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9. ABSTRACT

This document 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 socioeconomic development. The primary purpose of this study is to provide a concise and up-to-date introduction to the health situation in Morocco, for use by A.I.D. and the international health community. Topics of discussion include: Population; The Health Environment; Health Status; Nutrition; Health Infrastructure; Health Manpower; Health Facilities; Health Programs; and Morocco in Perspective. The majority of the population in Morocco subsists on extremely low incomes. Rapid population growth and a lowering of the death rate will cause the population to double in 23 years. In order to maintain the present low standard of living, housing, agricultural production, job opportunities and social services will also have to double their output. Malnutrition is found among more than 50% of Moroccan children under four years of age. The uneven distribution of food throughout the country and wide fluctuations in food production from year-to-year are partially responsible for this high rate of malnutrition. Tuberculosis, eye diseases such as trachoma and conjunctivitis and upper respiratory or gastrointestinal infections contribute significantly to the morbidity statistics of adults. The Moroccan public health system has grown rapidly during the past 20 years to a complex organization addressing the health problems of 80-90% of the population. One of the problems of the system is the underutilization of dispensaries for basic curative and preventive care. Another major problem is an uneven geographic distribution of facilities. Since independence, Moroccans themselves have made the major advances in the development of the Moroccan health care system, rather than outside assistance programs.

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Errata

Page x, line 8 change to "Nutritional Deficiency Diseases"

Page xiv, line 28 change to "U.S. Public Law 480 - governs use of excess foreign currency"

Page xv, line 20 change to "Domestic Water Consumption Per Capita - Urban areas--90 litres per day - Rural areas--10 litres per day"

Page 2, line 21 change to "six percent"

Page 14, line 24 change to "had"

Page 14, line 40 change ", " to ";"

Page 14, line 41 change ":" to ";"

Page 16, line 5 change to "average Moroccan woman was married at the age of 15.5 years"

Page 20, line 25 change to "the loss of certain powers or properties"

Page 35, line 42 "Tiznit, Agadir Province"

Page 37, line 16 change to "included"

Page 37 add to bottom of page: "transmission of the disease. Bulinus snails have been found lodged between the hooves of migrating."

Page 38, line 19 change to "due to poor sanitation"

Page 38, line 43 change to "out-patient"

Page 39, line 22 change to "Tetouan"



Page 45, line 15 change to "children,"

Page 92, line 34 change to "The addition to the system"

Page 95, line 44 change to "98 dispensaries in the system."

Page 96, line 24 change to "Regional hospital (800-1000 beds)"

Page 98, line 1 delete ", " after "is"

Page 116, line 14 change to "to be very promising"

Page 119, line 55 change to "study for the development of a common nomenclature for psychiatry;"

Page 119, lines 55, 56, delete "in the production of vaccines, serums, and biologicals;"

Page 123, line 51 change to "further exacerbated"

Page 125, line 37 change to "individual loyalty and apolitical routine management ..."

Page 129, line 5 change to "The availability of a well-educated ..."

Page 155, line 58 delete "(see Table I)"

Page 155, line 63 delete "(see Table 1, Figure 1)"

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## **SYNCRISIS:**

# **THE DYNAMICS OF HEALTH**

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

## **XXII: KINGDOM OF MOROCCO**



SYNCRISIS  
THE DYNAMICS OF HEALTH

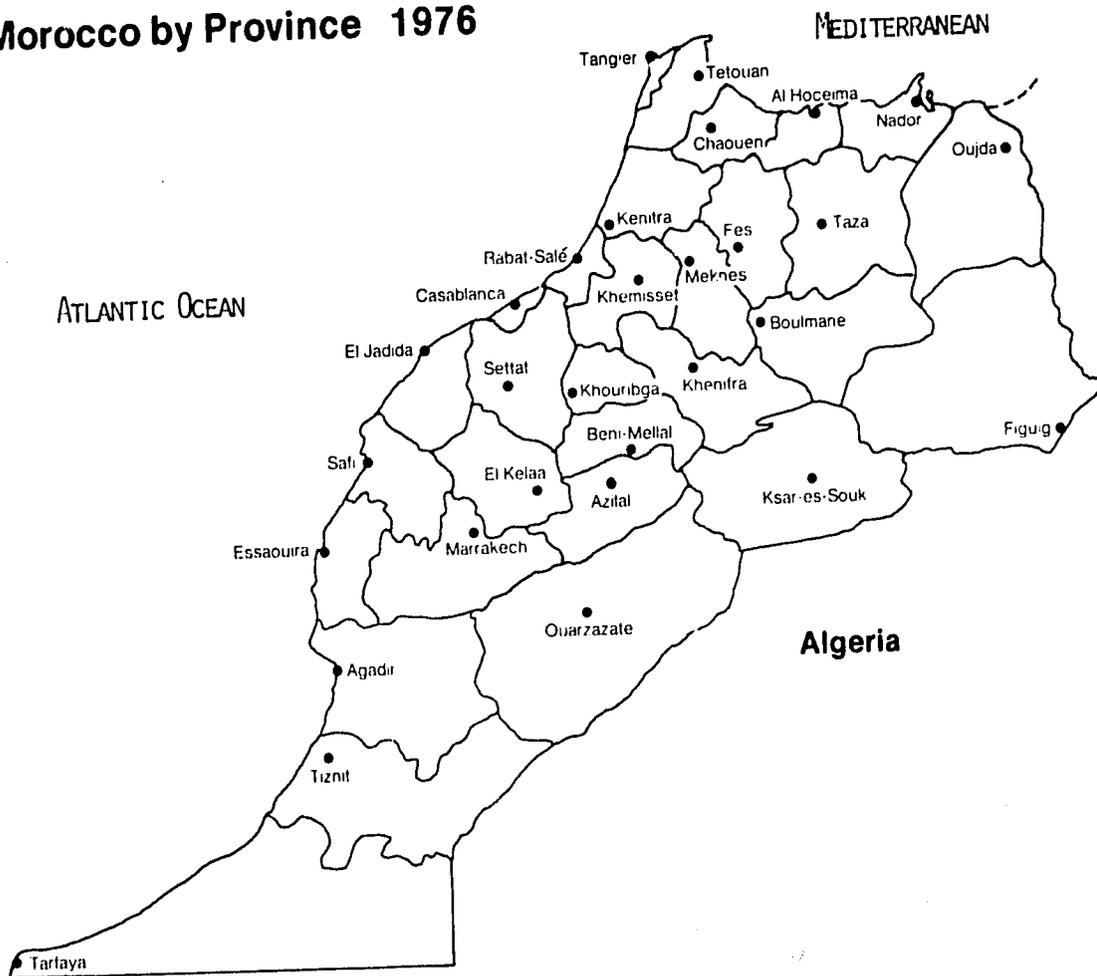
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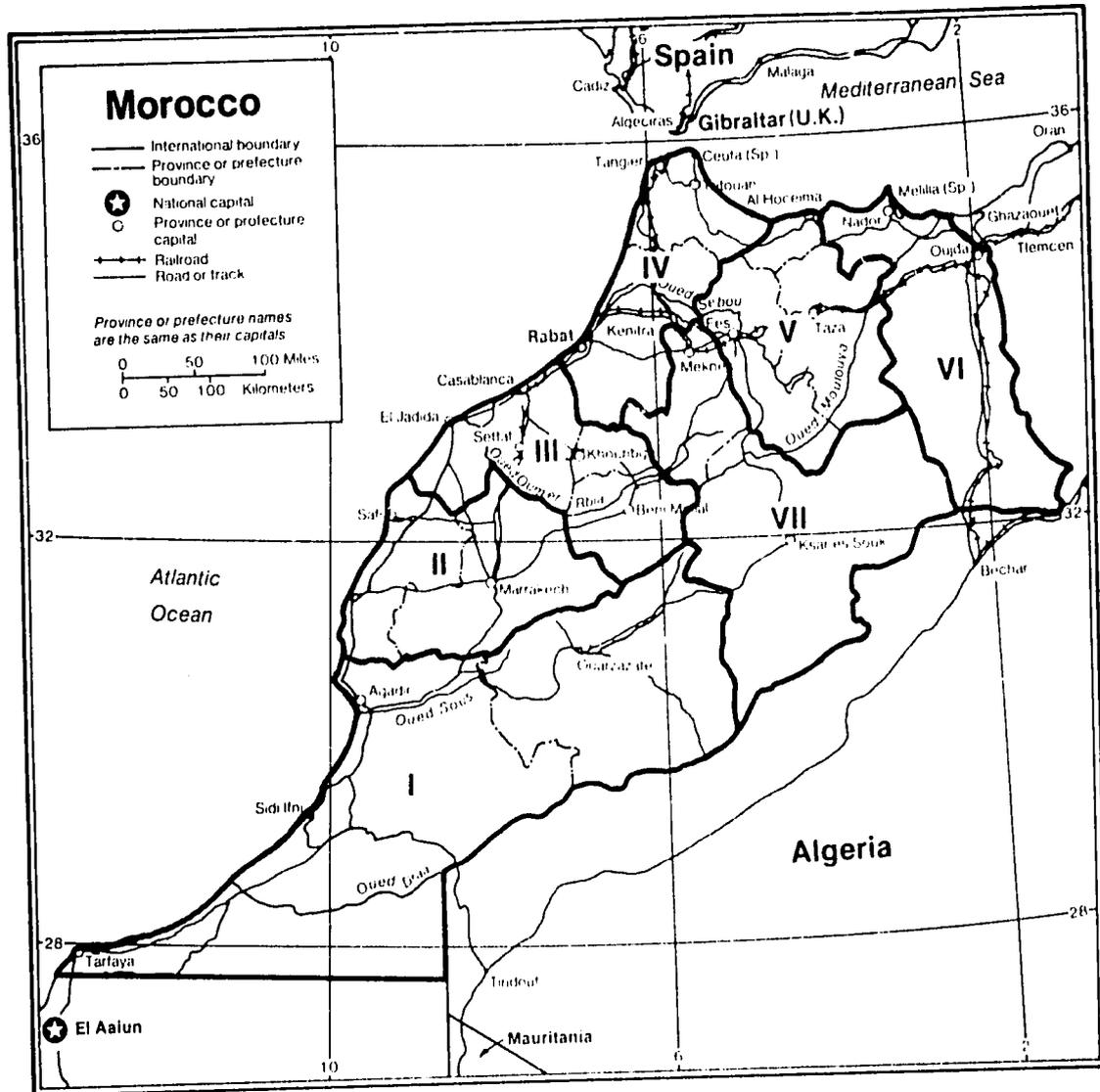
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Division of Program Analysis  
Office of International Health  
U.S. Public Health Service

June, 1977

## Morocco by Province 1976



# Economic Regions



- I Agadir - Tarfaya - Ouarzazate - Tiznit
- II Marrakech - Safi - Essaouira - El Kelaa - Azilal
- III Casa Pref. - El Jadida - Settat - Khouribga - Beni Mellal
- IV Rabat Pref. - Kenitra - Tanger - Tetouan - Chaouen, Khemisset
- V Fes - Taza - Al Hoceima
- VI Oujda - Nador - Figuig
- VII Meknes - Ksar es Souk - Khenifra - Boulmane

There is a zone hospital in each region



## 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 Morocco Syncrisis was produced in several stages. A first draft was prepared in Washington based on information available in the United States. A field trip to Morocco included interviews with officials from the Ministry of Public Health and international organizations in Morocco as well as visits to health facilities in various parts of the country. Documents were collected which were not available in Washington (e.g. the National Nutrition Survey and various current reports of the Ministry of Public Health). These were used in the preparation of the final draft of the Syncrisis.

I would like to express my appreciation for the cordial reception given me by the officials of the Ministry of Public Health in Morocco. I hope this report will be of use to them. I appreciate the support of USAID officials in Washington and in Morocco in the completion of this study. Special thanks go to Ms. Patricia Suzanne Gibson, AID/Rabat, for her comments and suggestions for the final draft.

Within the Office of International Health Division of Program Analysis, I am indebted to Ms. Robin Menes who researched and wrote several chapters of the first draft of the study, and to Ms. Karen Lashman and Mr. John Gallivan who reviewed the final draft. Special thanks also to the secretarial staff of the Division of Program Analysis, who produced the excellently-typed final copy.

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### List of Abbreviations

B.C.G.	- - - - -	bacille Calmette Guérin - anti-tuberculosis vaccination
CNSS	- - - - -	Caisse National de Securite Social
CERED	- - - - -	Centre de Recherches et D'Etudes Demographiques
GOM	- - - - -	Government of Morocco
GDP	- - - - -	Gross Domestic Product
IBRD	- - - - -	International Bank for Reconstruction and Development
IUD	- - - - -	Intra-Uterine Device
KAP	- - - - -	Knowledge, Attitudes, Practices
MOPH	- - - - -	Ministry of Public Health
OCP	- - - - -	Office Cherifien des Phosphates
ONEP	- - - - -	Organisation Nationale des Eaux Potables
PSE	- - - - -	Protection de la Sante de L'Enfant
PL480	- - - - -	Public Law 480 - governs use of excess currency
UNDP	- - - - -	United Nations Development Program
UNFPA	- - - - -	United Nations Family Planning Association
UNICEF	- - - - -	United Nations International Children's Emergency Fund
U.S.A.I.D.	- - - - -	United States Agency for International Development
W.H.O.	- - - - -	World Health Organization

### BASIC COUNTRY DATA

Population (1976)	17.9 million	Crude Birth Rate	47.6/1,000 population
Population Density	37.7/km <sup>2</sup>	Crude Death Rate	16/1,000 population
Population Distribution	Urban 35% Rural 65%	Infant Mortality Rate	130/1,000 live births
Percent 0-15 years old	46%	Maternal Mortality	n.a.
Annual Population Growth Rate	3%	Average Life Expectancy	53 years

Percent Literate - 25%

Percent Unemployed (Urban) - 12-16%

Domestic Water Consumption  
per capita - U.S.\$4.59

Percent of Children 0-4 years of age with  
moderate/severe protein calorie malnutrition - 45%

Population per physician - 16,000

Population per registered nurse - 15,000

Population per hospital bed - 754

Percent deliveries in hospital - 10.5%

Gross National Product per capita - U.S.\$560

Annual Public Sector Health Expenditure  
per capita - U.S.\$4.59

Currency Equivalent - 1 Dirham = U.S.\$0.25



## AN OVERVIEW OF THE MOROCCAN HEALTH SECTOR

Morocco is an ancient Islamic kingdom which is striving to become a modern nation without losing its rich cultural heritage. For several hundred years, Morocco was the center of the various medieval empires which controlled much of North Africa and Spain. After many centuries of independence, Morocco became a French protectorate for a relatively brief period from 1912 to 1956. The impact of colonization was profound. The introduction of French systems of public and private institutional management and the imposition of the French language and culture upon the Moroccan community resulted in the division of that community into two groups - a French-speaking, educated, modern society and an illiterate, Arabic or Berber-speaking traditional society. While the former group has benefited greatly from the rapid economic expansion which has taken place since independence, the latter has benefited very little.

Although information on income distribution is unavailable, the household consumption survey of 1971 indicated a highly skewed distribution, with the majority of the population subsisting on extremely low incomes. The continuing high rates of communicable diseases and other preventable health problems are further evidence of this uneven distribution of development benefits. Rapid population growth (estimated at 3.0% per annum) has diluted the achievements of the past twenty years. An important effect of the eradication of smallpox and the control of malaria and other diseases has been the lowering of the death rate in Morocco, while the birth rate has remained high. The result is an annual rate of population increase which will cause the population to double in twenty-three years. Thus, in order to maintain the low standard of living which is even now considered unacceptable to most Moroccans, housing, agricultural production, job opportunities, and social services such as health will have to double their output in only twenty-three years.

The general mortality rate in Morocco has been falling (from 18/1000 to 16/1000 in ten years), however infant mortality has remained high (estimated 130/1000 live births) despite massive vaccination campaigns and good public acceptance of these general preventive measures. Preventable childhood diseases and other communicable diseases such as gastrointestinal and upper respiratory infections are widespread and may, in combination with malnutrition, be the leading causes of morbidity and mortality among infants and children up to five years of age. According to the 1971 national nutrition survey, malnutrition, particularly protein-calorie malnutrition, is found among more than fifty percent of Moroccan children under four years of age. Wide fluctuations in food production from year-to-year result in abrupt changes in the availability of food supplies. The uneven distribution of food throughout the country and within the individual family unit are also important contributing factors to the high rate of malnutrition.

The leading causes of death for adults are unknown, but tuberculosis, eye diseases such as trachoma and conjunctivitis, and the communicable diseases which are classified as either upper respiratory or gastrointestinal infections contribute significantly to the morbidity statistics. The limited information which is available concerning the health status of the Moroccan population is a function of the process for the collection of health statistics; emphasis is placed upon the development of information related to the activities of the health services rather than the health status of the population. Although the statistical service is a well-organized and well-developed arm of the MOPH, the kind of statistics gathered and the compilation and analysis of those statistics need expansion and refinement in order to provide the kinds of information which will be useful to better define health problems and improve the delivery of health services in Morocco.

National health policy in Morocco consists of a series of very general statements concerning the provision of health services to all Moroccans, the development of the health infrastructure for both preventive and curative services, the training of health manpower, and the integration of family planning into the activities of the health sector. These broad statements of goals have not been translated into a well-defined health strategy, nor has there been an ordering of program priorities, the selection of program alternatives based on an objective analysis of the problems and possible solutions, or the evaluation of past program activities.

The Moroccan public health system has grown rapidly during the past twenty years from a small organization which delivered limited services to a minority of the people to a very large and complex organization which intends to address the health problems of 80-90% of Morocco's seventeen million people. Health facilities which range from the sophisticated specialized treatment centers represented by the two University Hospital Centers, to the four-room rural dispensaries in remote villages, have mushroomed throughout the country. The health manpower force has grown eight times over since independence, and the majority of health workers are now Moroccan-born and Moroccan-trained. Even this rapid expansion of the health care system has been unable to meet the needs of the population. It is estimated that only fifteen percent of eligible children are covered by the preventive-oriented maternal-child health services, and only three percent of women of fertile age accept family planning services. There are other serious imbalances in the system as well, in the distribution of facilities and personnel and in the organization of services. The results are empty dispensaries in rural areas, overcrowded health centers in urban areas, and underutilized hospital beds throughout the country.

The organization of health services is well-conceived, with dispensaries staffed by nurse aides who refer patients to health centers staffed by aides, registered nurses, and physicians, who in turn may refer patients for inpatient care within a hierarchy of hospital which culminates in the highly specialized treatment available in the two University Hospital Centers. One of the basic problems with this beautifully designed system, aside from the uneven geographic distribution of facilities, is the underutilization of the dispensary for the provision of basic curative and preventive care. Preventive care is theoretically an important element in the Moroccan health system, but health education and access to the delivery system have been limited, and as a result the highest demand is for curative, rather than preventive services. The rather limited use of the dispensary for basic preventive and curative measures and the triage system which refers everyone who is "really sick" to the health center, lowers the value of the dispensary services in the eyes of the community. Many patients regard the dispensary as an obstacle which must be overcome if curative care is to be obtained rather than as a valuable component of the health care system. An important element in the modification of the system for the delivery of health services would be the further training and adequate supervision of the nurse aides so that an expansion of services at the dispensary level would be feasible. At the other end of the spectrum, the low occupancy rates and high average length of stay in most hospitals suggests that these facilities are not being operated at maximum efficiency. Since hospitals are the most costly of all health facilities to build and to operate, more efficient use would substantially increase the return on this major investment in the health care system.

The health environment in Morocco is generally poor. Low incomes, inadequate housing, unsafe water, and overcrowded conditions in urban areas all contribute to an environment which favors the propagation of flies, mosquitos, rats, and other vectors and encourages the spread of disease. While the solution to many of these problems is beyond the scope of the health system's activities, health education can play an important role in teaching people how to deal with unfavorable environmental conditions. Nutrition education should be an important part of health education, particularly in a country where incomes are low and malnutrition is a major health problem.

While the development of the Moroccan health system has never been given top priority in Development Plans, it has not been neglected either. Both the investment and operating budgets of the Ministry of Public Health have grown steadily since independence. The investment budget has grown from 16 million Dirhams in 1956 to 105 million Dirhams in 1975. The operating budget has grown from 73 million Dirhams to 331 million Dirhams during the same period. The health sector has received a smaller proportion of total government expenditures in recent years as large increases in government revenues have been allocated primarily to industrial and regional development. The operating funds allocated to the health sector have increased between 8% and 12% every year, while the per capita expenditures on health have doubled in the past fifteen years. Because of the designation of health personnel as "polyvalent workers" and the integrated delivery of health services, it is not possible to determine individual program costs in Morocco or the relative investment in preventive versus curative services. Although this ideally promotes the most efficient use of health resources, it creates problems in relation to the allocation of costs to services and in the evaluation and cost-benefit analysis of health programs. While this has not proved to be a serious problem in the past, any future attempt to increase the efficiency of the health system and maximize outputs will have to consider costs in a more program-specific manner.

Outside assistance to the Moroccan health system has come primarily from France. For many years even after independence, the majority of health personnel in Morocco were French. While this is no longer true, there are still a great many French physicians in Morocco and technical assistance and equipment are provided in significant quantities every year. The United States has contributed to the family planning program in Morocco and the United Nations agencies, particularly the World Health Organization, have provided important assistance to the malaria and smallpox eradication programs and to the improvement of water supplies. For the most part, however, it is the Moroccans themselves who must be credited with the major advances which have been made in the development of the Moroccan health care system since independence.



## CHAPTER ONE

### POPULATION

The population of Morocco in mid 1976 was estimated to be 17,964,724 persons.<sup>1</sup> It can be characterized as young (46% under age 15), homogeneous (99% Muslim - Arab or Berber), widely dispersed (Casablanca is the only prefecture with over 10% of the total population), and growing rapidly (the annual rate of natural increase has averaged over 3% for the past ten years).

There have been only two modern censuses in Morocco; one in 1960 and another in 1971. The census in 1971 was conducted by the Office of Statistics in the Ministry of Plan and Regional Development. (Within the Office of Statistics, the Center for Research and Demographic Studies, CERED, continues to collect population data in intercensal years). According to United Nations observers, the census data cannot be considered completely reliable. An evaluation of census data was published in 1973 in the United Nations Demographic Yearbook. On a scale of I (highly accurate) to V (very rough), Morocco was rated V. Although this study was published before all the data from Morocco has been tabulated, it must be kept in mind when the census data is used for analytical purposes.

#### Population Growth and Dynamics

Morocco's rate of population increase has been accelerating steadily during the past forty years. Between 1935 and 1960 the population grew from seven to eleven million persons.<sup>2</sup> Between 1960 and 1971, the population increased to over seventeen million.<sup>3</sup> By 1990 the population will reach thirty five million if the annual growth rate remains unchanged.<sup>4</sup> Projections made in 1973 by the United States Bureau of the Census (see Figures 1 and 2) illustrate the magnitude of the population problem Morocco will face over the next century if the rapid rate of growth is not slowed. The current annual growth rate is estimated at 3.0, which means that the population will double in twenty three years.

Demographers attribute the high rate of growth to a general improvement in environmental health conditions (due to economic growth and development) and the growing availability of modern medical care. The resulting decrease in the death rate has not yet been matched by a decrease in the birth rate. The benefits of economic development are being diluted by the

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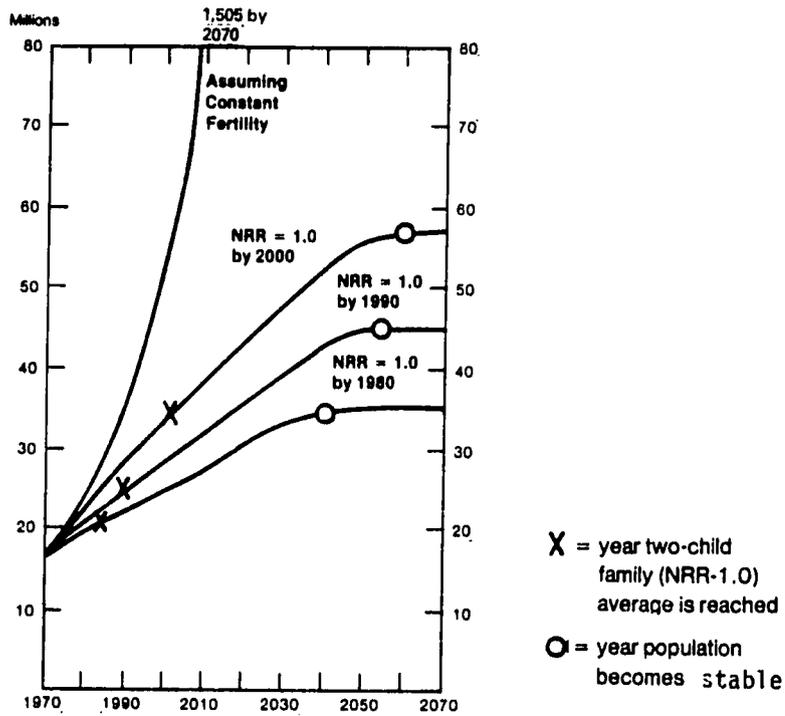
<sup>1</sup> CERED, 1976 Population Projections (Centre de Recherches et D'Etudes Demographiques).

<sup>2</sup> Ministry of Plan, Division of Statistics.

<sup>3</sup> United Nations, Population Division, cited in World Population Growth and Response, Population Reference Bureau, Inc., p. 268.

<sup>4</sup> U.S. Bureau of the Census, The Momentum of Population Growth in Morocco, March 1973, p. 1.

Figure 1 Morocco: Estimated and Projected Population Size According to Four Fertility Assumptions 1970-2070



Source: International Statistical Programs Center, U.S. Bureau of the Census March, 1973

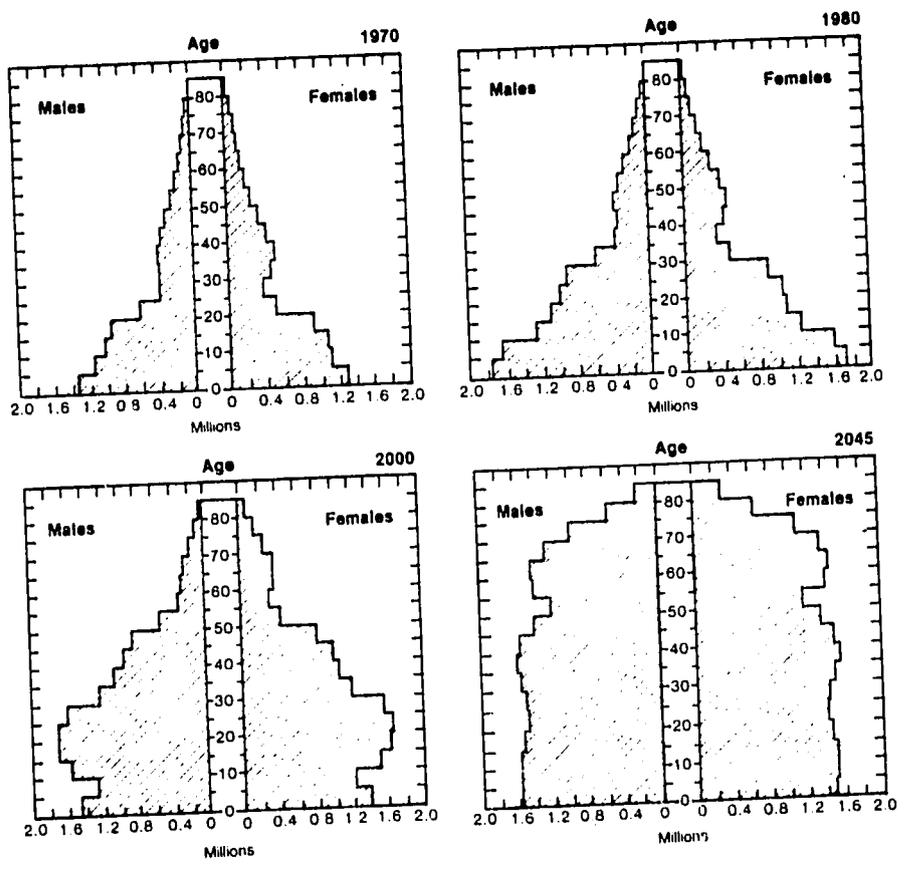


Figure 2. Morocco: Estimated and Projected Population by Age and Sex, 1970, 1980, 2000 and 2045, Assuming Two-child Family Average (NRR = 1.0) Beginning in 1980

Source: International Statistical Programs Center, U.S. Bureau of the Census March, 1973.

rapid population growth, and the demand for jobs, housing and social services is already far ahead of the supply. The implications for the Moroccan health system are serious. In order to maintain services at the current level, which is admittedly inadequate, health facilities and personnel will have to be found to serve an estimated 250,000 additional persons every year. The demographic explosion is one of the most important problems that Morocco will have to cope with during the remainder of this century.

### Fertility

The crude birth rate in Morocco was estimated to be 47.67/1000 in 1971 (see Table 1 for urban-rural differentials). An additional 100,000 women of reproductive age are being added to the Moroccan population each year, which increases the momentum of population growth.

In traditional Moslem society, "seven sons and seven pilgrimages to Mecca" were considered to be man's greatest blessings. A survey in 1968 indicated that those values are changing, at least in relation to the seven sons. According to the survey, rural Moroccan women desired an average of 4.6 children, while women in urban areas desired an average 3.3 children. Moroccan men desired even smaller families - in rural areas, men wanted an average of 4.1 children, while urban men wanted an average of 3.1 children.<sup>5</sup> While the survey indicates that Moroccans still desired many more children than the number which would result in an appreciable decrease in population growth, they desired fewer children than the 6-7 which are currently being born of the average Moroccan woman. (See Table 1) This seems to indicate that there are a great many men and women in Morocco who would be receptive to modern family planning services who are not yet being reached by the health system.

Table 1

TOTAL GENERAL FERTILITY			
<u>Age</u>	<u>Urban</u>	<u>Rural</u>	<u>Total</u>
15 - 19	54.7	84.2	74.0
20 - 24	301.6	340.3	326.9
25 - 29	362.6	386.9	378.5
30 - 34	290.1	338.9	321.9
35 - 39	209.2	246.3	233.4
40 - 44	87.5	130.8	115.8
45 - 49	15.1	38.1	30.1
<u>Crude Reproduction Rates</u>			
	3.21	3.82	3.61
<u>Crude Birth Rates</u>			
	45.83	48.65	47.67

Source: CERED (Centre des Etudes et Recherches Demographique) 1971.

<sup>5</sup> 1968 KAP study conducted by the Moroccan Ministry of Public Health. (Note: The U.S. Census Bureau in 1976 estimated a total fertility rate of 7.2.)

The high fertility rate has much broader implications for the country than the provision of family planning services. The high parity and close spacing of births is highly detrimental to the general health of the pregnant woman as well as to the health of the children she bears. The low birth weight of the child born of a very young or multiparous mother makes it more susceptible to a wide range of perinatal problems, which can become permanent disabilities if the child survives. Maternal anemia and malnutrition are aggravated by closely spaced pregnancies. Gynecological problems often develop as a result of the heavy demands placed on the woman's reproductive system. A woman whose health has been compromised by high parity is more susceptible to other diseases as well, and her productivity at home is reduced. Although the work of women is rarely measured in economic terms, it is often an important element in the productive output of the family unit. Thus, the high fertility rate in Morocco must be evaluated not only in terms of its impact on population growth, but also in relation to its effect on the health status of Moroccan women and children, and on the productivity of the woman.

#### Mortality

Mortality rates can only be estimated in Morocco, as there is no standardized countrywide system for recording births and deaths. (Several years ago the Moroccan government estimated that it would cost ten million Dirhams to institute a uniform civil registration system, with no guarantee that there would be complete coverage.) Estimated death rates vary according to the source. In 1966, the Moroccan Ministry of Public Health estimated the death rate to be 18.7 per 1,000. In 1975, the U.N. Population Division estimated the death rate to be 16 per 1,000.

#### Age Structure

One of the outstanding characteristics of the Moroccan population is its youth. According to the 1971 Census, there were seven million Moroccans under the age of 15. This is approximately 45% of the population. The economically active population (ages 15-60) was only 48% of the population in 1971, down from 60% in 1960. (See Table 2) The rapidly increasing younger population must, therefore, depend upon a declining proportion of economically active adults for support. In addition to the problems caused by this high dependency ratio, there is an expanding need for jobs, educational facilities and social services which intensifies the social and economic pressures created by the growing population.

#### Population Density and Distribution

In contrast to the rest of North Africa, Morocco's broad and adequately watered coastal plains have helped to spread the population over a large portion of the country. The historical development of urban settlements in the interior of the country (such as Fez, Meknes, and Marrakech) also served to disperse the population over a wide area. The dryer areas of the country which were not well suited to agricultural development (particularly the southern and southeastern parts of the country) have always been the most sparsely populated and the least developed economically.

In 1975, population density in Morocco ranged from 1.8 persons per square kilometer in Tarfaya Province to 1084.0 persons per square kilometer in Casablanca, (see Table 3) with a nationwide average of 37.7 persons per square kilometer. While the rural areas of Morocco are growing in terms of absolute numbers of population, the urban areas are growing much faster, and

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<sup>6</sup> Ministry of Plan, Division of Statistics.

TABLE 2  
POPULATION BY SEX AND AGE, 1971  
(Thousands)

Age Group	Year	Males	Percent	Females	Percent	Total	Percent
0 - 4	1971	1,247	8.2	1,217	8.0	2,464	16.3
5 - 9	1971	1,243	8.2	1,204	7.9	2,447	16.1
10 - 14	1971	1,102	7.3	985	6.5	2,087	13.8
15 - 19	1971	744	4.9	706	4.7	1,450	9.6
20 - 24	1971	499	3.3	546	3.6	1,045	6.9
25 - 29	1971	402	2.7	502	3.3	904	6.0
30 - 34	1971	387	2.6	493	3.3	879	5.8
35 - 39	1971	389	2.6	420	2.8	809	5.3
40 - 44	1971	349	2.3	388	2.6	737	4.9
45 - 49	1971	265	1.7	230	1.5	495	3.3
50 - 54	1971	263	1.7	245	1.6	508	3.4
55 - 59	1971	151	1.0	101	0.7	253	1.7
60 - 64	1971	176	1.2	195	1.3	370	2.4
65 and over	1971	370	2.5	337	2.2	707	4.7
<b>Total</b>	1971	<b>7,586</b>	<b>50.1</b>	<b>7,568</b>	<b>49.9</b>	<b>15,154</b>	<b>100.0</b>

Source: 1971 Population Census.

Table 3

Population Density by  
Province and Prefecture, 1975

Provinces and Prefectures (1)	Population	Area in Km <sup>2</sup>	Density per Km <sup>2</sup>
Agadir	847,900	18,855	45.0
Al Hoceima	273,400	3,550	77.0
Azilal	365,100	10,050	36.3
Béni-Mellal	489,700	7,075	69.2
Boulmane	129,800	14,790	8.8
Chaouen	278,600	4,350	64.0
El Jadida	655,900	6,000	109.3
El Kelaa-Sraghna	515,700	10,070	51.2
Essaouira	404,900	6,335	63.9
Fez	1,130,000	10,145	111.4
Figuig	98,600	55,990	1.8
Kenitra	1,043,500	8,805	118.5
Khemisset	387,600	8,305	46.7
Khenifra	275,100	11,115	24.8
Khouribga	372,000	4,250	87.5
Ksar-es-Souk	366,900	59,585	6.2
Marrakech	1,109,300	14,755	75.2
Meknes	687,000	8,510	80.7
Nador	531,300	6,130	86.7
Ouarzazate	581,400	56,990	10.2
Oujda	669,700	20,700	32.4
Safi	595,300	7,285	81.7
Settat	744,100	11,445	65.0
Tanger	330,700	1,195	276.3
Tarfaya	79,700	43,420	1.8
Taza	588,400	15,465	38.0
Tetouan	607,400	6,025	100.8
Tiznit	389,400	23,585	16.5
Pref. Casablanca	2,010,800	1,855	1,084.0
Pref. Rabat-Salé	745,800	2,100	355.1
Total	17,305,000	458,730	37.7

(1) The new provinces of El Ayoun, Smara and Boujdir in the Sahara have a total area of 150,000 Km<sup>2</sup> and a total population of 50,000 inhabitants.

Source: Le Maroc en Chiffres, 1975.

are therefore rapidly increasing their proportion of the total population. In 1900, only ten percent of Morocco's population lived in urban areas.<sup>7</sup> By 1971, the urban population had grown to thirty five percent of the total. It is expected that the urban population will reach fifty percent of the total before the end of the century. This rapid urbanization is changing the traditional patterns of settlement in Morocco and is creating some serious problems in the process.

Because population density per se is not a problem in Morocco (except in a few urban areas) it is easy to conclude that Morocco's population problem is one of too few people (in the less developed areas) rather than too many. In fact, some areas of the Rif Mountains are very densely populated. Other regions are sparsely populated because they are unable to support larger population groups without intensive development of the economic base. The means to effect this development are not available. Even with improved agricultural techniques, it is unlikely that most of Morocco's cultivable areas could support a larger population. Population density must, therefore, be looked at in relation to the actual and potential productivity of the land area in question, and the presence or absence of the means to develop that productivity. While Morocco's potential productivity is great, the means to develop it are currently limited, and will be more limited if the benefits of development must be spread among an ever increasing number of people.

### Migration

Large movements of population have always been an important element in Moroccan history. The migratory movement which is most significant in Morocco today is the migration from rural to urban areas. Although Casablanca, because of its size, stands out first as the city with the most serious problems in relation to the urban migration, there are many other cities in Morocco which are growing even faster than Casablanca. Agadir, and Quarzazate, for example, were three times as big in 1971 as they were in 1960.<sup>8</sup> All of the coastal cities are feeling the effects of the urban migration (see Tables 4 and 5).

Table 4  
Estimated Annual Growth Rate of Selected  
Moroccan Cities - 1971

<u>City</u>	<u>Growth Rate</u>
Casablanca	6.5%
Rabat	7.3
Kenitra	7.0
Safi	5.8
Agadir	10.0

SOURCE: Government of Morocco, 1971 Census.

In the past, the government has attempted to stem the urban migration by either refusing to give identity cards to migrants, or in some cases, by returning them to the rural areas. These efforts were unsuccessful and current government policies appear to be more concerned with the resolution of the problems created by the migration, rather than the suppression of attempts to move to the cities. Nationwide, the annual addition to the urban population is estimated to be 200,000 people.

<sup>7</sup> Area Handbook, p. 25.

<sup>8</sup> Government of Morocco Census, 1971 (Table 1 in statistical appendix.)

TABLE 5  
INTERNAL MIGRATIONS, 1960, 1970

Provinces	Population in 1960	Population in 1971	Average Annual Growth Rate	Migratory Movements <sup>1</sup>	
				Total	Annual Rate
Rabat-Sale	338,087	641,714	4.7	+132,310	+2.1
Casablanca	1,100,379	1,719,421	4.1	+267,300	+1.5
Beni-Mellal	474,001	663,691	3.1	+ 35,350	+0.5
Nador	347,566	480,517	3.0	+ 20,100	+0.4
Khouribga	236,777	328,304	3.0	+ 16,530	+0.4
Kenitra	995,913	1,345,975	2.8	+ 28,550	+0.2
Tanger	164,246	215,502	2.5	- 2,010	-0.1
Tanfaya	18,361	24,161	2.5	- 40	-0.1
Taza	445,745	578,556	2.4	- 9,480	-0.2
Meknes	577,137	753,117	2.4	- 8,200	-0.2
Fes	830,999	1,071,416	2.3	- 22,500	-0.3
Agadir	857,893	1,168,010	2.3	- 3,250	-0.3
El Hoceima	191,495	246,594	2.3	- 6,140	-0.3
Marrakech	1,237,196	1,558,541	2.1	- 76,510	-0.5
Ksar El Souk	380,949	471,620	2.0	- 29,100	-0.6
Tetouan	647,271	796,278	1.9	- 52,400	-0.7
Settat	545,725	670,769	1.9	- 45,750	-0.7
Oujda	523,130	633,828	1.8	- 53,000	-0.8
Safi	739,477	897,946	1.8	- 90,170	-0.8
El Jadida	489,637	590,923	1.7	- 51,300	-0.9
Ouarzazate	434,480	522,376	1.7	- 50,000	-0.9
Total	11,626,470	15,379,259	2.6	+0	-0.0

<sup>1</sup>Estimates assuming a uniform annual growth rate of 2.6.

Source: Third Five-Year Plan (1973-1977)

Migration within the rural areas of Morocco is a centuries old tradition. The people of the middle Atlas move to the plains surrounding Fes and Meknes in search of pasture. Similar movements occur in the Tadla Plain of the upper Oum Al Rbia River, in the semi-arid steppes of the southeast, and on the steppes of the Moulaya River.<sup>9</sup> In the spring, migrants return to their mountain villages. The health status of the Moroccan population is affected in several important ways by these migratory movements. The physical movement of people and animals promotes the transmission of disease from one area to another. In Morocco, schistosomiasis and hydatidosis are two serious diseases which are endemic in certain areas and which may be spread by migration. (See Health Status Section). The delivery of health services to migratory groups in rural areas is difficult and costly, which often means that fewer services are delivered and health status is generally lower than it is for people who are easier to reach. In the urban areas, the services are usually not far away, but the rapid growth of the urban population has caused most urban health services to be seriously overcrowded. Health care may therefore be almost as difficult to obtain in urban areas as it is in the countryside.

