

# Public Health and Urbanization in Africa

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URBANIZATION contains few dangers except when it is unplanned or ill planned. Ill-planned urbanization results from adherence to preconceived ideas or the transposition of planning methods from other countries and other climes without regard to the political, economic, demographic, and cultural factors of the region in which urbanization is occurring.

The idea that man's health and happiness are related to his ecology has been gaining ground in recent years. Rogers (1) expresses the view succinctly that improvements in health can only be achieved by a study of man's ecology and that public health workers have a responsibility to undertake such studies and to attempt to control man's environment on the basis of them. Medawar (2) presents the same view when he says, "The bells which toll for mankind are . . . most of them, anyway . . . like the bells on Alpine cattle; they are attached to our own necks, and it must be *our* fault if they do not make a cheerful and harmonious sound."

Clearly, the implications of urbanization in Africa are vast, and their effects on the minds and ways of life of rural African peoples are often underestimated. Hennessey (3) makes these effects clear when he says, "Physical conditions of life are undergoing marked changes, especially in urban areas associated with industrial development. A new outlook on conduct

and responsibilities is being formed. It is to be expected that people whose traditional ways are being rudely disturbed should sometimes feel anxieties about what is happening to them."

A common mistake in planning an urban ecology conducive to health and happiness is to study those countries where urbanization has already occurred and to apply procedures based on their experience, without considering that the process has occurred over a long period. The unique opportunity of planning urbanization practically *ab initio* is overlooked. Thinking tends to be stereotyped and obsessed by the planning experience of established urban areas; these are mainly endeavors to correct past mistakes rather than planning so that mistakes do not occur.

However, some lessons to be learned from countries and cities already well developed must be more deeply printed on our minds. Public health experts are well aware of these lessons, but populations at large are unwilling to face the costs and difficulties of planning adequate preventive measures; frequently they are also lethargic in executing such measures even if they are planned. The situation is analogous to the concern of an individual human being for his own health; it is neglected until it has been lost and the individual is sick. So countries are apt to disregard urbanization and the problems that arise from it until the diseases of urbanization, medical and social, are starkly obvious.

What is urbanization? It is all those phenomena which lead to and accompany the rapid growth of towns; these phenomena have been well studied and described in other countries. The problem in Africa today, therefore, is not lack of knowledge or unawareness; it is how

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to apply the fruits of 20th-century science in an atmosphere and economy comparable to that of England in the 16th century, a rural peasant economy and a largely uneducated population. In addition, there is the difficult task of changing the will and activities of man from age-old customs and beliefs, retaining the good and discarding the bad.

### Rural Aspects

In considering the consequences of urbanization, it must not be forgotten that preventive measures can be applied in both town and countryside. Population growth, industrialization, and changing social wants, which lead to the growth of towns, also change the pattern of country life. The definition of urbanization includes "the phenomena which lead to it," both the apparent "positive" attractions of town life, and the "negative" detractions of rural life.

The public health hazards of urbanization arise from disparity in the growth of towns and in the growth of a national economy strong enough to support them. Preventive action can be taken in the rural areas to retard the flow of population from country to town; this is important because in Africa, rural problems are in many ways cheaper and easier to solve than urban ones.

As yet, the urban population is but a small fraction of total national populations throughout Africa, and only a handful of townships pose problems of urbanization on any scale. Dar es Salaam, for example, with a population of less than 130,000, represented only 1.5 percent of the total population of Tanganyika, (9.2 million) in 1960. Other data on urban populations in Africa are given in table 1. It is apparent that urban populations, even if the smaller townships are included, represent less than 10 percent of the national populations in most African countries, and the major towns, only 5 percent.

Blacker (4) remarks that, in the 1948 population estimates, the urban population of Kenya represented 5.2 percent of the total (including 50 townships of more than 2,000 people); three-quarters of these town dwellers lived in Nairobi and Mombasa. In Tanganyika in 1957 there were 35 townships with populations of

more than 2,000 representing 4.1 percent of the total population of the country; one-third of these people lived in Dar es Salaam. The Uganda 1959 statistics showed that 95 townships contained 3.2 percent of the population; one-third of the Uganda town dwellers lived in Kampala and Jinja. The 1958 figures for Zanzibar showed that 5 townships contained 26.5 percent of the total population; nine-tenths of these were in Zanzibar town itself. The

**Table 1. Some urban populations in Africa**

Country and town	Population of town	Percentage of total population
Kenya, 6.5 million (1960):		
Nairobi.....	261, 000	4. 02
Mombasa.....	160, 000	2. 46
Nakuru.....	40, 000	. 62
Kisumu.....	23, 000	. 35
Eldoret.....	17, 000	. 26
Kitale.....	13, 000	. 20
3 others (4,000-10,000).....	28, 000	. 43
Total.....	542, 000	8. 34
Uganda, 6.5 million (1959):		
Kampala.....	47, 000	. 72
Jinja.....	30, 000	. 46
Mbale.....	14, 000	. 22
Entebbe.....	11, 000	. 17
Kabale.....	11, 000	. 17
7 others (4,000-10,000).....	44, 000	. 51
Total.....	157, 000	2. 25
Tanganyika, 8.7 million (1957):		
Dar es Salaam.....	129, 000	1. 48
Tanga.....	38, 000	. 44
Mwanza.....	20, 000	. 23
Tabora.....	15, 000	. 17
Morogoro.....	15, 000	. 17
Moshi.....	14, 000	. 16
Dodoma.....	13, 000	. 15
Mtwaru.....	10, 000	. 11
Lindi.....	10, 000	. 11
Arusha.....	10, 000	. 11
3 others (4,000-10,000).....	21, 000	. 24
Total.....	295, 000	3. 37
Madagascar, 5.1 million (1957):		
Tananarive.....	201, 000	3. 94
21 others (more than 5,000).....	349, 000	6. 84
Total.....	550, 000	10. 78

NOTE: Sources for the population statistics in tables 1, 5, and 6 are reports of the medical officer of health of the various countries, East African statistical reports, and reference 6.

**Table 2. Comparison of rural and urban populations in East Africa with other countries**

Country	Year	Urban population (percent of total)	Rural population (percent of total)
Kenya	1948	5.2	94.8
Uganda	1959	3.2	96.8
Tanganyika	1957	4.1	95.9
Zanzibar	1958	26.5	73.5
United States of America	1950	64.0	36.0
United Kingdom	1951	80.3	19.7
Brazil	1950	36.2	63.8
Malaya	1947	26.5	73.5
India	1951	17.3	82.7
Pakistan	1951	11.4	88.6

smallness of these urban populations constitutes an important factor in East African demography. Comparative totals for some other countries are given in table 2.

