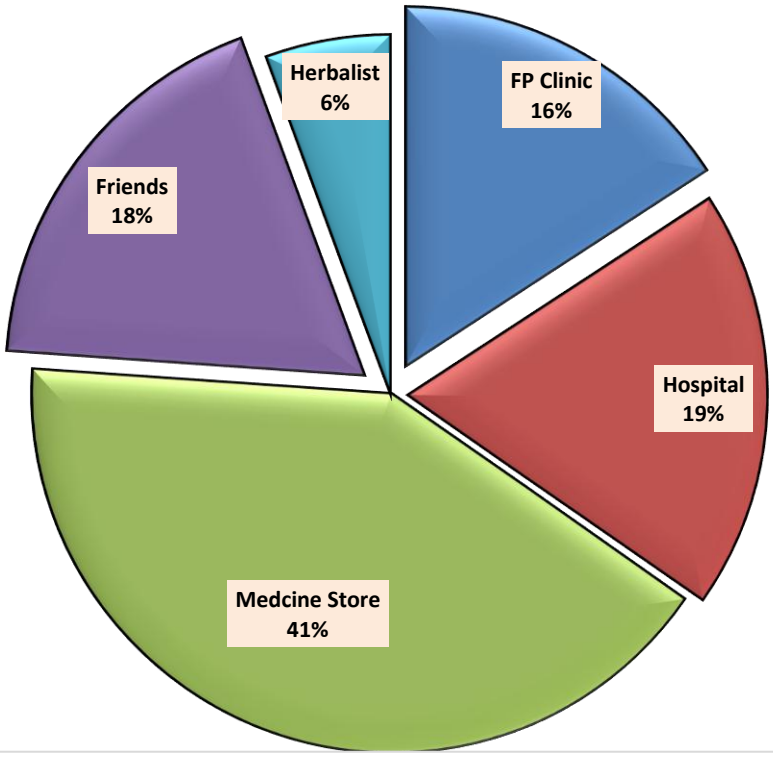
FIG. 6: TYPES OF CONTRACEPTIVES USED BY ADOLESCENTS



4.7 Sources of Contraceptive Information

Figure 7 shows that the major source of information for the adolescents on various types and usage of contraceptives is patient medicine store (41%), followed by hospitals (19%), friends (18%) and Family Planning Clinics (16%). Few adolescents (6%) confessed they patronized herbalists. This confirmed earlier findings that access to contraceptives was often through unofficial or commercial channels (Health Care Women Int'l 2006). It is not surprising that patient medicine store is the major source of information for the adolescents on issues of contraceptives, our knowledge of the health seeking behaviour of the people in the study area shows that patient medicine sellers generally constitute the major source of procurement of common drugs and even "off the counter" drugs. This is particularly because they are not only accessible, the drugs being sold are cheaper even though most are of less quality if not outrightly fake and thus dangerous for human consumption.

FIG. 7: SOURCES OF CONTRACEPTIVE INFORMATION



4.8 Determinants of Contraceptive Usage.

Table 5 shows that the bulk of the respondents claimed that societal disapproval of usage was a major factor militating against the use of contraceptive. The level of societal disapproval was highest in Iwo LGA (58.8%), followed by Ife Central and Oshogbo each with about 55%. Aiyediire, a rural LGA had the lowest level of 41.3%. This is to be expected due to the fact these areas are strong religious centres, both Islamic and Christian religions. According to a male adolescent who volunteered to comment on the how of societal disapproval, said

> " the reason is that the major buyers of the products were known to be the prostitutes and their customers and that there was always a castigating view of any adolescent who dared to pick up the product at the centre where it is sold".
>
> Victor SSS3, Oshogbo, June 2015

Another adolescent had this to say.

> "the owner of the shop where they sell the products is Mumsy's friend, I can't go there"
> Bello, SS3 Oshogbo, June 2015

> "even when you buy condom from a nearby store, the seller may not say anything, but the news would soon go round that you are a prostitute"
>
> Shakirat, SSS1, Iwo, June 2015

The complaint of societal disapproval is understandable in the above context. The fact is, since the sellers and prospective buyers are well known to each other, being members of the same community and or possibly of the same religious faith. The prevailing socio-cultural attitude and general understanding of sexuality and reproductive behaviour favour chastity while discouraging premarital sexual activities. Abstinence therefore is a doctrine that is well enshrined in the people's socio-cultural lives and religion, both Islamic and Christian religions. The implications of societal disapproval of use of protective measure for sexually active adolescents

has health implications. First the adolescents are prone to sporadic unprotected sexual activity and are thus exposed to associated risk of contracting Sexually Transmitted Infections including HIV/Aids. Secondly, there is likely to be high level of unwanted pregnancies leading to disruption of education and increase in dropout rate particularly for female adolescents. The implications of the above portend great danger for the health and career of the adolescents. On the health implications, apart from risk of contracting STI/Aids, occurrence of unwanted pregnancy may compel criminal abortion, resulting in maternal mortality and morbidity. Where abortion is not procured, as is sometimes the case, the burden of single parentage for the female adolescent is an enormous socio-economic problem, since the female adolescents is often left alone to cater for her unwanted baby.