Morocco's population size and composition have been strongly influenced by international immigration and emigration. The most significant trend since Independence has been the permanent emigration of Europeans, Jews and of young Moroccan workers to Western Europe and other Arab countries. Worker remittances from abroad are a major factor in Morocco's maintenance of a sound balance of payments position. Because of this and because unemployment is a serious problem in Morocco (see Economic Section) the government has officially supported and encouraged this emigration. During the 1960's, an average of 10,000 workers a year emigrated to Europe. By 1970, annual emigration has tripled to thirty thousand workers.

France is the main destination of Moroccan workers. Moroccans accounted for 22% of immigrants to France in 1974. By the end of that year, there were 150,000 workers and 152,000 other Moroccans in France. Another 40,000 Moroccans were working in other countries of the European Economic Community.<sup>10</sup> (See Statistical Index for Registered Emigration by Year). This emigration is an important factor in reducing pressure on the Moroccan job market, which is at this point, overburdened with unskilled workers. It also alleviates the in-country demand for most social services.

#### Ethnic Composition

The population of Morocco is primarily Arab and Berber in origin, these two groups account for 99% of the population. Census statistics do not differentiate between the two groups: Moroccan nationals are classified simply as "Moslem" or "Jewish." The European community in Morocco, which reached 6% of the total population before independence, has declined sharply since then. Both Spanish and French-speaking groups are represented, however, there were no more than 112,000 in 1971. (See Table 6) The Jewish population began to decline in 1948 as immigration to Israel, France and the United States increased. Between 1948 and 1970, the population declined from 227,000 to 40,000.<sup>11</sup>

According to the 1971 census, there were 31,000 Jews in Morocco at that time. Over 44% of the Jewish community was over sixty years old in 1967.<sup>12</sup>

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<sup>9</sup> Area Handbook, p. 25.

<sup>10</sup> European Bureau of Coordination, 1974.

<sup>11</sup> Area Handbook, p.78.

<sup>12</sup> Ibid.

**TABLE 5**  
**ETHNIC POPULATION 1935, 1952, 1960 and 1971**  
 (Thousands; mid-year estimates)

Item	1935	1952	1960	1971
<u>Moroccan Nationals</u>				
Moslems	6,590	8,585	11,068	15,236
Israelites	<u>185</u>	<u>218</u>	<u>162</u>	<u>31</u>
Sub-total	6,775	8,803	11,230	15,267
<u>Foreigners</u>	<u>265</u>	<u>539</u>	<u>396</u>	<u>112</u>
Total	7,040	9,342	11,626	15,379

Source: Secretary of Planning, Department of Statistics  
 (Secretariat d'Etat au Plan, Direction de la  
 Statistique)

### Marital Status

Women in Morocco continue to marry early; a survey conducted in 1967 revealed that the average Moroccan woman was married at the age of 15.5, while men were married on the average at 22.3 years of age. In rural areas, women tend to marry at a younger age than in urban areas.

Polygyny has never been widely practiced in Morocco. Estimates of polygynous unions do not exceed 5% for rural areas, and 10% for lower middle-class townsmen.<sup>13</sup> Economics and the spread of European values, especially among educated Moroccans, have had a significant influence on attitudes toward polygyny.

Divorce is common in Morocco; it is estimated that a third of ever-married women had been divorced at least once. Divorce is more frequent in urban areas where young women do not have the protection of the extended family and kinship ties which often bind men to their wives in rural areas. For the male, grounds for divorce are unlimited and the divorce can be obtained by merely repeating the words "I divorce thee," three times before witnesses. For a woman, there must be proof of non-maintenance, abandonment, physical cruelty, or sexual abstinence. Table 7 shows the marital status of Moroccans at the time of the last census.

Table 7  
Marital Status of Moroccans  
Age 15 and Above

	<u>Men</u>	<u>Women</u>
Single	1,274,000	650,000
Married*	2,554,000	2,716,000
Widowed	69,000	586,000
Divorced	66,000	173,000

\*Note: Polygyny and married men who are out of the country account for the disparity.

SOURCE: Government of Morocco, 1971 Census.

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<sup>13</sup> Area Handbook, p. 116.

## CHAPTER TWO

### THE HEALTH ENVIRONMENT

There are many elements in the environment which, singly or in combination, have a profound impact upon health status. Geography and climate, living conditions and societal values all contribute to the development of a particular kind of health setting.

In Morocco, the dry winds and blowing sands of the desert regions contribute to a high incidence of trachoma and other eye diseases. Coastal swamps provide a favorable breeding ground for malarial mosquitos. Rapid urbanization throughout Morocco has aggravated those health problems which are related to overcrowding and inadequate sanitation facilities. Tuberculosis, enteric infections and communicable diseases spread quickly and easily through the congested cities. Pre-Islamic belief in djinns and evil spirits is still strong in Morocco. Their perceived role in the disease cycle renders ineffective many efforts to educate the public in matters relating to health. These and many other factors must be taken into account in order to reach a clear understanding of the country's health problems. The following section attempts to describe some of the elements in the Moroccan environment which have a significant impact upon health status.

#### Social Structure

The traditional social structure in Morocco is one of Arab and Berber tribal groups in which all the male members of the tribe claim descendance from a common ancestor. Kinship ties within a tribal group are highly elastic, and often allow personal desires and affections to outweigh the more formal requirements of structure, in the development of relationships. Within the tribe, the extended family, usually three generations in a household, is the most important social unit. Family obligations override most others, except in some cases where other relatives live much closer than the immediate family members.

In addition to the Arab and Berber groups, Jews, European Christians (especially from Spain and France) and sub-Saharan Africans have coexisted and intermingled with the Muslim Moroccan population for centuries. The European Christians and the Jewish population of Morocco (which included both Sephardic Jews expelled from Spain at the time of the Reconquest and some indigenous groups) have always played an important role in the economic and cultural life of Morocco.

Moroccan society can be further divided by class and by urban and rural groups. The upper classes tend to be primarily French-speaking and very Europeanized; the middle class is bilingual with a more traditional Arab-Islam lifestyle; and the Arabic or Berber-speaking lower class is often illiterate and maintains more of the kinship and tribal relationships. These have been weakened, however, by the urbanization process. The distinction between urban and rural societies is one that has existed for centuries. Differences of dress, custom, livelihood, and loyalty have helped to maintain the social barriers which mitigated against close relationships or intermarriage.<sup>2</sup>

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<sup>1</sup> Area Handbook, p. 101.

<sup>2</sup> Area Handbook, p. 101.

## Urban Society

The traditional Moroccan city was composed of a series of derbs, or quarters. Within each quarter were all the services needed for daily life - a souk (market), a fountain, a communal oven, a public bath, a mosque, and a Quaranic elementary school.<sup>3</sup> Each quarter contained families of all social and economic levels. The community's leaders were chosen from the prominent families in the quarter. The economic viability of the city was maintained by the many craftsmen and merchants; each pursued the livelihood traditional within his family.

The rapid urbanization of Morocco during the twentieth century coincided with French colonization and so the growth of the cities represented more than just an increase in population. Marshall Lyautey, the first French governor of Morocco wanted to preserve the integrity of the traditional Moslem cities and to provide suitable living areas for the European colonists. His solution was to develop separate cities which were designed in the European tradition, with broad streets, detached houses and parks. Sanitary systems for the new sections of the city would provide a hygienically better life for the Europeans while the filth and disease of the poor element among the Moroccans could be contained in the old quarters. In order to preserve the old cities, modern building materials and techniques were prohibited and so the Moroccans were forcibly prevented from attempting to modernize or improve their living quarters.<sup>4</sup> Many Moroccans were attracted to the new areas by the European life style and those who could afford to move out of the old quarters of the cities. These became neighborhoods for the poor and residential segregation by class and economic status became a characteristic of Moroccan cities for the first time.

Economic development accelerated during this period, and rural migrants streamed into the cities in search of jobs. The old quarters of the cities were rapidly filled to overflowing and by the 1920's the bidonvilles\* began to appear as the new migrants sought to live near their jobs in the industrial perimeters of the carefully planned French cities. The bidonvilles or shanty towns were built of flattened oil drums, scrap lumber, and other discarded materials and were grouped in the traditional Moroccan style with houses crowded together and narrow streets and passageways in between. The French attempted to discourage the squatters and provided no service for the bidonvilles. The poor ventilation of dwellings and the lack of electricity, potable water and sanitation facilities made the bidonvilles some of the unhealthiest places in the country. Population density in the bidonvilles often reached 2000 persons per acre of land. Conditions in the old quarters of the cities were no better. Population density in the old medina of Casablanca, had been estimated at 1,000 persons per hectare.<sup>5</sup>

After Independence and the exodus of much of the European population, the cities experienced another wave of migration from rural Morocco. In an attempt to deal with the severe housing shortage which resulted, the government built 13,000 low-cost housing units between 1956 and 1965.<sup>6</sup> But government policy was altered during the mid-1960's and resources were directed

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<sup>3</sup>Area Handbook, p. 107.

<sup>4</sup>De la Casiniere, Les Municipalités Marocaines, p. 96.

<sup>5</sup>Portrykowska, Essays on World Urbanization, p. 328.

<sup>6</sup>Ibid., p. 29.

\* Note: Bidon is the French word for tin can - many of the squatters used flattened oil drums as siding for their houses.

to the development of agriculture and industry instead. The 1973-77 Plan suggested renewed interest in social welfare programs and there are indications that the new Plan (1978-1982) will place even more emphasis on programs of this type. (See section on Health Policy.)

### Rural Society

One of the most remarkable features of rural Moroccan society is its diversity. Despite the fact that most Moroccans share a single religion (Islam) and only two languages (Arabic and Berber) the physical isolation which has been imposed on Moroccan communities by the mountains and the desert has resulted in the development of mutually unintelligible dialects and differences in social customs, dress, housing and livelihood.

Much attention has been focused on the changes which are taking place in urban Morocco, and on the adaptation of rural Moroccans to an urban life style. There are also changes taking place in the rural lifestyle which are just as profound. In the Atlas mountains, Berber tribes which were formerly nomadic or semi-nomadic are being forced to switch to a sedentary life of small-scale farming as open pastureland is reduced. Because of the loss of territorial suzerainty and the power which accompanied it, family ties based on tribal alliances have weakened and no longer serve to bind the rural population together.<sup>7</sup> The social disorganization which has accompanied these changes has resulted in high divorce rates, prostitution, illegitimacy, and a high incidence of venereal disease and venereal disease-induced sterility.<sup>8</sup> The Christian missionaries who have worked in the Rif since colonial times now care for the orphaned, sick, and malnourished children of the area - an unusual development in Islamic society.<sup>9</sup>

### Marriage, Divorce and the Position of Women

In traditional Arab society, marital alliances were arranged by the families of the man and woman in question, often to cement political ties, exchange grazing rights between two groups, or advance one's family position. Often marriages between parallel cousins were preferred. A man may still marry up to four wives if he can treat them all equally, however, a woman may have only one husband at a time. The 1957 civil code permits a wife to stipulate in the marriage contract that her husband may not take another wife. She has grounds for divorce if he does. Women may administer their own wealth after marriage and engage in business without consulting their husbands. While a husband may still divorce his wife in the traditional way (by repudiating her three times in front of witnesses) a woman must present proof of non-maintenance, abandonment, physical cruelty, or sexual abstinence in order to obtain a divorce. Among some Berbers, when a husband agrees to a divorce at his wife's request, he may stipulate men whom she may not marry. Reforms in 1954 and 1961 limit the number of men who may be prohibited.

Men are usually many years older than their wives and so many women are widows for much of their life. While single women are expected to live with their families until they marry and to be virgins when they wed, no limitations are placed on the activities of divorced or widowed women and in fact they have traditionally been regarded as the appropriate source of sexual experience for single men.

Prostitution is increasing rapidly, however, for the extended family structure no longer serves as an economic refuge for widowed and divorced women. Many are, therefore, forced to

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<sup>7</sup>Teitelbaum, Land-Use and Nutri-Structural Changes Among Berber..., p. 74.

<sup>8</sup>Ibid., p. 16.

<sup>9</sup>Ibid.

earn their living however they can. Since close to 90% of Moroccan women are illiterate, their marketable job skills are limited. The rapid spread of venereal diseases is one of the unfortunate results of the social disintegration which is now in progress in Morocco. (See Health Status section.)

### Health Beliefs and Behavior

Despite the rapid development of a modern health system in Morocco, pre-Islamic beliefs and practices remain strong throughout the country. Doctrines of holy men (marabouts), belief in djinns (spirits), in the evil eye, and in rites which will assure good fortune still play an important role in the diagnosis and treatment of health problems. These beliefs enable the patient to play a role in his own destiny and to free himself from physical insecurity (i.e. poverty, illness). Without some knowledge of these traditional beliefs, it is difficult to appreciate some of the problems which are involved in the communication between medical personnel and patients. While the majority of Moroccans apparently use the modern health system and appreciate the effectiveness of modern medical treatment, they may supplement it with a traditional cure, or resort to it when modern care is unavailable.

In the Middle East, medical diagnosis developed as a science which was based on astrology, hepatoscopy, and the interpretation of dreams.<sup>10</sup> Illness was thought to originate either from the loss of certain powers or properties (in which case therapy was restorative) or from the invasion of the body by a spirit (in which case therapy must include exorcism or revulsion).<sup>11</sup> Djinns are omnipresent, invisible, and by preference inhabit the earth. There is a Moroccan proverb that says that a male child is born with sixty djinns in his body, a girl child is born pure. The boy sheds one djinn with each year of life, while the girl takes one in. For this reason women who are sixty years old and possess sixty djinns are thought to be sharper than the very devil.<sup>12</sup> Djinns are believed to have supernatural power which can be used benevolently or malevolently. The worst djinns manifest themselves most frequently by an attack on health. They possess the mentally ill and epileptics. Illnesses such as cancer and tuberculosis are thought to be caused not by djinns, but by the ingestion of bewitched food. Taam, (food) is bewitched when couscous is rolled between the hands of the dead. Only person who is experienced in the occult may successfully bewitch taam.<sup>13</sup>

The best protection against the evil eye, spells, and djinns is religious practice. Magical incantations, petitions to holy men, offerings to them, and animal sacrifices all offer protection as does the use of colors such as black, yellow, blue and red and symbolic forms of the number five or of the hand. The daily use of salt protects against djinns, as do fire, brimstone, tar, and incense.

The treatment of various illnesses includes the use of herb preparations, purification (with water or cauterization), and magical transfer. In the latter case, the victim places some physical object with which he has been in contact in the path of another who by traveling over it becomes the victim.

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<sup>10</sup>Simon, Men and Medicine in the Middle East, p. 35.

<sup>11</sup>Choffat, Conception de la Vie et de la Maladie Dans le Milieu Rural Marocain, p. 8.

<sup>12</sup>Epton, Saints and Sorcerers, p. 39.

<sup>13</sup>Ibid.

In the traditional tribal society, the survival of the group and strength in numbers were of primary importance. Sterility was considered the worst possible malady because it was associated with extinction. The rites which insured the fertility of the tribe were analogous to those which insured the fertility of the earth.<sup>14</sup> Remedies for sterility include mixtures of saffron, mandragore, and belladonna. A remedy for women who want more children is, seven baby mice must be rolled in flour and swallowed alive with a little water.<sup>15</sup> To cure impotence, drink a mixture of rosewater, sugar, and pounded almonds. Then go and watch a horse mating, then take a bath at the hamman (Turkish bath).<sup>16</sup>

The control of fertility through the use of herbs, incantations, and self-induced abortions is also common. A list of traditional birth control methods is included in the appendix. Despite the law which prohibits abortion except when the mother's life is in danger, it is apparently a commonly used method of birth control. Interviews with women in the Rabat bidonville of Maadid revealed that many of the women considered the written laws to be part of the world that belongs exclusively to men. This world was viewed as antithetical to their rights and interests (especially the unilateral right of repudiation), unjust, and arbitrary.<sup>17</sup> Many poor women arrive at Moroccan hospitals in serious condition as a result of self-induced abortion attempts and they usually refuse to acknowledge having made the attempt.<sup>18</sup> Sodium permanganate and ergot (which is poisonous) are used, as well as such concoctions as the following: For an abortion eat a pound of red peppers macerated with vinegar every morning before breakfast.<sup>19</sup> Safe abortions by trained medical personnel are only available to those who can pay for them, and as long as this is true, poor Moroccan women will continue to risk their lives by using these dangerous traditional methods.

The fquih, (a semimagical religious figure, usually a man) and the saint's<sup>20</sup> tombs both play important roles in traditional medical practice. The fquih will, upon request, perform a tkaf (a magical ceremony) usually to prevent the occurrence of something (pregnancy, polygamy). If the woman wishes to undo the tkaf, she may request this also. At the saint's tomb, women go to communicate their problems, often in great detail. They may shout, scream, cry, and at the end, fall to the floor in exhaustion where they are then comforted by other women. The marabout who is present may do little more than listen to the woman's problems, but the process of emotional catharsis which takes place there is rather like a traditional form of psychotherapy.

Different health programs have been accepted in Morocco according to the perceived benefits of the treatment and the difficulties encountered in obtaining the treatment. The vaccination of children, for instance, is widely accepted because the benefits are obvious. The majority of women in Maadid go to a Rabat hospital for their first delivery because they appreciate the value of the medical care available there in the event of complications. Most, however, prefer to deliver at home after that, assisted by a friend. The reason most often cited for this preference was the impersonality and lack of humanitarian concern expressed by hospital

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<sup>14</sup>Choffat, p. 7.

<sup>15</sup>Epton, p. 45.

<sup>16</sup>Ibid.

<sup>17</sup>Mernissi, Obstacles to Family Planning Practice in Morocco, p. 42.

<sup>18</sup>Ibid.

<sup>19</sup>Epton, p. 45.

<sup>20</sup>A Saint is usually a local person who has led an exemplary life.

medical personnel.<sup>21</sup> The modern family planning methods are often used in combination with traditional methods, and when modern methods are not used, the difficulty in obtaining them is most often cited as the reason for not using them.<sup>22</sup> It could therefore be expected that many of the traditional medical practices will decline as the health delivery system expands and improves.

### Housing

The housing supply in Morocco can be described as inadequate in both quantity and quality. It is debatable whether the situation is worse in rural or urban areas. In rural areas, potable water and waste disposal systems are rare and housing is frequently shared with animals, which promotes the spread of certain diseases. Urban housing has more interior space, according to the national housing survey, but little or no exterior space. There, too, potable water is not always available and sewerage systems are woefully inadequate. The overcrowding in both medinas and bidonvilles and the poor ventilation provide an ideal breeding ground for a variety of diseases which are brought in by migrants from all over Morocco.

In 1971, a housing survey was conducted in connection with the population census. The survey, like the census, was the work of the Office of Statistics of the Moroccan Ministry of Plan. Although the survey was purported to be a survey of both urban and rural housing conditions, most of the information which was published relates to urban areas. It is a valuable document, nevertheless, for it provides more information on the condition of Moroccan housing than had been heretofore available. In 1971, there were approximately 2,820,000 households in Morocco. A 10% sample revealed that the average Moroccan household contained 5.5 persons (6 in the rural areas, 5 in the urban areas). In most of Morocco, housing is constructed of bricks, stone, or clay. Architectural styles vary throughout the country, from the whitewashed Spanish-style houses of the north to the red sandstone and clay of the south. (See Tables in Statistical Appendix.)

Nationally, there is an average of 2.6 persons per room in Morocco. (See Table in Statistical Appendix.) The average number of persons per room in urban Morocco ranged from 2.3 persons citywide to 3.4 in the bidonvilles.<sup>23</sup> A third of urban housing consisted of only one room and another third had only two rooms. Only 10% of all housing had more than four rooms, and 75% of these households consisted of five or more persons. Rural housing has less space - an average of 2.0 rooms per house and 2.9 persons per room. Social stratification is reflected in the varying population densities of the different quarters of cities such as Casablanca. In the modern quarters, density is approximately one hundred persons per hectare and in the old medina, it is 1000 or more persons per hectare.<sup>24</sup>

The facilities available in different types of housing (See Tables in Statistical Appendix) vary considerably. The bidonvilles not only have the highest density, they also have fewer amenities. Housing conditions are quite different in various regions of the country as well. While nationally only 18% of houses have no toilet, almost 47% of houses in Ouarzazate

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<sup>21</sup>Mernissi, p. 423.

<sup>22</sup>Ibid.

<sup>23</sup>1971 Household Survey. The data from this survey is not internally consistent. It should therefore be used with caution.

<sup>24</sup>Potrykowska, Morocco, Essays on World Urbanization, p. 328.

have no toilet, and 42% in Beni-Mellal have no toilet. Since these provinces have a high incidence of schistosomiasis in addition to the usual enteric diseases (See Health Status section) it is particularly important to improve the sanitation situation if these diseases are to be arrested. Only 48% of urban housing has running water. The situation varies throughout the country. In Casablanca, only 34% of houses do not have running water. In Beni Mellal 81% do not have running water.

Electricity is only available in 68.4% of Moroccan homes. Tarfaya province has the worst situation (72% no electricity) while Tetouan (80% with electricity), Casablanca (77%), Al Hoceima, and Marrakech (75% each), have the highest percentage of homes with electricity (see Tables in Statistical Appendix). For a comparison of the facilities available in 1960 and 1971 see the Appendix. Tenant Status in both years is also indicated there.

During the 1973-1977 Plan period, urban housing was given priority over rural housing. Housing was to be provided only to families whose monthly income is under 1000 Dirhams per month. Low-cost housing was to be built for approximately 600,000 people who have incomes ranging from 350-1000 Dirhams per month (120,000 units), while sites and services will be provided for families whose incomes range from 350 to 175 DH per month. The services, such as water, sewerage, garbage removal, and electricity are to be added gradually to the areas over a period of five years. For families whose incomes are less than 175 Dirhams per month, public water taps, sewage lines, garbage removal and road systems are to be established over a period of up to eleven years.<sup>25</sup>

As part of Morocco's efforts in regional development, four "Etablissements Regionaux d'Amenagement et de Construction" were established in 1975 to build low-cost housing. Three more agencies were to be established during 1976. Each corresponds to one of the seven economic development regions of the country. In 1975, the four existing ERAC's constructed 13,400 low-cost housing units and 14,170 lots were cleared for the relocation of bidonville residents. There will be some international assistance for housing improvements in Casablanca and Rabat. The IBRD is in the process of developing an Urban Sector project which will include slum rehabilitation and sites and services.

#### Environmental Sanitation

"Many different kinds of microorganisms cause enteric disease, but transmission generally depends on fecal contamination. Thus, the most fundamental of all actions needed to combat enteric infections in developing countries is provision of water supply and sewerage systems in both urban and rural zones."<sup>26</sup>

#### Water Supply

Morocco is unevenly endowed with water resources. Extremely dry areas in the southern and eastern parts of the country blend gradually into the Sahara desert. Rainfall in the north and west is usually in excess of 400mm per year. Even in the areas of higher precipitation, rainfall varies from year to year and is concentrated in the winter months. Groundwater is used to supplement rainfall in some areas. In others, the rivers which flow from the Rif and Atlas Mountain ranges are used for human consumption as well as for animals, agriculture, and

<sup>25</sup>1973-1977 Plan, pp. 456-467.

<sup>26</sup>Wolman, Abel, Environmental Sanitation in Urban and Rural Areas: Its Importance in the Control of Enteric Infections, p. 157.

industry. While surface water is more plentiful than subterranean sources, the distance of these from major population centers requires the development of an extensive system for the transportation of water and for its treatment (decanting, filtration and sterilization). The rapid population growth of the past decade and the expansion of industry, tourism, and agriculture have intensified the competition for the use of Morocco's water resources.

In 1968, UNDP financed a study of the supply and use of potable water in Morocco. The study included the identification of water resources and an estimate of their quantity and quality; an inventory of the in place production and distribution systems; an estimation of need for the period 1972-2000; the delineation of future production and distribution; the estimation of costs relative to the development of water resources; and the financial implications of actual and future exploration and installations. The W.H.O. was the executing agency for the studies. In addition, a detailed study was made of the Rabat-Sale sewage disposal system and its problems. This was considered by the Moroccan government to be a priority area of interest.

For each city or major population center within a province, the following subjects are considered: 1) Demography, 2) Per capita production, 3) Needs, 4) Resources and actual infrastructure, 5) Resources to mobilize - future works, and 6) Costs of exploration and development. For rural areas, the following points were considered: 1) Demography, 2) Per capita production, 3) Needs, and 4) Costs of exploration and investment.

Water supplies available for public consumption range from 90-194 litres per person per day in the larger cities to 70-200 liters in medium size cities (most are close to 70) and 50-120 litres in small population centers. This is considered to be relatively good for the big cities, adequate for the medium sized cities and unsatisfactory for the smaller cities. In rural areas only 10 litres per person per day is available. National per capita consumption of water is extremely uneven. Approximately 70% of the population consumes 20% of the water while the remaining 30% (in the larger urban areas) consumes 80%. In the late 1960's, an estimated 30% of Casablanca's residents lived in bidonvilles, yet the bidonvilles accounted for only 1% of the city's consumption of piped water. Although this seems extremely low, the housing survey in 1971 revealed that only 8.1% of the country's bidonville households had either running water (3.6%) or well water (4.5%). (See Table in Statistical Appendix.) A W.H.O. survey of Community Water Supply estimated that 90% of Morocco's urban population had reasonable access to potable water.<sup>27</sup> The average per capita consumption from public standpipes was only 10-20 litres per person per day, however, whereas the per capita consumption for the country ranged from 60-260 litres per person per day.<sup>28</sup> Unfortunately there is no current information available on the consumption of water in the bidonvilles or in other areas. Seventy percent of the water used is from subterranean sources and 30% is surface water sources. The production and distribution systems which are currently in operation are all considered to be functioning at the limits of their capability.

The demographic projections which were used to estimate the future needs envisioned a population of 30,200,000 by the year 2000, with the urban population increasing to 15,900,000 and the rural population increasing to 14,300,000. Total demand for water was expected to increase from 1,235,000 cubic meters per day in 1977 to 4,606,000 cubic meters per day in 2000. The per capita demand in the future was estimated as follows:

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<sup>27</sup>W.H.O. Statistical Report, 1971, p. 728.

<sup>28</sup>Ibid., p. 772.

Litres per person per day

	<u>1977</u>	<u>1985</u>	<u>2000</u>
Large City	120-220	150-260	200-290
Medium sized City	70-200	75-235	90-290
Small Centers	55-215	60-265	80-380
Rural Areas	30	50	100

The per capita investment which was estimated to be necessary to develop an adequate series of water systems throughout Morocco was as follows:

13.00 Dirhams*	1972-1977
6.60 Dirhams	1978-1985
5.40 Dirhams	1986-2000

The initial investment is high because of the assumption that greater effort will be required in the beginning to expand water systems to the extent necessary to make them adequate. Per capita investment will decrease once the current deficit between supply and demand has been filled.

The second phase of water supply program in Morocco involves the construction of the recommended supply systems for Casablanca and Rabat-Sale. The system includes dams, reservoirs, pumping stations and supply pipes. Financing costs are to be divided between the GOM (U.S. \$50 million) and the IBRD (\$48 million U.S.). In a third phase of the project, several other cities were to receive aid for the improvement of water supply systems. The source of funding for these systems has not yet been established.

Included were the following:

- Oujda - new production and distribution systems which will be controlled by ONEP
- Essaouira - new production capability will be developed. The municipal distribution system will remain independent of ONEP
- Tetouan - new production capability, distribution to remain under municipal control
- Oued Zem and Boujaad - ONEP will aid in the development of the production (from wells) and distribution systems
- Fez and Meknes - new production and distribution systems are to be developed. By law the new production capacity must be controlled by ONEP. The municipalities have kept their water rates low (32 Dh/m<sup>3</sup>) in the past and will be forced to raise them (to 45-60 Dh/m<sup>3</sup>) to cover costs for the new systems.
- Tanger, Marrakech, and Agadir have found other funds (reportedly from a Western European country, though this is unconfirmed) to proceed with the improvement of their water systems.

There are two Ministries in Morocco which are involved in the production and distribution of potable water. The National Potable Water Company, ONEP, (Organisation National de l'Eau Potable) was established in 1969 under the direction of the Ministry of Public Works. ONEP is responsible for all new production of potable water throughout Morocco and its transportation to the cities. All existing production and all old and new distribution systems are under

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\*Exchange Rate: 4.5 Dirhams = U.S. \$1.00.

municipal control. The Ministry of the Interior has jurisdiction over the municipalities. Distribution systems in smaller urban centers and in rural areas are also under the jurisdiction of the Ministry of the Interior. The Division of Water Resources in the Ministry of Public Works controls all requests for water resources, including those from agriculture, industry, tourism facilities, and the cities.

### Waste Disposal

The adequate disposal of organic and inorganic waste matter is imperative for the maintenance of a good health environment. In Morocco, the Municipal Governments are responsible for the development of systems for waste disposal. The lack of financial resources and technical expertise in many areas of the country has limited the extent to which these systems have been developed. According to the 1971 housing survey, 20% of all housing had no toilet and 48% had no running water. Sewerage systems exist only in the large cities (primarily in the provincial capitals). There are no major sewage treatment facilities. In Rabat, sewage is treated and pumped into the ocean away from the city. However, a separate part of the system empties into the Bou Regreg River, which causes a serious pollution problem. The beaches near the mouth of the river are not considered safe - cholera and shigella bacteria have been found in chemical tests of the river. In other cities as well, untreated sewage is emptied into rivers and streams which creates serious pollution problems for those who live downstream. Seepage of sewage into water lines is another serious problem in the cities which is caused by the poor condition of many of the municipal water and sewer lines. Thus, water which has been adequately treated before distribution may no longer be potable when it reaches its destination. In rural areas, streams often serve the function of a waste disposal system. Human excreta deposited in open fields contributes to the propagation of flies and provides a favorable vehicle for the transmission of a wide variety of communicable diseases.

Garbage collection and street cleaning are fairly regular in the large cities. In small towns and rural areas, there is no collection of garbage. Usually a dumping ground is established at the edge of town and garbage is left there to rot in the open air. These open garbage dumps provide an ideal habitat for flies, rodents, and other vermin, and are a serious health hazard to the nearby community. Rats are a serious problem in the bidonvilles. Rat extermination campaigns are frequent. Poison is distributed to the residents of the bidonvilles to help in the extermination campaigns.

Environmental hygiene is the responsibility of the Ministry of Public Health. The Office of Environmental Hygiene, which is under the Director of Technical Services, is responsible for guiding the environmental sanitation programs of the MOPH. Within each Province or Prefecture, the Chief Medical Officer works with the Bureau of Municipal Hygiene or with local officials to control the environmental health problems in that province or prefecture. In Casablanca, for example, a Hygiene Office was established in 1912. The Office inspects drinking water, commercial beverages, public swimming pools, sewerage systems, schools (annually), factories, restaurants and food stores. It also enforces quarantine regulations. The rapid growth of the city has unfortunately not been matched by an increment in personnel in the Hygiene Office. Because of this, sanitary inspectors are hard pressed to meet the city's needs. In areas where there is no hygiene office, sanitary aides from the provincial medical staff perform the work of the urban Bureau of Municipal Hygiene. Their work is coordinated by the Provincial Medical Officer and the local officials. Throughout the country there is a shortage of health personnel who are trained to work in the area of environmental sanitation. The result is that the inspection of markets, restaurants, and other public places is irregular. All meat is supposed to be inspected by a veterinarian or a veterinary assistant before it is sold, yet in practice this is impossible. Violations of the sanitary regulations

are common and are often difficult to discover. The problems should be ameliorated as more public health personnel are added to the environmental sanitation programs.

#### Industrial Pollution

Most of Morocco's industrial development has occurred along the Atlantic Coast, so industrial pollution is a serious problem for many of the major coastal cities. Most of these cities have been indiscriminately dumping industrial waste products into the Atlantic Ocean for many years. There has been no attempt to measure the effects of this pollution on marine life or on the safety for human consumption of locally caught seafood.

Industrial pollution presents a serious problem for the development of tourism in Morocco as well, therefore, its potential economic impact must not be underestimated. The Moroccan government, with assistance from the IBRD, will undertake some oceanographic studies off the coast of Casablanca in order to measure the nature and extent of the pollution problem there. The construction of sewage treatment plants in Casablanca and Rabat will undoubtedly help to control industrial pollution in these two cities.



## CHAPTER THREE

### Health Status

The major health indicators suggest that there has been steady improvement in the health status of the Moroccan population since Independence. Some major diseases such as smallpox have been eradicated while others, such as malaria and cholera, have been brought under control. In the last ten years the death rate has dropped from 18.7/1,000 to 16/1,000, and life expectancy has increased from forty-seven to fifty-three years. (See Table 8)

Morocco's health status appears to be remarkably similar to that of the other countries of North Africa (See Table 9). In all of these countries, the death rate is falling while the birth rate continues to be high. Communicable diseases and gastrointestinal infections are the major causes of morbidity and mortality in Morocco, as in the rest of North Africa, but there are indications that some of the health problems which are common to the more industrialized countries, such as heart disease and cancer, are also increasing in importance.

Information on the health status of the Moroccan population is collected by the Division of Health Statistics in the Moroccan Ministry of Public Health. Some of the information is published in summary form in the Quarterly and Annual Health Bulletins of the MOPH and in Maroc en Chiffres, a publication of the Division of Statistics of the Ministry of Plan. The accuracy and completeness of the information gathered appears to be very good - statistics from the local health facilities are consistent with those found in the national reports. However, the kind of statistics reported are not always the most useful. A great deal of detailed information is published on malaria, although there were only 278 cases reported during 1975 and four cases during the first quarter of 1976. Despite the high incidence of malnutrition, no information is available on the number of children treated for nutritional deficiency diseases. Statistics for birth-related deaths are aggregated, whereas it would be far more useful to record separately maternal, fetal, and perinatal deaths. The health information system should be revised periodically to reflect changing health conditions. Unfortunately, not all of Morocco's population has regular access to either public or private health care (excluding traditional unlicensed practitioners) and so reports on health statistics can be considered to reflect the health condition of only about 50% of the population. There have been very few household interviews, sample surveys, or other special studies which would reveal additional information on Moroccan health problems. There are other limitations on the use of the data which are imposed by the shortage of trained personnel in the statistical division of the MOPH. An inordinate amount of time is required to tabulate data, which means that the most current information is often available in the form of raw data only. The statistics do appear to be used by some of the program divisions of the MOPH as indicators of program effectiveness, however, these statistics are not linked to information on the cost of program activities; therefore, it is impossible to compare the cost of the various activities of the health services with the benefits derived.

### Mortality

One of the principal gaps in the health data available in Morocco is the almost complete absence of information concerning mortality levels and causes of death. Since recording of deaths is not a function of the health system, but rather of the civil authorities throughout the country, only those deaths which occur in the public health facilities (primarily the hospitals) are recorded regularly according to age and cause of death. The data is so meager that only a small amount of information concerning mortality is actually published by the MOPH. (See Tables 10 and 11.) Any improvement in this situation is linked to the development of a uniform civil registration system (see Population section). The Ministry of the Interior has primary responsibility for civil registration, therefore, it would be necessary for that Ministry to develop and implement a uniform system for the reporting of deaths and their causes.

**TABLE 8**  
**Health Indicators for Morocco**

	<u>1966</u>	<u>1976</u>
Births/1000	46.1	46
Deaths/1000	18.7	16
Infant Mortality	149.0	130
Life Expectancy	47.0	53

Source: 1966-Ministry of Health Statistical Office 1966  
1976-Statistics gathered by U.N. Population Bureau  
1973-74

**TABLE 9**  
**Comparative Health Indicators - North Africa**

<u>Country</u>	<u>Births/1000 Population</u>	<u>Deaths/1000 Population</u>	<u>Infant Mortality</u>	<u>Life Expectancy</u>
Morocco	46	16	130	53
Tunisia	38	13	100	54
Algeria	49	15	128	53
Libya	45	15	130	53
Egypt	38	15	118	52

Source: United Nations, cited in World Population Growth and Response,  
1970-74 data.

Table 10

Deaths Reported in Twenty-eight  
Municipalities in Morocco, 1975

Municipalities	Deaths			Total	Stillbirths
	Moroccan Muslim	Moroccan Jewish	Foreigners		
Agadir	1752	0	12	1764	346
Al-Hoceima	235	0	0	235	106
Asilah	98	0	0	98	14
Azemmour	22	0	0	22	2
Casablanca	7814	18	53	7885	1260
Chaouen	154	0	0	154	0
El Jadida	896	0	5	901	18
Essaouira	495	0	1	496	101
Fes	2187	4	2	2193	278
Ifrane	21	0	0	21	3
Kenitra	1564	0	10	1574	294
Khouribga	319	0	0	319	53
Ksar-el-Kebir	376	0	0	376	21
Larache	391	1	5	397	65
Marrakech	4774	8	15	4797	490
Meknes	2271	1	3	2275	309
Mohammedia	494	0	0	494	90
Nador	378	0	0	378	75
Ouezzane	513	0	0	513	27
Oujda	849	0	31	880	180
Rabat	4165	13	70	4248	515
Safi	1788	3	6	1797	183
Sale	1339	1	9	1349	58
Sefrou	269	1	0	270	43
Settat	525	1	0	526	84
Tanger	2082	20	92	2194	250
Taza	761	0	1	762	121
Tetouan	1141	1	5	1147	171
Totals	37673	72	320	38065	5157

Source: Bulletin Annuel D'Information Sanitaire, 1975 Ministry of  
Public Health

Table 11

Deaths Reported in Some Rural  
Areas of Morocco - 1975

Provinces	Death			Total	Stillbirths
	Moroccan Muslim	Moroccan Jewish	Foreigners		
Agadir	667	0	0	667	185
Al-Hoceima	-	-	-	-	-
Beni-Mellal	436	0	0	436	61
El-Jadida	29	0	0	29	0
El Kelaa	140	0	0	140	0
Fes	52	0	0	52	4
Kenitra	145	0	2	147	10
Khemisset	-	-	-	-	-
Khenifra	73	0	0	73	0
Khouribga	-	-	-	-	-
Ksar-es-Souk	402	0	0	402	122
Marrakech	28	0	0	28	8
Meknes	84	1	0	85	1
Nador	-	-	-	-	-
Quarzazate	350	0	0	350	66
Oujda	19	0	0	19	7
Safi	95	0	0	95	37
Settat	122	0	0	122	14
Tanger	-	-	-	-	-
Taza	29	0	0	29	8
Tetouan	35	0	0	35	1
Total	2706	1	2	2709	524

Source: Bulletin Annuel D'Information Sanitaire, 1975, Ministry of  
Public Health

Sample surveys have indicated that the infant mortality rates in Morocco are approximately 170 per thousand in rural areas and 100 per thousand in urban areas. In 1973, the rate for the country as a whole was reported to be 130 per thousand.<sup>1</sup> Information on causes of infant mortality was collected in 1970 (See Table 12). At that time, upper respiratory infections and gastrointestinal diseases accounted for over one third of infant deaths. The high incidence of measles, malnutrition (See Nutrition section), and poor sanitary conditions in urban, as well as rural, areas contribute significantly to the high infant mortality rate.

Table 12

Infant Mortality and Causes of Death (1970)

1. Congenital malformation, diseases of early infancy	18.64%
2. Gastroenteritis diarrheas	12.75%
3. Pneumonias, broncho-pneumonia	10.00%
4. Other infectious diseases	8.40%
5. Tuberculosis, all forms	6.88%
6. Heart diseases	6.08%
7. Accidents	3.43%
8. Other respiratory diseases	3.30%
9. Other diseases of the digestive system	2.81%
10. All other diseases	27.71%
TOTAL	100.00%

SOURCE: USAID. Development Assistance Plan for FY 1975-1979.

Data is not available on maternal mortality, age-specific mortality, or causes of death. A special survey in 28 cities in 1971 indicated that among the leading causes of death for all ages were gastrointestinal diseases, upper respiratory infections, measles, heart disease, and accidents. Since the survey covered a very small part of Morocco, and did not include any information on the rural areas where the majority of the population live, it cannot really be used to make any meaningful statements about the causes of death in Morocco. However, when the statistics on communicable diseases are compared with the reported causes of death, there appears to be some correlation. A large number of cases of gastrointestinal infections are reported, and there are also many cases of measles and tuberculosis.

Morbidity

Morbidity statistics are far more complete than mortality statistics, particularly for the reportable communicable diseases. (See Table 13). The statistics published can be said to be an accurate reflection of the health problems which are being brought to the Moroccan public health system. They do not necessarily reflect all the health problems that exist, however, nor do they always reflect the extent of any particular problem. For example, although births are reported, abortions are not, despite the fact that they "are legal" if the mother's life is in danger. The abortion rate has been estimated to be close to 250/1,000 live births which is high. (The rate for the U.S. after the Supreme Court decision is 200/1,000 live births). Hydatidosis was referred to by several health officials as a serious problem in some provinces (see next section) but it was not possible to find out whether the provinces where the problem supposedly exists have focused their attention on control of this disease. A special study in the province of Beni-Mellal in 1972 uncovered 752 cases of schistosomiasis in one area of the province (See section on Schistosomiasis) yet these cases, which were confirmed by laboratory tests, do not appear in the records of the MOPH in 1972 or 1973. Health officials in the area estimated that there were as many as 1,500 cases in the province. The lack of communication between the public

<sup>1</sup>USAID Population Program Assistance, p. 165.

