

PN-AAN-296
ISSN 39059

Maternal and Infant Nutrition Reviews



BURMA

an International Nutrition Communication Service publication

Developed and produced with funds provided by the United States Agency for International Development

MATERNAL AND INFANT NUTRITION REVIEWS

BURMA

A Guide to the Literature

Compiled by

Ron Israel - Senior Editor
Joanne Nestor Tighe - Editor and Reviewer
Ellen Blumenstiel Taylor - Principal Reviewer
Steve Wirtz - Reviewer

May, 1983

An International Nutrition Communication Service (INCS) Publication

Education Development Center, Inc.
55 Chapel Street, Newton, MA 02160 USA

INCS Advisory Board: Derrick B. Jelliffe, E. F. Patrice Jelliffe, Richard K. Manoff,
Marian L. Tompson, R. R. N. Tuluhungwa, Joe D. Wray, Marian F. Zeitlin, Roy E. Brown

*This project has been conducted under Contract A.I.D./DSAN-C-0209, Project No. 931-1010.
Project Officer: Dr. Tina Sanghvi, Office of Nutrition--Science and Technology Bureau,
Agency for International Development, Washington, D. C.*

CONTENTS

Introduction	i
MINR Classification System	iii
Map	iv
Table I: Locations Studied	v
Review Highlights	vii
Review	1
Bibliography	39

INTRODUCTION

MATERNAL AND INFANT NUTRITION REVIEWS: A RESOURCE FOR NUTRITION PLANNERS AND EDUCATORS

The MATERNAL AND INFANT NUTRITION REVIEWS (MINR) profile existing data on nutritional status and nutrition-related beliefs and practices of mothers and children in developing countries. MINRs also contain information on current nutrition policies and programs of governments, the United States Agency for International Development, and other bilateral, international agencies and Private Voluntary Organizations (PVO). There are thirty-five MINRs in all, profiling forty-four different countries. (See list on next page.)

Special thanks are due to Marian Zeitlin for providing many of the materials reviewed for the Burma report, and to David Sahn for providing materials and reviewing an earlier draft of this document.

Maternal and Infant Nutrition Reviews summarize important information obtained from available literature, government documents, consultant reports, and personal correspondence. The data is presented in bulleted form under six major headings: nutrition and health status, dietary beliefs, dietary practices, nutrition status correlations, nutrition and health policies and programs, and commentaries. A bibliography at the back of each monograph describes the listed documents in terms of type of study, methodology, sample characteristics and location, and a summary.

Nutrition planners and policy makers can use MINRs to help identify a given country's data base. For example, the information contained in each review enables the reader to identify key planning factors such as problem areas of malnutrition, prevailing beliefs about breast feeding, the extent of bottle feeding, types of weaning foods, the government's inter-agency five-year nutrition plan, the amount of donated food being distributed at MCH centers, and major PVOs involved in administering food and nutrition programs.

MINRs can be used as background documents for consultants going into the field and for program developers in-country. They can provide a frame of reference for an in-country workshop aimed at developing a national nutrition strategy. Technical assistance in organizing a workshop of this kind is available through the International Nutrition Communication Service. MINRs can also be used as a resource document in the development of journal articles and textbooks.

MINR data is stored on a computerized word processing system that allows for updates and individualized literature searches on specific topics. Patterns in a particular country or group of countries can be analyzed in accordance with user needs. A nutrition information retrieval service is available free to those working in developing countries and for a small fee to all others. Orders, inquiries, and comments should be addressed to:

Ron Israel, Director
International Nutrition Communication Service
Education Development Center
55 Chapel Street
Newton, Massachusetts 02160, USA

MINR Country Reports:

AFRICA:	NEAR EAST:	ASIA:	LATIN AMERICA AND CARIBBEAN:
Cameroon	Egypt	Bangladesh	Bolivia
Gambia and Senegal	Jordan	Burma	Costa Rica
Ghana	Morocco	India	Dominica
Kenya	Tunisia	Indonesia	Ecuador
Lesotho	Yemen	Nepal	Guatemala
Liberia		Pakistan	Haiti
Mali		Philippines	Honduras
Sudan		South Pacific*	Jamaica
Tanzania		Sri Lanka	Panama
Zaire		Thailand	Peru

*South Pacific Region includes the nations of Cook Islands, Fiji, Kiribati, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, and Western Samoa

MATERNAL AND INFANT NUTRITION REVIEWS

CLASSIFICATION SYSTEM

1. Nutrition and Health Status
 - 1.1 General
 - 1.2 Women, Pregnant
 - 1.3 Women, Lactating
 - 1.4 Infants 0-6 Months
 - 1.5 Infants 6-24 Months
2. Dietary Beliefs
 - 2.1 General
 - 2.2 About Pregnancy
 - 2.3 About Lactation
 - 2.4 About Breast Milk Substitutes (including bottle feeding)
 - 2.5 About Weaning
3. Dietary Practices
 - 3.1 General
 - 3.2 Women
 - 3.2.1 During Pregnancy
 - 3.2.2 During Lactation
 - 3.3 Infants 0-24 Months
 - 3.3.1 Breast feeding
 - 3.3.2 Weaning
 - 3.3.3 After Weaning
 - 3.4 Health and Medicine
4. Nutrition Status Correlations
5. Nutrition and Health Policies and Programs
 - 5.1 Policies
 - 5.2 Programs
6. Commentaries

Bibliography

Map of

BURMA

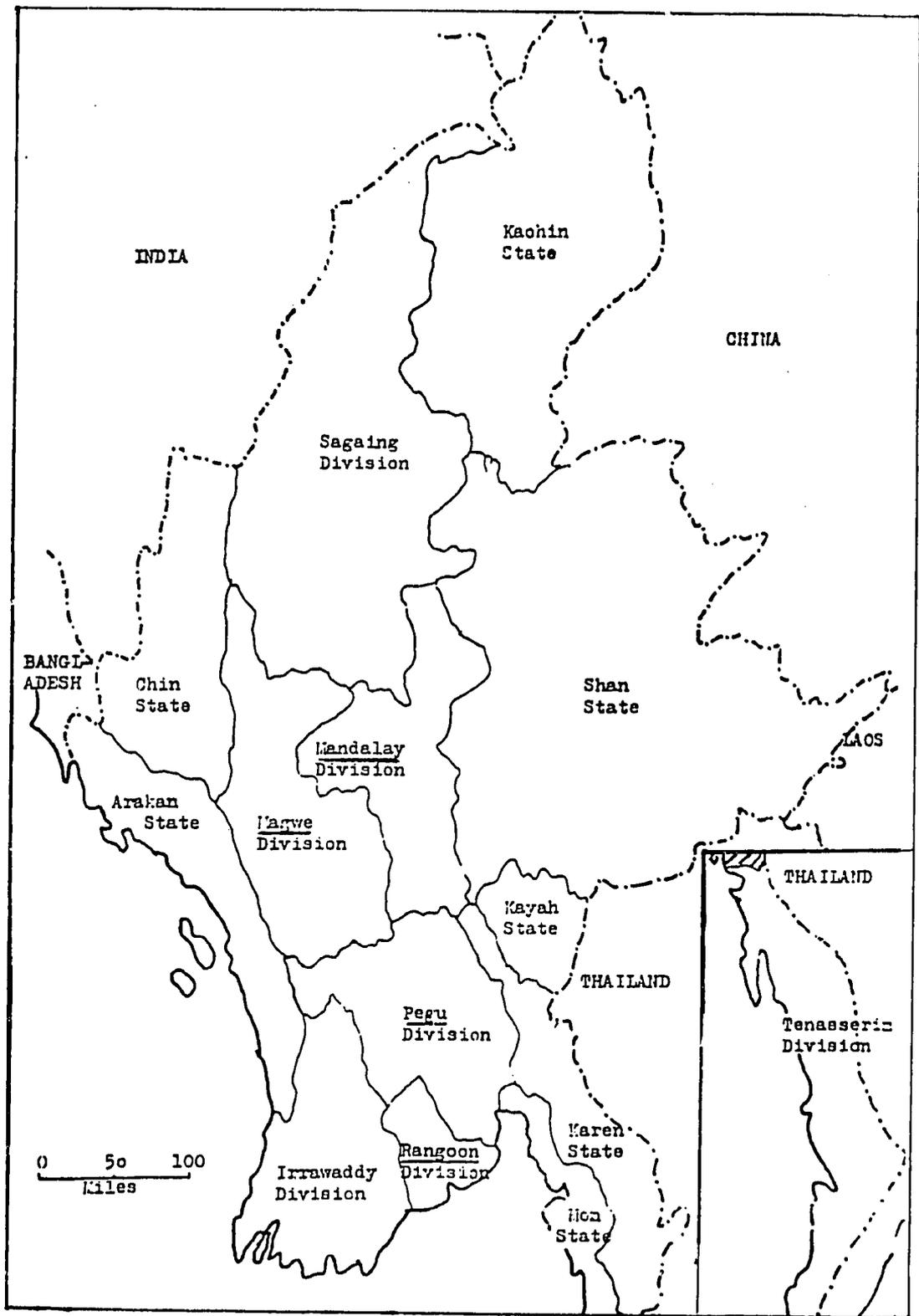


TABLE I
LOCATIONS STUDIED

Division - Township	Author and Date								
	Aung Tun Thet 1981	Berggren 1980a	Dept. of Child Health 1979	Khin-Maung-Naing et al. 1980	May Thein Hto 1980	Nutrition Project Dept. of Health 1979a	Nutrition Research Division Dept. of Medical Research 1979a	Nutrition Research Division Dept. of Medical Research 1979b	Thein Maung Myint, et al 1982
Irrawaddy								X	
Magwe								X	
Rangoon		X		X		X			
Tennesarim								X	
Tavoy	X								
Launglon	X								
Division Not Specified									
Hlegu			X						
Insein					X				
Mingaladon					X				
Htauk-kyant							X		
North Okkalapa									X
Rural Locations - Town Not Specified						X			X

HIGHLIGHTS

1. NUTRITION AND HEALTH STATUS: The most common nutritional deficiencies are protein energy malnutrition, nutritional anemias, goiter, and deficiencies of vitamins A, B₁, and B₂. Goiter is endemic in some areas, particularly the Chin Hills. 33% of non-pregnant, non-lactating women in rural areas are anemic.

The maternal mortality rate is 1.4 to 1.8 per 1000. Limited investigations indicate that many women gain little weight during pregnancy. It is estimated that 60% of pregnant women and 2% of lactating rural women are anemic. The infant mortality rate is officially 56 per 1000 live births but unofficially is believed to be closer to 100 per 1000 live births. About 50% of children below 5 years of age have malnutrition of grades I to III. The incidence of protein calorie malnutrition peaks in the 2 to 3 year age group. About 2% of children 1 to 3 years of age suffer from severe marasmus, and 13% suffer from moderate marasmus. 55% of children are anemic. Principal causes of growth retardation among young children are maternal malnutrition, infections, and faulty infant feeding practices, including feeds which are too small, too infrequent, and of low calorie density.

2. DIETARY BELIEFS: Food is restricted in pregnancy to avoid having a large baby. Most mothers believe breast milk is good for their babies. Many mothers do not feed colostrum to their newborns because they feel it is dirty, foul, or bad for the baby. Mothers call colostrum "yellow milk." Meat and fish are not given to young children due to the belief that they cause worms; eggs are not given because it is believed that if children eat eggs they will swell.

One form of Burmese traditional medicine relies on maintaining a balance between hot and cold. The Burmese also have versions of Indian ayurvedic and Greek unani medicine. Most villagers view medicine pragmatically; they will try anything until they are cured. One's present state of health and well being are believed to be the direct result and consequence of one's previous existences.

3. DIETARY PRACTICES: The Burmese diet is composed primarily of boiled rice and curry sauce of different vegetables, supplemented with meat, eggs, or fish when available. In markets and villages an exceptionally wide variety of different foods are available which, with the exception of vegetable oil, are relatively inexpensive. An extensive range of nutritious snacks, thayeza, is a feature of the Burmese diet. There has been an eight-fold increase in the price of edible oil in recent years. Food is the single greatest expense of most families, averaging 70% of income.

The traditional practice of prolonged breast feeding is an important source of calories and protein. Most mothers feed the baby on demand, though few give it colostrum. Moringa or drumstick leaf soup is traditionally given to women in the days following birth. Studies in rural areas have demonstrated that breast milk alone is not adequate for the nutrient needs of infants above four months. In urban areas, 64.7% of mothers reported that they stopped breast feeding due to a new pregnancy, 13.1% due to insufficient milk, and 6.6% due to illness of the mother.

Poor infant feeding practices include meals which are too small, too infrequent, and of low calorie density. When the first feeding is offered

before the child is six months of age, it is usually rice and salt, either prechewed or mashed. Recent increases in the price of oil have diminished the amount of oil and thus the energy density of this mixture. Bottle feeding is rare because bottles, as well as infant formula, are expensive.

4. NUTRITION STATUS CORRELATIONS: Milk outputs of well nourished mothers are significantly higher than outputs of less well nourished mothers. As lactation continues there is a decline in the protein content of breast milk. High perinatal mortality rates, over 60 deaths per 1000 deliveries, are seen in children of mothers less than 20 years of age and 35 years of age and older. The perinatal mortality also is much higher among children with a birth weight below 2000 grams than among children with a birth weight of 2000 to 2499 grams, who in turn have a higher mortality rate than normal weight children.

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS: The priority areas for the Ministry of Health are basic health services and primary health care, environmental sanitation, immunization, MCH and nutrition, vector-borne disease programs, and curative care. The People's Health Plan (1982-86) aims at covering 48% of all villages through a Community Health Care program. Medical care is free of charge to all citizens. All government employees are covered by a system of Social Security which provides maternity benefits.

The Primary Health Care I project established a village level health delivery system. It relied on voluntary labor, including 7400 Community Health Workers (CHWs), 1400 Auxiliary Nurse Midwives (ANMs), and 2400 traditional birth attendants, let-thes. The volunteer health worker program has been very successful in Burma because there is a strong tradition of volunteer help. The Community Health Care Program will build on the Primary Health Care Project. Growth monitoring and nutrition education will be built into the program. A 1981 INCS Workshop developed a nutrition education strategy for the Community Health Care program that will promote improved weaning practices.

