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9. ABSTRACT
 Bangladesh, with its estimated 78 million people inhabiting an area the size of Wisconsin, has been experiencing a growing imbalance between the numbers of its people and the carrying capacity of the land. According to the Bangladesh government, 50 percent of the population is suffering from malnutrition. If the current population growth rate of three percent continues, the 1998 population will be 145 million, or 950 persons per square kilometer. Reliable health statistics are notably lacking in Bangladesh. Available information indicates that the current crude death rate is about 17 per 1,000; average life expectancy at birth is 48 years. The infant mortality rate is estimated to be 140 per 1,000 live births; 40 percent of all deaths occur in the 0-4 age group. The immediate causes of most deaths are infectious diseases such as cholera, diarrheal diseases, tuberculosis, and measles. Malnutrition is often a contributing factor. General malnutrition stems from four factors: (1) the rapid population growth, which is offsetting any gains in agricultural production and distribution; (2) a low per-capita income, which limits the quantity and quality of food consumed; (3) a high incidence of diarrheal diseases; and (4) dietary attitudes and practices that restrict nutrient intake. The only official document on national health policy in Bangladesh is the chapter on health in the First Five-Year Plan, 1973-1978. The Plan advocates establishing an integrated and comprehensive rural health care system aimed primarily at infants, children, and mothers. However, government actions have not been consistent with the Plan, and the original goal of establishing at least one 25-bed hospital and outpatient clinic in each of the 356 rural counties has evidently not been emphasized. Scattered government health services have had minimal effects. While Bangladesh has about 7,000 physicians, over 75 percent of them are working in urban centers. Medical education has been hospital-oriented, with minimal emphasis on public health, and many graduates prefer to emigrate rather than remain in Bangladesh. The lack of trained and licensed

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nurses represents the most critical manpower shortage in the country. In 1973 the country had only 700 nurses--all urban-based and hospital-oriented. A potable water supply is available to only a small fraction of the Bangalee population. Of 185,000 tubewells in rural areas, 30 percent of them were reported in 1973 to be inoperative because of silting or poor maintenance. The Five-Year Plan called for an increase of 286,200 tubewells, to be provided by UNICEF. Little progress has been made in construction of either tubewells or watersealed latrine slabs. Examination of the Bangladesh national budget reveals that health is not a national priority. Health funding is less than five percent of the total budget, with very little allocated for rural primary care services. However, the new national leadership is apparently beginning to grapple with the urgent health problems. The most critical need is to control fertility to slow the rate of population growth.

SYNCRISIS:
THE DYNAMICS OF HEALTH

*An Analytic Series on the Interactions
of Health and Socioeconomic Development.*

XVII BANGLADESH

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
OFFICE OF INTERNATIONAL HEALTH
DIVISION OF PROGRAM ANALYSIS

SYNCRISIS
THE DYNAMICS OF HEALTH

An Analytic Series on the Interactions
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XVII: BANGLADESH

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PREFACE

This document was prepared within the Division of Program Analysis of the Office of International Health, Public Health Service, U.S. Department of Health, Education and Welfare, at the request and with the support of the U.S. Agency for International Development (AID). It is part of the Syncrisis series, which consists of country profiles describing and analyzing health conditions in particular countries and the impact of those conditions on the countries' socioeconomic development.

The primary purpose of these studies is to provide a concise and up-to-date introduction to the health situation in a country, for use by AID and throughout the international health community. The studies do not necessarily reflect United States government policy, and do not include recommendations for specific programmatic actions by AID. They do provide a background against which further analysis and health program development may occur.

Specifically, Syncrisis studies are intended to acquaint the generalist in development administration with (1) interventions in the health system of the country which will contribute to socioeconomic development, and (2) the effects of other developmental activities in health. To the specialist in comprehensive health planning, they will provide both a preliminary document for his work, and an indication of the sources of information available for health planning in that country. For the specialist in a specific aspect of health care, Syncrisis studies are intended to provide insight into the relationship of the subsystem with which he is concerned to the comprehensive health system and the larger society. For each of these professionals, Syncrisis studies are intended not as a final definitive document, but rather as a point of departure from which their own professional skills can be applied to develop activities that will benefit the country.

In addition to the principal target audience, which will probably include a few dozen persons for a specific country, it has been demonstrated that Syncrisis studies are useful to others. For this reason the studies are published and made available for sale to the public. Some consideration is given in the preparation of the documents to their possible use in health science education in the subject country, in international health education, and by scholars concerned with more general aspects of the country or with closely related sectors.

Syncrisis studies form an unusual resource for the student of comparative health systems. They present, in a uniform format, parallel descriptions of health systems in countries with widely varying cultural, social, economic, and government systems. It is hoped that in the future this aspect of the Syncrisis series can be of increasing value.

The research for the Bangladesh Syncrisis has consisted primarily of the utilization of resource documents available in the United States. Supplemental information was provided through personal interviews with individuals having first-hand knowledge of Bangladesh.

Although every effort has been made to obtain an accurate and comprehensive picture of the health situation in Bangladesh, the nature of the research itself, the limitations of statistical base of the country, and the changing political climate have served to constrain the completeness of the document. Therefore, all figures and analyses expressed are tentative and must be interpreted with caution. More importantly, it should be noted that varying lengths of sections of this study reflect the availability of information on the given topic, rather than a desire to assign relative importance to the diverse health problems of the country.

I am personally indebted to the many people who gave of their time to discuss the Bangladesh health sector. Special thanks must go to the following individuals: Dr. Richard Cash, Ms. Ishrat Husain, Dr. Taek Kim, and Dr. Colin McCord.

I would like to express my appreciation to Paul Ahmed, Dr. John Daly, John Gallivan, and Nancy Pielemeier of the Office of International Health for the editorial support and criticisms. Finally, special thanks must go to the secretarial staff, Ms. Jessica Auerbach, Ms. Kathleen Howard, and Ms. Vicky Ugas, who patiently struggled through the entire initial-rough-draft-to-final-copy-for-publication process.

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List of Abbreviations

ADP	Annual Development Program
BRAC	Bangladesh Rehabilitation Assistance Committee
CRL	Cholera Research Laboratory
DPHE	Department of Public Health Engineering
FWW	Family Welfare Worker
FY	Fiscal Year
GDP	Gross Domestic Product
GNP	Gross National Product
ICNND	Interdepartmental Committee of Nutrition for National Defense
IDA	International Development Association
IU	International Unit
IUD	Intrauterine Device
LHV	Lady Health Visitors
MCH	Maternal and Child Health
MOHP	Ministry of Health, Population Control, and Family Planning
ODM	United Kingdom's Overseas Development Ministry
RHC	Rural Health Complex
SIDA	Swedish International Development Authority
TK	Taka
TREC	Directorate for Training, Research, Evaluation, and Communications
UNFPA	United Nations Fund for Population Activities
UNICEF	United Nations Children's Fund
U.S.	United States of America
USAID	United States Agency for International Development
WASA	Water Sewerage Authority
WHO	World Health Organization

BASIC COUNTRY DATA

Population	78 million (1975)	Gross National Product	US\$5 billion (1975)
Population density	502/sq. kilometer	Gross National Product, per capita	US\$70
Percent 0-15 years old	45%	Annual public sector health expenditure, per capita	US\$0.25
Population growth rate	3% per year	Percent literate	20% (1975)
Crude death rate	17/1,000 persons	Population distribution	94% rural; 6% urban
Crude birth rate	47/1,000 persons	Surfaced roads	3,840 kilometers
Infant mortality	140/1,000 live births	Percent unemployed	30% (1974)
Maternal mortality	5.7/1,000 live births	Currency Equivalents 1973:	7.55 Taka = US\$1
Average life expectancy	48 years		1975: 13.00 Taka = US\$1

	<u>Rural</u>	<u>Urban</u>	<u>Average</u>
Percent of population with access to potable water	<10%	<25%	<10%
Percent of population with access to sewerage	a	<10%	<5%
Percent of children ages 1-4 with moderate/severe protein calorie malnutrition	a	a	a
Population per hospital bed	15,665	500	6,000
Population per physician	40,000	2,674	10,714
Population per nurse	*	6,685	111,430
Population per allied health personnel ^b	5,550	3,170	5,315

* there are very few rural nurses

a not available

b trained midwives, lady health visitors, sanitary inspectors,
compounders/dressers, lab technicians and field auxiliaries

CHAPTER ONE

AN OVERVIEW OF THE BANGLADESH HEALTH SECTOR

Bangladesh, a land of cultural and geographic uniformity, is marked on the one hand by a long historical tradition, and on the other hand, by its recent emergence as a national entity. Born in a spasm of repression, civil war, and destruction in the early 1970's, Bangladesh is now struggling to maintain its national viability. The exhilaration of independence and the promise of self-determination have, by mid-decade, given way to basic uncertainties concerning the country's future.

The source of these uncertainties lies in the growing imbalance between the population and the carrying-capacity of the land. In mid-1975 with an estimated 78 million people inhabiting an area the size of Wisconsin, Bangladesh is one of the most densely populated countries in the world. Although all available land is being utilized, the population pressures, already great, are expected to increase tremendously in the future. The current annual population increase of 3%, if unabated, would produce a 1998 population of 145 million Bangladeshis, or 950 persons per square kilometer. Such a density would not only have extremely negative impacts on the health status of the population, but would probably make questionable the very survival of Bangladesh as a political entity.

As in many developing countries there is a notable lack of reliable health statistics. What information is available paints a picture common to the Third and Fourth Worlds. The current crude death rate is approximately 17 per 1,000; average life expectancy at birth is 48 years; infant mortality rate is estimated to be 140 per 1,000 live births; 40% of all deaths occur in the 0-4 age group; and, maternal mortality is a high 5.7 per 1,000 live births.

Infectious diseases such as cholera, diarrheal diseases, tuberculosis, and measles are the immediate causes of most deaths. The underlying factor contributing most heavily to death and sickness, however, is malnutrition. The Bangladesh Government has stated that at least 50% of the population is suffering from some degree of protein-calorie malnutrition.

The greatest impact of malnutrition is on children and women of the reproductive age, especially pregnant and lactating mothers.

The general malnutrition of the populace can be attributed to four key factors:

- rapidly growing population, offsetting any gains in agricultural production and availability;
- a low per capita income limiting both the quantity and quality of food consumed;
- a high incidence of diarrheal diseases contributing ominously to nutritional deficiencies; and,
- dietary practices and attitudes that restrict nutrient intake.

The average Bangalee's diet is based heavily on rice. Although the essentials of a good diet are present, actual food intake is poorly balanced. Some pulses provide the principal source of protein; when pulse intake drops, deficiency becomes more prevalent. Moreover, deficiencies may be compounded by the lack of knowledge among the people concerning the special needs of growing children and pregnant and lactating women.

The main thrust of nutrition programs has been food supplementation activities. Current plans call for continuing the supplementation programs, increasing nutrition education, and the establishment of an Institute of Public Health Nutrition.

Over the past decade there has been only a slight reduction in communicable diseases. What progress has been made has been the result of unipurpose campaigns mounted with foreign assistance. Success has been most prominent in the malaria and the smallpox programs. Unfortunately, preventive health programs have not had wide geographic coverage, and partially as a consequence, immunization levels are low. Chronic diseases play a relatively minor role in overall death rates, especially in light of the heavy contribution by communicable diseases to morbidity and mortality levels.

National Health Policy

Presently the chapter on health in the First Five-Year Plan, 1973-1978, is the only official document on national health policy. Although subsequent governmental actions appear to modify and conflict with the Plan, no official change has been made in the published statements. The Plan advocates the establishment of an integrated and comprehensive rural health care system aimed primarily at infants, children and mothers - a major step away from the current system of health care, which is urban-based and curative in nature. The Plan stresses the need to make low-cost health care available to the majority of the rural population, and the desirability of attacking communicable diseases, identified as the main source of mortality and morbidity, on a broad comprehensive front, rather than through a series of unipurpose programs.

In order to implement this general national health policy, the Plan proposed that at least one 25-bed hospital and outpatient clinic (Rural Health Complex - RHC) be established in each of the 356 rural thanas (counties); each one to be supported by three outpatient subcenters at the 1,068 union levels (subdivision of the thana). Each RHC was to be staffed with five doctors and five nurses, fifteen paramedics and technicians, and twenty-four support people. Additionally, each subcenter was to have a staff of eleven, including one physician. Each thana would thus have eighty-two health-related individuals on staff.

The RHC was to be the hub of the referral system. It would provide the curative health services beyond the capacity of the subcenters, the logistic support, and the administrative coordination. The subcenters would provide primary preventive and curative care, family planning services, and health education. The key members of the health team at the subcenter were to be paramedical personnel, called family welfare workers (FWW). Their duties would include immunizations, maternal and child health, family planning services, basic sanitation education, routine treatment of minor ailments, and other simple health tasks, including record-keeping, and health and family planning education.

Because of events since 1973, the original health policy has not been realized. Plans have been dropped for the immediate construction of the 25-bed wards in the RHC's. The intention now is to attach a 6-bed maternity ward to each rural outpatient clinic. Also, there has been a reduction in proposed staffing patterns, although the exact number and type of personnel for each RHC has not been redesignated.

The Plan gave the responsibility for implementation of health and population programs to the Ministry of Health and Population. Since 1973 the structure of the Ministry has changed. In 1975 the Ministry was divided into two separate divisions - the Health Division and the Population Control and Family Planning Division. In effect, that de-emphasized the initial concept of an integrated rural health and family planning program. In place of the integrated approach there has emerged a separate field staffing pattern that has one division concentrating on health and the other division focusing on family planning and maternal and child care activities.

The planning process is hampered by a lack of information. An adequate statistical base on disease incidence simply does not exist. For that reason the only operational goals which were firmly fixed in the Plan were in terms of numbers of facilities and personnel. Success or failure of a plan can only be evaluated when the result can, in fact, be identified and compared to a prior situation. In Bangladesh, presently, that can only really be done in terms of buildings and trained medical people. Given the magnitude of Bangladesh's health problems and its scarcity of resources, the need for improved health planning and health information systems appears to be obvious, but the Plan makes no mention of that need.

The responsibility for planning and administration of the Government's activities in the health sector has been vested in two separate bodies: the Planning Commission and the Ministry of Health, Population Control and Family Planning. The Planning Commission is directly responsible for the planning, evaluation, and approval of all health-related projects. It also has an intersectoral coordinating function so that projects impacting in several sectors will be adequately integrated.

Health Services

At the present time health services are being delivered in three distinct patterns:

- The centralized public system based upon the concept of the RHC with a system of referral from the small subcenter all the way to the urban-based hospital.
- Scattered private services, ranging from community cooperative health insurance plans to individual private physician care.
- Traditional services based upon folk beliefs and herbal treatments.

The vast majority of the population is served by the third method - traditional. The governmental health services are widely scattered throughout the countryside with some concentration in the urban areas. Their effect on health patterns has been minimal. The most effective medical care is probably rendered by the urban-based private physician and a few private community instituted health services, such as in Savar thana.

Health Resources

Bangladesh has approximately 7,000 physicians or a nationwide doctor/patient ratio of 1/10,714. Over 75% of the doctors are working in the urban centers. This geographic imbalance in distribution is symptomatic of the general malady affecting health manpower resources. The vast majority are general practitioners. About 30% of the doctors are employed by the Government, though all have private practices. Medical education has been hospital-oriented and curative in nature, with a minimal emphasis on public health. The result has been a high-quality physician, suited better for practice in the developed world than at home. Moreover, many graduates prefer to emigrate rather than remain in Bangladesh.

Currently there is an annual output of about 500 doctors from the country's seven medical schools. By 1978, according to the Five-Year Plan, that annual output should increase to over 1,000. Alleviation of Bangladesh's manpower problems will be dependent on several factors: reaching potential manpower output; redirecting the medical curriculum towards community health; redistributing graduates towards the rural areas; and, greater utilization of paramedical personnel, all of which are difficult to accomplish in the short term.

The exact number of dentists working was not discovered. Although a dental college does exist in Dacca, information on its annual number of graduates was unavailable. Reports put the number of foreign-trained dentists at two - both in Dacca.

The lack of trained and licensed nursing personnel represents the most critical manpower shortage in the country. In 1973, Bangladesh had only 700 nurses - all urban based and hospital-oriented. The inadequacy of nursing services is evident in light of the doctor/nurse ratio of 10/1. The Five-Year Plan, 1973-78, has given a high priority to the training of additional nurses, and it has proposed to augment the total number of nurses by about 1,700. This should improve the doctor/nurse ratio to 4/1. As with the doctors, it will be necessary to redirect the nurses into public health and out into the rural areas.

The nation's remaining health personnel who are formally trained in Western medicine are generally limited in number, although their geographic distribution is not as concentrated as doctors and nurses. The Five-Year Plan reported that there were 250 trained midwives, 275 Lady Health Visitors (LHV), 980 sanitary inspectors, about 200 technicians, less than 1,000 auxiliary personnel, and about 12,000 male smallpox and malaria workers. Unreported, but widespread are the local curers employing traditional methods of medicine.

The Five-Year Plan calls for a dramatic increase in paramedical personnel. Many of the unipurpose smallpox and malaria workers have been given additional training and have been renamed Family Welfare Workers (FWW). The FWW are the core of the rural health system at the RHC and subcenters. Another 7,500 female workers are to be trained to provide family planning and maternal and child health services at the village level. Other personnel to be added in five years include 290 LHV's, 381 midwives, and 624 technicians.

The shift away from the training of curative-oriented physicians towards the training of a community health team is certainly encouraging. The important question is whether this new manpower will be effectively and efficiently channeled into an adequate health infrastructure. If that can be done, Bangladesh will begin to have the basis of a comprehensive health care delivery system.

As of June 1973, Bangladesh had 12,311 hospital beds of all categories of which 10,449 were in the public sector and 1,862 in the private sector. At that time, the only general hospital beds available to the rural population have been provided by the private sector, mostly church-related voluntary organizations. Nationwide there is a hospital-bed/population ratio of 1/6,000. Observers have reported hospitals in Dacca to be extremely overcrowded, and unsanitary. Such conditions are certainly conducive to a decreased quality of medical care.

In the rural areas, the only public health facilities available are the Rural Health Centers, of which there are approximately 160 scattered around the countryside. Laboratory facilities throughout Bangladesh are rudimentary, except for the Cholera Research Laboratory (CRL) which provides a sophisticated base for research and training. Health training in 1973 was provided at seven medical colleges, five nurses' training centers, three Lady Health Visitors' training centers, one training institute for paramedical workers, and one dental college.

The Five-Year Plan calls for an increase in the number of RHC's from 160 to 356, and in the outlying subcenters from none to 1,068. It has also proposed that another 7,231 hospital beds be added. Whether the Government of Bangladesh should invest in health services at so rapid a rate is questionable. Perhaps, with major foreign assistance, the Plan's goals concerning health resources could be reached, as several donors have been participating actively in this sector, but the likelihood of their attainment by 1978 appears slim.

Environmental Sanitation

A potable water supply is available to only a small fraction of the Bangalee population. Consequently, there is a high incidence of water-borne diseases: typhoid, cholera, gastroenteritis, etc. Although water itself is available in abundance, the means of providing a clean and sanitary supply is not. According to the Planning Commission in 1973, there were only 185,000 government tubewells in the rural areas and only thirty of the more than seventy-six urban centers had piped water. Unfortunately, even these numbers are misleading, for it has been estimated that approximately 30% of all of the rural tubewells were inoperative, either through silting or poor maintenance, and that many of the urban systems provided running water only four or five hours daily.

The Five-Year Plan has called for an increase of 286,200 shallow and deep tubewells, the majority of which are to be provided by United Nations Children's Fund (UNICEF). In addition, water supply systems were to be installed in thirty-eight urban centers, including all the district and subdivisional headquarters, and the water supply capacity was to be improved and enlarged in seven other important towns.

Pilot projects aimed at constructing watersealed latrine slabs have been started, and UNICEF had plans to provide 100,000 latrine slabs by 1974. Dacca is the only urban center in Bangladesh that has a relatively modern sewage system. The remaining cities, including Chittagong, are without modern systems and as of 1974 there were no definite plans for their construction.

The level of environmental sanitation is thus appallingly low. As long as a safe water supply and an adequate waste disposal system are unavailable to the majority of Bangalees, the overall health status of the population cannot improve appreciably.

Health Financing

Examination of the Bangladesh national budget reveals that health is not a national priority. The Five-Year Plan calls for an outlay of approximately US\$390 million for health and family planning over the total five-year period. On a yearly basis health funding is less than 5% of the total budget. Health expenditures per capita amount to US\$0.25. To date most of the funds have been directed into capital projects and hospital-based curative programs, rather than the rural primary care services. Total centralization and the lack of administrative direction have hampered efficient disbursement of funds. A restructuring of the financial allocation process and reordering of budgetary priorities towards stated health goals, few as they are, are essential to improving health status in a cost-efficient manner.

Donor Agencies

The contributions of international, multilateral, bilateral, and private voluntary agencies have been generous. The range of health and health-related projects in which they

are involved is diverse: food and nutrition programs, health education and training, and provision of medical care and family planning services. Although widespread, these programs have evidently managed to retain a large degree of coordination through informal mechanisms. Still the danger exists for duplication and redundancy of programs. The Planning Commission should define and formalize its coordinating activities in light of national health priorities, so that resource allocation can be optimized.

In summary, Bangladesh is in the unenviable position of having one of the planet's lowest levels of health and one of its greatest population growth rates. After three years of governmental indecision, the new national leadership is apparently beginning to grapple realistically with the urgent problems facing the country. Clearly, the most critical problem is the need to control fertility. At this point Bangladesh threatens to present the world with its first Malthusian disaster. As a consequence, health policy and programs need to be structured so that they support the reduction of excess fertility.

CHAPTER TWO

BACKGROUND INFORMATION

Geography

Lying at the foot of the great Indo-Gangetic Plain of the Asian subcontinent, the character of the People's Republic of Bangladesh is marked by its uniform deltaic terrain. With a total area of 55,598 square miles - about the size of Wisconsin - this irregularly shaped country is almost entirely an alluvial plain formed by the many branches of the Padma (Ganges), Jamuna (Brahmaputra), and Meghna rivers. The only significant elevations are in the Chittagong Hill Tracts in the southeast, and in the Sylhet District of the northeast.

