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ADULT MORBIDITY DIFFERENTIALS IN LAGOS, 1968-1978

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I. INTRODUCTION

The rapid rate of growth of contemporary African cities creates appalling and chronic overcrowding and deterioration of facilities available both within individual houses and in the cities themselves. The poor environmental conditions are inimical to health. Of recent, the environmental degradation has been aggravated by various kinds of pollution associated with the machine age. As the industrial development of the cities progresses, their inhabitants enter the urban-industrial labour force in large numbers. The tempo and tension of city life concomitant on the new social roles (particularly industrial employment) give city-dwellers repeated exposure to particular risks of illness and injury (Puffer and Griffith, 1967).

Yet little is known about the epidemiological transition in African cities. What is known are causes of death but not all illnesses lead to death (Lauckner, Rankin & Adi, 1962; Ogunmekan, 1973; Adetuyibi, Akinsanya & Onadeko, 1978). Morbidity that does not lead to death produces losses in productivity of town dwellers. The losses vary with type of illness which in turn varies with socio-economic characteristics of city dwellers. It is therefore desirable to inquire into the effects which type of employment and educational level have on mobidity of city dwellers. There is also a need to know how the increasing participation of women in urban-industrial employment has affected their morbidity.

In this paper, an attempt is made to analyse the morbidity of an urban population exposed to modernization processes at an early stage of development. Specifically, the following questions are considered:

a) What are the patterns of morbidity among the adult population in an urban setting ?

b) What changes have occured over time in sex-age differentials in morbidity ?

c) How is the nature of employment related to type of disease ?

d) Which group of the population is showing signs of particular health problems ?

II. THE SURVEY, THE DATA AND THE SAMPLE

a) The Lagos Morbidity Survey

The article is based on a large clinical survey conducted in the capital city of Lagos, the fastest growing city in Nigeria. The survey consisted of two questionnaires that were fielded in 1978 in the Lagos University Teaching Hospital (LUTH). The results of the first set of questionnaires which covered the children segment of the survey had already been reported elsewhere (Chojnacka and Adegbola, 1984). The current study reports on the results of the adult segment of the survey.

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Both segments of the survey used a patient-based probability sample consisting of randomly selected respondents who attended the hospital at two points in time: 1968 and 1978. The 1968 respondents were selected by randomization from the register of patients who attended the hospital that year. From the files of the selected respondents, available information was culled and copied into a questionnaire. In 1978, live interviews were conducted among randomly selected patients attending the hospital at randomly selected days in the year. The 1968 data set consists of 773 patients while the 1978 data set is made up of 742 respondents.

b) The data used in the analysis

The key item for the morbidity analysis is the medical data. These data, consisting of diagnosis of the patients, were grouped according to the "A" List of the International Classification of Diseases Manual. The seventeen major categories which form the root of the four-digit classification in the manual were used (W.H.O., 1967). The non-medical data are demographic and socio-economic characteristics of the respondents. It turned out that only a few items of non-medical data were available in the record cards of the 1968 patients. Consequently, only the 1978 sub-set provided data for estimating the magnitude of the key socio-economic variables affecting adult morbidity. A detailed description of these medical and non-medical variables, the methodology adopted in the collection and analysis of the data and an examination of the reliability and validity of clinical data were given in Chojnacka and Adegbola (1984).

What remains to be done here is to provide some evidence to show that a study based on a single hospital reflects the health situation of metropolitan Lagos. An important evidence is a comparison of the mortality statistics published annually by the Lagos State Ministry of Health with the annual mortality statistics obtained in LUTH. The comparison reveals that the secular trends in mortality in the LUTH data are generally similar to those indicated by the Lagos vital statistics (Adegbola and Chojnacka, 1984). Furthermore, there is a high and significant correlation between the number of cases reported for each disease in LUTH IN 1978 and the number of cases reported for corresponding disease in all the other hospitals in Lagos in the same year. The correlation coefficient is 0.83 and is significant at .01 level. The same high coefficient of correlation (.71) and level of significance .01 is obtained when the relationship between the percentage of death resulting from each category of disease in LUTH and the corresponding percentage in other hospitals in Lagos is measured.