Thus, despite the rapid growth of urban areas in recent years, the great bulk of the population of East Africa remains rural. However, they live in a rapidly changing society, and planning rural improvements is as important as town planning and requires a deep knowledge of country life. Fortunately, the trend toward living in villages is only beginning, but it will gather momentum as more and more people fail to derive their living entirely from the land and are forced to leave their individual farm homesteads. If village and country planning could anticipate the wants of these rural peoples, then the exodus to the towns could be at least retarded.

Rural people exhibit three major wants: (a) a stable and adequate wage structure comparing favorably with that available in towns; (b) full and adequate public services, such as schools, health centers, cottage hospitals, housing, sanitation, and safe water supplies; and (c) the amenities of towns, such as electric light, piped water, social and shopping centers, and recreational and entertainment facilities.

In many ways it is easier and cheaper to provide these basic amenities in villages than in towns. Rural housing requirements, for example, can be met by building improved indigenous designs in locally available materials. Piped water can be supplied at comparatively low cost, as has been demonstrated in the Cen-

tral Province of Kenya. Sanitation requirements can be met by aqua privies or sewage lagoons at a much lower cost than traditional township waterborne systems (5).

Present population densities and the current growth in rural populations make it both realistic and necessary to consider rural planning along these lines. In East Africa at the moment the population density is 37 persons per square mile as compared with 21 per square mile for the whole of Africa and 319 per square mile for India. Blacker (4) observes that the combined populations of India and Pakistan are more than twice that of the whole of Africa, although the land area is little more than one-seventh that of the African continent. An agricultural census and a nutritional survey were conducted in Kenya in 1962; the results of these will make it possible to assess the capacity of the land to support a larger population and to prepare a comprehensive long-term plan for rural improvements.

It is a gross error to argue that rural people possess a higher immunity to disease than urban people. With standards of hygiene rising all over the country, natural immunity is being lost and an era of epidemics is rapidly replacing the era of endemic diseases; poliomyelitis is an example of this danger.

A study of cerebrospinal meningitis and ty-

**Table 3. Cerebrospinal meningitis and typhoid fever in Kenya**

Year	Cases of cerebrospinal meningitis		Cases of typhoid fever	
	Kenya	Central Province	Kenya	Central Province
1952	71	28	582	227
1953	51	36	1,226	360
1954	204	109	2,001	994
1955	661	323	1,874	1,038
1956	1,369	797	1,902	955
1957	760	487	1,671	694
1958	661	291	1,239	637
1959	458	160	1,115	576
1960	563	99	988	615
1961	556	146	1,065	639

NOTE: 1952-54, emergency villagization started in Central Province; 1957-60, improved villages built with piped water, sanitation, lighting, and adequate ventilation; 1960-61, return to farm homesteads.

phoid fever in Kenya during the past decade shows how village planning can affect the incidence of infectious diseases. Table 3 demonstrates these effects very clearly. During the period 1952-54, when the people of Central Province were living in hastily erected emergency villages, approximately 50 percent of the cases of these two diseases occurring in Kenya arose in Central Province. However, during 1957-60, when the second stage of villagization was in progress and improved villages with adequate ventilation, lighting, accommodation, sanitation, and water supplies were being built, the incidence of disease in Central Province fell much more rapidly than in the country as a whole. The number of cases of cerebrospinal meningitis in the province dropped from one-half of the national total in the 1954-56 period to approximately one-sixth of the national total in 1960; the statistics for typhoid fever are less dramatic but the same trend can be observed. In 1961, with population movement away from the villages back to temporary homesteads on the farms almost complete, the figures once more showed both an absolute and a relative rise.

Urban difficulties are admittedly more obvious and more urgently in need of solution than rural ones; these aspects of rural change are discussed merely to demonstrate that true preventive measures in urbanization commence in the rural areas. Fortunately, at this early stage of rural and urban development and of population movement toward towns there is

an opportunity to initiate wise country planning and development measures.

The problem of reordering and revivifying rural society is not simple. The siting of villages, the moving of people from their small holdings, the provision of water and sanitary services, and the planning of shopping areas and educational, social, and health services are all major endeavors. The new villages will be different in population balance from the old; a small industrial class will be introduced, rural cooperatives and industries started, and small tradesmen encouraged. The traditions and beliefs of country people must be most carefully studied and villages planned so that villagers have adequate opportunities for both work and play.

#### Demographic Trends

The trend to a rapidly expanding population in Africa consequent upon high birth rates and falling death rates requires little demonstration; the facts are well known. Some comparative statistics are given in table 4.

Population increase varies from 1.4 to 2.5 percent annually; for the whole of Africa the 1950-59 average annual rate of increase was between 1.8 and 2.3 percent. In urban areas, however, the increase is even more dramatic. Population growth of some major African towns in recent years is shown in table 5.

In Nairobi a sample population census showed an increase of more than 100,000 between 1948 and 1958 to 221,700, an increase of 86 percent, or some 6.2 percent per year. The rate of growth was not uniform for all races, Europeans increasing by 105 percent, Africans by 80 percent, and Asians by 93 percent. This survey also showed that during the past 10 years a change in sex ratio has taken place in the city's population. The male proportion has fallen from 69 to 62 percent, whereas the female has risen from 31 to 38 percent. This relative increase in the female population occurred among all races but was most noticeable among Africans, where the increase was from 21 to 29 percent. At the same time that the female population increased, there occurred a rise in the child population of all races; again this increase was most marked among Africans.

**Table 4. Recent population trends in Africa**

Country and population group	1948	1960	Percent increase	Cumulative annual increase (percent)
Kenya.....	5,399,000	6,551,000	21.3	1.6
African.....	5,240,000	6,264,000	19.5	1.5
Uganda.....	4,942,000	6,682,000	35.2	2.5
African.....	4,900,000	6,590,000	34.5	2.5
Tanganyika..	7,461,000	9,238,000	23.8	1.8
African.....	7,389,000	9,099,000	23.1	1.8
Zanzibar.....	264,162	<sup>1</sup> 304,000	15.1	1.4
Madagascar..	4,149,000	<sup>2</sup> 5,287,000	27.4	2.2

<sup>1</sup> 1958 total.