The Department of Health operates 12 Nutrition Rehabilitation Centers, mainly in urban areas. The Rangoon Children's Hospital has developed a methodology for demonstration education for mothers and a follow-up system which includes the use of the road-to-health chart as an educational tool for the mother. The Nutrition Unit of the Children's Hospital has developed various Nutripaks to be used in parent education concerning appropriate weaning diet. The Nutripaks are composed of rice, oil, and a protein source such as skim milk, chickpeas, bengal gram, or groundnuts.

1. NUTRITION AND HEALTH STATUS

1.1 NUTRITION AND HEALTH STATUS, GENERAL

NATIONAL

MOST COMMON NUTRITION DEFICIENCIES: The most common nutritional deficiencies were protein energy malnutrition, nutritional anemias, goiter and specific vitamin deficiencies such as ariboflavinosis, infantile beri beri, and vitamin A deficiency. The groups most at risk of nutritional deficiency were children under age 5 and pregnant and lactating mothers. (Liberi, 1979)

VITAMIN A: Serum vitamin A levels and ophthalmological studies have shown that avitaminosis A was not a significant public health problem; 0.8 to 0.9% of the total population was affected. (Jelliffe and Jelliffe, 1980b)

VITAMIN A DEFICIENCY: Both preschool children and pregnant and lactating women were found to meet their vitamin A intake requirements in a 1974 study. 95% of vitamin A came from vegetable sources. Other reports indicated some manifestations of vitamin A deficiency (prevalence not stated). Keratomalacia has been frequently associated with kwashiorkor. (Liberi, 1979)

BERI BERI: Some dietary surveys found that diets were deficient in B complex, but only a few cases of clinical beri beri have been reported. Hospital records indicated that incidence had decreased. The Ministry of Health has concluded that borderline thiamin deficiency exists which could precipitate an outbreak of beri beri under stress such as famine. (Liberi, 1979)

RIBOFLAVIN DEFICIENCY: Dietary and biochemical surveys indicated riboflavin deficiency, with 30% or more of those examined found to have clinical symptoms such as angular lesions, angular stomatitis, and cheilosis. (Liberi, 1979)

ANEMIA: Several forms of anemia were prevalent: iron, vitamin B₁₂, and folate deficiency, megaloblastic anemia among pregnant women, and protein deficiency anemia among the general population. Hookworm, which affected 50 to 70% of the population, was a contributing factor to the iron deficiency anemias. (Liberi, 1979)

ANEMIA--FEMALES: 20 to 48% of adult non-pregnant females were anemic. (Liberi, 1979)

ANEMIA--ADULT MALES: 30 to 39% of adult males were anemic. (Liberi, 1979)

GOITER: Goiter was endemic in some areas. In the Chin Hills, prevalence was 91.1% prior to 1970. A goiter control program in which the government distributed iodized salt resulted in prevalence rates dropping to 20% in this area. (Liberi, 1979)

1.1 NUTRITION AND HEALTH STATUS, GENERAL (CONTINUED)

GOITER: Goiter is a problem throughout the country. (Sahn, 1982)

MAJOR HEALTH PROBLEMS: Major health problems included protein energy malnutrition; fever of unknown origin; malaria; micro-nutrient deficiencies including goiter and anemia; gastrointestinal diseases; infection of the eye including trachoma; skin infections including leprosy; injuries; influenza; and respiratory diseases including tuberculosis. (Sahn et al., 1982)

MAJOR HEALTH PROBLEMS: Malaria, protein energy malnutrition, pulmonary tuberculosis, hypovitaminosis, leprosy, and cholera were major health problems. Public health efforts have eliminated smallpox and lowered rates of infant and maternal mortality. (Liberi, 1979)

MALARIA: Malaria had been the leading cause of hospital admissions outside Rangoon since 1964. The 1973 case fatality rate was 15/1000 population hospital treated. (Liberi, 1979)

TRACHOMA: Trachoma was endemic in central Burma. Incidence ranged from 5.4 to 89.2% by township. (Liberi, 1979)

HELMINTHIC INFECTION: 50 to 70% of the population had helminthic infections. (Liberi, 1979)

TUBERCULOSIS: 6.64% of the adult population had chest symptoms. 4.23 per 1000 adult population had confirmed pulmonary tuberculosis. (Liberi, 1979)

LEPROSY: Prevalence of leprosy was 8.6 per 1000 population. (Liberi, 1979)

VACCINATION AMONG WOMEN: 96.4% of women were found to have had a small-pox vaccination; 47.2% had BCG scars. (Tin U and T.O. Kyaw-Myint, 1981)

RURAL

ANEMIA: 33% of non-pregnant, non-lactating women were anemic, according to WHO standards, in villages 24 miles north of Rangoon studied by Khin-Kyi Nyunt et al. in 1972. (Berggren, 1980b)

ANEMIA: 5 to 15% of non-pregnant women and 1 to 5% of men were anemic, according to a study conducted in five villages by Batu in 1972. (Berggren, 1980b)

TETANUS VACCINATION: 3.4% of rural women had been vaccinated against tetanus. (Tin U and T.O. Kyaw-Myint, 1981)

URBAN

TETANUS VACCINATION: 11.3% of urban women had been vaccinated against tetanus. (Tin U and T.O. Kyaw-Myint, 1981)

1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT

NATIONAL

MATERNAL MORTALITY RATE: The maternal mortality rate was 1.4 to 1.8 deaths per 1000 births. (Sahn et al., 1982)

MATERNAL MORTALITY RATE: The maternal mortality rate was 1.7 deaths per 1000 live births. (Satoto, 1981)

MATERNAL MALNUTRITION: Limited investigations have indicated that many women gained little weight during pregnancy. A variety of restrictive customs limited the intake of important food items in pregnancy and lactation. (Jelliffe and Jelliffe, 1980a)

WEIGHT GAIN: Weight gain in pregnancy appeared to be low, between 5 and 7 kilograms. (Jelliffe and Jelliffe, 1980b)

AVERAGE WEIGHT GAIN IN PREGNANCY: The average weight gain during pregnancy was 6.4 kilograms. (Satoto, 1981)

ANEMIA: It was estimated that 60% of pregnant women were anemic. (Sahn et al., 1982)

ANEMIA: 42 to 71% of pregnant women were anemic. (Liberi, 1979)

ILLNESS DURING PREGNANCY: 7.5% of pregnant women had edema of the lower limbs, and 0.8% had episodes of vaginal bleeding during pregnancy. (Tin U and T.O. Kyaw-Myint, 1981)

COMPLICATIONS OF PREGNANCY: The incidence of complications during pregnancy was 58 per 1000 pregnancies. Preeclampsia and antepartum hemorrhage were the commonest types of complications with incidence rates of 27.4 per 1000 and 22.9 per 1000 pregnancies respectively. (Tin U and T.O. Kyaw-Myint, 1981)

RURAL

MATERNAL MORTALITY RATE: The maternal mortality rate in rural areas was 2.3 deaths per 1000 deliveries. (Tin U and T.O. Kyaw-Myint, 1981)

ANEMIA: 28% of pregnant women were anemic, according to WHO standards, in two villages 24 miles north of Rangoon studied by Khin-Kyi Nyunt et al. in 1972. (Berggren, 1980b)

ANEMIA: 13 to 24% of pregnant women were anemic, according to a study conducted in five villages by Batu in 1972. (Berggren, 1980b)

ANEMIA: 1.6% of pregnant rural women were severely anemic (hemoglobin below 5 g%); 80.7% were moderately anemic (hemoglobin between 5 and 11 g%); and 17.7% were not anemic. (Tin U and T.O. Kyaw-Myint, 1981)

OUTCOME OF PREGNANCY: Among 1,612 pregnancies studied in rural areas, there were 87 abortions and 1,525 deliveries, including 27 stillbirths and 1,498 live births. (Tin U and T.O. Kyaw-Myint, 1981)

1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT (CONTINUED)

URBAN

MATERNAL MORTALITY RATE: The maternal mortality rate in urban areas was 0.8 deaths per 1000 deliveries. (Tin U and T.O. Kyaw-Myint, 1981)

ANEMIA: 0.3% of pregnant urban women were severely anemic (hemoglobin below 5 g%); 74.1% were moderately anemic (hemoglobin between 5 and 11 g%); and 25.6% were not anemic. (Tin U and T.O. Kyaw-Myint, 1981)

OUTCOME OF PREGNANCY: Among 1,512 pregnancies studied in urban areas, there were 231 abortions and 1,381 deliveries, including 32 stillbirths and 1,349 live births. (Tin U and T.O. Kyaw-Myint, 1981)

1.3 NUTRITION AND HEALTH STATUS, WOMEN, LACTATING

NATIONAL

COMPOSITION OF BREAST MILK: There was a decline in the protein content of breast milk as lactation continued. Protein content at 1 to 4 months of lactation was 1.187 grams per 100 ml.; at 4 to 7 months, 1.149 grams per 100 ml.; and at 7 to 12 months, protein content was 1.059 grams per 100 ml. Protein content at stage 1 was significantly higher than that of stage 3 ($p < 0.02$). There were no significant differences in fat, lactose, and energy contents of breast milk at different stages of lactation. (Khin-Maung-Naing et al., 1980)

BREAST MILK OUTPUT: There was a slight decline in potential quantity of breast milk output of mothers as lactation progressed from 1 to 12 months, but there were no significant differences between the three stages of lactation (1 to 4, 4 to 7, and 7 to 12 months of lactation). There were also no significant differences in milk intakes of infants at the three stages of lactation. This might be because most of the infants were receiving supplementary foods in addition to breast milk. (Khin-Maung-Naing et al., 1980)

MILK OUTPUT AND NUTRITION STATUS: Milk outputs of mothers belonging to the well-nourished group were significantly higher than outputs of the less well-nourished groups. Among mothers with a weight-height ratio greater than 95% of standard, milk output averaged 934.5 ml. per day; among mothers with a weight for height between 85 and 94% of standard output was 815.3 ml. per day; among mothers 75 to 84% of standard, output was 792 ml. per day; and among mothers less than 75% of standard weight for height output was 767 ml. per day. (Khin-Maung-Naing et al., 1980)

RURAL

ANEMIA: 42% of lactating women were anemic, according to WHO standards in two villages 24 miles north of Rangoon studied by Khin-Kyi Nyunt et al. in 1972. (Berggren, 1980b)

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS

NATIONAL

PERINATAL MORTALITY RATE: The perinatal mortality rate was 47.5 deaths per 1000 deliveries. The stillbirth rate was 17.4 per 1000 deliveries, and the early neonatal death rate was 30.1 per 1000. (Tin U and T.O. Kyaw-Myint, 1981)

PERINATAL MORTALITY: The perinatal mortality rate among pregnancies of less than 37 weeks duration was 244 per 1000 deliveries; the rate among pregnancies of 37 weeks and more was 15.7 per 1000 deliveries. (Tin U and T.O. Kyaw-Myint, 1981)

PERINATAL MORTALITY AND BIRTH WEIGHT: The perinatal mortality rate among children with a birth weight below 2000 grams was 440 per 1000 deliveries; among children with a birth weight of 2000 to 2499 grams the rate was 65 per 1000; among children of normal birth weight (2500 grams or more) the rate was 19 per 1000. (Tin U and T.O. Kyaw-Myint, 1981)

CAUSES OF PERINATAL MORTALITY: Perinatal deaths were due to prematurity and low birth weight; anoxia or asphyxia; infections; congenital abnormalities; birth injuries; cerebral hemorrhage; and unknown causes. (Tin U and T.O. Kyaw-Myint, 1981)

STILL BIRTHS: There were 16 stillbirths for every 1000 live births. (Satoto, 1981)

INFANT MORTALITY RATE: The infant mortality rate was 56 deaths per 1000 live births. (Satoto, 1981)

INFANT MORTALITY RATE: The infant mortality rate was estimated by some to be as low as 56 per 1000 live births and by others as high as 120 per 1000. (Sahn et al., 1982)

INFANT MORTALITY RATE: The infant mortality rate was officially listed as 56 per 1000 live births, but Burmese officials were inclined to believe that an infant mortality rate of 100 per 1000 live births was closer to the actual national average. (Liberi, 1979)

LOW BIRTH WEIGHT: 22.4% of 5,677 deliveries studied were low birth weight, below 2,500 grams; 6.2% of deliveries were less than 2,000 grams. (Tin U and T.O. Kyaw-Myint, 1981)

LOW BIRTH WEIGHT INFANTS: It was estimated that low birth weight infants accounted for about 20% of live births. (Sahn et al., 1982)

LOW BIRTH WEIGHT: There were 250 low birth weight infants per 1000 live births. (Satoto, 1981)

GROWTH: Infants in the first six months of life grew according to international standards for weight for age and weight for height. At 4 to 6 months children began to fall behind standards so that the "third percentile" of Boston children was about the Burmese 50th percentile or

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

norm. This syndrome resulted in "late marasmus" which in severe cases gave the skeletal appearance typical of children lacking both protein and calories. (Berggren, 1980a)

GROWTH: The growth curves of young children tended to follow the Harvard standard growth curves in the early months of life but fell off slightly after nine months of age. (Nutrition Project, 1979b)

NEONATAL TETANUS: Incidence of neonatal tetanus was 5 per 1000 live births. (Tin U and T.O. Kyaw-Myint, 1981)

REDUCED NEONATAL TETANUS: The training of traditional birth attendants in sterile procedure for delivery appeared to be a highly effective, low cost procedure for reducing the incidence of neonatal tetanus. (Sahn et al., 1982)

RURAL

INFANT MORTALITY RATE: The infant mortality rate in rural areas was 97.4 deaths per 1000 live births, according to retrospective data collected by the Perinatal Project in 1978. (May Thein Hto, 1980)

INFANT MORTALITY RATE: The infant mortality rate was 63 deaths per 1000 live births. (Thein Maung Myint et al., 1982)

WEIGHT FOR AGE AND WEIGHT FOR HEIGHT: A study of children in Yankin village in 1974 found that among children birth to five months of age, 100% had normal weight for age (at least 80% of standard). Among these same children 80% had normal weight for height (at least 90% of standard weight for height), and 20% had first degree malnutrition (81 to 90% of standard weight for height). (Nutrition Project, 1979b)