The strong correlation between the LUTH data and the data from other sources stems, in part, from the characteristics of LUTH. The hospital was not only the largest but also the best equipped and staffed of all the hospitals in Lagos. The heavy subsidy it received from the Federal Government enabled it to provide cheap services to its patients. The difference between the cost of medication in LUTH and the cost in other hospitals was difficult to estimate because costs of medication were guided secrets of private hospitals. But judging from the consultation fees paid by all patients, the costs of hospital bed per night paid by in-patients and the cost of drugs given to out-patients, there is no doubt that the cost of medication was much cheaper in LUTH than in any other hospital. This low

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cost of medication soon transformed the hospital from being a reference hospital to a clinic attending to both primary and referred cases. The hospital, for example, had the largest proportional share of all the hospital patients in metropolitan Lagos in 1978. More important, its catchment area covers the whole metropolis and its clientele spans all categories of people. This feature of the hospital is reflected in the range of patients in the samples.

c) Characteristics of the samples

The respondents were predominantly residents of Lagos and mainly natives of urban centres. Over 90% of the respondents claimed to be living in Lagos while over 80% of them said they were born in urban centres. The state of origin of the respondents reflects the cosmopolitan nature of Lagos although majority of the respondents were migrants from western Nigeria (Table 1).

TABLE 1

STATE OF ORIGIN

Region	Relative Frequency 1978 Sample	1968 Sample
West and Lagos	57.1	52.3
East	20.3	24.4
Midwest	12.7	10.4
North	8.0	5.1
Others	1.9	7.8
Total	100.0	100.0
N	742	773

In 1968 there were more females than males but males outnumbered females in 1978 (Table 2). The widening gap between the sexes arose from excess of males in the age group 15-49 as well as from the predominance of females in the '50 and above' age category. The mean age of respondents was 34.7 and 37.2 years for the 1968 and 1978 samples respectively.

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TABLE 2

AGE-SEX COMPOSITION

ge Group	Relative Frequency					
	M	F	T	M	F	T
15-29	55.3	52.6	54.3	43.1	53.6	48.8
30-49	25.8	22.4	24.5	38.5	37.5	38.0
50 and over	18.9	25.0	21.2	18.4	8.9	13.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	462	280	742	354	415	769

M - Male
F - Female
T - Total

The occupational composition shown in Table 3 indicates substantial sex differentials over time. There was a distinct decline in the proportion of housewives from 51.6 per cent in 1968 to 30 per cent in 1978. The decline is a clear reflection of an increase in the rate of female labour force participation.

About 40 per cent of the women were engaged in unskilled or semi-skilled jobs while only 15 per cent were employed in professional duties.

The distribution of occupations among males indicates that there were about 50 per cent of unskilled and semi-skilled workers in 1968 and 42 per cent of them in the 1978. Between 1968 and 1978, however, there was an increase in the proportion of middle level professionals from 7.6 to 18.2 per cent.

Data on education are available for the 1978 sub-set only. As shown in Table 4, over one-fifth of respondents and two-fifths of their spouses were without education. About 42.3 per cent of respondents had at least secondary education, but only 26.1 per cent of their spouses reported that they had secondary education.

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TABLE 3

Occupation	Relative Frequency						
	1978 Sample				1968 Sample		
	M	F	M	F			
Housewives	-	30.0	-	51.6			
Unskilled workers	19.7	30.0	32.8	19.5			
Semi-skilled workers			22.7		8.7	17.9	6.0
Low professionals	6.8	3.7	15.2	4.6			
Middle professionals			18.2		10.0	7.6	10.1
High professionals			6.8		0.0	8.3	0.5
Others	25.0	16.3	16.7	7.5			
Unemployed	0.8	1.3	1.5	0.2			
Total	100.0	100.0	100.0	100.0			
N	462	280	341	415			

TABLE 4

EDUCATION OF RESPONDENTS (R) AND THEIR SPOUSES (S), 1987

Level of Education	Relative Frequency	
	R	S
Illiterate	22.6	42.2
Primary	35.1	31.7
Secondary	32.0	16.9
Post-Secondary	10.3	9.2
Total	100.0	100.0
N	679	497

