THE HEALTH NEEDS OF RURAL THAILAND: A CHALLENGE TO TRADITIONAL UNIVERSITY STRUCTURE AND FUNCTION

by
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More than half of the world's people have no reasonable access to health care, and for most of the rest, the care they receive does not answer the problems they have. The deficits in health care are greatest in the less developed countries, and Thailand is no exception. Despite having a substantial number of medical and nursing schools of recognized international standard and a well-established and concerned Ministry of Health, Thailand is faced with extremely serious problems in trying to reach its people with adequate health care.

While the reasons for these inadequacies are complex, important causative factors can be found in the universities. In brief, the traditional means by which universities develop their programs are not well suited to meeting the problems as they exist in the nation.

In this paper, we will use the relationship between the health needs of rural Thailand and the education of physicians as a framework for discussing the challenges that confront universities around the world and the difficulties universities are having responding to those challenges.

THE DISEASES

The leading causes of death in Thailand are pneumonia, gastroenteritis, tuberculosis, malaria, and accidents. To these must be added malnutrition, which is often overlooked but is a frequent contributor to death in young children. These three diseases—pneumonia, gastroenteritis, and malnutrition—are the leading causes of death in developing countries around the world, and by looking closely at them we can understand the extraordinary difficulties of providing effective health care.

All three diseases are imbedded in culture, custom, and economic status. Malnutrition is as often due to the customs of eating as to the lack of food in the house—taboos and simple oversight lead to deprivation of children too small to help themselves. It is not unusual, for example, to see a child weakened with malnutrition watching apathetically as his mother tends a vegetable garden rich in nutrients. If a mother can be brought to feed her child the same food she feeds herself, much of malnutrition would not occur.

Gastroenteritis and respiratory infections are often due to infectious organisms that are not susceptible to the antibiotics in which we have such confidence: rather they are due to viruses or to ill-defined mixtures of micro-organisms.

The interrelationships of these diseases, one with another, increase the complexity of dealing with them. Malnutrition is often the underlying culprit. Not only does it cause damage itself, such as retardation of physical and mental development, but it seems to set the stage for other illnesses. One sees pitiful downward spirals as malnourished children develop gastroenteritis, inability to eat, further weakness, and then the devastating dehydration that comes with diarrhea. In the presence of such debilitation, the child can be quickly carried away by an infection such as pneumonia.

The deadly and debilitating illnesses often come in clusters. I recall visiting an area in Malawi, East Africa, where 100% of people had malaria, hookworm (an intestinal parasite that causes severe anemia), and schistosomiasis (a parasite that infects the intestine and bladder). Schistosomiasis infection of the bladder causes bloody urine, which was so common that mothers occasionally brought their children to the hospital because their urine was not red and they thought something was wrong. In this part of Malawi, the population begins with a baseline, so to speak, of three diseases, and in this setting gastroenteritis, pneumonia, and malnutrition do their destructive work.

There is yet another factor that contributes to this grim picture—it is family size. In many developing societies, the income of the father does not increase as he grows older but the size of his family does. The studies of Dr. Joe Wray in Colombia, South America,

showed that as the father grows older, the number of his children increases, but since his income is static, the amount of food money per child steadily decreases and, just as steadily, the percentage of malnourished children increases.[1]

Malnutrition sets the stage. Add the crowding of a large family into a small, poorly ventilated, unkept home, and you have life that is saturated with the causes of death and disability. And consider the rest of the drama. Parents try to build a life within the confines of poverty and ignorance from which they know no escape. They can sense with despair the arithmetic of adding another child and try desperately to avoid pregnancy but acting in ignorance often fail. It does not surprise us that the leading causes of death among children in Colombia are gastroenteritis, pneumonia, and malnutrition, but notice that among young women it is abortion and suicide, and among young men it is homicide.

The relationships between family size and death rates of children are complex and what holds in one community may not hold in another. As Walsh McDermott points out, a high death rate among small children often reinforces the tendency of parents to have more children.[2]

People are not inclined to limit the size of their families until it is apparent that their children have a reasonable chance of survival. So they continue to crowd the home with small children which, as we saw, contributes to their death. So the sad cycle turns. This is one of the arguments supporting the notion that population control programs should include effective means of reducing unnecessary deaths among children.

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1) A. Aguirre and J.D. Wray, "Estudios Epidemiologicos Sobre Desnutricion en Candelaria" (Unpublished, 1965). Cited in J. Bryant "The Gap Between Biomedical Technology and Health Needs in Developing Countries" *Science and Technology in Developing Countries*, ed. Zahlan and Nader (Cambridge University Press, 1968).