<sup>2</sup> 1959 total.

**Table 5. Growth of some urban populations in East Africa**

City, population group, and period of growth	Change in population	Increase		Cumulative annual increase (percent)
		Number	Percent	
Nairobi, Kenya, 1948-58:				
African.....	64, 397-115, 000	50, 603	80	6. 1
Asian.....	43, 749- 84, 500	40, 751	93	6. 8
European.....	10, 830- 22, 200	11, 370	105	7. 4
Total.....	118, 976-221, 700	102, 724	86	6. 2
Kampala, Uganda, 1948-59:				
African.....	11, 905- 24, 100	12, 195	102	6. 6
Asian.....	10, 692- 19, 268	8, 576	80	5. 5
European.....	1, 297- 3, 129	1, 882	145	8. 5
Other.....	304- 232			
Total.....	24, 198- 46, 779	22, 581	95	6. 3
Dar es Salaam, Tanganyika, 1948-59.....	69, 227-134, 000	64, 773	93	6. 3
Zanzibar town, Zanzibar, 1948-59.....	45, 284- 59, 000	13, 716	31	2. 5
Tananarive, Madagascar, 1955-59.....	190, 000-248, 000	58, 000	31	7. 0
Salisbury, Southern Rhodesia, 1946-59.....	123, 190-271, 000	147, 810	120	6. 3

These changes are indicative of a move away from migratory habits to a more permanent and settled African family population in the city. (According to the 1962 census, the population of Nairobi has now increased to 266,700.)

An important facet of urbanization is the proportion of aged and infirm persons in the population of a township, but at the moment no statistics for this are available. There is no reason to suppose that they exceed the proportion of aged in the population as a whole, which varies between 10 and 12 percent (taking 45 years as the lower limit of aged in Africa), nor is there any evidence to suggest that family size and fertility rates in towns differ as yet from those in rural areas.

In Dar es Salaam the total population increased by 86 percent during the years 1948-57; for six other large towns in Tanganyika the population increase was 56 percent over the same period.

The data for Kampala reveal a slight difference in the proportionate racial increases, but the overall rate of growth is of the same order as for Nairobi and Dar es Salaam (table 5). Salisbury shows a similar trend, but Zanzibar and Tananarive, island towns, show a much slower rate of expansion. In general, therefore, these towns are doubling their populations in a period of 12 to 15 years (that is, the average

growth rate is about 6 to 7 percent annually). This factor and the probability that all towns are following the same trend as Nairobi in developing a family population present urban growth problems of unprecedented magnitude. While total populations of African countries are doubling in a period which varies from 25 to 40 years, urban populations are doubling in less than 15 years.

Finally, the most serious aspect of urbanization from the public health viewpoint is the overflow of populations from towns proper and rural areas into the peri-urban areas. In these areas the degree of public health control varies considerably, but in general they fully deserve their popular name of "shanty towns" or "septic

**Table 6. Population of some African cities and their urban agglomerations**

Town	Year	Population of city proper	Population of urban agglomera- tion
Salisbury, Southern Rhodesia.	1946	54, 090	69, 100
Salisbury, Southern Rhodesia.	1956	105, 550	225, 700
Leopoldville, Congo.....	1955	299, 806	366, 819
Freetown, Sierra Leone.....	1947	64, 576	87, 341
Kampala, Uganda.....	1959	46, 735	76, 597
Jinja, Uganda.....	1959	29, 741	2, 651

fringes." It is difficult to obtain data to demonstrate this aspect of urbanization, but the United Nations Demographic Year Book does separate the population of many towns into cities proper and urban agglomerations (6). Some African examples are given in table 6.

The report of the East African Royal Commission, 1953-55 (7) points out that although the estimated population of Kampala in 1952 was 16,800, the number of persons employed in the city that year totaled 30,000. The report also states, "Settlements of closely packed African huts are to be seen on the fringes of all the larger towns in East Africa." Perhaps one more quotation, taken from the 1959 annual report of the medical officer of health, Nairobi, is appropriate (8) :

A problem of great importance and one which caused much concern was the amount of malnourishment in children who came particularly from the peri-urban areas . . . the problem of malnourishment with malnutrition is not nearly so acute amongst children who are actually resident in the city itself.

A further factor that complicates the urban population picture is migration. The statistics quoted from the sample census of Nairobi show that there is a trend toward settled African family life, but this is as yet only in its infancy. In a tuberculosis survey carried out in Nairobi in 1958-59, only about half of the persons initially sampled could be traced at the end of 1 year (9).

Much of the transitory nature of African urban populations is caused by men arriving to work for cash for brief periods while maintaining their families on farm holdings in the native reserves. Prothero (10) remarks, "The large-scale migration of labour in Africa is a feature of major social and economic as well as of demographic importance." It is also a matter of vital concern to public health authorities. Prothero records movement between village and farm, town and country, and across national boundaries, and the nomadic movements of cattle-herding peoples: he writes that in central and eastern Africa population movements are primarily concerned with migrant labor and their importance and magnitude have been insufficiently appreciated. These movements are already a major factor in malaria control measures, and his remarks apply equally to other

vector-borne diseases, as well as to "social ill health."

### **Mental, Social, and Economic Aspects**

It is well known that the incidence of psychiatric disorders is higher in urban areas than in rural ones; this is true of well-developed societies and well-planned towns and cities. It is probably even truer of people who are undergoing rapid social, political, and economic changes, changes which affect the urban African much more than the rural African. It is estimated that the number of persons requiring some form of psychiatric attention in Africa amounts to about 1 percent of the total population.

The African in his rural setting is strictly bound by tribal patterns of behavior, beliefs, and customs. He is an integral part of his community and his thinking tends to be communal; as Jung (11) has shown, he demonstrates the archetypal patterns of the collective unconscious as well as any people on earth. With transposition to the towns he forsakes communal life for an individualistic life, unsupported by tribal rules and regulations. While forsaking these supports, he is not yet ready to adopt the codes and rules which have brought social stability to western civilizations. Furthermore, he is abandoning ingrained centuries of agricultural or pastoral tradition and learning the technical skills of an industrial world quite strange to him.

