MEDICINES, HEALTH and the POOR WORLD

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Office of Health Economics

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Introduction

In 1972 the Office of Health Economics produced a paper entitled *Medical Care in Developing Countries*. Drawing on both information available within the pharmaceutical industry and the writings of commentators such as King (1966), Bryant (1969), Abel-Smith (1967) and Gish (1971), the report argued that medical resource allocation in most developing countries was too heavily biased towards urban, hospital based, curative medicine. OHE noted that in many poor countries two thirds to three quarters of public health spending goes on hospitals. This leaves very few resources available for the care of the 70 per cent or so of people who in a typical poor country live in the rural areas. Private health care is also likely by its very nature to benefit only a small minority of the population.

The 1972 paper stressed the potential value of improved primary health care facilities for the bulk of the less developed countries' inhabitants. And it warned against excessive expenditure on sophisticated medical education in poor nations. The example of China was used to suggest that more reliance might usefully be placed on less expensively trained medical auxiliaries or community health workers. The study also maintained that Western aid in the form of prestigious, resource hungry medical equipment was often ill conceived, and argued instead that help aimed at meeting the essential requirements of the poor of Africa, Asia and Latin America should be the first priority. These include clean water supplies and adequate nutrition.

During the decade following the publication of *Medical Care in Developing Countries* several major international agencies took up new stances in relation to health care in the 'poor world'. For instance, in 1975 the World Bank produced the first of its health sector policy papers. Table 1 outlines the Bank's current understanding of the problems commonly encountered in this area. In 1976 McNamara, the then President of the World Bank, called for a global compact which would have the goal of meeting the basic needs of the world's poorest people by the end of the twentieth century.

Despite the fears of some people in the third world that 'basic needs' policies might slow economic growth in poorer countries, or blind the international community to arguments in favour of a redistribution of wealth between rich and poor nations, McNamara's initiative was widely supported. In 1977 the World Health Organisation, which had, it has been suggested, previously lagged behind in this context (Mburu 1980), adopted the goal of 'health for all by the year 2000'.

In 1978 a joint WHO/United Nations Children Fund (UNICEF) conference held in Alma Ata in Kazakstan in the USSR strongly endorsed the view that the provision of low cost primary health care to the mass of the world's people should be seen as an urgent international priority. The conference declaration argued that the latter was the vehicle by which all the people of the world might attain 'a level of health that will enable them to lead a socially and economically productive life'.

Some aspects of the WHO's 'health for all' (WHO 1979a) programme may be questioned (Passmore 1979). However, the political significance of the initiative is considerable (Bryant 1980). It has provided a much needed impetus to the drive for health development.

The year 1980 saw the publication of the Report of the Independent Commission on International Development Issues, better known as the Brandt Commission. This body was formed in the late 1970s at the suggestion of McNamara; its work served to highlight a number of matters relating to aid and the responsibility of the economically rich 'North' to assist the poor 'South'. The Brandt prescription does not pay close attention to health care. But its proposals in areas like nutrition are highly relevant to the well being of the 800 million or so individuals the World Bank describes as living in absolute poverty.

The work of the Commission has attracted some criticism (Raghavan 1981, Loraine 1981, *Lancet* 1981). And it may be thought not to have influenced the immediate course of world events to any great extent. Yet once again, it was an enterprise of considerable political significance.

This paper up-dates OHE's previous work in the field of health in the developing countries taking into account the events of the last decade and extending the analysis provided to include an examination of the distribution and use of modern medicines in the 'third world'. In the light of criticism made of industrial, professional and governmental behaviour it attempts to provide a balanced view of pharmaceutical use in the poor nations of Latin America, Africa and Asia, where three quarter's of the world's people consume only about one fifth of global drug production. It also examines aspects of medicine innovation, arguing that new pharmaceutical products may have significantly more to contribute to health care in the poor world than is generally perceived.

Table 1 *Commonly encountered health service problems and deficiencies*

Health facilities are geographically inaccessible to the majority of people. Women with children are most likely to experience difficulties in reaching a source of care.
Economic barriers exclude many people. Even where users are not charged for services, the costs of transportation and time away from work can be prohibitive for the poor, particularly those who live in urban areas.
Curative care is emphasised while prevention and early treatment are neglected.
Hospital facilities built are excessive relative to primary health care facilities.
Education of physicians is often not geared to the conditions in the country; it neglects common local health problems and appropriate technologies, while emphasising rare diseases and the use of costly equipment.
Health workers, particularly those in rural health positions, frequently are not sufficiently trained, supported, or supervised.
The availability of services is erratic, particularly in more remote areas, because of unreliable delivery of drugs, pesticides, and other essential supplies.
The services provided are sometimes not socially acceptable or not perceived to be efficacious by their intended beneficiaries.
Community participation and integration with other sectors is underdeveloped.
Health services lack planning capacity, procurement expertise, transport facilities, technical and personnel administration and training procedures.

Source World Bank 1980.

The paper commences with a review of the population changes associated with the process of development followed by a look at the social and economic factors underlying patterns of ill health. However, before this there are four preliminary points to be made.

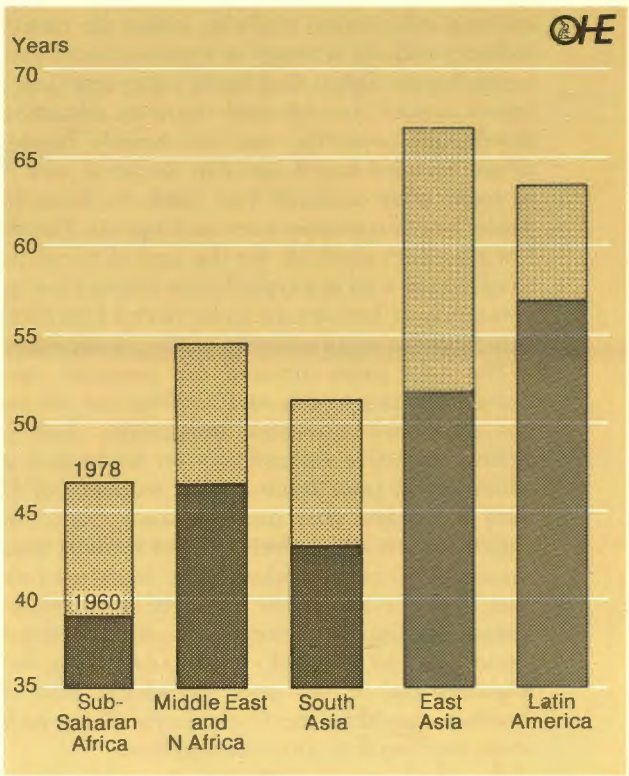
First, the nations of the South are extremely diverse. Their physical and cultural characteristics vary widely on both the continental and sub-continental levels, as do the disease and allied problems they face. In practical terms solutions to their difficulties must be tailored to fit local conditions. Arrangements appropriate to the needs of one less developed country may be quite wrong for another.

A second point, following on from that above, is that the lessons of European history cannot necessarily be applied to today's poor world realities. The nations of late twentieth century Africa, Asia and Latin America differ very significantly from, say, nineteenth century Britain, not least because many are still in some respects undergoing a process of decolonisation. The availability of modern technologies alongside pre-industrial age cultural traditions is also a major variable. These observations imply that the relatively rigid theories of development or modernisation which were once accepted (see, for instance, Rostow 1960) are in fact of questionable value. Societies probably need not all go through similar stages of, or achieve similar levels of, economic or allied social change to attain aims such as low infant mortality and high life expectancy.

Third, data available from most less developed countries are often of limited accuracy, and may easily be subject to misinterpretation. Popular 'facts', such as the suggestion that developing countries spend only 1 to 2 per cent of their wealth on health, must be significantly qualified if a genuine understanding of the field is to be built up. In addition anecdotal evidence regarding, say, particular instances of drug misuse or administrative incompetence, needs to be treated with caution if false generalisations are to be avoided.

The fourth point is that undue pessimism as to the problems of the poor world must also be avoided. It is true that life expectancy in the least developed nations is only 40–50 years. Many of the problems described by OHE in 1972 remain virtually unaltered in 1982. But against this Figure 1 suggests that, on the basis of United Nations figures, a baby born in the South today will on average live ten years or so longer than one born in 1960. Parallel to that the crude birth rate in the countries of Asia, Africa and Latin America has fallen by an overall 20 per cent in the same period. Literacy is up a third to a half. Such indicators strongly suggest that 'health for all' is a realistic possibility within a relatively limited time span, particularly if political climates can be changed in such a way as to make better health a primary goal of development plans, rather than simply a desirable 'spin-off' from industrial or other economic growth.

1 Life expectancy, 1960 and 1978



Source World Bank 1980a

Development and demographic transition

Up until 200 or so years ago population growth throughout the world probably averaged little more than 0.4 to 0.5 per cent per annum. This relatively low figure was the result of a balance between high, stable fertility and high mortality. The latter tended to fluctuate with epidemics, but generally the death and birth rates were both in the 30–40 per thousand range.

However, in the eighteenth and nineteenth centuries this pattern slowly began to change, first in France and then in other Western European countries like Sweden and Britain. Death rates fell, probably initially because of better food supplies and later because of environmental improvements and preventive health measures. In time fertility also declined, but not before Europe's population had considerably increased. Between 1800 and 1900 it more than doubled, from around 190 million to some 420 million, whilst European emigrants also helped substantially to populate North America.

The picture now in countries such as the United Kingdom is one of low stable mortality, around 10 per 1,000 population, and low fertility. Today it is the birth rate which fluctuates slightly, mainly in response to changes in the economic climate. Overall, an approximate balance between birth and death has once again been achieved whilst, as Figure 2 shows, life expectancy is almost double the mid nineteenth century average

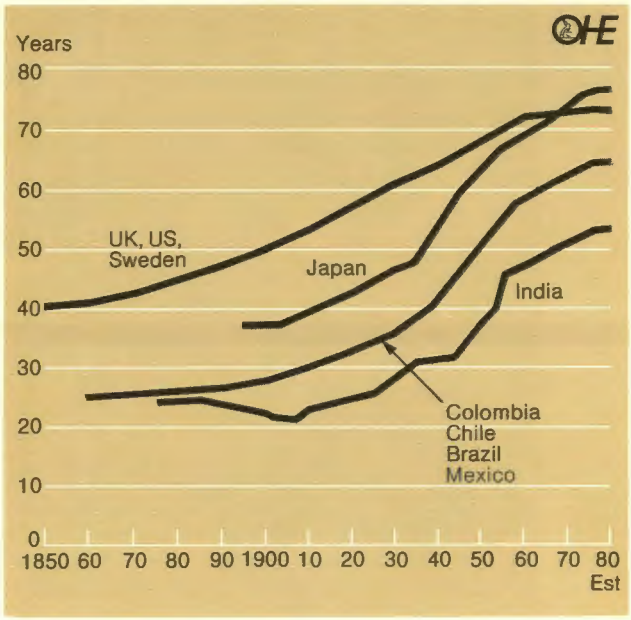
Figure 3 gives a diagrammatic representation of this process, which is normally referred to as demographic transition. If the health of people is taken to be a central concern, as it is in this paper, demographic transition may be regarded as a key characteristic, and perhaps the main goal, of the 'development' of nations. For it not only implies profound changes in the age structure and, during transition, the size of a population; it is also a result of and an engine of altered patterns of disease and social relationships in communities.

The scale of the 'ageing' effects is indicated by Figures 4a and 4b. Typically a pre-transitional or 'less-developed' population will have 40 or even 50 per cent of its members in the 0–15 age band and only 5 per cent or less in the 65 plus group. In extreme cases 20 per cent of the total population will be under 5 years old. By contrast developed societies have only 20–25 per cent in the 0–15 group, whilst around 15 per cent of their people are 65 or over.

The result of these differences is that the dependency ratio between adults aged 15–65 and others in today's poorer nations is around 1:1, whereas in the rich states it is 2:1. Even if the fact that many older people are an active asset to the community is ignored this disparity alone may make it possible for post-transitional societies to maintain, in simple material terms at least, a higher standard of life than pre-transitional ones.

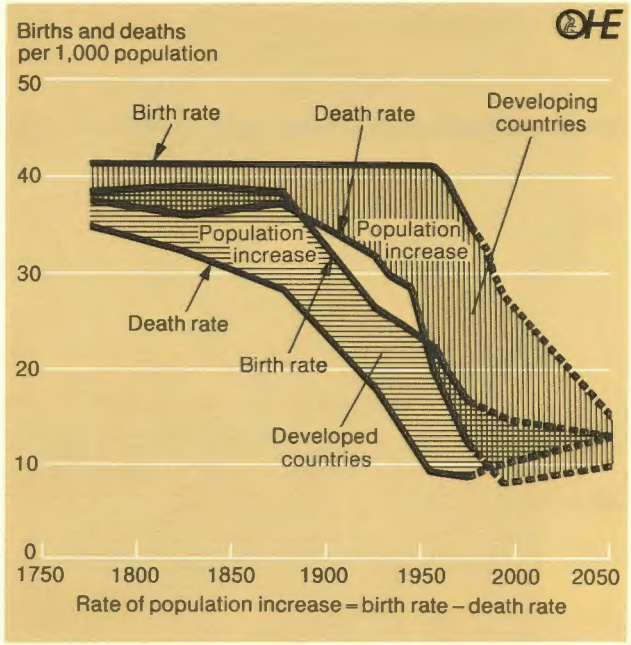
But more importantly in societies which are undergoing transition, as most of the 'third world' is today, the rapidly increasing number of children resulting from high fertility yet lowered mortality constantly demands fresh resources for their care and education. As Figure 5 illustrates in the specific cases of Sweden and Sri Lanka, the decline in death rates in current conditions can be much faster (in part due to modern medical knowledge and therapies) than that experienced by Europe in the past. Hence unless fertility falls relatively swiftly there is a danger that *per capita* wealth may actually drop, and thus

2 Trends in life expectancy in selected countries 1850–1980



Source After World Bank 1980b

3 Demographic transition – the vital indicator trends

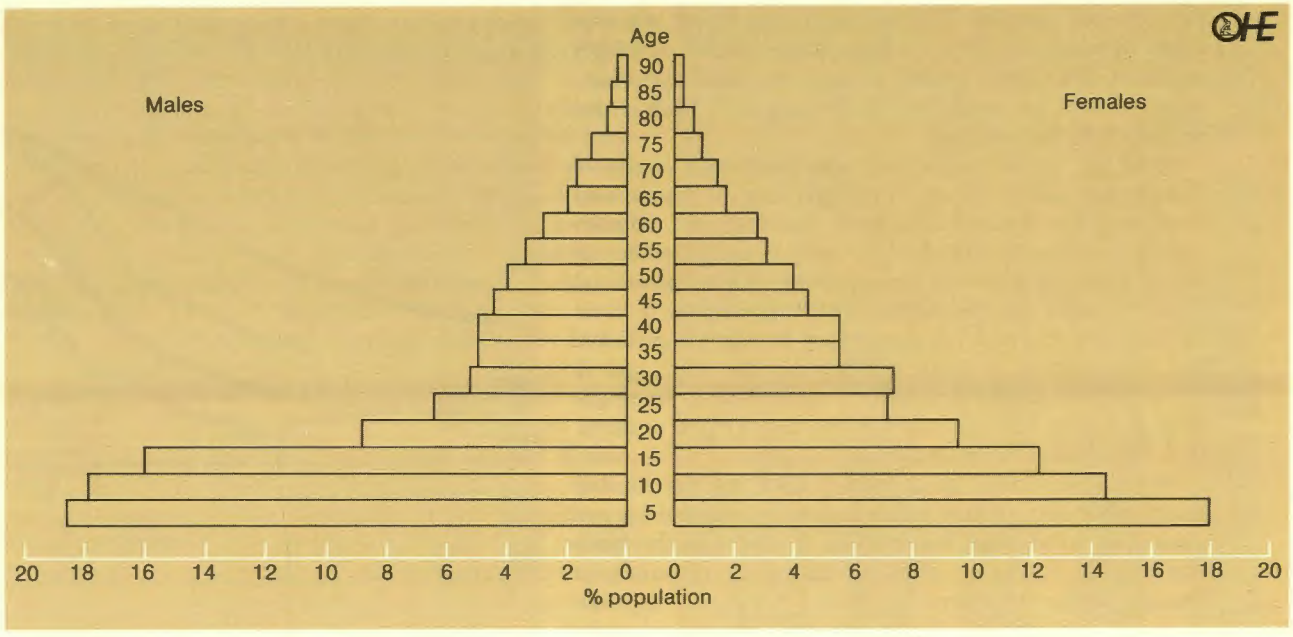


a Crude birth and death rates. The projected increases in death rates after about 1980 reflect the rising proportion of older people in the population.
b Include industrialised countries, the USSR and Eastern Europe.

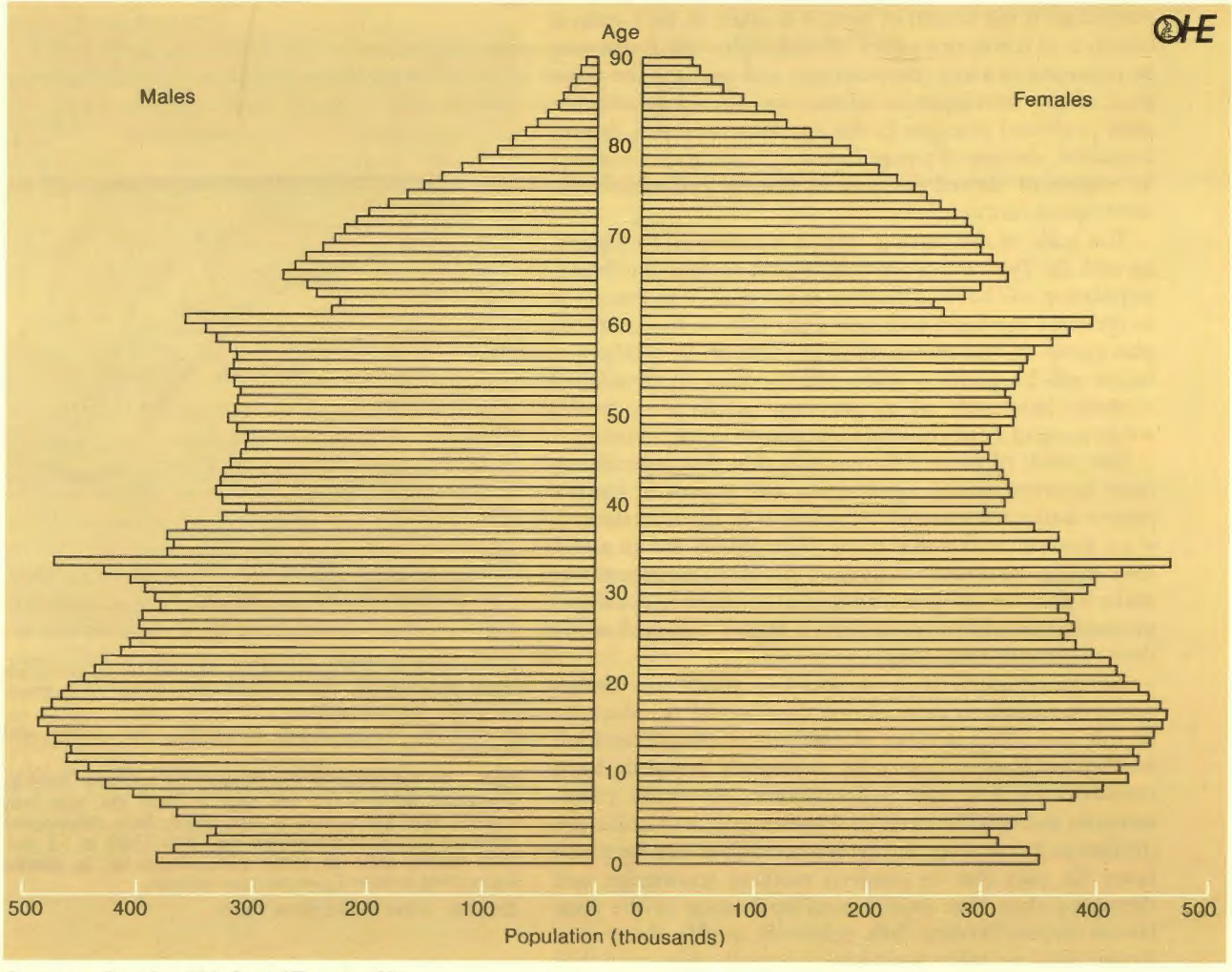
Note At the start of the nineteenth century natural increase averaged around 0.5 per cent in both the now industrialised nations and the currently industrially less developed states. It reached a peak in the former just after 1950, at 1.2 per cent. The third world, with its more precipitous fall in deaths, is now expanding at over 2 per cent per annum.