GROWTH: Both weight and height were normal among infants 3 to 6 months of age in Htauk-Kyant township. Children showed an increasing weight deficit from 6 to 21 months of age. (Nutrition Research Division, 1979b)

GROWTH IN HLEGU TOWNSHIP: Weight for age fell below the Harvard Standard by the age of 6 months. Height for age fell below standard by 8 months. (Department of Child Health, 1979)

URBAN

INFANT MORTALITY RATE: The infant mortality rate in urban areas was 69.7 deaths per 1000 live births, according to retrospective data collected by the Perinatal Project in 1978. (May Thein Hto, 1980)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

NATIONAL

MALNUTRITION: About 50% of children below five years of age were malnourished (grades I to III). (Sahn et al., 1982)

PROTEIN CALORIE MALNUTRITION: The incidence of protein calorie malnutrition peaked in the two- to three-year age group in a review of studies conducted in 1970-71. In studies conducted between 1974 and 1978 there was an increased incidence of protein calorie malnutrition among children 1 to 2 years of age. (Nutrition Project, 1979b)

PROTEIN ENERGY MALNUTRITION--MARASMUS: It was estimated that 2% of children 1 to 3 years of age suffered from severe marasmus, and 13% suffered moderate marasmus. (Satoto, 1981)

PROTEIN ENERGY MALNUTRITION: A review of growth studies in both urban and rural areas indicated growth retardation in children. Weight for age, weight for height and upper arm circumference studies indicated that children in Burma had protein energy malnutrition. (Berggren, 1980a)

LATE MARASMUS: The main nutritional problem was late marasmus in the weaning or transitional period, with flattening of weight curves from 6 to 18 months and with severe protein energy malnutrition occurring most commonly between 1 and 3 years of age. Severe marasmus affected up to 2% of the 1 to 3 year age group, and 13% were moderately affected. (Jelliffe and Jelliffe, 1980a)

EARLY MARASMUS: Early marasmus was much less common than late marasmus. It was generally due to defective breast feeding of babies caused by mothers leaving home to work or in some cases by mothers whose lactation was inadequate after only a few months. (Jelliffe and Jelliffe, 1980a)

CAUSES OF PEM: Causes of protein energy malnutrition were infection, economics, and sociocultural factors. (Satoto, 1981)

CAUSES OF GROWTH RETARDATION: The principal causes of growth retardation among young children were infections, preceding maternal malnutrition and faulty infant feeding practices including meals which were too small, too infrequent, and of low calorie density. (Jelliffe and Jelliffe, 1980a)

ANEMIA: 55% of children were anemic according to WHO standards. (Berggren, 1980a)

ANEMIA: 20 to 37% of preschool children were anemic. (Liberi, 1979)

ANEMIA: Iron deficiency was widespread. The common restriction on giving dark leafy vegetables to young children contributed to this problem. (Jelliffe and Jelliffe, 1980a)

VITAMIN A: Vitamin A deficiency was not a public health problem, defined as 2% affected. It was commonly seen in children hospitalized with severe protein energy malnutrition. (Jelliffe and Jelliffe, 1980a)

VITAMIN A: Night blindness in children was recognized as kyet myethint (chicken's eyes). Bitot's spots and xerophthalmia have been seen in association with cases of malnutrition. High potency capsules of vitamin A will be provided by USAID to be given to children at risk. (Jelliffe and Jelliffe, 1980b)

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

DISEASES: Diseases including tuberculosis, measles, respiratory diseases, gastrointestinal diseases (especially diarrhea), worm infestations, skin diseases, and dental disorders were most prevalent in children below five years of age. (U Ba Tun, 1977)

RURAL

MORTALITY: 138.8 children per 1000 live births died before the age of 5 years in rural areas. (Tin U and T.O. Kyaw-Myint, 1981)

PEM: A study of 5807 children aged one to five years, conducted in 1978 in 31 rural areas, indicated that 64% of the children were below the third percentile in the Harvard weight-for-age classification, and 38% were below 90% of the Harvard weight-for-height reference mean. 6.49% suffered acute PEM; 5.55%, acute chronic malnutrition; and 47.4% showed the effects of past chronic malnutrition. (Liberi, 1979)

PEM: Among 62 children birth to one year of age in six villages in Hlegu and Hmawbi townships 19.3% were moderately malnourished; 19.3% were mildly malnourished, and 61.4% were normal. Among 301 children one to five years of age 6.6% were severely malnourished, 54.5% were moderately and 25.1% mildly malnourished, and 15.8% were normal. (Nutrition Project, 1979b)

WEIGHT FOR AGE: 20% of children 6 to 11 months of age in Yankin Village had second degree malnutrition, 10% had first degree malnutrition, and 70% were normal. Among children 12 to 23 months of age, 81% had first degree malnutrition, and 19.9% were normal. (Nutrition Project, 1979b)

WEIGHT FOR HEIGHT: 20% of children 6 to 11 months of age in Yankin village had second degree malnutrition (71 to 80% of standard weight for height), 40% had first degree malnutrition (81 to 90% of standard weight for height), and 40% were normal. Among children 12 to 23 months of age 6.3% had second degree malnutrition, 68.7% had first degree, and 25% were normal. (Nutrition Project, 1979b)

ANEMIA: 55% of children below 14 years of age were anemic according to WHO standards in two villages 24 miles north of Rangoon studied by Khin-Kyi Nyunt et al. in 1972. (Berggren, 1980b)

ANEMIA: 3 to 27% of children were anemic, according to a study conducted in five villages by Batu in 1972. (Berggren, 1980b)

URBAN

MORTALITY: 106.1 children per 1000 live births died before the age of five years in urban areas. (Tin U and T.O. Kyaw-Myint, 1981)

NUTRITIONAL STATUS: Urban children 1 1/2 years of age from homes with low socioeconomic status were found to be underweight for their heights, characteristic of mild protein calorie malnutrition. No overt signs of vitamin deficiencies were found among these children, but most were suffering from worm infestations, gastrointestinal disturbances, and respiratory infections. (Nutrition Project, 1979a)

PEAK INCIDENCE OF MALNUTRITION: According to observations made in urban nutrition rehabilitation centers, the peak incidence of malnutrition was seen mostly in the one to two year age group. Nutritional marasmus was also seen in infants; the exact percentage was not known. (Nutrition Project, 1979b)

2. DIETARY BELIEFS

2.1 DIETARY BELIEFS, GENERAL

2.2 DIETARY BELIEFS, ABOUT PREGNANCY

NATIONAL

FOOD RESTRICTED: Food intake was restricted during pregnancy to avoid having a large baby. (Jelliffe and Jelliffe, 1980a)

2.3 DIETARY BELIEFS, ABOUT LACTATION

NATIONAL

ATTITUDES TOWARD BREASTFEEDING: 99% of mothers interviewed said they would like to breast feed their children and also felt that breast milk was good for their babies. (Tin U and T.O. Kyaw-Myint, 1981)

COLOSTRUM: Mothers did not feed colostrum to their newborn infants because they felt it was dirty, foul, or bad for the baby. Mothers called colostrum "yellow milk." (Satoto, 1981)

LITTLE BOTTLE FEEDING: Most mothers did not bottle feed since they believed that breast milk was sufficient for their babies. Only three mothers in the sample bottle fed, one because of her work, one because she was pregnant, and the last mother had been advised to do so by the hospital after hospitalization. (Satoto, 1981)

FOODS AVOIDED: Foods avoided during lactation were legumes, green leafy vegetables, and meats, all of which were thought to cause gastric troubles. (Jelliffe and Jelliffe, 1980a)

2.4 DIETARY BELIEFS, ABOUT BREAST MILK SUBSTITUTE (INCLUDING BOTTLE FEEDING)

2.5 DIETARY BELIEFS, ABOUT WEANING

NATIONAL

FOODS AVOIDED: Meat and fish were not given to young children due to the belief that they caused worms; peas and beans were believed to cause indigestion and diarrhea; and groundnuts, jaggery, and bananas were believed to cause coughing. (Jelliffe and Jelliffe, 1980a)

EGGS: Eggs are not given to children because it is believed that if children eat eggs they will swell. (Jelliffe and Jelliffe, 1980b)

FISH: Fish is believed to cause worm infestations in children. (Jelliffe and Jelliffe, 1980b)

URBAN

CULTURAL BLOCKS AND NUTRITION EDUCATION: In the nutrition rehabilitation centers it was demonstrated to mothers that jaggery-peanut butter balls did not cause coughing, and leafy greens did not cause indigestion.

2.5 DIETARY BELIEFS, ABOUT WEANING (CONTINUED)

Mothers observed that their children improved and that this improvement was due to quantity and quality of foods given to the children. Cultural blocks against giving foods such as fish and green vegetables were thus overcome. (Berggren, 1980a)

2.6 DIETARY BELIEFS, ABOUT ILLNESS AND CURE

NATIONAL

CONCEPTS OF DISEASE: Both natural and supernatural causes of disease are recognized. Concepts of health and illness are tied intimately to religion and supernaturalism. (Liberi, 1979)

TRADITIONAL SYSTEMS OF HEALTH CARE: Several traditions coexisted with Western medicine. One system was based on maintaining a balance between hot and cold. Burmese versions of Indian ayurvedic and Greek unani systems existed as well as a variety of non-systematic health beliefs. Most villagers viewed medicine pragmatically: they would try anything until they were cured. The government maintained a parallel system of traditional medicine clinics. (Chauls, n.d.)

BELIEFS ABOUT DISEASE: One's present state of health and well being is believed to be a direct result and consequence of one's previous existences. The greater merit accomplished in former lives, the better health status will be in the present life. Health is not merely a physical, mental, or emotional state but also a spiritual state. As an individual comes closer to nirvana via the path of wisdom, their health becomes better. Coupled with this is the Buddhist attitude toward the inevitability of disease and death. This allows for both spiritual and pragmatic attitudes toward disease. (Liberi, 1979)

SUPERNATURALLY CAUSED DISEASE: Diseases of children attributed to the supernatural included prolonged crying, abdominal pains, diarrhea, dysentery, fever, and body sores. In adults the diseases included sore eyes, choking feelings, appetite loss, abdominal pain, diarrhea, dysentery, fright, and mental illness. (Liberi, 1979)

SUPERNATURALLY CAUSED DISEASE: Treatment of supernaturally caused illness consisted of placing food outside the home for spirits to eat, wearing of amulets, and leading a proper Buddhist life. To prevent plague or cholera epidemics, public ceremonies were held. (Liberi, 1979)

SUPERNATURAL AGENTS OF DISEASE: Supernatural agents of disease included witches, ghosts, and evil spirits known as nats. Nats were malevolent spirits who were human beings in former lives and came to sudden and violent deaths. (Liberi, 1979)

ATTITUDE TOWARD FAMILY PLANNING: 49.2% of women interviewed had a positive attitude toward family planning; 50.8% felt negative towards it. (Tin U and T.O. Kyaw-Myint, 1981)

ATTITUDES TOWARD IMMUNIZATION: 92.5% of women interviewed had a positive attitude toward immunization, realized the value of immunization, and would accept vaccination against disease. (Tin U and T.O. Kyaw-Myint, 1981)

3. DIETARY PRACTICES

3.1 DIETARY PRACTICES, GENERAL

NATIONAL

COMMON FOODS: The diet was composed primarily of boiled rice and curry sauce of different vegetables, supplemented with meat, eggs, or fish when available. Fresh water fish was more common than salt water fish. Some pork was eaten. The average meal also included clear soup and cooked vegetable or salad. Seasonings included garlic, onion, tamarind leaves, and ngapi, a paste of fermented fish or shrimp. Tea or coffee were usually taken between meals. Fresh milk was disliked, but condensed milk was used in tea. (Liberi, 1979)

DIVERSITY OF FOODS: In markets and villages an exceptionally wide variety of different foods were available, and, with the exception of vegetable oil, were relatively inexpensive. Some foods were even free, such as a wide variety of dark green leafy vegetables often growing semi-wild in rural areas. (Jelliffe and Jelliffe, 1980a)

FISH: Fish was plentiful, very fresh, and varied in cost. Salted fish and prawns were available as well as fish pastes. (Jelliffe and Jelliffe, 1980b)

OIL: There has been an eight-fold increase in the price of edible vegetable oil in recent years. (Jelliffe and Jelliffe, 1980a)

SNACKS--THAYEZA: An extensive range of nutritious snacks, thayeza, were a feature of Burmese diet. Many were finger foods, composed of a variety of foods, usually nutritious and calorie-dense. (Jelliffe and Jelliffe, 1980a)

"HIGH PROTEIN" FLOUR: Processed packaged rice flour, erroneously called "high protein" flour, containing rice flour, possibly some glucose, and vitamins, was available in the market at several times the price of processed loose rice flour or the more nutritious legume flours. (Jelliffe and Jelliffe, 1980b)

MEAL PATTERN: Generally two meals are eaten daily, one at midmorning and one in late afternoon. These meals may be supplemented by a light breakfast or between-meal snacks of fruit and sweets. (Liberi, 1979)

DIETARY ADEQUACY: Diet surveys showed that the diet was sufficient in calories (except in children under five years and pregnant and lactating women), vegetable protein, thiamin, and iron, and very low in calcium and riboflavin. (Liberi, 1979)

FOOD EXPENDITURE: Food was the single greatest expense of most families, averaging 70% of income in the mid-1970s. (Liberi, 1979)

INCOME AND INTAKE: Among the poorest income group (100 kyats/household/month) daily consumption met only 70% of calorie needs. This group comprised 2% of the population. (Liberi, 1979)

3.1 DIETARY PRACTICES, GENERAL (CONTINUED)

STATUS OF WOMEN: Burmese women enjoy high status and control the family economy. Women control most of the retail trade throughout the country and run the shops in towns and the stalls in city bazaars. Women account for half the teachers and half the medical school graduates in the country. (Liberi, 1979)

FOOD SURPLUS: Traditionally Burma was a food surplus area and exported much of its staple crop, rice, to other Asian countries. (Liberi, 1979)

FOOD EXPORTS: Burma had an abundance of food and was a rice-exporting country. (U Ba Tun, 1977)

WATER: Except for parts of Mandalay, there was no government-operated water supply system. Outside of Rangoon, where about 77% of the population had access to water, only 10% of the other urban areas had adequate water. For the 78% of the population living in rural areas a great deal of labor was necessary to transport water from stream to house. (Liberi, 1979)

