HEALTH ASPECTS OF HUMAN SETTLEMENTS

A review based
on the Technical Discussions
held during the Twenty-ninth World Health Assembly, 1976

Edited by

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PREFACE

The Technical Discussions at the World Health Assembly are an annual event. They are not, however, a formal part of the proceedings. All participants in the Health Assembly — delegates, representatives of Associate Members, observers, and representatives of other organizations — may take part and they attend informally, not as delegates of their governments or as officials of their organizations. The subject of the discussions is one of general public health interest, selected in advance.

The Technical Discussions in 1976 were on the "Health aspects of human settlements". There were 255 participants who, after the General Chairman had delivered an address, divided up into eight separate discussion groups, each of which produced a report on the aspects of the subject it had discussed. A session of all the groups was then held and a joint report was prepared for submission to the Twenty-ninth World Health Assembly.

Prior to the discussions, Member States had been sent a preliminary outline and a questionnaire and had been asked to contribute material describing the state of human settlements in their countries, including a detailed description of one or more individual settlements illustrating particular problems or achievements. Participants in the Technical Discussions were provided with various background documents including a copy of the material prepared by WHO for "Habitat: United Nations Conference on Human Settlements" that was held in Vancouver, B. C., Canada, from 31 May to 11 June 1976.

INTRODUCTION

The choice of the subject "Health aspects of human settlements" by the WHO Executive Board reflects the growing concern over the rapidly increasing world population, the widening disparities in the distribution of wealth, the general decline in the quality of life for many of the world's inhabitants, and the difficulties encountered in pursuing health programmes designed to achieve the optimum state of physical and mental health and well-being throughout the entire world.

A general objective agreed to by the participants was to ensure that health is accepted as an integral part of planning and development of human settlements at the local, national and international level. To achieve this, it is necessary:

(1) to clarify health policies pertaining to the planning, management and development of human settlements. This, in turn, requires a greater understanding of the physical and social environment in the various types of settlements and the resulting health effects;

(2) to identify techniques, manpower and organizational patterns useful in making the health sector a partner in national policy and decision-making for human settlements. This is equally necessary both between health and other government interests and between the community itself and the government.

During the discussions it became clear that new concepts are now being developed that are widening the field of community health to encompass the whole quality of life in human settlements. If health authorities are

to be fully effective, their responsibilities must be sufficiently comprehensive to provide for the country's needs and full cooperation must exist between health and other government departments so that health considerations are taken into account in the planning and development of human settlements.

Participants defined the priority health needs in human settlements as an adequate state of nutrition for the inhabitants, adequate water supply and waste disposal services, and a system of health care, particularly primary health care, that is available to all. The importance of these priority health needs has been stressed on many occasions and cannot be overemphasized. They are essential to the attainment of an acceptable quality of life.

The subject of housing and the housing environment, obviously important to human settlements, is no new concern of WHO, which has been active in this field for many years. An account of the past meetings, documents and publications of WHO having a direct bearing on the topic is given in Annex 2, which shows how public health thinking on various aspects of the subject has developed over the past 15 years to the point that it is now possible to consider the range of material in the context of human settlements as a whole. Summaries of most of the WHO publications mentioned, together with other relevant material, are now available in an annotated bibliography.[1]

The Technical Discussions are intended primarily to provide a forum for the exchange of ideas and practical experience to assist participants in dealing with the health and social problems of settlements in their own countries. Priorities in individual countries and individual settlements differ and each country has to determine its priorities by assessing its own problems. Ideally, their priorities should be based on firm statistical and epidemiological data, but such information is often unavailable, particularly for developing countries. However, the problems of highest priority are usually well known and it is not necessary to have precise data to determine that an urgent need exists. Thus the need for adequate uncontaminated water supplies, safe wastes disposal, and sanitary housing will be apparent even in the absence of figures on the prevalence of related infections and parasitic diseases. Beyond this, accurate data are a vital public health requirement, both in assessing a given situation and in persuading decision-makers of the need for improvements. Where the problems of organizing national statistical and disease reporting are too great, limited *ad hoc* surveys may provide important data.

At a more sophisticated level there is the need for in-depth research on many other aspects of the environmental influence on health such as

[1] MARTIN A. E., KALOYANOVA, F., & MAZIARKA, S. *Housing, the housing environment and health: an annotated bibliography*. Geneva, World Health Organization, 1976 (WHO Offset Publication No. 27).

the effects of individual air pollutants and trace elements in water supplies and the assessment of how different factors interact in causing disease. Detailed consideration of such subjects was outside the scope of the Technical Discussions but their long-term importance to the health of human settlements was noted. Likewise, the impact of conditions in settlements on mental health was considered to be a subject requiring further research.

It is particularly appropriate that the Technical Discussions were followed almost immediately by "Habitat: United Nations Conference on Human Settlements" held in Vancouver, B.C., Canada, from 31 May to 11 June 1976. The material presented at the Technical Discussions and the views expressed by participants were of great value in formulating a health policy for human settlements that could be integrated into the more comprehensive plans being considered at Vancouver.

OPENING ADDRESS BY THE GENERAL CHAIRMAN

MIHAIL ALDEA
Vice-Minister of Health, Romania

In our deliberations we will share together the common challenge of our topic — the health aspects of human settlements. It is a topic almost boundless in scope. It conceivably encompasses the whole range of human activity, and even the term "human settlements" itself defies precise definition. Indeed, it will be a challenge to understand the problems clearly and to state our conclusions precisely after discussing such a broad and diffuse subject. Yet there are vital reasons for the participants in the World Health Assambly, acting in their individual capacities as health experts, to consider this topic. These reasons have to do with the basic relationship between health and environment, the tremendous growth of population and changing patterns of settlement, and the response of governments to the aspirations of people to improve the conditions of life.

It is not possible to work in the field of public health and not be impressed by the dynamic approach to solving health problems. Most of the strategies for improvement of health are outlined in the WHO Constitution. One such strategy highly relevant to our technical discussions is the attainment of health through the improvement of the environment. It is an approach that has yielded many health dividends but in applying it we are often frustrated by the complexity of environmental conditions that contribute to health problems. We have often found ourselves unable to control all the environmental factors contributing to certain health hazards and have thus failed to meet our objectives completely. In other circumstances successful environmental interven-

tions have in themselves been the cause of new and unforeseen health problems. Our response to these shortcomings has been to seek a greater understanding of the interdependence of environmental factors important to health and steadily and progressively to broaden our perspectives to include an ever greater number of relevant factors. This broadening of outlook is apparent from a review of the topics selected for previous World Health Assembly Technical Discussions. These include, for example, public health problems in rural areas (1954 and 1955), the influences of community water supply programmes on health and social progress (1964), the challenge to public health of urbanization (1967), the contribution of health programmes to socioeconomic development (1972), and the role of the health services in preserving or restoring the full effectiveness of the human environment in the promotion of health (1974).

The focusing of our attention on human settlements is of the utmost importance because of the dramatic demographic changes now occurring throughout the world. The present world population of 4000 million could increase by 3500 million by the year 2000 and concurrent with this growth is a massive human migration from rural to urban areas in many countries. Even so, rural areas are not becoming depopulated and will show a net gain in population during this period. We must also take account of the fact that there is much back-and-forth movement between rural and urban areas. In developing countries cities are growing at a rate unprecedented in history. Twenty-five years ago there were sixteen cities in developing countries with populations of one million or more. Today there are 74 and, if current trends continue, there will be 276 such cities by the year 2000. Urbanization will bring social, cultural and physical advantages to many people, but unless current income distribution trends are drastically changed, the majority of this new urban population will be very poor and will reside in slums and squatter settlements.

At the same time, the sociodemographic structure of the population will undergo substantial changes with repercussions on health. Family size is decreasing and generations no longer live together in a way that provides the sick and disabled with the care they need. Great influxes of one age-group or sex create various pressures for services, which then wane as other age- and sex-linked health problems emerge.

Rapid population growth and rapid unplanned urbanization are, however, only two of the considerations affecting the condition of human settlements and the quality of life of their inhabitants. Other major considerations are (a) the dispersion of rural population that makes it difficult to provide satisfactory facilities and services; (b) the deterioration of social, ecological and environmental conditions; and (c) the great disparities of wealth that exist within and between countries.

One illustration of the present deficient state of human settlements and the need to provide for growth of population can be found in housing statistics. In a report of the Secretary-General of the United Nations, it was stated that 1400 million new dwellings would be required by the year 2000. This would require a global construction of 47 million dwellings per year.

As the nations of the world and the international community have attempted to cope with these problems there has been a growing recognition of the limitations of the sectoral approach to development with its inherent imbalances and a complementary recognition of the need for new comprehensive policies for the development of human settlements that harmonize major components such as population growth and distribution, employment, shelter, physical and social services, and health services and facilities.

A particularly important consideration within these new comprehensive policies is the question of regional management of problems and distribution of costs. There is a growing understanding of how decisions and actions taken in one place vitally affect other areas. New political, legal and administrative structures are called for, together with long-term plans for development and organization that are closely linked with available resources, so as to ensure more efficient management of resources on a regional basis. However, these new structures will need to be developed carefully to ensure appropriate controls while allowing for local initiative and responsibility.