Located in about the same latitude as Mexico, Bangladesh is bounded on the west, north, and east by a long land border (1,500 miles) with India, continued in the southeast by a short land and water border (120 miles) with Burma. The southern coastline, fissured by innumerable streams and rivers, disappears haphazardly into the Bay of Bengal.

The dominant feature of the country, its provider as well as its destroyer, is its profusion of rivers, flowing generally north to south. On the one hand the rivers provide the land with a tremendous infusion of fertile soil drained from a vast area of the subcontinent and the Himalaya Mountains, and, on the other hand, the same rivers destroy life and property during their periodic floodings. Moreover, the river systems establish the lines of communications and transportation and determine settlement patterns throughout the country. It must be added that Bangladesh is essentially flat. Most elevations are less than thirty feet above sea level, although higher elevations are found in the northern section of the country and along the Chittagong Hill Tracts on the Burmese border. The Chittagong Hills form a series of narrow, roughly parallel, forested hill chains, which are generally no wider than 120 feet and rise to about 2,000 to 3,000 feet above sea level.

Climate

Bangladesh is often characterized as having a humid, tropical monsoon climate. Climatic differences from place to place in this flat country are minor by comparison with those in a more varied terrain. Three seasons within the year are generally recognized: a hot "summer" season of high humidity from March to June, a somewhat cooler but still hot and humid monsoon season from June through September or early October, and a cool, drier "winter" season from mid-October to early March. January is the coolest month; the hottest are April and May. Temperatures between 100°F and 105°F are occasionally recorded, but these are unusual and of short duration. Daily temperature ranges are moderate to minor, seldom exceeding 30°F in the cool months and usually not more than 20°F during the other months of the year.

Winds are a highly significant element of weather and climate in the life of the country. They occur in three principal categories: rain-bearing monsoon winds off the sea; the violent thunderstorms called "nor'westers"; and, the more infrequent tornadoes.

The southwest monsoon, constituting a whole season of the year in itself, is the most important of these. About three-quarters of the country's annual rainfall comes from the monsoon. Six to eight times a year the winds created by the monsoon build up to cyclone force. September through October, especially the latter month, is the time when cyclones are most likely to occur, although it is not unusual for them to strike during November or December.

The heavier cyclones, or supercyclones, are national disasters. The storm of November 12, 1970, and the consequent high tidal wave the next day resulted in an estimated 300,000 killed. Though the monsoon period is a time of danger, a failure of a monsoon, as in 1972, typically results in widespread crop failure and may then be equally dangerous.

The land-originated thunderstorm squalls, which occur during the premonsoon months of March through May provide the country with one-fifth of its annual rainfall. The average annual rainfall varies from between fifty and sixty inches in the west to 100 inches or more elsewhere. In the Sylhet District annual precipitation exceeds 200 inches.

Throughout the year humidity is high. Even during the cooler months of November through February, the relative humidity ranges between 75 and 80%.

History

Though a new nation, the roots of Bangladesh lie deep within a culturally and historically rich past. The geographic region of East Bengal has been a racial and religious melting pot for successive influxes of disparate peoples - Dravidians, Aryans, Mongolians, Arabs, Persians, and Turks. Although linked with the great empires of the subcontinent, the area maintained an extremely independent position. Its deltaic geography made it remote and inaccessible until the sixteenth century when the Mughal emperors decided to exploit the region's agricultural wealth and to open the area to trade.

Bengal had a high degree of cultural contact with the religious and social movements of the subcontinent, which was manifest in its scholars, institutions, and architecture. Although Buddhism and Hinduism were practiced in the early years of Bengal's history, they were replaced in importance by the introduction and mass acceptance of Islam in the thirteenth century. Islam continues to exert considerable religious and cultural influence, and about 85% of Bangladesh's population professed to Islam in the mid-1970's.

During the period of the Mughal Empire, Dacca assumed importance as the headquarters of local Muslim rulers owing allegiance to the Emperor in Delhi. This was a period of prosperity for Bengal as the local cloth industries thrived and agricultural production increased.

As Mughal power declined and European power politics worked in Great Britain's favor, the British East India Company increased its influence throughout the subcontinent.

By 1815 the supremacy of the British East India Company was unchallengeable. Having outlasted its European competitors, the British were free to move from the status of merchant in Calcutta to administrator of Bengal. As administrators, they introduced British law, institutions, and customs that eventually provided the base for Bengalis¹ to administer their own affairs. The British failed, however, to provide the area with a viable modern economy. By encouraging the production of raw materials to supply British factories they stimulated agriculture, and through the introduction of cheap British manufacturing goods, reduced the incentive for native industry. In thirty years from 1801 Dacca's population fell from 200,000 to 67,000. Eastern Bengal became a backwater with the administration, trade, and landholding dominated by Hindus and the Muslim majority confined to agriculture.

¹ Bengali refers to the cultural group which speaks Bengali and is located in historical Bengal. Bangalee refers to the citizens of modern Bangladesh.

The year 1857 proved to be a watershed for British rule in the subcontinent. The Sepoy Rebellion occurred during that year and many regarded it as their first war of independence. As a direct consequence of the meeting, the British crown dissolved the British East India Company and assumed direct responsibility for the rule of India. The Government was headed by a governor-general, who embodied the supreme legislative and executive authority and who was responsible to the secretary of state for India, a member of the British cabinet in London.

For administrative purposes British India was divided into provinces, each under a governor. They were in turn subdivided into divisions and then into districts. The district, under the control of a district officer, became the basic administrative unit.

A great transformation took place in the economy in the late nineteenth century. The British authorities quickly set out to improve the means of inland transport and communication. By 1870 an extended network of railways, coupled with the removal of internal customs barriers and transit duties, opened up the interior markets to domestic and foreign trade and further linked present-day Bangladesh to Calcutta. Prosperity returned to Eastern Bengal with the development of the jute cultivation and the revival of weaving.

Up until the latter part of the nineteenth century, the Muslims lagged behind the Hindus, who had adapted themselves more rapidly to changing socioeconomic conditions. Gradually, under the leadership of Sir Syed Ahmed Khan, a beginning was made toward reconciliation between the traditional views of Muslims and the new ideas and educational system being introduced by the British.

In 1905 the British divided Bengal along Hindu/Islamic lines with the object to end the relative backwardness and isolation of predominantly Muslim eastern Bengal and to improve British administration in eastern India. The experiment was shortlived as the Hindus reacted strongly against the partition, even though the Muslims generally supported the division.

Islamic nationalism began to assert itself with the formation of the Muslim League in Dacca in 1906. During the subsequent years prior to World War II, the cry for independence grew stronger on the subcontinent. In the 1930's the concept of a separate Islamic state (formulated by the Muslim League) called Pakistan developed and finally matured into the "Lahore Resolutions" of 1940 which declared "that the areas in which the Muslims are numerically in a majority as in the northwestern and eastern zones of India should be grouped to constitute 'Independent states' in which the constituent units shall be autonomous and sovereign." In the 1946 elections the Muslim League won the majority of the Muslim seats contested in Bengal, thereby indicating overwhelming support by Bengali Muslims for the Pakistan concept.

When British India attained its independence and was partitioned into the two successor states of Pakistan and India on August 14-15, 1947, Bengal again was divided along communal lines. Predominantly Hindu West Bengal was incorporated into India while Muslim East Bengal, to which the Sylhet District of Assam was added, formed the eastern Province of Pakistan or East Pakistan.

Independence did not improve East Pakistan's economic position. The agricultural hinterland was cut off from the region's industrial and banking center at Calcutta. New markets had to be developed for agricultural products, and industrial plants were established for processing and manufacture. The departure of Hindu artisans and merchants weakened the economy, while the influx of Muslim immigrants from India put further strain upon it. The two parts, or "wings" of Pakistan were unlikely economic partners to begin with, and the inequality of the relationship became more pronounced with the passage of time. The

East wing continued in general to be a supplier of raw materials while the West wing built up factories and assumed the role of processor. East Pakistan, with a majority of the population, found itself playing a limited role in the army, the more important organ of the Pakistan state, and taking a subordinate place in the administration. Consequently, the people of East Pakistan developed the feeling that the central government located in the west was oppressing them.

The 1950's were years of political instability for the new state of Pakistan. In 1958 martial law was imposed. In 1962 another attempt was made at political, as opposed to military, rule under a constitution promulgated by the previous military administration. In March 1969, however, that constitution was suspended, and the military once again took the reins of power with the promise of free elections in the future.

During the period of military rule, the status of the Bengalis vis-a-vis West Pakistan remained improved. Bengali resentment gave impetus to a movement for provincial autonomy as a means of redressing perceived imbalances between the two wings of the country. Champion of Bengali aspirations was Sheikh Mujibur Rahman, president of the East Pakistan Awami ("People") League. Mujib, as he was known, in 1966, announced a six-point constitutional plan for reallocating powers between the central government and the provinces.

As promised, elections were held in late 1970. The Awami League of Mujib, riding a crest of popular regionalist sentiment, swept to victory by capturing all but two of the seats allocated to the eastern sector in the legislature and consequently a majority of 60% in the nation. The Pakistan People's Party (PPP) led by Zulfikar Ali Bhutto came in second with a majority in the west but less than 30% in the country.

The military regime of General Agha Mohammad Yahya Khan refused to accept the victory of the Awami League. They feared the effects of the six-point program on the country, especially in respect to fundamental constitutional questions relating to division of powers between the central government and the provinces. When last minute efforts at negotiation failed, the Pakistani Army sought to repress Bengali dissidence. On the night of March 25-26, 1971, Sheikh Mujibur Rahman was arrested, his party banned, and most of his aides were forced to flee to India where they organized a provisional government.

In the ensuing civil war between the Pakistan Army and Bengali insurgents (Mukti Bahini) an estimated ten million Bengalis (mostly Hindus) sought refuge in India, and countless others were displaced in East Pakistan. The loss of life and property was great. After months of escalating tensions between India and Pakistan, the Indian Army intervened in East Pakistan in late November. With the surrender of the Pakistani forces in East Pakistan on December 16, 1971, the new, but heavily war-damaged, nation of Bangladesh emerged.

Mujib, released from West Pakistan in January of 1972, returned to a triumphant welcome in Dacca where he took charge as the prime minister of Bangladesh.

The situation confronting Mujib and his associates was chaotic. The cyclone of 1970 and the war of 1971 had devastated the country-side and had killed hundreds of thousands. The entire economic and administrative infrastructure was a shambles. With the exodus of the West Pakistanis, the country had lost the bulk of its experienced executives, entrepreneurs, and senior government officials. Everything had to be reconstructed. In addition, the incidence of violence continued at high levels, mainly as a result of overarmed citizenry.

Even to attempt to recreate a semblance of normality required a strong, viable civil service, which the Government neither possessed nor attempted to develop. Many of the Bangladeshis who had achieved senior positions in the Pakistani Civil Service had been serving

in West Pakistan when the civil war broke out and were detained there until 1973 and 1974. Even when these experienced officers returned to Dacca, however, they were only rarely given positions of responsibility. Mujib's failure to bestow upon the civil service its traditional immunity from political reprisal prompted some observers to note that Mujib in power behaved as though he were still in opposition.

Over time Mujib's rule became more and more centralized and despotic. On January 25, 1975, Mujib assumed the presidency after his Awami League followers in Parliament amended the 1972 constitution to grant the president powers that are, at least potentially, more sweeping than those exercised by the presidents of Pakistan during the periods of martial law. The Awami League (Peasants, Workers, and Peoples League) was declared the sole legal political party in the country. Members of Parliament were required to join the party or forfeit their parliamentary seats, and members of the Government services were urged to join. Mujib reserved to himself all important decision-making powers within the party.

During the immediate post-independence years the economy appeared to be recovering, revitalized by massive amounts of foreign assistance. However, in 1974 and 1975 development faltered as the population continued to grow, the price of essential imports rose, and the national administration system degenerated. On August 15, 1975, amidst mounting corruption and unpopularity, Sheikh Mujibur Rahman was slain by the armed forces during a successful coup.

Former commerce Minister Khondakar Mushtaq Ahmed, a long-time colleague of Mujib, assumed the presidency. He immediately moved to restore public confidence in the Government by instituting strong programs to curb corruption, and by promising to hold parliamentary elections in February, 1977.

Almost immediately after Mujib's death, an intense power struggle began to develop within the army. Although exact details are obscure, it is apparent that Brigadier Khallid Mashariff, chief of staff under Mujib and who retained that position under Mushtaq, on November 3, 1975, moved against the majors who overthrew Mujib. He arrested General Ziaur Rahman, chief of the army staff and replaced Mushtaq with former chief justice A.M. Sayem. Khallid's power endured a scant three days.

On the morning of November 6, army troops freed General Ziaur Rahman, sparking a spontaneous mutiny within the army ranks. Khallid was captured and killed, along with thirty-four of his supporting officers.

In early 1976, Ziaur has emerged as Bangladesh's strongman, even though Sayem has remained as President. At this point the Government continues to be committed to returning the country to parliamentary democracy in February 1977.

Governmental Structure

The 1972 Constitution, while retaining the four basic principles of state policy - nationalism, secularism, socialism, and democracy - was amended in January 1975 to provide a strong, centralized executive rule. The role of the president was changed from that of a constitutional figurehead to that of a literal monocrat possessed of potentially unlimited powers. Although the 300-seat Parliament continued to exist, its powers were effectively emasculated by the ability of the president to block any legislation with a non-reversible veto. Likewise, the judiciary was made subservient to the executive as the president was given the power of appointment and dismissal of all judges under the amended constitution.

The executive machinery of the Government was composed of twenty-four ministries, and each minister was directly responsible to the president.

The amendment of January 1975 essentially abolished elected local Government as had been provided previously. In other words all governmental decision-making had been completely centralized in the figure of the president.

The civil service has also felt the winds of change. Previously immune from political pressure, members of the civil service had been trained to discharge their activities in an objective apolitical manner. However, since independence, Awami League politicians have demanded preferential treatment from the civil service. As a result, inefficiency and corruption crept into the administration.

Although changes have been planned for some time, the administrative units are essentially the same as the Pakistani era. They are, in order of descending geographical size: Divisions (4), Districts (19), Subdivisions (62), *Thanas* (Police Precincts - 416), Unions (4,041), and Villages (71,000).

Since the coups of August and November 1975, there has been no overt change in the governmental structure. However, martial law has been imposed with the President and triumvirate of military officers controlling the governmental apparatus. As of early 1976 there was a strong movement towards re-establishing the integrity of the civil service and the removal of political appointees from mid-level positions.

Economy

With an estimated gross national product (GNP) of US\$5 billion, and a per capita income estimated at around \$70.00 per annum, Bangladesh is considered among the "least developed" countries in the world. Based almost exclusively on agriculture, the economy has not been able to expand rapidly enough to meet the needs of its constantly growing population. For generations, farming techniques and yields remained relatively unchanged. When no more new land could be cultivated, and technology stagnated, the agricultural output had to be shared with more and more people. Within the lifetime of older Bangalees the area has gone from one with a food surplus to one where nearly one-fifth of the grains consumed, which make up the bulk of the inadequate diet, must be imported.

The disasters of 1970 and 1971 battered an already overburdened economic structure and economic activity declined in all sectors. Since 1971 the Government has struggled to regain pre-independence levels. Unfortunately, population growth has continued unabated. Consequently, the average Bangalee is now poorer than six years ago.

During the years when the area was East Pakistan, an effort was made to promote economic growth through a series of five-year plans. Multiple cropping and irrigation increased land utilization and a small modern industrialized sector was added, although it provided relatively few jobs and was heavily dependent on imports for machinery and raw materials. The economy did grow, in fact, but at best at about the same pace as the population.

The Pakistan development strategy was based on industrialization. There were special problems with such a strategy in East Pakistan, however, particularly because of the lack of natural resources to support industries and the need to find productive employment for the annual additions to the working force. The problems of declining rural incomes, a heavy dependence on imports, and an unfavorable balance of payments were partly obscured in statistics since the flow of goods between West and East Pakistan was carried on in a common currency and largely exempt from outside competition. East Pakistan, however, imported increasing quantities of food and consumption goods for its expanding industrial sector, partially paying for the import bill with increasing exports of manufactured goods to West Pakistan. The import dependence and balance-of-payments problems became immediately apparent in the

1970's when the special relationship with West Pakistan disappeared and foreign trade was conducted in world markets.

Independence in 1971 gave the Bangalees their first opportunity to establish their own economic policies. The First Five-Year Plan, 1973-78, attempted a new emphasis to counteract the deficiencies of the Pakistan development strategy. Growth of the agricultural sector was seen as most important because it accounted for over 78% of the working force, it was the only sector capable of absorbing the large annual additions to the work force, and greater food production would reduce the need for imported grains. Moreover, a sharp advance in rice technology had occurred in the late 1960's, on which agricultural development could be based. Emphasis was also given to small-scale industry, which meant mostly processing local materials for a small market with labor intensive methods.

The break with past development strategy was limited, however. When it came to investment funds, the Plan laid down priorities for several large capital-intensive and import-intensive industrial plants and several large and costly water control projects, even though this kind of investment had shown a poor return in the 1960's. The Plan also required a concentrated effort to mobilize domestic resources to meet the investment goals.¹

The Plan was relatively realistic in setting modest goals and frank in acknowledging the policy and institutional changes necessary to accomplish even these goals. The gross product (GDP) was to grow at an annual average rate of 5.5%, and per capita consumption of such basic commodities as grain, meat, sugar, and cloth was to be only marginally higher in 1978 than in 1970. The Plan anticipated that the 37% of the agricultural work force estimated to be unemployed and underemployed in June 1973 was to be reduced to 32% by July 1978.

Unfortunately, nature and circumstance have not been kind to Bangladesh. The chief natural resources of the country are its fertile soil and its hardworking people, more than 80% of whom are farmers. Water is in abundant supply in most of the country, but floods and untimely periods of drought place that resource beyond the control of the farmer or of those who rely on the rivers for transport. Some lumber is available from the Chittagong Hill tracts and Sunderbans forest areas. Natural gas deposits are exploited for domestic fuel and fertilizer production, but other mineral resources are sadly lacking. Hope has been expressed that oil may be discovered in significant amounts, and intensive exploration is likely to take place, both on- and off-shore, in the next several years. The lack of indigenous stone and cement - not to mention iron, steel, and other metals - also greatly complicates the construction of roads and other public works such as bridges, dams, and coastal embankments, offering vivid testimony that it is not economically feasible for Bangladesh to plan for large-scale industrial development.

Raw jute and jute manufactures provide some 90% of its foreign exchange earnings. Although the jute industry was damaged by the war in 1971, and by the loss of the many Pakistani entrepreneurs and managers, by mid-1972 production had nearly returned to pre-1970 levels. This industry, like other elements of the modest industrial infrastructure was nationalized by the Government.

The staple foodgrain is rice, which is harvested in three seasons. Rice production in 1973-74 is estimated at 12.5 million tons, a 26% increase over the previous year's crop. Other agricultural products include wheat, sugarcane, and tea.

¹ Bangladesh Planning Commission. First Five-Year Plan, 1973-78. Dacca, November 1973.

Given the deltaic nature of Bangladesh, fishing plays a key role in the agricultural sector. Although commercial fishing is not a respected occupation among Bangalee Muslims, nearly all rural families do some fishing. More than 80% of the annual protein in the diet comes from fish.

Livestock are raised as part of overall farming activity. Cattle and buffalo are raised primarily as draft animals, although their milk and meat are consumed as food, the skins sold for processing and export, and the manure used as fertilizer and fuel.

Land reform has made Bangladesh a country of small farmers. Owner-cultivators possessed 66% of all farms and tilled 58% of all farm land in 1960.² The average farm size was 3.1 acres, but more than 50% of all farms were less than 2.5 acres. As in the case of Latin American *minifundio*, land holdings have become extensively fragmented, partly as a result of inheritance under Islamic law.

The damage and disruption to the economy during the civil war created a scarcity of goods that from the moment of independence pushed the economy into an inflationary situation. Imports and domestic production remained low, continuing the scarcity of goods, and deficit financing further fueled inflation. From 1970 to mid-1974 the cost-of-living index for a Dacca worker increased by more than 225%.

The bulk of investment in the First Five-Year Plan was to be in the public sector and the Government's budget, therefore, became a major instrument for mobilizing domestic resources and their allocation. Tables 1 and 2 show the proposed expenditures, by sector, over the Plan's period.

Table 1: PLAN FINANCIAL ALLOCATION

Sector	in Tk. Million			in %		
	Total	Public Sector	Private Sector	Total	Public Sector	Private Sector
Agriculture and Water	10,670	10,410	260	24.0	26.3	5.1
Industries	8,770	7,380	1,390	19.7	18.7	27.7
Physical Infrastructure	16,810	14,790	2,020	37.7	37.4	40.2
Social Sectors	6,060	6,060	-	13.6	15.3	-
Other	<u>2,240</u>	<u>880</u>	<u>1,360</u>	<u>5.0</u>	<u>2.3</u>	<u>27.0</u>
TOTAL	44,550	39,520	5,030	100.0	100.0	100.0

Source: Bangladesh Five-Year Plan, 1973-78, p. 32.
Tk. Million = US\$132,450.00 (1973).

² Nyrop, Richard F., et. al. Area Handbook for Bangladesh. The American University, Washington, D.C., 1975.