2) Walsh McDermott, "Modern Medicine and the Demographic-Disease Pattern of Overly Traditional Societies: A Technological Misfit". *Journal of Medical Education*, Volume 41, pp. 137-162, September 1966.

The modern physician who depends on wonderdrugs and the dazzling machinery of modern biomedical technology can do little to change this disease pattern. The destructiveness of these diseases will lessen only as people learn to live their lives differently – to have fewer children, to feed them differently, to improve their lethal environment. But let us not overlook the fact that these are intensely personal decisions that people make in the quietness or despair of their own lives. Programs designed to improve their well-being must reach them at that level of personal decision, and must then provide means for implementing their decisions.

We could discuss many other health problems but enough has been said to illustrate the issues a nation must consider as it attempts to provide health care for its people. On the one hand, it must provide for the urgent and complex problems, such as acute illnesses and obstetrical and surgical emergencies, for which hospital care is essential. On the other hand, it must reach into the communities and homes to find those who need care but do not seek it out and to get at the causes of such diseases as malnutrition and gastroenteritis.

THE PROBLEM OF PROVIDING HEALTH CARE

There are problems of extraordinary difficulty in reaching people with health care. The problems have to do with insufficient resources, maldistribution of resources, inadequacies in health care concepts, and the education of personnel who work in the health care systems. Let us consider these issues individually.

Manpower and Health Care

The proportion of population to doctors in developing countries varies from 2,000 in Colombia to 76,000 in Malawi: in Thailand it is 7,600 (Table 1). A similar range holds for nurses. For comparison, the proportion is about 750 in the United States and less than 500 in Israel. But nation-wide figures are misleading because of the clustering of resources in the major cities. The proportion of population to doctors in Bangkok is less than 1000 while the figure for the remainder of the nation is 17,000. But even this "out-of Bangkok" figure is misleading since there is another level of clustering in the

TABLE I

*Ratio of population to doctors, nurses and beds in selected countries**

	Ratio Population to Doctors	Ratio Population to Nurses	Beds per 1,000
Thailand	7,600	6,070	0.8
Jamaica	2,200	950	4.3
Colombia	2,000	17,100	3.1
Sudan	29,000	44,000	1.0
Senegal	20,000	5,500	1.3
Nigeria	50,000	7,100	0.4
Malawi	76,000	46,000	0.8
Guatemala	3,600	8,800	2.4
Iraq	4,900	6,700	2.1

* Based on data obtained from WHO or Ministry of Health of country.

Source: John Bryant, "*The Gap Between Biomedical Technology and Health Needs in Developing Countries*" from Science and Technology in Developing Countries (ed. Zahlan and Nader) Cambridge University Press, 1968.

provincial cities. In 1967, there were approximately 135 doctors stationed at health centers in rural Thailand. With few exceptions, the remaining doctors worked in provincial capitals or sizable cities. Putting the figure of 135 against the estimated rural population gives 216,000 rural people for each rural physician. It can be argued that doctors in the provincial capitals are serving the rural population, and to some extent that is true. But people do not travel far for health care, and it is extremely important that the health care go to the people as well.

These figures are extremely rough, but there is no doubting the seriousness of the problem. We can ask how fast the figures will improve. The answer is: with agonal slowness. For example, if a new medical school is developed in Thailand every five to ten years and if every graduate is required to serve in a rural position for at least one year, then by the year 1990 the proportion of rural popula-

tion to rural physicians would approach 50,000 (Table 2). Whether or not this is accomplished depends on a number of interlocking political, educational, and financial decisions. Even if the 50,000 figure can be achieved, there remains the awesome challenge of building an effective health care system around so few physicians. Effectiveness will depend mainly on three factors: money, organization of health care, and education of health personnel.

TABLE II

Projections of physicians serving at primary health centers in rural Thailand

Year	Population (mills.)* National	Population (mills.)* Rural[1]	Primary health centers (PHS)	PHS staffed by physicians	Rural pop. per physician at PHS	Medical school graduates
1965	33.2	29.8	217[2]	135[2]	220,000	265
1990	64	40	600[3]	600[3]	66,000	600[3]

* Current rate of population growth is 3.4 precent per year, which would yield a national population of 74 million by 1990. Figures presented here assume a 10 percent decline in growth rate each five years after 1970 (Henry F. McKusker, "The Relationship between Population and the Economic and Social Development of Thailand," *Thai Social Science Review*, 2, no. 1 [1967]: 19-38).

1) Assumes urban population will grow at about 7 percent per year.

2) Data from Ministry of Health, Thailand.

