

**MEDICAL EDUCATION IN THE DEVELOPING COUNTRIES  
OF AFRO-ASIA : A CRITICAL REVIEW**

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This International Conference on "The Role of Universities in Developing Countries" has as one of its three primary objectives the reassessment of University curricula in developing Afro-Asia in the context of achieving goals of national and regional development. This paper is a critical review of medical education in the above context.

Development as it affects human beings and societies is a many-sided complex process involving mental, physical, environmental, economic and other aspects. For the individual it may imply increased skill and knowledge, better health, increased productivity and enhanced material well-being; for the family increased status, prosperity and income; for the country political and economic independence. The history of mankind is one of development, but it never has been equal, differences sometimes considerable existing between individuals, families and communities within a country, and between countries. Much study and research has gone into the reasons for this unequal development, and commonly cited and accepted causes are climatic, socio-economic and political. However, there is no acceptance of the view that an individual or a family or a race is backward because of a genetic predisposition. Whenever this is recognised as a cause, the individuals concerned are suffering from known genetically predisposed diseases.

The differences in development have resulted in an over-simplification of the world today as being divided into two camps: developed and developing. This division is not based on levels of culture or history or contribution towards civilization for countries with ancient and sophisticated civilizations such as China, India, Egypt are now in the category of developing. In general terms "developed" and "developing" are broadly synonymous with "rich" and "poor" based on an annual per capita income of about US\$500/- thus separating the highly



industrialised "North" (viz., Northern America, Europe, Australia, New Zealand, Japan and U.S.S.R.) from the predominantly agricultural "South" (viz., Northern Africa, Sub-Saharan Africa, Asia and Latin America). The least developed or poorest countries are spread across the middle of Africa and South Asia (the poverty belt) containing 1200 million people with per capita GNP of under US\$200/-. A developing country may also be regarded as one which has not yet become a modern highly technological society providing the material conditions that feature such a society.

Although there is great diversity among the developing countries of Afro-Asia in respect of wealth and resources, political and social structure, tradition and culture, and religion, nevertheless there are several common factors which characterise them as "developing".

1. Physically these countries belong to the tropics situated thirty degrees north and south of the equator with annual average temperatures exceeding  $20^{\circ}\text{C}$ <sup>1</sup>. This includes the arid belt which crosses middle Africa through South-West Asia to Pakistan and India. There is either too little rain or too much rain resulting in an annual cycle of drought alternating with floods. The soil is poor and mineral resources are scanty. The physical environment has not favoured the developing countries.

2. Poverty is their hallmark, both personal and national. It comes as relative and absolute poverty where little or no income causes suffering in hunger, disease and death. The World Bank estimate<sup>2</sup> is that nearly 800 million people about 40% of the population of the developing countries are living in absolute poverty, the majority of them in rural areas,



especially South Asia, Indonesia and Sub-Saharan Africa. In 1975, about 1200 million people with a GNP per capita of US\$150/- lived in the low-income countries of Africa and Asia; compare this with the U.S.A. figure of \$7,890/-. Most of the poverty is due to low national output and income, combined with maldistribution of available income.

3. As a corollary to poverty, malnutrition is a leading cause of illness and death among children, while under-nutrition affects all age-groups. Malnutrition is most severe in middle Africa and South Asia affecting one-third to one-half of the inhabitants especially children. Of those who survive, poor nutrition contributes to chronic debility and to impaired functional performance.
4. Diseases that have been largely eliminated in the developed countries viz., infections, parasitic and respiratory diseases are still the principal source of morbidity and mortality in the developing countries. Schistosomiasis, filariasis, trypanosomiasis, leishmaniasis, and malaria affect many millions (250 - 600) in Africa and Asia. Tuberculosis occupies the fourth place among causes of death in the South East Asia region. Leprosy remains a problem, prevalence in the African region being 10 to 40 per 1000 population. Morbidity and mortality from diphtheria, pertusis, tetanus, measles, poliomyelitis and tuberculosis remains high as fewer than 10% of 80 million children born annually are fully immunized. These six diseases are thought to cause some five million deaths among children under five years of age and permanent disability of an equal number. The infant mortality rate, the early childhood mortality rate and expectation of life at birth are the lowest in the world<sup>3</sup>.