He has forsaken even his immediate family. Clifford (12) summarizes his position :

Over the continent Africans are flocking to the towns where the break with older traditions is marked. Even those trained in Christian Missions find it difficult to practice their religion in the atomised way of life of the large centres of population without the social pressures and controls of their own people or of the mission station to support them. This effect of urbanization is not peculiar to African society of course, and we can see the effects of weakening social cohesion and control in European towns. The point here, however, is that against the personal background just explored we can see how much more devastating it must be for the African who is denied the gradualism of developments in Europe. He understands, we are told, concrete situations rather than abstract principles; he expects much of society because of the early indulgence of his mother towards him and he is inclined to find

outside explanations for his failures . . . . The significance of these fundamental attitudes to life will affect any work for or with Africans. In all our efforts to help the African it will be seen that a *communal approach is likely to be of more value than an individual approach*. For some time to come he badly needs the social ties which he is rapidly losing. He is a social thinker, a social performer, not yet acclimated to personal independence and self-sufficiency which he requires for modern town life.

The new urban immigrant thus arrives in town mentally confused, with his social supports removed, not understanding the monetary economy, possibly lacking a common language with which to speak to his new neighbors. He will live in overcrowded accommodation on a bed-space basis or in the septic fringes. Separated from his wife and family, with no understanding of urban social codes and facilities, he has no standards or experience from which to judge how he should be living and behaving in a town.

It is not surprising, therefore, that mental health is affected or that social ill health—prostitution, crime, alcoholism, and delinquency—flourish. The truth is that it is surprising that they are not more common. Unemployment frequently follows as a result of monetary stresses and an inability to either give or find satisfaction in the new working environment. Unemployment may lead to borrowing, stealing, or graver crimes, and finally a slum mentality is created with its vicious circle of deteriorating mental health, increasing lethargy, unwillingness to help oneself, and increasing social ill health.

To prevent this progressive deterioration it is essential to direct urban development toward the following goals.

1. Stable family life.
2. Development of areas where people can live in healthy surroundings regardless of their financial status.
3. Creation of a healthy social climate by the development of small neighborhood units where communal life can be enjoyed and appreciated.
4. Prevention of septic fringes and overcrowding.
5. Provision of suitable economic opportunities.
6. Restriction of migration to towns to a level which can be comfortably supported.

*Social health.* Rogoff (13) in an analysis of the social background to suicide and violence in Kenya remarks that the social health of the

country as a whole is satisfactory because the bulk of the population still forms a traditional rural society; in towns the disintegration of African society is a major factor. He relates this not to the accustomed town dweller but to the impermanent migratory worker.

Another major social health problem is the withdrawal of support, traditionally given by African rural societies, to the underprivileged sections of the population; the aged, infirm, and crippled, and the orphan or deprived child. Provision for these special groups becomes urgently necessary in towns and depends upon regular and detailed analysis of urban social ill health.

Africans, with their strong social tradition of close communal life, may adapt well to living in high flats (blocks of high rise apartments). Such housing has the advantages of economical use of expensive urban land and accommodation close to places of work. However, in view of recent studies in the United Kingdom of the problems accompanying living in high flats, their potential usefulness in African cities will require thoughtful appraisal.

*The economic background.* It is a fact that poverty breeds poverty; East Africa cannot afford the luxury of dissipating its resources in unwise policies and planning. Individual productivity figures per capita per year for some African countries follow.

Country	Net cash product	
	1951-52	1961
Kenya.....	£14 (\$39.34)	£30.8 (\$85.42)
Uganda.....	15 (42.15)	22.8 (62.94)
Tanganyika.....	7.8 (20.79)	19.9 (54.65)
Northern Rhodesia.	47.1 (132.21)	84 (236.04)
Southern Rhodesia..	47.6 (132.91)	94 (264.14)
Union of South Africa.....	101 (283.81)	123 (345.63)

This low productivity means that cash earnings are also low, a factor which is reflected in the minimum wages paid in the various townships. Low wages in turn prohibit the purchase of houses and prevent the payment of sufficient rent to obtain an adequate standard of rented housing; the economic position of these countries rules out any possibility of subsidized housing. These factors lead to reluctance to establish family life in towns and to overcrowding in a desperate effort to reduce the proportion of income spent on accommodation.

The gap between high rents and low wages is aggravated by mismanagement of money. It is still strange to a people accustomed to growing their own foods to be suddenly plunged into a cash economy. It is of prime importance to health that family and bachelor patterns of budgeting income and expenditure be carefully studied in urban areas. Such a survey was carried out by the East African Statistical Department in Nairobi in 1957-58 (14).

This survey revealed these facts:

1. Forty-seven percent of all households received contributions to the supply of meals from lodgers, friends, and other persons apart from the head of the family. Such income pooling arrangements appealed particularly to novices to urban life before they had acquired their own household utensils.

2. Income is supplemented in kind by employers and from garden produce.

3. The cohesiveness of tribal groups persists in housing units.

4. Following are the average expenditures for various items:

Item	Percent of income
Food-----	58
Rent and water-----	13
Clothing and footwear-----	7
Fuel and light-----	5
Beverages-----	4
Furniture and furnishing-----	3
Tobacco-----	3
Personal care and health-----	2
Household aspects-----	2
Recreation-----	1
Miscellaneous-----	1
Total-----	100

5. As income rose, the proportion spent on food fell from a maximum of 62 percent of the total to 53 percent; conversely, expenditure on clothing increased with increasing income.

6. Expenditure on transport, health, recreation, and miscellaneous items was approximately 6 percent of the total income and rose both relatively and absolutely with income.

7. Alcohol accounted for 3 to 5 percent of income, more than the amount spent on health.

8. Seven items of food—meat, maize, flour, milk, vegetables, sugar, and bread—accounted for 67 percent of the total food expenditure. The proportion spent on maize declined as income rose.

9. Eating out (“hotel” meals) accounted for 8 percent of food expenditure. Bachelors in particular ate out at “hotels” and in the houses of unmarried aged ladies. This pattern is said to have been devised to circumvent the “uninvited hungry guest” and is a break from established rural custom.

10. Certain tribal food patterns persisted; the Nyanza Province tribes continued to eat fish and the Central and Southern Province tribes lived mainly off maize.

11. There was overexpenditure in a high proportion of households.

12. A large number of households spent most of their cash income immediately after receiving it and were then dependent on systems of credit and loans. This practice had a serious impact on the purchase of essential items.

13. Expenditure on food in the lowest income groups was twice as high in the first 10 days of the month as in the last 10 days. Alcohol consumption was three times as high in the first 10 days as in the last 10 days.

