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HEALTH, POPULATION DYNAMICS AND DEVELOPMENT  
(SESSION V)

## HEALTH, POPULATION DYNAMICS AND DEVELOPMENT

## 1. INTRODUCTION

1. Health and Population Dynamics.

Looked at separately, health and population dynamics would seem to represent different fields of study. Thus, when mention is made of health planning, the main preoccupation from the health point of view seems to be the provision of health infrastructure. In point of fact, health planning embraces population dynamics because the current structure and foreseeable development of population in the future determine the health infrastructure required now and in future. It may be just as well to note that the argument is about public health, a term which embraces far more than health services and staff. Population dynamics, the three major components of which are mortality, fertility and growth, offer a field of investigation in common with health. This is particularly so because health and population dynamics fall within the framework of development planning, and influence the various strategies adopted in national development plans.

2. Health and Development

It is also worth recalling the importance of the interaction of health and development, without going into the numerous arguments on the subject. In a recent study, Myradal<sup>1</sup> pinpointed the role of health in the development process. If health is affected by socio-economic factors, certain socio-economic factors which play a decisive role in development such as living conditions, income and nutrition, are in turn influenced by health. Reference is often made to the consequences of disease on the national product and economic growth.<sup>2</sup> Incapacity represents loss of working hours, debility represents loss in labour productivity and death is a definite loss in the labour force.

Taylor<sup>2</sup> mentions two definite instances. In a region in the Philippines, the daily absenteeism among workers because of malaria was 35 per cent. An anti-malaria programme was implemented and, as a result, absenteeism fell to less than 4 per cent: 20 to 25 per cent less workers were needed to do the same amount of work as before. In Haiti, it has been estimated that a yaws eradication campaign made it possible for 100,000 workers who had been incapacitated to resume work.

It must be generally admitted that the reason why health like education has long been regarded as a priority in theories of development, is that the highest priority was accorded to investment in capital and not to investment in humans.<sup>2</sup>

3. Common preoccupations and the role of demography

The common preoccupations of health and population policy in development plans, calls for a precise statement of the role of demography in health planning. The methods of demography and its sources of information, make it possible to describe population dynamics, a knowledge of which is useful to the health planner. In this way, demography supplies information that can be used in health planning. This is the purpose of the present paper in which reference will be made to work recently carried out in the

Maghreb countries and West Africa.

## II. Contribution of Methods and Sources of Demographic Information

### 1. Censuses and sample surveys

Population censuses and, to an increasing extent, sample surveys, represent the main sources of information. As regards sample surveys, repeated passage surveys provide the most reliable and most extensive information on population. These surveys, which have been conducted in the past ten years in several Maghreb and Sub-Saharan African States, particularly French-speaking ones, have made it possible to fill certain gaps and to obtain more precise data than was obtained from censuses or retrospective surveys. For instance, the survey which has been conducted since 1963 in the Sine-Saloum region in Senegal, provided information on infant mortality which was more strictly accurate and more detailed than in the past (variation and distribution according to age.). These surveys are not all inspired by considerations of demography. Some, for instance, aim at economic, health and educational goals. This was the case in Morocco with the national survey which was a multi-purpose one (1961-1963). The national demographic survey of Tunisia (1967-1969) may also be mentioned, and the survey on the Adamaoua region in Northern Cameroon (1965-1968).

Special mention should be made of two advantages and one disadvantage with regard to multi-purpose surveys. In the first place, these surveys collect various types of data in order to secure an overall picture of the facts of population or the particular subject under review. In the second place, the same staff may be used for data collection, and this reduces the cost of the operation. But, there is this disadvantage in that the survey is unwieldy and makes concessions to its protagonists by according priority to a particular type of information over another. It is difficult to determine the dosage, and this explains why occasionally fragmentary surveys with a simple objective and limited aim are undertaken, limited in extent as well as in the quality of information. But it is precisely the extent and the quality of data that the health planner needs and the development planner, too.

### 2. Indices on situation. Population projections and health indicators.

The various mortality, natality and population growth rates are basic indicators for getting to know a particular situation. The advantage in making use of these indices depends particularly on the crude data (births, deaths etc.) used for working them out (their exhaustiveness and their quality) and, of course, on the characteristics of the population concerned and their reaction to data collection (their willingness to co-operate and provide assistance).

Moreover, if projections that can be used in health planning are to be obtained, the projections of overall population and of certain age groups in particular must be available. Indeed, there are certain age groups which should have priority in projections, because of their immediate implications as regards health infrastructure. For instance, projections on children at the breast and on the female population provide some idea of the probable needs in pediatric and obstetric services. Projections of population density per square metre are also important as a means of estimating the establishment or development of appropriate health services.