Table 13

INCIDENCE OF REPORTABLE COMMUNICABLE DISEASES  
(NUMBER OF CASES)

DISEASE	1968	1969	1970	1971	1972	1973	1974	1975	1976 ▼
Typhoid & Paratyphoid	8230	11740	9454	3421	4996	2643	3724	4069	983
Dysentery	49935	39397	40286	37531	34998	51323	22793	N.A.	909
Tuberculosis	23230	23937	22057	19719	17668	20244	N.A.	N.A.	N.A.
Diphtheria	989	903	521	250	247	213	200	101	18
Meningitis	6336	1876	945	475	557	619	408	579	192
Tetanus	190	196	205	202	180	161	374	44	19
Poliomyelitis	293	348	385	265	353	382	364	575	80
Measles	92673	90567	89198	90305	125640	114250	123366	143,883	14,746
Trachoma	131367	79272	67261	42614	48672	70732	43155	42,670	6223
Conjunctivitis	288642	169053	146820	194663	148155	218349	203892	326182	62046
Malaria	3919	8122	5327	10314	6559	1685	913	278	4
Schistosomiasis	3237	1994	226	1787	4423	1916	1825	6348	2879

\* 1st 3 months only

N.A. = Not available

Source: Compiled from the Quarterly and Annual Bulletins of the Moroccan  
Ministry of Public Health.

and private health sectors, (traditional as well as modern practitioners) implies that the MOPH receives limited information concerning the health problems which are being treated in the private sector. Until new methods are developed which compensate for these data gaps, the information on morbidity in Morocco cannot be considered to reflect the total health picture in the country.

The following is a summary of the information which is currently available on specific diseases.

### Malaria

Malaria occurs throughout Morocco. The coastal swamps are the principal problem area. Anopheles labranchiae breed there. In the mountainous areas Anopheles claviger occurs, and on the Mediterranean Coast, Anopheles hispaniola appears. Anopheles multicolor breed in the southern oases of Morocco and Anopheles sergenti infest the northern interior oases. Despite the variety of vectors and habitats, the incidence of malaria in Morocco has dropped from 97,599 cases reported in 1956<sup>2</sup> to 278 reported in 1975. Only four cases were reported during the first three months of 1976. (See Table 13.)

The Malaria Control program in Morocco began in 1962 and is an integral part of the health program in every province. There is equipment and chemicals for spraying operations in each province. Spraying operations in malaria-endemic areas have reached over four million households. Blood smears are taken for every person who arrives at the health centers with a fever. Over 1,600,000 slides were processed in 1975.<sup>3</sup> The quarterly health bulletin statistics indicate that only a few provinces of Morocco report more than a scattered number of malaria cases each year. Oujda, Khemisset, Ouarzazate and Beni-Mellal appear to have reported the largest number of cases in 1975.<sup>4</sup>

### Measles

Morocco has one of the highest reported incidences of measles in the world. Over 90,000 cases have been reported every year since 1968 (See Table 13). In 1971, the only year for which statistics are available relating to causes of death, measles appear among the ten leading causes of death. In April, 1975, a measles epidemic in the area of Tiznit Agadir Province, was reported to have caused 104 deaths according to Paris newspapers. No information is available concerning the geographic or seasonal distribution of cases. The complication rate was estimated to be about 3%, according to one MOPH official. Many Moroccan officials consider measles to be a relatively benign childhood disease which rarely results in complications. While complications from measles are generally believed to be most commonly upper respiratory infections, a study in sub-Saharan Africa revealed that diarrhea was also a common complication. The effects were often not attributed to the original case of measles, and persisted long after the measles had been cured. In a country with significant nutrition problems, these relationships should not be overlooked. A study in Sale which demonstrated that the cost of vaccination was higher than the cost of treating complicated cases of the disease was instrumental in a MOPH decision not to conduct a major vaccination campaign against the disease. It is unfortunate that the study did not compare the cost of treating all cases of measles with the cost of vaccinations, for the cost to the public health system of treating over a hundred thousand cases of measles a year must be significant.

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<sup>2</sup> MOPH. 20 years of Public Health - 1956-1957, p. 94.

<sup>3</sup> Ibid. p. 95.

<sup>4</sup> Bulletin Trimestriel d'Information Sanitaire, MOPH.

## Tuberculosis

Tuberculosis is widely reported in Morocco. Although the number of cases recorded has changed very little during the past ten years, it may be because improved medical surveillance has led to the discovery and treatment of a larger percentage of cases. The number of new cases of tuberculosis reported annually has remained at around 20,000 for the past ten years. (See Table 13.)

The tuberculosis control program in Morocco is one of the major health programs. During the past ten years, the number of BCG vaccinations administered annually has risen from approximately 100,000 in 1964 to 1,163,090 in 1975.<sup>5</sup> Most were administered to children seven years of age or younger. Most children who receive DPT vaccination in Morocco's health clinics also receive a BCG vaccination. Those children who enroll in primary school who have not yet received a BCG vaccination are vaccinated through the school health program. The percent of the population vaccinated has increased from less than 1% in 1965 to over 5% in 1975.<sup>6</sup> There are 24 anti-tuberculosis dispensaries in health centers throughout Morocco, and approximately 42 locations where radiology is used for detection of tuberculosis. The geographic distribution of radiology equipment is unknown. In 1975, 1,000,000 x-rays were taken in the course of this program's activities. In addition, seven laboratories processed 187,000 bacteriological specimens.<sup>7</sup> The number of cases treated has declined from 400,000 in 1966 to slightly over 200,000 in 1973.

## Gastrointestinal Infections

One of the leading causes of morbidity and mortality among all age groups in Morocco is those diseases (including typhoid, paratyphoid, amoebic dysentery and bacillary dysentery) which are generally referred to as gastrointestinal infections. While Morocco does not have a large number of reported cases of any specific gastrointestinal infection, the impossibility of confirming their existence without laboratory examination probably means that many cases go undetected or at least unconfirmed, even when suspected.

"A host of specific organisms or combinations thereof can produce enteric disease. Which ones, precisely, are involved will vary with time and place, and age of susceptible persons, and other factors. Nevertheless, epidemiologic studies make it abundantly clear that all these infections have a common source: namely, human excreta in the wrong place - in water, in food, on the hands, and frequently on household facilities and equipment."<sup>8</sup>

Improvements in water supplies and waste disposal methods throughout the country and health education aimed at improving standards of personal hygiene will aid in reducing the incidence of these diseases in the future.

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<sup>5</sup>Vaccinations, 1975, Ministry of Public Health.

<sup>6</sup>Ministry of Public Health - 20 years of Public Health, p. 92.

<sup>7</sup>Bulletin Annuel D'Information Sanitaire, 1975, Ministry of Public Health.

<sup>8</sup>Wolman, Environmental Sanitation in Urban and Rural Areas, PAHC Bulletin, Vol. 9 Number 2, 1975, p. 157.

## Eye Diseases

Conjunctivitis and trachoma are reported in Morocco more often than any other diseases (see Table 13). While these eye diseases are rarely fatal, they have been one of the principal causes of morbidity for centuries. Trachoma had historically been the most common cause of blindness throughout North Africa. In 1952, it was estimated that virtually every child in Morocco had trachoma before reaching the age of one year. By 1976, approximately 80% of all known cases of trachoma had been cured or stabilized. Sixty percent of children are still free of the disease by the age of one year. While progress in the treatment and control of eye diseases has been impressive, it is clear that both trachoma and conjunctivitis continue to be major health problems in Morocco. The MOPH has launched a continuous campaign against eye diseases. In 1956, 800,000 inhabitants of Morocco were treated for eye infections. In 1974, 8,500,000 people were treated.<sup>9</sup> Over 65 million applications of eye ointment were made during 1974, which is an average of four treatments for each Moroccan citizen. The school health program includes 1,246,055 treatments for the control of conjunctivitis, and 695,480 treatments were administered for trachoma.

As with tuberculosis, the improved programs for discovery and treatment of eye diseases have resulted in a larger number of cases recorded in 1975 than in 1967. In fact, the increase in the number of cases discovered has also led to an increase in cases treated and, therefore, the situation can be considered to be one which has improved markedly during the past ten years.

## Schistosomiasis

Schistosomiasis is a health problem which has only recently been given serious attention in Morocco. The example of Egypt in particular has caused the Moroccans to consider more carefully the health implications of irrigation projects and other water supplies which are readily accessible to the public.

The Schistosome *Haematobium* occurs in a few areas of Morocco. The provinces of Agadir, Beni-Mellal, Ksar Es Souk, Marrakech, and Ouarzazate report the largest numbers of cases of the disease. Other provinces throughout the country report a few cases, which suggests that the problem is spreading beyond the areas where it is endemic. A study in one health district of Beni-Mellal province revealed a prevalence of 37.6% for children aged 10-14 and a global prevalence of 18.4%.<sup>10</sup> The fact that this study resulted in the laboratory confirmation of 752 cases in only one area of the province is an indication that the overall problem has not been fully revealed. Since comparable studies have not been undertaken in other areas of Morocco where schistosomiasis is endemic, it is possible that this is a far more serious health problem in Morocco than is indicated by current statistics.

The danger that this disease will spread is a real one. As irrigation projects in endemic areas are extended, the habitat of the intermediate snail host, *Bulinus*, is enlarged. The constant migration of people and animals from one area of Morocco to another also aids in the

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<sup>9</sup>Ministry of Public Health - 20 Years of Public Health, p. 96.

<sup>10</sup>Contribution to the Epidemiological Study of Schistosomiasis *Haematobium* in Morocco, Faculty of Medicine, Rabat, 1972.

livestock in other areas of the Middle East.<sup>11</sup> Progress of this disease must be carefully monitored and environmental controls instituted wherever necessary if schistosomiasis is not to become the major health problem that it is in other areas of the world. A summary of the epidemiological study in Beni-Mellal province and a description of a proposed program for schistosomiasis control are included in the appendix.

### Venereal Disease

In Morocco, between ten and twelve thousand cases each of syphilis and gonorrhea are reported every year. The statistics are incomplete; only seven provinces and the two prefectures (Casablanca and Rabat-Sale) report on a regular basis. The statistics for Casablanca and Tanger indicate that venereal diseases are epidemic in those two cities (see Table 14). An anthropological study which was conducted in the Atlas Mountains suggests that the problem is not confined to the cities. Among the Berber tribes of the Atlas, one-third or more of the marriages arranged by the parents now end in divorce. Prostitution has developed out of the traditional Berber practice of women becoming dancing girls and Courtesans. "Venereal disease is widespread and has become endemic due to poor sanitation, ignorance, and lack of medical facilities and drugs."<sup>12</sup> More children are now vulnerable to congenital venereal disease infections and venereal disease-induced sterility has become common.

There is considerable underreporting of venereal diseases in every country; there is no reason to believe that Morocco is exceptional. In the United States, for instance, 842,621 cases of gonorrhea and 87,469 cases of syphilis were reported in 1973.<sup>13</sup> It was estimated, however, that approximately 2,700,000 cases of gonorrhea occur each year and that there are close to 450,000 people in need of treatment for syphilis.<sup>14</sup> Even the most conservative estimate of actual cases of venereal disease in Morocco indicates the existence of a very serious public health problem. Venereal diseases are treated in the health facilities, but there have been no active campaigns to detect cases, educate the public, or investigate contacts - the "hidden" reservoir of infection. In the absence of such a campaign, the discovery and treatment of cases will have only limited effectiveness in controlling these diseases.

### Leprosy

Leprosy is a relatively minor health problem in Morocco. Only 69 new cases were reported in 1974.<sup>15</sup> There are 200 beds for leprosy patients in the Ain-Chock Hospital in Casablanca, and a special hospital for lepers in Tetouan which has 45 beds. The average length of stay in these hospitals varies from 30 days in Tetouan to 60 days in Casablanca. The occupancy rate in Tetouan was only 32 percent, whereas it was 80 percent in Casablanca.<sup>16</sup> Most leprosy patients are treated on an out-patient basis.

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<sup>11</sup> Nomadic Populations in Selected Countries of the Middle East and Related Issues of Sedentarization and Settlement, United Nations, New York, p. 110.

<sup>12</sup> Teitelbaum, Land-Use and Nutri-Structural Change Among Berbers of the Moroccan Inter-Atlas.

<sup>13</sup> Health, United States, 1975, p. 259.

<sup>14</sup> Ibid., p. 258.

<sup>15</sup> Bulletin Trimestriel d'Information Sanitaire, No. 1, 1975, pp. 26 and 27.

<sup>16</sup> Ibid.

TABLE 14  
 VENEREAL DISEASES REPORTED  
 IN MOROCCO, 1974

	Syphilis-all kinds	Gonorrhoea
Agadir	188	319
Fez	199	1047
Marrakech	258	--
Meknes	140	12
Oujda	463	103
Tanger	4414	3185
Tetorian	222	255
Casablanca	3619	5458
Rabat-Salé	290	171
TOTAL	9793	10550

Source: Bulletin Annuel D'Information Sanitaire,  
 1974 Ministere de la Sante Publique

### Hydatidosis

There are no published statistics on the incidence of this disease. It was mentioned by doctors in Rabat and Khouribga as a serious problem in Morocco, though not necessarily in those provinces. The problem is one which has developed along the migration routes in Morocco. Many sheep are slaughtered along the major roads to supply the small food stands which have been established to serve the migrants. Infected sheep entrails are then consumed by dogs who pass the infection to the people who are in contact with them. The problem is more serious in the countryside because of the lack of sanitation controls. In the cities, marketplaces are inspected and the collection of waste products is regular. In the countryside, there is no regular collection of waste or inspection system.

### Recurrent Fever

Morocco-Hispanic relapsing fever occurs periodically in epidemic form in Northern Morocco. The most recent epidemic occurred in Taza in 1974, when 222 cases were reported.<sup>17</sup> The epidemic apparently overflowed into Beni-Mellal, Fes, Khemisset, and Oujda with a few cases reported in other provinces as well. During the first quarter of 1975, there were 41 cases reported in Kenitra.

### Chronic Diseases

The incidence of chronic degenerative diseases tends to increase as the average lifespan lengthens and economic development, especially industrialization, progresses. There is some indication that this is happening in Morocco - heart disease was among the leading causes of death reported in the 1971 survey. Diabetes and hypertension are becoming important health problems. Cancer has yet to be reported as a leading cause of either morbidity or mortality.

### Occupational Health

Occupational health problems vary in Morocco; for construction workers, accidents are the most serious health hazard. For phosphate miners, pneumoconiosis and eczemas are the major health problems. Enforcement of safety codes is lax in urban areas and non-existent in rural areas. Child labor is used in small mining operations in the countryside where working conditions are reported to be extremely hazardous.

### Accidents

Accidents were one of the leading causes of death in Morocco, according to the 1971 survey. Traffic accidents, work-related accidents and accidental poisonings are among the most common. Morocco is reported to have the world's highest ratio of traffic accidents per vehicle mile. The hazardous driving conditions in Morocco are responsible for the large number of traffic accidents. Roads are poorly marked and badly lighted in many areas. Motor vehicles are quite often in poor operating condition and the large number of animals, animal-drawn vehicles, and pedestrians, especially outside the cities, all create additional safety hazards. Emergency care is theoretically available in all hospitals in Morocco, but only the major hospitals in the major provincial capitals are equipped with special facilities for the treatment of emergency cases. (See Table 15.)

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<sup>17</sup>Bulletin Annuel d'Information Sanitaire, 1974, p.3.

Table 15

Traffic Accidents, Injuries, Fatalities  
in Morocco, 1975

	Fatal	Non-	Killed or Mortally Wounded*				Total	Injuries	All	# Vehicles
	Accidents	Fatal	1	2	3	4				
Population Ctr.	1232	5851	1016	220	179	43	1458	12,838	13,841	10,053
Road	648	15820	336	140	158	49	683	18,364	19,047	24,139
Total	1880	21671	1352	360	337	92	2141	30,747	32,808	34,192

- \* 1. Killed instantly
- 2. Died en route to hospital
- 3. Dead within 3 days of accident
- 4. Dead between 4 and 30 days after accident

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Source: La Situation Economique du Maroc en 1975, Pub. 1976.

### Mental Health

Mental illness is not uncommon in Morocco. Bipolar depression<sup>18</sup> and nervous breakdowns are apparently common, although no statistics are available to substantiate this. A "neurosis of relative sterility" has been observed in northern Morocco. It occurs among women who have produced more daughters than sons, or only daughters. A state of obsessive anxiety with phobic symptoms increases with repeated births of girls. Birth control measures are demanded, then abandoned within a few months. "Even women in menopause may demand of the physician dangerous treatments in order to promote conception."<sup>19</sup>

### Drug Addiction

There is no information available concerning the number of drug addicts in Morocco. Kif, or hashish, has been smoked for centuries, and despite the law outlawing the use of kif, it continues to be used, especially in the Northern provinces.

In the mid-1960's an estimated one million persons smoked hashish. Control of drug traffic is hampered by the difficult terrain and lack of cooperation from the farmers who grow it. It is one of their most profitable crops.

### Zoonoses

Rabies occurs throughout Morocco.<sup>20</sup> There were 2,153 cases reported in Casablanca in 1974. By the beginning of 1975 this epidemic had been brought under control - only 155 cases were reported during the first three months of that year. Nationwide there were 8,523 cases of rabies reported in 1974, but this cannot be considered a complete record, for only sixteen provinces reported. Because of the shortage of veterinarians and veterinary assistants, there are undoubtedly many cases in other areas of the country which are never reported.

### Dental Health

There is no information available on dental health. The small number of dentists in the country (approximately 146 in 1975 - see Health Personnel section) and their concentration in the cities indicate that professional dental care is simply not available to most of the Moroccan population.

Serious dental health problems are apparent even to the casual observer everywhere in Morocco. Some dental care is administered in open market places by untrained practitioners, but the extent of this type of activity and the kinds of services offered are not known.

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<sup>18</sup>Bipolar depression is a manic-depressive state.

<sup>19</sup>Huerta Izquierdo, u., A Neurotic Mechanism Observable in Morocco: The Neurosis of Relative Sterility, p. 318.

<sup>20</sup>Information for this section was taken from the 1974 Bulletin Annuel d'Information Sanitaire, p. 98, and 1974 Bulletin Trimestiel d'Information Sanitaire, p. 103.

### Other

There are a wide variety of other diseases which occur in Morocco for which incidence is unknown. These include Boutonneuse fever, Q fever, sandfly fever, endemic flea-borne and louse-borne typhus, helminthiasis, and leishmaniasis.



## CHAPTER FOUR

### NUTRITION

#### Introduction

The productive potential of a nation's human resources is seriously affected by the nutritional status of the population. The impact of malnutrition on national development is substantial and can be measured in economic terms by the loss of productivity which is caused by a physical and mentally debilitated work force, the impaired learning ability of malnourished children, and the need for costly medical care for diseases the severity of which is exacerbated by malnutrition. The causes of malnutrition are as numerous as the effects. Some of the factors which must be examined to determine the causes of malnutrition in a given population include food production, government policies related to nutrition planning, food pricing and external trade, food consumption habits, disease patterns, and environmental sanitation.

#### Food Production

Ten years ago, according to Jacques May, the food supply in Morocco would have been barely sufficient to meet the needs of the population if it were equitably available and evenly distributed throughout the year.<sup>1</sup> As this was not the case, an estimated 20% of the population, especially pregnant or lactating women and children under 12, were insufficiently fed. Although food production has increased since then, population growth has kept pace with the expansion of the agricultural sector and the result is that Morocco's food supply position in the seventies is not appreciably better than it was a decade ago.

The wide swings in agricultural production which are caused by annual variations in rainfall contribute to the precarious nutritional status of the population. The persistence of subsistence-level farming on small plots of land prevents the most efficient and productive use of arable land. The F.A.O. estimates that per capita energy supplies in developing countries should be about 10% above aggregate requirements to allow for maldistribution. The only year during the past decade in which Morocco was able to meet that requirement was 1971 (See Table 16). In 1973 bad weather caused food production to fall to the extent that only 86% of estimated need was filled. Although food production rose in 1974 to 103% of the aggregate requirement, this did not compensate for 1973 and when production fell in 1975 to only 80% of energy requirements, food imports rose again. When domestic production is low and food imports must be increased, a greater expenditure of foreign exchange is required just at the time that the foreign exchange earnings have been reduced by a decrease in food exports. (See Appendix for production by commodity.)

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<sup>1</sup>May, The Ecology of Malnutrition in North Africa, p. 179.

Table 16

Indices of Total Agricultural and  
Food Production, Average 1961-65, Annual 1956-75

	Average 1961-65	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
----- Million Dollars at Constant Prices -----											
<b>Aggregates of Production</b>											
Crops	324.9	262.9	190.9	313.7	275.2	323.0	200.1	318.1	363.2	352.6	390.2
Livestock	119.1	114.0	117.4	118.0	117.6	126.0	118.0	113.6	117.9	118.9	126.9
Total Agriculture	444.0	376.9	308.3	431.7	392.8	449.0	318.1	431.7	481.1	471.5	517.1
Total Food	429.6	363.6	295.8	416.7	378.0	435.3	306.4	417.9	467.8	454.8	500.8
(1961-65 = 100)											
<b>Indices of Production</b>											
Crops	100	81	59	97	85	99	62	98	112	109	120
Total Agriculture	100	85	69	97	88	101	72	97	108	106	116
Total Food	100	95	69	97	88	101	71	97	109	107	117
Per Capita Agriculture	100	104	82	112	99	110	76	100	108	103	109
Per Capita Food	100	104	82	112	99	110	75	100	109	103	110
<b>Index of Population</b>											
1961-65 Population= 12,735,000	100.0	81.7	83.9	86.3	88.8	91.4	94.1	96.9	99.9	102.9	106.2
----- Million Dollars at Constant Prices -----											
<b>Aggregates of Production</b>											
Crops	324.9	289.5	324.6	575.3	409.4	431.2	497.7	493.9	387.0	490.9	380.7
Livestock	119.1	132.4	136.9	136.8	142.8	139.1	138.9	145.9	143.1	157.7	144.9
Total Agriculture	444.0	421.9	461.5	712.1	552.2	570.3	636.6	639.8	530.1	648.6	525.6
Total Food	429.6	407.1	448.6	700.0	536.4	555.0	621.2	620.1	508.5	629.9	508.8
(1961-65 = 100)											
<b>Indices of Production</b>											
Crops	100	89	100	177	126	133	153	152	119	151	117
Total Agriculture	100	95	104	160	124	128	143	144	119	146	118
Total Food	100	95	104	163	125	129	145	144	118	147	118
Per Capita Agriculture	100	87	92	137	103	103	111	108	87	103	80
Per Capita Food	100	87	92	140	104	104	113	108	86	103	80
<b>Index of Population</b>											
1961-65 Population= 12,735,000	100.0	109.5	113.0	116.7	120.5	124.5	128.6	133.0	137.4	142.1	146.6

Source: U.S. Department of Agriculture, Economic Research Service, Statistical Bulletin 556.

The government policy of controlling the prices of both domestically produced and imported foodstuffs protects the lower income groups from the sharp price increases which generally follow a poor harvest, but this may discourage the expansion of agricultural production. There are indications that the policy of maintaining price ceilings on staple commodities such as flour, bread, sugar and edible oils has aggravated the country's nutrition problems by attracting people to the urban areas where the cost of living has been maintained at an artificially low level.

#### Food Crops

Barley, wheat (durum and bread wheat), and corn are the main food crops in Morocco. Over 80% of the cultivated land is devoted to these crops. The durum wheat is produced primarily for domestic consumption and bread wheat is imported to meet domestic demand. Before 1970, Morocco produced enough cereals in a good year to fill domestic needs. Since then Morocco has been a net importer of grains every year. Low production in 1973 and 1975, due to unfavorable weather conditions, forced Morocco to import even larger quantities of grains in these years. It is still unclear whether the improvements in agricultural production in recent years will return Morocco to the position of net exporter of cereals. Yields are almost twice as high on the modern farms which were started by the European colonists. These farms comprised only 10-15% of total agricultural land by 1970, yet they produced 85% of commercialized agricultural production. Since cereals are a major source of protein and calories for Moroccans, their availability is one of the major determinants of the nutritional status of the population.

Citrus fruits, pulses, vineyards, and truck gardening are important for export earnings as well as for domestic consumption. Unfortunately the high export price of pulses (particularly chick peas) has encouraged many farmers to export their crop, rather than consume it. Thus a valuable source of nutrients is lost to the population. A wide variety of fruits and nuts are cultivated and are available seasonally. Vineyards have declined with the disappearance of the protected European market but figs, melons, dates (a major food source in Southern Morocco) and almonds are among the many fruit and nut crops grown throughout the country. The uneven distribution of these and other food contributes to a pattern of regional and seasonal nutritional deficiencies such as the localized epidemics of pellagra reported by Jacques May.<sup>2</sup> According to May, these outbreaks occurred when the inadequate yield from other cereals caused corn to become the dietary staple. Sugar beet production now covers almost 50% of domestic need, which has helped to reduce the amount of foreign exchange required for its purchase abroad. Sugar is consumed in large quantities in Morocco (see Tables 17 and 18), especially in mint tea, the national drink. Sugar replaced honey as the national sweetener shortly after World War II.

Oils play an important role in the Moroccan diet - the olives which are widely grown are a principle source of vegetable oil. Fluctuations in production and the relatively high cost of olive oil (which makes it attractive for export) have resulted in increased consumption of oils from cottonseed, sunflower seeds, linseeds, and groundnuts. Because domestic production is inadequate, oils are always a major food import item.

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<sup>2</sup>Ibid., p. 187.

Table 17.

Quantity of Foods Consumed According to  
Economic Region of Morocco 1970-71

Products (kg.)	National	By Economic Region (See Map)						
		1	2	3	4	5	6	7
Cereals	193.32	165.00	230.81	194.95	194.10	175.19	225.58	169.70
Milk & Cheese	29.79	36.45	34.04	31.25	30.05	18.62	25.01	24.92
Fats & Oils	13.19	12.38	12.31	13.39	12.97	14.27	17.24	11.20
Meat & Poultry	17.89	14.77	14.95	22.22	18.38	15.27	17.65	19.38
Fish, Shellfish	3.57	.44	1.43	3.64	6.50	3.76	9.11	1.42
Vegetables	88.72	62.73	82.44	103.84	90.82	76.35	130.11	80.40
Fruits	45.50	49.66	34.02	66.29	44.02	34.86	35.39	37.65
Sugar	29.68	31.66	33.63	32.90	22.92	24.02	33.15	30.38
Sugar Products	.46	.27	.24	.78	.57	.39	.23	.32
Tea, Coffee	6.62	4.60	7.57	8.46	6.48	4.77	7.86	4.87
Non-alcoholic bev.	1.62	.62	.47	3.83	1.88	.50	.99	.54
Alcoholic Bev.	.75	.13	.30	1.70	1.01	.27	.42	.45
Spices & Condiments	9.62	10.98	14.33	8.90	7.75	4.38	11.57	11.27
Meals & Drinks Away	.91	.15	1.06	1.26	1.19	.72	.79	.61
From Home								
Miscellaneous	0	0	.02	0	0	.01	0	0

Source: Summarized from "La Consommation et les Depenses des Menages au Maroc, Volume IV Alimentation et Nutrition," 1970-71, Table 45, p. 59-61, Office of Statistics, Ministry of Plan and Regional Development.

Table 16

Consumption Per Person Per Year (in kg.)  
in Urban Areas According to Socioeconomic Status

Socio-Economic Status According to Place of Residence

Food Consumed	National	1	2	3	4	5	6
Cereal & Cereal Products	141.67kg	157.93kg	142.69kg	147.60kg.	135.45kg.	126.47kg.	141.67kg
Milk & Cheese	24.59	35.70	39.73	22.09	23.41	12.39	14.66
Fats & Oils	15.94	18.88	20.70	15.63	15.59	10.23	12.81
Meat & Poultry	24.15	38.21	36.75	20.38	23.11	15.70	19.09
Fish & Shellfish	7.14	7.86	11.19	6.61	6.73	5.18	4.31
Vegetables	123.59	144.00	166.30	112.37	120.23	100.33	105.65
Fruits	48.11	71.05	78.44	44.99	43.18	23.63	30.03
Sugar	26.46	28.31	28.05	23.16	27.91	25.63	27.39
Honey, other sweets-candy, choc.	.99	1.38	2.15	.73	1.02	.06	.16
Coffee, teas	8.88	8.21	9.29	8.93	8.72	9.35	8.61
Non-alcohol. bev.	4.38	11.60	15.04	1.53	2.88	0.73	1.17
Alcoholic bev.	2.18	7.93	10.41	0.50	0.38	0.34	0.30
Species & Condiments	7.33	8.42	8.06	7.91	6.76	4.70	8.64
Meals & drinks taken away from home	1.95	1.91	4.22	2.14	1.38	1.00	.53
Miscellaneous	-	-	-	-	-	-	-

1. Upper Class
2. Middle Class
3. Old Medina
4. New Medina
5. Bidonvilles
6. Housing projects (semi-urban)

Source: Summarized from "La Consommation et Les Depenses des Menages au Maroc, Volume IV, Alimentation et Nutrition," Office of Statistics, Ministry of Plan and Regional Development, Table 44, p. 56., 1970, 71.

Livestock production in Morocco accounts for over one-third of all agricultural income and is a major source of income for traditional farmers.<sup>3</sup> However, the low level of livestock and poultry production in Morocco results in an inadequate supply of animal protein for the population. The condition of the livestock is poor, in part because the livestock population exceeds the country's grazing and feeding capacity.<sup>4</sup> In 1974, Morocco imported 120,000 sheep for slaughter. By 1977, an estimated 30,000 metric tons of fresh meat imports will be required. Reports published by the Livestock Service in 1974/75 showed a decrease in the carcass weight of animals slaughtered. The carcass weight of sheep dropped from 14.5 kg. in 1955 to 10.5 kg. in 1973. Milk production is also low, and subject to seasonal fluctuations. In 1973, milk production averaged only 532 liters per head of cattle. The total milk production of 525,000 metric tons meets only 40% of needs. The country is dependent upon milk and meat imports from Europe to maintain the already low level of consumption. (See Table 19 - Herd Size).

Fish consumption is very low in Morocco, despite the existence of abundant supplies, especially in the Atlantic coastal waters. Canned fish and fish products are an important export item; in fact, virtually all of Morocco's fish production is exported every year. Whether it would be consumed if available locally is questionable. Despite increases in production over the past decade, consumption has remained at the same level during this time. The high unit cost of producing fish protein concentrate in Morocco has prevented it from becoming competitive with the product of other countries, most notably Portugal.<sup>5</sup> Unless the production costs can be lowered, this potentially valuable source of protein will not be fully exploited.

#### Consumption

Consumption patterns in Morocco do not appear to have changed significantly during the past fifteen years. In fact the basic diet of cereals and oil has been typical of the Mediterranean area for centuries. The variety and amount of food consumed varies according to family income and local availability of foods. There are usually three meals a day: an early breakfast consists of either cooked corn meal, bread, lentil soup, and tea with yogurt occasionally added to the cereal. There are tea breaks at mid-morning and in the afternoon. The main meal of the day is often in the afternoon. It consists of couscous (semolina) cooked with vegetables, oil and meat when available, or tajine, which is a stew of meat or poultry cooked in sunflower or peanut oil to which vegetables, fruit, or nuts are added. In more affluent homes, a pastry-wrapped pigeon pie is served heaped with powdered sugar. Leafy salads and fruits in season are also served and heavily sugared mint tea ends most meals. The excessive use of sugar in foods and beverages, the reliance on oils or butter, and the quantity of tubers and cereals consumed gives the combined effect of a diet which is high in calories and low in protein and vitamins. The diet is particularly bad for small children, who are not able to eat enough of the bulky staple food to satisfy their nutritional needs.

Food is generally served in a round pottery bowl placed in the center of a table or mat. In a large family or when there are guests, men and male children over seven or eight

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<sup>3</sup>USAID, Development Assistance Program FY 1975-1979, p. 25.

<sup>4</sup>Area Handbook, p. 254.

<sup>5</sup>Area Handbook, p. 255.

Table 19  
Herd Size<sup>1/</sup>, 1967/68-1971/72  
(In thousands of head)

	1963	1967/68	1968/69	1969/70	1970/71	1971/72	1973/74	1974/75
Cattle	2,900	2,536	2,576	2,674	2,718	2,785	2,740	2,445
Sheep	15,000	10,918	11,174	11,724	11,120	11,907	12,262	12,296
Goats	7,400	5,852	5,826	5,553	5,023	4,616	4,854	4,739
Camels	NA	140	147	141	146	139	110	81
Hogs	NA	NA	NA	19	11	20	9	NA

<sup>1/</sup>Only includes taxable animals, i.e. cattle over 18 months old, weaned sheep and goats, and camels over two years old.

Sources: Secrétariat d'Etat au Plan; La Situation Economique en Maroc en 1973, from May, The Ecology of Malnutrition in North Africa; Le Maroc en Chiffres, 1975.

years of age eat first, then women and small children. When the supply of food is inadequate, the largest share goes to the working adults. Although the nutritional requirements of growing children and pregnant or lactating women may not then be met, the inactive child does not jeopardize the family's survival as does the inactive adult. Retardation of growth is not immediately apparent in most cases and may not be associated by the parents with nutritional deprivation.<sup>6</sup>

A national consumption survey was conducted in 1970-71 by the Moroccan Ministry of Plan. Surveyors visited each family once a day for a week and recorded expenditures, quantities of food purchased, and food produced by the consumer. Consumption patterns varied according to socio-economic class and geographic region of the country. While the consumption of cereals and cereal products showed little variation, the differences in the consumption of animal protein, fruits and vegetables were marked. (See Tables 17 & 18 ). Consumption measured in calories ranged from 1737 calories per day (55% of need) to 2880 calories per day (124.8% of need). (Jacques May reported consumption levels as high as 4615 calories per day).<sup>8</sup> Protein intake ranged from 40 grams daily (77.2% of need) to 87.7 grams per day (144.9% of need). Animal protein furnished only 11.4% to 12.7% of the total protein consumed by agricultural workers but up to 41% of protein consumed by the professional-managerial class. It is generally agreed that a person is malnourished when less than 80% of daily needs are met. The minimum amount of animal protein which is considered desirable is 20%. A correlation of per capita expenditures and theoretical availability of certain nutrients revealed that Vitamins B2 (riboflavin), vitamin A, vitamin C, and calcium would not be provided in adequate amounts in daily diets of the majority of Moroccan people. (See Table 20 ). Protein calorie malnutrition seriously affected the lower income groups - only 58% of theoretical energy needs could be met for persons who had less than 466 Dirhams to spend. Expenditures on food and beverages averaged only 468 Dirhams per person, according to the survey.

#### Nutrition Deficiencies

The most recent information available concerning the extent of nutritional deficiencies in Morocco is a National Nutrition Survey which was conducted by the Ministry of Public Health in 1971. The survey plan used is the same one which was used by the Ministry of Plan for the Consumption Survey. The only difference was that only children under four years of age were included in the nutrition survey. The reason for this was that in a pilot survey of children 0-14 years of age which was conducted in 1967, the group which was found to be most affected by nutritional deficiencies was children from approximately six months to three years of age.<sup>9</sup> The survey was planned to include over nine thousand children but in fact only 71% of this goal were reached. This was due in part to bad weather in some mountainous rural areas, and in other cases to the reluctance of people to participate in the survey.<sup>10</sup> The Ministry of Public Health considers the survey to be a reasonably accurate

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<sup>6</sup>The State of Food and Agriculture, 1974, p. 106.

<sup>7</sup>La Consommation et les Depense des Menages au Maroc, Volume IV, Alimentation et Nutrition, p. 84.

<sup>8</sup>The Ecology of Malnutrition in North Africa, p. 187.

<sup>9</sup>Enquete Nationale Sur L'Etat de Nutrition des Enfants de Moins de 4 ans, p. 4; from A. Raoult, Rapport d'une enquete par sondage sur l'Etat de Nutrition d'enfants Marocains de un jour a 14 ans inclus - 1967.

<sup>10</sup>Ibid., p. 18.

Table 20

Availability of Nutrients Per Person Per Day According  
to Level of Expenditures

Nutritional Coverage	Expenditure Level										
	-466 DH	466- 542	542- 627	627- 732	732- 864	864- 943	943- 1171	1171- 1358	1358- 1977	1977 +	All Levels
Calories-grams	1337	2033	2236	2582	2790	2952	3050	3960	3300	4455	2466
% Requirements	58.0	88.1	96.9	111.9	120.9	127.9	132.2	171.6	143.0	193.1	106.9
Proteins in grams	37.1	56.1	65.4	69.8	79.2	84.4	88.8	115.7	111.9	131.1	71.0
% Requirement	62.1	94.3	109.0	116.3	132.0	140.6	148.0	192.8	186.5	218.5	118.3
Lipids-grams	22.5	36.2	37.3	49.2	53.9	55.8	61.2	76.3	82.4	119.5	50.2
Calcium-mg.	153.0	247.3	254.3	318.2	318.5	333.0	362.0	460.0	443.0	600.0	296.4
% Requirement	30.6	49.4	50.8	63.6	63.7	66.6	72.4	92.4	88.6	120.0	59.2
Iron-mg	8.1	12.3	13.2	14.8	16.9	17.1	17.9	23.4	20.7	23.9	14.3
% Requirement	75.0	113.9	122.2	137.0	156.5	158.3	165.7	216.6	191.6	221.3	132.4
Vitamin A-IU	630.0	2322.9	2447.2	3046.5	3749.5	3799.1	3971.0	4505.2	4462.2	6446.0	3281.0
% Requirement	46.6	66.3	69.9	87.0	107.1	108.5	113.4	128.7	127.4	184.1	93.7
Vitamin B1-mg	0.8	1.3	1.4	1.5	1.9	1.7	1.9	2.7	2.2	2.6	1.6
% Requirement	86.9	141.3	152.2	163.0	206.5	184.8	206.5	293.5	293.1	271.7	173.9
Vitamin B2-mg	0.2	0.4	0.4	0.6	0.6	0.6	0.6	0.9	0.7	1.1	0.5
% Requirement	15.3	30.8	30.8	46.2	46.2	46.2	46.2	69.2	53.8	84.6	38.5
Vitamin PP-mg	8.8	13.9	14.5	15.8	17.3	17.7	19.0	24.8	21.8	23.0	15.6
% Requirement	57.8	91.4	95.4	103.9	113.8	116.4	125.0	163.2	143.4	151.3	102.6
Vitamin C-mg	20.9	34.5	34.4	46.2	54.1	57.8	64.5	73.2	88.5	132.0	50.6
% Requirement	29.1	47.9	47.8	64.2	75.1	80.3	89.6	101.7	122.9	183.3	70.3

Source: La Consommation et les Depenses de Menages au Maroc, Volume IV, Alimentation et Nutrition, p. 147.

reflection of nutritional status at the national level according to socio-economic situation and milieu, however, it does not contain the information necessary to rank the Provinces according to nutritional status nor does it provide the profile of malnutrition in Morocco which was anticipated.<sup>11</sup>

The survey was conducted during the time of year (March-April) when protein-calorie malnutrition is least severe.<sup>12</sup> A repeat survey was planned for November of the same year, when nutrition problems are more serious, however, this was not possible. The survey indicated that birth weights were not unusually low and that the growth curve from birth to about six months of age was normal. After six months, however, increases in height and weight slowed through the age of thirty months. The children most severely affected were found to be those between the ages of ten and twenty-seven months. Growth after 30 months increased, probably because the child had by then suffered the common infections of early childhood and passed the critical nutritionally vulnerable period following weaning.

Height was measured against Meredith's linear growth curves.<sup>13</sup> It was found that children who were of normal height at birth began to lose ground at about six months of age, and again, the deficit was more marked in rural than urban areas. For both sexes, growth retardation was established as follows:

Number of Centimeters Below Normal Height for Age			
	Urban	Rural	Both
at 6 months	0.3cm	2.3cm	1.6cm
1 year	2.2	3.8	3.2
2 years	6.5	7.7	7.3
3 years	3.3	6.3	5.3
4 years	6.6	7.5	6.9

Arm circumference, head circumference, and skinfold thickness were also recorded for all children surveyed. Because increases in height and weight usually modify each other, a malnourished child often goes unnoticed simply because he or she appears to be well proportioned and is without any of the more obvious clinical symptoms of malnutrition. The median age of dental eruptions was also found to be later than the international norms, but comparable with the norms established in 1968-69 in sub-Saharan Africa.<sup>14</sup> (See Table 21).

<sup>11</sup>Ibid., p. 19.

<sup>12</sup>Ibid., p. 22.

<sup>13</sup>Meredith, H.V. has published many articles on the study of physical growth and has established a series of standards which are widely used.

<sup>14</sup>Ibid., p. 49.

Table 21  
Age of Dental Eruptions

Age in Europe, USA		Total # Teeth	Median Age of Eruption Africa <sup>1</sup>	Median Age of Eruption- Morocco
		2	9-10 months	10-11 months
Central Incisors	5-7 months	4	11-13 months	11-12 months
Side Incisors	7-9 months	8	15-16 months	14-15 months
First Year Molars	12-14 months	12	18-20 months	19-20 months
Canines	16-18 months	16	21-23 months	23-24 months
Second Year Molars	20-24 months	20	25-30 months	35 months

<sup>1</sup> Adapted from Dupin and MacGregor in J.P. Vulsteke, Nutrition en Afrique Noire, l'Etat Nutritionnel - Appréciation et Résultats.