The usual option left for prospective buyers of products was to travel long distances to places where anonymity was guaranteed. This perhaps explains why a significant proportion of adolescents claimed that the cost of contraceptives (27.8%) and or that cost of transportation (21.9%) were too high for them.

Table 5: Factors that affect use of Contraceptives.

S/N	LGA	Frequency	Societal Disapproval	%	High Cost of Contraceptive	%	Cost of Transport	%
1.	Boluwaduro	188	80	(42.6)	60	(31.9)	48	(25.5)
2.	Osogbo	284	156	(54.9)	72	(25.4)	56	(19.7)
3.	Atakunmosa West	184	80	(43.5)	60	(32.6)	44	(23.9)
4.	Ife Central	260	144	(55.4)	64	(24.6)	52	(20)
5.	Ayedire	252	104	(41.3)	72	(28.6)	76	(30.1)
6.	Iwo	272	160	(58.8)	72	(26.5)	40	(14.7)
	Total	1440 %	724	(50.3)	400	(27.8) 316		(21.9)

Source: Authors' Field work (2012).

The spatial pattern of factors of low usage of contraceptives is shown in figure 8. A major observation from the figure is the fact that, whether rural or urban, factor of societal disapproval of use of contraceptive by adolescents was highest in all the Local Government Areas, followed by costs of products and cost of transportation to locations of sale of products. The fact that adolescents complained of cost of transportation shows that, they were willing to travel to get the product wheresoever it may be found if service was available, accessible and affordable.