Source After World Bank 1980

4a Age structure of the Madagascar population in the late 1960s

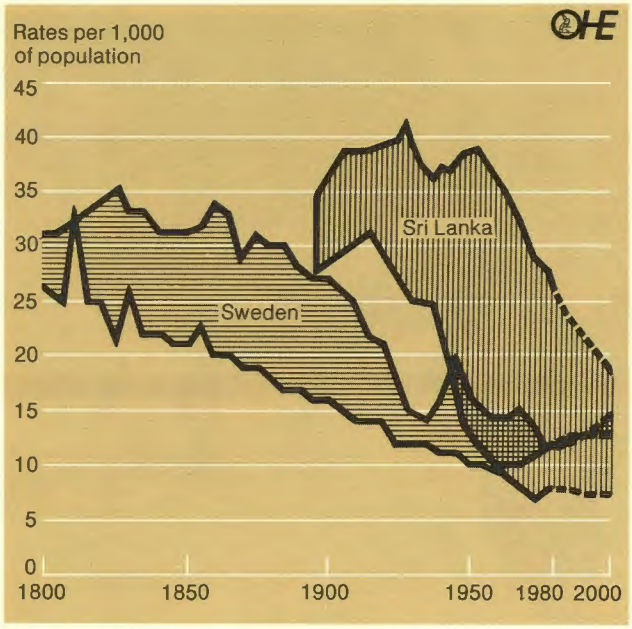


4b Age structure of the UK, 1980



Sources Dadzie 1980, Social Trends 1981

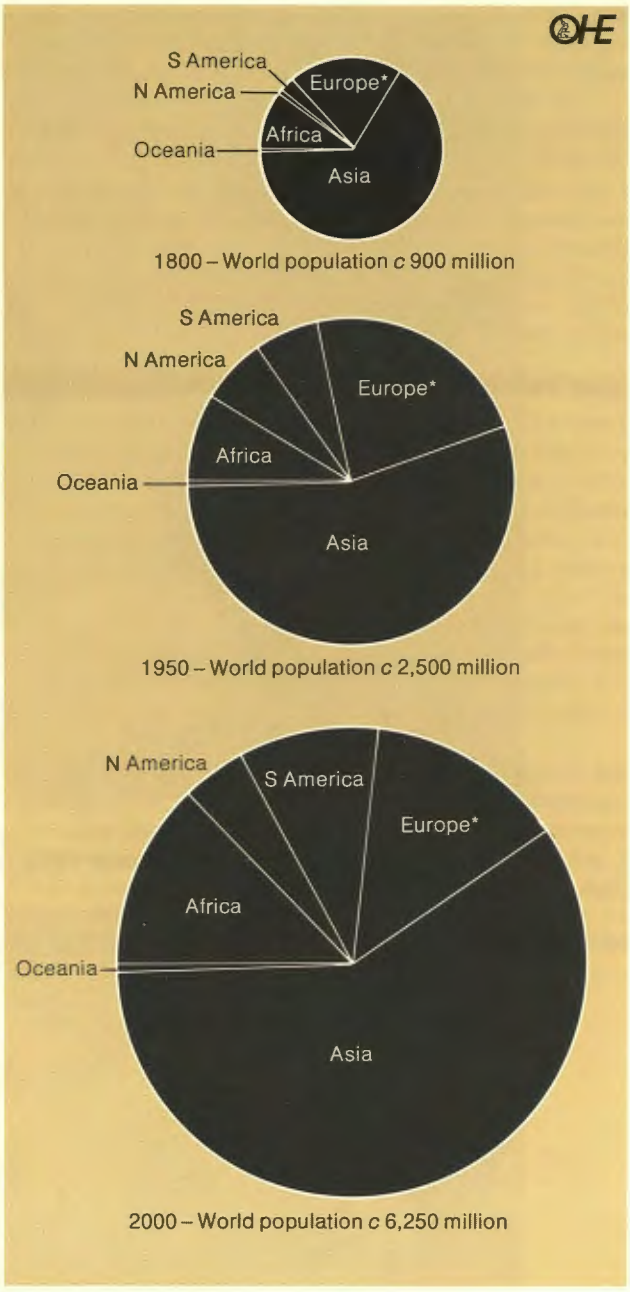
5 Demographic transition in Sweden and Sri Lanka



Note Demographic transition in Sweden is compared with the much more abrupt transition through which Sri Lanka is now progressing. Sweden has reached the stage of 'zero population growth' and is expected to stay at about that level through 2000. Sri Lanka's birth rate has yet to decline to a level near that of its sharply decreasing death rate, which is now even lower than Sweden's because Sri Lanka's population is younger than Sweden's.

Source Mahler 1980

6 World population 1800–2000



*Europe includes all USSR

Sources OHE 1972, WHO 1980

development in the sense of a genuinely improving quality of life may be impaired.

Population growth and fertility choice

Figure 6 indicates that between 1980 and 2000 world population is expected to rise from 4,400 million to over 6,000 million. Today around a quarter of the total live in the developed nations of the North. By the year 2000 this proportion will have fallen to under a fifth. The greatest population expansion is expected to take place in Africa. For instance Kenya, with a growth rate of 3.4 per cent per annum, will probably have 34 million people in 2000 as compared with 16 million in 1980. The United Kingdom population will probably rise by just 2 million, from 56 million to 58 million, in the same time.

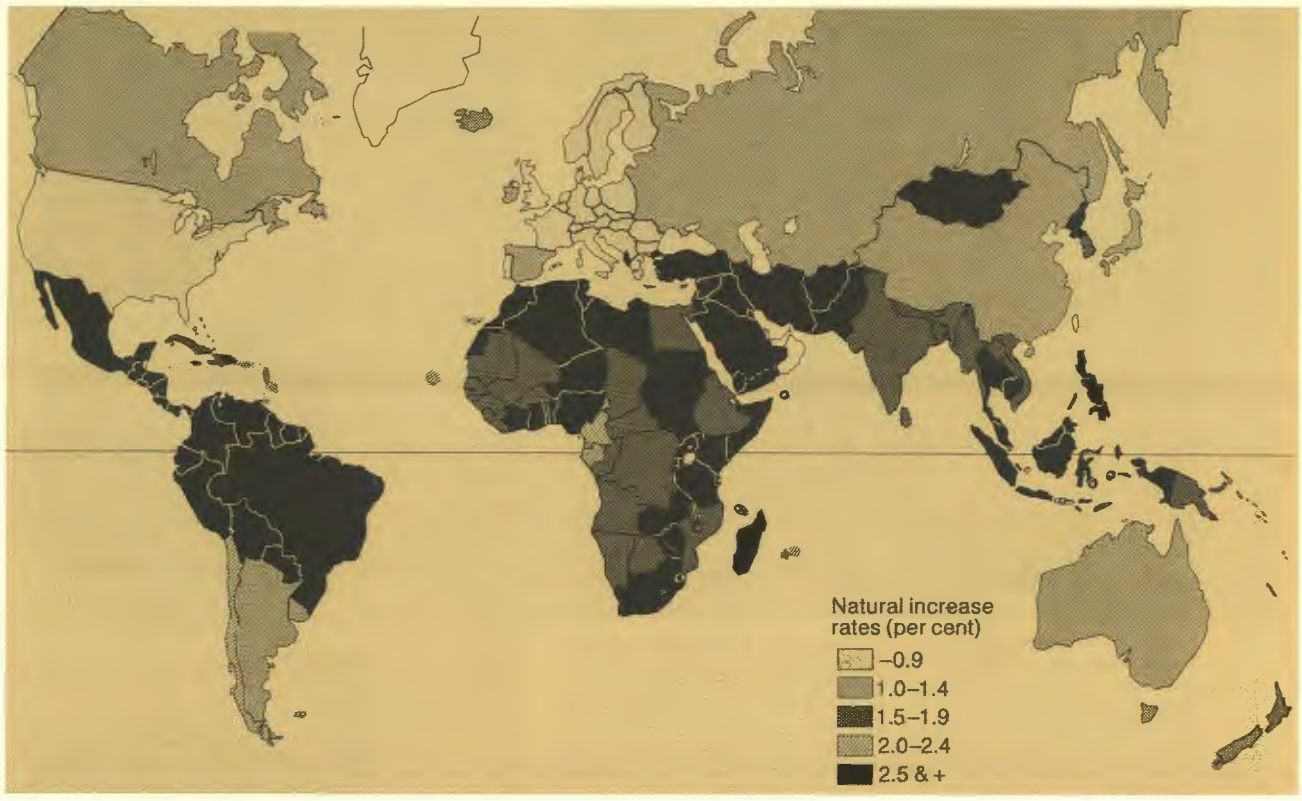
Some commentators in the third world may feel that the North's concern with the South's population is based essentially on self-interested strategic considerations. There might be some truth in this belief.[1] But even so it would be wrong for planners in most parts of the South to ignore the potential advantages that a rapid achievement of demographic transition might bring in the context of improved health. Figures 7a and 7b strongly suggest that lower birth rates are associated with increased life expectancy.

Governments such as that of China have already clearly recognised the desirability of stabilizing, or even reducing, their population sizes (Ding Chen 1980). China has recently reported a 50 per cent fall in its birth rate as compared with the level estimated for the late 1950s. It now has the goal of achieving zero population growth by the start of the next century, when its people should number around 1,300 million. The policies used to facilitate such a remarkable demographic shift include restrictions on the age of marriage; widespread education about and supply of a range of contraceptives; and tax incentives aimed at reducing family sizes.

Such an example is in many respects encouraging. However, not all commentators regard measures such as

1 Yet the technologies available to the industrialised countries mean that they have relatively little military reason to fear the poorer nations whatever their populations; and also that as time progresses their need for third world raw materials will probably decrease.

7a Natural increase rates (per cent), around 1975



7b Life expectancy at birth, around 1975

Source WHO 1980

the fiscal incentives used in China as acceptable. Nor, indeed, do all authorities believe that various other initiatives, such as the sterilization programmes which have been encouraged in India, are desirable. Human rights issues are involved. Following on from this, a second set of questions relates to whether or not the goals of improving medical care whilst simultaneously attempting to reduce population growth are in conflict. And a third critical topic involves analysis of the fundamental social motors of demographic transition, and the shaping of third world national policies appropriate to the understandings so generated.

Women in society

Regarding the first of the areas of debate outlined above different cultures, with different value systems, will not necessarily come to uniform conclusions about matters in areas related to sexual activity. Broad generalisations should thus be avoided. Yet it can be argued that should thus be avoided, although it can be argued that strong local involvement with and acceptance of the ethic underlying population control programmes, as has for instance been achieved in parts at least of Indonesia (World Bank 1980a), would seem a desirable goal, whatever specific approach is adopted. To this end professionals involved in family planning need to be trained not only about clinical issues related to reproduction but also to be sensitive to the social and psychological facets of sexual and child bearing behaviour in a community (WHO 1981a).

Yet at the same time, where potentially sensitive moral issues are involved, decision makers should objectively be aware of the consequences that their choices carry. For instance, in the context of abortion, this form of birth control played a key role in Eastern European and more especially Japan's spectacularly fast twentieth century demographic transition. Also there is evidence from several countries of the third world that it is the technique that relatively unsophisticated women first turn to limit family size, despite the great risks that non-professional interventions may carry (World Bank 1980b). Failure to supply legal medical abortion on moral grounds may result not only in undesired births but also in much morbidity and mortality. One conclusion which could be drawn from this observation is that on occasions community values may need to be changed to permit particular goals to be reached. Sensitivity to cultural variables does not mean that they should be seen as immutable.

As to whether the goal of fertility limitation conflicts with that of universal health care, the simple answer is that if the primary drive is towards achieving demographic transition, and thus long life expectancy coupled with stable population size, it does not. Only a crude desire for population control *per se* could possibly be seen to be in conflict with measures aimed at better health. Those concerned with development as defined in this paper are more likely to see health care and birth control acting synergistically one with the other.

On one hand high fertility is in itself a major cause of ill-health. Mothers are exhausted by repeated, closely spaced births. Health risks for both women and their babies are especially high at the extremes of the maternal age spectrum. Children of large, poor families are often ill-fed and deprived of adult attention and care. Also, a high proportion of children in a population, because they are less likely to be immune, increases the risk of epidemics of infectious disease. All the socio-economic problems related to health such as sanitation, the supply of pure water and adequate nutrition (discussed below) are made more acute by a rapidly increasing population.

And on the other hand there is usually a lagged link between falls in early life mortality and fertility rates. This may be in part due to economic factors and in part due to psychological ones like a decreased need to 'replace' lost children. In addition there could be an increased intensity of the parent-child relationship associated with better survival. In time consequent changes in values and/or personality structures may lead to a reduction in preferred family size.

This last point leads on to the question of the fundamental motors of demographic transition and the role of women in the family and society. It is of note that communities which have 'developed' in demographic terms have all tended to display a pronounced shift in female roles; whilst many of the less developed countries with somewhat disappointing records retain strong cultural barriers which in effect serve to limit female opportunities in, for instance, the educational field. India, for example, is one of the last Asian countries left where male life expectancy still exceeds that for females. This may in part be due to the fact that male babies tend to receive preferential treatment.

Numerous studies indicate that improved female education leads to better child health and greater acceptance of fertility limitation (World Bank 1980a). This observation has obvious policy implications, in that it suggests that in the final analysis third world development may to a significant degree rest on the choices offered to women, not just in terms of their freedom to control family size, but also to participate more fully in non-domestic aspects of social life.

Table 2 *Examples of Major Diseases in Third World Countries*

Disease group	*Comments*
Worm infections a) Vector transmitted	Examples here include onchocerciasis, various forms of filariasis (for instance, Wuchereria Bancrofti) and schistosomiasis. The incidence of the latter is over 10,000,000 *per annum* (prevalence 200,000,000) whilst filariasis incidence is an order of magnitude higher. Onchocerciasis blinds many of its victims, schistosomiasis debilitates. Filariasis can cause elephantiasis. Moderately effective drugs are available for all vector transmitted worm diseases, but better products are on the whole required. However, in the case of guinea worm (dracunculiasis), which afflicts around 30,000,000 people and has the crustacean cyclops as its only vector, eradication is possible. Clean water supplies from wells built with concrete surrounds break the man/cyclops transmission cycle.
b) reservoir host involved in transmission	Worm conditions in this group are often transmitted to man via infected food, like undercooked pork in the cases of some forms of tapeworm (taenia solium) or trichinella. The annual incidence of both the latter and taenia is 1,000,000+. Effective drugs are available for these two groups of infection, but for other conditions in this class improved products are again required.
c) transmitted by faecal contamination or infected food and water	These helminths are the commonest human complaints. They include ascariasis, trichuriasis and the hookworms. Each has a prevalence around the 500,000,000 mark. (Individuals may suffer multiple infection). Sufferers are often weakened, especially if they are malnourished. Effective medicines are made, but the scale of the problem is enormous. Only massive improvements in sanitation and water supply systems will cut the incidence rates significantly.
Fungal infections	The most prevalent forms of fungal disease are the dermatophytoses (such as 'athelete's foot') and superficial and systemic candidiasis. The incidence of such disorders is in the range of 10,000,000 – 100,000,000 *per annum*. Fungal disorders can be life threatening, and the treatments available for the more serious, non-superficial, ones are only of limited efficacy.
Protozoal infections a) Vector transmitted	This group of insect spread diseases comprises malaria, African trypanosomiasis and its South American counter-part Chagas' disease and leishmaniasis. The last includes a range of states the most serious of which is visceral leishmaniasis or Kala-azar (from the Hindu for black fever) which is fatal in some 70 per cent of untreated cases. All these conditions are included in the current WHO Tropical Disease Programme. Malaria is the most frequently occuring; over 10,000,000 cases were reported to WHO in 1979 alone, half of them in sub-Saharan Africa. Chagas disease has a prevalence of over 5,000,000 with an incidence of around 1,000,000 cases *per annum*. As a group these conditions present a most formidable challenge to health in the poor world. Better medicines and novel vaccines are urgently needed, as is also so in the case of toxoplasmosis. This last condition is not vector-transmitted, but domestic animals act as reservoirs and so promote its acquisition by man. It can cause congenital handicaps as well as severe illness in adults.
b) Spread by faecal contamination and other routes	The protozoan illnesses in this group include amoebiasis, trichomoniasis and giardiasis (lambliasis). The most prevalent is the first, which affects perhaps 10 per cent of humanity and has an annual incidence of 100,000,000 plus. Valuable medicines are available for all the conditions in this sub-group
Bacterial infections	These include a wide variety of conditions. Some like tetanus, diphtheria, meningitis and pertussis can be prevented by immunisation; whilst most others are to a degree vulnerable to antibiotics. Zoonotic bacterial conditions, that is those which may be passed from animals to man, include plague, brucellosis, anthrax and tuberculosis. This last is a major problem in many poorer countries, with a recorded world wide incidence rate of some 5,000,000 cases. Half a million people a year still die from TB, despite the availability of effective medicines. Leprosy is a condition in some ways related to tuberculosis, although there is no known animal reservoir host involved in its human transmission cycle. Some 12,000,000 people currently have leprosy. A vaccine is being sought. Other significant bacterial conditions include the streptococcal and staphylococcal infections, gonorrhoea, syphilis, shigellosis (bacterial dysentry) and cholera. With the exception of the latter (which may be controlled by environmental interventions) these all have incidences in the 10,000,000 – 100,000,000 range.
Viral infections	Some viral infections can today be controlled by vaccines. These include yellow fever (transmitted by a mosquito), mumps, measles, rubella, polio and rabies. The development of a vaccine against hepatitis B is a major step, which may in time cut the incidence of liver cancer as well as the direct infection. The control by drugs of some forms of herpes infection is now also possible in richer areas. But many other viral states are as yet untreatable, the most notable of which are the influenzas and the rhino virus infections (common colds). Both have incidence rates of over 100,000,000 cases *per annum*. Pandemics of the former represent a major disease hazard to man. Infectious mononucleosis is also widespread in the third world, and is linked with some forms of cancer, particularly in malarious areas.
Rickettsial infections	Rickettsial infections such as the various forms of typhus, Rocky Mountain spotted fever, South American spotted fever and South African tick fever are transmitted by vectors like lice and ticks. They are acute and highly contagious. Effective medicines are available, as may soon be an oral typhoid vaccine.

Note The prevalence and incidence figures given are only indicative of orders of magnitude. In the review on which this table is largely based Janssen and Peters (1979) remark that out of the 87 diseases their work covered 10 could be prevented by immunisation and that for 23 excellent chemotherapy is available. Only for 10 conditions is there no chemotherapy whatsoever. They are mostly viral.

Ill health and its causes

Table 2 lists the main parasitic (protozoal and worm), fungal, bacterial, viral and rickettsial infections encountered in the developing countries, and provides information as to their prevalence, modes of transmission and current potential preventability or curability. Figures 8 and 9 demonstrate the major differences in the patterns of illness which predominate in 'poor world' as opposed to 'rich world' nations.

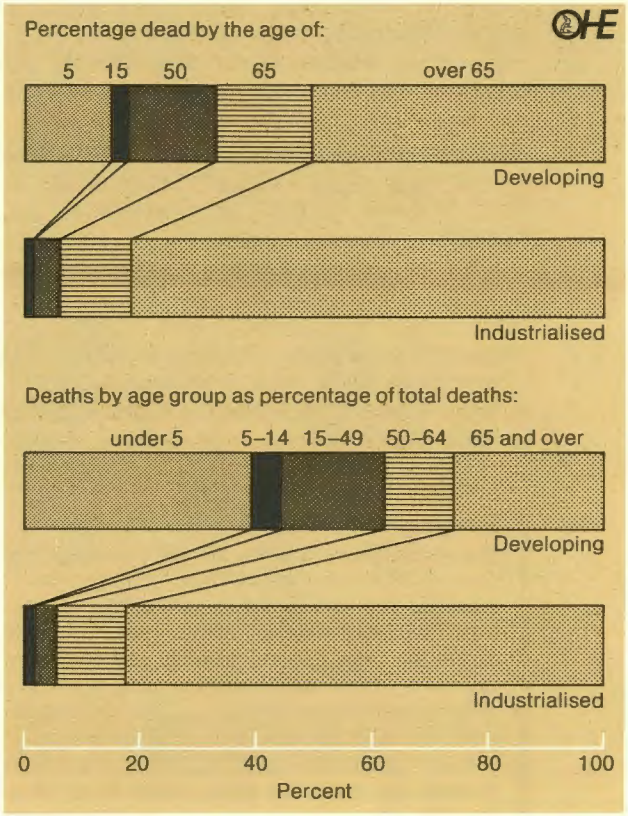
The key facet of the formers' morbidity and mortality is the predominance of communicable disease and the heavy burden which falls on children. Combinations of infections causing diarrhoea (see Box 1) and pneumonia or influenza, malnutrition and in poorer regions near universal, debilitating worm infestations cause 40 per cent of all deaths in the South to occur in the population aged under 5 years.