Source: GOM Nutrition Survey, p. 50.

Degrees of protein-calorie malnutrition were classified according to the following scale:

Between 90 and 81% of normal weight - 1st degree or light malnutrition

Between 80 and 61% of normal weight - 2nd degree or moderate malnutrition

Sixty-one percent or less normal weight - 3rd degree or severe malnutrition<sup>15</sup>

Children of all ages who lived in urban areas were found to be in a better nutritional state than children from rural areas. Thirty-three percent of the children from urban areas were suffering from moderate malnutrition, while 45% of rural children were so classified. National-ly, 42% suffered from second degree protein-calorie malnutrition. Five and a half percent of rural children were found to be severely malnourished, while only 2% of urban children were in this condition. Even children in the bidonvilles were better off than children in rural areas. (See Chart 1.) On the basis of these findings it was estimated that over one million children in Morocco were probably suffering from second degree protein-calorie malnutrition and that approximately 115,000 children required medical treatment for severe malnutrition. Other clinical findings from the Nutritional Survey highlighted the following nutritional deficiencies:

#### Edema

At the national level, 4.72% of children under age four had edemas. Three percent of the edemas were localized and 2% were general. Between the ages of 10 and 15 months, 8.89 % of rural children and 4.85% of urban children had signs of edema.

#### Rickets

Twenty-three percent of all the children examined manifested at least one clinical symptom which was suggestive of rickets. Four percent showed two clinical signs of rickets (up to almost 8% at certain ages in rural areas - See Table 22). The percent of children who had three signs of rickets rose to over 16% of rural children age 22-27 months and over 5% of urban children in the same age group. The overall pattern of a higher incidence of nutritional disease between 10 and 27 months of age is consistent with the other findings of the survey. Rickets is not uncommon in warm climates. The type of clothing worn in the desert and windowless housing prevent the exposure of children to sunlight.

Vitamin A deficiencies were not significant in this age group, however, the increase in symptoms from 1% of the age group 10 to 15 months to 2% of children between 40 and 45 months of age suggests that this may be a nutritional deficiency which is more common in older children. Xerophthalmia was observed by Jacques May in the Rif mountains.<sup>15</sup> Cutaneous lesions which are usually associated with a lack of Vitamin A, were found by Ferro-Luzzi in more than 16% of cases during their survey of Moroccan school children.<sup>17</sup>

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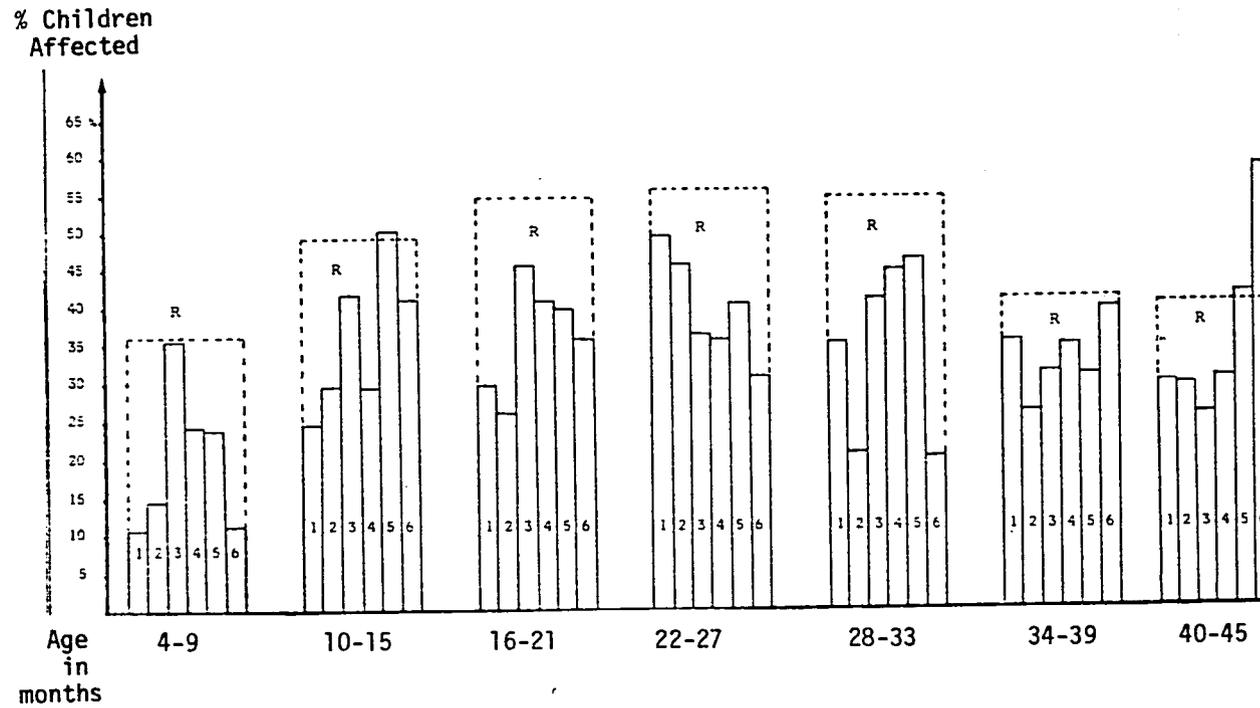
<sup>15</sup>Ibid., p. 37.

<sup>16</sup>May, The Ecology of Malnutrition in North Africa, p. 193.

<sup>17</sup>Ibid.

Chart 1

Variations in the Rate of Protein-Calorie Malnutrition Found According to Age Group and Area of Residence Within Urban Areas and Compared to Rural Areas



R = Rural  
U1 = Upper Class

U2 = Middle Class  
U3 = Old Medina

U4 = New Medina  
U5 = Bidonvilles

U6 = Housing Project  
(Semi-Urban)

Source: GOM Nutrition Survey, p. 38.

Table 22  
 Infants Who Show Two Clinical  
 Symptoms\* of Rickets

Age in months	0-3	4-9	10-15	16-21	22-27	28-33	34-39	40-45	46-47	Total
All	.88	4.06	5.53	5.96	5.75	3.61	3.40	1.90	5.74	4.09
Urban	0	3.57	3.54	2.20	4.45	3.34	1.90	0.63	2.76	2.64
Rural	4.21	4.25	6.33	7.88	6.32	3.73	4.04	2.41	7.21	4.71

\*Any two of the following symptoms:  
 craniotabes  
 nodular enlargements on joints  
 thoracic deformation  
 rachitic rosary

Source: GOM Nutrition Survey, p. 57.

The following nutritional deficiencies were not studied during the national nutrition survey but were observed in the course of other studies in Morocco:

#### Anemia

In 1967 Jacques May reported that women in particular showed gross evidence of anemia and lack of iron in the diet.<sup>18</sup> Multiple pregnancies aggravate anemia, as do the numerous intestinal parasites to which the average Moroccan is exposed. In 1958, Ferro-Luzzi observed pallor in 15 to 20% of school children studied. This was often accompanied by geophagia.

#### Kwashiorkor

Kwashiorkor was reported by Jacques May to be common in Moroccan children, especially those who had been weaned abruptly. The appearance of the symptoms in breastfed children stimulated research into the quality of mother's milk in Morocco. The protein content of the milk of women whose children manifested symptoms of kwashiorkor was as low as 8.36 grams per liter. (The average for all Moroccan women was 12.83 grams per liter; for French women, 15-18 grams per liter). Symptoms of kwashiorkor in weaned children usually appear in October and November. Observation over a period of five years revealed that abrupt weaning, followed by the overconsumption of water during the hot summer months precluded the intake of sufficient food. In contrast, signs of deficiency diseases were rare among the nomadic tribes south of the Atlas mountains. Gradual weaning is customary in the south, and the child receives other foods such as camel's milk and cereal during the weaning period. The area water's high mineral content keeps the metabolism of water in balance and thus allows other food intake.<sup>19</sup>

#### Goiter

The village of Skoura, in Ouarzazate, is a major center of endemic goiter. The percentage of goiters reported there was 59% among boys and 46% among girls. Cretinism was not unusual. The only salt in the area was supplied by mines near the village. In Ksar es Souk, 7% of students had goiter and in Goulmina, 3% were affected. Tazenakht is apparently another region where goiter is a significant problem, but the prevalence is unknown.<sup>20</sup>

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<sup>18</sup>Ibid.

<sup>19</sup>Ibid.

<sup>20</sup>Ibid.

## Other Nutritional Deficiency Diseases

Signs of Vitamin C deficiencies were not found by Ferro-Luzzi. H. Faure found a type of liver cirrhoses which especially affected the malnourished rural population. He assumed that the adult cases were those who had suffered from lack of protein in their diets since childhood and had survived kwashiorkor in infancy.<sup>21</sup> The national nutrition survey found evidence of enlarged liver in only 2% of the children surveyed, however the incidence rose to 6% among children whose weight was less than 60% of normal.<sup>22</sup>

## Nutrition Policy and Programs

There is to date no national nutrition policy. In 1959, soon after the publication of the first nutrition survey by Ferro-Luzzi, an Interministerial Council for Food and Nutrition was decreed.<sup>23</sup> The purpose of the Council was to respond to the acknowledged national nutrition problem by coordinating the heretofore autonomous activities of the various ministries. In August of 1972, the Council was expanded and delegated responsibility for nutrition education, and nutrition research and food promotion. CEPEN is the unit created by the Ministry of Plan which is responsible for the coordination of the nutrition research and action programs. Its responsibilities include:

1. Determination of the extent and nature of nutrition problems in Morocco.
  - a. Collection and analysis of existing data and identification of additional data needs.
  - b. Sponsorship and support of research to identify groups whose diets are inadequate.
  - c. Promotion of surveys on the existing flow of food from producer to individual and identification of leakages in the flow which might be susceptible to modification.
  - d. Support of studies to determine the nutritional needs of various groups and the feasibility of producing the foods necessary to meet those needs.
2. Elaboration with the concerned ministries of a national nutrition strategy which can be included in the National Plans for social and economic development.
3. Assistance to the Interministerial Council on Nutrition (CIAN) to coordinate the nutrition-related activities which are being carried out by the various Ministries.

The Ministry of Public Health provides nutrition education at several levels. Both registered nurses and practical nurses receive nutrition education as a part of their training. They in turn instruct mothers in the elements of good nutrition in health centers and dispensaries throughout the country. The Ministry of Public Health and the Ministry of Agriculture are cooperating in the development of a program for nursing technicians in applied clinical nutrition. The two-year program is offered at the College of Public Health. INAV,

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<sup>21</sup>Faure, H., "Les Cirrhoses nutritionnelles au Maroc," Maroc Medical, 30:239-242, 1959.

<sup>22</sup>National Nutrition Survey, p. 64.

<sup>23</sup>The Ministries of Public Health, Interior, Finance, Education, Plan, and Agriculture are members of the Council.

the Hassan II National Institute for Agriculture and Veterinary Sciences, teaches food technology and human and animal nutrition.

Nutrition education is also provided by several other ministries. Primary and secondary schools provide some nutrition education for their students. The nutrition textbook which is used in the Moroccan high schools was written by the Director of the Child Health and Nutrition Section of the Ministry of Public Health. In a program called Jardins Scolaires, school children have established over four hundred gardens for the practice of agriculture, horticulture, and animal-rearing. Nutrition education is part of the curriculum in the non-formal education programs operated by the Ministry of Youth and Sport (the Foyers Feminins) and Entraide Nationale (ouvroirs).<sup>24</sup> These are both programs which have been developed to teach handicrafts and literacy to young women between the ages of 8 and 22 who have not been educated in the formal school system.

#### International Assistance

##### USAID

Assistance is focused in three areas - nutrition planning, nutrition education, and feeding programs.

1. Technical support is being provided by USAID for the development of the nutrition unit in the Ministry of Plan. Two long-term advisors have been assigned to Rabat for approximately two-and-a-half years to assist in the development of nutrition research activities and studies, the training of Moroccans who will in turn train other Moroccan staff members, and the development of nutrition methodology. Other short-term technical advisors will also be used in this project.
2. Nutrition education training is being offered to the teachers (monitrices) who teach in the Entraide Nationale centers (ouvroirs), throughout the country. Long-term training (three years) at the National Institute of Nutrition in Tunisia is being given to four supervisors, and short-term training is being offered to between 500 and 600 monitrices in Marrakech at the Entraide center there. This program is being funded through the Catholic Relief Services in Morocco.
3. PL 480 Title II Feeding Program
  - a. Between 1959 and 1975, AID distributed 893,648 metric tons of food valued at U.S. \$120 million through the Catholic Relief Services and Entraide Nationale. The average number of recipients was 900,000 per year. Priority is given to pre-school children and their mothers, and workers and dependents involved in self-help development projects.
  - b. Between 1957 and 1975, 26,577 metric tons of food valued at U.S. \$4.5 million was distributed through the American Joint Distribution Committee to an average of 36,000 recipients a year. The majority of recipients were elderly Jews.

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<sup>24</sup>Entraide Nationale is the Ministry of Social Assistance. Approximately 50,000 young women are enrolled in the ouvroirs programs nationwide. The Foyers Feminins program enrolls 45,000 young women.

- c. Food for Work projects sponsored by Promotion Nationale also received food for distribution. Between 1961 and 1972, 1,000,000 metric tons of food worth U.S. \$105 million was distributed to an average of 960,000 recipients per year.

#### UNICEF

UNICEF has supported projects in Morocco in the areas of health services, primary and nutrition education, family and child welfare, and nutrition (Institute of Agronomy) for several years.

With UNICEF's assistance, nutrition education has been introduced as a separate subject in first-year secondary courses; the teaching materials for these courses are now being prepared. The system of school gardening and small animal raising has developed steadily, as has the appropriate training of the personnel in charge of such activities.

UNICEF cooperation has made it possible to establish a human food and nutrition department in the Hassan II National Institute of Agronomy by supplying laboratory equipment and teaching materials. Since 1972 the Institute has provided a complete course in nutrition. A weaning food has been developed with UNICEF support. Production began in 1976 but no plan had been established for its promotion or distribution through the health system or through commercial outlets.

#### Private Non-Profit Organizations

##### American Jewish Joint Distribution Committee

In Tetouan, one infant milk center is supported. The AJJCD supports school and kindergarten canteens serving 2,504 students; distribution of family food parcels to 835 families in Casablanca and other communities; soup kitchens for 105 adults in Fez, Rabat, and Marrakech; canteens for 313 aged in homes and hotels and collective rehousing in Casablanca, Tangier, Tetouan, El Jadida and Marrakech.

##### Catholic Relief Services

This group has developed food for work projects such as reforestation, general sanitation, coops for handicapped, vocational training programs, house and school construction. They sponsor a program for establishing countrywide preschool nutrition centers in cooperation with the Government of Morocco, including periodic regional seminars to train leaders for new centers. Grants and gifts-in-kind including milk powder and chocolate-flavored dry milk, with a total value of \$18,887, were obtained through CRS during FY 1974.

##### Ozar Hatorah

This organization operates a school lunch program in eight centers, which serve over 1,200 students.

CHAPTER FIVE  
HEALTH INFRASTRUCTURE

Health Policy

Health policy in Morocco is often articulated by the King in his addresses to the nation. His speeches in recent years have emphasized the importance of preventive care and the impact of health on national development.<sup>1</sup> The Ministry of Public Health is the major provider of health care in Morocco and is therefore the primary source of recommendations on health policy. Top staff members in the Ministry formulate policy recommendations which are submitted to the King through the Prime Minister. It is these recommendations which form the basis for the King's pronouncements on health. The Minister, the Secretary General, and the Minister's Chief Technical Advisor are the principals who are currently involved in the formulation of health policy at the ministerial level.

Health policies are expressed in very general terms in the 1973-77 Social and Economic Development Plan. The Plan's broad goals are to maximize economic growth and to more equitably distribute the benefits of economic development. In the section of the Plan devoted to health, the goals expressed are to extend the delivery of health services to reach the majority of the population and to provide those services which will improve the health environment.<sup>2</sup> More specifically, efforts will be directed to the development of the health facilities infrastructure, the training of health workers, and the integration of family planning services into the activities of the public health programs.<sup>3</sup>

The capital investment of the government in the health sector is not large in comparison to the investments in other sectors such as Agriculture or Public Works. Less than 2% of the Investment Appropriations in the Revised 1973-77 Plan are allocated to health.<sup>4</sup> (See Table 23) What is impressive is the absolute increase in the appropriation for the health sector from sixty million Dirhams in 1968 to 702 million Dirhams in the Revised Plan.<sup>5</sup> The increase is in fact so large that the possibility for full implementation of the Plan in the brief period of time remaining is somewhat problematic.

The Plan for 1978-82 is now in preparation. In all probability Agriculture and Public Works will continue to be the sectors which receive the largest amount of investment funds.

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<sup>1</sup>Extracts from speeches delivered by the King, quoted in "20 Years of Public Health," pp. 5 & 7.

<sup>2</sup>Economic and Social Development Plan, 1973-77, Volume 1, p. 54.

<sup>3</sup>Ibid., Volume II, pp. 846-849.

<sup>4</sup>The Economic and Social Development Plan for 1973-77 was revised upward in 1975 (see Column 3 in Table 22) primarily because of the expectation of greatly increased revenues from phosphate mining.

<sup>5</sup>Exchange Rate: 4.5 Dirhams = U.S. \$1.00.

Table 23

Central Government: Investment Appropriations by Ministry, 1968-72 and 1973-76  
(Millions of dirhams)

Ministries/services	Total <sup>1/</sup> 1968-72	Total <sup>2/</sup> 1973	Total <sup>3/</sup> 1973-77	Authorized 1973	expended <sup>4/</sup> 1974	1975	1976	Commitment <sup>5/</sup> 1977 and 78
Royal services	97	134	184	30	35	30	82	8
Prime Minister:								
- Planning and regional develop.	23	41	89	12	21	20	26	7
- Fishing office	2	15	21	3	4	5	5	4
- National promotion	14	351	466	71	68	107	103	100
- Handicrafts	4/	4/	44	4/	4/	16	10	18
Administrative affairs	5/	8	9	7	2	3	2	.
Information	29	200	319	36	48	42	60	135
Justice	10	102	161	18	28	39	40	49
Foreign affairs	5	20	34	5	5	14	9	2
Interior	321	813	1,190	232	243	264	313	273
Defense	184	777	4,200	272	507	523	1,211	1,912
Tourism, urbanism and housing	85	655	878	125	141	211	280	115
Finance	10	1,108	12,947	134	236	2,067	3,287	7,113
Trade, industry and shipping	792	447	911	73	17	175	226	320
Agriculture	1,403	2,180	4,107	479	544	735	1,360	1,248
Public works and communications	2,081	2,673	7,673	545	912	1,408	2,054	2,754
Post and telecommunications	145	372	575	--	23	40	205	297
Education	331	1,204	1,960	221	309	366	525	539
Labor and social affairs	26	117	139	21	15	27	33	3
Youth and sports	6/	6/	229	6/	6/	61	74	94
PUBLIC HEALTH	60	318	702	83	47	105	207	266
Habous, islamic and cultural affairs	5	48	64	7	19	14	12	12
Cooperation and training	5/	120	112	5/	20	23	45	24
Total General budget <sup>7/</sup>	5,623	11,701	37,014	2,238	3,337	6,288	9,864	15,289

1/ Credits authorized, as shown in etc.

2/ Credits authorized and unobligated funds, Adjusted Budget Estimates 1973.

3/ Credits authorized (1973-75) and unobligated funds (1977) - adjusted Budget Estimates of 1973 and '74 for those years and Budget Estimates for 1975 and 1976.

4/ Included under national promotion.

5/ Included under Prime Minister.

6/ Included under labor and social affairs.

7/ Includes transfers to annex budgets and special accounts for investment.

Source: Lois de Finance, 1973 (adjusted), 1974 (adjusted) and Estimates for 1975 and 1976.

Details may not add up to totals due to rounding.

Reportedly, the importance to the nation of the family as a social unit is going to be stressed in the new Plan. The improvement of health status and the provision of health care are seen as principal elements in the support of the family unit.

### Health Planning

There are two separate exercises in health planning which occur in Morocco. The first is the preparation of the program for the capital investment budget in the Economic and Social Development Plan. This process takes place every five years. The second is the preparation of the operating budget for the Ministry. This is an annual activity. There are no other national health plans in Morocco.

The capital investment (or equipment) budget has been developed in the past by a few top staff members in the Ministry of Public Health who have been called together by the Minister to form an ad hoc planning committee. The result of the committee's efforts is negotiated by the Minister in a Tripartite Commission which includes the Ministers and top officials from the Ministries of Plan, Finance, and Public Health.

The investment budget provides the funds for the development of the health system infrastructure. The priorities established in the past two Plans have been almost identical -

- training of medical and paramedical personnel. The construction of the two University Hospital Centers in Rabat and Casablanca will provide modern training facilities.
- maintenance, modernization, and expansion of the hospital network
- extension of the network for preventive and ambulatory care in both urban and rural areas
- integration of family planning into the activities of the Public Health system<sup>6</sup>

The allocation of financial resources to implement this program has been changed very little (See Table 24 ). The plan consists of the expansion of the existing network of health facilities and the training of more health personnel to staff the facilities. While the Ministry has theoretically shifted its emphasis from curative to preventive services, the Plans consistently allocate most funds to the development of the curative care facilities, i.e., hospitals. There is no ongoing planning process in the Ministry, nor are there any staff members whose primary function is health planning. The result is that although the requirements of the Development Plan are met every five years, there is no one who monitors the progress of the Plan, evaluates its effectiveness, or develops new strategies based upon the outcome of past planning efforts. Within the Plan, there is no ordering of priorities. If for some reason the Plan cannot be fully implemented (as has been the case in the past) there is no established program for meeting the most critical needs first and delaying other projects which might not be as important.

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<sup>6</sup>Economic and Social Development Plan, Volume II, pp. 846-849.

<sup>7</sup>20 Years of Public Health, 1956-1975, MOPH, p. 12.

Table 24

Comparison of Investment Expenditures Planned  
for 1968-72 and 1973-77

	1968-72 (in thousands of Dirhams)	% Total	1973-77 (in thousands of Dirhams)	% Total
Family Planning	6,100	6	6,025	2
Prevention	26,578	26.4	80,000	26.4
University Hospital Centers	33,630	33.3	94,000	31
Other Hospitals	28,472	28.3	110,000	36.3
Other Expenditures*	5,973	6	13,000	4.3
Total	100,753	100.0	303,025	100.0

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* Rural Education	508
Studies	500
Social Diseases	4,965
	<u>5,973</u>

**Laboratories	1,700
Housing-M.D.'s	1,400
Ambulances	1,500
Anti-TB Disp.	1,400
College-Public Health	7,000
	<u>13,000</u>

Exchange Rate: 4.5 Dirhams = U.S. \$1.00

Source: 1968-72 Development Plan, 1973-77 Development Plan

The communications between the Ministries of Public Health and Plan as to the requirements for the health section of the Development Plan do not appear to be very good. The expectations expressed by the Ministry of Plan suggest that something more than a list of construction plans for health facilities should be forthcoming from the MOPH. The Ministry of Public Health has continued to submit plans for the construction of facilities in the belief that this is the primary concern of the Ministry of Plan. It is clear that some guidelines will need to be established for the health section of the next development plan if both ministries are to benefit from this important planning exercise.

The preparation of the annual operating budget for the MOPH is in reality a budgeting, rather than a program planning process. The Ministry of Finance issues guidelines for the preparation of the budget each June. The funding level established by the Ministry of Finance is based on past program levels. Allowance is made for inflation, any increase in government salaries,<sup>8</sup> and the operating expenses of facilities which have been constructed or expanded during the previous year.

Within the Ministry of Public Health, the budgeting exercise involves the Minister, the Secretary General of Public Health, the Directorate of Technical Affairs, and the Directorate of Administrative Affairs (See Organization Chart). The Administration Affairs Directorate prepares the budget for the Central Ministry and for each Province or Prefecture. The Provincial Medical Chief in each Province submits his requests for changes in his portion of the proposed budget to the Administrative Affairs Directorate. This division then confers with the Provincial Medical Chief, the specialized technical staff in the Directorate of Technical Affairs and with the Secretary General. All proposed amendments to the budget are then submitted to the Minister for final approval.

The budgeting process as it now stands does not allow a great deal of flexibility in health programming. Because the budget is prepared by a division of the Ministry which is separate from the program division, program and budget functions are seen as two very distinct processes. This results in an almost complete lack of cost-consciousness on the part of the program staff. It would appear to be difficult to make the most efficient use of resources if the staff which develops health programs is unaware of budgetary limitations or the relative cost-effectiveness of various programs.

#### Organization of Health Services

The formal health care delivery system in Morocco is dominated by the Ministry of Public Health. Although there is an active private sector which operates primarily in the major cities, it serves a very small minority of the population (Est. 10-20%). The Moroccan armed forces provide medical care for an estimated 60,000 men and their dependents, but their health facilities are limited and the military in many areas of the country must depend upon the public health facilities for the provision of health care. The social security system has yet to become an important provider of health care. (See Health Programs for description.)

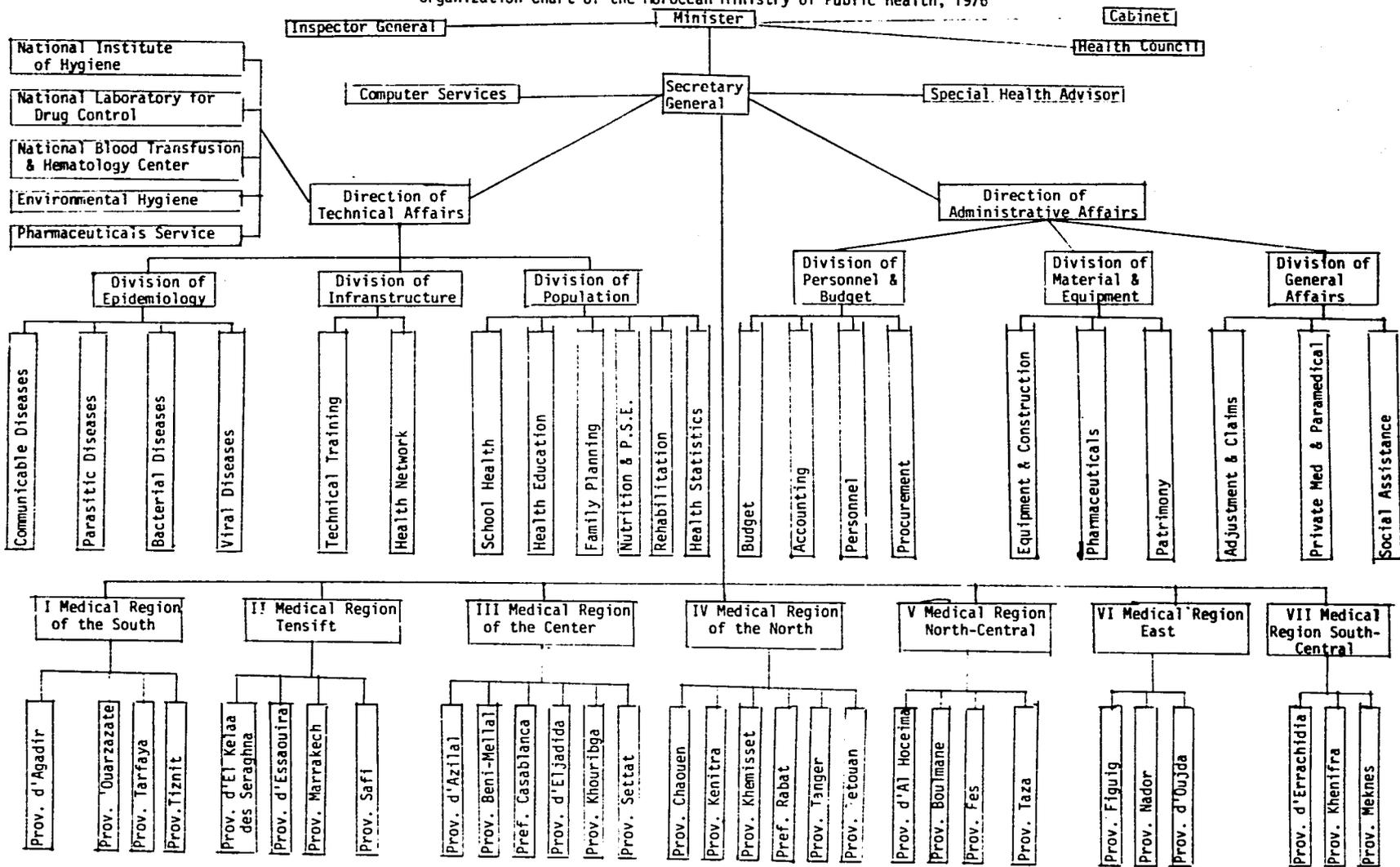
The organizational infrastructure of the Ministry of Public Health has three levels - the policy and decision-making level (the Secretary-General and above - see Organization Chart), the program development and coordination level (Central Ministry - staff functions)

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<sup>8</sup>MOPH employees are civil servants and are paid according to the regular government salary schedule.

Organization Chart of the Moroccan Ministry of Public Health, 1976

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Note: There are no regional level activities as yet, nor any delegation of authority, responsibility, etc. This is still in the planning stage.

Source: "20 Years of Public Health," Ministry of Public Health, 1976.

and the program implementation level (provincial - prefectural offices - line functions). The chief executive is the Minister of Public Health. As a Minister he is also a member of the Royal Cabinet. He is appointed by the King, is a man, a medical doctor, a Moroccan citizen, and rarely serves for more than two or three years. This is customary for all Cabinet positions in Morocco. He is assisted in his duties by a Cabinet of Advisors chosen by him and a Health Council, an advisory group whose membership and functions are not clearly defined. An Inspector General reports directly to the Minister on the actual functioning of the health services, and carries out any inspections, investigations, or studies requested by the Minister.<sup>9</sup> The Secretary General oversees the application of the Minister's decisions and ensures the coordination of all of the operating activities of the Ministry. He is assisted by a special Health Advisor. These officials comprise the policy and decision-making level of the Ministry.

The program development and administration functions of the Ministry are performed by the Directorate of Administrative Affairs and the Directorate of Technical Affairs. The Administrative Affairs Directorate prepares and implements the operational and equipment budgets, implements and evaluates health facilities construction programs, and has responsibility for personnel management and administration. The Directorate of Technical Affairs is responsible for the development of health programs which are consistent with the goals and policies set forth in the National Development Plan. The National Institute of Hygiene, which monitors the activities of the laboratories in the country, is also a part of this Directorate. There will eventually be some as yet undetermined regional administrative structure for health programs. At the present time, medical regions exist only on the organization chart. Until this new structure is in operation, the implementation of health programs in Morocco will continue to be directed by the Chief Medical Doctor of each Province or Prefecture.<sup>10</sup> The *Medecin-Chef*<sup>11</sup> is responsible for the operation of all health facilities within the province and for the supervision of all health personnel who are employed there. He works directly with the Provincial or Prefectural Governor to coordinate health programs with other activities in the province. Although each provincial or prefectural health system functions autonomously, referrals may be made to zone hospitals or other special facilities when the necessary treatment is not available within the province. For instance, the new diagnosis center in Rabat and the two University Hospital Centers in Casablanca and Rabat provide specialized health care which is not available elsewhere in Morocco.

The master plan for the provision of health care in Morocco is a pyramidal structure of facilities and manpower which has a carefully designed system for referral and delivery of health services. (Diagram, p70) The plan cannot be fully implemented, however, due to shortfalls in the number of facilities and trained health personnel who are available to operate the facilities. Beyond this, a certain inflexibility in the referral system sometimes requires patients to spend an unnecessary amount of time within the system simply to fulfill bureaucratic requirements. The urban facilities usually appear to be more fully staffed and equipped than rural facilities, which suggest difficulties in the assignment of personnel to rural areas and either distribution or maintenance problems in relation to supplies and equipment. The widely varying statistics on utilization of hospital services (see Health Facilities Section) also indicate a certain unevenness in the efficiency of the system.

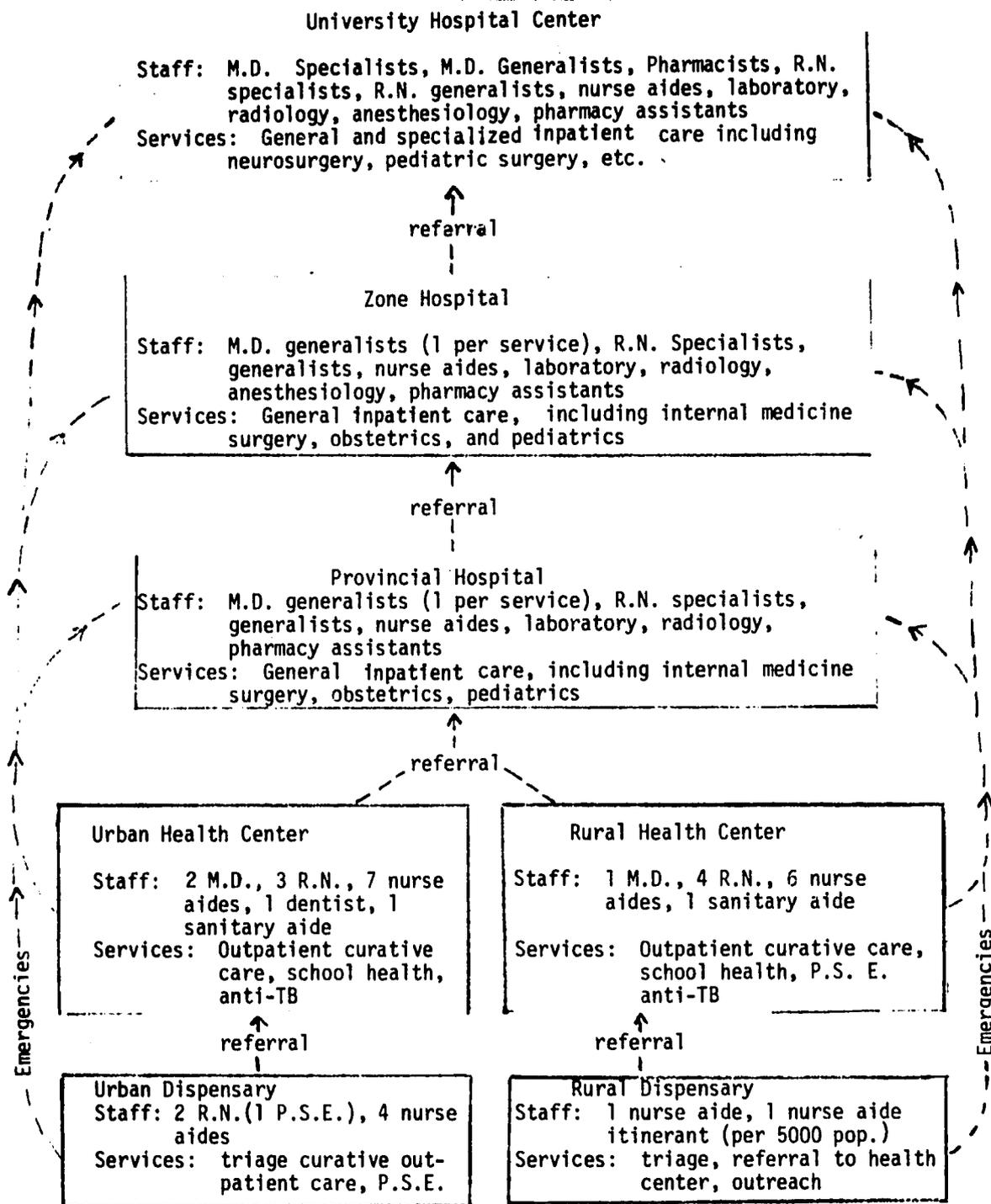
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<sup>9</sup>Ministry of Public Health Circula #42, Decree No. 2-75-835, February, 1976.

<sup>10</sup>The military is temporarily in charge of government services, including health, in the three Provinces which comprise the former Spanish Sahara region.

<sup>11</sup> *Medecin Chef* = Chief Doctor

## Organization of Health Services



Coordination and communication between the Central Ministry staff and the provincial and prefectural health services is most often informal and irregular. The Provincial Medical Chief may deal directly with the Secretary General (who oversees the entire health care delivery system) or with one of the Bureau Chiefs in the Technical Affairs Directorate. The central ministry staff members in turn communicate directly with the Provincial Medical Chiefs on matters relating to the operation of health programs within a particular province. One of the few formalized processes which occur on a regular basis and involves staff from all three levels is the preparation of the annual operating budget. (See next section.)

The delegation of responsibility for provincial operations to the Provincial Medical Chiefs allows for the adaptation of health programs to the specific conditions within each province. The informal nature of the procedure for communication with the Central Ministry staff makes it possible for the Provincial Medical Chiefs to use the technical skills of this staff as needed. Some of the major failings of the system lie in the operations of the Central Ministry. There is limited delegation of authority by the Minister to the central staff, so decisions such as the transfer of health personnel from one Province to another or disciplinary action<sup>12</sup> must be referred directly to the Minister for approval. The staff support provided by the Technical Affairs Directorate in particular is limited by the shortage of persons with mid-level technical and managerial skills. (This is a nationwide problem which seriously affects other sectors as well.) The separation of the program and budget functions within the Ministry results in a lack of cost-consciousness on the part of the technical staff and prevents the objective comparison of alternate program strategies through the use of cost-benefit analysis. The absence of a mechanism (staff meetings, workshops, seminars) for the regular interchange of ideas and information among key staff members at the provincial and ministerial levels, limits the possibilities for them to benefit from each other's experiences.

#### Health Care Financing

There are two budgeting processes which operate concurrently in the Moroccan public health system. The investment budget, which is the implementation of the Development Plan, is never integrated with the operating budget, which includes only operating costs. As was mentioned earlier, the health investment budget is a relatively small part of the total government investment appropriation but it was increased substantially when the Plan was revised in 1975. The composition of the investment in the health care system has not changed however.

Implementation of the Plan appears to have improved during the 1973-77 Plan period. Authorized expenditures for the 1968-72 plan were barely 60% of planned expenditures. By the end of 1975, 72% of planned expenditures had been authorized (see Table 23). The revision of the Plan in 1975, which represents a doubling of the investment in health, is going to require a rapid increase in the implementation rate during the last year of the plan period.

It appears that the Ministries of Plan and Finance recognize the problems related to the fast buildup of programs and have therefore attempted to allocate the additional investment funds to those sectors which can absorb large infusions of funds rapidly. Some of the

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<sup>12</sup>A Disciplinary Council in the Personnel Division hears complaints and makes recommendations. Dismissal is rare because MOPH employees have civil service status.

problems which developed during the past Plan period included difficulties in the identification and purchase of land for construction of health facilities, a shortage of architects who were qualified to design health facilities, and a slow movement of projects through the bureaucracy. A reform in budgetary procedures introduced in 1974 should aid in the acceleration of project implementation. Unused appropriations are now carried forward automatically from one year to the next. The requirement to reinstate unused appropriations resulted in prolonged delays in project implementation in past years.

The annual operating budget of the MOPH has increased by almost 350% since Independence (See Table 25). Personnel costs dominate the budget, in contrast to the situation twenty years ago, in part because of rising salaries and in part because the health system is absorbing an increasing number of new personnel each year (see section on Health Manpower). It also reflects an earlier preoccupation with the purchase of supplies and equipment needed to upgrade the health facilities. Operating expenditures have increased from ten Dirhams per capita in 1960 to twenty Dirhams per capita in 1976. (See Table 26) The increase has been diminished by the inflation during this period, however, there has been an increase in per capita expenditures from U.S. \$2.69 in 1971 to U.S. \$4.59 in 1975 because the effects of inflation were offset by an increase in value of the Dirham from U.S. \$.19 in 1971 to U.S. \$.24 in 1975. The real increase in per capita expenditures amounts to about U.S. \$.40 when the increase is adjusted to reflect the 33% increase in the cost of living which occurred during the 1971-75 period.

The generally unfavorable economic conditions during 1974 and 1975, and the increase in the cost of fuel oils, (See Economics section) caused a precipitous increase in the amount of government funds required for subsidies and a resultant decrease in the proportion of the government's operating budget which was allocated to the health sector (See Table 27 ). This does not indicate a lack of commitment to the health program on the part of the Central government. In fact, the operating budgets for public health as well as for other social services continued to increase during this period. It has been reported that the health programs will be the only social service program to receive a budget increase in 1977, which is intended to again emphasize the importance of health programs to the government.

The Moroccan policy of integrated delivery of health services, which includes the use of polyvalent paramedical workers, may in fact permit the most efficient use of facilities and personnel, but it does create problems relative to the analysis of program costs. While some expenses may be readily extracted from the budget, such as the cost of vaccinations for the PSE program, the allocation of staff time to such a program, or an attempt to estimate the value of the health center's operating expenses which should be applied to the program would be virtually impossible. This has important implications for the development of new health programs. The projection of costs for any new program would be very tentative. An attempt was made in 1975 to separate the costs of the family planning program from other health program costs. The results are in Table 28. In addition to the issues raised above, no allowance has been made for inflation or for increases in the program operating level. Improved program budgeting techniques are essential if the health programs are to operate at their maximum level of efficiency. Some knowledge of program costs is important to the development of new programs, especially if foreign assistance funds are to be used to finance program development. In addition, the allocation of costs to programs facilitates the evaluation of activities through the use of cost-benefit analysis. Program evaluation appears to be an enumeration of the quantity of services delivered, rather than a careful measurement of the returns on a particular, quantified investment in health programming.

