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# CAUSES OF DEATH IN LAGOS: STRUCTURE AND CHANGE

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## Summary

An analysis of the changing structure of causes of death in the city of Lagos between 1965 and 1975 was conducted. Registered deaths from the vital statistics system of the Lagos State Ministry of Health were employed. It was found that significant changes in causes of death among the population had occurred during the period. In the 1960s, diseases which killed children were more common than those which killed adults. The most significant feature of these fatal children diseases was the sharp contrast between the causes peculiar to neonates (perinatal) on the one hand and those common among post-neonates and pre-school-age children on the other.

Commencing around 1970, however, children-related causes ameliorated considerably and the proportion of adults dying then became the higher. The most important cause of death during this period was accidents. The gap between male and female deaths from accidents is explained not only by different roles and behaviour of the sexes but also by men's obsession with high-risk vehicles. But this safety which women enjoyed was countered by increasing mortality from pregnancy complications, a phenomenon associated with higher gravidity in the 1970s.

## Résumé

Une analyse du changement de la structure des causes de décès dans la ville de Lagos entre 1965 et 1975 a été entreprise. Il a été fait usage des décès enregistrés à partir du système de statistiques vitales du Ministère de la Santé de l'Etat de Lagos. Il a été constaté que la structure des causes de décès a subi de profonds changements au cours de cette période. Dans les années 1960, les maladies qui tuaient les enfants étaient plus communes que celles qui abattaient les adultes. La caractéristique la plus importante de ces maladies infantiles fatales était le grand contraste existant entre les causes particulières aux nouveaux nés (décès périnataux) d'une part, et celles communes parmi les enfants d'âge pré-scolaire de l'autre.

Cependant, aux environs de l'année 1970, les causes liées aux enfants se sont considérablement améliorées et la proportion des décès d'adultes s'est alors accrue et est devenue plus forte. Au cours de la période étudiée, la cause de décès la plus importante était les accidents. Le fossé existant entre les décès des sujets de sexe masculin et ceux de sexe féminin dûs aux accidents s'explique non seulement par les différents rôles et comportements de ces sexes mais également par l'obsession qu'ont les hommes pour les véhicules comportant en risque élevé. Toutefois, la sécurité dont jouissaient les femmes a été amoindrie par la mortalité due aux complications de la grossesse, phénomène lié à une forte gravidité pendant les années 1970.

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## Introduction

Urban environment is generally recognized to have an important influence on the health of

city dwellers. At various times in the past, towns have been noted for their high mortality: high population densities assisted the diffusion of infection while lack of sanitation and polluted water supplies encouraged pestilence and plague (Benjamin, 1965). Even in modern times, the high urban mortality has not been seriously modified despite a continuous improvement in material standard of living and in medical science and technology (Murray, 1967). This seeming lack of change is explained by the replacement of the eliminated scourges with increased risks from higher traffic densities, atmospheric pollution and greater nervous strain. These new groups of killers are so powerful as to whittle away all the health advantages conferred on city residents by the improved standard of living.

Yet, there is a lack of contemporary documentation on the kind and degree of health damage to dwellers in African cities. With respect to Nigeria, the studies on causes of death available for a few towns (Adetuyibi, Akinsanya & Onadeko, 1978; Balanchandran, 1975; Sogbamu, 1979) employed clinical data which made the generalization of their results over the entire city awkward, if not misleading. The only source of data representative of the city situation is the vital registration system which is only available for the city of Lagos. The 1977 segment of the data has been analysed by Ayeni (1980) but his analysis represents, as it were, a one-time instantaneous description of a dynamic situation from which inferences on trends can hardly be made. Yet, the health problems of the city dwellers are likely to change with increasing metropolitanization. A knowledge of these changes is desirable if health planners are to have a sound basis for shaping and strengthening health programmes to serve the inhabitants of the city.

It is the purpose of this paper, therefore, to analyse the structure of the causes of death in the city of Lagos between 1965 and 1975 and to identify and interpret the pattern of change observed.

## Materials and methods

The analysis is based on the vital registration statistics collected annually by the Ministry of Health for the city of Lagos (Lagos State Ministry of Health, 1965–1976). The cause of death data are tabulated by the Ministry according to the Intermediate or B List of the International Classification of Diseases (WHO, 1967) with the earliest returns dating from 1965. Two categories of the data are available for analysis. The first tabulates the data for all the registered deaths by sex but not by age. This set does not, therefore, lend itself readily to age–sex analysis. The second category consists of the children component and disaggregates the data into broad age groups. Neither set of data, however, permits the computation of sex–age-specific mortality rates nor the construction of life tables partly because of the nature of the data and partly because the needed additional information giving totals of population at risk by age is not available.