These world-wide concerns about the quality of life in human settlements and the urgent need to find more effective approaches to solutions have led to the convening of Habitat: United Nations Conference on Human Settlements. Recognizing that there is great value in sharing experiences, while also acknowledging that each country bears primary responsibility for solving its own problems of human settlements, the delegates to the Habitat conference will consider recommendations for national action in six key areas:

— *Settlement policy and strategies*—the goals and objectives a nation sets for itself and the ways and means it chooses for achieving them;

— *Settlement planning*—an important tool for decision-makers;

— *Institutions and management*—the organization, both public and private, necessary for the effective functioning and management of cities, towns and villages;

— *Land*—a finite resource whose ownership and use have a profound influence on conditions of human settlements;

— *Shelter infrastructure and services*—the vital framework of human settlements (housing, transportation, water, communications, health and other social services); and

— *Public participation*—the means of ensuring that public policy responds to the needs of people and of securing their active assistance.

The state of health and the quality of life are interwoven concepts; the Habitat conference, therefore, aiming at the improvement of the quality of life in human settlements, will have numerous implications for health services. One of the most important near-term effects will be the revitalization or formulation of cohesive policies for human settlements at the national level. These policies will tend to be comprehensive and encourage participation of all relevant governmental ministries, including health. This will provide national health ministries with increased opportunities to participate in national development planning and secure a more effective voice in national development policies for human settlements by contributing effective health information. At the level of the national health ministry, we must take the necessary steps to assess our readiness and preparedness to do this.

This is an immense task. It is easy to say that all the major problems facing mankind in the places where he lives are closely interrelated: poverty, hunger, population growth, unplanned urbanization, environmental decay, disease, illiteracy and others. But it is extremely difficult to collect needed information, analyse it properly and develop effective courses of action that are acceptable to all.

We must also be realistic in acknowledging that the present way of dispensing health resources is not conducive to our new task. The bulk of our health effort has been on the side of curative medicine. Even the training of clinicians has paid scant attention to the broad environmental causes of disease and has demonstrated little interest in the promotion of positive health. Our preventive programmes have achieved tremendous successes in disease control and some aspects of environmental health. However, there is often a preference for medically oriented approaches such as immunization rather than the permanent control of health hazards by environmental improvement. This is evident with cases of waterborne diseases that are among the leading causes of death and disability in areas occupied by more than two-thirds of the world's population. A survey by WHO covering developing countries in 1970 indicated that more than 1000 million people do not have access to water that is free from gross biological pollution and can thus be considered comparatively "safe". It is discouraging to consider that many countries will not meet the modest targets for providing clean water set forth in the programme for the Second United Nations Development Decade and will rely primarily on immunization to contain waterborne infections. Such measures can only prevent some diseases; they cannot protect the whole population.

Even after conceding some success to many preventive health pro-

grammes it must be noted that they have generally ignored the complex relationship of man to his environment. We have little understanding of the effects of simultaneous hazards to health arising from the environment or of appropriate measures for dealing with them. We need to consider whether the individual exposed to an acceptable level of water pollution, a tolerable amount of air pollution, and bearable noise and congestion may not be in jeopardy because of synergistic or potentiating effects.

If we public health workers are to make a truly useful contribution to the development planning of human settlements, we must go beyond our traditional concern with the causes and control of explicit conditions of ill health. We must develop a capability to consider man in his total environment confronted by multiple threats to his wellbeing; we must also consider more deeply the promotion of good health and the causes of disease. We must take into account the behaviour of people and their knowledge, attitudes and practices as these affect their settlements. The greater understanding of the need for a healthier environment and the capacity to mobilize individuals and groups to help achieve it are, it seems to me, very powerful tools for good, tools that we have not yet learned to apply. Those who continue to act as though the solutions to settlement problems lie solely in the technical sphere will never get very far. You can immunize people against some diseases, but the maintenance of a hygienic and pleasant environment obviously cannot be technologically engineered without community participation even though it can be facilitated by the use of the right materials and careful organization of space. Therefore, much needs to be learned about how to promote the healthy use of the structures we build.

The current global discussion about human settlements encourages innovation and new approaches to problems. The organizers of the Habitat conference are emphasizing the opportunities for advancing the quality of life, human settlements being viewed as instruments of development. It is therefore timely that we in the health field set forth goals and objectives commensurate with these opportunities and aspirations of mankind.

In a practical vein, I therefore suggest that the health goals for human settlements be stated in terms of the optimum environment for man rather than the more limited disease-control concepts of the past. As an example, the ideal settlement in which a person would wish to live, to raise a family and conduct his or her life would have the following characteristics:

(1) an environment where people would not be subject to local health hazards, whether communicable diseases including water- and food-borne infections and those spread by poor sanitary conditions and insect

vectors; chemical hazards such as air pollution, adulterated or contaminated foods; or physical hazards such as earthquakes or floods;

(2) efficient preventive health services to safeguard against the health hazards that may still arise, e.g., vaccination and immunization activities, maternity and child welfare services, health education and occupational health services;

(3) good medical care services including an adequately staffed hospital with consultant facilities and appropriate supporting services;

(4) good social welfare services ensuring adequate financial provision for sickness, unemployment and old age, and including care for the physically and mentally handicapped;

(5) a satisfactory standard of living and quality of life to ensure sufficient quantity and variety of food, satisfactory housing and satisfying employment, together with pleasant surroundings, facilities for recreation and social intercourse, as well as a stable administration and government, all providing for the full enjoyment of life, development of personality and freedom from undue stress and anxiety.

A health goal of this type for human settlements is neither revolutionary nor unfeasible. Each provision is a current objective of health workers and of society in general. It should also be recognized that most communities have had some success with at least some of the listed provisions, and the shortcomings, although enormous in a global sense, are also well within the reach of man's long-term capabilities.

I believe, however, that such a goal constitutes a new departure for health and provides an opportunity to align health programmes more closely with the aspirations of people for improvement in the quality of their lives. This goal would also enable us, as we design our programmes, to view man in his total environment, to appreciate the variety of hazards that affect his health and wellbeing, and to understand more clearly the gap between his present condition and the ideal conditions that we associate with positive health.

It would also provide a baseline to gauge the activities of the health sector against the work of other economic and social forces in society. It would help us to understand how solving one problem may help or hinder the solutions of other problems, thus achieving an effective harmonization of effort between health and other social and economic activities.

The goal I have suggested also takes fully into account the definition of health that appears in the WHO Constitution: "Health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity". We would do well to be guided by the insight of the founders of our Organization 30 years ago. Their emphasis

on wellbeing or positive health is totally in accord with the broader aspirations of international cooperation and the will of nations to improve the quality of life for mankind as a whole.

Just as important as the formulation of goals is the action taken to implement them. In my remarks I have chosen not to dwell on the health problems of human settlements, with which we are all familiar. However, in view of the serious situation of human settlements in some parts of the world and the opportunities provided by the current global discussion, it is imperative that we organize our resources effectively to have a maximum impact on these problems. May I suggest three ways of increasing our impact?

(1) We should resist the tendency to delay while we search for greater understanding of underlying causes of problems or data to define their nature and extent. We must take timely and intelligent action and not lose our way in the search for complete answers to the interrelated causes of man's ill health in human settlements.

(2) We should be keenly aware of and support the efforts of the United Nations to achieve a reduction of armaments, with the goal of using the resources thus released to achieve a better quality of life.

(3) We must not commit ourselves to single solutions, and we must be prepared to adapt to the changing perceptions of society. Our very successes in meeting certain basic needs will create new life perspectives and new social and cultural outlooks, to which we should be prepared to respond.

In some cases health authorities have an enormous stake in the outcome of settlement activities in areas now uninhabited. Take, for example, the international effort against onchocerciasis in Africa. As a result of immense expenditure and effort, fertile land will be opened up in a few years for approximately 10 million people. In our new thinking we realize our health responsibilities do not stop with the eradication of the blackfly and the consequent disappearance of a disease. In fact this is when fresh socioeconomic problems will arise. How will the land be used and by whom? Will the newly constructed settlements be really acceptable or will people leave them for the cities? Will settlement policies strengthen or weaken the family? Sanitary engineers and organizers of health care programmes can play a unique and vital role in helping provide answers to such questions and in creating the desire and determination to advance yet further along the path towards the common goal.

I therefore endorse the general objective contained in the background document for the Technical Discussions which is "to ensure that health is accepted as an integral part of planning, development and action for human settlements at the local, national and international levels".

Action to achieve this objective would entail (*a*) the clarification of

health policies for the planning, management and development of human settlements; (*b*) greater understanding of the relationship between the physical and socioeconomic environment of settlements and the health effects deriving therefrom; and (*c*) perfection of relevant manpower policies, organizational patterns and operational techniques. Operational techniques are particularly needed in the field of health planning to facilitate its integration with national development planning. The efforts in many countries to develop national environmental health plans are a commendable illustration of the type of action required.