3) Rough estimates. Assumes Ministry of Health can build and staff over 300 primary health centers with associated satellite centers. Also assumes that three or four more medical schools will be developed in the next two decades and that most graduates will spend one year serving at a primary health center and a few will serve longer.

Source: John Bryant, *Health and the Developing World* (Cornell University Press, 1969) p. 81.

Money and Health Care

Money is a crucial factor in health care. It determines how many health personnel can be trained, how many can be maintained in the field, and the resources they will have to work with when they are there. Table 3 shows the expenditures of various countries on health care, ranging form $.20 per person per year in Indonesia to $56.00 in the United Kingdom. The figure for Thailand

is about $.60. Part of that $.60 goes for central administration and laboratory development; of the remainder, about half goes to the Department of Medical Services, which operates most of the hospitals, and about half goes to the Department of Public Health, which has a variety of responsibilities including rural health care. It is difficult to know how much is actually spent on the health of the rural people, but a fair estimate would be between $.10 and $.20 per person per year. That would amount to $5,000 to $10,000 for the 50,000 people of a district, to be spent on salaries, drugs, vehicles, petrol supplies, equipment, and so on. The slimness of these resources illustrates one of the central issues of underdevelopment.

How soon might there be substantially more money available for health care? Table 4 shows our attempts to answer that question for several countries. By making a number of assumptions, rough projections can be made of future expenditures on health. In these projections, it is assumed that national economies will continue to grow at the 1965 rate with health receiving the same share of total government expenditures. On that basis, the annual per capita expenditure on health in the year 2000 by the Indonesian government would be $.25, for Nigeria $.75, for Thailand $1.91, and for the United Kingdom over $200.

Such projections are subject to wide error, of course, and in their defense it can only be asked what other assumptions would form a better basis for projections. One can manipulate the variables. The projections in Table 5 are based on assumptions of different rates of economic growth, the other variables being kept constant. Depending on whether the annual rate of increase of the GNP in Thailand is 3, 6, or 7 per cent, the expenditure on health would be $.71, $1.91, or $2.66.

These are examples of small numbers growing at slow rates. A more dramatic presentation of the same problem is seen in Table 6, which shows the numbers of years required for different countries to achieve the 1965 United States per capita income of $3600. Sweden will reach that level in 11 years. It will take Thailand 99 years; Nigeria 339 years; Indonesia 593 years.

TABLE III

*Governmental expenditures on health services**

Country	Year	Expenditure on Health as % of General Government Expenditure	Expenditure per Inhabitant U.S. $
Nigeria[1,2]	1964	12.0	0.50
Thailand	1963–64	3.4	0.60
Indonesia	1963	2.8	0.20
Malawi	1964	5.8	0.64
Sudan	1963–64		1.42
Iraq	1964–65	5.5	3.10
Colombia	1964	11.0	3.50
Jamaica[1]	1963–64	11.0	9.60
United Kingdom	1963–64	12.9	56.00

* From *Third Report on World Health Situation 1961-64, Part I*, General Survey, unless otherwise noted.

1) Northern region of Nigeria only.

2) From official sources of country.

Source: Same as TABLE I

TABLE IV

*Projections of expenditures on health per capita, five countries**

Country	GNP per capita (1965 U.S. $)		Expenditure on health per capita (1965 U.S. $)	
	1965	2000	1963–1964	2000
Indonesia	99	123	.20	.25
Nigeria	83	125	.50	.75
Thailand	126	402	.60	1.91
Colombia	277	359	3.50	4.54
United Kingdom	1,804	6,530	56.00	202.26

* The assumption is that per capita expenditure on health will increase in proportion to the per capita GNP. See Table 10 for the basis for calculating the per capita GNP.

Source: John Bryant, *Health and the Developing World* (Cornell University Press, 1969) p. 48.

These projections could be wildly wrong, but the point is not to argue for one set of figures or another but to indicate the probable pace of change and to call attention to the implications for health care and for the education of health personnel. It is essential that we all understand that for decades to come, most people of the less developed world will receive health care under conditions in which there is less than one physician for every 50,000 people and less than $1.00 of governmental expenditure per person per year. These realities of health care become important determinants of the jobs of health personnel and, therefore, of the education of those health personnel.

