URBANIZATION AND HEALTH IN DEVELOPING COUNTRIES: A CHALLENGE FOR HEALTH FOR ALL

L'URBANISATION ET LA SANTÉ DANS LES PAYS EN DÉVELOPPEMENT: UN DÉFI POUR LA SANTÉ POUR TOUS

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World Health Organization
Organisation mondiale de la Santé
Genève
The World Health Organization is a specialized agency of the United Nations with primary responsibility for international health matters and public health. Through this organization, which was created in 1948, the health professionals of some 160 countries exchange their knowledge and experience with the aim of making possible the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life.

By means of direct technical cooperation with its Member States, and by stimulating such cooperation among them, WHO promotes the development of comprehensive health services, the prevention and control of diseases, the improvement of environmental conditions, the development of health manpower, the coordination and development of biomedical and health services research, and the planning and implementation of health programmes.

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* * *

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URBANIZATION AND HEALTH IN DEVELOPING COUNTRIES: A CHALLENGE FOR HEALTH FOR ALL
A. Rossi-Espagnet, G.B. Goldstein & I. Tabibzadeh

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FOREWORD

This issue of the World health statistics quarterly is devoted to urbanization and health development in the cities of the developing countries with specific emphasis on poor and underserved populations and on services at the primary level.

For the preparation of this issue, material has been drawn from WHO publications, more particularly those listed below in chronological order, as well as from a number of other published and unpublished works to which specific reference is made in the text.

— Primary health care in urban areas: reaching the urban poor in developing countries, A state-of-the-art report by UNICEF and WHO (WHO document SHS/84.4).

The material in this issue has been prepared by A. Rossi-Espagnet, short-term professional, District Health Systems, Division of Strengthening of Health Services; G. B. Goldstein, Environmental Health in Rural and Urban Development and Housing, Prevention of Environmental Pollution, Division of Environmental Health; and I. Tabibzadeh, District Health Systems, Division of Strengthening of Health Services. Ms Stella Tabengwa, Division of Strengthening of Health Services, typed the manuscript.

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INTRODUCTION

Governments and international organizations, when concerned with health and health services development and the application of primary health care to poor and underserved groups, have so far given priority attention to the populations living in rural areas. Common justification for such orientation is the assumption that cities, especially in the developing countries, have traditionally benefited from a disproportionate share of the resources available for health care.

This issue of the World health statistics quarterly does not advocate a drastic reorientation or a shift of attention and resources away from the rural areas. However, it emphasizes that the distribution of resources within the cities is often inequitable and not in accordance with prevailing needs, that cities have become places of great contrast, and that the migration waves which have flowed into large capital and secondary cities of practically all developing countries during the last decades have led to the creation of vast peri-urban slums and shanty areas where people live under conditions of extreme deprivation and poverty.

In the Third World generally and in certain regions in particular (for example, sub-Saharan Africa, East Asia and Latin America) rapid urbanization has become a challenge for politicians and managers concerned with the development of basic services in urban areas. It must be borne in mind that, according to projections, about 50% of the world’s population will be living in urban areas by the year 2000; that in many countries this proportion is already substantially higher; that a large sector of the urban population, especially in developing countries, is economically and socially deprived and receives little benefit from the amenities commonly associated with urban living. All this has specific and important implications for the health sector.

The aims of this issue are to:

- alert people to the scale, nature and urgency of the predicament of the poor in many cities of the world;
- advocate a fundamental shift in health care priorities and strategies in the cities, from simply trying to do more of the same to applying primary health care principles;
- explain some of the key characteristics of successful action to improve urban health as reflected in actual local experience;
- focus attention upon the urgent need to broaden one’s perspective from successful pockets of action to comprehensive coverage, that is, to action on an adequate scale.

Rather than reviewing the health effects of urbanization in general and everywhere, this issue will focus on developing countries, with emphasis on low-income, at-risk and underserved populations, and on services at the primary level.

To this effect, facts and trends related to urbanization in developing countries have been summarized in the section on the urban crisis. The section entitled Urbanization and the urban environment reviews the environmental conditions under which the urban poor live in most Third World cities and their implications for health. The next two sections summarize the epidemiological patterns in poor urban areas, with particular reference to vulnerable groups (women and children) and to selected health problems. The penultimate section, Improving urban health systems, is devoted to health services and to the application of the primary health care concept and strategies to urban areas; it discusses the need for intersectoral articulation, decentralized health development at neighbourhood level, sustainability and expansion. The final section reviews policy implications and the need for joint partnership for health development in Third World cities.

The discussion on health development and the urban poor throws light on the gravity of the situations observed, the complexity of the action required, the inadequacy of the available means and structures and the need for mobilizing a multiplicity of resources in order to foster the process of urban health development where this is needed.

Fundamental in this context is the urgency and the difficulty of applying primary health care concepts and strategies to urban health development, the need to ensure both comprehensiveness and selectivity, as well as effectiveness in the presence of limited resources. The way to a new health order is not likely to be smooth, for in the words of Machiavelli (1) "there is nothing more difficult to take in hand, more perilous to conduct, more uncertain in its success than to take the lead in the introduction of a new order of things".
SUMMARY

Urbanization in developing countries is one of the most significant demographic and social phenomena of our times. Together with beneficial effects, it has also produced vast slums and shanty towns, an exacerbation of poverty and complex patterns of socioeconomic, environmental and health problems. The purpose of this issue of the World health statistics quarterly is to draw the attention of politicians, managers and scientists to the importance of this phenomenon, its determinants and characteristics, as well as its effects on health and health services through modifications of social conditions and the physical environment. Experiences will be briefly reviewed and commented upon in the various sections of this issue with the aim of improving awareness, and stimulating and facilitating action related to health development in the cities of the developing world.

RÉSUMÉ

Introduction

L'urbanisation dans les pays en développement est l'un des phénomènes démographiques et sociaux les plus importants de notre époque. Elle a eu des effets positifs, mais elle a aussi provoqué la multiplication des taudis et des bidonvilles, l'aggravation de la pauvreté et des problèmes socio-économiques, écologiques et sanitaires d'une grande complexité. Le présent numéro du Rapport trimestriel de statistiques sanitaires mondiales cherche à attirer l'attention des responsables politiques, des cadres et des scientifiques sur l'importance de ce phénomène, ses causes et ses caractéristiques ainsi que ses effets sur la santé et les services sanitaires, liés à la transformation des conditions sociales et de l'environnement physique. Il est divisé en sections dans lesquelles les données d'expérience sont brièvement analysées et commentées, afin de sensibiliser davantage au problème et de stimuler et faciliter l'action dans le domaine du développement sanitaire dans les villes des pays en développement.

REFERENCES – RÉFÉRENCES

THE URBAN CRISIS

Facts and trends

During the last decades the main emphasis in community health in developing countries has been on extending health service coverage in rural areas, but in more recent years health authorities throughout the world have become increasingly concerned with the public health problems emerging in the cities.

During the last 20 years or so, a number of international meetings have called the attention of decision makers and researchers to the issue of urbanization. Among these were the United Nations conference on the human environment in 1972; the United Nations world population conference in 1974; the United Nations conference on human settlements (Habitat) in 1976; two international conferences on population and the urban future in 1980 and 1986; the United Nations conference on large cities in 1985; and the conference on small and medium-sized cities in 1986.

In 1980, the Rome Declaration on Population and the Urban Future predicted that "in the next two decades, the world will undergo, as a result of the urbanization process, the most radical changes ever in social, economic and political life". It also castigated the inadequacies, in most cities of the world, of "virtually every service, amenity and support required for tolerable urban living" (1, 2).

The total population of the world, estimated at 4,851 million for 1985, is expected to reach 6,261 million by 2000 and 8,504 million by 2025, an increase of 36% between 1985 and 2000 and of a further 36% between 2000 and 2025.

The urban population of the world, estimated at 2,048 million for 1985, is projected to reach 3,197 million by 2000 and 5,493 million by 2025, an increase of 56% between 1985 and 2000 and a further increase of 72% between 2000 and 2025. This increase may be attributed to a combination of rural-urban migration, natural increase in the urban population, reduced mortality and reclassification of rural lands as urban or peri-urban areas. The contribution of migrants to urban growth is greater than would appear from numbers alone: most migrants, in fact, are in the child-bearing age and thus have higher birth rates than the urban population as a whole.

United Nations estimates suggest that, between 1975 and 1980, 54.3% of the total population increase in the developing regions took place in urban areas. It

FIG. 1

AVERAGE ANNUAL URBAN GROWTH RATE, LESS DEVELOPED REGIONS AND MORE DEVELOPED REGIONS, 1970-1975 TO 2020-2025


0 1 2 3 4 5

Percentage - Pourcentage


More developed regions - Régions plus développées
Less developed regions - Régions moins développées

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is anticipated that in the period 1995-2000, 71.5% of the increase will be in urban areas as against 28.5% in rural areas.

From 1985 to 1990, the urban population of the less developed regions grew by 4.5% annually (Fig. 1), that is about 1.5 times the rate of the urban and rural populations combined (3.1%). This rate of urban growth is slightly lower than that of the previous 5-year period (4.6% annually), showing the reversal of a trend of rising urban growth rates since 1960. The urban population growth rate of the less developed regions is projected to decline to 3.7% per year during the period 1995-2000 and to 2.2% in 2020-2025.

Cumulative percentage changes anticipated in the urban and rural population of the developing countries to the year 2025 are shown in Fig. 2.

The speed at which a population is urbanizing is expressed in terms of the rate of urbanization (see definition in Box 1). The rate of urbanization is also equal to the difference between the urban population growth rate and the total (urban and rural combined) population growth rate; it is therefore a sensitive measure of the intensity of the redistribution of population from rural to urban areas. The rate of urbanization in the less developed regions was estimated at 2.5% during the period 1980-1985 and 2.4% during 1985-1990. In these regions, population redistribution from rural to urban was intense during the 1980s, and will still be important in the future.

The level of urbanization (Box 1) in the developing regions is expected to increase from 37% in 1985 to 45% by the end of the century, and to 61% by 2025. Most major areas of the world are likely to show some increase in urban population in the future; in Africa and South Asia increases as high as 30-60% are expected in each decade from 1990 to 2020.

The United Nations publication World urbanization prospects 1990 (3) shows that the growth in the world urban population over the period 1975-1985 was 507 million. This growth was 53.4% in developing regions compared with only 11.5% in developed regions.

A significant proportion of the urban population of the world resides in large agglomerations. The size and rate of growth of urban agglomerations are such that they outstrip the capacity of urban administrations to face the growing demand for services with the result that large sections of the population live in poverty and squalor. An urban

**FIG. 2**

PERCENTAGE CHANGE IN THE POPULATIONS OF URBAN AND RURAL AREAS IN DEVELOPING COUNTRIES UP TO THE YEAR 2025 *

MODIFICATION DES POURCENTAGES DANS LES POPULATIONS DES ZONES URBAINES ET RURALES DES PAYS EN DÉVELOPPEMENT, JUSQU’À L’AN 2025 *

![Graph showing percentage change in urban and rural populations](image)

* Base 1970.

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**Box 1. Definitions**

The level of urbanization is defined as the fraction of the total population living in the urban areas.

The rate of urbanization is defined as the annual rate of change of the level of urbanization.

The rate of urban population growth defines the change in the number of people living in urban areas relative to the initial number at the beginning of a given period.

Of the 22 regions of the world into which the 210 countries (or areas) have been grouped by the United Nations, the more developed regions cover five regions in Europe, Northern America, Eastern Asia (excluding China), Australia/New Zealand and the USSR; the less developed regions cover the remaining regions in Africa, Asia, Latin America and Oceania.
agglomeration comprises a central city or several cities and the surrounding urbanized areas. In 1970, there were 62 urban agglomerations with 2 million or more inhabitants; by 1985 there were 99. Fifty of these were situated in less developed countries and they have been growing more rapidly than those in the more developed regions.

In 1970, there were 20 urban agglomerations with a population of 5 million or more, of which 11 (55%) were in less developed countries. In 1990, there were 34 such agglomerations, 23 (67%) of which were in the less developed countries. It is projected that by the year 2000 the agglomerations of >5 million people will number 45, of which 34 (75%) will be in less developed countries.

“Mega-cities” have been defined by the United Nations as cities having >8 million inhabitants. In 1950 only 2 agglomerations in the world had 8 million or more residents: New York City (12.3 million) and London (8.7 million). According to the latest estimates, 20 agglomerations have reached that population size in 1990, and it is expected that by the year 2000 there will be 26, including 22 in less developed countries. The largest mega-city will be Mexico City, projected to reach 25.6 million inhabitants, followed by São Paulo (22.1 million) and Tokyo (19 million). Growth rates of urban agglomerations in the less developed regions are significantly higher than those in the more developed regions. This may perhaps reflect the vast differences between the two categories in terms of population growth rate and the pace and level of urbanization.

While the developing world is undergoing urbanization at an unprecedented rate, there are major differences among countries, areas and regions (Fig. 3). Those with low absolute levels of urbanization, such as in sub-Saharan Africa and parts of Asia, are currently experiencing high levels of migration from rural to urban areas and the ensuing rapid rate of urban growth. It is not simply the absolute level of urbanization that has negative consequences, but also the speed at which it is increasing which causes the demand for facilities and services to outstrip the resources available. Thus, no developing country can afford to ignore the phenomenon of urbanization in relation to health. Those that already have high rates of urbanization may well be aware that large numbers of their urban poor lack adequate health care. Those that have low rates are likely to find that a similar problem is developing in the poorest areas of their cities at an alarming and accelerating rate.

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FIG. 3

PERCENTAGE CHANGE IN URBAN AND RURAL POPULATION IN MAJOR AREAS OF THE DEVELOPING WORLD, 1950-2020

Despite vast differences in the degree of urbanization, regional trends also present similar features. In every case, urban populations are growing at a far higher rate than rural populations, generally at least 3 times as fast.

Where the urbanization level is already high, as in Latin America, virtually the whole of a region's population increase will be urban. Where it is low, as in sub-Saharan Africa and parts of Asia including China, a marked rise in the percentage of the total population increase is expected to take place in urban areas.

The demographic transition theory postulates that once death rates have decreased, people will tend "naturally" to lower their fertility. Nonenstein's model (4) of the demographic transition consists of three stages. "During the first stage birth and death rates are high and the population grows only slowly. During the second stage living and health conditions improve and death rates fall; the population grows fast as the birth rates are still high. Finally during the third phase economic and social gains combine to reduce poverty, and will also reduce birth rates; these will be in equilibrium again with death rates, but at a lower level".

Experience has shown that, notwithstanding the above, change often takes place at a very slow pace. In most developing countries of the Americas, for example, in spite of a decline in death rates, the situation is still one of relatively high fertility, thus the risk of falling into what has been called the "demographic trap" (5), that is an unsustainable state characterized by increasing pressure on the available resources and a rapidly deteriorating environment. King (6) points to the "ecological predicament in which the huge and rapidly-growing cities of the world find themselves at present. These cities, unlike the rural areas, "are normally fed, watered and supplied with energy and materials from elsewhere. Many are fed from the grain surpluses of North America. Many of these cities are even now barely viable and the human condition of most of their citizens defies adequate description and is better described as "eat to deteriorate" (6). Furthermore, there is the additional effect of the growth of the population under 15 and over 65 years of age and the related increase in the economic burden that the productive portion of the population must carry."

A 1985 United Nations report on the subject (7) points out that cities in selected developing countries, on average, are growing more from natural increase than from net migration. However, because the migrants are mostly in the age group 15-29 years, the role of migration in the growth process of cities is more important than this general finding seems to indicate. When the natural increase among migrants is added to net migration, it amounts to a very substantial proportion of total metropolitan growth. Because of their young age, migrants also create a demand for employment opportunities that few cities are able to meet. On the other hand, as the report states, migration, although usually considered in many cases to increase social costs, may benefit cities economically.

In short, the data available indicate that urbanization:
- is the major new factor in the demographic growth of the developing countries and is, in these countries, a severe problem;
- is not confined to large cities, as secondary cities also grow rapidly and are not exempt from the problems affecting the main cities;
- will not be dependent on continuing rural-urban migration, as already about two-thirds of urban growth stem from natural increase, and will therefore continue at a rapid pace after migration to cities tapers off or ceases altogether.

Figures, however eloquent they may be, do not tell the whole story and "no amount of statistics or reports can convey the true feeling and the real dimension of the destitution and even abjectness under which large populations in many cities of the world are forced to live. Only exposure to that destitution and direct observation of it can create the awareness and motivation required for dedicated involvement" (8).

Urban change in Africa. Africa is the continent with the lowest level of urbanization, but it shows the most spectacular increases in city populations, for example Khartoum, Nairobi, Abidjan and Dar-es-Salaam, more than 6-fold; Lagos, 16-fold; and Nouakchott, 40-fold. Here, net migration has contributed more than natural increase and yet these, as well as other African cities, present relatively slow or no economic growth.

As demonstrated by the United Republic of Tanzania, the reaction to the restrictions on rural-urban migration imposed during the colonial period, the need to build the institutional base of newly independent nations, and the enthusiasm for promoting import substitution industries may have triggered rapid urbanization after independence, even without substantial growth of national economies.

South Africa is an exception because even in the presence of a market and mixed economy the control on migration to large cities was maintained by the apartheid system.

Urban change in Asia. Aggregate figures show that South and East Asia have lower concentrations of population in cities than Africa and Latin America. However, by 1985 Third World Asia had 5 of the world's largest urban agglomerations: Shanghai, Beijing, Calcutta, Bombay and Seoul, each with more than 10 million inhabitants. In Asia during the 1960s and 1970s the richer nations (Iraq, Saudi Arabia and the Republic of Korea) showed the highest urbanization increase, while the poorer nations (Bangladesh, India, Myanmar, Nepal, Pakistan and the Philippines) showed the lowest. In India most of the rapidly growing cities (single-industry cities or state capitals) had less than 500,000 people; however, for the larger metropolitan agglomerates such as Bombay, Calcutta and Hyderabad, cities close by but outside the metropolitan area often grew more rapidly than the metropolitan centre as a result of "polarization reversal", also observed in other Asian cities and in Latin America. Here the tendency is towards decentralization of population and economic activities within the urban agglomeration. National trends, however, remain towards centralization.

China's situation is complicated by the multiplicity of factors brought to bear on the urbanization process. Kirby (9) recognizes three periods: one of rapid urban population growth (1949-1960), one of forced

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de-urbanization (1961-1976) by various means, and one of return to rapid urban growth with officially sanctioned return to the cities of millions of people previously displaced, and with net rural-urban migration playing a larger role than natural increase.

Singapore, Hong Kong, the Republic of Korea and China (Province of Taiwan) urbanized rapidly during the period 1960-1982 as they developed economically, while Indonesia, Malaysia and Thailand showed smaller increases in the level of urbanization despite relatively rapid economic growth. It has been suggested that this may be due to understatements because of inaccurate statistics, the exclusion from calculations of the 1982 data for new urban centres, the booming agriculture that kept the work force in rural areas, a rapid growth of jobs and incomes in the rural areas, but not in agriculture, or possibly a combination of these.

The political orientation may also be important as centrally-planned economies do not show the concentration of urban population that prevails in market or mixed economies.

As for China, the People's Democratic Republic of Korea and Viet Nam, the controlled de-urbanization imposed by governments during the period 1961-1971 have had important effects on the cities (10, 11).

Urban change in Latin America. Some countries of Latin America have a high proportion of their population living in urban areas and cities which rank among the largest in the world: by 1985 Buenos Aires, Mexico City, Rio de Janeiro and Sao Paulo had populations of more than 10 million inhabitants. The largest increases in the level of urbanization were observed in countries with rapid growth in economy and manufacturing in the period 1960-1970, such as Brazil, Colombia and Mexico. Now, however, urban growth rates are declining. Argentina, Chile and Uruguay experienced less dramatic recent increases in the level of urbanization and slow economic growth; their major urbanization impulsion was the result of immigration from Europe at the end of the XIXth and the beginning of the XXth century.

Peculiar to Latin America is the heavy concentration of productive activities and urban population in a few "core regions" which contain the largest cities: examples are the regions of La Plata-Buenos Aires-Campana Zarate-San Nicholas-Rosano-San Lorenzo, of Rio de Janeiro-Sao Paulo-Belo Horizonte and of Mexico City-Toluca-Cuernavaca-Puebla-Queretaro. Here growth has taken place mostly in the suburban rings.

The urban poor

The censuses of the 1980s on which levels and trends of urbanization in the developing countries have been estimated and projected, are rather old. Caution must therefore be exercised when interpreting the statistics reported and discussed in the previous sections, until the results of the 1990 or 1991 censuses are known.

The above caveat notwithstanding, certain conclusions are evident. The level of urbanization reached by cities and the speed at which they are expected to continue growing have different implications depending on the ability of the local authorities to provide existing and future populations with adequate livelihoods, appropriate health and social services, protection of the environment and the institutional and legal structures required to sustain development and preserve a balance between supply and demand. It is being realized that in most cities of developing countries local administrations have been unable to meet the challenge.

This failure to respond adequately has been the central problem for decades, but it has been aggravated recently by widespread economic difficulties. Poverty and its well-known array of social manifestations, deterioration of services and degradation of the environment are all consequences of this situation.*

The interpretation of the urbanization process has generally been based on the experiences of industrialized countries. In this model the key elements are the increasing complexity of technology and the shift in the demand for labour from the agricultural to the nonagricultural sector (12). The imbalance between labour demand and the geographical distribution of labour supply created "pulls" and "pushes" between urban and rural areas, and a migration flow from rural to urban areas with a resulting rise in the proportion of people living in the cities.

What happened in the developing countries may not easily fit this model as urbanization may be occurring independently of any increase in prosperity through industrialization. Urban growth may not be caused primarily by the "pull" forces of economic prosperity in the cities, but by the "push" forces of rural poverty. Even in economically stagnant societies therefore, there may be significant additions to the urban population which are not absorbed into the urban economy, but remain employed in unproductive fields or totally unemployed.

The situation may be aggravated by other events taking place in developing countries, such as economic recession, external debt, drought, storms and floods, guerilla warfare, etc., all of which contribute a further push to rural-urban migration and to poverty. Contributing factors may also be those government policies which tend to concentrate on new productive investments in large cities, thus diverting resources away from those working in small towns and rural areas.1

The population explosion experienced in the cities of the developing world during the last decade has resulted in a dramatic increase in the number of squatter settlements and slums.

It is estimated that an average 50% of the urban population live in conditions of extreme deprivation, and this figure is much higher in some cities: for example, slum and squatter settlements account for 79% of the population of Addis Ababa (and this proportion has been estimated to be as high as 90%). Although this may be an extreme case, other major cities in the developing world are not far
behind. By the end of the century, the urban poor may represent a quarter of the world population.

Unemployment, underemployment, low income, low education and malnutrition are closely associated with poor health. The unemployed in developed countries are estimated to number about 30 million, more than 70% of whom live in urban areas. It has been calculated that between 1970 and 1985 the size of the urban population living in absolute poverty increased by 73% (from 177 million to 306 million); the corresponding increase for rural populations was 11%.

Assuming that in the year 2000 one-half of the urban population is still living in conditions similar to present ones, at least 1 billion people will be counted among the urban poor. Of these, approximately 56% will live in Asia, 24% in Latin America and 20% in Africa. These figures, translated into human terms, forecast harsh times ahead for most of the poor living in the cities and towns of the developing world where squatter settlements built of cardboard, wood and flattened kerosene cans have already become a common sight and even a permanent feature of the landscape.

Attempts to analyse the characteristics of low-income households in urban areas bring to the fore the category of "women-headed households". In spite of scarce information on the extent of the problem, their growing number is generally recognized. So is their condition of being the poorest among the poor. Women heads of households, in addition to being among those with the least access to income-earning activities, have heavy domestic responsibility for the management of the household and the care and raising of children. This generally happens under conditions of neglect from authorities and of discrimination both in the job market (because they are women) and in the competition for shelter in low-income housing schemes.1

As many as 30% of all households in the world are estimated to be headed by women, with the highest proportions being observed in Latin American cities (more than 50%) (13).

In their discussion on the causes of urban poverty, Moser & Satterthwaite refer to the two stereotypical interpretations of the forms of social and economic development observed in different Third World nations. The first is known as the "modernization" approach in which Third World nations are undergoing a process of development similar to that experienced in the past by Western nations; a dualist economic and social structure would become apparent, of which the traditional and backward sector would become gradually adapted and assimilated into the modern sector, so that by the end of the century the dual economy and is attributed to their own shortcomings rather than to a malfunctioning society itself.

The alternative interpretation is that Third World nations, with few exceptions, could not go through a process of social and economic change similar to that undergone by Western nations because their societies are different and the international context has little in common with the one prevailing when the Western nations underwent rapid industrialization (large empires providing cheap raw materials, protectionist measures, etc.). The problem of urban poverty may not be one of particular characteristics and traits (or a "culture of poverty" as in Oscar Lewis), but the consequence of a particular type of economic development and the result of a lack of opportunities and resources. There is now an increasing tendency to give credit to the resourceful innovative behaviour of the urban poor in relation to their own survival strategies and to their importance as contributors, despite innumerable problems and constraints, to the social and economic development of the cities.

Rural-urban migration flows can be considered as responses, largely dictated by necessity, to changing economic circumstances. Moreover, on the whole urban immigrants have demonstrated a remarkable ability to adapt to urban life in ways that are necessary for survival. As Moser & Satterthwaite point out:

"People in urban squatter communities establish their own norms of social organization. Unstable households and high incidence of single-parent households are often cited as examples of the breakdown of social organization. But empirical studies suggest that they are more realistically seen as the result of economic uncertainty. Under conditions of extreme poverty, men may be unwilling to commit themselves to relatively permanent obligations. In other instances, women themselves may be unwilling to take on the liability of a permanent attachment. The fact that there are similarities between fathers and sons and mothers and daughters may well be the outcome of their sharing similar experiences and problems rather than the transmission of cultural traits. Where the under-utilization of public services such as health clinics by lower income groups occurs, the primary determinant may not be apathy or alienation (as so often thought by static theorists) but structural factors such as transportation costs or availability or clinic hours. Misra, in a study of a small squatter settlement in Allahabad (India) where illiterate, unscheduled castes made up most of the families, found that their under-utilization of the free hospital close by was essentially due to the fact that a three-four hour wait before seeing a doctor was common, and adults who have to work each day to survive cannot afford the time to do this. Furthermore, the inhabitants did not feel that the doctors in the hospital gave them much attention because of their low status—and some doctors were reported to tell patients that they can only receive treatment if they come to their private clinics for which they have to pay".

