Maternal and Infant Nutrition Reviews

MOROCCO

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MATERNAL AND INFANT NUTRITION REVIEWS

MOROCCO

A Guide to the Literature

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INTRODUCTION

This monograph reviews the available literature on maternal and infant nutritional status, beliefs, and practices in Morocco. It also lists current government, USAID, international agency, and private voluntary organization nutrition-related programs and policies.

This is not an all-inclusive listing, but it should provide enough information to enable the health/nutrition planner (our primary target audience) to ascertain quickly what is known (and what needs to be studied) about this subject. The information is organized according to a Maternal and Infant Nutrition Review (MINR) system outlined on page iii.

The map on page iv and Table 1 on page v show the extent to which various regions and specific locations have been surveyed. Pages vii and viii present the highlights of our findings. Pages 1 to 50 contain the data categorized according to the MINR classification system with boldface titles within each category to describe specific listings.

Pages 51 to 56 contain an annotated bibliography with each entry described in terms of type of study (original data or literature review), with methodology, sample characteristics, and location, where relevant, and a summary.

These reviews are limited to documents available to us in the United States working under time constraints. We hope that we will be able to obtain further information and to update the reviews.

Special thanks are extended to Ms. Ursula Nadolny for helping us locate materials used in this report.

Ron Israel
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MATERNAL AND INFANT NUTRITION REVIEWS

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Bibliography

* Gilmore, 1980

TABLE I

TABLE I

Locations Studied

	CRS, 1979	Enquete Nationale, 1973	FAO, 1979	Gilmore, 1980	Robinson, 1977
National	X	X	X	X	
Rural areas of Ouarzazate					X

HIGHLIGHTS

1. **NUTRITION AND HEALTH STATUS:** Deficiency diseases include protein malnutrition, which occurs in infants who are weaned late (12 to 18 months) and in an abrupt manner. This condition is known as "maladie oedemateuse de sevrage." Other deficiency diseases are undernutrition; insufficient calories, even marasmus; osteomalacia in pregnant women; iron deficiency anemia; and vitamin A deficiency. The national infant mortality rate is around 135 deaths per one thousand live births. 19.59% of children from birth to three months of age have at least one sign of PEM. The percentage of underweight children is greatest in the age group 10 to 27 months. Median weights of rural infants is 2.1 kilograms below international standards at two years of age. 55% of children one year of age are below 90% of the standard height for age. Data is not available on maternal mortality, nor is there much information on the nutrition and health status of pregnant and lactating women. Localized epidemics of pellagra occur when cereal harvests are inadequate and corn consumption increases. A major center of endemic goiter exists in the region of Ouarzazate, in the village of Skoura.

2. **DIETARY BELIEFS:** Many mothers believe that weaning should begin at around one year. 85 to 87% of mothers believe that mother's milk is best for the newborn. Rural women desire an average of 4.6 children and urban women desire an average of 3.3 children. 36.2% of mothers believe that children should not be fed when they have measles.

3. **DIETARY PRACTICES:** Barley and wheat are the staple foods, followed by corn. Shortages in barley are likely to occur between December and April; in corn, between May and July; and in wheat, between January and May. 20% of the population is insufficiently fed, especially pregnant or lactating women and young children. Sugar is consumed in large quantities, especially in mint tea, the national drink. 80% of expenditures for cereals are used to purchase foods which are prepared in the home. Mothers' milk in Morocco was found to contain more fat than the milk of French women, but less protein. There is no special weaning diet. Solid foods are usually given in the second year--on average, by the fifteenth month. 50% of mothers wean abruptly due to a new pregnancy. 66% of children receive tea, bread and oil twice a day after weaning. Only 50% have some protein food in their meals.

4. **NUTRITION STATUS CORRELATIONS:** The members of a large family get less food per capita than do the members of a small family, in spite of an increased percentage of income appropriated for food. July through November is generally throught to be a period of higher diarrheal disease incidence than the Spring. There is no significant difference in the incidence of moderate to severe PCM between male and female children. The percentage of mothers who didn't feed their infants growth foods (protein) decreased from 43% to 7% as a result of a three year Catholic Relief Service nutrition education project.

5. **NUTRITION AND HEALTH POLICIES:** The Interministerial Council for Food and Nutrition (CIAN) coordinates food and nutrition related activities of various ministries. CEPEN is a unit within the Ministry of Plan responsible for determining the extent and nature of nutrition problems in Morocco, collecting and analyzing existing data, identifying groups whose diets are inadequate, surveying the existing flow of food from producer to individual, and

supporting studies to determine nutritional needs of various groups. There is no national nutrition policy. Government policy controls the price of both domestic and imported foods to protect lower income groups from sharp price increases which may follow a poor harvest. The last national nutrition survey was carried out in 1971. A combined nutrition and consumption survey is planned for 1981. The Ministry of Public Health runs maternal and child health programs designed to prevent malnutrition, to prevent the infectious diseases of childhood and to improve maternal health. The Ministry runs about 200 health centers throughout the country which provide basic preventive services including prenatal and postnatal care for women, family planning, nutrition education and vaccination. Under the Protection de la Santé de l'Enfant (PSE) program, outreach workers go into rural areas to find malnourished or sick children and pregnant or recently-delivered mothers and tell them about health clinic services. Health clinics provide Actamine 5, a weaning food prepared from locally-available foods. Most primary and secondary schools offer classes in nutrition education. 70,020,000 pounds of U.S. PL 480 commodities are to be distributed in Morocco in FY 1982. Voluntary agencies who distribute this food include Catholic Relief Services, Entraide Nationale and the American Jewish Joint Distribution Committee. Catholic Relief Services has run a very successful nutrition education project aimed at changing the feeding practices of mothers who attend CRS Social Education Centers, now operating in 30 provinces in Morocco.

1. NUTRITION AND HEALTH STATUS

1.1 NUTRITION AND HEALTH STATUS, GENERAL

NATIONAL

DEFICIENCY DISEASES: Deficiency diseases include protein malnutrition which occurs in infants who are weaned late (12 to 18 months) and in an abrupt manner. This condition is known as "maladie oedemateuse de sevrage." Other deficiency diseases are undernutrition; insufficient calories, even marasmus; osteomalacia in pregnant women; iron deficiency anemia; and vitamin A deficiency. (Royaume du Maroc, 1971)

GOITER: A major center of endemic goiter exists in the region of Ouarzazate, in the village of Skoura. 59% of boys and 46% of girls had goiters. Cretinism is not unusual. The only salt in the area is supplied by salt mines near the village. Goiter is also found in the region of Tazonakht. (May, 1967)

PELLAGRA: Localized epidemics of pellagra occur when cereal harvests are inadequate and corn consumption increases. (May, 1967)

IRON STATUS AND EMPLOYMENT: Iron intake appears to be satisfactory for almost all groups except unemployed persons. (Benrida, 1976)

CAUSES OF DEATH: Leading causes of death in all age groups include gastrointestinal diseases, upper respiratory infections, measles, heart disease, and accidents. Pneumonia is also a cause of infant mortality. (Pillsbury, 1978)

EYE DISEASE: Conjunctivitis and trachoma are reported more often than any other diseases. These diseases have been one of the principal causes of morbidity for centuries. Trachoma historically has been the most common cause of blindness throughout North Africa. Progress in treatment and control of eye disease has been impressive, but both trachoma and conjunctivitis remain major health problems. (Weissman, 1977)

MEASLES: Morocco has one of the highest reported incidences of measles in the world. (Weissman, 1977)

RURAL

SCHISTOSOMIASIS: Prevalence of schistosomiasis was about 20%. (Weissman, 1977)

1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT

NATIONAL

MATERNAL MORTALITY: Data is not available on maternal mortality. (Weissman, 1977)

ABORTION: Many poor women arrive at hospitals in serious condition as a result of self-induced abortion attempts, and they usually refuse to

1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT (Cont.)

acknowledge having made the attempt. Sodium permanganate and ergot (which is poisonous) are used, as well as concoctions such as a pound of red peppers macerated with vinegar, eaten every morning before breakfast. Safe abortions by trained medical personnel are available only to those who can pay for them. (Weissman, 1977)

1.3 NUTRITION AND HEALTH STATUS, WOMEN, LACTATING

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS

NATIONAL

INFANT MORTALITY RATE: The infant mortality rate declined from 149 deaths per 1000 in 1966 to 130 per 1000 in 1976. (Weissman, 1977)

INFANT MORTALITY RATE: The infant mortality rate was 135 deaths per 1000 live births in 1976. (Sivard, 1979)

INFANT MORTALITY: Infant mortality has remained high, despite massive vaccination campaigns and good public acceptance of general preventive measures. (Weissman, 1977)

INFANT MORTALITY: In 1972, 30% of all deaths occurred in children less than one year of age. Of 700,000 children born each year, more than 10% die during their first year. (Benrida, 1976)

CAUSES OF INFANT DEATHS: Upper respiratory infections and gastrointestinal diseases accounted for over one-third of infant deaths. Congenital malformations accounted for 18.64% of infant deaths; 12.75% were due to gastroenteritis diarrheas; 10%, pneumonia; 8.4%, other infectious diseases; 6.8%, tuberculosis; 6.08%, heart disease; 3.43%, accidents; 3.3%, other respiratory diseases; 2.81%, other diseases of the digestive system; and 27.7%, all other diseases. (Weissman, 1977)

BIRTH WEIGHT: Median birth weight of infants was above international norms; mean birth weight was 3.7 kilograms. (Enquete Nationale, 1973)

RICKETS: 14.2% of children from birth to three months of age showed at least one sign of rickets; 0.88% showed two signs, and 0.88% showed three signs. (Enquete Nationale, 1973)

CLINICAL SIGNS OF PEM: 19.59% of children from birth to three months of age showed at least one sign of PEM; 80.41% were free of all clinical signs of PEM at examination. (Enquete Nationale, 1973)

WEIGHT FOR AGE: Median weights of children followed international growth curves through three months of age, and then fell below the norms. (Enquete Nationale, 1973)

HEIGHT FOR AGE: 64.22% of children from birth to three months of age had a normal height for their age; 32.95% were 81 to 90% of standard height

for age, and 2.83% were 80% or less of standard height. (Enquete Nationale, 1973)

HEIGHT FOR AGE: At six months of age, the height of the average child was 1.6 centimeters below the standard height for age. (Enquete Nationale, 1973)

WEIGHT AND HEIGHT: The pilot study of the National Nutrition Survey found that growth in height and weight for both males and females was satisfactory during the first six months of life. (Enquete Nationale, 1973)

WEIGHT AND HEIGHT: Mean heights and weights are normal at birth and for the first two months of life. Then, the mean weight and height curves for both sexes decline and no longer achieve the 50th percentile. (Enquete Nationale, 1973)

EDEMA: 3.19% of children from birth to three months of age had edema at clinical examination; 1.81% had edema in their hands or feet, and 1.38% had edema in their arms, legs or faces. (Enquete Nationale, 1973)

ARM CIRCUMFERENCES: 51.59% of children from birth to three months of age had a normal arm circumference, 35.96 were 81 to 90% of standard, 11.97% were 60 to 80% of standard, and 0.49% fell below 60% of standard. (Enquete Nationale, 1973)

SKINFOLD THICKNESS: 3.07% of children from birth to three months of age had a skinfold thickness less than 6 millimeters (60% of standard). (Enquete Nationale, 1973)

HEAD CIRCUMFERENCE: At birth, the average head circumference was 1.4 centimeters above standard, but at three months of age, it averaged .1 centimeter below standard. By 6 months of age, the average measurement was .2 centimeters below the standard. (Enquete Nationale, 1973)

RURAL

INFANT MORTALITY RATE: The infant mortality rate in rural areas was 170 deaths per 1000 live births. (Weissman, 1977)

INFANT MORTALITY RATES: In 1973, the infant mortality rate was 120 deaths per 1000 live births in rural areas. This figure was up from an estimate of 97 deaths per 1000 live births in the previous year. (Benrida, 1976)

INFANT MORTALITY RATES: The infant mortality rate was 158 deaths per 1000 live births in rural plains areas, and 186 deaths per 1000 live births in the arid mountain regions. (Royaume du Maroc, 1971)

BIRTH WEIGHT: Average birth weight in rural areas was 3.6 kilograms. (Enquete Nationale, 1973)

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS (Cont.)

CLINICAL SIGNS OF PEM: 21.56% of rural children from birth to three months of age showed at least one clinical sign of PEM; 78.44% of rural children in this age group were free of all clinical signs of PEM. (Enquête Nationale, 1973)

EDEMA: 4.22% of rural children from birth to three months of age had edema upon clinical examination. 2.43% had edema of the hands or feet, and 1.82% had edema of the arms, legs, or face. (Enquête Nationale, 1973)

WEIGHT FOR AGE: 47.38% of rural children from birth to three months of age had a normal weight for age. 29.89% were between 81 and 90% of standard weight for age; 16.42% were between 61 and 80% of standard; and 6.31% fell below 61% of standard. (Enquête Nationale, 1973)

HEIGHT FOR AGE: 60.83% of rural children from birth to three months of age had a normal height for age; 35.73% achieved 81 to 90% of standard height for age, and 3.44% were 80% or less of standard height. (Enquête Nationale, 1973)

HEIGHT FOR AGE: The average height of rural children six months old was 2.3 centimeters below standard height for age. (Enquête Nationale, 1973)

WEIGHT AND HEIGHT: Heights and weights are normal at birth and for the first two months of life; then the weight and height curves for both sexes decline and no longer achieve the 50th percentile. This falling off occurs earliest, and is most pronounced, in rural areas in almost all the provinces except Settat, El Jadida, Khouribga, Kenitra, Meknes and Safi, which are the regions closest to the rich plains. (Enquête Nationale, 1973)

HEAD CIRCUMFERENCE: At birth, the head circumference of the average rural child was 1.8 centimeter above the standard. At three and six months of age, the average measurement was 0.3 centimeter below standard. (Enquête Nationale, 1973)

ARM CIRCUMFERENCE: 47.24% of rural children had a normal arm circumference, 38.56% were 81 to 90% of standrd, 13.92% were 60 to 80% of standard, and 0.28% were below 60% of standard. (Enquete Nationale, 1973)

SKINFOLD THICKNESS: 4.13% of rural children from birth to three months of age had a skinfold thickness less than 6 millimeters (60% of standard). (Enquête Nationale, 1973)

RICKETS: 16.6% of rural children from birth to three months of age showed at least one sign of rickets; 4.21% showed two signs, and 1.21% showed three signs. (Enquête Nationale, 1973)

URBAN

INFANT MORTALITY RATE: The infant mortality rate in urban areas was about 100 deaths per 1000 live births. (Weissman, 1977)

