MATERNAL AND INFANT NUTRITION REVIEWS

SRI LANKA

A Guide to the Literature

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INTRODUCTION

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

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

The map on page iv and Table 1 on page v show the extent to which various regions and specific locations have been surveyed. Pages vii and viii present the highlights of our findings. Pages 1 to 42 contain the data categorized according to the MINR classification system with boldface titles within each category to describe specific listings.

Pages 43 to 49 contain an annotated bibliography with each entry described in terms of type of study (original data or literature review), with methodology, sample characteristics, and location, where relevant, and a summary.

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

Ron Israel
INCS Project Manager
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HIGHLIGHTS

1. NUTRITION AND HEALTH STATUS: The highest infant mortality rate is found between the first week and the first month after birth. Infant mortality is highly correlated with maternal nutrition status and socioeconomic status. The infant mortality rate is 52 deaths per 1000 live births, with much regional variation. The highest infant mortality rates are recorded for the districts of Nuwara Eliya, Kandy, Bdaulla and Tarnapura. Gastroenteritis remains the most important cause of the high and rising rate of infant mortality. An average of 42% of Sri Lanka's rural children aged 6-71 months suffer from Gomez classification second and third degree malnutrition (based on weight for age). 34.7% of a total rural survey sample of 13,450 6-71 month old children were classified as stunted (based on height for age).

2. DIETARY BELIEFS: Many mothers do not know how long to breast feed. Urban mothers have the belief that nursing is a "personal matter" and that the workplace is not a suitable place to breast feed. Older women view bottle feeding as prestigious and a status symbol of modern society. Most mothers are aware of infant formula food advertising, and many believe that formula is a more reliable source of milk than mother's milk due to erratic maternal diets. Some mothers reduce food intake during pregnancy in the belief that this practice will mean a small baby. Cereals, rice and biscuits are considered better for children under 12 months of age than for older children by a majority of mothers regardless of income.

3. DIETARY PRACTICES: Rice is the staple for all income classes. Two meals of rice and curry are eaten daily, with an additional light breakfast of rice, wheat flour or yams. 63% of all calories in the diet come from starches, an unusually low proportion for Asian countries. 70% of total household expenditure is spent on food. Fathers also tend to take the biggest portion of the family meal. The mean length of breast feeding was 17 months. There has been a trend towards a decreasing volume of breast milk beginning at 6 to 8 months. In a 1974 study, 30% of children up to the age of 12 months were exclusively breast fed. 24% of a sample of 170 urban infants 0-24 months in 1980 also were being exclusively breast fed. Many rural mothers report using prelactal feeds after birth, including water, glucose and water, and formula. The highest incidence of malnutrition occurs in children after weaning, usually around the first birthday. A major problem, especially among rural mothers, is prolonged breast feeding without supplementation, and the sudden termination of breast feeding without recourse to suitable weaning foods. In urban areas, participation in the work force has caused an increasing number of mothers to be away from their infants for long periods. Once maternity leave expires, usually during the child's second month, mothers commence supplementation of breast feeding with bottles. At least 21 brands of milk powder are readily available in the Colombo area, along with sweetened, condensed milk.

4. NUTRITION STATUS CORRELATIONS: The prevalence of stunting has been correlated with a larger than average household size and high birth order. The source of water has been found to be the most significant variable associated with infant mortality; the apparent decline in breast feeding was thought to be due to the high cost of living which forced both parents to seek employment. 61% of formally-employed women solely artificially feed their infants compared to 21% in the non-employed group. Since 1961, the national
HIGHLIGHTS (Cont.)

infant mortality rate has been stable at about 50 deaths per 1000 live births, despite increases in the health budget.