Even survivors amongst children who have typically suffered an attack of diarrhoea once every two to three months, and who have an 80–90 per cent chance of having at least one helminth (worm) infection at any one time (Van Zijl 1966), may be to a degree physically and/or mentally impaired and particularly vulnerable to other diseases. Measles, for instance, is an extremely dangerous condition in weakened malnourished communities, with a case fatality rate which can be more than 200 times that now recorded in countries like Britain (Puffer and Serano 1973).

Reported infant mortality is, as Table 3 shows, still running at an average of some 160 per 1,000 live births in the poorest countries of Asia and Africa, and the true figure probably exceeds 200 per 1,000 in many rural areas, including those of the richer countries of Latin America.

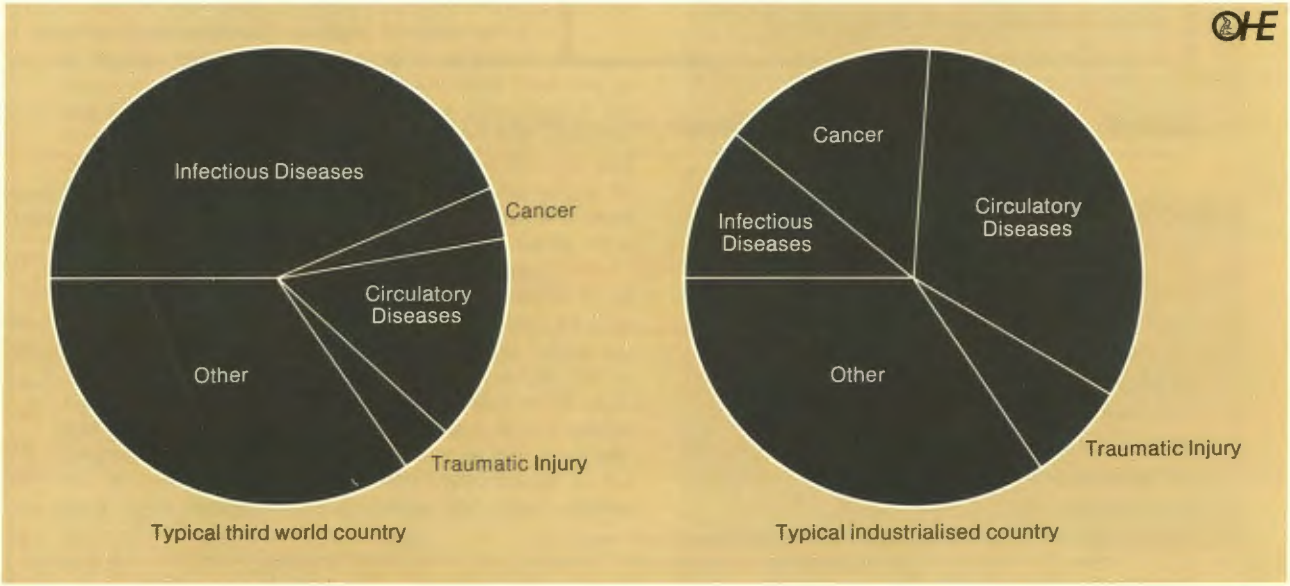
By contrast the nations of Western Europe today have infant mortalities of around 10 per 1,000. Even the figure for the USSR, with its large Muslim Asian population, is probably below 30 per 1,000. It is of historical interest that the WHO's estimate of infant mortality for the rather better off developing countries in 1980, 94 per 1,000, is the

9 Death by age groups: developing and industrialised countries, 1980



Source World Bank 1980a

8 Deaths by cause in the rich and poor worlds



Source OHE estimates

same rate as that which Seebohm Rowntree, a pioneer social researcher, found amongst the more affluent classes in York in 1898. His estimate for the poor there was 247 infants deaths per 1,000 live births.

Figure 10 emphasises the discrepancies between the childhood (1–4 year old) mortality rates of the North and the South. The plight of sub-Saharan Africa is shown by this indicator to be especially acute. There child mortality is on average approaching 100 times greater than the UK level. And maternal mortality may be up to 300 times higher.

After the age of 5 average life expectancy in the third world is about 8 years less than it is in Western Europe, North America or Japan. Much of the younger adult population is subject to the long term deleterious effects of conditions like malaria or schistosomiasis, so that even in areas where life expectancy is under 50 years people have on average to live out a quarter or so of their time in a disabled state. However, in balance to this last point it is important to note that as conditions improve to give levels of longevity comparable to those of the North the prevalence of the chronic diseases of later life, like arthritis and the various forms of circulatory disease, will also necessarily increase. Due to the population ageing effect of demographic transition these 'new' forms of disability inevitably emerge as dominant health problems, a process which can be described as 'disability transition' (Taylor 1979).

Signs of this fresh challenge to the now developing communities have already been reported in parts of the more prosperous urban areas of Latin America and also in those poorer countries which have achieved high life expectancy, like Sri Lanka and China (WHO 1981b). This observation is of critical importance in relation to the role of medicines and priorities in medical research, discussed later in this paper. It underlines the fact that contrary to popular understanding the diseases suffered in the rich world are in many instances experienced in the poor world as well.

Past research conducted in the developed countries on such universal 'core' infectious diseases as polio, whooping cough or tuberculosis led to vaccines and drugs which are of universal value to human health. So too will research on other types of 'core' condition like cancer and the rheumatic disorders now being conducted by agencies such as the international pharmaceutical companies be of central relevance to the poorer nations' needs in the near future. It is only in the case of the geographically variable 'outer skin' of diseases, which are prevalent but usually effect only limited areas of the third world and are normally helminthic and protozoal conditions (McDermott 1979), that there is a divergence in the medicine needs of the North and the South. And even in this context it should not be forgotten that the expansion of international travel provides the entire human community with a motive for developing effective preventive and curative techniques.

In fact many of the diseases now confined to tropical and sub-tropical countries of Asia, Africa and Latin America were once widespread in the temperate, now industrialised regions. Europe, for example, has known malaria as far north as England, and as the predominant

Box 1 *Oral Rehydration*

Diarrhoea kills by dehydration and associated depletion of essential minerals. For upwards of a century doctors in the North have treated 'at risk' victims with intravenous drips, a technique not suitable for widespread use in the South. But in the 1960s research in India and elsewhere on glucose and glucose mediated electrolyte absorbtion in the small intestine led to the concept of oral rehydration. Mixtures of simple ingredients such as common salt, glucose, sodium bicarbonate and potassium chloride can help dramatically to cut diarrhoea related death rates, even in the difficult conditions of countries like Bangladesh. In recent years WHO has encouraged the spread of this highly effective technical advance, in part through the Diarrhoeal Disease Control Programme started in 1978. In 1980 UNICEF alone facilitated the distribution of 25 million rehydration salt packs.

This is very welcome. Yet it is in a way a sad comment on the progress of medicine in the third world that it has taken so long for a form of rehydration appropriate to the needs of poor populations with few medical resources to emerge. 'Target oriented' research programmes which combine an awareness of the social and economic constraints, on care delivery with excellence in the biological and allied sciences are clearly desirable.

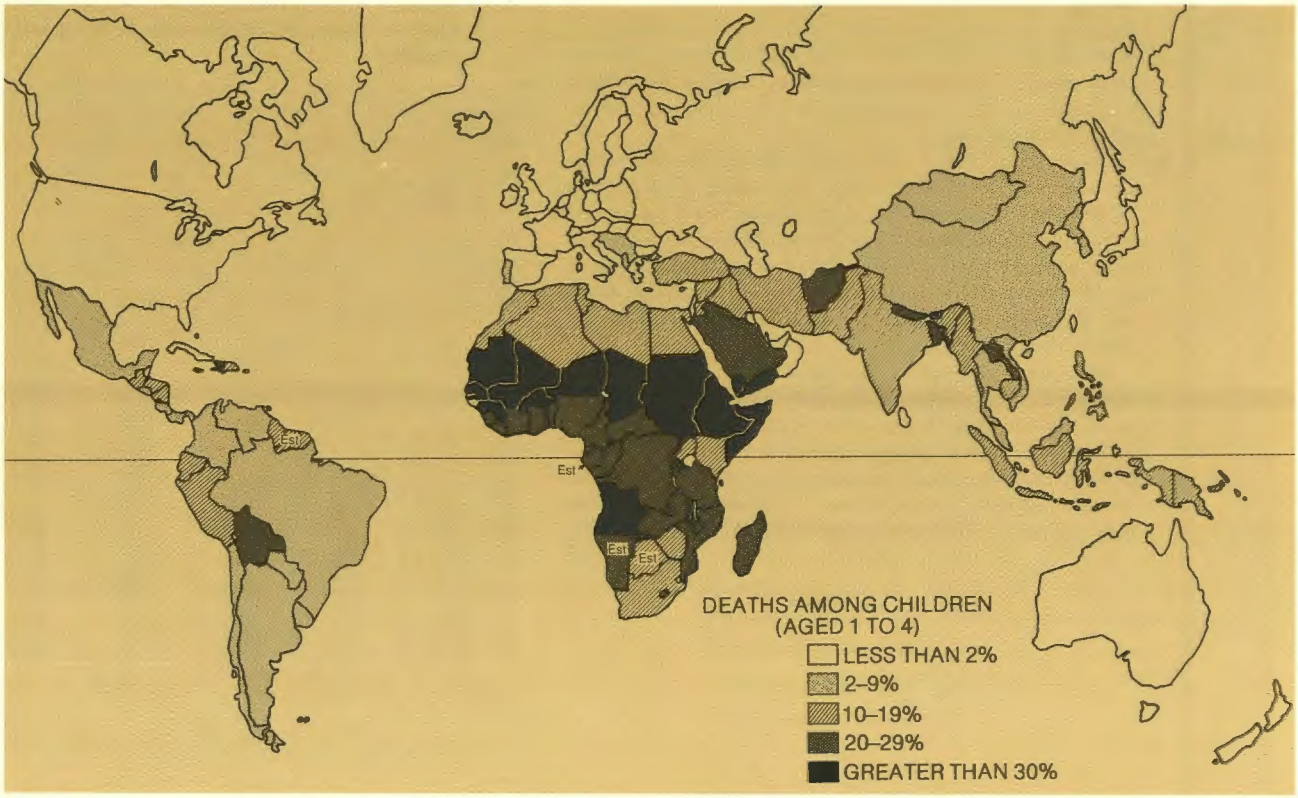
Table 3 *Health and related socioeconomic indicators calculated by the WHO*

	Least developed countries	*Other developing countries*	*Developed countries*
Number of countries	31	89	37
Total population (millions)	283	3,001	1,131
Reported infant mortality rate (per 1,000 liveborn)	160	94	19
Life expectancy (years)	45	60	72
% birth weight 2,500 grams or more	70	83	93
% coverage by safe water supply	31	41	100
% adult literacy rate	28	55	98
Population per doctor	17,000	2,700	520
Population per nurse	6,500	1,500	220
Population per health worker (any type including traditional birth attendant)	2,400	500	130

Figures in the table are weighted averages, based upon estimates for 1980 or for the latest year for which data are available.

Source WHO 1981.

10 Childhood mortality, late 1970s



Source World Bank 1980b

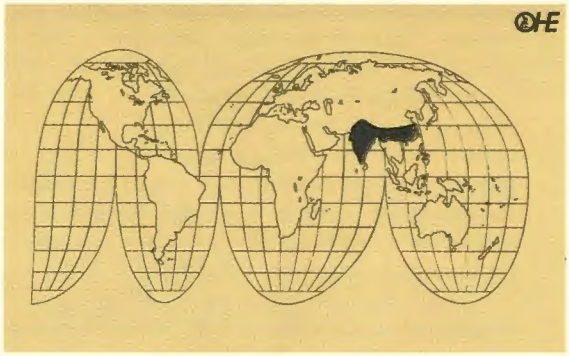
Box 2 *Cholera Control*

The 1980 World Bank health sector policy paper calls for cost effective public health programmes, and illustrates its case with reference to cholera control. The World Bank argued that vaccination gives only 50 per cent protection for up to six months at a cost of 15 US cents. It then noted that in the Phillipines privies built at a cost of US $1 each (excluding 'self-help' labour) could, where properly maintained, cut cholera rates by over 60 per cent. The latter are clearly a 'better buy', especially as they can help prevent other conditions.

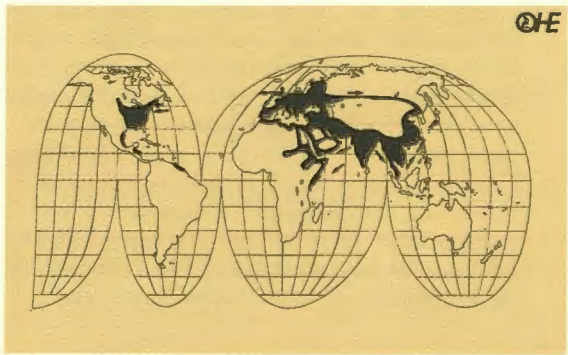
The type of thinking very simply outlined above is an unquestionably valuable and relevant skill. However, it might be added that in choosing cholera control the World Bank focussed upon a highly atypical example. Nearly all other vaccines are much more effective and longer lasting, as indeed cholera vaccination might be made to be if sufficient research and development monies were invested in the area. And cholera itself has an interesting history.

As Figure 2.1 shows, cholera's pre 1817 endemic focus was around Bengal. It was only after that date, with increasing world trade and travel, that it began to spread. The first cholera pandemic did not affect Europe. But, as Figure 2.2 indicates, the second reached Moscow in 1830, and from there went across the continent to the United Kingdom. It was even carried by ships to the Americas. The seventh pandemic threatened parts of Europe in the early 1970s, but improved sanitation and water supplies ensured swift control.

2.1 Cholera before 1816



2.2 The 1826–1837 Pandemic



Source WHO 1976

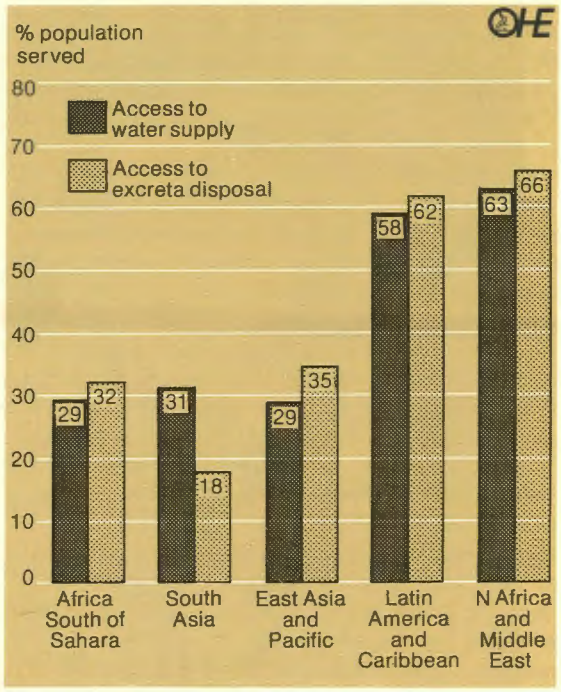
Box 3 *Water supply and sanitation*

Figure 3.1 indicates that under a third of the population of much of Africa and Southern Asia have no access to either clean water or basic sanitary facilities. Around four out of five cases of infectious illnesses in such areas are due to water-born pathogens.

During the period 1981–1990, the UN 'World Water Decade', it is hoped that around 2,000 million people will be provided with a source of uncontaminated water and some form of sanitation. The projected cost of this could be as high as $300,000 million. But it is probable that, with rapidly expanding populations, some 1,500 million third world citizens will still not have adequate services by the start of the 1990s.

With sanitation special problems exist. This is in part because it is less politically attractive to supply sewage disposal systems than it is to give people 'pure' water. But without the former, programmes for disease control are unlikely to be successful. In Bangladesh the entire population should have access to clean well water by 1990. But only one family in twenty has sanitation (Kaletsky 1981).

3.1 Access to community water supply and excreta disposal services in developing regions[1]



Source World Bank 1980

condition in parts of Greece and Italy. It was also found in the north east of America, as was smallpox, yellow fever and cholera (see Box 2). Hook worm, perhaps the most important form of intestinal parasitism, plagued the constructors of the San Gothard Tunnel and was well known in the southern United States. Before tuberculosis spread in Europe, leprosy was prevalent.

The first stages of the eradication or successful control of such diseases in the North began long before pioneers such as Snow, Pasteur, Koch and Ehrlich made their contributions to medical science. They started with gradual changes in human behaviour related to enhanced agricultural and then industrial production coupled with environmental improvements in areas like sanitation and water supply. Some current issues related to these last are outlined in Box 3.

Applying this knowledge to today's problems in the third world Gordon Smith (1979) has argued that 'for many populations only the cure of poverty and illiteracy will provide lasting solutions . . . and this means better distribution of wealth and welfare as well as increases in national wealth'. Although new pharmaceutical technologies may in a number of cases prove more important in improving the health of the poor world than this observation could be taken to imply, it rightly highlights the importance of the broad social and economic determinants of ill health.

Box 4 *GNP and GDP*

The gross national product (GNP) of a country is the total value of the goods and services generated in that nation's economy plus the income accruing to it through foreign investment in any given period. Gross domestic product (GDP) excludes the latter, which in the case of poorer nations is not likely to be a major factor in determining wealth and consumption. National income is defined as GDP less capital depreciation in any given period.

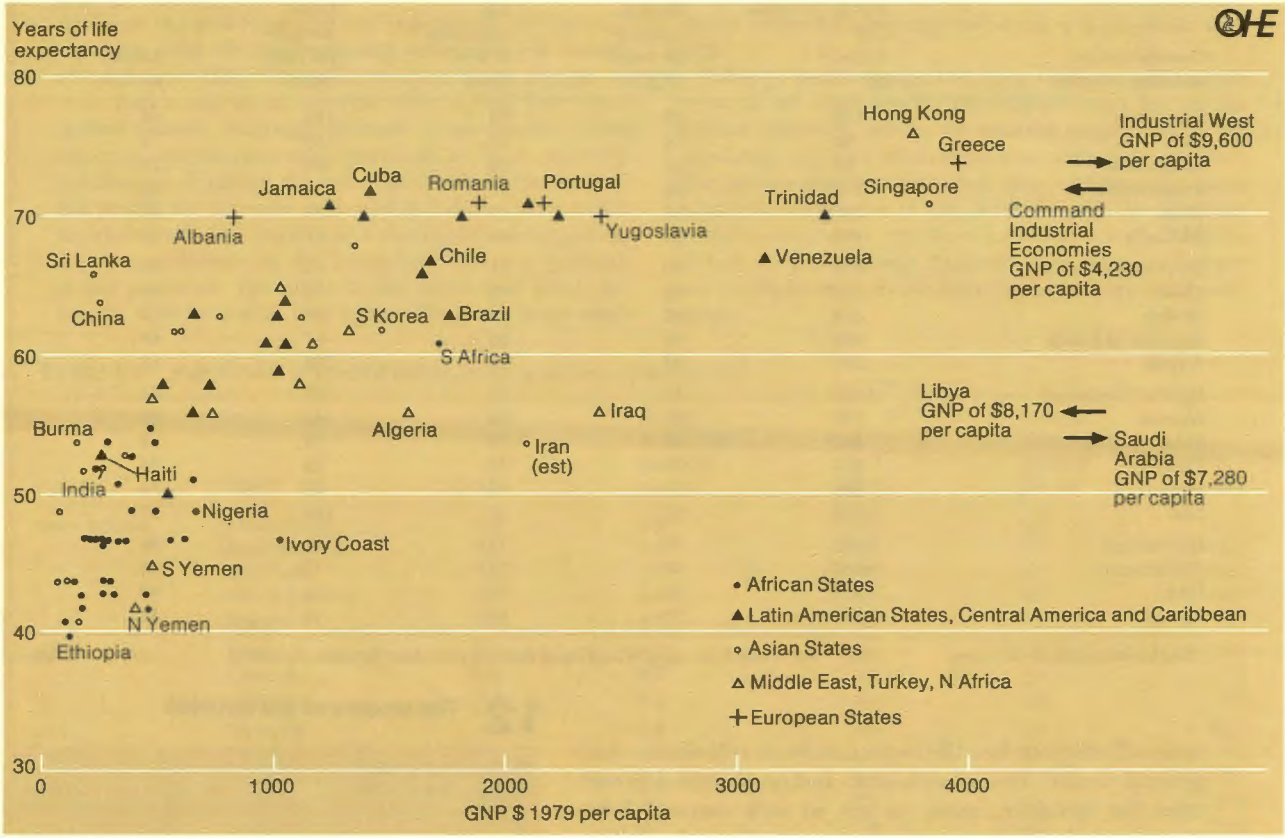
GNPs determined on the basis of official exchange rates provide a reasonably reliable framework for comparing the performances of the industrialised nations. But in the case of poor countries difficulties arise. Because of their low internal price levels real living standards tend to be higher than the usually quoted data imply. Approaches aimed at determining actual purchasing power parities (PPP's) are needed – Isenman 1979. Such calculations normally suggest that the poor states are between two and three times 'better off' than the conventional GNP/GDP figures indicate.