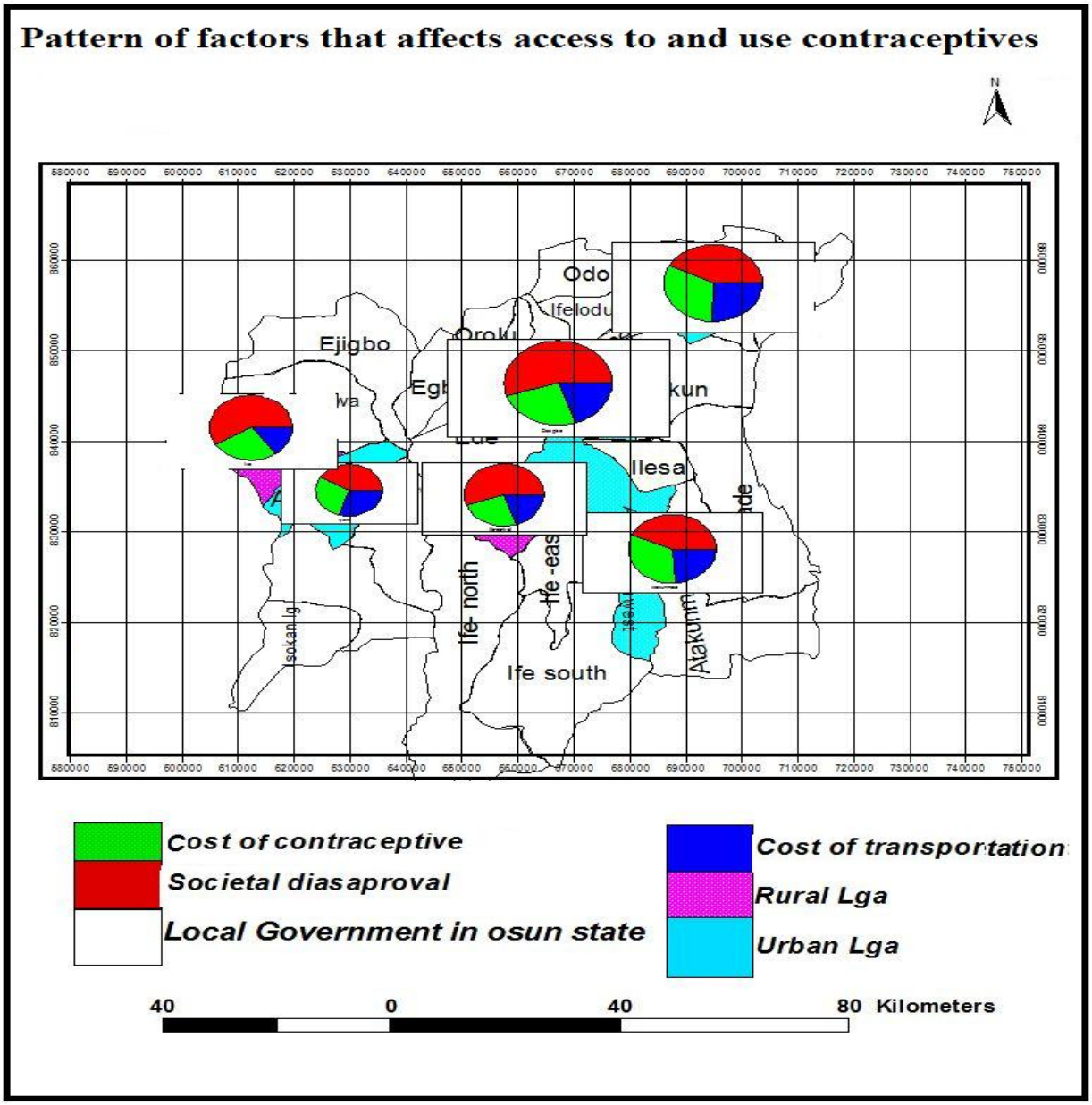


Figure 8: Pattern of factors that Affect Access and use of Contraceptives

5 SUMMARRY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study analyzed the spatial pattern of adolescents' access to and use of contraceptives and examined the relationship between the pattern of outlets and use of contraceptives among secondary school adolescents in three urban and three rural Local Government Areas in Osun State, Nigeria. Primary data involved the use of handheld GPS to obtain the geographic coordinates of the contraceptive outlets and of schools. Also, questionnaires were administered to collect data on the socio-demographic characteristics of students and their contraceptives usage. Multi-stage sampling procedure was used to select respondents. The rural-urban variation in the distribution of outlets and adolescents' use of contraceptive was analyzed using both GIS tools and statistical analysis.

The results showed that though, there were more contraceptive outlets in the urban LGAs (70%) than in the rural LGAs (30%), in relation to the total population to be served, there was observed gross inadequacy in the level of service provision with ratio of population to outlet being 1:21,431. Also while the pattern of outlet was clustered that of schools was random with a tendency towards dispersion. A low uptake of contraceptive was observed as more than half of the respondents never used any method. The level of non-usage of contraceptive was highest in the three precolonial cities which are the epitome of Yoruba socio-cultural heritage with strong puritanican tradition on matters relating to premarital relationships.

Similarly, the mapped relationship between the patterns of service of service provision and commodity usage shows higher levels of usage than service provision, further confirming inadequate level of provision and acute shortage of services where it was required.

Adolescents relied mostly on traditional methods featuring, use of rings and beads, as well as the inefficient and risky withdrawal method. Major determinants of access and usage of contraceptives were observed to be societal disapproval reinforced by religious beliefs and misconception about usage, particularly association of usage with prostitution.

5.2 Conclusion

It is concluded that not only was uptake of contraceptives low in the study area, relative to pattern of population distribution, there was low level of service provision both in the urban and rural areas. While there was strong societal disapproval of use of modern methods, a view reinforced by religious beliefs and misconception about usage of contraceptives, the subtle nature of the provision, distribution and usage of traditional method enhanced by its relatively higher level of affordability and availability made it a preferred option of contraception among the populace.

5.3 Recommendations

1 Given the various misconceptions about adolescents' sexuality and reproductive health issues, sex education should be made part of the secondary school curriculum and also taught in various adult education programmes for parents with low level of education. In the secondary schools, such subjects as physical and health education can incorporate this aspect.

2 Government at all levels should pay greater attention and commit more resources to the health needs of adolescents in Nigeria, particularly in the rural areas where access to information and contraceptive usage is limited.

3 Perhaps as a result of their religious and socio-cultural background, there is the tendency for health workers to castigate adolescents patronizing contraceptive outlets. There is therefore the need to promote professionalism among health workers, through mandatory continuous education programmes.

4 There is the need for the government to create a forum for continuous education among religious leaders on the relevance of healthy sexual life among families and adolescents in particular. This it is hoped will change parental views about the strategies for promoting healthy sexual behavior and reproductive health among adolescents.

5 As a suggestion for further research, it is recommended that, research attention on similar matter should include out-of-school adolescents and compare access to and use of contraceptives among this group with that of in-school adolescents which is the focus and limitation of the current study.