INFANT MORTALITY RATE: The infant mortality rate in urban areas was 105 deaths per 1000 live births. (Basta, 1977)

INFANT MORTALITY RATES: In 1973, the infant mortality rate was 104 deaths per 1000 live births in urban areas, up from 70 per thousand the previous year. (Benrida, 1976)

BIRTH WEIGHT: Average birth weight among urban children was 3.8 kilograms. (Enquête Nationale, 1973)

EDEMA: 0.08% of urban children from birth to three months of age had edema of their arms, legs, or faces at clinical examination. No urban child in this age group had edema of the hands or feet. (Enquête Nationale, 1973)

CLINICAL SIGNS OF PEM: 13.86% of urban children from birth to three months of age showed at least one clinical sign of PEM. 86.14% were free of all clinical signs of PEM at examination. (Enquête Nationale, 1973)

WEIGHT FOR AGE: 59.47% of urban children from birth to three months had normal weight for age; 21.54% were from 81 to 90% of standard weight for age; 17.84% were from 61 to 80%; and 1.15 fell below 61% of standard. (Enquête Nationale, 1973)

HEIGHT FOR AGE: 74.05% of urban children from birth to three months of age had a normal height for age; 24.91% were 81 to 90% of standard height for age, and 1.04% were 80% or less of standard. (Enquête Nationale, 1973)

HEIGHT FOR AGE: The average height for age of urban children six months old was .3 centimeters below standard height for age. (Enquête Nationale, 1973)

HEAD CIRCUMFERENCE: At birth, the head circumference of the average urban child was 0.6 centimeter above the standard. At three months of age, head circumference averaged 0.2 centimeter above the standard, and at six months of age, 0.1 centimeter below the standard. (Enquête Nationale, 1973)

ARM CIRCUMFERENCE: 64.25% of urban children from birth to three months of age had a normal arm circumference, 28.38% were 81 to 90% of standard, 6.26% were from 60 to 80% of standard, and 1.11% were below 60% of standard. (Enquête Nationale, 1973)

SKINFOLD THICKNESS: 0.02% of urban children from birth to three months of age had a skinfold thickness less than 6 millimeters (60% of standard). (Enquête Nationale, 1973)

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS (Cont.)

SIGNS OF RICKETS: 7.2% of urban children from birth to 3 months of age showed one sign of rickets. No child in this age group showed more than one sign. (Enquête Nationale, 1973)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

NATIONAL

MALNUTRITION RATE: Malnutrition, particularly protein calorie malnutrition, is found among more than fifty percent of children under four years of age. (Weissman, 1977)

NUMBERS OF MALNOURISHED CHILDREN: 41.58% of children from birth to four years of age were found to have moderate protein calorie malnutrition, and therefore were in need of nutrition rehabilitation. Extrapolating from this sample, there are 1,024,199 children in the country who need nutritional rehabilitation. 4.66% had severe protein calorie malnutrition and needed hospital treatment. Extrapolating from this percentage, there are 114,785 children so severely malnourished they require hospitalization. (Enquête Nationale, 1973)

MALNUTRITION AND MORTALITY: The malnutrition which follows weaning plays an important role in infant mortality. The average child is well-nourished on mother's milk for the first six months, but between 1 and 3 years, rates of mortality vary between 10 and 40%. Through three years of age, malnutrition which follows weaning is the most important cause of mortality. (Royaume du Maroc, 1971)

PROTEIN CALORIE MALNUTRITION: 42% of children were suffering from second degree or moderate malnutrition (between 61 and 80% of normal weight for age). 4.72% had edema: 3% were localized edemas and 2% were general. (Weissman, 1977)

SEVERE PCM: 5% of children under four years of age had severe PCM (a weight for age deficit of greater than 40% of standard). (Enquête Nationale, 1973)

MODERATE PCM: Over 40% of children below four years of age had moderate protein calorie malnutrition (a weight for age deficit of 20 to 40% of standard). (Enquête Nationale, 1973)

CLINICAL SIGNS OF MALNUTRITION: 18.17% of children 4 to 9 months old showed at least one clinical symptom suggestive of protein calorie malnutrition, along with 26.1% of children 10 to 15 months old, 24.56% of children 16 to 21 months old, and 22.93% of children 22 to 27 months old. (Enquête Nationale, 1973)

MALNUTRITION AND AGE GROUP: Among children 10-15 months of age, 44.9% were between 61 and 80% of standard weight for their age; 5.96% were below 61% of standard; 26.1% showed at least one clinical sign of PEM; and 7.8% had edema. Among children 16 to 21 months of age, 49.39% were

between 61 and 80% of standard weight for age; 7.51% were below 61% of standard; 24.56% showed at least one clinical sign of malnutrition; and 4.17% presented with edema. (Enquête Nationale, 1973)

UNDERWEIGHT AND AGE: The percentage of underweight children (low weight for age) was greatest in the age group 10 to 27 months. (Enquête Nationale, 1973)

ANTHROPOMETRY AND AGE: In a national survey, anthropometric measures were superior to the norm at birth, but there was a dip in the growth curves at the age of weaning. This dip was most marked between the ages of 10 and 27 months. (Enquête Nationale, 1973)

FALL-OFF IN GROWTH: In general, fall-off in growth occurs around 8, 9, or 12 months of age and persists until 2 1/2 or 3 years of age. Thus, at 18 months of age, the average weight of children examined was about 9 kilograms, although international norm is 11 kilograms—a difference of 2 kilograms. Similarly, at 24 months, standard weight is 12.5 kilograms, and the average among the children examined was 9.5 kilograms—a difference of 3 kilograms. (Enquête Nationale, 1973)

IMPROVED GROWTH: The growth curves produced by the 1971 National Nutrition Survey were compared with the curves from the 1967 pilot study. The fall-off in growth, at least in urban areas, and perhaps in rural areas as well, was more gradual, less important, and less prolonged in the 1971 study than in 1967. This trend was probably due to more gradual weaning practices. Mothers try to introduce other foods into the infants' diets, but these foods are still insufficient in quanitity and quality. (Enquête Nationale, 1973)

GROWTH AND AGE OF CHILD: After six months of age, increases in height and weight slowed through the age of thirty months. The children most severely affected were between the ages of 10 and 27 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. (Weissman, 1977)

KWASHIORKOR: Kwashiorkor is common; it occurs between the twelfth and eighteenth months after birth, reaching a peak among two-year old children. In Northern areas, it follows abrupt weaning—the first symptoms appearing six weeks later. Signs of kwashiorkor also occur in breast fed children. (May, 1967)

EDEMA: Among 277 children from six months to three years of age examined in the pilot study for the National Nutrition Survey, 42 (15%) were found to have edema. (Enquête Nationale, 1973)

EDEMA: 4.72% of children under four years of age presented with edema (about 3% with a localized edema and about 2% with a generalized edema). (Enquête Nationale, 1973)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS (Cont.)

EDEMA AND REGION: Among 80 children from six months to three years of age living in the southern part of the country, 32.5% had edema; among 58 children living in the north, 6.9% had edema. (Enquête Nationale, 1973)

EDEMA AND AGE: 4.29% of children from 4 to 9 months of age had edema upon clinical examination, as did 7.80% of children from 10 to 15 months of age, 4.17% of children from 16 to 21 months of age, and 5.84% of children from 22 to 27 months of age. 3.01%, 3.95%, 3.09%, and 3.16% in each respective age category had edema of the hands and feet. 1.28%, 3.85%, 1.08%, and 2.68% in each respective age category had edema in the arms, legs or face. (Enquête Nationale, 1973)

WEIGHT FOR AGE: About 80% of all children were born in the normal weight range and remained there for about six months. The drop in relative weight at six months was drastic, and the children did not regain a normal weight for age by five years of age. (CRS, 1979)

WEIGHT FOR AGE: 50.48% of children from birth to three years of age had a normal weight for age; 27.75% were between 81 and 90% of standard weight for age; 16.78% were between 61 and 80% of standard; and 4.99% were 60% or less of standard. (Enquête Nationale, 1973)

WEIGHT FOR AGE: At six months of age, median weights of children fell .6 kilograms below international standards; at one year, they were 1.17 kilograms below the standards; and at two years, 1.87 kilograms below the standards. (Enquête Nationale, 1973)

WEIGHT FOR AGE: 34.57% of children from 4 to 9 months of age had a normal weight for their age; 27.54% fell between 81 and 90% of standard weight for age; 32.79% were between 61 and 80% of standard, and 5.19% were below 61% of standard. Among children 10 to 15 months of age, 20.81% were normal, and 28.74%, 44.49%, and 5.96% fell in each respective category of malnutrition. Among children 16 to 21 months of age, 16.04% were normal, and 27.06%, 49.39%, and 7.51% fell in each respective category of malnutrition. (Enquête Nationale, 1973)

WEIGHT FOR AGE: Among children measured in 1975 before their mothers participated in a CRS program of nutrition education and supplementary foods, 32% were 91% or better of the Harvard Standard weight for age, 37% were 81 to 90%, 24% were 71 to 80%, 6% were 61 to 70%, and 0.9% were 60% or less. After the program, rates in the respective ranges were 43%, 40%, 13%, 4%, and 0. (CRS, 1979)

WEIGHT FOR AGE: 32% of children entering the CRS feeding and nutrition education program fell below 80% of the expected weight for age for children under five years old. Only 10% of children already in the program fell in this category. (Gilmore, 1980)

WEIGHT FOR AGE: 55.74% of children from 4 to 9 months of age had a normal height for age; 41.30% were 81 to 90% of standard height for age; 2.83% were 71 to 80% of standard, and 0.13% were 70% or less of standard. Among children 10 to 15 months of age, 48.01% were normal, and 47.86%,

3.07%, and 0% fell in each respective category of stunting. Among children 16 to 21 months of age, 32.47% were normal, and 58.61%, 8.78%, and 0.03% fell in each respective category of stunting. (Enquête Nationale, 1973)

HEIGHT FOR AGE: At one year of age, the height of the average child was 3.2 centimeters below the standard height for age. By two years of age, the average child was 7.3 centimeters below the standard. (Enquête Nationale, 1973)

HEAD CIRCUMFERENCE: The average head circumference of children one year of age was 0.1 centimeter above the standard. At 18 months, the average measurement was 0.2 centimeter below standard, and at 24 months, 1.0 centimeter below the standard. (Enquête Nationale, 1973)

ARM CIRCUMFERENCE: 29.49% of children 4 to 9 months of age had a normal arm circumference; 44.25% were 81 to 90% of standard; 25.73% were 60 to 80% of standard; and 0.53% were less than 60% of standard. 18.36% of children 10 to 15 months of age were normal, and 44.59%, 34.30%, and 1.75% fell in each respective category of malnutrition. 24.64% of children 16 to 21 months of age had a normal arm circumference, and 48.31%, 26.03%, and 1.02% fell in each respective category of malnutrition. (Enquête Nationale, 1973)

ARM CIRCUMFERENCE: After six months of age, the average arm circumference falls below standards. (Enquete Nationale, 1973)

SKINFOLD THICKNESS: 16.40% of children 4 to 9 months of age had a skinfold thickness below 6 millimeters (60% of standard), as did 15.12% of children 10 to 15 months of age, 16.83% of children 16 to 21 months of age, and 13.33% of children 22 to 27 months of age. (Enquête Nationale, 1973)

HEPATOMEGALY: 96.84% of children were free from all signs of liver enlargement; 2.3% had an enlargedliver. 1.04% of children with a normal weight for age had an enlarged liver; 2.35% of children with a weight for age between 61 and 80% of standard had an enlarged liver; and 6.13% of children with less than 61% of standard weight for age had an enlarged liver. (Enquête Nationale, 1973)

SPLENOMEGALY: Enlarged spleen affects less than 1% of children under four years of age and about 2.5% of children below 61% of standard weight for age. (Enquête Nationale, 1973)

GOITER: The village of Skoura, in Ouarzazate, is a major center of endemic goiter. The rate of goiter 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. (Weissman, 1977)

RICKETS PREVALENCE: More than 4% of children under four years of age had indisputable diagnoses of rickets. Extrapolating from the survey

results, 98,528 children nationwide had rickets. (Enquete Nationale, 1973)

RICKETS: 23% of children examined had at least one clinical sign suggestive of rickets. 4% showed 2 clinical signs. The overall incidence was higher among children aged 22 to 27 months. The type of clothing worn in the desert and windowless housing prevent the exposure of children to sunlight. (Weissman, 1977)

SIGNS OF RICKETS: 13.1% of children 4 to 9 months of age showed at least one sign of rickets, as did 21.5% of children aged 10 to 15 months, 40.33% of children aged 16 to 21 months, and 28.1% of children aged 22 to 27 months. 4.06%, 5.53%, 5.96%, and 5.75% of children in each respective age category showed two signs of rickets. 2.46%, 4.73%, 5.68%, and 5.44% in each respective age category showed three signs of rickets. (Enquête Nationale, 1973)

XEROPHTHALMIA: 0.37% of children 10 to 15 months of age, 0.44% of those 22 to 27 months of age, and 0.53% of those 40 to 45 months of age had xerophthalmia. Xerophthalmia was not found in the other age ranges. (Enquête Nationale, 1973)

VITAMIN A DEFICIENCY: Vitamin A deficiency does not appear to be a public health problem, as less than 1% of children examined were found to have signs of vitamin A deficiency. (Enquête Nationale, 1973)

TRACHOMA: In 1952, it was estimated that virtually every child in Morocco had had trachoma before reaching the age of one year. By 1976, approximately 80% of all known cases of trachoma had been cured or stabilized. 60% of all children are still free of the disease by age one year. (Weissman, 1977)

CAUSES OF MORBIDITY AND MORTALITY: 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. (Weissman, 1977)

SEASONAL DIARRHEA: July through November is generally thought to be a period of higher diarrheal disease incidence than in the spring. (Gilmore, 1980)

DENTAL ERUPTION: The median age of dental eruptions was found to be later than international norms, but comparable with the norms established in 1968-69 for sub-Saharan Africa. (Weissman, 1977)

RURAL

CAUSES OF MALNUTRITION: Malnutrition in young children is often caused by lack of knowledge of the needs of the young child. Because much of the population lives in dispersed patterns in rural areas, it is

difficult to conduct effective nutrition education programs. (Royaume du Maroc, 1971)

NUMBERS OF MALNOURISHED CHILDREN: 44.78% of rural children from birth to four years of age were found to be moderately malnourished. Extrapolating from this figure, there are 740,743 rural children in need of nutrition rehabilitation. 5.56% had severe protein calorie malnutrition. Extrapolating from this figure, there are 91,971 rural children requiring hospitalization for malnutrition. (Enquête Nationale, 1973)