TABLE V

Projections of gross national product per capita and health expenditure per capita using different growth rates, Indonesia and Thailand

Country	Assumed annual rate of increase (%)*	GNP (bills. 1965 U.S. $) 1965	GNP (bills. 1965 U.S. $) 2000	GNP per capita (1965 U.S. $) 2000 [1]	Expenditures on health services per capita (1965 U.S. $) 1963–1964	Expenditures on health services per capita (1965 U.S. $) 2000
Indonesia	2	10.40	21	88	.20	.18
	3		29	123		.25
	6		80	335		.68
Thailand	3	3.85	11	149	.60	.71
	6		30	402		1.91
	7		41	558		2.66

Source: Herman Kahn and Anthony J. Wiener, *The Year 2000* (New York: Macmillan, 1968), tables 12-17, pp. 157-165.

* Low medium, and high rates considered appropriate for each country by Kahn and Wiener, *op. cit.*

1) Assumes population of Indonesia will be 239 million and that of Thailand 73.5 million.

TABLE VI

Years needed to achieve 1965 U.S. gross national product per capita, selected countries

Country	GNP per capita, 1965 (1965 U.S. $)	No. of yrs. needed to reach 1965 U.S. GNP per capita ($3,600)*
Indonesia	99	593
Colombia	277	358
Nigeria	83	339
Mexico	455	162
Pakistan	91	144
Brazil	280	130
India	99	117
S. Africa and S.W. Africa	503	115
China	98	101
Thailand	126	98
United Arab Republic	166	97
Taiwan	221	71
Argentina	492	69
New Zealand	1,932	42
Romania	757	38
Poland	962	34
Italy	1,101	30
U.S.S.R.	1,288	28
Australia	2,009	25
Israel	1,334	24
Japan	857	22
Czechoslovakia	1,554	20
United Kingdom	1,804	19
France	1,924	18
East Germany	1,574	17
West Germany	1,905	16
Canada	2,464	12
Sweden	2,497	11

Source: Herman Kahn and Anthony J. Wiener, *The Year 2000* (reprinted with permission of The Macmillan Company; copyright by The Hudson Institute, Inc., 1967), p. 149.

* The number of years needed to reach the 1965 U.S. GNP per capita ($3,600) was calculated on the basis of the 1965 GNP for each country and the "medium" rate projected for growth of population and GNP. The "numbers of years needed" is thus simply a way of looking at the rate at which the country's GNP per capita seems likely to approach the current U.S. level; obviously, to the extent that the number of years is large, many factors can be expected to change in the interim.

Organization of Health Care

We can look at health care systems from two points of view: one, their design; the other, how they work.

Thailand has a reasonably well-designed health care system based on a series of health centers distributed across each district or amphur and staffed with teams of health personnel. Table 7 shows the composition of the health team that the Ministry considers appropriate for a rural district of 50,000 people. Notice that one physician leads a team of about 35 persons, four of them with university education; the rest have less than university education and are referred to as auxiliaries.

To illustrate the scope and quantity of health events in the lives of 50,000 people, there will be about 2,250 births and 400 deaths in a year, to say nothing of numerous problems of lesser significance. But we must recognize that it is wildly optimistic to hope that there will be one physician and a team of 35 serving 50,000 people. As we saw earlier, it is more likely that they will be serving 200,000 people.

TABLE VII

	One Primary Health Center	Four Secondary Health Centers	Eight Midwifery Centers
MD	1		
Public health nurse	1		
Graduate nurse	2		
Senior sanitarian	1		
Junior sanitarian	2	4	
Midwife	2	4	8
Nurse-aid	3	4	
Dental auxiliary	1		
Junior technician	1		
Clerk	1		
	15	12	8

Total health team = 35

Source: Ministry of Health, Thailand.

It should not surprise us, therefore, that health services reach only a small percentage of the population. Eighty percent of the women of Thailand have their babies delivered by persons with no modern training whatsoever. And in communities within 20 or 30 kilometers of Bangkok, 50% of the children have readily measurable malnutrition.

These deficiencies are due partly to shortages of health personnel and other resources but there are other reasons, some of which have to do with the physician. Trained to excellence in the care of individual patients in a university hospital setting, he often waits at his health center to care for individuals, rather than leading his health team in providing care broadly across his district. And the other health personnel often follow his example, waiting at health centers and midwifery centers for people to come to them.

While the health services are not very effective in reaching out to the people, it is also true that the people often do not go to the health services. In this respect, there is a curious contrast between Thailand and Africa. In Africa, the average person visits a health facility about two times per year. In the United States, the figure is around four, but in Thailand it is about 0.2. This means that the people of Thailand use their health services one twentieth as often as the people of the United States and one tenth as often as the people of Africa. The reasons are not clear, but Clark Cunningham, the social anthropologist, suggests there is an inhibiting social distance between the people and the government doctor.[3] The doctor seems not to know how to approach them and at times assumes a style of behaviour that they do not like. Perhaps they are put off by his behaviour or by the fact that he is a government officer, or perhaps they sense that the care they will receive at the health center is not effective. Whatever the reason, they often choose not to go.