We shall refer to the projections of health indicators only by way of reminder. It is worth recalling that the measurement of natality is essential for estimates on maternity and child welfare services. The estimates raise particular problems for developing countries, because the preparation of projections on natality rates require some knowledge of the population of married women on the basis of age and the duration of marriage. As it happens, most of the time these two items of information do not exist, especially in the rural areas.

### 3. The role of models and epidemiological studies

It is worth recalling that the strict preparation of demographic models which can be used in health planning depends on the possibility of data collection and also on its quality. In addition to demo-economic models, mention might also be made of ecological models and models on genetics and fertility.<sup>2</sup> Certain models, including the stochastic model referred to as "Popsim" make it possible to simulate data on cohorts or periods.<sup>6</sup> The information can be analyzed in a similar manner as information collected from longitudinal sample surveys.

Mention might also be made of information supplied by epidemiological surveys on the prevalence of certain specific diseases determined by sample surveys. These surveys are often limited to a population group or a time sequence. Where a population group is concerned, the survey covers only the observed diseases such as contagious diseases and those which have been recorded like cancer. The advantage of epidemiological information lies not only in the knowledge it provides of a situation, but also in the possibilities it offers of drawing the necessary conclusions as far as health policy is concerned. In this connexion, the role of certain approaches to health problems can be appreciated for the information they provide as well as for their implications as regards health policy.

### III. Use of demographic information in health planning.

The use of demographic information for health planning falls within the framework of the diagnosis of the current situation and of projections.

#### 1. Diagnosis of the current situation

When a public health plan is in preparation, it is important to identify health problems and also the available resources; but this issue will not be dealt with in this paper.

It is necessary to use demographic information to identify health problems. The objective, in such a case, is to collect and analyze four groups of data: mortality, the demographic situation and, in the broad sense of the term, the environmental factors which affect the health of the population.

This fourth group deserves to be mentioned as part of demographic information. Indeed, in certain demographic surveys and even in censuses (for example, Senegal's national demographic survey, 1970; the Population Census in Tunis 1966), one can get information on certain environmental factors (such as dwelling units, housing and hygiene, educational level, employment and activity). Similarly, interesting factors can be ascertained on the presence of vectors and pockets of contagious disease in demo-ecological investigations carried out as part of environmental surveys, like the one now being carried out in Senegal (The WHO Project - Netherlands Office NEDECO. Survey on Shanty-towns by the Institut Fondamental d'Afrique Noire - IFAN Project - Medina-Pikine, Dakar.)

Information on mortality is very often limited to general mortality rates by age group and sex and, in certain cases, on the basis of the cause of death particularly as far as capital cities and very large urban centres are concerned). As regards morbidity, which can be ascertained only through sero-epidemiological surveys and for certain diseases only, very little data exists on cause or per age group. Of course, reference can be made to fragmentary knowledge based on hospital statistics.

In short, as far as the demographic position is concerned, with the help of civil status records, censuses and sample surveys, some access can be gained to the necessary information on the numerical strength of the population, distribution by age group and sex, geographic distribution and densities and natality rates and rates of natural population growth. In addition, certain sample surveys, particularly since the development of repeated passage surveys, make it possible to acquire data on the average size of families, distribution by ethnic groups and religion, socio-professional groups and, occasionally, the rural/urban distribution of population and rates of migration and urbanization.

Although this information is only a rough guide, it can help to define the current situation in the absence of any specific or detailed studies on the components of population dynamics, namely, mortality, fertility and growth, as well as the population structure (by age, sex, activity, education, whether rural, urban etc.) It is worth noting on the subject of specific studies, that in the last ten years special efforts have been made in African countries where repeated passage surveys have taken place, as mentioned (such as Guinea, Senegal, Cameroon, Ivory Coast, Tunisia, Algeria, Madagascar and Morocco. Studies on morbidity are still few and far between and, of the countries just mentioned, special reference should be made to the work done in Senegal on rural and urban populations.

\* The distinction between population dynamics and population structure is primarily methodological, and does not create any watertight compartments between them, since because of their constant interaction, they represent a single demographic process.

