

# THE COST OF SICKNESS AND THE PRICE OF HEALTH

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*“ Les dépenses faites pour la sauvegarde  
de la santé publique sont les seules produc-  
tives de la richesse puisqu'elles protègent le  
capital humain.”*

*A. CALMETTE*

WORLD HEALTH ORGANIZATION

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of 41 per 1,000 in families of very low income and a rate of 2 per 1,000 in families of very high income.<sup>28</sup>

One of the most significant analyses of this kind was the US National Health Survey of 80,000 male workers in eight American cities.<sup>29</sup> It was found that families with an income below \$1,000 per year had nearly four times as much disability from tuberculosis, nearly three times as much disability from orthopaedic impairments, and approximately twice as much disability from rheumatism, digestive diseases, and nervous diseases as families with incomes over \$5,000. Considering all causes of disability together, the group with incomes under \$1,000 showed 66% more sickness disability than the families with incomes over \$5,000. The correlation displayed was no doubt due partly to poverty resulting from former disease but mainly to diseases whose evolution was favoured by poverty.

The factors involved in such studies are highly complex. Abriol<sup>1</sup> in the Philippines and Gray<sup>13</sup> in the North-Eastern USA found high mortality-rates in the more prosperous areas. A more exhaustive study of 1,926 counties of the USA<sup>30</sup> again showed a positive first-order correlation between mortality and indices of prosperity. By applying methods of partial correlation, however, it was shown that, when indices of urbanization were held constant, the overall positive correlation of mortality with prosperity disappeared, while indices of rural prosperity showed a negative correlation with morbidity.

Figures published by the Registrar-General for England and Wales<sup>13</sup> are of particular interest. They present the following "standardized mortality" adult-male ratios (for all causes) for 1921-3 and 1930-2 by division of the population into five social classes.

Social class	Standardized mortality ratios	
	1921-3	1930-2
I	82	87
II	93	94
III	94	97
IV	99	101
V	124	112

Thus, in a decade of progressive efforts to better the status of underprivileged groups of the population, an excess mortality of about 50% for the lowest economic group as compared with the highest economic groups was reduced to less than 30%.

On the whole, it seems certain from such studies as the US National Health Survey,<sup>29</sup> when the problem was analysed by direct house-to-house canvass of otherwise comparable populations, that poverty is associated—even in highly prosperous countries—with a considerable excess burden of preventable disease. The British data cited seem to indicate that, in a country where a determined effort has been made to improve the status of

#### CHAPTER 4

### INTERRELATIONSHIPS OF POVERTY AND DISEASE

Consideration has been given in earlier chapters to certain of the burdens which disease lays upon mankind in the form of premature death and disability, as well as in the provision of costly facilities for the care of those afflicted with maladies, most of which are largely preventable. The relationship, however, is a mutual one; and it is necessary to take note of the converse process—the role of poverty in the causation of disease.

#### Poverty as a Factor in the Causation of Disease

It happens that the relations between economic factors and health have received more attention in Great Britain and the USA than elsewhere; and the results of such studies in relatively prosperous areas are particularly significant. If—in such countries—relatively slight differences in economic status have demonstrable effects, the influence of far greater inequalities in other areas must be even more striking.

It has been noted that the modern public-health movement originated in England with the classic report of Sir Edwin Chadwick on *The sanitary condition of the labouring population of Great Britain*, emphasizing, at that early date, the primary challenge of less privileged groups. Chadwick's successor, Sir John Simon, in his first annual report as Medical Officer of Health for the City of London, wrote:

"I feel the deepest conviction that no sanitary system can be adequate to the requirements of the time, or can cure those radical evils which infest the under-framework of society, unless the importance be distinctly recognized, and the duty manfully undertaken, of improving the social condition of the poor." (quoted by Winslow<sup>31</sup>)

The relation between such diseases as malaria and typhoid fever caused by local substandard conditions is too obvious to need mention. The prevalence of contact-borne diseases is also associated with the overcrowding incident upon poverty. More than 40 years ago, the Health Officer of Glasgow studied the relationship between the size of the dwelling unit and the incidence of measles during an epidemic of that disease. In one-room tenements the case-rate during this epidemic was 125 and the death-rate 27 per 1,000; while in four-room tenements the corresponding rates were 11 and 1 per 1,000. For a disease of entirely different etiology, pellagra, studies in southern mill villages of the USA showed a case-rate

the economically lower population groups, the discrepancy between the extremes of society may be materially diminished.