MALNUTRITION AND AGE: 19.21% of rural children 4 to 9 months of age showed at least one clinical sign of PEM upon examination, as did 28.09% of children 10 to 15 months of age, 29.15% of children 16 to 21 months of age, and 25.33% of children 22 to 27 months of age. The remainder of the children were free of clinical symptoms of PEM. (Enquête Nationale, 1973)

MALNUTRITION AND AGE: Among rural children 10 to 15 months of age, 43.1% were between 61 and 80% of standard weight for age, 7% were below 61% of standard, 28.09% had at least one clinical sign of PEM, and 8.89% presented with edema. Among children 16 to 21 months, 54.08% were 61 to 80% of standard weight for age, 8.81% were below 61% of standard, 29.15% had at least one clinical sign of PEM, and 5.86% had edema. (Enquête Nationale, 1973)

PROTEIN CALORIE MALNUTRITION: 45% of rural children were suffering from moderate malnutrition (between 61 and 80% of normal weight for age); 5.5% were severely malnourished (below 61% of normal weight for age); and 8.89% had signs of edema. (Weissman, 1977)

KWASHIORKOR IN BREAST FED CHILDREN: Kwashiorkor has been found in breast fed children. Moroccan women were found to have significantly lower levels of protein in their breast milk than healthy French women. (Robinson, 1977)

EDEMA AND AGE: 5.07% of rural children 4 to 9 months of age showed edema upon clinical examination, as did 8.89% of children 10 to 15 months of age, 5.86% of children 16 to 21 months of age, and 6.72% of children 22 to 27 months of age. 1.62%, 4.69%, 1.54%, and 3.26% of children in each age group had edema of the arms, legs or face. 3.45%, 4.20%, 4.32%, and 3.46% showed signs of edema in the hands or feet. (Enquête Nationale, 1973)

FALL-OFF IN GROWTH: Marked fall-off in the growth curves of children from rural areas and from certain provinces indicates the poor nutritional state of these children. This can be explained by the isolation of these populations which makes health and nutrition services and education unavailable to them and by the insufficiency of personnel, especially women, in the health infrastructure in rural areas. (Enquête Nationale, 1973)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS (Cont.)

FALL-OFF IN GROWTH: The dip below international norms for growth begins earlier and is more marked in rural areas in almost all provinces--except Settat, El Jadida, Khouribga, Kenitra, Meknes, and Safi, which are the richest regions. (Enquête Nationale, 1973)

WEIGHT FOR AGE: 6% of rural children 15 months of age or less were severely malnourished, having a weight for age below 61% of the norm. (Basta, 1977)

WEIGHT FOR AGE: 31.32% of rural children aged 4 to 9 months had normal weight for age, 26.26% fell between 81 and 90% of standard weight for age, 36.16% were between 61 and 80% of standard, and 6.26% fell below 61% of standard. Among children 10 to 15 months of age, 15.51% were normal, and 29.38%, 48.10%, and 7% fell in each respective category of malnutrition. Among children 16 to 21 months of age, 11.77% were normal, and 25.34%, 54.08%, and 8.81% fell in each respective category of malnutrition. (Enquête Nationale, 1973)

WEIGHT FOR AGE: 43.5% of children one to five years of age were 80% or less than the standard weight for age, as were about 70% of children one year of age, 60% of children 18 months of age, and 75% of children 24 months of age. (Robinson, 1977)

WEIGHT FOR AGE: 69% of children one to five years of age were mildly to moderately malnourished (60 to 90% of standard weight for age) and 4.5% were severely malnourished (less than 60% of standard weight for age). (Robinson, 1977)

WEIGHT AND AGE: The distribution of significant weight deficit (below 80% of standard weight for age) by age group revealed that the problem was primarily present in children 12 to 30 months of age. (Robinson, 1977)

WEIGHT AND AGE: Median weights of rural children six months of age were 0.8 kilograms below international standards; at one year, they were 1.7 kilograms below standards, and at two years of age, 2.1 kilograms below standards. (Enquête Nationale, 1973)

WEIGHT AND DIARRHEA: The most severely underweight children were usually in the midst of a bout of diarrhea. (Robinson, 1977)

HEIGHT FOR AGE: 49.86% of rural children 4 to 9 months of age had a normal height for age; 46.34% were 81 to 90% of standard height for age; 3.80% were 71 to 80% of standard and none were 70% or less of standard. Among children 10 to 15 months of age, 43.92% were normal height and 50.87%, 3.73%, and 0% fell in each respective category of stunting. At 16 to 21 months of age, 28.42% were normal, and 61.33%, 10.21%, and 0.05% fell in each respective category of stunting. (Enquête Nationale, 1973)

HEIGHT FOR AGE: At one year of age, the height of the average rural child was 3.8 centimeters below standard height for age. By two years of

age, the average child was 7.7 centimeters below the standard. (Enquête Nationale, 1973)

HEIGHT FOR AGE: 52.7% of children one to five years of age were less than or equal to 90% of the Harvard Standard for height for age. The age group most affected was the children 12 to 30 months of age. (Robinson, 1977)

HEIGHT FOR AGE: 55% of children one year of age were below 90% of the standard height for age. About 80% of children 18 to 24 months of age were below 90% of standard. (Robinson, 1977)

ARM CIRCUMFERENCE: 24.84% of rural children 4 to 9 months of age had a normal arm circumference, 45.26% were 81 to 90% of standard, 29.37% were 60 to 80% of standard, and 0.53% were less than 60% of standard. 13.94% of children 10 to 15 months of age were normal and 45.71%, 31.99% and 2.35% fell in each respective category of malnutrition. 18.52% of children 16 to 21 months of age were normal and 49.99%, 30.41%, and 1.08% were in each respective category of malnutrition. (Enquête Nationale, 1973)

ARM CIRCUMFERENCE: About 55% of children one to two years of age were mildly to moderately malnourished (mid-arm circumference between 12.5 and 14 cm.). About 20% were severely malnourished (mid-arm circumference below 12.5 cm.). (Robinson, 1977)

HEAD CIRCUMFERENCE: The average head circumference of rural children 12 months of age was 1.1 centimeters below the standard. At 18 months of age, it was 0.3 centimeters below the standard, and at 24 months of age, it averaged 1.1 centimeters below standard. (Enquête Nationale, 1973)

HEAD CIRCUMFERENCE: 20.9% of children one to five years of age had a head circumference less than the fifth percentile for age. Children one to three years of age were more severely affected. (Robinson, 1977)

SKINFOLD THICKNESS: 17.54% of rural children 4 to 9 months old had a skinfold thickness below 6 millimeters (60% of standard), as did 16.32% of children 10 to 15 months old, 19.34% of children 16 to 21 months old, and 14.70% of children 22 to 27 months old. (Enquête Nationale, 1973)

TRICEPS FAT FOLD THICKNESS: 29.2% of children had fat fold measurements of 7 mm. or less. The standard is 9 to 11 mm. for preschoolers; therefore, this group of children had serious subcutaneous fat deficiencies. (Robinson, 1977)

HEPATOMEGALY: 96.35% of rural children were free of all signs of liver enlargement. 2.80% had an enlarged liver; 1.52% of children with a normal weight for age had an enlarged liver, as did 2.81% of children 61 to 80% of standard weight for age and 6.56% of children below 61% of standard weight for age. (Enquête Nationale, 1973)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS (Cont.)

RICKETS: 13.4% of rural children 4 to 9 months old showed at least one sign of rickets, as did 24.3% of children 10 to 15 months old, 43.7% of children 16 to 21 months old; and 32.4% of children 22 to 27 months old. 4.25%, 6.33%, 7.88%, and 6.32% in each respective age group showed two signs of rickets. 2.46%, 5.28%, 7.52% and 16.32% of children in each age group showed three signs of rickets. (Enquête Nationale, 1973)

BITOT'S SPOTS: 0.27% of rural children 4 to 9 months of age had Bitot's spots, as did 0.39% of children 10 to 15 months old, 0.25% of those 16 to 21 months old, and 0.65% of those 22 to 33 months old. (Enquête Nationale, 1973)

COMMON DISEASES: Skin diseases were the most evident affliction, and included fungal infections (ringworm), impetigo, scabies, and multiple abcesses. Suppurative conjunctivitis was widespread. It was not uncommon to see a child with a dozen flies surrounding his eyes. (Robinson, 1977)

URBAN

PROTEIN CALORIE MALNUTRITION: 33% of urban children were suffering from moderate malnutrition (between 61 and 80% of normal weight for age), and 2% were severely malnourished (below 61% of normal weight for age). 4.8% showed signs of edema. (Weissman, 1977)

SEVERE PCM: 1% of average income and 5% of low income urban children 3 months of age were severely malnourished, with a weight for age below 61% of the norm. At 9 months, 2% of average and 4% of low income children had severe PCM; at 15 months, 2.5% of average income and 3% of low income children were severely malnourished. (Basta, 1977)

CLINICAL SIGNS OF PEM: 15.35% of urban children 4 to 9 months old showed at least one clinical sign of PEM upon examination, as did 20.67% of children 10 to 15 month of age, 14.35% of children 16 to 21 months old, and 16.18% of those 22 to 27 months old. The rest of the children were free of clinical signs of PEM. (Enquête Nationale, 1973)

NUMBERS OF MALNOURISHED CHILDREN: 33.34% of urban children birth to 4 years old had moderate protein caloric malnutrition. Extrapolating from this percentage, there were 269,945 urban children requiring nutrition rehabilitation. 2.36% of urban children were severely malnourished. Extrapolating from this figure, there were 19,108 urban children so malnourished they required hospital treatment. (Enquête Nationale, 1973)

DECREASED MALNUTRITION: The incidence of malnutrition in hospitalized children in urban areas fell from 33% in 1971 to 13% in 1981 in Rabat, but the level of infant mortality has remained quite high nationwide. (Radwan, 1981)

MALNUTRITION AND AGE: Among urban children 10 to 15 months of age, 34.69% were between 61 and 80% of standard weight for age; 3.13% were below 61% of standard; 20.67% had one clinicial sign of PEM; and 4.85%

had edema upon clinical examination. Among children 16 to 21 months of age, 39.1% were between 61 and 80% of standard weight for age, 4.67% were below 61% of standard; 14.35% had at least one clinical sign of PEM, and .38% had edema. (Enquête Nationale, 1973)

GROWTH AND WEANING: Growth curves of children from families of high socioeconomic status generally reached the 25th percentile, but there was a dip during the period of weaning when the children did not receive the food they needed. These needs are not recognized by their families. Moreover, their mothers lack the authority to force the young child to adapt to his new diet. (Enquête Nationale, 1973)

EDEMA BY AGE GROUP: 2.18% of urban children 4 to 9 months of age had edema upon clinical examination, as did 4.85% of children 10 to 15 months of age, 0.38% of those 16 to 21 months old, and 3.33% of children 22 to 27 months old. 0.37%, 1.57%, 0.05%, and 1.03% of children in each age group had edema of their arms, legs or faces. 1.81%, 3.28%, 0.33%, and 2.30% of children in each age group had edema of their hands or feet. (Enquête Nationale, 1973)

EDEMA: Among 66 children six months to three years of age living in Rabat who were examined in the pilot study of the National Nutrition Survey, 13.6% had edema; among 73 children in Casablanca, 4.1% had edema. (Enquête Nationale, 1973)

WEIGHT FOR AGE: 43.14% of urban children 4 to 9 months of age had a normal weight for age, 30.59% fell between 81 and 90% of standard, 23.90% fell between 61 and 80% of standard, and 2.36% fell below 61%. Among children 10 to 15 months, 35.19% were normal and 26.99%, 34.69%, and 3.13% fell in each respective category of malnutrition. Among children 16 to 21 months, 25.41% were normal and 30.82%, 39.10% and 4.67% fell in each respective category of malnutrition. (Enquête Nationale, 1973)

WEIGHT AND AGE: At six months of age, median weight of urban children fell .5 kilograms below international standards; at one year, .32 kilograms below the standards, and at two years, 1.6 kilograms below the standards. (Enquête Nationale, 1973)

HEIGHT FOR AGE: 71.27% of urban children 4 to 9 months of age had a normal height for age; 27.97% were 81 to 90% of standard height for age; 0.28% were 71 to 80% of standard and 0.47% were 70% or less of standard. Among children 10 to 15 months of age, 59.18% were normal and 39.64%, 1.18%, and 0% fell in each respective category of stunting. At 16 to 21 months, 41.34% were normal and 52.64%, 5.66%, and 0% fell in each category of stunting. (Enquête Nationale, 1973)

HEIGHT FOR AGE: At one year of age, the height of the average urban child was 2.2 centimeters below standard height for age. By two years of age, the average child was 6.5 centimeters below the standard. (Enquête Nationale, 1973)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS (Cont.)