Experience has shown that the poor can develop complex patterns of social interaction based on friendship, kinship, ethnicity, caste or religion or important mutual self help initiatives, or developing mutual aid linkages with new neighbours. Such link-
ages provide the basis for community mobilization to appeal to local authorities to allocate public investments in infrastructure and services to the area. This contradicts the concept of political marginality. Likewise, it is possible to argue against the concept of economic marginality that portrays the immigrants as a mass of idlers, since the problem is not that of the unemployed poor, but of the "working poor" subjected to long hours of work under harsh conditions, and for low returns. The "informal sector", by which name a large proportion of Third World city populations is designated because self-employed or working in small enterprises escaping recognition and regulation, is neither marginal to the city economy nor a separate sector and is functional in relation to the prevailing economic system. Finally, the fact that squats and other low-income settlements are often spatially separated from the main city centre and better-off areas ("spatial marginality") does not mean that they are not closely integrated into the urban economy. Squatting on land ill-suited to housing or on tidal swamps or on land prone to flooding or landslides just makes it easier to avoid harassment and forceful eviction. In fact, now that the days of unrestricted bulldozing are generally over, an increasing number of governments are realizing that squatters and other poor urban populations can be functional to city economies and of benefit to city governments. It is therefore possible to conclude with Frankenhoff that "... it is essential to facilitate the involvement of the urban poor in the process of marginal communities into the process of urban development. There are political, social and economic arguments in favour of this option. The political argument states that increasing the stability of these slum communities in terms of jobs, housing, education and health will contribute to national political stability. The social argument states that the community which is helped to build itself will produce social benefits for the nation. The economic argument states that the slum community can generate significant consumer demands as well as capital formation. Houses, sewers, sidewalks, schools and clinics can be built by such a community with a minimum of assistance."

Reversing the trend

The current urban population increase is without precedent since today's developed countries experienced lower rates of urban population growth when they started to industrialize. There is great concern among governments about the consequence of rapid population increase and population distribution. In a survey conducted in 1978, only 3 out of 76 respondents expressed the desire to accelerate rural-urban migration. Most developing countries indicated dissatisfaction with the rise and continuing high growth rates of their largest cities. Preoccupation was expressed for the overloaded public services, inadequate social infrastructure, environmental degradation and the amount of resources needed to deal with these problems.

Even when migration benefits the individual immigrant, it may impose a heavy burden on the cities. This has led many governments to adopt policies to control and regulate the flow of rural-urban migrants. Opponents of these policies maintain that they disturb spontaneous balancing mechanisms and contravene Article 13(1) of the Universal Declaration of Human Rights which states that everyone has the right to freedom of movement and of residence within the borders of his own state.

Policies adopted by governments to stem rural-urban migration can be divided into the following four categories:

1. Incentive measures to reduce rural-urban migration. Taking into consideration the prevailing causes of migration, governments have undertaken reforms to increase rural employment and economic opportunities. Attempts have been made to replace traditional, landlord-type farming with modernized farming, or to abolish the use of servant labourers, or to introduce tenancy contracts or the introduction of mechanized production by landlords.

Paradoxically, land reform also stimulated urban growth indirectly, leading to transfer of capital and other resources to urban areas because of the improvements made by landlords in manufacturing, construction or other urban industrial sectors. There were exceptions: land reform did have some measure of success in Bolivia and Costa Rica, for example. In general, in such cases land reforms in order to be successful had to be backed by other policies relating to farm credit, rural infrastructure or favourable agriculture prices, among others. In many cases, for example in Egypt, these improvements never materialized.

Moreover, rural minimum wage legislation as a means of improving rural employment conditions failed to reduce rural-urban wage differentials and actually stimulated rural-urban migration rather than reduced it. This type of legislation was easily bypassed by paying a large proportion of the wage in kind, overvaluing the non-monetary elements, by replacing permanent labourers with unprotected casual workers and by accelerating labour-saving mechanization. Tax reform to induce land redistribution was also easily evaded (especially in the absence of an effective land-title system) or the burden was passed on to the consumer and thus contributed to raise labour costs.

Agricultural subsidies have been introduced in many countries but they have led to labour-displacing...
technological innovations, more rural unemployment and therefore more rather than less migration.

"Integrated rural development" as a migration-oriented policy has met with greater success, but has required massive government commitment to social services and infrastructure as in China, the Republic of Korea and Sri Lanka. In Cuba rural reform was part of an effort to transform the entire economy, following an unsuccessful attempt to industrialize, and involved a large transfer of resources to the agricultural sector.

(ii) Restrictive or coercive measures directed to rural-urban migrants. They consist of altering the distribution of the population through direct control of migration movement either by resettlement of part of the population or by legal restrictions on residence and employment in specific areas. In India such measures were difficult to implement and there is no evidence of impact on migration. In Manila (Philippines) these measures led to riots, and the return of displaced people to the city centre or to other slum areas was subsequently organized. In Rio de Janeiro (Brazil) eviction from favelas on hillsides near the city centre was not combined with relocation assistance to low-cost housing projects, but rents were too high and the new housing too far from the work place. In Jakarta (Indonesia) a "closed city" policy adopted in 1970 met with limited success and stimulated the development of a black market for identification cards and residence papers. In China, following the big urbanization move of 20 million people between 1949 and 1956, a registration system was introduced that seems to have been effective in reversing rural-urban migration. In general, however, legal migration control must be accompanied by important measures favouring the economic and social development of the rural areas of destination.

The largest population redistribution was carried out in China where, between 1969 and 1973, 10-15 million urban secondary school graduates were resettled in rural areas. It is debatable whether the motivations were political or economic (urban unemployment and the need to stimulate agricultural production), and it is not clear whether relocation contributed to rural development.

(iii) Colonization and resettlement schemes within rural areas. This approach consists of directing migrants from densely to sparsely populated rural areas. It is made possible, as in Latin America, by the availability of large quantities of unused arable land.

One such colonization scheme is in progress to resettle part of the population of the densely populated island of Java (Indonesia) to other less populated islands of the same country. There have been gaps between the programme targets and the actual numbers moved because of unrealistically high targets and political and administrative problems. The impact on relieving population pressure in Java has been minimal, and it was noted that the number of migrants to Java was 2.5 times the number of people resettled in the outer islands from Java.

Another ongoing effort to resettle people is in progress in the Amazon region of Brazil. Problems were experienced in the distribution of ownership titles because of inadequate organization complicated by the large number of people who migrated spontaneously to the Amazon region and by the activities of speculators who bought and resold land plots at high prices. It turned out that despite the vastness of the Amazon region, the number of people actually absorbed was insufficient to have an impact on the overpopulated regions of northeast Brazil.

Malaysia has carried out a successful resettlement scheme during the last 20 years that increased rural production, raised rural income and lowered rural-urban migration. This was achieved at very high cost (US$ 12 000 per family) and there are indications that the scheme will not be able to support the dependents (first generation) of the settlers who will have to seek work elsewhere. Thus a new migration cycle is created.

Similar programmes are available in India, Nepal and Sri Lanka and also in Bolivia, Guyana and Peru. Altogether, the available experience on colonization and resettlement schemes indicates that the benefits have been small and costly compared to the magnitude of the problems of population pressure, unemployment and poverty being faced.

Furthermore, there is no guarantee that a reduction in population pressure will be beneficial in the rural areas. In China where, between 1969 and 1973, 10-15 million people migrated from densely to sparsely populated rural areas, the return of displaced people to the city centre or to other slum areas was subsequently organized. It is debatable whether the motivations were political or economic (urban unemployment and the need to stimulate agricultural production), and it is not clear whether relocation contributed to rural development.

(iv) Policies to accommodate or redirect migrants within urban areas. To improve the social and economic conditions in the areas of destination of the migrants, low-cost housing has been constructed as in Caracas (Venezuela), or "sites and services" schemes have been developed. In Kenya minimum wages were set and employers were subsidized to hire more migrants.

Other policies attempted to redirect migrants to other urban areas by building dormitory towns, industrial parks or satellite cities with both housing and industries. The town of Pekine near Dakar (Senegal) and the "pueblos jovenes" (young communities) in Lima (Peru) are relevant examples: both ended up with populations much greater than planned. Similar initiatives were taken in Mexico City with the creation of industrial parks at the edge of the city which, however, were quickly absorbed into the rapidly-expanding city.

Another strategy for redirecting migration within urban areas is to decentralize industrialization by creating "growth pole schemes" on the assumption that congestion and unemployment in metropolitan cities can be relieved if industry is successfully located in smaller cities. This approach has been used in India, Malaysia, the Republic of Korea and Venezuela. Some success was obtained in situations in which large resources were available at the outset, as in the case of Ciudad Guyana in Venezuela, or where large industries were involved that could organize their own network of supply and repair services. In all cases the orderly projections of planners were upset by the large numbers of migrants flocking to the new development areas, which invariably and even in the absence of adequate infrastructure preparation ended up stimulating more rural-urban migration.

While it is difficult to compare the relative merits of the policies described above, some conclusions...
appear to emerge from available experience. Rural-based policies aimed to reduce migration, although successful in some cases, were generally insufficient to improve the standard of living in rural areas, largely because they could not be implemented as planned or because they were incompletely carried out.

The policy to control migration through legal measures, apart from possible ethical considerations, has only led to useful and durable results if additional measures were taken to improve the economic infrastructure and social services. Colonization and resettlement schemes designed to move people from high-density to low-density rural areas seldom succeeded in relocating the targeted number of people and also proved very costly. Finally, policies aimed at accommodating or redirecting migrants within urban areas, whether successful or not, tended to stimulate more migration from the rural areas and therefore aggravated urban congestion and unemployment.

In many cases, even potentially successful policies failed to provide the expected results because of incorrect planning, lack of interministerial coordination and poorly-guided execution.

SUMMARY

Migration from rural areas, urban growth and urban poverty in the developing countries have been briefly reviewed in this section. The world urban population is expected to reach 2.8 billion by the year 2000, i.e. 47% of the total world population and an increase of 44% over the level of 1985. Half of these urban people will be poor and to various extents will not have access to the essential services and amenities currently associated with life in the city. The speed of urbanization in certain regions (for example, in sub-Saharan Africa) has overwhelmed the capacity of city administrations to face existing and emerging needs. Attempts to reverse the migration trend and to control urban growth have generally met with failure.

RÉSUMÉ

La crise urbaine

Cette section analyse brièvement le problème de l'exode rural, de la croissance des villes et de la pauvreté urbaine dans les pays en développement. D'après les estimations, la population urbaine mondiale s'élèvera à 2,8 milliards d'habitants en l'an 2000, ce qui équivaut à 47% de la population mondiale totale et représente une augmentation de 44% par rapport à 1985. La moitié des habitants des villes seront pauvres et seront privés, à des degrés divers, des services essentiels et des équipements généralement disponibles en ville. Etant donné le rythme de l'urbanisation dans certaines régions, en particulier en Afrique au sud du Sahara, les autorités municipales n'ont pas les moyens de faire face aux besoins existants et nouveaux. Les tentatives faites pour inverser les flux migratoires et maîtriser la croissance des villes se sont en général soldées par un échec.

REFERENCES

The living conditions of hundreds of million urban dwellers around the world are hazardous to health, in addition to having potential catastrophic social consequences. The manifestations of the urban crisis vary greatly among countries and regions, but hardly any large city in developing and developed countries is immune.

The crisis in the urban environment is having a greater immediate health impact than could be expected from the current priority environmental concerns, i.e. changes in the natural environment, including global climate change, the loss of rain forests, pollution of seas, lakes and rivers, acid rain, and the disappearance of plant and animal species.

Urban growth has outstripped society's capacity to meet human needs, leaving myriad people with inadequate incomes, diets, housing and services. All too often urban development is associated with destructive effects on the physical environment and the resource base needed for sustainable development, leading to illness, accidents, crime and other social pathologies.

In the developed countries, where population growth has slowed down to very low rates, the major impacts of urban development on health and the environment result from technological changes: from psychosocial problems such as drug abuse, crime, mental illness and vandalism; from poverty; from increased consumption of resources, changing diet, changing residential patterns, shifts in transportation; and from the saturation of the environment's capacity to absorb wastes. Many of their cities need to extend infrastructures, replace them when they deteriorate, and control pollution more effectively.

In developing countries, the major impacts of urban development on health and the environment result from:

- rapid and massive urban population growth, both in megacities which are increasing in number and in secondary cities;
- the increasing density of human settlements, with overcrowding, congestion, traffic, and increased occupation of urban land subject to landslides, floods and other natural hazards;
- ever growing numbers of people living in extreme poverty, many of them—especially women and children—at high risk;
- increasing biological, chemical, and physical pollution of air, water and land from industrialization, transportation, energy production, and the increasing generation and improper disposal of commercial and domestic wastes; and
- the overwhelming of the financial and administrative capacity of cities to provide such infrastructures as water and sanitation, adequate employment and housing and waste management, and to ensure security and environmental controls as well as health and social services.

Urban health problems occur in all countries, but are most severe in developing countries, because (i) their populations—and particularly those living in poverty—are growing so fast; (ii) environmental changes have produced a pattern of health problems that includes both the diseases typical of under-development and the diseases typical of developed communities; (iii) the resources for response are relatively meagre, poorly distributed and misplaced; and (iv) inadequacies in governmental structures and policies inhibit effective responses. On the other hand, the concentration of resources—economic, technological, human—in the cities provides a stronger basis for action than is found in more dispersed settlements.

In many Third World nations, new urban forms are developing which are very different from Western concepts of urban settlements—perhaps, not surprisingly, since urban forms reflect the economy, culture and society of which they are part. For example, many African cities are "ruralizing" as jobs become so scarce and incomes so inadequate that lower and even middle-income groups increasingly grow part of their own food in or close to the city.

Housing

In the developing world, rapid urban growth has rarely been accompanied by adequate investments in infrastructure and services, especially in residential areas with a predominance of poorer households. Few governments have given priority to increasing the authority, resources and trained personnel available to municipal and local governments who were meant to cope with rapid urban growth. The result has been a rapid increase in the number of people living in very overcrowded and illegal or informal settlements.

There are hundreds of case studies describing the development of different illegal or informal settlements in Third World cities, and it is in these settlements that most new urban housing has developed over the last 30-40 years. These case studies reveal the ingenuity with which new settlements have been built at a low cost and with scarce resources; they often demonstrate a sophisticated capacity among poorer groups to organize and plan (i). But individual ingenuity and collective organization among low-income households cannot, without outside support, address problems such as unpaved roads, the absence of drains and sewers, piped water and garbage collection services, and treat accidents, injuries and illness. Even where community organization does seek a solution to some of these problems, this is often undermined by the hostility of the authorities to the settlement's very existence.

Rapp. trimest. statist. sanit. mond., 44 (1991)
It is impossible to estimate with any precision what proportion of all urban dwellers live in substandard housing with inadequate water supply, sanitation and other basic necessities. Case studies have shown that it is not uncommon for 30-60% of the population of a city to live either in illegal settlements with little or no provision of infrastructure and services, or in overcrowded and often deteriorating tenements and cheap boarding houses. Most of these case studies however relate to large cities, when in fact a high proportion of the urban dwellers in most Third World countries live in relatively small urban centres.

Estimates for 1990 suggest that less than 2.5% of the Third World's urban population lived in cities >10 million inhabitants and less than 25% in cities of > 100 000 inhabitants (2).

In most small urban centres and in many of the larger cities in the poorest Third World countries, the proportion of people living in illegal settlements may be smaller. This could partly be due to less inflated land markets. In addition, in many of the least urbanized nations, traditional land-tenure systems limit an individual's right to own, buy and sell land, and this has made it easier for poorer households to obtain land for housing. On the other hand, in these same urban centres the proportion of the population living in areas without adequate infrastructure and services may be as high or higher than in the largest cities of richer Third World countries—the inadequacies stemming less from their illegal status and more from lower incomes and weaker local governments.

Water

WHO estimates for 1985 indicated that one-quarter of the Third World's urban population did not have access to adequate safe water supply, and one-half did not have access to an adequate excreta-disposal system.

While there was considerable progress during the 1980s (designated by the United Nations as the International Drinking Water Supply and Sanitation Decade) in increasing water supply and sanitation coverage, the figures above certainly underestimate the number of people inadequately served. There are several reasons for this. Firstly, the criteria used to define an "adequate" water supply are open to question. For instance, the availability of a water tap within 100 metres of a house is often considered "adequate", yet this is not necessarily adequate for maximizing health (3).

In addition, statistics on coverage are often based on the assumption that all those with water taps in their settlements are adequately served—but frequently communal water taps are so few that people have to queue up for a long time. This has the effect of reducing water consumption below the level required for good health. In addition, in many tropical cities piped water systems function only intermittently, for a few hours each day, which makes it particularly difficult for households relying on communal taps. The water in piped systems is often of doubtful quality, and many households and settlements judged by governments to be "adequately served" by public systems may have to resort to other water sources or may not be able to afford to purchase the water they need.

Official figures for many of the poorer Third World nations claim that over 80% of the urban population had access to safe water in the mid-1980s, including 100% coverage in Nigeria and Liberia and 99% coverage in Togo (4). Local specialists find it hard to reconcile these figures with reality in the urban centres in which they work.

Sanitation

Most urban centres in Africa and Asia have no sewage system at all, including many cities with > 1 million (2). Rivers, streams, canals, gullies and ditches are where most human excrement and household wastes end up, untreated. For those cities with a sewage system, it rarely serves more than a small proportion of the population—typically the richer, residential, government and commercial areas.

Garbage-collection services are inadequate or non-existent in most residential areas of Third World cities; an estimated 30-50% of the solid wastes generated within urban centres are left uncollected (5). They accumulate on streets, on open spaces between houses and wasteland, they block drains and contribute to serious health problems. Here again, the problem is more acute in the poorer areas of cities.

Crowding

Another characteristic of most of the homes and neighbourhoods of poorer population groups is crowded, cramped conditions. This results in easy person-to-person transmission of diseases such as tuberculosis, influenza and meningitis. This is often aggravated by low resistance due to malnutrition. Poorer households frequently have less than 1 m² of space per person. In the most extreme cases, even small rooms are subdivided to allow multiple occupancy (for example, in a city of the Western Pacific Region many people live in beds stacked three high in dormitories, with each bed surrounded by a cage for privacy and protection against robbery); in one dormitory, 130 persons were found living in this way. In a large city in South-East Asia, bunk beds in tiny rooms are available for rent by the hour, with 2 or more persons renting the bed within any 24 hour period—this is known as the "hotbed" system.

Pollution

In terms of the broader environment, problems usually relate to high levels of air pollution. The main contributors and their relative importance vary greatly from city to city. In cities with high concentrations of heavy industry, the industries themselves are usually the main contributor. In many cities congested streets, poorly-maintained motor-vehicle engines and (often) high levels of lead in petrol contribute substantially to air pollution. Thermal power stations burning high-sulphur coal or oil are also frequently incriminated. In some cities, the use of wood or coal as the main domestic fuel is also a major contributor to overall city pollution, as well as to respiratory problems for the users of these fuels. A high level of air pollution in certain

* Murphy, D. Hong Kong: some are left out. In: Housing by people in Asia. Newsletter published by Third World Network and the Asian Coalition for Housing (1990)
Recent studies suggest that air pollution levels are sufficiently high in many cities of Latin America (for example São Paulo, Rio de Janeiro, Belo Horizonte, Bogota, Santiago, Mexico City, Monterrey, Guadalajara, Caracas and Lima-Callao) to warrant that high priority be given to control measures. Air pollution is responsible for an excess mortality of approximately 24,300 deaths a year and for over 2 million cases of chronic cough among children in this region. The same source estimated that some 65 million person-days of workers’ activities were lost to respiratory-related problems caused by air pollution. Although these are rough estimates, they give an idea of the order of magnitude of the problem. Topography and climate can exacerbate problems, as in Mexico City where thermal inversions help trap pollutants within the valley in which the city is located.

Meanwhile, in most cases there is little or no incentive for industry and commerce to cut down polluting emissions, since few are penalized and the penalties, when imposed, are so small as to have little deterrent effect.

There is also the interaction between the city and its wider region which usually includes large areas considered to be rural. Its inhabitants and its natural resource base usually suffer from a series of environmental impacts from city-based activities or city-generated wastes, for example:

- the destruction of coastal and estuarine fisheries as a result of water pollution from city-based enterprises— as recently documented for many cities in China, India and Malaysia, Lake Maryut in Alexandria (Egypt), the Gulf of Paria in the Caribbean, Manila Bay, the Bay of Dakar, the Indus delta;

- city water supplies taking priority over farmers’ water needs for irrigation;

- air pollution arising from city-based industries damaging vegetation—as recently documented around many Chinese and Indian cities or certain Brazilian cities.

Again, on this broad geographical scale, solid wastes from city enterprises present a particular problem as they are dumped on poorly prepared and maintained landfill sites. In most cities, there is little or no separation of toxic wastes from those which can be safely disposed of in landfill, and proper management of landfill sites is nonexistent. The result is contamination of the ground water used by farmers or rural households for their own consumption.

**Sustainable development**

Government policies and public institutions working in the urban sphere have a central role in meeting development goals—for instance in meeting people’s needs for water, sanitation, shelter and transport, and in implementing the laws and regulations which protect human health and the human environment from pollutants and pathogens. The achievement of sustainable development implies incorporating a concern for sustainability into existing development goals. Underlying the concept of “sustainable development” is a dual concern about the management of human activities: one relating to development goals and the other to the control of harmful impacts of human activities on the environment. Although the origin of this dual concern is not recent, the concept was made more explicit and the use of the term “sustainable development” promoted by the report of the Brundtland Commission, *Our common future*, published in 1987. In one of the most widely quoted definitions of sustainable development, the report stated that we must meet “the needs of the present generation without compromising the ability of future generations to meet their own needs” (7).

The goals of the development component are in effect the same as those stated in the United Nations Universal Declaration of Human Rights—i.e. meeting each person’s right to a standard of living adequate for health and wellbeing including food, clothing, housing, medical care and necessary social services. This same Declaration, subsequent United Nations documents and *Our common future* also stress that development goals should include the right to vote within representative government structures.

The “sustainability” component, with its emphasis on not compromising future generations’ needs, implies the need for human activities to avoid depleting what might be termed “planetary capital”. Thus, sustainable development requires that human society today should meet the needs of the world’s inhabitants without depleting three different kinds of planetary resources:

- **The capacity of natural systems to absorb pollutants without side-effects**, whereas the heavy costs passed on to future generations; at a global level the two most widely discussed threats to such systems arising from human activities are the depletion of the atmospheric ozone layer and the possible climatic imbalances caused by the emission of greenhouse gases.

- **The finite stock of nonrenewable resources**—for instance, fossil fuels and other mineral resources. Most of these resources (especially the fossil fuels burnt for heat and power) are consumed, so that finite stocks are depleted with use. Others are not “consumed” since the resource remains in the waste—for instance, metals in discarded goods. To some extent, these are “renewable” if materials in discarded goods are reclaimed and recycled.

- **Renewable resources**—although human use of some renewable resources (e.g. solar power) does not deplete the resource, in many cases the resource is only renewable if the natural systems on which it depends are not overexploited. Food crops and forestry products are only “renewable” if the soil, water and other elements of the natural system are not themselves damaged or depleted. Water supplies are only renewable within certain limits (for instance, water withdrawal from an aquifer cannot be sustained beyond the rate of natural recharge).

Since applying such a definition of sustainable development means making development sustainable at the level of nations and at the global level, it requires that socio-economic development objectives, also seek to maintain a constant stock of environmental assets for use by future generations and that they avoid irreversible damage
to any significant single asset. If agreement is reached on this principle of maintaining a constant stock of environmental assets, systems must be set up to catalogue the stock of assets and monitor their use. It also implies increasing the use of renewable assets and measures taken to safeguard natural systems from overexploitation. For nonrenewable resources, it implies efforts to increase the efficiency with which they are used (including the reclamation, re-use and recycling of materials drawn from waste streams) and a commitment to finding alternatives to resources whose future supply is in doubt. In regard to global life-support systems, sustainable development requires that the sum of all human activities does not jeopardize the capacity of these systems to continue to work effectively.

Such a definition of sustainable development has profound political implications since it involves constraints on the right of individuals, companies and nations to use resources which, under present law, they can legitimately use. If a particular kind of human activity is threatening the stability of the biosphere on which these developed and international on limiting this activity. What needs to be stressed is that sustainable development can be achieved; meeting development goals need not imply an unsustainable level of resource use or serious damage to natural systems. With careful planning and management, meeting development goals can be accompanied by more sustainable patterns of resource use. It can also be accompanied by such environmental improvements as better protection of natural landscapes and more attention to the preservation of genetic diversity.

However, many current global trends in resource use and polluting emissions are neither sustainable nor contributing to development. In the developing regions the main problem is the lack of development—the scale of poverty and the failure of three decades of “development planning” to make much impact on this. There are also worrying trends in terms of unsustainable levels of use for some resources, but the central problem remains the failure to meet development goals. In the developed regions, the problem centres on the current scale of resource use and of pollution—in particular the scale of consumption for certain resources and for greenhouse gas emissions which result from high-consumption lifestyles. The consequences of unmet developmental needs are manifested by more sustainable patterns of resource use. It can also be accompanied by such environmental improvements as better protection of natural landscapes and more attention to the preservation of genetic diversity.

The demand for resources arising from consumers and level of production in one nation can be a major

Cities and sustainable natural resource use

In their role as the main centres of production and consumption, urban centres are the location for the generation of most wastes arising from production and consumption. As a result, if provision is not made to control and remove such wastes and pro-

risk natural systems from which the city draws resources, cities become major centres for resource degradation.

Water needed for industrial processes, for supplying residential and commercial buildings, for transporting sewage (and other uses) is usually returned to rivers, lakes or the sea at a far lower quality than originally supplied. In many regions, air pollution from industries and internal combustion engines in cities has damaged vegetation (and affected farmers’ livelihoods) in surrounding areas. Solid wastes collected from city households and business are usually disposed of on land sites around the city, while much of the uncollected solid waste finds its way into water bodies, adding to the pollution.

The scale of interlinkages between rural and urban areas is so great that sustainable urban development and sustainable rural development cannot be separated. The more populous and spread-out the city and the richer its inhabitants, the larger its demand on resources is likely to be and the larger the area from which these demands are drawn. The rural—urban linkages can be positive in developmental and environmental terms. For instance, demand for rural produce and resources from city-based enterprises and households has often provided the basis for prosperous farming and prosperous rural settlements. Such links can also have negative aspects. For instance, agricultural land can be lost as built-up areas expand without control, and land speculation on urban fringes drives out farmers. The impoverishment of rural people in a region and their movement to cities may be considered a rural problem—but it may be largely the result of the commercialization of agricultural land and crop markets because of city-based demand. Although currently considered a rural problem, it may be intimately linked to the demand for fuel wood or charcoal from city dwellers and enterprises. Furthermore, soil erosion linked to deforestation may be destroying rural inhabitants’ livelihoods, with the result that they migrate to the city.

The relationship between human populations and the carrying capacity of ecosystems may receive increasing attention in the next decade. Latin American specialists have suggested that most of the areas in South and Central America experiencing rapid population growth in recent decades are within or adjacent to forest areas where sustainable exploitation of natural resources is more problematic. The expansion of the agricultural frontier is the most important element in altering or destroying natural ecosystems. As in most regions of Africa and Asia, this is not related only to population growth since the driving force for population movements to such areas is these people’s exclusion from access to better land (or other means of an adequate livelihood) elsewhere.