The general objective, which calls for integrated action, reflects the salient point in dealing with the health problems of human settlements. Health authorities concerned with ameliorating the environmental causes of ill-health are faced with many difficulties, the principal one being lack of resources. A huge gap exists between the resources available to health authorities and those required to correct these environmental deficiencies. To close this gap, health authorities need to reach out and guide the utilization of resources available to other ministries, the private sector and the people. This cannot be achieved through good intentions alone; there must be a vigorous pursuit of a well-defined policy that:

(1) enables the health authority to act as an advocate to secure the support and cooperation of others in bringing resources to bear on health problems;

(2) capitalizes on the desire of other sectors involved in improving human settlements to rationalize their own operations on the basis of human health;

(3) permits evaluation of the effect of improved health on increased productivity and the reduction of welfare costs in both urban and rural settlements; and

(4) provides information to decision-makers on the health consequences of environmental conditions of settlements, reveals the interrelationship of causative factors, and shows how solving health problems can contribute to the solution of other problems.

In the long run the success of such a policy will be proportionate to our ability to provide needed and acceptable services.

The subject of health aspects of human settlements is vast and complex, and I have therefore attempted in my remarks to chart a possible path through the maze. It is not possible to define precise functions for health authorities, given the great variations between countries in administrative structures, sociological conditions and rates of development; however, during the course of the discussions we should be eager to identify principles on which we can reach agreement.

I have used the phrase "quality of life" several times in this presentation. It is a central concept in work on human settlements. I am convinced that continued failure to endorse the highly unifying and holistic connotations of this concept erodes the very basis for saving life. Members of the health professions, political leaders and builders of settlements share a common goal. That goal is to enable man to put down social roots and experience the inspiration and deep satisfaction that membership of a human community can bring.

Therefore, I urge each of you to give freely of your knowledge of problems experienced in your country, of remedies attempted, and of your ideas, for such an exchange is vital to understanding of this complex subject. I also urge you to take from our discussions new ideas and suggestions for policies, programmes and practice, to take them to your country and share them with you colleagues, for it is in each of our respective countries that the approach to the health aspects of human settlements will be determined.

SOME BASIC CONCEPTS AND A TYPOLOGY OF HUMAN SETTLEMENTS

SOME BASIC CONCEPTS

"Human settlements" and the "quality of life" have proved difficult to define in a satisfactory and acceptable way. For the purposes of the Technical Discussions, the term *human settlements* was taken to mean: "all places in which a group of people reside and pursue their life goals; the size of the settlement may vary from a single family to millions of people". In discussing this definition it was felt by some participants that it was incomplete and that the settlement included not only the place but all the human and ecological structures within it, including all the psychosocial, cultural, political and economic factors that combine to give the settlement its particular characteristics. It was also noted that the size and density of such human concentrations confers specific characteristics on them. These characteristics have repercussions on health, making their appearance through the micro-environment that constitutes the habitat. Both the quantitative aspects (population density, area, etc.) and the qualitative aspects (water supply, waste disposal) must be taken into account.

All human settlements resulted originally from migration and subsequent resettlement and many of today's most acute problems have resulted from the recent migration or displacement of populations. However, the problems of older communities, many of which have existed for hundreds of years, must not be overlooked. Many older cities have outgrown their current resources and potentialities, and many have

experienced an added influx of immigrants. Superimposed on this are the problems of obsolescence and deterioration that together have led to a general decline in the quality of life. Such conditions are inimical to the attainment of an optimum health status and there is an urgent need for replanning and for the development of new resources.

A suitable working definition of the *quality of life* was taken as "the condition of life resulting from the combination of the effects of the complete range of factors such as those determining health, happiness (including comfort in the physical environment and a satisfying occupation), education, social and intellectual attainments, freedom of action, justice and freedom from oppression". Determining which combination of these factors constituted a high or low quality of life would depend to a certain extent on the personal characteristics and desires of an individual.

THE TYPOLOGY OF HUMAN SETTLEMENTS

A typology is useful for the classification of data in a way that facilitates the consideration of the subject as a whole; yet many of the influences, causative factors, points of intervention and solutions are common to several groups of settlements. It is therefore important to develop the subject as a comprehensive entity to reach the underlying issues. Population movement, migration and resettlement are themes running throughout this document; in the following typology their influence is seen to extend to all forms of settlements with large-scale rural-urban migration and rapid urbanization being issues of first priority.

Traditional villages

These are one of the oldest forms of human settlement, with varying degrees of self-government and with social and religious influences forming a stabilizing element. They have increasingly become victims of rural-urban migration, owing in part to the physical hardships of village life and in part to the higher wages, greater freedom and seemingly greater opportunities of the city. The villages are thus losing the stronger and more enterprising members of the community who leave because of political underrepresentation, poverty, poor social and medical services, and unsatisfactory public utilities.

Existing towns and cities

In the older cities much of the present-day urban deterioration and poor quality of life can be traced back to rural-urban migration of the

past, often hundreds of years ago. Workers were attracted by higher incomes and the social amenities and freedoms of urban life, illusory though they sometimes turned out to be. Temporary huts and makeshift accomodations were replaced by the cheapest forms of housing, usually provided by the employers and these were erected when there was little control of building or sanitation. Overcrowding and communicable diseases were rife. In some cities the more affluent members of the community moved away from the noise, congestion, air pollution, and general deterioration of the town centre to new accommodation in more select areas, and their older houses, often of considerable architectural merit, became multiple family dwellings. Other towns and cities of a more stable character preserved relatively unchanged the characteristics, layout and mixed population classes that have existed for generations.

Settlements resulting from rural-urban migration

To the typical urban background must be added the effects of the more recent rural-urban migrations, resulting in further overcrowding of run-down central areas and the growth of squatter communities on the outskirts. The degree to which this has been occurring varies from place to place, as also does the extent to which the municipalities have exercised regulatory control or have invested in municipal housing programmes. In many developing countries today, people are coming to the cities in much greater numbers than before and the pace of urbanization is rapidly outstripping the capacity of industry to provide employment or of governments to provide the services and amenities these migrants hope to find. As a result, much of the urbanization of recent decades has been characterized by the spreading of shanty towns, squatter settlements and generally sub-standard living conditions. Their mixed populations, frequently drawn from different areas, present serious racial, religious and sociological problems. Such settlements are often very large; at the worst they consist of extensive areas of hutments without ready access to water, sanitation, gas or electricity, or health, education, or other social services. They are often beyond municipal boundaries and are thus regarded as the financial and moral responsibility, not of the municipality, but of some more remote level of administration.

Settlements for displaced persons and groups

The need for human settlements for displaced persons and groups usually results from wars or natural disasters; they are almost always of an emergency nature, unplanned and frequently without adequate sanitary facilities and other services. Displacement and the associated

psychological suffering of the people involved create attitudes that often hinder adaptation to the new circumstances and interfere with the provision and acceptance of services, including health services. These settlements are often regarded as temporary and therefore receive only the minimum financial help; however, they sometimes continue to exist and ultimately become permanent.

Settlements for moving groups

Under this classification are included settlements designed for migrant workers, nomads, semi-nomads, tourists and pilgrims. Due to the improvements in transportation and communication, the number of people involved in such groups has increased markedly in recent decades.

From a health point of view, moving groups deserve special attention because of the high risk that they might transmit communicable diseases and carry disease vectors along the route of travel and the difficulties often encountered in providing them with services.

Settlements resulting from planned government or private sector initiative

Such settlements are rapidly increasing in numbers and their success depends primarily on the financial resources available and the planning capabilities of the designers. They may in fact represent prototypes of the human settlements of the future; as such they deserve careful attention in research and planning. They may be designed for agricultural, industrial, commercial, or mixed communities and the mistakes and omissions of initial efforts are often all too evident. Only by seeking and using the best available advice from experts from a wide range of disciplines can the perpetuation and duplication of mistakes be avoided along with the accompanying ill effects on both the health and the quality of life of the new communities.

HEALTH IN HUMAN SETTLEMENTS*

THE EXTENT OF THE PROBLEM

Health in human settlements is a vast subject. In its broadest sense it may be taken to cover the entire range of medicine and allied disciplines, because the presence of diseases of all types is a feature of life in human settlements. The subject includes the whole field of community medicine — environmental health and the provision of good housing; the epidemiology of prevention and treatment of communicable and noncommunicable diseases; accident prevention, occupational health, social medicine and the provision of health education and of health care, including maternal and child welfare services. Although the relative importance of these varies from country to country, from area to area, and from settlement to settlement, health-related problems of human settlements are common to both the developed and developing countries. Developing countries emphasized problems of basic sanitation and nutrition while developed countries were more concerned about chemical and physical hazards and psychosocial problems.

The various factors are closely interwoven; health is affected by the physical and social environment of a settlement, the economic circumstances and the efficiency of administrative services, and the state of the health of the community may in turn have a direct effect on the working capacity and enterprise of the people.

* This section is a synthesis of the Chairman's report on the Technical Discussions made to the World Health Assembly on 13 May 1976.

The protection and maintenance of health are an essential requisite of life in human settlements. In some countries, however, many aspects of health are dealt with by departments other than health, e.g., planning, agriculture, housing and the environment, and the social services, with sometimes unfortunate health effects. Thus, the construction of man-made lakes, irrigation schemes and other large-scale works may result in an increase in communicable diseases, and even economic or social legislation has had unforeseen health effects on communities. Where social service departments exist, close cooperation is necessary so that assistance can be provided to families of unemployed or ill wage-earners and to the aged.