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III. THE CHANGING STRUCTURE OF MORBIDITY

a) Pattern and Trend

A relative ordering of diseases by sex is given in Table 5. For the 1968 subset, the three leading diseases among the two sexes are infective, respiratory and digestive. These three diseases together accounted for 58 per thousand and 55.4% among the males and females respectively. In both sexes, the most dominant disease group is the infective which made up well over a quarter of all the diseases within each sex. But while respiratory recorded the next highest proportion among males, digestive was the next leading disease among females. At the next level, circulatory, genito-urinary, musculoskeletal, neoplasms, endocrine, accidents and nervous show moderately low proportion (each constituting between 3% and 7%) among the males. The least important diseases, each accounting for less than 25%, were blood, congenital, mental and perinatal diseases and were found mostly among the female population.

In the 1978 sample, two main features are particularly striking. The first is the eliminating of the spectre of a dominant disease. The diseases were relatively more spread out, with no single disease accounting for more than 20% of all the diseases in either sex. The second is the significant shift in the composition of the five leading diseases in both sexes. Among the males, the highest ranking diseases, taking up 17.7% of the total, were due to violent causes particularly accidents involving motor vehicle crashes. Respiratory contributed a further 13.1% while nervous and infective diseases each contributed slightly over 12%. It is also important to note the sizeable proportion of males suffering from diseases of the circulatory system, due largely to the contribution from cardiovascular heart disease.

Among the females, on the other hand, the most prominent disease remained the infective. It was followed by respiratory and circulatory each of which contributed just about 9%. As might be expected, some of the largest proportion were found among the maternal related diseases.

In order to better discern the pattern of structural shift over the years, the percentage point change is summarized in the last two columns of the table. Three broad categories of change are recognizable:

i) negative overall change in both sexes
ii) positive overall change in both sexes
iii) dissimilarity in direction of change in the sexes

In the first category are diseases, the relative importance of which declined between 1968 and 1978. The most prominent in this category are infective and digestive. But while females recorded a higher percentage point change in digestive, the magnitude of change in infective is higher among males. This sex differential probably reflects males' generally higher initial susceptibility to the disease. Similarly, males recorded a larger amount of change in all the other diseases in this category (except genitourinary) although the magnitude of change is small, ranging from -0.3 to -3.0.

TABLE 5

DISTRIBUTION OF DISEASES BY SEX

Disease	1968 Sample				1978 Sample				% point change	
	Male		Female		Male		Female		Male	Female
	%	Rankk	%	Rank	%	Rank	%	Rank		
Infective	28.6	1	27.3	1	12.1	4	11.8	1	-16.5	-15.5
Respiratory	15.6	2	9.1	3	13.1	2	9.3	2	- 2.5	+ 0.2
Digestive	13.8	3	19.2	2	8.6	6	8.4	5	- 5.2	-10.8
Circulatory	6.9	4	6.2	6	10.9	5	9.1	3	+ 4.0	+ 2.9
Genito-urinary	6.4	5	6.7	4	4.2	9	3.7	14	- 2.2	- 3.0
Musculoskeletal	4.1	6	4.4	7	5.0	7	6.6	8	+ 0.9	+ 2.2
Meoplasms	3.9	7	6.5	5	1.4	12	5.5	10	- 25	- 1.0
Endocrine	3.7	8	3.7	88	4.1	10	3.8	13	+ 0.4	+ 0.1
Accidents	3.2	9	1.8	13	17.7	1	7.2	7	+14.5	+ 5.4
Nervous	3.1	10	2.6	11	12.2	3	4.0	12	+ 9.1	+ 1.4
Skin	2.7	11	3.0	9	3.8	11	4.1	11	+ 1.1	+ 1.1
Mental	2.6	12	0.5	17	0.8	14	1.7	15	- 1.8	+ 1.2
Ill-defined	2.3	13	2.4	12	1.2	13	1.5	16	- 1.1	- 0.9
Blood	1.6	14	1.1	16	4.3	8	5.6	9	+ 2.7	+ 4.5
Congenital	1.5	15	1.6	14	0.6	15	1.3	17	- 0.9	- 0.3
Pregnancy	0.0	16	2.7	10	0.0	16	8.6	4	-	+ 5.9
Perinatal	0.0	17	1.2	15	0.0	17	7.8	6	-	+ 6.6
N	342		100.0		100.0					