A major factor is the control by a small elite of most of the productive land within less fragile ecozones. In the northeast area of Brazil, a region long characterized by poverty, drought and emigration, it is not a shortage of good quality land but its control by a small proportion of people which fuels rapid emigration. This has been a major factor in the migration of poor Brazilians to Amazonia and the deforestation and other environmental problems to which they contribute.

The demand for resources arising from consumers...
factor in overexploitation of natural resources and environmental degradation in other nations. Consumers and producers in a rich nation may appropriate the carrying capacity of a city or a rural region in a poor nation—for instance, a demand for wood products in industrialized countries being the major factor in deforestation and soil erosion in one particular area of the developing world. The attempt by Western business to export hazardous wastes to developing countries is another aspect of this transfer of environmental costs from one nation to another.

Various factors have heightened the pressure on developing countries to increase their exploitation of natural resources. These include a shortage of foreign exchange and demands for payments of debts, the (often) deteriorating terms of trade so that increased volumes of natural resource exports are needed to compensate for falling prices (relative to the cost of imports) and structural impediments to the possibility of diversifying their exports, because of protectionist barriers around the world's largest consumer markets.

Considering first the extent to which current levels of nonrenewable resource use are sustainable, it should be noted that per capita consumption of resources such as metals and fossil fuels in the richest nations and cities of the world has reached unprecedented levels. In 1988, average energy consumption per capita in sub-Saharan Africa was 95 kg of oil equivalent; in many of the richest nations, per capita figures exceeded 5 000 kg of oil equivalent, more than 50 times the sub-Saharan African average (9). Comparable contrasts exist between per capita consumption in rich and poor nations for most other nonrenewable resources.

A distinction should be made between nonrenewable resources which are consumed when used (for instance fossil fuels used for heat or electricity) and those which remain after use but are discarded (for instance, metals in consumer or capital goods). For the fossil fuels, the rate at which they are used could be cut considerably in two ways: (i) by recovering them from waste streams—for instance, recycling the metals in road vehicles as is commonly done in most nations: and (ii) by ensuring that the goods into which they are incorporated are made to last longer or are re-used.

The dates at which the prices of nonrenewable resources will begin to rise rapidly, reflecting depletion of their stocks, may have been overstated in the various reports produced during the 1970s, but the finite nature of nonrenewable resource stocks is a certainty. There may be sufficient nonrenewable resources to ensure that the needs of 9-10 billion people on earth, late in the next century, are met. But it is unlikely that the world's resources and ecosystems could sustain a world population of 9 or 10 billion with a per capita consumption of nonrenewable resources similar to that enjoyed by the richest households today.

"Sustainable urban development" would have as its goal that cities (or urban systems) continue to support more productive, stable and innovative economies, yet do so with much lower levels of resource use. In the nations which make up the Organisation for Economic Co-operation and Development (OECD), the central issue in this regard is a reduction in nonrenewable resource consumption (especially fossil fuels). OECD nations represent about 15% of the world's population but account for around 80% of the world's consumption of nonrenewable resources. Governments can promote much less resource-intensive production and consumption through changes in the price of basic resource inputs (for instance a steady annual increase in the real price of fossil fuels) and support for their more efficient use (including the recycling, reclamation and re-use of many of the inputs into city production and consumption). Such measures provide little threat to employment in advanced economies; most new jobs are in the service or high-technology manufacturing sectors where the cost of natural resource inputs is very small relative to value added. The revolution in electronics and greatly improved communications also reduce the need to travel. Many new jobs will also be created by the development of more fuel-efficient, resource-conserving cities (10).

Most cities in the developing world are more resource-conserving than their counterparts in the developed countries. In terms of nonrenewable resource use, many cities in developing countries are among the most resource-conserving in the world. Per capita consumption levels are much lower and every item of waste from households or businesses which has some value is reclaimed for re-use or recycled. This is generally motivated by poverty; thousands of households can depend for their survival on a meagre income derived from selling materials obtained by sifting through garbage at the local dump.

In the longer term, growing national economies will make increased use of nonrenewable resources. The vast majority of nations in the developing world are unlikely ever to have per capita levels of resource use approaching those in the richest nations today. But stronger, more productive economies will demand substantial increases in nonrenewable resource use and the consumption of nonrenewable resources in the Third World is likely to grow rapidly.

**SUMMARY**

Poor living conditions in urban areas are destroying the lives, health and social values of hundreds of million people. Unsanitary neighbourhoods and housing conditions are damaging to health, as people are often exposed to air pollution, inadequate water supply, heavy traffic, excessive noise, and indoor air pollution associated with the burning of biomass fuels for heating and cooking. Urban growth has outstripped the capacity of municipal governments to deal with solid waste collection and disposal, and with air pollution due to road traffic, industrial activities and other sources.

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Air pollution (indoor and outdoor) is associated with excess morbidity and mortality from asthma and bronchitis, and water pollution with diarrheal disease, hepatitis and other diseases. Overcrowding and inadequate housing contribute to respiratory diseases, tuberculosis and meningitis, among other conditions. Poor environmental conditions in residential areas (including inadequate security of tenure and such problems as noise and heavy traffic) also contribute to stress, mental problems, accidents, violence, antisocial behaviour, as well as drug and alcohol abuse.

The concept of sustainable development implies the principle that meeting the needs of the present generation should not compromise the ability of future generations to meet their own needs. Furthermore, the demand for resources arising in one nation should not lead to overexploitation of natural resources and to environmental degradation in other nations. Finally, sustainable urban development should have as its goal that cities continue to support more productive, stable and innovative economies, yet do so with much lower levels of resource use.

RÉSUMÉ
L’urbanisation et l’environnement urbain

Les mauvaises conditions de vie dans les zones urbaines ruinent l’existence, la santé et les valeurs sociales de centaines de millions de personnes. Les habitants des quartiers et des logements insalubres sont exposés à de nombreuses nuisances — pollution atmosphérique, insuffisance de l’approvisionnement en eau, circulation, bruit, pollution de l’air à l’intérieur des habitations due à l’utilisation de combustibles de biomasse pour le chauffage et la cuisine. En raison de la croissance rapide des villes, les autorités municipales n’arrivent plus à assurer la collecte et l’évacuation des déchets solides et à lutter contre la pollution atmosphérique due, entre autres, à la circulation et aux activités industrielles.

La pollution de l’air — à l’intérieur des habitations et au dehors — se traduit par une surmortalité et une surmorbilité pour cause d’asthme et de bronchite et la pollution de l’eau est à l’origine de maladies diarrhéiques, d’hépatite et d’autres problèmes. Le surpeuplement et les mauvaises conditions de logement jouent un rôle dans les maladies respiratoires, la tuberculose et la méningite. Les mauvaises conditions ambiantes dans les quartiers d’habitation, notamment la précarité du statut d’occupation des logements, le bruit et la densité de la circulation, sont aussi des facteurs de stress, de troubles mentaux, d’accidents, de violence, de comportement antisocial, de toxicomanie et d’alcoolisme.

La notion de développement durable signifie que la satisfaction des besoins actuels de la population ne doit pas compromettre la capacité des générations futures à subvenir à leurs propres besoins. De même, la satisfaction des besoins d’un pays ne doit pas conduire au pillage des ressources naturelles et à la dégradation de l’environnement des autres pays. Enfin, pour être viable, l’aménagement urbain doit permettre aux villes de soutenir une activité économique plus productive, plus stable et plus créatrice, en utilisant beaucoup moins de ressources.

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HEALTH EFFECTS OF URBANIZATION

Awareness and information

Health for all is primarily a call for social justice which is best expressed through the concept of "equity". Equity could be said to mean that the essential must be available to all, but more must be available to those in need and in proportion to that need and the level of risk (1). Needs and risk conditions must therefore be known so that the commitment of politicians and health authorities and the support of the public for action in favour of those in need unfold gradually as awareness grows.

Cities are complex and heterogeneous entities within which health and health-related conditions vary widely between geographical areas and between socioeconomic groups. The information supplied to political leaders and health managers must reflect these differences in order to generate awareness of the health problems of the urban poor, and to stimulate and guide appropriate action in their favour. In practice, information from within the city may be meaningless and even misleading, if not properly disaggregated, since it does not allow the true dimensions of the problems and the real conditions of the deprived groups to emerge clearly.

Basta (2) remarks that among the reasons why city health statistics tend to look so much better than rural ones is that squatter or slum inhabitants do not appear in the statistics (they are not “official” residents of the city in many cases), or their inclusion is obscured by the enormous difference that exists between their status and that of the middle- to high-income parts of the city. Thus a very misleading average becomes the basis of that city’s statistics, and averages are, unfortunately, what many look at.

Statistical data are generally plentiful but appropriate information to provide effective descriptions of areas, populations and problems and stimulate action is either not available or not absorbed by busy administrators. Thus deprived of recognition, the urban poor are relegated indefinitely to their “marginal” condition which, at best, will attract temporary attention and stimulate palliative measures.

There is therefore an urgent need to systematically improve the information base for urban health development, to give proper emphasis to variations within the city of health conditions, health-related factors and the availability and utilization of health services, and to develop mechanisms for the prompt submission of analysed information to the responsible authorities and for feedback to the public.

To make this possible, routine information should be collected using approaches that will permit analysis by (small) geographical areas and by relevant social and economic characteristics. This has seldom been possible in the past. What routine information should include and what urban information systems should regularly collect, process and provide remains to be determined.

Indicators should also be developed for monitoring health conditions; they should be designed to allow for comparisons within the city, within the country and also at the international level. An example is the publication of Minimum evaluation procedures for water supply and sanitation projects which gives a detailed description of indicators for monitoring and evaluating drinking-water and sanitation services. Other publications provide the basis for indicator selection (3-5). A report of a joint UNICEF/WHO meeting on primary health care in urban areas identifies, on the basis of city experiences, at least three uses for indicators, namely (i) the detection of high-risk urban communities, (ii) case and community health management by the community health worker, and (iii) management by the primary health care supervisor. In all cases the emphasis is on a strategy of indicator selection and data collection that differentiates high-risk groups quickly and cheaply.

Routine information should be complemented where necessary by ad hoc surveys focusing on specific aspects. The importance of these surveys cannot be overemphasized as they can provide critical information on specific issues when it is needed and at a relatively low cost.

In practice, the scarcity of appropriate information is increasingly deplored. It is to be hoped that from efforts such as the ones mentioned above, the health profiles of major and secondary cities, showing internal differences and their perceived determinants, will gradually emerge. Careful choice of appropriate methods is important also in order to reconcile the need for more information with that for timeliness, economy and, to the extent possible, freedom from bias. A series of observations interesting from the point of view of content and methods is reported by Williams.

The health interview survey, cross-sectional or longitudinal, is probably the most commonly used method for identifying types of illness and causes of morbidity, and to assess utilization of health services. Ross & Vaughan have made a review of such surveys carried out during the last 15 years in rural and urban areas of less developed countries. While they deplore the scarcity of theoretical studies upon which the rational choice of methods could be based and the lack of rigour in their application, they

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suggest ways to improve survey performance and results. As health interview surveys are generally used to improve planning, ample consultation should take place between planners and epidemiologists, and the results should be communicated widely and fed back to study populations. The objectives should be clear and the study design tailored accordingly. A multistage, stratified sample is the most efficient way to determine the sample population, with the final stage unit preferably being the household. Among many other things, they recommend larger sample sizes for more detailed information and particular attention "to the representation of marginal groups (slum dwellers, migrants, etc.) who may not be recorded in official population statistics".

Much can also be learned from qualitative information related to preferences, attitudes, beliefs and opinions of both communities and health workers.

Such information is useful to define the context for quantitative data and can be obtained using methods such as participant observation, unstructured interviews and discussions with relevant groups. The report of a survey in which qualitative and quantitative methods of data collection were usefully associated in Cairo (Egypt) (7) pointed out that excessive dependence on quantitative data may provide an incomplete and perhaps distorted picture of the situation.

Information systems for the management of urban health development need reorientation and streamlining in most cities of the developing world. Many efforts in this direction are being undertaken. Essentially, these systems should be judged by their capacity to:

- provide disaggregated data for residential areas (whether legal or illegal) according to the health status of their inhabitants and their social needs, and according to the extent to which these needs are satisfied;
- support management at the local level (neighbourhood/district and aspects of health action at this level);
- support management at higher levels and provide feedback to the public and institutions involved.

Guidelines for rapid appraisal to assess health needs of urban communities have been developed by WHO4 and used in a number of urban situations.

**Vulnerable urban groups**

The poor in the cities of the developing world are all vulnerable, but particular risks may vary according to age, sex and other relevant factors. Vulnerable groups include the following.

**Children.** Millions of children in the world live in dramatically difficult circumstances. They require urgent attention, protection and assistance by families, communities and governments in the context of national policies and international cooperation.

The urban environment can be particularly hostile to children. Poor housing, low-quality and insufficient food, high environmental risks, lack of parental supervision and even abandonment, early childhood labour and other consequences of urban poverty are endemic and contribute to high morbidity and mortality in this group. Formal education systems are often inadequate, and family and community structures in the urban environment provide little opportunity for informal education through, for example, peers and grandparents. There are limited recreational facilities. Children, particularly those in single-parent families where the parent often has to work long and irregular hours outside the home, suffer from cultural deprivation and face a conflict of value systems, which further contributes to psychosocial difficulties. The proportion of unattended or abandoned children is high, and there are only limited facilities at the community level to provide care and protection. Under these conditions, children easily fall prey to the enticements and promises of unscrupulous people. Abuse and exploitation of children in a variety of ways and their involvement in prostitution and crime are becoming common features of the cities.

According to the International Labour Organisation, some 55 million children under age 15 were working in the developing countries in the late 1970s (9). As this estimate includes only full-time workers and the figures are provided by the countries concerned, it is likely to be a gross understatement. The number of street children has grown as a result of rapid urbanization, and the circumstances in which they live seriously jeopardize their health, safety and moral welfare. They are often a product of massive migration from rural areas and the resultant breakdown of family life, or of the death of a parent, or the divorce or separation of parents.

These children, now an integral part of the urban scene and estimated to number about 80 million (9), lead hazardous lives, sometimes working at odd jobs, scavenging or begging for food, and often having to seek shelter. Some, unsupervised by adults, spend their days on the street but are able to return home at night. Others have no home to return to and sleep anywhere they can find shelter. Besides having an unstable environment, they do not attend school, live hand-to-mouth (being undernourished as a result) and are more likely than others to turn to stealing or violence as a way of living.

Abandoned children inevitably suffer the consequences of lack of sanitation and clean water, occupational accidents, sexually transmitted diseases, drug abuse, crime, and all the other effects of striving to cope alone, resulting in a deep sense of insecurity and emotional conflict. There seems to be no place for them in the present social system.

Sexual exploitation of children is another serious problem which governments and a number of organizations are trying to bring under control (10). Here too, it is impossible to give precise figures, but estimates are high. The extraordinary growth of tourism has led to dangerous developments in this area, especially in some cities of the developing world.

Thousands of girls, some as young as 12 who have been sold by their parents, are caught up in a network of prostitution, child pornography and drug trafficking. The prostitution of male children is also increasing. Kept in bonded labour, children of both

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sexes are exposed to alcohol and drug consumption and dependence, and sexually transmitted infections are widespread among them. Governments are reluctant to release information, lest it give their country an unfavourable image, even though they thereby make remedial action more difficult.

Other forms of child abuse are also on the increase, although some researchers think that the figures may reflect growing awareness rather than rising incidence. Nevertheless, only a small fraction of all such abuse is reported, probably amounting to no more than 20-30% of all cases (11). The problem is complex and borders or overlaps those just mentioned. It includes physical abuse and excessive behaviour of different kinds (beating, burning, deprivation of food, etc.), as well as emotional deprivation, sexual, psychological and mental cruelty, and partial or total abandonment. The slums and shanty towns of the developing countries constitute an environment that is all too conducive to child abuse, given all the difficulties which parents face in bearing, feeding and raising children there.

Tragically, there is a high concentration of abuse in institutions established for the care and wellbeing of young people. Child abuse may well be a self-perpetuating process, as often the "guilty" parent was abused as a child. Preventive and remedial action is hampered by difficulties in defining child abuse in legal terms, and getting law-makers and social agencies to agree on what is to be done.

Women. A significant proportion of urban households are headed by women who in many cases do not have any close relatives living nearby, and the nature of the marginal areas in which they live does not foster the development of other links as alternative support. Many women have to seek work to support their family. In the context of high unemployment, their often limited education and job skills tend to confine them to low-income occupations or to the service sector; their working hours are often long, so that their families, particularly the younger children, are deprived of care and protection. This situation also has adverse consequences for their own physical and mental health. They may run a persistent risk of pregnancy in their search for male support, they are often malnourished and exposed to mental stress, sexual harassment and abuse in searching for and maintaining a job. They tend to neglect their own health, putting their children's interests before their own; their access to health services is limited, perhaps because such services do not exist locally or do not have convenient opening hours, or are too costly.

Other vulnerable groups are found among adolescents, workers and the elderly, who may be at great disadvantage when living and working in poor urban areas.

Health consequences of rapid urbanization

It is difficult to define and describe poor urban populations with a sufficient degree of statistical reliability. From the health point of view, the urban poor can be said to be at the interface between underdevelopment and modernization and their disease patterns reflect the problems of both. From the former they inherit a heavy burden of communicable diseases and malnutrition, while the latter brings its typical spectrum of chronic and social diseases.

The patterns of mortality and morbidity observed among the urban poor are shaped by the environmental conditions and behaviours prevailing in their areas of origin, and by those of the areas to which they are confined in the city, as well as by the web of low income, insecurity and unsatisfied human needs typical of life in Third World cities.

It has often been said that it is not so much the difference between life in the rural and in the urban environments that matters, as the contrast between affluence and poverty, and the fact that the real dimensions of the latter are generally buried, at times intentionally, in the average values used for urban-rural comparisons. On the other hand, some conditions are typically associated with life in poor urban areas. These include:

- the fact of being forced to live on land that is environmentally hazardous; the limitation of space and the overcrowding; the threat of eviction;
- the fact that the extended family with its protective structure has been replaced by the nuclear family; the social structures available in the rural areas is destroyed in the migration process and difficult to rebuild in the city;
- the higher vulnerability of the urban immigrant and slum dweller;
- the higher proportion of single-parent households, often headed by a woman, and the consequent need for women to work and the risk of children being neglected;
- the need for children to contribute to the family income and thus be exposed to accidents, maltreatment and abuse.

Three groups of health hazards have been recognized as simultaneously and perhaps synergistically operating on the urban poor: the first includes low income and low education, overcrowding, underprotection and inadequate diet which generally leads to communicable diseases and malnutrition; the second includes man-made conditions such as pollution, traffic, noise, stress, alienation and unhealthy behaviour predisposing to cardiovascular, neoplastic and mental diseases, as well as to accidents in the home, at work and on the road; the third is related to social instability, promiscuity and prostitution which, in a context of poverty and low education, can lead to alcohol and drug abuse, crime, child abuse and sexually transmitted diseases (12). Many case studies within specific cities have highlighted the fact that those living in poorer districts face more serious health problems than those living in wealthier districts.

These studies suggest that infant mortality rates or the incidence of some of the most serious common diseases are several times higher in poor districts when compared to city averages or to wealthier districts. Most highlight the health problems of poorer groups, because they contrast average health statistics for districts with a majority of poor inhabitants with averages for the whole city, or for districts with a majority of rich inhabitants. Contrasting health statistics for poorer groups and richer groups would certainly reveal an even greater disparity.

The profusion of statistical data on urban areas contrasts with the scarcity of appropriate information that can be used with confidence to stimulate awareness and for planning and evaluation purposes. Too often, information about poor squatters and slum inhabitants, because of their alleged "illegality" is not included in official statistics or is hidden in misleading averages relating to the city as a whole. The need for suitable and reliable city information profiles is felt widely. Many vulnerable at-risk groups are found in the growing cities, most important among them are children and women. The urban poor suffer the worst of two worlds: poverty on the one hand, and uncontrolled modernization on the other. The resulting health pattern includes a majority of infectious diseases and malnutrition, an increasing prevalence of cardiovascular and neoplastic diseases and accidents, as well as a worrying proportion of diseases due to maladjustment, promiscuity, alcohol and drug abuse, and crime.

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SELECTED HEALTH PROBLEMS

General

A large number of studies have been reviewed and their findings summarized in this section; some were included in the report by the Urbanization Panel of the WHO Commission on Health and Environment (1).

The review is not exhaustive but, as already pointed out, the emerging general picture seems to be one where the urban populations in developing countries suffer the "worst of both worlds" in their mortality and morbidity profiles. They experience the problems of populations in less developed countries (deaths from infectious diseases, malnutrition and a predominance of post-neonatal deaths over neonatal deaths) as well as those of populations in developed countries (deaths from lung cancer, cardiovascular disease and accidents).

A number of descriptive studies examine intra-urban differentials in mortality from all causes and point to the link between poverty and increased mortality, but (generally) without reference to intermediate variables. This is true also of many morbidity studies, which explore the determinants of ill-health and use "poverty" as a proxy indicator for their analyses.

The studies which examine urban differentials in mortality and morbidity tend to focus on communicable diseases, particularly diseases transmitted through the gastrointestinal tract. The literature on links between the urban environment and urban mortality places an emphasis on infant deaths and deaths from communicable disease, and glances over other conditions such as respiratory infections and accidents.

In several studies linking water quality and access to infant mortality from communicable disease, access to an "individual" water supply emerged as an important variable. The interaction of behavioural factors is noted, including the importance of maternal education.

Would-be causal studies relating urban conditions to mortality should be interpreted with caution: some of these studies derive environment-mortality associations from total population-based data, while other studies are facility-based or limit their investigation to a particular age or socioeconomic group.

Study results indicate that deaths from communicable disease disproportionately affect poor urban groups, with infants and children among these groups being particularly at risk. A similar pattern emerges from the studies examining morbidity and communicable disease.

Emerging from the analysis of overall mortality is the significant impact of noncommunicable degenerative diseases in urban areas, as the predominant cause of mortality for total populations and for adults, and as the main cause of death across socioeconomic groups. The link between poverty and increased mortality from noncommunicable disease with and without reference to intermediate variables is also evident.

Studies analysing morbidity are more numerous than those investigating mortality by cause in urban areas; they show associations with environmental variables, such as water accessibility and quality, and sanitation.

Many studies point to the complex synergism of environmental and social risk factors for communicable (and also for noncommunicable) diseases. Some studies perceive that health outcomes in urban areas derive ultimately from the socioeconomic, more than the physical environment. Studies of intra-urban differentials related to communicable diseases remain rare, and tend to concentrate on children. Numerous studies demonstrate a high prevalence of diarrhoea and helminth infections in children living in slums, shanty towns and squatter settlements.

Evidence of intra-urban differentials in nutritional status is plentiful, with poorer groups (particularly women and children) being at a distinct disadvantage. There are few studies on chronic disease in urban areas of developing countries. Where data on mortality are available, diseases of the heart and neoplasms emerge as significant causes. These have been termed "diseases of affluence" but their existence in urban areas of developing countries suggests that they might be more aptly titled "diseases of modernization", in which "modernization" is a composite determinant of ill-health and mortality, acting via diet, health behaviour and psychosocial factors. At present, modernization seems to be most notable in urban rather than rural areas of developing countries and tends to implicate urbanization as a determinant of mortality from noncommunicable disease such as heart disease, malignant neoplasms or hypertension-related conditions. As already pointed out, it seems probable that the rural/urban division is to some extent an artificial one. Intra-urban differentials in mortality and morbidity from noncommunicable disease indicate that the greatest burden is upon the poor.

For adults in urban areas, data indicate that the interaction of psychosocial and economic variables produces a mortality and morbidity pattern largely idiosyncratic to an individual city and its people at that time. Descriptive studies of adult mortality do exist and data can be disaggregated for urban areas, but there are few studies which have managed to identify psychosocial causal mechanisms acting on adult health in the urban environment. Those that do this tend to originate from developed countries and many point to links between poverty and mortality. In trying to identify intermediate variables in urban 

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situations most studies produce results specific to a certain urban locality.

Poverty as a composite index of deprivation extending from command over economic resources, access to education, social support and self-esteem to control of housing and the quality of the physical environment remains the most significant predictor of urban morbidity and mortality.

A comprehensive and detailed review of specific disease priorities in urban areas is not possible within the compass of this section, even if it were to focus only on low-income and underserved populations. Nonetheless an attempt has been made to deal briefly with specific diseases or conditions that appear to have a special interest in relation to urbanization, beginning with malnutrition which often constitutes the common denominator for a variety of diseases due to other causes.

Food, diet and nutrition

Food, diet and nutrition are important aspects of health development which are profoundly affected in different ways by urbanization. Food and diet interact with infectious diseases and unhealthy lifestyles to cause wasting and stunting in some cases and diet-related noncommunicable diseases in others. The relationship between malnutrition and high death rates in early childhood has been clearly established. In Patterns of mortality in childhood (2) the Pan American Health Organization reports the results of a study conducted in 10 countries of the western hemisphere on the causes of death in infants and children. It concluded that nutritional deficiency was the most important health problem associated with childhood mortality in South America. Table 1 from another study, a longitudinal one carried out in Bangladesh in about 2000 children aged 0-23 months, documents the increased risk of death according to degree of malnutrition.

Urbanization produces significant changes in the way people live, in dietary practices and, depending on the urban setting, in the amount and quality of services used. In dealing with food and diet, mention will be made of the effects of urbanization on agriculture, food production and distribution and services.

Rural-urban migration can reduce the number of agricultural producers just when demand increases.

Table 2 summarizes the result of a study* attempting to estimate the increase in food requirements (expressed in wheat equivalent) in middle- and low-income countries for the additional urban population by the year 2000. To produce this food would require a 24% increase in production per agricultural worker in Africa, 16% in Asia and 17% in Latin America.

Urban life requires significant changes in diet, with commodity processed foods becoming obligatory components of the diet. Newly-arrived migrants are often pushed into illegal and overcrowded settlements, away from markets and transportation. Certain foods are purchased because of their relatively low price; roots, tubers and coarse grains are thus often replaced by simple sugars and fats coupled with refined starches. This type of diet leads to wasting and stunting in infancy, and to noncommunicable diseases in adults.

Improvements in market structures are necessary to reduce the cost of more adequate diets and improve standards for food preparation; sales have to be maintained through different means. The poor in a city usually have to pay more than the higher income group. Price increases are associated with losses and deterioration of the food items as they pass through the marketing process.