As with all vital statistics data, the question of inaccuracies in the present set of data has been a troubling one. First, although the registration of vital events is claimed to be at least 60% complete (Ayeni, 1980), the degree of the completeness cannot be judged with confidence. Second, there is bound to be variation in diagnostic fashions and precision among the various hospitals supplying data to the Ministry with the result that two deaths with a similar cause might have been assigned to different diseases depending on the physician. Third, classification of diseases might have been distorted by the under-reporting of less fatal diseases and the over-reporting of others, particularly external causes of death. Fourth, the proportion of ill-defined causes will vary with the professionalism, the experience and, probably, the work-load of the physicians.

All these problems limit the type of analysis that can be performed with the data. The analysis has to be confined to proportional distribution of causes of deaths. This method of analysis, for which a case has been made by Ayeni (1980), together with the foregoing problems, dictates caution in interpreting the results.

## Results

### Pattern and trend

The structure of causes of death between 1965 and 1975 is presented in Table 1. The main features of this structure are as follows:

TABLE 1. Major causes of death in the total population (1965–1975)

| Diseases | 1965 % | R* | 1966 % | R | 1967 % | R | 1968 % | R | 1969 % | R | 1970 % | R | 1971 % | R | 1972 % | R | 1973 % | R | 1974 % | R | 1975 % | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Infective | 28.9 | 1 | 28.5 | 1 | 27.1 | 1 | 27.1 | 1 | 26.7 | 1 | 29.0 | 1 | 32.6 | 1 | 27.2 | 1 | 26.9 | 1 | 29.6 | 1 | 24.9 | 1 |
| Respiratory | 19.4 | 2 | 16.0 | 2 | 16.5 | 2 | 15.4 | 2 | 16.3 | 2 | 15.2 | 2 | 15.4 | 2 | 16.2 | 2 | 15.6 | 2 | 13.1 | 2 | 13.8 | 2 |
| Perinatal | 13.4 | 3 | 13.8 | 4 | 13.9 | 3 | 12.0 | 3 | 13.3 | 3 | 11.0 | 3 | 10.4 | 3 | 11.0 | 3 | 9.3 | 4 | 10.7 | 3 | 10.0 | 5 |
| Other diseases | 11.1 | 4 | 13.9 | 3 | 8.0 | 5 | 8.4 | 5 | 7.8 | 6 | 5.9 | 7 | 5.3 | 7 | 4.9 | 7 | 5.2 | 7 | 5.0 | 7 | 6.1 | 7 |
| Circulatory | 8.2 | 5 | 7.6 | 5 | 7.3 | 6 | 8.0 | 6 | 9.2 | 5 | 8.4 | 4 | 7.7 | 5 | 8.2 | 6 | 7.3 | 6 | 7.8 | 6 | 9.4 | 6 |
| Ill-defined | 7.3 | 6 | 6.4 | 6 | 12.5 | 4 | 11.4 | 4 | 10.9 | 4 | 8.1 | 5 | 8.4 | 4 | 10.6 | 4 | 15.2 | 3 | 9.1 | 5 | 11.4 | 4 |
| Blood | 2.9 | 7 | 3.2 | 8 | 2.7 | 8 | 3.5 | 8 | 3.9 | 7 | 3.1 | 9 | 3.6 | 8 | 3.4 | 8 | 3.1 | 8 | 3.7 | 8 | 2.9 | 8 |
| Neoplasms | 1.9 | 8 | 1.7 | 10 | 2.0 | 9 | 2.2 | 9 | 2.5 | 9 | 1.7 | 12 | 2.0 | 11 | 1.5 | 12 | 1.6 | 12 | 1.6 | 12 | 1.9 | 11 |
| Pregnancy | 1.6 | 9 | 1.1 | 11 | 0.8 | 12 | 0.9 | 12 | 0.5 | 14 | 3.5 | 8 | 2.2 | 10 | 2.5 | 9 | 2.2 | 10 | 2.5 | 10 | 2.1 | 10 |
| Accident | 1.5 | 10 | 3.7 | 7 | 4.5 | 7 | 5.6 | 7 | 3.8 | 8 | 7.5 | 6 | 6.4 | 6 | 8.8 | 5 | 7.4 | 5 | 9.7 | 4 | 11.7 | 3 |
| Nervous | 1.4 | 11 | 1.8 | 9 | 2.0 | 10 | 2.2 | 9 | 2.0 | 10 | 1.9 | 11 | 1.6 | 12 | 1.7 | 11 | 2.0 | 11 | 1.8 | 11 | 1.6 | 12 |
| Digestive | 1.2 | 12 | 0.8 | 12 | 1.0 | 11 | 1.4 | 11 | 0.9 | 12 | 1.4 | 13 | 1.5 | 13 | 1.4 | 13 | 1.4 | 13 | 1.5 | 13 | 1.0 | 13 |
| Genito-urinary | 0.6 | 13 | 0.6 | 13 | 0.7 | 13 | 0.7 | 14 | 1.2 | 11 | 0.4 | 14 | 0.3 | 14 | 0.1 | 15 | 0.1 | 15 | 0.3 | 14 | 0.2 | 14 |
| Endocrine | 0.4 | 14 | 0.5 | 14 | 0.6 | 14 | 0.8 | 13 | 0.8 | 13 | 2.6 | 10 | 2.4 | 9 | 2.2 | 10 | 2.5 | 9 | 3.3 | 9 | 2.8 | 9 |
| Congenital | 0.2 | 15 | 0.4 | 15 | 0.4 | 15 | 0.4 | 15 | 0.2 | 15 | 0.3 | 15 | 0.2 | 15 | 0.3 | 14 | 0.2 | 14 | 0.3 | 14 | 0.2 | 14 |
| n | 5988 | | 6101 | | 5393 | | 6336 | | 6170 | | 8450 | | 10,672 | | 10,326 | | 10,739 | | 10,509 | | 10,939 | |