Health and wealth

Figures 11a and 11b show the general relationship between GNP *per capita*, the literacy rates in the communities of the third world and the average life expectancy of its members. The data indicates a strongly significant correlation between longevity and wealth up to a level of around $2,000 per head ($1979 – Box 4). It shows a similar, if anything more robust, relationship between literacy and life expectancy.

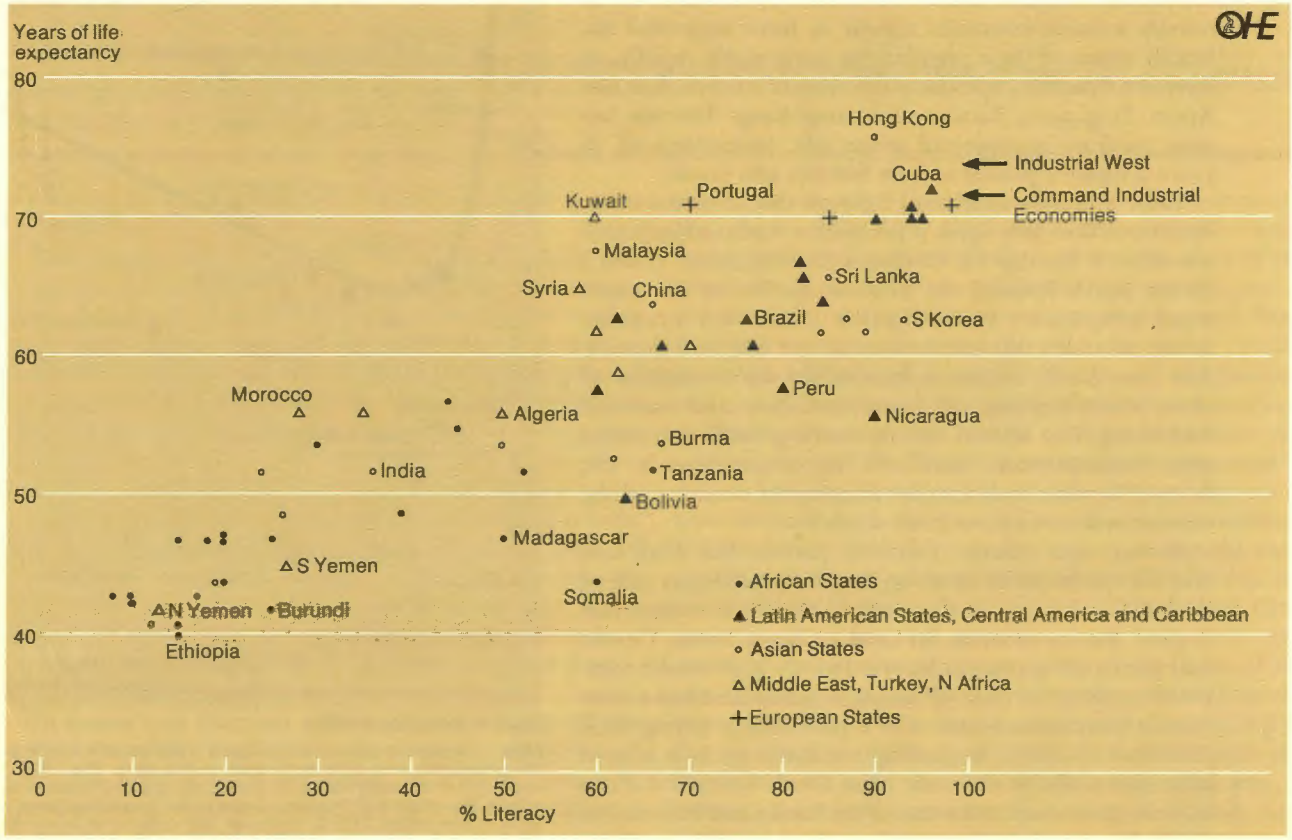
It would be unwise to attempt any elaborate theorising on the basis of these crude, and not entirely reliable, data. But it is apparent that certain regions or countries have

11a Life expectancy and GNP in 1979



Source World Bank 1981

11b Life expectancy (1979) and literacy (mid-1970s)



Source World Bank 1981

Table 4 *Economic and social indicators of development in selected countries and areas, early 1970s*

Countries or areas according to income	*Average per capita GNP 1970–75 ($)*	*Physical quality of life index (PQLI)*	*Life expectancy at birth (years)*	*Infant mortality per 1,000 births*	*Literacy per cent*	*Birth rate per 1,000*
Low-income	156	39	48	136	34	40
Mali	90	14	38	188	5	50
Bangladesh	92	32	46	153	22	47
Kerala, India	110*	68	61	58	60	27
India	133	41	49	129	34	34
Sri Lanka	179	82	68	47	81	26
Lower middle-income	452	60	61	95	60	30
China	350*	68	62	65	60	22
Zambia	415	38	44	159	47	50
Republic of Korea	464	82	65	47	88	24
Angola	600	16	38	203	13	47
Upper middle-income	1,026	67	61	87	65	36
Algeria	780	41	53	145	26	48
Cuba	800*	85	70	27	78	21
Taiwan	847	87	70	25	85	26
Mexico	996	75	65	66	74	42
Iran	1,260	52	57	104	37	45
High-income	5,272	93	71	17	96	17
Netherlands	5,558	96	74	11	98	13
USA	7,024	95	73	15	99	15
Kuwait	13,787	75	69	44	55	43

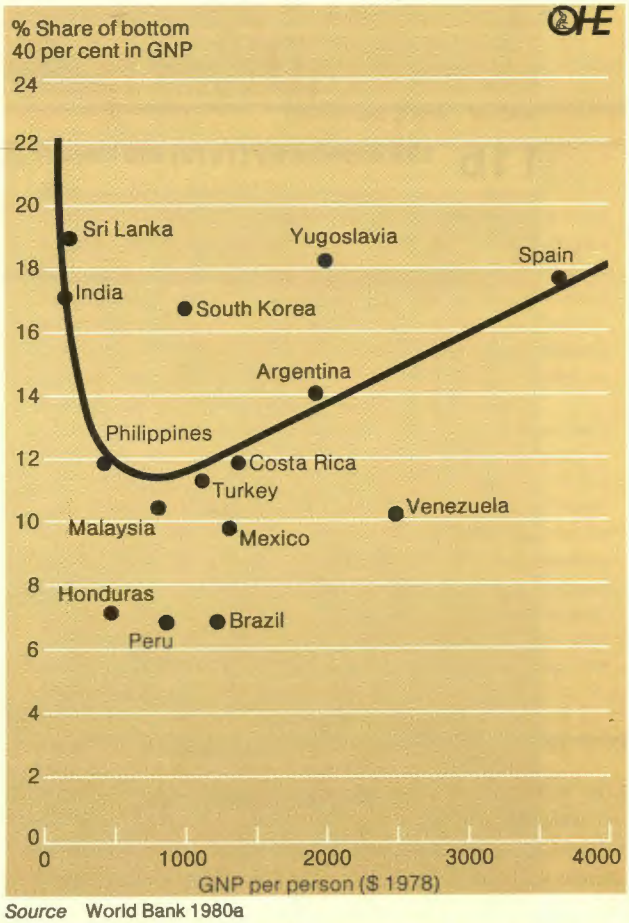
*Single-year estimate for 1975. *Note* See Table 6 for 1979 World Bank data on GNP. Also Figures 11a and b. *Source* Grant 1981.

unusually high or low life expectancies in relation to their general wealth. The oil rich Arab and north African countries, for instance, seem as yet to lack cultural infrastructures of sufficient sophistication to allow the full expression of their wealth in health terms. Those of sub-Saharan Africa do not perform as well on life expectancy criteria as the poor areas of southern Asia. Some more overtly socialist countries appear to have improved the health status of their populations particularly rapidly, as have the dynamic capitalist economics of eastern Asia like Korea, Singapore, Taiwan and Hong Kong. The last has now attained a projected mean life expectancy of 76 years, a figure equalled only by Sweden and Japan.

Table 4 throws additional light on this area. Based on data from the early 1970s it presents a statistical indicator introduced by the US Overseas Development Council (Grant 1981). Termed the physical quality of life index (PQLI), it represents a consolidation of three key measures; infant mortality, life expectancy at age one and literacy. The first closely relates to factors like the availability of clean water, housing and home conditions and maternal well-being. The second reflects more general nutritional and environmental standards important outside the home. The third indicates the situation of women and the educational status of societies as a whole.

As the PQLI column indicates nations like Mali and Angola appear to be in a very serious position, as indeed do India and Bangladesh to only a slightly less desperate degree. But by contrast Sri Lanka, China, Cuba, Taiwan and Korea all appear to have relatively high health standards, as does the state of Kerala in India. This has a communist government and also a particularly strong local Christian tradition. Regarding economic growth it is of note that whilst in the early 1970s South Korea had a GNP of little more than twice that of Sri Lanka and half that of Cuba, by 1979 it had more than six times the *per capita*

12 The income of the poorest



Source World Bank 1980a

Note The pattern shown in the Figure is known as a Kuznets curve, after the economist who pioneered work in this area. The 1978 data shown imply that in the early stages of growth, up to a GNP level of say $800 *per capita*, the income of the poor tends to fall in relative terms. Above that level it rises again. This is, however, like most other economic observations, not a 'law'. Political choice can lead to other development patterns.

Box 5 *Urbanisation*

Between the mid-1970s and the year 2000 it is expected that the cities of the developing countries will absorb around 70 per cent of the projected population increase of Asia, Africa and Latin America. That is, well over 1,000 million people. Although in some areas, notably Latin America, urbanisation may eventually prove an effective mechanism of raising the living standards of the mass of the people (for example, it should in some ways be easier to provide effective health and social care to more concentrated populations) in the immediate future it presents severe problems. The plight of the 'peri-urban' poor, the people who in search of a better life move from rural areas to the outer parts of large cities but who cannot then obtain satisfactory housing and work, is a particular concern.

Table 5.1 outlines expected city growth rates in various areas of the third world. The highest rates are in the African countries, where the existing proportion of the population living in urban areas is at present the smallest. The process of urbanisation is an area which may be taken as an exemplification of the point that the development problems of today's transitional societies are qualitatively as well as quantitatively different from those of Europe and North America in the eighteenth and nineteenth centuries.

Table 5.1 *Populations of selected urban areas 1950–2000 (in millions)*

Country	*City*	*1950*	*Average annual rate of growth per cent*	*1975*	*Average annual rate of growth per cent*	*2000*
Latin America	Mexico City	2.9	5.4	10.9	4.4	31.5
	Buenos Aires	4.5	2.9	9.3	1.5	13.7
	San Paulo	2.5	5.7	9.9	3.9	26.0
	Rio de Janeiro	2.9	4.4	8.3	3.4	19.3
	Bogota	0.7	6.5	3.4	4.2	9.5
Africa	Cairo	2.4	4.3	6.9	3.6	16.9
	Kinshasa	0.2	9.7	2.0	5.6	7.8
	Lagos	0.3	8.1	2.1	6.2	9.4
Asia	Shanghai	5.8	2.8	11.5	2.6	22.1
	Peking	2.2	5.8	8.9	3.7	22.0
	Jakarta	1.6	5.1	5.6	4.7	17.8
	Calcutta	4.5	2.4	8.1	3.7	20.4
	Bombay	2.9	3.7	7.1	4.2	19.8
	Karachi	1.0	6.2	4.5	5.4	16.6
	Seoul	1.0	8.3	7.3	3.8	18.7
	Manila	1.5	4.4	4.4	4.3	12.8
Developed Countries	New York	12.3	1.3	17.0	1.3	22.2
	London	10.2	0.2	10.7	0.7	12.7
	Paris	5.4	2.1	9.2	1.2	12.4
	Tokyo	6.7	3.9	17.5	2.0	28.7

Source Beier *et al* 1976.

wealth of Sri Lanka and had also overtaken the Cuban economy.

The factors influencing such variations in health and economic performance are numerous. For instance, income distribution is one important determinant of overall wellbeing. Figure 12 helps to explain why Latin American countries such as Brazil and Venezuela are not quite as successful in overall population health status terms as their *per capita* average income levels might lead observers to expect. In the former the top ten per cent of the population has over fifty per cent of the available income.

Mexico with a rather different history of land reform and over fifty years of government under the Party of Institutional Revolution is slightly more egalitarian. Its 1979 life expectancy figure was about 5 per cent above Brazil's, despite its GNP *per capita* being 10 per cent below. Similarly, Argentina's 1979 child death rate was significantly below Venezuela's.

In balance to criticism which might be made of the Latin America economies (and their post-colonial relations with the United States – see, for instance, Gunder-Frank 1971) it is clear that in terms of making a 'breakthrough' into the status of fully developed societies within the next few decades, Latin America is overall the best placed of the three third world continents. The implication is that governments may have to make choices between measures aimed at rapid economic growth, and in the medium to long term general prosperity, and those designed to 'make the best of poverty'. Yet in any circumstances a deliberate disregard for the health of significant sections of the population could be thought inexcusable.

Other influences on health standards include the nature and specific objectives of the political groups in power and the homogeneity or otherwise of the social structures of given third world nations. Some communities are deeply divided by cultural factors such as the caste system in India, tribalism in many areas of Africa and the racialism which seriously effects part of Asia and Latin America. And leading politicians may have little true desire to ensure that the basic needs of the mass of the poor are met. Instead some concentrate primarily on the interests of their own, usually urban based, sub-group of the population. Policies are thus skewed towards the needs of the rich; or disturbingly large amounts of resources devoted to items like internal security and defence.

Box 6 *Nutrition*

The UN Food and Agriculture Organisation's figures show that *per capita* food production in the third world overall has kept roughly stable in the past thirty years. The population increase of 1,500 million in the period has been matched by increases in agricultural productivity and the amount of land cultivated. However, this means that there are still over 50 developing countries where 15 per cent or more of the population is officially designated as undernourished. The sub-Saharan African states, which have millet and sorghum or roots and tubers as their main crops, are the most vulnerable.

Even in Latin America, a comparatively well-fed continent, around one child death in twenty is directly caused by nutritional deficiencies and over a half of all such mortality is linked with underfeeding. In adults and children alike this weakens resistance to disease; whilst lack of specific nutrients causes conditions like anaemia (lack of iron – 500 million affected) and goitre (lack of iodine – 200 million affected). Vitamin A deficiency alone affects up to half the children of many poorer nations, weakening the eyesight of many and blinding perhaps half a million individuals every year.

A particular problem area is that of infant nutrition. A significant proportion of the 4–5 million diarrhoea related baby deaths which occur each year are probably associated with factors like baby-milk (and presumably other weaning foods) being made up with infected water.

The remedies for third world malnutrition lie in a) improved distribution of existing food and b) increased production. In the former area measures may range from micro-level activities like efforts to ensure that families share their resources evenly and do not, for instance, neglect female members to macro-level legislation on food marketing and the distribution of available stocks. Experience with subsidies on basic foods suggests that this is one effective way to help the poor, whilst it is obviously desirable to ensure that nursing mothers are sufficiently well fed to breast feed for as long as possible. If nothing else this enables the transmission of some immunities, although it is important to educate men and women about issues like the value of colostrum, the clear anti-body containing 'pre-milk' secreted just after birth. In some cultures this is regarded as inferior and not given to the baby.

Regarding agricultural efficiency, the average acre of land in the South still only produces a half or less of the food which and acre in the North provides. There may thus also be significant productivity gains possible, although the cost of fertilizers and agricultural machines may make Northern methods inappropriate.

In this context the $10,000 million agricultural aid given by the North to the South each year may often in the final analysis be of little value to the world's poorest people. Excessive bureacracy, maldistribution of resources, and the needless and destructive displacement of labour by over-sophisticated techniques are all frequent dangers.

In the final analysis, local independence in food production using methods which harmonise with local needs and abilities is usually the most desirable goal. But it is a sobering thought that according to the World Bank the diversion of just 2 per cent of the World's grain output to the mouths that need it would be enough to eliminate malnutrition in the third world. Whilst areas like America and Western Europe have disease related to excessive consumption and yet have been able to increase their *per capita* food output by 15–20 per cent in the last decade alone, many people in the South are starving.

In the context of the latter wars between and internal strife within poor countries, sometimes stimulated by the interests of foreign powers, have recently had a severely deleterious effect on health in certain areas. Examples include Afghanistan, Somalia and Ethiopia, and El Salvador.

It would be beyond the scope of this paper to discuss such issues further. However, Box 5 presents data on problems related to urbanisation in the third world, whilst Box 6 examines the topic of nutrition. Socially and economically determined variables in areas like these are critically important background determinants of patterns of ill health around the globe.

The provision of health care

In the societies of Western Europe and North America the technical developments and changes in the patterns of production and work relationships linked with demographic transition were indigenously created. They were not imposed by or imported from other cultures. Thus although events such as the shift of population from rural, agrarian life to the factories and towns undoubtedly imposed heavy strains on the social fabric of countries like Britain, it was possible to retain a substantial degree of unity and stability.

Even in Eastern Europe and Japan, where population changes in the twentieth century have been more rapid and where foreign ways of life were more obviously overlaid onto old traditions, the accommodation process has been seemingly successful. It may also be that the ancient cultural strength of China will allow that country too to 'modernise' whilst retaining a fairly balanced and orderly social structure.