Table 1. Protein-energy malnutrition and associated mortality over a 12-month period in children aged 0-23 months, rural Matlab, Bangladesh, 1975

<table>
<thead>
<tr>
<th>Method of measurement</th>
<th>Percentage of inter­national reference</th>
<th>Percentage of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight-for-age</td>
<td>60-75%</td>
<td>3.7</td>
</tr>
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<td>Height-for-age</td>
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Table 2. Estimated increase in food requirements, developing regions, 1980-2000

<table>
<thead>
<tr>
<th>Region</th>
<th>Additional requirements due to urban immigration</th>
<th>Additional requirements due to natural increase</th>
<th>Total additional requirements for urban areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa — Africa</td>
<td>25.6</td>
<td>31.3</td>
<td>56.9</td>
</tr>
<tr>
<td>Asia — Asie</td>
<td>78.1</td>
<td>95.5</td>
<td>173.6</td>
</tr>
<tr>
<td>Latin America — Amerique Latine</td>
<td>26.8</td>
<td>32.8</td>
<td>59.6</td>
</tr>
</tbody>
</table>

Source: FAO (see footnote *) — Voir note *.

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Because of massive urbanization and the well-intentioned donation of wheat, the consumption of traditional staples—maize, rice, millet, etc. has been rapidly decreasing. In Mexico City, for example, the consumption of maize in the urban diet is decreasing in favour of rice and wheat. In Côte d'Ivoire, the high yield of maize and rice is inducing a rapid decrease in the consumption of millet, roots and tubers. The diversification of the diet taking place in the process of urbanization comes to a large extent from the permanent availability of fruit, vegetables, meat and poultry, milk and dairy products. There is a tendency for complex carbohydrates to be replaced by sugar, fats of animal origin and sweet beverages.

Household surveys throughout the world (3) have confirmed the increased intake of sugar, alcohol, soft drinks, highly milled cereals and processed foods.

The consumption of commercially-prepared meals has become an important aspect of urban life. In the poor areas these meals are provided by the informal sector in response to the increased demand from large numbers of single adults, students, and men and women employed outside the home. The demand is facilitated by more irregular meal schedules within the family and by changes in the availability of time and facilities for food preparation. FAO studies show that the lower the socioeconomic status of the street food consumer, the higher the percentage of total income spent on street food consumption.

Urbanization has therefore resulted in a proliferation of street food vendors. From an economic point of view this is a positive development, as about one-quarter of the urban labour force (especially women and sometimes entire families) works in the street food trade. From the health point of view however, the risks of contamination, adulteration, use of non-processed and storage techniques, are high.

Despite these difficulties, in the short term most street foods are surprisingly safe, while the long-term effects are more difficult to assess. Codes of hygienic practices for street foods are currently being prepared under the auspices of the FAO/WHO Codex Alimentarius Commission.

In general, urban dwellers ought to have a better quality of life than rural populations, since they have access to health care and additional services, to water supply and sanitation and to a more diversified diet. This, however, depends on the conditions of the city. In Brazil, for the same income, health conditions are better in São Paulo (South-east) than the North-east, while in other countries low-income urban dwellers seem to be worse off than rural groups. Black and Hispanic neighbourhoods in slum areas of cities of high-income countries have higher infant, child and maternal mortality. The level of activity in an urban settlement may explain the reported lower energy consumption in urban slums. Moreover dietary surveys in a city may not always take into account snacks and soft drinks more widely available in the urban set-up.

The complexity of the situation to which the urban poor are exposed is well exemplified in the observations on a slum in Stockton-on-Tees (United Kingdom) by M’Gonigle in 1933 and referred to by Wray (4). In this study, an unexpected increase in crude mortality was observed over a 5-year period in a population which had moved to a new housing area. Clearly, the possible gain that might have been derived from the better housing situation was offset by the reduced dietary intake that the increase in rent (although modest) forced on these families.

In many poor urban areas the effect of overcrowding is increasing the risk of transmission of diseases; the need for women to work outside the home can affect pregnancy and lactation and may be associated with a high prevalence of low birthweight and wasting at early ages (5).

Fig. 1 shows the high prevalence of weight deficit in a slum area of Bangkok in the first six months of life. Recent studies in Egypt, Kenya and Mexico suggest that most of the weight and height deficits during the first years of life could be attributed to problems in pregnancy (6).

Conditions in cities are so diverse as to make it difficult to generalize the specific causes of a problem. Working mothers represented an asset in the health of the children in Candelaria (Colombia) while it was a negative factor in a similar town in Costa Rica. Generally, mothers in the slums have to work outside and rely on artificial feeding provided by other persons. Table 3 illustrates the relationship between the duration of breastfeeding and the risk of mortality.

As pointed out in a recent systematic review of urban malnutrition (7), employment and conditions of work are factors of paramount importance in relation to the health and nutritional status of children and mothers, breastfeeding and weaning practices, and to the ability of the family to pay the prices of food and other essential items or to face various kinds of possible economic crisis. Box 1 illustrates the complex relationships which in an urban situation may influence the nutritional status of the child at various levels of the social system.

Other observations point to the influence of urbanization on the shortening of breastfeeding and early supplementation, particularly in urban and peri-urban areas. Low proportions of children ever breastfed and shorter duration of breastfeeding are reported in urban areas throughout the world.

Early and sometimes inadequate supplemental feeding is a problem of urban areas. In a multicentre study conducted by WHO (8) urban infants were supplemented earlier than rural infants except in the Philippines and Zaire (9, 10).

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7 FAO. The role of food quality and standards in food security, trade and health. Committee on Agriculture. (FAQ document COAG/87/5).
8 FAO. The role of food quality and standards in food security, trade and health. Committee on Agriculture. (FAQ document COAG/89/3/ Suppl.1).
10 Wray, J. O. Nutrition and health in urban slums. Paper prepared for a workshop on community health and the urban poor organized jointly by the London School of Tropical Medicine and Hygiene, OXFAM and UNICEF, 7-16 July 1985, Oxford, United Kingdom.
FIG. 1
PREVALENCE OF MALNUTRITION AMONG RURAL AND URBAN CHILDREN BY AGE AND SEVERITY, THAILAND, 1972
PRÉVALENCE DE LA MALNUTRITION CHEZ LES ENFANTS EN MILIEU RURAL ET URBAIN SELON L'ÂGE ET LE DEGRÉ DE GRAVITÉ, THAÏLANDE, 1972

![Chart showing prevalence of malnutrition by age and severity in rural and urban areas, Thailand, 1972.](chart)

A summary of some of the problems, interventions and constraints observed in current programmes in urban areas is presented in Box 2. The chart has to be interpreted carefully as it includes cities with very different characteristics and the interventions and constraints are pooled together. Some of the positive experiences have been recently analysed (11).

Rapid urbanization has created situations that require urgent action to improve access to food for the poor and teach them better consumption habits. Current efforts in developing countries are aiming to establish "fair price shops" and consumer cooperatives, the building of reserve food storage and communal buying. Activities such as these are included in a comprehensive programme established in São Paulo (Brazil) by the Secretary of Agriculture and Food Supply with FAO assistance (12). The programme operates along three main lines: facilitating access of poor households to food, educating families in better nutrition practices and monitoring impact.

Country programmes partially supported by World Bank loans include a variety of indirect food transfers for the urban poor such as those through ration shops and government stores distributing a basic food basket at controlled prices and food coupons.

Improvements in consumption levels have been documented in some cities in Brazil and Colombia and a clear deterioration in urban areas of Sri Lanka.
Box 1. A framework for the analysis of different influences on child nutritional status

<table>
<thead>
<tr>
<th>Level of social analysis</th>
<th>National</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>food pricing and distribution policies</td>
<td>employment, environment, housing and health policies</td>
</tr>
<tr>
<td>Community</td>
<td>Social class, household economic and social relation with others in the community</td>
<td>Quality of environment</td>
</tr>
<tr>
<td>Household</td>
<td>Household resources: income, ownership of assets, levels of indebtedness, adult health and nutritional status</td>
<td>Household demand for food and other basic needs, household size and structure</td>
</tr>
<tr>
<td>Individual</td>
<td>Child's physical development, feeding patterns and illness</td>
<td>Child nutritional status</td>
</tr>
</tbody>
</table>

Source: Reference (7) — Référence (7).

FAO is preparing to extend to poor urban areas food distribution so far confined to deprived rural areas (23).

Emphasis has also been placed on the quality control of street foods that can be obtained from the very large number of street vendors and may constitute a risk of spreading food-borne diseases among low income consumers.

Nutrition surveillance activities are of particular importance to guide policy, design programmes and in general understand how the poor urban consumer has access to food supplies and other relevant facilities. For example, it was found that expenditure on public transportation among poor householders in the slums of Rio de Janeiro could absorb as much as 30% of total household expenditure, well above rent and food expenditure. Monitoring information is all the more important at times of economic adjustment measures that can adversely affect the conditions of poor urban populations and the programmes for them. A new impetus was given to food and nutrition information systems through the combined efforts of WHO, FAO and UNICEF collaborating under the auspices of the Administrative Committee on Coordination to promote and support governments in the utilization of regular sectoral information to monitor risk factors for health populations and give orientation to sectoral activities and policies.

These systems have been using data normally collected by the different sectors, by household income and expenditure surveys, or by other means to monitor health, food and diet, and physical state and permit the identification of marginalized population groups and the more critical problems requiring solutions (14).

**Acute diarrhoeal disease**

An urban setting puts children at high risk of diarrhoeal diseases; however, it also provides opportunities for diarrhoeal disease control because of the greater accessibility of preventive and curative services.

Socioeconomic deprivation in both developed and developing countries leads to increased exposure of the urban poor to risk factors for diarrhoeal disease. Overcrowding, poor sanitation, contaminated water and inadequate food hygiene result in high diarrhoeal morbidity and mortality. A study in urban Brazil, for example, showed high attack rates of diarrhoea in poor neighbourhoods, while the more prosperous areas, those with piped water and flush...
### Box 2. Reports and results of FAO missions to urban centres in Africa, Asia and Latin America in 1986

<table>
<thead>
<tr>
<th>Problems</th>
<th>Interventions</th>
<th>Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prices of food too high for the poor; food value/packaging ratio.</td>
<td>Fair price shops; simpler packaging, communal buying, consumer cooperatives.</td>
<td>Economical and political decisions required.</td>
</tr>
<tr>
<td>Prices of staples fluctuate at times of scarcity and prices at parallel markets soar.</td>
<td>Have city stocks especially for the poor, placed in poor areas for easy access.</td>
<td>Political and economic decisions.</td>
</tr>
<tr>
<td>Time shortage for breastfeeding, infant food preparation, reduced child-care; nutritional problems of the old.</td>
<td>Day-care centres at work places, formulated cheap weaning foods, communal kitchens.</td>
<td>Lack of relevant legislation for working mothers; lack of technology and resources.</td>
</tr>
<tr>
<td>Unbalanced food intake, micronutrient deficiencies, lack of household food safety.</td>
<td>Urban agriculture for fresh vegetables and fruit; fortification and production of cheap nutrient-dense food mixes; fish ponds and small animal raising.</td>
<td>Legal restriction for city agriculture; lack of space and extension services; lack of fruit-tree nurseries.</td>
</tr>
<tr>
<td>Poor environment: scarcity of cooking fuel; insufficient safe drinking-water sources; poor health.</td>
<td>Piped water at street outlets; urban fuel-wood plots; expansion of health services to slum areas; education on environmental hygiene.</td>
<td>Cost-effective interventions but requiring political decisions.</td>
</tr>
<tr>
<td>Long distances to markets.</td>
<td>Establishment of controlled and serviced markets in poor areas.</td>
<td>Needs careful planning and execution, may require subsidies.</td>
</tr>
<tr>
<td>Lack of knowledge regarding nutrition.</td>
<td>Nutrition education.</td>
<td>Illiteracy; programme funding; misleading advertising.</td>
</tr>
<tr>
<td>Lack of statistics on the urban poor and nutrition status, and of programmes for planning and monitoring.</td>
<td>Mandate the collection of data to urban statistical offices.</td>
<td>Legal problem as slum areas not considered to be part of city administration.</td>
</tr>
<tr>
<td>Scarcity of manpower for programme implementation.</td>
<td>In-service training for staff, volunteers and youth.</td>
<td>Difficulty in finding sufficient literate volunteers, high drop-out rate.</td>
</tr>
<tr>
<td>Insufficient nutritional aspects within existing community development activities.</td>
<td>Awareness-raising among urban leaders and planners.</td>
<td>Need for greater political awareness.</td>
</tr>
<tr>
<td>Waste of resources and efforts due to lack of programme coordination by public sector and NGOs.</td>
<td>Establish coordinating mechanism.</td>
<td>Danger of diluting commitment and initiative of NGOs through formalized action.</td>
</tr>
</tbody>
</table>

* Nairobi, Lusaka, Lagos, Dhakka, Jakarta, Bangkok and cities in Argentina, Brazil, Colombia, Chile, Ecuador, Mexico, Peru, Uruguay and Venezuela.

Source: FAO document COAB/89/5.

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Toilets, were found to have rates similar to those in developed countries.

As already pointed out, urbanization has a significant effect on breastfeeding practices. Exclusive breastfeeding, one of the most important preventive measures for diarrhoeal disease in infants, is declining more rapidly in urban than in rural areas. Reversing this trend through effective promotion, however, is possible and has been documented, for example in São Paulo (Brazil).

Under the influence of many competing health services—public and private, formal and informal—urban populations are often more exposed to inappropriate treatment with commercial drugs than are rural populations.

This unnecessary drug therapy diverts attention from proper treatment and adds to the already heavy financial burden of poor urban families.

However, there is evidence that urban residents have greater access to oral rehydration therapy (ORT) to prevent and treat dehydration than do rural residents. Household surveys conducted in developing countries have shown higher rates of use of ORT in urban than in rural areas. This difference reflects, in part, the easier access to health services in urban areas.
The urban setting presents unique opportunities to reach care givers and children. With the support of international agencies, such as UNICEF and WHO, and of nongovernmental organizations (NGOs), ministries of health have launched a variety of activities as components of nationwide diarrhoeal disease control programmes: diarrhoea training units (DTUs) which also provide treatment to large numbers of children and are usually established in large hospitals; the ORT corners at smaller urban hospitals and health centres; and community-based activities such as those of urban volunteers and mothers' breastfeeding support groups.

The diarrhoea training units at Black Lion Hospital in Addis Ababa, Kalawati Children's Hospital in Delhi, the Children's Hospital in Freetown, Mama Yemo Hospital in Kinshasa and San Lazaro Hospital in Manila are a few examples of the many located in urban areas. At these DTUs, doctors learn to assess and treat diarrhoea and mothers receive advice on home therapy.

An increasingly common sight in many urban hospitals and health centres is an ORT corner where health workers supervise mothers giving ORT and advise them on how to feed and rehydrate their children at home.

DTUs and ORT corners foster the active involvement of the care takers in providing for their children. The rapid and obvious improvement in the condition of the child with diarrhoea when ORT is given correctly increases the mother's self-confidence and encourages self-reliance in caring for her children. The many encounters with mothers who bring their children for treatment of diarrhoea or for other services such as immunization also provide opportunities for education on effective ways to prevent diarrhoea, such as handwashing, correct preparation of weaning foods and exclusive breastfeeding.

Lessons can be drawn from the experience of urban volunteers in Dhakka, mothers' breastfeeding support groups in Manila (Philippines) and Nairobi (Kenya), and from the many past and ongoing research projects focusing on interventions in urban settings such as the “pueblos jovenes” in Lima (Peru). Opportunities exist for involving other potential providers of health services in urban areas, such as drug vendors, pharmacists, school teachers or community health workers, in ORT training and promotion.

The unique opportunities for child care present in urban settings should be increasingly utilized in the future to reduce the morbidity and mortality in vulnerable groups. Improving diarrhoeal disease control efforts in urban settings should target not only the urban poor in large cities, but also those living in small towns, by providing preventive and curative services and referral in small urban settings. The surrounding rural communities can also benefit\(^9\) (15-17).

### Acute respiratory infections

Studies on morbidity from acute respiratory infections (ARI) in urban communities in developing countries have shown an annual incidence of 5-8 episodes per child. This is higher than those reported in rural communities (18). This high incidence of ARI may be a reflection of facilitated transmission resulting from high population density in the community and the adverse socioeconomic conditions under which these children live.

ARI are now well recognized as a major cause of childhood mortality in developing countries, some 25-30% of all childhood deaths being associated with ARI (principally pneumonia). This situation exists in both urban and rural settings. A study of infant mortality in the municipality of Porto Alegre, Rio Grande Do Sul (Brazil) found that 21% of deaths were due to pneumonia, with an ARI-specific mortality rate of 6.9 deaths per 1000 infants. However, a further analysis by place of residence showed that mortality from pneumonia was 6 times higher in the shanty town compared to the city (4.6 per 1000 and 3.6 per 1000 respectively). Pneumonia was the main cause of death in shanty-town areas, whereas it ranked third as a cause of infant death in other areas.

The favourable downward trend of infant mortality in Porto Alegre is threatened by rising numbers of shanty-town deaths, the leading cause of which is pneumonia (19).

Although few relevant population-based mortality studies have been carried out and modern epidemiological and statistical techniques rarely help to evaluate the factors casually associated with ARI deaths, a number of important risk factors can be identified which may contribute to explaining the excess ARI mortality associated with urbanization.

High levels of outdoor pollution have been documented in many urban areas in developing countries. The components of air pollution most widely studied have been suspended respirable particles, sulphur dioxide, nitrogen dioxide and ozone. A number of studies in developed countries have suggested an association between air pollution and lower respiratory infections (20-22).

A recent study undertaken in the metropolitan area of Rio de Janeiro (Brazil) showed a significant association between average annual levels of respirable particles and infant mortality from pneumonia (23). The high dependence on wood and kerosene for domestic cooking exposes urban children to domestic air pollution, particularly in situations in which no separate kitchen exists (24). The association between passive smoking and ARI morbidity has been well documented (25-28).

Mortality from pneumonia is strongly associated with malnutrition (29) and this, as already discussed, is common in certain urban areas (25, 30).

Breastfeeding, which is less commonly practised in urban than in rural areas, appears to protect against ARI mortality and to reduce the incidence of both upper respiratory infections (including otitis media) and pneumonia in young children (31-33). The promotion of breastfeeding may be a promising intervention for the prevention of deaths due to ARI in urban communities.

General conditions of crowding and poor ventilation promote ARI transmission by aerosol droplets and by direct hand-to-hand contact. The correlation between overcrowding and childhood pneumonia

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Rapp. trimest. statist. sanit. mond., 44 (1991)
mortality has been recognized for many years (34, 35).

Crowding is common in depressed urban communities and has been found to be a potentially important risk factor for ARI mortality (36, 37). It has been shown that intensive exposure to measles viruses through overcrowding and case-clustering are important factors in mortality from this disease (38).

Likewise low birthweight, which is highly prevalent in some urban communities, has been shown to be closely correlated with infant mortality in general and with ARI mortality specifically (37, 39, 40).

ARI case management, together with measles and pertussis vaccination, has been the cornerstone of ARI control in many countries. The majority of ARI deaths are potentially preventable through effective utilization of health care services which are equipped with trained health workers and supplies of effective antibiotics.

However, although urban areas are generally considered to offer better access to medical services, compliance with EPI vaccines, and general improving mortality, utilization of health care services which are equipped with trained health workers and supplies of effective antibiotics.

These differentials suggest that tuberculosis is a great problem in poorer areas of these cities. For example, in Rio de Janeiro (Brazil), with a metropolitan population of 10 million, the sputum smear-positive TB incidence rates in 1985 ranged from 46/100,000 to 86/100,000, with the latter rate in the poorest peri-urban districts. A study in Addis Ababa found that TB patients admitted to a major urban hospital were generally poorer than other medical admissions (42).

The variation in TB incidence from low-income to high-income areas of urban centres may be even more pronounced than the data suggest. Underreporting of TB cases is common in developing countries. In addition, most countries lack information on TB patients served by the private sector or by social security system facilities which are concentrated in urban areas.

Some of the risk factors for tuberculosis infection and its breakdown to disease that may particularly apply in urban areas include the following which may themselves be highly correlated:

- HIV infection is the greatest risk factor yet identified which increases the probability that latent TB infection will progress to active disease due to the loss of cell-mediated immunity (43).
- More than 3 million people are believed to be dually infected with Mycobacterium tuberculosis and HIV, 2.4 million of them in sub-Saharan Africa. While rising in rural areas, the problems of co-infection are still concentrated in urban areas in many countries. Increased demand for drugs, health manpower and hospital beds are severely straining the capacity of health facilities (44). In some of the countries with the highest prevalence of HIV infection, reported tuberculosis cases have increased a hundredfold since the mid-1980s (45).

- Malnutrition. Tuberculosis has historically been linked to severe malnutrition, and studies in Europe during and following the Second World War documented the association (46). Although recent studies from developing countries are not available, there is no reason to believe a similar relationship does not exist.

- Housing conditions. The basic structural conditions of housing in squatter settlements and slums likely contribute to TB transmission, as does overcrowding within these structures. Poor ventilation means that M. tuberculosis bacilli are likely to circulate within the limited space for longer, thus increasing opportunities for transmission.

Overcrowding can also increase opportunities for exposure. A study in urban Glasgow showed that overcrowding was more strongly associated with TB mortality and morbidity than any other social factor considered (47).

- Occupational risks. Urban residents in developing countries are more likely to be employed in industrial settings than their rural counterparts. Their industrial workplaces are more likely to be small-scale workshops in the informal sector than large factories. Cramped work spaces, poor ventilation and air-borne particulates (particularly silica dust) in these shops may contribute to TB transmission. Stress, associated with urban conditions and work hours, may also contribute to reduced resistance to disease (49).

- Social/behavioural factors. Alcoholism, drug abuse and homelessness, which are associated with urbanization, are risk factors both for disease occurrence and for non-compliance of diagnosed patients with tuberculosis chemotherapy (50-53). The living conditions and nutritional status of persons with these characteristics are likely to put them at increased risk. If diagnosed with TB, lack of a permanent residence or social behaviour may mean that these patients are unable or unlikely to make regular visits to health facilities for supervised treatment, or to follow self-administered chemotherapy regimens.

In urban Brazil, tuberculosis patients are sometimes hospitalized not for clinical reasons but as a result of abandonment by families because of the social stigma attached to the disease.

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Wild hth statist. quart., 44 (1991)
categories such as alcoholics are hospitalized as a means of ensuring regular drug-taking.1 Tobacco smoking which is generally highly prevalent in urban areas of developing countries reduces pulmonary capacity and may inhibit an individual's ability to ward off disease, once infected. Some studies in developed countries have shown an association between smoking and tuberculosis morbidity and mortality (54-56).

Health services in poor areas in cities tend to be overburdened, and access to services may be difficult for the TB sufferer who requires diagnosis and then, ideally, supervised daily or intermittent therapy for 6-9 months. Maldistribution of drug supplies in urban areas can also mean that the health centres in poor neighbourhoods with the greatest TB case-loads lack the drugs necessary to ensure treatment until cure.

In many countries anti-tuberculosis drugs are sold over the counter, without prescription, or sold directly by private physicians (57, 58). The uncontrolled availability of these drugs in the private sector, particularly in urban areas, may hold more risks than benefits. A survey of private providers in an urban squatter settlement of Bombay showed that most of the physicians had poor knowledge of how to accurately diagnose and treat tuberculosis patients, and demonstrated inappropriate prescribing practices (57). Inadequate or improper treatment can fail to cure patients and may actually cause more transmission by creating chronic excreters of TB bacilli, some of which may be spreading drug-resistant strains. While tuberculosis treatment is provided free of charge in almost all public sector facilities in developing countries, high charges may be incurred for diagnosis and drugs in private clinics or pharmacies.

Meningitis

Transmission of meningococcal infection takes place rapidly in the overcrowded urban areas of the sub-Saharan meningitis belt. An epidemic of cerebrospinal meningitis (CSM) which occurred in Chad, Ethiopia and the Sudan in the period 1988-1989 was the subject of a study in 1990 which focused on the three capital cities (Addis Ababa, N'Djamena and Khartoum) because this is where most of the known cases occurred. Higher case loads in the cities could, to some extent, be the result of a statistical artifact due to deficient case reporting from the rural areas. Information was obtained from responsible health personnel and hospital records and included data from non-epidemic years (59).

Sudan. During the 1988-1989 epidemic, 38,805 cases were reported (2,770 deaths) in the Sudan, most of which occurred at the 1988 peak. The epidemic started in January 1988 in the outskirts of Khartoum and spread rapidly through the three sections of the city. Khartoum, Khartoum North and Omdurman. In February, when the daily collection of data began, the number of cases increased threefold during one week and the peak was reached after six weeks. In March, 52 samples had been analysed showing Neisseria meningitidis, group A, sensitive to sulfadiazine, crystalline, penicillin, ampicillin and chloramphenicol.

In May, resistance to sulfadiazine was detected. Schools, cinemas and stadiums were closed and messages were broadcast to the public. Mass vaccination, using polyvalent A and C polysaccharide vaccines, was initiated during the third week of February at the 60 immunization centres existing in the city. Between 60,000 and 90,000 persons were vaccinated each day, but the coverage of the large poor population recently migrated to the capital was low because of insufficient immunization centres and mobile teams, and poor infrastructure. Although the detection was quick, remedial action was slow and inadequate because of lack of preparedness, shortage of control instruments and poor knowledge of the magnitude of the epidemic.

Ethiopia. The western part of Ethiopia lies in the meningitis belt and several epidemics have been experienced in regions such as Gondar, Gojam, Wollo, Wollega, Shoa and Eritrea. The first cases of the last epidemic were reported in Addis Ababa in November 1987. Specific measures were initiated in January 1988, and cases peaked in February. Initially, only rifampicin chemoprophylaxis was provided to household contacts but immunization was initiated later on in February. By April 70,000 persons had been vaccinated.

Chad, which also lies in the meningitis belt, had already experienced two epidemics in the 1980s. The 1988 epidemic began in February in N'Djamena but there was no outbreak in 1989. Case-reporting was very deficient, but most cases were seen at the Central Hospital; so the delay in the declaration of the epidemic was short. Most cases were from areas to the north of the city. A vaccination campaign, started early in February 1988, reached 119,500 high-risk persons in 11 days, plus 37,000 other non-targeted persons. The campaign was not considered successful as there was a recrudescence of the epidemic following an initial reduction in the number of cases.

In all these epidemics, slum populations were severely hit and presented the conditions of high vulnerability that are commonly observed in refugee and transmigration camps. Unfortunately, surveillance operations were least effective among the people who were most susceptible and constituted the initial foci of the outbreaks. This, coupled with the limited epidemiological expertise available, delayed the recognition of the epidemic and reduced the capacity to propose effective measures. It was only when the outbreak moved beyond the marginal areas and affected the population at large that the system was able to recognize it.

Inequitable proceedings were also followed during the control phase: vaccinations were not concentrated on the population among which the epidemic began or even where the largest number of cases was occurring. In this way, those who were in greatest need and also those who could more easily cause the continuation of the epidemic were not included.

