SOME OBSERVATIONS ON THE SPATIAL EPIDEMIOLOGY OF MENTAL ILL-HEALTH IN NIGERIAN CITIES : A PRELIMINARY INVESTIGATION OF IBADAN MENTAL CLINICS

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INTRODUCTION

There have been very few studies concerned with the spatial patterns of mental ill-health. Most of the available studies have been done by non-geographers, especially by sociologists who have built in some spatial elements into their studies (e.g. Faris and Dunham, 1939 [1], followed the model of concentric zones, sectors or «natural areas» established in 1925 by Park and Burgess). The paucity of such studies has also been explained by the fact that psychiatric medicine is not a popular field (Giggs, 1983)[2].

The need to undertake psychiatric epidemiological studies arises from the fact that certain socio-cultural environmental factors provide strong correlates with mental disorders. Nonetheless, this reality does not preclude the multivariate dimensions in the aetiology of mental disorders. However, associative environmental factors, such as poor housing, residential mobility, extensive migration, travel stress provide environmental stimuli that are likely to predispose individuals to mental stress. An ecological approach to mental ill-health assumes that there exist certain pathogenic areas within the city or any region which are stress - inducing [3] (Smith 1977) and seem to «destroy» mental health.

Therefore, the main objective of the present preliminary study is to explore the relationships between mental illness and certain socio-cultural environmental factors in a Nigerian City. It is anticipated that the study will be able to identify high risk populations and their environmental associatives in Ibadan City which epitomises many Nigerian urban centres.

THE DATA AND METHODS

The data for the present study were collected from the records of the two hospitals that run clinics for patients of mental disorders in the city. These were the University College Hospital (Lambo Unit) and the Ring Road State Hospital. The former is located in the north-eastern part of the city (Ward N6B) while the latter is situated in the south-western part (Ward SW9) (Fig. 1).

Figure 1 - Distribution of the total cases of mental disorders in the Ward areas 1980-84

The case files of all patients treated at the two clinics for the period of 1980 to 1984 were retrieved and examined. The Lambo Unit of the University College Hospital was first of its kind, established by the one and only world renowned psychiatric doctor, Professor Adeoye Lambo. The Oyo State Government in 1983, established a psychiatric unit at the Ring Road State Hospital which is supposed to be the state's premier referral hospital.

From the case files of the patients, demographic data and certain clinical details were extracted. During the period of study, 1980 to 1984, 3508 psychiatric patients were treated in the two hospitals (Table 1). Of this number only 3478 patients were found relevant for this study.

Year	n°of patients	% of Total
1980	257	7.4
1981	835	24.0
1982	768	22.1
1983	945	27.2
1984	673	19.3

Table 1 - The Clinic attendance of mentally ill patients

There are certain inherent problems in the clinic data in respect of being representative and reliable. It is appreciated that the clinic data will be biased since many mental patients may not seek modern medicine. It is not also feasible to track the patients down at traditional and spiritual healing houses. Interview surveys do not reduce the problem since mental disorders carry social stigma and high confidentiality even at the clinic level to obtain data on the patients. However, the significance of the issue is a common knowledge in Nigerian cities as mentally deranged individuals are common sights on the Nigerian streets and public places.

The important point here is that, despite the inherent problems associated with using clinic data, more reliable data are difficult to come by because of their sensitive nature. It is therefore hoped that the clinic data will give us some insight into the spatial patterns as well as the socio-cultural environmental factors that tend to be stress inducing in the urban centres of Nigeria. For the purpose of the present analysis, the patients were aggregated into their residential locations and census tracts in Ibadan City.

THE STUDY AREA

Ibadan which still recently was the largest city in Black Africa, but is now second only to Lagos is the study area. Ibadan still retains the characteristics of a traditional town alongside a modern urban centre like most Nigerian towns. This dual characteristic is evidenced in the marked differences in urban characteristics of the western half and the eastern section. The latter is occupied mainly by the indigenous population while the former is more heterogenous and occupied mostly by immigrants [4].