When the less fortunate regions of the globe, where the total resources are woefully meagre and where, also, the differences between rich and poor are far greater than in Western Europe, are considered, poverty must be a major factor in disease. In comparing three countries near the top and three near the bottom of the economic scale in the period immediately preceding the second World War the following figures<sup>25</sup> may be noted:

	Per capita income (US dollars)	Expectation of life at birth (males) (years)
USA . . . . .	554	62
Germany . . . . .	520	60
United Kingdom . . . . .	468	60
Mexico . . . . .	61	37
Brazil . . . . .	46	39
India . . . . .	34	27

**Problem of Overpopulation**

Some investigators have been so deeply impressed with the possible influence of poverty—and, particularly, of inadequate food-supply—upon the human race as to feel that drastic limitations on population offer the only possible solution. It is pointed out that the world population is about 10% larger than before the second World War, while world supplies of food in terms of calories per person were, in 1947-8, still 5%-10% below prewar level and even further below standards with respect to specific nutrients-necessary for health.<sup>26</sup> Walker & Bolles<sup>27</sup> have recently reviewed some of the more extreme arguments of this kind by those who see a growth of world population at a rate of 200,000,000 per decade as the greatest threat to the human race. The two world wars are credited to population pressure. Available agricultural land is said to be diminishing as a result of erosion. Even the USA is held by one authority to be overpopulated! An important study by the Rockefeller Foundation<sup>2</sup> analyses this problem as related to conditions in China, Indonesia, Japan, Korea, the Philippines, and Taiwan. A recent contribution from the Population Reference Bureau<sup>3</sup> lists Ceylon, Egypt, Formosa, Japan, Java, India, Korea, Latin America, the Micronesian Islands, the Philippines, Puerto Rico, and Turkey and the Near East as areas where high birth-rates constitute a serious menace.

The question naturally arises whether public-health workers are doing more harm than good by reducing death-rates while birth-rates maintain—or increase—their present level.

There are a number of valid answers to this challenge.

(a) As pointed out in earlier chapters, the major effect of the modern public-health programme has been to reduce mortality occurring before the productive period of life. It is certainly good economy of such natural resources as exist to use them for the support of those who produce as well as consume, rather than largely for those who are not permitted to reach the age at which they begin to make their contribution to society. The argument—sometimes advanced—that one may “preserve the unfit” is, of course, without any rational basis. “Fitness” to resist the germ of tuberculosis is highly specific and has nothing to do with any other kind of “fitness” for useful and productive living.

(b) The public-health movement prevents disease, as well as death, and thus increases the potential efficiency of the population. This process has been described at work in Italy and Sardinia, in the USA, and in South Africa.

(c) The potential food-supply of the world is not a fixed quantity determined by some mysterious iron law as some population experts appear to believe. Students of agriculture take a different point of view. The process of erosion can be checked, as it has been checked in the Tennessee Valley of the USA. Irrigation in many areas could turn deserts into fertile fields. Improved methods of agriculture could play a major role in bridging the gap between a yield of 10-15 bushels of wheat per acre (7-10 quintals per ha) in India and China and 40 bushels per acre (27 quintals per ha) in Western Europe; as between 26 bushels of rice per acre (13 quintals per ha) in India and 76 bushels per acre (38 quintals per ha) in Japan. The addition of boron and manganese to the soil has increased peanut crops in Gambia fourfold at very small expense. Control of plant diseases has worked wonders with tomato crops in Lebanon and citrus fruits in Brazil. Entirely novel crops can be developed, as in the cultivation of kenaf, a new fibrous plant in Cuba.<sup>28</sup> The introduction of hybrid corn in Italy has increased crop yields by 32%-117%. The sea could provide large food resources, as yet unutilized. It has been estimated that per acre yields (1 ha = 2.47 acres) of grain in India could be increased by 30% in ten years—5% by the use of improved varieties, 20% by manuring, and 5% by protection against pests.<sup>4</sup> The experts of FAO<sup>11</sup> have set target goals which contemplate an increase of 90% in the calorie yield of the less-developed areas by 1960, an increase which could not only provide for probable population growth but also for a material rise in standards of living. The limiting factor in such a programme<sup>10</sup>

“is not the physical capacity to produce enough food but the ability of nations to bring about the complex economic adjustments necessary to make adequate production and distribution possible.” (page 3)

It happens that those areas which offer the greatest promise of increased agricultural development are precisely those areas now handicapped by preventable disease. Approximately one-fourth of the world's cultivable lands lie in the tropics,<sup>9</sup> and Norris E. Dodd, Director-General of FAO, considers that Africa offers major possibilities for future development. Yet 4,500,000 square miles (11,654,900 km<sup>2</sup>) of fertile land lie idle on that continent because of the handicap of sleeping-sickness.