Vaccine-preventable diseases

In his report to the Thirty-ninth World Health Assembly in 1986, the Director-General of WHO stated that:

"Half the population of the world is expected to live in large urban areas in the year 2000. Despite the abundance of health facilities and health personnel in urban as compared to rural
areas, immunization coverage in the disadvantaged populations surrounding major cities is typically poor. High migration rates, lack of social cohesion and friction between new immigrants and established authorities pose barriers which have proved difficult to overcome.

This led the Executive Director of UNICEF to warn that some countries may fail to achieve the goal of universal child immunization because they have been unable to immunize the required proportion of their urban populations, especially those living in the poorest areas. Because it is implied that cities, with their well-known concentration of health facilities, should have achieved satisfactory levels of immunization or because cities are often autonomous and not subject to ministries of health, urban coverage has not received adequate attention; it may be lower than rural coverage or totally unknown.

Yet the growth of the urban population is such that the burning issue of health development at the beginning of the next century will be whether responsible administrations have been able to meet the needs of the urban poor. UNICEF points out that the future battle ground of child survival and development, of which universal child immunization is a most important element, will be in cities and towns of the developing world.

The six vaccine-preventable diseases of the WHO Expanded Programme on Immunization (EPI) are diphtheria, measles, pertussis, poliomyelitis, tetanus and tuberculosis. Their transmission and incidence are influenced by high exposure, vulnerability and lack of basic and appropriate services that are typical conditions of life in slums and shanty areas. Thus, for immunization as for other aspects of primary health care, the greatest challenge is likely to come from population groups at the fringe of urban societies and often officially unrecognized, but still capable of overwhelming available structures and services with the impact of their rapidly increasing demands.

Measles, a major cause of morbidity and mortality in poor urban areas, is a case in point. A majority of children are infected during the first few years of life, and in the absence of immunization between 1% and 5% of infected urban children will die before their fifth birthday, or up to 11% as in a study of measles case-fatality in the four main cities of Bangladesh.

In urban Africa, because of population densities and patterns of social interaction, 30-50% of children are infected with measles in the first year of life, and as much as one-quarter of measles cases may occur before the age recommended for measles vaccination. In addition, the community and public transport where infected and susceptible children come in contact with each other, infection can also take place at health facilities: in Abidjan, of 445 children exposed to measles in a clinic, 39 returned 10-20 days later—56% had acquired measles (attack rate: 3.4%). Considering that some children might have already been immune and that some may not have returned to the clinic, the real attack rate may have been even higher (62). Because of the intensity of transmission, vaccination can take place after the occurrence of measles infection. Thus, the achievement of desired levels of coverage does not ensure achievement of disease reduction; therefore, evaluation of vaccination effectiveness must be based on actual cases and deaths prevented and not only on the level of coverage. In the urban situation, preference could be given to the use of the Edmonston Zagreb Vaccine which is effective at 6 months of age and does not interfere with maternal antibodies, rather than to the traditional Schwarz vaccine effective at 9 months.

Some national experiences

Bangladesh. The six vaccine-preventable diseases account for no less than 31% of the 877,000 child deaths occurring each year in Bangladesh. The national EPI began in 1973, but did not move into urban areas until 1987. Yet 18% of the total 100.5 million population live in towns and cities and these are the fastest growing areas in the country.

When national disasters accelerated the pace of urban growth, managerial difficulties soon became evident: although municipal governments are responsible for EPI, they fall under the Ministry of Housing, Local Government, Rural Development and Cooperatives, and the Ministry of Health is responsible for health units where a proportion of the vaccinations are given. Coordination with the Ministry of Health proved difficult. In the urban areas private physicians are also important. In 1988, the average situation for various antigens in three wards of Dhakka was as follows: BCG, 42.2%; measles, 22.2%; DPT III, 29.2%; OPV III, 9.4%; and TT III, 31.7%.

Since then, progress has been slow as the municipalities had to get organized and develop fixed centres, and there are no up-to-date statistics available on vaccination coverage.

Philippines. The Philippines immunization programme started in 1976 with the vaccination of school entrants with BCG. Although the programme was accelerated in 1986, it was only recently identified as a priority programme. There are 4-5 million urban slum dwellers in the Philippines concentrated in various urban areas, with Metro Manila having the largest slum population (1.7 million).

Cluster surveys revealed that coverage in Manila fell from a previous level of 40% (fully immunized) to 23% in 1986. These levels are lower than those observed in the rural areas. Contributing to this poor performance are high mobility, low social cohesion, scarcity of community-level health manpower and facilities, concentration of external funds in rural areas and weak institutional linkages between the Department of Health and city health offices. Furthermore, it is estimated that up to 60% of the urban slum dwellers are "illegal" and the government is reluctant to establish health centres that could appear to legitimize the squatters.

As a result of this unsatisfactory situation, a survey of 60 target cities was carried out in mid-1987 and an EPI acceleration plan specific for the urban areas drawn up. The urban EPI strategy entails integration into primary health care programmes of which, in unorganized communities, EPI can constitute an entry point. The plan was meant to: (i) prioritize congested slum areas where disease transmission is high and health centres often absent; (ii) place the administration of urban EPI under the responsibility of the Department of Health; (iii) organize, coordinate and mobilize existing resources existing outreach activities and mobile teams in unregistered

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* UNICEF. Internal memorandum and related guidelines issued to all field offices, October 1988.

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slum areas; (iv) utilize the multi-media approach (newspaper, radio, television); (v) recognize the cost-effectiveness of urban EPI; and (vi) given the high density of urban population and the concentration of health facilities, carry out more frequent immunization sessions.

As a result of this special strategy, the rate of fully immunized children increased from 53% in 1987 to over 60% in 1988. This was still below the target of 70% and the drop-out rate for DPT and OPV was still high. Within the Manila area the best result was obtained in Passay City, with a record level of fully immunized children of 68%. These results were due to the conduct of daily immunization sessions at the 9 existing health centres, the integration of EPI into PHC, the involvement of volunteer health workers and the allocation of 9% of the total city budget to health services. Further improvements are likely to depend on more in-depth knowledge of individual neighbourhoods, on better record-keeping of eligibles, priority attention to cities with a low performance, in-service training and supervision, special measures to decrease the number of drop-outs and the promotion of tetanus toxoid immunization among women (63).

Mozambique. In Maputo and other urban areas the urban EPI acceleration effort demonstrated the benefits of door-to-door canvassing to identify defaulters and recent immigrants, and refer them to the nearest health centre or outreach session. With the exception of Beira, all cities increased coverage as shown in Table 4.

A detailed study of both recurrent and capital costs was carried out in 1987. The total cost for a fully-vaccinated child under 1 year turned out to be US$ 8.40. If half the increase in coverage between 1985 and 1987 is attributed to acceleration activities, it was calculated that US$ 5.0 in health service resources and 2.5 man-days of voluntary work were required for each additional child fully vaccinated. Door-to-door canvassing also had other indirect benefits such as: referral of defaulters from other services (tuberculosis, nutrition, family planning), establishing regular contacts with communities, mobilizing transport and fortifying outreach teams, taking census of children and mothers, etc.

There were also shortcomings such as the too-hurried application of the strategy, unproductive outreach visits, disruption of routine vaccination services at health centres and reduction in the number of vaccinations at fixed posts, mothers being turned away because vaccine was unavailable, long waits at vaccination sessions, disillusioned communities and health workers when mobilization activities were not followed by adequate service delivery (64).

Ethiopia. Addis Ababa has a population of 1.7 million which is growing at the annual rate of 5%. The majority of the population lives in poor, densely populated slums surrounded by open sewers where insanitary conditions are widespread. Immunization activities have been its main focus and have included registration of eligibles, assessment of vaccination status of kebele (neighbourhoods), house-to-house tracing of defaulters, sustained communication through the media, timely provision of vaccines, equipment and other supplies and personal involvement of kebele leadership. Cluster-sampling surveys in 1989 showed that, with the exception of measles, the average target rate of 75% had been reached (Table 5).

TABLE 4. IMMUNIZATION COVERAGE (%) OF CHILDREN AGED 12-23 MONTHS, BEFORE AND AFTER PROGRAMME ACCELERATION (1985 AND 1987 RESPECTIVELY), IN FOUR URBAN AREAS, MOZAMBIQUE *

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Beira</th>
<th>Tete</th>
<th>Quelimane</th>
<th>Inhambane</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG (scar)</td>
<td>90</td>
<td>81</td>
<td>70</td>
<td>86</td>
</tr>
<tr>
<td>DPT/OPV 1</td>
<td>93</td>
<td>88</td>
<td>79</td>
<td>92</td>
</tr>
<tr>
<td>DPT/OPV 2</td>
<td>86</td>
<td>83</td>
<td>66</td>
<td>85</td>
</tr>
<tr>
<td>DPT/OPV 3</td>
<td>75</td>
<td>71</td>
<td>52</td>
<td>72</td>
</tr>
<tr>
<td>Measles</td>
<td>68</td>
<td>69</td>
<td>52</td>
<td>74</td>
</tr>
<tr>
<td>Fully immunized — Vaccinations completes</td>
<td>55</td>
<td>51</td>
<td>23</td>
<td>55</td>
</tr>
<tr>
<td>Drop-out DPT/OPV 1-3 — Perdus de vue DTC/OPV 1 à 3</td>
<td>19</td>
<td>18</td>
<td>34</td>
<td>22</td>
</tr>
</tbody>
</table>

** Mothers — Mères **

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Beira</th>
<th>Tete</th>
<th>Quelimane</th>
<th>Inhambane</th>
</tr>
</thead>
<tbody>
<tr>
<td>T.T. 1 — Anatoxine tétanique 1</td>
<td>80</td>
<td>74</td>
<td>77</td>
<td>80</td>
</tr>
<tr>
<td>T.T. 2 — Anatoxine tétanique 2</td>
<td>70</td>
<td>65</td>
<td>70</td>
<td>62</td>
</tr>
</tbody>
</table>

* 210 children aged 12-23 months were studied in each survey, using the EPI cluster sample survey method. Figures for children's vaccines are from the "Road to Health" card, after discounting vaccines administered too early or with too short an interval between doses. Figures for tetanus toxoid are according to the history given by the mother as there were no home-based records for maternal vaccination — Chaque enquête, effectuée selon la méthode de sondage en grappe du PEV, a porté sur 210 enfants âgés de 12 à 23 mois. Les taux de couverture vaccinale des enfants sont calculés sur la base de la fiche "la voie vers la santé", compte non tenu des vaccins administrés trop tôt ou à intervalles trop rapprochés. Pour l'anatoxine tétanique, les chiffres sont calculés sur la base des renseignements fournis par les mères, car elles n'avaient pas de carnet de vaccination.

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325 community health workers and of 1,260 health animators, the setting-up of 14 maternal and child health clinics, a cold chain and 25 health posts. The Addis Ababa primary health care and immunization programmes have given impetus to other urban areas in Ethiopia (65).

Malaria

Urban malaria has challenged malariologists for a long time. Reports on urban malaria in Freetown (Sierra Leone) date back to 1926 (66, 67), and since 1983 the evolution of the disease has been thoroughly studied in India (68), where it occurs commonly in Bombay, Calcutta, Madras and other major cities. In recent decades, however, with the rapid uncontrolled growth of urban populations, the urban malaria situation has become very severe in endemic countries in large parts of Africa, Asia and Latin America. For example, in Karachi (Pakistan) in the years 1960-1970, malaria related to uncontrolled urbanization affected 10-20% of the urban population (69).

Malaria is a focal disease and the impact of urbanization on the mosquito vectors is twofold. In general, urbanization tends to reduce the prevalence of malaria through a reduction in available breeding sites for the autochthonous (rural) vector species. The major vectors of malaria in Africa, Anopheles gambiae s.l. and An. funestus, are examples of such mainly rural species. Environmental pollution, canalization of surface water, and contamination of ditches and gutters by domestic wastes all are unfavourable to the breeding of these mosquitoes.

Such ecological modifications are particularly evident in the central urban districts, and with the growth of cities, malaria transmission is displaced to the ever-expanding peripheries. On the other hand, however, urban development can create habitats which are suitable for malaria vectors, and malaria vectors which are well-adapted to the urban environment will find plenty of breeding sites. This is particularly true for An. stephensi, a well-known vector of urban malaria in India and Pakistan, which can breed in cisterns, wells, overhead tanks, flooded basements and in some cases even in ponds and pools. In the peri-urban areas of many African towns another situation exists which favours the transmission of malaria: the abundance of peri-urban "villages", inhabited by people originating from the rural areas, concentrates the ideal transmission conditions of the rural village setting very near the city limits, thereby in fact actively attracting malaria to the urban environment. A different way in which urban development has created habitats suitable for malaria vectors occurs in the African town of Cotonou (Benin), which is located in a coastal lagoon area: while the majority of the coastal and lagoon villages in the vicinity of Cotonou are colonized by An. melas, which breeds in brackish water and is not a very efficient vector, in Cotonou itself the urban environment has created freshwater collections through the absence of canalization of surface water and the exposure of large areas to floods. An. gambiae, a much more efficient vector, can breed in these freshwater collections. As a consequence the intensity of malaria transmission in some districts of the town of Cotonou is higher than in nearby traditional villages, contrary to the usual situation in Africa. The movement of people is another important aspect of rapid urbanization affecting malaria transmission. Many of the new immigrants from rural areas carry plasmodia with them, constantly providing fresh reservoirs of infection accessible to the urban malaria vector. The problem is compounded by rapid development activities, including new constructions, which provide additional breeding grounds for the disease vector, while at the same time attracting immigrant labour forces.

In general the malaria situation varies greatly from one district of a city to another, depending on the density of the human population and its interface with the adjoining rural environment, as well as on the quality of the development.

Lack of adequate housing facilities produces a change in the urban environment characterized by the proliferation of squatter settlements and the development of slum conditions. Typically, these settlements are collections of temporary housing units, unauthorized, and set up on any available space, very often on waterlogged low-lying areas or marginal land. Combined with a lack of piped water supply or insufficient maintenance of existing services, these settlements create favourable conditions for the proliferation of mosquito vectors. The makeshift housing offers little protection against man-mosquito contact, and will therefore lead to greater exposure of its inhabitants to mosquito bites, enhancing transmission.

In rural areas the presence of cattle near the house may somewhat protect the inhabitants from mosquito bites by the dilution factor (mosquitoes will also feed on the cattle). This protective effect is lost in the urban areas where people are largely involved in nonagricultural economic activities. In those instances where a few cows or goats are kept in the urban environment, this may eventually even hamper malaria control efforts, since even under perfect physical vector-control conditions, where no mosquito can feed on humans anymore, the mosquito populations will still be able to survive by feeding on the cattle.

In the Americas another situation exists which enhances man-mosquito contact: while none of the anophelines in the Americas is a truly urban or domestic species, the actual expansion of the urban area into the rural habitat of An. darlingi or An. albimanus brings the mosquitoes right to the doorstep of the peri-urban areas. Similar situations occur
where larval habitats such as rice fields border cities and towns in Africa; an example of this kind is Antananarivo (Madagascar), recently struck by a serious malaria epidemic.

As in any other malaria situation, immunity plays a major role in the clinical course and outcome of infection. Young children and pregnant women, non-immune migrants and travellers are always at high risk of developing serious disease if exposed to the infection. However, while in stable communities the high-risk groups may be relatively easy to define, in rapidly-expanding urban areas this is much more complicated. In these areas there is a mixing of people originating from different geographical regions of the country, all with different levels of immunity to malaria, depending on their previous exposure. This variability of immunity level has important consequences for the clinical courses of malaria infections in the urban areas, and places an additional burden on the health care services. Health care services in squatter areas and urban slums are usually insufficient in relation to the need, and as a result many people will buy antimalarial drugs in shops within the market area, take them in suboptimal dosages, or they will resort to traditional medicines, either out of choice or for economic reasons.

Studies in Libreville (Gabon) have shown that up to 92% of children are home-treated for malaria, often with inadequate dosages (70), and in Kinshasa (Zaire) studies showed that the child’s mother was responsible for 85% of first drug administration, either for prophylaxis or for treatment (71). With the spread of antimalarial drug resistance, these situations gain special importance.

Since the breeding of urban vectors and pests results from the deterioration of the environment and its mismanagement, environmental management practices combined with community involvement can generally provide a permanent solution.

However, social structures in the urban areas most affected by the problem are usually very loose, so that newer arrivals are not, a priori, receptive to community-based activities, and ways of mobilizing them must therefore be found (72).

In India, where An. stephensi is the main urban vector, good results are obtained with the use of larvivorous fish in wells and cisterns, while the pesticide Abate is used in confined water bodies and domestic water tanks.

Indoor residual insecticide spraying is neither practically feasible nor cost-effective in urban areas. A very high number of houses would have to be sprayed per surface area, and while the spraying of temporary slum houses is useless because of the often shaky and insufficient nature of the buildings, the spraying of the more well-to-do residential areas usually meets with poor acceptance by the inhabitants.

Finally, access to early diagnosis and adequate treatment is the mainstay of any malaria control strategy, and should be considered a basic human right of all populations exposed to the disease. While this is true for rural populations, it is equally true for urban populations, however unorganized or unauthorized their settlements may be. The provision of adequate basic health care services to the urban poor should therefore be given utmost priority.

Other arthropod-transmitted diseases

Urbanization, with increased human population leading to increased demands on basic essential services such as housing, water supply, etc. invariably induces conditions which also increase the transmission potential of a number of other vector-borne diseases.

Inadequacies in piped water supplies necessitate large-scale water storage. Domestic water-storage containers such as earthen pots/jars, drums, cisterns, small tanks etc. are ideal breeding habitats for the Aedes group of mosquitoes, which transmit diseases such as dengue, dengue haemorrhagic fever (DHF), dengue shock syndrome (DSS), yellow fever and chikungunya virus disease. Similarly, poor inadequate garbage disposal facilities, discarded containers, tins/cans, bottles, and tyres etc. long enough in the open to allow breeding of the Aedes mosquitoes. Changes in food habits, which can occur with urbanization, also lead to increased use of tinned food, and more use of disposable containers.

Ae. albopictus, also a vector of dengue in South-East Asia which has a tendency to breed in tyres, is known to have been transported to and established in urban areas in a number of countries. Thus in many urban areas of tropical and subtropical countries, Ae. aegypti and Ae. albopictus have become well adapted to peridomestic and domestic water containers. Breeding occurs either seasonally or perennially. As a consequence, epidemic outbreaks of dengue and DHF occur frequently in many urban areas of tropical countries. Ae. polynesiensis, which transmits both dengue and filariasis in Polynesia, is well adapted to urban domestic breeding places in Papeete and Tahiti. There are many other species of Aedes which are well established and become nuisance pests in a number of cities.

Poor sewage facilities leading to blocked drains, septic tanks, cesspools, pit latrines and other sources of stagnant, polluted water have all created suitable breeding grounds for Culex quinquefasciatus, the vector of bancroftian filariasis in the tropical and subtropical countries around the Indian Ocean, the Caribbean, the Americas and the Western Pacific. It is also a nuisance mosquito. In central and southern China, Culex pallens and C. pipiens, the vector of bancroftian filariasis in Egypt, have similarly adapted to urban domestic water containers. Culex taeniorhyncus, the vector of Japanese encephalitis, is reportedly breeding in the outskirts of cities in the Republic of Korea.

The majority of the breeding places of Aedes and Culex mosquitoes in urban situations are man-made. Therefore a control approach based on community involvement is more likely to minimize the sources of breeding. Community-involvement programmes have been undertaken in a number of countries for the control of these mosquitoes. These actions include removal or burial of discarded containers, periodical emptying of domestic water containers, or where the latter is not possible, treatment with temephos or use of larvivorous fish in Aedes control.

Epidemic outbreaks of dengue, DHF, DSS, etc. are often dealt with by the use of 'knockdown' insecticides for space spraying in fogging or ULV applications against these vectors. This is particularly suitable for heavily-populated areas.
Expanded polystyrene beads have been very effectively used in West Africa in the control of Culex in cesspits. Improvements of sewage systems are attempted in some countries. Larvivorous fish—Gambusia affinis and Poecilia reticulata—which can tolerate polluted water are used even in polluted breeding habitats. Gambusia has also been used in breeding sites in underground storm drains. Many countries use chemicals such as fenithion and chlorpyrifos in the control of Culex breeding in polluted water. Better maintenance of drains and canals in the urban areas to minimize their blockage and the elimination of unwanted water bodies are environmental management methods which have been tried in some countries to minimize mosquito breeding.

Community participation can also help to reduce mosquito bites and hence prevent transmission by using bed nets, screening (mosquito-proofing) houses; using repellents, mosquito coils, mats, etc. These measures, however, are not affordable by the majority of those who need them.

In some countries—Malaysia and Singapore, for example—control of these vectors, with the prevention of epidemic outbreaks of the diseases concerned, have been to a large extent achieved by community involvement with strong, actively enforced legislation.

In the long term, sustained control of these diseases is best achieved by national investments in improved, well-maintained sewage facilities, water services etc., coupled with health care facilities for the prompt treatment of the sick where drugs, vaccines and adequate patient care are available. In addition, community-based activities should be promoted which will minimize vector breeding in a more organized manner.

Other parasitic diseases

Parasitic diseases other than malaria (namely, Chagas disease, filariasis, leishmaniasis, schistosomiasis and the diseases due to the infections with Ascasis lumbricoides, Trichuris trichiura, Giardia lamblia and Entamoeba histolytica) are current public health problems in the urban and peri-urban settlements in the large cities of the developing world. A recent comparative analysis of community health statistics suggests that nutritional and general health status, and rates of disease, are not necessarily better among the poorest sector of the urban population than among rural inhabitants (73). Rural-urban migration has resulted in the development of overcrowded and unsanitary slums which act as new foci for the transmission of all these diseases.

Epidemiological determinants of urban parasitic diseases

The epidemiological determinants of vector-borne urban parasitic diseases can be analyzed in six general scenarios. Each situation may be appropriate for one or more diseases.

Some situations are not clear-cut and cannot be classified in this stratification. For example, it may not be possible to determine if transmission was recently established in an urban area or if vectors were already present prior to migration.

In all of these situations intestinal parasitic diseases are present. The environmental and socioeconomic interface of urbanization is the key determinant of intestinal parasitism. Environmental factors affect their development, survival and transmission of intestinal parasites whereas socioeconomic factors aggravate or alleviate the effects of intestinal parasitism.

Scenario I. Infected persons entering nonendemic urban areas without vectors

Infected persons entering a nonendemic urban area will require diagnosis and treatment in urban health care facilities. In the case of Chagas disease, urban blood banks should be aware of the risk of transmission through transfusion. The rates of infected blood used for transfusion are alarming in some cities of the Americas, for example: in Argentina, 6% in Buenos Aires, 20% in Santiago del Estero; 12% in Mendoza; in Brazil, 15% in Brasilia, 25% in Goiania; and in Bolivia, 63% in Santa Cruz (74). This situation calls for surveillance of possible habitats for vectors.

Nearly 40 years ago, Elsdon-Dew & Freedman (75) demonstrated that when individuals move from a rural area into an unhealthy suburban area, the prevalence of T. trichiura increases: 62% of those residing for more than two years in an urban slum in Durban (South Africa) were infected, compared to 30% of the new immigrants from rural areas. This has been confirmed in a recent study in which the prevalence of ascariasis was 9.8% in the rural group while the prevalence in the same age and ethnic group in Guguletu, Cape Town was 71%. Trichuris was even more common, reaching 89.9% in towns compared to 3.3% in the children living in the rural environment (76). Epidemiological surveillance in urban health services will provide information on:

(a) the distribution of the parasitic infection in the rural areas from which the migrants originated;
(b) the type of parasite to be monitored;
(c) the overall prevalence in the population (77).

Scenario II. Infected persons entering nonendemic urban areas with vectors

In this situation, the existence of the vector is known and the need for surveillance of the migrants to avoid the initiation of transmission is obvious. Schistosomiasis is generally considered a rural disease, but major African cities such as Dar-es-Salaam (United Republic of Tanzania) (78), Harare (Zimbabwe) (79), Ibadan (Nigeria) (80), Kinshasa (Zaire) (81), Lusaka (Zambia) (82) and Yaoundou (Côte d’Ivoire) (83), as well as industrialized cities like São Paulo (84) and Belo Horizonte (85) in Brazil, are endemic.

Scenario III. Infected persons entering endemic urban areas

Transmission has already been established and infected migrants will contribute directly to the spread of the disease.

The distribution of parasitic diseases in the urban areas will initially depend on their prevalence among migrants. The spatial distribution of parasitic diseases is not uniform either in the rural or urban areas. For example, Kloetzel & Vergeetti (86) have shown that prevalence and intensity of infection are highly focal within endemic urban areas.
Two species of *Filaria* transmitted from man to man by mosquitos cause lymphatic disease which produces serious deformities such as elephantiasis and hydrocele: of these, *Wuchereria bancrofti* is transmitted in urban areas of Asia, East Africa and Latin America, while *Brugia malayi* is almost entirely rural.

Both urban and rural filariasis are a major problem in Bangladesh, India, Indonesia and Pakistan (87, 88).

**Scenario IV. Noninfected persons entering endemic urban areas**

The presence of transmission in the peri-urban area can have severe clinical and epidemiological consequences. Individuals who have never been exposed to infection may develop more severe forms of acute schistosomiasis or of acute Chagas disease than those who live in the endemic areas.

Urban cutaneous leishmaniasis is transmitted from man to man through the bite of the peri-domestic sandfly, *Phlebotomus sergenti*. When the disease is endemic, most of the human population becomes infected and immune early in life. In the case of rapid rural-urban migration, the risk of transmission of urban cutaneous leishmaniasis is increased, and even reaches epidemic proportions among the dense nonimmune populations from rural areas.

In recent years in Afghanistan, about 4 000 cases have been reported annually in Kabul and 5 000 cases are reported annually from the cities in other provinces by passive case detection (89).

**Scenario V. Urbanization or domestication of natural zoonotic foci**

In the tropics and subtopics uncontrolled, rapidly expanding urbanization may bring the population into contact with the previously-established zoonotic cycle in adjacent rural areas.

*Cryptosporidium* species complete their life cycle within a single host and may infect numerous animals including man. The transmission is via environmentally robust oocysts (90).

Five outbreaks of waterborne cryptosporidiosis have been documented recently (91) and in one an estimated 13 000 persons were infected, indicating the large numbers of people at risk of contracting the disease from contaminated potable water.

*Giardia* cysts can be found in surface water and in some potable water supplies even in developed countries (92). Wild and domestic animals may serve as reservoirs of human giardiasis in nature. Cysts can withstand chlorination at concentrations used to disinfect water; they may survive longer than two weeks in a cool moist environment but are susceptible to heat and probably to prolonged freezing, although ice used in drinks was implicated as the source of infection in some cases. Infection with *G. intestinalis* is generally associated with poor hygienic conditions including poor water-quality control (92).