By 1963, the city with a population of 627.379 was demarcated into 39 census tracts or ward areas, but today has 46 wards. The city is known to grow in all directions especially along the major routes to Lagos to the south, Ile-Ife to the east, Abeokuta to the west and Oyo to the north. The boundary of the city was calculated by Ayeni (1982) to be a radius of twelve kilometers from Mapo Hill and said to extend over 452.39 square kilometers [5]. Based on the 6% growth rate arrived at by Ayeni in 1982, about 2.220.784 inhabitants are estimated to live in Ibadan in 1986.

RESULTS

In the five years, 1980-1984, there were 3680 cases treated for various types of mental ill-health including 71 cases of epilepsy in the two clinics. There were also 783 admissions. Categories of Mental ill-health treated

Twenty two different types of mental disorders were identified in the clinics. These were later on classified into 7 broad diagnostic categories as shown in Table 2. A fairly large part of the patients were grouped under miscellaneous.

Rank	Types of Mental Disorder	N°of case	% of identified total cases
1	Unspecified psychosis	896	35.8
2	Functional Psychoses	836	33.4
3	Neuroses	599	23.9
4	Organic Psychosis	144	5.8
5	Drug Abuse	18	0.7
6	Personality Disorder	10	0.4
7	Miscellaneous Types	1253	33.4

Table 2 - Mental ill health diagnostic categories or unspecified mental disorders including many cases of depression.

Table 2 shows that unspecified psychoses topped the list (35.8%) and followed closely by functional psychoses. A fairly large number of the patients also suffered from neuroses especially anxiety.

THE PATIENTS

In Ibadan City, it seems both males and females carry equal risk of being predisposed to mental disorders. In this study 50.2% of the patients were males while 49.8% were females. However, it appears males suffer more from organic psychosis and to some extent neuroses while they are most prone to alcoholism and drug abuse in the Nigerian society (Table 3). On the other hand, more females 62.5% tend to suffer from senile psychosis.

In respect of marital status of the patients, 55.7% of them were married, 41.2% were single and only 1.8% and 1.3% were separated and divorced respectively. Also, 56,3% of the patients were christians while 43.7% were muslims.

	Type of mental disorder	N°	Males	Females	Total
1	Unspecified Psychosis	450	50.6	439	49.4
2	Functional Psychoses	409	49.1	424	50.9
3	Neuroses	320	54.3	269	45.7
4	Organic Psychosis	115	79.9	29	20.1
5	Drug Abuse	17	94.4	1	5.6
6	Personality Disorder	5	50.0	5	50.0

Table 3 - Sex Distribution of the Diagnostic Categories of Mental Disorders

The age distribution of the patients of mental disorders is of interest in this study. Table 4 indicates that the bulk of the patients fall within ages 16 and 40, while age-group 21-25 (22.1%) is most seriously affected.

Age-group	N° of Cases	% of Total
Less 16	248	7.27
16 - 20	526	15.43
21 - 25	754	22.12
26 - 30	637	18.69
31 - 35	370	10.85
36 - 40	284	8.33
41 - 45	190	5.57
46 - 50	145	4.25
51 - 55	95	2.79
56 - 60	66	1.94
60 and above	94	2.76

Table 4 - Age Distribution of Patients of Mental disorders

Also, the occupational categories of patients were of concern in the present analysis. On the whole traders (24%) and students (23.6%) tend to be most vulnerable as observed on Table 5. They were followed by housewives, teachers, driver/mechanics, artisans including carpenters, bricklayers and civil servants. The most vulnerable occupational categories altogether contributed 47.6%.

	Types of occupation	N° of cases	% of total
1	Trader	747	24.00
2	Student	735	23.62
3	House wife	264	8.48
4	Teacher	166	5.33
5	Driver/mechanic	123	3.95
6	Artisan	120	3.86
7	Civil servant	111	3.57
8	Tailor/seamstress	97	3.12
9	Clerk	90	2.89
10	Farmer	83	2.67
11	Professional/managerial	82	2.63
12	Household/Labourer	69	2.22
13	Unemployed	68	2.19
14	Technician	56	1.80
15	Secretarial	42	1.35
16	Apprentice	34	1.09
17	Military/Police	30	0.96
18	Businessman/Contractor	27	0.87
19	Salesworker	23	0.74
20	Pastor	14	0.45
21	Retired	12	0.39

Table 5 - Occupational Categories of Mental Disorder Patients

THE GEOGRAPHICAL PATTERN

There is not enough information to do any serious analysis of the temporal pattern of the patients. However, more patients (63.6%) were admitted during the wet season of the year (Table 6) especially during the peak months of the raining season July to September.