HEAD CIRCUMFERENCE: The average head circumference of urban children one year of age was 0.5 centimeter above the standard. At 18 months of age, the measurement was equal to the standard, and at 24 months of age, was 0.8 centimeter below the standard. (Enquête Nationale, 1973)

ARM CIRCUMFERENCE: 41.73% of urban children 4 to 9 months of age had a normal arm circumference, 41.58% were 81 to 90% of standard, 16.14% were 60 to 80% of standard and 0.55% were less than 60% of standard. 30.42% of children 10 to 15 months of age were normal, and 45.27%, 24.22% and 0.09% fell in each respective category of malnutrition. 38.15% of children 16 to 21 months of age were normal and 44.59%, 16.37% and 0.90% fell in each respective category of malnutrition. (Enquête Nationale, 1973)

SKINFOLD THICKNESS: 13.39% of urban children 4 to 9 months of age had a skinfold thickness below 6 millimeters (60% of standard), as did 11.88% of children 10 to 15 months old, 11.32% of children 16 to 21 months old, and 9.57% of children 22 to 27 months old. (Enquête Nationale, 1973)

HEPATOMEGALY: 98.39% of urban children were free of all signs of liver enlargment; 0.99% had an enlarged liver. 0.19% of children with a normal weight for age had an enlarged liver; 0.73% of children 61 to 80% of standard weight for age and 3.56% of children less than 61% of standard weight for age had an enlarged liver. (Enquete Nationale, 1973)

RICKETS: 2.64% of urban children had rickets. (Enquête Nationale, 1973)

RICKETS: 12.5% of urban children 4 to 9 months of age showed at least one sign of rickets, as did 13.9% of those 10 to 15 months old, 32.7% of those 16 to 21 months old, and 16.3% of those 22 to 27 months old. 3.57%, 3.54%, 2.20%, and 4.45% in each respective age category showed two signs. 2.46%, 3.38%, 2.10% and 3.40% in each respective age category showed 3 signs. (Enquête Nationale, 1973)

BITOT'S SPOTS: Bitot's spots were not found in any urban child in the sample. (Enquête Nationale, 1973)

2. DIETARY BELIEFS

2.1 DIETARY BELIEFS, GENERAL

2.2 DIETARY BELIEFS ABOUT PREGNANCY

RURAL

FAMILY SIZE: Rural women desired an average of 4.6 children; rural men, an average of 4.1 children. The average woman currently bears 6 or 7 children. (Weissman, 1977)

URBAN

FAMILY SIZE: Urban women desired an average of 3.3 children; urban men, an average of 3.1 children. The average woman currently bears 6 or 7 children. (Weissman, 1977)

2.3 DIETARY BELIEFS ABOUT LACTATION

NATIONAL

85 to 87% of mothers felt that mothers' milk was best for the newborn, about 10% felt other milk was, and the remainder preferred mixed foods. (CRS, 1979)

2.4 DIETARY BELIEFS ABOUT BREAST MILK SUBSTITUTES (INCLUDING BOTTLE FEEDING)

2.5 DIETARY BELIEFS ABOUT WEANING

NATIONAL

AGE TO BEGIN WEANING: Before receiving nutrition education, 48% of mothers believed one should begin weaning before 8 months, 2% at 9 to 11 months, and 50% at one year or later. After education, 67% felt one should begin before 8 months, 2% at 9 to 11 months, and 30% at one year or later. (CRS, 1979)

2.6 DIETARY BELIEFS ABOUT ILLNESS AND CURE

NATIONAL

MEASLES: 36.2% of mothers felt that children should not be fed when they have measles; 63.8% felt that they should be fed. (CRS, 1979)

SUNSHINE: 20% of mothers believed that sunshine is bad for children. (CRS, 1979)

HEALTH BELIEFS: Medical diagnosis in the Middle East developed as a science which was based on astrology, hepatoscopy, and interpretation of dreams. Illness was thought to originate either from loss of certain powers (in which case therapy was restorative) or from invasion of the body by a spirit (in wich case therapy involves exorcism). Djinns

2.6 DIETARY BELIEFS ABOUT ILLNESS AND CURE (Cont.)

(spirits) are omnipresent, invisible, and by preference, inhabit the earth. (Weissman, 1977)

TRADITIONAL TREATMENTS: The treatment of various illnesses included the use of herb preparations, purification (with water or cauteriziation) and magical transfer. In the latter case, the victim placed some physical object with which he had been in contact in the path of another, who, by traveling over it, became the victim. (Weissman, 1977)

PREVENTIVE HEALTH CARE: The best protection against the evil eye, spells, and djinns (spirits) was religious practice. Magical incantations, petitions to holy men, offerings to them, and animal sacrifices all offered protection, as did 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 protected against djinns, as did fire, brimstone, tar and incense. (Weissman, 1977)

BEWITCHED FOODS: Illnesses such as cancer and tuberculosis were thought to be caused by the ingestion of bewitched foods. "Taam" (food) is bewitched when couscous is rolled between the hands of the dead. Only a person experienced in the occult may successfully bewitch "taam." (Weissman, 1977)

DJINNS: Djinns (spirits) 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. (Weissman, 1977)

TRADITIONAL HEALTH BELIEFS: Doctrines of holy men (marabouts) and beliefs 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. While most people use the modern health system and appreciate the effectiveness of modern medical treatment, they supplement this with traditional cures or resort to the traditional sector when modern care is unavailable. (Weissman, 1977)

CAUSES OF DISEASE: There is no single systematic Moroccan theory of disease causation. Beliefs vary from tribe to tribe and from city to city. Supernatural elements enter either directly or indirectly into the Moroccan explanation of any disease. Explanations may include djinn, magical poisoning, magical curses, evil eye and witchcraft. Most vulnerable to attack by djinn are pregnant women, newborn children, boys about to be circumcised or just circumcised, couples about to be married, and the dying. (Pillsbury, 1978)

CHOICE OF HEALTH CARE: People used the public health system for medical treatment and also used traditional healers. When there is no money for the antibiotic prescribed by the doctor at the modern system's health center, the "fquih" (herbalist) will supply an herb or amulet at a much lower price. Services of traditional healers have been continually demanded because of their 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 is unknown, but it is entirely possible that these health workers reach more persons than the modern medical system. (Weissman, 1977)

WOMEN'S ROLE IN HEALTH CARE: Medicine and healing have traditionally been a part of the woman's domain. 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. (Weissman, 1977)

3. DIETARY PRACTICES

3.1 DIETARY PRACTICES, GENERAL

NATIONAL

STAPLE DIET: Moroccan diets are of the classic antique Mediterranean type based on cereals and oil. Barley and wheat are the preferred cereals. More and more, these cereals are being transformed into bread of the European type by privately-owned mills. (May, 1967)

DIET OF LANDED FARMERS: A survey of landed farmers in the northern Atlantic area found that 3700 calories were available per capita year round. 92% of the calories and 85% of the protein were of vegetable origin; cereals provided 67% of calories and 78% of protein. The diet was rich in phosphorus and thiamine, but low in calcium and riboflavin. The variety of foods in the diet was very limited: cereals, sugar, a little milk and butter, oil, potatoes, onions, turnips, carrots, tea, salt, spices, and coffee. (May, 1967)

FOOD CONSUMPTION: Consumption of cereals and cereal products averaged 193 kilograms per person per year in 1970/71. Average consumption was 19.5 kg. of potatoes, 30.14 kg. of sugar, 63 kg. of vegetables, 46.53 kg. of fruit, 17.89 kg. of meat, 3.57 kg. of fish, 29.79 kg. of dairy products, 13.19 kg. of fats and oils, and 8.99 kg. of beverages (FAO, 1979)

STAPLE FOODS: Barley, wheat (durum and bread wheat) and corn are the main food crops. Over 80% of all 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 cereal to meet domestic needs but has had to import grain every year since then. (Weissman, 1977)

STAPLE FOODS: Barley is the main staple, followed by wheat and then corn. (May, 1967)

MONOTONY OF DIET: The monotony of the diet is remarkable. Above the level of 3,000 calories per capita per day, there is a certain variety in diet. Below that level, the diet consists of a single staple. (May, 1967)

LIMITED DIET: A survey of landed farmers in the northern Atlantic area found that diet was limited. Fruits were not preserved, but nibbled at by children between meals or sold; legumes were eaten only at the end of Rhamadan in the form of the basic ingredient in a specially-prepared soup. No fish or vegetables were ever eaten. Vegetables were sold to Europeans. The diet was richer in energy in summer, but poorer in vitamins and calcium due to the lack of milk. (May, 1967)

CEREALS: Wheat is the most important cereal grain, accounting for 3/5 of cereal consumption. Barley and maize follow in that order. (Benrida, 1976)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

CEREALS: Cereals were the staple food. 25% of all consumption expenditures and 14% of total expenditures went for cereals. Cereals provided an average of 1,536 calories per person per day, or about 62% of total energy intake. 80% of expenditures for cereals were used to purchase foods which were prepared in the home; the remainder was used to purchase commercially-processed cereal foods. (Benrida, 1976)

CORN: Corn is consumed in limited amounts throughout the country. Its consumption increases when the harvest of other cereals is inadequate. In such cases, it is not unusual to observe localized epidemics of pellagra. (May, 1967)

STARCHY FOODS: The average daily intake was 2466 calories per person; 76.6% of this was provided by cereals, starchy food, and sugar. (Benrida, 1976)

FOOD SUPPLY: Nutritional status is dependent on the adequacy of agricltural production and the mechanism for distribution. Irregular rainfall is responsible for wide variation in annual agricultural yields. In rural areas, access to markets is limited, and purchasing power may also be limited. The prevalence of small, fragmented land holdings and the persistence of traditional farming techniques also limit the level of output. Even in years when production is adequate, the population still may not have sufficient access to foods such as fresh vegetables and citrus fruits, which are exported. (Pierce, 1978)

FOOD SUPPLY: The FAO 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. In 1973, bad weather caused food production to fall to the extent that only 86% of the estimated need was filled. Food production rose in 1974 to 103% of aggregate requirement, but fell in 1975 to 80%. These wide swings are caused by variation in rainfall. (Weissman, 1977)

SEASONAL FOOD SHORTAGES: Shortages in barley are likely to occur between December and April; in corn, between May and July; in wheat, between January and May; and in tomatoes, between March and June. On the whole, the chances of foods being scarce are greater during the spring. (May, 1967)

INADEQUACY OF FOOD SUPPLY: The food supply of Morocco would be adequate to meet the needs of the population, if it were equitably distributed and available throughout the year. 20% of the population is insufficiently fed, especially pregnant or lactating women and young children. The geographic areas most severely hit by shortages are the arid or semi-arid rural zone and the city slums. Post harvest losses also reduce the supply of food. (May, 1967)

AGRICULTURAL PRODUCTION AND POPULATION GROWTH: The rate of growth of the population was 2.9% per year. During the same period, agricultural

production, evaluated in real terms, had remained practically constant. (Radwan, 1981)

IMPORTANT CROPS: Barley, the most important grain, was grown mostly in the plains and valleys between the Atlas Mountains and the sea. Durum wheat, the major export cereal, was sown on about 1,200,000 hectares. Bread wheat covered about 400,000 hectares, making it necessary to import additional wheat. Corn was planted on about 500,000 hectares, and legumes were planted on 265,000 to 315,000 hectares. (May, 1967)

LAND TENURE: The land tenure problem has handicapped efficient native agriculture. The best farmland was owned by a few people, often foreigners or absentee landlords. Substantial amounts of good land are owned by religious communities (habous) or by certain tribes (guich lands) acquired in the past for military services. The government is now trying to recover and reallocate this land. The least desirable farmland is still worked by the less-educated population under one form or another of ownership or tenancy. (May, 1967)

RAINFALL: Irregularity of rainfall is responsible for wide variation in annual agricultural yields. In 1973 and 1975, years of low rainfall, the value of agricultural production fell 14% and 12% respectively below the levels of the preceding years. The rural population is very hard-hit during agricultural failure because they depend on home-produced foods to meet their nutritional needs. (Pierce, 1978)

INCREASED FOOD PRICES: The increase in the price of foods occurring since last May has been 40% for flour, 14% for milk, and 76% for butter. This has had a severe effect on the buying power of the poor, especially those spending more than 50% of their revenue on food. (Radwan, 1981)

FOOD EXPENDITURE: Food accounted for 54% of total expenditures in 1970-71. (Pierce, 1978)

FOOD EXPORTS: 23.5% of the barley crop was exported, 24% was fed to animals, and the remainder was eaten by humans. About 15% of the wheat crop was exported; this was hard wheat that can be made into Arab bread but not into the preferred European type. The country had to import soft wheat to make regular bread. 80% of the legume crop and 66% of the citrus crop were exported. (May, 1967)

CHICK PEAS AND EXPORT PRICE: The high export price of pulses (especially chick peas) has encouraged many farmers to export their crop rather than consume it. (Weissman, 1977)

ANIMAL FOODS: Sheep were the most numerous animals, followed by goats and cattle. Hens were also raised, although egg consumption is low. Meat was always in short supply. Milk prodution was inadequate to meet needs and was imported. (May, 1967)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

MEAT: 50% of the population did not eat meat. The other 50% ate mutton about once a week in quantities that did not exceed 150 to 200 grams per person. 10% had meat three to four times a week. The larger the household, the less meat consumed. (May, 1967)

MEAT: 12% of the total household budget went to meat; this was 22% of food expenditures. 107 Dirhams per person per year were spent on average for meat. (Benrida, 1976)

MILK: Consumption of fresh milk was low. Some dried or evaporated milk was drunk by some people in the rural areas. Skim milk, called "lobon," was commonly drunk, especially in the countryside, where the rich gave it to the poor after separating the cream for their own use. (May, 1967)

DAIRY PRODUCTS: Dairy products accounted for 4.6% of food expenditures and 2.5% of the total family budget. Average expenditure for dairy products was 22 Dirhams per person per year. Three-quarters of these expenditures were used for fresh milk. (Benrida, 1976)

MEAT AND MILK: Low levels of livestock and poultry production resulted in an inadequate supply of animal protein. Milk production was also low and met only 40% of needs. Both meat and milk were imported to maintain the already low levels of consumption. (Weissman, 1977)

CHICKENS AND EGGS: Chickens and eggs are the property of the mother of the family. She sells them for cash, occasionally to her own husband. (May, 1967)

EGGS: Consumption of eggs was very low, estimated at only 21 per person per year. (Benrida, 1976)

FISH: Fish consumption was very low. An average of 7 Dirhams was spent annually per capita for fish. This represented 0.7% of the total budget of an average household or 1.3% of all food expenditures. These expenditures amounted to about 3.6 kilograms of fish per person per year. (Benrida, 1976)

FISH: Consumption of fish was low in all geographic areas and all economic groups. Much of the fish produced was exported; the difficulty of transporting fresh fish to interior markets also accounted for the low domestic consumption. (Pierce, 1978)

FISH: Despite increases in fish production over the last decade, consumption has not changed. (Weissman, 1977)

FRUITS AND NUTS: Fruits and nuts are cultivated and are available seasonally. Vineyards have declined, but figs, melons, dates, and almonds are cultivated throughout the country. (Weissman, 1977)

FRUITS AND VEGETABLES: 12.8% of food expenditures were for fruits (2.6% of total expenditures) and vegetables (4.3% of total expenditures). Average annual consumption was 19.5 kg. of potatoes, 27 kg. of root

vegetables (beets, carrots, turnips, onions, and radishes), and 9.8 kg. of citrus fruits. Most citrus fruits are grown on large farms and exported. (Benrida, 1976)

FRUITS AND VEGETABLES: Fruits and vegetables used were tomatoes, potatoes, artichokes, carrots, turnips, squash, melons, peppers, legumes, citrus, olives, dates, apricots, apples, peaches, grapes, nuts, and almonds. Sugar beets were also grown. (May, 1967)

FRUITS AND VEGETABLES: Vegetables such as tomatoes, turnips, onions, carrots, and squash were eaten regularly. Fruits such as grapes, figs, and melons were often added to the usual diet of the poor. Dates were eaten, especially by the people living in the palm groves of the south. (May, 1967)

FRUIT TREES: Fruit trees are concentrated in the hands of a minority. 55% of rural families have no fruit trees, which adversely affects nutrition as well as limiting the income from fruit production to a small number of families. (May, 1967)