Health must therefore be regarded as a multi- or trans-disciplinary subject and cannot be the prerogative of any one profession. Health workers themselves must be fully oriented to the social, preventive and planning aspects of medicine as well as to the curative services. Within the health department, policies can be worked out by multidisciplinary teams composed of doctors, nurses and other health professionals, public health engineers, food hygienists, architects and others. It is essential also that close liaison should exist between the health department and other agencies dealing with health-related subjects. In turn, the latter should, by persuasion or regulation, consult the health department regarding plans that may have health consequences. Such inter-departmental liaison and advice can be facilitated by creating a high-level liaison committee.

This liaison work can be promoted by the health department in making a special point of educating governmental officers and administrators, as well as elected representatives, in the importance of health problems to the community. Also, transdisciplinary liaison should exist at the local level and an organized system of health education for administrators and politicians could well be an integral part of general health education; in this way, interested persons can be made fully aware of the contribution of health services to the quality of life of the community, in turn enabling them to allocate an equitable share of resources to health departments. A further step would be the preparation of a health planning manual to help publicize the health problems, plans and aspirations of human settlements in individual countries.

In addition, due account must be taken of the social, economic, environmental and health circumstances, including cultural and psycho-social characteristics, of local communities and the special needs that result from them. Highly decentralized administrative services often

prove beneficial by making administrators and decision-makers more keenly aware of the needs and problems of the people. Likewise the administrative infrastructure at both national and local levels must be designed with the community's needs in mind and must be reviewed frequently to ensure that it accommodates to the changing circumstances of the community.

From a legislative standpoint, the authority of the health services should be clearly delineated, giving them adequate powers of enforcement and enabling them to encourage the development of the community within the framework of appropriate health and environmental policies; these powers should be reviewed and revised regularly to ensure that they reflect the changing needs of the community.

Also of importance in the work of a health authority is the determining of norms and standards; these are the subject of much public health law governing such matters as food and water quality, prevention of pollution, formulation of environmental, housing and planning standards, control of the quality of building materials and protection of the public from harmful consumer products. Other sections of the health department should be concerned with occupational health, the protection of the worker, and protection of populations living near factories likely to emit harmful substances. However, without the understanding and support of the public, they cannot achieve their basic objective of raising the level of health.

Economic factors provide an essential background to the health of any human settlement. The development of modern medical knowledge has outstripped the financial and manpower resources of even the most highly developed settlements so that the most sophisticated treatment techniques may not be available. Yet the extent of the problems outlined in these pages makes it apparent that the improvement of the community's health and thus its quality of life places heavy demands on available resources.

Accordingly, every country should strive as best it can to mobilize all available financial, material and human resources to deal with priority health needs. The sanitary requirements of communities, for example, must form an integral part of the general plan for the development of a country, while requirements derived from systematic studies of existing human settlements help assure that such plans do not overstrain available resources or create inequalities in the degree to which they are met. Ways of rationalizing services to provide more efficient use of resources should be studied. Priorities should be determined and, where possible, cost/benefit analyses undertaken. It is also of paramount importance to make maximum use of local resources and minimize dependence on outside help. Such measures will help ensure a better distribution of

resources, avoid luxury and non-urgent expenditures, and make a larger proportion of resources available for health and other purposes in human settlements.

A health authority should, for instance, opt for relatively cheap and technologically simple methods of environmental sanitation in preference to more sophisticated ones that are liable to break down. In another context simple measures to reduce accidents and occupational disease can result in a net economic saving to a settlement. A health authority should also search for new resources. Good liaison between the health and planning authorities may make it possible to site a new industry in an impoverished settlement, which will result in employment leading to better nutrition with consequent effects on health, or more money for the development of the settlement's health services. Finally the possibility of securing outside resources from international agencies and other sources must not be overlooked. These can take the form of grants towards capital expenditure (e.g., for water supply schemes) or assistance with the development of personnel training schemes.

Finally, full community participation is essential in any proposed changes. In many parts of the world this enables schemes to be implemented that would otherwise be impracticable on financial grounds; it also stimulates public interest in health projects. To be fully effective, community participation must be part of a well-thought-out plan by which the public is educated from the beginning in the advantages to be obtained from the proposed project. Rural water supply schemes are a field in which this is proving particularly successful.

NUTRITIONAL FACTORS

Surveys in many parts of the world have demonstrated that many populations suffer from malnutrition either because of lack of food or from an unbalanced diet, resulting from cultural or religious customs that ban certain types of food. Malnutrition also is a major factor contributing to both the prevalence and severity of diseases, particularly communicable, infectious and parasitic conditions. Illnesses such as measles which are of relatively minor importance in well nourished populations become serious if accompanied by malnutrition and can result in high death rates, particularly in infants and children. Infectious infant diarrhoea is an important cause of death in many developing countries and, when accompanied by malnutrition, can create a vicious circle wherein poorly nourished infants are more liable to suffer from diarrhoea and this in turn results in more severe malnutrition. This is

most apparent in countries where unsatisfactory or unhygienic weaning habits prevail.

In contrast, many prosperous communities encounter problems with overweight individuals and consequent high incidence of cardiovascular disease and conditions such as diabetes.

THE PHYSICAL ENVIRONMENT AND ITS EFFECTS ON HEALTH

Water supplies and sanitary disposal of excreta

Waterborne communicable and parasitic diseases resulting from polluted water supplies, bad sanitation, or poor hygienic habits are important causes of ill health and excessive mortality in many areas of the world. A survey conducted by WHO in 1962[1] showed that 41% of the urban population in developing countries had no access to piped water within a reasonably distance from their homes; a survey in 1971 and 1972[2] showed that the provision of rural water supplies was lagging far behind that in urban areas and nearly two-thirds of the rural populations of developing countries had access neither to safe water nor to adequate excreta disposal facilities. The link between water supplies and sanitation must not be overlooked. If both services have not been provided at the same time the benefits of safe water in reducing the prevalence of waterborne diseases can be largely negated by ineffective waste disposal.

The provision of adequate safe water supplies and satisfactory sanitation is one of WHO's priority areas of concern; it is essential that it be a point of primary emphasis in the planning of human settlements. The importance of community participation, associated with appropriate health education, has already been mentioned, and it must be pointed out that relatively simple, unsophisticated equipment that is easy to use and maintain is proving more effective in developing areas than the more elaborate systems used in many cities.

Industrialized countries increasingly find themselves short of water for different reasons; mounting demand for industrial use, agricultural irrigation and domestic consumption comes at a time when the cost of developing new supplies is high and some countries find themselves hard-pressed to raise the necessary capital. This problem is further complicated by the need to protect natural water supplies from industrial pollution and to treat polluted waters before discharge to watercourses.

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[1] DIETERICH, B. H., & HENDERSON, J. M. *Urban water supply conditions and needs in seventy-five developing countries.* Geneva, World Health Organization, 1963, (Public Health Papers, No. 23).

[2] PINEO, C. S. & SUBRAHMANYAM, D. V. *Community water supply and excreta disposal situation in the developing countries: a commentary.* Geneva, World Health Organization, 1975, (WHO Offset Publication, No. 15).

One solution often adopted is the principle of "the polluter pays", with the polluter being required either to treat the effluent in accordance with standards laid down by the health or water authority or to pay the authority to do the job.

In many developed countries where waterborne communicable disease has virtually disappeared more attention is now being paid to chemical pollution and the possible effects of natural trace substances in water. In these countries more research is needed into methods of producing safe water by recycling, by desalination and by controlling pathogenic viruses in treated water supplies.

Housing structure and planning

Making adequate statistical analyses of the effects of housing structure on health is difficult owing to the many variables involved. Nevertheless, there are well known associations between housing and certain communicable diseases and these need to be taken into account in selecting building materials and equipment. For example, in warm climates, dampness can cause moulds that give rise to allergies; in temperate climates a damp house will be cold and clammy, increasing the chances of high respiratory illness rates. The use of unsatisfactory fuels or unsuitable heating appliances may give rise to pollution hazards, yet very little research has been done on indoor air pollution, the effects of central heating and air conditioning, and the influences of indoor microclimates on health.

In many areas the relationship between housing structure and the housing environment is an important feature. In Middle and South America Chagas' disease is spread by triatomid bugs living in cracks in the walls of houses, and in various part of the world leishmaniasis is similarly spread by the sandfly *Phlebotomus*. Water near houses in puddles, discarded cans and water cisterns can provide breeding places for mosquito vectors of malaria and of filarial and certain viral diseases. Insanitary conditions close to houses may give rise to many communicable diseases and parasitic infections, and colonies of rats in dilapidated properties may increase the plague hazard. Moreover, psychosocial effects of housing must not be overlooked; the sense of isolation felt by persons living on the upper floors of high buildings is now well known to have harmful effects. Often, also, people living in densely populated urban areas feel a similar sense of isolation and attention should be given to providing adequate social and cultural facilities in such areas.

Because of these factors there is a growing need for health criteria for housing that are based on reliable scientific and medical data and will enable health and planning departments to work together in estab-

lishing norms and standards for housing. This in turn should give a firm basis for legislation.

Conservation, anti-pollution measures and planning of the environment

Increasing attention is being paid throughout the world to the careful planning of man's environment. Land, minerals, food and other resources are finite; with a rapidly increasing world population it is essential to make the most effective and economic use of what is available. Every effort must therefore be made to counter the deterioration in the quality of life that will occur if population growth continues to outrun the availability of resources.