5. NUTRITION AND HEALTH POLICIES: An inter-ministerial National Food Policy Coordinating Committee (NFPCC) coordinates all aspects of food distribution, pricing, procurement, processing, imports, exports, buffer stocks and distribution. An inter-ministerial National Food and Nutrition Coordinating Committee advises the government on food and nutrition activities, and coordinates food and nutrition functions. Within the Health Ministry there is a National Food Advisory Committee that deals with food law, its enforcement and implementation, food quality control and surveillance of the food control system. Food, Nutrition and Population Committees have been established in all districts to coordinate food, nutrition and population activities. There is no explicit nutrition policy, yet the provision of adequate food to all sections of the population has been a central government focus. The Government has assumed a responsibility for guaranteeing a basic food supply for all its people. Originally this policy was implemented through a policy of food ration distributing, but now a food stamp system is in effect. The Commissioner of Internal Trade has banned all forms of advertising of infant milk foods and the sale of infant milk foods in containers which do not state "breast feeding is best." A Maternity Benefits Ordinance guarantees a paid maternity leave for a period of 14 days before and 28 days after confinement. Employers of more than a certain number of women are supposed to provide a creche for children under 6 years old. Current nutrition programs of the Food and Nutrition Policy Planning Division of the Ministry of Plan Implementation include mass media programs on nutrition, an adult nutrition education pilot project in six villages, a nutrition curriculum development project to revitalize the teaching of nutrition in primary school and school farm projects in 65 schools to develop small demonstration plots. There are currently about a dozen non-government organizations engaged in community-level nutrition interventions, including CARE, Lanka Jtika Sashodaya Sangamaya, Redd Barna (the Norwegian Save the Children Program), the U.S. Save the Children Fund, the Central Council of the Young Men's Christian Association, the Lanka Mahila Samiti, the International year of the Child Secretariat, the University of Ceylon, the Young Women's Christian Association, World Vision International and the Freedom from Hunger Campaign. The food subsidy program accounts for 12 to 15% of the national budget. Food stamps are issued to households with incomes below 300 rupees per month and are interchangeable for rice, paddy, wheat, flour, bread, sugar, milk foods and dried fish. Thriposh is a fortified food manufactured and distributed under the supervision of CARE to health clinics, estate clinics, outlets of the Social Services Department and certain voluntary agencies. Its free distribution is intended for pregnant and lactating women, infants, preschool children and ward patients. It is also marketed commercially. In 1979 and 1980 54% and 46% of the targeted beneficiaries received Thriposh, which consists of donated instant corn-soya-milk powder. The goal is to phase in pre-cooked local cereals to replace the imported materials. In FY 81 the Government of Sri Lanka paid CARE and the U.S. Government nearly Rs 22 million for Thriposh-related program costs.
1. NUTRITION AND HEALTH STATUS

1.1 NUTRITION AND HEALTH STATUS, GENERAL

RURAL

NUTRITION STATUS: In spite of continued economic growth from 1975 to 1980, the general nutrition status of the population has either remained the same or even deteriorated. (Food and Nutrition, 1980)

ANEMIA: 50% of women sampled on the tea estates had hemoglobin levels below WHO norms for non-pregnant women (120 grams per liter), 80% of the anemias were due to iron deficiency, 12% to iron and folic acid deficiency, 3% to iron and B₁₂ deficiency and 6% to all three. (WHO, 1979)

ANEMIA PREVALENCE: 70% of adult rural women had hemoglobin levels below WHO standards. (WHO, 1979)

1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT

NATIONAL

MATERNAL MORTALITY RATE: The maternal mortality rate was about 1 death per 1000 births in 1976. (Department of Census and Statistics, 1978)

MATERNAL MORTALITY RATE BY DISTRICT: The highest maternal mortality rates in 1977 were found in Nuwara Eliya (2.1 deaths per 1000 live births), Kandy (1.9), Badulla (1.5), Matale and Batticaloa (1.4) and Ratnapura (1.3) according to statistics from the Registrar General's Department. 53% of maternal deaths in 1976 were caused by hemorrhage, toxemia and sepsis. (UNICEF, 1980)

MATERNAL MORTALITY RATE BY DISTRICT: In 1974, the maternal mortality rate for Sri Lanka was recorded as 1.0 deaths per 1000 live births by the Registrar General's Office. The highest rates were in the districts of Kandy (2.6/1000), Nuwara Eliya (2.4/1000) and Matale and Matara (1.6/1000 each). The rates were lowest in Colombo (0.5/1000), Galle (0.6/1000) and Jaffna and Kegalle (0.7/1000). (Department of Census and Statistics, 1978)

MORTALITY RATES BY DISTRICT: In 1972, the highest maternal mortality rates were in Nuwara Eliya and A'pura districts (2.3 deaths per 1000 live births), Kandy (2.2/1000), and Puttalam, Badulla and Monaragala (2.0/1000). (Soyza, 1979b)

MATERNAL MORTALITY RATE TREND: Since 1965, when the maternal mortality rate was 2.4 deaths per 1000 live births, the rate has continued to decline to 1.2/1000 in 1970 and 1.0/1000 in 1975, according to figures from the Registrar General's Office. (Department of Census and Statistics, 1978)
1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT (Cont.)