The Ministry of Public Health has assumed responsibility as primary provider of health care in Morocco, however, free health care is offered only to those who are unable to

Table 25  
Operating Budget of the Ministry of Public  
Health

Year	Personnel Expenses	Material Expenses	Total
1956	24,701,500	48,658,700	73,630,290
1957	25,688,330	49,537,400	75,225,730
1958	32,175,720	59,213,870	91,389,590
1959	39,199,060	62,716,280	101,915,340
1960	55,655,970	62,733,590	118,915,560
1961	62,994,211	73,952,500	136,946,711
1962	76,212,873	73,758,500	149,971,373
1963	96,531,458	81,437,500	177,968,958
1964	103,591,871	89,332,600	192,924,471
1965	103,812,075	80,399,340	184,211,415
1966	106,442,533	84,172,600	190,615,133
1967	111,124,734	89,021,155	200,145,889
1968	112,535,061	91,156,224	203,691,285
1969	116,815,221	96,453,489	213,268,710
1970	119,335,678	96,752,564	216,088,242
1971	120,703,432	96,281,190	216,984,622
1972	124,492,218	98,415,137	222,907,355
1973	136,742,025	99,924,346	236,666,371
1974	181,112,897	106,088,498	287,201,395
1975	208,774,761	112,149,698	330,924,459
1976	219,239,925	143,299,000	362,538,925
1977	240,402,179	166,467,000	406,869,179

Source: 20 Years of Public Health 1956-1977, p. 41. Loi de Finance, 1977.

**Table 26**  
**Per Capita Health Expenditure**  
**1960-1976**

Year	Operating Expenses MOPH (in millions)	Population (CERED Estimates) in millions	Per Capita Expenditure
1960	119 DH	11.6	10.25 DH
1971	217 DH	15.3	14.18 DH
1974	287 DH	16.8	17.00 DH
1975	331 DH	17.3	19.10 DH
1976	363 DH	17.9	20.28 DH

Exchange Rate: 4.5 Dirhams = U.S. \$1.00

Source: 20 years of Public Health, MOPH, 1975 CERED Population Projections, MOP.

Table 27

Central Government Current Expenditures, 1973-76<sup>1/</sup>  
(Millions of dirhams)

Item	1973	1974	1975	1976
<u>Economic services</u>	420	480	643	715
Trade, industry, mining and shipping	22	26	32	37
Public works and communications	132	148	194	213
Agriculture and agrarian reform	222	251	299	374
Urbanization, housing and tourism	26	34	42	47
Planning, national promotion, handicraft and cooperation	18	21	76	44
<u>Social services</u>	1,245	1,389	1,697	2,254
Education	935	1,018	1,319	1,796
Health	237	287	331	363
Labor, youth, sports and culture	73	84	47	95
<u>Administration and security</u>	1,457	1,690	2,096	2,618
Defense	612	677	841	1,129
Internal security	466	557	659	813
Finance	112	129	156	166
Justice	100	117	150	172
Foreign affairs	62	71	127	130
Other	96	139	163	208
Subsidies, etc. <sup>2/</sup>	133	1,653	3,735	1,871
Contingencies	258	911	678	755
Subtotal	3,513	6,123	8,849	8,213
<u>Annex Budgets<sup>3/</sup></u>	199	238	268	478
Official printing	2	2	3	3
Port of Casablanca	13	12	15	28
Other ports	17	19	22	27
Post and telecommunications (PTT)	134	165	177	359
Radio and television (RTM)	33	40	51	60
Total	3,712	6,361	9,117	8,691

Percent of Budget Allocated to all Social Services

1973	1974	1975	1976
34%	22%	19%	25%

Percent of Budget Allocated to Health

6.4%	4.5%	3.6%	4.1%
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<sup>1/</sup>Budget estimates, including revisions.

<sup>2/</sup>Paid out by Ministry of Finance.

<sup>3/</sup>Operating expenditures only.

Source: Lois de Finances 1973 (rectificative), 1974 (retificative), 1975 and 1976

Details may not add up to totals due to rounding.

Table 28

## Divestment of Family Planning Budget 1973-1977 (in dirhams)\*

<u>Category</u>	<u>(1)</u> <u>Investment</u>	<u>(2)</u> <u>Operating</u> <u>Annual</u>	<u>Total for Period</u> <u>[(1)+5x(2)]**</u>
Construction	2,400,000		2,400,000
Directors Office, National FP Program	80,000	111,400	637,000
Communications Unit	370,000	621,700	3,478,500
Staff Training & Reeducation	110,000	121,200	716,000
Evaluation/Research	70,000	85,200	496,000
Administrative Unit	10,000	34,500	182,500
Motivators (training, equipment, salaries, miscellaneous)	250,000	280,000	1,650,000
Medical (equipment, supplies)	650,000	197,000	1,635,000
TOTAL	3,940,000	1,451,000	11,195,000

\* at rate 4.5 DH = \$1.00

\*\*annual operating costs for five years

Sources: Moroccan Ministry of Public Health.



the medical education facilities, however, the Development Plan capital investments budgets cited the following amounts which were to be spent on the medical schools during the 1973-77 Plan period:

University Mohamed V medical school - Rabat	18,610,000 DH
Faculty of Medicine - Casablanca	50,000,000
College of Public Health - Rabat	<u>7,000,000</u>
Total	75,610,000

In addition, the expenditures for health manpower training for 1976 can be estimated from the average cost of manpower training cited in the Development Plan. (See Table 29.) It must be kept in mind that this is an estimate based on average training costs, and should not be interpreted as anything more than that.

Expenditures on health care in Morocco should also include the contributions of the semi-public mining corporations such as the phosphate company OCP.<sup>14</sup> OCP employs 21 physicians in Khouribga Province alone. Important support to the activities of the Ministry of Public Health is rendered by the Ministry of Plan through the demographic studies of CERED. Other health-related activities whose value is unknown are the health, nutrition and family planning education in the non-formal education programs of the Ministries of Social Assistance and Youth and Sports; the schistosomiasis control programs attached to the Ministry of Agriculture's irrigation projects; and the sanitary inspection and environmental hygiene activities of the municipalities. Other interventions which are not usually included with health expenditures but which nevertheless have a measurable impact on health status include improvements in diets, water supplies, shelter, clothing, accident prevention, income, and general education.

The economics of health in the private sector are an enigma. The earnings of medical doctors in the private sector are said to average about 20,000 Dirhams per month but there is no way to verify this. Given the number of doctors licensed to engage in private practice in Morocco (582 in 1975), it can be estimated that well over one hundred million Dirhams per year are being spent on private health care offered by doctors. If the income generated by dentists (128), pharmacists (381), midwives, (58) laboratories and private clinics were added to this, a very conservative estimate would be that something over two hundred million dirhams per year are spent in the private sector on health care.

In addition to the activities of individual practitioners, Morocco has a number of private voluntary organizations which deliver health care. Every province appears to have a few individuals or groups from a wide variety of missions, foundations, or international organizations which offer services which range from midwifery to rehabilitation work. The contributions of the largest of these groups are summarized in the section on international assistance.

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<sup>14</sup>Office Cherifien des Phosphates.

Table 29

Estimated Cost of Health Manpower  
Training in Morocco 1976

Moroccan Civil Service Classification	Health Sector Position	Cost of Training <sup>1</sup> Per Year	No. of Years Training Required	Total Cost Training	1976 Students <sup>2</sup> Enrolled	Estimated Cost Training 1976
10-11 Cadre	Physician	17,700 DH	7	123,900 DH	3,700	\$65,490,000 DH <sup>4</sup>
7-9 Master Agent	Nurse Spec.	11,500	2	23,000	250 <sup>3</sup>	2,875,000
5-6 Qualified Agent	Registered Nurse	8,900	2	17,800	1,167	10,386,300
3-4 Specialized Agent	Nurse Aide	3,500	1½	5,250	3,357	11,849,500
Estimated Total Cost of Health Manpower Training--1976						\$90,590,800

1. Training Cost per year cited in 1973-77 Social and Economic Development Plan Volume II, p. 745. Cost is average for all workers qualified for specific Civil Service grades.
2. Estimate is based on actual number graduates in 1976 and number expected to graduate in 1977.
3. Actual Enrollment 1974/75. This program was not expanded during 1975/76, therefore any change in enrollment is presumed to be small.
4. Exchange Rate 4.5 Dirhams = U.S. \$1.00



## CHAPTER SIX

### HEALTH MANPOWER

One of the major constraints to the development of health services in Morocco is that there are a limited number of trained health workers who are available to provide health care. Despite the fact that the supply of health manpower in Morocco has increased eight times over since 1956, population growth and the demand for health services have more than kept pace with the increase and the result is that the pressure on medical and paramedical personnel is greater than ever.

#### Doctors

Morocco has made the transition in only twenty years from a country dependent upon others for the provision of physicians to one in which a majority of the physicians are Moroccan nationals. In 1975, there were 1,319 medical doctors licensed to practice in Morocco. The most recent statistics on the nationality of doctors were published in 1973, and at that time, 483 of 1,143 physicians were Moroccan. (See Table 30). Since then, 264 physicians have graduated from the Mohamed V Medical School in Rabat and approximately fifty more have returned from medical training abroad. Therefore, it appears that a slight majority of the physicians are now Moroccans. There are still a large number of foreign doctors in the public health system, however. Their presence can be noted in every hospital and health center. (Tables 31 and 32 indicate the number of medical personnel employed in the public health system).

The doctor population has become more Moroccan during the past ten years, however, the total number of doctors in the country is still relatively small. In 1975, the doctor/population ratio was 1/16,000 population. The number of doctors who are trained in Morocco is expected to increase to about 300 per year by 1982, when the first class graduates from the Casablanca Medical School, however, the doctor/population ratio will increase to only 1/9,500 population by 1985. While this is a marked improvement, it also serves to highlight the need to train and mobilize large numbers of supporting medical workers if health care services are to be extended to a larger segment of the population.

The geographic distribution of doctors in Morocco is not unlike that in other countries. Major cities and other urban areas have the greatest concentrations of doctors, while rural areas have few, if any doctors. Even in the public sector, an estimated 77% of the doctors work in either hospitals (which are located in urban areas) or urban health centers. (See Tables 31, 32, and 33.) The number of doctors who are available to serve the rural population is limited to the 134 who are assigned to rural health centers and those few whose private practice includes rural areas. (See Table 30 for doctors employed in major urban centers.) In addition to the inequalities in geographic distribution, there is the inequality of distribution between public and private practice. In 1976, 737 doctors were employed by the MOPH and 592 doctors were licensed for private practice. It is estimated that less than 20% of Morocco's population can afford to pay for private health care, and over 40% of the doctors are serving that small minority of the population. Thus, the doctor/population ratio is even less favorable than it appears to be for the majority of Moroccans.

Table 30

Distribution of Doctors by Sector and Nationality  
in Morocco - 1970 and 1973

	1970					
	Public		Private		Total	
	Number	%	Number	%	Number	%
Moroccan	70	12	136	26	206	18
Foreign	504	88	382	74	886	82
<b>TOTAL</b>	<b>574</b>	<b>100</b>	<b>518</b>	<b>100</b>	<b>1092</b>	<b>100</b>

	1973					
	Public		Private		Total	
	Number	%	Number	%	Number	%
Moroccan	262	46	221	39	483	42
Foreign	308	54	352	61	660	58
<b>TOTAL</b>	<b>570</b>	<b>100</b>	<b>573</b>	<b>100</b>	<b>1143</b>	<b>100</b>

Medical Doctors Employed  
in Urban Centers in Morocco  
1973 and 1976

City	Public		Private		Total	
	1973	1976	1973	1976	1973	1976
Tanger	18	23	37	31	55	54
Rabat-Sale	77	128	75	74	152	202
Casablanca	116	145	243	256	359	401
<b>Total</b>	<b>211</b>	<b>296</b>	<b>355</b>	<b>361</b>	<b>566</b>	<b>657</b>

Ministry of Public Health Doctors

Year	Number	By Specialty 1973	
		General Medicine	Other
1956	346	411	
1966	537	47	
1970	574	31	
1973	570	26	
1976	737	55	
		<b>Total</b>	<b>570</b>

\*All kinds of Tuberculosis

Source: Bases de Rationalisation des Programmes Sanitaires au Maroc, 1973, Ministry of Health, 1976.

Table 31

Summary of Medical Personnel  
Employed in Public Health Hospitals, January, 1975

Medical Doctors	
State Doctors	479
Regular Doctors*	90
Full Time Generalists	123
Part Time Generalists	36
Full Time Specialists	266
Part Time Specialists	88
Full Time Pharmacists	54
Part Time Pharmacists	2
Total Full Time Doctors	389
Total Part Time Doctors	124
Para-medical Personnel	
Specialized Registered Nurses	33
Registered Nurses	768
Practical Nurses	2617
Others	685
Total	4103

\*Private sector doctors sometimes contribute their services to public health hospitals. They also use these facilities for their private patients. The extent to which their services are available to public health patients is unknown.

Source: Ministry of Public Health

Table 32

Summary of Ministry of Public Health Medical Personnel  
Employed in Other Public Health Facilities, January, 1975

Medical Doctors	
Generalists-Full-Time	197
Generalists-Part-Time	36
Specialists-Full-Time	5
Specialists-Part-Time	37
Dentists-Full-Time	20
Dentists-Part-Time	4
Total Full-Time Doctors	202
Total Part-Time Doctors	73
Other Medical Personnel	
Registered Nurse Specialists	14
Registered Nurses	254
Practical Nurses	3011
Others	926
Total	4305

Source: Ministry of Public Health

Table 33

Medical and Paramedical Personnel in the Public Health  
Service by Province as of December 31, 1975

<u>Provinces</u>	<u>Doctors</u>	<u>Pharmacists</u>	<u>Dentists</u>	<u>Other</u>
Agadir	50	3	--	623
Al Hoceima	9	--	--	198
Azilal	--	--	--	--
Béni-Mellal	16	--	--	337
Boulmane	--	--	--	--
Chaouen	--	--	--	--
El Jadida	16	1	1	312
El Ke1aa -Sraghna	9	--	--	184
Essaouira	4	--	--	117
Fes	48	5	3	768
Figuig	--	--	--	--
Kenitra	35	2	--	598
Khemisset	7	1	--	164
Khenifra	7	--	--	153
Khouribga	4	--	--	120
Ksar-es-Souk	12	--	--	275
Marrakech	50	4	--	728
Meknes	36	3	--	734
Nador	13	--	--	169
Ouarzazate	9	1	--	281
Oujda	29	--	--	505
Safi	23	1	--	365
Settat	14	1	--	408
Tanger	23	1	--	206
Tarfaya	--	--	--	--
Taza	19	2	1	333
Tetouan	31	--	1	472
Tiznit	--	--	--	--
Pref. Casablanca	145	32	4	1,347
Pref. Rabat-Sale	128	62	8	1,294
Total	737	119	18	10,691

Source: Ministère de la Santé Publique

Until 1962, all of the doctors who practiced medicine in Morocco were trained in other countries. Morocco opened its first medical school at the Mohamed V University in Rabat, in 1962. The first doctors graduated in 1969. Between 1969 and 1976, 504 doctors have graduated from the school in Rabat. In 1975, a medical school was inaugurated in Casablanca. Its first class will graduate in 1982. By 1982, the two medical schools will be graduating a total of about 300 doctors per year. There are currently about 3,700 medical students enrolled in the two schools. The curriculum includes practical as well as theoretical training. The University Hospital Centers in Casablanca and Rabat are used for practical training. Since the size of the classes and the professor/student ratios are unknown, it is impossible to assess the extent of opportunities for students to participate directly in patient care. The quality of the medical schools has not been evaluated as yet. The faculties of both are supplemented by professors from European countries, primarily France. A considerable amount of money (DH 55 million in 1976 alone) is being invested in buildings and equipment for the two schools. Funds are channeled through the Ministry of Education, which administers the schools. The Ministry of Public Health has been consulted on the content of the medical school curriculum, and as a result both family planning and public health have been included in the course work of the two schools.

In 1975, over 300 Moroccans were studying medicine in other countries. The majority went to other French-speaking countries such as France (158) and Belgium (76). There were also 42 students in Spain and 38 in other countries. All of these students were either privately financed or the recipients of scholarships provided by the host country government or medical school. The number who return to practice in Morocco is unknown.

Since 1970, every medical doctor who is educated in Morocco is required by law to serve two years in the public health system. (The same requirement holds true for every college graduate - each serves two years according to his or her speciality.) They are not allowed to maintain a private practice during this period. Although some stay beyond the required two years, many leave for private practice. The income differential alone (2,000 DH per month in public health service versus a range of 10,000 DH to 30,000 DH per month in private practice\*) is a strong incentive to turn to private practice. The other advantages of private practice - the choice of location, and the availability of amenities in the urban areas especially, also add to the flight from public service. The 25% wage increase which was given to all government workers in 1973, has undoubtedly helped to keep some doctors in the public health system a little longer, but further incentives will be necessary in the future if the Moroccan public health system is to increase the number of doctors who are willing to make a career of public health service.

All doctors who practice in the private sector must be licensed by the Secretary General of Government. The Secretary General oversees the activities of the Conseil del Ordre des Medecins\*\*, which is a professional society whose members include all doctors who are in private practice in Morocco. The attempts of the council in recent years to have doctors voluntarily set medical fees have been unsuccessful. Other areas of concern according to the council are the following:

- qualifications for specialists
- occupational diseases
- relations with insurance companies

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\* 4.5 DH = U.S. \$1.00

\*\*Council of Medical Doctors

- establishment of medical offices by foreign doctors
- medical problems in small urban centers and rural areas
- fees
- the role of the doctor in the hospital dispensary
- cadre health training

(See Table 34 for geographical distribution of doctors employed in the private sector.)

#### Pharmacists

In 1975 there were 500 pharmacists in Morocco: 381 were working in the private sector and 119 were assigned to the health care facilities of the Ministry of Public Health. Of the latter 54 worked full-time in hospitals and 12 worked full-time in other provincial and prefectural facilities. The remainder (53) work in the major laboratories of the public health system in Rabat and Casablanca. In addition, two other pharmacists were working part-time for the Ministry of Public Health (see Tables 33 and 34).

The pharmacists in the private sector work under rather strict government controls. They are licensed by the Secretary General of Government and because of the fact that the prices of all drugs are fixed, their profit margin and to some extent their income, is determined by the government. Pharmacists in the private sector are heavily concentrated in Casablanca and Rabat - over 60% of them practice in one of the two cities. There is no educational program for pharmacists in Morocco. All are trained in other countries. There is a Conseil del Ordre des Pharmaciens for pharmacists who work in the private sector.

#### Pharmaceutical Assistants

In 1975, there were 73 pharmaceutical assistants working in the Ministry of Public Health facilities and an unknown number at work in the private sector. Drugs may be prepared and distributed only by Licensed Pharmacists. In order to alleviate the problem of availability of drugs in rural areas, which is caused by the maldistribution of pharmacists, the Pharmaceutical Division of the Ministry of Public Health has authorized private sector pharmacists to train assistants to work with them in rural areas. These assistants work in outlying areas and fill requests for drugs under the supervision of the pharmacist. The pharmacist is ultimately responsible for the sale of drugs through these outlets.

Training for pharmaceutical assistants is currently available in the seven registered nurse training schools. Admission to the programs is gained either by examination or by possession of a baccalaureate degree. Training is for two years. There are approximately 30 students enrolled each year. Additional training will be available at the new College of Public Health in Rabat. About 80 pharmaceutical assistants will be enrolled in the two year program. (See Health Programs - IRBD assistance for further description.)

Table 34

Private Clinics and Medical Personnel Authorized in Morocco, 1975  
Private Sector, 1975

Provinces and Prefectures	Clinics	Doctors	Pharmacists	Dentists	Midwives	Herbalists	Nurses	Veterinarian
Agadir	1	17	9	3	1	--	2	--
Al-Hoceima	--	1	2	--	--	--	--	--
Beni-Mellal	--	6	8	2	--	--	1	--
El Jadida	--	6	8	1	2	--	1	1
Fes	3	29	20	7	3	--	7	2
Kenitra	2	23	16	2	1	--	5	1
Khemisset	--	2	2	1	2	--	--	--
Khenifra	--	1	1	0	--	--	--	--
Khouribga	--	4	4	2	3	--	15	--
Ksar-Es-Souk	--	1	1	0	1	--	--	--
Marrakech	4	16	16	5	4	--	2	1
Mekues	4	24	13	4	1	--	18	--
Nador	--	8	4	--	--	--	3	--
Ouarzazate	--	3	1	--	1	--	2	--
Oujda	2	16	7	5	2	--	10	--
Safi	2	12	7	3	2	--	4	--
Settat	--	10	7	--	--	--	2	--
Tanger	2	31	10	8	6	--	13	1
Taza	--	1	2	--	--	--	--	--
Tetouan	--	24	13	--	2	--	12	1
Casablanca	22	256	178	58	19	1	164	8
Rabat	10	74	51	27	7	--	33	3
Azilal	--	1	--	--	1	--	--	--
Boulmane	--	--	--	--	--	--	--	--
Chaouen	--	--	--	--	--	--	--	--
El Kelaa-Sraghna	--	--	--	--	--	--	--	--
Essaouira	--	3	1	--	--	--	--	--
Figuig	--	--	--	--	--	--	--	--
Tarfaya	--	--	--	--	--	--	--	--
Tiznit	--	1	--	--	--	--	--	--
TOTAL	52	582	381	128	58	1	301	18

Source: Secretariat General of the Government of Morocco, December, 1975, Le Maroc en Chiffres

NOTE: Table includes only health personnel employed in the private sector.

## Dentists

There were 146 dentists in Morocco in 1975. The majority were in private practice in either Casablanca or Rabat. In 1975, thirteen provinces had no dentists at all and three others had only one. In 1975, there were twenty dentists who worked full time for the Ministry of Public Health and eight who worked part time. The shortage of dental care is apparent everywhere in Morocco. A walk through any souk reveals a number of indigenous practitioners of dental surgery. Extraction is often the only treatment available for dental problems in a country with a serious shortage of trained dentists. There are no dental schools in Morocco. There is no information available concerning the number of dental technicians in Morocco. There is no training available and the number of dental assistants is very small.

## Nursing Personnel

There are three levels of trained nursing personnel in Morocco. The three are distinguished by the amount of general education and nurse training they have had. The Nurse Aide or practical nurse (Infirmiere Breveté) has completed 19 months of training in addition to four years of secondary education. The Registered Nurse (Infirmiere Diplômé d'État) has a baccalaureate degree and two years of nursing education. The Specialized Registered Nurse (Diplôme d'État Spécialisé) has completed all the requirements to be a Registered Nurse plus two additional years of specialized training. Midwifery, nursing education, social work, and psychiatric nursing are currently offered as specialities. All of the nursing schools are under the direction of the Ministry of Higher Education, however, there is extensive coordination with the Ministry of Public Health in the design of curriculum as well as in the development of practical training within the Ministry of Public Health facilities.

Registered nurses who work in the public health system are expected to perform many supervisory and administrative responsibilities in addition to their nursing duties. The head nurse in a health center may be called upon to organize consultation services, oversee epidemiological surveillance programs, review the maternal and child health situation of the health district, monitor school health conditions, and evaluate subordinate staff members. It may be necessary, in addition, to provide on-the-job training for new workers. Because all public health services are integrated in Morocco, all nursing personnel participate in the fight against communicable diseases, MCH, health education, family planning, and provide care for outpatients who are under treatment by doctors and specialists in the health centers. All nurses are trained to be polyvalent workers (up to the specialist level) and are expected to be able to perform any or all of the above functions as part of a team of health workers. Turnover among nursing personnel is not high because nurses are regular civil servants whose wages are comparable to those of other civil servants with the same amount of training. When it is necessary for a nurse to move to another area of the country (when a spouse is transferred for example) a job can usually be found there due to the chronic shortage of health personnel throughout the country.

### Registered Nurses (Infirmiere Diplôme d'Etat)

There were 1,432 registered nurses (including 119 nurse specialists) working in the public health system in 1975. Another 294 nurses worked in the private sector, primarily in Rabat and Casablanca. The geographical distribution of nurses employed by the Ministry of Public Health is shown in Table 35. The data for 1973 were the most recent figures available.

There has been a rapid growth in the training capacity of the Moroccan nursing schools in recent years. Between 1956 and 1975, according to Public Health officials, 957 registered nurses were trained in Morocco's eight nursing schools (Rabat, Casablanca, Marrakech, Meknes, Oujda, Agadir, Fez, Tetouan). In 1976 alone, it is expected that 488 candidates will receive degrees, and the projection for 1977 is 553. In contrast, the education of nurse specialists has continued at the same level - 21 graduated in 1975, 29 in 1976, and 35 are expected to receive diplomas in 1977. Since these are nurses who have previously been registered nurses, they cannot be considered new nurses entering the work force. The effects of the increase in the total number of registered nurses can already be seen in some provinces. Ouarzazate, for example, had only nine registered nurses in the public health facilities in 1973. By 1976, there were 21, including two nurse specialists. Khouribga Province had five nurses in 1973 and eleven in 1976, including one nurse specialist. Approximately one third of the candidates for Registered Nurse degrees are already practical nurses in the public health system. They continue to receive their salaries during the training period. The other two-thirds enter directly from other schools from which they have received a baccalaureate degree. This is a change from earlier years, when the majority of students in the nursing schools were formerly practical nurses. The sex composition of the classes has also changed in recent years. In 1970, there were only four women in the nursing schools. By 1973, 50% of the students were women. The change in the student body of the nursing schools has also caused some changes in the curriculum. Obstetrics and gynecology are given more emphasis now, which will hopefully result in an improvement in the health care services provided for the women of Morocco. Since 1969, more emphasis has been given to preventive medicine and less to the delivery of hospital-oriented curative services. The training is supposed to emphasize the importance of teamwork and polyvalent personnel, however, certain weaknesses in this aspect of the training have been observed by outside experts. A general lack of attention to community and social medicine was noted during a visit in 1975. Curriculum problems will be addressed in the IBRD Loan (See Health Programs section). Another weakness of the nursing education system is the shortage of trained, experienced nursing teachers. At the present time, only the École de Cadres, the school which trains nurse specialists, trains nurse educators. The school offers specialties in this and in preventive services, hospital services, and midwifery. The number of graduates, as previously mentioned, is small.

#### Practical Nurses (Infirmière Breveté)

The lay practical nurses of Morocco perform many of the major nursing functions within the public health system. They are the patient's first point of contact with the health system in the urban health facilities as well as in the rural areas where quite often the only health services available are those offered by the itinerant nurse. The number of practical nurses in Morocco has increased rapidly during the past decade. In 1974, there were approximately 7,553. In 1975, 1276 were graduated from nursing schools and projections from 1976 and 1977 were 1226 and 1591 graduates respectively. In 1975, there were 6068 practical nurses employed by the MOPH. They were distributed throughout the country in urban and rural health facilities.

There are training schools for practical nurses in 22 of Morocco's provinces. The schools are administered by the Technical Training Division of the Ministry of Public Health. Applicants for the schools must have at least four years of secondary education and must be between 16 and 35 years of age. The course of study is 19 months. The curriculum for the first year includes general nursing studies and public health practical experience. The second year includes application of theory and practical experience. Study visits, student evaluation, and supervised study are also included. All nursing programs are supposed to be taught by specialized instructors from the post-basic school and by general registered nurses who have taken courses for this purpose. Nurses who will become itinerant workers are

Table 35

## Geographical Distribution of Paramedical Personnel in Morocco - 1973

Province	Nurse Specialist		Nurse		Nurse Aide		Other		Total	
	Center	Hosp.	Center	Hosp.	Center	Hosp.	Center	Hosp.	Center	Hosp.
Agadir	-	2	15	36	107	143	112	80	234	261
Al-Hoceima	1	-	2	3	58	65	21	10	82	78
Beni-Mellal	-	-	3	7	101	46	37	6	141	59
El-Jadida	-	1	5	14	80	55	28	11	114	81
Fes	1	3	11	47	193	172	89	63	300	285
Kenitra	-	1	17	26	284	131	88	23	386	181
Khouribga	-	-	1	4	54	6	15	4	70	14
Ksar-es-Souk	-	-	3	10	53	51	32	11	88	72
Marrakech	4	-	32	62	269	211	67	52	372	325
Meknes	1	1	25	54	145	204	107	78	278	337
Nador	-	-	1	5	73	34	12	3	96	42
Ouarzazate	-	-	4	5	41	71	47	17	92	93
Oujda	-	1	3	26	134	116	62	13	199	156
Safi	1	1	13	20	115	128	61	33	190	182
Settat	-	-	5	13	107	59	52	80	164	152
Tanger	1	-	5	17	38	74	13	39	57	130
Taza	-	-	1	9	86	51	36	24	123	84
Tetouan	-	1	11	6	193	117	44	46	248	170
<u>Prefectures</u>										
Rabat-Sale	6	6	41	159	211	346	75	61	333	572
Casablanca	2	-	32	176	291	342	107	127	432	645
TOTAL	17	17	234	699	2,633	2,422	1,105	781	3,989	3,919

Source: Bases de Rationalisation de Programme Sanitaires au Maroc, Ouakrim M'Hamed.

NOTE: Tables include only health personnel employed by the Ministry of Health.

given field training in addition to the regular course work. The drop-out rate for these nursing schools is about 10%. Because of the shortage of registered nurses, the practical nurses are often called upon to do the work of the registered nurses. This creates difficulties, for they have not been trained to fill the role of the registered nurse.

#### Veterinarians

There are very few veterinarians in Morocco; 18 were in private practice in 1975, according to the Moroccan Government. The majority are in coastal cities; Fez is the only city in the interior which seems to have veterinary care available. The other veterinarians are in El Jadida, Casablanca, Rabat, Tangier, and Tetouan. The Hassan II Institute of Agronomy in Rabat was expanded in 1971 to include veterinary medicine. The courses at the Institute are open to students who have completed two years in the Faculty of Science at the University. Training in the veterinary medicine course is to be of four years' duration with one year of preparatory work required in the Faculty of Science. Enrollment in the veterinary medicine course is unknown. Student enrollment at the Agronomy Institute of which it is a part was 40 students in 1970.

#### Other Paramedical Workers

There are a variety of other workers who are of vital importance in the provision of medical care. These include laboratory assistants, radiology assistants, anesthetist assistants, physiotherapists, and psychiatric assistants. Their numbers are included in Table 36.

Training for the above mentioned paramedical workers has been carried out at several schools primarily located in Rabat. In addition, pharmacy assistants, health statisticians, sanitary assistants, are trained in these same schools. A new College of Public Health is being organized which will consolidate the training of paramedical personnel into a single facility. As planned the school would enroll about 780 students each year, including 80 health assistants, 120 nurses, 80 psychiatric assistants, 40 physiotherapy assistants, 80 pharmaceutical assistants, 40 radiology assistants, 40 health statisticians, 80 laboratory assistants, 40 anesthetics assistants and 120 health inspectors, health visitors and social workers. Another school in Casablanca would train radiology and anesthetics assistants (40 of each) to supplement the output of the College of Public Health in Rabat. The curricula of the two schools would be identical - general education and health training for approximately one-third of the first year, and specialist training, including 50% practical training for the remainder. The second year would consist of all specialist training, with 40% theory and 60% practical training. The University Medical Centers in both cities would be used for part of the training. Implementation of this project is expected to take about five years. Training will meanwhile continue in the Rabat Schools previously mentioned. Two hundred and fifty students were enrolled during 1974/75.

#### Sanitary Engineers

There is a shortage of sanitary engineers throughout Morocco. There are a number who work with ONEP and the Ministry of Public Works in water resource development and maintenance. In 1975, six worked for the MOPH to design and guide the work of the Sanitary Assistants. Training of Sanitary Engineers began in 1971 at the Engineering School in Mohammedia. The MOPH plans to have one engineer assigned to each of the seven economic regions of the country.

Table 36

Technical and Paramedical Personnel in  
the Moroccan Public Health Service  
1975

Sanitary Engineers	6
Radiology Assistants	147
Psychiatric Assistants	59
Laboratory Assistants	198
Anesthetist Assistants	139
Obstetrical Assistants (Midwives)	175
Sanitary Assistants	187
Physiotherapists	28
Social Workers	9
Health Educators	36

Source: Ministry of Public Health

#### Hospital Administrators, Health Planners

There are no trained hospital administrators or health planners in the Moroccan public health system. Hospitals are administered by doctors who have not necessarily received any training in hospital administration and health planning is done by the top level professional staff in the Ministry, most of whom have not had formalized training in planning. Economist-administrators work directly with the doctors and perform many of the administrative duties throughout the health system, however, their activities are limited primarily to accounting and gathering of statistics. The addition of the system of a health planning staff would aid in the coordination of efforts and help to maximize the output of the entire health system. The addition of trained hospital administrators to the health system would be most valuable in relieving the administrative burden on doctors who would then be free to devote full time to direct patient care; it would also provide the hospitals with a corps of personnel who could help to improve the efficiency and increase the productivity of these facilities.

Overall the Moroccan Ministry of Public Health has designed a well-conceived program for the development of an effective and efficient health manpower supply. As the production of trained health personnel increases, population coverage of the health system is expected to improve. (Facilities at all levels are currently understaffed.) Future concerns will be the recruitment of sufficient numbers of qualified candidates for training (this is apparently already beginning to be a problem) and the quality of training. Continuing needs for re-training staff in the public sector indicate gaps in the basic training as well as a lack of refresher courses to keep personnel informed on the current state-of-the-art.

#### Traditional Healers

Theoretically, every woman is a midwife in Morocco, and although there are a declining number of indigenous midwives (gablas) who perform this service for a fee, it is quite often the neighbors or relatives who aid in a home delivery. Medicine and healing have traditionally been a part of the woman's domain in Morocco. It is she who seeks out the fquih (herbalist) to buy a cure; she goes to the marabout (holy man) to have the evil spirit exorcised. Although more and more people every year turn to the public health system for medical treatment, this treatment is often supplemented and in some cases replaced by the care of the traditional healer. When there is no money for the antibiotic prescribed by the doctor at the modern system's health center, the fquih will supply an herb or amulet at a much lower price. In addition, the

services of the traditional healers have been continually demanded because of their reported highly personalized nature. The language and cultural barrier between the French-language-trained health worker and the illiterate Arabic or Berber speaking patient often proves insurmountable and so many people return to the more comfortable, more familiar world of the traditional healers. The number of traditional healers who provide health care in Morocco is unknown, but it is entirely possible that these "health workers" reach more persons than the modern medical system.



## CHAPTER SEVEN

### HEALTH FACILITIES

During the Middle Ages, the hospitals of the Arabian Empire stretched from Persia to Spain. Their pharmacies were stocked with drugs from all over the world. Important surgical knowledge and the sciences of ophthalmology and pharmacology developed in hospitals whose facilities included such amenities as murmuring fountains, libraries, and musicians and storytellers for the sleepless.<sup>1</sup> With the decline of the Arab Empires, the center of medical knowledge shifted to Europe, and several centuries later, it was European and especially French medical practice which became the model for the modern health system of Morocco. The French colonial administration developed a health care network which by 1956 included 24 hospitals and 199 dispensaries.<sup>2</sup> Since Independence, another 16 hospitals, 194 health centers, and 540 dispensaries have been added to the health system. A network of laboratories and blood transfusion centers provide vital support for the preventive and curative services offered by the health system. In only twenty years, the Moroccan government has taken the embryonic French colonial health care system and developed it into an extensive network of health care facilities which attempts to serve 80 to 90% of Morocco's seventeen million people.

The construction of health facilities is one of the major elements in the health section of the National Development Plan. In the 1968-72 Plan and again in the 1973-77 Plan, the importance of developing the network of curative and preventive health care facilities is stressed. The construction of health facilities is based on a carefully planned hierarchy of hospitals, health centers and dispensaries. Laboratories, administration buildings, and health education centers provide a support system. According to the Plan the ideal model for a health services delivery network is outlined on the next page. (See map for illustration of a typical health district.) All patients enter the system at the dispensary level. The only exceptions are emergencies, which are referred immediately to the nearest hospital. Patients who do not need emergency care are seen by the dispensary nurse (a practical nurse usually) and if the nurse decides that the person is sick, that person is referred to the health center where outpatient curative services are offered. Only inpatient services are offered at the hospitals. Even patients recently discharged from a hospital will go to the health center for follow-up treatment. Preventive services are offered in both the health centers and the dispensaries.

At the present time there are two University Hospital Centers (Casablanca and Rabat), five regional hospitals, thirteen provincial hospitals, and twelve zone hospitals. There are also 194 health centers and 729 dispensaries. Construction planned for 1977 will add seven health centers and 98 dispensaries to the system. The facilities which should theoretically be available to provide for the health needs of the population in 1976 are listed in Table 37.

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<sup>1</sup> Simon, Men and Medicine in the Middle East, p. 38.

<sup>2</sup> 20 Years of Public Health, pp. 24, 32.

MODEL HEALTH SERVICES DELIVERY NETWORK

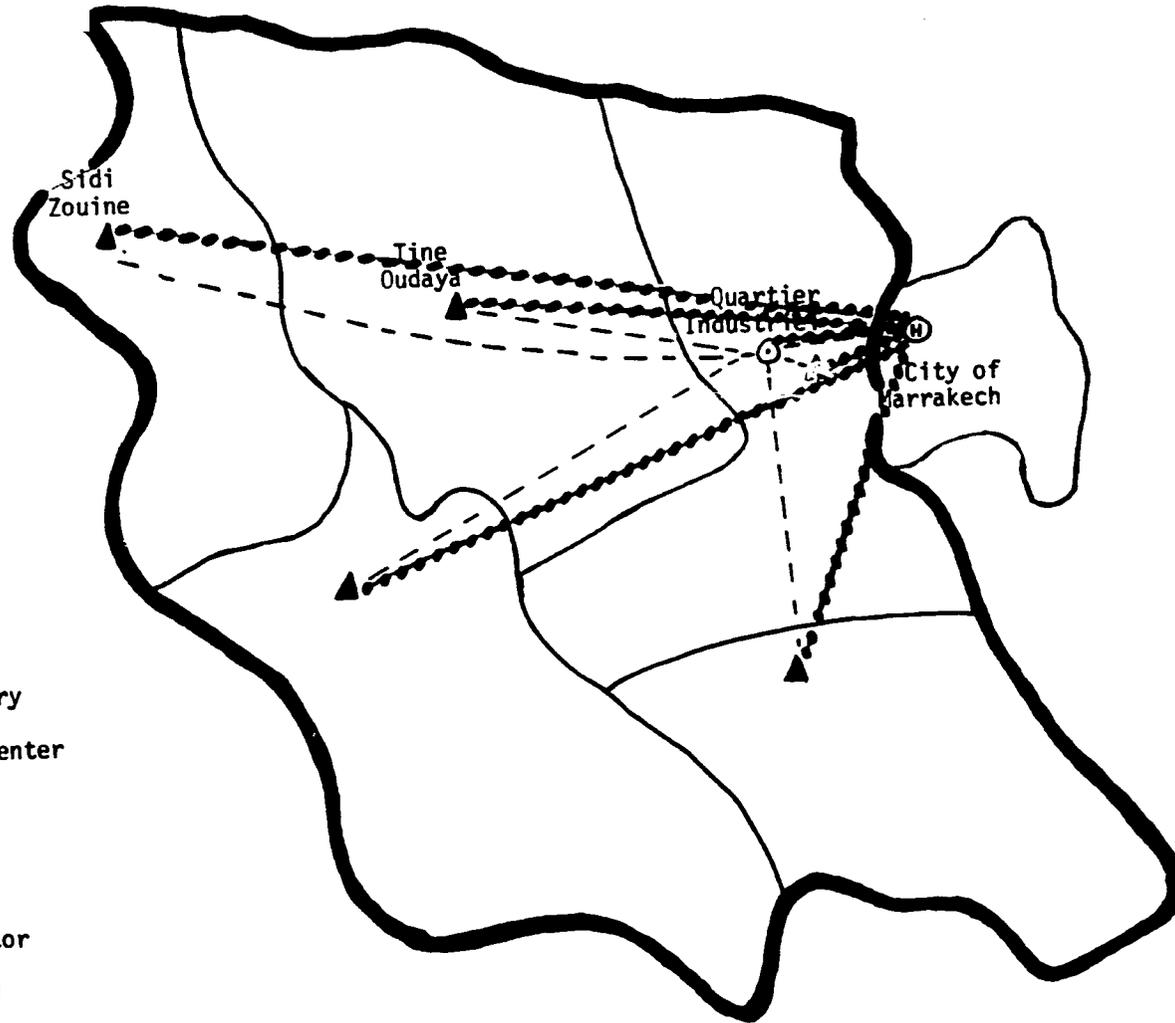
Facility	Population Coverage Planned	Geographical Division Encompassed
Dispensary	1 dispensary per 15,000 population	1 health sub-sector
Health Center	1 center per 45,000-60,000 population	3-4 sub-sectors or 1 health district (circonscription)
Zone hospital (210-250 beds)	1 per 200,000-250,000 population (4-5 health districts)	4-5 districts of 1 zone
Provincial hospital (400-500 beds)	1 per province	See map of Provinces
Regional hospital (800-1000 beds)	1 per economic region	See map of Regions
University Hospital Center (1600-2000 beds)	2 in country	Rabat and Casablanca medical schools

Table 37  
HEALTH FACILITIES AND PROJECTED NEEDS

<u>Projected Need for 1976</u>		<u>Actual Facilities Available in 1976</u>
1197	Dispensaries	739
399	Health Centers	194
72	Zone Hospitals	12
30	Provincial Hospitals	21
7	Regional Hospitals	5
2	University Hospital Centers	2

(Based on CERED population estimate of 17,964,724 in 1976 and model number of health facilities as described on previous pages.)