In many countries the shortage of land necessitates the greater use of high-density housing; this requires the most careful attention to the provision of open spaces, recreation and play areas, the development of social amenities and the effective separation of residential and industrial areas.

Pollution of all kinds is now receiving attention but there is still need for a more effective enforcement of control measures. More research is required, including the search for new or undetected hazards and the effects on health of known pollutants such as pesticides and herbicides. New production methods and technologies that are essential for man's survival are always liable to produce new hazards; constant monitoring and vigilance are therefore required in all countries.

Accidents

Much can be done to reduce the rates of domestic accidents, which affect old people and young children particularly. Attention should be paid to the design and state of repair of dwellings and the planning of their environment, to the design and safety of furnishings and domestic appliances, and to protection from fire, drowning and accidental poisoning.

Road accidents are a growing hazard everywhere, and measures for their reduction include the safe design of road vehicles, the proper planning of roads, the separation of road traffic from pedestrians, and the training and education in safety techniques of drivers and pedestrians (particularly children). Creating special play areas for children will also help to reduce the prevalence of road accidents.

Work-related accidents can be reduced by education of the worker, by the preparation of codes of practice, and by the creation of effective powers of statutory control over industrial processes.

Slums, shanty towns and squatter settlements

Urban slums are common to both developed and developing countries. Unsound structures result in an above-average accident rate while accumulations of filth and refuse encourage insect infestations and disease-conveying vermin such as rats.

Rapid industrial expansion commonly draws workers from rural to urban areas where they must often live in shanty towns or slums for lack of better housing. In addition to poor sanitation and lack of public services, these settlements present their own social and medical problems. Settlers uprooted from the stable pattern of life in the traditional village find themselves strangers in a mixed population group with few friends and no social traditions. The likely presence of neighbours with criminal and other undesirable social characteristics often causes the social and mental state of the community to deteriorate, leading to a high prevalence of emotional instability and mental disease and high crime and delinquency rates.

The control of these problems is often beyond the capability of the city authorities; it then requires national or regional attention. The problem is often so acute that even the most strenuous control efforts only result in a slowing down of the rate of deterioration. To avoid such situations it is necessary to put into effect long-term plans for the rational development of settlements in accordance with available resources, to create new settlements, and where practicable to enact legislation to prevent the further growth of slums and shanty towns.

New housing and new towns

Another approach has been to construct extensive rehousing and resettlement projects. However, without the most careful planning and consideration of the needs of the community concerned, such projects can create more problems than they solve; in extreme cases relatively new housing has had to be demolished owing to poor planning. Careful study is therefore needed to consider not only the design but also the psychosocial factors involved in order to provide the desired improvement in the quality of life for the inhabitants.

In some areas the development of new towns has been an important method of controlling the over-development of older cities. Such schemes also require the most detailed planning if they are to provide a satisfactory physical and social environment for the inhabitants. It is impor-

tant that countries embarking on such projects should benefit from the experience of those who have already done work in this field.

Agricultural settlements

Land resettlement schemes for rural populations have been undertaken on a considerable scale in some countries; they have the advantage of increasing the size of agricultural holdings sufficiently to provide an adequate livelihood for farmers and their families, together with more efficient agricultural production. However social upheavals accompanying the resettlement process may lead to mental problems; in some cases environmental changes result in increased incidence of communicable and parasitic diseases. This is particularly so with large-scale irrigation projects and man-made lakes, where improved economic opportunity attracts farmers and fishermen while putting them at higher risk of parasitic infections like schistosomiasis. In some cases 90% or more of the population has been found to be infected. Frequently these problems can be minimized or prevented through adequate consultation with health departments in the early planning stages of the schemes.

Transitional and temporary settlements, migrants, nomads, pilgrims etc.

Some of the problems of rural-urban migration have already been dealt with in the preceding paragraphs. Other forms of migration may result from changes in political policies or from natural or man-made disasters. In any of these circumstances whole populations may find themselves without housing. Some people, perhaps victims of earthquakes, may try to survive in what remains of their property; others, perhaps refugees fleeing a theatre of war, will find themselves in new surroundings devoid of any facilities. The problems are often too great to be dealt with by local organizations, and help has to be provided by the central government, often assisted by international agencies. The victims of a disaster are often been in a state of shock, unable to do much to help themselves. The gamut of services that may have to be provided for can thus range from emergency burial of the dead and first aid for the injured, through the supply of food, water, shelter and basic sanitation, to rehabilitation training that will help victims begin the process of reestablishing themselves. Housing victims of large disasters near the site of their original homes usually results in fewer social problems but due regard must obviously be paid to the possible recurrence of the conditions that caused the original disaster.

Other problems of international migration arise as a result of labour shortages in industrialized countries that are made good by the importation of migrants, sometimes with their families, from less developed coun-

tries or as a result of political problems that have forced population groups to seek asylum elsewhere. Such movements are frequently accompanied by housing, social and health problems. Living conditions are often difficult and there is overcrowding, with the migrant populations tending to retain their own social customs and language. They thus become isolated from everyday life in the host country and in turn are inclined to feel alien and unwanted. This can lead to higher delinquency rates and a higher incidence of disturbed behaviour. Some of these immigrant groups may also have higher carrier rates of gastrointestinal infections and of parasitic conditions than are experienced in the host countries, and tuberculosis and venereal diseases are apt to be more common.

Another problem common to many parts of the world is the itinerant agricultural worker. Following the harvest and travelling wherever work is likely to be available, agricultural workers and their families often live in shacks without proper sanitation, water, or medical facilities. Nutrition is often poor, particularly during the winter when there is little work. The prevalence of communicable diseases, especially enteric infections, is likely to be high as are sickness rates for many other diseases. Accidents with farm machinery are common among children. Help can sometimes be given through special medical care facilities, coupled if possible with a system of follow-up treatment of patients as they travel from one area to another.

The health problems of pastoral nomads are a special case. They travel from pasture to pasture, usually isolated from other communities and from social, educational and medical facilities. By nature, they tend to be deeply suspicious of threats to their independence and are thus difficult to help. The best approach to their health problems, worked out at a seminar organized by the Regional Office of WHO for the Eastern Mediterranean in 1973, seems to be an indirect one, designed in the first place to win their confidence by providing help in improving water resources and animal husbandry. Medical facilities can probably be provided only at a few fixed points along the routes that they travel, but the training of one or two members of each group in nursing and elementary medical techniques can go far towards providing care when they are far from other assistance.

The masses of pilgrims to religious festivals in the eastern Mediterranean and south-east Asia, often accommodated in tents, require the most careful arrangements to ensure the availability of adequate shelter, a safe water supply, proper sanitation and efficient food hygiene services. When necessary, facilities also have to be provided for vaccination and immunization, and consideration given to the adequacy of first aid, ambulance, medical and hospital services.

OTHER PRIORITY NEEDS IN THE PROVISION OF HEALTH SERVICES IN HUMAN SETTLEMENTS*

Health care

Health care, and particularly the provision of primary health care, has been accepted as a matter of the highest priority. In many parts of the world today health care services are grossly deficient and sometimes completely lacking. Shortages of doctors, nurses and allied health personnel and the absence of clinics and hospitals over large areas are one cause of this situation.

Health education

The provision of health education facilities is of vital importance in many human settlements, because much ill-health is due to ignorance of simple precautions. Instruction can most effectively be started at primary school level. Health education workers do not all need to be highly trained, and good results are often obtained by the training of members of local communities to impart basic health care knowledge to members of the population. On a cost/benefit basis health education yields a high return in improved community health.

* The subject matter of this section was not debated in detail during the discussions as it had already been discussed *in extenso* at other WHO meetings. It was, however, included within the scope of the Technical Discussions to enable priority needs of human settlements to be determined.

Communicable diseases

Although communicable diseases have been reduced to relatively minor proportions in many developed countries, they are still the primary health hazard over large areas of the world. The fight to control them must therefore continue unrelentingly.

Mental health

Mental illness causes much suffering in human settlements and its social, environmental and community aspects are still little understood. Increased attention must therefore be given to this subject and particularly to research into the social and environmental factors. This subject is likely to play an increasingly important role in planning future settlements. High-risk groups include displaced persons, migrants, populations living in slums, shanty towns, squatter settlements and generally overcrowded and deteriorating conditions, and persons suffering from poor economic or social circumstances. The association with delinquency and drug addiction requires investigation.

High-risk groups in human settlements

High-risk groups in the population must continue to receive increased attention, including the provision of preventive and curative medical services to infants and young children, expectant and nursing mothers, the old, and persons engaged in hazardous occupations.

Information and statistical services

Health workers require statistical data and information to assess the extent of deficiencies in existing conditions, to determine the action necessary to remedy them, and to convince administrators and decision-makers of the need for development. Information on disease incidence and mortality is lacking in many parts of the world, particularly in areas in greatest need of improved health services. In such areas information is difficult to obtain owing to the absence of adequate numbers of health personnel and workable reporting systems. Attention has therefore to be given to methods of collecting simple health data suitable for such areas. It should be noted that major deficiencies in health care are often apparent without detailed investigation, and corrective action should not be delayed while awaiting improved statistical information.

The broadened concept of health resulting from its integration into the social, ecological and organizational structures that contribute to the quality of life in human settlements emphasizes the need for extensive research efforts. This should encompass not only medical and scientific problems but research into the organizational, economic and legislative factors related to health influences in human settlements.