*R = Rank.

(i)   The leading causes of death are clustered around three categories of diseases, namely, infective, respiratory and perinatal. These three groups comprise not less than 50% of all causes of deaths in each of the years of observation. But while each of these major causes of death maintained its rank for most of the decade, the relative significance of each fluctuated from year to year. In 1965, the percentage contributed to total deaths by infective and respiratory was nearly 30 and 20% respectively. By 1975, however, the corresponding contribution had declined to about 25 and 14%.

(ii)   Throughout the period, the highest proportional increases in causes of death were recorded by accidents and endocrine. In 1965, accidents accounted for only 1.5% of, and ranked seventh among all causes of death. By 1975, however, accidents had become the third most important cause of death, accounting for 11.7% of all deaths. Although endocrine contributed only 0.4% to the causes of death in 1965, its share steadily increased, reaching 3.3% in 1974, and its rank dropped from fourteenth to ninth within the decade.

(iii)   While the proportion of deaths caused by circulatory and blood diseases was unstable, the ranks of these diseases among all causes of death were strikingly consistent. Circulatory, which contributed 7.3% in 1965 but 9.4% in 1975, remained the fifth or sixth most important disease throughout the period. Those of blood were, for the most part, the eighth important disease, but their share of causes of death oscillated between 2.7% and 3.9%.

(iv)   The three most insignificant causes of death are congenital, genito-urinary and digestive, holding the least positions for most of the period.

(v)   The sizeable contribution of 'other' and 'ill-defined' diseases points to the relative propensity of certifiers to code deaths to residual category. Although the relative importance of deaths classified under 'other causes' declined from 11.1% in 1965 to 6.1% in 1975, that of ill-defined rose from 7.3 to 11.4% during the same period.

### Sex differentials

Trends in the differential causes of death among the sexes are summarized in Table 2. It becomes obvious that the increases recorded in the percentage contribution of some diseases have arisen primarily because of the upward surge in the significance of male deaths from those diseases. Thus, while the relative importance of male deaths caused by accidents increased by 150% between 1965 and 1975, that of females increased by only 66%. Increases were also registered in the percentage contribution to total male deaths in circulatory, blood and 'other diseases' whereas the proportion of deaths caused by these diseases among the females decreased. On the other hand, diseases which recorded decreases in their relative contribution to total deaths were, in the 1970s, among the principal causes of death within the female group. During the 1970s also, infective remained the most important cause of death but while the proportion of male deaths caused by infective diseases fell, that of females increased. At the same time, males recorded larger decreases in the percentage contribution to deaths from respiratory, neoplasms, nervous and genito-urinary diseases.

### Age components of changing causes of death

Information on age distribution of registered deaths is available for children in infancy and early childhood (Table 3). A comparison of columns 7 and 8 reveals that during the period, the share of deaths in infancy and early childhood, though higher than that of late childhood and adulthood combined, has been declining steadily. In 1965, the ratio of deaths in the two age categories was 59.2–40.8. By 1975, however, the ratio had been reversed, with the early childhood group having a marked advantage (48.3–51.7).