Month of the year	N° of admission cases
January	66
February	54
March	73
April	57
May	79
June	69
July	81
August	84
September	83
October	45
November	60
December	32

Table 6 - Monthly Distribution of the First Admission Cases

There were altogether 3478 patients of mental disorders at both University College Hospital and the Ring Road State Hospital between 1980 and 1984. Out of this figure 2624 (75.4%) attended the clinics from the city even though 3.0 % of them gave their official adresses (Table 7). Also 8.7% attended clinics from the rest of Oyo State while some patients (12.9%) came from 15 other states of the Federation.

The present clinic data could not be analysed into the most relevant population characteristics as observed already. Be that as it may, the present analysis has to rely on the absolute number of reported cases from the ward areas.

Even though the range of reported cases from the ward areas appears wide (the lowest was 8 (from S6B) patients and the highest was 322 (from N6B), the distribution was tested for variability. The coefficient of variation (CV) was calculated to be 99.6%. The spatial pattern of the patients of mental disorders has been shown on Table 7 and depicted in figure 1.

On the individual census tracks, the highest mental disorders were reported from both the modern and indigenous areas of the city e.g. wards N6B, SW8, E9, N4, E7, SW9, S7, N3 NW3, E4 and NW4 (Fig. 1). The lowest cases were shared almost equally by both modern and traditional areas e.g. wards SW3B, S6B, E5B, S1, SW2 and NW1 (Fig. 1 and Table 7).

The prevalence rates based on an 'outdated' 1963 census figures also indicated that the wards with highest absolute rates were presented by wards E9, E7, E4, SW9, SW8, S7, NW4, NW5, NW6, S6, N4, N6, E1, E5, E6 and E8. These were evenly shared by the outer and inner sections of the city. On the other hand, the lowest rates were recorded by wards SW6, SW7, SW3, SW1, S1, C1, C2 and N1 (Figure 2).

For a better understanding of the spatial pattern, Ibadan City has been roughly divided into three broad residential zones - viz. the inner city (buildings constructed pre-1830 to 1900), the middle city (built between 1900 and 1950) and the outer city (built mostly after 1950). It was observed that both the inner and outer city zones sent equal propertion of patients to the mental clinics, that is 38.0% and 38.6% respectively. On the other hand, the middle city contributed the least (22.9%) of mental disorders treated at the clinics. The implication of the present pattern in Ibadan, is that both the inner and outer city zones seem to possess similar stress inducing environmental attributes.

DISCUSSION

Even though there is paucity of studies on the spatial epidemiology of mental disorders, the studies found certain environmental stimuli provide the strongest correlates with mental disorders. In the temperate regions, climatic fluctuations have been identified as one of the prespitating factors of mental disorders.

From the previous studies in developed societies different forms of blight, deterioration and degradation of the immediate environment have been held responsible for "des-

troying" mental health, hence greater proportions of patients often report from the inner city (Brunn, 1974, p. 140 and Griggs, 1983, p. 27-28). Other environmental stressors include overcrowding, physical quality of housing and residential mobility. In 1982, Louden discovered that about 62.5% of the mental patients were born outside Maiduguri, the study area [6].

In this study, there is not enough information in support of the role of climate in the incidence of mental disorders. It however suffices to state that more patients (63.6%) were admitted during the wet season of the year (Table 6). Since the wet season tends to present more fluctuating weather phenomena, may be such wet weather conditions tend to induce mental disorders in the tropical climate.

It is also difficult to really state the possible role of migration in including mental ill-health in Ibadan City. By inference, the age-groups (16 - 40, 75%) that tend to suffer most from mental disorders are most mobile. They also tend to be most exposed to stress-inducing or supportive socio-cultural environmental associatives, such as migration, (urbanization) stress and stress induced by adaptation to socio-economic changes that are most prevalent in students and trading populations that contributed 47.6% of the occupational categories.