OILS: Olives are the principal source of vegetable oil. The relatively high cost of olive oil has resulted in increased use of oils from cottonseed, sunflower seed, linseed and groundnuts. Domestic oil production is inadequate and oils are always a major food import item. (Weissman, 1977)

OILS: Oils were produced from cottonseed, sunflower seeds, linseed and groundnuts. These sources of lipids have gained favor over olive oil since World War II because they are lower priced and because olive oil is used for export. (May, 1967)

SUGAR: Sugar beet production now covers almost 50% of domestic need. Sugar is consumed in large quantities, especially in mint tea, the national drink. Sugar replaced honey as the national sweetener shortly after World War II. (Weissman, 1977)

SUGAR: The average person spent about 58 Dirhams each year to purchase 29.6 kilograms of sugar. (Benrida, 1976)

SALT: Annual salt consumption averages 7.29 kilograms per person. (Benrida, 1976)

MEAL PATTERN: There are usually three meals a day: an early breakfast of cooked corn meal, bread, or lentil soup and tea, with yogurt occasionally added to the cereal. The main meal is often in the afternoon, consisting of couscous, vegetables, oil and meat when available or tajine, a stew of meat or poultry cooked in oil to which vegetables, fruits, and nuts are added. In more affluent homes, a pastry-wrapped pigeon pie is served heaped with powdered sugar. Leafy salads and fruits are served and heavily sugared mint tea ends most meals. (Weissman, 1977)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

FOOD DISTRIBUTION AND AVAILABILITY: 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. (Weissman, 1977)

INTRA-FAMILY FOOD DISTRUBUTION: The food bowl is served first to men, and then passed on to the women and children. There are many rules governing how much the men may eat. Although men have first priority they do not simply eat their fill, passing the leftovers to the women and children. (Horowitz, 1980)

MEN FIRST: Food is served in a round pottery bowl placed in the center of a table or mat. Men and male children over seven or eight years old eat first, then women and small children. When food supplies are inadequate, the largest share goes to the working adults. (Weissman, 1977)

ORDER OF EATING: Over 70% of families reported that the entire family ate together; in about 15%, the children ate first. The remainder were equally distributed between father first, mother first, and infants first. (CRS, 1979)

SHOPPING: In a 1975 survey, the father did the shopping in 78% of families; in 17%, the mother did; and in 5% of families, it was an older family member or eldest child. (CRS, 1979)

FOOD PREPARATION: The nutritional value of the food that is available is often reduced because of improper and unsanitary preparation. Food cooked with unsafe water, or by persons whose personal hygiene is remiss, often becomes a source of infection rather than nourishment. (Pierce, 1978)

NUTRIENT CONSUMPTION: Consumption varied from 1737 calories per day to 2880 calories per day. Protein intake ranged from 46.7 grams to 87.7 grams per day. Consumption varied with socioeconomic status and region of country. (Weissman, 1977)

AVAILABLE NUTRIENTS: The food consumption survey found that 2466 calories (106.9% of requirements), 71 grams of protein (118.3% of requirements), and 50.2 grams of fat were available per person per day. (Weissman, 1977)

NUTRIENTS AND REGION: Caloric intake varied by region. The poor farmer in Chiadma was found to have only 800 calories per day, and the rich farmer in Beni Moksal consumed 4,615. All intermediate levels have been observed. Considerable variation by season was also observed. Other nutrients also varied by region. Protein intake varied from 28.2 grams to 118.6 grams a day; fats, from 8.4 to 97.2 grams. (May, 1967)

CALORIE AND PROTEIN SUPPLY: In 1976, there were 2568 calories and 68 grams of protein available per person per day. The country was ranked 56

in calorie supply and 58 in protein supply among the world's nations. (Sivard, 1979)

NUTRIENTS AVAILABLE: 2466 calories (106.9% of requirement), 71 grams of protein (118.3% of requirement), 296.4 mg. of calcium (59.2% of requirement), 14.3 mg. of iron (132.4% of requirement), 3,281 I.U. of vitamin A (78.9% of requirement), 1.6 mg. of vitamin B_1 (173.9% of requirement), 0.5 mg. of vitamin B_2 (38.5% of requirement) and 15.6 mg. of niacin (102.6% of requirement) were available per person per day. (Pierce, 1978)

PROTEIN: 56 grams of protein per person per day was the average intake in the southern provinces of Agadir, Ouarzazate and Tarfaya. The national average was 71 grams of protein per person per day. (Benrida, 1976)

PROTEIN: Average protein intake was 71 grams per person per day. 82.7% of proteins were derived from plant sources, the remainder from animal products. (Benrida, 1976)

PROTEIN: Average protein intake was 58.7 grams per person per day, of which 11 grams came from animal sources. 42% of the population received only 45.7 grams of protein per person per day. (Royaume du Maroc, 1971)

INSUFFICIENT INTAKES: Consumption of calcium, vitamin A and vitamin C was clearly insufficient. Almost 67% of the daily caloric intake was comprised of cereals and cereal-based products. Such a diet, although rich in vitamin B and iron, lacks the needed calcium, vitamin A and vitamin C. (Pierce, 1978)

VITAMINS AVAILABLE: The food consumption survey found that 3281 IU of vitamin A (93.7% of requirements), 1.6 mg. of vitamin B_1 (173.9% of requirements), 0.5 mg. of vitamin B_2 (38.5% of requirements), 15.6 mg. of vitamin B_6 (102.6% of requirements), and 50.6 mg. of vitamin C (70.3% of requirements) were available per person per day. (Weissman, 1977)

VITAMIN A: Average vitamin A intake was 3,280 I.U., 22% below the FAO standard of 4,160. The deficit was worse when compared to the usual standard of 5000 I.U. Consumption of leafy, green and yellow vegetables, foods high in vitamin A, was low. (Benrida, 1976)

THIAMINE: Thiamine intake was adequate. 80% of thiamine came from cereals, the remainder from pulses and starchy roots. (Benrida, 1976)

RIBOFLAVIN DEFICIENCY: Riboflavin intake averaged 67% below optimum intake in the population at large; intake was 87% below optimum levels in poor areas. This was due to low consumption of foods high in riboflavin such as milk, eggs, liver and green leafy vegetables. Meat and fish, which do supply some riboflavin, are not eaten in large enough quantities to alleviate this deficiency. (Benrida, 1976)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

NIACIN: Niacin intake averaged 15.6 mg. per person per day. (Benrida, 1976)

MINERALS: The food consumption survey found that 296.4 mg. of calcium (59.2% of requirements) and 14.3 mg. of iron (132.4% of requirements) were available per person per day. (Weissman, 1977)

IRON: Iron intake averaged 14.34 mg. (Benrida, 1976)

CALCIUM: Calcium intake was very low. The average intake was estimated at 266 mg., 41% below the recommended daily allowance of 500 mg. Intake of fresh vegetables, milk and milk products (foods rich in calcium) was very low. Cereals accounted for 35% of calcium intake. Among low income groups, intake may be as low as 60% below recommended allowances. (Benrida, 1976)

RURAL

ANNUAL FOOD CONSUMPTION: Annual consumption in rural households averaged 219.2 kilograms of cereal and cereal products per person in 1970-71, and 17 kg. of potatoes, 31 kg. of sugar, 4.7 kg. of pulses, 48.71 kg. of vegetables, 14.77 kg. of meat, 1.79 kg. of fish, 32.32 kg. of milk, 11.8 kg. of oils, and 5.77 kg. of beverages. (FAO, 1979)

CEREALS: 66% of calories come from cereals in the average rural diet. 10% of the budget for cereals was spent for processed foods such as bakery bread, cookies or doughnuts. (Benrida, 1976)

PREPARATION OF CEREALS: Cereals may be boiled, made into couscous (the grain is coarsely ground and then steamed), or baked into bread. In general, boiling is preferred at breakfast, bread at lunch, and couscous or thick, boiled cereals are preferred for the evening meal. (Bruneton, 1975)

HARD WHEAT: Rural households consumed more hard wheat than soft wheat. (Benrida, 1976)

CARBOHYDRATES: In rural areas, 80.2% of all calories came from cereals, starchy foods and sugar. Sugar accounted for 12% of total energy intake, and cereals accounted for 66%. (Benrida, 1976)

COUSCOUS: Couscous, a semolina made from barley, is usually served only at supper, piled in a large mound covered with vegetables and sometimes small pieces of meat. It is eaten as a hand-rolled ball formed from a portion removed from the dish. (Robinson, 1977)

KESRA BREAD: Kesra, the popular bread made from wheat or barley, is eaten at practically every meal. Utensils are rarely used. Food is removed from a large communal platter or cooking pot using a piece of kesra torn from the large circular loaf, much as one would sample hors d'oeuvres on a cracker. (Robinson, 1977)

BREAD BAKING: Bread is made every day from wheat and barley. Leavened bread made from barley is the most popular. Women prepare the bread from cereal which must be cleaned and separated, winnowed, mashed, and run through a sieve. Hand and water-driven mills are available in the countryside. The bread is then kneaded and leavened with a little dough left over from the day before. After rising, it is baked in ovens made from clay and stones. (Bruneton, 1975)

FRUIT AND VEGETABLE CONSUMPTION: Annual per capita consumption was 24 kg. of root vegetables, 17 kg. of potatoes, 11.9 kg. of fresh tomatoes, and 6 kg. of citrus fruits. Raisins, apples, watermelons, grenadine, and figs were also popular. (Benrida, 1976)

VEGETABLE PREPARATION: Vegetables are usually included in a stew called "tajine" with tomatoes, turnips, onions, carrots, squash and potatoes. (Robinson, 1977)

MEAT: 14.8 kilograms of meat was consumed annually per capita in rural areas. (Pierce, 1978)

MEAT: Average consumption was 14.8 kilograms of meat per year per capita. 81 Dirhams were spent on meat per person per year in rural areas. (Benrida, 1976)

FISH: In rural areas, about 1.8 kilograms of fish were consumed per person per year. (Benrida, 1976)

MILK: In rural areas, average consumption was 8 liters of fresh, whole milk and 18 liters of skim milk per person per year. (Benrida, 1976)

EGGS: Consumption of eggs was very low, estimated at 14 per person per year in rural areas. (Benrida, 1976)

OILS AND FATS: Olive oil was the preferred oil in rural households, where 6.3 kilograms were consumed per person each year. Olive oil accounted for 53% of total consumption of fats and oils. Butter consumption was 1.2 kilograms per year; the remainder came from seed oils. (Benrida, 1976)

SUGAR: About 61 Dirhams was spent per person per year to buy sugar in rural areas where the average consumption was 26.4 kilograms. (Benrida, 1976)

TEA AND COFFEE: Annual tea consumption was 1.4 kilograms per person in rural areas. Coffee consumption was low, about 0.65 kilograms per person per year. (Benrida, 1976)

SALT: Annual salt consumption averaged 9.34 kilograms per person in rural areas. (Benrida, 1976)

FOOD EXPENDITURE: In rural areas, food accounted for 64% of total household budget expenditures. (Pierce, 1978)

FOOD SUBSIDY AND EXPENDITURE: Among the rural poor, 42% of the total budget is spent for foods which are subsidized. Subsidized foods account for 61% of all food expenditures and over 80% of all calories consumed. (Radwan, 1981)

INTRA-FAMILY FOOD DISTRIBUTION: In Berber families, men and women eat together, but the father and guests get the choice and largest pieces of meat. Preschool children are helped by the mother and other women to get a share, while older children seem relegated to the background until the others have eaten. The women invariably push the best pieces of meat toward the head of the household and guests, and stay occupied with feeding the infants and young children at the expense of themselves. (Robinson, 1977)

INTRA-FAMILY FOOD DISTRIBUTION: At the end of the meal, all the crumbled pieces of bread that remain are carefully gathered up by the woman of the family, who gives them to those of her children who have not been able to have anything from the first distribution; or she puts them into her sleeve or sets them aside to be redistributed at the first opportunity. (Bruneton, 1975)

CALORIES AND PROTEIN: Average energy intake in rural areas was 2,888 calories. Total protein intake was 84 grams: 12 grams from animal sources and 72 grams from vegetable sources. (Basta, 1977)

PROTEIN: Average protein intake was 75 grams per person per day in rural areas. Animal protein accounted for only about 10 grams of protein; the remainder was derived from plant sources, mainly cereals. (Benrida, 1976)

IRON: Iron intake averaged 15.9 mg. in rural areas. Cereals provided 80.5% of iron intake, the remainder coming from meat, fish and vegetables. (Benrida, 1976)

VITAMIN A: Consumption of vitamin A averaged 2,695 I.U. in rural areas, 33% below the optimal intake. Diets were low in foods high in vitamin A such as leafy, green and yellow vegetables. (Benrida, 1976)

URBAN

FOOD CONSUMPTION: Consumption of cereal and cereal products averaged 141.67 kilograms per person per year in urban households. 24 kg. of potatoes, 27.45 kg. of sugar, 5.47 kg. of pulses, 92 kg. of vegetables, 50 kg. of fruits, 24 kg. of meat, 7 kg. of fish, 24.5 kg. of milk, 15.94 kg. of fats and 15.44 kg. of beverages were consumed on average over the course of a year. (FAO, 1979)

CEREALS: Cereals provided 52.3% of calories in the average urban diet. 36% of the cereal budget was used to purchase processed foods such as bakery bread, cookies, and doughnuts. (Benrida, 1976)

CARBOHYDRATES: 67.7% of all calories in urban diets came from cereals, starchy foods and sugar. (Benrida, 1976)

SOFT WHEAT: Urban households consumed more soft wheat than hard wheat. (Benrida, 1976)

MEAT: Consumption of meat was about 24.1 kilograms per person per year. 159 Dirhams per person per year were spent on meat in urban areas. (Benrida, 1976)

FISH: Fish consumption averaged 7.1 kilograms per person per year in urban areas. (Benrida, 1976)

MILK: In urban areas, average intake was 20 liters of fresh milk, 6 liters of milk concentrate and 2 liters of skim milk per person per year. (Benrida, 1976)

EGGS: Consumption of eggs was low, estimated at 36 per person per year in urban areas. (Benrida, 1976)

FRUIT AND VEGETABLE CONSUMPTION: Annual per capita consumption was 33 kg. of root vegetables, 24 kg. of potatoes, 30.5 kg. of fresh tomatoes, and 18.8 kg. of citrus fruits. Salads are also eaten in urban areas. (Benrida, 1976)

FATS AND OILS: Urban households consumed an average of 2.3 kg. of olive oil per person per year, accounting for 15% of all fats and oils consumed. 9.4 kg. of edible oil seeds such as peanut oil were consumed each year, and 4.13 kg. of imported butter. (Benrida, 1976)