Almost all the change can be ascribed to differential mortality trends in infancy. For, while the proportion of deaths among the pre-school children declined very slightly, proportionately large declines have been

TABLE 2. Major causes of death by sex for 1965–1969 and 1970–1975 (%)

Proportions of deaths

| Diseases | Males | | | | Females | | | | Both sexes | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965–1969 | | 1970–1975 | | 1965–1969 | | 1970–1975 | | 1965–1969 | | 1970–1975 | |
| | % | R* | % | R | % | R | % | R | % | R | % | R |
| Infective | 28.0 | 1 | 27.4 | 1 | 27.1 | 1 | 29.4 | 1 | 27.5 | 1 | 28.3 | 1 |
| Respiratory | 16.0 | 2 | 14.1 | 3 | 17.2 | 2 | 15.9 | 2 | 16.6 | 2 | 14.9 | 2 |
| Perinatal | 13.3 | 3 | 10.7 | 5 | 13.2 | 3 | 10.0 | 4 | 13.3 | 3 | 10.4 | 4 |
| Other diseases | 10.4 | 4 | 16.0 | 2 | 9.3 | 5 | 4.6 | 8 | 9.9 | 4 | 5.4 | 7 |
| Circulatory | 8.2 | 6 | 8.8 | 7 | 8.0 | 6 | 7.3 | 5 | 8.1 | 6 | 8.2 | 6 |
| Ill-defined | 8.9 | 5 | 10.1 | 6 | 10.6 | 4 | 11.2 | 3 | 9.7 | 5 | 10.6 | 3 |
| Blood | 2.9 | 8 | 3.2 | 8 | 3.5 | 7 | 3.5 | 9 | 3.3 | 8 | 3.3 | 8 |
| Neoplasms | 2.1 | 9 | 1.6 | 12 | 2.0 | 10 | 1.8 | 11 | 2.1 | 9 | 1.7 | 12 |
| Pregnancy | – | 15 | – | 15 | 2.2 | 9 | 5.6 | 6 | 1.0 | 12 | 2.5 | 10 |
| Accidents | 4.6 | 7 | 11.5 | 4 | 2.9 | 8 | 4.8 | 7 | 3.8 | 7 | 8.6 | 5 |
| Nervous | 1.9 | 10 | 1.8 | 10 | 1.8 | 11 | 1.8 | 12 | 1.9 | 10 | 1.8 | 11 |
| Digestive | 1.5 | 11 | 1.7 | 11 | 0.6 | 13 | 0.9 | 13 | 1.1 | 11 | 1.3 | 13 |
| Genito-urinary | 1.0 | 12 | 0.3 | 13 | 0.7 | 12 | 0.1 | 15 | 0.8 | 13 | 0.2 | 14 |
| Endocrine | 0.8 | 13 | 2.5 | 9 | 0.5 | 14 | 2.9 | 10 | 0.6 | 14 | 2.6 | 9 |
| Congenital | 0.4 | 14 | 0.3 | 13 | 0.4 | 15 | 0.2 | 14 | 0.3 | 15 | 0.2 | 14 |
| n | 16,495 | | 34,655 | | 13,493 | | 26,980 | | 29,988 | | 61,635 | |

*R = rank.

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TABLE 3. Distribution of registered deaths in Lagos city (1965–1976)

| Year | n | Infants | | | Total infants (Sum of cols 2, 3 and 4) | Early childhood | Infants and early childhood (sum of cols 5 and 6) | Late childhood and adulthood |
| | | Early neonates (under 1 week) | Late neonates (between 1 and 4 weeks) | Post neonates (between 1 and 12 months) | (under 1 year) | (1–4 years) | (under 5 years) | (5 years and over) |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1965 | 5988 | 13.1 | 5.5 | 16.8 | 35.4 | 23.8 | 59.2 | 40.8 |
| 1966 | 6101 | 11.1 | 5.5 | 18.0 | 34.6 | 22.7 | 57.3 | 42.7 |
| 1967 | 5393 | 12.5 | 5.7 | 15.1 | 33.3 | 21.4 | 54.7 | 45.3 |
| 1968 | 6336 | 11.2 | 5.1 | 15.1 | 31.4 | 24.5 | 55.9 | 44.1 |
| 1969 | 6170 | 12.4 | 6.0 | 15.2 | 33.6 | 22.3 | 55.9 | 44.1 |
| 1970 | 8450 | 11.7 | 5.9 | 14.8 | 32.4 | 21.6 | 54.0 | 46.0 |
| 1971 | 10,672 | 10.8 | 4.5 | 13.2 | 28.5 | 20.5 | 49.0 | 51.0 |
| 1972 | 10,326 | 11.6 | 4.7 | 14.0 | 30.3 | 20.6 | 50.9 | 49.1 |
| 1973 | 10,739 | 10.6 | 4.0 | 15.5 | 30.1 | 22.4 | 52.5 | 47.5 |
| 1974 | 10,509 | 11.5 | 4.4 | 13.2 | 29.1 | 23.9 | 53.0 | 47.0 |
| 1975* | 10,939 | 10.9 | 3.8 | 12.7 | 27.4 | 20.9 | 48.3 | 51.7 |