5. Lack of safe water is a major cause of ill-health; four out of five people living in rural areas of developing countries do not have reasonable access to even relatively unpolluted water.
6. Inadequate sanitation is an even worse problem causing spread of food-borne, water-borne and helminthic diseases.
7. The marked inequality in the quantity and quality of health care available in developed and developing countries respectively is reflected in the distribution of basic health manpower: for each 100,000 inhabitants there are about 1000 health workers in the former countries and 200 in the latter<sup>3</sup>. For the same population there are in the developed countries six times as many physicians, five times as many pharmacists, and 12 times as many nurses and midwives. Therefore, the overall coverage of health services in the developing countries is sparse and the poorer the country the thinner the coverage; each doctor has to serve in Indonesia 18,100, Nigeria 25,000, Malawi 86,000, and India 4,160 persons<sup>1</sup> as compared to 500 to 700 for Canada, U.S.A., Britain and Australia.
8. The inequality is even more striking between urban and rural areas of the developing countries where physician density is five times greater in urban than rural areas. In India four-fifths of the physicians are in urban areas serving one-fifth of the country's population. In some countries of Africa 50% and 75% of physicians are in the capital cities where less than one-tenth of the population reside.
9. There is a corresponding disparity in the physical facilities available as shown by the bed/population ratio. In the developed countries there are 95 beds per 100,000 population as against 14 beds in developing countries<sup>3</sup>. The health care facilities whether hospitals of whatever



size, health centres, dispensaries or clinics suffer from chronic shortage of manpower and insufficient or faulty equipment and poor mechanical and electrical services.

10. Most developing countries provide 2 to 3% of their GNP for health against 5 to 9% by developed countries. This means that the average Indian gets about one hundredth as much health care as the Briton although the latter, with his sanitized environment, falls ill much less frequently.
11. Population growth puts enormous pressures on many aspects of the economy of a country and when rapid increases the existing poverty, illiteracy and unemployment, and places an enormous strain on the existing health services. The pace of growth in the developing countries was 1% between 1920-50; 1.9% 1950-55; 2.13% 1955-60; 2.27% 1960-65; 2.3% 1965-70<sup>1</sup>. Between 1970-77 it was 2.7% in Africa and 2.6% in South Asia as compared to less than 1% in Europe and Northern America. The poor countries account for an increasingly massive proportion of the world's population, two-thirds of the total up to 1960 and by 1980 three fourths.
12. Although food production in the developing countries has expanded, the growth of population increased the demand for food more than its actual production. Therefore, for a large number of developing countries, per capita consumption has not increased at all and in some countries of Africa it has decreased.
13. Illiteracy is concentrated among the lower income groups. In 1977 approximately 80% of the adult population in low-income countries were still illiterate: this represents 800 million people or one-fifth of the world's population. Education has an impact on health that is



independent of income. Although developed and developing countries are spending increasing proportions of their budgets on public education (6% and 4% respectively of GNP), the amount per person was US\$268/- in developed countries and US\$19/- in developing countries<sup>3</sup>.

To understand how this period of underdevelopment occurred, we shall have to recognise the historical past and acknowledge the great transformation that took place in the world as a result of the aggressive overseas expansion of European mercantile and industrial civilization into the countries now considered as "developing". The initial motive was profit from trade, but as the demands of commerce grew the national flag made its appearance leading to political conquest and foreign rule. The intense rivalries of the European countries were reflected in a carving up of Africa, Asia and Latin America amongst them. Two world wars and numerous freedom movements had to take place before liquidation of the empires, establishment of independent governments and the development of the present world community. It is not the intention to review the effects of colonial rule, except to state that during that era nations became divided into industrial ones and those that provided the raw materials for their industry. This then formed the basis of the present division into developed and developing countries. The latter may also be regarded as "emerging" inasmuch as they are moving from a subordinate status as a colony or protectorate into political or economic independence and to the status of <sup>a</sup> nation among nations. The emergent nations are newly independent coming forth to take their rightful places on the international scene. Their desire is to become more self-reliant and complete the process of political independence with economic independence. Hence, the institution of social and economic reforms to narrow the gap that separates them from the developed countries.



The end of the colonial era saw a scattering of medical schools in several, but not all countries of Afro-Asia. The output of doctors from these schools was totally inadequate for the needs of the population at that point in time. Faced with an enormous amount of ill-health and dire scarcity of health personnel of all categories, the newly emergent governments concentrated on efforts to increase the number of various health workers by increasing the intake of students into the existing training centres and establishing new ones. But the attempt was mainly on the production of more doctors rather than the other members of the health professions. This resulted in an increased number of medical schools in countries where there were already some in existence and new schools where there were none at all. During the 20 years 1955-75, 493 new medical schools were established throughout the world<sup>4</sup>. Of these 139 (28.2%) were in the developed countries and 354 (71.8%) were in the developing countries. Of the 119 new schools established in developing countries during 1970-75, 31 (26%) were in countries that had no schools previously. More than 50 schools in Africa and 200 in Asia have been established during the past two decades and class sizes of more than 100 students are quite common. In the older established schools the admission policies were revised to provide also for large classes of more than 100 each.