FATS AND OILS: Expenditures for fats and oils (including oilseed, olive oil, butter and ghee) accounted for 8.4% of food expenditures or 4.5% of the total household budget. Annual per capita expenditures were 15.6 Dirhams for olive oil, 13 Dirhams for other oilseeds, 10.7 for butter, and 1.7 for ghee. (Benrida, 1976)

SUGAR: About 51 Dirhams was spent per person per year to buy sugar in urban areas where the average consumption of sugar was 31.1 kilograms. (Benrida, 1976)

COFFEE AND TEA: Annual tea consumption averaged about one kilogram in urban areas, and coffee consumption was about 1.3 kilograms. (Benrida, 1976)

SALT: Annual salt consumption averaged 3.13 kilograms per person in urban areas. (Benrida, 1976)

FOOD EXPENDITURE: In urban localities, food accounted for 44% of the total household budget. (Pierce, 1978)

FOOD INTAKE AND INCOME: In urban areas, people with an annual income below 466 Dirhams (about U.S. $105.00) per year obtain only about 40% of

3.1 DIETARY PRACTICES, GENERAL (Cont.)

their energy, protein, vitamin and mineral requirements. The proportion rises slightly with income. People with an income of 466 to 541 Dirhams meet about 60% of their requirements. Those with an income of 1977 Dirhams (about $466.00 U.S.) obtain 150 to 180% of their requirements. (Basta, 1977)

FOOD SUBSIDY AND EXPENDITURE: Among the urban poor, 31% of the total budget is spent for foods which are subsidized. Subsidized foods account for 52% of all food expenditures and over 80% of calories. (Radwan, 1981)

CALORIES AND PROTEIN: Average intake was 2521 calories per day in urban areas. Protein consumption averaged 70 grams: 19 from animal sources and 51 from vegetable sources. (Basta, 1977)

CALORIES AND PROTEIN: Poor urban households met 85% of calorie requirements and 91% of protein requirements. More than 40% of urban households fell into this category, with an average annual expenditure of less than 864 DH ($216.00) per person. (Benrida, 1976)

PROTEIN: Average protein intake was 62.7 grams per day in urban areas. About 17 grams of this intake came from animal sources; the remainder came from plant sources, mainly cereals. (Benrida, 1976)

PROTEIN AND SHANTY TOWNS: People living in shanty towns had a daily protein intake of 51 grams. (Benrida, 1976)

VITAMIN A: Urban vitamin A intake was 4,425 I.U. per person. This surpassed the FAO requirement of 4,160 I.U., and was relatively satisfactory when measured by the more usual standard of 5,000 I.U. per day. (Benrida, 1976)

IRON: Iron intake averaged 11.4 mg. in urban areas. Cereals provided 59.6% of total intake, with the remainder provided by meat, fish, and vegetables. (Benrida, 1976)

3.2 DIETARY PRACTICES, WOMEN

3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS

3.3.1 DIETARY PRACTICES, INFANTS 0-24 MONTHS, BREASTFEEDING

NATIONAL

NUTRIENT CONTENT: Mothers' milk in Morocco was found to contain more fat than the milk of French women, but less protein. The protein level in the milk of women whose sucklings showed signs of kwashiorkor has been found to be as low as 8.36 grams per liter; among French women, protein content was 15 to 18 grams per liter. (May, 1967)

SALT CONTENT OF BREAST MILK: Maternal milk in Morocco was found to contain 500 milligrams of sodium chloride per 100 to 200 grams. (May, 1967)

3.3.2 DIETARY PRACTICES, INFANTS 0-24 MONTHS, WEANING

NATIONAL

WEANING DIET: There is no special weaning diet. Solid foods are usually given in the second year--on average by the 15th month. (CRS, 1979)

WEANING IN THE SOUTH: Nomadic peoples roaming the Sahara south of the Atlas Mountains were found to wean their children gradually. This process takes at least six months, during which other foods, such as camel's milk and cereals, are given to the child. Kwashiorkor has not been observed among these people. (May, 1967)

ABRUPT WEANING: 50% of mothers weaned abruptly due to a new pregnancy; 25% weaned gradually as the child matured. The remainder were not specified. Late weaning is preferred. (CRS, 1979)

ABRUPT WEANING AND EDUCATION: In 1975, 91% of 845 mothers questioned weaned abruptly. In 1978, after a program of nutrition education, only 15% of 692 mothers reported that they weaned abruptly. (Gilmore, 1980)

KWASHIORKOR, SEASON, AND REGION: Kwashiorkor was reported to be common, especially in children who had been weaned abruptly. Symptoms of kwashiorkor in weaned children usually appear in October and November. Observation over a five-year period revealed that abrupt weaning, followed by 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 children receive other foods such as camel's milk and cereal during the weaning period. The high mineral content of the area's water keeps the metabolism of water in balance and allows other food intake. (Weissman, 1977)

RURAL

WEANING DIET: Children are usually breast fed for one to two years before they are weaned onto a diet of semolina (couscous), corn, bread, macaroni, sweet tea, and water. (Robinson, 1977)

MINT TEA: Mint tea prepared with large amounts of sugar is the national drink. It is introduced early in life, at weaning, exerting a substantial effect on the high rate of dental caries. (Robinson, 1977)

3.3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS, AFTER WEANING

NATIONAL

CHILDREN'S MEALS: 66% of children received tea, bread and oil for breakfast. During lunch, only 50% of the children had some protein food in their meals. 20% of the children had only tea, bread, and oil for dinner. (CRS, 1979)

DIET: After weaning, the infant is given a diet of semolina, corn, rice, bread, macaroni, sweet tea, and water. No salt is ever added until the child is two years old. The flours used in the diets are locally milled, and are only rarely produced industrially with salt added. The basis of the diet is bread or "kesra", made of unsalted durum wheat, and highly sweetened mint tea. (May, 1967)

RURAL

MEAL PATTERNS: The average rural preschool child has bread and a wheat or barley gruel for breakfast with dry milk. The midday meal is usually "tajine" (stew) made with potatoes, tomatoes, carrots, and onions cooked in oil and eaten with bread. Supper is composed of tajine again, or the same vegetables over couscous occasionally accompanied by a small portion of beef. Mint tea and coffee accompany meals with an occasional piece of fruit or portion of nuts. (Robinson, 1977)

BREAKFAST: WSB (wheat soy blend) broth or gruel was a common item at breakfast for children. The author felt that its apparent popularity might be overstated by mothers in an effort to please the Western interviewer. (Robinson, 1977)

MEAT: Beef was the meat mentioned most often by mothers of children 1 to 5 years of age. Overall, the proportion of meat in the diet was low compared to vegetables and grain products. 23% of the children ate no meat on a typical day. (Robinson, 1977)

FRUITS AND VEGETABLES: Tomatoes, potatoes, carrots, and onions were the most regularly eaten vegetables, according to the 24 hour recalls of mothers of children 1 to 5 years of age. The pattern did not vary much, as there is little seasonal variation in vegetable availability. The large variety of fruits grown was not reflected in the diet histories of the children. Dates were the predominant fruit, although citrus fruits, pomegranates, and apples were also in season at the time of the survey. (Robinson, 1977)

3.4 HEALTH AND MEDICINE

NATIONAL

MIDWIVES: Theoretically, every woman is a midwife in Morocco, and although there is 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. (Weissman, 1977)

CAUSES OF RICKETS: The customary clothing and way of life of young children prevents exposure to the sun and is one cause of the rickets rate. (Enquête Nationale, 1973)

4. NUTRITION STATUS CORRELATIONS

NATIONAL

NUTRITION EDUCATION AND KNOWLEDGE: After a nutrition education program, more mothers knew about nutritionally appropriate practices during pregnancy, lactation, and weaning. Mothers knew more about vaccination, treatment of diarrhea, and protein alternatives to meat. (Gilmore, 1980)

NUTRITION EDUCATION AND BEHAVIOR: After a nutrition education program, more mothers reported having given their children protein foods on the previous day; fewer mothers reported that their children ate no legumes, or ate them once a week, and fewer reported weaning abruptly. (CRS, 1979)

BENEFITS OF NUTRITION EDUCATION: 33% of children 0 to 5 years of age who received only food supplements fell below 80% of the expected weight for age, but only 11% of children who received supplements plus nutrition education fell into this category. (Gilmore, 1980)

NUTRITION REQUIREMENTS AND EXPENDITURE: A correlation of per capita expenditures and theoretical availablility of certain nutrients revealed that vitamin B_2 (riboflavin), vitamin A, vitamin c, and calcium would not be provided in adequate amounts in the daily diets of the majority of people. (Weissman, 1977)

NUTRIENTS AND LEVEL OF EXPENDITURES: Available nutrients rose as expenditures rose. For example, in the lowest income group, 1337 calories and 37.1 grams of protein were available per person per day, but in the highest income group, 4455 calories and 131.1 grams of protein were available. Similarly dramatic increases were seen for vitamins and minerals. (Weissman, 1977)

NUTRIENTS AND OCCUPATIONAL STATUS: Calorie intakes were almost identical for the managerial cadre (2,865) and farmers owning their own land (2,880). Among the management cadre, 59.8% of the calories came from carbohydrates, 12.2% from proteins, and 28% from fats; 41.3% of protein was of animal origin. Among land-owning farmers, 74.5% of calories were from carbohydrates, 12% from proteins, and 13.5% were from fats; only 12.7% of proteins were of animal origin. (Pierce, 1978)

IRON STATUS AND EMPLOYMENT: Iron intake appears to be satisfactory for almost all groups except unemployed persons. (Benrida, 1976)

ANIMAL PROTEIN AND ECONOMIC STATUS: 11.4 to 12.7% of protein came from animal sources in diets of agricultural workers, but up to 41% of protein consumed by the professional managerial class came from animal products. (Weissman, 1977)

FOOD SUBSIDY AND INCOME GROUP: Among households earning less than 2,400 DH per year, each person received 20.1 DH in food subsidies per year; in households earning 2400 to 6000 DH, the subsidy was 35.9 DH per person per year; in households earning 6000 to 10,800 DH, the subsidy was 52.5

4. NUTRITION STATUS CORRELATIONS (Cont.)

DH per person per year; and in households with an income over 10,800 DH, the subsidy amounted to 71.9 DH per person per year. (Radwan, 1981)

MEAT CONSUMPTION AND OCCUPATION: Administrative officers and high officials consumed 47 kilograms of meat per person per year but agricultural laborers consumed 11 kilograms. (Benrida, 1976)

DIET AND FAMILY SIZE: The members of a large family get less food per capita than do the members of a small family in spite of the increased percentage of income they are willing to appropriate for food. The animal protein portion of the diet becomes smaller and smaller as the size of the family increases. (May, 1967)

DIET VARIETY AND EXPENDITURES: As expenditure levels increased, a wider range of food products was consumed. (Pierce, 1978)

RURAL

PCM AND SEX: There was no significant difference in incidence of moderate to severe PCM between male and female children. (Robinson, 1977)

ANTHROPOMETRIC MEASUREMENTS AND AGE: The age group most profoundly affected by low anthropometric measurements was the 1 to 2 1/2 year olds. This was found for all parameters measured. (Robinson, 1977)

FOOD SUBSIDY PROGRAMS: In rural areas, the 1.5% of the population with the most wealth received a food subsidy equal to nine times that of the 50% poorest members of the population. (Radwan, 1981)

URBAN

FOOD INTAKE AND OCCUPATION: Bureaucrats consumed 119% of their calorie requirements, but slum inhabitants consumed only 76% of requirements. For protein intake, the percentages were 140% and 75% of requirements. Iron intake met 122% of requirements among bureaucrats and professionals, and 78% among non-professionals and traditional artisans. (Basta, 1977)

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS

5.1 NUTRITION AND HEALTH POLICIES

NATIONAL

NUTRITION POLICY: The government has recognized the critical need to improve the nutritional status of its population. Considerable emphasis has been placed on nutrition education; this approach, however, has limited impact in a country in which 75% of the population is illiterate. (Pierce, 1978)

NUTRITION POLICY: To date, there is no national nutrition policy. In 1959, an Interministerial Council for Food and Nutrition was decreed. The purpose of the Council ws to respond to the acknowledged national nutrition problem by coordinating the previously autonomous activities of the various ministries. In August 1972, the Council was expanded and delegated responsibility for nutrition education, nutrition research and food promotion. CEPEN is the unit created by the Ministry of Plan which is responsible for the coordination of the nutrition resarch and action programs. (Weissman, 1977)

CEPEN: CEPEN, created by the Ministry of Plan, is responsible for determining the extent and nature of nutrition problems in Morocco; collecting and analyzing existing data; identfying groups whose diets are inadequate; surveying the existing flow of food from producer to individual; and supporting studies to detemine nutritional needs of various groups. CEPEN is to work with other ministries to develop a national nutrition strategy and to assist the Interministerial Council on Nutrition (CIAN) to coordinate the nutrition-related activities carried out by various ministries. (Weissman, 1977)

NUTRITION PLANNING: In 1972, the Interministerial Commission of Food and Nutrition (CIAN) was formed to coordinate the various nutrition programs. The 1973-77 Plan emphasized the importance of infant nutrition and the need to rehabilitate those suffering from serious malnutrition. It is likely that the next five year plan will put even greater emphasis on nutrition. The Human Resources Division in the Ministry of the Plan has established a group, the Cell for Study and Research in Nutrition (CEPEN), whose responsibility is to analyze the nutrition situation and formulate a nutrition strategy for inclusion in the 1978-82 Plan. Pierce, 1978)

U.S. AID: Technical support is provided by U.S. AID for the development of the nutrition unit in the Ministry of Plan. (Weissman, 1977)

FOOD POLICY: Government policy controls the price of both domestic and imported foods to protect lower income groups from sharp price increases which may follow a poor harvest, but this policy may discourage expansion of agricultural production. (Weissman, 1977)

FOOD SUBSIDIES AND INCOME: In 1977, the lowest income groups, 1/3 of the population, received 18% of the benefits of the food subsidy program, while the group with the highest income, 10% of the population, received

20% of the benefits of the program. Similarly, subsidies to agricultural producers had benefitted the large farmer. Small farmers with 10 hectares or less were left completely out of the system (except for animal production). (Radwan, 1981)

DIETARY SHIFT: The Ministry of Agriculture and Agrarian Reform has suggested a recommended desirable diet. The number of calories remains about the same as is consumed now. This recommended diet increases the proportion of calories obtained from animal products, fresh vegetables, butter and oils. It is recognized by the government that the shift to the model diet is contingent on the availability of the recommended food products in all regions and the ability of the population to purchase these products. (Pierce, 1978)