ANEMIA: In 1976, about 5% (23,490 of 464,112) of pregnant women were severely anemic and another 29% (134,040) were mildly anemic. The highest rates of anemia were in the health districts of Batticaloa (55%), Anuradhapura (54%), and Badulla, Kegalle, and Kalutara (47% each). (Soysa, 1979b)

ANEMIA PREVALENCE: 62% of pregnant women had hemoglobin levels below WHO norms (<110g/1). The mean concentration was 106 g/l. Over half of the women also had below-normal serum iron, serum folate and serum B₁₂ concentrations. (WHO, 1979)

MATERNAL MORBIDITY: High rates of anemias of pregnancy, high pregnancy wastage due to abortion, high rates of toxemias of pregnancy and sepsis in the puerperium all reflect the poor nutritional and health status of women in pregnancy, childbirth and the puerperium. (Soysa, 1979b)

RURAL

CHILD SPACING: The birth interval between the youngest and second youngest child was 3.75 years for women in Pindeniya, 3.3 years in Wattagedara and 3.25 years in Jaffna, according to a 1979 study of about 300 women. (Soysa, 1979b)

URBAN

MATERNAL NUTRITIONAL STATUS AND BIRTH WEIGHT: Low maternal height and weight were related to the 20% of babies born with low birth weight, in the De Soysa Maternity Hospital. (Soysa, 1979b)

CHILD SPACING: The urban women of Borella showed a birth interval of 3.93 years, preserving maternal reserves and permitting recuperation of maternal health. (Soysa, 1979b)

1.3 TARGET GROUP NUTRITION AND HEALTH STATUS, WOMEN, LACTATING

1.4 TARGET GROUP NUTRITION AND HEALTH STATUS, INFANTS 0–6 MONTHS

NATIONAL

NEONATAL MORTALITY: The highest mortality rate is found between the first week and the first month after birth. Infant mortality is highly correlated with the mother's nutritional status and socioeconomic status. (Senanayake, 1979)

INFANT MORTALITY: The high incidence of neonatal mortality is caused by tetanus neonatorum, the result of unsanitary practices in severing the umbilical cord after birth. (Patel, 1980)

INFANT MORTALITY RATE: The infant mortality rate is 52 deaths per 1000 live births, with much regional variation. (Patel, 1980)
INFANT MORTALITY RATE: The infant mortality rate in 1976 was 45 deaths per 1000 births. (Department of Census and Statistics, 1978)

INFANT MORTALITY AND LIFE EXPECTANCY: Infant mortality is estimated to be under fifty deaths per 1000 live births. Life expectancy at birth is over 65, more than 10 years above the Asian average. (Gwatkin, 1979)

INFANT MORTALITY RATE AND LOCATION: The infant mortality rate is highest in the Central Region among the Indian Tamils on the tea and rubber estates, the main cause being poor food habits. (Senanayake, 1979)

INFANT MORTALITY RATES BY DISTRICT: The highest infant mortality rates in 1977 were found in Nuwara Eliya (76 deaths per 1000 live births), Kandy (63), Badulla (61), Ratnapura (56), Matale (53), and Batticaloa (51), according to statistics from the Registrar General's Department. (UNICEF, 1980)

INFANT MORTALITY RATE AND LOCATION: The infant mortality rate is highest in the Central Region among the Indian Tamils on the tea and rubber estates, the main cause being poor food habits. (Senanayake, 1979)

INFANT MORTALITY RATES BY DISTRICT: The highest infant mortality rates in 1977 were found in Nuwara Eliya (76 deaths per 1000 live births), Kandy (63), Badulla (61), Ratnapura (56), Matale (53), and Batticaloa (51), according to statistics from the Registrar General's Department. (UNICEF, 1980)

INFANT MORTALITY BY REGION: In 1971, the highest regional infant mortality rate, 91 per 1000, was found in the central district of Nuwara Eliya. Kandy had a rate of 61, Ratnapura 59 and Budulla 56. The mean for these four districts was 64, which was more than twice that of the four lowest districts, Jaffna, Vavuniya, Puttalam and Kalutara, where the mean rate was 31. (Patel, 1980)

INFANT MORTALITY RATES BY DISTRICT: In 1974, the infant mortality rate for the country was 51.2 deaths per 1000 live births, according to the Registrar General's Office. The rates were lowest in the districts of Jaffna (21.2/1000), Polonnaruwa (23.8/1000), Vavuniya (24.3/1000), and Puttalam (29.3/1000). The highest rates were recorded for the districts of Nuwara Eliya (119/1000), Kandy (31.7/1000), Badulla (72.5/1000), and Ratnapura (66/1000). (Department of Census and Statistics, 1978)

INFANT MORTALITY AND GASTROENTERITIS: Gastroenteritis remains the most important cause of the high and rising rate of infant mortality. (Food and Nutrition, 1980)