The rapid growth of some cities surrounded by the primary forest (e.g. Manaus and Santarem in Brazil) has led to large new suburbs built at the edge of the city in areas of cleared primeval forest.

The extremely close contact with the surrounding forest, where cutaneous leishmaniasis is enzootic, has led to an annual incidence of thousands of cases. In many villages and cities of various countries, the infection rate was higher amongst people living at the edge of the forest, close to the sylvatic cycle (93). The transmission rate rapidly decreases as the distance from the forest becomes greater, because of the limited flight range of sandflies (94).

The population of Khartoum (Sudan) has increased dramatically during the last 10 years, through immigration from drought-stricken areas. Between 1985 and 1987, 100 000 cases of cutaneous leishmaniasis were reported by the Ministry of Health (95).

In eastern Saudi Arabia (Hofuf, Riyadh and Al Khardi), 4 500 infections, particularly in nonimmune migrants, were observed in 1987 (96, 97). High prevalences were also observed in Kuwait City (98).

In Jordan, between 1982 and 1987, 300 cases were reported from new residential areas near Amman which were previously uninhabited, suggesting that a zoonotic cycle had been previously established in these areas.

**Scenario VI. Vectors entering nonendemic urban areas**

It is not often appreciated that persons moving from rural areas into urban areas may bring both the parasites and their appropriate vectors. Snails travel well in fishermen's nets and buckets and reach urban areas in ornamental plants (99).

**Sanitation**

*Ascaris lumbricoides* and *Trichuris trichiura* may find favourable conditions for transmission in urban and suburban slums. Prevalence and intensity of these conditions increase in the rural population moving to urban shanty towns in developing countries.

A large well-documented study on the relation between intestinal parasitism and excreta-disposal technologies in Gaborone (Botswana), Ndola (Zambia) and Kumasi (Ghana) was conducted between 1977 and 1978 (100). The study suggested that the provision of superior water and sanitation facilities to a small cluster of houses, or to houses scattered throughout an area, may not protect those families from infection if the overall level of faecal contamination of the environment is high. Reduction in environmental contamination with eggs and larvae depends upon the provision and use of latrines, especially by those age groups (typically 5-20 years) with the highest prevalence and intensity rates of intestinal helminthic infections.

Sanitation does not have an effect on infection of children in suburban and urban slum areas if not applied on a large scale.

"Metropolitan" geohelminthiasis

In the deprived inner city areas of developed countries, individuals are at increased risk (101). Neigh-

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bourhood transmission may not be the only way of acquiring the infection for children living in houses with good sanitation in areas highly contaminated by human excreta in developing countries. For example in Macao City, a highly urbanized metropolis, 22% of a cohort of schoolchildren were found to be infected with one or two species of intestinal helminths (102). The author suggested that soil-transmitted helminths were acquired from fresh vegetables imported to Macao City from China where night soil is used extensively as a fertilizer.

**Transfer of rural culture/ ecology to the urban environment**

The rural traditions of water collection and water usage tend to persist in the peri-urban environment. Natural water bodies are the immediate sources of water for domestic and recreational purposes since protected sources are either not available or unreliable. Thus a high prevalence of intestinal parasites and schistosomiasis among rural migrants, especially women and children, creates a high risk of transmission.

Primitive housing and low sanitary standards increase the risk of transmission in the peri-domestic areas. Organic refuse, piles of bricks and stones, water in containers, all constitute potential breeding sites for mosquitoes, rodents and sandflies.

**Employment patterns and parasitic diseases in urban areas**

While work opportunities are a major factor in inducing urban migration, scavenging is a first option when survival is the issue. In Calcutta (India), the rates of intestinal parasitism are significantly higher among scavengers than among non-scavengers in the same environment.

Miners living in peri-urban slums may be transported long distances or reside for short periods at the mines. The mines are appropriate for the development of infective hookworm larvae. In China, coal miners have been found to be heavily infected in the provinces of Liaoning, Hunan and Guangxi, with rates ranging from 4.3% to 88.6% (103).

Schistosomiasis is paradoxically related to employment patterns in the peri-urban areas. The small irrigated vegetable gardens are essential food sources for the city dwellers and if infected, these workers can introduce transmission provided that the intermediate host is present. On the other hand, if not previously infected, the worker may risk acute schistosomiasis and its associated acute or permanent disability (due to invasion of the central nervous system).

The risk of sudden death due to Chagas cardiomyopathy among bus drivers in the interior of Brazil and among construction workers in the metropolitan areas of Rio de Janeiro and São Paulo has been well documented. Migrants from São Paulo and Minas Gerais presented higher prevalence and higher relative risks—of 2.2 and 1.9 respectively—in relation to workers from the city of Goiania (104). Some employers have refused employment to all seropositive applicants.

**Consequence of parasitic diseases on urban health services**

It was observed in Recife, northeast Brazil, that the majority of persons infected with *S. mansoni* in major hospitals were admitted to undergo some form of surgery related to advanced disease (105). Bladder cancer associated with urinary schistosomiasis may have a dramatic impact on health care delivery. In seven years (1977-1983) at the National Cancer Institute in urban Cairo (Egypt), 4,163 cases of bladder cancer were observed and radical cystectomy with urinary diversion was performed on 1,973 patients (106) at enormous costs for the health care system. In another study, the five-year survival rate for this type of cancer ranged from 27.3% to 38.9% (107).

The cost of surgical management of chronic lymphatic filariasis is enormous, with long periods of hospitalization. In Calcutta (India) it was estimated that 30% of men and 5% of women had acute clinical symptoms attributable to filariasis (108). There are wide geographical differences in the frequency of acute and chronic manifestations.

Chronic cardiomyopathy due to Chagas disease is a major cause of outpatient consultation in urban hospitals in Brazil, northern Argentina and Bolivia. Medical management, whether based on antiarrhythmic drugs or cardiac pacemakers, is expensive and is a burden to these health care systems.

An urban epidemic of cutaneous leishmaniasis creates a catastrophic situation with which existing health services cannot hope to cope. Each full course of treatment costs between US$ 120-240.

**Urban-specific control of parasitic diseases**

The control of urban parasitic diseases should be included in a long-term national control programme, and the general and specific control measures should be identified. Intersectoral coordination is an integral part of the urban planning process with the participation of parasitologists, epidemiologists and environmental health personnel. The control of urban parasitic diseases is based on four fundamental interventions:

- adequate area-wide public services such as water supply, sanitation, drainage, as well as health education and promotion;
- efficient health services with operational laboratories capable of diagnosis and adequate drug supplies for correct treatment;
- surveillance and monitoring of data derived from inpatient and outpatient health services to determine the pattern and distribution of parasitic diseases;
- appropriate and sustained vector-control measures.

For the prevalence and intensity of infection due to intestinal parasites in urban slums, environmental human excreta pollution in the neighbourhood is more important than the pollution caused by the use of single-family toilets.

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Soil-transmitted helminths may also be acquired from fresh vegetables in areas where night soil is used as a fertilizer even if water supply and sanitation are available on a large scale. In these areas, chemotherapy may reduce the risk of infection. In Ramchandrapur, an industrial town near Hyderabad in Andhra Pradesh (India), where sanitary facilities are available, periodic treatment with anthelmintics significantly reduced prevalence and intensity of infection and improved the nutritional status of schoolchildren (105).

Cryptosporidium and Giardia species can gain access to potable water systems. Chlorination and current filtration techniques may not be sufficient to make the water safe for consumption. In one outbreak an estimated 13,000 persons were infected (110).

It is generally accepted that intervention directed against the vectors of parasitic diseases can be highly efficient and cost-effective in urban areas. However, environmental management and vector control are not solely the responsibility of the health sector. Control of parasitic diseases in urban areas represents a challenge to intersectoral collaboration in urban planning, development, and administration.

Sexually-transmitted diseases, including AIDS

This group includes an expanding list of sexually-transmitted diseases (STD) and infections with the human immunodeficiency virus (HIV) and its corresponding disease, the acquired immunodeficiency syndrome (AIDS). The intent is to present a conceptually unified view of STD, including AIDS, the most important and deadly STD which often has been viewed as separate or different from other STD, and to emphasize that most STD result from contact with subclinical infections. This section also focuses on a number of potentially important biological interactions between traditional STD and HIV infections, which may help to explain the strikingly disparate growth rates of the HIV epidemic among urban heterosexual men and women in various parts of the world. Of greatest concern is that STD, through epithelial lesions, and HIV, through immunosuppression, mutually enhance infectiousness of and susceptibility to the other, resulting in bidirectional epidemic amplification. This section considers some of the known and potential effects of urbanization on the epidemiology of sexually transmitted infections (STI) in developing countries, with special reference to poor women and children. As in other populations, the disease burden of STI is determined by a complex interplay of infection prevalence, sexual behaviour, and the availability of clinical and preventive services. Urban crowding per se does not increase rates of STI, but it does increase the opportunity for and the efficiency of locating new sexual partners. Disease-steady states are achieved when the number of new cases equals the number of old cases removed by deaths, spontaneous cures, and/or effective treatment; epidemics continue to expand as long as each new infection is transmitted to more than one sexual partner. While there is great variation in disease burden within and between developing regions of the world, it is in the rapidly urbanizing areas of the least developed countries of sub-Saharan Africa that these factors are most unfavourable to the prevention and control of STI, and, consequently, where additional resources are most needed.

Measuring the disease burden of STI

The global epidemiology of sexually-transmitted diseases (111) and of AIDS cases and HIV infections (112) has been recently reviewed by WHO. Although more than 20 pathogens are known to be sexually transmitted, and the worldwide incidence of major bacterial and viral STI is estimated at over 125 million cases each year, discussion here will be limited to gonorrhoea, syphilis and HIV infections. This is because these agents produce diseases which seriously affect women and children and because of the extensive reservoir of infection. Most information comes from ad hoc prevalence surveys of women attending urban prenatal and family planning clinics, and female prostitutes. It must be stressed, however, that owing to differences in study populations and diagnostic methods, even these data are rarely adequate to make accurate comparisons between and within urban and rural areas. There are insufficient data available to confidently establish secular trends for any of the STI.

Gonorrhoea. In men, infection with Neisseria gonorrhoeae usually produces a symptomatic urethral discharge within a few days, which leads the patient to seek treatment. By contrast, infected women experience no or nonspecific symptoms. In the absence of diagnostic and treatment services, a large reservoir of infection may develop along with high rates of salpingitis, ectopic pregnancy, infertility and ophthalmia neonatorum.

The rates are 10-40 times or more the rates reported from developed countries. As a result, infections with N. gonorrhoeae, Chlamydia trachomatis, and other sexually transmitted pathogens are believed to involuntarily sterilize up to 60% of women in some African countries. The few published studies from cities of Latin America and South-East Asia combined with other unpublished data indicate prevalence and incidence rates which fall between those of sub-Saharan Africa and the developed countries.

Syphilis. The proper diagnosis and staging of infection with Treponema pallidum is complicated and often requires a medical history, clinical examination, the results of both treponemal and non-treponemal serological tests, and some knowledge of local nonvenereal treponematosis. The specific treponemal tests (e.g. TPHA, FTA-ABS) best measure cumulative attack rates, while the non-treponemal tests (e.g. VDRL, RPR) are better measures of rates of current infectious syphilis, and therefore the risk of fetal infection.

In Africa, VDRL/RPR positivity has been reported to range from 0.5% to 20% in pregnant women, and from 6% to 74% in female prostitutes; congenital syphilis has been estimated to cause up to 25% of perinatal mortality (111). The high prevalence of syphilis and other genital ulcer diseases, most importantly chancroid, may explain a significant portion of the excess of heterosexually-transmitted HIV infection in sub-Saharan Africa (113). By almost any set of assumptions the adverse impact of syphilis on urban African women and their children is many
times higher than in much of the rest of the developing world.

HIV infections, including AIDS. As with the traditional STIs, it is clear that Africa is disproportionately burdened by AIDS and the underlying HIV pandemic.

WHO estimates that by early 1991, more than 800,000 cases of AIDS had occurred in adults in sub-Saharan Africa compared with slightly over 100,000 in Latin America and the Caribbean, and over 2,000 in Asia which contains half of the world's population. By early 1991, estimated rates of HIV infection in women aged 15-49 years were 1 in 1,400 in Western Europe, 1 in 700 in North America, 1 in 500 in Latin America, but 1 in 40 in sub-Saharan Africa (112), whereas as many as one-third of pregnant women attending antenatal clinics in some large urban areas of East and Central Africa are infected.

WHO also estimates that globally by the end of the last decade, 5-6 million people were infected with HIV, of which 50% will likely develop the disease within 8-10 years and most within 20 years. Projections for the 1990s only look worse: 90% of new HIV infections will occur in developing countries, including 5-10 million children; Africa will experience a decline in life expectancy by mid-decade and 10-15 million children will be orphaned by AIDS by the year 2000 (112).

Outside Africa, the developing country urban areas of major concern are the slums of large cities in Brazil and India and the sex workers and/or drug-using communities of Thailand. All have shown some evidence of recent and rapid dissemination of HIV infection.

AIDS is still primarily an urban health problem because it is in the urban setting that its transmission mostly, but not exclusively, operates (Fig. 2). This happens through sexual contact (75%), transfusion of HIV-infected blood or blood products (5%), use of unsterilized needles or syringes by intravenous drug users (10%), exposure in a medical setting and perinatal infection from an HIV-infected mother (10%).

The spread of the virus is facilitated when migrants to the city return to their place of origin in a rural area or in other urban areas and by the coexistence of other sexually-transmitted diseases. The epidemic's greatest impact has been in urban areas, to 30% of the adults living in some urban areas were found to be HIV positive in 1988. Among pregnant women the prevalence of infection was at the 16-19% level in Lilongwe and Blantyre (Malawi); 12% in Lusaka (Zambia); and 2% in Nairobi (Kenya). Among the blood donors, 5-22% were found positive in Kampala (Uganda) and 3-5% in Kinshasa (Zaire).

* USAID. HIV infection and AIDS: a report to Congress on the USAID for Prevention and Control, Washington, D.C., Unpublished document, July 1990. [Unless otherwise indicated, the remainder of this section on AIDS is based on information contained in this document.]

**FIG. 2**

HUMAN IMMUNODEFICIENCY VIRUS (HIV) SEROPREVALENCE AMONG HEALTHY ADULTS IN SELECTED AFRICAN COUNTRIES

SÉROPRAVÉLANCE DU VIRUS DE L'IMMUNODÉFICIENCE HUMAINE (VIH) PARMI LES ADULTES ASYMPTOMATIQUES DANS QUELQUES PAYS AFRICAINS

High infection rates have been reported among prostitutes: 35-90% in Nairobi (Kenya), 69-75% in Moshi and Arusha (United Republic of Tanzania) and 55% in Blantyre (Malawi); in Nairobi HIV prevalence rates rose from 4% in 1981 to 61% in 1985 and 86% in 1986 (112).

AIDS is emerging as a major urban health problem in West Africa also. In Abidjan (Côte d’Ivoire), at two hospitals, 43% of the patients were HIV positive and in one, 3% of all deaths were due to AIDS complications.

In the Abidjan region in 1990, seroprevalence rates were 75% in the urban areas against 5% in the rural areas. In Ouagadougou (Burkina Faso), the positivity rate was 10% among blood donors and 7.5% among pregnant women. Among the prostitutes studied, the positivity rate was 10% in Bamako (Mali) and 7% in Yaounde (Cameroon).

Every country in Latin America and the Caribbean has reported AIDS cases to WHO with a total of 21,405 cases, but the WHO estimates for those regions are the order of 500,000 infected cases. Initially, most of the cases were reported from the urban areas and from homosexual males, later on heterosexual transmission became increasingly common and is now the most common mode of transmission.

With the exception of Haiti (11% among pregnant women in a slum of Port-au-Prince), prevalence remains low in the general population or in groups thought to be representative of the general population. However, the rates are high among female prostitutes (42% in Port-au-Prince) and homosexual men.

Until recently Central America seemed to be relatively spared. Now, Honduras accounts for 50% of the 1,063 cases so far reported in Central America, and in Panama City infection rates of 3% have been reported in homosexual men, compared to 0.2% in blood donors.

In South America, male homosexual transmission in urban areas prevails. Seroprevalence rates of 29% have been reported from Buenos Aires (Argentina), 25% from Rio de Janeiro (Brazil) and 21% from Bogota (Colombia). Infection rates are also high in intravenous drug users (33% in Buenos Aires, 16% in São Paulo and Rio de Janeiro) but remain low in groups thought to be representative of the general population, such as blood donors in Buenos Aires, Recife and seven major cities in Colombia and Peru.

Asia and the Near East still have few reported cases of AIDS. In Bangkok (Thailand), a survey reported a 44% infection rate among intravenous drug users but little is known about this mode of transmission in other countries. In India, the infection has been reported among prostitutes in Bombay and Calcutta and the transmission due to contaminated blood is increasing.

The predominantly urban spread of the AIDS epidemic is causing or threatening to cause setbacks in at least four areas: economic development, child survival, health care and social structure.

Because the age group 14-45 years is most affected by AIDS, reductions of the workforce are possible in situations of high prevalence and because HIV infections are concentrated in the cities, industrial, commercial and tourism enterprises can be severely hit (this also happens to agriculture where disease rates in rural areas are high). Additional economic difficulties may be caused by the need to increase government expenditure for AIDS-related health care and HIV prevention programmes.

World Bank estimates of the share of total government health expenditure required to face AIDS are reported to be at least 55% in Uganda; 5-10% in Burundi, Malawi and Rwanda; 2.5% in Kenya, United Republic of Tanzania and Zambia, and 1-2% in Botswana, Cameroon, Côte d’Ivoire and Ghana.

The gains in child survival obtained through years of efforts in immunization, oral rehydration therapy, improved nutrition, birth spacing and other relevant interventions risk being offset by the threats to child survival posed by the AIDS epidemic. In Uganda, 24% of women attending one antenatal clinic were found HIV positive in 1987 and perinatal transmission is estimated to range from 24-29%. In 1988, the infection rate of newborn babies in Kampala was estimated at 5-12% and of these infected children, 49-63% are expected to die between the first and third birthday. The same study estimated that 18-89 per 1,000 children under 5 will die of AIDS by 1992, and that between one-tenth and one-third of all deaths among children under 5 will be related to AIDS. This will happen in Kampala and other urban areas where HIV rates in women of childbearing age are high (e.g. Lusaka, 12%; Lilongwe and Blantyre, 20%).

In spite of the concentration of health facilities in the cities, there are in certain urban areas critical short­ages of equipment and supplies. This will make it difficult to face the additional demand for services in situations such as those of the capital cities of Congo, Rwanda, the United Republic of Tanzania, Uganda, Zaire and Zambia where close to half of the hospital beds in 1988 were occupied by AIDS patients. World Bank estimates of outpatient and inpatient care for AIDS range between US$ 104 and US$ 631 per case in the United Republic of Tanzania, and between US$ 132 and US$ 1,585 per case in Zaire. The multiplied by the number of cases adds up to a staggering health cost that will compete with and jeopardize the running of ongoing priority health programmes. AIDS is also responsible for the revival or aggravation of other infections, most importantly tuberculosis. In Ouagadougou, 29% of the tuberculosis patients tested in 1987 were found HIV positive.

AIDS is likely to split families and disrupt the life of communities. Already a growing social problem is the number of children who have lost one or both parents due to AIDS. It has been estimated that of the women who become HIV positive 1 year before their last pregnancy, 23% will die before their fifth birthday and 78% before the fifteenth birthday of their child. In the United Republic of Tanzania, a special programme has been established for AIDS orphans and a study in the Rakai district (at the Uganda-Tanzania border) found an HIV seroprevalence close to 50% in urban areas and 20-50% in rural areas. In this district, 24,000 orphans were identified, one-quarter of whom had lost both parents. Although the war may have contributed to this situation, it was concluded that in this region, AIDS was the main cause of orphanhood.

Sexual behaviour and prostitution. At any given prevalence of STI, the future course of an epidemic is most dependent on the average numbers of

_Rapp. trimest. statist. sanit. mond., 44 (1991)_
sexual partners per person; and behavioural interventions are appropriately directed at reducing this number and increasing the proportion of sexual contacts which are “safer”, e.g. by using condoms. However, the modification of sexual behaviour is a challenge, both in developed and developing societies (114, 115).

Having large numbers of sexual partners may also be influenced by poverty and urbanization which for some make formation and continuation of viable family units impossible and prostitution an economic necessity. Although difficult to verify, as many as 80-97% of African men have attributed their STI to prostitutes (116), and Piot Carael have reported that HIV positive female prostitutes in Nairobi have very large numbers of clients per year (117).

Clinical and prevention services for STI (118-120)

Urbanization tends to concentrate public and private resources, providing the opportunity to create accessible, efficient and higher-quality clinical and prevention services. Unfortunately, the greater resources rarely match the even greater need, and maldistribution is commonplace. With the exception of some upper classes in Africa, the greatest disease burden is to be found in the most marginalized of urban residents. Job opportunities for women remain depressingly limited. Essential sexual health education, condoms and clinical services for early detection, treatment, and/or counselling are often in short supply or unaffordable. Within the least developed countries, only a few urban areas have specialty STI clinics, while primary health care centres, family planning programmes, and maternal and child health services are seldom developed to take advantage of their potential to prevent and treat STI. As a result STI continue to accumulate to very high levels.

Collectively, STI are among the most common communicable diseases in urban areas of the least developed countries. Through AIDS, salpingitis, infertility, fetal wastage and neonatal infection they cause enormous morbidity, mortality, human suffering and economic loss. These adverse effects have been felt hardest in sub-Saharan Africa. More can always be done with existing resources, but significant long-term improvements will require economic development combined with a reorientation of health care and disease prevention priorities and improved attitudes towards and opportunities for poor urban women and their children.

Zoonoses

The health risks due to animals are increasing among urban populations, especially in the developing world. Animals can cause zoonoses such as rabies, anthrax, brucellosis, echinococcosis, leptospirosis, dermatophytoses, Q-fever, toxocariasis, toxoplasmosis, trichinellosis, tuberculosis of animal origin, salmonellosis and many others. Injuries and risks from animal bites in cities may be serious because, for example, of difficulties in embarking on immediate post-exposure vaccinations against rabies in humans and controlling dogs and cats. Rat bites often occur in cities and cause rat-bite fever in young children and elderly people. In rapidly growing cities of Eastern Mediterranean countries, livestock farms and animal populations are often kept in parts of urban areas. This provides for direct contact with infected animals. Raw animal products, such as milk and cheese, are consumed without having been processed to ensure food safety. Health problems due to brucellosis have been increasing significantly amongst urban dwellers because of consumption of infected milk of cattle, sheep and goats, without prior heating to increase its safety and durability.

Throughout this century, natural disasters such as floods, earthquakes and volcanic eruptions have exposed urban populations to serious health hazards. Amongst the health problems occurring under such harsh conditions, zoonoses of various kinds have emerged affecting entire populations. Damage to a clean water supply and sewage systems have caused salmonellosis and other enteric infections. Ecological changes and disruption of pest control may increase populations of reservoir species and vectors of various arthropod-borne diseases (Japanese encephalitis, Rift Valley fever, rickettsioses such as Tsutsugamushi disease and plague). Flood waters covering low-lying land can be heavily contaminated with various pathogens derived from plagues, animals, water, and soil, which increase the risk of human infection due to leptospirosis, tularemia, anthrax, clostridium and other infections.

For example, outbreaks of leptospirosis occurring in the urban areas of the developing world have been linked with flooding. The risk of outbreaks increases in situations of high population density, high incidence of animal leptospirosis and when rats, cats and dogs abound in the environment. In Rio de Janeiro and Sao Paulo (Brazil) outbreaks of leptospirosis have been observed since the beginning of this century. A major outbreak with 700 cases took place in Rio de Janeiro in 1988 following heavy floods. In Sao Paulo, epidemics occurred in 1983 (382 recorded cases) and 1987 (340 recorded cases). The latter outbreak motivated a study that was carried out at the University Hospital, Sao Paulo is a city with a rapidly growing population of about 15 million and endless shanty areas. Various factors in the city have created a difficult drainage situation, raised the level of the rivers and altered the microclimate. Heavy rainfall causes frequent flooding and the occurrence of leptospirosis has been regularly observed to coincide with this. Most of the cases lived in the vicinity of an abandoned lot and a rubbish tip where the presence of rats and stray dogs was common, and about 90% were in males because of occupational exposure to contaminated water.

About 10% of the cases developed renal insufficiency and required dialysis at high cost. The average length of hospitalization was 10.6 days per person. Appropriate water management, measures to control rats and stray dogs and an alert service to sensitize the public and the physicians would be needed.

Moreover, there may be a number of other unexpected conditions arising from complex disaster situations which may impede relief activities. A well-prepared veterinary public health (VPH) team should therefore be established under the leadership of the municipal relief operations committee to play a leading role in the prevention of zoonoses by ensuring food and water safety, animal carcass disposal, waste management and safe disposal, stray animal
elimination and many other emergency activities related to zoonoses prevention and control.

VPH services should therefore be established for controlling zoonoses and related health problems as an integral part of the medical and environmental health infrastructures in order to protect the population from the human health risks mentioned above. Furthermore, VPH services should provide a wide range of services including slaughterhouse hygiene, meat inspection, food safety, dog and pet animal population management and control, pest control and elimination, proper carcass disposal, and related information support and public relations. Municipal VPH services can play an important role, in collaboration with other medical and public health sectors, with regard to first-aid and health problems related to slaughterhouse workers, workers in food and by-product processing plants, rubbish disposal workers, zoo-and-circus workers and those engaged in the pet animal and bird trade.

VPH services in many cities in the world have already gained considerable experience in carrying out their responsibilities in the face of many difficulties. Further strengthening of VPH services and activities should be encouraged and supported to the fullest extent by the municipality. For example, continuing initiatives taken by the municipal administration can eliminate rabies in both animals and man. This was achieved by the municipality of São Paulo. Rabies vaccination administered to 60 000-70 000 dogs annually in the city since 1977 markedly reduced dog rabies cases, from 292 in 1977 to 1 or no cases since 1984. However, post-exposure treatment in humans was continued because of dog bites, 1324 incidents were recorded in 1989, less than 10% the number of such incidents in 1977 (121).

Well-designed medium- and long-term plans for veterinary public health services are required to provide the best possible services to cities. Modern technology and science can be introduced to assist efficient and effective performance of services and to meet the rapidly-increasing populations at risk.

Successful control and elimination of rabies and other zoonoses have been achieved in major cities in China, with active community participation in reducing the dog population in entire cities and eliminating rats and hazardous insects. This was achieved at minimal cost, and with strong political support. There are lessons to be drawn from this successful development in China.

Mental conditions

One of the most important urban processes relevant to mental health is redevelopment and residential relocation. In 1938, the description of "suburban neurosis" (122) recorded the stresses which were commonly occurring after relocation from more central areas, e.g. higher expenses, social isolation, distance from employment and loss of familiar surroundings.