On the scientific and medical aspects there is a vast field. One prerequisite is information on demographic and other population characteristics for use in epidemiological studies because the epidemiology of human settlements is still in its infancy; more effective and more sophisticated methodologies are needed to assist, for example, in disentangling the extremely complex interrelationships of the physical, social, psychosocial and economic environments and their effects on the etiology of disease.

On a somewhat less complicated level, little is known of the effects of many aspects of the physical environment, such as climate (including indoor microclimates, especially humidity), the effect of ventilation systems on the spread of communicable diseases and toxic substances, air ionization, and interference with magnetic fields by steel-framed buildings.

In the toxicological field there is a constant need to assess the potential effect of new chemicals on the environment including the long-term effects of pesticides, herbicides, certain food additives, colourants and food packaging materials. Much remains to be done on the effects of some of the commoner pollutants: carbon monoxide, sulfur and nitrogen oxides, toxic elements such as lead, cadmium and mercury, and both the beneficial and harmful effects of trace substances in drinking-water and foods. Much also has still to be done on the environmental causes of cancer and degenerative and other diseases; although our knowledge of environmental carcinogens, teratogens and mutagens is constantly increasing, it is difficult to assess their effects in the concentrations occurring in the environment. WHO has recently begun setting forth health criteria for many environmental pollutants but the evidence so far available, along with that used in compiling maximum allowable concentrations (threshold limit values) in industry, confirms the many deficiencies in our knowledge. The sciences of toxicology and epidemiology have much work ahead of them, including the study of the additive and synergistic effects of many environmental pollutants that remains relatively untouched.

In the field of mental health there are as yet no epidemiological methods capable of assessing the effect of environmental and psychosocial factors

on mental health. Little is known about the health effects of crowding or the amount of living space required by populations in high-density urban areas. Similarly the appalling conditions under which some sections of the population spend their lives have existed almost unchanged for generations with obviously harmful effects on the quality of life but with yet-to-be determined effects on mental health.

Training programmes

The training of medical and allied health personnel has in the past concentrated almost exclusively on the curative aspects of medicine, and changes are needed in the curricula to reflect the increasing concern with the socioeconomic and environmental aspects of health in human settlements. For workers specializing in social and community medicine there is a need to adapt to the new concepts now prevailing if health services are to play their proper role in improving the quality of life in human settlements. The same applies to the training of experts in other disciplines — planners, architects, and civil engineers — who will be engaged in the development of services in human settlements.

Environmental health criteria

Environmental health criteria are the relationships between a given hazard expressed in quantifiable units and the risk or magnitude of the resulting effects on the human body. Sound scientifically based criteria are required not only for toxic substances, pollutants, contaminants, pesticides, etc. but also for many other factors such as housing design and quality, population density, heating, lighting and ventilation systems, and noise. Often the scientific basis for such criteria is rudimentary, particularly in respect to mental health. When suitable criteria have been agreed they may be used to establish norms and standards for health legislation.

THE RELATIVE IMPORTANCE OF INDIVIDUAL INFLUENCES ON HEALTH

The various known environmental, socioeconomic and other factors affect the health of people in both developed and developing countries and in both stable and migrant populations but in different ways in each situation.

One problem that needs to be considered is the extent to which it is possible to determine the relative importance of environmental and other influences on the health of human settlements.

With the more common hazards a partial answer may be easy. Thus a water supply heavily contaminated with *Vibrio cholerae* or *Salmonella typhi* will lead to an explosive outbreak of disease, but socioeconomic factors may affect the susceptibility of the population and the seriousness of the resulting outbreak. Similarly a high urban prevalence of bronchitis may be related to persistently high levels of air pollution, but other factors, e.g., the proportion of smokers in the population or some specific occupational hazard, will also have an influence.

In other situations the possible etiological factors may be so numerous that sophisticated statistical techniques have to be used and even these may not provide a conclusive answer owing to the poor quality of the basic data or the complex interrelationship of the factors. Often, however, a well planned epidemiological investigation will produce sufficient evidence to justify specific public health action. Such was the case in the Inter-American investigation of childhood mortality.[1] Another problem

[1] PUFFER, R. R. & SERRANO, C. V. *Patterns of mortality in childhood*, Washington, DC, Pan American Health Organization, 1973 (PAHO Scientific Publication No. 262).

that needs to be considered is the extent to which it is possible, in certain environments that are commonly said to be "unhealthy" (e.g., slums), to define the precise causes of this unhealthiness.

This problem is so complicated that statistical assessment or proof is not practicable at present. An example of the difficulties likely to be encountered is provided in the report on the uses of epidemiology in housing programmes and in planning human settlements,[1] which, in discussing epidemiological evidence that the house itself is related to ill-health, points out that the many factors associated with living conditions are strongly interrelated. Social class, occupational status, unemployment, poverty, mental capacity, general ability, and the social status and health education of parents, none of them strictly covered by the term "environment", may singly or in combination cause a family to find itself in an "unhealthy" environment. Thus the worker of limited ability may only be able to find a low-paying job, if he can find one at all; this leads to poverty, which forces a family to live in a substandard house and environment. Moreover, lack of education or inadequate cultural adaptation can have a more direct effect on health than a poor standard of home management and health care for the family.

Despite these statistical difficulties there is no evidence of significant unrecognized factors at work in these areas. So the problem is primarily the determination of priorities among the known health influences to ensure that the optimum use is made of the available economic and manpower resources and to increase these wherever possible and necessary.

[1] WHO Technical Report Series, No. 544, 1974.

THE ROLE OF THE WORLD HEALTH ORGANIZATION

Suggestions regarding the work that might be undertaken by WHO included:

— the training of personnel, including medical specialists and health educators, the training being oriented to the community aspects of preventive medicine;

— the granting of fellowships and the arranging of exchange visits of personnel between countries;

— the organization of regional and interregional seminars to permit participants from different countries and conditions to exchange experiences;

— technical cooperation and help by consultants on specific projects;

— dissemination of information and exchange of information between countries, including the publication of technical literature and the preparation of bibliographies (a bibliography on cost/benefit analysis in relation to housing programmes was suggested);

— coordination of research on the relationship of the physical environment to health;

— assistance in setting of environmental health criteria and standards;

— supply of commodities;

— coordination of the work of national and international institutions dealing with health aspects of human settlements;

— promotion of research on mental health, particularly on the connexion between the mental health of children and the housing conditions in

which they live and between behavioural disturbances or delinquency and the problems of living in large urban centres;
— promotion of research on the impact on health and national economies of activities undertaken to improve and develop housing.

CONCLUSIONS: PRIORITY HEALTH NEEDS OF HUMAN SETTLEMENTS

The most obvious health sector needs in human settlements as debated during the Technical Discussions may be summarized as follows:

(1) Improved health service legislation, organization and administration (including adequate liaison with other policy-making government departments and with members of the community). Particular stress was laid on this, especially on the need for close relationships with other departments in order to enable health departments to make the maximum contribution to the quality of life in human settlements.

(2) Adequate nutrition. Apart from its direct effects on the body malnutrition is an important predisposing factor in the prevalence of and mortality from many diseases.

(3) Adequate preventive and curative health care services, including maternal and child care, mental health, occupational health, care of the aged and the disabled, accidents and accident prevention, chemical and radiation hazards and hazards from consumer goods. This is a major WHO priority because of the inadequate or sometimes non-existent health care facilities in many parts of the world.

(4) Satisfactory environmental conditions, particularly an adequate supply of safe drinking-water and an adequate and safe system for the disposal of excreta. These two are also major WHO priorities because waterborne communicable diseases and urinary and faecally transmitted parasites are important causes of ill-health and excess mortality.

(5) The control of preventable communicable diseases.

(6) Improved health education services.

(7) Adequate financial and material resources.
(8) The training of sufficient health service personnel.
(9) The need for improved collection of data and information.
(10) The need for more research.

Annex I

SUMMARY OF INFORMATION CONTRIBUTED BY MEMBER STATES

INFORMATION ON NATIONAL CONDITIONS

Nature of the information contributed

The replies were clearly related to the type of country involved. In countries with long-established systems of public health control and well-established settlements of whatever type, the needs consisted mostly of up-dating and expanding the service to keep pace with the progress of medical and environmental science. Other countries were more concerned with providing basic sanitary, public health and health care services and extending these to the entire country.

It was apparent that there was considerable uncertainty about what was meant by the term "human settlements", some countries adopting a more restrictive definition than others. There was an obvious need for definitions of both human settlements and the quality of life. In the absence of any agreed definition, working concepts of these terms were drawn up for use during the discussions (see pages 21 and 22).

Administration, finance and legal controls

Some countries expressed a need for a thorough review of their system of public health law and administration; some had obviously given great thought to developing a logical and comprehensive system, including emphasis on determining hygienic norms and standards. Other

countries with well developed public health systems were concerned with improving efficiency and strengthening the powers of public health control. One country whose public health service, law and administration had remained relatively unchanged for some years was interested in modernizing its legal and administrative systems to enable it to cope with contemporary problems. There were obviously great differences in policy between countries about the extent of health care to be provided by the State as opposed to the health care provided by private services. One country stressed the need for publishing clearly-thought-out policy plans to encourage community participation.