Illustration of a Typical Health District  
MAP 1



- ▲ Dispensary
- ⊙ Health Center
- Ⓜ Hospital
- District
- Sub-sector
- Referral
- Emergencies

Marrakech Province, Quartier Industriel Health Circumscription (District)  
with Health Center and Sub-sectors with Dispensaries

The geographical distribution of these MOPH hospitals, health centers, and dispensaries is, illustrated on Maps, 2, 3, & 4.

### Inpatient Care

In addition to the hospitals described above, there are another 40 general and specialized hospitals and some 59 health centers which offer inpatient care. The number of hospitals and health centers with beds and beds per 100,000 population is shown in Table.38. The distribution of hospital beds is very uneven. The three provinces which have no inpatient facilities were just created last year, so presumably the development of inpatient facilities will be included in the 1977 budget and in the new development plan. The fact that Settat has the highest bed/population ratio is somewhat deceiving for a 1900-bed long-term psychiatric care facility is included as part of that province's hospital bed capacity. This is one of two such facilities which provide mental health services for the entire nation. The bed/population ratio in the province excluding this facility is 104.7/100,000. Rabat, Casablanca, Tetouan, Tanger, Meknes, and Agadir have the most favorable bed/population ratios. With the exception of Agadir, these are among the most urbanized provinces in Morocco.

Each general hospital has sections for surgery, internal medicine, obstetrics and gynecology, and pediatrics. Other services provided vary according to the size, age and location of the hospital. There are blood transfusion facilities in 27 locations, laboratory facilities of varying quality in most hospitals, x-ray equipment, and a scattering of other specialized equipment which has not been completely inventoried. The only outpatient care provided by the hospitals is emergency care. All other outpatients are referred to the health centers for treatment.

Specialized hospitals include two psychiatric hospitals, five rehabilitation hospitals, a maternity hospital and an ophthalmology hospital in Rabat, and a leprosarium in Tetouan (which has only 45 beds and a 20% occupancy rate).<sup>3</sup> In countries where leprosy has been brought under control, the occupants of leprosariums are quite often older people who were disfigured and disabled by the disease many years ago. They have no family, no other home, and no source of income. The small number of cases of leprosy reported in Morocco suggest that the disease has been controlled there and that the patients in the leprosarium will remain there as wards of the state until they die.

The hospitals in Casablanca and Rabat are staffed and equipped to provide care in the following specialities: orthopedics, neurology, neuro-surgery, urology, rheumatology, infant surgery, and cardiology.

Occupancy rates for the hospitals averaged about 74.3% in 1975 according to the Ministry of Public Health, but the range from one hospital to the next is quite wide, from 25.6% to 109.8%. The statistics on occupancy rates seem to indicate some organizational and administrative problems. In the hospital in Tiznit, for example, the 1975 occupancy rate was 91.6%. In 1976, the occupancy rate fell to 18%. In 1975, Tiznit was part of Agadir Province and presumably shared the health manpower resources of that province. In 1976, Tiznit became administratively independent; the low occupancy rate suggests that adequate personnel may not have been assigned to the new province to maintain services at the previous level. The statistics on health care provided in Tiznit indicate that the services at the hospital were in fact severely reduced. From 1975 to 1976, examinations by doctors dropped from 2503 to 284. During this same period paramedical care encounters dropped from 595 to 86.

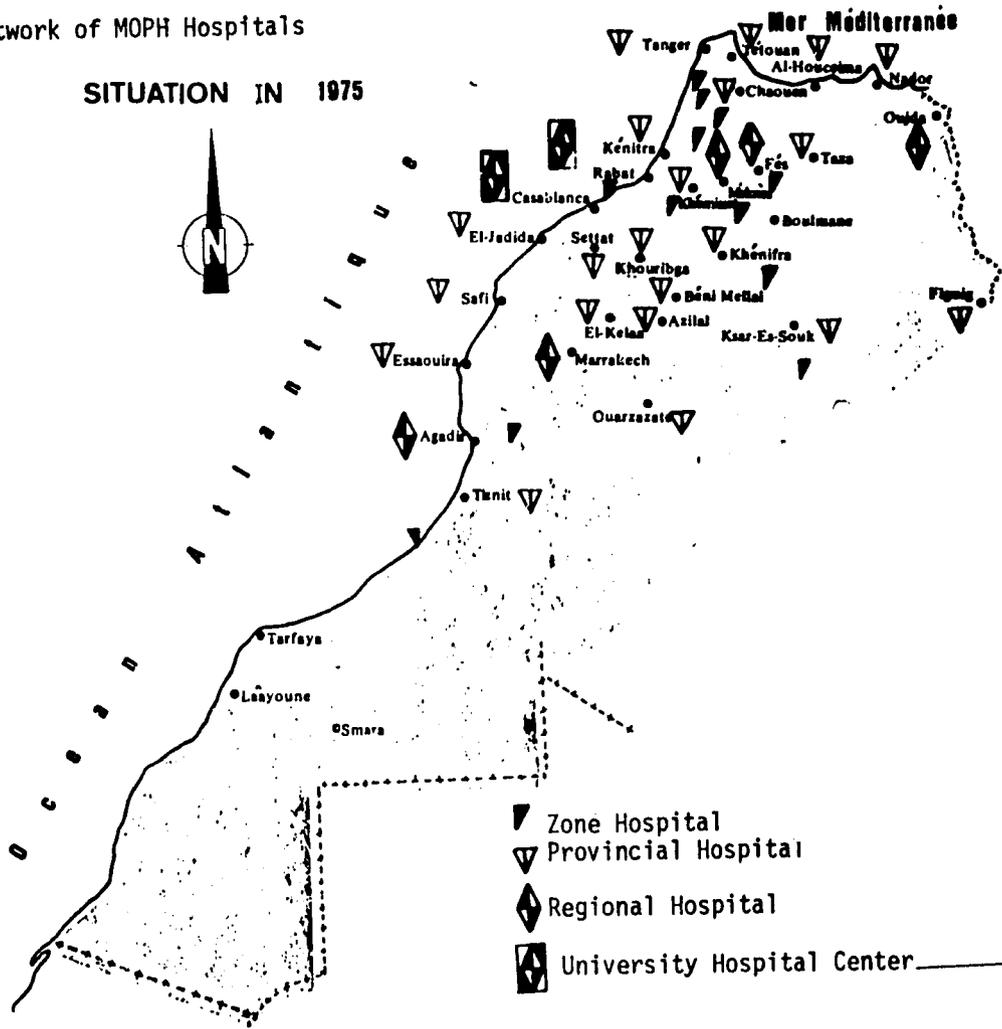
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<sup>3</sup> See Health Status section-Leprosy.

Map 2

Network of MOPH Hospitals

SITUATION IN 1975

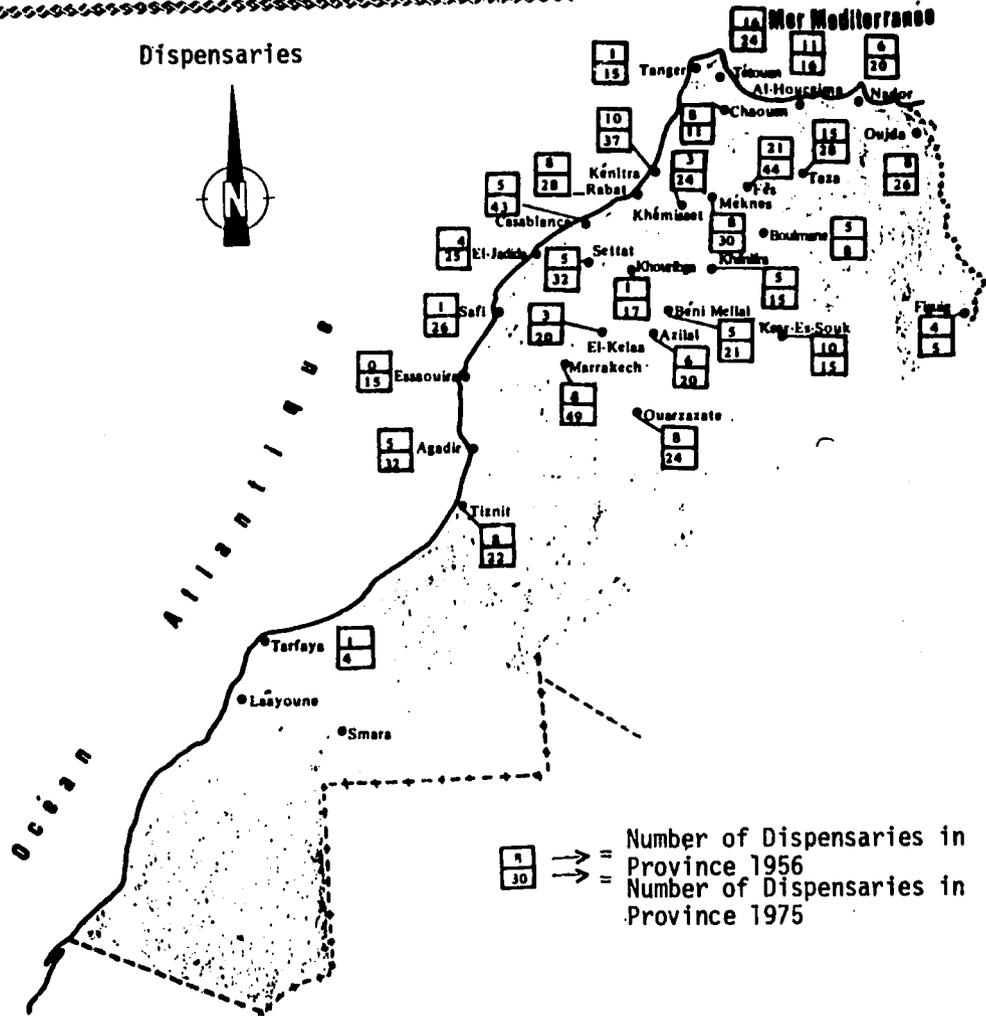


Source: 20 Années de Santé Publique, 1956-1975, Ministry of Public Health.



Map 4

Network of MOPH Outpatient Facilities



Source: 20 Années de Santé Publique, 1956-1975, Ministry of Public Health.

Table 38

## Hospitals and Health Centers with Beds, 1975

Provinces and Prefectures	No. of Hospitals	No. Beds	Health Centers	No. Beds	Beds/10,000 Pop.
Agadir	5	1,412	4	165	185.5
Al Hoceima	1	309	1	40	127.8
Azilal	--	--	--	--	--
Beni-Mellal	1	223	5	105	66.9
Boulemane	--	--	--	--	--
Chaouen	--	--	--	--	--
El Jadida	2	541	--	--	82.5
El Kelaï-Sraghna	1	162	2	42	39.5
Essaouira	1	234	--	--	57.8
Fez	7	1,609	6	200	160.0
Figuig	--	--	2	49	49.7
Kenitra	4	637	4	107	71.3
Khemisset	2	136	--	--	35
Khenifra	2	228	--	--	83
Khouribga	1	50	1	22	19
Ksar-es-Souk	3	351	2	54	110
Marrakech	5	1,518	3	63	142.6
Meknes	5	1,402	2	49	211
Nador	1	287	1	20	57.8
Ouarzazate	2	321	4	136	78.6
Oujda	2	708	4	90	119
Safi	1	617	--	--	103.7
Settat	4	2,606	3	73	360
Tanger	4	554	--	--	167.4
Tarfaya	--	--	3	61	76.5
Taza	2	274	6	118	66.6
Tetouan	6	1,245	2	90	219.9
Tiznit	1	160	--	--	41.1
Casablanca	8	3,615	--	--	179.8
Rabat	6	2,209	4	50	302.8
Total	77	21,408	59	1,534	22,942

Source: Ministère de la Santé Publique

The situation in Tiznit is an exception, however. An examination of the activity records published by the Ministry of Public Health shows considerable variation over this period; some hospital occupancy rates actually increased where staff levels remained constant while lower occupancy rates were noted in some facilities where staff numbers increased.

In government publications, occupancy rates are averaged for all of the hospitals in each province rather than by type of hospital despite the fact that this latter measure is generally more useful for an analysis of operational efficiency. The cost of maintaining one unoccupied hospital bed for one year is about \$50,000 in the United States. Although the cost per bed per year is not known for Morocco, the average occupancy rate of 74% is well below the 80-85% occupancy rate which is usually considered necessary to maintain the investment in hospital space.

There is no information currently available on the utilization rates of the various hospitals and their services. Such a study might suggest that it would be possible to increase the utilization rate of hospitals by grouping certain kinds of services in one area or another. As it is now, the wide variations in occupancy rates from one facility to another and from one year to another must make it extremely difficult to plan staffing levels and to allocate supplies and equipment. It is not possible to state the reasons for the variations in occupancy rates other than to note that Morocco does not have a cadre of trained hospital administrators, therefore, the efficiency of hospital operations depend to a large extent on the administrative capabilities of the particular doctor who is director of the hospital, and on the amount and quality of staff support he receives. The wide variations in the efficiency of hospital operations suggest that the standardized procedures for hospital administration should probably be reviewed.

#### Outpatient Care

The outpatient facilities of the Ministry of Public Health are designed to provide for the integrated delivery of health services. Each facility is designed to serve a particular population group, as previously mentioned. As can be seen by the number of facilities needed and actually available, the system cannot provide all of the health care that is considered necessary and desirable. The extreme overcrowding of urban health services and the under-utilization of rural dispensaries which provide limited care point to two of the major problems with the health care system in Morocco - chronic shortages of resources and poor utilization of those that do exist.

The geographical distribution of the outpatient facilities is uneven, more so for health centers than dispensaries. In 1975, the total population covered by the services of a single dispensary ranged from 14,000 per dispensary in Safi to 46,764 per dispensary in

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<sup>4</sup>Bulletin Trimestriel D'Information Sanitaire No. 1, 1976, p. 88.

Casablanca and 77,880 in Tiznit. The health centers, which are designed to provide outpatient care for a population of 45-50,000 people, in fact must serve an average of 84,000 people each with a range of 34,350 in Meknes to 165,350 in Tanger. In eight provinces, the health center services are used by population groups of over 100,000 people per center. (See Table 39.)

Utilization of the outpatient facilities also varies. According to the statistics on medical attention provided by each health care facility, the per capita per year number of visits to either a health center or a dispensary for any reason ranged from .13 visits per capita per year to 5.1 visits per capita per year.<sup>5</sup> The average number of visits per capita is never below 3 in urban areas, while it rarely rises above that in rural areas. According to an as yet unpublished study of an urban health center in Rabat, approximately 25% of visitors to the health center were men, 30% were women, and almost 50% were children.

Because of the relative autonomy of each Provincial Medical Chief the organization of health services can be quite different from one province to the next. Occasionally, a facility will be closed for lack of staff. In 1975, eight provinces did not provide services in at least one dispensary within the province.<sup>6</sup>

The basic preventive services provided by the health centers include prenatal and post-natal care for women, family planning, nutrition education, and vaccinations (DPT, polio, BCG, smallpox). Curative services may include treatment for eye infections, contagious diseases, tuberculosis, and other diseases depending on the staff and equipment available. In some dispensaries, doctors will provide care occasionally; others are never visited by a doctor. The rural health centers and dispensaries depend to some extent on the outreach work of the itinerant nurses to attract patients. If special services (such as vaccinations) are to be offered only at irregular intervals, (which is sometimes the only possibility) the itinerant worker must make sure that the people in outlying areas are informed about the service and are encouraged to use it. In the urban areas, facilities are usually not as far away and word spreads quickly when new services or special programs are instituted.

#### Family Planning Reference Centers

A National Family Planning Reference Center has been constructed in Rabat and 12 others were scheduled for installation in other provinces in Morocco during 1976. These centers were partially financed by international assistance (see Health Programs). Some were to be new buildings, others were to be renovations of existing buildings. The center in Rabat is used for administrative purposes. The other centers are to be used to deliver family planning and other health services for women.

#### Laboratories

The laboratories in Morocco are organized along the same lines as the hospitals - zone, province, region, and nation. All of the laboratories below the national level are equipped to perform tests in bacteriology, parasitology, chemistry, and hematology. They are expected to take care of individual diagnostic procedures, epidemiological testing, environmental

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<sup>5</sup> 1975 Bulletin Annuel D'Information Sanitaire.

<sup>6</sup> Agadir-2, Beni Mellal-1, Kenifra-6, Khouribga-4, Meknes-1, Ouarzazate-1, Oujda-1, Taza-1, Per Bulletin Annuel D'Information Sanitaire, 1975.

Table 39

## MOPH Health Centers and Dispensaries - 1975

Province	Health Centers		Pop. ** Served	Urban Disp.	Rural Disp.	Served ** Pop.
	Urban	Rural				
Agadir	13	2	56,527	5	45	16,958
Al Hoceima	1	5	45,567	2	17	14,389
Azilal	--	--	--	--	--	--
Beni-Mellal	1	5	81,617	1	31	15,303
Boulemane	--	--	--	--	--	--
Chaouen	--	--	--	--	--	--
El Jadida	2	5	93,700	4	22	25,227
El Kelaâ	--	5	103,140	1	24	20,628
Essaouira	--	--	--	--	--	--
Fez	6	8	80,714	10	38	23,542
Figuig	--	2	49,300	--	--	--
Kenitra	1	8	115,944	8	30	27,460
Khemisset	--	3	129,200	2	22	16,150
Khenifra	1	1	137,550	1	14	18,340
Khouribga	1	2	124,000	1	16	21,882
Ksar-es-Souk	--	5	73,380	-	15	24,460
Marrakech	7	5	92,442	18	34	21,333
Meknes	12	8	34,350	14	16	22,900
Nador	1	6	75,900	2	18	29,065
Ouarzazate	1	4	116,280	--	21	27,686
Oujda	2	8	66,970	10	16	25,758
Safi	5	7	49,608	11	30	14,520
Settat	1	9	74,410	1	31	22,253
Tanger	2	--	165,350	7	2	36,744
Tarfaya	--	--	--	--	4	19,925
Taza	1	7	73,550	1	29	19,613
Tetouan	8	8	37,962	10	26	16,872
Tiznit	--	--	--	--	5	77,880
Pref. Casablanca	16	--	125,675	36	7	46,763
Pref. Rabat-Sale	8	--	33,225	20	8	26,636
TOTAL	89	113		165	574	
		202*			739	

Source: Ministry of Public Health

\* Does not agree with latest total of 194 released by Ministry.

\*\* Indicates population served per facility.

sanitation measures (water and food inspection) and inservice personnel training. In 1975 there were 33 laboratories in Morocco which provided most of the above services. Other national laboratories and their functions include the following:

Pasteur Institute of Morocco - Casablanca - research on production of serums and vaccines

National Laboratory of Virology

- surveillance of viral diseases in Morocco, especially polio, trachoma, and hepatitis
- control of viral vaccines

National Laboratory for the Control of Medicines

- quality control of all medicine and pharmaceuticals destined for human or animal use

National Center for Blood Transfusions

- blood collection, storage, and distribution to hospitals

### Emergency Care

All of the hospitals in Morocco must provide emergency care but only a few are specially equipped to do so. The emergency units at the Sidi Othman and Averroes Hospitals in Casablanca are staffed 24 hours a day with two doctors and two interns. The Averroes emergency department has 20 beds and is equipped with an anesthesia system, a recovery room, and several other specialities. Provincial hospitals are not always sufficiently staffed to provide physician care around the clock.

### Diagnosis Center - Rabat

In September 1975, a diagnosis center was opened in Rabat to concentrate the previously separated equipment and specialists necessary for full diagnosis of patients with special health problems who have requested care through the public health service. Patients are sent to the center only if the doctor of the health district in which they reside deems it necessary, as there is a limit to the center's capacity. The center consists of two wings, the laboratory wing and the operating wing. The latter is divided into ten units with identical designs according to specialities; neurology, pediatrics, cardiology, etc. The center is equipped with up-to-date equipment from an electronic lancet to the most modern x-ray device. The center's pride, however, is a device called "futralix" which is a remote-controlled robot with a TV circuit which makes it possible to locate disease in a patient. Medical specialists work at the center in shifts which provide 24 hour coverage. They are assisted by a permanent staff of six pharmacists, one doctor in biology, ten registered technicians and seven auxiliary technicians. During the first 12 days of existence, the center registered 4,337 specialists examinations, 5,098 laboratory tests, and 702 x-ray examinations.

## Supplies, Equipment, Pharmaceuticals

The majority of Morocco's medical supplies and equipment are imported. The 1974 report on foreign trade lists over sixty million dirhams<sup>7</sup> worth of medical equipment imported from abroad. Included were an electrocardiograph, x-ray equipment, dental equipment, anesthetic equipment, syringes, and respirators. Major suppliers include France, the Low Countries, West Germany, Italy and the U.S.S.R..

Within the public health clinics, basic clinical equipment including a sterilizer and a refrigerator for cold storage appear to be available even in small dispensaries. Equipment is repaired locally if possible, or returned to Rabat for either repair or replacement if it is not. It was not possible to assess the effectiveness of this system.

Each province has a fleet of ambulances and other vehicles for the transportation of patients, medicines (each has one vehicle equipped with cold storage) and supplies. In 1976 there were a total of 300 ambulances and 800 other vehicles at the disposal of the public health authorities. In addition, itinerant nurses and heads of rural health sectors shared a total of 724 motorbikes and 800 bicycles. The number of vehicles is determined by the size of the province and the number of health facilities which must be served. There are not sufficient vehicles to provide all of the health services which are programmed. For example, the Maternal-Child Health nurses (PSE) travel each week to the rural dispensaries in their respective province to provide services such as nutrition education and vaccinations, to conduct surveillance for malnutrition, and to refer pregnant women to the health centers for prenatal care. There are 127 rural health centers which should be providing this outreach service, but there are only 79 vehicles allotted to the PSE program.

## Pharmaceuticals

Morocco manufactures many of its own pharmaceutical products. Toxic and narcotic drugs, injectables, yeast-based and ophthalmic drugs are imported. By law, all others are manufactured in Morocco. Raw materials are often imported from Europe. Some vaccines and antibiotics which would prove too expensive to produce in country are also imported. The standards of the French Codex are used for the classification of pharmaceuticals. In 1974, over fifty-one million Dirhams worth of pharmaceuticals were imported. Western Europe, especially France and Italy, is the major supplier.

## Private Sector

There is no single source of information concerning the health care facilities which are available in the private sector. There are seven private clinics in Rabat with 6-30 beds each (most have 20). They offer OB-GYN services and some general surgery services. The American Joint Distribution Committee operates three dispensaries, two MCH centers and a medical program for the aged, all in Casablanca. There are four homes for the aged in Casablanca, Marrakech, Tetouan, and Tanger which provide health care services for their residents. The Moroccan Family Association has seven clinics in four urban areas and one rural area which offer family planning services primarily to women. IPPF provides some financial support for the Association (See Health Programs International Assistance).

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<sup>7</sup>Exchange rate 4.5 DH = U.S. \$1.00.



## CHAPTER EIGHT

### HEALTH PROGRAMS

The majority of health programs in Morocco are under the direction of the Ministry of Public Health. These programs emphasize the integrated delivery of health services. Nevertheless, there are a series of programs which are organized as discrete services within the multipurpose health facilities.

M.C.H. (Maternal & Child Health)

School and University Health

Family Planning

Campaign against Infectious Diseases

Anti-Tuberculosis Campaign

Malaria Eradication

Environmental Sanitation

Health Education

#### Maternal and Child Health Programs (PSE)<sup>1</sup>

The primary goals of the program are to prevent malnutrition, to prevent the infectious diseases of childhood, and to improve maternal health. Children from birth to age two are included in the program. After that, they attend the regular health facilities. The PSE activities are carried out in the health centers in rural areas and in the dispensaries in urban areas. There were approximately 300 PSE programs in operation at the end of 1976. The emphasis in the programs is very much on the children, which is evident from the suggested schedule for PSE activities. The activities of the program include the following:

- vaccinations - B.C.G., smallpox, DPT, and polio
- nutrition education - food preparation demonstrations and supplementary feeding according to medical prescription for malnourished children
- prenatal and postnatal consultations (including examinations of mother and infant, medical history, identification of possible-complicated deliveries for referral to physician, urine test, health education--relevant to pregnancy and delivery. Family planning services are offered during post natal clinics).

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<sup>1</sup>Protection de la Sante de l'Enfant.

- administration of three doses of Vitamin D (600,000 units per dose) at six month intervals to prevent rickets
- the weight and height of children is measured on 14 occasions between birth and age two. Referral for curative treatment is made, if necessary, to the clinic triage, the health center curative services or to the hospital pediatric service

The amount of time devoted to each of these activities is illustrated by the suggested weekly schedule published by the MOPH. Not all health centers follow this schedule exactly. The schedule may be modified by the Provincial Medical Chief in consultation with the PSE staff members.

#### Suggested Schedule for PSE Activities

<u>Monday</u>	<u>Tuesday</u>	<u>Wednesday</u>	<u>Thursday</u>	<u>Friday</u>
A.M. Nutrition Demonstration and Supplementary Feedings of Malnourished Children	Same as Monday.	Post Natal Consultation including BCG and Vitamin D Supplementary Feedings	Same as Monday.	Same as Monday.
P.M. Prenatal Consultation	Weight & ht. Smallpox vac. Vitamin D	DPT Polio	Same as Tuesday.	Home visits Staff meetings

The PSE staff will sometimes travel to rural dispensaries to provide some of the same services. This is done at most on a monthly basis. The itinerant workers in the sub-sector which the dispensary serves are responsible for discovery of malnourished or sick children and pregnant or recently delivered mothers who should be informed of the scheduling of the PSE clinic. The PSE service assumes that a mother with child can and will walk no more than five kilometers for these services. The program has grown rapidly since its inception. In 1975, the program was estimated to be reaching almost 200,000 children. This represents approximately 15% of all Moroccan children 0-2 years of age (see Table 2 - Population by Age and Sex in Section on Population). Prenatal and postnatal consultation were conducted for over 300,000 women. More PSE centers will be organized as the health personnel and facilities become available. The major goals of the PSE service at the present time are to increase the number of vaccinations given, to find malnourished children at an early stage of the problem, to provide more and better care for malnourished children, and to provide more prenatal care.

#### School and University Health

This program has several facets.

- Vaccinations including DPT, polio, smallpox and BCG for those who do not have proof of vaccination from a doctor or public health clinic
- Surveillance for eye diseases, particularly trachoma and conjunctivitis and also for infectious diseases including tuberculosis
- Inspection of educational facilities to insure their safe, sanitary condition

- Referral of any obvious health problems to public health facilities for diagnosis and treatment

This program covers all public and private schools at all levels.

### Family Planning

The family planning program in Morocco was established in 1966 after economic and demographic studies by outside experts defined the nature and extent of the population explosion which is occurring in Morocco. The law which forbade the advertising and sale of contraceptives was rescinded and the abortion law was modified to permit abortions to save the mother's life. A Royal Decree established a High Commission on Population, however, this group has not been very active.

The family planning program began in 1966 with the IUD the only method of contraception offered. In 1969, pills were introduced and soon became the most popular method. By 1975, there were 60,000 new acceptors of pills versus only 7,500 first acceptors of IUD's. Pills must be prescribed by a physician initially, but refills may be distributed by a paramedical worker if a short questionnaire reveals no problems. The IUD may be inserted by a physician or a trained midwife. Condoms, foams and jellies are available but are not widely used. A 1972-73 study of continuation rates revealed that three years after acceptance, 57% of IUD acceptors were still using some method of birth control while only 23% of pill acceptors were. Further, 67% of IUD acceptors and 37% of pill acceptors had managed to avoid pregnancy for three years.<sup>2</sup> In the short run, the drop-out rate is even higher. It has been estimated that within a single year, for every ten women who become new acceptors, six drop out of the program.<sup>3</sup> In 1975 alone the increase in the number of women protected was only one-fourth of the increase in women in the fertile years. It is estimated that only 3% of women at risk are protected by the family planning program of the MOPH.<sup>4</sup> Thus the coverage of this program is even more limited than that of the PSE program. (See Table 40.)

Tradition is the most obvious reason cited. In the past, many sons meant a strong tribe, and "seven sons and seven pilgrimages to Mecca" were looked upon as man's greatest blessing. The right of repudiation creates an atmosphere in which women are made to feel very much at the mercy of their husband's whims. A husband who expresses reservations about the use of birth control for whatever reason will usually have his way, regardless of his wife's desires. The use of any type of preventive measure relating to health needs is a fairly new concept in Morocco. The abortion rate in Morocco, which is estimated to be as high as 250/1000 live births, attests to the fact that Moroccan women do not necessarily want all the children they are having, and so they continue to use a more familiar curative measure, rather than an unknown and poorly understood preventive measure. The religious leaders in the Muslim world have interpreted the Koranic writings which relate to the use of birth control measures in various ways, and the different political factions in Morocco are quick to support the view which is most politically expedient. This has not always favored the family planning programs, and at times, has resulted in vigorous attacks on it. The other reasons all relate to the

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<sup>2</sup>Report of the Evaluating Team on the Morocco Family Planning Program, p. 37.

<sup>3</sup>Ibid., p. 40.

<sup>4</sup>Ibid.

Table 40  
Additional Women at Risk and New Acceptors (IUD, Pill, Condom), 1969-1975  
Government of Morocco National Family Planning Program, Rabat

Calendar Year	Population Mid-Year	WOMEN AGED 15-49 YEARS				NEW ACCEPTORS		
		Percent	Number	Annual Increase		Number	Percent Q15-49 + G	Annual Index of National Coverage
				Percent	Number			
column: A	B	C	D	E				
1968	13'851'545	22.65	3'137'375					
1969	14'308'097	22.60	3'233'630	3.066	96'255	21'304	0.66	21.5
1970	14'779'769	22.55	3'332'838	3.068	99'208	25'067	0.75	24.4
1971	15'267'350	22.50	3'435'154	3.070	102'316	28'953	0.84	27.4
1972	15'771'436	22.45	3'540'687	3.072	105'533	27'478	0.78	25.4
1973	16'292'613	22.40	3'649'545	3.074	108'858	37'030	1.02	33.2
1974	16'831'474	22.35	3'761'834	3.077	112'289	55'396	1.47	47.7
1975	17'388'633	22.30	3'877'665	3.079	115'831	72'179	1.86	60.4
1976	17'964'724	22.24	3'995'355	3.035	117'690	( 121'459	3.04	100.0) <sup>1)</sup>

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- A)** GOM Population Projections, CERED, Publication No.14, Sept. 1975, Page 8, 1971-1976. Backprojections 1970-1968, rb.
- B+C)** GOM Population Projections, CERED, Publication No.15, Oct. 1975, Page 7, 1971 & 1976. Backprojections 1970-1968, rb.
- D+E)** Percent and Number Increase of Women aged 15-49 Years. Backprojections, rb.
- F)** Number New Acceptors. 1969-1973: Lecomte, J. and Abd-El-Kadar-Laraqui. Morocco in Family Planning Programs: World Review 1974. Studies in Family Planning, 6:8, August, 1975. 1974-1975: Dr. Oakrim, personal communication to rb.
- G)**  $G = F/C$ . New Acceptors per 100 Women aged 15-49 Years in that calendar year. New Acceptors of either Pill, IUD, or Condom
- H)**  $H = G/D$ . Ratio of (New Acceptors per 100 Women aged 15-49) to (New Women aged 15-49 per 100 Women aged 15-49).  
This Ratio may serve as an INDEX of PERFORMANCE of the National Family Planning Program. Index 100 = Ratio 1.
- I)** Number and Percent New Acceptors required in 1976 to reach Index 100. New recruitment would then equal the Additional Women at Risk.
- Source: Report of the Evaluating Team on the Morocco Family Planning Program, A.P.H.A., Feb. 1976.

availability and delivery of family planning services by the MOPH and by the private sector. The promotion of family planning is very limited. Posters, pamphlets, audio-visual materials have not been utilized in health facilities or elsewhere to the extent necessary to raise public awareness of the program and explain the different family planning methods. Training of health workers did not include education in family planning techniques until 1969, therefore, there are still a great many health workers who cannot provide adequate services for this program. Outreach work is limited by the number of health workers available. The majority of Moroccan women give birth at home and receive no prenatal or postnatal care. Opportunities for communicating with them about family planning are therefore rare. The triage system used in the health facilities proves to be an obstacle to the quick and convenient delivery of family planning services. Since this is a preventive, rather than a curative service, the urgency to receive the service is not great, and the long lines at crowded health facilities may encourage women to postpone their visit indefinitely. The hurried attitude of health workers which is due to the pressures on them to serve too many patients results in an incomplete explanation of birth control methods and their side effects, no time for questions, and little or no consideration for the sensibilities of the individual patient. The future success of the family planning program in Morocco will depend to a great extent upon modifications of the present program which are designed to raise awareness of the program, to increase the outreach activities so that more women are included in the program, and to improve the delivery of services so that more women will accept family planning services and continue to accept them on a long-term basis.

#### Campaign Against Infectious Diseases

The campaign against communicable diseases is one of the oldest health programs in Morocco. It has registered some notable successes, such as the eradication of smallpox (approximately 80% of the population of Morocco have been vaccinated). Vaccination programs for diphtheria, tetanus and whooping cough began in 1963. One and a half million DPT vaccinations were administered in 1975.<sup>5</sup> Six hundred thousand doses of polio vaccine were also administered in 1975. Vaccinations are offered through the PSE program and the school health program. It is impossible to know how many children have been protected because there is no method for tabulating the number of children who receive one, two, or all of their DPT injections, or the number who receive the complete polio series. The border health authorities work under the direction of this division of the MOPH to prevent the entry of infected persons into the country. There are now 15 frontier control stations and a total of 30 special agents to man them. In addition to these two preventive programs, statistics on the reportable communicable diseases are collected from the health facilities and monitored in order to control epidemics and provide special medicines or other services as necessary.

#### Anti-Tuberculosis Campaign

There is a special anti-tuberculosis dispensary in almost every Moroccan province. (See Chapter on Health Status). These aid in the diagnosis of the disease and provide regular outpatient treatment. Inpatient care is provided at a special tuberculosis hospital in Settat and in some of the provincial and regional hospitals as well. There are an estimated 4800 hospital beds in Morocco which are available for tuberculosis patients. The tuberculosis patient who is unable to work may apply for a subsistence allowance which ranges from 125 Dirhams per month for a single person to 300 Dirhams per month for a married person with six

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<sup>5</sup>20 Years of Public Health, p. 89.

children. The MOPH has limited funds available for this purpose, so not all tuberculosis patients can receive it. In most provinces, funds are allocated on a first-come, first-served basis. The total number of people who benefit from this program is unknown. The preventive program is also an important component of the tuberculosis program. The preventive activities are carried out in the schools (BCG vaccination campaign), the PSE clinics (BCG), and in the health centers where radiology facilities are available. Over one million chest x-rays were done in 1975. The number of examinations has increased steadily over the past 22 years and the number of cases of tuberculosis reported has remained steady, which may indicate a declining incidence particularly in view of the population growth during this period.

#### Malaria Eradication

The wide variety of favorable malarial mosquito breeding grounds (see Health Status) has made it necessary to continue a program of spraying, especially in the damp coastal areas of Morocco and in the irrigated areas. The surveillance activities have increased appreciably; over 1.5 million slides were made and examined in 1975 in the public health facilities. The results have been very positive (283 cases in 1975 versus 97,599 cases in 1956) but the campaign will have to continue if the incidence of malaria is to remain low.

#### Environmental Sanitation

The environmental sanitation programs in Morocco combine the efforts of the MOPH sanitary engineers and sanitary assistants with those of the local government. The quality of food and potability of water are among the major concerns of the program, as well as the disposal of liquid and solid wastes. The shortage of trained sanitation workers has always meant that the quality of water supplies is not adequately monitored, the inspection of markets and restaurants is irregular, and the methods used for the disposal of waste materials are not always adequate. Although the increases in trained sanitary workers will ameliorate the problem of staff shortages, the additional problem of the division of responsibility between several ministries and several levels of the government remains to be solved. (The Ministries of Public Works and Interior are responsible for water supplies, the Provincial Governors report directly to the Prime Minister, the Ministry of Public Health provides sanitation workers, and the Ministry of Agriculture is responsible for irrigation water, food production and distribution.)

#### Health Education

Health education is one of the most important functions of a health program, particularly in a country where illiteracy is high and the standard of living has traditionally been low. The effective use of health education can help to change attitudes and habits, inform people of the benefits of good health care, and promote cooperation with the health establishment in the improvement of the health environment. The health education program in Morocco has two parts - the health educators (animateurs) who are in charge of the health education program in each province, and the printed materials and audio visual materials which are produced primarily in Morocco. They are developed by the Bureau chiefs in the MOPH who are in charge of particular health programs. Theoretically there should be several specialized health educators in each province - one for family planning and PSE, one for malaria, one for tuberculosis, one for public and personal hygiene, and one for communicable diseases. There were 18 malaria health educators and 18 general health educators in Morocco's 30 provinces in 1975. There is a noticeable lack of posters and printed material in health centers and clinics throughout the country. One of the constant complaints of family planning workers is the

lack of audiovisual materials. (The one movie available in most provinces has been seen many times by most of the women who attend the clinics). The lack of health education materials even extends to the posting of schedules for health center programs and hours of operation. A mobile health education unit is available in each province but when repairs have to be made, the truck sits idle in Casablanca or Rabat for as much as four or five weeks while the repairs are made. The vast distances which must be traveled in some areas and the large concentrations of people in other areas makes it difficult for one audiovisual unit to meet the needs of an entire province.

### Social Security

In 1961, a social security system was introduced in Morocco for the first time. The CNSS (Caisse National de Security Sociale) is a financially autonomous agency which is under the general supervision of the Ministry of Labor. The system offers minimal benefits for old age, illness, disability and death, and maternity benefits and family allowances as well. Only regularly employed salary and wage earners in industry and commerce are covered (approximately 15% of the Moroccan labor force). Most insured workers are unionized employees. Seventy-five percent live in Casablanca. Workers who are specifically excluded from the system are agricultural workers, domestic employees, railroad employees, and part time workers.

The system is financed by a contribution of 5% of each employee's salary from the employer and 2.5% from the employee. Employees with a minimum of 180 months (15 years) of contributions are eligible for a pension at age 60. The minimum pension is 20% of the average annual earnings during the three years prior to retirement. It is increased by each year of contributions up to a maximum of 40% of salary. Disability benefits equal to 20-40% of salary are paid to those with a minimum contribution of 60 months (5 years). Widows receive 50% of what would have accrued to the insured person, and orphans receive a 25% share.

Sickness benefits up to 50% of earnings are paid from the seventh day up to 26 weeks of illness. It is necessary to have worked at least 54 days in the four months prior to the illness in order to receive sickness benefits. To receive maternity benefits, it is necessary to have worked 108 days during the ten months prior to confinement. Benefits run for ten weeks and represent 50% of salary. The time used for maternity leave may not include more than six weeks of leave before the birth or eight weeks after. There are no medical benefits for sickness or maternity leave.

Before the development of the social security program, a work injury program was established (in 1927) by the Work Accident Service of the Ministry of Labor. It is financed by a direct contribution of the employers or by liability insurance sold by private companies. Benefits include 50% of pay for a temporary disability for the first 28 days and 2/3 of pay after that until a medical doctor certifies a complete recovery. There are no minimum employment periods necessary to qualify for benefits. For a permanent disability, the amount of the benefit is governed by the degree of disability. Medical benefits and nursing care are also authorized if necessary. In case of death, the employer pays for the funeral. Widows receive a pension of 30% of earnings if the worker was under age 60 and 50% of earnings if the worker was over age 60.

### Other Health Programs

The Moroccan League for the Protection of Children operates dispensaries and 30 nursery schools in Casablanca and other cities. The program includes health, sanitary education, nutrition, and a pre-school educational curriculum.

The National Moroccan Women's Union operates a wide variety of programs which include daycare centers and nutrition centers.

The Moroccan Family Planning Association, a private, voluntary organization, was founded in 1969 by a group of Moroccan doctors and prominent Moroccan women. The International Planned Parenthood Federation provides approximately \$100,000 per year to support the activities of the MFPA. The total operating budget of the Association was \$127,000 in 1975. The Association considers information and education to be important functions; a national family planning postage stamp was designed by the President of the Association, and posters and booklets have also been designed and produced by the Association. In 1975, the MFPA participated in an experimental project funded by the Ford Foundation in which women were used as family planning promoters in the "hammams" (Turkish baths). The project appeared to be a very promising, however, financial difficulties forced its cancellation. The six urban clinics of the MFPA recorded a total of 7,333 new acceptors of pills in 1974 and 6,652 in 1975. The Association clinics have a reputation for providing good family planning services in a pleasant, unhurried atmosphere which promotes confidence in the services and encourages women to return.

The American Joint Distribution Committee operates three dispensaries, a maternity care clinic, two maternal child health centers, and a medical program for the aged. In addition, it operates homes for the aged in four cities (Casablanca, Marrakech, Tetouan, and Tangier).