*For 10 months only.
All ages = 100.

recorded among the infants, particularly among the post-neonates. Among the early and late neonates, the change has been rather negligible.

The principal causes of death responsible for this trend are presented both graphically and statistically. On a cautionary note, it is important to emphasize that disaggregation of cause of death data into age-specific groups has been affected by changes in the classification procedure adopted by the Ministry of Health. While the 7th Revision of the International List was used for the 1965–1969 data set, the 8th Revision was employed for the 1970–1975 set. The result is that, in the latter set, 'Birth injury and difficult labour' (B43) and 'Prematurity' (B44) were combined as 'Perinatal causes' while each of 'Avitaminosis' (B22), 'Tetanus' (B18) and 'Dysentery and diarrhoea' (B1–4) was distinctively coded. On the other hand, in the 1965–1969 data set, B43 was separated from B44 but B18 was grouped with 'All other diseases classified as infective parasitic' while the B1–4 group was replaced by 'Gastricis, duodenitis, enteritis and colitis'. Apart from these exceptions, the statistical comparability of broad categories of causes of death has been largely preserved.

The age structure of each disease for each year is illustrated in Fig. 1. It is immediately obvious that much of the large component of infant mortality identified earlier among infants arises as a result of higher mortality from perinatal causes. Specifically, throughout the period (1965–1975), about 80% of all deaths from perinatal causes were concentrated among infants under 1 week of age. By contrast, deaths caused by measles were entirely concentrated among post-neonates and children of pre-school age.

The major import of the relative impact of these causes of death for age mortality differences is brought into sharp relief by the age–cause-specific contingency tables presented for each age category. As Table 4 shows, over 70% of early neonates died of perinatal causes, the proportion being slightly higher in the 1970s than in the 1960s. The next significant contribution was made by tetanus (6%) and pneumonia (3%), the incidence of which was higher in the 1970s than in the 1960s.

Among the late neonates, causes of death are more diffused (Table 5). Perinatal causes, although no longer as important as among early neonates, still ranked first (36.5%), with tetanus being the next most frequent cause of death (20%). The proportion of deaths due to the former was stable throughout the decade but the proportion attributable to the latter declined in the 1970s. The other conditions, pneumonia and dysentery, accounted for about one-fifth of deaths in the age group and were more prevalent in the 1970s than in the 1960s.

Pneumonia and acute dysentery were the significant features of death in the post-neonatal period (Table 6). But, while the relative importance of pneumonia slackened in the 1970s, that of dysentery continued to wax stronger. Although the cholera epidemic of 1970 might be a contributory factor, the start of weaning, with the addition of food supplements to continued breast feeding, appears to be the precipitating factor in the relative significance of dysentery as a cause of death. It is in this age group that malaria and measles started to gain importance. The proportional contribution of malaria waned in the 1970s, but that of measles continued to increase throughout the 1970s.

These four killers of post-neonates continued to exert their effects on the pre-school age children (Table 7).

Pneumonia remained the most outstanding although its relative significance declined in the 1970s. Of the other three prominent ones, only malaria appears to account for lower percentages of deaths in the 1970s; the proportion dead from dysentery and measles continued to surge in the 1970s. It is in this age group that avitaminosis is evident among causes of death, claiming 7.5% of pre-school age deaths. Neither in this group nor in any other group of the younger children do accidents show up as a major cause of childhood death.