14. Savings accounted for only 1 percent of the total income.

15. Advance of wages, the borrowing of money, and extended credit systems are suggested as producing resistance to the breakup of communal living patterns traditional to rural areas.

This analysis should be correlated with a detailed dietary and nutritional survey. Nevertheless, there is ample evidence in these findings of poverty, improvidence, and the need for health education in family management and budgeting.

Kark (15), writing on the problems of urban families, points out that low earning power means that several members of the family need to work and is a major determinant of the state of health of the community. He states that this is illustrated by the high prevalence of malnutrition and tuberculosis and also by emotional stress and social maladjustment.

Another factor common to urban societies is illustrated by an excerpt from the annual report of the medical officer of health, Nairobi for 1959 (8):

The young ayah problem is increasing. More and more babies of 2 to 3 months are left in the care of children of 7 to 10 years while their mothers are working. Frequently these babies are fed on tinned artificial foods, and the result is often gastroenteritis, due to lack of hygiene, and eventual malnutrition as the artificial foods, being expensive, are made to last much longer than they should. Parents of these infants are difficult to contact since they are out all day. . . .

This is a reflection of the economic stress, changing social patterns of urban life, and the breakdown of the communal pattern, indicating a need for more government activities in the provision of baby crèches and home visiting services.





**Traditional materials, mud, wattle, and flattened 4-gallon tins, form this family's shelter in Kario Bangi Location, Mathari Valley, near Nairobi. Large bowl leaning against the wall is used for carrying water and washing.**

### **Home Environment**

A proper physical environment is necessary if city dwellers are to achieve a happy, contented, and stable family life that fosters prosperity and health.

The bewildering variety of public health problems that call for attention can be confusing in their apparently opposing needs; they can only be seen as complimentary to one another if they are regarded as reaching out to the family in its home environment. If personal health services are excluded, these health needs can be divided into four areas; housing, water, sewage, and amenities.

The statistics of urban growth given previously indicate the magnitude of the task of housing all the people. To house but a proportion of the population at the expense of the rest leads to the growth of shanty towns, slums, the septic fringe, ill health, and social maladjustments. Therefore, it may be accepted as axiomatic that the design of a housing policy

should envisage the living conditions of the whole population, not merely a part of it.

Such an outlook makes the task very nearly intractable in rapidly developing urban areas situated in newly emerging countries with their comparative and absolute national poverty. Here are a few examples.

A recent survey of housing in Jinja (16) revealed that a third of the workers lived in African built and owned mud-and-thatch, or mud-and-metal-roof huts on the fringe of town not conforming to any design or plans; a further third lived in employer-provided accommodation of mostly reasonable standard. Only 1 in 10 lived in houses built and run by government as a social service.

In Nairobi, a contract for the building of 3,002 dwellings, together with neighborhood services and facilities, at a cost of some £1.5 million, was placed in 1960. At the same time it was estimated that an additional 25,000 persons had entered one area of the city alone as a

result of the removal of restriction orders on movement.

The rate of expansion of urban areas in East Africa cited previously reveals comparable trends in other cities so that costs elsewhere will also be comparable. It is doubtful whether costs would fall outside a range of £50-£150 (U.S. \$140.50-\$421.50) per person depending on land and local building costs. Experience has shown that building costs in East Africa fall somewhere between 20s. and 60s. (U.S. \$2.80-\$8.40) per square foot.

Nakuru, a Kenya town of intermediate size, was selected for a housing survey in 1958 (17). The town was known to have an active housing policy. Following is an analysis of the results of the survey.

	<i>Number</i>
Total African population.....	23, 121
Number of persons in 4,671 families.....	18, 687
Single persons.....	4, 434
Total number of housing units.....	6, 993
Family housing units (2 rooms or more)---	329
Satisfactory family units.....	284
Unsatisfactory family units.....	45
Single room units.....	6, 664
Satisfactory single-room units.....	3, 890
Unsatisfactory single-room units.....	2, 774
Percent of family units to families.....	7
Percent of satisfactory family units to families	6
Percent of single units to bachelors.....	150
Percent of satisfactory single units to bachelors	88

From these data it appears that the average family size in Nakuru is four persons. On a bed-space basis, calculating at 40 square feet per adult, there is no apparent overcrowding, 21,515 bed spaces for 17,992 adults. But of the 4,671 families only 284 have satisfactory family units of two or more rooms. On the other hand, bachelors are adequately catered for, theoretically, there being a potential 3,890 fit single units for 4,434 bachelors, 88 percent of the demand.

However, on a living-space basis, there are 9,105 self-contained families and bachelors to fit into 4,174 fit housing units. It is apparent that the majority of families have to live in single-room units, and bachelors, two and three to a room. The full report notes that of the 6,993 units, 2,079 are overcrowded.

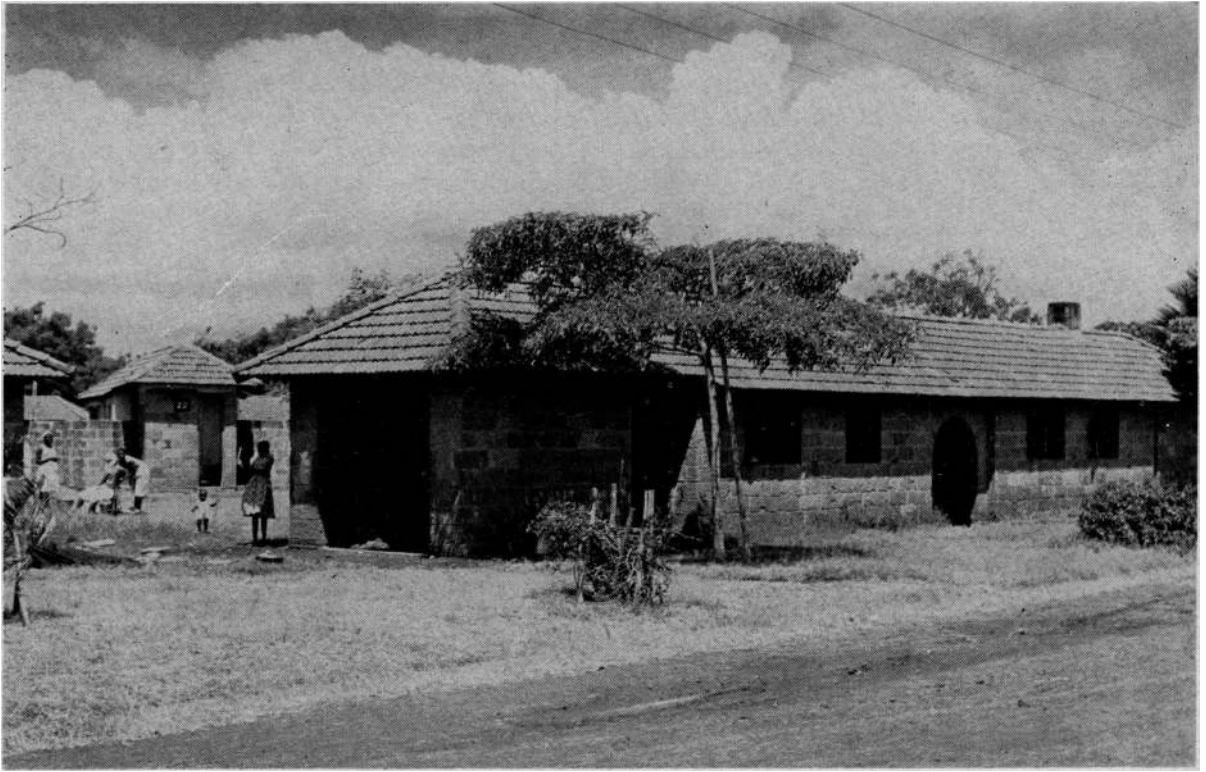
The efforts of Nakuru Municipality between 1948 and 1956 represented an outlay of £164,000 or £115 per living room. On this basis, to expand to a "living space" principle would cost more than £1 million. But this is not a sufficient sum, since the population is now reported to have expanded to some 40,000.