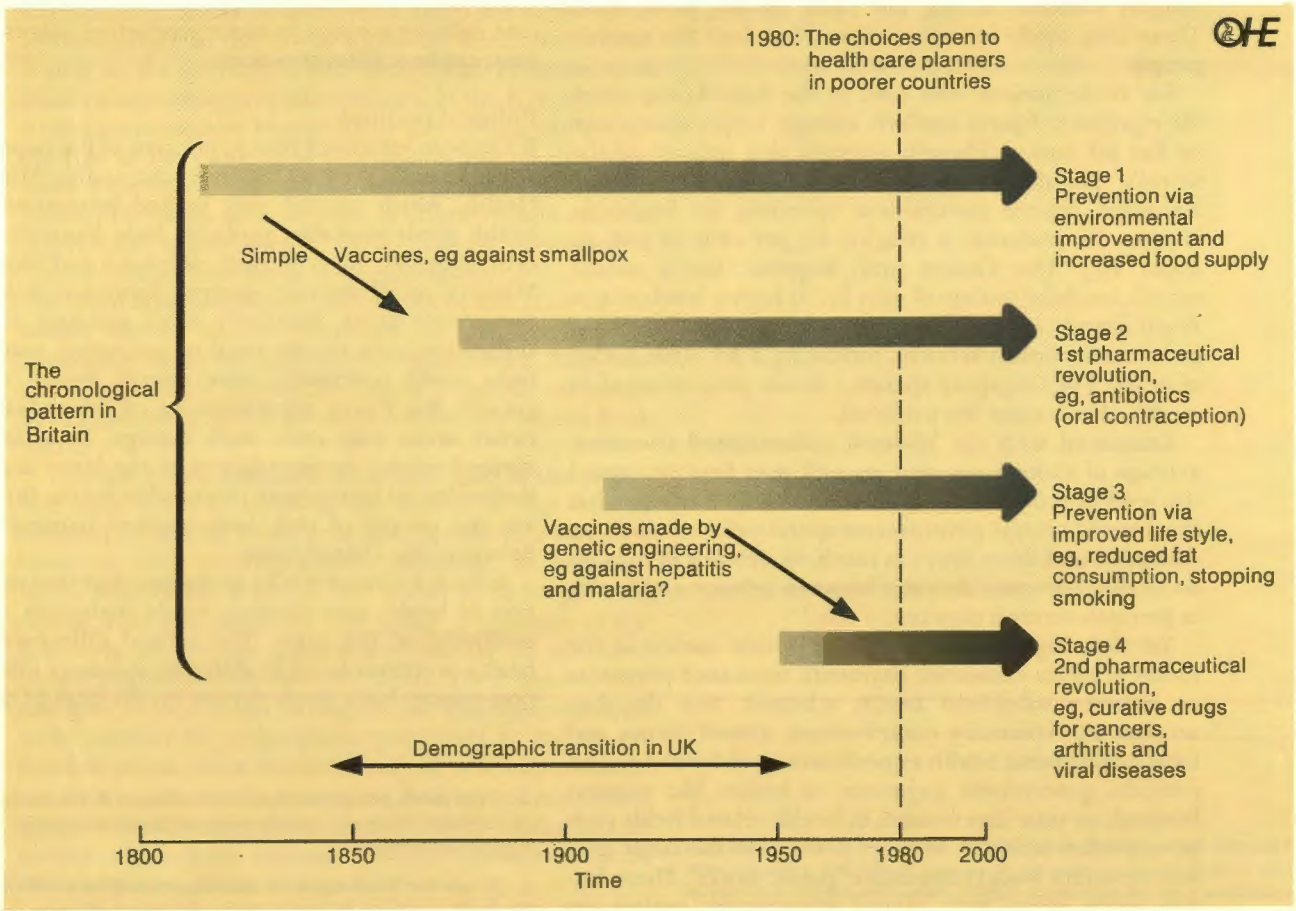
But in many parts of Africa, Asia and Latin America this does not appear to be the case. The introduction of modern technologies alongside what could be described as primitive, pre-transitional life styles has reinforced divisions in social and economic structures. The interests of the urban middle classes working in industry or state administration are in such circumstances likely to be largely separate from those of the rural poor.

'Developments' which benefit the former will not, therefore, necessarily 'ripple-out' or 'drip down' to help provide the basic needs of the latter, at least in the short term. And in addition the interaction of two or more value systems in a community, (the modern, 'official' one of which is only veneered over more deeply held beliefs) may, some sociologists believe, lead to problems of corruption in official or business circles and make decisions as to investment policies in poor world countries unlikely to be fully efficient in welfare terms.

With specific regard to the provision of health care these points are clearly relevant. Figure 13 presents a simplified scheme describing the emergence of better health in countries like the United Kingdom. During stage 1 the main emphasis was on environmental improvement, such as better sanitation. This paved the way for stage 2, dominated by curative medicine and the control of the remaining pools of communicable disease. This in turn 'uncovered' the underlying patterns of chronic illness and disease related to domestic and industrial life styles, leading to the stage 3 emphasis on new patterns of prevention and handicap reduction. A current objective of the international pharmaceutical industry is that this will be followed by a fourth curative stage, in which new technologies may be applied to conditions like cancer, multiple sclerosis and rheumatoid arthritis.

But in much of the third world this orderly sequencing of health service development has been disrupted. The curative medicine and hospitals of stage 2 may have been introduced before adequate stage 1 investment. The rich

13 **The stages of health development**



are in some cases prematurely seeking stage 4 technology, when the poor have virtually no health care at all, or may even now be being introduced to factors like cigarette smoking, dangerous factory conditions, excessively 'fatty' or 'sugary' diets and the risks of mechanised road transport. A car in a country like Nigeria is many times more likely to be involved in a fatal accident, per mile covered, than is one in the United Kingdom.

It is against this background that the remainder of this section examines aspects of, first, the general level and pattern of health funding available in the poor world and, second, the constraints on the strategic choices health authorities in developing countries have open to them.

Health spending

In most poor nations the data available on health spending are of limited value. Reliable statistical measures of any sort tend to be expensive, and may simply not be worth the resources needed to generate them. This means that superficial analyses of published information can result in misleading conclusions. And errors are often compounded when inexperienced commentators aggregate fragmentary evidence from widely different developing countries to give overviews of topics like third world health investment or the use of pharmaceuticals. The outline given below attempts to avoid as many pitfalls as possible, but can at best provide only a general picture.

Central government spending on health in low income countries with *per capita* GNPs of under $400 (all figures in $1979) represents only 1 to 1.5 per cent of GNP, or say an average of around $3 per head. In real terms it stayed roughly constant during the 1970s (World Bank 1981). These data apply to rather more than half the world's people.

For those nations with GNPs in the $400–$4,000 range the equivalent figures similarly average 1.5 per cent of GNP or $20 *per capita*, although amongst this quarter of the world's population there is much more variation. Recorded central government spending on health in Nigeria, for instance, is roughly 0.5 per cent of GNP, or about $3.5. The Yemen Arab Republic has a similar record, implying outlays of only $1. At higher levels of GNP Brazil spends rather more than 1.5 per cent on central government health services, indicating a *per capita* outlay of nearly $30. Singapore spends a similar proportion of its wealth, that is some $60 per head.

Compared with the Western industrialised countries' average of about 3 per cent, or well over $250 *per capita*,[2] this level of provision is very modest. And it is of note that third world central governments spend twice as much on education and three times as much on defence as they do on health. For some the ratio between defence and health in *per capita* terms is over ten to one.[3]

Yet these figures do not include private outlays in the forms of direct consumer payments, insurance payments or industry subsidised health schemes. Nor do they account for voluntary contributions, armed forces and local government health expenditures, aid funded health projects, government payments to bodies like mission hospitals or state investments in health related fields such as sanitation schemes. Moneys devoted to the latter may well be under budget heads like 'public works'. These factors alone mean that central government outlays on health care, despite being widely quoted indicators, are of extremely dubious value as guides to countries' total health investments.

In addition there is the fact that in most poor economies a great deal of activity takes place on an exchange basis, and is not reflected in conventional measures of GNP or health spending. Items paid for in cash, like pharmaceuticals, should be visible but much domestic activity and traditional medicine will not be so.

Research conducted by individuals such as Cumper (1981a, 1981b) and agencies such as the Sandoz Institute for Health and Socio-economic Studies (which collaborated closely with WHO over work in this area – see WHO 1977) indicates that if all payments identifiable in national accounts are included in computations of health costs then the poorest developing nations spend a minimum of 3 per cent of GNP in the direct health care sector alone. The World Bank (1981b) has concluded that the limited evidence available suggests the in total 'about 6 per cent to 10 per cent of the gross domestic product is spent on health care . . . in the developing countries'. This implies a total of over $80,000 million ($1980), added to which substantial sums go to projects related to water supply, waste disposal, nutrition and family planning.

Although exceptions exist, generalisations to the effect that the world's poor nations could as a whole easily and significantly increase their total health spending are thus of limited validity. Substantial sums are already devoted to this end. However desirable better health might be in social or economic terms the resource shortages facing many developing countries are so severe that they cannot easily find additional moneys. The alternative is to reallocate existing moneys to more productive usages. But this also may be a difficult process.

Political realities

It has been estimated that 75 per cent of the population of Latin America is cared for under the various Ministries of Health, which control only limited proportions of the health funds available, probably little more than 25 per cent (Roemer 1977). Private schemes and non Health Ministry social security systems dominate in the more prosperous areas. Relatively small amounts of moneys shifted into care for the rural or peri-urban poor populations could potentially raise overall health standards greatly. But forces representative of the industrialising, richer areas may resist such change. In a deeply segmented society the populations of the latter may believe themselves to be no more responsible for the former than are the people of rich, industrialised nations like, say, Britain or the United States.

In such a climate it is by no means clear that reorganisation of health care funding would materially effect the wellbeing of the poor. The radical differences in the health problems faced by different sections of the population means that a single service on the lines of the British

2 Total public plus private health spending on the industrial economies of the North West now averages around 8 per cent of GNP, that is some $750 *per capita* ($1979).

3 In 1980 the North exported some $44,000 million worth of arms to the South. The USSR was the major trader, followed by France.

NHS would be difficult to run appropriately.[4] And in the absence of evidence that Ministry of Health services are actively damaged by the existence of different care systems in urban areas an integrated system could prove to be even more skewed in its resource allocations.

Within the public sectors of many less developed countries significant distributional biases also exist. In some cases major, capital city hospitals absorb 50 per cent of total state health revenues. Yet 90 per cent of their patients are from their immediate districts (Gish 1977). Similarly, doctor training may be a major item in the national health budget. Yet the international mobility medical degrees confer may mean that in the end all that such expenditure by poor nations achieves is a ready supply of doctors for the rich countries; that is, an inverse form of international aid (OHE 1972). Peretz (1981) has, for example, suggested that 50 per cent of the physicians who trained in Pakistan since independence are now practising outside the country.

Since a typical developing nation may spend in the order of a half to two thirds of health resources on manpower it would seem reasonable to reduce costs wherever possible by employing auxiliary personnel who are less expensively educated and highly paid than fully qualified doctors. Medical assistants require only a twentieth or so of the resources needed to train a doctor; rural aids may well be 50 per cent less costly again (Gish 1977).

But here also conflicts of interest occur and difficult decisions have to be made. On the one hand groups like doctors and nurses with Northern level qualifications may feel their interests threatened by the employment of less fully qualified medical staff, even though the former tend to concentrate in the towns whilst the latter are needed mainly in the peri-urban and rural areas. Pressures thus build up against appropriate policies, in the face of which some commentators may react by discounting altogether the role of the established professions. But on the other hand experience has shown that effective third world health provisions, such as those of China, require referral centres and upper tiers of highly trained personnel. A careful balance thus needs to be maintained.

A third area commonly cited as one in which savings in health outlay and/or increases in efficiency could apparently easily be made is pharmaceuticals. These on average probably account for about a quarter of public health spending in less developed countries (World Bank 1981a).

This last area is discussed more fully later in this paper. The main point to stress in the context of this section, however, is that, as Table 5 outlines, in both rich and poor countries total pharmaceutical spending, in manufacturers' price terms, averages only about 0.7 to 0.8 per cent of GNP. It is also estimated that some 70 per cent of the people in an average poor world country do not have regular access to even essential drugs. These figures indicate that, even if Ministry drug lists are confined to a minimum number of preparations purchased at the lowest possible prices, extra resources may be needed to finance the fuller and more appropriate delivery of medicines. These will inevitably have to come from exchanges of money within poor nations or from transfers between rich and poor nations.

Some commentators tend to gloss over this area, or imply that pharmaceutical spending is an homogenous whole within which reallocations from richer populations to poorer ones can simply be made. This is not the case. Reduced outlays on non life-saving medicines for the former would not necessarily result in more essential medicines becoming available to the latter. Rather, increased consumer expenditures outside the health sector altogether might well result. To the extent that this would harm the finances of medicine manufacturers it would actually tend to drive up pharmaceutical unit prices.

The conclusion to draw from these remarks is that although increased efficiency in all the areas touched on above is clearly a desirable goal, it will not be easily achieved. Unrealistic and oversimplified hopes and strategies may in the end lead to needless disillusion or the unfair scapegoating of particular groups or agencies blamed for the failure of fundamentally unworkable programmes. Systematic and pragmatic planning for better health is essential.

Table 5 *Consumption of pharmaceuticals as a percentage of gross domestic product*

'Developed' countries	0.74
American industrially less 'developed' countries	0.83
Asian industrially less 'developed' countries	0.78
Middle Eastern industrially less 'developed' countries	0.42
African industrially less 'developed' countries	0.79
Total industrially less 'developed' countries	0.70
Total World	0.73

Source OECD (1979).

4 Even in China a multiplicity of funding mechanisms exist, varying between localities and labour groups. In the countryside commune health services are largely self funded, which means that the care available will vary with the prosperity and productivity of the unit.

In the 1950s and 1960s the inappropriate concentration of poor world health resources on items like large, highly equipped teaching hospitals was to an extent balanced by programmes aimed at eradicating or controlling particular diseases. The most notable of these was the WHO smallpox immunisation drive. This major international initiative led, after some setbacks, to the total eradication of the condition by the end of the 1970s.

But in other areas such 'single target' initiatives have been less successful. The eradication attempt in the case of malaria is one example which critics have quoted (Yekutiel 1981). Some argue that such schemes can become like ill-planned big hospital projects, draining resources from other health services and confusing or distorting the overall view of priorities. The alternative is to concentrate on establishing a comprehensive structure of health care delivery which can be used to provide a complete range of services to the mass of the population. It is this concept which largely underlies current WHO thinking on primary health care.

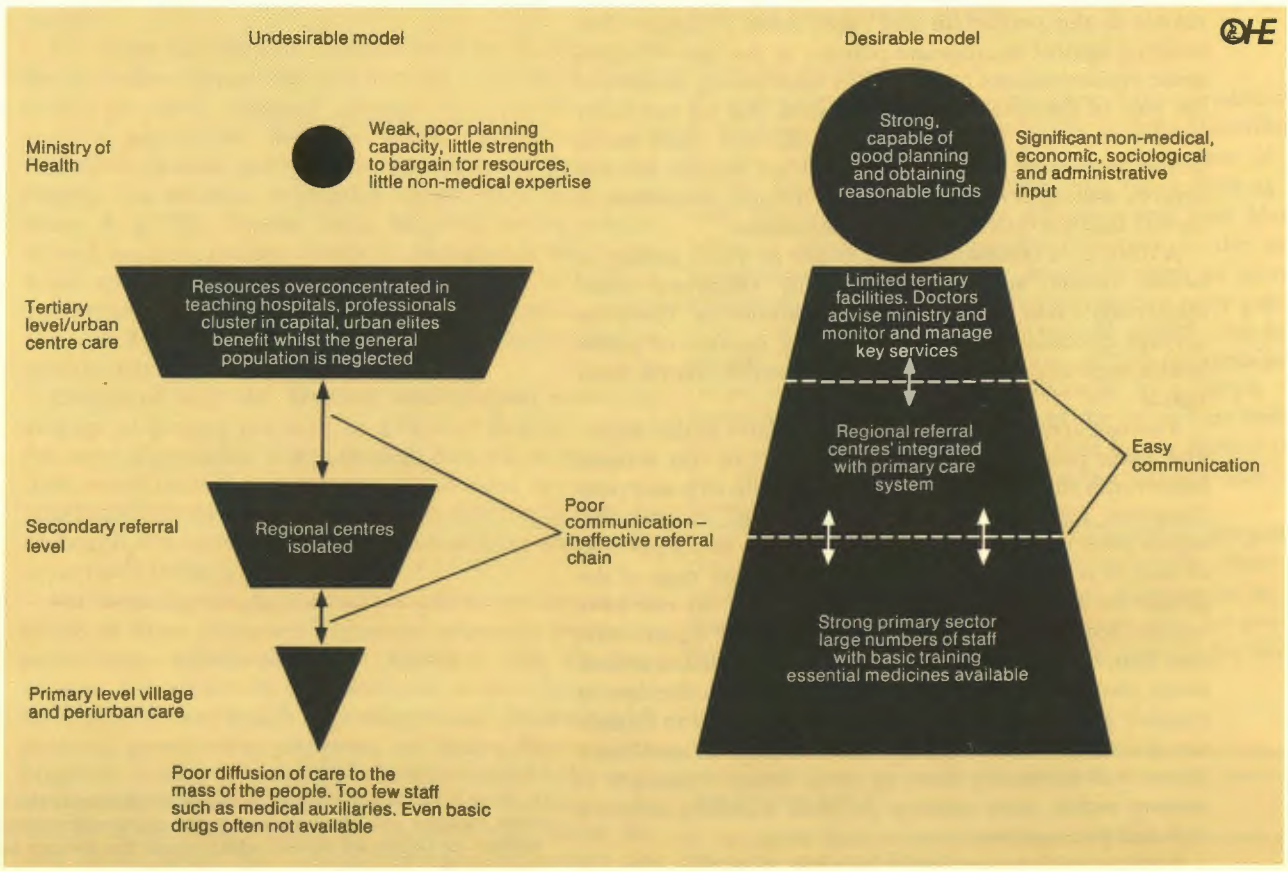
The 'health for all' programme aims to concentrate on half a dozen key areas: education relevant to health; the provision of adequate food supplies; clean water and adequate sanitation services; maternal and child health care, including family planning; the prevention or control of endemic disease; and the provision of a basic range of medicines or 'essential drugs'. More precise targets to be used as indicators of the programme's implementation include whether or not safe water is available within 15 minutes walking distance of each residence; whether or not the child population is immunised against diphtheria, tetanus, whooping-cough, measles, polio and tuberculosis; and whether or not local health care (including the availability of at least 20 key medicines) is available within one hours walk of each residence.

The global strategy for health for all by the year 2000 developed by WHO under the directorship of Mahler also suggests that every country should devote at least 5 per cent of its GNP to health. It is hoped that adult literacy even in the poorest nations will be at least 70 per cent within two decades, that average life expectancy will be at least 60 years and that infant mortality will be no more than 50 per 1,000 live births.

Progress towards the upgrading of provision is already being stimulated by global initiatives such as the Expanded Programme on Immunisation (see OHE 1980), the World Water Decade (1980–1990) and the Action Programme on Essential Drugs. The latter was first mooted in 1978 and approved by the WHO Executive Board in 1979. It was slow to come into operation, however, and was 're-established' in February 1981. Each of these is of considerable interest in its own right, but their health implications are only fully realisable if the need for nation by nation programmes to establish appropriate health care infra-structures is perceived and acted upon.

Figure 14 outlines the differences between a typical and an ideal system. The former model is characterised by a weak Ministry of Health, under which there is an inverted pyramid of facilities and manpower, made up in discrete,

14 Health systems in industrially less developed countries



isolated tiers. In relative terms the numbers of village based health workers and basic dispensaries are too small compared with those of doctors and hospital level beds, although Table 6 suggests that in absolute terms the numbers of more highly qualified health personnel in poor countries are also disturbingly low.

There is much research available which indicates that in rural areas people cannot travel far to health facilities because of factors like the lack of transport, not to mention roads. (See for instance, Roemer 1972). The effective area served by a small health facility may only be five kilometres in radius. Thus a highly dispersed system is needed. Gish (1977) has argued that in the ideal world this should be based on simple rural dispensaries, staffed by auxiliaries and serving only a few thousand people. A typical cost would be in the order of £5,000 (£1980). Village health workers, whether paid or voluntary, might use such dispensaries as a resource and contact point with the rest of the health system.

Above this level health centre complexes, manned mainly by assistants and costing up to say £50,000 might serve communities numbering anywhere between 20,000 and 50,000 individuals. Beyond this level would be district, regional and national hospitals, costing from under £200,000 to perhaps several million pounds. Thus a referral and management chain would exist from village level right up to that of the capital cities, where in the ideal model a strong Ministry of Health would be able to plan competently, monitor performance and negotiate strongly with other Ministries for a full share of national resources.

This simplified schema brings out the main points of an improved health care infrastructure for a typical developing country – one which would be able to deliver comprehensively the types of care envisaged in the WHO 'health by the year 2000' programme. Nevertheless, a number of significant caveats must be borne in mind if it is to be interpreted usefully into practical reality.

First, there are questions relating to resource limitations affecting the establishment of primary care systems in developing nations. Evans *et al* (1981) suggest that a basic service could be provided for around $2–$5 per head in late 1970s terms, sums which the data presented in the previous section indicate would be theoretically acceptable in even the poorest nations. However, there is a constant danger that the distribution of health resources may become skewed by professional or political forces, so depriving basic services of funding.

Following on from this, a second set of relevant points focus on the relations between 'community based' facilities and provisions like hospitals further up the referral chain. On a simple level the working of the latter involves ensuring that physical communication facilities are adequate. All too frequently they are not.