RURAL

INTRA-FAMILY FOOD DISTRIBUTION: Among 23 children in Hlegu and Hmawbi townships, a dietary survey found that the children obtained 73% of their protein requirements and 29% of calorie requirements. Adults received 140% of the protein requirement and 107% of calorie requirements. (Nutrition Project, 1979b)

FOOD PREPARATION: In preparing food, women cleaned vegetables, ground food with mortar and pestle, and cooked in a variety of stoves using sawdust, bamboo sticks, bamboo and wood kindling, wood alone, or kerosene. (Jelliffe and Jelliffe, 1980b)

IRON INTAKE: Dietary iron intake ranged from 9 to 32 mg. per person per day in a study conducted in five villages by Batu in 1972. (Berggren, 1980b)

WATER: The main source of water for drinking was a dug well. In non-dry zone areas, i.e. coastal and delta regions, 90% or more of the households surveyed relied on dug wells, and 10% used water from streams or rivers. (Thein Maung Myint et al., 1982)

WATER: Environmental sanitation was poor and potable water was unusual in rural areas. (Liberi, 1979)

3.2 DIETARY PRACTICES, WOMEN

3.2.1 DIEATRY PRACTICES, WOMEN, DURING PREGNANCY

NATIONAL

INTAKE DURING PREGNANCY: Ten out of 20 mothers in an unspecified location reported that they ate more frequently during pregnancy; they added another meal. Two mothers reported eating a larger amount of food. Three mothers reported that they ate less due to loss of appetite. The

others ate the usual amount. Dark green leafy vegetables, pulses, and animal protein were eaten in the same or larger amounts during pregnancy. 18 mothers reported using iron supplements. (Satoto, 1981)

LIMITED FOOD INTAKE: Food intake is limited during pregnancy to avoid having a large baby. (Sahn et al., 1982)

ADVICE FROM TRADITIONAL BIRTH ATTENDANTS: The traditional birth attendant advised women on nutrition. However, the TBAs lacked knowledge about nutrition and encouraged adherence to taboos, some of which were undesirable such as discouraging the consumption of protein. (May Thein Hto, 1980)

RURAL

NUTRITIONAL ADEQUACY OF DIET: A survey of pregnant women in Yankin Village, Hlegu, found that intake of calories met 80% of nutritional requirements, protein 100.2%, calcium 25.8%, iron 53.7%, vitamin A 112%, vitamin B₁ 77.8%, vitamin B₂ 45.5%, niacin 58.2%, and vitamin C 104%. (Liberi, 1979)

3.2.2 DIETARY PRACTICES, WOMEN, DURING LACTATION

NATIONAL

SOUP: Moringa or drumstick leaf soup was traditionally given to women in the days following birth. (Jelliffe and Jelliffe, 1980a)

RURAL

NUTRIENT ADEQUACY: A survey of lactating women in Yankin Village Hlegu found that intake of calories met 65.1% of nutritional requirements, protein 88%, calcium 20.8%, iron 71.6%, vitamin A 109%, vitamin B₁ 81.8%, vitamin B₂ 33.8%, niacin 50.5%, and vitamin C 122%. (Liberi, 1979)

3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS

RURAL

FEEDING UNDER SIX MONTHS OF AGE: Among 135 children under 6 months of age, 100% received breast milk. 69% were exclusively breast fed, 11% were partially breast fed (received breast milk and other milk), and 20% were given breast milk plus weaning foods. No child received only artificial feeding. (Department of Child Health, 1979)

FEEDING BETWEEN 6 MONTHS AND 2 YEARS OF AGE: Among 312 children 6 months to 2 years of age, 99% received breast milk, 0.96% were artificially fed, and 5.7% were totally breast fed. 97% of children 1 year of age still received breast milk. (Department of Child Health, 1979)

PROTEIN AND ENERGY: Mean daily intakes of infants at 6, 9, and 12 months of age were deficient for both protein and energy. Among children 1 to 2 years of age, mean protein intake was just sufficient, but energy intake was inadequate. (Nutrition Research Division, 1979b)

3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS (CONTINUED)

NUTRIENT INTAKE: Nutrient intake among children 1 to 3 years of age in Yankin Village provided for 63.5% of the calorie requirement, 92% of protein, 38% of calcium, 31.9% of iron, 121.5% of vitamin A, 64.5% of thiamin, 28.6% of riboflavin, 40% of niacin, and 160% of vitamin C. (Nutrition Project, 1979b)

DEFICIENT NUTRIENTS: A study of rural children up to 2 years of age found that the daily intake was below normal for the following nutrients: calories, 89.9% of the recommended daily amount; calcium, 60%; vitamin A, 41%; riboflavin, 56%; niacin, 82%. Intakes of protein, thiamin, and vitamin C were above the recommended amounts. (Department of Child Health, 1979)

3.3.1 DIETARY PRACTICES, INFANTS 0-24 MONTHS, BREASTFEEDING

NATIONAL

TRADITION OF BREAST FEEDING: Breast feeding was a highly esteemed tradition. The traditional practice of prolonged breast feeding was identified by Burmese nutritionists as an important source of calories and protein. (Berggren, 1980a)

INITIATING BREAST FEEDING: 99.2% of mothers reported that the infant was first put to the breast within 12 hours after birth. (Tin U and T.O. Kyaw-Myint, 1981)

COLOSTRUM: No mother reported feeding colostrum to her baby. They felt it was dirty, sour, or bad for the baby. The baby was given water, rice water, honey, glucose (prepared by nurses in the hospital), or nothing during the first 2 to 48 hours. (Satoto, 1981)

DEMAND FEEDING: Most mothers fed the baby on demand, whenever it was hungry or cried. (Satoto, 1981)

DURATION OF BREAST FEEDING: Over 60% of children were still breast fed at 1 year of age, but over 98% had been completely weaned from the breast by 2 years of age. (Tin U and T.O. Kyaw-Myint, 1981)

NO BREAST FEEDING: Only 3% of women interviewed did not breast feed at all (72 in the urban area and 6 in the rural area). 42 women said this was due to inadequate or absent lactation; 14 mothers did not breast feed because they were working; 22 mothers did not breast feed because of a negative attitude toward breast feeding. (Tin U and T.O. Kyaw-Myint, 1981)

EMPLOYMENT AMONG MARRIED WOMEN: 81.2% of married women were unemployed. Employment was defined as any job or occupation by which women could earn money and thus contribute toward the family income. (Tin U and T.O. Kyaw-Myint, 1981)

RURAL

DURATION OF BREAST FEEDING: 95% of children birth to 18 months of age were breast fed; 72% 18 to 24 months of age; 40% 24 to 30 months of age;

24% 30 to 36 months of age; and 11% breast fed beyond 3 years of age. (Nutrition Research Division, 1979a)

DURATION OF BREAST FEEDING: 12.5% of rural children were breast fed less than 6 months; 34.3% between 7 and 12 months; 37.5% between 13 and 18 months; 15.6% between 19 and 24 months; and none were fed beyond 24 months. (Tin U and T.O. Kyaw-Myint, 1981)

DURATION OF BREAST FEEDING: 95% of rural infants were still breast fed at 12 months, and 69% at 24 months. Mothers produced an average of 800 ml. of breast milk each day containing 1.1 grams of protein and 65 calories per 100 cc., according to a study by the Medical Research Institute in 1980. (Berggren, 1980b)

DURATION OF BREAST FEEDING: 2.4% of children in Yankin village were weaned from the breast at 6 to 11 months of age; 9.5% at 12 to 17 months; 71% at 18 to 23 months; 7% at 24 to 29 months; 2.45% at 30 to 35 months; and 7% after 36 months of age. (Nutrition Project, 1979b)

BREAST FEEDING IN HLEGU TOWNSHIP: The average duration of exclusive breast feeding was 4.9 months. At two years of age 88.5% of children were still receiving breast milk, and 11.5% were off the breast. (Department of Child Health, 1979)

REASONS FOR STOPPING BREAST FEEDING: When asked why they stopped breast feeding, 71% of mothers in Yankin village reported they stopped due to a new pregnancy, 9.5% due to illness of the mother, 7% due to mother's work, and 12.4% reported that they felt the child was old enough to be weaned. (Nutrition Project, 1979b)

ADEQUACY OF EXCLUSIVE BREAST FEEDING: Breast milk alone was sufficient in calories and protein for the needs of infants up to 4 months of age. Breast milk alone was not sufficient for growth and maintenance of nutritional status of infants after four months. (Nutrition Project, 1979a)

BREAST MILK BEYOND 4 MONTHS: Although breast milk alone was not adequate for the nutrient needs of infants above four months, breast milk still played an important role in the maintenance of nutritional status of infants for up to one year. At one year breast milk provided 50% of protein and 50% of calorie needs of infants. At two years breast milk provided about 25% of the protein requirement and 26% of the calorie requirement. Milk protein has a high biological value and was a good supplement to the predominantly rice-based weaning diet of children. (Nutrition Project, 1979a)

CONSUMPTION OF BREAST MILK: Breast milk of Burmese mothers averaged 1.14 grams of protein per 100 ml., 3.54 grams of fat per 100 ml., 7.1 grams of lactose, and 64.9 kcal per 100 ml. (Nutrition Project, 1979a)

COMPOSITION OF BREAST MILK: There was no significant difference in protein content of breast milk of Burmese mothers compared to that of Indian mothers or mothers in the United Kingdom and Australia. The fat content of breast milk of Burmese mothers was similar to that of Indian

3.3.1 DIETARY PRACTICES, INFANTS 0-24 MONTHS, BREASTFEEDING (CONTINUED)

mothers but lower than that of mothers in developed countries.
(Nutrition Research Division, 1979a)

BREAST MILK QUANTITY: Output of breast milk averaged 855 ml/24 hours from 1 to 3.99 months; 831 ml. from 4 to 6.99 months, and 779 ml. from 7 to 12 months. The average was 821 ml. per 24 hours for 1 to 12 months of age. (Nutrition Research Division, 1979a)

BREAST MILK OUTPUT AND NUTRITIONAL STATUS OF MOTHER: The quantity of breast milk produced each 24 hours by well-nourished mothers was significantly greater than the quantity of breast milk produced by poorly nourished mothers. (Nutrition Research Division, 1979a)

METHOD OF MILK FEEDING: 97.1% of rural children below 2 years of age were fed only breast milk, 2.2% breast and other milk, 0.2% other milk alone, and 0.2% received the breast initially and other milk later. (Tin U and T.O. Kyaw-Myint, 1981)

URBAN

DURATION OF BREAST FEEDING: 23.5% of urban children were breast fed less than 6 months; 29% between 7 and 12 months; 31% between 13 and 18 months; 16% between 19 and 24 months; and 0.5% were breast fed for more than 24 months. (Tin U and T.O. Kyaw-Myint, 1981)

AVERAGE DURATION OF BREAST FEEDING: Among 578 mothers who had taken their children off the breast at the time of the interview, the average period of breast feeding had been 13.5 months. The remaining 570 cases were still on the breast at the time of interview. The average duration would have been longer if these children were included. Of the children already weaned, 10% were taken off the breast at under 6 months, 28% between 6 and 11 months, 35% between 12 and 17 months, and 27% between 18 and 23 months. 50% of children weaned under 1 year of age were taken off the breast due to a new pregnancy. (Nutrition Project, 1979a)

REASONS FOR STOPPING BREAST FEEDING: Among 578 mothers who had already stopped breast feeding at the time of the interview, 64.7% had stopped because of a new pregnancy; 13.1%, due to insufficient milk; 6.6%, illness of mother; 4.1%, baby stopped sucking; 3.5%, child old enough; 2.6%, mother's work; 2.1%, illness of child; 1.5%, medical advice; 0.9% cracked nipple; and 0.9% separation of mother and child. (Nutrition Project, 1979a)

REASONS FOR PARTIAL BREAST FEEDING: Among 363 children who received both breast and artificial milk during the first six months of life, 51% were partially breast fed because of insufficient breast milk initially; 37%, due to mother's work; 4.9%, due to illness of mother; 4.4%, due to absence of breast milk subsequently; 1.1% due to twinning; 0.8% due to prematurity; and 0.6%, due to nipple retraction. (Nutrition Project, 1979a)

REASONS FOR ARTIFICIAL FEEDING: Among the 75 children who received no breast milk during the first six months, 40% were artificially fed due to the absence of breast milk; 33%, due to the mother's work; 8%, due to

illness of mother; 6% because of breast abscess; 2.7%, due to prematurity of infant; 2.7%, due to death of mother; 2.7% due to congenital malformation; 1.3% due to separation of child and mother; and 2.7%, due to nipple retraction. (Nutrition Project, 1979a)

BREAST MILK: 80.9% of urban children below 2 years of age were fed no milk other than breast milk; 18.4%, breast and other milk; 23% received other milk only; and 1.3% initially received the breast and later received other milk. (Tin U and T.O. Kyaw-Myint, 1981)

METHOD OF MILK FEEDING: 64.2% were fed only breast milk through 6 months of age; 29.7% were partially breast fed and also received some other milk; 6.1% were purely artificially fed. (Nutrition Project, 1979a)

3.3.2 DIETARY PRACTICES, INFANTS 0-24 MONTHS, WEANING

NATIONAL

POOR INFANT FEEDING PRACTICES: Poor infant feeding practices included meals which were too small, too infrequent, and of low calorie density. Over-diluted rice gruel was introduced, followed by the traditional rice and vegetable oil mixtures, with added salt, used for young children. Introduction of dark green leafy vegetables, legumes, and fish was delayed until the second year of life. The first foods, rice prechewed by mother, rice gruel, and rice oil mixture, were introduced on average at 3 to 4 months of age. These foods were deficient in energy, iron, and vitamin A. (Jelliffe and Jelliffe, 1980a)

INFANT FEEDING PRACTICES: Problems with infant feeding practices included late introduction of supplementary foods and reduced food intake during illness. (Sahn et al., 1982)

WEANING PATTERN: A review of studies concluded that the weaning pattern showed that the time of introducing solid foods was not too late, 3 to 6 months of age, but the type of food, density, and frequency were unsatisfactory. Weaning foods were usually rice, oil, and jaggery. The texture and density were usually thin and watery. Tradition, cheapness, and local availability seemed to determine the choice of foods. (Nutrition Project, 1979b)