On the whole, even when these studies provide information covering the data necessary for health planning, such data are of limited value because of the difficulty of interpretation. Indeed, it is not enough to know the level of infant mortality in childhood (1 - 5 years); it is also necessary to have information on nutrition, housing and hygiene. Similarly, a knowledge of the extent and importance of certain diseases on the basis of hospital statistics is not enough; such knowledge must be supplemented by a knowledge of the epidemiology and the risks to which the population is exposed. In short, studies on fertility require some knowledge of the attitudes, behavior and opinions of the population if some idea is to be secured of the amount of education necessary in that direction and the expediency of family planning programmes. It is worth recalling the fact that apart from the Economic Commission for Africa, there are certain UN specialized agencies which are trying to fill these gaps such as FAO, UNESCO, WHO.

## 2. Consideration of future trends

We have already mentioned the part population projections plays (particularly in the case of the important age groups) and mortality and fertility rates. As far as health planning is concerned, a knowledge of the implications of population growth, in broad general terms, is also essential. The consequences of demographic growth on public health and public health services can be briefly indicated. Of course, consideration of the effects of demographic growth depends on other factors apart from population, such as decisions on the priority to be given to health as compared with other sectors such as education, employment, agriculture, transport etc. These effects also depend on medical and technological progress as well as on the levels of technical assistance.

In any case, demographic growth implies the provision of medical assistance for a larger population as well as changes in the future distribution of population by age, which will require some adjustment in the infrastructure (new maternity and Child Welfare centre, for instance) and also a larger medical and para-medical staff, better distributed throughout the various regions. Since much is not known of the use made of health services, it is difficult to work out projections of future demand on the basis of our present knowledge. There is no accurate knowledge either of the needs of that part of the population which makes no use of health services; in other words, the task of projecting their requirements is even more difficult.

One of the most useful indices as regards the projections of the future supply of medical assistance is the index which reflects the percentage of doctors, midwives and nurses per 10,000 or 100,000 inhabitants. In this connection, it is worth referring to the report of WHO<sup>8/</sup> which provides basic information on how the percentage of doctors per 100,000 inhabitants develops. The average for 31 countries was 17.9 doctors to 100,000 inhabitants in 1955; 1965, the percentage of doctors

to 100,000 inhabitants was said to have risen by 18.5 per cent. With the help of population growth rates and on the basis of the results of certain studies on the foreseeable increase in the number of medical practitioners, an attempt may be made to estimate the number of doctors required to meet future medical demands. Most of the time, these studies are not available except in some developed countries; moreover, information would also be necessary on the future generations of doctors, midwives and nursing staff. On this subject, reference might be made to studies on medical personnel carried out in Taiwan, Turkey and Peru.<sup>11/</sup> These supply information on the effects of population growth, health services (particularly family planning services) and express in terms of figures the needs as regards doctors, nursing staff and midwives. It is interesting also to recall that the consideration of the effects of demographic growth raises the problem of medical training and the conditions for the employment of health staff.

#### IV. Conclusions

##### 1. Levels of analysis and interpretation.

The application of demographic data to development planning, in general<sup>12/</sup> and health planning in particular, raises problems of the specific analysis of the demographic structure (certain age groups like the 0 - 5 age group; some age groups in combination with the female population, 15 - 45 years) and demographic factors such as mortality in childhood, for instance, and fertility. This is particularly the case where the implications of population projections for certain age groups and females<sup>13/</sup> as well as the projection of mortality and fertility rates are concerned.

In this connection, "for purposes of health planning and evaluation, (health) statistics should be beamed towards problems, be based on the population and linked with persons and events".<sup>14/</sup> In this way, information could be collected which, when analysed and interpreted, could be taken into account by health planners at various stages in planning, particularly at the stages of plan preparation and elaboration.<sup>15/</sup>

##### 2. Disciplining information and its use.

In the first place, the problem is one of collaboration between persons who collect information, analyse and interpret it and those who use it for health planning. Generally speaking, there is a discrepancy in time between the moment when the information is collected and when it is used. The result is that collaboration would seem to be impossible if the person collecting the information is unaware of the requirements of the person using it. But, at the moment when data is being processed, there is a possibility for both of them to make the maximum use of demographic information and their respective roles should promote the use of such information in planning.

\* The projections on the subject do not necessarily reflect any development in the health system, in general and the aspirations of the population, in particular. For instance, one doctor per 100,000 inhabitants does not mean that this average is sufficient or not to cover the needs of the population.

In the second place to discipline information and the use made of it, there should be an attempt to interpret it in a manner that will ensure attention by health planners to all its possible implications, enabling them to identify objectives and actually attain them, with full knowledge of what is at stake. There is another advantage in the implementation of a health strategy which promotes a link between health and development planning as a whole.<sup>10/</sup> In this way, the best application of demographic information can be made by evaluating its use in relation to planning for health, as well as for the other sectors of general development planning.

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