RECOMMENDED DIET: The diet recommended by the Ministry of Agriculture includes 51.4% of calories from cereals (66.8% of calories come from cereals in the average diet), 12.8% from animal products (5.4% are from animal products in the present diet), 11.6% from fruits and vegetables (7.8% in the current diet); butter and vegetable oil are to increase from 8.1% to 13.8% of calories. The Ministry recognizes that it will require considerable educational effort to persuade people to modify their customary diet. (Pierce, 1978)

HEALTH POLICY: In the 1973-77 Social and Economic Development Plan, the health goals expressed were to extend the delivery of health services to reach the majority of the population and to provide those services which would improve the health environment. Efforts were to be directed to the development of health facilities' infrastructure, the training of health workers, and the integration of family planning services into the activities of the public health programs. Capital investment in the health sector increased from sixty million Dirhams in 1968 to 702 million in the revised 1973 to 1977 plan. (Weissman, 1977)

HEALTH POLICY: 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. (Weissman, 1977)

MEASLES POLICY: Many officials in the Ministry of Public Health consider measles to be a relatively benign childhood disease which rarely results in complications, so the Ministry of Public Health has decided not to conduct a major vaccination campaign against the disease. (Weissman, 1977)

ABORTION: Abortions are legal only if the mother's life is in danger, but the abortion rate is 250 per 1000 live births. (Weissman, 1977)

MAGHREB COMMITTEE FOR PUBLIC HEALTH: The Maghreb Committee for Public Health, which includes Morocco, Algeria, and Tunisia, was founded in 1973 to promote cooperation and communication in matters of public health interest. In 1977, the Maghreb Health Committee discussed maternal child health services, malnutrition, and chronic diarrhea in children, among other topics. (Weissman, 1977)

SOCIAL SECURITY AND MATERNITY BENEFITS: Under the social security system, to receive maternity benefits a woman must 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. (Weissman, 1977)

5.2 NUTRITION AND HEALTH PROGRAMS

NATIONAL

NATIONAL NUTRITION SURVEY: A national nutrition survey was conducted by the Ministry of Public Health in 1971. The survey was planned to include over 9,000 children, but in fact, only 71% of this goal was reached--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. The survey was conducted at the time of year when protein calorie malnutrition is least severe, March and April. A repeat survey was planned for November of the same year when nutrition problems are more serious, but this was not possible. (Weissman, 1977)

NATIONAL NUTRITION SURVEY: The last nutrition survey was carried out in 1971; a combined nutrition and consumption survey is planned for 1981. (Gilmore, 1980)

GOVERNMENT NUTRITION PROGRAMS: Many sections of government are involved in nutrition. The Ministry of Health, the Ministry of Youth, Sports and Social Affairs, and the Ministry of Education all have programs aimed at improving nutrition. (Royaume du Maroc, 1971)

COST OF FOOD SUBSIDY PROGRAMS: Less than 5% of total government expenditures went to subsidize food consumption and production during the period 1970-73. Due to inflation, these subsidies accounted for 32% of expenditures in 1974, and averaged 13% during the period 1976-79. (Radwan, 1981)

MATERNAL AND CHILD HEALTH PROGRAMS: The Ministry of Public Health runs maternal and child health programs designed to prevent malnutrition, to prevent the infectious diseases of childhood, and to improve maternal health. Children from birth to two years of age are included in the program. (Weissman, 1977)

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

MCH CENTERS - SERVICES: The Ministry of Public Health runs about 200 health centers which provide basic preventive services including prenatal and postnatal care for women, family planning, nutrition education, and vaccination. Curative care is also available. (Weissman, 1977)

MCH CENTERS - COVERAGE: It is estimated that only 15% of eligible children are covered by the preventive maternal child health services. (Weissman, 1977)

MCH CENTERS - NUTRITION CARE: During the period of the 1973-77 Plan, the Maternal and Child Health Service devoted some resources to monitoring the progress of infants and to promoting nutrition education. When a baby is brought to the dispensary for its innoculations, its weight is recorded; if the weight falls below the norm, a program of feeding supplements is initiated. For babies seriously undernourished, a program of rehabilitation involving hospitalization or feeding at either the health center or dispensary is implemented. (Pierce, 1978)

MCH CENTERS - NUTRITION ACTIVITIES: Maternal child health programs provide nutrition education, food preparation demonstrations, and supplementary feeding according to medical prescription for malnourished children. This program administers three doses of vitamin D (600,000 units per dose) at six-month intervals to prevent rickets. Weight and height are measured on 14 occasions between birth and age two. Referral for curative treatment is made as necessary. (Weissman, 1977)

PROTECTION DE LA SANTE DE L'ENFANT (PSE): Outreach workers for PSE go into rural areas to find malnourished or sick children and pregnant or recently delivered mothers who should be informed of PSE clinics. The PSE service assumes that a mother with a child can and will walk no more than 5 kilometers for these services. In 1975, the program reached an estimated 200,000 children (about 15% of all children 0 to 2 years of age) and about 300,000 women. (Weissman, 1977)

PSME AND WEANING FOOD: Maternal child health centers (PSME) provided Actamine 5, a weaning food prepared from locally-available foods, to children under 4 years of age in an on-site feeding program. In 1979, this program reached 6.6% of children in the target group (children below 80% of normal weight for age). (Radwan, 1981)

UNICEF AND WEANING FOOD: The government is working with UNICEF to develop a weaning flour to be manufactured locally and available at a moderate cost. Introduced as early as three months of age, it is primarily intended as a weaning supplement, but can be used to augment the diets of older children and undernourished adults. (Pierce, 1978)

MINISTRY OF PUBLIC HEALTH AND RICKETS: The Ministry of Public Health has launched a concerted campaign to reduce the incidence of rickets. (Pierce, 1978)

NUTRITION EDUCATION PROGRAMS: Most primary and secondary schools offer nutrition education. It is also included in non-formal education

programs such as Foyers Feminine (organized by the Ministry of Youth and Sports) and the Ouvriors (run by Entraide Nationale). The Maternal and Child Health Service sponsors programs instructing mothers in the proper and sanitary preparation of food; these sessions attempt to communicate to the women an appreciation for sound nutrition practices. (Pierce, 1978)

MINISTRY OF PUBLIC HEALTH AND NUTRITION EDUCATION: The Ministry of Public Health provides nutrition education at several levels. Registered and practical nurses receive nutrition education as 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. (Weissman, 1977)

A.I.D. AND NUTRITION EDUCATION: Technical support is provided by U.S. AID for the development of the nutrition unit in the Ministry of Plan. Nutrition education training is offered to teachers who teach in the Entraide Nationale centers. Long-term training is given at the National Institute of Nutrition in Tunis and short-term training is given in Marrakesh. (Weissman, 1977)

FOOD DISTRIBUTION PROGRAMS: The programs of direct food distribution include a program thorugh the social education centers (CSE), the maternal child health programs (PSME), and the school feeding program. The percentage of target groups reached by these programs was 6.6% for the PSME program and 26% for the school feeding program. No figure was specified for the CSE program. A total of 11.9% of the poor population benefits from programs of direct distribution of food, but the quantity received by each beneficiary may be insignificant. (Radwan, 1981)

FOOD DISTRIBUTION PROGRAMS: In 1979, the total amount of food distributed in food distribution programs amounted to 3.05 kilograms of food per person per year. This food provided only 1% of total energy intake. (Radwan, 1981)

C.R.S. AND PL-480: 70,020,000 pounds of food, valued at $12,020,000, is to be distributed in FY 1982. Most of the foods are to be distributed by Catholic Relief Services through maternal-child feeding programs, other child feeding programs and food for work. (Anonymous, 1981)

U.S.A.I.D. AND PL-480 FOODS: Between 1959 and 1975, U.S. 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 annually. Priority was given to preschool children and their mothers, and workers and dependents involved in self-help development projects. Between 1957 and 1975, 26,577 metric tons of food, valued at U.S. $4.5 million, were distributed through the American Jewish Joint Distribution Committee to an average of 36,000 recipients per year. The majority of recipients were elderly Jews. 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, were distributed to an average of 960,000 recipients per year. (Weissman, 1977)

CATHOLIC RELIEF SERVICES: Catholic Relief Services developed food-for-work projects, and in FY 1974, more than 8,000,000 man days of work on projects were completed. With Ozar Hatorah, CRS shipped 129,542,000 pounds of U.S. government-donated food and distributed these through 2,198 centers to 768,000 recipients, including 273,000 school and preschool children. CRS also provided powdered milk to the country-wide network of preschool nutrition centers run by Ozar Hatorah and the Government of Morocco. (TAICH, 1975)

CATHOLIC RELIEF SERVICES: CRS sponsored a program establishing country-wide 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. CRS also developed food for work projects. (Weissman, 1977)

CATHOLIC RELIEF SERVICES AND SOCIAL EDUCATION CENTERS: The CRS runs a food distribution and nutrition education program in the 250 social education centers throughout the country. Each month, mothers of children under five years old attend a class of 20 to 50 minutes, register the weights of their children, pay a fee of about 54 cents, and receive a monthly ration of food. Each recipient receives about 45 kilograms of food per year. (Gilmore, 1980)

CATHOLIC RELIEF SERVICES AND NUTRITION EDUCATION: Nutrition education has been introduced in the Social Education Centers operating in 30 provinces in Morocco. Presently, there are 250 centers, with the prospect of 50 additional centers being opened in the near future. 125,000 mothers with children below five years old were enrolled in the program and attended a nutrition lesson once monthly. Each mother received supplementary foods for herself and two children per family. Children's heights and weights were recorded at monthly sessions. (CRS, 1979)

IMPACT OF NUTRITION EDUCATION: Mothers who participated in the CRS food supplement and nutrition education program were more likely to know the importance of supplementing the infant's diet by six months, and of gradual weaning. They were able to describe an appropriate diet in pregnancy and lactation, could prescribe a treatment for infant diarrhea, knew of more diseases which could be prevented by vaccination, and knew animal or vegetable substitutes to use when there was no money to buy meat. (Gilmore, 1980)

IMPACT OF NUTRITION EDUCATION: In 1975, before receiving nutrition education, 43% of mothers reported that their children had received no growth food (protein) during the day before the survey; in 1978, this

figure was 7%. In 1975, 70% reported their child ate no legumes or only ate them once a week; in 1978, only 10% reported this. (CRS, 1979)

IMPACT OF NUTRITION EDUCATION: In 1975, 91% of mothers reported that they weaned abruptly. In 1978, after receiving education, only 15% reported they weaned abruptly. (CRS, 1979)

BENEFITS OF NUTRITION EDUCATION: 33% of children 0 to 5 years of age who received only food supplements fell below 80% of the expected weight for age, but only 11% of children who received supplements plus nutrition education fell into this category. (Gilmore, 1980)

AMERICAN JEWISH JOINT DISTRIBUTION COMMITTEE: The American Jewish Joint Distribution Committee supports three dispensaries, a maternity care clinic, two MCH programs, and a hospital in Tangier with a community medical service. They also have an infant milk center and feeding programs in schools and kindergarten canteens. Family food parcels are distributed to 835 people in Casablanca. Approximately 350,000 pounds of food were distributed in 1973. (TAICH, 1975)

UNICEF: UNICEF has supported projects in the areas of health services, primary and secondary nutrition education, family and child welfare and nutrition at the Institute of Agronomy. UNICEF cooperated in establishing a human food and nutrition department in the Hassan II National Institute of Agronomy. A weaning food was developed with UNICEF support; production began in 1975, but no plan had been established for its promotion or distribution through the health system or through commercial outlets. (Weissman, 1977)

NATIONAL MOROCCAN WOMEN'S UNION: The National Moroccan Women's Union operates a wide variety of programs which include day care centers and nutrition centers. (Weissman, 1977)

HEALTH EDUCATION: Theoretically, there should be several specialized health educators in each province. There were 18 malaria health educators and 18 general health educators in the 30 provincesin 1975. There is a noticeable lack of posters, printed material, and audio-visual materials which 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 trucks may sit idle for weeks. (Weissman, 1977)

GIVING BIRTH: The majority of women in Maadid go to a Rabat hospital for their first delivery because they appreciate the value of 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 is the impersonality and lack of humanitarian concern expressed by hospital medical personnel. (Weissman, 1977)

TRADITIONAL HEALERS: Traditional health personnel include ‹ablas, the traditional birth attendants, who still deliver the majority of babies; saints, who are very learned and illiterate and are said to play the role

of the psychiatrist; and Fuquba, or quranic healers, who specialize in writing amulets and talismans. (Pillsbury, 1978)

URBAN

MOROCCAN LEAGUE FOR THE PROTECTION OF CHILDREN: 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 preschool educational curriculum. (Weissman, 1977)

FOOD SUBSIDY PROGRAMS: In urban areas, the 12% of the population with the most wealth received a food subsidy equal to five times that received by the 20% poorest members of the population. (Radwan, 1981)

TRADITIONAL BIRTH ATTENDANTS: Qablas, the traditional birth attendants, have an important role. A recent survey of several thousand women in nine Moroccan cities found that 3/4 of them had delivered their last child at home, many with assistance from a qabla. Rates in rural areas are likely to be even higher. (Pillsbury, 1978)

6. COMMENTARIES

NATIONAL

NATIONAL NUTRITION SURVEY AND SEASON: The national nutrition survey was conducted during the time of year (March-April) when protein calorie malnutrition is least severe. A repeat survey was planned for November of the same year, when nutrition problems are more serious, but this was not possible. (Weissman, 1977)

NATIONAL SURVEY RECOMMENDATIONS: The authors of the national nutrition survey recommend that intensive nutrition education be undertaken at all levels of society, that a weaning food which is rich in protein and inexpensive be developed and promoted, and that a systematic program of prevention of rickets be undertaken. (Enquête Nationale, 1973)

IMPROVED GROWTH: The 1971 national nutrition survey indicated that the fall-off in growth curves was less marked and less prolonged than in the 1967 pilot study. The author feels this is due to improved weaning practices. The mothers are weaning less abruptly and introducing foods gradually into the children's diets. This improvement is probably due to new ideas introduced by the educational efforts of the Ministry of Public Health. (Enquête Nationale, 1973)

CAUSES OF KWASHIORKOR: It was noted in the Rabat region that kwashiorkor occurred most frequently just after the dry season. The suggested explanation was that the reduction of nutrients that occurs after weaning is complicated by an overconsumption of water that precludes any other food intake and creates the syndromes observed. This deficiency was not seen in desert nomads. The water and soil in these areas are richly mineralized, which may keep the metabolism of water in balance and allow other food intake. Furthermore, weaning is progessive here, lasting at least six months, during which children are given milk and cereal as supplements. (May, 1967)