## Discussion

The structure of causes of death in the city of Lagos has undergone significant changes during the decade 1965–1975. In the 1960s, the leading causes of death reflected heavily the main causes of child mortality. Deaths from
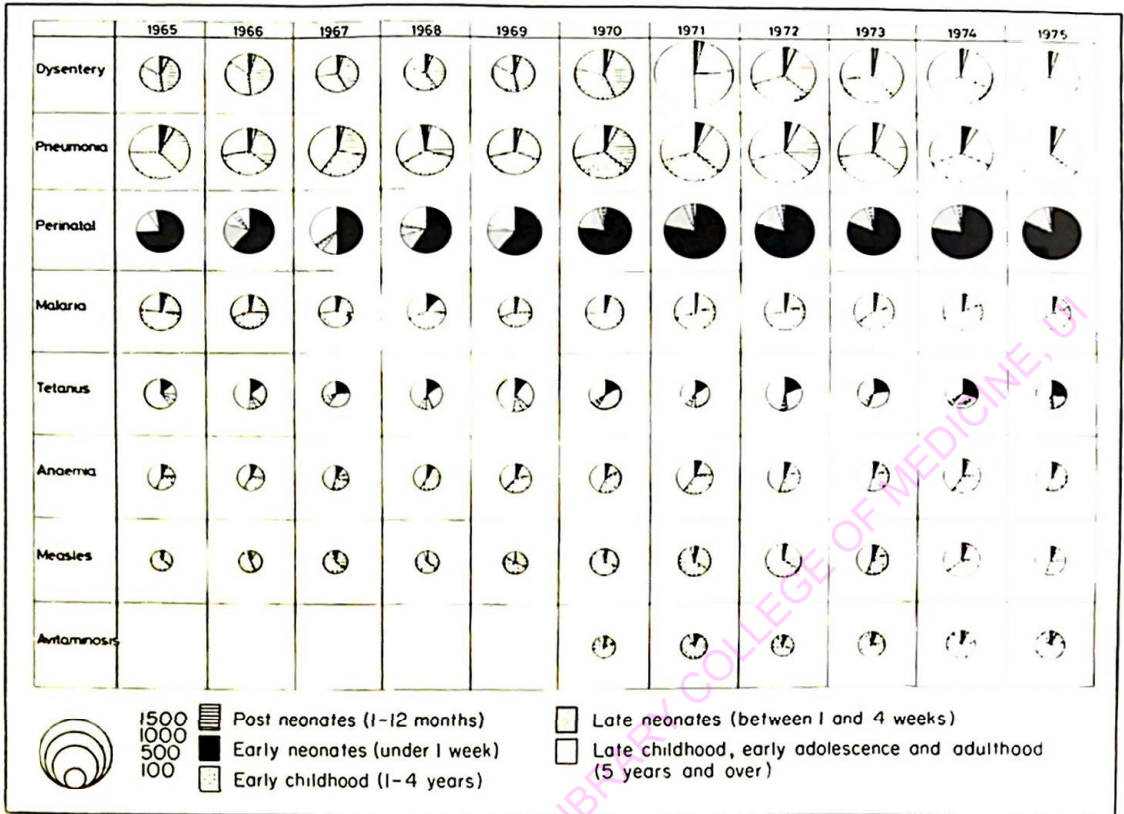
FIG. 1. Components of infant and childhood mortality (1965–1975).

perinatal causes were almost entirely occurring among early neonates while deaths from infective, respiratory and tetanus diseases (grouped with 'others') were occurring to a lesser extent among early neonates but to a high degree among other children under 5. Recent trends, however, suggest that, with the exception of infective, the contribution to total deaths by infant-related diseases has slackened considerably, thereby shifting the proportion of people dying against adults. Much of this change can be attributed to decreasing proportion of diseases of infancy and early childhood and an increase in the proportion of diseases peculiar to adults, particularly accidents and pregnancy complications.

Commencing around 1970, the percentage of mortality from accidents began to rise very fast. The rise is explained largely by socio-economic conditions of the city dwellers. Generous vehicle loan and allowances encouraged the possession of a vehicle by young entrants into the then booming labour market. The rate at which vehicles were obtained was revealed by the rise in the number of vehicles registered in the city from 6999 in 1969 to 25,533 in 1972 (FOS, 1979).

The sharp distinction between male and female deaths from accidents is due first to the social (breadwinner) role of men, and second to their behaviour. In travelling to and from work and/or in the course of their occupational duties, men are more exposed to risks of accidents than females. Furthermore, men are more prone to use such vehicles as motor cycles which are associated with an abnormally high risk of accidents. When one turns to behavioural factors, men are equally disadvantaged. They are more likely to drive under the influence of alcohol, thereby increasing their risks of being involved in a traffic crash.