At this point it becomes necessary to examine the fundamental requirements for healthy living. What makes a healthy environment for raising a family? It is essential to differentiate between building standards and health standards when speaking of housing standards. Perhaps it would be even more true to speak of home standards. There are two factors in urban housing problems: the relief of overcrowding and improvement of standards.

It has been amply demonstrated that overcrowding leads to an increased prevalence of communicable diseases such as pertussis, measles, and tuberculosis. Overcrowding, then, should be solved first. Only secondly should attention be turned to improvement in standards, and when this is attempted, care has to be taken not to worsen the situation either by creating further overcrowding with excessive demolition and slum clearance or by worsening the economic position of the family through increasing rents, expenditure that can be ill afforded.

Capital cost and rental structure are two factors which inhibit the improvement of building standards. By the adoption of simplified standards, such as omitting internal plastering, simplifying internal amenities, and providing curtains instead of doors, building costs can be lowered to as little as 15s. (U.S.\$2.10) per square foot, but it is apparent that in East Africa one cannot reduce this figure further if "permanent" materials are to be used. Approximately half of the other limiting factor, the rental structure, is made up of nonhousing items such as road maintenance, lighting services, and housing estate management, which are also difficult to reduce unless simplified standards are introduced.

An additional difficulty is the fact that the building authority must obtain its money by constructing houses that will last for the loan replacement period, normally some 40 years. Thus, even modification of building standards



**Public housing at Pumwani Location, Nairobi**

would not seem to be the means of providing all the adequate housing that is needed.

But if we examine housing from the viewpoint of health standards, we must define what we mean by "a healthy home environment," having already considered social health aspects.

A healthy home environment has these requirements:

1. Living space for the family, both inside and outside the house. This permits privacy, amenities, and decent living practices, allows health education principles to be adopted and practiced, and limits the spread of common contagious diseases.

2. Safe water supplies, safe sanitation, and adequate conservancy services, which will limit the risk of spread of communicable alimentary diseases.

3. Adequate ventilation, light, and protection against the vagaries of the climate, mainly dampness, which can help to decrease the prevalence of the common respiratory diseases.

4. Amenities such as ablution facilities, cooking facilities, and artificial illumination.

These are the basic needs which, with the social health requirements (welfare, social life, protection of morals, and religious, educational,

recreational facilities) and economic security, will lead to the establishment of a stable family life and the growth of the competitive spirit so essential if continuous progress is to be achieved.

These desiderata for healthy living are not inconsistent with simplified building standards, although they are, of course, enhanced by high building standards. If, therefore, the alternative lies between constructing a limited number of houses according to high building standards for a minority of the people, with the consequent growth of uncontrolled and insanitary septic fringes and shanty towns, or permitting simplified building standards for all, then the second alternative is the only sensible choice.

Zoned areas, where the building of suitably planned houses of traditional materials, together with adequate attention to the four requirements listed previously and good estate management, can solve the lack of suitable housing. Such houses would need to be owner occupied to insure recurrent maintenance and provide loan security. Infestation, often used

as an argument against traditional materials, can be controlled by insecticides and attention to basic sanitation. However, it must be remembered that too high building standards will defeat their own ends and that a spirit of balanced realism must prevail.

### **Sanitation, Water Supplies, and Conservancy**

Simple but strictly controlled sanitation, which includes latrine buildings and sanitary arrangements for the disposal of waste water, are a necessity. Simple methods can be as safe from a health viewpoint as more expensive and elaborate waterborne sewerage systems with their high capital and recurrent costs.

A recent WHO public health paper (18) drew attention to the fact that ankylostomiasis was spread by the soiling of ground in the immediate vicinity of houses by toddlers, demonstrating the need for good health practices.

Well-managed pit latrines, bucket latrines, and aqua privies have all proved effective in limiting disease. Good management is equally necessary for a waterborne sewerage system. An intermediate solution which is becoming increasingly popular in Kenya is the sewage lagoon or oxidation pond. The lagoon combines the advantages of waterborne sewage systems with low costs and is readily applicable to populations of from 100 to 10,000. This method was given impetus in Kenya when a £14,000 activated sludge sewage disposal unit at Nairobi Airport became overloaded and was paralleled by a sewage lagoon costing about £3,400, obviating the need for a £15,000 extension to the original unit (5).

Similarly, it is not essential to operate elaborate and expensive methods of refuse removal. Rubbish can be quite satisfactorily disposed of by backyard incineration and composting, with adequate controls.

Safe, cheap water supplies are essential. A faucet to every house is not necessary; a common standpipe to every four houses can supply sufficient water for hygienic habits and yet reduce the hazards of waste water drainage. This system lowers overhead costs as well as conserving water. Such conservation practiced throughout a city of 250,000 people can make a material difference in the magnitude of reservoir and water supply systems required.