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The second category consists of diseases which have become increasingly important as the rate of urbanization increases. Aside from the two female-specific diseases (perinatal and pregnancy), the magnitude of change in all the diseases in this category (except blood and congenital) was consistently higher for the male. The case of the spectacular increases in accidents and nervous disease is noteworthy. In the 1968 data set, the proportion of each of these diseases is not only insignificant but the difference between the two sexes is marginal. In the 1978 sample, however, not only have both sexes recorded a large percentage in the two diseases but the divergence between their shares has further widened. Common to the two sexes is the increasing entry of their members into the urban-industrial labour force with the attendant journey-to-work and all the exposure and tensions associated with it, a major risk factor implicated in the etiology of the two diseases. Since more men than women were employed in industries, the risk of attack of these diseases should be greater among men than among women.

The trend characteristic of the third category is a positive change among the females but a negative or no change at all in the male population. The most significant in this category are the female-specific diseases of peri-natal and pregnancy. Both of them record the highest percentage point change, a phenomenon strongly suggestive of increased gravidity despite increasing participation of females in the labour force.

b) Age decomposition of morbidity differential

In order to better understand the changing structure of morbidity, the composite account given above is further disaggregated into age components in Table 6. The disaggregation produces small cells but in only one instance is the number of cases for a particular age group less than 50. Nonetheless, results based on a sub-group whose total number of cases is less than 75 should be interpreted with extreme caution. With this caveat, the results can now be examined. It immediately becomes obvious that the diseases fall into three categories. In the first two categories the proportion of the total number of people afflicted with the diseases either decreases or increases with age. In the last group, the pattern of change is non-directional.

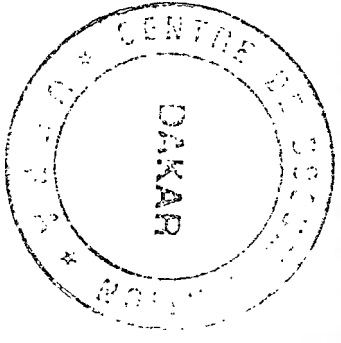
In the 1968 sample, only two diseases fall in the first category. Among males, infective and skin, and among females, genito-urinary and congenital diseases progressively decline with age. The clear-cut tendency for the proportion of diseases to increase with age was more pronounced among males than among females. It is, however, important to note that in this category, circulatory, endocrine and ill-defined diseases were common to both sexes. The sexes differed in gonadial-and behavioural- specific diseases such as perinatal (females) and accidents (males).

The tendency for the incidence of some diseases in the third category to be concentrated in the middle age was much more pronounced in females than in males. Among both sexes, the diseases which recorded lowest percentage in the middle age were rather scanty. The most important among males was musculoskeletal while among females, they were infective and digestive.