Table 2: FIRST FIVE-YEAR PLAN EXPENDITURES BY SECTORS
(in Tk billion)

Sector	Financial Expenditures					Non-financial Expenditures
	Investment	Non-Investment	Total	Public Sector Expend.	Private Sector Expend.	(Private Subsistence Investment)
Agriculture and Water	8.98	1.69	10.67 (24.0)	10.41 (26.3)	0.26 (5.1)	1.29 (22.1)
Industries	7.98	0.79	8.77 (19.7)	7.38 (18.7)	1.39 (27.7)	0.18 (3.1)
Power and Natural Resources	4.15	1.07	5.22 (11.7)	5.22 (13.2)	-	-
Physical Planning and Housing	2.99	1.52	4.51 (10.1)	3.15 (8.0)	1.36 (27.0)	2.42 (41.3)
Transport	4.69	1.25	5.94 (13.4)	5.28 (13.5)	0.66 (13.2)	-
Communications			1.14 (2.5)	1.14 (2.9)	-	-
Education and Manpower			3.16 (7.1)	3.16 (8.0)	-	0.34 (5.8)
Health and Social Welfare			2.20 (4.7)	2.20 (5.6)	-	-
Family Planning	8.90	0.54	0.70 (1.6)	0.70 (1.8)	-	-
Government			0.26 (0.6)	0.26 (0.7)	-	-
Trade			1.70 (3.8)	0.62 (1.6)	1.08 (21.3)	1.01 (17.3)
Miscellaneous Services			0.28 (0.6)	-	0.28 (5.7)	0.61 (10.4)
TOTAL	37.69	6.86	44.55	39.52	5.03	5.85

Tk. Billion = US\$132,450, 330.00 (1973)

Notes: For some sectors, a breakdown between investment and non-investment expenditures has not been made.

Figures in parentheses indicate percentages of column totals.

Source: Bangladesh Five-Year Plan, 1973-1978.

Budget revenues were derived primarily from regressive, easily-collected, commodity-transaction taxes. For example, the proposed revenues from fiscal year 1974 consisted of 35% from custom duties, 24% from excise duties, 11% from sales taxes, 4% from income taxes, 4% from nationalized enterprises, 1% from the land tax, and 21% from all other revenue sources. The level of imports strongly influenced the Government's revenue position.

The tax structure has been lenient to the better-off groups who were best able to contribute to development financing. The individual income tax, which has progressive rates, exempts those with incomes below TK6000 annually.³

By early 1975 the financial side of the Five-Year Plan was in a shambles. The anticipated budget surplus of current revenues over current expenditures had failed to materialize, largely because revenue collection had been less than planned. The accounts were balanced by reducing development expenditures, relying on foreign aid, and deficit financing.

By early 1974 economists estimating the impact of the inability to mobilize domestic resources thought that investment expenditures would fall short of Plan targets by more than one-quarter and that domestic savings would be less than one-half of the amount planned, even with optimistic assumptions. With the realization that the economy was falling short of the Plan's targets, and with increased import prices in 1973 and 1974, the Government decided to scale down the scope of the Plan itself. There was very little hope that enough foreign aid would be forthcoming to bring imports to the level the economy needed, and there was even less hope that exports could be raised sufficiently to make an appreciable impact. The increase in domestic rice prices that had forced farmers to plant rice instead of jute threatened the future of the commodity on which the bulk of the country's export earnings depended. A reduced volume of imports would mean slow industrial recovery and growth, and the scarcity of goods and price inflation would take longer to remedy.

Economists attempting to quantify the impact of developments found the prospects for growth bleak in 1975. The lower volume of import and the shortfall of investments pointed to an economic growth rate less than that of population.

Some difficult policy changes, much needed, were made during 1974. Interest rates were raised, subsidies reduced, taxes increased, and a compulsory rice procurement program instituted. However, overall, the situation has continued to deteriorate. Whether the new Government can reverse the downward spiral of the economy is still unknown, but it is obvious that action is needed if there is to be any possibility of growth.

Transportation

Coastal and inland water transport, although slower than railway, road, or air, account for about 75% of the movement of goods and people. During flood seasons large areas are completely dependent upon water transport.

The countryside terrain and the maze of rivers not only favor water transport but also inhibit the development of other forms of transportation. Generally, airport runway and bridge construction is difficult in the wet, sticky soil, and bridge siting and design are complicated by the continuous minor shifting of channels in the multichannel rivers. Embankments for roads and railways may block natural drainage and cause flooding, and an average of six bridges or culverts per mile of rail line has been required along much of the trackage.

³ 13.00 Taka = US\$1.00 (mid-1975)

Transportation facilities suffered heavy damage as a result of the November 1970 cyclone and heavier and more extensive destruction occurred during the 1971 war. Many bridges, berthing and launch facilities, inland watercraft, railway rolling stock, and trackage were destroyed or left inoperable. Consequently, after independence, Bangladesh faced the major problem of restoring its transportation infrastructure to pre-war levels. Four years later those 1970 levels are just being reached.

Dacca is the focal point of the transportation system. Arterial traffic has been mainly concentrated on the triangle formed by Dacca-Narayanganj in the center and Chittagong and Chalna ports in the southeast and southwest. Secondary and tertiary roads and waterways permeate the whole area of the country though very little is known about the volume and pattern of movement of this kind of traffic.

As of early 1971 there were approximately 5,000 miles of navigable inland waterways of which about 3,300 miles were usable year round, the remainder being seasonal. Regular river steamers operated along 2,600 miles of these waterways. The principal types of craft included about 2,500 registered steamers, motor launches, ferryboats, and barges, as well as some 300,000 "country-boats" ranging in size from a small canoe to larger single-sail boats capable of carrying thirty-five tons of cargo. Registered craft have a yearly carrying capacity of 156,000 passengers and a total of 295,000 tons of cargo, while the "country-boats" move an estimated 17 million tons of cargo yearly.

The inland waterways system, operated under the Bangladesh Inland Water Transport Authority, has at least 1,400 launch landings, and five major river ports: Dacca, Narayanganj, Chandpur, Barisal, and Khulna. Coastal shipping and ferryboats run between Chittagong, Cox's Bazaar, Narayanganj, and Khulna.

On the north bank of the Karnaphuli River, Chittagong, the principal port, has an excellent natural harbor and anchorage. Port facilities were developed after 1947, and by 1970 Chittagong could berth twenty ships at a time and handle 4 million tons of cargo annually. Chalna, the other major port, is on the Paisur River about forty miles south of Khulna. In 1970 it had fifteen ship moorings and eight more berths under construction and was handling almost 2 million tons of cargo yearly.

In 1971 the total railway route mileage stood at 1,775 miles. About 32% of that mileage is broad gauge, found in the northwestern and western parts of the country, while elsewhere the track is meter gauge. Passenger cars numbered 1,208 and freight cars totaled 20,523. Though there was extensive damage to the entire railway system in the 1971 war, pre-1971 services were essentially restored by September 1973 with the reopening of the King George VI bridge across the Meghna River at Kilipur.

There is no unified national road system as such in Bangladesh. Road transport's importance is generally localized. As compared to rail or water it is not a principal method of travel. In 1971 there were 2,398 miles of hard surfaced roads and 1,400 miles of unmetaled roads of low capacity and reliability. Countrywide the number of licensed road vehicles in 1970 was 68,057: 5,676 buses, 9,355 trucks, 23,047 passenger cars, and 29,952 others (mostly motorcycles and autocarts).

Since World War II, like many other countries, air travel has gained in importance. The principal airport is at Dacca which is serviced by several international carriers. Other airports, for in-country service, are at Chittagong, Cox's Bazaar, Comilla, Shamsheerager, Sylhet, Jessore, Thakurgaon, and Ishurdi. There are also a number of lesser airstrips for small aircraft. Air Bangladesh is the national airline, and in late 1974 operated one DC-8 and eight Fokker Friendship aircraft.

Table 3: DEVELOPMENT OF TRANSPORT IN BANGLADESH

	<u>1947/48</u>	<u>1954/55</u>	<u>1959/60</u>	<u>1964/65</u>	<u>1969/70</u>
<u>Railways</u>					
Route Mileage ¹	1,615	1,708	1,713	1,713	1,776
Passenger miles (million) ²	2,923	1,368	1,816	1,923	2,062
Freight ton-miles (million) ²	441	474	872	893	960
<u>Roads & Road Transport</u>					
Metalled Roads (miles)	240	320	890	1,964	2,398
Number of buses	668	1,376	1,842	2,969	5,676
Number of trucks	80	1,735	3,962	6,965	9,355
<u>Inland Water</u>					
River Routes (miles)					
Perennial	n.a.	n.a.	2,668	3,341	3,352
Seasonal	n.a.	n.a.	705	1,643	1,643
Motorized Vessels					
Cargo tons (excluding dumb craft)	n.a.	n.a.	n.a.	39,112	55,917
Cargo tons (including dumb craft)	n.a.	n.a.	n.a.	119,491	293,705
<u>Ocean Ports</u>					
Cargo handled (thousand tons)					
Foreign	1,450	1,355	2,777	3,603	4,726
Coastal	345	517	753	685	2,068

¹ Year indicated is fiscal year ending June 30 except for 1947/48 and 1954/55 where year ending is March 31.

²For 1947/48, year ending is March 31.

Source: Government of Bangladesh, Planning Commission, Transport Statistics, 1972; Government of Pakistan, Central Statistical Office, 25 Years of Pakistan in Statistics, 1947-1972, 1972.

Communication

The communication system of Bangladesh developed very slowly in the past and the services have been unsatisfactory owing to the low level of priority accorded to this sector. The number of telephones has increased by about 2,000 per year to 66,000 in 1973, and the number of post offices increased from about 3,000 in 1947 to about 6,600 in 1973. The number of telephones per 1,000 persons is 0.9 and there is one post office for every 12,000 people - both figures among the lowest in the world. Radio broadcasting was started in 1947 in Dacca. Today, besides the broadcasting station in the capital city, there are five other radio stations, Chittagong, Rajshahi, Sylhet, Khulna, and Rangpur, which are utilized chiefly as relays of the broadcast from Dacca. Among these, Rajshahi and Chittagong have independent broadcasting facilities. As of 1974 there were an estimated 700,000 radio receivers in the country. Television came to the area in 1964, although development has been slow and the number of television sets is extremely limited. Although there is a continuing shortage of newsprint, newspapers and magazines flourish. By late 1974 there were 31 dailies, 138 weeklies, 13 fortnightlies, and 76 monthlies in circulation nationwide.

Education

Most observers, both foreign and domestic, agree that Bangladesh's educational system does not meet the needs of the country. The heavy emphasis on examinations, rote learning, and liberal arts subjects prevents the schools from producing graduates who can be easily absorbed into the existing labor market. Also, many rural youths view the educational system as a means of escaping rural life. Thus, the vast bulk of graduates congregate in the urban areas.

The formal schooling system only affects a minority of the population. It has been estimated that only slightly over 20% of the population five years and older are literate. Education, instead of serving as the great equalizer of opportunity, has been discriminatory. The poor have not been able to avail themselves of the educational facilities and, as a consequence, enrollment has been concentrated in relatively few families. The minority who take advantage of the educational system do so with consistency. In the early 1970's only 30% of families with primary age-children had any who attended school. However, 80% of these families had all of their children in school. Those families averaged two to three times the annual mean income of the non-enrolling families. The discrepancy increases at the more advanced stages of education. Thus, formal education has been called elitist and a perpetuator of the status quo.

Academic training consists of three levels before the University or equivalent degree college. Five years of primary school lead to seven years of secondary, divided into two levels. The five years of lower secondary (grades six through ten) result in a secondary school certificate examination, passage of which entitles the student to proceed to two years of higher secondary or intermediate training, which culminate in a higher secondary school examination after grade twelve.

In many cases, education at the primary level is of low quality. About one-third of all primary teachers have received no teacher training at all, while the remaining two-thirds have attended primary training institutes that emphasize rote methods of instruction. Physical facilities are often little more than bamboo huts, although not much else is required in Bangladesh's climate. However, more important is the lack of supporting aids.

The Government claims that 58% of the primary-age cohort was enrolled in the 30,000 primary schools in 1972, but observers believe that this estimate is too high. About one-half of the students drop out after the first year, and three-quarters drop out while still in the primary grades. The dropout rate for girls is especially high, in part because of the

belief that women do not need education, in part because girls are needed to help at home with younger siblings, and in part because only about three percent of the primary teachers are women, creating problems for parents who wish their daughters to avoid contact with men.

In the early 1970's, according to official statistics, 17% of the 11-15 age group were enrolled in the lower levels of the secondary system. An estimated 10% of the boys and 3% of the girls who started in the formal system continued to the end of this level.

Conditions in many of the lower secondary schools are little better than those in the primary grades. Only about 30% of the teachers have any pedagogical training, and less than 10% are women. Classes are often very crowded; fifty to seventy-five students per room are not uncommon. Supplies and teaching aids are scanty. The direct tuition costs, free at the primary level, amount to about US\$1.00 per month. Since there are fewer secondary schools, travel costs also increase, making it difficult for poorer students to attend.

In 1972-73 about 6% of the 16-17 age group were enrolled at the higher secondary level. There were about 5,100 secondary teachers, although because of the institutional set up, many college teachers also do instruction at this level.

At the post-secondary level, the student can enroll in six universities and over 600 degree and intermediate colleges, of which 34 were run by the Government in 1973. Of the universities, those at Dacca, Rajshahi, Chittagong, and Jahangirnagar offer a number of courses, including studies in Bengali literary and artistic tradition. Universities at Mymensingh and Khulna specialize in engineering and agriculture, respectively.

The technical education sector, which experienced some growth in the 1960's, nevertheless fails to provide the numbers and kinds of personnel required by the economy. On the one hand, the weak industrial sector has difficulty absorbing the 140 engineers graduating annually. On the other hand, many of the 2,800 diploma graduates and the 1,500 certificate holders produced annually lack appropriate practical experience to compete with nongraduates who demand lower pay and often require no more training by their employers.

Government documents also suggest that much university training may be unproductive. Many enter the university because of lack of employment rather than any dedication to scholarship and higher studies.

The First Five-Year Plan has stated that there is an urgent need to reorient the educational system toward mass literacy, technical training, coordination of curricula with manpower needs, increased access to education for the poor, and vastly increased adult and nonformal education. Unfortunately, the Plan fails to suggest a realistic strategy for implementing these goals. Furthermore, observers point out that the Plan emphasizes expansion of the existing system rather than fundamental changes of the system itself.

The general weakness of the entire educational system has various unfavorable repercussions on the health sector. The lack of adequate numbers of appropriately educated candidates for paramedical training compounds the shortage of such personnel. This is particularly serious in the rural areas and among women, since one assumes that one solution to staffing rural health centers and family planning programs will be to train suitable personnel from the localities containing the health services.

Housing

In the mid-1970's the housing available to the average Bangalee family provided neither adequate protection from the elements nor sanitary conditions conducive to good health. By far the most common kind of housing was the rural *kutcha* (raw or rough) house, composed of bamboo, straw, or reed walls and roof over a mud floor. The 1960 housing census showed that 90% of rural houses had walls of these materials and 65% had roofs of this kind as well. About one-third of the rural houses have galvanized corrugated iron or corrugated asbestos cement roofs. Only about 1% were *pucca* houses of stone, concrete, or baked brick. Although built of only readily available materials, the *kutcha* houses are deficient in several important respects, according to authorities. They require constant repair and provide inadequate protection from the severe storms common to the country.

Urban housing conditions were even worse. In 1960 only 27% of the urban houses were classified as "permanent or semipermanent"; 72% fell into the category of "temporary and unclassified". Many of the latter were *bustees*, squalid shanties crowding the squatter districts around the urban centers.

According to the 1960 census, more than half of the households lived in one room. The number of rooms per household, however, averaged 1.77, with an average of 3.2 individuals per room. Thirty-one percent of the people lived five or more to a room; and 13%, four or more to a room.

The series of calamities starting with the 1970 floods, however, damaged or destroyed a substantial portion of the country's already inadequate housing stock. In 1970 the floods destroyed an estimated 80,000 houses and damaged almost 250,000 more. The cyclone of November of that year destroyed at least 100,000 additional houses; this was followed by the war of 1971, which left 2 million families homeless. By August 1972 relief organizations and Government efforts had constructed an estimated 250,000 houses. The floods of 1974, however, affected 36.6 million people, destroyed 500,000 houses, and damaged 1.2 million others, according to Government figures. The famine of the fall of 1974 brought a reported 100,000 or more people a month to the capital in search of food. At that time the press began to describe people living in abandoned buildings, in the streets, and in the most rudimentary shelters.

Cultural Environment

Two key factors influence the cultural environment of Bangladesh: (1) the historical tradition and common language of the Bengali people; and, (2) the Islamic faith.

First and foremost the people of Bangladesh reflect the historical traditions of the Indian subcontinent. There is a strong consciousness of the people's own cultural identity as expressed in their literature, art, and above all, in the Bengali language. Among all economic and social classes, literate and illiterate, there is a remarkable gift of articulate expression. Rabindranath Tagore, one of the greatest figures of Bengali letters, was awarded the Nobel Prize for his poem, *Gitanjali* (Tribute in Song) in 1913.

Overlaid upon that historical base are the trappings of the Islamic faith. Although loyalty to and pride in Islam are widespread, the degree of observance varies with social position, geographic location, and personal predilection. Among the uneducated and rural populations, both belief and practice tend to incorporate elements that vary from, and in some cases conflict with, the teachings of orthodox Islam. Ramadan, a period of obligatory fasting, is widely observed throughout Bangladesh. During this month-long time, all but the sick, the weak, pregnant women, soldiers on duty, travelers on necessary journeys, and young children

are enjoined from eating, drinking, smoking and sexual intercourse during the daylight hours. Since the months of the lunar calendar revolve through the solar system, Ramadan, the ninth month, falls at various seasons in different years. A fast in summertime imposes considerable hardship on those who must do physical work.

Family and kinship form the core of social life in Bangladesh. In the eyes of rural people, the *arba* (common hearth) defines the effective household, a group exploiting jointly held property and eating from a jointly operated kitchen. A homestead may comprise one or more such functional households, depending on the circumstances of the family relationship. Married sons generally live in their father's household during the older man's lifetime. Although they usually construct separate houses to shelter their own nuclear families, they remain under their father's authority, and their wives, under the authority of their mother-in-law.

The inability of the extremely densely settled land to support constantly increasing numbers of people, and the high death rates at all ages, are important limiting factors to household development. Family members, especially men, frequently seek employment away from the homestead, often leaving their wives and children in the care of relatives who remain at home. Population estimates indicate, furthermore, that at least 25% of women aged thirty-five to forty-four are widows, with the percentage rising to 50% by the age of fifty. These figures imply that large numbers of men do not live long enough to head the fully developed extended family household and that many young men assume household leadership at an earlier stage in their own lives.

Since kinship ties play such an important role in Bangalee life, manipulation of relationships within the relatively fluid social structure is common. This is often manifested through marriage arrangements. Marriage is considered a social contract rather than a religious sacrament in Islam, and the parties to the contract represent the interest of families rather than the direct personal interests of the prospective spouses.

The typical marriage takes place between a girl recently past puberty and a man as much as ten years older. A 1961 study estimated that about half the women had married by thirteen and almost all by nineteen; these ages seem to have risen somewhat by the mid-1970's. Early marriages tend to extend the reproductive lifetime and increase the expected number of pregnancies per woman.

Divorce, especially of young couples without children, is by no means rare in Bangalee villages. Several village surveys found that approximately one in six marriages end in this fashion. A smaller number, between 6 and 10%, are polygamies.

The role of the woman in the family is definitely subservient to the male. A woman only begins to gain respect as she produces boys. Mothers therefore cherish and indulge their sons, while daughters experience discipline and heavy household chores from an early age. Many families will continue to reproduce until they are assured of having two living sons. This may necessitate having six or seven offspring.

Practice of *purdah* (the traditional seclusion of women) varies widely according to social milieu, but even in relatively sophisticated urban circles the core of the institution, the segregation of the sexes, persists. Traditionally a mark of high status and still a source of prestige in tradition-oriented circles, full *purdah* requires the complete seclusion of women from the time of puberty.

The trappings of full *purdah* require both a devotion to traditional practice and the means to dispense with the labor of women in field work. For most rural families a lack of the latter makes full observance impossible, although the ideal remains.

This segregation of the sexes extends into social groups who have rejected full *purdah* as a result of modern education. Although the city woman may enjoy more physical freedom and the opportunity to pursue a professional career, she moves, according to A.K. Nazmul Darim, in a "different social world" from her husband and often works at her profession in a specifically feminine milieu, such as a women's college or a maternity hospital. The health field, especially family planning, is considered an acceptable avenue open to women. As long as women remain second-class citizens, their movement into the health professions will be limited, and perhaps more importantly, their role in national development will be muted.

Beliefs Affecting Dietary Habits and Health Practices

Beliefs derived from the Ayurvedic or ancient Hindu medicine still prevail within some of the village areas. These are rather elaborate and in many cases resemble the Hippocratic attitudes toward medicine which may be found in other parts of the world.

Foods are classified according to their "heating" or "cooling" effect on the body. Such foods as meat, eggs, ghee, fish, honey, and some oils (nuts, mustard, and coconut) are considered "hot". Vegetables and fruit, especially the squash, alu, lemon and cucumber, curd and some oils such as those from til, lau and koud seeds are thought of as "cold." Illnesses are also classified as "hot" and "cold." A "hot" illness must be neutralized by "cold" food and medicine, and vice versa. A person suffering from the effects of excessive heat (all forms of fever) should be bathed in cold water and given "cold" foods to eat. In general it is thought that a weak person must limit his consumption of "hot" foods because he is incapable of digesting them. As his health improves, he may take more "hot" foods.

For several days after childbirth, women, it is believed, should eat no meat, eggs, or fish, or hot curries, which would cause indigestion, but rather should eat chiefly rice, bread, tea and cumin seed, which are more easily digested. The cumin seed is thought to have the additional property of making things dry. The supply of breast milk is thought to be increased by eating certain kinds of fish (koi, magur, shing). The first meal of a newborn infant should be honey and mustard oil, "heating" foods, which give strength and freedom from colds. An infant suffering from diarrhea is believed to be suffering from a "hot" stomach, and therefore, should be given "cool" foods which lessen the heat and allow the stool to harden.

It is thought that "hot" foods should be eaten in cold weather and "cold" foods in the summer. For example, *panta bhat*, a "cold" wet food, is suitable for summer mornings, but in winter dry foods, such as *cerna* (beaten rice) and *mrui* (puffed rice) are preferred. Other beliefs concerning the effects of food are that sour foods irritate wounds and tamarind causes loss of sexual power.

Magic plays an important role in determining health and nutrition practices. This is especially true with the woman's behavior toward pregnancy and infant care. For example, mothers attribute all infant deaths to attacks by demons and spirits. Once a person has been attacked there are only a limited number of ways to counteract the demon's effect. Consequently, preventive measures are considered more effective. For example, the earlobe of a newborn will be scarred, thereby making the child a less desirable object of attack.