TABLE 4. Causes of death among early neonates (%)

| | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Prematurity (B44) | 57.3 | 56.3 | 53.9 | 47.0 | 47.7 | 74.7 | 76.8 | 76.4 | 72.0 | 74.9 | 76.4 |
| Birth injuries (B43) | 20.1 | 17.3 | 15.9 | 24.2 | 24.1 | | | | | | |
| Tetanus and all other infective (B18) | 5.9 | 6.9 | 8.0 | 7.5 | 5.2 | 5.9 | 3.5 | 5.8 | 5.9 | 8.0 | 6.8 |
| Anaemia (B23) | 0.4 | 1.0 | 2.4 | 2.0 | 1.0 | 6.7 | 0.9 | 1.3 | 1.0 | 1.0 | 1.5 |
| Pneumonia (B32) | 5.5 | 2.7 | 1.5 | 0.6 | 0.9 | 4.4 | 5.6 | 4.0 | 3.1 | 4.7 | 3.4 |
| Malaria (B16) | 0.6 | 0.4 | 0.7 | 0.7 | 0.3 | 0.1 | 0.3 | 0.1 | 0.1 | 0.5 | 0.2 |
| Dysentery and diarrhoea (B1–4) | 0.5 | 1.0 | 0.4 | 0.1 | 0.7 | 1.4 | 1.3 | 1.7 | 0.4 | 0.6 | 0.8 |
| Measles (B14) | | | | | | 0.1 | 0.1 | 0.1 | 0.3 | 0.6 | 0.1 |
| Avitaminosis (B22) | | | | | | – | 0.3 | 0.1 | 0.1 | 0.6 | 0.1 |
| Sub-total | 90.3 | 85.6 | 82.8 | 82.1 | 79.9 | 87.3 | 88.8 | 89.5 | 82.9 | 90.9 | 89.3 |
| All causes ($n$) | 785 | 677 | 674 | 710 | 765 | 989 | 1153 | 1198 | 1149 | 1209 | 1192 |

TABLE 5. Causes of death among late neonates (%)

| | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Prematurity (B44) | 36.4 | 37.7 | 27.8 | 33.1 | 34.4 | 35.7 | 36.5 | 38.6 | 30.5 | 42.6 | 36.5 |
| Birth injuries (B43) | 3.6 | 3.6 | 3.3 | 1.9 | 2.7 | | | | | | |
| Tetanus and all other infective (B18) | 14.2 | 24.0 | 28.4 | 31.2 | 30.1 | 31.1 | 17.5 | 22.7 | 22.8 | 21.4 | 20.0 |
| Anaemia (B23) | 2.2 | 1.2 | 6.3 | 2.2 | 1.1 | 0.6 | 1.7 | 1.2 | 1.2 | 1.7 | 1.9 |
| Pneumonia (B32) | 14.5 | 7.2 | 4.2 | 2.8 | 4.9 | 8.2 | 14.0 | 12.6 | 12.1 | 9.1 | 13.0 |
| Malaria (B16) | 3.6 | 1.5 | 2.3 | 1.6 | 0.8 | 1.6 | 0.2 | 1.2 | 0.9 | 0.4 | 1.0 |
| Dysentery and diarrhoea (B1–4) | 9.1 | 5.1 | 4.2 | 4.4 | 4.9 | 7.0 | 8.7 | 10.5 | 5.3 | 8.2 | 9.1 |
| Measles (B14) | 0.3 | 0.3 | 0.7 | – | – | 0.4 | 0.4 | 0.4 | 0.7 | 0.6 | 0.2 |
| Avitaminosis (B22) | | | | | | 0.2 | 1.2 | 0.8 | 0.9 | 1.7 | 2.9 |
| Sub-total | 83.9 | 80.6 | 77.2 | 77.2 | 78.9 | 84.8 | 80.2 | 88.0 | 74.4 | 85.7 | 84.6 |
| All causes (n) | 329 | 336 | 307 | 323 | 370 | 498 | 480 | 485 | 430 | 462 | 416 |

TABLE 6. Distribution of causes of death among post neonates (%)

| | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Prematurity (B44) | 4.4 | 3.7 | 4.2 | 4.6 | 2.4 | 1.5 | 2.5 | 1.7 | 1.5 | 1.4 | 1.8 |
| Birth injuries (B43) | 0.4 | 1.5 | 0.7 | 1.1 | 1.1 | | | | | | |
| Tetanus and all other infective (B18) | 2.4 | 1.7 | 1.1 | 2.3 | 2.1 | 0.5 | 0.7 | 0.6 | 0.2 | 0.4 | 0.1 |
| Anaemia (B23) | 3.1 | 3.6 | 2.2 | 4.2 | 4.4 | 2.7 | 4.3 | 3.3 | 2.5 | 5.0 | 3.7 |
| Pneumonia (B32) | 31.1 | 26.9 | 31.4 | 26.7 | 27.2 | 26.9 | 28.6 | 32.3 | 27.6 | 21.3 | 29.0 |
| Malaria (B16) | 9.9 | 7.8 | 8.7 | 8.4 | 7.8 | 7.6 | 6.7 | 6.0 | 5.0 | 5.8 | 5.0 |
| Dysentery and diarrhoea (B1—4) | 20.9 | 26.9 | 22.5 | 22.2 | 27.7 | 33.5 | 27.9 | 27.5 | 27.5 | 29.6 | 23.1 |
| Measles (B14) | 6.6 | 5.7 | 7.4 | 7.5 | 5.9 | 6.6 | 7.5 | 8.0 | 10.0 | 13.8 | 10.4 |
| Avitaminosis (B22) | | | | | | 2.1 | 2.5 | 2.9 | 2.4 | 2.9 | 2.7 |
| Sub-total | 78.8 | 77.8 | 78.2 | 77.0 | 78.6 | 81.4 | 80.8 | 82.3 | 76.7 | 80.2 | 75.9 |
| All causes (n) | 1006 | 1098 | 815 | 957 | 938 | 1251 | 1408 | 1446 | 1664 | 1387 | 1390 |

TABLE 7. Distribution of causes of death among pre-school age children (%)

| | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Prematurity (B44) | − | 1.2 | 0.7 | 0.4 | 0.4 | 0.2 | 0.1 | 0.2 | 0.5 | 0.1 | 0.0 |
| Birth injuries (B43) | 0.14 | 0.5 | 0.1 | 0.3 | − | | | | | | |
| Tetanus and all other infective (B18) | | | | | | 7.0 | 6.3 | 4.9 | 6.4 | 7.4 | 7.5 |
| Anaemia (B23) | 2.0 | 1.7 | 1.6 | 1.8 | 2.5 | 0.8 | 0.5 | 0.6 | 0.5 | 0.4 | 0.9 |
| Pneumonia (B32) | 4.0 | 4.7 | 4.2 | 4.8 | 6.6 | 5.9 | 6.9 | 5.6 | 4.9 | 6.6 | 4.2 |
| Malaria (B16) | 29.0 | 23.6 | 28.3 | 23.7 | 26.0 | 23.4 | 22.6 | 24.6 | 23.7 | 18.0 | 21.9 |
| Dysentery and diarrhoea (B1−4) | 16.1 | 12.6 | 14.5 | 13.6 | 11.1 | 12.3 | 11.0 | 11.4 | 8.3 | 11.1 | 8.7 |
| Measles (B14) | 13.0 | 17.5 | 12.7 | 15.6 | 15.7 | 20.1 | 23.4 | 19.2 | 18.1 | 18.9 | 16.9 |
| Avitaminosis (B22) | 9.9 | 8.0 | 10.0 | 8.9 | 6.8 | 9.9 | 9.8 | 11.5 | 11.4 | 15.7 | 15.0 |
| Sub-total | 74.14 | 69.8 | 72.1 | 69.1 | 69.2 | 79.6 | 80.6 | 78.0 | 73.8 | 78.2 | 75.1 |
| All causes (n) | 1425 | 1385 | 1154 | 1552 | 1376 | 1825 | 2188 | 2127 | 2406 | 2512 | 2286 |

It should be noted, however, that the benefits women derived from lower percentage of deaths from accidents seem to have been countered by increasing mortality from pregnancy complications, a phenomenon probably associated with higher gravidity among women (Adegbola & Page, 1979). However, the increasing living standard, the emancipation of women and their entry into the labour market will erode the advantage of women and increase the contribution of accidents to female deaths.

In the case of infant-dominated causes of death, the most significant feature of the fatalities is the sharp contrast between the neonates on the one hand and the post-neonates and pre-school age children on the other. Under good conditions, the relative proportion of deaths in the neonatal period to those in the remaining months of the 1st year should be 3:1 (Gordon *et al.*, 1965). In this study, the proportion was close to 1:1, thus indicating that deaths in the later period are excessively high. The explanation rests mainly on disease situations which are preventable through either immunization or improvement in both nutrition and environmental sanitation.

In sum, therefore, it appears that a large part of the deaths in Lagos are caused by diseases amenable to attack through the application of fundamental preventive measures. For the infants and children, environmental sanitation, nutrition and immunization procedures are the major lines of attack. For the adults, greater sense of personal restraint and better quality maternal care in pregnancy and at delivery time are the preventive strategies.

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