TABLE 6

DISTRIBUTION OF DISEASES BY AGE AND SEX

	1968 Sample						1978 Sample					
	Male			Female			Male			Female		
	15-29	30-49	50 & over	15-29	30-49	50 & over	15-29	30-49	50 & over	15-29	30-49	50 & over
Infective	28.2	12.4	3.1	18.4	7.8	19.4	9.1	2.1	2.1	10.3	5.6	5.4
Respiratory	6.8	10.7	5.0	6.1	7.0	5.6	8.9	13.2	4.0	10.4	9.1	6.2
Digestive	21.3	27.0	18.9	15.2	5.8	8.3	12.5	22.1	4.7	3.7	4.6	7.2
Circulatory	8.8	20.2	24.2	4.7	10.9	15.9	9.5	15.2	28.0	2.6	14.3	21.1
Genito-urinary	7.5	8.5	10.1	11.9	7.8	5.3	4.4	3.0	2.6	2.6	0.0	0.0
Musculo-skeletal	4.1	3.8	4.6	3.1	3.9	2.7	5.3	6.1	4.0	3.5	0.0	0.6
Neoplasms	2.1	4.6	2.5	6.1	13.5	13.9	1.2	3.0	4.0	7.9	15.5	20.3
Endocrine	2.0	3.8	7.7	2.9	3.9	9.0	2.8	0.1	6.8	4.0	4.1	5.9
Accidents	2.0	3.8	4.6	2.3	4.5	1.2	23.6	14.1	8.5	12.6	5.6	5.3
Nervous	2.0	4.5	4.6	2.8	6.7	4.1	10.2	12.1	13.3	3.5	7.8	7.9
Skin	5.4	1.5	0.0	3.7	1.3	2.8	3.1	2.0	0.0	5.2	2.1	1.5
Mental	3.7	2.3	3.1	0.5	0.7	0.1	0.0	0.0	4.0	1.6	0.0	0.1
Ill-defined	1.7	4.6	5.5	1.5	3.2	5.6	0.7	0.0	6.4	1.6	2.2	5.7
Blood	1.7	2.3	4.6	1.4	0.7	1.6	3.9	0.0	8.0	3.3	2.9	2.7
Congenital	2.7	0.0	1.5	2.8	0.7	0.5	1.4	0.0	0.0	2.9	1.4	1.6
Pregnancy	0.0	0.0	0.0	10.3	17.3	17.5	2.8	0.0	0.0	0.0	19.2	4.2
Perinatal	0.0	0.0	0.0	6.3	4.1	1.2	0.0	0.0	0.0	7.3	5.6	4.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	153	136	65	222	156	37	256	119	87	147	63	70



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In the 1978 subset, the pattern is quite different. The number of diseases declining with age increased. Not surprisingly, perhaps, infective and accidents fell within this category. The trend in infective disease is a clear reflection of progress achieved in reducing morbidity from the disease in late adolescence and early adulthood. The pattern exhibited by accidents is a reflection of health consequences of increased motoring. The tendency for circulatory, nervous and neoplasms to increase with age is typical of the experience of an emergent society characterized by difficult intracity mobility and extremely hazardous living conditions which put great strain and stress on members of the society.

Unlike the 1968 sample, diseases in the non-directional category were much less widespread among females than among males. The most important in this category among females was pregnancy, the highest proportion of which was confined to child-bearing ages. Among males, instances of the highest percentage of disease occuring in middle age were found in respiratory, digestive and musculoskeletal.

The changing structure of morbidity which the above analysis portends is brought into sharp relief graphically in Fig. 1a & b. Bars in the negative region indicate that improvement has taken place in the disease while a positively signed bar signifies that the disease has worsened.

As expected, the most striking improvement occurred in infective and digestive diseases. Whereas among males the highest drop was recorded in early adulthood (for the infective category) and in old-age (for the digestive group), the reverse was the case among females. Some progress in the decline of the incidence of genito-urinary was also noticeable in both sexes with the females in the age group 15-49 benefiting most.

By far, the most serious deterioration took place in accident, with the worst conditions occurring in early adulthood of both sexes. Similar trends were also observed in nervous, circulatory and respiratory diseases although the impact of each of the various age categories was not the same. While males in their middle age bore the brunt of the increment in the incidence of circulatory and respiratory diseases, females in early adulthood were most afflicted with respiratory disease and aged females'health was most impaired by circulatory diseases.

The trend shown by neoplasms is worthy of note. Among the male, there was some deceleration in the incidence of the disease in early adulthood but an increase in later life. Among females, on the other hand, there was a major upward shift in the incidence of the disease in all the age categories. This increase probably reflects high susceptibility of women to cancer of the genital organs. Rising incidence of musculoskeletal and endocrine diseases in the young adult and their declining incidence in the older age categories was as significant as rising incidence of pregnancy and perinatal. Net increments in endocrine disease within the young adults of both sexes contrasted with net decline in the disease at subsequent ages. Among females relative incidence of mental, ill-defined and blood diseases was constant at all ages but their incidence varied with age among the males.

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IV. URBAN DEVELOPMENT AND MORBIDITY

The growth of Lagos into an industrial-urban complex has introduced a number of occupational hazards and has widened social stratification. Both features might reasonably be expected to have effects on health. The degree of these effects is assessed by data on occupation and education.