INTRODUCTION OF SOLIDS: When the first feeding was offered before the child was 6 months of age, it was usually rice and salt either prechewed or mashed. Occasionally children were given potato, banana, or jaggery. Well-off families gave infants milk powder and sometimes eggs, fish, or dark green leafy vegetables. By one year most children ate the family food except for hot and spicy foods. By two years of age children commonly ate whatever the family ate but in smaller quantities--about 1/4 to 1/2 of the father's portion. (Satoto, 1981)

RICE: Rice was often pre-chewed by the mother for infants. (Jelliffe and Jelliffe, 1980a)

OIL: A mixture of boiled rice, oil, and salt which had been pre-chewed was a traditional food given to children. Recent sharp increases in the

3.3.2 DIETARY PRACTICES, INFANTS 0-24 MONTHS, WEANING (CONTINUED)

price of oil have diminished the amount of oil and thus the energy density of this mixture. (Jelliffe and Jelliffe, 1980b)

FISH PASTE: Fish paste is introduced into children's diets at 3 or 4 years of age. (Jelliffe and Jelliffe, 1980b)

VEGETABLES: Vegetables are introduced at about six months of age, but dark green leaves are introduced very late, around 2 years of age, as are foods such as squash. (Jelliffe and Jelliffe, 1980b)

INITIATION OF SUPPLEMENTATION: 25% of children received supplementary foods by the age of 2 months; about 50% by 4 months. Nearly all children were being given mixed feeding by the age of 1 year. (Tin U and T.O. Kyaw-Myint, 1981)

INTRODUCTION OF PROTEIN FOODS: Only 25% of children were being given animal or vegetable protein foods at the age of 6 months; about half the children received protein foods at 10 months of age. When supplementary feeding began, the child was offered rice with no added protein. (Tin U and T.O. Kyaw-Myint, 1981)

FAMILY FOOD: By one year of age most children were eating the adult diet. (Tin U and T.O. Kyaw-Myint, 1981)

FOODS SUITABLE FOR WEANING: Foods readily available in the market which would be suitable for weaning age children included thayeza, snacks in the form of finger foods which were high in protein and calorie dense; mohinga, the national dish made of noodles, bits of meat, and green vegetables which would make an ideal weaning food when rubbed through a sieve; as well as bengal-gram flour, arrowroot flour, toasted rice flour, etc., which could be combined into suitable multimixes. (Berggren, 1980a)

BOTTLE FEEDING: Bottle feeding was rare, because bottles were expensive; infant formula (aside from sweetened condensed milk) was expensive and not used. (Berggren, 1980a)

WEANING FOODS: Mothers could package foods for multimix weaning foods at the village level. During the monsoon season, molds may develop on food mixtures if the usual heat sealing is undertaken. (Jelliffe and Jelliffe, 1980b)

RURAL

WEANING DIET IN HELGU TOWNSHIP: The average age of introduction of solid foods was 4.97 months. 92% of children received rice as the staple of their weaning diet. Animal proteins such as meat, fish, etc. were given at an average age of 9.7 months. (Department of Child Health, 1979)

INTRODUCTION OF SUPPLEMENTARY FEEDING: 30% of children in Yankin village first received supplementary feeding after one year of age. (Nutrition Project, 1979b)

WEANING DIET: The weaning diets of children in Htauk-Kyant township usually began with rice. Occasionally biscuits were also introduced. Up

to 12 months of age, protein-rich foods such as fish, meat, egg, or pulses were rarely given; children began to receive protein rich foods at about 15 months of age, but consumption of pulses continued to be very low. (Nutrition Research Division, 1979b)

RECEIVING SUPPLEMENTARY FOOD: Among children birth to three months of age, 11% received supplementary foods; 43% received supplementary foods at 3 to 6 months; 81% at 6 to 9 months; 71% at 9 to 12 months; 92% at 12 to 15 months; 96% at 15 to 18 months; 94% at 18 to 21 months; and 100% of children 21 to 24 months of age received supplementary foods. (Nutrition Research Division, 1979b)

URBAN

INTRODUCTION OF SOLID FOODS: The mean age of introduction of supplementary foods was 6.5 months. 25.4% first received supplementary foods under three months of age; 25.9% between 3 and 5 months; 18.2% between 6 and 8 months; 15.2% between 9 and 11 months; and 15.3% between 12 and 14 months. The first semi-solid food was usually a starchy gruel or paste. The diet of infants was not widened rapidly enough to cover the whole adult range. Especially lacking were animal and plant protein foods. (Nutrition Project, 1979a)

WEANING FOODS: In a study conducted in urban nutrition rehabilitation centers, the weaning food commonly given was rice and oil in paste or chewed form. Sometimes jaggery was used. Mothers did not know how much to give and often gave rice in small amounts, once a day, up to 9 or 10 months of age. The adult diet was given at 1 1/2 years of age, although the child was not accustomed to an adult diet. No pulse or animal foods were given with the exception of Muslim children who received meat. (Nutrition Project, 1979b)

ARTIFICIAL MILK: Among mothers who used artificial milk, 90.6% reported using milk powder distributed by the people's shop; 5.2% used condensed milk, and the remainder used cow's or goat's milk. (Nutrition Project, 1979a)

KNOWLEDGE OF CORRECT FORMULA PREPARATION: In general mothers did not know the proper method of preparing formula. 58.3% prepared milk without following any formula; 22.8% followed instructions from the health literature or advice from a doctor or nurse; the remaining 18.9% used the formula printed on the milk powder tin. (Nutrition Project, 1979a)

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

RURAL

MILK USED IN THE ABSENCE OF BREAST FEEDING: Among children who were not breast fed, 73.3% received milk powder, 18.2% sweetened condensed milk, and 8.5% animal milk. (Tin U and T.O. Kyaw-Myint, 1981)

NUTRIENT INTAKE: A survey of children 3 to 5 years of age in Yankin Village, Hlegu, found that intake of calories met 63.5% of nutritional requirements, protein 91%, calcium 38%, iron 32%, vitamin A 121%, vitamin B1 60%, vitamin B2 6%, niacin 40.5%, and vitamin C 160%. (Liberi, 1979)

3.3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS, AFTER WEANING (CONTINUED)

DIET AMONG HEALTHY CHILDREN: Among 14 healthy children 3 to 5 years of age who had already been weaned, a dietary survey indicated that the average intake of calories was 90% of the recommended allowance, protein 151%, calcium 60%, iron 108%, vitamin A 41%, thiamin 112%, riboflavin 56%, niacin 81%, and vitamin C 132%. (Department of Child Health, 1979)

3.4 DIETARY PRACTICES, HEALTH AND MEDICINE

NATIONAL

HEALTH SYSTEM PROBLEMS: The health system problems were characterized by a largely rural population with a high dependency ratio and a paucity of health care services; lack of adequate water supply and environmental sanitation; scarcity of trained health manpower; inadequate data collection and health planning infrastructure; and a host of endemic diseases that contribute to high mortality and morbidity rates. (Liberi, 1979)

MODERN AND TRADITIONAL MEDICINE: A dual system of medicine exists, a modern scientific one and a traditional one. The traditional system includes the indigenous practitioners and the traditional birth attendants, let-thes. (May Thein Hto, 1980)

CHOOSING HEALTH CARE: When a person becomes ill, a wide variety of medical specialists including modern physicians, herbal doctors, astrologers, shamans, exorcists, and others are available. Initial aid is usually sought from a traditional herbalist. Only rarely are modern physicians consulted. Physicians are almost exclusively found in towns and cities and the traditional herbal doctor can typically be found in every village. (Liberi, 1979)

MEDICAL PRACTITIONERS: 450 to 500 doctors graduated annually from Burmese medical schools. About 45 to 50 dental graduates were produced annually, and 195 dental surgeons were practicing. 60 to 68 students were admitted annually to each of 5 specialties for paramedical training. An estimated 50,000 practitioners of indigenous medicine were practicing in 1975. (Liberi, 1979)

WESTERN HEALTH CARE: The western health care system had three major elements: a sub-center in the village, a larger rural health center a few miles beyond the subcenter, and a hospital at township headquarters and in one or two of the major towns. (Chauls, n.d.)

ACCESS TO MODERN HEALTH CARE: 45% of the population had access to modern health care. (Liberi, 1979)

DISTANCE TO HEALTH CARE: Distance was not a major constraint to access to health care. In lowland Burma a villager even at the periphery of a Rural Health Center area was never farther than a four-hour journey, and most were much closer. (Chauls, n.d.)

DISTANCE TO HEALTH CARE: Distance to health centers was often a deterrent to potential users. (Sahn, 1982)

AVAILABILITY OF DRUGS: Smuggling of all types of consumer goods thrives; among the smuggled items were half or more of all drugs sold in Burma. The Burma Pharmaceutical Industry promised to make drug replenishment kits available to community health workers, but due to foreign exchange problems, a shortage of raw materials, and management difficulties, it has rarely been able to fulfill this promise. (Chauls, n.d.)

SUPERVISION OF COMMUNITY HEALTH WORKERS: Technical supervision was performed regularly by the midwife from the subcenter and by the health assistant, lady health visitor, and public health supervisor. The number of person visits varied considerably but seemed to be at least twice per month, and often as many as 7 or 8 times each month. There were no guidelines to assist them in this supervision. The process was relaxed. The visits were often for other purposes and supervision was a secondary focus. (Chauls, n.d.)

AUXILIARY MIDWIFE: The auxiliary midwife received six months of training. Her job was focused on prenatal care, delivery, and postnatal care. A major additional responsibility, nutritional surveillance of children, was being added to this job. On average, midwives delivered 2 to 3 babies per month. They work in cooperation with let-thes, the traditional birth attendants. Midwives often received some payment for their services. (Chauls, n.d.)

KITS OF AUXILIARY MIDWIVES: The basic kit of the auxiliary midwives contained the equipment necessary to perform deliveries and drugs including multivitamin tablets with ferrous sulphate and folate, oral rehydration salts, engometrine tablets, aspirin, vitamin A high potency capsules, tetracycline eye ointment, and gentian violet. (Jelliffe and Jelliffe, 1980b)

PRENATAL CARE: 95% of pregnant women reported that they had received prenatal care, i.e. they were seen at least 2 or 3 times before delivery either at home or at a health center. (Tin U and T.O. Kyaw-Myint, 1981)

GIVING BIRTH: 30.2% of live births took place in government or private hospitals. 30.5% of births were attended by a physician, and 48% were attended by a registered midwife or nurse. (Liberi, 1979)

TURMERIC: Powdered turmeric was sold in small packages in local markets and used by midwives to place on the umbilical cord stump after delivery. There was danger of tetanus when the turmeric was no longer fresh and became contaminated. (Jelliffe and Jelliffe, 1980b)

NEONATAL TETANUS: The training of traditional birth attendants in sterile procedure for delivery appeared to be a highly effective, low cost procedure for reducing the incidence of neonatal tetanus. (Sahn et al., 1982)

RURAL

HEALTH SERVICES USED: A variety of health services were used: self care with indigenous medicine, self care with modern drugs, traditional birth attendants and traditional practitioners, services provided by Basic

3.4 DIETARY PRACTICES, HEALTH AND MEDICINE (CONTINUED)

Health personnel, modern doctors and hospitals, community health workers and auxiliary midwives. (Thein Maung Myint et al., 1982)

COMMUNITY HEALTH WORKERS: Community health workers spent an average of 2.2 hours per day in providing health care. Providing curative care was the predominant activity. (Aung Tun Thet, 1981)

PERFORMANCE OF COMMUNITY HEALTH WORKERS: Performance of community health workers was better in areas where village leaders supported the community health worker program, where there was monetary support and good supervision. Community workers did poorly where there was lack of incentives, shortage of drugs, where community health workers were involved in other village organization and had little time to spend in health activities, and when health workers had to cover a number of villages in addition to the one they lived in. (Thein Maung Myint et al., 1982)

AUXILIARY MIDWIVES: Auxiliary midwives spent an average of 2.3 hours per day in providing health care. Auxiliary midwives provided curative care as well as pre- and post-natal care, delivery, nutrition education, and assistance to other health personnel. (Aung Tun Thet, 1981)

TRADITIONAL BIRTH ATTENDANTS: Traditional birth attendants delivered about 60% of all babies in rural areas. (May Thein Hto, 1980)

DELIVERY: 49.5% of rural infants were delivered by midwives; 47.3%, by traditional birth attendants; and the remainder were not specified. (May Thein Hto, 1980)

ENVIRONMENTAL CONDITIONS: The level of sanitation in and around houses was made through observation and applying certain criteria such as cleanliness, free of pests and flies, etc. 70% were classified as fair, 20% as unsanitary, and 10% as good. (Thein Maung Myint et al., 1982)

URBAN

DELIVERY: 75.7% of urban infants were delivered by a midwife; 16.3% by a traditional birth attendant; and the remainder were not specified. (May Thein Hto, 1980)

4. NUTRITION STATUS CORRELATIONS

NATIONAL

PERINATAL MORTALITY RATE AND BIRTH WEIGHT: The perinatal mortality rate among children with a birth weight below 2000 grams was 440 per 1000 deliveries; among children with a birth weight of 2000 to 2499 grams the rate was 65 per 1000; and among children of the normal birth weight (2500 grams or more) the rate was 19 per 1000. (Tin U and T.O. Kyaw-Myint, 1981)

PERINATAL MORTALITY RATE AND AGE OF MOTHER: High perinatal mortality rates, over 60 deaths per 1000 deliveries, were seen in children of mothers less than 20 years of age and 35 years of age and older. Children of mothers aged 20 to 24 years had the lowest perinatal mortality rates, 34.7 per 1000. (Tin U and T.O. Kyaw-Myint, 1981)

PERINATAL MORTALITY RATE AND GRAVIDA: Primigravida and mothers with gravida of more than 5 had high perinatal mortality rates: 48.9 deaths per 1000 deliveries for primiparas and 60.7 per 1000 for grand multiparas. (Tin U and T.O. Kyaw-Myint, 1981)