MCH POLICY: Government policy on maternal and child health and nutrition is basically sound and well-designed, but the issue is whether they have reached a significant proportion of the most disadvantaged groups, particularly the rural poor. In urban dispensaries, infants are carefully examined and evaluated, and demonstrations of food preparation are well attended and presented. Similar care is available at some rural dispensaries, but the inaccessibility of these units often limits the effectiveness of such interventions. (Pierce, 1978)

MCH EXTENSION: An effort should be made to expand the Maternal Child Health Program to regions which are not yet served or to those regions where the problems of nutrition and infant mortality are very severe. The integration of the MCH program with the program conducted in the social and educational centers (CSE) is also recommended. (Radwan, 1981)

HEALTH COVERAGE: Urban health centers are overcrowded, but rural dispensaries are underutilized, as are hospital beds throughout the country. (Pillsbury, 1978)

HEALTH MANPOWER: A major constraint to the development of health services is the limited number of trained health workers. Despite the fact that the supply of health manpower 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. Further, physicians tend to be unequally distributed, the majority remaining in urban areas. (Weissman, 1977)

MEASLES: Government policy considered measles to be a relativley benign childhood disease, and therefore the Ministry of Public Health has decided not to conduct a major vaccination campaign against the disease. Complications from measles include upper respiratory infection and diarrhea, which may persist long after the measles has been cured. In a country with significant nutritional problems, these relationships should not be overlooked. (Weissman, 1977)

IMPORTANCE OF NUTRITION EDUCATION: Even among children from the advantaged socioeconomic classes, there is a deflection in growth, both in weight and height, at the time of weaning. This demonstrates the importance and the necessity of nutrition education at all levels and in all areas of the country. (Enquête Nationale, 1973)

IMPORTANCE OF NUTRITION EDUCATION: The health environment 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, mosquitoes, rats, and other vectors, and encourages the spreading 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 since incomes are low and malnutrition is a major health problem. (Weissman, 1977)

DELIVERY OF NUTRITION EDUCATION: 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. 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 audience who would benefit most from it. (Weissman, 1977)

FOOD DISTRIBUTION PROGRAMS: Food distribution programs should focus on rural areas. The programs provided through maternal and child health centers should be integrated with the programs of the education and social centers. Food aid should be used, in the short term, to undertake these programs, but use of food aid must be reviewed periodically. (Radwan, 1981)

WEANING FOOD: Actamine 5, a weaning food made of locally-available foods, was fed to underweight children at centers for maternal and child

health. However, only one third of the food necessary for these children to recover was provided. Further, the program has been focused on urban areas, even though the national nutrition survey indicated that rates of malnutrition were highest in rural areas. (Radwan, 1981)

POPULATION GROWTH AND FOOD SUPPLY: Rapid population growth further attentuates the adequacy of the food supply. Although agricultural output rose from 1960 to 1970, the increase was just sufficient to keep pace with the population growth. Since 1970, Morocco has been a net importer of grain. With population growth projected at 3% per annum until about 1990, it is likely to become more dependent on overseas food sources, unless levels of domestic agricultural production increase considerably. (Pierce, 1978)

GOVERNMENT SUBSIDIES: Government subsidies have helped stabilize food prices for the urban consumer. This is important as, since 1974, Morocco has moved from being a net exporter of food to a net importer of grain. (Gilmore, 1980)

SUBSIDIZED FOODS: If the food subsidy program were eliminated, calorie consumption would drop by as much as 10% among the poorest classes. Among the very poor, calorie intake is already below requirements. (Radwan, 1981)

FOOD SUBSIDY PROGRAMS: Because these programs were not targeted, the advantages of the programs were greater for the wealthier segments of the population than for those in need, for whom the subsidies were intended in the first place. The system has been ineffective in maintaining the buying power of the poorest members of the population. (Radwan, 1981)

SUBSIDY OF SUGAR: Sugar is used to justify the food subsidy program because its consumpiton is generally not as dependent on level of income or degree of urbanization of the consumer as other subsidized foods. Some reservations have been expressed about subsidzing sugar due to its nutritional implications; but it is likely that removing the subsidy from sugar would not diminish its consumption significantly, but might reduce the ability to buy other foods, such as meat. (Radwan, 1981)

RURAL

NUTRITION EDUCATION: The poor nutritional status of young children under four years of age in rural areas is explained by the great dispersion of population which makes the penetration of new ideas more difficult, and by the insufficient number of personnel, especially women, in the health infrastructure in rural ares. (Enquête Nationale, 1973)

URBAN

FOOD POLICY AND URBANIZATION: Government policy controls the price of both domestic and imported foods to protect lower income groups from sharp price increases which may follow a poor harvest. There are indications that this has aggravated nutrition problems by attracting

people to urban areas where the cost of living has been maintained at an artificially low level. (Weisman, 1977)

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1981 Fiscal year 1982 Public Law 480 Title II ISC Approved Quantities Voluntary Agencies/WFP/Government to Government. Food for Peace, A.I.D., State Department, Washington, D.C.

This document describes the amounts and dollar values of PL-480 foods, the commodities, and the program sponsors for each recipient country in fiscal year 1982.

Basta, S.S.

1977 Nutrition and Health in low income areas of the Third World, Ecol. Food Nutr. 6:113-24.

Data are presented which illustrate the profound differences in health and nutritional status betwen different income groups in cities of the developing world. The intra-urban differences cited seem to be greater than urban to rural differences. Dependence on wage income, instability of employment, and high residential densities contribute to the onset of disease and malnutrition for the urban squatter family.

Benrida, A.

1976 Food Consumption and Dietary Patterns in Morocco, Unpublished Draft, May 1976.

The National Household Consumption survey carried out in 1970-71 found diets of poor nutritional quality to be common among low income groups, especially in rural areas, where diet depended heavily on cereals, starchy foods and tea. A high proportion of calories from cereals and small amounts of animal protein characterized the national diet. Mineral and vitamin intakes were inadequate due to the low consumption of green and yellow vegetables and fruits.

Bruneton, A.

1975 Bread in the Region of the Moroccan High Atlas; A Chain of Daily Technical Operations in Order to Provide Daily Nourishment, from M.L. Arnott (ed.) Gastronomy: the Anthropology of Food and Food Habits, Mouton: The Hague; Aldine, Chicago (U.S. distributor).

This document recounts in detail the making of bread among a particular Berber tribe, the Ait Mgun people, in the upper Atlas region. There are descriptions of the three main types of bread, and the processes of cleaning, winnowing, grinding, kneading and baking are described in detail.

CRS (Catholic Relief Services)

1979 Final Report and Evaluation of Nutrition Education Project CRS/Morocco done in collaboration with Ministry of Social Affairs, Morocco and U.S.A.I.D., Grant # AID/NESA-G-1169.

Original data.
Method: Children were weighed and measured before and after mothers received nutrition education, and were compared to themselves and younger siblings. A preliminary survey was done of socioeconomic conditions and dietary practices.
Sample: 845 mothers in 1975 and 692 mothers in 1978 responded to the survey about socioeconomic status and diet. 1626 children were evaluated for height and weight; 317 were compared to siblings.
Geography: national

This report describes a large CRS program which trained nutrition personnel, developed educational materials and ran an extensive nutrition education and food supplementation program. Children were weighed and measured before and after the program and compared to younger siblings as well as serving as their own controls. Many variables were not controlled for, and no controls outside the program were used. In 37% of cases, the older child was in a higher weight for age category, and in 58% of cases, the younger child was in a higher weight for age category; 5% were in the same category.

Enquête Nationale

1973 Enquête Nationale sur l'Etat de Nutrition des Enfants par les Equipes Techniques du Ministere de la Sante Publique; Royaume du Maroc, Ministere de la Sante Publique, Bulletin de la Sante Publique; Nouvelle Serie, Tome 3, No. 54; Rabat.

Original data.
Method: Cross sectional. Anthropometric measurement (weight, height, skinfold thickness, head circumference, arm circumference). Questionnaire. Carried out in March-April 1971, the season of least PCM. Planned for November also (period of greatest malnutrition), but not carried out.
Sample: about 7000 children up to age 4 years. Representative sample. Urban categories from I, luxury, to VI, poor; and rural groups from 1, small village, to 5, largest rural village.
Geography: national

A nutrition survey was carried out on a national sample in March and April of 1971. Weight and height were normal at birth and for the first months of life. After that, there was a fall-off in growth, starting at about 6 to 12 months, and persisting through 2 1/2 to 3 years of age. Nutritional status was consistently poorer in children from rural areas. 40% of children examined had moderate PCM and 5% had severe PCM with edema. Rickets was widespread.

FAO

1979 Food and Nutrition Paper, Review of Food Consumption Survey 1977, Vol. 2: Africa, Latin America, Near East, Far East. Food and Agriculture Organization of the United Nations, Rome.

Original data.
Method: stratified sample based on the list of households of the 1960 census. Each family was interviewed for one week, concerning food purchases, weighing for consumption data.
Sample: 6546 households, with a response rate of 98.6%.
Location: National; 273 urban and 334 rural areas.

This volume reviews food consumption and expenditure surveys conducted during the period 1963 to 1976 in the regions of Africa, Latin America, the Near East and the Far East.

Gilmore, J.W., Adelman, C.C., Meyer, A.J., and M.C. Thorne

1980 Morocco: Food Aid and Nutrition Education, A.I.D. Project Impact Evaluation Report No. 8, August 1980.

Original data.
Method: Used data on weight collected monthly at social education centers. Data collected longitudinally. 1975 baseline survey. 1978 data collected when program switched from food supplement only to food plus nutrition education. Also, site visits to centers and homes of recipients and interviews with local influentials.
Sample: Poor mothers participating in the CRS program with children under 5 years: 1621 in 1975 and 1417 in 1978.
Geography: National, 250 centers all over Morocco.

This document summarizes the evaluation of the food supplement and nutrition education program run by CRS through the 250 social education centers in Morocco. Children in the program were found to be less malnourished, and the education component was found to contribute substantially to the reduction of malnutrition. Food was found to be an important subsidy, equivalent to as much as 24% of the per capita incomes of some families.

Horowitz, G.

1980 Intra-Family Distribution of Food and other Resources: A Report to the Nutrition Economics Group under Contract No. 53319R-9-50, U.S.A.I.D., July 1980.

This paper reviews the literature on intra-family food distribution around the world. It critically reviews the methods for determining intra family distribution, reviews the literature on the distribution in the less developed countries, and examines the determinants of these distribution patterns.

May, J.M.

1967 The Ecology of Malnutrition in Northern Africa, Libya, Tunisia, Algeria, Morocco, Spanish Sahara and Ifni, Mauritania. Studies in Medical Geography, Volume 7; Hafner Publishing Co., N.Y.

This book describes the geography, climate, population, government, agricultural policies and foreign aid of each country. Food production, industry, and export-import information is given. The diet is described in general and for specific groups. The adequacy of food resources and nutritional disease patterns are described to evaluate the nutritional condition of each country.

Pierce, C.S.

1978 Morocco: The Health Situation. Population and Human Resources Division, Development Economics Department; Unpublished Draft.

This document describes the nutrition situation in Morocco. It reviews and summarizes the National Nutrition Status Survey and the 1970-71 Food and Expenditure Survey. It also describes government policy and programs in nutrition.

Pillsbury, B.L.K.

1978 Traditional Health Care in the Near East. A report prepared for the U.S. Agency for International Development, Washington, D.C., March 1978.

This review examines health care available in eight Near Easten countries. For Morocco, information is presented on health and population, indigenous health care systems, beliefs about the etiology of illness, and health practitioners.

Radwan, S. and Thomson, A.M.

1981 Le Systeme des Subventions Alimentaires et les Distributions Directes au Maroc. Rapport present au Ministere de l'Agriculture et de la Reforme Agraire-Maroc, August 4, 1981.

This document reviews the impact of food subsidy programs and direct distribution programs on the nutritional status of the population and on the economy of Morocco. It describes the various food programs and the World Food Council Evaluation of these programs.

Robinson, J.S.

1977 Malnutrition among Arab and Berber Children in Rural Morocco. UCLA School of Medicine, Department of Pediatrics, Los Angeles, California; June 1977.

Original data.
Method: Cross sectional. Anthropometric measurements (height, weight, arm circumference, head circumference, fat fold thickness) and 24 hour recalls. Children were weighed with their clothes on.
Sample: 110 1 to 5 year old children attending MCH centers. A small but unspecified number of urban children were included.
Location: rural areas of Ouarzazate and a poor slum area; a village 30 to 50 miles outside of Marrakesh City.

This study was a brief nutritional survey of Arab and Berber preschool children conducted in the High Atlas foothills south of Marrakesh and in the Draa River valley in the pre-Sahara region. 44% of the children were found to be moderately to severely malnourished by weight for age, and 40% by arm circumference criteria. The group most affected was the 12 to 30 month old children. Nutritional stunting was the predominant form of malnutrition found, with a few cases of frank marasmus and no kwashiorkor.

Royaume du Maroc, Premier Ministre

1971 Delegation au Plan et au Developpement Regional, Division du Plan et des Etudes Economiques, Service de la Planification des Resources Humaines, La Situation Nutritionnelle au Maroc, Unpublished; October 1971.

This paper reports on the state of nutrition in Morocco as it was known in 1971. Most of the information came from studies carried out in the 1950s and 60s, as the national survey was underway and no results were available. Nutrition policy and planning are discussed, and the importance of good nutrition for successful development is stressed. A review of food consumption and nutrition studies is included in a bibliography at the end.

Sivard, R.L.

1979 World Military and Social Expenditures 1979. Leesburg, Virginia: World Priorities, 1979.

This document summarizes the world situation in 1979 in statistics concerning military development and expenditures and juxtaposes these with figures on social underdevelopment concerning poverty, employment, food, health and education. Extensive statistical tables with figures for every country make up the core of this document.

TAICH

1975 TAICH Country Report: Development Assistance Programs for Morocco. New York: American Council of Voluntary Agencies for Foreign Service, Inc., Technical Assistance Information Clearing House, May 1975.

This report describes the assistance programs of 12 U.S. organizations, including voluntary agencies, missions, foundations and

other non-profit organizations, which provide the people of Morocco with assistance in medicine, public health, education, and other areas.

Weissman, J.

1977 Syncrisis--The Dynamics of Health, XXII--Kingdom of Morocco. Report number HRP-0028084, Public Health Service, Rockville, Md. Office of International Health; June 1977.

This review of the health situation in Morocco includes information on major health problems, policies and programs. Information is presented on family planning, curative and preventive health care, nutrition, food availability, population growth, and traditional healers.