At a more political level some commentators feel that attempts to integrate hospital systems and higher professionals with the primary care network along lines such as those recently discussed at the joint WHO/Aga Khan Foundation conference in Karachi (Dean 1981) are doomed to failure. It is true that it is claimed that in China the two million or so 'barefoot doctors' are supported by a comprehensive hospital system to a degree not always acknowledged in the past. But it may be that this system cannot easily be transplanted to other developing countries; and that attempts to do so may in some cases be motivated by individuals intent on actually maintaining the power and funds of the major hospitals.

Also some people doubt even the desirability (not to say the actual existence) of the Chinese model. For example, Rifkin (1978) saw that country's early use of unpaid, village based 'barefoot doctors' as a fundamental challenge to the power of the established professions, intended to help the transfer of health knowledge and health responsibility into the hands of the people. But she describes the later stages of China's modernisation as a step back towards professional medical control (Rifkin 1980). Although this view may be thought an extreme one, experience throughout the third world points to the limitations of traditional Northern medical training as a preparation for work in poorer countries and throws considerable doubt on the wisdom and cost effectiveness of policies aimed at encouraging such professionals to practice in rural areas.

Leading on from this, it is clear that for primary care services to be effective there must be a strong focus throughout the structure on encouraging local community participation and health worker understanding of the social aspects of each community's needs. Clinical competence alone is not enough to ensure better health, not least because in many repects effective health care is always a result of informed self care efforts. If, for instance, local etiquette with regard to matters like interaction between people of opposite sexes is ignored or patterns of authority and status are misunderstood then health workers may themselves be ignored or misunderstood.

The danger associated with insensitive intervention can be illustrated in the context of the provision of pure water supplies, which superficially might seem a socially neutral activity. On some occasions such schemes do not have their expected impact because those undertaking them make inadequate efforts to explain to villagers the health advantages of clean water, or to change customs, tastes and patterns of recreation associated with the use of, say, river water. On others dominant individuals at village level have regarded new water outlets as their own property, restricting access to them once the team introducing the scheme has withdrawn (Cronin 1981).

A fourth group of caveats relates to the effect of extending 'North' influenced primary care to the poorer parts of the South at the expense of existing traditional medical practices. At present groups offering such expertise, from the Ayurveds of India to the Curanderos of Latin America, still provide not only basic care but also spiritual support to the mass of the poor world's poor people. In the case of sub-Saharan Africa, for example, traditional healers offer both a knowledge of medicinal plants and a metaphysical system which explains the meaning of illness in terms of man coming into conflict with, or falling out of harmony with, his environment.

Aggressively introduced primary care services can undermine faith in, and the knowledge base of, such systems. If the former then for some reason fail (through, perhaps, poor planning or withdrawal of funds) the population may subsequently be left physically no better off and culturally impoverished. Even if health status is improved there is still a danger that overall wellbeing will

Table 6 *Medical and nursing manpower*

	Population (millions) Mid–1979	GNP per capita Dollars 1979	GNP per capita Average annual growth (per cent) 1960–79	Population per Physician 1960	Population per Physician 1977	Population per Nursing person 1960	Population per Nursing person 1977
Low-income countries	**2,260.2**	**230**	**1.6**	**11,680**	**6,150**	**5,700**	**6,200**
China and India	**1,623.7**	**230**	**—**	**3,730**	**2,160**	**5,510**	**2,900**
Other low-income	**636.5**	**240**	**1.8**	**39,290**	**16,380**	**7,370**	**14,890**
Kampuchea, Dem.	—	—	—	34,830	—	—	—
Lao PDR	3.3	—	—	54,140	*20,060*	—	*3,040*
Bhutan	1.3	80	—0.1	—	—	—	—
Bangladesh	88.9	90	—0.1	—	*8,780*	—	*56,880*
Chad	4.4	110	—1.4	72,190	41,940	*8,040*	*4,810*
Ethiopia	30.9	130	1.3	100,470	75,320	*14,920*	*5,400*
Nepal	14.0	130	0.2	72,870	*35,250*	—	53,540
Somalia	3.8	—	—0.5	36,570	—	6,220	—
Mali	6.8	140	1.1	67,050	25,150	*4,980*	*3,230*
Burma	32.9	160	1.1	15,560	5,120	—	*6,120*
Afghanistan	15.5	170	0.5	28,140	20,550	*23,210*	25,920
Vietnam	52.9	—	—	—	5,620	—	*900*
Burundi	4.0	180	2.1	*96,570*	*45,020*	*6,770*	*6,180*
Upper Volta	5.6	180	0.3	81,650	*49,810*	4,090	*4,510*
India	659.2	190	1.4	*4,850*	*3,620*	*9,630*	*6,430*
Malawi	5.8	200	2.9	35,250	*40,680*	*12,920*	*2,790*
Rwanda	4.9	200	1.5	*138,100*	38,920	11,200	10,490
Sri Lanka	14.5	230	2.2	4,490	*6,750*	*4,150*	*2,050*
Benin	3.4	250	0.6	23,030	26,880	—	*3,040*
Mozambique	10.2	250	0.1	20,390	33,980	*4,720*	—
Sierra Leone	3.4	250	0.4	20,420	—	*5,900*	—
China	964.5	260	—	*3,010*	*1,160*	*2,850*	*480*
Haiti	4.9	260	0.3	*9,230*	5,940	*10,340*	*4,230*
Pakistan	79.7	260	2.9	11,000	3,760	—	9,980
Tanzania	18.0	260	2.3	18,220	17,550	10,440	3,080
Zaire	27.5	260	0.7	*37,620*	*15,530*	*3,510*	*1,940*
Niger	5.2	270	—1.3	*82,170*	42,720	*8,450*	*6,270*
Guinea	5.3	280	0.3	*48,000*	16,630	*3,260*	2,490
Central African Rep.	2.0	290	0.7	41,580	17,610	*2,760*	1,560
Madagascar	8.5	290	—0.4	8,900	10,240	*3,110*	*3,470*
Uganda	12.8	290	—0.2	14,060	27,600	*9,420*	4,300
Mauritania	1.6	320	1.9	40,400	15,160	*7,320*	3,430
Lesotho	1.3	340	6.0	23,510	18,640	—	4,340
Togo	2.4	350	3.6	*35,760*	17,980	*5,340*	2,000
Indonesia	142.9	370	4.1	46,780	*13,640*	—	*8,850*
Sudan	17.9	370	0.6	33,500	8,690	*3,040*	*1,280*
Middle-income countries	**985.0**	**1,420**	**3.8**	**10,430**	**4,380**	**3,390**	**1,820**
Oil exporters	**324.8**	**1,120**	**3.1**	**22,320**	**5,940**	**4,820**	**2,120**
Oil importers	**660.2**	**1,550**	**4.1**	**4,570**	**3,580**	**2,790**	**1,610**
Kenya	15.3	380	2.7	10,690	*11,630*	*2,230*	*1,090*
Ghana	11.3	400	—0.8	21,600	9,920	*5,430*	*860*
Yemen Arab Rep.	5.7	420	10.9	—	*12,460*	—	*5,660*
Senegal	5.5	430	—0.2	24,540	15,710	4,110	*1,660*
Angola	6.9	440	—2.1	14,910	—	—	—
Zimbabwe	7.1	470	0.8	4,790	*7,030*	1,010	*1,380*
Egypt	38.9	480	3.4	2,560	1,050	2,730	*1,100*
Yemen, PDR	1.9	480	11.8	13,760	*7,760*	—	*1,620*
Liberia	1.8	500	1.6	*12,600*	*9,260*	5,810	*2,900*
Zambia	5.6	500	0.8	9,540	*10,190*	*9,920*	*1,930*
Honduras	3.6	530	1.1	12,610	3,290	—	1,240
Bolivia	5.4	550	2.2	3,830	*1,850*	—	3,070
Cameroon	8.2	560	2.5	*48,110*	16,500	*6,150*	2,230
Thailand	45.5	590	4.6	8,000	*8,150*	4,900	*3,540*
Philippines	46.7	600	2.6	6,930	2,760	—	3,110
Congo, People's Rep.	1.5	630	0.9	16,430	*7,290*	*1,510*	*800*
Nicaragua	2.6	660	1.6	2,740	*1,670*	5,460	800
Papua New Guinea	2.9	660	2.8	14,390	14,040	2,450	1,930
El Salvador	4.4	670	2.0	5,260	3,600	—	*1,310*
Nigeria	82.6	670	3.7	73,710	*15,740*	*6,020*	*4,030*
Peru	17.1	730	1.7	2,010	1,550	2,210	750
Morocco	19.5	740	2.6	9,410	*11,040*	—	*1,690*
Mongolia	1.6	780	3.0	1,070	480	*300*	250
Albania	2.7	840	4.2	3,630	960	*540*	370
Dominican Rep.	5.3	990	3.4	—	—	—	—
Colombia	26.1	1,010	3.0	2,640	1,970	*3,740*	1,250
Guatemala	6.8	1,020	2.9	*4,410*	*2,490*	*9,040*	—
Syrian Arab Rep.	8.6	1,030	4.0	4,630	2,570	6,660	*3,890*

Table 6 *Medical and nursing manpower (continued)*

	Population (millions) Mid–1979	GNP per capita Dollars 1979	GNP per capita Average annual growth (per cent) 1960–79	Population per Physician 1960	Population per Physician 1977	Population per Nursing person 1960	Population per Nursing person 1977
Ivory Coast	8.2	1,040	2.4	*29,190*	*15,220*	2,920	*2,370*
Ecuador	8.1	1,050	4.3	2,660	1,620	*2,280*	—
Paraguay	3.0	1,070	2.8	1,800	*2,150*	—	*2,260*
Tunisia	6.2	1,120	4.8	10,030	*4,800*	—	*1,070*
Korea, Dem. Rep.	17.5	1,130	3.5	—	—	—	—
Jordan	3.1	1,180	5.6	5,800	1,960	1,650	*820*
Lebanon	2.7	—	—	1,210	—	—	—
Jamaica	2.2	1,260	1.7	2,590	3,520	1,990	550
Turkey	44.2	1,330	3.8	3,000	1,770	—	*1,460*
Malaysia	13.1	1,370	4.0	7,470	8,730	*1,780*	1,290
Panama	1.8	1,400	3.1	2,730	1,220	3,460	*1,410*
Cuba	9.8	1,410	4.4	1,060	*1,110*	*910*	—
Korea, Rep. of	37.8	1,480	7.1	3,540	1,990	3,220	*550*
Algeria	18.2	1,590	2.4	*5,230*	5,330	—	1,480
Mexico	65.5	1,640	2.7	1,800	1,820	—	1,400
Chile	10.9	1,690	1.2	1,780	1,620	640	*440*
South Africa	28.5	1,720	2.3	2,180	—	*540*	—
Brazil	116.5	1,780	4.8	*2,560*	1,700	*2,770*	—
Costa Rica	2.2	1,820	3.4	2,700	1,390	710	*590*
Romania	22.1	1,900	9.2	*780*	740	*620*	640
Uruguay	2.9	2,100	0.9	*960*	*540*	—	*3,700*
Iran	37.0	—	—	4,090	—	8,160	—
Portugal	9.8	2,180	5.5	*1,200*	700	*1,430*	500
Argentina	27.3	2,230	2.4	740	*530*	—	—
Yugoslavia	22.1	2,430	5.4	1,620	760	*1,350*	410
Venezuela	14.5	3,120	2.7	1,510	930	*1,890*	380
Trinidad and Tobago	1.2	3,390	2.4	2,390	*1,970*	—	*580*
Hong Kong	5.0	3,760	7.0	3,070	1,180	*2,950*	*1,090*
Singapore	2.4	3,830	7.4	2,360	1,250	*650*	*380*
Greece	9.3	3,960	5.9	*790*	450	*2,080*	600
Israel	3.8	4,150	4.0	400	310	*360*	—
Spain	37.0	4,380	4.7	*820*	*560*	1,290	900
Industrial market economies	**671.2**	**9,440**	**4.0**	**830**	**620**	**450**	**220**
Ireland	3.3	4,210	3.2	*950*	*830*	*190*	*200*
Italy	56.8	5,250	3.6	640	*490*	*920*	*330*
New Zealand	3.2	5,930	1.9	*690*	740	—	200
United Kingdom	55.9	6,320	2.2	1,090	750	*420*	300
Finland	4.8	8,160	4.1	1,570	630	*220*	110
Austria	7.5	8,630	4.1	*550*	430	600	260
Japan	115.7	8,810	9.4	*930*	*850*	*460*	*290*
Australia	14.3	9,120	2.8	860	*650*	—	120
Canada	23.7	9,640	3.5	910	560	*300*	130
France	53.4	9,950	4.0	930	*610*	530	170
Netherlands	14.0	10,230	3.4	900	580	—	270
United States	223.6	10,630	2.4	*750*	570	*340*	*150*
Norway	4.1	10,700	3.5	850	540	*330*	100
Belgium	9.8	10,920	3.9	780	*440*	450	*250*
Germany, Fed. Rep.	61.2	11,730	3.3	670	490	*450*	260
Denmark	5.1	11,900	3.4	810	*510*	*270*	*150*
Sweden	8.3	11,930	2.4	1,150	*560*	—	130
Switzerland	6.5	13,920	2.1	740	510	*390*	220
Capital-surplus oil exporters	**25.4**	**5,470**	**5.0**	**8,920**	**1,810**	**5,810**	**1,860**
Iraq	12.6	2,410	4.6	*5,270*	*2,190*	*6,680*	*2,990*
Saudi Arabia	8.6	7,280	6.3	16,370	1,700	5,850	*950*
Libya	2.9	8,170	5.8	6,580	900	2,390	*280*
Kuwait	1.3	17,100	—1.6	1,150	790	*190*	*290*
Nonmarket industrial economies	**351.2**	**4,230**	**4.3**	**660**	**350**	**360**	**210**
Bulgaria	9.0	3,690	5.6	710	440	*550*	*240*
Poland	35.4	3,830	5.2	1,070	610	*490*	*270*
Hungary	10.7	3,850	4.8	*720*	430	*350*	*200*
USSR	264.1	4,110	4.1	560	290	*340*	210
Czechoslovakia	15.2	5,290	4.1	620	390	*280*	*160*
German Dem. Rep.	16.8	6,430	4.7	1.180	530	—	—

Figures in italics other than for year stated. *Source* World Bank 1981.

have been reduced (OHE 1972). The risk of such social iatrogenesis (Illich 1975) implies that the aim of modern primary care services should be to enhance rather than destroy traditional structures. This is a goal which requires a sensitive approach for its attainment. It may be very difficult for a health worker operating in an alien society to see or accept that sometimes it may be better to preserve a culture's integrity than to act swiftly to cut, say, baby and child death rates.

Finally, awareness of the desirability of establishing primary care networks with global caring abilities should not distract attention from the fact that as and when appropriate technologies and resources are available eradication efforts aimed at single conditions may be worthwhile; or that services can and should select and concentrate on particular sets of limited objectives. The global elimination of guinea worm is one obvious example currently in the former category. Its transmission depends entirely on infected drinking water (Bourne 1982). Regarding disease control priorities Walsh and Warren (1979) have argued that diarrhoeal illness, measles, malaria, whooping cough, neonatal tetanus and schistosomiasis should be made special targets throughout much of the third world.

The latter authors' calculations were largely dependent on an analysis of the curative and preventive techniques available, and are thus sensitive to the introduction of new medicines and vaccines. The potential of pharmaceutical products for opening new ways for speeding the transitional processes of health development today is not always fully appreciated.

Medicines for the poor world

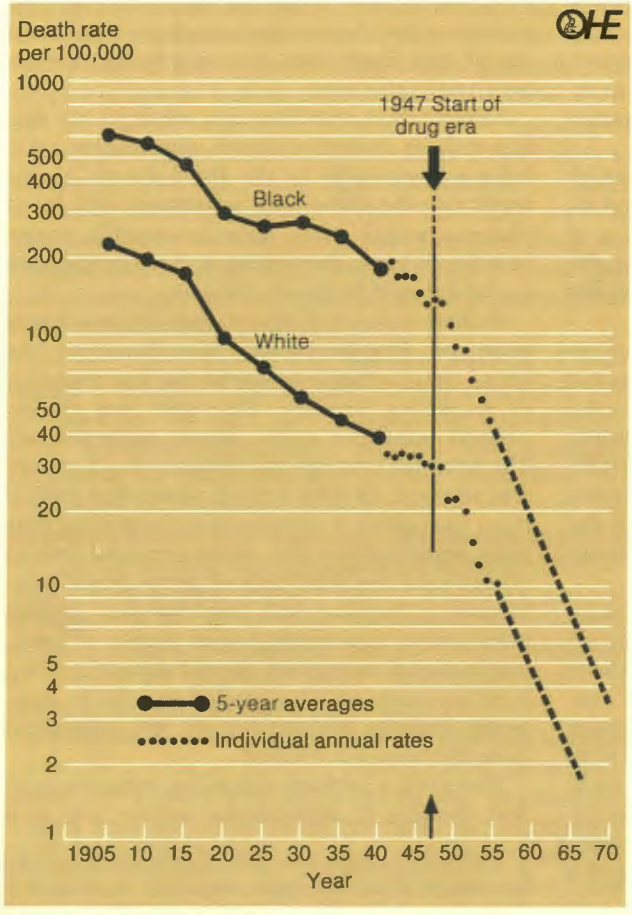
In the previous section it was noted that the sequential European and North American pattern of health care development described in Figure 13 was unlikely to be followed in the third world. The availability of developed country medical techniques alongside pre-transitional health and social problems faces health planners with complex choices. On the one hand there is the danger of inappropriate and wasteful investments in over sophisticated, curative care in environments where the constant risks of infection and reinfection make primary prevention the first goal. But on the other hand there is the possibility that intelligent use of selected therapies could speed dramatically the processes of health improvement.

Some commentators may have wrongly taken the historical studies of authorities such as McKeown (1976), who described the limited role of medical intervention in promoting demographic transition in countries like Britain, to mean that modern medicine will necessarily play a similarly small part in future progress against today's poor world (and even rich world) health problems. Others, although rather better informed, may have tended to understate the role of drugs as essential co-partners in public health programmes or have failed fully to perceive their special importance in less advantaged populations. For instance, Draper and St George (1981), in calling for 'a renaissance in public health', argued that even when a powerful and effective chemotherapy, such as that for tuberculosis, is made available, other public health measures and allied social changes must remain the major determinants of disease experience.

Yet in this context Figures 15 and 16 outline tuberculosis mortality amongst blacks in New York and Maoris in New Zealand, as compared to whites in those areas. The clearly greater impact of medicines on the poorer populations illustrates the point that the mix of chemotherapy to other forms of public health input in disease control can in reality vary very substantially. In the modern world decision makers may, in some instances, be faced with important choices as to which alternative areas of investment are in the short term the most attractive; although this is not to deny, of course, that in the long term *both* good environments and effective treatments are needed.

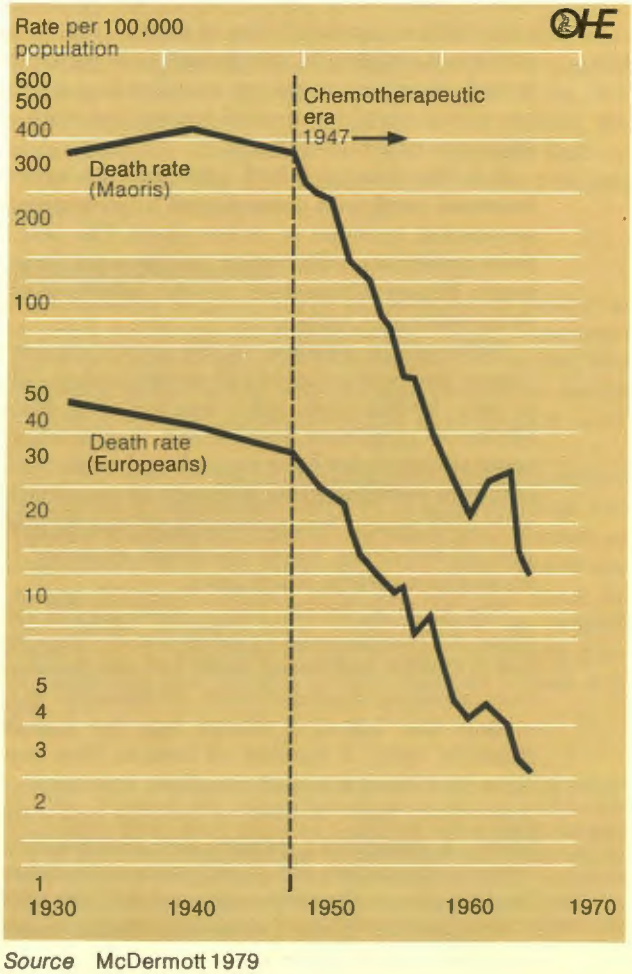
Recent advances in, for example, the drug treatment of schistosomiasis made by the pharmaceutical companies are relevant in this context. Control of the parasite's transmission cycle by the medication of human hosts is now likely to be possible at a fraction of the cost of previously attempted environmental measures. Similarly, research on new drugs against malaria, in part pioneered in China, and work on vaccines being conducted in both academia and industry may towards the end of the 1980s

15 Tuberculosis mortality for blacks and whites, New York City, 1905–55



Source McDermott 1979

16 Tuberculosis death rates in New Zealand



Source McDermott 1979

make radically more effective control of that disease possible in areas where more traditional public health measures have not succeeded.