MILK OUTPUT AND NUTRITIONAL STATUS OF MOTHERS: Milk outputs of mothers belonging to the well-nourished group were significantly higher than outputs of the less well nourished groups. Among mothers with a weight/height ratio greater than 95% of standard, milk output averaged 934.5 ml. per day; among mothers with a weight for height ratio between 85 and 94% of standard, output was 815 ml. per day; among mothers 75 to 84% of standard, output was 792 ml. per day; and among mothers less than 75% of standard weight for height, output was 767 ml. per day. (Khin-Maung-Naing et al., 1980)

COMPOSITION OF BREAST MILK AND STAGES OF LACTATION: There was a decline in the protein content of breast milk as lactation continued. Protein content at 1 to 4 months of lactation was 1.187 grams per 100 ml.; at 4 to 7 months, 1.149 grams per 100 ml.; and at 7 to 12 months protein content was 1.059 grams per 100 ml. Protein content at stage 1 was significantly higher than that of stage 3 ($p < 0.02$). There were no significant differences in fat, lactose, and energy content of breast milk at different stages of lactation. (Khin-Maung-Naing et al., 1980)

RURAL

PERINATAL MORTALITY RATE AND DELIVERY ATTENDANT: In rural areas there was no significant difference in perinatal mortality rates between deliveries attended by midwives compared to deliveries by TBAs (traditional birth attendants). (Tin U and T.O. Kyaw-Myint, 1981)

MOTHER'S NUTRITION STATUS AND QUANTITY OF BREAST MILK: Breast milk output of mothers belonging to the well-nourished group of mothers was significantly higher than that of less well nourished groups. (Nutrition Research Division, 1979a)

4. NUTRITION STATUS CORRELATIONS (CONTINUED)

MOTHER'S NUTRITIONAL STATUS AND QUALITY OF BREAST MILK: The quality of breast milk had no significant association with the nutritional status of the mother. (Nutrition Research Division, 1979a)

URBAN

PERINATAL MORTALITY AND DELIVERY ATTENDANT: In urban areas deliveries attended by midwives had significantly lower risk of perinatal mortality than deliveries attended by traditional birth attendants. (Tin U and T.O. Kyaw-Myint, 1981)

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS

5.1 NUTRITION AND HEALTH POLICIES AND PROGRAMS, POLICIES

NATIONAL

HEALTH POLICY: The constitution of the Socialist Republic of the Union of Burma declared that "Every citizen during sickness has the right to medical treatment as arranged by the State." (Berggren, 1980b)

PEOPLE'S HEALTH PLAN 1982-86: The People's Health Plan (1982-86) will include "Community Health Care," a combination of the former Family Health Program and the Primary Health Care and Basic Health Services Program. By 1986 it is hoped that 48% of all villages will be covered by the program. (Satoto, 1981)

PEOPLE'S HEALTH PROGRAM 1982-86: The People's Health Program for 1982 to 1986 had the following priorities: provide health care in rural areas, increase access to potable water and improve sanitation and waste disposal facilities, involve the community in identifying health problem and needs, promote preventive and curative services, provide adequate and essential medical care to prevent and reduce mortality due to disease and injuries, and give priority to health problems affecting mothers and children. (Sahn et al., 1982)

PEOPLE'S HEALTH PLAN 1978-82: The People's Health Plan (1978-82) was the health section of the Third Four-year National Economic Development Plan. The Plan provided seven health programs in accordance with the health priorities. Two of these programs were the Primary Health Care and Basic Health Services Program, and the Family Health Program. In the Primary Health Care and Basic Health Services Program, Community Health Workers were trained and worked under the Basic Health Services Personnel to run community based health programs. The Family Health Program focused on mothers and children and trained auxiliary midwives. (Satoto, 1981)

HEALTH OBJECTIVES OF THE GOVERNMENT: The health objectives of the Government of Burma were to raise the health standards of working people and provide efficient treatment for disease; to give priority to preventive measures, to narrow the gap in availability of health services between rural and urban areas, to improve health facilities, and to extend and improve social welfare services including health. (Liberi, 1979)

COUNTRY HEALTH PROGRAMMING EXERCISE: A country health programming exercise carried out under the guidance of the World Health Organization established the following priority programs: 1) primary health care program, 2) environmental sanitation program, 3) expanded program of immunization, 4) family health care program, and 5) vector borne disease control program. (Liberi, 1979)

PRIORITY AREAS: Six priority areas identified by the Department of Health were basic health services and primary health care, environmental sanitation, immunization, MCH and nutrition, vector-borne disease programs, and curative care. (Liberi, 1979)

5.1 NUTRITION AND HEALTH POLICIES AND PROGRAMS, POLICIES (CONTINUED)

HEALTH POLICY—PRIMARY HEALTH CARE: Government policy concerning health care was: to raise the health standard of the working people and to provide efficient treatment of all disease, to promote improvement of both curative and preventive health service with high priority for the latter, and to narrow the gap between urban and rural areas in availability of health services. (Berggren, 1980b)

FAMILY HEALTH PROGRAMS: In 1976 a Country Health Program was planned and Family Health was a project to be implemented between 1977 and 1982. The objective of the Family Health Program was to improve the health of the family through provision of maternal and child health services, school health services, immunization, nutrition counselling, screening, distribution of nutritional supplements and vitamins, and family health care. (U Ba Tun, 1977)

FAMILY HEALTH CARE STRATEGY: The Family Health Care strategy was to provide care for infants, young children, and women in clinics and home visits through growth monitoring, immunization, provision of vitamins and nutritional supplements, treatment of minor ailments, health education, antenatal care and home delivery attended by trained midwives, school meals and distribution of iodized salt. (U Ba Tun, 1977)

HEALTH CARE: Medical care was free of charge to all citizens. The Department of Health was directly responsible for the health care delivery. (U Ba Tun, 1977)

MINISTRY OF HEALTH—AREAS OF RESEARCH: The Ministry of Health focused on six general areas of research: nutrition, communicable diseases, nutrition-infection interaction, indigenous medicinal drugs and practices, other diseases such as snake bite and urinary stones, and development of an infrastructure for research. (Berggren, 1980b)

HEALTH: Health remained a low priority within the general development objects of the government--number nine in the eleven development priorities. Expenditures on health accounted for 6.7% and 7.4% of total current and capital expenditures respectively. 1977-78 government expenditures on health amounted to \$1.30 per person nationally. (Liberi, 1979)

PROTOCOLS FOR PEM: The Government has established protocols for the management of PEM in hospitals and for community involvement in prevention and follow-up of PEM. The government has also established nutrition education and training programs for health workers and others. (Liberi, 1979)

NUTRITION RESEARCH: The Department of Medical Research under the Ministry of Health conducted surveys and did research on health problems. The Division of Nutrition of the Department of Medical Research did special surveys and research concerning nutrition and health status of women and children. The Nutrition Bureau of the Department of Health also conducted research in nutrition. (U Ba Tun, 1977)

SOCIAL SECURITY: All government employees were covered by a system of Social Security which provided medical and maternity benefits as well as

compensation to dependents for death of an employee. In 1973 there were 365,610 insured persons. (Liberi, 1979)

PRONATALIST POLICY: The Burmese Government has a pronatalist population policy. However, government statistics indicated that there was a hospital abortion rate of 48.6 per 100 deliveries or about one admission for incomplete or septic abortion for every two admitted normal deliveries. Abortions are illegal in Burma, and this figure does not include a possibly larger number of abortions done on the black market. (Liberi, 1979)

RICE PURCHASE PRICE: The government sets a mandatory low paddy purchase price for all rice not used for home consumption. The price was set so low that it has discouraged rice production and created an incentive to sell as much rice as possible on the black market. (Liberi, 1979)

RICE: There is not much rice on the black market. Rice production has risen during the past 5 years, indicating that prices are still high enough to encourage farmers to produce rice. (Sahn, 1982)

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS

NATIONAL

PRIMARY HEALTH CARE I PROJECT: The Primary Health Care I project was a health delivery system which placed significant responsibility on a voluntary health staff working in rural communities. The staff included 7400 community health workers, 1400 auxiliary midwives, and 2500 traditional birth attendants. The voluntary health staff worked at the village level. They received training and direct supervision from permanent, paid health staff. (Sahn et al., 1982)

PRIMARY HEALTH CARE I PROJECT--EVALUATION: Accurate quantitative data was not available for evaluation, but it appeared that the initial attempts at deploying a voluntary health services force had been successful. (Sahn et al., 1982)

PRIMARY HEALTH CARE I: In 1980 the Agency for International Development began providing assistance to the Government of the Socialist Republic of the Union of Burma (GSRUB) through the Primary Health Care I Project. This project supported and improved the delivery of health services in rural villages. (Sahn et al., 1982)

PRIMARY HEALTH CARE PROJECT: AID's role in the Primary Health Care Project included commodity support, participant training, and technical assistance. (Sahn et al., 1982)

PRIMARY HEALTH CARE PROJECT--COMMODITIES: Commodities for the Primary Health Care Project were supplied by AID. Commodities included pharmaceuticals and other items supplied to the community health workers and auxiliary midwives. About a third of the dollar amount ordered has been distributed. This has left many of the trained voluntary health workers deployed without the intended supplies and equipment. (Sahn et al., 1982)

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS (CONTINUED)

PRIMARY HEALTH CARE PROJECT--NUTRITION SURVEILLANCE: Nutrition surveillance was a priority activity of the Primary Health Care Project. It has not been incorporated into the daily routine of many voluntary health workers. Voluntary health workers who were doing nutrition surveillance generally had learned about it during in-service training, usually a year or more after their original deployment. Nutrition surveillance was carried out on children identified as malnourished according to midarm circumference criteria. In no instance did the evaluation team observe a growth chart maintained from birth. (Sahn et al., 1982)

PRIMARY HEALTH CARE--VOLUNTEER WORKERS: The volunteer health workers included community health workers (CHWs) and Auxiliary Nurse Midwives (ANMs). The traditional birth attendants, let-thes, were also to be trained. These women, usually rather elderly, have been serving their communities in the absence of other care. (Sahn et al., 1982)

PRIMARY HEALTH CARE: The Primary Health Care Project relied heavily on the work of volunteer community health workers and auxiliary midwives. Auxiliary midwives and traditional birth attendants were trained in methods of clean delivery and infant care. The training also emphasized feeding of infants and children. Auxiliary midwives were also involved in village weighing clinics. (U.S.A.I.D., 1982)

VOLUNTEER HEALTH WORKER PROGRAM--SUCCESS: The volunteer health worker program has been very successful because there was a strong tradition of volunteer help in Burma; political support for volunteer workers; extensive community participation and power in the program; good supervision of the health worker; a focus on things which the villagers felt were important--drugs and child deliveries; the health worker received intellectual and social stimulation as well as high status as a "doctor"; there was cooperation with traditional practitioners rather than competition; and the village itself provided financial inputs and did not rely on the government for a budget. (Chauls, n.d.)

VOLUNTEER HEALTH WORKERS PROGRAM: According to the volunteers, the Volunteer Health Worker Program has not cooperated with the traditional system, nor has it been properly supervised or provided intellectual stimulation to the volunteer worker. (Sahn, 1982)

VOLUNTEER HEALTH WORKER PROGRAM--PROBLEMS: Problems with the volunteer health worker program included inadequate amounts of effective training and support materials for motivating villagers and inadequate resupply of drugs for volunteer health workers. (Chauls, n.d.)

COMMUNITY HEALTH WORKER: The community health workers were generally male, selected by the village council to receive three weeks of training. After training they received first aid and medical kits with aspirin, ephedrine, sulphanomides, and oral rehydration salts. They returned to work in the villages from which they were chosen. The cost of training and providing food and shelter for the community health worker was borne by the village. (Liberi, 1979)

COMMUNITY HEALTH WORKER: The community health worker distributed drugs, and he saw from 1 to 5 patients each day. He encouraged people to construct latrines and sanitary waste disposal pits; chlorinated wells; organized people for immunization; made referrals for people who were very ill to the hospital or rural health center; did nutritional motivation; identified epidemics; and provided health education. (Chauls, n.d.)

COMMUNITY HEALTH WORKERS: The major activities of the community health workers included medical care of minor ailments and first aid, referral of severe ailments; assistance in communicable disease control including immunization; motivation of the community for environmental sanitation; dissemination of health education emphasizing nutrition and family health; assistance in family health activities; assistance in reporting vital events; and support and assistance to the basic health services staff in their community activities. (Sahn et al., 1982)

TRAINING AUXILIARY MIDWIVES: WHO/UNICEF training courses for auxiliary midwives took place every three months. Nutrition surveillance was not part of their training, and it was not part of the training of trainers. (Jelliffe and Jelliffe, 1980b)

AUXILIARY MIDWIVES: The major activities of the auxiliary midwives included health education, environmental sanitation, communicable disease surveillance, vital health statistics, antenatal and postnatal care, home delivery, and assistance with immunization. (Sahn et al., 1982)

TRAINING OF TRADITIONAL BIRTH ATTENDANTS: A program of informal training of traditional birth attendants was carried out in Insein and Mingaladon Townships. After receiving training, let-thes gave better advice on diet (they had previously advised restricting the diet of pregnant women), had become more skillful in their work, understood the need for environmental cleanliness, advised mothers to use the postnatal clinic, and were more willing to work with other health staff. (May Thein Hto, 1980)

TRAINING OF TRADITIONAL BIRTH ATTENDANTS: A program of informal education for let-thes in Insein and Mingaladon Townships resulted in the following changes in practices: improved personal hygiene, boiling of equipment used for delivery, putting the baby to the breast immediately after delivery, recognition of the risk factors in the baby and making referrals. Practices which have been extinguished included internal examination, pushing on the abdomen during delivery, and putting non-sterile substances on the baby's cord. (May Thein Hto, 1980)

NUTRITION COMPONENT--COMMUNITY HEALTH CARE: Beginning in 1982 nutrition will be a component of the Community Health Care Program. Nutrition activities oriented toward behavioral change will become part of the program. (Satoto, 1981)

COMMUNITY HEALTH CARE PROGRAM--NUTRITION EDUCATION: The objectives of the Nutrition Education Component of the Community Health Care Program included improved maternal, infant, and child nutrition and improved weight/age ratio for children birth to three years of age. The program promoted the use of weight charts and monthly weighing of children up to