After an infant reaches at least one year of age, Bangalee mothers begin to seek advice from medical practitioners, normally a homeopath, and from holy men. Homeopathic medicine subscribes to a "law of similarity" that is commonly used in indigenous cures. For example, presented with a case of cholera, a homeopath will prescribe a small dose of arsenic; that is, a medicine which produces similar symptoms.

Holy men treat illnesses through a variety of ritual activities. The emphasis of this kind of treatment is on emotional comfort for the patient and the family, which may play an important role in recovery.

CHAPTER THREE

POPULATION CHARACTERISTICS

With an estimated 78 million inhabitants in 1975 and over 502 people per square kilometer, Bangladesh is one of the most densely populated countries in the world. Only the city-states of Singapore and Hong Kong have greater densities. Considering that the annual growth rate is approximately 3.0, population pressures are expected to increase greatly in the future. By the year 1998, if current trends continue, the population will approach 145 million, with a density of 950 people per square kilometer.

Table 4: PROBABLE POPULATION PROJECTION (millions)

1973	74.0
1978	86.1
1983	99.9
1988	114.7
1993	129.4
1998	145.0
2003	161.7

Source: IBRD, found in Development Assistance Program
FY 75, Bangladesh, Department of State,
Washington, D.C., December 1974.

Given the fixed amount of land available, the future appears bleak. The Bangladesh Planning Commission comments in the Five-Year Plan that at "the present 3% growth rate its population will double in twenty-three years and treble by the beginning of the next century. Even a doubling of population on the limited land space of Bangladesh is a disturbing prospect. A trebling of the population is simply frightening to visualize." It is clear that an effective family planning program is urgently needed to temper the runaway population growth.

It has only been in recent times that population has been a concern to the area's planners. Since World War II, the population has almost doubled.

Currently the crude birth rate is 47 while the crude death rate stands at 17. There are 14 million women of child-bearing age in Bangladesh. It is estimated that 70% of these are fertile and exposed to risk of pregnancy, and the total fertility rate is about 6.0 children per person. Given these facts, the chances of the birth rate decreasing without major Bangladesh governmental intervention are slim. One must inescapably conclude that the alternative to such intervention appear that the death rate will increase because of starvation, epidemics, and a breakdown of health services, thus producing a braking effect on the unlimited growth of the population.

Table 5: CENSUS DATA FOR BANGLADESH
1901-1961 (millions)

1901	28.9
1911	31.6
1921	33.3
1931	35.6
1941	42.0
1951	41.9
1961	50.8

Source: M. Abdur Rahim, "An Appraisal of Census Populations of East Pakistan from 1901 to 1961," Institute of Statistical Research and Training, University of Dacca, Monograph No. 21, about 1967, pp. 1-26.

Distribution

By and large, the population of Bangladesh is evenly distributed throughout 65,000 villages, averaging 1,100 person/village. The exception is the Chittagong Hill Tracts which remain sparsely populated. Ninety-four percent of the population is rural, while the remaining six percent is urban-based. Urban areas are defined by size, by the nature of employment of the population, and by the kind of administration. They include municipalities and any identifiable collection of houses inhabited by 5,000 or more people. Places of fewer than 5,000 may also be classed as urban at the option of the census director if they have substantial urban characteristics, such as good roads, sanitation facilities, schools, and a significant non-agricultural working force.

In early 1974, only four places could be classified as cities: Dacca (1,310,976); Chittagong (416,773); Khalna (436,000); and, Narayanganj (176,879). These figures must be considered only as an indication of relative size since all have increased due to the movement from the rural sector to the large cities by people seeking food and employment.

Migration

Emigration from Bangladesh over the years has played a role in curbing even greater population growth. Between 1921 and 1961 an estimated 3.6 million people left the area of Bangladesh, most having gone to either India or Pakistan. During the war for independence, approximately 10 million refugees fled to India. Most of these have since returned to Bangladesh, although an undetermined number have remained. Since 1971, about 120,000 Beharis have emigrated to Pakistan. At the same time over 100,000 Bangalees have been repatriated to Bangladesh. The Bangladesh Institute of Development Economics has estimated that between 1961 and 1974, net annual emigration averaged 150,000. Whether emigration will continue to be an outlet for population pressures is questionable, since India is discouraging further immigration from Bangladesh.

The scarcity of data in general makes it difficult to calculate internal migration. However, indications are that many are leaving the rural areas for the cities as shortages of food and work become more acute. As food shortages grow, an increasing stream of rural refugees can be expected to pour into the major urban centers.

Age

The population of Bangladesh is dominated by the younger age groups. Forty-five percent of the total population, or 35,880,000 persons are under fifteen years of age. Such a high proportion of the population under fifteen years of age means that a significant group of people is dependent upon the balance of the population for subsistence. In addition to simply feeding and clothing this young population group, the rest of society must invest a certain amount of its resources into social and educational services for the future welfare of the nation. Moreover, this age structure gives a good indication as to the types of health problems that exist and to which groups health care must be provided. (See Illustration 1 - age and sex.)

Sex

There are apparently more males than females in Bangladesh, a ratio of 38,537,000 to 36,569,000; or a male-female ratio of 108:100. These figures are based on the preliminary 1974 Census, which is not considered very reliable because of its 7-11% underenumeration. A partial explanation of this large disparity in numbers is probably due to underreporting of females.

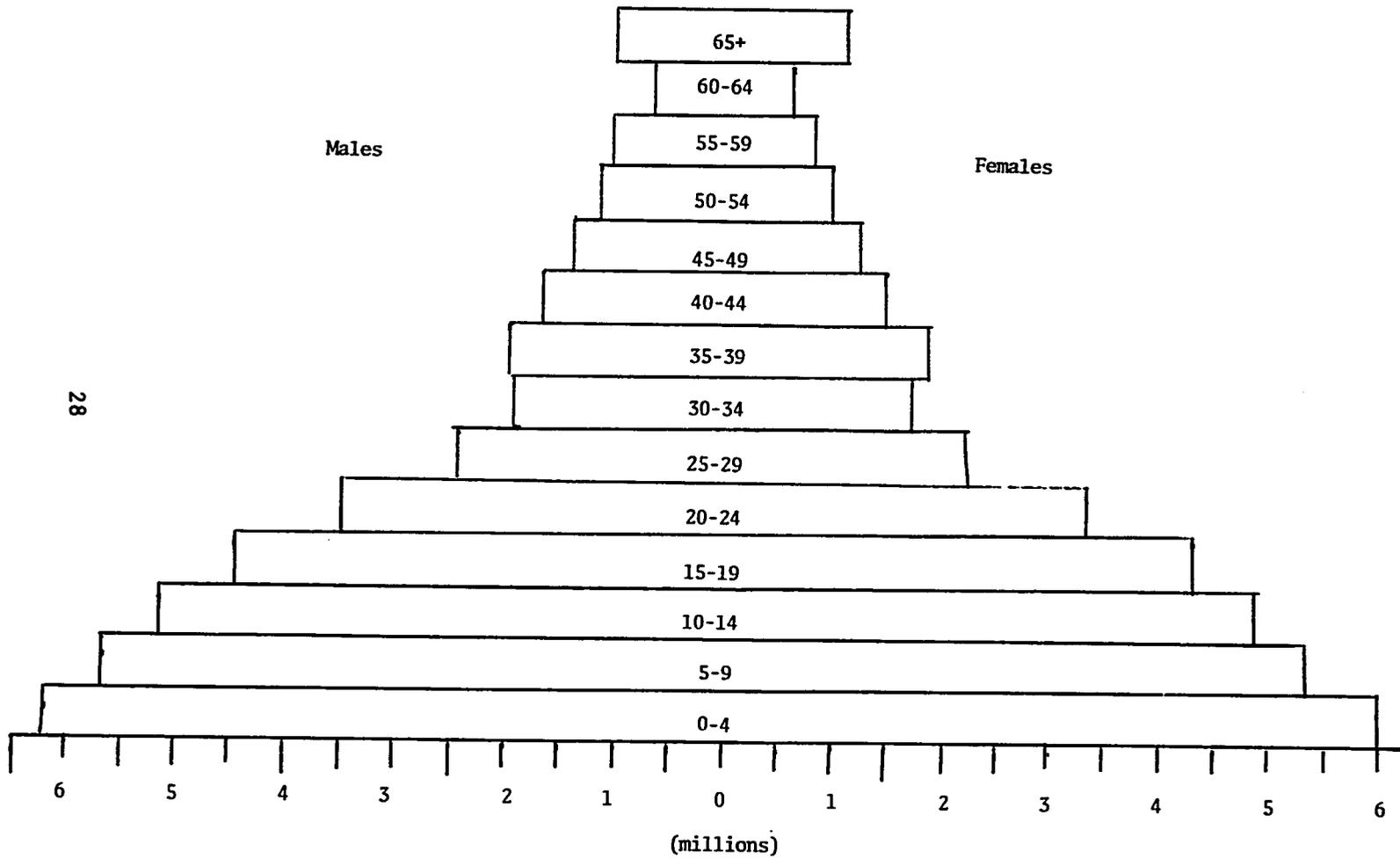
Ethnic Composition

The vast majority of the population is Muslim Bengali; approximately 85%. Hindu Bengali comprise 14% or practically the remaining segment of the population. The last 1% is composed of several tribal groups located in the Chittagong Hills Tracts. Like the topography and population distribution, the ethnic composition of Bangladesh can be characterized as uniform.

Marital Status

The marriage rate is extremely high in Bangladesh. Marital unions are generally formed at a very early age. For example, the census of 1961, considered to be fairly reliable, showed that 95.4% of all women in the age group of 20 to 29 were or had been married. As mentioned previously the total fertility rate is around 6.0 children per woman. Large families are the norm. Sons are considered more desirable than daughters and many couples will consciously continue to increase their family size until there is some assurance that at least two sons will live. This provides a future "insurance policy" for the couple in their older years.

Illustration 1: POPULATION BY AGE AND SEX, 1973



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CHAPTER FOUR

HEALTH STATUS

Although there is no direct or exact method for measuring the health of a nation, there are several indirect indicators of health status. Morbidity and mortality figures are the indicators most commonly used. Unfortunately, in the case of Bangladesh, there is no country-wide system of mortality and morbidity reporting. Consequently, an assessment of the health of the population must be based on scattered reports and subjective observations.

Mortality

Given the fact that a mortality reporting system does not exist, only some rough guesses can be made on national mortality rates.

The crude death rate per 1,000 people is commonly put at 17, although it can probably be said with more confidence that it actually ranges between 15 and 20. Life expectancy at birth is about 48 years. The immediate cause of the majority of deaths can probably be attributed to infectious diseases -- cholera, diarrheal diseases, tuberculosis, measles, diphtheria, and small-pox.

However, malnutrition must be considered the underlying contributor to death. The synergism between malnutrition and infection has been well documented throughout the world. Many observers have, in fact, classified malnutrition as the most important health problem in Bangladesh.¹

As in most developing countries, the very young and the very old contribute most heavily to the mortality rates. It has been estimated that the under-five-year olds account for 40% of all deaths. The main causes of death for this age group are diarrheal diseases, diphtheria, tetanus, whooping cough, measles, and other bacterial and viral infections, all of which are considerably more lethal in a malnourished population.

Focusing more specifically on the infant age population, the infant mortality rate is estimated at approximately 140 per 1,000 live births. The infant mortality rate has decreased from about 170 in the 1950's to the estimated level in the early 1970's. As might be expected, the urban infant death rates appear to be lower than the rural rates. This can be attributed to improved sanitation and greater accessibility to medical facilities.

The fact that infants and children are dying from water-borne and fecal-related diseases illustrates the need for improved water supply and sanitation and increased preventive health programs. Moreover, the high numbers of deaths indicate a generally poor level of health among Bangladesh's young.

¹ Chen, Lincoln C. (ed.) Disaster in Bangladesh. New York: Oxford University Press, 1973.

Various maternal mortality rates have been reported, ranging from a low of 5.7 per 1,000 live births (Chen, et. al. 1974)² to a high of 34 (Robinson, 1967)³. The low figure was cited from a study done through the Cholera Research Laboratory at their Matlab facility. While the surveillance was of much higher quality in the target area than in the country as a whole, it is difficult to assess the secondary effects of the cholera-related treatment programs on deaths due to pregnancy and childbirth. Perhaps the effects were minimal, as claimed by the authors. On the other hand, the Government of Bangladesh and the World Bank commonly use the estimate of thirty maternal deaths for every 1,000 live births. Regardless of the exact rate, the numbers of deaths are still appallingly high (see Table 6). Most of the deaths can be attributed to eclampsia, hemorrhages, and infections. Considering the lack of prenatal services for the vast majority of women and the number of women suffering from anemia, it is not surprising that eclampsia and hemorrhage are the main maternal killers.

Table 6: MATERNAL MORTALITY - 1969

Country	Deaths per 1,000 Live Births
United States	0.222
Ireland	0.318
Sweden	0.102
Norway	0.148
Denmark	0.168
Finland	0.148
France	0.249
Italy	0.606
Portugal	0.791
Austria	0.330
U.S.S.R.	0.320

Source: Health Care: The Growing Dilemma. McKinsey and Company, Inc., New York, 1974.

Another important result of the Matlab study was the discovery that of 119 pregnancies recorded, only 49 resulted in a live birth. In other words, approximately 59% of the reported pregnancies resulted in fetal death. The failure to carry a pregnancy to term can be accounted for by many causes, such as intrauterine infections and nutritional deficiencies, indications of a generally poor quality of health care.

The outlook for the future is not hopeful. Though mortality rates have been decreasing in recent years, increasing population pressures on a fragile economy may result in a resurgence in mortality.

² Chen, Lincoln C., et. al. Maternal Mortality in Rural Bangladesh. The Ford Foundation: Dacca, October, 1974.

³ Robinson, W.C., "Recent Mortality Trends in Pakistan." In Studies in the Demography of Pakistan. Pakistan Institute of Development Economics, Karachi, 1967.

Communicable Diseases

An in-depth analysis of communicable diseases is impossible in Bangladesh, because of the lack of information available. However, a few diseases such as smallpox and cholera can be discussed more fully, mainly due to the extensive work that has been done in Bangladesh in combatting these diseases. Other prevalent diseases are listed and discussed briefly.

Smallpox

The last known case of smallpox in Bangladesh was reported on October 16, 1975. This represents a tremendous success for WHO and the Government of Bangladesh, since as recently as May 1975, there were 1,280 infected villages in the country. Presently, the only known cases occur in Ethiopia. Therefore, there is substantial reason to believe that the chances of reinfection are slim. Nevertheless, a two-year program of surveillance is being instituted to ensure that no hidden foci remain undiscovered.

Cholera

Cholera remains a major problem throughout all of Bangladesh. Endemic in the deltaic regions of Bengal, cholera is caused by the gram negative bacillus *Vibrio cholerae*. The disease is spread by the ingestion of the causative organism, usually by drinking water contaminated with fecal matter from an infected individual. The organism elaborates an enterotoxin which causes massive outpouring of fluid and electrolytes into the small intestine. The resulting dehydration and electrolyte imbalance are responsible for the signs and symptoms of cholera. Through the efforts of the Cholera Research Laboratory, intravenous treatment has been developed which has decreased the case-fatality rate to less than 1%. Without treatment, the case-fatality can be as high as 50%. Because cholera attack rates are highest in those age groups of relatively low mortality, over one year and under forty years of age, the disease has a considerable impact on overall mortality figures.

Cholera has a definite seasonal pattern. Starting in September, the disease appears in the northern areas of the country and moves southward, reaching Dacca in November and December. The southern sections have their highest attack rates in March, April, and May. There is no satisfactory explanation for this pattern, although there may be some connection with the monsoon season.

Concerted efforts are underway for the development of an adequate immunizing agent against cholera. Success has been limited and the ultimate solution, as in the case of so many other diseases, lies in improved sanitation.

Tuberculosis

The Five-Year Plan estimated that there are 100,000 deaths annually due to pulmonary tuberculosis. Over 80% of the adult population have positive tuberculosis skin tests, and it has been estimated that the incidence rate of active disease is 500 per 100,000 or about 320,000 cases per year. Contrary to experiences in other parts of the world, tuberculosis infection appears to be more common in the rural areas than in the urban centers.

Malaria

Malaria eradication has been in process in Bangladesh since 1964. As a consequence of that program, the incidence of malaria has been steadily decreasing over the past ten years. In late 1974, WHO reported that of a total population of 71 million at risk to malaria, 30.149 million were in the pre-maintenance phase, 33.011 million in consolidation, and 7.843 in attack phase areas. During the first six months of 1974, only 4,895 malaria positive slides were detected in the examination of 749,421 blood smears. Even though the malaria program has been quite successful, there are still residual pockets of the disease in the border regions. Unless efforts are continued, there is a very real possibility of a resurgence of malaria, a phenomenon which has occurred in many other locations worldwide.

Other Diseases

The following diseases are known to be common in Bangladesh: diphtheria, tetanus, pertussis, measles, poliomyelitis, typhoid, paratyphoid, visceral leishmaniasis, filariasis, dengue, yaws, venereal disease, leprosy, and diarrheal disease. It is impossible to approximate the prevalence and incidence of the above diseases because of the lack of a health data base. Observers have noted that upon visiting hospitals in Dacca, entire wards were filled with children suffering from diphtheria or tetanus. It has been estimated that tetanus neonatorum is the cause of 10% of all infant deaths. This is presumably related to unsanitary care of the umbilical cord after birth, and could be greatly reduced by inoculation of pregnant women) who transmit immunity to their fetuses) and by simple training of birth attendants.

Measles, when compounded by malnutrition, is known to be a major childhood killer throughout the developing world. There is every reason to believe that the pattern persists in Bangladesh, especially in light of the prevalence of malnutrition and of the absence of either preventive or curative care.

Diarrhea is an extremely common syndrome in Bangladesh. However, the etiologies of the vast majority of diarrheal episodes are undefined. Shigella is known to be present, while salmonellosis, other than typhoid fever, appears to be unusual. Intestinal parasites characterized as ubiquitous include hookworm, roundworm, whipworm, and pinworm.

Filariasis, a mosquito-borne disease, is endemic to northern Bengal. Fourteen percent of the people examined in one survey in Dajipur District demonstrated evidence of the causative microfilariae in the bloodstream.

Leprosy victims number an estimated 100,000.

Unfortunately, little additional information is available concerning the diseases mentioned beyond the fact that they appear to be common.

Zoonoses

Rabies is endemic, though information concerning its incidence is nonexistent. Brucellosis in humans, as well as cattle, is not an infrequent occurrence due to the lack of preventive veterinary practices.

Chronic Diseases

Chronic diseases, at this point in Bangladesh's history, are not major health problems. The need for action directed toward the infectious diseases is so overwhelming, that chronic diseases have been ignored. Consequently, little or no information is available concerning the prevalence of diseases such as cancer, cardiovascular and respiratory diseases.

Morbidity

Because of the same deficiencies in morbidity data as in mortality information, it can only be assumed that the same diseases which cause the greatest number of deaths also cause the greatest amount of morbidity. Gastroenteritis compounded by malnutrition is probably the most important contributor to morbidity. Many of the diseases previously mentioned, such as malaria and tuberculosis, certainly play their part in increasing morbidity rates and, consequently, in decreasing effective work capacity.

CHAPTER FIVE

NUTRITION

The spectre of famine, characterized by scenes of emaciated children slowly dying of hunger, has become the image of Bangladesh in the minds of many people. The amount of nutritional deficiency is evidently very high. A United Nations Relief Organization Bangladesh survey shows that at least 3.8 million children under the age of ten years are suffering from moderate to severe malnutrition. The Bangladesh Five-Year Plan estimates that 50% of the entire population has varying degrees of protein-calorie malnutrition. The Nutrition Survey of East Pakistan, taken in 1962 to 1964, indicated that at that time 46% of the households studied had inadequate caloric intakes and that 85% of the rural population had an average protein intake below adequate levels¹

The impact of protein-calorie malnutrition on mortality and morbidity rates can safely be said to be great and wide-ranging. Due to the interaction of nutrition and infection, a malnourished individual is more prone to infection, and that infection in turn precipitates malnutrition. Whereas healthy individuals may suffer only a mild attack of measles or gastroenteritis, the undernourished may be fatally affected by the same infections. Consequently, malnutrition, while not necessarily the prime contributor to mortality and/or morbidity, certainly exacerbates any illness episode. Therefore, a high mortality rate due to infectious diseases is a good indication that malnutrition continues to be a problem.

It is very difficult to ascertain the prevalence and incidence of nutritional deficiencies. The social convulsions caused by the cyclone of 1970 and the war of 1971 certainly contributed to increasing the numbers of individuals suffering from malnutrition. Unfortunately, the most recent accurate information is over ten years old. Since independence, only brief surveys mostly related to relief work, have been carried out. Therefore, most of the information in this section comes from the East Pakistan Nutrition Survey. Since the data are not recent, they therefore do not reflect events of the past few years. Nevertheless, they do indicate a baseline situation.

The general pattern of food intake is based heavily on rice. Over two-thirds of the dry weight of the daily diet consists of rice, which is supplemented by curries, primarily of vegetables or fish, and pulses in the form of *dal*. Milk and meat products are consumed in small amounts, and fruit intake is almost entirely seasonal (May - July). Intake of cooking fats and oils is scanty. Most foods are taken in their natural unrefined forms, but cooking practices often lead to considerable loss of certain nutrients, such as Vitamin C, thiamine, and niacin. It is fortunate that the bulk of the rice consumed is parboiled, and thus retains a portion of its thiamine and niacin even after cooking.

Although the essentials of a good diet are present, actual food intake is poorly balanced. The protein foods are taken in such small quantities that they seldom contribute substantially to nutrient intake. Moreover, there is little knowledge of the special needs for growing children or for pregnant and lactating women, and as a result, available food of high nutritional quality

¹ Ministry of Health, Government of Pakistan. Nutrition Survey of East Pakistan, March 1962-January 1964. Printed by United States Department of Health, Education, and Welfare, Public Health Service, May 1966.

may not be distributed within the household in an effective manner. As in many other societies, the best food is reserved for adult males with women and children receiving what remains.