(d) For many areas which cannot provide the necessary food-supply within their own borders there are other practical possibilities. The development of mineral and other natural products, of timber resources, and of local industries, if coupled with free international trade, could so increase income that the purchase of food from primarily agricultural areas would be possible. Harris<sup>14</sup> has estimated that the areas of the world at present underdeveloped, while increasing their population 50%, could more than quadruple their total income, increasing their per capita average earnings of \$50 in 1950 to \$139 by the year 2000. This is a long-range goal! It is, however, best not to be too hasty in the process since over-rapid industrialization may produce more evils than it cures.

(e) A highly important fact, which is too often ignored by the population expert, is that—between countries, and within a given country—increased prosperity is normally associated with lower reproductive rates.

This is not always true. Prosperity and parallel increasing birth-rates were often manifest in the days of the industrial revolution. As a rule, however, the reverse has been the case. United Nations estimates<sup>15</sup> indicate a present excess of birth-rates over death-rates of 10 per 1,000 for the world as a whole; but this figure falls to 4 for North-West Central Europe, 6 for Canada and the USA, and 7 for Southern Europe, while it rises to 14 for Eastern Europe, 15 for the Near East, and 20 for Latin America. Notestein et al.<sup>16</sup> have made a penetrating study of these relationships in Europe, showing the sharp contrast between Western Europe, where underpopulation causes anxiety, and Eastern Europe, where overpopulation is a serious problem. How far certain countries are rich because their population grows slowly, and how far their population grows slowly because they are prosperous, is not easy to assess; but the general relation is clear. In Western Europe and the USA, reduction of reproductive rates has certainly come about without any designed purpose. In Ireland, the great potato famine of a century ago led to emigration on a large scale; but it was also followed by a drop in the birth-rate from 27 per 1,000 in 1870 to 23 per 1,000 in 1900. Late marriage and a high proportion of unmarried persons in the population contributed to this result.<sup>17</sup> In Japan today the active development of marriage-guidance clinics is taking place. Where limitation of population may seem essential, there are more economical and more humane agents of control than malaria and tuberculosis.

On the whole, the fear of overpopulation offers no valid grounds for modifying the responsibility of public-health workers for the control of preventable disease. Here, as in other aspects of human ecology, there are diverse angles of philosophical approach. There are those at one extreme who hold a defeatist "man-under-nature" concept of human destiny. There are those at the other extreme who maintain an equally unfortunate "man-over-nature" philosophy, and may bruise themselves on the jagged surfaces of reality. The position of the true scientist should lie between these two poles. A "man-with-nature" approach, recognizing both the facts of life and the human aspirations, which are equally a part of nature, is a creative force with almost unlimited powers to control and mould the physical universe nearer and nearer to the goals of human health and happiness. As the FAO experts have said:<sup>11</sup>

"Many people who have given serious study to the population problem prophesy doom for much of mankind unless the rate of population growth can be drastically checked. It is worth reiterating that the fundamental solution of the problem lies in increasing the productivity of the individual by putting at his disposal modern scientific knowledge and the tools of modern technology. To the extent that this is done, every individual can become a source of new wealth to his country and to the world. To the extent that it is not done, he is a potential liability, unable to supply his own needs let alone helping to supply those of his fellow human beings." (page 25)

#### Importance of a Broad and Integrated Programme

The importance of economic and social factors in the health and welfare of our peoples does not weaken—but strengthens—the argument for a comprehensive programme for world health. On the other hand, the interrelationships involved make it abundantly clear that the public-health programme cannot be planned in a vacuum, but only as a vital part of a broader programme of social improvement. In this programme the public-health worker must work in the closest and most intimate contact with the United Nations and its constituent and co-operating bodies (such as the Department of Social Affairs, and the Economic and Social Council), with FAO, ILO, the United Nations Educational, Scientific and Cultural Organization (UNESCO), UNICEF, non-governmental organizations, and other similar groups.

An interesting approach (to which reference has been made in chapter 3) toward co-ordination of health and social and educational programmes was initiated five years ago in Egypt by an agreement between the Ministries of Public Health, Municipal and Rural Affairs, Social Affairs, Agriculture, and Education to establish a joint experimental demonstration in the Manuf district. A system of social centres, health centres, agricultural centres, and rural schools has been projected. Farnsworth,<sup>8</sup> in

a recent report, urges the more complete development of this enterprise, and concludes that:

"The entire success of any public-health programme is dependent on the concurrent and integrated approach to the social, educational, and economical problems within the area. Improvement in health will automatically follow improvement in the educational, economical, and social status of the people.

Mobilization of all the effective individual agencies and programmes of the area into one local generalized practical programme is the ultimate objective."