Occupation was classified into four groups based on the kind of work done and the nature of operation performed. These are:

i) unskilled and semi-skilled category, made up mainly of manual workers.

ii) professionals consisting of low - (e.g. clerks), middle - (e.g. nurse) and high - (e.g. engineers) range categories

iii) "others" who are mainly traders and businessmen

iv) housewives

The relevant data are summarized in Table 7. The most striking feature of the first three columns of the table is the fact that, for males in the 1968 sample, four groups of diseases accounted for over half of all diseases in each occupational category. Two of these, respiratory and circulatory, which comprised less than a quarter of all diseases, were related to occupational hazards, while the remaining two, infective and digestive, were related to environmental hazards. This pattern thus implies that, contrary to expectation, environmental conditions were a stronger determinant of health than occupational attributes. But while respiratory was the most frequent among the unskilled workers (reflecting their relatively greater exposure to pollution), circulatory was the most important among the professionals and 'other' category of workers. This pattern shows that while unskilled workers' exposure to pollution affected their health adversely, it was the stressful conditions and tension under which professionals work that were injurious to their health.

In the 1978 sample, however, occupational differentiation is brought into sharp relief. Not only did respiratory and circulatory increase in proportion, but two other occupation-related diseases, accidents and nervous, also suddenly acquired a great significance. Among the unskilled, respiratory was the most frequent (17.1%), closely followed by accidents (16.4%). The high proportion of accidents among the unskilled workers is explained by the fact that their means of commuting is motorcycles which are associated with an abnormally high accidental risks. Accidents (15%) and circulatory (14.9%) were the most important among professionals. Although only a few members of this group (clerks) probably possessed motorcycles, the recreational preoccupation of the higher ranking professionals with social week-end motoring to their home towns was a factor in the large proportion of morbidity due to accidents.

TABLE 7

PATTERN OF DISEASES BY OCCUPATION & SEX

	Male						Female							
	1968 Sample			1978 Sample			1968 Sample				1978 Sample			
I	1	2	3	1	2	3	1	2	3	4	1	2	3	4
Infective	16.5	14.8	14.5	7.8	10.3	16.2	16.7	11.0	15.1	7.7	7.6	4.5	8.3	9.2
Respiratory	15.2	9.9	4.8	17.1	12.5	3.1	3.9	5.4	4.5	1.9	10.7	8.2	6.4	3.5
Digestive	15.2	13.9	21.0	12.6	8.6	14.0	11.6	9.3	9.7	4.9	6.7	3.6	6.5	8.4
Circulatory	10.8	13.7	17.7	13.5	14.9	19.2	4.8	6.3	2.7	7.8	8.5	9.7	13.8	4.7
Genito-urinary	5.2	4.0	4.3	3.6	7.5	6.1	8.8	7.5	8.1	13.3	2.1	2.1	3.2	1.2
Musculoskeletal	4.6	4.0	4.8	1.4	3.0	2.6	2.7	2.6	6.9	3.4	4.5	4.5	3.7	1.2
Neoplasms	5.6	3.9	4.8	3.6	3.4	2.6	7.3	5.8	3.2	10.2	3.4	3.6	8.4	6.4
Endocrine	4.5	6.5	4.8	3.6	5.0	2.1	6.7	5.8	3.2	1.9	4.5	2.6	1.2	6.8
Accidents	3.3	5.6	3.2	16.4	15.0	10.2	0.9	3.2	3.2	2.4	9.5	21.0	4.5	5.4
Nervous	5.7	9.1	5.3	10.2	10.0	6.4	2.9	4.1	9.7	1.5	6.5	7.3	10.6	3.2
Skin	3.9	1.9	3.3	5.1	2.5	1.8	1.5	3.2	6.5	2.4	2.6	4.7	4.1	1.2
Mental	2.7	4.9	4.8	1.2	0.0	4.1	1.2	4.5	3.2	0.5	0.0	0.0	0.0	1.2
Ill-defined	2.7	4.0	2.6	1.1	1.2	5.3	2.3	1.6	0.0	3.4	3.4	0.0	0.0	1.2
Blood	1.7	1.9	1.5	1.6	5.0	4.1	2.1	2.7	3.2	1.0	2.1	1.4	6.8	9.4
Congenital	2.4	1.9	2.6	1.2	1.1	2.2	2.1	11.6	0.0	2.4	2.0	1.2	0.0	0.0
Pregnancy	0.0	0.0	0.0	0.0	0.0	0.0	13.3	14.6	16.2	23.8	15.3	16.0	16.0	24.7
Perinatal	0.0	0.0	0.0	0.0	0.0	0.0	11.2	10.8	4.6	11.5	10.6	9.4	6.5	12.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100	100	100	100	100	100
	172	106	57	196	147	116	106	63	31	214	208	38	46	84