The spatial distribution of the mentally sick patients are also of interest. It was observed that both the inner and outer city zones sent equal proportion of patients to the mental clinics, that is 38.0 % and 38.6% respectively. The implication of the present pattern in Ibadan, is that both the inner and outer city zones seem to possess similar stress inducing environmental attributes.

In the inner core of Ibadan, the possible environmental correlates can easily be identified. They include deteriorated houses crowded together, uncollected piles of rubbish, gutters running continuously through adjoining houses with poor ventilation and lighting and stinking open sewers clogged with piles of rubbish.

In general, the houses are overcrowded. They are also mostly occupied by low income groups. Contrary to the above, the outer city has generally better housing, healthier environment and more affluent occupants. These are usually low density areas. It is therefore not realistic to infer environmental associatives in the explanation of the high incidence in the outer zone of the city.

Because of lack of relevant data in respect of the breakdown of the socio-demographic characteristics of the city population and other important environmental associatives, the following city attributes * [7] have been relied upon :

1) % of size of building plot 50' by 100'
2) % of size of building plot 60' by 120'

3) % of size of building plot 100' by 120'
4) % of age of houses before 1925
5) % of age of houses 1926-1950
6) % of age of houses 1951-1960
7) % of age of houses 1961-1970
8) % of age of houses 1971-1980
9) % of heads of household annual income N200-2000
1O) % of heads of household annual income N 2001-4000
11) % of heads of household annual income N 4001-6000
12) % of heads of household annual income N 6001-8000
13) % of heads of household annual income above N 8000
14) % of personal house ownership
15) % of family house ownership
16) % of government or company ownership
17) % of private tenancy
18) % of free annual rental levels
19) % of less N120 annual rental levels
2O) % of N121 - 500 annual rental levels
21) % of N501 - 1000 annual rental levels
22) % of over N1000 annual rental levels *

* Note : The above residential attributes have been used as surrogates for levels of quality of housing conditions

Variables 1 - 3 as surrogates for housing congestion

Variables 4 - 8 as surrogates for residential quality which can be said to be closely related to age of building

Variables 9 - 13 as surrogates for levels of standard of li ving since income differentials relate greatly to economic pressure

Variables 14 - 18 as surrogates for residential quality. In the Ibadan situation tenancy types to some extent indicate the quality of buildings, the socio-eco- nomic status of occupiers and the geographical location of individuals.

Variables 19 - 22 as surrogates of social amenities availa- ble in the buildings and to some extent the socio-economic status of the residents.

It must be stated here that the total reliance on the above variables (Table 7) introduces a serious limitation to the explanation of the spatial pattern of mental disorders in the city. The problem of multi-collinearity is a serious set-back in this regard. It is however hoped that the results of this analysis can serve to make some preliminary observations on the epidemiology of mental disorders in the Nigerian cities.

Hence, the above stated variables were utilized as the explanatory (independent) factors

in a step-wise multiple regression that followed while the reported number of mental cases were used as the dependent variable. This multi-variate technique proceeds by entering first the variable that contributes most to the explanation of the dependent variable. Other independent variables are then entered in turn depending on the magnitude of their additional contribution to the explanation. This in fact means in order of the level of their partial correlation or F value.

The results of the multiple regression analysis are shown in Table 8. These results indicate that the most significant explanatory factor of the spatial pattern of mental disorders was the percentage of houses that were either government or company owned in the ward areas of the city (multiple r = 0.39 and r2 = 15%), followed closely by percentage of building plot of size 100' by 120', which made up 12.7%. However, the F-values of slightly less than half of the twenty-two independent variables were not significant. This result reflected the fact that some of the variables exhibited high degrees of multicollinearity. This is especially true of variables 4, 6, 7 and 8. The joint overall contribution of eighteen out of the twenty-two explanatory factors was 72% while eight factors made a total of 61.4% individual variable contribution.