Whereas communal water standpipes are possible, it is wise to avoid communal latrines, for experience has shown that no one family accepts responsibility for them and they soon become unsanitary. The alternative is for the local authority to maintain communal latrines, but this is not an economical solution.

The key to the success in urban areas of simplified building standards is good estate management with rigorous controls to insure the maintenance of high standards of hygiene. Without a system and controls there would no doubt be a rapid degeneration into slums, but this can happen even where building standards are high.

The long-term requirement is continuous and intensive health education to instill the principles and practices of hygiene into the individual, the family, and the community. Unless this is achieved, the whole objective is lost.

### **The Disease Pattern**

The difficulty of all epidemiologic studies in East Africa is the paucity of vital statistics from which to make valid deductions. In urban areas the migrant nature of much of the population confounds the rapid analysis of statistics. To obtain accurate data, it would be necessary to determine for each case of disease if the patient was truly urban or a recent urban arrival.

In a quotation previously cited, the medical officer of health, Nairobi (8), observed that many malnourished children attending city clinics live in the peri-urban areas. Also, an analysis of the cases of malnourished children admitted to the King George VI Hospital from Nairobi city clinics would reveal that a high proportion of them come from the remoter rural areas. Thus, in addition to the impermanent nature of the population, there is the peri-urban drift to the city and the tendency of mothers to follow the father to the city when sickness afflicts the family.

A further element in the accuracy of statistics is registration. Registration of births and deaths is by no means complete and is only observed to any extent in the towns so that comparative urban and rural data are well-nigh impossible to obtain. Morbidity rates only reflect the attendances at clinics and hospitals,

**Table 7. Birth rates per 1,000, Nairobi, 1955-59**

Population group	1955	1956	1957	1958	1959
European.....	21.4	23.0	21.8	24.1	21.4
Asian.....	50.8	55.4	46.8	67.7	42.4
African.....	23.6	25.6	28.5	32.3	32.4

and coverage being more adequate in towns and distances shorter, statistics will reflect a higher proportion of actual disease prevalence.

Those statistics which both absolutely and comparatively are more likely to reflect a true picture are those obtained from the weekly reports of infectious diseases, because considerable administrative supervision is exercised in preparing them in the interests of accuracy.

With these provisos, I propose to use the statistics that are available. Except when stated, rates refer to the city of Nairobi.

*Births and infant and maternal deaths.* Table 7 shows the birth rates in Nairobi for 1955-59. The crude birth rate for Asians is the highest of the three groups although there appears to be a decline commencing, despite the fact that the Asian female population increased proportionately from 41 to 47 percent between 1948 and 1958. The Asian birth rate per 1,000 is 35 in Tanganyika and Uganda and about 40 for Kenya. Thus the town rate reflects the countrywide rate, since the bulk of the Asian population are town dwellers. With such high rates maternal and child care services need to be well developed for this group.

Blacker (4) states that the lower level of fertility in the island of Zanzibar (30 per 1,000) is almost entirely attributable to the exceptionally low birth rate of the Afro-Arab group in Zanzibar town, where it is estimated that the crude birth rate is not above 20 per 1,000.

The European rate in Nairobi represents a normal state of affairs by Western standards.

The crude birth rate per 1,000 for Africans is 50 in Kenya, 40 in Uganda, and 46 in Tanganyika, but the city rates are much lower. The rising trend for Africans in Nairobi (table 7) is caused by the steadily increasing proportion of females in the population; the fact that the Nairobi rates are substantially below the birth rate for the whole of Kenya is caused by

the normal urban trend toward smaller families and the proportion of females in the city's population, although rising steadily, being well below the proportion in the whole country. (For Kenya the ratio is 1,000 females to 975 males; in Nairobi the sample census revealed 84,300 females to 137,400 males, that is, 38 percent females). Thus in the city the maternity services do not call for as great an effort as in the rural areas; moreover, domiciliary services and home visiting are easier to organize in towns than in rural areas.

Table 8 shows the Nairobi infant mortality rates for 1955-59. Countrywide figures are difficult to obtain; Blacker (4) gives a figure of 190 per 1,000 live births for Kenya. Grounds (19) in a survey in South Nyanza estimated infant mortality at 147 per 1,000 live births, and Roberts in North Nyanza (20) as 105. (Both are rural areas.) Grounds considered his figures too low, but Roberts pointed out that in his area there exists a well-developed health center service and he considered his figures accurate.

From these statistics it is apparent that child health services have a long way to go before they reach an adequate level. Surprisingly, the urban rates do not appear to be much in advance of the rural areas with well-developed services.

One cannot, however, be sanguine about the density of maternity and child health services in view of the high birth rates and high infant mortality rates. There is little question but that domiciliary midwifery and home visiting child health services need to be developed at the greatest possible rate. Home services are advocated rather than hospital services since it is in the home environment that the greatest improvements are needed, and only in the home environment can health education be really effective.

**Table 8. Infant mortality rates per 1,000 live births, Nairobi, 1955-59**

Population Group	1955	1956	1957	1958	1959
European.....	18.0	19.9	28.6	31.7	25.7
Asian.....	48.0	46.8	46.2	38.9	44.5
African.....	111.0	130.5	98.3	89.8	103.8

Table 9 shows the main causes of infant mortality in Nairobi and Mombasa for 1959. These data emphasize that the causes of prematurity require further investigation since they account for 30 to 40 percent of infant deaths; rural figures are somewhat lower. Again, the other causes are mainly communicable diseases, which are avoidable.

The maternal death rates for 1959 for Nairobi are 2.5 per 1,000 births for Asians and 2.4 for Africans (8). The only rates available for the country as a whole are from the hospital statistics, where the recorded figure in 1958 is some 175 maternal deaths, a rate of 0.65. Comparisons are not possible as this statistic certainly does not represent the true state of affairs. All that can be said is that those services which do exist are working effectively.