The potential relevance of pharmaceutical products to the third world is further emphasised by the observation that, as compared with most other forms of health related intervention, they can be distributed to the mass of the population relatively swiftly and cheaply. This is so in situations where very limited professional care is available; an important consideration in that at present two thirds or more of the rural populations of many poor countries do not have regular access to modern services.

Given these facts and the probability that medicines can, through their likeness to traditionally used drugs, act as a bridge or gateway between customary and scientific approaches to health care it is perhaps surprising that in the North recent public attention has frequently concentrated on the harm that medicines may generate in the South, rather than the benefits that properly employed pharmaceuticals might bring. The remainder of this section attempts to throw some light on this phenomenon and to present outline economic data relating to drug production and use in Africa, Asia and Latin America.

Problems in medicine supply

The underlying difficulty which causes poor standards or levels of medicine supply in the third world is poverty. Lack of purchasing power and skilled manpower are problems which, in the short term at least, can only begin to be countered by policies aimed at providing the most cost-effective possible forms of health care. In relation to medicines supplied by the government sector these often include confining the drugs employed to a limited number of basic products needed to treat the more commonly encountered forms of illness.

It is this concept which underlies the various lists of 'essential' medicines promulgated by governments and international agencies in recent years. The best known of these guidelines is that which has been put forward by the WHO's Expert Committee on the selection of essential drugs (WHO 1977, 1979b).

However, in addition to the central problems of resource shortage a number of commentators (Silverman *et al* 1981, Yudkin 1978, 1981, Agarwal 1979, Melrose 1981, Medawar 1979) have argued that international pharmaceutical companies have exacerbated medical supply difficulties in poor countries. Recently an organisation known as Health Action International (HAI) was formed with the goal of becoming 'an international antibody' to counter alleged commercial malpractice.

The 50 or so bodies which make up this coalition include the International Organisation of Consumer Unions (IOCU), Oxfam and Social Audit Ltd. HAI members believe that medicine manufacturers deliberately 'ill-treat' consumers (HAI 1981a), a charge that the industry denies (Cunliffe 1981). A number of Eastern bloc organisations have also been active in this field. For instance, a trade union body based in Moscow recently held a meeting entitled 'a conference against the pharmaceutical intertional corporations for a pharmaceutical industry and a health policy at the service of mankind' (HAI 1981b).

It is possible to take a somewhat cynical view of this last initiative, as some communist countries are in direct competition with Western firms for third world pharmaceutical trade.[5] Some third world government statements about the pharmaceutical companies, made either directly or through UN agencies, may also be questionably motivated. Yet criticism of North Western medicine manufacturers stemming from within societies like Britain and bodies such as the Church cannot be so dismissed. Most of the authors and bodies listed above accept that drugs and vaccines have made a real contribution to health in the poor world. But they also claim that unsafe products, banned in the North, are 'dumped' in third world nations; that medicine promotion is misleading and that excessive claims are made for products while their side effects are concealed; and that prices and pharmaceutical industry profits are excessive. Some seem to believe that international companies are particularly undesirable.

Controversy has also surrounded topics like the use of chloramphenicol and other antibiotics, especially in countries where they are freely available or control over their purchase is not fully enforced; the treatment of diarrhoea, particularly in children; the use of injectable hormonal contraceptives; and the sale of certain types of (amidopyrine and dipyrone containing) analgesic medicines.

This paper does not have as an objective the investigation of specific charges aimed at particular products, companies or individuals. But with regard to third world health problems generally it would seem that perhaps the most substantive issues so far raised by HAI and the authors noted above relate to promotional matters. There can be little doubt that cases of genuine malpractice have occurred in this area.

Nevertheless, this does not mean to say that all international, or indeed national, pharmaceutical companies behave unethically in the third world. Neither does it imply that the disbenefits associated with free enterprise pharmaceutical trade have necessarily outweighed its benefits. What it does mean is that current achievements can and should be improved upon.

In this context it is of note that the International Federation of Pharmaceutical Manufacturers' Associations (IFPMA 1981) recently produced the first international code of marketing practice. The goal was to indicate the general principles which should underpin such activity. The need for honesty and accuracy in all communications was stressed. Despite a swift, somewhat critical response from HAI (1981c), it represents an important initiative. The code demonstrates the pharmaceutical industry's intention to raise the standards of promotional practice. Commentators familiar with the complex problems facing associations representing wide ranges of local as well as international companies should appreciate that a step by step approach may be needed to achieve this goal. Currently policing procedures for the enforcement of the code are being established.

However, a perhaps somewhat negative point to add is that changes in promotional activity are, in themselves

5 On a more political level, most modern medicines originated in the laboratories of free enterprise companies. The relative failure of the Soviet Union and its allies to contribute to such progress (either because of lack of investment or other organisational inadequacies) may have led to a desire to discredit the 'capitalist' approach.

alone, unlikely substantially to improve the quality of life in poor world countries, or indeed to alter medical practice for the better. Misinformation must be stopped. But on the whole it is the dearth of medicines, not their excessive use, which helps to perpetuate poor world health problems. And financial motives rather than ignorance could often underly misprescribing. In the absence of any worthwhile empirical data on the ill effects of medical promotion on the world's poor it may be useful to point out that topics of major interest to middle class commentators in the North may seem less vital to those suffering the poverty of the South.

A second possibly unpalatable point relates to the use of medicines with side effects not acceptable in the North but perhaps justified in the South because of higher levels of counter-balancing risk and pressing resource constraints. For example, it may be suggested that when a drug is being used by a village health worker or being passed 'under the counter' to a sick person the appropriate question to ask is not 'could some people die as a result?' but 'will more die if the drug is not available?' This has been called the concept of 'statistical morality' (McDermott 1966). It implies that in countries with high levels of disease, little money and few professional workers relatively high treatment risks are more acceptable than in the rich North.[6]

Cost benefit considerations are relevant in areas such as the Indian government's past slowness to encourage or permit the replacement of amidopyrine containing medicines in that country and the reportedly widespread recent use of chloramphenicol in China. Regarding the last it may also be added with respect to antibiotics generally that although problems such as those related to bacterial resistance may be of concern to doctors or pharmacologists working in large hospitals where resistance is most likely to occur, adults and children in rural communities are more likely to be faced with threats to their immediate survival. Little satisfactory field research aimed at identifying the best antibiotic control policies from the view point of poor rural populations without qualified medical practitioners seems to have been attempted.

The need for a careful and objective analysis of indiscriminate charges made against pharmaceuticals is well illustrated by the case of the injectable contraceptive depot medroxyprogesterone acetate. The company responsible for marketing this product throughout the world (it is an accepted contraceptive in countries like Germany, France, Switzerland and New Zealand as well as most poorer nations) has been accused of malpractice because it is only approved as a cancer treatment, and not for contraception, in the USA. The United States Agency for International Development (AID) has been condemned for helping to distribute depot medroxyprogesterone acetate in the third world (Wyrick 1981).

Yet the many studies made over the past two decades or so show it to be an effective contraceptive, particularly suitable for women who might not be able or permitted by their relatives to use other methods. Its employment might be justified even if much publicised American doubts as to its safety were valid, although it is of note that Sweden has recently approved the injectable contraceptive in question as safe for use in that country. Its Medicines Commission and Board of Health and Welfare were unable to verify scientifically the existence of the grave adverse reactions alleged by the contraceptive's critics. This example underlines the complexity (and the political dimensions) of the issues so often superficially raised in debates on 'drug dumping'.

Perhaps the most illuminating conclusion to point to here is that the history of the development of appropriate patterns of pharmaceutical supply in the North has been one of a build up of balanced, countervailing power structures between government, academia, the medical and allied professions and industry (Teeling Smith 1982). Consumer groups have also peripherally been involved. But in the currently developing world a fully appropriate environment has not yet emerged, not essentially because of the strength of industry but more because of the weakness of other balancing influences and the ineffectiveness of the distributional stages of the medicinal supply process (Herxhiemer and Lionel 1981).

International companies are not particularly to blame for this state of affairs. Indeed, they are likely if anything to be agencies for the dispersal of Northern standards of practice worldwide. If all industry was simply national or state owned pressures to reform might actually be decreased. Perhaps, therefore, those genuinely concerned with improving third world medicine use should seek the active help of medicine manufacturers in creating more informed patterns of pharmaceutical consumption and improved distributional arrangements. This is the direction the WHO may now be moving in (WHO 1982). As the following sub-section argues, the economics of pharmaceutical production and use in poor countries are such that such progress should not only benefit the general population; it should also, in the longer term at least, protect or expand pharmaceutical markets. At present the major medicine manufacturers have relatively little to lose in the South. But if successful development proceeds they may one day have much to gain.

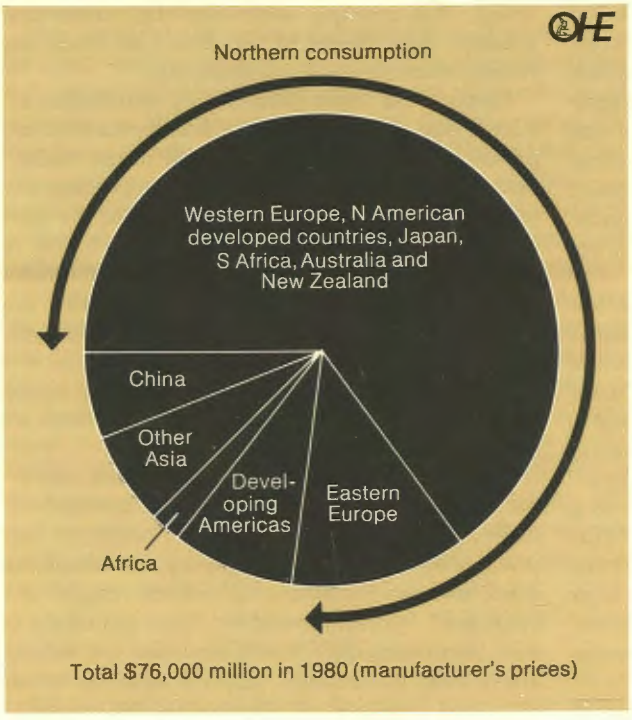
Spending on medicines

It is frequently suggested that pharmaceutical outlays in the third world are disproportionately high. Sometimes figures of a half or more of all spending are quoted, and compared unfavourably with the percentages of health budgets devoted to medicines in the industrialised countries.

In some specific instances drug spending does indeed account for a substantial share of health spending. For example, it is probable that in the public health sector of Bangladesh it is in the order of 40 per cent. And in the Chinese 'bare-foot doctor' services, which it must be remembered depend to a large degree on unpaid workers, up to two thirds of expenditure reportedly goes on traditional and modern pharmaceuticals (Evans *et al* 1981).

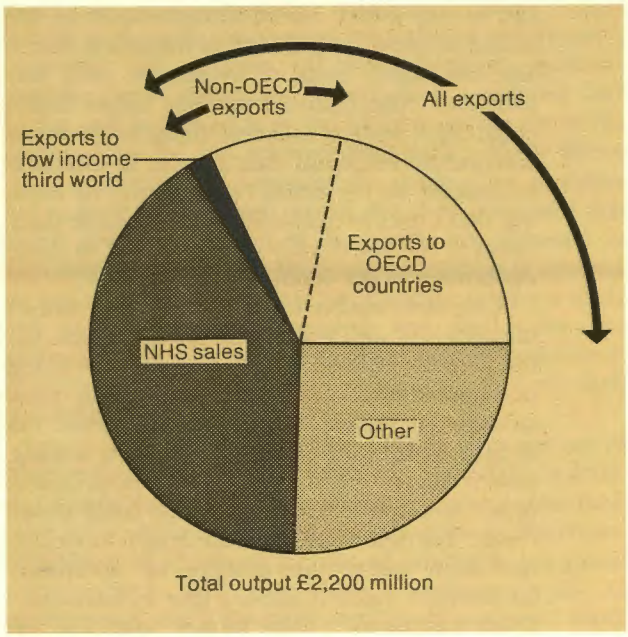
6 This may be seen to be related to the principles underlying limited drug lists. To those who object that statistical morality accepts that human life is being valued less in the South than in the North, the reply must be that such a difference may be undesirable but that those concerned with alleviating distress to a maximum degree must accept the world as it is, not as they believe it should be. People in the North who find the situation uncongenial should divert their resources into constructive efforts for change, not merely use bodies like the pharmaceutical industry as scapegoats.

17 World pharmaceutical consumption



Source IMS 1982

18 The UK pharmaceutical industry's gross output in 1980



Source OHE

But across the third world as a whole the share of health resources spent on drugs is considerably less. The mean level of public sector outlay is probably in the order of 25 per cent (World Bank 1980a). And as the data below suggest, total less developed country spending on pharmaceuticals is, in manufacturers' price terms, actually about the same as that of Europe and North America when expressed as a proportion of all public plus private health spending. That is to say around 15 per cent.

If anecdotal stories of very much higher relative outlays have any real substance it is because 'middle man' mark-ups, charged by doctors and pharmacists as well as other sellers, can be unduly large. However, other factors such as the taxes placed on medicines in some countries can also distort figures, as can errors such as comparisons based on all, private and public, pharmaceutical outlays against only government health spending (Peretz 1981).

The available facts about international pharmaceutical trade are as follows Figure 17 indicates that, in manufacturers' prices, world medicine consumption stood at a little under $80,000 million in 1980 (IMS 1982). Of this around one fifth takes place in the developing countries, as opposed to only 10–15 per cent of production. The latter is concentrated in Latin America and Asia, which produce approaching three quarters of their medicines domestically (UN 1981). Sub-Saharan Africa is the least developed area in this context. Africa as a whole accounts for only 0.5 per cent of world production, and 3 per cent of consumption. In aggregate these figures imply that the poor world pharmaceutical balance of trade deficit with the rich countries of both the North West and the North East stood at around $4,000 million in 1980. This total represents about one per cent of all the South's imports from the North.

Western Europe, Japan and America alone consume some 60 per cent of world drug production. Because the domestic markets of the industrialised states are large as compared with the volume of world export/import trade the less developed nations account for around a third of all world medicine imports.[7] This last statistic has been used by some commentators to suggest that Western pharmaceutical houses are dependent on the less developed countries for their profits and general financial viability. This is false, as data for Britain, the world's fourth largest pharmaceutical exporter, indicate.

In 1980, as Figure 18 shows, total UK pharmaceutical production (including inter-company trading) stood at around £2,200 million. Of this some £750 million, a third, was exported. About 50 per cent went to the EEC and a further 14 per cent to other industrialised nations. Just over a third went to developing countries. That is one ninth of total production. And it is of note that oil-producing countries, including those of the middle east, were the main purchasers. Under 5 per cent by value of British exports of medicines in 1980 went to low income countries like India, Pakistan, Bangladesh, North Yemen and the smaller African states like Uganda, Tanzania and Malawi.

It may be noted, however, that of internal production in less developed nations around two thirds or so takes place in subsidiary companies of Northern corporations. It is sometimes suggested that these 'exploit' the countries in which they are based. But they are in the main subject to close financial control by host governments, and provide training and employment for 150,000 to 200,000 people. A recent US Department of Commerce Report

7 Contrary to the claims of some commentators UN figures show that this proportion fell slowly throughout the latter half of the 1970s. Projections of increased pharmaceutical trade in the third world are largely based on Latin American and East Asian expectations, and will be primarily of relevance to that area's domestic producers.

(1981) found that, amongst American international corporations, drug industry investments and total assets in poorer nations were substantially above average (26 per cent of foreign assets and investments as opposed to around 20 per cent for industry as a whole) whilst net income from the developing nations was well below the mean (10 per cent as opposed to 22 per cent).

Such figures suggest a very much more reassuring picture of pharmaceutical industry activity in the third world than is commonly presented. But this is not to say it is an entirely acceptable one. It may be asked, for instance, whether it is desirable that the world's poor majority pays in the order of $4,000 million to the rich communities of the North East and West for its medicines. Similarly questions arise as to whether or not it is acceptable that people in the North West can afford over $70 worth of medicines *per capita per annum*, whereas in the South consumption is $5 or less per head ($1980). And perhaps most seriously of all the data above suggest that the current market structure may fail to give industry adequate incentives to discover and manufacture medicines needed to treat the 'outer skin' of diseases prevalent in developing countries but eradicated in the industrialised regions.

From the viewpoint of both the people of the poorer nations and the world's medicine manufacturers some measures aimed at improving the distribution and expanding the overall consumption of medicines appear to be needed. Also more investment in research aimed at providing new pharmaceutical technologies relevant to the South's health problems would be likely to be rewarding to both sides. Aspects of these areas are discussed below.

Table 7 *Health indicators and targets in Bangladesh*

		Benchmark June 1980	*To be achieved by the year*			
			1985	*1990*	*1995*	*2000*
Health status						
Infant mortality/1,000 live births		140	100	75	60	50
Child mortality/1,000 (1 to 5 years)		23	15	11	8	5
Maternal mortality/1,000 live births		30	15	10	7	5
Crude birth rate/1,000 population		43.25	31.56	19.3	21	20.7
Population growth rate %		2.65	1.78	0.79	1	1
Life expectancy at birth		47	52	57	61	65
Health care delivery						
Hospital beds		20,500	33,000	43,000	52,000	60,000
Health posts	Each serving 6,000–7,000 people.	—	—	2,700	6,500	13,500
Family welfare centres	One per *union* of 20,000 people.	1,990	4,500	4,500	4,500	4,500
Thana health complexes	One in each rural *thana*.	290	356	380	380	380
Immunization against tuberculosis	% BCG coverage children under 15.	50	80	90	95	95
Control of tuberculosis	% cases found and treated, of estimated total cases.	10	25	50	70	90
Immunization against diphtheria, pertussis, and tetanus	% children under 2 immunized.	1	30	55	65	75
Control of diarrhoeal diseases	Oral rehydration salt, distribution coverage, %.	5	90	95	100	100
Ante-natal care	% pregnant women given care at family welfare centres at least once.	—	20	50	70	90
Delivery by trained birth attendant	% deliveries attended.	2	25	50	70	90
Deworming	%children under 15 with worms.	70	50	25	10	5
Blindness prevention	% children under 6 receiving vitamin A.	60	90	90	90	90
Nutrition services	% cases with 2nd and 3rd degree malnutrition found and treated, of estimated total cases.	5	25	50	70	90
Medical assistants		450	5,500	14,500	22,000	29,000
Nurses		2,700	9,465	17,250	24,250	30,500
Traditional birth attendants		12,375	68,000	68,000	68,000	68,000
Village health workers		24,000	180,000	204,000	204,000	204,000
Drugs and biologicals	Availability of 31 essential drugs in public sector, % total requirement.	10	25	75	100	100
Health laboratory services	Simple tests at family welfare centres, % coverage.	—	10	50	100	100
Quality of Life						
Nutritional status	Average adult energy intake with balanced diet in MJ (kcal).	8.0 (1,900)	8.4 (2,000)	8.7 (2,075)	9.0 (2,150)	9.2 (2,200)
Water supply	Population per tubewell.	178	120	75	75	70
	% population served with public supply.	70	90	100	100	100
Education	% children receiving primary education.	58	91	95	95	95
	Adult literacy, %.	22	75	90	95	100
Coverage of population by health services, %.		30	60	80	90	100

Source Choudhury 1981.