A further study (123) in the 1950s examined a variety of possible mental health indicators in groups of people who had been relocated to a new housing estate. These indicators were: (i) admissions to mental hospital; (ii) referrals to psychiatric outpatient clinics; (iii) general practitioner consultations for psychiatric or psychosomatic complaints; and (iv) the psychological complaints of depression, "nerves", sleeplessness and undue irritability elicited during a population survey.

These latter complaints were numerous amongst those rehoused in the previous 2 years as compared with those rehoused 3-6 years before (Table 6). Two of the other three indicators also reflected a negative mental health impact of the rehousing compared with what might have been expected on demographic grounds.

Very little research has been carried out on the possible adverse psychological and emotional effects of relocation on individuals, or of the social effects on the areas they left behind. Such effects are not unexpected considering that many of the cleared areas were long-established communities, with a characteristic culture of their own and important social networks which could never be reproduced artificially. It has been increasingly recognized in recent years that the social support derived from these networks is of fundamental importance in the maintenance of mental health.

The new residential areas usually lack the established kinship and mutual-help networks of older communities and most occupants tend to place greater emphasis on their domestic privacy, in place of social interactions with their neighbours.

In some countries, the inner city areas have been largely emptied of their previously-established working-class residents, much of the accommodation that remained has been reoccupied, predominantly by members of minority races or else by people with socially marginal characteristics (such as alcoholics, drug addicts or those with severely disordered personalities). During this process, the nature of large urban communities has changed fundamentally, and in many places in such a way as to foster the development of major problems, particularly as it...

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**TABLE 6. INCIDENCE OF CERTAIN SYMPTOMS IN RELATION TO DURATION OF RESIDENCE ON A HOUSING ESTATE, UNITED KINGDOM, AROUND 1987**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number in rehoused sample</th>
<th>Depression</th>
<th>Nerves*</th>
<th>Sleeplessness</th>
<th>Undue irritability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1948-49</td>
<td>538</td>
<td>16</td>
<td>21</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>1950-51</td>
<td>730</td>
<td>16</td>
<td>23</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>1952-54</td>
<td>219</td>
<td>23</td>
<td>25</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: Reference (123) — Reference (123).
has coincided with their economic decline and de-industrialization.

Overcrowding and social isolation in urban settings have also been closely linked with mental and social problems. Density-pathology research has mostly assumed that dense living conditions have "pathological" effects on the inhabitants of urban areas, but Magaziner (124) points out that no consistent or linear relationship has been demonstrated between the two. His own data from Chicago (where extensive research into this subject has been done) show that density outside the dwelling unit interacts with the in-unit density to promote or prevent mental disorder. Thus, if opportunities for social contacts are readily available in the neighbourhood, living alone need not cause social isolation. This joint effect was more apparent in the older age groups, presumably because they are generally less mobile, whereas younger people can usually obtain their social contacts more widely, unless prevented by poverty or lack of public transport. Mitchell (125) has pointed out that density (number of persons per dwelling unit) is different from crowding (excessive demands on available space) which is strongly influenced by psychosocial factors; except in extreme cases, the amount of space per person is less important for mental health than lack of personal control over it, with the accompanying disordered social relationships.

For adolescents, redeveloped environments—particularly those with heavy traffic—may be unfriendly and fail to provide opportunities for the kind of social interactions and physical activity that they need. In these circumstances vandalism, drug-taking and the defacement of every accessible surface with graffiti are likely to be on a massive scale, compared with older communities. Such "incivilities" are especially frightening to older people, leading to a deterioration in the community's morale and hence to poorer mental health. It has been proposed that young people should constitute the priority target group for mental health promotion through the reinforcement of social networks; this action might take place particularly in schools, where attempts could also be made to strengthen the psychological, emotional and social abilities of individuals so that they could cope better with stressful situations.

To promote endless urban sprawl, while obliterating community landmarks and replacing them with the tasteless impersonality of most present-day buildings, seems like a recipe for social disaster in the long run. However, it remains the task of scientific enquiry to demonstrate these dangers in a way that can influence both the political process and the practice of architecture and planning.

On the other hand however, urban life has more to offer than decayed inner-city areas or marginal rehousing schemes. The fact is that large numbers of people choose to live within cities, and that very many others wish to move to urban areas and remain there in the face of all these problems. The attractions of city life are manifold, especially to the young, providing excitement, new possibilities, opportunities for wealth, mobility and freedom.

This question has been dealt with extensively in a recent publication of the WHO Division of Mental Health. 1

Although most health indicators show a higher standard of health in even the poorest of cities in comparison to poor rural areas, attention must be paid to the humanization of the city environment. Progress in this endeavour can only come through scrupulous painstaking research, based on clear concepts, and through action which is directly related to what has been scientifically demonstrated. In this process, the mental health professions could form a useful alliance with those architects and planners who have a genuine concern for the human consequences of their activities.

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**SUMMARY**

This section reports on specific health problems which, in poor urban areas, contribute to child mortality to a great extent, or exist at a particularly high level of prevalence (e.g. diarrhoea and acute respiratory diseases), or constitute an aberration (e.g. malaria), or are almost a typical, although not necessarily exclusive, problem of the urban areas (e.g. AIDS, early malnutrition), or a combination of these. The series starts with a section on food, diet and nutrition since malnutrition represents an important health problem per se and is an underlying factor for other causes of death. This is followed by sections on other diseases, such as diarrhoeal diseases, acute respiratory diseases, tuberculosis, meningitis, vaccine-preventable diseases, malaria, other arthropod-borne diseases, other parasitic diseases, sexually-transmitted diseases (including AIDS), zoonoses and mental conditions.

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**RÉSUMÉ**

**Quelques problèmes sanitaires**

Cette section traite de certains problèmes sanitaires qui, dans les zones urbaines pauvres, contribuent dans une large mesure à la mortalité infantile ou dont la prévalence est particulièrement élevée (mali­des diarrhéiques et maladies respiratoires aiguës), ou encore qui constituent une aberration (paludisme, par exemple) ou sont des problèmes typiques, mais pas spécifiques, des zones urbaines (SIDA, malnutrition précoces), ou bien qui combinent ces différentes caractéristiques. La série commence par une section...
sur les aliments, le régime alimentaire et la nutrition, car la malnutrition est non seulement un problème sanitaire important en soi, mais aussi une cause sous-jacente de la mortalité due à d'autres maladies. Les sections suivantes traitent de diverses maladies, comme les maladies diarrhéiques, les infections respiratoires aiguës, la tuberculose, la méningite, les maladies évitables par vaccination, le paludisme, d'autres maladies transmissibles par les arthropodes, d'autres maladies parasitaires, les maladies sexuellement transmissibles, dont le SIDA, les zoonoses et les troubles mentaux.

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Rapp. trimest. statist. sanit. mond., 44 (1991)


Primary health care and the urban poor

Paradoxically, although facilities and services are more highly concentrated in urban areas and local governments more elaborate, poor neighbourhoods receive low priority and find it difficult to deal with city governments.

The health problems of the urban poor have a complex etiology, but they are rooted in poverty itself. Relevant information that would make it possible to assess the extent of various problems and take adequate remedial measures is not available in most cases. Data concerning the urban poor are either omitted from official statistics or aggregated with data from more affluent areas. Low-income groups will therefore have to develop their own representative organizations to ensure that their voice is heard.

Primary health care as defined in the 1978 Declaration of Alma-Ata is relevant to the situation of the urban areas as it is to that of the rural areas:

- it focuses on vulnerable, poor and underserved communities and encourages them to become self-reliant in determining priorities and controlling related action;
- it ensures that issues of a multisectoral nature are tackled and indicates ways by which this can be done;
- it mobilizes additional resources through community involvement;
- it makes health intervention more effective through a far-reaching network of community health workers and outreach services.

Although the primary health care strategy provides an answer to the needs and problems referred to above, its understanding by planners and decision-makers leaves much to be desired and must be improved. National health policy orientation must be changed from the welfare approach to that of community-based development, and the involvement of all people must be stimulated to the point that imagination and leadership become important ingredients.

The generally recognized operational unit of primary health care in an urban area is the urban district or neighbourhood (or other equivalent names such as block, municipality, department). The district denotes a clearly defined administrative area with a population between 50,000 and 500,000 with some form of local government or administration and a referral hospital. It includes the institutions and the individuals providing health care (governmental and nongovernmental, social security, private and traditional) and therefore it involves a variety of interrelated elements that contribute to health up to the hospital at the first referral level, with a laboratory and other diagnostic and logistic support services. An officer coordinates all the elements into a comprehensive range of promotive, preventive, curative and rehabilitative health activities.

Policies and plans

Among the constraints that the primary health care strategy will have to face in the specific context of poor urban areas are: (a) the heterogeneity of communities, widespread individualism and a low sense of collective responsibility; (b) the difficulty of reaching the poorest groups, i.e. the landless, the homeless, the jobless and the street children, and all those with the greatest needs; (c) the difficulty of obtaining voluntary work from people who are struggling for survival and are crucially dependent on cash incomes; (d) the multiplicity of agencies resisting coordination; opposition from the medical establishment, as well as from the politicians and the public, to changes in the status quo, particularly in relation to the way resources are allocated; (f) the specific problems posed to city administrators by the scale and tempo of urbanization.

Under the conditions of widespread and rapid urbanization that prevail in many developing countries, it is important to have national policies for urban health incorporating the concepts of primary health care and recognizing the exceptional needs of those living in low-income urban areas. It is also important that these policies be reflected in both short- and long-term city health plans and that, in turn, these plans reach out to vulnerable groups and encompass all the relevant needs, resources and action.

The definition of priorities

Priorities should be defined on the basis of (a) the most important causes of mortality and morbidity, and (b) the achievement of total coverage. While the prevailing epidemiological and socioeconomic conditions will depend on the specific local choices, it is likely that the following measures will be universally required: control of vaccine-preventable diseases particularly in children and in women of reproductive age; control of acute diarrhoeal disease (including oral rehydration therapy) and of acute respiratory infections; maternal, postnatal and delivery care; promotion of breastfeeding and appropriate weaning practices, monitoring of child growth, health and development; health education with special emphasis on the education of mothers; and supplementary feeding in case of acute food shortages.

Other disease priorities may be considered in specific cases but this package of "essential" interventions should be sufficient to reduce mortality and morbidity significantly in most cases. To guarantee success and to ensure sustainability of the results obtained, other important developments will have to be considered, namely:

- the training and retraining of health personnel;

Rapp. trimest. statist. sanit. mond., 44 (1991)
the greater involvement of universities and other training and research institutions;
• the strengthening of peripheral health facilities;
• the strengthening of municipal health departments;
• greater emphasis on multisectoral action; and
• the promotion of community organizations.

Ultimately, primary health care should emerge as a comprehensive package of integrated services made available through the government, private, voluntary and community facilities of the urban district. Communities will in each case decide on the type, the sequence and the emphasis of interventions; they will also ensure that no important needs are neglected and that no needy groups are left out.

**Strengthening the urban infrastructure**

Urban health systems include a variety of facilities and services ranging from those that are community based (including traditional practitioners) to those operated by the government.

Comprehensive profiles of urban health systems are seldom available in the cities of the developing world. However, one can say that generally the distribution, availability and utilization of health facilities and services are not related to population distribution and to the patterns and levels of needs. There are large strata, namely the migrants and the poor, who have accessibility problems and are grossly underserved.

Given the present trends of urbanization in the developing countries, the proportion of these underserved people in the total population is likely to increase. Paradoxically, the health units located at the periphery of the cities, closer to the areas of residence of the poorest groups, are often underutilized and bypassed: this is because these facilities are poor and understaffed, the equipment and the selection of drugs limited and the competence and the behaviour of the personnel leave much to be desired. In contrast, centrally-located facilities and higher-level services are overcrowded and improperly utilized. Under these conditions the referral process is chaotic and the logistic support and supervision insufficient.

Large proportions of the available health budget are already absorbed by urban health care systems. Given this and the present economic situation, it is unlikely that substantial additional resources will become available in the near future, even if only to expand the services at the primary level for the underserved strata of the population. Utilization of the resources must therefore be improved by eliminating wasteful spending, reallocating resources to needy groups, involving universities and other training and research institutions, and calling on the collaboration and the contributions of the people themselves. This will make it possible to strengthen the peripheral units, upgrade them where needed, and improve the referral system.

Several cities such as Cali (Colombia), Jakarta (Indonesia), Karachi (Pakistan), Mexico City (Mexico), and Sao Paulo (Brazil) have initiated efforts along these lines.¹


In Cali,² this initiative was in response to a continuously deteriorating situation of overcrowding and improper use of central (university) hospital facilities and to the bypassing and underutilization of peripheral health units. The project resulted in real benefits for the poor populations living in peripheral barrios. Among the main achievements was the strengthening of the peripheral units, thus removing one of the main obstacles to their correct utilization and the main reason for hospital congestion. To facilitate the implementation of these changes, referral committees were established at the university hospital, at the municipal health department and in the four health areas, each including about 300,000 people, into which the city had been divided. A referral manual was produced and used as a training instrument. Over a period of 10 months, large numbers of health personnel were specifically trained on the referral process at various levels of the urban health system, including final-year medical students. A special effort was made to inform the public on the best way of using the health facilities and to encourage the use of the closest units: maps were placed in all health units and posters and notices widely distributed. All mass media participated in the information campaign together with the clergy and the parent-teacher associations.

A subsequent, but equally important development of this project was the establishment of four “intermediate health units” (also called in other projects “advanced” or “filter” units), one in each health area (1).

The intermediate health unit is a reference health centre with 20-30 beds for stays up to 72 hours. Emergency 24-hour services are provided and an ambulance and a two-way radio system are available. Permanent medical attention is available on a 24-hour basis together with emergency services, obstetrical care for low-risk pregnancies and simplified surgery under a special programme developed and tested for several years by the local university. For short stays, food and drugs are provided by the families, and laundry services are contracted to general hospitals of the city so as to avoid the cost of expensive equipment.

The development of the reference health centres in Cali and, more generally, the improvement of the referral process, greatly contributed to improving the services available in the four urban health areas, and alleviating the workload at the central outpatient and inpatient hospital facilities.

**Coverage and utilization**

Limited information is available on the extent to which low-income groups in the city are covered by the available services, and on the pattern of utilization of these services. What is known has contributed to dispel misconceptions on the subject and to emphasize that:

- there is a logic in the way poor populations interact with their services and this logic must be understood if the objective is to reach at least minimum standards in coverage and utilization;
- the morbidity pattern of the urban poor is complex and not only made up of communicable diseases and malnutrition;
- the poor are not only dependent on the public sector, but use the facilities eclectically, ranging...
from the public to the private to the traditional sector; and finally
• even within the population of each given city the condition of poverty varies widely in extent and characteristics and this complicates considerably the demand-and-response patterns.

The results of a recent evaluation in the city of Bombay (India), provide evidence in line with the above conclusions and, in addition to contributing to the knowledge of what goes on in this city, could also be considered as typical of utilization patterns in other poor urban areas.

Hospitals: re-entering the system
In a decentralized, neighbourhood or district-based urban health system, the hospital plays a vital role in service delivery, support, training and research. Regrettably, so far, hospitals have generally manifested an inward-looking attitude and have, therefore, had a limited involvement in the development of primary health care plans and strategies in the cities (2).

The situation has been changing rapidly especially since the WHO/Aga Khan Foundation Conference of 1981 in Karachi pointed to a new and important role of the hospital in primary health care. Following this new orientation, the role of the hospital would be associated with a well-defined catchment area within a district framework, and would have a department of community health to mobilize interest in and support to primary health care in the catchment area, provide in-service training to change the hospital workers' medical outlook into a health outlook, participate in the education and supervision of primary health care workers, collaborate with the community in seeking relevant information on health problems and actions, make sure that the hospital meets its responsibilities as regards referral and logistic support, propose effective ways by which the community can assist in improving hospital services, work with public agencies, nongovernmental organizations and community associations (including women's groups), and promote relevant research on practical issues to achieve progressive improvement of services.

In 1987, the WHO Expert Committee on the role of hospitals at the first referral level (3) emphasized the need for integration of the hospital with the other local health services and stated that "the conceptual focal point for organizational and functional integration should be the district health system encompassing the hospital and all other local health services".

Urban health departments
Effective support for PHC may require reorganization and strengthening of city and national health departments. More important than organizational change, however, is a change in attitude throughout the department, since a fundamental shift of values, strategy and approach is involved. In most cases, reorganization is not the first step required, but rather should evolve when there is already some record of initial achievement. Various alternatives have been discussed in a WHO document (4). On the whole it seems better not to set up new PHC units vertically organized, but to seek to build PHC into the plans and operating systems that shape activity across the entire department. Collaboration and communication depend fundamentally on personal qualities and personal contacts. They also depend on sufficient concordance of objectives among all those concerned. An example is provided by the reorganization that took place in the Manila Municipal Health Department (Philippines) in 1983.

Several steps were involved, including drastically shorter lines of communication between the Department and its operating staff in the field; new roles for the public health nurses expected to work more closely with community leaders; coordination of field services under the supervision of a team leader; strengthening of the city information system and its ability to assess needs dynamically, to monitor progress and to evaluate the effect of health interventions; improved training programmes for the basic and continuing education of community health workers; and finally, greater involvement in meeting the basic needs of the client population (food, water, sanitation, housing, employment) through intersectoral collaboration.

Capacity building
The development of local capabilities to promote, plan and implement urban health development in a modern and efficient way is a complex, multifaceted process that goes far beyond the training of new categories of personnel, such as the community health workers or the health promoters.

It starts with the delicate task of involving political leaders and high-level managers in an awareness-generating process that includes the presentation of facts, the discussion of determinants and the analysis of options for action. The importance of this aspect of the urban health development process cannot be overestimated since the understanding of the concepts and strategies on which primary health care is based, the recognition of the real health priorities of the city, including the problems of the poorest, at-risk and underserved groups, the willingness to reallocate resources as required and the determination to stand against the opposition of hostile professional or business groups all depend on the success of this awareness-generating phase.

Two other tasks of fundamental importance in capacity building often do not receive adequate attention. The first is information of the public as a prerequisite condition of its mobilization and participation. It implies the information and continuous involvement of the various mass media, journalists, community organizations, religious groups and nongovernmental organizations directly or indirectly active in the field of health.

The second task is the development of a tool or mechanism to generate the information required to define priorities, and to monitor and evaluate the results of interventions on a continuous basis. Information generation and the monitoring and evaluation of results include the capacity to carry out action-oriented research as and when needed.
Resources

It has already been said that with the difficult economic conditions prevailing in most developing countries and with budgets largely absorbed by existing curative facilities and services, it is unrealistic to expect that additional resources will be allocated to municipal administrations even if only intended to alleviate the problems of the poor and strengthen health care at the primary level.

A determined advocacy effort is therefore needed involving all those who have contributions to make or are in power and can help. The administrative situation of costly or elite medical institutions must be assessed and savings generated.

All other available institutional resources, including those which, although relevant, are outside the health sector, should be mobilized to advance the cause of health among the urban poor. Untapped resources must also be involved (for example, students and newly-graduated physicians).

Finally, communities and individuals must be brought to contribute resources in any way they can to make primary health care in poor urban areas possible, for example by participating in medical insurance schemes and in methods of cost-sharing and cost-recovery. One of these is being developed, with the support of WHO and UNICEF, through the Bamako Initiative.6

Convergent action for urban health development

The etiological complexity of urban health problems and the well-accepted critical importance of environmental influences in their determination, make it imperative to move away from compartmentalized approaches in urban health development, towards solutions that entail coordinated and convergent actions by all responsible sectors.

Furthermore and also in line with the orientation of other organizations including the World Bank (4), urban development must be recognized as the driving force of economic growth. Attention must be focused on:

- integrated programmes that cover whole cities (rather than limited, isolated projects), encourage productivity and reduce obstacles to effectiveness;
- increasing the demand for manpower and creating employment in favour of the poorest groups;
- improving access to basic infrastructure and social services, while trying to meet the particular problems of women and of the economically weak;
- finding a solution to the most urgent problems of the urban environment;
- resorting to international research endeavours for an improved understanding of urban problems.

Community involvement

Community involvement is the fundamental ingredient of urban health development; it makes it possible to decide on priorities and plans and to carry them out with the participation of those for whom health development is intended. It is the most significant innovation put forward in the concept and strategy of primary health care and the one that most typically characterizes health development in the post Alma-Ata era. Gradually and increasingly it has been permeating action not only in health but also in other sectors of socioeconomic development (5). In rural areas community organization is a natural phenomenon, based on solid cultural foundations; it remains reasonably efficient and largely taken for granted, but it is lost with the influx to the cities, just at the time when a reference point for protection and direction is most needed. Nevertheless many cities have managed to form local organizations for community involvement and the initiative and resourcefulness of low-income urban populations have been increasingly recognized by planners and other government officials. Success is most likely when a partnership between community and government is established, entailing recognition of what self-help can do, respect for the individual and willingness of the government to cooperate with popular action.7 There are different methods of implementing the partnership mentioned above (6, 7), and although examples do not lend themselves easily to any simple classification, viability seems to be enhanced if the involvement of the community originates from a clear community understanding of the problems being faced, or from initiatives taken from within.

In poor urban communities the goal of community involvement is to gain organizational and managerial skills and the confidence to work with government officials.8 To this effect, the mobilization process can start around an issue, such as the threat of eviction, a health intervention such as a child survival and development programme, an interest group such as women, a government scheme, an existing community structure or a charismatic leader.

Priorities for community action vary widely according to local needs. An interesting example is the "basic minimum needs" pattern emerging from a recent Thai community survey in Bangkok (Thailand); it identifies 33 indicators corresponding to as many development targets for which it provides the levels.9

Whatever the approach used and the activities carried out, four groups are generally involved in the process of community action: government staff, health professionals, people from nongovernmental organizations (NGOs) and community residents. Much has been said about the positive and negative contributions of these groups (8, 9). Here it may be appropriate to single out two of these groups because of their relative novelty and their importance in the development of the urban slums
and shanty areas, namely the NGOs and the community health workers.

Nongovernmental organizations. NGOs are not easy partners as they often have a limited scope in the pursuit of their own objectives; but they have advantages over governments in a number of ways: they are not bound by bureaucratic inflexibility and red tape, they may have access to substantial funds, they employ highly motivated and committed staff and are not mandated to provide coverage for a large number of people.

At times NGO orientation and practices can be very different from governments', and open conflict between them is not uncommon. However, the best and most long-lasting results have generally been obtained in those cases where a peaceful and durable collaboration has developed between the two.

Community health workers. The key actors and really innovative elements in community development and primary health care are the community health workers (CHW). Their function responds to the practical need to reach into the community, moving away from strictly curative medicine towards promotion and prevention, emphasizing behaviour and the environment in which people live and compensating for the scarcity of health professionals (whether real or due to inappropriate distribution) and their reluctance to work in the poor areas (although private practitioners now seem to have "discovered" the slums). Community health workers are now an accepted reality in many cities and their deployment is likely to reduce the gap in service availability, in spite of technical limitations and problems and of the opposition of the medical profession encountered occasionally.

There is considerable variation in the way in which community health workers are recruited, trained and deployed. Generally selected by and responsible to the community, they are the most accessible primary health care provider locally.

A controversial point is whether and how CHWs should be remunerated: in the urban situation of high turnover and cash economy this is an important issue. Also important is how broad the spectrum of their functions should be and whether it should include diagnostic and curative tasks. Many urban projects prefer a broad background including nutrition, maternal and child health, prevention, community organization, communication and health education. Alternatively, the deployment of community health workers may start with one function, as in the case of the urban volunteer programme in Dhakka (Bangladesh), and then move on to other functions by incremental training.

Neighbourhood health development

The typical product of community involvement in urban primary health care and the one in which the community health worker has found multiple and useful ways of expression is the neighbourhood (urban district) health system, that is a community-based development scheme with a multisectoral orientation and linkages with the existing health service infrastructure.

There is no established blueprint for neighbourhood health development since the fundamental characteristic should be to adjust to local conditions. Sometimes an approach successfully initiated in the countryside and based on family spirit and solidarity has later been adapted to specific urban settings. This is the case of the barrio, kebele or kampung community health development schemes of Cali, Addis Ababa and Jakarta respectively. Others were originally formulated as urban schemes. The barangay development programme of Manila is a good example of the latter. Its main features, which are common to other similar programmes, include: a close knowledge of the community, prevention and care of malnutrition, vaccination, treatment of easily recognizable diseases, referral, environmental improvement, and information and education for the families concerned. The programme is based in the community health centre, the upgrading of which is continuously pursued. It emphasizes the training and wide deployment of community health workers and education of the public, using all available means.

The neighbourhood health development system can be seen as the approach by which district health development, in the context of primary health care, is applied to urban areas. The variety and continuous proliferation of this approach speaks for the appeal, the perceived feasibility and the confidence which the multisectoral approach for health development appears to command. An epidemiological approach is followed in which environmental and social influences on health, in addition to biological ones, are given appropriate emphasis. Thus, at this level health problems are not looked at through the distorting effect of disciplinary or sectoral considerations, but on the basis of their true determinants, their relative importance and their chronological relationship.

In the case of an urban population in general and of the urban poor in particular, the links among social, environmental and economic conditions, individual and community behaviour, health status and general wellbeing, are so intricate and all-pervading that no lasting solution to the prevailing problems can be envisaged which does not give due weight to all the relevant elements in proportion to their importance.

Thus, if a level of health compatible with the WHO definition is to be attained, additional interventions, coming under the responsibility of other sectors but having fundamental importance for health, will have to be considered. These include the provision of adequate shelter, a healthy environment, the initiation of small-scale income-generating activities and, as important factors and common denominators of all development activities, health and basic education.

Environmental health action

Environmental health outcomes depend on a multitude of actions within national and local communities. The environmental health role of community health authorities is crucial to these outcomes; a strong role may be the most powerful contribution they can make to the goal of health for all. This role involves not only direct action through programmes, but even more importantly influencing the actions of other organizations.

Increasing the awareness of politicians, managers and the public about the health implications of environmental health hazards is essential. The health authority is the government organization with the best potential to provide the necessary technical guidance, such as standards and criteria for various processes and facilities. Public health leadership can
help to optimize the contributions of other agencies, by increasing awareness, providing technical support, and advocating health-promoting choices in policies and programmes. To do so, sound "health intelligence" must be generated and communicated. The health authorities' role includes (a) defining and assessing health problems and their environmental determinants (contributing or causative factors); (b) identifying policies (or changes in existing policies) that can improve the health problems by reducing adverse environmental impacts; (c) communicating health intelligence to decision-makers in the relevant sectors; and (d) providing technical assistance in the programming and implementation of policies.

In the governmental sphere, health-affecting actions in the physical and social environment are taken by authorities in the following sectors: agriculture (food production, agrochemical use, land-use practices), industry and labour (worker safety, wastes and other emissions), housing and public works, sanitation, transportation, education and communications, crime control, social welfare, energy generation, forests and fisheries, and environmental management. Actions by these authorities' counterparts in private or state enterprises affect health even more, especially when their actions fall outside the scope of governmental regulation, as is the case with small enterprises in most countries.