Several countries referred to the need for liaison between health departments and other branches of government; others commented on the general shortage of funds for much-needed health projects, including in particular, the building of low-cost housing.

PRIORITY SUBJECTS MENTIONED BY MEMBER STATES

Environmental health

In their lists of requirements many newly independent countries concentrated almost exclusively on basic sanitary measures — safe and adequate water supplies, effective waste disposal, the more obvious pollution problems and adequate housing. By contrast the countries of Europe and North America that replied listed many subjects requiring research or more effective methods of control. These included:

— noise, air, water, soil pollution and development of the technology of processing and utilizing wastes.

— methods for developing safe and adequate water supply systems, the use of standposts instead of piped water supplies in areas with grave water shortages, and guidelines for cheaper water supplies and waste disposal systems (including low energy means of waste disposal).

— pest management, cheap, safe and non-persistent pesticides, vector control.

— low-pollution sources of energy.

— the health effects of specific environmental pollutants including lead, asbestos, motor vehicle emissions, and those from power plants and specific industrial processes.

— improvements in food hygiene and control of food additives.

— the effect of household ventilation on health, particularly on the spread of airborne communicable diseases.

— the health effects of changes in electromagnetic fields and air ionization due to the steel frameworks of some types of buildings.

One European country stressed the need for regulating the growth of large cities and conurbations, selecting healthy sites for new towns, creating health protection zones round industrial plants, and preserving green belts and areas of natural beauty. This country also referred to the need for positive action in opening up less developed areas, the rational utilization and conservation of water resources, the creation of large artificial reservoirs by damming rivers, the planting of new forests and irrigation of desert regions, the creation of national nature reserves and the reclamation of territory lost through industrial activity.

Health education and accident prevention

The importance of health education was stressed by countries in most parts of the world; this, together with family planning, could result in very marked health improvements. Some countries commented that their efforts in this field were hampered by language and illiteracy problems.

The importance of accident prevention and community safety was stressed by many countries.

Housing and planning

Alleviating shortages of housing, as might be expected, was a high-priority task for many developing and rapidly growing countries, particularly the shortage of housing near places of work that results in squatter settlements, shanty towns, improvised housing, overcrowding, slum conditions and the uncontrolled growth of cities.

Many comments cited the need for giving planners adequate powers. Valuable suggestions on methods of dealing with some housing problems included the improvement of rural conditions to increase local stability and the establishment of new rural growth areas to induce populations to stay.

One country has in fact used this technique on a considerable scale over the past 20 years to create a series of new towns in rural areas, each designed to have a population of several hundred thousand, thereby relieving pressure on old established cities. Such new towns give great scope for efficient, but sometimes mistaken, planning. It is therefore important that experiences derived and lessons learned are publicized to prevent the repetition of errors. One country made a special point of describing the ill-effects on family life of multistorey housing, a lesson that has unfortunately had to be relearned in many countries.

National and international migration

In their contributions most countries mentioned migration. The typical problems of rural-urban migration and some suggested remedies have

been described in the previous paragraphs. In the worst cases the action being forced on local authorities is often not so much to improve conditions as merely to find ways of slowing the deterioration of local environments as populations increase in size.

Many comments were made on emergency migration resulting from natural disasters, wars, or expulsion of populations. These are frequently international in scope, often taking place with great urgency and under conditions of stress. Great hardships and high mortality are often experienced at the outset with temporary settlements growing up in unsuitable situations; however, once established, they tend to become permanent.

In some countries international migrations have been slower and of a more controlled type with the main difficulties being a lack of adaptability and the tendency of migrants to gather in groups with their own language and customs. Efforts to overcome these difficulties include special language tutoring, education, social services and housing.

Information services and data collection

The importance of comparative health statistics and other data for the evaluation of health services was mentioned by many countries as a means of helping to ensure the best use of economic resources. Countries with adequate systems of data collection commented on the difficulty of correlating health effects with essential environmental and other factors. Improved information, were it available, would assist health officers in establishing new projects.

Community participation

A number of countries indicated their awareness of community participation as a means of stimulating public interest and of making up for limited financial and material assistance.

Manpower problems and training

Comments on manpower were mostly related to shortages of trained personnel and of training facilities, and the use of aides and partly trained assistants.

INFORMATION ON SPECIFIC HUMAN SETTLEMENTS

Agricultural settlements

A number of countries have been successful in developing agricultural settlements. In some cases projects were established to deal with a par-

ticular social problem such as unemployment. In central Africa an agricultural settlement provided a reasonable standard of life for 400 young unemployed persons (married and single) drawn from various parts of the country and settled in a fertile area that had been cleared of the tsetse fly. Training and community participation brought good results. Health and nutritional status were good.

In South America, a somewhat similar scheme provided work for 4000 people in a derelict mining area. By taking advantage of the existing infrastructure of houses, roads and public services the government created a cooperative farming scheme; the miners, after retraining, were able to adopt a new way of life and remain in the area. Nutritional and health status were on the whole reasonable but improved health services and health education are needed.

In a very large scheme reported from a western Pacific country, families working small unproductive plots of land were resettled on holdings of 4 ha (10 acres) that had been reclaimed from the jungle and planted mainly with rubber trees and oil palms; the settlement now totals some 28 000 people. Nutrition is good and health services have been established. Unfortunately disease vectors of malaria and dengue were present, and malaria introduced by migrant labourers from other states became rampant, necessitating energetic control programmes. This is an example of the need for consultation with the health department during the early planning stages of new settlements to prevent outbreaks of disease.

Lack of liaison between government departments was also partly responsible for the spread of schistosomiasis in settlements created near a new lake in one African country. Another example of the consequences of inadequate health consultation came from a country in the WHO Eastern Mediterranean Region where a small agricultural settlement of 750 people was established on land reclaimed by draining a lake. Instead of being built on the higher ground the new settlements were often situated near the drainage canals, resulting in a high incidence of schistosomiasis and an increase in ankylostomiasis and malaria. Another problem was protein-energy malnutrition resulting from the sale of too high a proportion of poultry and dairy products to a nearby town where prices were high.

Another country in this Region gave an interesting account of the action being taken to assist its roughly 200 000 nomads who move between winter and summer grazing grounds each year. The programme includes improved education in health and animal husbandry and improved health care facilities. To reach remote tribesmen members of the tribe are given basic health training so that they can treat their neighbours when they return to their tribes. A third country in this Region described the problems of pilgrim camps.

Many of the agricultural settlements are based on the redistribution of existing land in parcels large enough to permit the use of efficient farming methods, thereby providing adequate support for the farmers and their families. New housing with adequate water supplies and other services are provided. Some retraining may have to be given and health services (including health education services) developed. Health and nutritional status in these settlements is usually good.

In contrast to these new developments were the unchanged conditions in a number of agricultural villages and hamlets in Africa and Middle America. These are mostly small and poverty-stricken with considerable malnutrition and as yet little benefit from government social and health services; water supplies are contaminated and sewage and refuse disposal systems absent; housing is primitive, giving inadequate protection from the weather. Not surprisingly, health in these settlements is poor and infectious and parasitic disease rates are high.

Long-established towns and cities

A number of countries selected long-established, often large, industrial towns as examples of urban settlements. The conditions described are typical of the well-known urban problems; the health services have usually developed over many decades and the problems are mainly those of filling in of gaps in the services in response to modern demands for good living conditions, the development of environmental controls that take advantage of recent research, and the development of more efficient systems of administration.

In Asia, the population of one typical city had grown from 95 000 to over 560 000 during the past century, with some 55% of the inhabitants living in slum or shanty-town conditions. A recent outbreak of cholera was attributed to poor sanitation, poor nutrition and unsatisfactory personal hygiene. Efforts to remedy conditions in this city were concentrated on expanded public utility services (water, sanitation, street lighting, etc.), the building of modern apartment houses for slum and shanty-town dwellers, and government-aided self-help housing schemes.

Suburban and satellite settlements: industrial developments

For this category of settlements the examples selected run the gamut from good to bad. These are the settlements that bear the brunt of rural-urban migration; at their worst they constitute mere squatter settlements and shanty towns. In other areas private industrial or government investment has made possible the development of new settlements, but lack of effective planning has caused various problems.

In one south-east Asian country a settlement with a population of 90 000 was developed in response to local industrial needs. In the absence of housing codes or standards, the site chosen was on low-lying land that is subject to flooding. With a continued influx of rural migrants at a rate of about 3% annually, however, housing is now congested and individual houses are overcrowded and deteriorating. Although protein-energy malnutrition and communicable disease rates are high, they are lower than elsewhere in the country, probably because of the better economic conditions. There is an obvious need for long-term planning to improve the standard of life. The needs of this area are characteristic of those described in the outline document sent to Member States prior to the discussions — new resources, better exploitation of existing resources, external funding, better manpower utilization, reduction of individual economic disparities, and community participation. These are recognized but are difficult to put into effect under existing circumstances.

Another example, drawn from central Africa, was of a suburb of 20 000 population with a 10% annual growth rate resulting from rural-urban migration. The settlement was built partly with government help; the dwellings were fairly well constructed of semi-durable materials, but disease vectors in the vicinity caused malaria and typhus. Also nutrition was about 20% below standard.