To test the significance of the additional contribution by each individual independent variable, t-values were utilised. From Table 8, the t-values for eight of the independent variables were significant at least at the 5% level. The variables include - % of government or company house ownership, % of size of building plot 100' by 120', % of heads of household earning N6001-8000, % of private tenancy % of annual rental levels N501-1000, % of size of building plot 60' by 120', % of age of houses 1926-1950 and % of size of building plot 50' by 100'. The implication of this result is that the above stated variables made significant additional contribution to the explanation (not in a causal or stimulating manner) of the spatial patern of mental disorders in the city and they are also more associated with the outer city.

Even though caution needs to be taken in the interpretation of the results on Table 8, one can still make certain inferences. Considering the types of variables that made significant explanatory contribution to the spatial pattern of mental disorders in Ibadan, it seems that some elements of stressful conditions often produced by migration are indirectly revealed in these results. The point here is that some of the factors that made individual significant contribution to the explanation of the spatial pattern of mental disorders, relate more to the immigrant population of the city. The immigrant population in many Nigerian cities often have better chance compared with the indigenes to live in residential quarters provided by government or company (relatively spacious and high quality accomodation), houses that were built during the colonial period (1926-1950) when government and many companies were actively involved in construction of staff quarters, sizeable building plots (100' by 120'), houses that carry relatively high rental values and privately rented accomodation.

It should also be stressed that the present spatial pattern may relate primarily to the rate of reporting of mental disorders in the city. More often than not, people are likely to report of such conditions from more enlightened areas of the city. At the same time, it

is also obvious from the hospital records that more patients (70%) stated they first sought medical help from modern medicine while 27.7% claimed they first contracted traditional healers before attending the clinics.
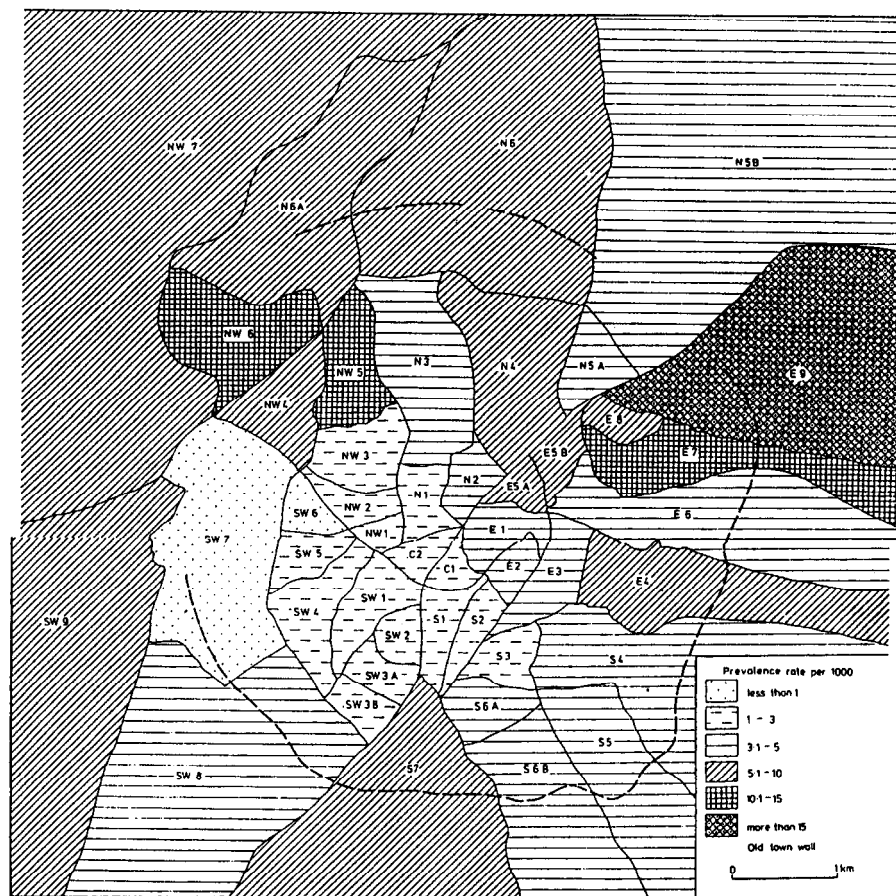

Figure 2 - Distribution of prevalence rates mental disorders based on 1963 population in Ward areas.