Environmental health outcomes are determined also by the actions of individuals, families, and informal groups. Throughout the world, most housing is built through individual and small-scale enterprises; practices in house construction, water use, sanitation, waste disposal and domestic economic activity have enormous impacts on their environments and environmental effects on the health of individuals, families and others.

Because of their responsibility for the health of the population, national and local health authorities need to interact both with other sectors and organizations, and with the broader community and its members. To be effective, these interactions should be built into partnerships amenable to interdisciplinary, intersectoral, and intergovernmental approaches. Although the main partners of the health sector vary in different communities, they usually include the environmental management authorities, health-related officials in other ministries, certain elements of universities and research institutions, and some dedicated nongovernmental organizations. They need to act collaboratively with organized and unorganized elements of the community, its market mechanisms, and its makers of public policies. The health authorities' functions in the partnership should be deliberately and explicitly defined.

Within a comprehensive health development strategy, health authorities should be able to carry out the following essential functions for the protection and promotion of environmental health.

Leadership functions

1. Advocate preventive measures to protect the health of the population, by representing health considerations in the formulation of public policy, increasing the awareness of related ministries, private enterprises and the public about environmental health issues, and otherwise encouraging behaviours and environmental modifications which have positive health impacts.

2. Foster community capacity to manage environmental health by strengthening the ability of local authorities to carry out their functions, encouraging initiatives in the private sector, and supporting community self-help programmes and family skills.

3. Carry out health impact and risk assessments, based on adequate monitoring, to identify threats to health from existing environmental practices and conditions and from proposed changes relating to shelter, occupation, industrial processes, energy generation, water resources, etc. Such assessments should entail evaluation of the health implications of environmental data that may originate in the monitoring activities of other agencies.

4. Conduct epidemiological surveillance of environment-related diseases, informing decision-makers and the public about the situation and trends in the health status of communities and populations with respect to health hazards. The records of hospitals and clinics can provide a valuable picture of the disease situation, for use by health and other agencies.

Advisory and participative functions

5. Train personnel to identify, prevent and control environmental health hazards, including public health and medical staffs, personnel in other sectors such as agriculture, industry and labour whose duties enable them to affect safety conditions and the use of chemicals; community-based auxiliaries and volunteers, and—respect to actions within the domestic sphere—the general public.

6. Establish and operate environmental control programmes and services, including those assigned to the health ministry and other government departments, those carried out through intersectoral and intergovernmental mechanisms, and those conducted through public/private coalitions and networks of community groups.

7. Develop and implement interagency emergency response capabilities for natural disasters and accidents, including capabilities for medical treatment of disaster victims.

8. Collaboratively develop norms, standards and legislation with the health and other related authorities providing necessary scientific and technical information, advisory resources, and assistance to legislative and administrative leaders in the drafting and review of proposals.

9. Incorporate evaluations of health implications of integral elements of socioeconomic development and planning, emphasizing the prevention of environmental hazards arising from development projects in various sectors, as well as promoting grassroots capabilities for social development and environmental improvement. Health evaluations should be required routinely in environmental impact assessments, and the implementation of development projects should be systematically monitored to ensure health protection.

10. Charter and carry out research into health-related environmental problems, conditions, and interventions.
SUMMARY

Health problems of the urban poor present considerable etiological complexity and remedial measures are equally complex. The primary health care strategy provides potential solutions and appropriate orientation for equitable urban health development. However, in most situations, its application leaves much to be desired. Urban planning and the allocation of resources seldom reflect the needs of the most deprived groups. Although promising initiatives that are community-based, comprehensive and integrated do exist, they generally cover only a limited proportion of the target populations. Total coverage, efficient utilization and good quality remain distant goals. Involvement of other health-related sectors, particularly those concerning the environment, education, employment and productive activities, is still at the initial stage.

RÉSUMÉ

Amélioration des systèmes de santé urbains

Les problèmes de santé des pauvres des villes sont d'une grande complexité étiologique. Les mesures à prendre pour y remédier sont elles aussi complexes. La stratégie des soins de santé primaires offre des solutions potentielles et une orientation appropriée pour un développement sanitaire équitable en milieu urbain. Mais dans la plupart des cas, son application laisse beaucoup à désirer. L’urbanisme et la répartition des ressources tiennent rarement compte des besoins des plus défavorisés. Des initiatives prometteuses, consistant en mesures d’ensemble intégrées, reposant sur la communauté, ont certes été prises, mais en général elles ne profitent qu’à une petite fraction des populations visées. Il reste fort à faire pour parvenir à une couverture totale et pour assurer l’utilisation efficace des ressources et la qualité des services. L’engagement des autres secteurs concernés par la santé — environnement, éducation, emploi et production, notamment — est encore limité.

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The scale and tempo of urbanization, its health, social and environmental implications and the inadequacy of national and municipal administrations to meet the challenge of existing and emerging needs are becoming increasingly evident. Soon, half of the world's population will be living in urban areas. Half of these people, by all criteria and measurements, will be poor, and many will be confined to a condition of social, economic and political marginality and deprived of essential services and of the amenities associated with life in the city.

Urbanization and its attendant problems are particularly felt in the cities of the developing world, not only because of the speed and characteristics of the phenomenon there, the natural and man-made catastrophes that often aggravate and accelerate the phenomenon, the poverty of the incoming population and the high rate of natural population increase, but also because of the current economic situation and debt crisis which in the same developing countries delay substantial development. Thus, man-made catastrophes that are entirely preventable are not avoided (such as the famine that follows war or civil war), while lack of foresight and years of neglect are at the root of tragedies such as the recent outbreaks of cholera in various urban areas of Latin America and Africa.

Rapidly-urbanizing cities of the developing world are heterogeneous entities in which poor health conditions, social disruption and environmental degradation combine in certain areas into dramatic patterns affecting large populations.

Awareness of the prevailing situation and political will are the prerequisites for undertaking appropriate actions, particularly those in favour of poor, underserved and at-risk urban populations. Both are based on the availability of information that faithfully reflects the epidemiological situation of the city with its levels and distribution of health conditions, and the well-known array of related biological, physical and social factors. Often, information is simply not available or is intentionally withheld or is hidden in city averages. The development of reliable city information profiles is therefore rightly perceived by some as an urgent need.

The political will referred to above is of the kind which endeavours to translate into practice the principles of equity on which primary health care and the health-for-all strategy are based, and which would give priority attention to those in greatest need and to action at the primary level. Intentions should here evolve into formal policies, and these in turn should lead to the formulation of legislation and plans capable of guiding action with coherence and continuity.

Action should begin at the root of the problems. Thus, urban development should be in harmony with rural development, not only because the urbanization drama of our time originated mostly as a rejection phenomenon in the rural areas, but also because accelerated urban growth may further negatively affect the surrounding rural areas, just when the cities would increasingly depend on them for basic food and fuel supplies and for the satisfaction of their recreational, educational and aesthetic needs. Attention to the rural areas, in the context of rapid urbanization, can also contribute to decelerate or even to reverse the migration flow from the rural areas to the large cities by recreating conditions that would make it possible for rural people to remain in their place of origin, or by directing them to other rural areas or to intermediate or small cities.

Decision makers who are in a position to deal with urbanization and urban poverty in the Third World seem to be lacking the sense of urgency and the spirit of determination which are essential for coming to terms with this pressing problem. Moreover, the growing problems of the urban poor in developing countries are only receiving limited attention from international organizations. Where action is undertaken, it tends to be fragmentary, palliative, and limited in coverage and scope, with the result that almost everywhere the situation remains unchanged. Will the urban poor, the poor in general, and the deteriorating urban environment ever find their own Jacques Cousteau?

Admittedly, urban poverty is an enormous problem but it takes place in a context in which the levels of resources, skills and education are undeniably higher than in rural areas. If national administrations are so hopelessly incapable of coping with the situation in the cities, what will they do in the much more demanding situation of the even poorer, more distant, sometimes nomadic, isolated, backward rural populations?

Currently, rural and urban health problems are dealt with by different entities which operate in a compartmentalized and segregated manner and almost in competition with each other. How can this approach be effective and bear fruit? Should we not, instead, pursue a more integrated and coordinated approach whereby the cities take responsibility for rural and urban development, making the existing resources available and accessible to both areas, and giving absolute priority to poor underserved populations irrespective of their location?

Indeed, what a different meaning urban health development would acquire if the urban infrastructure were also strengthened in such a way as to better serve rural people when they come to the city as well as when they remain in the rural areas, by providing the required technical, managerial and logistic support.

Turning more specifically to action in the city and for the city, it has been said that the primary health care strategy applies equally well to the urban and rural
areas. Unfortunately, this also holds true for constraints in its implementation. Politicians and decision makers have on occasion made a real and enduring contribution to primary health care and the health of the urban poor, but it must be remembered that they also respond to public opinion, to professional groups with opposing views or to business people with contrasting interests. An enormous effort must therefore be made to foster a better understanding of the conditions and aspirations of the urban poor and the part of their fellow citizens and to reduce cultural barriers, misunderstandings or frank opposition.

Implementing primary health care in slums and shanty areas entails three interrelated concerns:

(i) strengthening the level of first contact between the people and the health system and the referral to first and other levels of care;
(ii) developing outreach services in the community (i.e. where people live or study or work);
(iii) mobilizing other sectors so that they can contribute to health improvement, when necessary, by interventions in the field of water supply, sanitation, housing, education, transport and other health-related aspects of development, and also by endeavours to avoid harmful health side-effects from their activities.

The common denominators of these three types of action are:

- the mobilization of the public and community organizations and of the mass media;
- the strengthening and further development of the infrastructure, particularly the health infrastructure, including the city health departments and, where necessary, the municipal departments and health departments at regional and national levels;
- interaction within the city, within the country and outside the country with institutions and groups that can contribute to the process of health development.

All the above interventions and facilitating initiatives are possible in the "decentralized urban district (or neighbourhood) health development approach" promoted and supported by WHO and already operational in some cities of the developing countries. This approach makes it easier to:

- refer action to specific catchment areas and populations;
- mobilize and involve these populations to decide on and contribute to action;
- adhere to priorities that are locally relevant and have been locally identified and selected;
- reconcile methods of top-down and upward planning;
- adopt a more manageable base for action and for monitoring and evaluating results.

Some neighbourhood-based health development schemes have emphasized, as in Manila (Philippines), outreach health activities and the training and deployment of a large number of community health workers. Others, as in Cali (Colombia), have concentrated on strengthening the health infrastructure, reorganizing the referral process and developing intermediate or reference health units that would make it possible to decrease the workload of inpatient and outpatient services at secondary and tertiary hospitals. Others again, as in the barrio Rocinha in Rio de Janeiro (Brazil), have given priority to water, sanitation, housing and the containment of the sliding ground on the slopes of the hills on which the neighbourhood is located.

One of the fundamental features of the neighbourhood health development approach is that the pattern of interventions is a local decision. To be effective, this pattern of interventions must be broad and epidemiologically coherent. The complexity of disease causation and of the pattern of morbidity and mortality in a Third World city demands that, in the situations of high endemicity often prevailing there, the battle for health be fought on several fronts simultaneously. For example, it may be feasible to invest resources in an isolated effort against acute diarrhoea when the child surviving this disease has a high probability of still falling prey to other highly prevalent diseases, such as acute respiratory infections or malaria. It would be preferable to launch an integrated, convergent (and in the long run more cost-effective) attack against all local contributors to child mortality (especially where malnutrition increases vulnerability to all those conditions).

Likewise, rehydration of diarrhoea cases, fundamentally important as it is for child survival, would leave disease incidence practically unaffected in the population without a parallel effort for the improvement of water supply and sanitation, and for a change in behaviour and basic education of the mothers.

Too often, a limited understanding of the epidemiological implications of the conditions prevailing in slum and shanty areas results in interventions that leave the job unfinished or allow the persistence of potentially explosive situations, such as the ones responsible for the recent cholera outbreaks in Latin American and African cities to which reference has already been made.

Neighbourhood health development projects and other useful endeavours have come into being in many cities at the initiative of a charismatic leader, an action group, a nongovernmental organization, the government or a combination of these. Some of these initiatives may have enjoyed considerable local success. But too often, even successful schemes remain confined to the original areas and communities or their progress is limited. They are like small islands of development in a sea of needs. Given that one of the fundamental objectives of primary health care is to achieve total coverage of areas and populations and to provide everybody with comprehensive, low-cost, first-contact services properly linked, as required, to other levels of care, then it is essential that sustainability and expansion, in addition to effectiveness and efficiency, be perceived as criteria of ultimate success.

If this is accepted and sustainability can be guaranteed, then it could be debated whether expansion should take place as a series of incremental ad hoc steps based on what is available or as the result of the implementation of a comprehensive total city health plan or, alternatively and preferably, whether the incremental approach should be guided by and take place in the context of an existing total city plan.

A UNICEF/WHO consultation in Guayaquil (Ecuador) in 1984 reviewed the issue of project expansion. It

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recognized that expansion or scaling up from limited projects to broadly-based programmes is a perennial problem in development and that it would be less difficult if prerequisites for expansion were built into local initiatives from the outset.

Facilitating conditions were identified as follows:

- the lower the cost and outside inputs, the greater the possibility of replication and of extending the lessons to the urban health care system as a whole;
- the more flexible the approach, the more likelihood of its being adapted and "owned" locally: greater decentralization may help towards achieving this flexibility;
- the closer the contact with government, the more credible the project and the greater the possibility of its being replicated (it must be said that voluntary organizations are rightfully distrustful of the stultifying effect of some government interventions);
- the greater the community involvement, the greater the possibility for adaptation, extension and continuity;
- a long-term view is necessary and the longest way round may sometimes be the shortest way home: scaling up should be a gradual, phased process;
- although government officials and the professionals rarely trust people enough or believe that they can take responsibility for their own health and wellbeing, in reality people are likely to be more often right than wrong in their perception (officials are equally suspicious of voluntary agencies);
- the greater the cooperation from the people, the voluntary organizations and the medical profession, the greater the possibility of scaling up and changing the broader system.

Ultimately, scaling up is a political decision that should define priorities for applying the model tested, channel the necessary resources to do so and establish a political and management process to transform the decision into a plan of action.

Two important aspects must be considered to implement this plan:
- the assessment and generation of necessary resources;
- the involvement and coordination of all those who can contribute to the process.

On a per capita basis the resources required to transform the health of the urban poor may not be large, but even a modest sum becomes formidable when it is multiplied by the large number of people in need. Here NGOs, cooperation agencies and international organizations can help, but not entirely and sustainably fill the vacuum. Only the country and city concerned can do so.

However, at a time of economic crisis, as the one now being experienced, no substantial additions to health budgets can be realistically expected: under these conditions reductions are more likely to occur. Three possible ways could be considered to generate financial resources:

- increase the efficiency of and liberate resources from secondary and tertiary health facilities and services to reallocate them to the primary level;
- obtain and wisely use bilateral and multilateral external cooperation funds;
- elicit contributions (of different kinds) from local communities and community organizations including those based on methods of cost-sharing and cost-recovery, provided that these are not applied inequitably and do not negatively reflect on the utilization of the services by the poor in the city.

There is a severe shortage of motivated and well-trained people with experience in project development and community relations. As already pointed out, urban capacity building is a crucial aspect of development which goes beyond the straightforward task of professional training at different levels and includes advocacy, the shaping of attitudes, the briefing of senior politicians and managers, the mobilization of the public and the involvement of universities, other training and research institutions and the mass media. Networking is an approach that can bring together all relevant forces; it can facilitate the processes of resource generation, communication, mutual support and other efforts. Urbanization in Third World countries represents an immense challenge for cities, regions and countries, as well as for the international organizations. No government or nongovernmental institution has the knowledge and resources required to face this challenge alone.

Joining forces and coordinating the efforts of all those who can make a useful contribution is therefore essential. Networking is a functional arrangement (and therefore one that can be modified if the problems change or evolve) to bring together, as required, community representatives, health workers, city administrators, government departments, universities, nongovernmental organizations and a wide range of international agencies.

In 1986, at the initiative of the WHO Regional Office for Europe, a healthy city project came into being with the objective of putting urban health on the social and political agenda of local governments, and more specifically to contribute to the development of policies, encourage environmental health services to address not only pollution control but also the wider issues of sustainable development, and encourage the reorientation of urban health services. Until recently, this project was confined to developed countries, but it is now acquiring worldwide relevance and its adaptation to the context of the developing countries has been recommended. The project focuses on the involvement of municipal governments while emphasizing that local governments should not appear to "own" the project and should share its leadership with communities and other sectors beyond governments. It is important to decentralize intersectoral action and decision-making from within the urban areas to local communities and other sectors beyond governments. It is important to decentralize intersectoral action and decision-making from within the urban areas to local communities and other sectors beyond governments.

The project will not be confined to cities formally recognized as such, but will attempt to cover other urban and rapidly-urbanizing communities as well as rural communities, in order to deal more efficiently with the problems of urban migrants. The concepts of individual and community freedom, emancipation and empowerment are prerequisites for seriously addressing development problems.

Many nongovernmental organizations are involved in development work in poor urban communities;
their efforts should be better known and the relevant organizations should be encouraged and supported at the international level.

Urbanization has long been monitored by various international organizations, particularly those of the UN system such as FAO, HABITAT, ILO, UNDP and UNICEF, among others.

WHO has concerned itself with urbanization for many years and has discharged its traditional functions of advocacy, coordination, support and technical development. Many of its programmes and divisions are involved in and support specific country projects, numerous documents have been prepared on the subject and recently the technical discussions of the Forty-fourth World Health Assembly, in May 1991, were devoted to "Strategies for health for all in the face of rapid urbanization". An ensuing resolution (WHA44.27) provides WHO with a renewed and explicit mandate to pursue its work in this area. The resolution specifically requests WHO to:

- strengthen its information base for the benefit of Member States and its own work in relation to the human and environmental aspects of urban development;
- strengthen its technical cooperation with countries in order to increase awareness of the needs of the urban poor, develop national skills to meet these needs and support the extension of city networks for health worldwide;
- promote regional networks and interdisciplinary panels of experts and community leaders, to advise on health aspects of urban development.

In encouraging participants to take a positive view and to identify opportunities for making a contribution to improving urban conditions and health, the chairman of the technical discussions of the Forty-fourth World Health Assembly identified six personal imperatives:  

1. to decentralize and put the emphasis for action at the municipal level;  
2. to mobilize everyone who can help in city networks;  
3. to invest in safe drinking-water and waste disposal;  
4. to help the poor to enhance their incomes and improve their houses;  
5. to provide families with a range of sustainable health services in or near their homes with an emphasis on family planning as the centrepiece;  
6. to ask the poor to identify their own needs and priorities and expect surprises.

**SUMMARY**

Urbanization, because of its scale and tempo and in spite of some positive effects, remains one of the most significant problems of developing countries in our time. The resulting cities are very heterogeneous entities in which poor health conditions, social disruption and environmental degradation often combine into dramatic patterns affecting large populations. At present, most city health administrations are overwhelmed by the magnitude of existing and emerging problems, and action is urgently required. Primary health care provides the principles and the strategy for remedial action, but its application, however, leaves much to be desired. There is a need for a new framework for joint action in which the health sector retains a leading role and the municipal health departments are revitalized, and in which health is dealt with as an overall concern. All relevant resources at the local, national and international levels, must be involved for the prevention of harmful effects and the development of healthy cities.

**RÉSUMÉ**

Vers un cadre pour le développement sanitaire en milieu urbain

L'ampleur et le rythme de l'urbanisation font que ce phénomène est aujourd'hui, malgré quelques effets positifs, l'un des principaux problèmes des pays en développement. Les villes qui se développent ainsi sont des entités très hétérogènes dans lesquelles les mauvaises conditions sanitaires, le bouleversement du tissu social et la dégradation de l'environnement ont souvent des conséquences désastreuses pour de vastes populations. Dans la plupart des villes, les autorités sanitaires sont dépassées par l'ampleur des problèmes existants et nouveaux. Il est urgent d'agir. Cette action peut se fonder sur les principes et la stratégie des soins de santé primaires, mais leur application laisse beaucoup à désirer. Il faut donc établir un nouveau cadre pour une action commune, en laissant au secteur de la santé un rôle prédominant, en revitalisant les services sanitaires municipaux et en traitant le problème de la santé comme un problème global. Il faut mobiliser toutes les ressources disponibles aux niveaux local, national et international pour éviter les effets nocifs de l'urbanisation et favoriser le développement de villes saines.
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Improving urban health systems
Towards a framework for urban health development
PUBLICATIONS OF THE WORLD HEALTH ORGANIZATION 1991

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URBANIZATION AND HEALTH IN DEVELOPING COUNTRIES:
A challenge for health for all

This issue aims to draw the attention of political leaders, managers and scientists to the importance of urbanization as one of the most significant phenomena of our times. The determinants and characteristics of urbanization as currently observed in the developing countries are discussed, together with effects on health and health services through modifications of the social and physical environment.

The urban population of the world is expected to reach 3.1 billion by the year 2000, thus representing 75% of the total population. Urbanization affects large, intermediate and small cities alike. The growth of cities has doubtlessly brought about beneficial effects, but it has also given rise to vast slums and shanty areas and complex patterns of socioeconomic, environmental and health problems, including an exacerbation of poverty. The speed of the phenomenon has overwhelmed the capacity of the responsible administrations to face existing and emerging needs. Attempts to reverse the trend of rural-urban migration and to control urban growth have generally failed.

Poor living conditions in urban areas are destroying the lives, health and social values of several hundred million people. In poor residential areas, air and water pollution, inadequate housing and overcrowding, noise, heavy traffic and other harmful conditions produce complex and severe morbidity patterns in which the diseases of poverty coexist with those of modernization, social disruption and maladjustment. Yet, information about the urban poor is scarce: either it is not included in official statistics or it is hidden in misleading averages relating to the city as a whole.

An attempt has been made in this issue to single out and describe specific health conditions which, in poor urban areas, contribute heavily to morbidity and mortality. They may be an aberration or, conversely, can be considered almost characteristic of urban areas. Topics such as food, diet and nutrition, acute diarrhoeal disease, acute respiratory infections, tuberculosis, meningitis, vaccine-preventable infectious diseases, malaria and other arthropod-borne diseases, other parasitic diseases, sexually transmitted diseases including AIDS, zoonoses and mental conditions have been reviewed.

The primary health care strategy provides potential solutions for urban health problems and appropriate guidance for equitable urban health development. Its application, however, leaves much to be desired. Although promising initiatives that are community-based and sufficiently comprehensive and integrated do exist, they cover but a small fraction of needy populations. Total coverage, efficient utilization, good quality and sustainability are still distant goals and intersectoral action is in the embryonic stage.

Yet, greater attention to this problem is urgently needed and while the health sector must retain a leading role and the municipal health department must be revitalized, urban health must be dealt with at all levels of responsibility. A new framework must be developed to ensure that all necessary resources at the local, national and international levels are utilized for the prevention of harmful effects, the solution of existing problems and the ultimate development of healthy cities. WHO is working in this direction in collaboration with its Member States.

L'URBANISATION ET LA SANTÉ DANS LES PAYS EN DÉVELOPPEMENT:
Un défi pour la santé pour tous

Ce numéro est destiné à appeler l'attention des responsables politiques, des administrateurs et des scientifiques sur le problème de l'urbanisation, l'un des phénomènes les plus importants de notre temps. Les déterminants et les caractéristiques de l'urbanisation dans les pays en développement y sont décrits, ainsi que les effets sur la santé et les services de santé des modifications de l'environnement physique et social.

La population urbaine mondiale devrait atteindre 3,1 milliards d'habitants d'ici à l'an 2000, soit 75 % de la population totale. L'urbanisation se répand aussi bien sur les grandes villes et les villes moyennes que sur les petites villes. La croissance des villes a incontestablement des effets bénéfiques, mais elle a également favorisé la multiplication des faiblesses et des bidonvilles et pose des problèmes socio-économiques, environnementaux et sanitaires d'une grande complexité, notamment une aggravation de la pauvreté. La dépendance du phénomène a pris de court les administrations responsables, qui ne peuvent faire face aux besoins existants ou nouveaux. Les initiatives qui ont été mises en œuvre n'ont pas revêtu de largeur et de pertinence la croissance urbanisée dans son ensemble.

Les mauvaises conditions de vie dans les zones urbaines mettent en danger la vie, la santé et les valeurs sociales de centaines de millions de personnes. Dans les zones déshéritées, la pollution de l'air et de l'eau, les problèmes de logement et de surpopulation, le bruit, la circulation et autres nuisances produisent des tableaux de morbidité complexes, où les maladies de la pauvreté coexistent avec celles qui entraînent la modernisation, la désagrégation du tissu social et l'insécurité. Pourtant, on ne sait pas grand-chose de ces populations urbaines défavorisées, et ce n'est pas parce que les données concernant ne figurent pas dans les statistiques officielles, soit qu'elles se perdent dans des statistiques globales trompeuses parce qu'elles ont trait à une ville dans son ensemble.

On s'est efforcé dans ce numéro de choisir et de décrire les problèmes de santé particuliers qui, dans les zones urbaines pauvres, contribuent pour une large part à la mortalité et à la morbidité, et qui constituent une aberration ou, inversement, peuvent être considérés pratiquement comme caractéristiques des zones urbaines. Des sujets tels que l'alimentation et la nutrition, les maladies diarrhéiques aiguës, les infections respiratoires aiguës, la tuberculose, la méningite, les maladies évitables par la vaccination, le paludisme et autres maladies transmises par les arthropodes, d'autres maladies parasitaires, les maladies sexuellement transmissibles, y compris le SIDA, les zoonoses et les troubles mentaux, ont été passés en revue.

La stratégie des soins de santé primaires peut apporter des solutions aux problèmes de santé urbains et fournir des indications utiles, susceptibles de favoriser un développement sanitaire équitable en milieu urbain. Son application laisse cependant beaucoup à désirer. Bien que les initiatives prometteuses à base communautaire et suffisamment complexes et intégrées existent, elles ne concernent qu'une petite partie des populations défavorisées. Une couverture totale, une utilisation efficace, la qualité et la durabilité des services sont encore des objectifs loin det de l'action intersectorielle est encore à l'état embryonnaire.

Pourtant, l'urbanisation doit impérativement faire l'objet d'une attention accrue. Certes, le secteur de la santé doit conserver un rôle directeur et les services de santé municipaux doivent être renforcés, mais la santé urbaine est un problème qui doit être pris en main à tous les niveaux de responsabilité. Un nouveau cadre doit être élaboré pour faire en sorte que toutes les ressources nécessaires aux niveaux local, national et international soient utilisées pour prévenir les effets nocifs, résoudre les problèmes et promouvoir la santé dans les villes. L'OMS œuvre d'ailleurs en ce sens, en collaboration avec ses États Membres.