#### International Assistance

##### Multilateral Assistance

W.H.O. The World Health Organization will provide experts for short-term missions on request from the Moroccan government and will continue to award study and training fellowships in various subjects. The areas of assistance tentatively planned for 1976-1979 are listed in Table 41. The WHO resident advisor's office is scheduled to be closed in midyear 1977. (See section on Environment for description of water supply assistance).

U.N.F.P.A. The United Nations Fund for Population Activities granted a total of U.S. \$2,932,000 to the Moroccan government for family planning and feminine promotion activities. The grant has three components: W.H.O. provided short-term technical assistance in the development of audiovisual materials and in evaluation and communications (approx. U.S. \$52,000).

UNDP. It is supporting in-country regional training seminars for doctors, midwives, and nurses who work in the family planning program of the MOPH. Other seminars have also been sponsored for the teachers in the Foyers Feminins program of the Ministry of Youth and Sports. (Family Planning education is part of the curriculum of these centers - see also Nutrition Section) (U.S. \$580,000).

UNICEF. They will provide supplies and equipment for the family planning reference centers, health clinics which have PSE services, and urban and rural dispensaries. (\$2,175,000).

I.B.R.D. The International Bank for Reconstruction and Development plans to provide experimental sites and services in three areas of Rabat in its urban project loan to Morocco. There is a possibility that some health facilities will also be constructed. This project

Table 41

## W.H.O. Proposed Program and Budget, 1976-79

Program	Estimated Obligations (US\$)				Source of Funds
	1976	1977	1978	1979	
Health Services Development			35,000	36,000	WHO
Maternal and Child Health Services	204,100	350,000	170,000		
Moroccan Family Planning Program	40,700	5,500	5,500		UNFPA
Development of Public Health Services and Training of Personnel		17,100			WHO
Health Manpower Development			35,000	36,800	WHO
Lectures and Fellowships	18,000	25,000			WHO
Communicable Disease Control			35,000	35,000	WHO
Epidemiological Surveillance	49,700	53,600			WHO
Tuberculosis Control		3,000			WHO
Public Health Ophthalmology	1,500	4,500			WHO
Promotion of Environmental Health			32,800	35,000	WHO
Water Supply and Related Studies	304,500	467,000			UNDP
*Training of Sanitary Engineers		22,000			WHO
*Development of Environmental Health Services	59,600	51,700			WHO, UNDP
W.H.O. Liaison Office	39,500	15,000			WHO
<b>Total - Morocco</b>	<b>717,600</b>	<b>1,014,400</b>	<b>313,300</b>	<b>142,800</b>	
Regular Budget	156,300	191,900	137,800	142,800	
Other Sources	561,300	822,500	175,500	-	

\*These were the only confirmed programs as of December 31, 1976.

Source: W.H.O.

will probably begin in 1978. The Bank's Third Education Project (1975) includes the construction, furnishing and equipment of a College of Public Health (780 students) in Rabat and the development of a smaller school (80 students) in Casablanca for anesthesiology and radiology technicians. Technical assistance will be provided for the revision of architectural plans and for the development and organization of a medical library. In addition, the facilities of three paramedical schools (in Oujda, Fez, and Agadir) will be improved. The estimated cost of the project is between \$5 and \$6 million. It is part of a comprehensive Education loan which totals \$25 million. (See Health Manpower section.)

### Bilateral Assistance

France. France has provided a great deal of financial and technical assistance in health programs since Independence. The following assistance was given during 1975/76.

Physicians - 32 generalists and surgeons  
                  16 specialists

Nurses - 21 nurses

Paramedical - 61 persons

Social Workers - 20

Health Training - 4 specialists

Nursing Schools - 6 specialists

Health Administration - 2 specialists

In addition, four veterinary assistants were sent to France for training. The construction of a Cancer Institute in Rabat is also planned. Assistance to the Faculties of Medicine included nine professors and 20-30 short-term technical assistance missions. There are also approximately 38 French medical officers serving five to six years each in the Moroccan military hospitals, and another 50 French doctors who are serving one year each with the Moroccan military health services. The University Hospital Center Avicenne in Rabat will receive medical supplies and equipment valued at U.S. \$170,000. In addition, a technical assistance mission will oversee the expansion of the same hospital.

United States. The U.S.A.I.D. has provided aid in nutrition programs (see Nutrition section) and in Family Planning. Total funds provided for family planning between 1969 and 1975 were U.S. \$1,770,000. The U.S.A.I.D. assistance is designed to improve the institutional capability of the Moroccan MOPH to provide family planning services. Aid has also included in kind assistance for contraceptive and medical supplies and funds for the renovation and equipment of 25 family planning reference centers including a National Family Planning Center in Rabat.

The Peace Corps has no volunteers who are officially classified as "health workers" in Morocco. However, there are volunteers who work in rehabilitation centers in Rabat and Marrakech, an unknown number of civil engineers who are designing water and sewerage systems in provincial cities, and architects whose projects sometimes include the design of local health facilities at the request of the Provincial governor or Chief Medical Officer of the Province.

People's Republic of China. There is a medical team from the PRC which arrived in Morocco in September, 1975, and was installed in the Hassan II hospital in Settat province. The team consists of two surgeons, two general practitioners, one pediatrician, one OB/GYN specialist, one accupuncturist, one anesthesiologist, and one instrument orderly or nurse.

Yugoslavia. Thirty-six doctors, nurses, and pharmacists will work in the public health service facilities and in the administrative services of the MOPH.

Belgium. Two unspecified experts will work with the public health system in Tetouan and Safi. There will also be thirteen engineers assigned to thirteen provincial governments to provide whatever assistance is deemed necessary in that province.

#### Maghreb Committee for Public Health

A Maghreb Committee for Public Health, which includes Morocco, Algeria, and Tunisia, was formed in 1973 to promote cooperation and communication in matters of public health interest. Each year, a series of meetings are held which include the Ministers of Health, several technical committees of other Maghreb health officials and participants from European countries. The meetings are planned to coincide with the annual meeting of the Medical Congress of the Maghreb. The Medical Congress is made up of physicians from the public and private sectors.

The following items were on the agenda of the May, 1977 meeting of the Maghreb Health Committee:

- Interest in and benefits of the integration of maternal and child health services with the activities of the public health sector;
- Research on obesity and malnutrition;
- Standardization of the legislation relating to blood transfusions;
- Adoption of the agreement established in 1972 concerning narcotic drugs;
- Study for an agreement on psycotropic drugs;
- Program for cooperation in matters relating to toxicology;
- Malaria eradication;
- Study for the development of a common nomenclature for psychiatry in the production of vaccines, serums, and biologicals;
- Medical education in the region and possibilities for educational reforms.

The Medical Congress meetings had a very different agenda, as follows:

- Breast cancer;
- Recurrent rheumatic fever;
- Contributions of endoscopy in digestive system pathology;
- Non-hodgkins lymphomas of the digestive system;

- Chronic diarrhea in children;
- Early interventions in abdominal surgery.

## CHAPTER NINE

### MOROCCO IN PERSPECTIVE

#### Geography and Climate

Morocco, situated strategically on the northwest corner of Africa, occupies 172,000 square miles, an area about the size of California, and has an extensive coastline facing both the Atlantic and the Mediterranean.

Politically, Morocco is bordered on the south by Mauritania and on the east, along an undefined boundary, by Algeria. To the north Spain is separated from Morocco by the narrow Strait of Gibraltar. The geography of Morocco is dominated by the highest and most rugged ranges in the Atlas Mountain system of northwest Africa. This system, which remains geologically unstable, fragments the country into five geographic regions: the Rif coastal massif that borders the Mediterranean from Ceuta to Melilla, the Atlantic coastal plains and plateaus west of the Atlas ranges, the great High Atlas and Middle Atlas ranges, the pre-Saharan area including the Anti-Atlas range and the arid plateaus southeast of the High Atlas, and the plateaus of Eastern Morocco.

The country's population, agricultural, and industrial production are concentrated on the Atlantic Coastal plains. Because of the richness of its agriculture and the ease of access, the Atlantic plains and plateaus have been the focal point for invasions and have formed a base for the rulers of Morocco throughout history. The coast is low and regular but offers few natural harbors. Until the construction of the man-made harbors at Agadir, Essaouira, Al Jadida, Casablanca, and Rabat, landings had to be made by small boats through heavy surf.

Northern and central Morocco experience a "Mediterranean" type of climate that is strongly modified by local factors, with the mountain ranges playing an especially influential role. In this part of the country, warm wet winters and hot dry summers are the rule. As the elevation increases the mean temperature goes down and the accumulation of rainfall and snow increases. Moving southward the climate changes to semi-arid and eventually desert conditions.

In the Rif and the northern parts of the Middle Atlas, mean annual rainfall exceeds 30 inches and the summer drought lasts only three months, but in the rest of the Middle Atlas, in the High Atlas and over the northern half of the Atlantic lowland rainfall is reduced to between 30 and 16 inches and the summer drought lasts for four months or more. During the summer intensely hot winds from the Sahara, known as the Sirocco or Chergui, occasionally cross the mountains and sweep across the lowland desiccating all that lies in their path. Summer heat on the Atlantic coastal plain is tempered, however, by breezes that blow inland after they have been cooled over the cold waters of the Canaries current offshore.

Over the southern half of the Atlantic lowland and the Anti-Atlas semi-arid conditions prevail and rainfall decreases to between 16 and 8 inches a year. It also becomes more variable and generally insufficient for the regular cultivation of cereal crops without irrigation. East and south of the Atlas Mountains, which act as a barrier to rain-bearing winds from the Atlantic, rainfall is reduced still further and regular cultivation becomes entirely dependent on irrigation.

## History and Political Structure

Moroccans take pride in their country's distinctiveness and its role as the center of several medieval empires that at various times controlled much of North Africa and Spain. Unlike the rest of North Africa, the country did not fall under Ottoman Turkish sovereignty in the sixteenth century. In perspective, the relatively brief period of the French and Spanish protectorates (1912-1956), during which tribal resistance was succeeded by Moroccan nationalism generated by such leaders as Allal al Fassi, may be seen simply as a hiatus in the long history of independent Morocco. The country's ethnic and cultural identification with North Africa and the Arab and Islamic worlds ante-dated the European protectorates by thirteen centuries or more.

The effects of the colonial protectorate period, however, were profound. During this time, the country was unified under central control, industrial and economic development was initiated, government administration was reorganized, and notable improvements were made in transportation and communications. The colonials did leave severe postindependence problems with regard to language, education, and the replacement of the French bureaucracy in government and commerce.

### Early History

Indigenous tribal peoples of Mediterranean stock, speaking a language belonging to the broad Afro-Asiatic classification, have inhabited North Africa from before the recorded history of the area. Eventually, they became known in Europe and the Middle East as Berbers. Phoenician traders founded seaports at Tanger, Ceuta, and other points in the twelfth century B.C. Rome gained a firm foothold on the southern shore of the Mediterranean and brought northern Morocco securely under its administration in the first century A.D. For the next two centuries, Rome administered the area and called it the province of Mauretania Tingitana; its capital was Tingis (Tanger). The Latin word Mauretania meant the land of the Maures, or Moors, and from this designation the name Morocco is derived.

It was Idris, a descendant of al-Hosan, the son of Caliph Ali and of Fatima, the daughter of the Prophet Muhammad, who founded the first of the great Muslim dynasties in Morocco. Idris died in 792 A.D. after reducing most of Morocco and also Tlemcen (Algeria) to obedience with the aid of Berber tribesmen. After the death of his son, Idris II, who founded Fez, the regime fell into a period of decline, marked by two hundred years of tribal revolt. It was after this long period of turmoil and fragmentation that Morocco entered into the most splendid phase of its medieval history. Nomadic Sanhaja Berber tribes of the Sahara swept north and conquered in the name of their Sunni form of Islam. Known as the Almoravids, they were devoted to spiritual retreat and to holy war against the infidel. Eventually the Almoravids pushed into Spain where they settled in Seville. Under their aegis, a mixture of Berber, Arab, and Spanish culture was introduced into Morocco. Marrakech became one of North Africa's largest cities and a widely admired center of Islamic art and learning.

Several different tribal confederations ruled over Morocco after the decline of the Almoravids. When the Christian kingdoms of Northern Spain and Portugal gained in power during the fifteenth century, they succeeded in expelling the last Muslims from the Iberian peninsula in 1492. Thousands of Muslims and Sephardic Jews fled to North Africa where they gained great influence in government, commerce, and urban life. The Saadean regime which arose in resistance to Spanish and Portuguese incursions into North Africa brought considerable prosperity to Morocco. The Saadeans were followed in the seventeenth century by the Alawi dynasty, which still reigns today in Morocco.

Colonial expansion during the nineteenth century and the French seizure of Algeria in 1830 and Tunisia in 1881 pointed the way toward eventual occupation of Morocco. In a series of secret diplomatic maneuvers, Great Britain agreed to recognize France's interest in Morocco in return for a similar recognition of British rights in Egypt. An agreement between Spain and France in 1904 assigned two zones of influence to Spain, and the stage was set for colonization. In March 1912, Morocco became a Protectorate of France, with a French Resident-General empowered to direct foreign affairs, control defense, and introduce internal reforms. Although in theory the sultan retained his sovereignty, he reigned, but did not rule.

The pacification of dissident tribes occupied the French until 1934, and forced the French to abandon their original plan to establish their capitol at Fez. When Berber tribesmen besieged Fez, Marshall Lyautey, the French Resident-General, withdrew and moved the seat of government to Rabat. The Atlantic Coast thus became the focal point for French development. Although Lyautey attempted to limit the extent of French cultural influence in Morocco, official French circles favored the concept of the "Mission Civilisatrice" and when Lyautey was removed in 1925, direct French administration was progressively introduced.

Economic development was emphasized by the French, Morocco's mineral wealth was exploited, a modern agricultural sector developed, and Casablanca was converted into a major seaport. Railroads and a road system opened the interior of the country to economic exploitation. Thousands of colonists entered Morocco, bought up large areas of rich agricultural land and eventually dominated the economy. In 1936, about 200,000 Europeans, including 150,000 French, lived in Morocco. In the 1920's, modern cities mushroomed. Modern sanitation, hygiene, and medical facilities were introduced for the French population and gradually extended to the Moroccan population as well.

The French educational system was introduced intact for the children of the colons. As educational facilities expanded, the number of Moroccan children attending the French-administered schools steadily increased. These developments were to have serious future consequences. The French colonials used and promoted their own language. Arabic became relegated to classical studies, religion, ceremonial use, and the common dialectical speech of the people. A modernized school system in Arabic was not developed. The educational system and the practical operations of government and the larger economy were thus tied to French.

During the decade of the 1930's, nationalist sentiment began to grow in Morocco. A "Comite d'Action Marocaine" asked for a limitation of the protectorate. This "Comite" was dissolved in 1937, but nationalist propaganda continued against the French regime. A Party of Independence (Istiqlal), formed in 1943, demanded full freedom for Morocco, with a constitutional form of government under Sultan Muhammad ben Yusuf, who supported the nationalist movement.

Supported by the French, a local leader, Thami al Glaoui, pasha of Marrakech, openly attacked the sultan for his support of the nationalists. In May 1953, he asked for the removal of the sultan. On August 20, 1953 the sultan agreed to go into exile but not to abdicate. Muhammad ben Arifa was now recognized as sultan. The disposition of the sultan further exacerbated a tense situation. It has been estimated that during the two years of the sultan's exile, 6,000 acts of terrorism were committed and over 700 persons killed. Finally, Sultan Muhammad ben Arifa renounced the throne and withdrew to Tangier in 1955. Muhammad ben Yusuf, on November 5th of that year was recognized once again as the legitimate sultan. A joint Franco-Moroccan declaration in March 1956 stated that the French government now recognized the independence of Morocco.

In August 1957 the Sultan Muhammad assumed the title of king, with Prince Moulay Hassan proclaimed as heir to the throne. Muhammad's general popularity was high; he enjoyed the unusual position of being a royal figure who was an heir of the independence struggle. Under him, the dual Moroccan monarchical role as simultaneous temporal head of state and the religious head of society was strengthened as it had not been for centuries. In the months following independence, the sultan moved deliberately to develop a modern governmental structure under a constitutional monarchy. The problems confronting the new regime were imposing. It was faced with the need to train people to head the ministries, fill the ranks of civil service, assume judicial functions, establish governmental control over recalcitrant tribes, and form an independent foreign service, police, and national army. Muhammad died suddenly and unexpectedly on February 26, 1961, following minor surgery, and the nation was plunged into deep mourning. Some initial doubts were expressed as to the ability of Prince Hassan, then thirty-two years old, to hold the country together. But he acted speedily and decisively to take command and to assure his people that he would follow the domestic policies of his father.

Under the European powers, North Africa's border delineations were at times either vague or nonexistent. This was the case with the boundary between Algeria and Morocco. A border dispute degenerated into armed conflict in October of 1963. After a month of sharp engagements, a cease-fire was arranged, and in 1964 an agreement was reached on the establishment of a demilitarized zone. The first half of 1965 was a time of political tension in Morocco. Widespread rioting, initiated by students in response to a Ministry of Education directive and later joined by laborers and urban poor, was put down violently by the police and army. The result of the disturbances was the recognition by King Hassan of the internal economic and social difficulties of the country and a declaration of a policy of national union. The King proposed a program of development -- a program which emphasized the need for industrial advance with the aid of foreign capital, the introduction of measures designed to encourage investment, the stabilization of the cost of living, and the limitation of the birth rate.

The winter of 1965-66 witnessed the growth of considerable strain in the relations between Morocco and France. M. Mehdi Ben Barka, the former leader of the National Union of Popular Forces in Morocco, was abducted in Paris in October 1965 while living in exile after his alleged implication in a conspiracy against King Hassan in July 1963. His disappearance roused vehement protests and outcries from the left-wing opposition parties in Morocco. As the French authorities pursued their investigations, a tangled picture emerged, which was widely publicized but never fully clarified. A number of French as well as Moroccans were involved. French officials issued international warrants for the arrest of General Muhammed Oufkir, the Moroccan Minister of the Interior. The Moroccan government maintained that the warrants were in violation of the French-Moroccan judicial convention of 1957 and hence invalid. Oufkir was tried, in absentia, and convicted to life imprisonment for complicity in Ben Barka's abduction.

In July 1970, following approval of a new constitution which gave wide civil and religious authority to the King, the Istiqlal and the National Union of Popular Forces formed the opposition National Front. They boycotted the subsequent parliamentary elections, claiming that the new constitution only served to formalize the powers held by the King and government held during the "state of exception."

On July 10, 1971, a nearly successful coup d'etat was attempted against King Hassan. A number of senior military officers were implicated and consequently executed. In August of that year, King Hassan dissolved Parliament, appointed a new government and charged it with formulating an economic and social program. A revised third constitution was approved by popular referendum in March, 1972. A second coup d'etat was attempted on August 16, 1972, in which the Minister of Defense, General Oufkir, was implicated. Oufkir committed suicide rather than face execution. Although the new constitution provided for a unicameral parliament to be elected, no elections were held.

In December 1975, after a march by thousands of Moroccans into the Spanish Sahara, the Moroccan Army occupied the northern part of the former Spanish territory. In an agreement with Spain, the Saharan territory was divided between Morocco and Mauritania which caused strong

protests from the Algerians who had supported an Independence movement called Polisario. Intermittent skirmishes continue between Polisario guerillas and Moroccan army regulars. The conflict has resulted in the expulsion of over 10,000 Moroccans from Algeria. It has also strengthened the King's political position - the "Green March" captured the imagination of millions of Moroccans. A smaller march followed country-wide celebrations on the first anniversary of the march in November, 1976.

### Political Structure

Under the Constitution the King, who is Chief of State, has wide powers and exercises supreme civil and religious authority. He appoints and dismisses the Prime Minister (who is the Head of the government) and all cabinet ministers. He may also dissolve parliament (which as of January 1977 has not been elected) declare a state of emergency, and rule by decree. As a preliminary to an eventual national election, local elections were held in November of 1976. A more representative form of government will thus be introduced gradually in Morocco. The elected officials will have a voice in local, provincial, and perhaps regional affairs, but do not constitute the national parliament which is provided for in the Constitution.

The Cabinet continues to provide the major impetus for government initiatives and new policy directions. There are three different levels of cabinet ministers. There are four Ministers of State, twelve Ministers, and four Secretaries of State. The Ministries of Public Health, Education, Public Works, Agriculture, Finance, and Housing and Urban Development are all under the second echelon. There are twenty-eight provinces and two prefectures in Morocco. Each is headed by a governor who is appointed by the King. The governors have broad powers within their respective provinces - in many ways each acts as a mini-state. The provincial medical chief, who works directly with the provincial governor, has the same power of autonomy. Although the country is divided into seven Economic Regions (see map) there is no permanent administrative structure yet at the regional level.

Below the level of the appointed officials is a professional civil service which is designed like the French system. There is a certain amount of emphasis within the system on individual loyalty and a political routine management which has produced a high degree of self-protection, security, routine competence, and continuity in the office of bureau chiefs and their subordinates. A recurring rotation of ministerial and directorial positions takes place among a limited elite. Many characteristics of the preprotectorate sultanate have survived beneath the guise of a modern French administrative system. (For further information on health personnel, see section on Health Program Administration.)

### Economy

Morocco is endowed with a number of economically valuable assets. Agricultural potential is excellent and there are important mineral reserves. The natural beauty of the country and its mild climate offer good opportunities for the development of tourism. There is an emerging industrial sector, a small but growing managerial class, and a reasonably well-developed economic infrastructure. Agriculture and phosphate mining activities dominate the economy however. The agricultural sector employs over two-thirds of the Moroccan labor force and accounts for over one-fourth of the GDP. (See Table 42) Mining, and particularly phosphates, accounts for 16% of GDP and provide over one billion dollars annually in export earnings (Agricultural products provide 500 million dollars in export earnings). Manufacturing, particularly the metallurgical sub-sector, has experienced dynamic growth (up to 10% annually) during the 1970's. Its share of the GDP is 13%. Services, including tourism, are also expanding rapidly, particularly because of Morocco's recent efforts to enlarge its share of

Table 42

Gross Domestic Product by Sector. 1973-75  
(Millions of dirhams: 1960 market prices)

Item	1973	1974 <sup>1/</sup>	1975 <sup>1/</sup>
Agriculture <sup>2/</sup>	3,640	4,150	3,660
Energy	480	520	560
Mining	870	990	730
Manufacturing	2,020	2,100	2,230
Construction	710	830	1,390
Subtotal: Industry	<u>4,080</u>	<u>4,440</u>	<u>4,910</u>
Transportation and services	2,510	2,660	2,800
Trade <sup>3/</sup>	3,150	3,390	3,590
Subtotal: Services	<u>5,660</u>	<u>6,050</u>	<u>6,390</u>
Gross domestic production	<u>13,380</u>	<u>14,640</u>	<u>14,960</u>
Implicit price deflator	1,407	1,610	1,741
Gross domestic production at current market prices	18,830	23,570	26,040
General government <sup>4/</sup>	<u>2,460</u>	<u>3,520</u>	<u>3,850</u>
GDP at current market prices	21,290	27,090	29,890

<sup>1/</sup>Estimated.

<sup>2/</sup>Includes output consumed by farm families valued at farm gate prices.

<sup>3/</sup>Includes part of customs duties and indirect taxes not allocated to other sectors (about 30% of totals shown).

<sup>4/</sup>Salaries (current prices) not included in gross domestic production from services.

Sources: Secrétariat d'Etat au Plan

international transportation receipts. Tourism and non-factor services contributed over seven hundred million dollars in receipts to the economy in 1974.

The performance of the Moroccan economy during the 1973-77 Plan Period has been punctuated by wide swings in agricultural production, a rapid build-up of phosphate production which contributed to a depression in world prices and a slackening of demand, and several upward revisions in Development Plan expenditures which left the government in an overextended financial posture by the end of 1975. Because of the decline in agricultural production in 1974-75, the forecast annual GDP growth of 7.5% shrank to only 4.5% during the first three years of the Plan Period. However, government investment doubled while private sector investment rose by over 60%. Real consumption rose by 9% and private consumption by 7%. Exports of both phosphates and foodstuffs declined, while imports of food and consumer goods (principally automobiles) rose. The \$193 million balance of trade deficit of 1974 grew to over one billion dollars in 1975. The deficit in the balance of payments and corresponding external borrowing requirements will restrict growth in the investment program. The country's absorptive capacity for capital will also restrict growth, as will the limited availability of skilled manpower. The overall growth rate of current expenditures was less than 14% in 1975 and reflected the government's attempt to control expenditures and increase savings. Expenditures for social services, including health, grew faster (31%) than those for public works (26%), agriculture (14%), defense (13%), or administration (10%).

The performance of the economy improved during 1976, primarily because of an increase in agricultural production. The Ministry of Agriculture has predicted an increase in the cereal harvest of 50% over last year. Even if this estimate proves overly optimistic, grain import requirements will decline significantly, thereby relieving pressure on the balance of payments. Remittances from Moroccan workers abroad have continued to increase despite a freeze in new work permits in Europe. An unforeseen amount of illegal immigration to Europe has resulted in the maintenance of an annual emigration of between 30,000 and 50,000 Moroccan workers. In-country unemployment remains high - between 12-16% in urban areas. The demand for phosphates has recovered, although not quite as quickly as hoped for, tourism is recovering from a slight decrease in 1975 which was caused by the Sahara situation, domestic investment has doubled over the previous year, and there is some new foreign direct investment for the first time in several years. Foreign and domestic borrowing are at about projected levels. Inflation, on the other hand, has been spurred by a semi-speculative expansion of credit by the commercial banks. The Central Bank revised its lending guidelines at mid-year in order to control the expansion of credit. Nevertheless, inflation in 1976 is expected to be over 10%.

The revisions in the Development Plan which were made in 1974 (see Table 6 - Health Financing Chapter) were inspired by the extremely favorable economic conditions of that year. Investment in the health sector was more than doubled, however, even larger increases were allocated to public works for the development of infrastructure and the modernization of equipment, to the agricultural sector for an accelerated schedule of irrigation projects, and to the industrial sector for such major projects as a steel mill at Nador, a petrochemical complex, sugar refineries, and petroleum storage. The upward revision of the Plan has increased the demand for skilled labor in all trades as well as for management level personnel. In view of the fact that the shortage of trained manpower in the health sector is already a serious problem, increased investment in the health infrastructure would only serve to aggravate the problem. Government revenues needed to finance both current and capital expenditures will be sufficient at least through mid-1977 due to the generally favorable economic conditions, the successful arrangement of external financing and the promotion of a one billion dirham domestic bond issue. The "Sahara" bond was launched as part of the fiscal plan to reduce the inflationary impact of credit expansion earlier in the year. In summary, Morocco's economic planners have so far succeeded in maintaining the momentum of economic development despite the recent world recession and unfavorable conditions.

## Transportation and Communications

Morocco has a very well-developed transportation system which includes a road network over 31,000 miles, nearly 15,000 miles of which are paved. In addition, the Government-owned railroad system comprises approximately 1,000 miles of track. A modernization program is scheduled for completion during the 1970's. Two national airlines, the Royal Air Maroc (RAM) and Air Inter (RAI) serve Morocco. The majority of stock in both companies is either directly or indirectly state-owned. There are fifty civil airports through the country, eight of which can handle international flights. Four major and thirteen lesser ports handle sea traffic into and out of Morocco. Casablanca is the largest, it accounts for 75% of the freight handled by all ports.

Despite the extensive transportation system, large numbers of Moroccans still live in areas where transportation is difficult. The Atlas Mountains are dotted with villages which are accessible only on foot or horseback. The delivery of any kind of social service to these remote areas is difficult, if not impossible. Education, medical care, the agricultural and other products of the rest of Morocco may be scarce commodities there and the cost of delivering them to such places may prove to be prohibitive.

## Communications

There were nine daily newspapers in Morocco in 1976; one was a government newspaper and the rest were published privately by Moroccans and foreigners. Newspapers and periodicals are available in both French and Arabic and address themselves principally to the urban educated elite. The low literacy rate (25%) precludes their use by all but a minority of Moroccans. Articles concentrate on political and economic issues and are frequently severely critical of government policies and officials. Government policy toward these newspapers has been increasingly restrictive over the 1960 to 1970 period; however, there has been no prepublication censorship.

The government owns and operates both the radio and television facilities. Radio is the most influential form of mass communication and reaches as far as the illiterate Berber-speaking populations in the mountain areas. Programs include discussion of Morocco's culture and heritage and Islamic tradition. Audiences are reminded of the King's role as a cultural and religious figure-head. In 1970 the television network covered only limited parts of the country. Film production on mostly cultural topics is also government controlled. In 1970 there were about one million radio receivers and some 173,000 television sets. The high rates of illiteracy in Morocco prevent the dissemination of much information through the printed media. Radio programs are not often relevant to the lives of Morocco's poor, and therefore, mean little to them, especially the women whose world is limited to home and family.<sup>1</sup> The use of the "mass" media to promote the delivery of health services or for health or nutrition education would have to be carefully designed to appeal to the Moroccans who would benefit most from it.

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<sup>1</sup>Mermissi, Fatima, Obstacles to Family Planning Practice in Urban Morocco.

## Education

Education is an essential element in the economic and social development of Morocco. The availability of well-educated labor force provides an important impetus to national development. As education levels rise, incomes and standards of living also rise, and many of the social problems, including health problems, are ameliorated. Rapid economic development in Morocco during the past decade has highlighted the need for a more extensive educational system which is geared to the needs of an increasingly industrialized society. Approximately 75% of Morocco's population was illiterate in 1971, and unemployment among unskilled workers averaged 12-16%, yet shortages of technicians, skilled and semi-skilled workers were reported in every sector of the economy.

Before the establishment of the French protectorate in 1912, education in Morocco was offered solely within the framework of traditional Islamic institutions.<sup>2</sup> The educational system consisted of Koranic schools in local mosques, religious colleges in the cities, and the ancient Karaouine University in Fez. Education for women was almost unheard of. The French established a modern school system primarily to serve the resident French population. Although some Moroccan children were eventually admitted to these schools, by independence only about 10% of all school age children were enrolled in school.<sup>3</sup> The policy of the Moroccan government since Independence has been to attempt to provide free primary school education to as many children as possible and to develop a network of secondary schools and institutions of higher education which will provide the trained manpower force which is needed for the implementation of national development plans. The language of instruction in the schools was changed to Arabic after Independence, instead of French. The shortage of qualified Arabic-speaking teachers caused a rapid deterioration in the quality of education and so the rate at which the language of instruction was to be changed was slowed. In 1976, Arabic is still not the primary language of instruction in the Moroccan schools. Approximately two-thirds of the teachers in the primary schools are Arabic-speaking and one-third are "bilingual". Instruction in mathematics and science is in French and the French language is introduced in the third year of primary school in conjunction with the introduction of science and mathematics. In the secondary schools, only Arabic, History and Philosophy are taught in Arabic. English, Spanish, Art, Music, Mathematics, Sciences, and industrial and commercial training are only offered in French.

The Moroccan school system in 1975 consisted of state schools which account for over 95% of enrollments, and a small number of private primary and secondary schools. Higher education is conducted in two universities and thirteen specialized institutions. Enrollment in 1975 in primary schools was estimated to be 54%; secondary school enrollment was 13%; and enrollment in institutions of higher education was approximated at 2%. (See Table 43) Female enrollment had reached 35% in the primary schools by 1975, 33% in the secondary schools, and 19% in the universities. Although enrollments have been expanding at annual rates of 4.7% in primary schools and 8.9% in secondary schools, the 3% per annum increase in population has offset much of the growth in enrollments.

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<sup>2</sup> Area Handbook, p. 121.

<sup>3</sup> Ibid., p. 122.

Table 43

## Educational Enrollments in Morocco

	1973-74	1974-75	1975-76
Primary	1,337,931	1,413,993	1,547,647
Public	1,283,726	1,363,878	1,475,006
Private	54,205	50,115	72,641
Secondary	361,725	403,673	486,173
Public modern	326,362	366,570	421,004
Public traditional	7,142	8,279	9,584
Public E.R.I.*	3,685	3,922	3,953
Private	24,536	24,902	51,632
Superior	20,905	26,788	35,037
University Mohamed V	15,037	18,174	22,322
University Hassan II	3,399	4,272	7,320
Univ. Moh. B. Abdallah	1,829	3,620	4,550
Univ. Qaraouyine	640	722	845

\* E.R.I.: Ecoles Regionales d'Instituteurs.

## Enrollment by Sex

	1973-74	1974-75	1975-76
Primary (1)	1,337,931	1,413,993	1,475,006
Male	863,368	909,335	951,565
Female	474,563	504,658	523,441
% Female/Total	35.5	35.7	35.5
Secondary	361,725	403,673	434,541
Male	245,467	272,671	291,221
Female	116,258	131,002	143,320
% Female/Total	32.1	32.5	33.0
Superior (1)	20,905	26,788	35,037
Male	16,280	21,475	28,312
Female	3,985	5,313	6,725
% Female/Total	19.1	19.8	19.2

(1) Not including private schools

Source: Le Maroc en Chiffres, 1975

There are several serious problems in the educational system. Repeater and dropout rates are very high. At present, nine pupil/years are required to produce a primary school leaver and 15.4 pupil/years are required to produce a secondary school leaver. (Primary school is five years, secondary school has a 4-year first cycle and a 3-year second cycle.) Although schooling is theoretically compulsory for children 7-13 years of age, the availability and proximity of urban schools favor urban children. This is reflected in the literacy rates (see below). Urban areas are further favored by a larger number of qualified teachers - 80% are qualified in Rabat, versus only 18% in Ouarzazate. Female enrollment has grown little (from 32.5% in 1968 to 35% in 1976) and again, enrollment in urban areas is much higher (46% in Casablanca versus 9.7% in Ouarzazate). Poor multi-grade teaching and an outdated curricula add to the problems of the educational system.

Percent Illiteracy by Sex and Place of Residence  
in 1960 and 1971

(for the Population 10 years and older)\*

Sex	U R B A N		R U R A L		T O T A L	
	1960	1971	1960	1971	1960	1971
Male	58	39	85	75	78	63
Female	88	68	99	98	96	87
TOTAL	73	54	92	87	87	75

\* Census takers asked respondents if they could "read and write" and answers were recorded with no further verification.

Source: 1971 Census, Government of Morocco.

Administration

Public education is under the jurisdiction of the Ministry of Primary and Secondary Education and the Ministry of Higher Education. Each is responsible for school inspection, curricula, administration of examinations, teacher placement and issuance of official tests.

The ministries share a planning division in charge of research and statistical operations related to educational planning. Twelve field offices furnish statistical data and estimate facility needs in their area.

The Higher Board of Education, a consultative and planning body, is responsible for drafting policies on educational reform.

Local authorities in each of the 28 provinces and in two urban prefectures have limited responsibility in the administration of education.

## Education and the National Development Plan

The broad strategy of the National Development Plan for 1973-77 is based on a research and development program to prepare a major reorganization of the educational system which will be implemented during the next plan period. Some of the targets of the Plan include the following:

- 1) Primary Level  
Universal enrollment of 7 year olds by 1995, curriculum reform, a school inventory aimed at better distribution of facilities, increased teacher training, the expansion and nutritive improvement of school meals.
- 2) Secondary Level  
Greater emphasis on technology and science, Moroccanization of the teaching service through modifications in teacher training programs, and Arabization of the language of instruction.
- 3) Technical and Vocational  
Coordination of vocational and technical education programs of all major sponsors. Development and expansion of technical schools and technical teacher training.
- 4) Literacy Programs  
Preparation of a national plan to reduce illiteracy through the coordinated efforts of public and private agencies involved in the field.

(For information on health education, see section on Health Manpower.)

### Languages

Morocco is a country which has one official language (Arabic) and two other languages (French and Berber) which are of major importance. Berber is the oldest indigenous language in Morocco. Its many dialects are spoken by the Berber groups who live throughout the Rif and Atlas Mountains. An estimated 40% of Morocco's population speak Berber. Arabic was introduced to Morocco at the time of the Muslim penetration into North Africa. It is the native language of approximately 60% of the population. A small minority of northern Moroccans speak Spanish in addition to French and Arabic. Because of the geographical isolation of many of Morocco's settlements, the colloquial Arabic which is characteristic of one area may not be completely intelligible to an Arabic speaker from another area. French was introduced in the twentieth century when Morocco became a French protectorate. The French introduced modern methods of government organization and administration, European technology and culture to Morocco. The French language became the language of the modern sector of society, while Arabic and Berber remained the languages of the uneducated masses. Classical Arabic was a language of historical significance but was of no use in the conduct of modern bureaucratic, industrial, financial and intellectual affairs.

When Morocco became independent, the people who had been shut out by the French system began to demand access to the modern sector. The main route of access, the educational system, was and is a formidable linguistic obstacle course which even today the majority cannot successfully complete. The cultural barrier which exists between different groups in society is magnified by the language problem. The inability to communicate in French renders many Arabic and Berber-speaking Moroccans incapable of dealing with the public institutions which control their lives. The health system is one of the institutions where good communications between patient and health personnel are essential if adequate services are to be delivered. Here the vague complaints of the patient are expressed in colloquial Arabic to a nurse who must translate these complaints into precise French medical terminology in order to discover the problem. If the patient speaks only Berber, verbal communication is often completely impossible. As the educational system in Morocco expands, the language barriers will slowly fall, but the process is going to be a long one.

## APPENDICES

Appendix 1-A

LEGAL POPULATION BY PROVINCE AND PREFECTURE

PROVINCE OR PREFECTURE	RANKING ORDER (1)	POPULATION IN 1960	POPULATION IN 1971				NUMBER OF HOUSHOLDS IN 1971
			Total	Moroccans Total	Israelites	Aliens	
Agadir	Urban	58,668	170,600	168,691	431	1,909	55,366
	Rural	799,825	997,410	997,099	7	511	184,576
	Total	857,893	1,168,010	1,165,790	438	2,220	219,942
Al Hoceima	Urban	13,559	22,496	22,044	1	452	4,208
	Rural	177,956	224,098	224,065	--	35	38,423
	Total	191,495	246,594	246,109	1	485	42,631
Beni Mellal	Urban	65,572	117,296	117,106	127	190	23,021
	Rural	410,429	546,395	546,330	3	65	92,044
	Total	474,001	663,691	663,436	130	255	115,065
El Jadida	Urban	58,878	92,185	91,579	337	606	19,197
	Rural	430,759	498,738	498,607	4	131	89,502
	Total	489,637	590,923	590,186	341	737	168,699
Fes	Urban	259,358	383,904	381,661	1,862	2,245	74,165
	Rural	571,641	687,512	687,323	--	189	120,916
	Total	830,999	1,071,416	1,068,984	1,852	2,432	195,081
Kenitra	Urban	188,323	508,477	503,924	461	4,553	57,947
	Rural	807,590	1,037,498	1,035,921	--	1,577	176,271
	Total	995,913	1,345,975	1,339,845	461	6,130	234,218

(1) Class Decreasing by Number of Population

Source: GOM 1971 Census

LEGAL POPULATION BY PROVINCE AND PREFECTURE

	PROVINCE OR PREFECTURE	RANKING ORDER	POPULATION IN 1960	POPULATION IN 1971			NUMBER OF HOUSEHOLDS IN 1971		
				Total	Moroccans Total	Israelites Aliens			
138	Khouribga	Urban	88,305	143,170	142,508	13	662	25,480	
		Rural	148,472	185,134	185,133	--	1	27,891	
		Total	13	236,777	328,304	327,641	13	663	53,371
	Ksar es Souk	Urban	17	21,808	46,595	46,425	320	170	8,174
		Rural	13	359,141	425,025	424,755	1	270	77,481
		Total	17	380,949	471,620	471,180	321	440	85,655
	Marrakech	Urban	3	267,905	395,118	390,637	1,569	2,481	72,901
		Rural	1	989,291	1,165,423	1,165,281	22	142	194,747
		Total	2	1,257,196	1,558,541	1,555,918	1,591	2,623	267,648
	Meknes	Urban	5	233,563	363,499	350,055	2,252	3,444	70,032
		Rural	14	343,569	399,618	389,135	--	483	68,316
		Total	3	577,137	753,177	749,190	2,252	3,927	138,348
	Nador	Urban	18	19,367	44,176	43,893	11	283	7,361
		Rural	12	328,199	436,341	436,270	--	71	73,055
		Total	16	347,566	480,517	480,163	11	354	80,396
	Quarzazate	Urban	19	9,064	29,048	28,931	6	117	5,244
		Rural	11	425,422	493,328	492,970	2	358	84,980
		Total	15	434,486	522,376	521,901	8	475	90,224

Source: GOM 1971 Census

LEGAL POPULATION BY PROVINCE AND PREFECTURE

	PROVINCE OR PREFECTURE	RANKING ORDER	POPULATION IN 1960	POPULATION IN 1971			NUMBER OF HOUSEHOLDS IN 1971		
				Total	Moroccans Total	Israelites Aliens			
139	Cujda	Urban	6	231,000	315,188	305,997	197	9,191	54,625
		Rural	15	292,150	318,640	317,680	--	960	49,483
		Total	12	523,150	633,828	623,677	197	10,151	104,115
	Safi	Urban	9	122,133	193,619	192,271	625	1,548	39,357
		Rural	4	617,344	704,527	704,298	2	29	132,476
		Total	6	739,477	897,946	896,569	627	1,377	171,833
	Settat	Urban	14	69,675	112,347	112,750	68	197	20,801
		Rural	6	476,050	557,822	557,624	--	198	87,046
		Total	9	545,725	670,769	670,374	68	395	107,847
	Tanger	Urban	10	141,714	187,894	178,592	1,719	9,502	39,131
		Rural	20	22,532	27,608	27,499	9	109	5,106
		Total	20	164,246	215,562	205,891	1,728	9,611	44,327
	Tarfaya	Urban	21	1,521	11,826	11,825	--	1	2,107
		Rural	21	16,840	12,535	12,334	--	1	2,108
		Total	21	18,361	24,161	24,159	--	2	4,215

Source: GCM 1971 Census

LEGAL POPULATION BY PROVINCE AND PREFECTURE

	PROVINCE OR PREFECTURE	RANKING ORDER	POPULATION IN 1960	POPULATION IN 1971			NUMBER OF HOUSEHOLDS IN 1971	
				Total	Moroccans Total	Israelites		Aliens
140	Taza	Urban	58,242	73,218	72,730	48	488	15,081
		Rural	407,503	535,358	505,278	4	60	83,620
		Total	445,745	578,556	578,008	52	548	96,701
	Tetouan	Urban	200,022	278,882	275,681	1,155	5,201	63,055
		Rural	447,249	517,396	517,202	--	194	99,879
		Total	647,271	796,278	790,883	1,155	5,395	162,934
	Casablanca	Urban	1,000,287	1,582,531	1,553,183	16,867	49,548	284,214
		Rural	100,092	136,890	136,436	5	454	23,117
		Total	1,100,379	1,719,421	1,669,619	16,872	49,802	307,331
	Rabat Sale	Urban	505,244	559,056	525,833	2,991	13,223	103,553
		Rural	84,843	102,658	101,994	--	664	16,339
		Total	388,087	641,714	627,827	2,991	13,887	119,892
	Total Morocco	Urban	5,389,613	5,409,725	5,304,116	31,060	105,609	1,023,020
		Rural	8,256,857	9,969,534	9,965,234	59	6,500	1,727,451
		Total	11,626,470	15,379,259	15,267,350	31,119	111,509	2,750,471

Source: GOM 1971 Census

Appendix I-B

Registered Emigration, 1970-1975<sup>1/</sup>  
(Number of departures)

	1970	1971	1972	1973	1974	1975 (Forecast)	1975 Jan.-Feb.
Algeria	25	35	70	81	91	-	1
Germany	881	5,827	3,564	2,328	5	2,530	9
United Kingdom	2,046	49	65	65	105	465	19
Belgium	123	70	47	114	171	102	1
Spain	112	109	67	33	26	-	1
France	24,671	22,806	23,626	32,321	30,085	26,600	885
Netherlands	2,608	1,136	75	60	147	806	33
Libya	433	634	12	-	-	217	-
Switzerland	44	11	17	28	-	-	15
Others	<u>63</u>	<u>77</u>	<u>160</u>	<u>182</u>	<u>178</u>	<u>280</u>	<u>10</u>
Total	31,006	30,754	27,713	35,212	30,808	31,000	974

<sup>1/</sup>Figures in this table refer to departures from Morocco; returns are not registered.