1 = Unskilled and Semi-skilled.
2 = Professionals.
3 = Others.
4 = Housewives.

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The high proportion of circulatory diseases can probably be explained by the combined effect of two factors of heart disease. The first is higher average calorific intake. The high level of food consumption was not matched by exercises on which energy would have been expanded. This explanation is reinforced by the large proportion of obesity-related disease: endocrine. The second explanation is psychological stress associated with occupational demands, intense competition, frustration, insecurity and job tensions. This latter factor probably explains the large proportion of 'other' category of workers afflicted with circulatory diseases.

For females, the dominant diseases in 1968 were those related to childbearing (pregnancy and perinatal) with housewives and professionals clearly recording the highest frequency. While infective and digestive diseases were the next most important among the other three groups of workers, genito-urinary and circulatory diseases were by far the next most important among housewives.

By the 1970's occupational differences had begun to be attenuated. Childbearing diseases remained the most important health problem. But while accident was the next most important among the professionals, respiratory was the next most frequent among unskilled workers, an indication that more women had taken up jobs in factories. By contrast, businessmen recorded circulatory, and housewives recorded blood, as the next most important diseases.

Educational differentials in morbidity are reported in Table 8.Men with the highest educational attainment were involved in motor accidents and were also afflicted with blood, neoplasms and congenital diseases. By contrast, highly educated women suffered most from gravidity-related diseases.

A more discriminating analysis is portrayed graphically in Fig. 2. For both sexes, the proportions of respondents with infective and respiratory diseases were inversely related while those involved in accidents were positively related to educational status. The inverse pattern persisted for males who suffered from genito-urinary, skin and mental diseases and for females who had digestive, circulatory, musculoskeletal, endocrine and nervous ailments. Among females the positive relationship between level of education and proportions of women with pregnancy and perinatal diseases would imply that better educated people were subjected to higher gravidity.

V. DISCUSSION AND CONCLUSION

The structure of adult morbidity in Lagos changed dramatically between 1968 and 1978 when the city underwent stricking industrial development. In the 1960's, the dominant diseases were the environmental-related communicable diseases readily attacked by the classical measures of immunization. But in the 1970's, the dominant diseases were "modernization"-related. Much of the change occurred among young adults (particularly males) in the age group 15-30, among unskilled workers and professionals and among the better

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TABLE 8

PATTERN OF DISEASES BY MEAN NUMBER OF YEARS SPENT IN SCHOOL, 1978

	Male		Female	
	Mean	Standard deviation	Mean	Standard deviation
Infective	9.1	6.1	5.5	3.5
Respiratory	5.6	4.2	7.0	3.5
Digestive	7.9	6.3	3.3	3.9
Circulatory	8.7	2.0	6.5	4.4
Genito-urinary	6.3	6.7	11.0	6.8
Musculoskeletal	6.1	5.3	7.8	5.3
Neoplasms	10.5	2.5	4.9	5.2
Endocrine	7.2	4.4	4.7	6.4
Accidents	12.9	5.4	9.6	3.3
Nervous	8.4	5.6	6.5	3.5
Skin	7.2	2.7	6.0	4.5
Mental	1.0	0.0	0.0	0.0
Ill-defined	4.5	6.9	3.0	2.1
Blood	11.1	4.1	10.3	4.9
Congenital	10.0	3.0	7.2	5.6
Pregnancy	-	-	14.0	5.5
Perinatal	-	-	10.0	6.8
Total	100.0	100.0	100.0	100.0

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educated groups. As noted above, this change can be ascribed to changing incidence of traffic crashes, respiratory, circulatory and nervous diseases. Therefore, specifying causation effectively can be reduced to identifying major risk factors of fatal conditions to which Lagos residents were especially predisposed.