Incidentally by inference, the factors that made significant individual contribution do not relate significantly to different forms of blight, deterioration and degradation of the immediate environment and overcrowding in the city compared with results of studies in developed societies. Tentatively, it is being suggested that the spatial pattern of mental disorders may have to do with socio-economic factors that relate to more fluctuation fortunes, inability «to keep-up with the Joneses», student's failures to live up to their parents'/guardians' high expectations. Invariably the occupants of the outer city are sort of over-urbanized and they tend to be insular. Indeed, immigrants are likely to be more frustrated when life expectations are not realised. Hence, anxiety and

depression set in. The result of a related analysis showed that more cases of hypertension were found in the modern section of Ibadan compared with the indigenous areas (Iyun, 1978, p. 50, 65) (8).
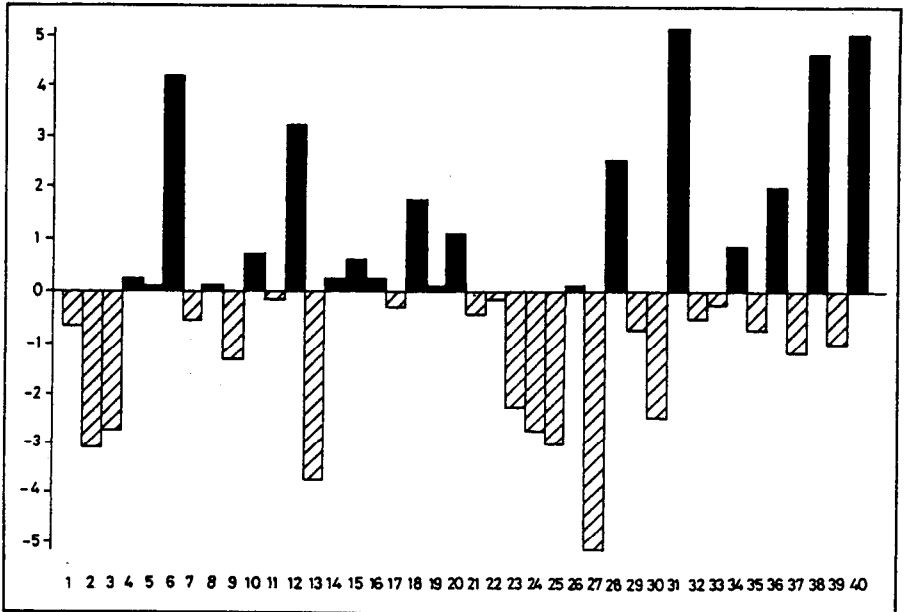

Figure 3 - Residuals between observed and predicted values in the ward areas calculated from step-wise multiple regression method

Furthermore, the distribution of the residuals of the regression analysis (Fig. 3) shows that the census tracts that recorded relatively high positive residuals are N4, NW2, S3, S5, SW4, SW8, E5, E7, E9, E3 N6B and NW6. These wards were also observed to have recorded highest absolute number of cases and prevalence rates. These wards are either located in the inner or outer city. On the other hand the highest negative residuals are recorded by wards, SW3B, NW3, SW1, C2, N1, SW2, SW7, S7, N6A, E6 and E4.

CONCLUSION

In conclusion, even though there is paucity of studies on the spatial epidemiology of mental disorders in Nigeria, there is evidence that various social problems that have been brought about by rapid growth of urbanization (internal migration) and recent economic depression tend to "destroy" mental health of many of the economically active population of our cities.

The spatial pattern of mental disorders in Ibadan City point to the fact that the outer city (occupied mostly by high income groups) shares similar risk with the "blighted" zone - the inner core of the city occupied primarily by Ibadan indigenes and low income groups. However, the contributory socio-cultural environmental factors are found to be different. While different forms of blight and environmental degradation tend to predispose individuals to mental stress in the inner core, socio-economic frustrations have been adduced to be responsible for the relatively high incidence of mental disorders in the outer zone of the city.

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