Nutritional Deficiencies

Calorie Deficiency

There are two seasons when calorie intake is especially low: the dry season and midmonsoon. Caloric intake closely follows the intake of cereals. Whether cereal intake is high or low, the proportion of calories coming from carbohydrate sources remain stable (82=83%). It is apparent that the availability of rice is the factor which largely determines levels of caloric intake. As the population continues to grow on a constant land base, the overall food availability can be expected to decline.

Protein Malnutrition

The East Pakistan Nutrition Survey found that 60% of the households studied did not meet acceptable protein intake standards, that 70% of dietary protein was cereal protein, and that only 14% of dietary protein was from animal sources. Since protective protein appears to be provided by pulses, when pulse intake drops, deficiency becomes more prevalent.

Pulse consumption, generally, is small but critical, for the small amount of pulse protein complements the basic rice protein to prevent deficiency. However, even if protein foods are eaten in normally adequate quantities, calorie deficiencies may result in the protein being metabolized for calories alone, rather than for growth and body mechanisms.

It has already been mentioned that protein-calorie malnutrition plays a synergistic role with infection increasing disease and death. Perhaps, even more important is the effect of malnutrition on the physical and mental capabilities of the affected population. Early protein-calorie malnutrition, as well as the lack of environmental stimuli, may detrimentally affect mental development. If these effects are irreversible, and there is a great deal of controversy about that, the implications for national development are alarming.²

Prevention of protein deficiency is closely related to factors of income and agricultural production. However, lack of knowledge also plays its part. Information on the role of pulses and fish as good protein sources and of the increased needs of vulnerable groups are matters requiring nutrition education rather than increased income alone.

Vitamin A Deficiency

Vitamin A deficiency leads to the development of keratomalacia, an extremely debilitating eye disease. Out of 500 boys in Bangladesh under the age of five, three or four die or are left blind by Vitamin A deficiency.

In the early 1960's the average intake was approximately half the Interdepartmental Committee of Nutrition for National Defense's (ICNND) suggested "acceptable intake value of 3,500

² Berg, Alan. The Nutrition Factor. The Brookings Institution, Washington, D.C., 1973.

International Units (I.U.) per person per day." Over 90% of the intake is obtained from the carotene in fruit and green leafy vegetables. Intake of these food subgroups does not appear to increase with added income. Low intake of Vitamin A is not necessarily the result of poverty but is due to the lack of knowledge of its importance and sources. A low intake of fat may further aggravate an already inadequate intake of Vitamin A, since fat plays a role in Vitamin A absorption.

The 1962-64 Nutrition Survey showed a close correlation between the total intake of Vitamin A in each season, and the intake of fruits and leafy vegetables. Consumption of green leafy vegetables appears to be fairly uniform throughout the year, but the quantities eaten are so small that some 40% of the sampled population had "deficient" or "low" plasma concentrations of Vitamin A and carotene. On the other hand, during the fruit season only 11% of the population demonstrated such low concentrations.

The most deficient segment of the population was growing boys, over half of whom had low plasma concentrations of Vitamin A.

Riboflavin Deficiency

Riboflavin is essential for cell respiration and metabolism. Foods of animal origin, especially dairy products, are the best sources of riboflavin. Green leafy vegetables and ripe fruit, though not the richest sources of riboflavin, contribute substantially to the amount available in the diet of Bangalees. Riboflavin intake seems to be low in all seasons and for all income groups. Intake, however, does improve slightly as income increases, since more dairy products are consumed. Though there is a mild improvement during the fruit season, intake remains deficient regardless of season or income.

Anemia

Anemia is a widespread and severe problem in Bangladesh. The great majority of the anemia found has been classified as iron deficiency. Average hemoglobin levels are about two-thirds that of European levels. Insufficient intake and improper absorption of iron, excessive blood loss, or parasitic infestation all contribute to anemia. It is clear from therapeutic trials that additional iron taken in a readily absorbable form would greatly diminish the degree of anemia. The most anemic sections of the population are women of child-bearing age, and growing children. More than 50% of the children under five years of age have parasitic infestations.

Goiter

Endemic goiter is usually the result of iodine deficiency. Other causes may include goiter producing substances (goitrogens) in the diet, lime-rich waters and soils, and pollution of water by human or animal excreta. Regardless of etiology, endemic goiter can usually be prevented by increasing the intake of iodine, either to replace the deficiency or to overcome the effects of goitrogens, excess lime intake, or pollution. Untreated goiter may become complicated by cretinism or dwarfism in contemporary and subsequent generations.

In the early 1960's approximately one-fourth of a study population had visible goiter. Prevalence patterns suggest that the etiology may be more than simple iodine deficiency. Mustard oil, the major cooking oil in Bangladesh, contains goitrogens which may play a role in causing this goiter. The solution for iodine deficiency is straightforward enough: increased iodine intake. The production of iodized salt has been the most common approach taken else-

where, but usually requires a processing industry with centralized production facilities. Iodization of cooking oil and other techniques have also been demonstrated useful in some settings.

Vitamin C

Vitamin C (ascorbic acid) is needed for the proper formation of connective tissue, and for integrity of cellular structure within the body. Deficiency leads to delayed wound healing, bleeding of the gums, and eventually to scurvy. The nutrient is destroyed by improper cooking (overcooking).

Dietary data indicate that there is sufficient Vitamin C in the raw (uncooked) diet in Bangladesh to prevent deficiency. However, biochemical and clinical evidence show that some 10% of the population have a subclinical (biochemical) deficiency and 3-4% have early clinical signs of deficiency. Occasionally, scurvy is seen in the hospitals.

Other Nutritional Deficiency Diseases

There has been no evidence of a significant incidence of rickets, beriberi, or pellagra in Bangladesh.

Nutrition Programs

Because of its multisectoral nature, national nutrition planning and coordination are done by the Planning Commission. In late 1975, the deputy commissioners were given the responsibility of coordinating all rural development activities in their respective districts. This provides the focal point where nutrition programs may be integrated on a semi-regional basis. Whether coordination and integration of the various sectors, i.e., agriculture, education and health, filters down to the village level is unclear.

The main thrust of nutrition programs is primarily food supplementation activities. UNICEF has been operating a school feeding program for several years. Through 900 elementary schools, approximately 2,500,000 students are being fed with specially blended protein-rich food. In addition, UNICEF has emergency food stations set up around the country. A tremendous amount of money and foodstuffs have poured into Bangladesh since independence. The United States, in one eighteen-month period, January, 1972-June, 1973, granted about \$200 million for food- and nutrition-related activities.

Early in 1975 plans called for continuing supplementation programs, increased nutrition education through agricultural extension agents, and the Family Welfare Workers, and with UNDP support, the establishment of an Institute of Public Health Nutrition.

The Institute would have as the immediate objectives: (1) the identification of the nutritional problems of the country and determination of priorities; (2) the advising on methods and means of improving the nutritional value of the common diet with the available foodstuffs in the country; and, (3) the development of an effective nutrition program for improving the food habits of the population.

The long-range objectives are: (1) to establish an institute for studying the nutritional aspects of health with a view to assisting the Government in reviewing and restructuring the nutrition programs; (2) to train manpower in nutrition; and, (3) to bring about a change in the present trend of malnutrition in order to create a healthier population.

A large part of the rather limited amount of nutrition research being conducted in Bangladesh is done in conjunction with Johns Hopkins University. To date the investigations have examined the effect of malnutrition on immune response, the effect of large doses of Vitamin A on signs of deficiency, and iron deficiency anemia in pregnancy.

The Government of Bangladesh must assume the responsibility for directing all aspects of the ongoing research into channels which reflect national health and developmental priorities. No clear review mechanism for nutrition research now exists.

CHAPTER SIX

NATIONAL HEALTH POLICY AND ADMINISTRATION

Health Policy and Planning

In Bangladesh the publication of national plans has necessarily been more of an academic exercise than an approach to programming. The inadequacies of the embryonic statistical data base has made it difficult to accurately assess the current situation in any given sector and next to impossible to develop goals responsive to the perceived needs of the community. Moreover, the relative absence of organizational and administrative skills at all levels further impedes the implementation and coordination of plans either vertically or between sectors. Additionally as the present Five-Year Plan illustrates, identification of types and levels of programs necessary for obtaining the ambitious goals outlined is largely ignored.

At independence the Prime Minister assembled some of the most prominent of the country's economists to organize the new Planning Commission with the aim of preparing the first Five-Year Plan and the Annual Development Program (ADP). It was declared to commence the Five-Year Plan from July 1, 1973, although there were many objections. First, very few projects had been developed during 1971 and the first part of 1972, and even this limited number of projects needed rethinking in light of the altered economic situation. Second, the data base for planning was weak. At least one full year of data on the fiscal situation and imports would have helped immeasurably and in addition some special studies could have been undertaken. Third, extra time would have permitted the preparation of an approach paper and some prior agreement on the overall strategy. These arguments were overruled (perhaps justifiably) by, firstly, the difficulties in going ahead with policy changes and project preparation without some longer term framework and, secondly, the political need to show some momentum on the economic front.

Twelve basic objectives were outlined in the Plan:

- To reduce poverty. As the foremost objective, the Plan called for an expansion of employment opportunities for the unemployed and underemployed, an acceleration in the rate of growth of national income, and an effective fiscal and pricing policy.
- To continue and complete the work of reconstruction and to return output back to the 1969-70 levels.
- To increase the rate of growth of the Gross Domestic Product to at least 5.5% per annum.
- To expand the output of essential consumption items.
- To arrest the rising trend in the general price level.
- To increase per capita income at the modest rate of 2.5% per annum.
- To reduce dependence on foreign aid over time through mobilization of domestic resources and the promotion of self-reliance.

- To consolidate the gains made so far in the socialist transformation of Bangladesh, to extend by stages the sphere of State participation, consistent with the ability of the State to manage and organize efficiently, to ensure a wide diffusion of economic opportunities in the self-employed sectors in the urban and rural areas, and to change the institutional framework of the economy of Bangladesh at a pace consistent with concomitant changes in social and political attitudes, motivation, organization, and mobilization effect.
- To transform the institutional and technological base of agriculture with a view to attaining self-sufficiency in foodgrains, widening employment opportunities in agriculture and stemming the flow of the labor force to the cities.
- To lay the groundwork for an ambitious program of population planning and control to ensure the total commitment of the political leadership and social consciousness to this most critical bottleneck to development efforts in Bangladesh, to build up an appropriate institutional framework for population planning, to experiment with a wide variety of techniques of family planning while retaining flexibility of approach in the light of continuous and close evaluation and research, and to attain a reduction in the growth rate of population from 3.0 to 2.8% per annum.
- To accelerate the rate of development expenditure and remedy the glaring deficiencies in the traditionally neglected fields of social and human resources development by improvement in education, health, rural housing and water supplies, etc., all of which will also help improve general capability and efficiency of work.
- To ensure a wide and equitable diffusion of income and employment opportunities throughout Bangladesh by a suitable combination of projects and programs designed to harmonize the requirement of economic efficiency with the considerations of spatial equity.

Rather than making precise, defined objectives, the Plan for the most part describes broad qualitative goals. Although qualitative objectives can be just as important as specific, measurable objectives, they are much more difficult to translate into action programs. Therefore, the twelve national development objectives of the Five-Year Plan serve a more useful function if viewed as long-term policy goals, rather than short-term objectives.

As can be seen, the national objectives contain only a passing reference to the health sector, except in regards to population policy. Quite specifically, the Plan states that one of its major five-year objectives is to reduce the annual growth rate from 3.0 to 2.8%. The emphasis on population control has a definite impact on the health sector, since the Planning Commission has called for the implementation of population and family planning programs through the proposed health delivery system. Whether this impact was intentional or incidental is difficult to ascertain. Consequently, as the reader examines the national development objectives, the conclusion is that health is given a very low priority within the general development strategy of the nation.

Presently, the chapter on health within the Five-Year Plan, 1973-78, is the only statement on national health policy or health goals. In this chapter, the Planning Commission discusses the basic strategy to be utilized in the health sector. The emphasis of health care is to be shifted from a curative urban-based system to a comprehensive rural-oriented system which is more balanced between curative and preventive health. A full range of community health programs is to be encouraged through a coordinated team effort. As a consequence of the shift in emphasis from the individual to the community, medical and health education would have to be reori-

ented to the concept of the health team. Finally, an adequate supply of medicines and drugs would have to be provided to the local level through a system of decentralized supply depots.

Within this general health strategy, the Plan defined ten objectives which were to be met during the five-year period of 1973 to 1978:

- To create a health infrastructure in the rural areas for providing integrated and comprehensive health services through *thana* health complexes and union subcenters.
- To ensure integration between the family planning and health programs at the grass root level under the leadership of the *thana* health administrator to attain the maximum possible prevention of births in rural areas.
- To provide a well-organized health care program to infants, children, and mothers by strengthening MCH services with a view to reducing infant mortality and maternal mortality rates.
- To ensure effective control/eradication of communicable diseases and to organize epidemiological services supported by well-equipped public health laboratories for meaningful execution of communicable disease control programs.
- To establish well-organized industrial health services for the industrial health hazards, to create a healthy environment at their place of work and to provide medical care to the workers and their families.
- To improve the quality of the existing hospital facilities to create new hospital beds with major emphasis on the establishment of at least one twenty-five-bed hospital in each rural *thana* and to reach a target of one hospital bed for every 3,500 persons by the end of the Plan period.
- To provide specialized hospital facilities for rehabilitation of Mukti-Bahini (Liberation Army) personnel who were injured in the war of liberation and to create additional hospital beds for specialized treatment of tuberculosis, leprosy, cancer, children, and mental diseases.
- To create adequate undergraduate and post-graduate teaching and training facilities for the medical, paramedical, and nursing personnel and to ensure proper service conditions for optimum utilization of the personnel.
- To ensure availability of life-saving drugs for treatment of the sick and immunizing agents for prevention or control of communicable diseases.
- To ensure intersectoral cooperation and coordination for achieving improvement of the environmental sanitation, housing facilities, potable water supply, etc., at the place of living and of work for every citizen.

Like the national goals, the health objectives are broad in scope and, therefore, are difficult to translate into operational programs. This difficulty of implementation is compounded by the fact that there was no viable health infrastructure carried over from the Pakistani period. The question arises, then, as to whether the health objectives as stated are sound.

Although in the short term they are unrealistic, they could serve as the basis for long-term health goals. Given Bangladesh's extremely limited resource base, the attempt to create a comprehensive rural health system with supporting facilities and trained personnel in five years, is simply not feasible. In 1975, almost half-way through the Plan's period, very little had been done regarding the implementation of the broad health objectives outlined in 1973.

This governmental inaction can be attributed to four factors:

- The lack of an operational plan which clearly delineates a specific goal-oriented program.
- Lack of efficient administrative mechanism.
- Lack of national resources - financial as well as manpower.
- Lack of governmental commitment to the health sector.

Any of these four factors could seriously damage implementation of a health policy; combined, they make it totally impossible to implement. As a consequence of this inactivity, in 1975 health policy has become confused. Indeed, many observers now question whether a viable governmental policy towards health exists. Until there is further clarification by the Government, in words and/or deeds, it must be assumed that the Five-Year Plan still forms the policy emphasis for all public health programs in the country.

National Health Administration

The responsibility for planning and administration of the health sector has been vested in two separate bodies - the Planning Commission and the Ministry of Health, Population Control and Family Planning (MOHP). The Health and Population Planning Section of the Planning Commission is directly responsible for the planning, evaluation and approval of all health-related projects. It also has an intersectoral coordinating function, so that projects impacting in several sectors will be adequately integrated. In the past the planning process has been done in relative isolation with little input from the various ministries, and none from the community-at-large. As a consequence, the ministries in general have been reluctant to implement policy which they have had no part in formulating. The MOHP has been no exception, and the translation of health policy into action has been slow.

The MOHP has the responsibility for the implementation of health and population programs. Since 1973 the structure of the ministry has undergone several changes. In early 1975 the ministry was split into two divisions: The Health Division and the Population Control and Family Planning Division. Each division is headed by a secretary who wields complete control of his respective division. The Minister of Health and Population has the responsibility of coordinating the activities of the two divisions and of providing general health and population policy guidelines.

Originally the Health Division was envisioned as the sole administrator of both health and family planning programs. The Population Division was considered to be the policy-formulating and intersectoral coordinating body for all population projects (in conjunction with the Planning Commission itself). However, under the new arrangement the Health Division will be responsible for all curative and some preventive programs, while the Population Control and Family Planning Division will have responsibility for all family planning and MCH programs.

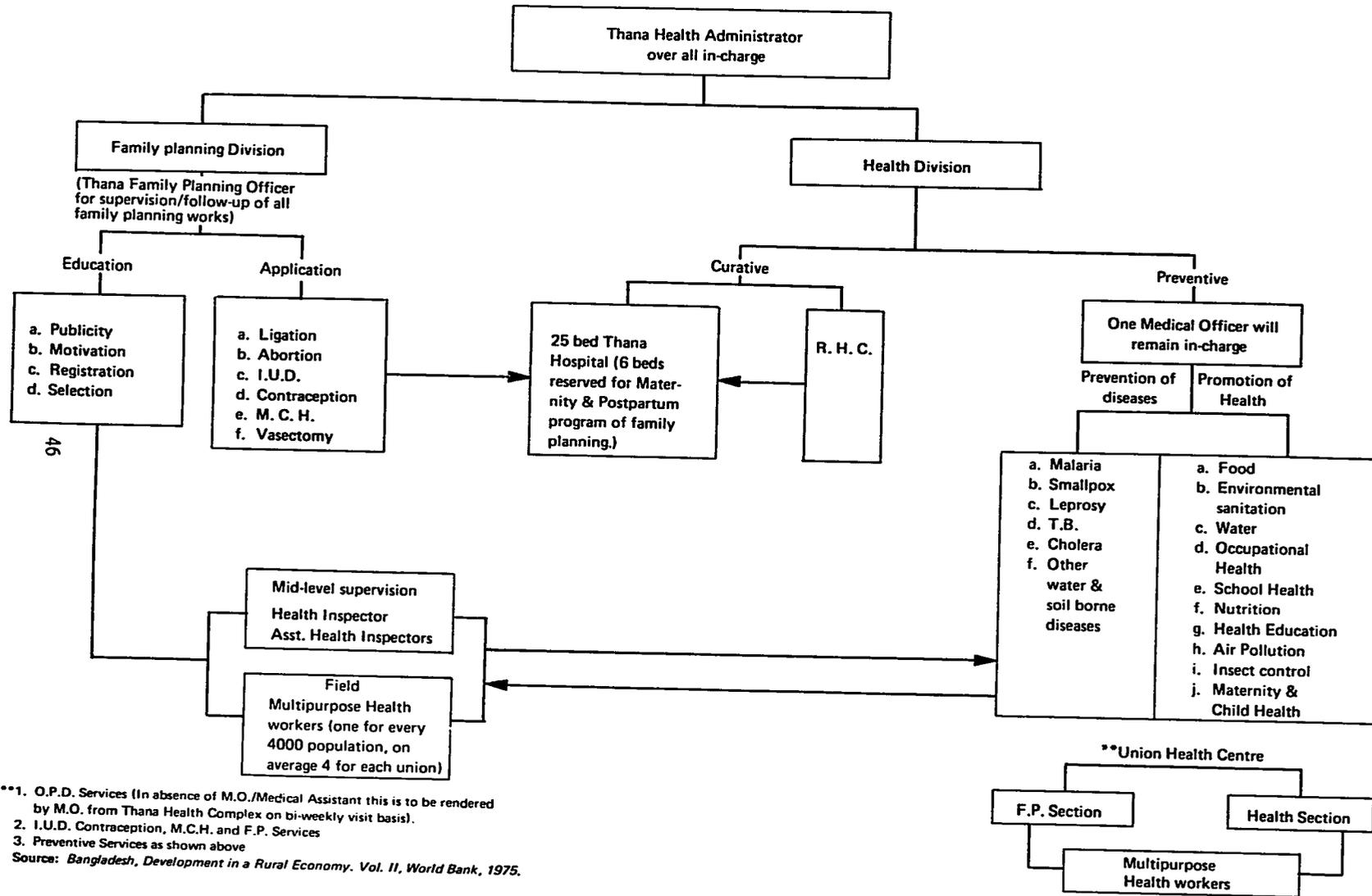
This brings up several important questions, all of which remain unanswered as of early 1976:

- Are the two divisions going to integrate their services as originally intended?
- Precisely what are the programmatic responsibilities of the respective divisions?
- How will health manpower resources be allocated to the two divisions?
- What is the specific administrative structure of the divisions?
- How will each division be funded?

Until these and other questions are answered, the status of the Government's health delivery system remains unclear.

Because of recent governmental changes, the administrative structure is in a state of transition. Although the mode of administrative command remains centralized, there is increasing movement towards district-level administrative control. The lack of an efficient communication network in Bangladesh has always impeded effective central administration. Any progress in the direction of decentralization should be viewed as a step towards a more responsive system of management.

Illustration 2
FUNCTIONAL CHART FOR THANA HEALTH & FAMILY PLANNING COMPLEX



**1. O.P.D. Services (In absence of M.O./Medical Assistant this is to be rendered by M.O. from Thana Health Complex on bi-weekly visit basis).
 2. I.U.D. Contraception, M.C.H. and F.P. Services
 3. Preventive Services as shown above
 Source: Bangladesh, Development in a Rural Economy. Vol. II, World Bank, 1975.

CHAPTER SEVEN

HEALTH SERVICES AND PROGRAMS

The vast majority of the Bangalee population seek health consultation with the traditional "healers" and "curers" rather than with Western-trained health professionals. The main thrust of the Government health policy is to provide the rural-based population a comprehensive, low-cost health package at the local level.

Governmental Health Services

The core of this health package was to be the Rural Health Complex. Each complex was to have two components: (1) the Rural Health Center (RHC) with outpatient subcenters at the union level, and (2) a twenty-five-bed hospital at the *thana* level. The Plan called for 356 RHC's, one in each rural *thana*, each covering an estimated population of 200,000. Every RHC would then be supported by three outlying subcenters (a total of 1,068) for extension of the health and family planning services. At the *thana*, a medical doctor, the Thana Health Administrator, would be in charge of health and family planning services. He would be assisted by other doctors, nurses, Lady Health Visitors, midwives, and other paramedical personnel. Illustration 2 shows the originally proposed functional scheme of the RHC. Although the changing administrative situation at the national level brings the local functional relationships into question, there is little reason to suspect that the general outline would be substantially altered. Table 7 shows the proposed staffing pattern at the *thana* and union level. The possible lack of manpower may cause some reevaluation of the quantity and type of personnel assigned to the various levels.