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS (CONTINUED)

three years of age, promoted breast feeding to four months of age, and introduction of supplements with continued breast feeding after four months. Introduction of adult foods was called for at one year. Proper feeding of the pregnant and lactating woman was encouraged, as well as oral rehydration therapy during diarrhea. (Nutrition Project, 1981)

ROAD TO HEALTH CARD: Many mothers found the idea of color grading of the road to health care rather confusing. Some mothers like the green area and felt it represented the idea of growth, freshness, cooling the eyes, and represented something favorable. One mother did not like green since green meant no milk powder. Gaining weight as a criterion of health was easily accepted and understood by mothers, even mothers with very little education. (Satoto, 1981)

NUTRITION COMMUNICATION STRATEGY: A nutrition communication strategy has been formulated based on monthly weighing of children under 3 years of age. Midwives, auxiliary midwives, and community health workers will carry out the program with the help of the community and individual mothers. (Nutrition Project, 1981)

NUTRITION EDUCATION MATERIALS: A workshop was held in July 1981 to develop a communication strategy for the nutrition component of the Community Health Care Program; to formulate job descriptions for the training needs to implement the nutrition component; to develop curriculum for training of voluntary health workers; and to develop communications materials. The results fell somewhat below expectations, as there were few people in Burma familiar with the use of mass media for education campaigns. (Manoff, 1981)

NUTRITION EDUCATION: Government controlled mass media can reach all areas of the country. Both radio and newspapers provide some health education including limited amounts of nutrition education. Other methods used on a limited basis included comic strip books, travelling group of actors puwe, use of cassettes and players, posters, and flannelgraphs. (Jelliffe and Jelliffe, 1980a)

NUTRITION EDUCATION PROGRAM: A proposed program of nutrition education would promote improved weaning practices and would complement this approach with production and introduction of processed weaning foods. The target of the program would be children four months to three years of age. Mothers of children in this age group would be reached for education concerning weaning. The program would focus on the low socioeconomic group since they are most at risk. The low socioeconomic group are those whose land holdings are 5 acres or less and whose cash incomes are Kyat 200 or less. The main occupations of women in this group include subsistence farming, work as laborers, vendors, and hired workers in cottage industries. (Berggren, 1980a)

ADMINISTRATION OF THE HEALTH CARE SYSTEM: The administrative structure which managed the health system was at the township level. The system had five levels: voluntary workers, subcenters, rural health centers, station hospitals, and a township hospital. Special projects such as immunization, water supply, etc. were managed at the township level as well as different functions such as personnel, supply, training,

supervision, etc. The manager of the system was the Township Medical Officer. (Chauls, n.d.)

HEALTH SECTOR DONORS: In the health sector, donors included WHO, UNICEF, and UNDP. In 1978 WHO spent \$1,413,800 on aid to Burma for health programs. In 1979 the planned budget was slightly larger and included money for nutrition counseling and distribution of supplements and vitamins. (Liberi, 1979)

HEALTH SECTOR DONORS: Health sector assistance has been provided by Australian ADAB and the Asia Development Bank. (Sahn, 1982)

DISTRIBUTION OF IRON AND FOLATE: Iron and folate tablets were distributed to anemic women. (Jelliffe and Jelliffe, 1980b)

GOITER: Goiter was a problem in some mountainous regions, and a salt fortification program with potassium iodate was in force. (Jelliffe and Jelliffe, 1980a)

IODINE PROGRAM--UNICEF: In an effort to combat a country-wide problem of goiter, UNICEF has begun a program of injections with iodized oil for prevention of goiter. (Sahn, 1982)

MATERNITY AND CHILD WELFARE SOCIETY: In every town and in some villages there was a Maternity and Child Welfare Society. These societies assisted and helped the poor in cash or in kind, provided health education, and promoted welfare activities of mothers and children. They also assisted the Department of health in the Family Health Care delivery. (U Ba Tun, 1977)

LITERACY: 89.4% of the population 15 years of age and older were literate. (Tin U and T.O. Kyaw-Myint, 1981)

REGIONAL

GOITER: The government distributed iodized salt in the Chin Hills area in a program to control goiter. Prevalence rates dropped from 90% to 20% as a result of the program. (Liberi, 1979)

RURAL

HEALTH CARE: Data from 1979 indicated there were 1107 rural health centers, which are generally staffed by one health assistant, one lady health visitor, five midwives, and two or three auxiliary health workers; 4,169 sub-rural health centers, staffed by midwives; and 195 rural stations staffed by physicians. (Liberi, 1979)

URBAN

NUTRITION REHABILITATION CENTERS: The Nutrition Project of the Department of Health has initiated 14 Nutrition Rehabilitation Centers since 1974, mainly in urban areas. Twelve centers are still operating. The centers screened moderately and severely malnourished children, provided nutrition education 2 hours each day, five days a week, as well as

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS (CONTINUED)

providing supplementary feeding and referral to the nearest hospital when necessary. (Satoto, 1981)

NUTRITION UNIT: The Nutrition Unit of Children's Hospital provided clinical care for severely malnourished children and also provided nutrition education for the family of the severely malnourished child. (Department of Child Health, 1979)

RANGOON CHILDREN'S HOSPITAL--NUTRITION ACTIVITIES: The Rangoon Children's Hospital has developed a methodology for demonstration education for mothers and a follow-up system which included the use of the road-to-health chart as an educational tool for the mother. In addition, appropriate weaning foods and their distribution in the form of "nutri-paks" has been explored. (Berggren, 1980a)

NUTRITION REHABILITATION: The Nutrition Unit of Children's Hospital in Rangoon opened in 1974 to educate parents of children who were being rehabilitated. Daily cooking demonstrations demonstrated the preparation of nutritious foods at minimum cost and comparison of food value of meat and vegetable protein. Mothers participated in the demonstrations and were shown the importance of weight gain in children, how to feed children and encourage them to eat. (Berggren, 1980b)

NUTRITION REHABILITATION CENTERS: Malnourished children in the Rangoon area have been successfully rehabilitated and their mothers educated in these centers. Mothers participated on a regular basis; with a nutrition educator they planned a daily menu using locally available foods. Despite "cultural blocks" to giving foods such as fish and green vegetables, mothers were observed feeding these foods to their children. Traditional healers also participated in the program and approved of the nutrition rehabilitation method. (Berggren, 1980a)

NUTRIPAKS: The Nutrition Unit of Children's Hospital has developed various Nutripaks to be used in parent education concerning appropriate weaning diet. The nutripaks are composed of rice, oil, and a protein source such as skim milk powder, chickpeas, bengal gram or ground nuts. Some mothers have begun to make a living selling such prepared foods to their neighbors, and these enterprises are encouraged by the staff of the Nutrition Unit. (Department of Child Health, 1979)

6. COMMENTARIES

NATIONAL

RECOMMENDATIONS TO IMPROVE NUTRITION: Recommendations by a consultant emphasized continued development of nutrition education programs at all levels, integration of nutrition into the work of auxiliary midwives and other health workers, development of appropriate weaning foods, and program evaluation. (Berggren, 1980a)

ORAL REHYDRATION SALTS: An effort should be made to improve the use of oral rehydration salts. Oral rehydration salts are not used aggressively and often not used correctly. There is a high level of hospitalization due to improper management of diarrheal disease. (Sahn, 1982)

WEANING FOODS: It was generally agreed that a program of home prepared weaning foods was needed for the country as a whole but that there was also a need for minimally processed weaning foods in urban areas. (Jelliffe and Jelliffe, 1980b)

IMPROVED WEANING: There are two complementary approaches to improvement of health and nutritional status of the weaning age child. One is the promotion of improved feeding practices and the other is the production of processed weaning foods. Promotion of improved feeding practices was strongly recommended, and the production of processed weaning foods was not recommended at the present time. (Nutrition Research Division, 1979c)

IMPROVED WEANING: A education program to improve weaning practices should be directed at women of reproductive age from low socioeconomic groups. Messages concerning improved weaning should be broadcast via mass media and through demonstration. Community participation and involvement should be encouraged. (Nutrition Research Division, 1979c)

WEANING FOOD: There was a clear need for improved dietary intake among infants and young children during the weaning period especially in poor communities. Attempts should be made to develop suitable weaning foods which are based predominantly on locally available foods, familiar to the community, culturally acceptable, and which are inexpensive. (Nutrition Research Division, 1979b)

IMPROVING WEANING: In order to improve the health and nutritional status of weaning age children under 5 clinics should be established to provide growth surveillance, immunization, health education, treatment of minor ailments, and nutrition supplements. Nutrition rehabilitation centers should be established where necessary. Health education of the general public through the mass media would also improve weaning practices. Weaning food mixtures should be produced, especially for use by working mothers. (Nutrition Project, 1979c)

IMPROVING WEANING DIET: To improve the weaning diet, the author recommended increased frequency of feeding, such as an extra midday meal, to improve the growth of children. Calorie density should be increased, and fish, eggs, and pulses should be introduced into the weaning diet early. (Nutrition Project, 1979b)

6. COMMENTARIES (CONTINUED)

FOOD PREPARATION AND BABY SITTERS: Baby sitters may be the very young older siblings of infants. These young sitters may be ignorant about how to feed and care for younger children whose food must be planned in advance. (Berggren, 1980a)

FOOD IN PREGNANCY AND LACTATION: Pregnant women should be encouraged to eat more dark green leaves such as drumstick or jackfruit leaf soup. They should also be encouraged to increase the calorie content of their diets. Lactating women do not like to eat green leaves, and they also should be encouraged to eat green leaves. (Jelliffe and Jelliffe, 1980b)

PRIMARY HEALTH CARE PROJECT RECOMMENDATIONS: Salter scales and growth charts should be provided to all auxiliary midwives during their initial training. Auxiliary midwives should thereafter maintain a chart for all children they deliver. (Sahn et al., 1982)

ROAD TO HEALTH CARE: The road to health card was part of nutrition communication. It allowed mothers to monitor their children's health. This card should be developed in accordance with scientific and program viewpoints and should be complete, simple, achievement oriented, self-explanatory, and well printed. (Satoto, 1981)

NUTRITION EDUCATION IN THE PRIMARY HEALTH CARE PROJECT: Nutrition education should be an integral component of the activities of the auxiliary midwives and community health workers. It should be incorporated into their training and reinforced by their supervisors through regular contact. Attention should be given to the introduction of supplementary foods, food during illness, preparation of indigenous weaning foods, proper hygiene, and the use of oral rehydration fluids. (Sahn et al., 1982)

NUTRITION IN THE PRIMARY HEALTH CARE PROJECT: Nutrition was an area receiving increased attention by the Ministry of Health. This priority was not reflected in the field activities of voluntary health workers. Attention should be given to developing and implementing a comprehensive nutrition strategy in the near future. (Sahn et al., 1982)

NUTRITION FOR VOLUNTEER HEALTH WORKERS: Nutrition should be given high priority for both auxiliary midwives and community health workers. The evaluation team felt that more emphasis should be placed on the nutrition content of health worker training and tasks. For example, village health workers should be explicitly taught those factors which identify mothers and children at greatest nutritional risk. (Sahn et al., 1982)

TRADITIONAL BIRTH ATTENDANTS: Since traditional birth attendants delivered about 60% of all babies in rural areas, they were an important source of maternal and child care. It was essential to improve the practices of these women through informal training and teaching. To train and utilize these women in the health care system, it was important to teach them about nutrition, personal hygiene, cleanliness of instruments during delivery, cutting the umbilical cord with clean instruments and dressing the cord with clean materials, and encouraging the family to immunize the child. (May Thein Hto, 1980)

CONSULTANTS: Consultants who would be useful for the Primary Health Care Program included an expert in curriculum design and data analysis, communications in the areas of mass media and printed materials, nutritional anthropology, and weaning food technology. (Jelliffe and Jelliffe, 1980b)

INCREASE VEGETABLE OIL PRODUCTION: It was recommended that attention be given to increasing vegetable oil production. The high cost of such oils seemed to be a significant cause of caloric deficit in young children and an unnecessary drain on foreign currency. (Jelliffe and Jelliffe, 1980a)

FURTHER RESEARCH: Children are not fed often enough. Priority should be given to research to determine how to increase the number of meals given each day. Research should be of the "child following type." Studies should be carried out in the homes of well nourished as well as poorly nourished children in families matched for other variables. This would lead to important findings about how mothers cope where children escape malnutrition. (Berggren, 1980a)

URBAN

NUTRITION EDUCATION: Mothers in Rangoon needed nutrition education concerning proper infant feeding practices. (Nutrition Project, 1979a)

BIBLIOGRAPHY

Aung Tun Thet

- 1981 Time Utilization of Voluntary Health Workers. Institute of Economics.

Original data

Method: A non-participant observation method with a work-diary method.

Sample: 25 community health workers and 16 auxiliary midwives.

Location: Tavoy and Launglon townships in Tenassarim Division.

A study was undertaken to determine the time utilization of voluntary health workers. Community health workers spent an average of 2.2 hours per day in providing health care, and midwives spent 2.3 hours per day. Providing curative care was the predominant activity of community health workers. Auxiliary midwives also provided curative as well as pre- and post-natal care, delivery assistance, and nutrition education.

Berggren, G. G.

- 1980a International Nutrition Communication Service (INCS) Consultant Report for Burma (May 4-9, 1980), Volume II. Newton, MA: Education Development Center. Submitted to U.S.A.I.D., Washington, D.C.

This trip was undertaken in order to consult with Burmese officials regarding infant feeding practices. Growth retardation during the weaning period was a major nutrition problem. Field trips to several nutrition and health programs in Rangoon, including a nutrition rehabilitation center, the Rangoon Children's Hospital, and a rural health center are described. Recommendations are made for technical assistance in program development and continued research.

Berggren, G. G.

- 1980b Consultant Report on Burma May 1980 Burma's Nutrition Problem, Weaning Practices, Weaning Foods, and Nutrition Program. Notes and Abstracts from documents distributed to the A.I.D. team for nutrition recommendation. Appendix A through G. Unpublished.

This document contains abstracts of papers on weaning foods, breast feeding, infant feeding trends, anemia, and iron deficiency; descriptions of special units; guidelines for community programs; a description of primary health care; and a bibliography of foods and nutrition in Burma.

Chauls, D. S.

- n.d. Volunteers Who Work: The Community Health Care Project in Burma. Unpublished paper. Boston: Management Sciences for Health.