Pharmaceutical policies for the future

Initiatives aimed at improving the supply of medicines to the least advantaged people of the third world can be grouped under three headings. First, those intended to rationalise the selection and purchase of medicines for public health programmes. Of these the key international initiative is the WHO Action Programme on Essential Drugs. Second, those aimed at increasing local production of medicines. The United Nations Industrial Development Organisation (UNIDO) has set a goal of achieving 25 per cent of world industrial production, including that of pharmaceuticals, in currently less developed nations by the year 2000. Third, those designed to stimulate effective research in poor world health problems.

Regarding the topic of medicine selection and purchase most developing countries have now established lists of basic drugs for the public sector (WHO 1981c). Some of these have existed for some time. At the sixth conference of Commonwealth Health Ministers held in Tanzania two years ago, in 1980, virtually all those attending were then able to report significant national initiatives in this area.

For example, amongst the Asian countries Sri Lanka described its system of trade controls, the work of its national formulary committee and a drug distribution system run by fully qualified pharmacists and auxiliaries. India also has a sophisticated system of controls on drug import, manufacture and export, as well as a national formulary and government controlled medicine distribution system. The Malaysian Health Minister reported that his country was promoting a list of 600 low cost drugs, particularly for use in the public sector. Bangladesh explained at the 1980 meeting that a list of 31 essential drugs for primary care had been drawn up, in addition to one of 182 products for more general use. It was pointed out that in that year 85 per cent of the drugs used in Bangladesh were formulated locally by 130 manufacturers,[8] including 8 international companies. Table 7 outlines the main objectives of Bangladesh's current health plan which may cost around $500 million over the first five years (Choudhury 1981).

It would be misleading to suggest that such countries have solved all or even most of the problems they face in attempting to ensure an adequate drug supply for their people. Imbalances between private and public sector health care persist and are reflected in drug utilization patterns. Difficulties also remain in areas like promotion and safety and quality control, not least because of the existence in many markets of 'pirate' manufacturers who fake branded medicines' packs with great skill.

But at the same time the underdevelopment of the third world should not be exaggerated. India, for example, which contains over a third of the world's population defined by the World Bank as living in absolute poverty, has a civil service which should be fully capable of administering schemes for controlling industrial (if not retail) practice in relation to medicines.

Regarding the prospects for the progress of the Action Programme on Essential Drugs (DAP) it is still not fully clear how it will be organised. Present debate centres on issues such as how medicine procurement should be conducted. Three multi-country schemes, in Africa, the Americas and the Western Pacific are under active consideration. It is of note, however, that some 46 multinational companies have already put forward offers covering over 200 drugs to be supplied to selected poor nations at preferential prices (Peretz 1982). Such support suggests that the programme should be able to function effectively as and when appropriate arrangements have been decided on within and between the WHO and its members.

This last point leads on to the question of pharmaceutical production. As Table 8 describes several of the larger developing nations, including India, Argentina, Brazil, Mexico, Egypt and of course China already have sophisticated pharmaceutical industries of their own. Others, like South Korea, Pakistan and Venezuela have substantial capabilities in this field and are continuing to strengthen their position. But many more, particularly the poorer and smaller nations of Africa, are highly dependent on imports. And no country, even in the North, manufactures the entire range of pharmaceuticals it uses domestically.

The main issue facing policy makers in the South in this context is obviously related to determining to what extent it is desirable and/or cost effective to attempt to achieve independence from imported medicines. Policies such as those put forward by UNIDO may be taken to imply that a high degree of pharmaceutical production is necessarily beneficial. But this is not, for several reasons, always the case, particularly from the viewpoint of the third world's poorest people.

Domestic production can be a relatively expensive business if conducted on a small scale. Also, in addition to any import costs associated with capital equipment, any foreign nationals employed to work in plants are likely to remit money back to their countries of origin. And poor countries which install pharmaceutical production capacity may find that within relatively short periods the products they are capable of making have been superceded by new, more effective or safer ones. Difficult choices may then have to be made either to 'write off' capital or to continue with existing therapies.

Combinations of factors such as these can make it a more desirable option for poor countries to build up systems for purchasing drugs on the world free market as efficiently as possible. In this way investment risks are minimised and production is centred in the most competitive plants. Although such a policy may seem unacceptable to some politicians anxious either for the prestige that a domestic pharmaceutical industry may bring or committed to policies of import reduction through substitution by domestically produced goods economic theory strongly supports the free trade option.

Research – a case for aid?

Turning to the topic of research on medicines for the third world, the analysis presented in this paper has shown that in many cases the health problems of the North and the South overlap. For example, drugs to control bacterial infections are needed in all communities. And all would benefit from new products active against 'core' viral diseases such as influenza. Further, the chronic diseases of later life common in the West are, like hypertension and cancers, already present in the third world.

8 The international companies hold a major share of the market, estimated to be worth $110–120 million in 1980. That is $1.30 per capita.

Table 8 *Stage of development of the pharmaceutical industry in some developing countries, 1979*

Stage of pharmaceutical production	*Africa*	*Latin America*	*Asia*	*Middle East*
Group 1 Countries which have no manufacturing facilities and therefore are dependent upon imported pharmaceuticals in their finished form. In many of these countries there is insufficient trained personnel, limited public health services and poor distribution channels.	Burundi Chad Lesotho Rwanda Zambia Sierra Leone Somalia Swaziland Togo Uganda Central African Republic	Honduras	Bhutan Mongolia	Yemen
Group 2 Countries which have started to repack formulated drugs and process bulk drugs into dosage forms.	Ivory Coast Kenya Madagascar Senegal Sudan United Republic of Tanzania	Bolivia El Salvador Guatemala Haiti Trinidad and Tobago	Afghanistan Burma Malaysia Nepal Sri Lanka Vietnam	Jordan
Group 3 Countries which manufacture a broad range of bulk drugs into dosage forms and manufacture some simple bulk drugs from intermediates.	Algeria Ghana Morocco Nigeria Tunisia	Colombia Ecuador Peru	Bangladesh Indonesia Philippines Singapore Thailand	Iran Iraq Syrian Arab Republic
Group 4 Countries which produce a broad range of bulk drugs from intermediates and who manufacture some intermediates using locally produced chemicals.		Chile Venezuela	Republic of Korea Pakistan Turkey	
Group 5 Countries who manufacture most of the intermediates required for the pharamaceutical industry and undertake local research on the development of products and manufacturing processes.	Egypt	Argentina Brazil Mexico	India China	

Source UN 1981.

Table 9 *Examples of modern drugs developed by the research-based pharmaceutical industry for the treatment of tropical diseases (Products with primary or secondary indications for tropical diseases)*

Approved names	*Indications*
Amoxycillin	Typhoid Fever.
5-Fluorocytosine	Anti-Fungal agent (especially for Chromomycocis).
Sulfametopyrazine and pyrimethamine	Anti-malarial.
Freeze-dried preparation of the living attenuated 17D vaccine virus strain.	Yellow Fever.
Trimethoprim and sulphamethoxazole	Typhoid and Paratyphoid fever. Bacillary dysentry, cholera, acute brucellosis, mycetoma, systemic fungal infections.
Metrifonate	Schistosomiasis.
Praziquantel	Schistosomiasis, Helminthiasis.
Sulfadoxine and pyrimethamine	Suppressive and curative treatment of malaria.
Stibophen	Schistosomiasis.
Secnidazole	Amoebicide, trichomonacide.
Metronidazole	Amoebiasis.
Bitoscanate	Hookworms (Ankylostoma duodenale and Necator americanus).
Levamisole	Roundworm infestations.
Nifurtimox	Chagas disease.
Clofazimin	Leprosy (all forms).
Pyrimethamine and dapsone	Prophylaxis of malaria, especially where resistance to antifolates exists.
Benznidazole	Chagas disease.
Rifampicin	Tuberculosis, leprosy.
Ornidazole	Giardiasis (lambliacide) and for all forms of amoebiasis.

As demographic transition proceeds so then will the poor increasingly need what have been termed 'rich man's' drugs. Thus work conducted on the latter by the pharmaceutical industry is of relevance to the wellbeing of the entire human population.

There is a second reason why it is misleading to attempt to split off pharmaceutical reseach oriented towards the health problems of countries like Britain from that for poor nations. New discoveries in any area may prove to have an unforeseen relevance in other fields of medicine. In immunology, for instance, it may be that research conducted in the context of diseases like leukaemia and rheumatoid arthritis may generate understandings which will one day prove of value in the prevention, via immunological techniques, of parasitic diseases common in Africa, Asia and Latin America. Because of phenomena such as this the Medical Research Council in Britain has frequently disputed bureacratic analyses and criticisms of its spending allocations.

And those wishing to present a relatively sanguine picture of pharmaceutical research and its contributions to the poorer nations may in addition observe that a wide range of modern medicines useful for primarily third world diseases already exists. Table 9 indicates some of the products to have been developed in this context. The international pharmaceutical industry spent over $50 million[9] on specifically 'third world' drug research in 1980, whilst the WHO (which is, of course, largely funded by the

9 Out of a total R and B budget of around $5,000 million in 1980.

Box 7 *Aid*

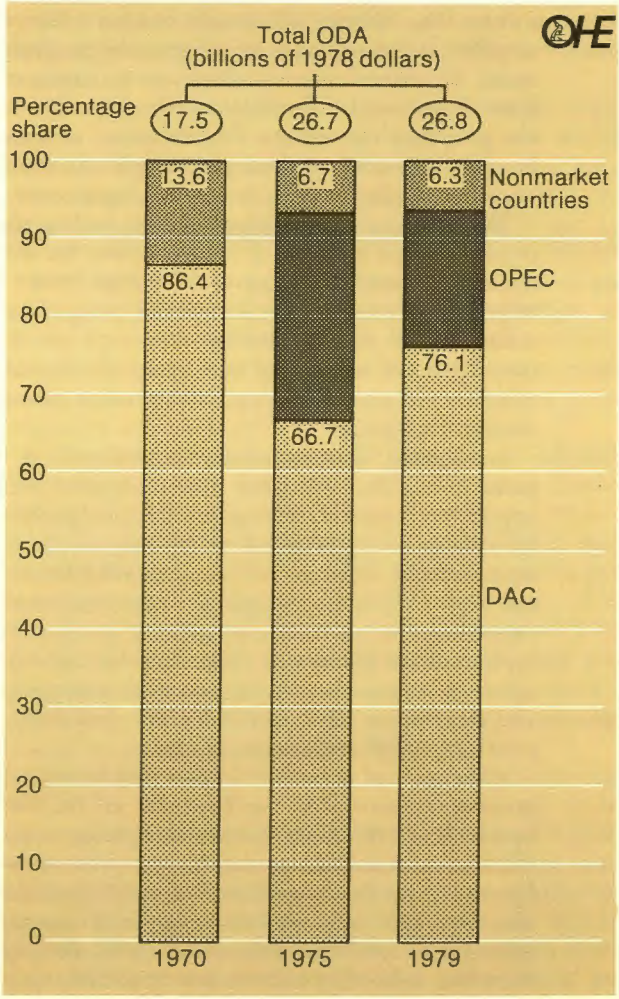
In 1980 official development assistance (ODA) from the Development Aid Committee (DAC) of the OECD to third world countries stood at about $26,600 million, of which Britain contributed some $1,760 million. The 1979 figures, in current prices, were $22,300 million and $2,060 million respectively. As Figure 7.1 shows, the OECD contribution is the major element in overall world aid, although in recent years some OPEC countries, most notably Saudi Arabia, have made significant efforts in this area.

There are two conflicting views on the significance of aid. On one hand, the Brandt report saw it of central significance in development and called on the DAC countries to double their input, for around 0.35 per cent of GNP to at least the UN target figure of 0.7 per cent. On the other hand commentators like Bauer and Yamey (1981) regard official aid as being of very limited value to the world's poor. Brandt believed that increased aid would turn the South into an 'engine of growth' for the North; whilst Bauer sees aid if anything as a threat to the countries that provide it and as a possible barrier to the emergence of patterns of free trade and enterprise which would genuinely benefit the third world. He also suggests that recipient countries may take up hostile stances towards providers in order to encourage larger gifts to be donated, thus making it potentially counter productive.

There appears to be some justification for this last view, at least in as much as many third world commentators seem to be tempted to believe that the South's poverty is somehow a function of the North's (West's) wealth. In fact if the countries of the latter were destroyed or isolated themselves it seems unlikely that the rest of the world would benefit. And it is also true that much aid is inefficiently used. The European Court of Auditors recently strongly criticised the allocation of European Development Fund (EDF) money to projects like, for instance, the construction of three international airports within a radius of 100 kilometres of each other in the Netherlands Antilles (Court of Auditors' Annual Report for 1980).

But against this it would be wrong to exagerate the scale of even the West's help for the poor countries or to deny that some forms of aid are useful. Total ODA funds supplied in 1980 represent under 30 per cent of the flow of capital from the North to the South. In the health sector the World Bank has argued that third world countries fund over 99 per cent of their activities from their own, unaided, resources. In the face of recent major reductions in aid on the part of the US (which is nevertheless still in overall terms the major donor) it is important to emphasise that initiatives in fields such as sanitation, water supply and road building can be of clear practical value in helping poorer nations to fuller independence and greater prosperity.

7.1 Sources and distribution of aid



ODA flows from major donor groups, 1970, 1975 and 1979
Source World Bank 1981

industrial economies of the North) spent a rather smaller sum on initiatives such as its Special Programme for Research, Development and Training in Human Reproduction (HRP) and the Special Programme for Research and Training in Tropical Diseases. The latter, which is focussed on six major conditions, currently involves on its working parties some 30 scientists based in industry.

Yet even when all these points are taken into account it may still be thought that, in the light of the enormous potential that pharmaceutical innovations may have for relieving suffering in the third world, more effort should be made to discover and develop appropriate new medicines. Recently a number of authorities, including Rigoni (1981) and Gordon Smith (1982), have argued that an effective way to support appropriate activity is to channel government or international agency funds into industrial laboratories for carefully defined projects.

Gordon Smith has based this conclusion on his experience not only as the Dean of the London School of Hygiene and Tropical Medicine and a Trustee of the Wellcome Foundation but also as Chairman of the recent Independent Commision set up by WHO to review the Onchocerciasis Control Programme. Investigations conducted by the Commission led him to believe that without effective new drugs the many millions of pounds spent on the environmental control of onchocerciasis could be wasted. The disease will simply reoccur when economic or political factors cause vector control programmes[10] to cease, a pattern already observed in connection with some other major conditions. The steps Gordon Smith has proposed involve the establishment of a £20 million fund, to be used to commission pharmaceutical companies to conduct specific research programmes.

There are of course objections to such a plan. Some commentators may feel it inappropriate for aid or associated government money to be placed in the hands of large, independent pharmaceutical companies situated mainly in the richer countries. Some people in industry may doubt the wisdom of new forms of research funding which could distort or weaken the forces of competition driving innovation.

But against such cautionary considerations it can be pointed out that effective pharmaceutical research (as opposed to activities like epidemiological investigation) is an activity deeply wedded to the way of life possible in sophisticated, relatively well off communities. It requires not only considerable physical resources but also heavy concentrations of multi-disciplinary support – human capital – skills not usually found in poor nations. And the agencies with the best track records in managing research and developing new medicines are unquestionably the international pharmaceutical houses.

If the type of initiative Gordon Smith and others have proposed can enable the expertise of the latter to be more effectively directed towards fighting disease in the third world it would arguably be one of the most effective forms of help the North can offer the South (see Box 7). The diversion of even relatively small amounts of aid money into medicine innovation could also significantly stimulate industry within donor countries, so generating clear mutual benefits. At a time of both economic difficulty in the United Kingdom and grave concern over the future of government backed academic research into tropical disease (Royal Society of Tropical Medicine 1981, *Lancet* 1982) the idea would seem to merit particularly close attention and unbiased appraisal in this country.

10 Onchocerciasis is spread by a blackfly which breeds in running water. It is most prevalent in Africa. It is of note that at least two international companies are now developing new medicines for this condition.

Conclusions

The scale and severity of the health problems still facing the peoples of the third world are enormous. The vital statistics outline a stark picture. Infant mortalities of over 200 per 1,000 babies born to poor mothers and child death rates of around 50 per 1,000 each year were thought scandalous in countries like Britain a century ago: that they still exist in much of the human community today, despite the great advances in knowledge and technical abilities made during the twentieth century, is deeply disturbing.

Further, the stresses of population and economic changes now affecting much of Africa, Asia and Latin America are creating new problems, not fully revealed by any available indicators. For example, movements away from the countryside and the break up of traditional life styles have probably exacerbated the social difficulties surrounding intellectual retardation in many parts of the poorer countries; and population ageing will inevitably increase the prevalence of conditions like arthritis, heart disease and cancer and the special types of disability and suffering they cause.

But despite this the underlying message of this paper is one of hope as compared to when, in 1972, OHE last surveyed the topic of health in the industrially less developed countries. Governments and international agencies then often took diverse and conflicting stances on the questions relating to health care for the mass of the poor world's people. Those calling for extended, more appropriate, primary services tended to be 'voices in the wilderness'. The importance of health care as a political issue was largely unperceived.

Now, in 1982, the initiatives of bodies like the World Bank and the World Health Organisation have created a much more informed framework from health planning. And the example of China is widely regarded as an established illustration of the fact that even poor states can go a considerable way towards achieving health development as it is defined in this paper; that is, completed demographic transition, whereby a population enjoys an average life expectancy of around 70 years coupled with birth rates at roughly the replacement level.

Contrary to the situation of a decade ago, the barriers which may prevent the introduction of health policies capable of promoting such progress are now widely understood. In addition to the overall resource constraints prevailing, these include inappropriate training levels and expectations amongst health workers and misapplications of medical technologies ('technological misfits'). Both stem from poor planning within and ill-conceived commercial, political and charitable interventions from outside the countries of the South; they result in imbalances between urban and rural and primary and secondary care patterns associated with 'top heavy' manpower structures. Large hospitals with much sophisticated equipment are under used, whilst many poor people have not even seen a health centre or a dispensary. Expensive anti-cancer medicines are available in the city centres; yet peri-urban and village populations do not have regular access to essential drugs and vaccines.

In the context of the latter this paper argues that the supply of appropriate pharmaceutical products should be seen as a fundamental requirement of public health care, like the supply of clean water, sanitation, adequate food and basic education. False polarisations between curative and preventive measures should be avoided. What is needed is balanced, interaction between such factors.

The fuller recognition by the international pharmaceutical industry of its responsibilities and opportunities in the third world has in part grown out of the advances of the last decade. Industry's recent voluntary innovations in areas like the control of promotional standards coupled with the co-operation offered by companies to the WHO's Essential Drugs Programme and its Tropical Disease Research and Training Programme are welcome steps. Hopefully they will eventually be backed within the communities of the North West by a clearer understanding of how new pharmaceutical technologies developed specifically for third world use might speed demographic transition and health development. For if the rich world's resources in this context can be fully utilised it will be one of the most effective ways in which the poor countries can be aided.

But this is not, of course, to suggest that 'over-night cures' for the South's health problems will be found. Only sustained effort by national governments, backed by international bodies, will succeed in having a major impact. And only sustained attention to the problems of the world's poor on the part of populations like that of Britain will enable them to gain a realistic image of the formers' needs. As one limited contribution to this process, OHE intends to extend its work during the 1980s and 1990s to include regular studies of specific disease and other health related matters relevant to the third world.

This initial paper was unable to comment on the organisational and political aspects of health care in specific parts of Africa, Latin America or Asia in any detail. But in conclusion what the analysis it provides suggests is that across the globe generally a key aspect of the debate and interest currently being shown in the McNamara/Mahler concept of 'health for all by the year 2000' is that it may have served to raise health expectations. Through not merely the written word but also the spoken one heard on transister radios or passed on from mouth to mouth, many individuals are now starting to realise that better health is a genuinely achievable goal.

In the 1960s and 1970s it was the 'command' economies of the third world – those depending on central decision making – which reported the most dramatic successes in the health sector. Most poorer countries modelled more on the pattern of the North West, which requires a positive interaction between the demands of the mass of the people and government for the maintenance of its 'social drive', tended to make less progress. Indeed, some commentators may see the poverty and distress of many of the world's people as a product of, or even a necessary facet of, 'capitalist' society (Elling 1981).

Yet the political forces in part generated by institutions such as the World Bank in the recent past may in the 1980s significantly speed and alter the pattern of world health progress. To the extent that they will help to stimulate and direct local, individual efforts aimed at achieving better health they could be particularly valuable. For the final analysis, the development of a community is a process which rests on the beliefs, values, knowledge and behaviour of the persons in that community itself, not on the dictates of remote leaders or the guidance of international pundits.

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