While pointing out that there are still serious deficiencies in the health services of Thailand, it must also be pointed out that there have been remarkable strides forward in recent years—eradication of yaws and the marked decrease in malaria are two striking examples.

3) Clark Cunningham, "Some Social Aspects of Rural Medicine in North-Central Thailand". (Mimeo doc., Chiengmai, Thailand, 1966).

The people in the Ministry of Health are fully aware of these problems and are pressing for solutions.

Thailand is not alone in the difficulties of reaching its people with health care. There are areas of New York city with 50,000 people per physician where the infant mortality has remained high and unchanging for several decades, despite the location in that city of some of the world's most famous medical schools.

Another illustration is to be found in Colombia, South America, a nation with problems similar to those of Thailand though with resources that are somewhat more plentiful. There, mortality among children (Figure 1) and death rates due to diarrhea (Figure 2) have been nearly unchanging in recent years, yet during these same years our understanding of the diseases responsible for these deaths has advanced to highly sophisticated levels, and the medical schools of Colombia have been turning out physicians who meet all the criteria of excellence by international standards.

The hard truth is that the connections between modern biomedical technology and the health needs of the world's people are very thin. While this is due partly to limitations in resources, it is also due to faulty design of health care systems and to major inadequacies in the education of health personnel.

Ministries of health will play an essential role in improving the health care systems and, to some extent, in improving the preparation of the personnel who work there. But the ministries alone cannot make the broad changes that are needed. Designing an effective health care system is an extremely complex matter, and the universities can help with that task, particularly through their research capability. In addition, substantial improvements in health care systems cannot be achieved without corresponding changes in the education of health personnel. Since the physician is the leader of the health team, we should look at his education most closely.

I am convinced, first, that the university cannot educate the physician properly unless it knows in exquisite detail the job he will fill, and, secondly, that the university cannot know that job unless it is intimately involved in the health care system itself.

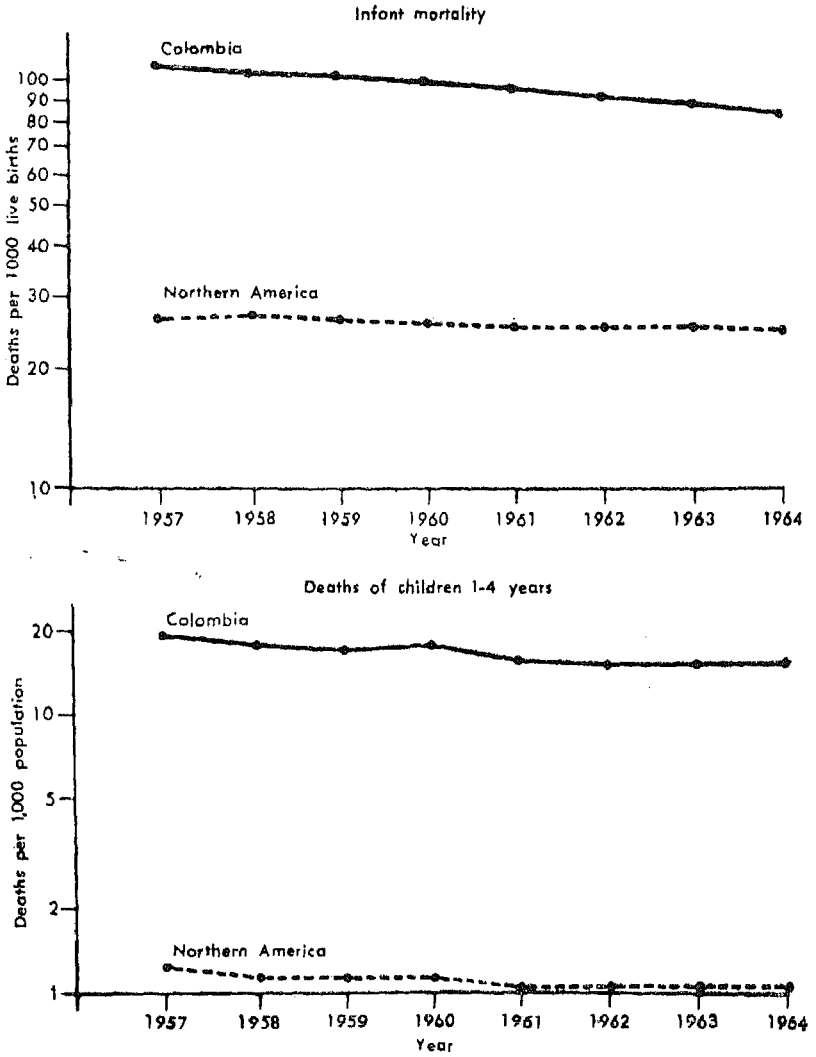

Figure I

Mortality of children under one year and between one and four years of age in Colombia. Adapted from Pan American Health Organization, *Health Conditions in the Americas*, Scientific Publication no. 138 (Washington, D.C., 1966).