Source: Ministère du Travail et des Affaires Sociales

## APPENDIX I-C

## Population Projection 1976

	<u>Province</u>	<u>Number</u>	<u>Percent</u>
Rank 1	Casablanca	2,140,941	11.92
2	Fez	1,161,073	6.46
3	Marrakech	1,135,442	6.32
4	Kenitra	1,111,246	6.19
5	Agadir	899,930	5.01
6	Rabat - Salé	816,766	4.55
7	Settat	760,845	4.23
8	Meknès	704,387	3.92
9	Oujda	666,210	3.71
10	El Jadida	665,493	3.70
11	Tetouan	620,147	3.45
12	Taza	615,666	3.43
13	Safi	610,648	3.40
14	Ouarzazate	592,903	3.30
15	Nador	570,499	3.18
16	Beni-Mellal	540,209	3.01
* 17	El Kelaa (Marrakech)	531,426	2.96
* 18	Essaouira (Safi)	403,275	2.24
* 19	Khemisset (Kenitra)	401,303	2.23
* 20	Tiznit (Agadir)	395,388	2.20
21	Khouribga	390,370	2.17
22	Ksar-es-Souk	382,304	2.13
* 23	Azilal (Marrakech, Ouarzazate)	371,192	2.07
24	Tanger	326,921	1.82
25	Al Hoceima	284,622	1.58
* 26	Khenifra (Meknes)	281,217	1.56
* 27	Chaouen (Tetouan)	278,887	1.55
* 28	Boulmane (Fes, Taza)	131,916	0.73
* 29	Figuig (Oujda, Ksar es Souk)	92,843	0.52
30	Tarfaya	80,655	0.45
		<u>17,964,724</u>	<u>100.00</u>

Source: CERED Ministry of Plan

\* These are provinces which have been created since the 1971 census. The names in parentheses are those of the provinces from which the new provinces were created. See maps in Appendix for old and new provincial boundaries.

## APPENDIX II-A

### TRADITIONAL METHODS OF CONTRACEPTION

1. Reduce the plant "ALASFA" to powder and mix with honey for ten minutes. The woman should take some of this mixture on her finger and place in the vagina before each act of intercourse.
2. Take some groundnuts, unhusked but cleaned, and crush them into a fine powder. Before each sexual act, the woman should deposit a pinch of this substance in her vagina.
3. Take an old, unusable sac and soak in the sap from a pine tree. Set it on fire and when it begins to smoke the woman should place herself over it to become "bien enfumee".
4. At the time of menstruation, the woman who does not wish to become pregnant should go to the fquih and have a talisman prepared for her. Once at home she should set the talisman on fire and fumigate the vagina.
5. With her eyes shut, the woman should take a lock of hair from the nape of the neck, knot the hair and dip it in menstrual blood, still keeping her eyes shut. Place the lock in a box and close it until another child is desired.
6. Take a certain number of grains of wheat and dip them in menstrual blood. Swallow them with a small amount of water. Each grain corresponds with a year of sterility.
7. Take five figs and without looking at them, dip them in menstrual blood. Hide them for as many years as the woman wishes to be sterile.
8. A relative of the woman who does not want any more children takes the figs that have been given after a death; while hiding, this relative then gives the woman the number of figs to eat which correspond with the number of years of sterility desired.
9. Find a "chebba", a type of rock transparent and soluble in water. Dissolve in water for 24 hours. Wash the genitals with this solution before sex.
0. Just after the expulsion of a newborn child, without looking nor knowing the sex of the newborn, she takes the umbilical cord and knots it a number of times to correspond with the years of sterility desired.

APPENDIX II-B

Percent of Persons Living  
in Households of Various Sizes, 1971

Number of person	All of Morocco	Urban	Rural
1	10.7	16.8	6.7
2	10.4	11.8	9.5
3	10.5	11.2	10.1
4	10.8	10.5	11.0
5	11.4	10.3	12.4
6	11.0	9.3	11.8
7	10.2	8.6	11.3
8 and more	25.0	21.5	27.2
Total	100.0	100.0	100.0

Source: Recensement General de La Population et de l'Habitat, 1971.

## APPENDIX II-C

Households and the Average Size and  
Number of Persons Per Room

Area		Number of Rooms in House								Total
		1	2	3	4	5	6	7	8 et +	
Urban	Average number of persons per room	3.5	2.7	2.0	1.6	1.3	1.2	1.1	0.7	2.3
	% Households	33.2	37.7	18.2	6.7	2.2	1.2	0.4	0.4	100.0
Rural	Average number of persons per room	4.4	3.1	2.4	2.0	1.6	1.4	1.3	0.9	2.9
	% Households	36.9	38.8	15.2	5.9	1.6	0.9	0.3	0.4	100.0
Ensemble	Average number of persons per room	4.1	2.9	2.2	1.8	1.5	1.3	1.2	0.8	2.6
	% Households	35.5	38.4	16.3	6.2	1.9	1.0	0.3	0.4	100.0

Source: Recensement General de la Population et de L'Habitat, 1971.

## APPENDIX II-D

## Houses According to Type of Construction

Provinces and Prefectures	Masonry	Stone	Clay	Bidonville	Other	Total
Agadir	54.1	5.1	28.8	11.5	0.5	100.0
Al Hoceima	85.7	2.9	8.9	2.2	0.3	100.0
Beni Mellal	55.7	5.6	32.3	4.0	2.4	100.0
El Jadida	88.6	1.4	6.6	2.8	0.6	100.0
Fez	82.2	4.8	7.2	1.5	4.3	100.0
Kenitra	62.4	8.0	8.6	19.8	1.2	100.0
Khouribga	80.6	1.5	0.2	17.2	0.5	100.0
Ksar Es Souk	24.7	1.3	73.5	0.3	0.2	100.0
Marrakech	28.9	5.8	64.7	0.3	0.3	100.0
Meknes	68.3	5.3	13.5	10.1	2.8	100.0
Nador	79.3	12.5	7.1	0.6	0.5	100.0
Quarzazate	20.3	3.5	75.6	0.3	0.3	100.0
Dujda	75.8	6.0	14.8	1.2	2.2	100.0
Safi	90.1	6.9	2.4	0.4	0.2	100.0
Settat	72.8	2.6	2.6	16.9	5.1	100.0
Tanger	81.3	3.3	0.3	15.0	0.1	100.0
Tarfaya	87.2	1.1	5.2	1.0	5.5	100.0
Taza	51.7	10.5	29.2	6.3	2.3	100.0
Tetouan	83.8	3.5	2.6	9.4	0.7	100.0
Casablanca	84.9	1.6	0.5	12.8	0.2	100.0
Rabat	75.2	1.8	3.3	18.0	1.7	100.0
Ensemble	73.6	3.8	11.4	10.0	1.2	100.0

Source: Recensement General de la Population et de l'Habitat, 1971.

## APPENDIX II-E

Facilities in Housing (in %)  
According to Province

Provinces	No Kitchen	No Toilet	No Bathroom	No Running Water	No Well Water or Other	No Electricity
Agadir	21.5	27.3	77.7	62.6	73.9	39.3
Al Hoceima	22.8	18.9	60.2	38.7	98.2	24.5
Beni Mellal	29.1	41.9	90.7	80.9	85.0	44.9
El Jadida	25.9	13.0	89.0	67.9	79.9	37.4
Fez	52.4	15.6	86.4	50.5	85.9	29.3
Kenitra	39.5	26.0	82.3	48.0	93.0	40.7
Khouribga	20.3	33.7	83.6	71.1	76.9	42.7
Ksar es Souk	19.9	29.1	89.3	64.3	65.7	32.8
Marrakech	23.8	10.9	86.9	58.8	72.1	24.9
Meknes	43.5	24.6	87.6	59.5	81.9	36.6
Nador	28.2	24.5	69.7	51.8	80.6	33.9
Quarzazate	20.3	46.9	83.9	72.5	87.8	50.9
Oujda	26.1	14.5	81.2	43.3	79.1	34.5
Safi	38.9	17.9	89.0	73.5	90.9	44.8
Settat	25.9	29.8	92.3	61.2	88.2	49.7
Tanger	26.7	8.6	76.1	57.5	95.9	30.3
Tarfaya	12.0	18.6	95.1	92.8	98.1	72.5
Taza	32.7	27.0	87.2	46.0	85.6	43.1
Tetouan	37.3	18.1	86.0	54.2	85.6	19.8
Casablanca	41.2	11.6	76.4	33.6	95.2	22.8
Rabat	25.7	18.9	74.0	37.7	96.0	34.7
All	35.0	17.8	81.3	48.3	88.1	31.6

Source: Recensement de la Population et de l'Habitat, 1971, Secretariat d'Etat au Plan.

APPENDIX II-F

Facilities in Masonry Housing

	Percent with Facility			Percent without
	Total	Private	Common.	
Running Water	64.8	49.9	14.9	35.2
Water from well or other source	10.5	5.4	5.1	89.5
Kitchen	70.1	66.1	4.0	29.9
Bathroom	24.2	23.2	1.0	75.8
Toilet	92.5	71.0	21.5	7.5
Electricity	81.5	81.5		18.5

APPENDIX II-G

Facilities in Bidonvilles

	Percent with Facility			Percent without
	Total	Private	Common.	
Running Water	3.6	2.3	1.3	96.4
Water from well or other source	4.5	1.5	3.0	95.5
Kitchen	37.7	36.4	1.3	62.3
Bathroom	1.0	0.9	0.1	99.0
Toilet	34.7	27.8	6.9	65.3
Electricity	6.9	6.9		93.1

Source: Recensement de la Population et de l'Habitat, 1971, Secretariat d'Etat au Plan.

APPENDIX II-H

Urban Housing According to Type of Construction

City	Masonry	Stone	Clay	Bidonville	Other	Total
Fez	85.2	5.6	4.3	1.6	3.3	100.0
Kenitra	61.1	11.6	0.1	27.0	0.2	100.0
Marrakech	29.0	4.5	65.9	0.3	0.3	100.0
Meknes	74.6	2.2	7.7	12.7	2.8	100.0
Oujda	81.5	6.2	10.8	1.1	0.4	100.0
Safi	91.1	7.3	1.3	0.2	0.1	100.0
Tanger	81.3	3.3	0.3	15.0	0.1	100.0
Tetouan	88.6	3.4	1.7	6.2	0.1	100.0
Casablanca	86.0	1.7	0.4	11.7	0.2	100.0
Rabat	76.4	1.5	3.0	17.0	2.1	100.0
Sale	75.2	2.7	1.4	19.8	0.9	100.0

Source: Recensement General de la Population et de l'Habitat, 1971.

## APPENDIX II-I

## Urban Households and Facilities

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	Percent with Facility			Percent without
	Total	Private	Common.	
Running Water	51.7	39.1	12.6	48.3
Water from well or other source	11.9	6.0	5.9	88.1
Kitchen	65.0	60.8	4.2	35.0
Bathroom or shower	18.7	17.9	0.8	81.3
Toilet	82.2	62.3	19.9	17.8
Electricity	68.4	68.4		31.6

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Source: Recensement de la Population et de l'Habitat, 1971, Secretariat d'Etat au Plan.

APPENDIX II-J

Masonry Housing in Urban Areas and  
Facilities, 1960 and 1971

Eleven Cities	Kitchen		Toilet		Shower		Water		Well Water		Electricity	
	1960	1971	1960	1971	1960	1971	1960	1971	1960	1971	1960	1971
									(1)			
Fez	71.2	50.6	87.6	94.5	21.8	17.2	66.0	57.4	---	15.6	90.4	80.3
Kenitra	89.1	82.3	67.2	96.5	10.9	31.4	67.5	89.9	---	2.4	96.8	91.7
Marrakech	79.5	82.8	85.7	65.2	12.5	34.4	33.2	82.6	---	9.8	79.7	95.8
Meknes	55.7	63.0	72.0	96.1	69.0	19.9	47.8	58.6	---	26.9	83.2	84.3
Oujda	83.7	80.2	88.5	65.8	7.1	24.4	23.9	61.2	---	31.0	81.7	79.6
Safi	63.0	60.9	81.9	87.4	8.6	12.0	22.3	25.6	---	7.3	68.9	56.1
Tanger	75.4	82.1	80.7	96.7	5.6	28.7	51.4	50.2	---	3.6	82.8	71.0
Sale	82.5	73.9	86.5	92.2	18.4	16.7	41.0	66.2	---	5.2	83.5	74.7
Tetouan	86.0	76.5	85.3	91.1	22.8	17.3	27.1	58.2	---	12.3	99.5	89.1
Casablanca	72.7	62.5	83.8	59.4	29.3	27.4	73.5	77.0	---	4.8	93.3	89.3
Rabat	87.0	85.5	86.4	62.9	34.8	40.8	86.8	85.3	---	3.1	96.5	86.6

(1) This question was not asked in 1960.

Source: Recensement de la Population et de l'Habitat, 1971, Secretariat d'Etat au Plan.

APPENDIX II-K

Facilities in Urban Housing  
(in %) According to Type of Housing

Facility	Type of Housing					Total
	Masonry	Stone	Clay		Others	
<u>Kitchen</u>						
yes Private	66.1	45.8	56.8	36.4	23.3	60.8
yes Shared	4.0	5.1	8.4	1.3	1.7	4.2
None	29.9	49.1	34.8	62.3	75.0	35.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0
<u>Toilet</u>						
yes Private	71.0	47.2	47.2	27.8	10.4	62.4
yes Shared	21.5	22.1	21.7	6.9	5.4	19.9
None	7.5	30.7	31.1	65.3	84.2	17.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0
<u>Bathroom</u>						
yes Private	23.3	6.5	3.6	0.9	1.4	17.9
yes Shared	1.0	0.6	0.3	0.1	0.2	0.8
None	75.7	92.9	96.1	99.0	98.4	81.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0
<u>Running Water</u>						
yes Private	49.9	17.5	12.8	2.3	3.1	39.1
yes Shared	14.9	17.6	7.7	1.3	1.1	12.6
No	35.2	64.9	79.5	96.4	95.8	48.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0
<u>Well Water</u>						
yes Private	5.4	6.8	13.8	1.5	3.2	6.0
yes Shared	5.1	8.1	12.7	3.0	5.4	5.9
No	89.5	85.1	73.5	95.5	91.4	88.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0
<u>Electricity</u>						
Yes	81.5	51.6	49.6	6.9	8.1	68.4
No	18.5	48.4	50.4	93.1	91.9	31.6
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Source: Recensement de la Population et de l'Habitat, 1971, Secretariat d'Etat au Plan.

APPENDIX II-L

Percentage of Tenants Who Own or  
Rent Housing: 1960 and 1971

Provinces and Prefectures	Own or Co-own		Rent		Other	
	1960	1971	1960	1971	1960	1971
Agadir	54.5	33.8	36.8	56.9	8.7	9.3
Al Hoceima	26.2	37.4	66.0	50.4	7.8	12.2
Beni Mellal	45.9	52.0	41.7	38.6	12.4	9.4
Fez	38.1	32.3	55.2	60.1	6.7	7.6
Ksar es Souk	33.1	32.3	39.0	55.8	27.9	11.9
Marrakech + Safi	46.2	41.2	40.5	49.8	13.3	9.0
Meknes	31.3	38.0	61.7	53.1	7.0	8.9
Nador	32.7	44.6	62.3	45.4	5.0	10.0
Quarzazate	1.4	5.1	69.8	78.3	28.8	16.6
Oujda	38.3	43.0	38.0	36.9	23.7	21.1
Tanger	25.5	29.0	67.5	62.5	7.0	8.5
Tarfaya	19.3	43.6	43.0	41.4	37.0	15.0
Taza	36.8	29.0	50.0	59.3	13.2	11.7
Tetouan	28.5	34.6	65.9	57.1	5.6	8.3
Pref. Casablanca El Jadida - Khouribga - Settat	42.0	28.5	50.9	65.0	7.1	6.5
Pref. Rabat-Sale + Kenitra	32.2	28.0	61.4	65.3	6.4	6.7
Ensemble	31.1	32.2	60.3	59.5	8.6	8.3

Source: Recensement de la Population et de l'Habitat, 1971, Secretariat  
d'Etat au Plan.

APPENDIX II-M

Per Cent of Dwellings  
Owned and Rented

Provinces	Own or Co-own		Rent		Other	
	1960	1971	1960	1971	1960	1971
Agadir	54.5	33.8	36.8	56.9	8.7	9.3
Ksar es Souk	33.1	32.3	39.0	55.8	27.9	11.9
Ouarzazate	1.4	5.1	69.8	78.3	28.8	16.6
Casablanca	42.0	28.5	50.9	65.0	7.1	6.5
Marrakech	46.2	41.0	40.5	49.8	13.3	9.0
Taza	36.8	29.0	50.0	59.3	13.2	11.7

	Own or Co-own		Rent		Other	
	1960	1971	1960	1971	1960	1971
Al Hoceima	26.2	37.4	66.0	50.4	7.8	12.2
Meknes	31.3	38.0	61.7	53.1	7.0	8.9
Tetouan	28.5	34.6	65.9	57.1	5.6	8.3

Source: Recensement General de la Population et de l'Habitat, 1971.

## APPENDIX III-A

### CONTRIBUTION TO THE EPIDEMIOLOGICAL STUDY OF SCHISTOSOMIASIS HAEMATOBIIUM IN MOROCCO

The Department of Parasitology of the Faculty of Medicine of Rabat of the National Institute of Hygiene conducted epidemiological studies on schistosomiasis *S. Haematobium* at the beginning of 1972, with a focus on genital urinary schistosomiasis in the Province of Beni-Mellal. The following reports the results of preliminary surveys carried out in the context of this study.

#### Description of the Geographical Location of the Focus

The health sector of Souk-El-Had of Bradia forms part of the sanitary geographical district of Fkih-Ben-Salah. It is subdivided into three subsectors. It is within subsector I of which the total population was estimated in 1972 to be 5,152 persons that the focus of the Schistosome *Haematobium* is located. It includes the neighboring rural areas of Bradia Centre, Les Ouldes Ahmed I and II, Ouled Ghalem, Ouled Messaoud, Ouled Ameur and Ouled Ahmed Blane.

The Muslim population of this sector is sedentary and its activities are dominated by agriculture.

The focus on agriculture derives from the fact that a system of irrigation canals have been established. The principle canal of the sector in Bradia is fed by L'Oued Er Rbia and is the beginning of an important system of irrigation canals which cover that area.

#### Material and Methods

Urine samples were collected preferably between 10 a.m. and 2 p.m. on a maximum of the subjects representing the child and adult population. These sampling hours were chosen to correspond with the habitual cycle of existence of the eggs of the schistosomes in the urine of patients.

#### Results

The parasitic examinations of urine of the subpopulation in Sector I of Souk-El-Had of Bradia has allowed the detection of 752 schistosomiasis cases among the 4,084 persons examined, that is, a global prevalence of 18.4% (see Table I).

The study of the infestation rates of the population according to age groups indicates that the age group from 10-14 is the most affected, with a prevalence of 37.6% for the 1,161 subjects that were examined (see Table I, Figure 1).

The analysis of the prevalence of this disease by age and sex of the patient gives the following results:

In the age groups 2-4 and 45-69, the infestation rates of males and females do not represent significant differences at the 5th percentile. From ages 5-44 and beyond the age of 60, schistosomiasis affects men more than the women. The observed differences for the six age groups considered are significant at the 95 percentile.

#### Intensity of Schistosomiasis Infestation

The study of the quantitative parameter based on the number of eggs found in a specified volume of urine allows an approximate evaluation of the contagiousness in the different age groups.

Only the age groups which had a sufficiently large sample, that is 25 or more, were compared. It is in the age group 10-14 that the emission of eggs is the highest, with an average number of 52.5 per individual.

#### Comments

We have not been able to examine the total population of 5,152. However, the large sample size, that is 4,084 subjects which were studied, represent 80% of the population and therefore, gives a representative sampling.

At the five percent level of confidence, we can assume that the real percentage of the prevalence of the disease is between 17 and 20%. We do not believe that schistosomiasis *S. Haematobium* is a recent occurrence in Souk-El-Had of Bradia. Interviews with the people who have lived in that sector for several years confirm this hypothesis.

It is above all the young population which represents the most dangerous reservoir in the epidemiological chain in this disease. In this sector, the highest observed prevalence, namely 37.6% were found in the age group 10-14. This data is significant at the 99 percent confidence level.

It is also in the 10-14 age group that one finds the patient which excretes the most eggs of *S. Haematobium* into the environment.

Beginning with age 5 in this geographical area, genital urinary schistosomiasis affects more males than females. This epidemiological difference is probably tied to the professional activities to customs or social cultural conditions which make it less likely for women to come into contact with the water environment. The schistosomiasis rates of infestation were 10.1 percent for 2,201 women examined and 28 percent for 1,883 men.

The importance of *B. Truncatus* as an intermediary host of *S. Haematobium* in Morocco has been confirmed.

Looking at meteorological data from 1972-1973 for the region close to the schistosomiasis focus, one can conclude that the disease is seasonal. It is principally found during the warm months of the year, that is, July, August, and September, and corresponds to the seasonal prevalence of the mollusk.

### Conclusion

An important focus of schistosomiasis *S. Haematobium* at Souk-El-Had of Bradia has been uncovered. The intermediary host is *Bulinus R. Truncatas*.

The examination of 4,084 subjects in a total estimated population of 5,152 persons has established a prevalence of the disease of about 20%. The young population, and especially the 10-14 year olds, pay the highest costs to this parasitic disease.

We believe that schistosomiasis *S. Haematobia*, which is actually found in seven provinces of the Kingdom of Morocco, is an important public health problem, and will in the near future become a priority disease.

Within the provisions of the 5-year plan, 1973-1977, the development of agriculture, based on the construction of new dams and waterways, will aggravate the risks of the disease where it already exists and also threatens to propagate schistosomiasis *S. Haematobia* in areas where it is not present.

APPENDIX IV-A

Morocco: Food Balance, 1959-61 and Totals for 1956-58  
 estimated population 11,626,000

Product	Supply				Nonfood use				Utilization				Per capita		
	Pro- duc- tion 1,000 m.tons	Im- ports 1,000 m.tons	Ex- ports 1,000 m.tons	Change in stocks 1,000 m.tons	Total supply 1,000 m.tons	Seed and waste 1,000 m.tons	Feed 1,000 m.tons	Indus- trial 1,000 m.tons	Total 1,000 m.tons	Extrac- tion rate Per cent	Total 1,000 m.tons	Per Kilo- gram	Calo- ries	Protein	Fat
Barley	925	66	23	...	968	76	160	...	236	80	585	50.3	488	15.2	2.5
Wheat	885	178	83	...	980	88	...	...	88	90	803	69.0	662	22.1	2.8
Wheat flour	...	16	2	...	14	...	...	...	...	...	14	1.2	11	...	...
Corn	308	...	64	...	244	17	32	...	49	97	189	16.3	159	4.2	1.9
Sorghum and millet	68	...	54	...	14	...	2	...	2	85	10	...	8	...	...
Rice	18	2	6	...	14	...	...	...	...	14	70	...	9	...	...
Other cereals	*16	...	2	...	14	...	2	...	2	50	6	...	5	...	...
Total cereals	...	357	10	...	347	...	...	...	11	93	323	139.1	1,312	42.3	7.4
Sugar	...	31	57	...	108	...	...	...	...	...	97	27.8	295	...	...
Potatoes	134	8	...	...	8	...	...	...	...	...	8	...	16	...	...
Peanuts	...	15	11	...	127	...	5	...	17	...	8	...	11	...	...
Pulses	123	...	125	...	143	...	...	...	20	...	110	9.5	90	5.8	...
Tomatoes	268	...	4	...	150	...	...	...	4	...	123	10.6	6	...	...
Other vegetables	*154	...	313	...	146	...	...	...	6	...	146	12.5	8	...	...
Citrus fruit	459	...	1	...	342	...	...	...	305	...	140	12.0	13	...	...
Grapes	343	...	...	...	152	...	...	...	146	...	22	1.9	4	...	...
Olives	152	...	...	...	80	...	...	...	3	...	6	...	2	...	...
Figs (fresh & dry)	80	2	...	...	58	2	...	...	2	...	77	6.6	20	...	...
Dates	56	...	...	...	23	...	...	...	1	...	22	2.0	37	...	...
Other fruits	*12	11	...	...	...	...	...	...	...	...	22	27.8	3	...	...
Beef and veal	64	...	...	...	64	...	...	...	...	...	64	5.5	34	2.2	2.7
Mutton and lamb	34	...	...	...	34	...	...	...	...	...	34	2.9	19	...	...
Other meat	58	...	...	...	58	...	...	...	...	...	58	5.0	27	...	...
Total meat	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fish	148	1	73	...	76	4	...	...	4	...	72	13.4	80	5.8	6.3
Olive oil	22	...	2	...	19	...	...	...	...	...	19	6.2	30	...	...
Vegetable oils	4	39	...	...	43	...	...	...	...	...	43	1.6	39	...	...
Animal fats	14	12	...	...	26	...	...	...	9	...	17	3.7	90	...	...
Total fats	...	...	...	...	...	...	...	...	...	...	...	1.5	37	...	...
Whole milk	532	...	...	...	532	6	...	...	73	...	453	6.8	166	...	...
Cheese	7	3	...	...	10	...	...	...	...	...	10	38.9	81	...	...
Dry milk	...	8	...	...	8	...	...	...	...	...	8	...	10	...	...
Total milk and cheese	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Eggs	50	...	3	...	47	...	...	...	...	...	47	40.5	98	5.2	6.2
Total consumption	...	...	...	...	...	...	...	...	...	...	47	4.0	16	1.2	1.1
1959-61	...	...	...	...	...	...	...	...	...	...	...	...	2,210	66.4	43.5
1956-58	...	...	...	...	...	...	...	...	...	...	...	...	2,210	70.3	45.7

Source: Food Balances for 30 Countries in Africa and West Asia, 1959-61, U.S. Dept. of Agriculture.

Appendix IV-B

Rates of Growth of Population, Food  
Supply and Demand in Morocco

Country	Annual Rate of Growth			Per Capita Daily		
	Population	Food Production	Domestic Demand	Energy Supply		Protein Supply
				Kilo- calories	% require- ment	Grams
Morocco	3.3	4.5	3.3	2220	92	62
Tunisia	3.1	4.0	4.3	2250	94	67
Algeria	3.2	1.3	3.4	1730	72	46
Mauritania	2.2	-0.8	3.0	1970	85	68
Egypt	2.8	3.2	3.8	2500	100	69
Libya	3.2	5.6	---	2570	109	62

Source: Adapted from The State of Food and Agriculture, 1975, F.A.O.,  
1976, p. 106.

Appendix IV-C

Regional Distribution of Households and Children Surveyed

Provinces (Survey Regions)	Households <sup>1</sup>						Rural						Urban						Total					
	P <sup>2</sup>		A		%		P		A		%		P		A		%		P		A		%	
Agadir Tarfaya	25	25	100	300	197	65.7	29	29	100	348	30.1	87.4	54	54	100	648	501	77.3						
Taza Al Hoceima	16	15	93.6	192	99	51.6	42	42	100	504	362	71.8	58	57	98.3	696	471	67.8						
Boni Mellal	16	16	100	192	129	67.2	36	36	100	432	289	66.9	52	52	100	624	418	67.0						
El Jadida Khouribga Et Settat	22	22	100	264	217	82.2	33	33	100	356	340	85.9	55	55	100	660	557	84.4						
Fez	30	29	96.7	360	199	55.3	21	21	100	252	165	65.5	51	50	98.0	612	364	59.5						
Ksar Es Souk	15	14	93.3	180	131	72.8	38	30	789	456	229	50.2	53	44	83.0	636	360	56.6						
Marrakech	26	26	100	312	192	61.5	28	28	100	336	263	78.3	54	54	100	648	455	70.2						
Meknes	24	24	100	288	221	76.7	29	29	100	348	257	73.9	53	53	100	636	478	75.2						
Quarzazate	10	10	100	120	60	50.0	39	39	100	468	340	72.6	49	49	100	588	400	68.0						
Oujda Nador	20	19	95.0	240	146	60.8	27	27	100	324	290	89.5	47	46	97.9	564	436	77.3						
Kenitra	22	21	95.5	264	201	76.1	38	38	100	456	426	93.4	60	59	98.3	720	627	87.1						
Tanger Tetouan	23	23	100	276	177	64.1	23	23	100	276	246	89.1	46	46	100	552	423	76.6						
Safi	20	20	100	240	137	57.1	33	33	100	356	323	81.6	53	53	100	636	460	72.3						
Prefectures Casablanca	52	50	96.2	624	436	69.5	-	-	-	-	-	-	52	50	96.2	624	436	69.9						
Rabat	46	45	97.8	552	334	60.5	-	-	-	-	-	-	46	45	97.8	552	334	60.5						
Total	367	359	97.8	4404	2876	65.3	416	408	98.1	4992	3834	76.8	783	767	98.0	9396	6710	71.4						

1 P = Projected

2 A = Actual

Source: Enquete Nationale Sur l'Etat de Nutrition, Ministry of Public Health, 1973.

APPENDIX IV-D

Children With Clinical Symptoms of Protein-Calorie Malnutrition

Months	0-3	4-9	10-15	16-21	22-27	28-33	34-39	40-45	46-47	TOTAL
(1)	% 80,41	% 81,83	% 73,90	% 75,44	% 77,07	% 78,04	% 79,72	% 84,44	% 81,31	% 78,66
Total (2)	19,59	18,17	26,10	24,56	22,93	21,96	20,28	15,56	18,69	21,34
(1)	86,14	84,65	79,33	85,65	83,82	85,35	85,61	87,16	79,27	84,15
Urban (2)	13,86	15,35	20,67	14,35	16,18	16,63	14,39	12,84	20,73	15,85
(1)	78,44	80,79	71,91	70,85	74,67	75,89	77,43	83,42	82,38	76,54
Rural (2)	21,56	19,21	28,09	29,15	25,33	24,11	22,57	26,58	17,62	23,46

(1) Children who show no sign of protein-calorie malnutrition.

(2) Children who have at least one clinical symptom which was suggestive of protein-calorie malnutrition.

Source: Enquete Nationale Sur l'Etat de Nutrition; Ministry of Public Health, 1973.

## APPENDIX IV-E

## Production By Commodity, Value and Indices of Total Agricultural and Food Production, Average 1961-65, Annual 1956-75

Commodity	Price	Average	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
	Weight	1961-65										
	Dollars		1,000 Metric Tons									
Wheat	74	1,336	1,054	668	1,281	956	1,280	720	1,500	1,440	1,440	1,580
Rice, Paddy	103	20	22	23	24	23	19	15	17	20	25	27
Corn	46	352	286	216	369	398	470	130	420	480	400	330
Barley	44	1,314	1,633	652	1,590	1,119	1,390	570	1,420	1,750	1,400	1,430
Oats	46	18	18	22	22	14	30	14	22	15	21	20
Sorghum	62	74	20	20	106	78	94	50	83	107	76	52
Other Grains	98	22	17	33	14	23	12	10	27	27	19	28
Beans, Dry	130	4	1	1	1	2	3	3	3	3	5	4
Broad Beans	43	75	27	13	38	48	62	39	58	59	97	120
Lentils	105	15	4	3	5	6	9	5	15	13	23	19
Chickpeas	130	42	13	10	28	57	44	16	38	54	51	51
Dry Peas	62	34	20	14	22	31	39	17	41	29	40	45
Potatoes	60	193	70	85	155	126	135	140	142	225	188	271
Sugar Beets	12	86	0	0	0	0	0	0	0	73	181	175
Tobacco	588	2	1	2	3	2	2	2	2	1	2	2
Cotton	650	6	3	2	2	2	2	2	2	4	5	8
Cottonseed	65	13	6	4	4	4	3	5	8	11	16	24
Flaxseed	140	6	11	10	19	22	14	4	10	6	8	4
Sunflower Seed	103	6	1	1	2	2	2	0	2	6	8	10
Tomatoes	43	232	102	177	172	193	270	198	210	175	253	326
Oranges and Tangerines	52	528	225	367	396	398	447	452	471	610	510	596
Lemons	42	7	8	6	7	5	3	3	8	9	8	9
Grapefruit	45	13	8	7	8	8	13	15	10	12	12	16
Figs, Fresh	148	76	42	46	49	58	81	77	66	61	96	79
Almonds, in Shell	470	18	16	16	20	32	16	12	12	16	20	32
Grapes	57	404	398	375	362	428	364	368	329	417	401	507
Dates	210	71	41	70	62	55	100	60	47	79	85	85
Olive Oil	532	25	35	9	35	22	25	16	19	27	26	38
Meats	454	154	125	134	134	136	167	165	148	150	148	160
Milk	96	421	500	500	500	486	427	359	394	429	443	482
Wool, Greasy Basis	572	15	16	15	16	16	16	15	15	15	16	14

Source: U.S. Department of Agriculture, Economic Research Service, Statistical Bulletin 556

APPENDIX IV-E

Production By Commodity, Value and Indices of Total Agricultural and Food Production, Average 1961-65, Annual 1956-75 (Cont'd)

Commodity	Price	Average	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
	Weight	1961-65										
	Dollars		-1,000 Metric Tons -									
Wheat	74	1,336	1,149	1,268	2,778	1,594	1,801	2,188	2,161	1,574	1,853	1,575
Rice, Paddy	103	20	25	28	41	50	40	3	14	12	14	29
Corn	46	352	157	236	415	450	320	390	368	217	389	371
Barley	44	1,314	610	1,320	3,494	2,205	1,953	2,572	2,466	1,255	2,389	1,585
Oats	46	18	13	19	21	11	12	15	24	13	43	28
Sorghum	62	74	47	48	87	41	48	121	59	52	87	74
Other Grains	98	22	14	17	24	10	48	26	17	13	15	16
Beans, Dry	130	4	3	5	7	4	3	4	2	2	2	2
Broad Beans	43	75	89	97	170	115	190	243	267	189	345	212
Lentils	105	15	9	15	18	20	16	20	20	11	27	34
Chickpeas	130	42	68	66	118	73	137	2	34	79	164	61
Dry Peas	62	34	30	32	47	41	60	50	62	37	124	98
Potatoes	60	193	275	205	160	300	275	275	280	280	275	275
Sugar Beets	12	86	391	367	785	918	1,000	1,584	1,677	1,293	1,950	1,792
Tobacco	588	2	2	2	1	2	3	3	4	4	4	3
Cotton	650	6	8	5	6	6	6	8	8	9	6	5
Cottonseed	65	13	16	11	13	12	13	16	16	16	12	12
Flaxseed	140	6	3	3	5	7	3	3	5	1	3	2
Sunflower Seed	103	6	5	9	4	8	21	12	25	18	14	25
Tomatoes	43	232	302	277	245	270	280	300	350	350	325	325
Oranges and Tangerines	52	528	676	775	720	819	753	821	838	925	820	580
Lemons	42	7	9	5	5	3	3	8	4	4	3	3
Grapefruit	45	13	17	15	13	8	5	15	8	10	17	16
Figs, Fresh	148	76	59	65	65	60	60	65	65	65	65	65
Almonds, in Shell	470	18	20	24	14	13	13	12	19	13	17	10
Grapes	57	404	362	238	310	160	203	276	264	282	240	220
Dates	210	71	95	75	100	100	100	75	100	90	95	50
Olive Oil	532	25	18	18	50	16	30	55	30	35	30	20
Meats	454	154	168	174	175	180	175	175	180	175	210	220
Milk	96	421	501	520	525	535	525	535	550	525	525	350
Wool, Greasy Basis	572	15	14	14	12	17	16	14	20	23	21	20

Source: U.S. Department of Agriculture, Economic Research Service, Statistical Bulletin 556.

Appendix V-A

Operating Expenses of the Ministry of Public Health,  
Morocco, 1966 and 1973

Summary (in dirhams)

	<u>1966</u>	<u>1973</u>
Personnel	106,442,533	136,742,025
Operating Expenses (all division)	43,536,000	53,594,846
Expenses - Division of Preventive Medicine	1,953,000	2,368,000
Health Education and Nutrition	28,700,000	33,819,000
Social and Medical Assistance	2,300,000	2,160,000
Subsidies for Health- Related Programs	<u>7,683,600</u>	<u>7,982,500</u>
TOTAL	190,615,133	236,666,371

Source: Bases de Rationalisation de Programmes Sanitaires au Maroc,  
Ouakrim M'Hamed, 1973

Appendix V-B

Itemized List - Operating Expenses of the Ministry  
of Public Health, Morocco  
(in dirhams)

	<u>1966</u>	<u>1973</u>
1. Personnel	84,172,600	99,924,346
2. Operating Expenses (all divisions MOPH) hdqtrs.	1,680,000	2,400,000
Miscellaneous Expenses (purchase of laboratory animals, utilities, printing costs, furniture repairs)	7,935,500	10,578,546
Transportation	2,350,000	3,205,000
Travel Expenses	920,000	870,000
Medical Supplies and Medicines	30,500,000	36,200,000
Consultants	500	--
Employee Accident Benefits	60,000	26,000
Professional Insurance (unspecified)	90,000	120,000
TOTAL	<u>43,536,000</u>	<u>53,594,846</u>
3. Expenses of the Division of Preventive Medicine		
-- Control of Epidemics	823,000	793,000
-- Control of Endemic Communicable Disease	700,000	1,085,000
-- Health Education	80,000	100,000
-- MCH Care	350,800	390,000
TOTAL	<u>1,953,800</u>	<u>2,368,000</u>

Source: Bases de Rationalisation de Programmes Sanitaires au Maroc, Ouakim M'Hamed, 1973.

	<u>1966</u>	<u>1973</u>
4. Expenses of Health Division		
-- Professional Schools	2,500,000	4,089,000
-- Scholarships	110,000	20,000
-- Nutrition Programs	13,400,000	14,400,000
-- Subsidies to Independent Hospitals for Public Health Patients	12,400,000	14,800,000
-- Miscellaneous	<u>290,000</u>	<u>510,000</u>
TOTAL	28,700,000	33,819,000
5. Social and Medical Assistance		
-- Health Assistance	1,650,000	1,430,000
-- ADC and Old Age	<u>650,000</u>	<u>730,000</u>
TOTAL	2,300,000	2,160,000
6. Subsidy Payments		
-- Independent Hospitals	2,050,000	3,300,000
-- Social Welfare Organizations	1,633,600	682,500
-- Social Works	<u>4,000,000</u>	<u>4,000,000</u>
TOTAL	7,683,600	7,982,500
TOTAL OPERATING BUDGET	<u>190,615,133</u>	<u>236,666,371</u>

Source: Bases de Rationalisation de Programmes Sanitaires au Maroc,  
Ouakim M'Hamed, 1973.



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