In terms of relative magnitude of change, accidents category was obviously the most important. The analysis clearly shows that age, occupation and education influenced one's chance of being involved in a vehicle crash. Changes in personal taste and behaviour occasioned by modernization are suspected to have adverse effects on accidents in at least two ways. Firstly, the per capita income of Lagos residents are believed to have changed considerably particularly since the Udoji Panel recommended, and government accepted, substantial increments in salaries of public officers in 1974. The second is the welfare measures which encouraged the possession of a vehicle by young entrants into the labour market. Not only were vehicle loans granted on extremely generous terms but handsome allowances were also paid to vehicle owners. The crave to possess a vehicle was further encouraged by the inefficiency of public transportation system (1). The combined effect of high income and governmental policy was to stimulate demand for vehicles as reflected in the number of vehicles registered in Lagos. In 1969, only 6,999 new vehicles were registered. By 1972, the number had gone up to 25,533 (2) (FOS, 1979).

Similarly, modernization side-effects concurrently generated high incidence of respiratory diseases. Although there are no direct data on levels of industrial air pollution in the city of Lagos, the high incidence of respiratory disease points to the possibility that by 1978, the amount of gaseous particulate effluents might have so exceeded the absorptive capacity of air as to make the work (and possibly home) environment have a deleterious effect on health. There is some support for this premise not only in the increasing concentration of industries in Lagos but also in the increases in the number of charcoal and kerosine stoves used in the corridors within the congested houses.

The degree of change was persistently relatively higher among males (whose members predominated in the industrial labor market) than among females. However, as more and more females entered the labour market, the proportion of their members afflicted with respiratory diseases increased. Among males, unskilled workers who were in contact with effervescent machinery were particularly susceptible to the disease.

Essentially, the same phenomenon of modernization can be said to have caused the high incidence of circulatory and nervous diseases in 1978. A new migrant to Lagos was subjected to stress in his quest for a job as well as to hazards of traffic and difficult living conditions. The low income worker spent long hours waiting for a bus. The car owner faced the problem of intra-city mobility because of traffic congestion. In the work-place, job tension and work demand led to stressful heart condition and exhaustion, especially among top executives. As more and more people moved to Lagos they underwent the same mechanism, and consequently stressful states of mind and the allied diseases were ever on the increase.

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There is an additional factor for the prevalence of circulatory disease among females. It is possible that the substitution of young househelps (and later machinery) for personal manual labour probably led to abstention from physical activities, particulary fatiguing chores. The result of the consequent reduction in energy expenditure was the tendency towards obesity (endocrine) among housewives and women in their middle age with grave consequences for circulatory diseases.

The same domestic-servant-system together with changing habits in breast-feeding probably explains the rather surprising increase in the incidence of child-bearing diseases. Bottle-feeding shortened birth intervals and decreased, at least for a while, post-partum abstinence, thereby subjecting women to higher gravidity and hence imposing a higher risk of maternal morbidity especially among the better educated and the professionals.

Quite apart from these factors, there are several other factors influencing morbidity differential and change. The first is the biological and constitution superiority of females, an attribute which confers a natural non-susceptibility advantage on them. The second is a group of social factors such as exercise, life-style (smoking habit, alcohol and drug abuse), quality of housing, income, nutrition and diet. These factors, though important, were not included in the analysis because data on them were not available.

Nonetheless, the evidence in this study suggests that Lagos society has adapted poorly to the process of modernization and its attendant behavioural changes. In sum, therefore, it is difficult to escape the ocnclusion that the high incidence of morbidity between 1968 and 1978 was largely self-imposed and avoidable. Any improvement will therefore depend on a greater sense of personal restraint in the society and a greater commitment of health resources to promoting preventive strategies.

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(1) Some families have several vehicles because of a law which allowed vehicles with odd or even numbers to ply the roads only on alternate days.

(2) These figures are rather on the conservative side since they excluded a large number of vehicles which were registered elsewhere but which were being used in Lagos.

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