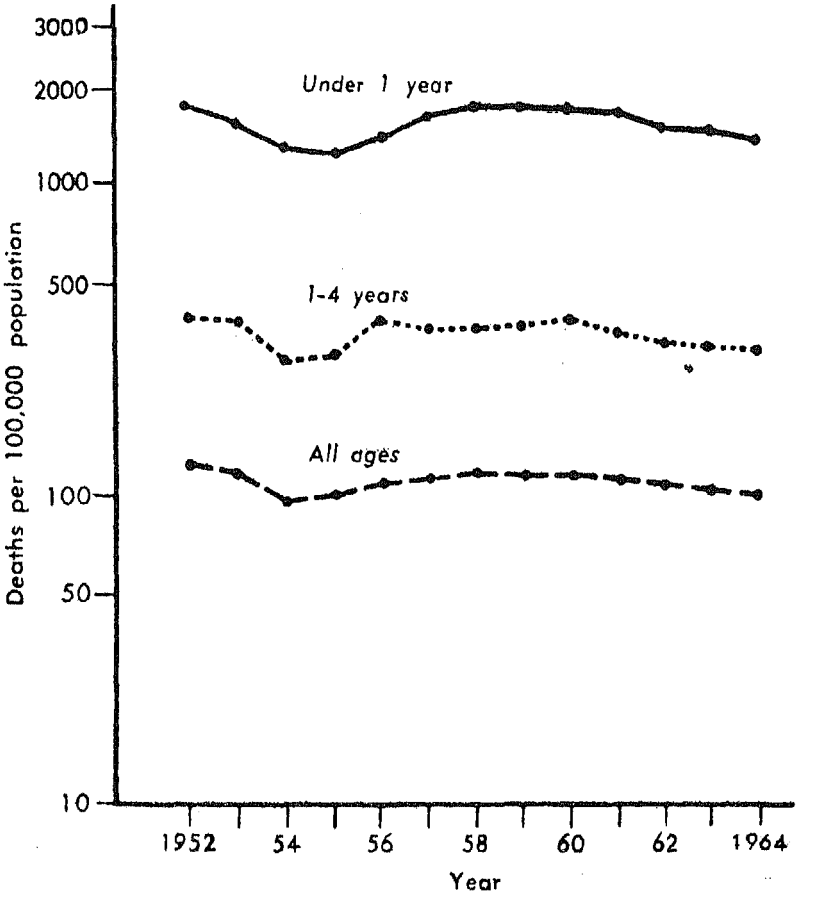

Figure II

Deaths from diarrheal diseases in Columbia, 1952-1964. From Pan American Health Organization, *Facts on Progress*, Miscellaneous Publication no. 81 (Washington, D.C., 1966). Deaths of children under one year are per 100,000 live births.

Since physicians fill many jobs, we can ask which job should we describe. Our immediate task is simplified by recent legislation in Thailand that calls for nearly every graduating physician to serve the government for three years, and it seems highly likely that part of that time will be spent as a health officer in a rural *amphur*. So let us take a few steps toward describing that particular job of the physician, keeping in mind the implications for his education.

To begin with, *he should consider himself responsible for all the people of his amphur*. This is in contrast to the usual practice among health personnel around the world who consider themselves responsible for those who come for health care but not for those who do not. I call this perhaps irreverently, the cafeteria approach to medical care—those who need and want, come and get it; we will do our utmost to serve you. But we know that many in need do not come and many needs cannot be met within institutional walls.

The decision to try to serve all the people of a population profoundly influences every step of planning and allocating for health care. Since resources are limited and all needs cannot be met, it requires care in deciding which needs should be met. And whatever is done for a few must be interpreted in terms of the needs of all.

Questions such as this must be asked: if all children cannot be cared for, who should be cared for? Those whose mothers know enough to bring them for care? Or those who are being slowly destroyed by malnutrition but whose parents do not know the need for seeking help? Another question: if the health service can provide obstetrical care for only 15% of the women, which 15% should it be? Currently it is the 15% who live nearby and who seek care, but if we are concerned about the entire population, it should be the 15% who are at greatest risk, that is those who are most seriously threatened by the pregnancy.