A significant trend over the past two decades has been the increased production of doctors, but their availability for the people of the country has been vitiated by their concentration in urban areas and migration to foreign countries. In 1972 there were at least 140,000 physicians in countries other than those of which they were nationals or in which they had been born or trained. This figure represents 6% of the world's physicians at that time. Over 75% of these migrant physicians were found in five countries: the United Kingdom, the U.S.A., Canada, Western Germany and Australia<sup>5</sup>.



There has been a similar intensified effort to educate and train other health workers of various categories and develop health teams, but the numbers produced have been grossly deficient for the populations to be covered.

In order to review medical education in Afro-Asia, an understanding of its historical development is important. In all the colonised countries of Afro-Asia where medical schools had been established, the pattern of medical education closely followed the European system of the colonising countries. Equivalent standards were maintained and "recognition" of the degrees granted by the colonies seemed important. This imported curriculum was then considered adequate for the largely agricultural-rural colonies. Teaching staff were mainly "expatriate" and natives participated little in the educational programmes.

When new schools were subsequently established by the national governments, the same basic curricular pattern was adopted as this was the experience and orientation of those founding the new schools and the advice of foreign "experts". Formal and informal links developed with schools in Europe and in some instances a University-College system became established; any changes in curriculum, appointment of staff and examiners and other academic matters being approved by the foreign University which also awarded the medical degree. This formal tutelage system does not exist nowadays except perhaps in an informal sense. As changes took place in the overseas curriculum and new disciplines such as statistics, sociology introduced, so were they adopted by the local medical schools. Although Departments of Preventive Medicine were established in the early 1960's, they did little to influence the overall curriculum, the Faculty and its main objective which was the development of a hospital-orientated clinical scientist modelled very much on his western counterpart.



Although there is some variation in the medical curriculum from school to school and country to country, the basic pattern is essentially similar. It begins with the study of the structure and function of the body (anatomy and physiology and biochemistry), is followed by examination of the processes of disease (pathology) and ends with clinical instruction in a hospital. The focus of attention is on the nature of the disease process, its recognition and treatment; the essential task of the doctor is that of diagnosis and treatment of a disease. Very little time is spent on the origins of disease, the conditions under which it occurs and its possible prevention. Since the clinical instruction is confined to a teaching hospital, the future doctor obtains only a restricted view of selected medical problems of a limited group of patients. He has little experience of the range of problems met with in general practice or in rural areas. This system of education has little relevance for health care in rural areas where the vast majority of the country's population live and where the required skills and knowledge have to be of a different kind. These include an ability to deal with all sorts of emergencies, to make a diagnosis with a minimum of investigations and to recognise malnutrition and communicable diseases and treat them; knowledge and understanding of the social-environmental causes of ill-health and how these could be overcome; ability to organise, supervise and teach para-medical staff and educate patients and their families; self-reliance.

The graduates of medical schools in Afro-Asia are better equipped to handle the Western diseases of affluence than the local assorted fevers, diarrhoeas, parasitic infections and nutritional deficiencies. Their basic pattern of education is similar to that of their Western counterparts, their standards at professional examinations are assessed by examiners from Western countries



and their qualifying degrees recognised for practice in those countries. Their ambition now is to be trained overseas to become specialists in some aspect of curative medicine. The lack of local postgraduate training programmes makes it obligatory for them to go overseas. On being duly certified they may return home, but are fit to work only in the large urban hospitals where the equipment they had used overseas may be available. If they cannot practice as specialists or if they are transferred to a district, they readily resign and go into private practice in the cities or emigrate.

Thus, the developing countries of Afro-Asia inherited, created and maintained a model of medical schools which are largely Western-based and have a strong curative tradition with in recent years a strong emphasis on technology. The technological advances in the last three decades have resulted in the development of a very expensive "medical industry" consisting of hospital builders, manufacturers of equipment for diagnosis and treatment, and producers and distributors of drugs contributing enormously to the rising costs of patient care; US\$50,000 for a hospital bed per year in the U.S.A., compared to the US\$1/- per capita available in African countries for total health care. Health problems in Afro-Asia are largely environmental in origin and preventable, but the Western approach has tended to focus on hospitals, equipment and drugs and expensively trained doctors which the developing countries can ill-afford.