In western Europe another suburban city area faces the opposite situation of a declining population after having grown from 348 to 24 500 between 1955 and 1960. Although nutrition and health are good, the social problems and poor planning associated with such rapid development continue to cause trouble.

A report from Australasia describes an industrial township near a large city that has now a population of 40 000 mostly made up of rural migrants; sanitation is satisfactory, houses are of a standard government design, and nutrition is good. The population is essentially homogeneous, being mostly of Polynesian-Maori origin, and the problems are primarily of a social nature. This, however, is thought to reflect on health and may account for the increased prevalence of tuberculosis. In commenting on the settlement the country stressed that new settlements should never be planned without adequate liaison between government departments and without giving full consideration to the medicosocial effects of the environment and the accompanying development of appropriate health services.

Holiday resorts and retirement areas

These constitute a special variety of modern urban and semi-urban development and examples were cited from the Mediterranean coast.

There, the settlements have developed into complexes of many hundreds of thousands of people with mostly good structural and environmental conditions. However, in some less urbanized areas, problems of poor water supplies and inadequate sanitation exist. Also, the demand for hotel and construction workers has depleted the labour supply in the hinterland, making these areas less productive.

New towns

Several countries commented on the creation of new industrial settlements as a means of relieving the pressures of rural-urban migration and expansion of squatter settlements in existing industrial areas. One report calls for planned housing to be built at the same time as industrial installations. Without this, new areas of squatter settlement would be created.

One European country described its valuable experience in the development of new towns, which have been built by the government over the past quarter-century to relieve pressure on existing cities. In the most recently established town, the population rose from 43 000 in 1969 to 70 000 at present and is expected to reach 250 000 by the year 2000. At the outset the suitability of a site for such a city was first determined and a development corporation appointed to manage the project. Extensive interdisciplinary discussions took place between architects and planners on the one hand and existing local authorities and organizations and industrial interests in the area on the other. On the medical side, local practitioners, hospital consultants, community physicians, hospital administrators, nurses and social workers worked with county and government representatives. In the early stages much of the discussion took the form of an exchange of information, progressing to definite plans as the group became more aware of each other's viewpoint. Thus national experience in hospital design, health centre planning and staffing problems were integrated with those of other departments (transport, industry, etc.) and with local experience. With building now going ahead it is hoped that the emerging city will incorporate the best that modern planning can contribute to the quality of life.

Annex 2

PREVIOUS WORK BY WHO ON HEALTH SERVICES IN RELATION TO HUMAN SETTLEMENTS

As early as 1961 a WHO Expert Committee on the Public Health Aspects of Housing[1] considered the broad relationship of housing with health and defined the fundamental requirements of healthful housing. In 1964 a book by Andrzejewski et al. was published on "Housing programmes: the role of public health agencies"[2] and an Expert Committee was convened in the same year to consider environmental change and the resulting impacts on health.[3] The following year the report of an Expert Committee was published on the environmental health aspects of metropolitan planning and development.[4] In 1966 a WHO Expert Committee on Appraisal of the Hygienic Quality of Housing and its Environment[5] was concerned mainly with methodology and set out in some detail the fundamentals of survey and appraisal methods, stressing that the purpose of appraisal is not simply to gather statistical information but to provide means to stimulate programmes that will improve housing and its environment.

The Technical Discussions at the Twentieth World Health Assembly in 1967 were on "The challenge to public health of urbanization". The deliberations at this meeting were centred on rural-urban migration resulting in the rapid growth of cities, particularly in the developing

[1] WHO Technical Report Series No. 225, 1961.
[2] ANDRZEJEWSKI, A. et al. *Housing programmes: the role of public health agencies.* Geneva, World Health Organization, 1964 (Public Health Paper, No. 25).
[3] WHO Technical Report Series, No. 292, 1964.
[4] WHO Technical Report Series, No. 297, 1965.
[5] WHO Technical Report Series, No. 353, 1967.

world, with the inevitable consequence that large proportions of the populations of these cities were living in improvised, overcrowded homes, with absent or inadequate sanitary facilities and with only the most elementary health, education and social services. The meeting considered that WHO could perform a useful function by disseminating the experiences of various countries in solving urbanization problems, and that reports on model projects in housing and planning and manuals on the health aspects of both urbanization and village planning should be prepared. The organization of interdisciplinary seminars was suggested.

A publication on "The physiological basis of health standards for dwellings" was issued in 1961.[1] In 1970 and 1974 respectively reports of Expert Committees on "National environmental health programmes: their planning, organization, and administration"[2] and on "Uses of epidemiology in housing programmes and in planning human settlements"[3] were published.

"The contribution of health programmes to socioeconomic development" was the subject chosen for the Technical Discussions at the Twenty-fifth World Health Assembly in 1972. The complex interrelationships between health and health services and socioeconomic development were explored and it was stressed that all sectors of a national economy face the common constraints of financial, manpower and technological resources.[4]

Two years later, at the Twenty-seventh World Health Assembly, the subject of the Technical Discussions was "The role of the health services in preserving or restoring the full effectiveness of the human environment in the promotion of health " and the report[5] contains much valuable information on the development of health services in human settlements and on the kinds of mental health problems associated with various environments.

A joint UNICEF/WHO study[6] in 1975 concluded that community participation in health activities is a crucial factor in developing the effectiveness of health services at the local level. This approach is highlighted in *Health by the People*[7] which describes innovative methods of delivery primary health care to the populations, particularly in rural areas, involving commuuity action and participation.

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[1] GOROMOSOV, M. S. *The physiological basis of health standards for dwellings.* Geneva, World Health Organization, 1968 (Public Health Papers, No. 33).

[2] WHO Technical Report Series, No. 439, 1970.

[3] WHO Technical Report Series, No. 544, 1974.

[4] WORLD HEALTH ORGANIZATION. *Interrelationships between health programmes and socio-economic development.* Geneva, 1973 (Public Health Papers No. 49).

[5] MEYER, E. E. & SAINSBURY P., ed. *Promoting health in the human environment.* Geneva, World Health Organization, 1975.

[6] DJUKANOVIC, V. & MACH, E. P., ed. *Alternative approaches to meeting basic health needs in developing countries.* Geneva, World Health Organization, 1975.

[7] NEWELL, K. W., ed. *Health by the people.* Geneva, World Health Organization, 1975.

In addition to this published material there have been many regional and interregional symposia, working parties and seminars dealing with specific subjects. As an example of these may be mentioned the inter-regional seminar on health problems of nomads held in Iran from 22 to 29 April 1973. This showed that, while health education and primary health care services could be based on certain fixed centres, a great deal could be done by training selected members of the nomadic tribes who would subsequently return and accompany the tribes on their journeyings.

An annotated bibliography on housing, the housing environment, and health has now been published by WHO.[1] Many other reports have of course been published by the Organization on specific effects of the environment on health including, *inter alia*, reports on air and water pollution, communicable diseases, nutrition, accidents, and the delivery of health services, all of which have a relevance to the health conditions prevailing in human settlements.

These reports and discussions together establish the basic requirements for healthful housing and the methods of investigating and evaluating the effects of the housing environment. They contain many suggestions to guide future progress, work that unfortunately has been hindered by the shortage of funds and of adequate numbers of trained personnel in many countries.

Specific suggestions emanating from the 1976 Technical Discussions regarding the work that might be undertaken by WHO will be found in an earlier section of this report.

[1] MARTIN, A. E., KALOYANOVA, F. & MAZIARKA, S. *Housing, the housing environment, and health; an annotated bibliography*. Geneva, World Health Organization, 1976 (WHO Offset Publications No. 27).

Annex 3

CHAIRMEN, RAPPORTEURS, AND SECRETARIAT OF THE TECHNICAL DISCUSSIONS

Chairmen

General Chairman: Dr M. Aldea (Romania).

Chairmen of subgroups: Professor O. Lopes da Costa (Brazil), Dr T. Mork (Norway), Dr J. Wright (Niger), Dr J. Pleite Sanchez (Spain), Dr M. Assar (Iran), Professor K. A. Khaleque (Bangladesh), Dr S. Ramrakha (Fiji), Professor S. Bedaya-Ngaro (Central African Republic).

Rapporteurs

General Rapporteurs: Dr M. A. Silva (Nigeria), Dr M. F. Lechat (Belgium).

Rapporteurs of subgroups: Professor L. Rosíval (Czechoslovakia), Mr A. Vinette (Canada), Dr W. A. van Kanten (Surinam), Professor R. Senault (France), Dr Y. Montesinos de Parra (Venezuela), Dr A. A. Idris (Sudan), Dr P. J. N'Dow (Gambia), Dr Sivakami Devi (Singapore), Dr S. Diakite (Mali).

Advisers

Consultants:

Dr W. A. Hassouna, Institute of National Planning, Cairo, Egypt.

Dr A. E. Martin, formerly Principal Medical Officer (Environmental Health), Department of Health and Social Security, United Kingdom.

WHO Secretariat

Secretary of the Technical Discussions: Mr L. A. Orihuela.
Adviser: Mr R. E. Novick.

Secretaries of subgroups: Mme B. Goelzer, Dr S. Nechaev, Dr D. Flahault, Dr M. Carballo, Mr H. A. Rafatjah, Dr M. A. Bailey, Mr G. Ozolins, Dr S. Moday.

Technical Officer: Miss M. Hilsenrad.