Table 7: PROPOSED STAFFING FOR EACH RURAL HEALTH COMPLEX

Categories	NUMBER OF STAFF	
	Thana Health Center	Union Health Center
Medical Doctors	5	1
Nurses	5	
Lady Health Visitors	1	1
Midwives	1	
X-Ray Technicians	1	
Laboratory Technicians	2	1
Health Inspectors	2	
Assistant Health Inspectors	3	
Basic Health Workers	4	4
Compounders/Dressers		
Family Planning Officers	1	
Others	24	4
Total	49	11

Source: Bangladesh, Development in a Rural Economy. Volume II, World Bank, 1975.

Initially it had been planned to establish a team of FWW's, one man and one woman, as the Government's prime interface with the populace. The man was to provide primary health services and the woman was to concentrate on family planning and maternal and child health (MCH) services. This plan was never completely activated. The malaria and smallpox workers (all male) were retrained as FWW's, but no corresponding female workers were recruited. When the Division of Population Control and Family Planning was created, the integrated team concept of field workers was abandoned.

In early 1976 the male FWW's continue to provide most of the health services envisioned in the previous plan. They are responsible for immunization, health education, vital statistics record-keeping, village sanitation, and other simple health tasks. Table 8 delineates the proposed duties of the FWW. In order to focus on the key problem of fertility control, the FWW are also distributing contraceptives at the village level. Ideally, there would be two FWW based at the union subcenter.

Table 8: DUTIES OF FAMILY WELFARE WORKERS

-
1. House-to-house visit as per schedule. Filling up of Health and Family Planning Cards and maintaining of Register of eligible couples.
 2. Impart health education in general and motivate eligible couples for family planning. Supply of family planning methods regularly according to the choice of the motivated couples and make regular follow-up visits of the adopters.
 3. Arrange for proper MCH care.
 4. Give routine primary vaccination and re-vaccination as necessary. Give preventive inoculation against Cholera and other diseases as necessary.
 5. Take blood smear from all fever cases and give presumptive treatment. Give radical treatment to confirmed malaria cases.
 6. Give treatment for minor ailments such as diarrhoea, dysentery, influenza, anaemia, etc. Give advice on personnel hygiene and sanitation.
 7. Record birth, death, and other vital information regularly. Notify incidence of an epidemic to the proper authority immediately and take necessary preventive measure.
 8. Submit reports regularly to the Health and Family Planning Inspector and send blood slides and other materials to the laboratory.

Source: Bangladesh, Development in a Rural Economy. Volume II, World Bank, 1975.

Over the last two years a number of revisions have also had to be made in the configuration of the physical facilities. In 1973 there were approximately 160 rural health centers with standard physical facilities such as a six-bed ward and some staff quarters. At that time only 186 subcenters were functioning in tandem with the health centers. Due to escalating costs, poor implementing ability, and national administrative conflicts, very little progress has been made. Consequently, priority has been given to the construction of RHC's with a six-bed ward, rather than to the twenty-five-bed *thana* hospital. In addition the number of union subcenters that can be built will apparently be severely limited by the same constraints. Given these facts, the World Bank in 1974 projected the development of the Rural Health Complexes over the duration of the First Five-Year Plan (see Table 9). The outlook indicates that at the end of the Five-Year Plan, very few of the health complexes will have been constructed. Unless there is a radical rethinking of the health strategy, the only conclusion is that the delivery of health services will only be marginally improved in 1978.

Table 9: PROJECTED DEVELOPMENT OF RURAL HEALTH COMPLEXES

Type of Institution	Existing	Plan's Objective	Probable end of Plan	Ultimate Objective
<i>Thana</i> Health Complex with 25 bed hospital unit	-	356 ^a	-	356 ^a
<i>Thana</i> Health Center with existing standards (including 6 bed wards)	160 ^b	-	356 ^a	-
Union Health Center	186 ^c	106 ^d	210	3,698 ^e

Note: The Bangladesh First Five-Year Plan anticipated building 196 *thana* health complexes each with a 25-bed hospital, and adding a 25-bed hospital to each of the 160 existing rural health centers, thus these would become rural health complexes.

a one per rural *thana*

b includes ten under construction

c active with some physical facilities

d one per rural union

e one per rural *thana*

Source: Bangladesh, Development in a Rural Economy. Volume II, World Bank, 1975.

Companiganj Health Project

This project is designed to serve as a *thana* model of the national integrated health and family planning program. The purpose of the project was to test and evaluate the various features of the Government's program. One of the major aims of the project was to demonstrate that health workers with no previous experience could be recruited and trained locally, and that this training could be accomplished with minimal formal instruction, followed by closely supervised on-the-job training.

Progress through 1974 and 1975 has been encouraging. Malaria and smallpox have been controlled, the incidence of Vitamin A deficiency appears to have decreased, acceptors of family planning have increased, and utilization of clinics by women and children has also increased.¹

The basic conclusions to date are that the proposed Government policy can work and can be effective, if adequate financial, technical, and administrative support is available.

Unipurpose Governmental Programs

In the past the Government has sponsored several unipurpose health programs. The most visible and most effective have been the malaria and smallpox eradication projects. The problem with such programs is that the workers are generally underutilized and the program itself is self-terminating. Generally, large numbers of field workers are required. Each person has a specific task which is repeated over and over. In such cases the worker certainly knows his job well, but is restricted from expanding his duties because of the nature of unipurpose programs. Naturally, upon the success of a program, large numbers of people are freed from their jobs. They are either retained for another similar program or are left to seek employment elsewhere. The Government has tapped this source of manpower and has augmented the duties of these field workers in order that they be able to perform a greater variety of tasks necessary in a comprehensive health system. As mentioned elsewhere, the workers have been renamed Family Welfare Workers (FWW), and their future responsibilities in the village will be to provide a broad range of services. Though many of the unipurpose field workers have been converted to FWW's, others remain in the malaria and smallpox eradication programs.

Both the malaria and smallpox campaigns have been extensively supported, financially and technically, by the World Health Organization (WHO). To date, the malaria eradication program has reaped the greatest success. Spraying of houses with DDT to eliminate the mosquito vector, surveillance to detect new cases through periodic examination of blood smears for the causative parasite and treatment with effective anti-malarials have been the major elements of the program. By and large, the disease has been confined to the border regions.

The smallpox campaign had more difficulty. The war for independence seriously disrupted activities. Large-scale epidemics broke out in 1973 and 1974. However, through an unflinching effort and with full WHO support, the last known case of smallpox appeared in Bangladesh in October 1975. Surveillance activities will continue for another two years.

Although other unipurpose programs, such as in tuberculosis and leprosy, do exist in Bangladesh, the lack of information disallows any discussion at this time.

Other Governmental Services

The Five-Year Plan proposes that health services be provided for workers. The Plan called for the establishment of Workers' Hospitals in five industrial zones, for twenty Labour Welfare Centers in major industrial centers which would provide health and recreational facilities, and for accidental insurance plans. Information on the progress of these proposals since 1973 was unavailable.

¹ McCord, Colin, "Companiganj Health Project, Noakhali, Bangladesh: The Second Year." August 1, 1975. (unpublished report)

The Government also provides health services to other limited groups, such as the armed forces and the railway workers. Unfortunately, data concerning these activities was also unavailable.

Private Health Services

The majority of health services are in fact non-governmental. Most services are provided by traditional rural health practitioners. In cities, there is a substantial number of private physicians who offer fee-for-service consultations. Although specifics are not known, the quality of care can be quite good.

There are many non-profit private organizations, mostly foreign-based, delivering health services at various levels around the country. For example, there are six Catholic hospitals in Bangladesh which cater generally to the Christian minority. The Cholera Research Laboratory (CRL) with its facilities in Dacca and Matlab provides disease-specific curative care to the public. Only cholera and diarrheal diseases are treated. All other illnesses are referred to governmental health services. (There is a more lengthy discussion of the CRL in a later section.)

Perhaps the most notable indigenously-sponsored private experiment is the Savar project. Started in 1972, the program seeks to provide comprehensive health care to a population in excess of 200,000 in Savar *Thana*, a rural area of 133 square miles. With a small hospital as its referral base, the project seeks to establish a network of eleven subcenters, through which primary health care is delivered by locally trained village health workers whose work is supplemented by weekly visits from a doctor at the hospital.

The emphasis of the program is largely preventive; it concentrates on immunization against communicable diseases and development of family planning services. Limited curative services are available through clinics at the base and subcenters. Inpatient facilities and emergency services are provided at the base hospital.

One of the project's basic principles is that health care cannot be viewed in isolation, but rather as a part of the overall pattern of development. Members of the community are taught handicrafts and improved agricultural methods to enhance their family incomes. Health education is undertaken in conjunction with the agriculture and nutrition programs. A full-time education extension officer is in charge of the center.

The intention is that the Savar project should be as nearly self-supporting as possible by relying on insurance subscriptions from the population. For a monthly fee of two *takas* (about twenty-five cents) per family, insured persons receive free outpatient treatment. When hospital admission is necessary members pay an extra fee of five *takas* only, plus one *taka* per day. No food is provided for inpatients, but all medicines are free. Persons not covered by insurance pay two *takas* per visit but receive free medicine, and admission to the hospital has to be paid for.

The Bangladesh Rehabilitation Assistance Committee (BRAC) has been considered one of the most successful local development programs in the country. Based upon local administrative control, the BRAC project has an integrated program of health, family planning, agriculture, and education. Trained male paramedics and female village healers have been incorporated into the system to deliver primary health care and family planning services.

CHAPTER EIGHT
POPULATION PROGRAMS

As it has been noted time and again in this report, the expanding population of Bangladesh poses a grave challenge to the future viability of the nation. Some of the following population indices are commonly cited:

- 78 million people at mid-year 1975
- 3% annual growth rate
- 23 years doubling time
- total fertility rate: 6.0 (average number of live born children per woman in a reproductive lifetime)
- 14 million women of child-bearing age
- 2.5 million annual net addition to the total population
- 45% of the population under 15 years of age
- density: 502 people per square kilometer
- 94% of population rural (i.e., in communities of less than 5,000)

The neutralizing effect of rapid population growth on economic and social progress has become increasingly apparent. For example, food production increased from 9.4 million tons in 1961 to 11.7 million tons in 1973, but the food availability dropped from 16.5 ounces to 15 ounces per person per day over the same period. During the decade of the 1960's population increased by about 20 million. The next ten years may witness an increase of over 25 million people. Given this substantial addition of inhabitants coupled with a dim prospect of increased agricultural production, the outlook is not optimistic.

Fortunately, the Government of Bangladesh recognizes the inherent danger of undiminished population growth. Through its First Five-Year Plan and through the statements of its public officials, the country has committed itself to a policy of population control.

Factors Influencing Fertility

One substantive factor influencing fertility is lactation. The average interval between pregnancy is much lower in Bangladesh than in other developing countries. Depending upon previous infant death experience, the median birth interval for all women with a surviving

infant was 37.2 months, and 24.1 months for those women with an infant death.¹ Much of this interval can be attributed to long periods of amenorrhea which is associated with breast-feeding.

Other physical factors such as parity, age of mother, mother's nutritional and general health status also contribute in varying ways to fertility. Social, psychological, and economic factors have also been associated with fertility. Unfortunately, the debated relationships of these factors to changes in fertility are difficult to evaluate. However, there is no lack of opinions on the reasons people have the number of children they actually have or would like to have. Whether these opinions are valid is still debatable. Some of the more accepted factors are:

- High value placed on sons. A son ensures continuity of the family and provides support to the parents in their later years.
- Woman's status as a wife and mother. As in other societies, Bangalee women achieve status by bearing children, especially sons.
- Community approval of large families.
- Universal marriage.
- Child survivorship. Infant and child mortality is high in Bangladesh. In order to ensure the survival of the appropriate number of sons and daughters, many couples provide extra children as insurance.
- An unborn child casts no shadow. It is very difficult for many couples to conceptualize additional children in cost/benefit terms.
- Psychological and emotional satisfaction. Parents may enjoy their children, particularly in a society where there are very few pleasures.

Although the question of the validity of the previous assumptions is still open, if policy is to be effective it is important that the Government of Bangladesh at least consider all factors, both physical and otherwise, in the planning and implementation of their population programs.

Past Programs

The Family Planning Association first initiated population activities in Bangladesh, then East Pakistan, in 1953. The Association, based mainly in Dacca, established a few clinics for dispensing family planning services, and carried out some educational work and publicity to popularize the concept of family limitation. These activities only received moderate governmental support prior to 1955.

¹ Chowdhury, A.K.M. Alaudin, et. al. The Effect of Child Mortality Experience on Subsequent Fertility: An Empirical Analysis of Pakistan and Bangladesh Data, The Ford Foundation: Dacca, March 1975.

During the First Five-Year Plan of the Pakistani era, the Central Government funded a limited program of family planning through voluntary efforts and as a part of the health program. This program provided advisory services and practical help with birth control methods to those couples who requested assistance.

A nationwide government program that was launched in 1960 at the start of the Second Five-Year Plan under the direction of the Ministry of Health made little headway. The limitation of success was attributed to the lack of a sound administrative system and the absence of field workers.

In 1965 a reorganization took the family planning program out of the Ministry of Health and established it as an independent single-purpose program with its own structure. There was an East Pakistan Provincial Family Planning Board as well as Family Planning Boards at the district and *thana* level. While doctors played an important role, particularly in sterilization, the program was one of the few in the world to be organized outside the Ministry of Health. Single-purpose female workers, known as lady family planning visitors (LFPV's) were trained to insert IUD's, which played a significant part of the Pakistani program, as did male sterilization. Little use was made of other methods such as pills or condoms. Part-time teams, normally consisting of a local man and a local woman, served as motivators at the village level.

During the 1960's, several important institutional developments occurred which had lasting effects on the program - the establishment of the University of California Health Education Project and the Sweden-Pakistani Family Welfare Project. Three training-cum-research institutes were initiated to handle the training of family planning personnel. By 1970 these scattered administrative units formed the Directorate for Training, Research, Evaluation, and Communication (TREC). TREC had overall responsibility for the functions indicated by its title and had substantial success in developing a capacity for designing and producing educational materials. A Postpartum Directorate was formed to be responsible for developing postpartum family planning services in a modest number of urban hospitals. An Inspection Directorate with primary responsibility for supervision of the program was also established. These three Directorates remain in existence today, though their future role and administrative structure is undetermined.

Although the program of the late 1960's achieved some statistical success in recruiting acceptors, there was widespread dissatisfaction with many of the program's features. For example, the pre-independence program relied heavily on incentive payments to both administrative personnel and to acceptors. The consequence was a great deal of financial corruption. However, one extremely important legacy was left from the earlier program - a high proportion of the population became aware of what family planning is and of the possibilities for limiting fertility. This knowledge seems to be quite widespread, even in the rural areas, and provides an invaluable base on which to build for the future.

Existing Situation

The war for independence and the consequent recovery period greatly disrupted family planning activities in Bangladesh. Therefore the main theme in the population sector since independence has been the search for a coherent national population policy and for a new organizational structure. The First Five-Year Plan has provided some rhetorical form to population policy, and it appears to recognize the urgency of the problem. For example, the Plan states that continued population growth could threaten the "sheer ecological viability of the nation," and that "no civilized measure would be too drastic to keep the population of Bangladesh on the smaller side of 15 *crores*" (*crore* = 10 million). Although awareness of the problem is present, the crux of the matter lies in action, and follow-up on the words of the Plan has been slow.

The strategy articulated in the Plan shifted the emphasis away from a unipurpose population program toward an integrated health/population package approach. Until early 1975 the Government envisioned a two-person team of multipurpose workers (one man and one woman) providing basic health and family planning services at the local village level.

With the creation of a distinct population control and family planning division within the Ministry in 1975, there was a concomitant separation of health and family planning services. The Health Division, with its 12,000 FWW's, would primarily be responsible for delivery of health services, while Population Control and Family Planning Division would be responsible for all population, family planning and maternal and child health (MCH) activities. Unfortunately at the time of the creation of the new division, there were only 500 trained midwives and Lady Health Visitors who could be incorporated into the new division. With the assistance of the World Bank, the United Nations Fund for Population Activities (UNFPA) and the United States Agency for International Development (USAID), the Government of Bangladesh is beginning to recruit approximately 6,000 female workers. Eventually the Government plans to have 18,000 family planning workers in the field (three women and one man per union).

The functions of each of these female workers will be to (1) motivate the eligible women through individual talks and group teaching; (2) provide information regarding availability of contraceptives; (3) deliver certain types of contraceptives, particularly pills; (4) refer clients to health centers and mobile clinic teams for Intrauterine Device (IUD) insertions and sterilization operations; (5) follow-up acceptors; and, (6) identify pregnant women and newborn babies for MCH services and for referral to health centers.

In addition it has been agreed that the FWW's of the Health Division will continue to distribute contraceptives during their home visits, concentrating on males as potential acceptors.

In 1975, a decision was made to establish a National Population Council headed by the Vice-President of the country. It is composed of six different ministries represented by the ministers themselves, with the Vice-chairman of the Council being the Minister for Health and Population. The Council was designed to provide a mechanism for the coherent development of a national population policy.

In early 1976, after a period of inactivity, the Council was strengthened through the announcement that the President would now chair the Council. The first meeting of the group took place in January 1976. The evidence indicates that the new Government was beginning to seriously grapple with the necessary implementation of heretofore official population policy.

External Assistance

The Planning Commission allocated about US\$93.0 million for the population program during the 1973-78 Five-Year Plan. It appears that external assistance may provide around 75% of the total financing during the Plan period.

The United Nations Fund for Population Activities (UNFPA) project, for which agreement has been signed for three years, includes US\$5.2 million for eight components that have been worked out in considerable detail, plus US\$4.8 million for two broad elements for which details are to be arranged later. The eight presently-planned components include: (1) technical assistance for census development and data processing, (2) rural development cooperatives and population education, (3) family planning motivation and services in industry and plantations, (4) population education and training for labor officers and labor organizations, (5) training programs for workers in an integrated national health and family planning program, (6) teaching

various aspects of population in medical schools, (7) strengthening the family planning clinical program with emphasis on MCH-based family planning, and (8) organization and management of comprehensive health and family planning supplies and delivery of service. The additional US\$4.8 million will be expended on projects now under appraisal: (9) construction of the union level subcenters, (10) communication, information, and educational activities, (11) population education in schools, and (12) health education.

The International Development Association (IDA) of the World Bank Group has proposed to finance US\$15.0 million of a US\$45.7 million population project. The project is designed to assist the Government of Bangladesh (1) in establishing a health delivery system to meet the existing demand for family planning services, and (2) in developing a comprehensive national population program aimed equally at the creation of demand for family planning and to the delivery of services. For the former it will (a) expand the capacity for training health and family planning manpower, (b) establish a number of pilot schemes for introducing family life education and motivation activities in the development programs of five ministries, (c) strengthen the capacity of the mass media to deal with population topics, and (d) build up research and evaluation activities to provide knowledge needed for future program expansion.

To date the largest bilateral assistance is from USAID, which from Fiscal Year (FY) 1972 through FY 1975 had made about US\$5.2 million available for contraceptive supplies and population activities. From FY 1976 through FY 1978 USAID plans to provide (1) US\$15.2 million grant to Bangladesh for provision of contraceptive supplies, (2) training in program management and related population fields, (3) technical assistance, and establishment of family planning training clinics in four medical colleges.

Another important form of indirect USAID assistance is provided by contracts with the University of Michigan for help to TREC and with Population Services, Inc., to test the feasibility of expanding contraceptive distribution through private commercial channels.

The Swedish International Development Authority (SIDA) has already committed US\$1.0 million for specific population assistance in 1974 as part of its general assistance program

The United Kingdom's Overseas Development Ministry (ODM) has committed US\$78,000 equivalent to the Census Commissioner's Office, for a retrospective survey of fertility and mortality following the national census in 1974.

Several private agencies will also make important financial and technical assistance contributions to the program. The Pathfinder Fund is supporting the postpartum program and a model clinic in Dacca through a grant of US\$1.5 million. The Population Council plans to conduct one of its worldwide Taylor Berelson postpartum demonstration projects at a total cost of about US\$2.0 million. The Ford Foundation's Dacca office, concentrating on a long-range, intersectoral support of research and training capabilities of Bangalee institutions, has recommended approval of a two-year grant of US\$300,000 for support of a new Population Studies Center at the Bangladesh Institute of Developmental Studies. The Foundation will also support a pilot project for the development of population education curriculum, and a demographic unit in the Planning Commission. Canada's International Development Research Center may contribute C\$30,000 towards applied population research.

Apparently, communication between the donors has been good and, consequently, their efforts seem to be coordinated. However, some donors have expressed the desire for a formalization of a coordinating mechanism for external assistance within the governmental structure.

CHAPTER NINE

ENVIRONMENTAL SANITATION

Inadequate systems of clean water supply and sewage disposal contribute heavily to the transmission of many of the communicable diseases which create high levels of mortality and morbidity in developing countries (see Table 10). As a consequence where there are high incidences of water-borne diseases, typhoid, cholera, gastroenteritis, etc., one might expect an unsatisfactory water supply and sanitation situation. Such is the case in Bangladesh.

Water Supply

Potable water supply is only available to a small fraction of the Bangalee population. According to the Planning Commission in 1973, there were only 185,000 Government tubewells in the rural areas (there are also an unknown number of private tubewells) and only thirty of the more than seventy-six urban centers had piped water. Unfortunately, even these numbers are misleading for it has been estimated that approximately 30% of all of the rural tubewells were inoperative, either through silting or poor maintenance, and that many of the urban systems provided running water only four or five hours daily.

Depending upon the effects of the monsoon season, water is generally available in the rural areas, since the water table is rarely below thirty feet from the surface. Therefore, water supply per se is not the problem. Rather the problem is a lack of potable water. On the other hand, urban dwellers in many cases must depend upon the piped water systems.