6 Increasing the use of modern contraceptive methods require governmental and communal interventions and support. The provision of information, life skills, support and access to youth-friendly services by Government and Non-Government agencies will further aid the use of contraceptives among adolescents. Interventions should aim to counter negative perceptions of modern contraceptive methods and the dual role of such method as use of condoms for contraception and STI prevention should be exploited.

7 Promotional programmes should include confidence building on modern contraceptives methods, particularly the additional advantage of protection against STI and HIV/Aids apart from prevention of unwanted pregnancies.

8 This study has demonstrated the possibility of storing and analyzing spatially referenced data about adolescents' access to and use of contraceptives in GIS environment for easy access and processing. This will therefore enhance further research on the subject matter in the study area.

REFERENCES

Adeniji, K, Oni. B, Ogbuozobe. J.E, Adesanya. S. O, Adeboyejo.A.T and Adeagbo. A; Residential Density and Adolescent Sexuality and Fertility Behaviours in Nigeria. (1998)

Adeboyejo, A.T and I. P. Onyeonoru. (2005); Aspects of Home Environment and Adolescent Sexual Behavior in Southwest Nigeria; Africa Population Studies Vol.20 No 1

Adeboyejo, A.T and I. P. Onyeonoru. (2007); A Multivariate Analysis of Adolescents' Sexual Behaviour in Southwestern Nigeria" Ife Psychology I A.

Chandra-Mouliet al (2014) Contraception for adolescents in low and middle income countries: needs, barriers, and access.

Erica A Hinckson (2014):Built environment and physical activity in New Zealand adolescents: a protocol for a cross-sectional study.

Guttmacher Institute, (2007).Biddlecom AE, Hessburg L, Singh S, Bankole A, Darabi L. Protecting the next generation in Sub-Saharan Africa: learning from adolescents to prevent HIV and unintended pregnancy. New York:

Guttmacher Institute, (2009) Adolescents in Burkina Faso: Sexual and Reproductive Health, Research in Brief Series, No. 3, accessed online at www.guttmacher.org.

Guttmacher Institute,(2010): State Policies in Brief: Emergency Conception, Available at http://www.Guttmacher.org/state center/spibs/spib_Ecpdf

Hassan. E.A and G.C Creatsas (2000) "Adolescent Sexuality: A developmental Milestone of Risk-Taking Behaviour? The role of Health care in the prevention of Sexually Transmitted Diseases" Journal of Pediatric and Adolescent Gynecology Vol. 13 No 13 pg 119 – 124.

Hubacher D, Mavranezouli I,.,McGinn E (2008): Unintended Pregnancy in sub-Saharan Africa, vol.78.Pg73-78.

Lisa M Williamson, Alison Parkes, Daniel Wight, Mark Petticrew and Graham J Hart (2009) Limits to Modern Contraceptive Use among Young Women in Developing Countries. Pg 1-10.

Makinwa, Paulina K, (1981) The National cost of illegal Abortion: A case for family planning programmes AMAN: Journal of Society, Culture and Environmental 1:1.

MakinwaAdebusoye, P. K. (1991); Adolescents' Reproductive Behaviour in Nigeria: A case study of five cities, NISER Monograph Series No. 3, NISER Ibadan.

Myles, M (1981) Textbook for Midwives, 9th Edition C and C Joint Printing Co Ltd, Hong Kong pg. 41-44.

Nancy L et al (2013), Migration Experience and Premarital Sexual Initiation in Urban Kenya: An Event History Analysis.

Nichols, D. J., et al (1986): "Sexual Behaviour, Contraceptive Practice and Reproductive Health in Nigeria", Studies in Family Planning.

Okpani A.O. U and Okpani J.U (2000) Sexual activity and Contraceptives Use Among Female Adolescents, A Report from Port Harcourt, Nigeria. African Journal of Reproductive Health vol. 4 No 1 pg 40-43.

Oringanje C, Meremikwu MM, Eko H, et al. Interventions for preventing un-intended pregnancies among adolescents. Cochrane Database of Systematic Reviews; 2009.

UNEFPA, (2010). Adolescents Population Selected Socio-Demographic Variables

UNEFPA, (2013). Adolescents Population Selected Socio-Demographic Variables

World Health Organization. (2010): Global recommendations on physical activity for health. Geneva: World Health Organization, 2010.

Williamson LM, Parkes A, Wight D, Petticrew M, Hart GJ. (2009): Limits to modern contraceptive use among young women in developing countries: a systematic review of qualitative research. Reprod Health. 2009;11:3. doi: 10.1186/1742-4755-6-3. [PMC free article][PubMed][Cross Ref]