Health aims cannot be attained, in many areas, without control of soil erosion, irrigation of desert areas, improvement in plant breeding and the use of fertilizers, control of animal and plant diseases, and development of fisheries, timber lands, and mineral resources.<sup>18</sup> In many countries their realization will depend on the development of local industries, on increased power resources, on the production of farm machinery and appliances, on competent government services, and on the co-operation of managerial groups. Furthermore, in the course of social evolution care must be taken to avoid the creation of new hazards such as psychosomatic illnesses which appear to have been associated with industrial and urban life. The social anthropologist, as well as the health expert, is needed in solving such problems.

All of the advances which are so essential in health, in agriculture, and in industry are primarily dependent on local, regional, and national leadership. Furthermore, their attainment requires a far-reaching improvement in the educational status of the population as a whole; so that the promotion of higher and lower levels of instruction, involving the extension of educational services to the mass of the population, must form an essential part of the broad programme.

With special reference to the needs of underdeveloped areas, UNESCO has formulated a constructive philosophy of "Fundamental education", in consonance with the ideal that:<sup>22</sup>

"The aim of all education is to help men and women to live fuller and happier lives in adjustment with their changing environment, to develop the best elements in their own culture, and to achieve the social and economic progress which will enable them to take their place in the modern world and to live together in peace." (page 9)

The principles of such a philosophy of fundamental education have been admirably presented in a special series of UNESCO monographs on the subject,<sup>4, 15, 21, 24</sup> and the progress already made is described in the annual report of the Organization for the period April 1950 to March 1951.<sup>22</sup>

The plan for a particular area should be worked out only after a careful study of local conditions and local psychology. Many of the problems involved were admirably set forth at the eighth session of the Economic

and Social Council in 1949.<sup>21</sup> Park<sup>17</sup> suggests the following considerations:

"Effective projects should be planned on the basis of a people's existing social and economic conditions. Where the economy is still largely at the subsistence level, the emphasis should be placed first on smaller, consumer industries. Production of consumer goods should utilize existing skills, artistic tastes, and familiar materials.

Programs should be planned in terms of the total requirements of a people. Industrial or agricultural projects should include plans for health and educational services, recreational activities, etc.

Existing institutions such as communal work groups, social units such as the extended family, and established lines of authority should be adapted and utilized to the fullest possible extent.

Efforts should be made to work in and with the local community. Underdeveloped areas are predominantly rural with a wide gap between urban and country life. Centering development projects in the cities will accelerate the urban drift, drain off from the rural areas much of the potentially talented human resources, and further accentuate the gap between rural and city life.

Industrial developments should in many cases start with the encouragement and improvement of local handicrafts. This would also help correct some of the unsatisfactory results of the growing urbanization.

Education should be encouraged of a type that would foster interest and pride in a people's own group or country at the same time that it trains in modern science and technology.

Fuller possible utilization of scientific studies of human societies should be used to provide a basis for the most satisfactory adjustment between the old and the new." (page 71)

In many instances the full success of plans for the development of underdeveloped areas may require the removal of barriers to international trade and the provision of necessary investment capital. Where possible such financing should come from the country itself, but sound investment of the surplus capital of more prosperous countries may often play a useful part. Whether the capital comes from within or from without the national boundaries, its employment should be adequately safeguarded so as to promote the essential social objectives outlined above.

A suggestive example of a carefully planned programme for South-East Asia was drawn up at a meeting of Commonwealth Foreign Ministers at Colombo, Ceylon, in 1950.<sup>5</sup> This programme envisages an expenditure over a six-year period of a sum in excess of \$5,000,000,000, of which about three-quarters would go to India, 15% to Pakistan, and 5% each to Ceylon, the Federation of Malaya, and Borneo. Of the grand total, 34% will be allotted for improving transport and communications, 32% for agricultural and river-valley development, 18% for health, housing, and education, 10% for industry and mining, and 6% for fuel and power projects.

Highly significant results have already been achieved in certain "pilot studies" made in India preparatory to the broader programme. In one

of these demonstrations the yield of wheat per acre (1 ha = 2.47 acres) has been increased by 20%; in another the yield of rice by 40%?

If we, as public health experts, realize the impact of prosperity on human health, we shall recognize that such projects are direct contributions to our own objectives. In a given area, higher crop yields, increased power developments, or improved transportation may accomplish as much for health as more clinics and hospitals. The results we wish to achieve can be attained only by comprehensive planning.

It is not enough then, for the health administrator to develop the soundest possible programme for his own field of social endeavour (as emphasized in chapter 3). He must also sit down with experts on agriculture, on industry, on economics, and on education and integrate his specific health programme as a part of a larger total programme of social reconstruction.

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