A valid criticism of the curriculum of the Afro-Asian medical schools is that they were developed with little consideration for the obvious differences in demographic patterns and socio-economic conditions between developed and developing countries. The latter have high birth rates, high prevalence of infections and parasitic disease, unsafe water, poor sanitation, poor housing, high illiteracy, low income per capita, a large rural population and different



health problems from Western countries with lower birth rates, high income per capita and a largely urbanised, sanitised population. The planning and development of the curriculum did not recognise sufficiently existing disease patterns, their causes, and the possibilities of both cure and prevention; priority health and health-related problems were not identified; integration with the country's health programming was minimal or non-existent nor was there any significant communication with other sectors concerned with water and sewerage, agriculture, public information and community education and development. This irrelevance of medical education is being recognised, and changes are being proposed or made in some of the established schools, but implementation is not easy without the full support of academic staff. It is not unusual for staff members to identify themselves with their colleagues in Western countries and not wish to lower the so-called "international" standards or risk lack of recognition by Western institutions.

There is much more hope in fresh beginnings when new medical schools are proposed, provided advice is sought from local sources and from other developing countries with similar problems. Study tours of established and well-known schools in Britain, U.S.A., and Australia and advice of 'experts' from these countries is fraught with peril for the fledgling school and the earlier experience of establishment of Western based models is likely to be repeated.

Education in medicine is usually the prerogative of the University and the responsibility of the Ministry of Education, but the reason for establishing a medical school is to increase the number of physicians for the health services which is the responsibility of the Health Ministry. The clinical teaching programme has usually included the use of patient-care institutions of the Ministry of Health, most often without responsibility for the care of patients.



In the teaching of preventive medicine, students may be introduced to rural health through visits and surveys, but participation in the delivery of health care is absent. Effective means must be found to merge functionally medical schools and institutions of the health care system so as to jointly provide an integrated programme of education, research and delivery of preventive, curative and rehabilitative services to the total population of a defined area. Recognition of a single administrative authority for the area whether derived from the medical school or the health sector is obligatory if this approach to the solution of a country's health problems is to succeed. The integration of the educational programmes with the health systems will be mutually beneficial to academic staff, students and all other health workers providing education with practical experience at all levels in both township and rural areas. In the absence of close collaboration with those responsible for the health care system, the medical school develops and implements its educational programmes in isolation and without relevance to the changing health needs.

During the last two decades several reforms in medical education have taken place. These have originated largely from medical schools in Britain and the U.S.A. and have been adopted by some of the older schools and newer ones in Afro-Asia. The reforms are mainly curricular and concern educational methodology and technology. They do not affect the traditional academic structure and organization which remained essentially department or discipline based. This makes multidisciplinary teaching difficult and students relate strictly to the disciplines taught.

A reorganization related to the major health problems will orientate staff and students and result in a better understanding of these problems and their solution. As 80% of the health and disease problems in most developing countries



can be grouped into three major categories: communicable diseases, malnutrition and population growth, medical schools could be reorganised into Departments of Communicable Diseases, Nutrition and Population with distribution of various related disciplines under each category<sup>6</sup>. Clinical problems not represented under these departments would come under a Department of General Medicine which would include internal medicine, psychiatry, and surgery. Three departments would then be devoted to the main health problems and the fourth to more general clinical ones. Two others relevant to all the departments could be added viz., one concerned with the organization and delivery of health care and the other with educational methodology and evaluation. The medical school would be one component of a Health Sciences Centre, the others being schools concerned with associated health professions such as nursing. Appointment of professors to the departments without specific discipline tags would help to remove existing disciplinary boundaries and make multi-disciplinary or integrated teaching easier.

Health problems in the Afro-Asian countries are remarkably similar and much of it preventable. However, their causes are multifactorial and their control and eradication require vector control, provision of clean water, proper sanitation, nutrition supplementation, education and other measures which require a multidisciplinary approach of which contribution by doctors is only one aspect. Yet medical education has been largely confined to the training of doctors to the near exclusion of other members of the health team who are as much if not more needed than doctors. In the rural areas, doctors are required to work closely with other members of the health team and obliged to teach, guide and organise them in order to implement various health programmes. Hence, medical schools should participate in the training of health personnel either as a component part of the educational programme of a Health Sciences Centre or contribute in other ways to the country's training programme in the health fields. Aspects of the programme may be multiprofessional involving joint courses for physicians, nurses



and other members of the health team. Involving medical students in these programmes is important if they are to understand and appreciate the problems, difficulties, and responsibilities of health care professionals and their place in the health care delivery system.