The physician cannot personally meet all needs but will have to depend on the members of his health team to handle many of the problems. Indeed, if he is to fill the role of leadership that awaits him, they will have to make the first decisions on most health problems, referring to him only those problems that require his professional skill. This is

feasible because many health problems are relatively simple or at least repetitive and can be taught to non-physicians. Midwifery is an example; diagnosis and treatment of simple medical problems is another.

But for non-physicians to fill these roles well requires constant coaching, guidance, encouragement, and consultation from the physician. We must bear in mind that the 50,000 people of a district will be living in 50 to 100 communities; almost all work at the community level, therefore, must be done by auxiliaries.[4] *Auxiliary personnel represent the critical connection between the health service and the people at community and home level, and one of the physician's most important tasks is to be certain that this connection is effective.* Notice how interdependent the members of the health team are: the physician, nurse, and sanitarian provide leadership, planning, and supervision, but they are dependent on the members of the team for implementation of the programs.

One of the physician's most critical roles is to make wise decisions on what his team should do and how they should do it. He must lead his team in assessing the health deficits in his district, in placing them in an order of priority, in developing solutions together with alternative solutions to the leading problems, in making choices among the alternatives with a concern for comparative costs and benefits, and in developing means for assessing the effectiveness of programs that are implemented. In the professional world of health care, this is surely one of the most complex problems with which physicians are faced.

I could go on describing the job of this young person, including for example, the surgical and obstetrical skills he should have. But you can appreciate the range of problems he will face and the technical, managerial, social, and ethical implications of those problems.

Unfortunately, current approaches to medical education fall far short of providing the preparation that is needed. The orientation of most of medical education and its physician products centers on

4) Auxiliary health workers have less than full professional qualification, usually below university level, and assist and are supervised by professional workers.

the care of individual patients in a hospital or well-equipped clinic. While there is growing recognition of the importance of teaching physicians how to take care of communities of people, it receives modest emphasis, and we as educators have limited skill in teaching it. The point here is not to argue for one over the other; both the care of individuals and the care of the many are inseparable parts of comprehensive health care. The point is that a good education for one is not necessarily an adequate education for the other. There is a wide area of learning common to both, but there are skills, knowledge, and attitudes involved in caring for communities that are not learned in the hospital setting. Indeed, to add to medical education this other dimension of caring for large numbers of people calls for an education of considerably more sophistication than we are accustomed to.

THE CHALLENGE TO UNIVERSITIES

A major challenge to universities around the world is to develop educational programs for teaching their graduates to provide health care for large numbers of people. The challenge is as strong to the universities in the United States with its deprived populations in rural and ghetto areas as it is to those of Africa, Asia, and Latin America. At the beginning, I said this relationship between health needs and medical education could be used as a framework for discussing challenges that confront universities and difficulties universities are having in responding to those challenges. I suggest there are two areas within the university that are not only responsible for some of the inadequacies of medical education but are also obstacles to recognizing and correcting them. One of these areas involves traditional approaches to developing teaching programs; the other involves the institutional mechanisms whereby universities identify and solve their problems.

In considering the limitations of traditional teaching programs, we can begin by questioning the department-oriented, course-oriented approach to education. The development of most medical educational programs begins with curriculum design, which usually has the purpose of dividing teaching time among departments. Each department then

decides what it is going to teach, teaches it, then examines the students on what it has taught. This approach to education is based on the assumption that these individual learning experiences will add together so that in the end the graduate will be able to do the job that is expected of him.

But now we are learning that the graduates of these programs, even those who get high grades on what they were taught, have serious deficiencies in areas of health care where the need is deep and urgent. We seem to lack the capability for deciding, *as an institution*, what the graduate should be able to do and for designing educational programs that will prepare him to do those things. The final test of an educational program should be what the graduate does, not what he was taught. A somewhat childish analogy would be the teaching of swimming—the final test should be how well the student swims, not what he was taught.[5] Thus, if the final examination in medical school evaluates the kinds of behaviour, knowledge, skills, and attitudes the institution thinks a physician should have at that stage of life, then the examination is measuring both the performance of the students and the effectiveness of the teaching program.