The principal agencies dealing with domestic water supply and sewerage are the Dacca Water and Sewerage Authority (Dacca WASA), the Chittagong Water and Sewerage Authority (Chittagong WASA), the central Government through the Department of Public Health Engineering (DPHE), and the individual municipalities. The WASA's are semi-autonomous, but are generally responsible to the Ministry of Public Works and Urban Development. DPHE is a branch of the Ministry of Local Government, Rural Development, and Cooperatives. The municipalities report to the same ministry. DPHE is generally responsible, outside of Dacca and Chittagong, for the planning and construction of systems. In the rural areas DPHE is accountable for the maintenance of handpump tubewells, although completed water supply systems in urban areas are normally handed over to the individual municipality for administration, operation, and maintenance.

The Five-Year Plan called for an increase in the number of drinking-water tubewells to a total of 285,000 shallow and 1,200 deep tubewells (see Illustration 3). UNICEF, which at that time had an ongoing project, was to provide financial and technical support through a US\$10.8 million grant under the reconstruction program. In addition, UNICEF was planning further assistance, US\$10.5 million, for the sinking of another 100,000 shallow and 9,500 deep tubewells. If, in fact, those projected levels are reached, then the Plan's target of provision of one handpump tubewell for every 150 persons in rural areas supplied by shallow wells and one well for every 200 persons in deep well areas will be realized.

However, unless there is widespread health education, all of this effort may be misdirected since there is a great deal of evidence indicating that the public prefers to get their drinking water from traditional sources - mainly the rivers and streams. Also, unless maintenance is improved, there is every likelihood that many of the newly constructed wells and handpumps will become inoperative.

Table 10
WATER AND HEALTH

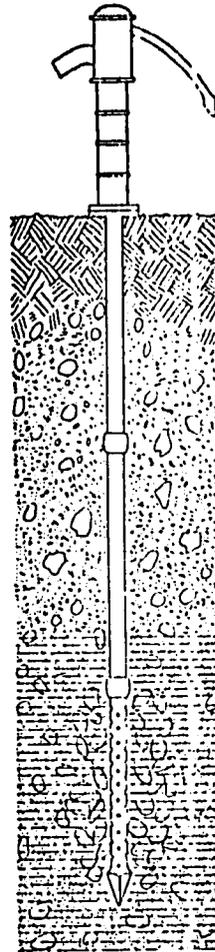
Role of Water	Disease	Remarks
Major Vehicle for Direct Transmission	Cholera Diarrhea and Enteritis Dracontiasis (Guinea worm disease) Hepatitis, Infectious Leptospirosis (Well's disease) Paratyphoid Fever Schistosomiasis (Bilharziasis) Typhoid Fever	Classic example of water-borne disease Symptomatic of many infections and toxemias; often non-specific Ingestion of infected <i>Cyclops</i> , 50 million active cases 100,000 cases in 1955 Delhi outbreak A zoonosis; ingestion of urine of infected animal Milder than typhoid Requires aquatic snail as intermediate host and water contact, with skin penetration by cercariae, or less often, their ingestion; over 150 million active cases Major 19th Century U.S. disease
Occasional Vehicle	Dysentery, Amebic (Amebiosis) Dysentery, Bacillary (Shigellosis)	Worldwide endemicity Many outbreaks due to cross-connections
Possible Vehicle	Poliomyelitis Pleurodynia Tularemia	Virus is found in sewage Non-fatal; Coxsackie virus A zoonosis; usually direct contact
Clean Environment (Lack of Safe Water)	All above except Schistosomiasis and Dracontiasis Ancylostomiasis (Hookworm) Ascariasis Echinococcosis (Hydatidosis) Enterobiasis Mycoses Relapsing Fever Scabies Trachoma Trichomoniasis Typhus Fever	Water-borne sanitation best preventive Avoid ingestion Food and drink contaminated by dog feces Personal hygiene Fungal diseases; personal hygiene Louse-borne; poor sanitation Personal hygiene 150 million victims with impaired vision <i>Trichomonas hominus</i> , <i>Giardia lamblia</i> ; contaminated food and drink Louse-borne; crowding, poor sanitation

Table 10
(cont'd.)

Role of Water	Disease	Remarks
Vector	Clonorchiasis	Ingestion of parasitized fish
	Dengue	Mosquito
Habitat	Diphyllobothriasis	Ingestion of parasitized fish
	Encephalitis	Mosquito
	Fosciolopiasis	Ingestion of water chestnuts containing cercariae
	Filariasis	Mosquito
	Loiasis	Aquatic fly (<i>Chrysops</i>)
	Malaria	Mosquito
	Onchocerciasis	Aquatic fly (<i>Simulium</i>)
	Paragonimiasis	Ingestion of parasitized crabs and crayfish
	Rift Valley Fever	Mosquito
	Yellow Fever	Mosquito
Carrier	Chemical Poisoning	Natural and polluted waters; acute and chronic
	Radiation Exposure	Cumulative

Source: Community Water Supply in Developing Countries, USAID, Washington, D.C., 1969.

Illustration 3: CROSS-SECTION OF A TUBEWELL



In areas having a water-bearing gravel subsoil, the simple tubewell may prove a useful means of water supply. Such wells are constructed by driving tubes into the gravel, one length being screwed on to another, the first being provided with a steel point above which it is perforated for about two feet. When the well is first used the surrounding sand is pumped up with the water, but after a time the perforated pipe is surrounded by clean pebbles which yield an abundant and clean supply.

Source: Clay's Public Health Inspector's Handbook, London, 1968, pp. 414-16.

For urban water supply, outside of Dacca and Chittagong, the Plan proposed that water supply systems be installed in thirty-eight urban centers, including all the district and sub-divisional headquarters, and that the water supply capacity be improved and enlarged in seven other important towns. No information was available concerning the implementation of these plans.

In Dacca and Chittagong the International Development Association (IDA) has extended credit for improvement of the water systems in those two cities.

Overall, it can be said that safe, reliable water is essentially unavailable to the vast majority of Bangalees. Even Dacca cannot claim an adequate supply of potable water.

Sewage Disposal

In the rural areas human excreta has been disposed of in make-shift latrines. In effect, the many rivers and streams have served as a convenient waste removal system. In the urban areas night-soil is collected systematically and is dumped outside the city. Neither system is conducive to the maintenance of adequate sanitary levels.

In ten rural *thanas* experimentation is beginning on a limited basis with the installation of water-sealed latrine slabs. Plans called for UNICEF to provide approximately 100,000 additional latrine slabs between 1972 and 1974.

Another pilot project in 1973-74 was to have constructed 1,655 water-sealed latrines in twelve selected *thanas*, which would then have a follow-up of one million additional latrines in 100 pre-selected *thanas* over a five-year period. Information on the current status of these programs was unavailable.

As with water supply, any construction project of latrines must have a concomitant health education program so that the public will become aware of the importance of the correct use of human waste facilities. In this case, a little bit of knowledge can go a long way in the prevention of health problems.

Dacca is the only urban center in Bangladesh that has a sewerage system. Even in this instance the system only extends to certain sections of the city. The Five-Year Plan has proposed improvement and enlargement of the system.

The remaining urban areas, including Chittagong, are evidently without modern waste disposal systems, and as of 1974 there were no definite plans for their construction.

Garbage is removed in the same manner as night-soil: by dumping on the outskirts of the city.

Manpower

Sanitary engineers are trained in three engineering universities. Approximately 200 are graduated each year and most are employed by the Government. Most reports claim that there is no real shortage of qualified manpower at the national and regional levels. However, there is a need for trained maintenance personnel at the local level.

Food-Sanitation

No effective system of monitoring food supplies is apparent in Bangladesh

Summary

Summarizing, the level of environmental sanitation is appallingly low. As long as a safe water supply and an adequate waste disposal system is unavailable to the majority of Bangalees, the overall health status of the population will not improve appreciably. Therefore, in order to realistically lower both mortality and morbidity rates comprehensive capital investments must be made in the environmental health area. Construction of facilities is not the sole answer. There must be an improvement in administrative and maintenance methods so that existing systems as well as future ones are run efficiently, and there must be large-scale campaigns to educate the public about sanitary health practices. Unfortunately, in a country like Bangladesh where resources are extremely limited, some hard decisions on allocation have to be made. Nevertheless, it is important to recognize that a successful environmental health program is imperative if the general health status of a nation is to improve.

CHAPTER TEN

HEALTH SECTOR RESOURCES

Health Manpower

Paradoxically, the scarcity of reliable data which made the reporting of mortality and morbidity rates so difficult does not hinder assessment of health manpower. While the urban-based curative-oriented nature of the Bangladesh medical system and the lack of numbers makes it relatively easy to account for personnel, it is evidence at the same time of the inadequacies of the health care provided to the majority of the rural population.

The Five-Year Plan reports a total number of 7,000 physicians which amounts to a doctor/population ratio of 1/10,714. Of that number over 75% are working in urban areas. Unlike many nations which require Government service, in Bangladesh there is no compulsion for medical graduates to offer their services to the rural countryside. The consequence is a doctor/population ratio in the rural areas of 1/40,000. Table 11 compares the Bangladesh situation with that of seven other developing countries.

Table 11: POPULATION PER MEDICAL DOCTOR IN URBAN AND RURAL AREAS
IN SELECTED COUNTRIES

<u>Country</u>	<u>Year</u>	<u>Population/Medical Doctor</u>		
		<u>Nationwide</u>	<u>Urban</u>	<u>Rural</u>
Pakistan	1970	7,400	3,700	24,200
Kenya	1969	12,140	800	50,000
Philippines	1971	3,900	1,500	10,000
Honduras	1968	3,860	1,190	7,140
Colombia	1970	2,160	1,000	6,400
Iran	1967-70	3,752	2,275	10,000
Panama	1969	1,790	930	3,000
Bangladesh	1973	10,714	2,674	40,000

Sources: Bangladesh, Five-Year Plan, 1973-78; and, Health Sector Policy Paper, IBRD, 1975.

The majority of the physicians are general practitioners. In 1973 only 259 specialists were available, although another 178 were doing post-graduate training in-country and abroad. Another 719 more doctors needed to be trained just to man existing programs.

Only 30% of the doctors are in Government service, the remaining being exclusively in private practice. Even the physicians in Government employ retain their private clients. The overlap of private and public practice has decreased the quality of available medical care to the public sector and has been a prime source of corruption. Governmental facilities and services are often utilized by private patients with the means to pay, rather than by the underprivileged for whom the programs are intended.

The situation for nursing manpower is even worse than the one existing for physicians. In 1973, in all of Bangladesh there were only 700 nurses - all urban-based and hospital-oriented. The inadequacy of nursing services is evident in light of the doctor/nurse ratio of 10/1 when there are two to five nurses for every doctor in some Western European countries. The scarcity of nurses has been attributed to poor salaries, particularly in relation to their extended training; long and irregular working hours; cultural distaste for nursing activities such as handling blood and excrement; and, the lack of an image in society of nursing as a desirable profession for educated young ladies.

In 1973 the Five-Year Plan reported that there were 250 trained midwives, 275 Lady Health Visitors, 980 sanitary inspectors, fewer than 1,000 compounders/dressers, 170 lab technicians, 11 radiotherapy technicians, 20 physiotherapy technicians, and approximately 12,000 male field auxiliaries who were involved in the smallpox and malaria eradication programs. The smallpox and malaria workers have been renamed Family Welfare Workers and some have received short-term training to broaden their usefulness. With such scanty numbers, the need for additional manpower to implement any health delivery system is apparent. In many countries the health system operates something like a funnel. The broad base is made up of the numerous primary health workers who have direct contact with the population. The tip of the funnel can be thought of as the workers who are responsible for several primary health people and who are slightly better trained. They would see those patients which cannot be taken care of by the primary health worker. As the medical problem becomes more complex, the individual is referred further up the neck of the funnel where he may be seen by a physician, and, if necessary, by a specialist. Ideally the system would work in such a hierarchical manner. However, in order for this referral system to work, there must be many more paramedical personnel available than physicians. This is one of the key problem areas in Bangladesh.

Dentists

The exact number of dentists working in Bangladesh is unknown. Although a dental college does exist in Dacca, the number of students or graduates is unavailable. Nevertheless, it can safely be said that the numbers are few and are certainly concentrated in the urban areas. Reports put the number of foreign-trained dentists at two - both in Dacca. An estimated twenty dental assistants were working in 1973.

Veterinary Services

As with dentists, the number of veterinarians was unavailable. Evidently, veterinarians are being trained by the agricultural university and agrarian colleges. Theoretically, every *thana* is supposed to have a Government veterinarian, who provides free service to the people for their livestock. In practice, however, this service is rarely available.

Medical Education

The caliber of medical education for physicians has been high. Standards have been set so that graduates would be the equivalent to their counterparts in the United Kingdom and other Western countries. Though the medical training is good, it is poorly adapted to the needs of the country. Medical professors teach high-quality, hospital-oriented curative medicine.¹ The

¹ Northrup, Robert S. Medical Manpower in Bangladesh. (mimeo)

emphasis has been more on diseases of higher incidence in Western societies than in Bangladesh. Only a minimal emphasis has been put on epidemiology, preventive medicine, statistics, education and motivation techniques, and administration - all aspects of medicine and public health necessary for the type of problems which affect the country. Opportunities for rural experience are minimal.

The result has been a physician suited better for practice in the developed world than at home, as indicated by the fact that many graduates emigrate. Those that do remain avoid rural practice and congregate in the cities. Emigration of trained doctors remains a problem for Bangladesh. An estimated 50% of all medical graduates leave. In the past most of these migrating physicians have gone to the United Kingdom or the United States. Today many of them are working in the oil-rich Islamic countries.

Like the programs for medical doctors, the training programs for nurses provide a primarily hospital-based education. The potential role of nurses in outpatient hospital care is generally unrealized. Rural experience does not enter the nurses' training. A redirectioning and strengthening of the role of nurses deserves attention if health care is to be improved.

The paramedical workers receive varying degrees of training. The Lady Health Visitors and midwives are more broadly trained in such items as the recognition and treatment of diseases common in rural areas, hygiene, family planning, and, of course, deliveries and pre- and post-partum care of the mother and infant. The compounders/dressers have only limited training, which has generally been restricted to on-the-job experience. Formal training has not been established for these individuals, generally men, even though they serve a valuable function and could be an extremely important member of a health team.

Traditional Medicine

It has been estimated that approximately 90% of the population seeks medical care from traditional sources: *hakim*, practicing a folk medicine based on indigenous herbs, homeopaths, faith healers, and quacks. These traditional healers follow any one of several medical systems, including Hindu *ayurvedic*, the Greek-based Muslim *Unani*, and the Western *allopathic*. Since modern medicines are available without prescription, the indigenous curers may employ scientific medications, and perhaps most importantly, provide strong psychological support for their patients.

Future Manpower Needs

The Government of Bangladesh has recognized the need for an increase in all categories of health manpower. The Five-Year Plan has projected that by 1978 9,100 physicians, a total increase of 2,100, will be available to the country. This would improve the doctor/population ratio from 1/10,000 to 1/9,000. Table 12 illustrates the output of medical doctors from the seven existing medical schools during Bangladesh's Five-Year Plan. In addition the Government has declared that "policies will be designed to ensure that all medical graduates can be absorbed at home and there is no further brain drain."² To date no such policies are evident and there is some doubt whether there will be in the near future.

² First Five-Year Plan, p. 518.

Table 12: PROJECTED OUTPUT OF TRAINED DOCTORS (1973-1978)

Medical College	Y E A R S					Total
	1973-74	1974-75	1975-76	1976-77	1977-78	
Dacca	100	100	140	140	140	620
Chittagong	72	72	105	105	140	494
Rajshah	72	72	105	105	140	494
Sylhet	52	52	70	70	112	356
Mymensingh	52	52	70	70	112	356
Rangpur			35	52	112	100
Barisal	35	35	52	70	112	304
Sir Sallmulah (in Dacca)	105	105	140	140	210	700
Total	488	488	717	752	1,076	3,523

Source: Bangladesh First Five-Year Plan, p. 519.

Although the need for additional specialists is recognized, no concrete plans have been elaborated by the Government for post-graduate training.

A high priority has been given to the training of additional nurses. The Five-Year Plan proposed the entry of 1,676 new nurses into the field during the Plan period. (See Table 13.) With a total of 2,300 nurses the population/nurse ratio should have improved to 1/35,000 and the doctor/nurse ratio to 1/4. Naturally, in order to train more nurses it is necessary to have trainers, which are in short supply. Only forty tutors are available. Consequently, Bangladesh with financial and technical support from the World Bank, has proposed a plan to train tutors who will train nurses and paramedical personnel. The hope is that by 1979, 270 tutors will be trained and teaching.

Paramedical personnel are to be increased dramatically. During the five years the development plan is in effect, 290 Lady Health Visitors, 381 midwives, 268 compounders, 624 technicians and 7,500 Family Welfare Workers, all female, are to be added. Once again, it is the World Bank, in conjunction with UNFPA, that is supporting the increases in manpower by providing for the training of 5,500 female Family Welfare Workers. Presumably, the Government will train the remaining 2,000.

Health Facilities

It is commonplace for a hospital/population ratio to be used as a relative indicator for hospital-based treatment. Unfortunately, such a ratio can be nothing more than a rough estimate since there is no measure of distribution of beds.

As of June 1973, in Bangladesh there were 12,311 hospital beds of all categories, of which 10,449 were in the public sector and 1,862 in the private sector.

All of the public sector beds, except 900 maternity beds attached to the rural health centers and 185 beds in railway hospitals, were located in urban areas. Through 1973 the only general hospital beds located in rural areas had been provided by the private sector, mostly

Table 13: PROPOSED OUTPUT OF TRAINED NURSES (1973-1978)

Year	Annual Intake Expected	Output of Nurses	
		Annual ^a	Cumulative Total
1972-73	775	215	215
1973-74	775	157	372
1974-75	900	64	436
1975-76	1,000	620	1,056
1976-77	1,200	620	1,676
1977-78	1,200		

^a output calculated as 80% of intake four years earlier - loss due to dropouts, etc.

Source: Bangladesh First Five-Year Plan, p. 523.

church-related voluntary organizations. The specialized hospital situation follows much the same pattern as general beds; 966 beds for tuberculosis, 60 beds for leprosy, 180 beds for infectious diseases, and 400 beds for mental disorders throughout the entire country.

Examining the hospital bed/population ratio against the various categorizations, some interesting results are revealed. The total hospital bed/population ratio is 1/6,000. Comparing this ratio with other countries in Table 15, the poor accessibility to hospital-based care by the population is illustrated.

Looking at the beds immediately available to the urban-based population, the ratio is substantially different. Assuming the urban population to be 3,900,000 in 1973 and calculating that 7,715 hospital beds in the public sector, both general and specialized, were available in the urban areas (jail, police, and railway hospitals were discounted), then the urban population/hospital bed ratio becomes 500/1. That is considerably different from the countrywide ratio. Realistically, since the few rural private hospital beds were accessible only to a restricted population, the rural areas were effectively without hospitals. A seriously ill rural individual needing hospitalization would have to travel several hours or even days to reach the cities where hospitals were available.

The meager number of health facilities existing in the rural areas are mainly the Rural Health Centers, of which there were about 160 with six maternity beds each, and scattered Maternal and Child Health Centers, both public and private.

Even such indicators as the number of beds and the location of facilities do not give a complete picture. Observers have reported hospitals in Dacca to be extremely overcrowded, and unsanitary. Although beds are put in the halls to provide for the great influx of patients, patients often lie on the floor. Certainly the quality of medical care must suffer in such a situation.

Training Facilities

As of 1973 there were seven medical colleges, five nurses' training centers, three Lady Health Visitors' training centers, one training institute for paramedical workers, and one dental college. (See Table 16)

Table 14: TOTAL HOSPITAL BEDS OF ALL CATEGORIES
June 1973

Category of Hospital Beds	Urban	NUMBER OF BEDS		Private Sector		Grand Total
		Public Sector	Total	Urban	Rural	
General Beds						
District Hospital	1,118		1,118	398	1,178	1,576
Subdivisional Hospital	1,086		1,086			3,780
Teaching Hospital	3,670		3,670			3,670
Specialized Hospital						
Tuberculosis and Chest Diseases	966		96			
Leprosy	60		60			1,606
Infectious Diseases	180		180			
Mental	400		400			
Maternity	235	900	1,135	286		286
Jail Hospital	860		860			860
Police Hospital	652		652			652
Railway Hospital	137	185	322			322
Total	9,364	1,085	10,449	684	1,178	1,862

Source: Bangladesh Five-year Plan.

Another paramedical training school had been built at Rajshahi, but had not begun to function because of a lack of staffing personnel and funds. In addition the Cholera Research Laboratory has a training component in its activities.

The medical schools, of course, are attached to hospitals which serve in the public sector.

Future Plans

The Five-Year Plan, 1973-78, has proposed a dramatic increase in facilities based upon the governmental plan to deliver health care through the Rural Health Centers. The Rural Health Centers, as the core of the preventive health plan, were to be increased from 160 to 356, and

Table 15: POPULATION PER HOSPITAL BED IN SELECTED COUNTRIES

Country	Population per Hospital Bed
Rwanda	769
Upper Volta	1,667
Ethiopia	3,030
Indonesia	1,724
Burma	1,190
India	1,612
Nepal	6,667
Colombia	446
Paraguay	624
Cuba	213
Bangladesh	6,000

Source: World Bank, 1975.

Table 16: INSTITUTIONS FOR TRAINING OF NURSES AND PARAMEDICAL PERSONNEL

Institutions	Number	Annual intake capacity for training
Nurses' Training Centers	5	325
Lady Health Visitors' Training Centers	3	115
Paramedical Training Institute	1	
-- Laboratory Technicians		50
-- Dental Technicians		20
-- Sanitary Inspectors		40
-- Radiographers		10
-- Physiotherapy Technicians		10
-- Pharmacists		50
-- Blood Bank Technicians		10

Source: Bangladesh Five-Year Plan, 1973-78.

the outlying subcenters at the union level were to number 1,068 by the end of the Plan period. In 1973 there were no subcenters. In order to provide curative services 356 Rural Health Complexes, including a twenty-five-bed hospital, were to be constructed. USAID has funded the building of fifteen Rural Health Centers at the *thana* level. However, only one was successfully completed. The remaining fourteen were unfinished due to a loss of construction materials and unsatisfactory building procedures. Based upon preliminary observations, fulfillment of the Plan's objectives in rural health facilities is doubtful.