**Malnutrition.** Malnutrition is evident throughout rural and urban areas, but the causative factors are somewhat different. In the urban areas a low wage economy, mismanagement of the family budget, ignorance, and the adoption of some of the less desirable Western social traits are the main causes. Malnutrition in rural areas is mainly caused by sheer

**Table 9. Principal causes of infant mortality, Mombasa and Nairobi, 1959**

Causes of death	Number of deaths		
	Mombasa: under 1 year	Nairobi: under 4 weeks	Nairobi: 1-12 months
Alimentary diseases <sup>1</sup> .....	27	77	14
Common respiratory diseases.....	39	102	21
Tuberculosis, pulmonary.....	0	8	0
Tuberculosis, other.....	0	3	0
Malnutrition, marasmus, debility, and anemia.....	7	41	8
Malaria.....	2	9	0
Prematurity.....	49	6	112
Infectious diseases, including meningitis.....	6	32	2
Tetanus.....	9	0	2
Congenital malformations.....	4	18	33
Birth accidents, difficult labor.....	16	3	53
Others.....	17	17	25
<b>Total.....</b>	<b>176</b>	<b>316</b>	<b>270</b>

<sup>1</sup> Poliomyelitis, gastroenteritis, dysentery, and salmonellosis.

lack of adequate food, the consequence of families without land, drought, floods, and incompetent and inefficient farming methods.

**Poliomyelitis.** During the poliomyelitis epidemic of 1959-60 some 150 cases occurred in Nairobi, an attack rate of 57 per 100,000 as compared with the national figure of 17 per 100,000. Likewise Nakuru Municipality, with 19 cases in an estimated population of some 40,000, showed a high attack rate, 47 per 100,000.

This higher attack rate in urban areas and population movement in and out of cities confirms the dangers of towns, particularly Nairobi, as a starting point for the dissemination of disease (21-23).

**Typhoid fever.** The incidence of typhoid fever is noted as being lower in urban areas than in the country as a whole, and it is to be expected that the majority of these urban cases will have come from the septic fringe. The report of the Medical Department of Uganda for 1958 (24) states:

Typhoid continued to be a serious problem. Six hundred seventy-seven cases treated in Government hospitals in 1958. Rare in primitive areas and in centers where sanitary services are fully developed, typhoid fever is common in crowded areas halfway between the primitive and the civilized areas, where the sanitary equipment is insufficient and where overcrowding favors the spread of the disease.

**Tuberculosis.** Tuberculosis has been described as a sociomedical disease that is likely to be introduced into villages by the migrant worker from overcrowded shanty towns.

Tuberculosis surveys conducted with the assistance of WHO and UNICEF (9,25,26) in recent years in both urban and rural areas have revealed some interesting facts. Although the prevalence of infected people in Nairobi is somewhat higher for all ages than in rural Kenya, the prevalence of open cases is almost 10 times higher in rural Kenya than in Nairobi. The conclusion is not that the country is a source of danger to the town but that people contract tuberculosis in Nairobi and return to their homes when seriously ill.

A second interesting facet of the disease in Kenya is that the comparative prevalence of pulmonary tuberculosis among the various tribes in the town mirrors the different prevalence rates in those tribes in their own land

units. This could be another consequence of labor migration. Furthermore, the relatively high incidence revealed in children of school age indicates that school medical examinations and screening are required as well as BCG campaigns. The prevalence of infected children is revealed as 10 times higher in the age group 0-4 years among contacts of open cases than among children who are not in household contact with such diseases. This illustrates the health hazards of overcrowding and, specifically, the need for young children to have separate sleeping accommodations.

*Malaria.* It is generally accepted that malaria recedes as urbanization proceeds, but that this is not altogether true is revealed by the sharp increase in malaria in both Nairobi and Mombasa as a result of unseasonable weather. This fact points the moral that antimalarial measures cannot be relaxed, even after years of apparent freedom. Good urban development is responsible for much of the disease's recession, but bad urban development can increase the hazard. Good engineering antimalarial measures must be maintained continuously.

Today, urban areas need to develop anti-mosquito measures rather than solely anti-malarial measures because there are other mosquito-borne diseases whose potential is increased by urbanization. The nuisance factor of mosquitoes, particularly as a disturber of sleep, should not be forgotten. Finally, the role of these insects in the epidemiology of virus diseases is by no means fully elucidated.

#### **Occupational and Industrial Hazards**

The translation of people from rural to urban areas with their high traffic density, electricity, factories, and heavy industries involves radical changes and almost inevitably will lead to a higher incidence of both physical and mental trauma. The countrywide statistics for Kenya reveal a trauma rate of some 10 to 12 percent of all hospital admissions; the rates for the King George VI Hospital, serving the urban area of Nairobi, are more than twice this rate.

Hawking of cooked foods is an almost entirely urban health hazard and should require recurrent medical examinations of cooks and vendors, proper facilities, and sanitary conveniences.

In Africa atmospheric pollution is regarded as a remote hazard, and yet a visit to Johannesburg would disillusion one. If a city is situated where there are currents of cold air, industrialization should be very carefully watched, for once atmospheric pollution has occurred, the cure is much more expensive than the prevention.

#### **Summary**

This paper sets out some of the stark facts of urbanization in Africa; it is not a detailed presentation of health problems but a study of a specific aspect, the drift to the towns. It surveys problems of urbanization in breadth without attempting to examine individual facets in depth.

The problems of urbanization can be classified into four major groups: demographic, social and economic, environmental, and epidemiologic.

Populations of African countries are doubling in 25 to 40 years; their urban populations, in less than 15 years. On the fringes of cities are closely packed huts, the peri-urban slums which often lack public health controls. Their dwellers are migrants from rural areas who may lack even an understanding of a monetary economy as well as experience in how to live in a town. They face mental and social strains without the support of traditional African rural societies.

The limited financial resources of many African countries and low per capita earnings make the provision of sufficient, adequate urban housing a formidable task. As an alternative to constructing an insufficient number of public housing units according to high building standards, a housing policy is proposed based on adequate living space in owner-occupied houses built of traditional materials with simple but controlled sanitation and water supplies.

As a primary preventive measure, equipping rural villages with adequate water supplies, sanitary facilities, and educational, social, and health services may serve to retard the flow of migrants to the cities.

Paucity of vital statistics for East Africa hampers epidemiologic studies, but the data available point to the living conditions in towns

as fostering malnutrition in children and promoting the spread of tuberculosis, poliomyelitis, typhoid fever, and other communicable diseases. High infant and maternal death rates emphasize the need for developing midwifery and visiting child health services, preferably operating in the home.

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### Glucose Testing Device

The Glover-Edwards glucose testing unit, suitable for use in small-scale diabetes detection programs, is no longer being manufactured by E. S. Piver & Sons, Wilmington, N.C. Inquiries should be addressed to A. K. Glover, Wilmington-New Hanover County Health Department, Wilmington, N.C. The unit was described in an article entitled "New Device for Diabetes Detection," in the August 1961 issue of *Public Health Reports*, pages 678-680.