But this suggestion—that the institution, acting as an institution, determine educational objectives and then evaluate the extent to which those objectives are accomplished—runs hard against current practices and institutional power structures. The walls around departments are high, and departmental prerogatives are tightly held. In addition, it is an exacting task to determine institutional objectives that reach beyond such platitudes as: "we want to produce a good doctor", to specific competencies such as: should he be able to do a Cesarean section? Should he be able to analyse the health problems of a rural district or a crowded urban slum? If so, what kinds of problems? Should he be able to evaluate the effectiveness of a health program? To ask and answer the right questions calls for interdisciplinary inquiry and lack of departmental possessiveness that would be unusual in most universities. But to shrink from such an institutional approach

5) George Miller, "Evaluation in Medical Education: A New Look." *Journal of Medical Education*, vol. 39, pp. 295-296, 1964.

means we are doomed to hoping that individual and often isolated departmental activities will somehow add up to what is needed. We should not settle for that uncertain arithmetic in the face of such serious problems.

Another illustration of the serious limitations of institutional dependence on departmentally-oriented teaching programs is seen in the teaching of community health care. In the past, as universities recognized the inadequacies of their educational programs with respect to communities, they used the mechanism that comes naturally to universities—giving the responsibility to a department, usually called a department of preventive or social medicine. While there have been occasional successes in this departmental approach, the results have more often been disappointing. The failures have certainly not been due to lack of diligence and concern on the part of these departments but, I suggest, to a fundamental misreading of what is needed.

The central objectives of the university in community health programs are two: one is to prepare young people to work effectively in providing comprehensive health care for large numbers of people. The second, which is necessarily related to the first, is for the university to be deeply enough involved in the health care systems of the country to understand intimately the roles its graduates will fill, for only then can it know what must be taught. In reality, health care systems that can provide effective care for large numbers of people on limited resources have not been satisfactorily developed, and universities must play key roles in their development.

The range of action required to achieve these objectives would be exceedingly difficult for a single department to undertake and is best handled by an institutional or inter-institutional program. For example, the university's community health program should be based on actual health care programs for defined rural and urban populations; these will have to be developed in concert with the ministry of health or municipality and with close cooperation with the community itself. And since health care will be provided by teams of health workers with the physicians as their leaders, the education of medical students must be effectively related to that of the other members of the health team. Finally, the focal point of the program is the provision of *total*

health care, which cannot be encompassed by a single department but requires contributions from all disciplines of medical care. Community medicine is not a discipline itself but a style of approaching problems that involved a number of disciplines.

Thus we have identified two areas—one in curriculum development, the other in community health care—in which the university is hampered if it cannot act in ways that cut across departmental lines. Now we can go on to another point. This departmental orientation is not simply a matter of pedagogical custom but is also embedded in institutional mechanisms for identifying problems and developing solutions.

Most decisions having to do with the university's role in health care and the education of health personnel are made in the medical school by an executive committee or faculty board composed of the dean and departmental heads, and the dean himself is often a departmental head. This decision-making structure has two serious weaknesses.

First, the existing departmental orientation to staffing, budgeting, institutional decision-making and even professional prestige, contributes a strong tendency to react to new problems with departmentally-oriented answers. As noted, it is becoming increasingly clear that some of the most important problems cannot be adequately handled through departmental programs.

Second, new challenges to universities--new developments in educational methods, new and beckoning areas of research, the rising needs of society, and the growing complexities of the universities themselves - cannot always be effectively met by a decision-making body composed primarily or solely of a dean and departmental chairman. There will be missing areas of competence without which these challenges cannot be evaluated and appropriate solutions developed.

This is not the place to enter into a detailed discussion of the institutional changes that are called for, but we would like to suggest here two major changes from the usual organizational structure.

One would be to give responsibility, authority, and budgetary support to selected interdepartmental or institution-wide programs.

Examples already discussed would be for an institutional approach to curriculum development and implementation; another to the institution's involvement in community health care. I am not suggesting that departments be abolished, but rather that we recognize the areas where departmental action is not as effective as inter-departmental action.

The second change would be to provide more adequately for planning and decision-making capability at the leadership level of the institution. There is the possibility of changing from the current leadership pattern of the dean and departmental chairman to the dean plus those who are responsible for the major programs of the institution. These might include persons responsible for undergraduate education, graduate education, nursing, community health, the education of paramedical and auxiliary personnel, research, the university hospital.

In addition, there should be a person with managerial competence. It is time we recognized that the educational, research, and health care programs of a university are extremely complex, and to run them well calls for advice from people who are skilled in handling complex activities. A manager with capability in systems analysis is an example of the kind of person that is needed.

Whatever the details, a more flexible, more effective organizational structure is needed if universities are to respond effectively to the increasing number of new challenges with which they are confronted. The central challenge is, of course, how to turn the considerable resources of the universities to producing physicians and other health personnel who are in fact prepared to handle the urgent problems of their nation.