This paper discusses the successful elements of the Community Health Care Project in Burma. Large numbers of community health workers and auxiliary midwives work on a volunteer basis throughout the country

BIBLIOGRAPHY (CONTINUED)

and have done so for several years. Some reasons for the success of the program include the tradition of volunteerism in Burma; support from the central government; extensive community participation and power in the program; amount of supervision--at least two or three visits each month; an emphasis on services desired by the village community, drugs and improved delivery; intellectual and social stimulation for the volunteer; and cooperation with traditional practitioners rather than competition.

Department of Child Health, Institute of Medicine I.

- 1979 Weaning food and practices and their nutritional adequacy in Burma. In Breast-feeding and Weaning Practices in Burma. Proceedings of the Research Seminar organized by Department of Medical Research, pp. 64-72, Rangoon, Burma, September.

This paper describes the experiences of the Department of Child Health, Children's Hospital. Two studies were described, one of children below two years of age in Hlegu township which found that children were usually breast fed to two years of age. The major weaning food was rice. Intakes of calcium, vitamin A, riboflavin, niacin, and calories were inadequate. A study of children 3 to 5 years of age who were in good health found their diets were low in calories, calcium, vitamin A, riboflavin, and niacin. The nutripak program is described.

Jelliffe, D. B. and Jelliffe, E. F. P.

- 1980a International Nutrition Communication Service (INCS) Consultant Report for Burma (May 4-9, 1980) Volume I. Newton, MA: Education Development Center. Submitted to U.S.A.I.D., Washington D.C.

A consultant trip undertaken to Burma resulted in recommendations for technical assistance in the areas of nutritional anthropology, food technology, education methodology, and communication methodology be sent to Burma to assist in the nasically excellent Burmese public health programs. Major nutrition problems of women and young children were late amrasmus, maternal nutrition, and early marasmus. Poor feeding during the weaning period was an important cause of child malnutrition. Food customs often limited the diets of women and young children.

Jelliffe, D. B. and Jelliffe, E. F. P.

- 1980b International Nutrition Communication Service (INCS) Consultant Report for Burma (September 20-23, 1980) Volume III. Newton, MA: Education Development Center. Submitted to U.S.A.I.D., Washington D.C.

This consultant report describes a follow-up visit on activities initiated in May 1980. After visits with government officials and AID personnel, it was determined that consultants would be useful in the areas of curriculum design, communication, nutritional anthropology, and weaning food technology. Notes concerning a field trip to a rural village are also presented.

Khin-Maung-Naing, Tin-Tin-Oo, Kwe-Thein, and Nwe-New-Hlaing

- 1980 Study on lactation performance of Burmese mothers. American Journal of Clinical Nutrition 33:2665-2668.

Original data

Method: At 8 am breasts of mothers were completely emptied. Infants were fed at 3-hour intervals and weighed before and after each feeding. After each feeding milk left in the breast was expressed out and weighed. 10 ml. of foremilk was expressed and pooled for chemical analysis.

Sample: Mothers belonging to low socioeconomic group between 18 and 35 years of age. 30 mothers from each of the following stages of lactation: 1 to 4, 4 to 7, and 7 to 12 months.

Location: Department of Medical Research, Rangoon, Burma.

Quantity and proximate composition of breast milk from Burmese mothers of low socioeconomic group at three stages of lactation were studied. Protein content of breast milk at 1 to 4 months of lactation was significantly higher than at 7 to 12 months, but there were not significant differences in milk fat, lactose, and energy among the three stages of lactation. No significant differences in proximate composition of breast milk were observed between well nourished and malnourished mothers, but maternal undernutrition decreased potential volume of milk output.

Liberi, D. M.

- 1979 A Study of the Health Sector of Burma. A study prepared for the U.S. Agency for International Development. Office of International Health, Public Health Service, Department of Health and Human Services, December.

This document reviews the health situation in Burma. Information is provided on morbidity and mortality, common diseases, health beliefs, delivery practices, and the nutrition status of population as far as it is known, and government health policy is reviewed.

Manoff, R. K.

- 1981 Executive Summary Report: Workshop on Development of Nutrition Communication Strategies in Community Health Care. Government of the Socialist Republic of the Union of Burma (GSRUB). Rangoon, Burma, July 6-17.

This report describes a workshop held to develop a communication strategy for the nutrition component of the Community Health Care Program; to formulate job descriptions for the training needs to implement the nutrition component; to develop curriculum for training of voluntary health workers; and to develop communications materials. The results fell somewhat below expectations as there were few people in Burma familiar with the use of mass media for education campaigns.

BIBLIOGRAPHY (CONTINUED)

May Thein Hto

- 1980 Dissertation on a Pilot Study on the Informal Training of Traditional Birth Attendants in Two Townships in Rangoon Division (May–November, 1978). Submitted to the Academic Body of the School of Preventive and Tropical Medicine, Rangoon, August.

This dissertation describes a pilot study of nonformal training of traditional birth attendants in Insein and Mingaladon townships. Trained TBAs provided safer deliveries by recognizing risk factors, improving cleanliness, boiling equipment, and not interfering during delivery with external pushing. They improved child care by encouraging breast feeding immediately after delivery and encouraging child immunization.

Nutrition Project, Department of Health

- 1981 Report on "Workshop on Development of Nutrition Communication Strategies in Community Health Care". Nutrition Project, Department of Health, Ministry of Health, Rangoon, Burma, July.

This workshop was held to develop a nutrition communication strategy. The strategy was based on monthly weighing of children under three years of age. The weight chart would be used as a communication and teaching tool with the community and with individual mothers. The workshop developed nine specific nutrition messages to be used by health workers and midwives in the community. These messages promoted child weighing, breast feeding, appropriate weaning and feeding of the child during diarrhea as well as proper feeding of pregnant and lactating women.

Nutrition Project, Department of Health

- 1979a The pattern of breastfeeding and its nutritional adequacy in Rangoon. In Breast-feeding and Weaning Practices in Burma. Proceedings of the Research Seminar organized by Department of Medical Research, pp. 20–36, Rangoon, Burma, September.

Original data

Method: Interview with mothers or guardians of children about 1 1/2 years of age concerning infant feeding. Children were examined and weights and lengths recorded.

Sample: 1223 children born during the month of January 1969 and registered with the local birth registers of Greater Rangoon.

Location: Rangoon

64.2% of children were exclusively breast fed for the first six months. 29.7% received breast and bottle feeding. 6.1% were purely artificially fed. Infants received exclusive artificial feeding mainly because of the absence of breast milk and the inability of working mothers to breast feed. The infants were taken off the breast at a mean age of 12 months. The main reason for stopping breast feeding was a new pregnancy. Supplementation with solid foods began at a mean age of 6.57 months. The time was appropriate, but the foods given were devoid of protein and other essential nutrients.

Nutrition Project, Department of Health

- 1979b Weaning foods and practices and their nutritional adequacy in Burma. In Breast-feeding and Weaning Practices in Burma. Proceedings of the Research Seminar organized by Department of Medical Research, pp. 43-63, Rangoon, Burma, September.

A review of studies of weaning in Burma indicated that the time of weaning, 3 to 6 months, was satisfactory, but calories were not sufficient. The types of foods used were limited, commonly rice, oil, and jaggery, served in a watery form of inadequate nutrient density. The frequency of feeding was too low, and the introduction of protein foods was postponed for too long.

Nutrition Project, Department of Health

- 1979c Suggested outline of action programme for improving weaning food and practices in Burma. In Breast-feeding and Weaning Practices in Burma. Proceedings of the Research Seminar organized by Department of Medical Research, pp. 96-98, Rangoon, Burma, September.

This article outlines suggestions for improving weaning food and weaning practices through establishment of under-five clinics, health education through the mass media, and production of weaning foods.

Nutrition Research Division, Department of Medical Research

- 1979a The Pattern of breastfeeding and its nutritional adequacy in rural communities. In Breast-feeding and Weaning Practices in Burma. Proceedings of the Research Seminar organized by Department of Medical Research, pp. 4-19, Rangoon, Burma, September.

Original data

Method: Questionnaire for cross sectional point prevalence study in the community. To determine the chemical composition of breast milk, samples were collected 3 hours after the morning feed by manual expression of both breasts. Output of milk was determined by test weighing of infants.

Sample: Low socioeconomic mothers 18 to 35 years of age: 30 mothers from each stage of lactation--1 to 3 months, 4 to 6 months, and 7 to 12 months.

Location: rural

Prolonged lactation was common in rural communities: 95% of children still breast fed at 18 months of age. The quality of breast milk was satisfactory. The quantity of breast milk produced by well nourished mothers was significantly greater than the quantity produced by poorly nourished mothers. Breast milk alone was sufficient for growth and maintenance of infants up to 4 months of age.

BIBLIOGRAPHY (CONTINUED)

Nutrition Research Division, Department of Medical Research

- 1979b Weaning foods and practices and their nutritional adequacy in Burma. In Breast-feeding and Weaning Practices in Burma. Proceedings of the Research Seminar organized by Department of Medical Research, pp. 73-92, Rangoon, Burma, September.

Original data

Method: Questionnaire concerning food habits; heights, weights, and ages of children collected; individual food survey of children 4.5 months to 3 years, through food weighing; test weighing to ascertain breast milk intake per 12-hour period.

Sample: 370 infants and children 0 to 3 year of age, a point prevalence community study.

Location: Four villages in Htauk-kyant township.

43.2% of children 3 to 6 months of age received supplementary foods. Up to 12 months, protein rich foods were not usually given. Daily intakes of infants 6 to 12 months were deficient in both protein and energy. Energy intake at 15 to 36 months was still inadequate, and protein intake was just adequate. There was a deficit of height and weight during the weaning period.

Nutrition Research Division, Department of Medical Research

- 1979c Suggested outline of action-program for improving weaning food and practices in Burma. In Breast-feeding and Weaning Practices in Burma. Proceedings of the Research Seminar organized by Department of Medical Research, pp. 102-115, Rangoon, Burma, September.

This document proposes that the health and nutritional status of the weaning child can best be improved through promotion of improved weaning practices. An education program should be directed towards women 16 to 39 years of age in the low socioeconomic groups. Both mass media and demonstration are to be used to broadcast messages.

Sahn, D.

- 1982 Personal Communication.

David Sahn has worked with the Government of Burma on health and nutrition planning. This communication contains his comments on his experiences in Burma and his comments on an earlier draft of this report.

Sahn, D., Merrill, H., and Pines, S.

- 1982 Primary Health Care I: Evaluation Midterm Report. Unpublished consultant report, April.

This document describes the Primary Health Care I project. This project provides a health delivery system which places significant responsibility on voluntary health staff working in rural communities. Accurate quantitative data were not available for evaluation, but it

appeared that the initial attempts at deploying a voluntary health service force had been successful. The evaluation team recommended that greater emphasis be placed on preventive rather than curative care, that supervision of volunteer health workers be improved, and that nutrition be given greater emphasis in the program.

Satoto

- 1981 International Nutrition Communication Service (INCS) Consultant Report for Burma (May 13-27, 1981). Newton, MA: Education Development Center. Submitted to U.S. A.I.D., Washington, D.C.

A consultant trip to Burma was undertaken to pretest materials and messages proposed for the nutrition component of the Burma Community Health program. The road to health card was part of nutrition communication and central to teaching the concepts of weight gain and health. The report also describes the planning and organization of a materials development workshop.

Thein Maung Myint, Thein Hlaing, W Tun Lin, Aung Myo Han, and Aung Tun Thet

- 1982 Evaluation of Voluntary Health Workers The Role and Performance of Voluntary Health Workers in Primary Health Care in Burma. Epidemiology Research Division, Department of Medical Research and Institute of Economics, Rangoon, May.

Original data

Method: Longitudinal comparison of areas before and after the program plus cross-sectional comparison between areas with and without program. Interview with questionnaire concerning health conditions, demographics, socioeconomic characteristics, environmental sanitation, and health services.

Sample: 3531, 3237, and 3281 households studied during three repeated sweep surveys.

Location: Tennesarim, Irrawaddy, and Magwe Divisions.

An evaluation was carried out to study the shift in health service utilization patterns of the community as a result of introduction of the voluntary health worker program, to measure the extent and use of services provided by voluntary workers, and to assess the performance of the health workers as indicated by health conditions and by the reaction of the community.

Tin U and T.O. Kyaw-Myint (eds.)

- 1981 Report of the Perinatal Mortality and Low Birth Weight Study Project--Burma. (SEARO Inter-country Collaborative Project, WHO). Rangoon: Department of Medical Education, Ministry of Health.

Original data

Method: Questionnaire interviews with households. Follow-up of pregnant women, including birth weight of newborn.

Sample: 19,462 families, 9,352 in rural and 10,110 in urban areas.

Location: North Okkalapa township (five administrative wards for the urban community) and 91 rural villages.

BIBLIOGRAPHY (CONTINUED)

58 per 1000 pregnancies had complications. The majority of pregnant women were moderately or severely anemic. Abortion was frequent. 22.4% of deliveries were low birth weight, below 2500 grams. The perinatal mortality rate was 47.5 deaths per 1000 deliveries. Most mothers had a favorable attitude toward breast feeding. Most children were breast fed between 1 and 2 years. Only 3% of the children did not receive breast milk. By one year of age most children were eating the adult diet.

U Ba Tun

- 1977 Burma: Development of Health Services. In Community Action--Family Nutrition Programmes. Proceedings of a joint IUNS/UNICEF/ICMR Working Conference held at the National Institute of Nutrition, Hyderabad, India, October 17-21, 1977. Jelliffe, D. B. and Jelliffe, E. F. P. (eds.). New Delhi: Aruna Printing Press.

This article summarizes the health care policy of the Socialist Republic of the Union of Burma. Medical care is free of charge to all citizens through the Department of Health. The following services are described: rural health services, MCH, hospital services, special disease control projects, training of personnel, research, Family health Project, and the Country Health Program.

U.S.A.I.D.

(U.S. Agency for International Development, American Embassy, Rangoon)

- 1982 Telegram Re: Review of Breastfeeding, Weaning, and Maternal nutrition Programs. Rangoon, April.

This telegram was a response to an A.I.D. request for information on current breast feeding, weaning, and maternal nutrition programs.