The Plan has also called for a substantial improvement in the number of hospital beds. All district and subdivisional hospitals were to be upgraded to provide at least 100 beds in each (see Tables 17 and 18).

During the Plan period one post-graduate institute of medicine and at least one new medical college were to be established and the existing medical schools were to be strengthened. Approximately 1,530 new beds were scheduled to be created in these teaching institutions (see Table 19).

Table 17: HOSPITAL BEDS AT DISTRICT LEVEL

Name of Hospital	NUMBER OF BEDS		Expected Increase During Plan Period
	1972-73 Benchmark	1977-78 Target	
Chittagong General Hospital	225	225	--
Rangamati Sadar Hospital	25	100	75
Noakhali Sadar Hospital	100	100	--
Comilla Sadar Hospital	110	110	--
Faridpur Sadar Hospital	80	100	20
Tangail Sadar Hospital	22	100	78
Dinajpur Sadar Hospital	76	100	24
Bogra Sadar Hospital	100	100	--
Pabna Sadar Hospital	100	100	--
Khulna Sadar Hospital	130	130	--
Jessore Sadar Hospital	77	100	23
Kushtia Sadar Hospital	50	100	50
Patuakhali Sadar Hospital	23	100	77
Total	1,118	1,465	347

Source: Bangladesh Five-Year Plan, 1973-78.

Specialized hospital beds were to be increased by 1,464 with the majority being in the area of tuberculosis, infectious diseases, and children's diseases (Table 20).

The International Bank for Reconstruction and Development and the International Development Association are currently participating in a population project which will involve the construction of several physical facilities. The plan calls for the building of a new College of Nursing, four Model Family Planning Clinics, eight Family Welfare Visitor Training Schools, eight *Thana* Field Training Health Complexes, and twenty-four Union Health Subcenters. Illustration 4 shows the type, number, and location of the facilities.

Table 18: HOSPITAL BEDS AT SUBDIVISIONAL LEVEL

Name of the Subdivision	Number of Hospital Beds		Expected Increase During Plan Period
	Existing	Target	
Narayanganj	65	100	35
Munshiganj	20	100	80
Manikganj	20	100	80
Kishoreganj	25	100	75
Jamalpur	25	100	75
Netrokona	26	100	74
Madaripur	22	100	78
Gopalganj	50	100	50
Goalundo (Rajhari)	25	100	75
Cox's Bazar	32	100	68
Ramgarh	10	100	90
Brahmanbaria	26	100	74
Bandarban	10	100	90
Feni	20	100	80
Chandpur	50	100	50
Habiganj	34	100	66
Moulvi Bazar	22	100	78
Sunaranganj	20	100	80
Nawabganj	25	100	75
Natore	30	100	70
Naogaon	50	100	50
Thakurgaon	25	100	75
Kurigram	50	100	50
Nilphamari	25	100	75
Gaibandha	13	100	87
Jaipurhai	Nil	100	100
Sirajganj	50	100	50
Bagerhai	50	100	50
Satkhira	23	100	77
Pirojpur	24	100	76
Bhola	30	100	70
Jhalakati	Nil	100	100
Barguna	Nil	100	100
Margura	50	100	50
Narail	14	100	86
Jhenaidah	50	100	50
Chuadanga	50	100	50
Meherpur	25	100	75
Total	1,086	3,800	2,714

Source: Bangladesh Five-Year Plan, 1973-78.

Table 19: NUMBER OF HOSPITAL BEDS IN TEACHING INSTITUTIONS

General Beds Attached to Teaching Institutions	N U M B E R O F B E D S		Expected Increase
	1972-73 (existing)	1977-78 Target	
Dacca Medical College Hospital	900	900	
Sir Salimullah Medical College Hospital	420	500	80
Chittagong Medical College Hospital	500	500	
Rajshahi Medical College Hospital	500	500	
Mymensingh Medical College Hospital	500	500	
Sylhet Medical College Hospital	200	500	300
Barisal Medical College Hospital	250	500	250
Rangpur Medical College Hospital	100	300	200
Institute of Post-Graduate Medicine	100	500	400
Khulna Medical College Hospital		300	300
Total	3,470	5,000	1,530

Source: Bangladesh Five-Year Plan, 1973-78.

Table 20: BEDS IN SPECIALIZED HOSPITALS

Specialty	N U M B E R O F B E D S		Increase during the Plan period
	Existing 1972-73	Target 1977-78	
Tuberculosis	966	1,200	234
Leprosy	60	120	60
Infectious Diseases	180	500	320
Children's Diseases	Nil	400	400
Mental Diseases	400	600	200
Cancer	Nil	100	100
Casualty	Nil	150	150
Total	1,606	3,070	1,464

Source: Bangladesh, Five-Year Plan, 1973-78.

Illustration 4: TYPE, NUMBER AND LOCATION
OF PHYSICAL FACILITIES FOR
POPULATION ACTIVITIES

Nursing College							
Model Family Planning Clinic							
FFWW Training School							
Thana Field Training Health Complex							
Union Health Subcenter							
District					Division		
1		1	1	3	Rajshahi	Rajshahi	
			1		Dinajpur		
			1		Bogra		
			1	3	Rangpur		
1		1	1		Khulna	Khulna	
			1		Kushtia		
			1		Barisal		
			1	3	Jessore		
1		1	1	3	Dacca	Dacca	
			1	1	3		Faridpur
			1		Tangail		
			1	3	Mymensingh		
1		1	1	3	Chittagong	Chittagong	
			1	3	Sylhet		
			1		Comilla		
			1		Chittagong Hill Tracts		
1	4	8	8	24			

Source: Appraisal Report of a Population Project in Bangladesh, IBRD, IDA, 1975.

The College of Nursing will be a facility capable of enrolling sixty new nurse-tutor students per year for a two-year course of training. The ultimate use of the building will be as a training college for public health nurses.

The Model Family Planning Clinics, to be located at four of the eight medical schools, will provide for instruction of medical students in new contraceptive technology and modern methods of induced abortion. Each clinic will have facilities for sterilization, abortion, and outpatient contraceptive services. A ward with twenty-five beds will be attached to the clinic for the abortion and sterilization cases.

The eight Family Welfare Visitor Training Schools will have dormitory and classroom space for ninety students composed of three classes of thirty each admitted at six-month intervals.

The eight new *thana* health complexes will be used as centers for field training of new health personnel. Each of these complexes will have four components: (1) an outpatient rural health center, (2) a twenty-five-bed maternity ward unit, (3) a dormitory for twenty-five students, and (4) staff housing. One of the main functions of these complexes will be to provide field training opportunities for medical and paramedical personnel in community medicine with emphasis on maternal and child health, family planning, and pediatric medicine.

The twenty-four health subcenters, three for each of the eight *thana* health complexes, will provide further field training for students. Each subcenter will have outpatient clinic facilities and housing accommodations for key staff and for two trainees.

The cost of this project has been estimated at US\$45.7 million, with construction accounting for 60% of the total costs.

Other Facilities

Laboratory facilities throughout Bangladesh are rudimentary. Even the Microbiological Laboratory at the Public Health Institute in Dacca is ill-equipped. At this time laboratory diagnostic services are nonexistent at the district and the subdivisional levels. Information concerning pharmaceutical suppliers and additional laboratory services was unavailable.

Cholera Research Laboratory

The Cholera Research Laboratory (CRL) was founded in Dacca in 1960 in response to a resurgence of epidemic cholera in Asia and a possible threat to other areas of the world.

Technical and financial support has come mainly from four sources: Government of Bangladesh, the United States, Australia, and the United Kingdom.

The work of the CRL currently focuses on (1) the diagnosis and treatment of cholera patients and (2) the search for an improved vaccine which may eventually control cholera, and (3) study of diarrheal diseases and other related health problems of the area. The Laboratory is housed in the Institute of Hygiene Building of Bangladesh and consists of hospital wards, research and diagnostic laboratories, and supply preparation rooms. Direction has been under an American scientist since its inception, but its work is reviewed by a technical committee at regular intervals, and it has been staffed not only by American scientists, but by those of other countries, including Bangalees. During epidemics CRL serves as the cholera hospital for the large metropolitan area of Dacca, and all suspected cases are referred to it for medical care. The CRL also operates a field hospital and research site at Matlab, about forty miles away by river boat where a large rural population is under surveillance.

While research at the CRL has involved the three broad areas of epidemiology, pathophysiology, and the study of diarrheal diseases other than cholera, there are very important and substantial activities carried on by the CRL which extend beyond the research function. Perhaps the most important of these is the actual treatment of Bangalees ill with cholera and other diarrheal diseases.

An additional function of the CRL is to train local Bangalee physicians in not only the proper treatment of cholera, but also to become independent investigators in fields such as bacteriology and epidemiology. The aim of this training program is to create a group of local scientists that can carry on this research program independently.

Recently Johns Hopkins University has begun to collaborate in several research areas with the CRL. It is expected that this type of cooperation will grow in the future.

The CRL continues to provide Bangladesh with a quality research facility and a base for elaboration of additional health-related investigations and training programs.

CHAPTER ELEVEN

FINANCING HEALTH CARE

It is not easy to ascertain the exact amount spent on health care in any given year in Bangladesh. Besides the great number of non-governmental organizations having health programs, not all of the Government's funds for health are funneled through the Ministry of Health, Population Control and Family Planning. The Ministries of Agriculture, Social Welfare, Education, and others contribute health-related monies. All of these public expenditures, of course, are overlaid on a private fee-for-service system. The result is a confused entanglement of coordinated and redundant health programs and costs. Even beyond the complexity of the finances, there is the ever-present lack of information. Nevertheless, a few observations can be made.

The Government has stated that, "health care is a basic right of every citizen," and as a result, "free health care must be provided to the poor and needy."¹ However, free care is not a universal right; those who have the means are required to pay, either through fees or taxation. The vast majority of public health programs have to be financed through general Government resources or by external sources. Unlike many other countries, there is no specific method for raising health-related funds from the private sector. Rather, health monies are allocated from the general revenue pool, which is fed by various taxes and duties.

Disbursement of funds is done by the individual ministries, who in turn receive their budgetary allocations from the Ministry of Finance. This centralized financial distribution system can best be visualized like an hour-glass. Countrywide resources are directed to the central Government in Dacca which subsequently reapportions the monies through the different ministries out to the country. There are no local or regional mechanisms for collection and redistribution. Unfortunately, as it so often happens, such a centralized bureaucratic process is slow and inefficient. The planning and budgeting process, as described, work poorly and many approved programs never materialize. Added to the inefficiency is the cruel fact that Bangladesh is resource poor. Consequently, many of its programs, including health, are principally financed by external donors.

Health is not a national priority, as can be demonstrated by budgetary plans. The Five-Year Plan has called for an outlay of approximately US\$390 million for health and family planning over the total five-year period. This amounts to 6.3% of the total public expenditures. On a yearly basis the percentage of health expenditures is smaller than the projected five-year total. For example, governmental health funding for 1973-74 was 4.8% of the total budget. This amounts to about US\$0.25 per person. Table 21 illustrates the amounts that other countries spend on health. Even among developing countries, Bangladesh ranks low in the amount of governmental health expenditures.

¹ Bangladesh Five-Year Plan, 1973-78, Planning Commission, p. 527.

Table 21: GOVERNMENTAL HEALTH EXPENDITURES IN SELECTED COUNTRIES

Country	Source	Health budget as percent of National budget	Government health expenditures per capita (US\$)
Ethiopia	a	6.9	0.67
Burma	a	6.2	0.85
India	c	4.9	0.91
Kenya	a	6.4	0.14
Bolivia	b	3.6	3.74
Thailand	b	6.0	2.45
Senegal	b	9.1	3.49
Paraguay	b	26.4	6.77
Colombia	a	10.4	2.04
Iran	c	2.5	2.60
Bangladesh	-	4.8	0.25
U.S.S.R.	c	5.8	27.04
United Kingdom	c	9.5	105.16

Sources: a, World Bank Estimates

b, World Health Organization. The Fifth Report on the World Health Situation, 1969-72. Geneva: WHO, 1974.

c, World Health Organization. World Health Statistics, Vol. 26, No. 11, Table 2. Geneva: WHO, 1973.

There should be a word of caution about this comparison, however. If the nature of the health sector is primarily private, then health services can be quite good and extensive with low governmental appropriations, as compared with a country with socialized medicine. In the countries mentioned in Table 21, the Government has the prime responsibility for extending health care to the majority of its population.

Currently, no social security or health insurance plan exists in Bangladesh. However, the Planning Commission, in the Five-Year Plan, did announce the intention to organize a health insurance scheme for workers. The proposal called for the employers and the Government to provide the financial backing and for the employees to be the beneficiaries. The Plan suggested that if every employer contributed fifteen *taka*² per month per employee, then the Government would have more than enough for the provision of adequate health care. Information on the progress of these proposals is not available at the present time.

Throughout Bangladesh there are local groups providing health care on a community financial base, such as in Savar *Thana*. Although this decentralized approach has much to offer, there are relatively few examples of it in the country. A heartening sign is the suggestion by the Planning Commission that the existing administrative structure be reviewed with an eye towards decentralization of both administrative and financial powers and responsibilities. Such a move would facilitate implementation of local health programs and make the organization more

² US\$1.00 = 7.55 *Taka*, 1973 exchange rate.

responsive to the needs of the community. Unfortunately, the trend in the past has been just the opposite: towards greater centralization.

How much does the individual Bangalee pay for medical care? As can best be understood, the majority of the people pay little or nothing for the meager governmental health services they receive. Of course, the main reason most people do not pay is simply because they do not have access to public health care. Therefore, as long as governmental health services are unavailable to the majority of the population, data on average health expenditures per person are meaningless. As has been mentioned previously, there is an extensive system of traditional medical care. These medical services are paid on a fee-for-service basis, with the individual curer establishing the cost according to the situation. Unfortunately, there is no information currently available analyzing individual household expenditures on health.

CHAPTER TWELVE

DONOR ASSISTANCE

Amidst limited national financial and manpower resources for implementing essential health-related programs, the work of numerous international groups, non-governmental as well as governmental, has made substantial contributions towards improvement of the health status of Bangalees. Due to time and data gathering limitations this section only outlines the health components of the many international organizations involved in the health sector of Bangladesh. However, that in no way negates the importance of their contribution.

Multilateral

World Health Organization (WHO)

The World Health Organization (WHO) has played a major role in the health sector, particularly in its assistance in disease control programs. WHO supportive technical assistance to the malaria and smallpox eradication campaigns has been notably effective. Currently operational are projects in leprosy control, a study of organization of health services, planning, and hospital administration, a review of child health training in the medical colleges, nursing advisory services and training, development of health services and education in public health, a blindness survey (with UNICEF), and community water supply and sanitation (with UNICEF). Projects planned are in tuberculosis control and pharmaceutical quality control.

United Nations Development Program (UNDP)

Hand in hand with other United Nations activities, including WHO, UNDP has been heavily involved in various health projects in Bangladesh:

- strengthening of epidemiological services, US\$184,000.
- establishment of an Institute of Public Health and Nutrition, US\$164,000.
- training of medical assistants, US\$300,000.
- establishment of a National Institute of Preventive and Social Medicine, US\$152,000.

United Nations Fund for Population Activities (UNFPA)

UNFPA has committed US\$5.2 million and is considering an additional US\$4.8 million for a series of family planning activities (see section on population programs).

International Development Association (IDA, World Bank)

IDA has been developing a US\$15.0 million population project which is designed to assist (1) in establishing a health delivery system to meet the existing demand for family planning services, and (2) in developing a comprehensive national population program aimed equally at the creation of demand for family planning and to the delivery of services (see population projects section).

Bilateral

United States Agency for International Development (USAID)

USAID has been the largest bilateral contributor in the area of health, family planning, and nutrition programs. From 1972 through 1975, US\$10.1 million was spent on health facilities, manpower retraining, medical equipment, and contraceptive supplies. During that same period over US\$392.0 million was granted for the purchase of food. Indirect assistance has been provided through a variety of private and voluntary organizations including: University of Michigan, Population Services, Inc., Catholic Relief Services, CARE, American National Red Cross, International Rescue Committee, Medical Assistance Programs, Foundation Service, International Voluntary Services, Community Development Foundation, and others. For further elaboration of USAID assistance in the area of family planning, see section on population programs.

Swedish International Development Authority (SIDA)

The Swedish Government allocated US\$1.0 million in 1974 for specific population assistance.

United Kingdom's Overseas Development Ministry (ODM)

In 1974 US\$78,000 was donated to the Census Commissioner's office for a retrospective survey of fertility and mortality following the national census.

Other

Numerous other countries have provided emergency relief supplies, clothing and shelter since 1970.

Non-Governmental Organizations

Unlike the governmental organizations which must work with the Government of Bangladesh, there is no certain way of knowing what the extent and form of cooperation between these largely private groups and the Government is. Obviously many of them do work closely with the Government, others probably have few if any official ties with the authorities in Dacca. Unfortunately, it has not been possible to differentiate which organizations have close contact with the Government and which do not.

American Friends Service Committee

The Committee is supporting a small, all-Bangalee staff's continuing work in Rajoir Thana in a community health and development program involving a children's health center and an adult educational project.

American National Red Cross

In 1973 this organization sent US\$10,000 for a relief program, US\$370 worth of medicines for a health program, and equipment valued at US\$209 for a cyclone preparedness program.

Canada-International Development Research Center

The Center has contributed C\$30,000 for applied population research.

Catholic Medical Mission Board

In 1973 medical goods valued at \$196,661 were sent to applicants operating medical facilities throughout Bangladesh.

Churches of God in North America, Inc.

This organization operates the Doyasthan Christian Hospital at Bogra, principally for women. A dispensary is attached to the hospital. The activities of the hospital include the training of practical nurses and midwives, hygiene classes, nutrition and gardening. An infirmary, staffed by nurses trained at the hospital in Bogra, is attached to the school at Khan-janpur. In January 1971 a wing was opened for children in the hospital at Bogra.

Ford Foundation

The Foundation is concentrating on long-range, intersectoral support of research and training capabilities of Bangalee institutions and, consequently, has recommended approval of a two-year grant of US\$300,000 for support of a new Population Studies Center at the Bangladesh Institute of Development Studies. It is also supporting a pilot project for the development of population education curriculum, and a demographic unit in the Planning Commission.

Holy Cross Foreign Mission Society, Inc.

The Society operates the following hospitals and dispensaries: the 100-bed Our Lady of Mercy Hospital at Jalchurtra for leprosy patients which includes an outpatient department and a general medical dispensary treating 5,000-10,000 leprosy and other patients per year; a 10-bed general hospital at Baramari including a home for widows and the aged and four dispensaries providing medical care, an advisory health service, and instruction in hygiene and sanitation in areas with few facilities; one dispensary at Bkalukapara which includes a small maternity and emergency hospital with seven beds; three dispensaries located at Birodakuni, Mariannagar, and Banikhong; and, a 10-bed maternity hospital at Tumilia including two dispensaries.

International Rescue Committee, Inc. (IRC)

The Committee supports the only orthopedic hospital and the only children's hospital in Bangladesh. It provides training programs for doctors on treatment of cholera and related diarrheal diseases in cooperation with CRL in Dacca which includes purchase of equipment for intravenous feeding, supports community health services and rural projects in several locations. Altogether, in mid-1973, IRC maintained nineteen separate health medical programs in Bangladesh, and ten other projects with increasing concentration on rehabilitation, training, and self-help. In April 1973, IRC initiated a year-long program of vocational rehabilitation for young Bangalees who were seriously disabled during the war. The goal is to train 1,000 disabled veterans to qualify for productive work.

Lutheran World Federation, USA National Committee

Their contribution consists of support for four hospitals, several health clinics and various nutrition education programs.

Medical Assistance Programs, Inc. (MAP)

MAP assists missionary groups in finding doctors and makes periodic shipments of donated drugs and medical supplies in response to the requests of missionary doctors. In 1973 205,390 pounds of drugs and supplies valued at \$773,462 were shipped.

Medical Mission Sister, Society of Catholic Medical Missionaries, Inc.

This religious group has supported one nurse/midwife as executive of Bihar voluntary relief association, which has been investigating need areas in the nation since 1971, and has supported the Chittagong public health program in preventive and curative health care, sanitation and housing by provision of supplies, educators and facilitators mobilizing local community resources and personnel (three-year contract begun in 1973); and, in 1971, turned over operation of a 188-bed general hospital in Dacca to the Red Cross and local staff.

Mennonite Central Committee

The Committee conducts nutrition and hygiene education courses; provides intensive care for severely malnourished Bihari children at Saudpur and Khulna, and supplies daily milk rations to 1,500 children and 500 pregnant women in Mirpur Bihari Center near Dacca.

Pathfinder Fund

The Fund is currently operating a postpartum program and a model clinic in Dacca with US\$1.5 million.

Population Council

There are plans to conduct one of the Population Council's Taylor Berelson postpartum demonstration projects at a total cost of US\$2.0 million.

The Salvation Army

The Salvation Army operates rural clinics in Dacca, Faridpur, Jessore, and Pabna where over 465,715 people were treated in 1972-73.

Save the Children Federation, Inc./Community Development Foundation, Inc.

With a grant from Family Planning International Assistance, FPIA, a village-based family planning program has been launched. Trained husband-wife teams will act as motivators and distributors of supplies, and as a communication link with medical personnel.

World Mission Prayer League

The League operates a dispensary at Ammura.

World Relief Commission, Inc. of the National Association of Evangelicals

This group operates a rural medical program with emphasis on family planning and health education, medical clinics in rural areas, and under-five clinics with nutrition education for mothers and preventive medicine for children.

Xaverian Missionary Fathers

The Fathers operate the fifty-bed Fatima Hospital at Jessore, a general hospital which includes a maternity clinic, and maintain clinics in Jessore District and Bhaparpara for general health education and care of the sick including leprosy patients.

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