While undergraduate programmes have been established, postgraduate ones remain undeveloped or poorly developed resulting in a large migration of Afro-Asian graduates to Western countries for specialist training and higher professional degrees with consequent depletion of the country's medical manpower. It is a sad and depressing reflection that after more than 30 years during which many medical schools and professional societies became established, indigenous development of specialist and postgraduate training has lagged far behind in meeting the country's needs and in comparison to what has been accomplished in the developed countries.

The single most important contribution of overseas medical schools and professional bodies towards health care development in the former colonies would have been to help in the establishment of indigenous postgraduate training programmes. Instead courses in tropical medicine, parasitology, and public health were maintained and new ones established, and the Royal Colleges continued to captivate the medical graduates of Afro-Asia by now holding their professional examinations on local soil. How much of these courses and examinations are relevant to local practice and whether the same pattern of specialist development should strictly be followed is open to question and will not be further discussed. However, we must accept the urgent need for greater self-sufficiency in post-graduate medical education. The field is so enormous that only by full cooperation of the three bodies concerned viz., the medical school, the professional societies or colleges and the Ministry of Health can anything be done. The medical school because of its special concern and responsibility for its graduates must accelerate this development by all possible means.



An important function of medical schools is research but several factors including lack of academic and laboratory staff and scarcity of equipment and finances have relegated research in the medical schools of Afro-Asia to a very subordinate position. In financial terms about 95% of all health research takes place in the economically developed countries primarily on problems of those countries. In Afro-Asia there is a growing demand for research directly relevant to local health problems. The most obvious are nutrition, malaria, schistosomiasis, filariasis, trypanosomiasis, leishmaniasis, leprosy and diarrhoeal diseases. In spite of the overall deficiency in manpower and funding, the magnitude of the health problems and the urgency for more active intervention require much more interest and involvement in research. This should include, besides those mentioned above, identification of other community health problems and their solution and research into methods of delivery of health care to determine the system best suited for the country.

In this paper I have presented the historical background to the development of medical education in Afro-Asian countries and emphasised that the curriculum is largely curative orientated and hospital based with little relevance to the health needs of the country. Nor has the increased output of doctors made any great impact on the solution of its health problems. However, it must be made clear that health is only one sector of national development and that the resolution of health problems requires the intervention of several government sectors as the main causes of ill-health are to be found in socio-economic poverty. That over the years there has been economic growth cannot be denied, except that rich countries are becoming richer and poor ones poorer and amongst the latter there is an even greater economic imbalance between different sectors of the population. We must also take note of the ever-increasing annual world



military expenditure and how only a small proportion of it could substantially increase our food production, eradicate malaria, conquer river blindness, provide safe water and adequate sanitation and supply other basic human needs<sup>7</sup>. Against this depressing background, it is difficult for medical educators to maintain their enthusiasm and optimism and not succumb to local professional and political pressures and once again follow traditional lines of medical education graduating doctors who in the main have neither the desire or motivation to work in rural areas and readily desert the public sector or emigrate. Nevertheless, we have an important role to play by virtue of our knowledge and experience of health and disease and the responsibility we have to medical education.

We must review and re-define the overall goals of the medical school. What are the health needs of the community which its graduates are expected to serve? What kind of doctors are required to fulfill these health needs? Do we need primary care physicians or specialists or both and in what proportion? What is the right mix of physicians, nurses and other health personnel? In what environment should the teaching/learning experience take place? The review requires an in-depth knowledge of local health needs, health manpower planning and health care delivery programmes. It calls for full consultation between those responsible for education of health personnel and those responsible for health delivery services in both the public and private sectors.

The content of the medical curriculum should be broadened to include all factors that have a bearing on good health and its maintenance. Its balance should be restored so that the emphasis on preventive, rehabilitative and promotive medicine is equal to that of curative medicine. Curative medicine should not be only the management of acute episodes of ill-health, but must



become orientated towards comprehensive health care including that of the elderly and the chronic sick. Amongst other things the revised curriculum should

- show greater emphasis on the environmental, the behavioural and the social sciences and on the humanities.
- provide for greater experience in community health practice, both rural and urban including general practice.
- provide for the development of knowledge of health care planning, health care delivery systems and their financing; health care service economics including cost of equipment and drugs.
- require active participation in the delivery of the health services and the implementation of the national health policy.

While not in any way lessening or losing its international relationships, the medical school should now deliberately look "inwards" to serve its own people and country by making its educational programmes relevant to its health needs, by intensified research into its health problems, and by assuming responsibility for postgraduate and continuing education for its health personnel.

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