MAJOR CAUSES OF INFANT MORTALITY: The five leading causes of infant mortality in 1971-1977 were immaturity, respiratory infection, enteritis and other diarrheal diseases, birth injury and other anoxic conditions, and nutritional deficiency, in that order except that nutritional deficiency was third and fourth respectively in 1974 and 1975. (UNICEF, 1980)

INFANT MORTALITY AND FOOD SUPPLY: Infant mortality rose from 43.1 in 1971 to 48.5 in 1974 as food availability declined from a per capita mean of 2250 calories daily to 1950 calories per day. Most of this increase was among the infants of estate workers who depend on the market for food. (Gwatkin, 1979)

BIRTH WEIGHTS AND MATERNAL STATUS: The mean birth weight for babies of well-nourished mothers was 7.2 lbs, and 6.0 lbs for babies of low income mothers (less than Rs 200/-) in a review of 1970 clinic data from
1.4 TARGET GROUP NUTRITION AND HEALTH STATUS, INFANTS 0–6 MONTHS (Cont.)

Anuradhapurn and Abeyratna. The birth weights of 20% of the well-nourished and 24% of the low income group infants were under 5.5 lbs (2500 grams). (Senanayake, 1979)

LOW BIRTH WEIGHT AND HIGH PARITY: The incidence of low birth weight babies increases after the third pregnancy, due to exhausted maternal resources. (Soysa, 1979b)

URBAN

PEM PREVALENCE - KIRILLAPONE: 4% of the 0–12 month old children of Kirillapone sampled (N=25) had second or third degree malnutrition in an October 1981 survey. 28% showed first degree malnutrition (Gomez classification). An urban development project with a supplementary feeding component had been in effect since May 1980. (Berggren and Abeyakoon, 1981)

LOW BIRTH WEIGHT: Over 20% of babies born in the De Soysa Maternity Hospital are of low birth weight (under 2500 grams), with about 80% of these being small for gestational age. Low birth weight was related to poor maternal height and weight. (Soysa, 1979b)

1.5 TARGET GROUP NUTRITION AND HEALTH STATUS, INFANTS 6–24 MONTHS

NATIONAL

CHILD MORTALITY AS PERCENT OF TOTAL DEATHS: Since 1965, when 32.2% of all deaths were children under 5 years, the rate declined to 27% in 1970 and 22.2% in 1975, according to the Registrar General’s Office. (Department of Census and Statistics, 1978)

REGIONAL MALNUTRITION RANKINGS: Using the combined ranking of health districts by height for age, height for weight and weight for age growth indices, rural Colombo, Jaffna and Puttalam have the least PEM and Kandy and Ratnapura have the most. Kandy and Ratnapura areas also have the largest estate populations. (Government of Sri Lanka, 1976)

ACUTE UNDERNUTRITION (WASTING): 6.6% of the national sample of 13,450 children aged 6–71 months were classified as acutely undernourished (wasted) using the criteria of weight for height less than 90% of the reference median. Significant variations from this weighted average prevalence were apparent among the 15 districts sampled; for example, Jaffna at 3.7% and Colombo at 4.9% represented the low extreme and Ratnapura at 8.8%, Kandy at 8.5%, Batticaloa at 8.4% and Galle at 8.2% the high extreme. (Government of Sri Lanka, 1976)

ACUTE UNDERNUTRITION (WASTING) BY AGE: The highest prevalence of acute undernutrition was found among children aged 12–23 months (10.8%); only 5% or the 6–11 month old children were wasted and 6.9% of the 24–35 month age group were so classed. (Government of Sri Lanka, 1976)
CHRONIC MALNUTRITION (STUNTING) BY SECTOR: Height for age measurements indicated the prevalence of nutritional stunting in the Rural Estate Sector (62.4%) to be more than double that in the rural village sectors (30.8%). The same age-dependent increase in the prevalence of stunting is apparent in the estate children (n=1,130) as in the total survey sample (n=13,450), except that the rates are about double the rural village rates. (Government of Sri Lanka, 1976)

CHRONIC UNDERNUTRITION (STUNTING) BY AGE: Chronic undernutrition increases with age in a consistent pattern: 11.8% of 6-11 month olds are stunted; 24.8% of 12-23 month olds, 33.1% of 24-35 month olds, 40.8% of 36-47 month olds, 41.9% of 48-59 month olds, and 46.2% of 60-71 month olds have heights for age less than 90% of the reference median. (Government of Sri Lanka, 1976)

CONCURRENT ACUTE AND CHRONIC UNDERNUTRITION BY AGE: The percentage of acutely and chronically undernourished children was lowest among children 6-11 months old (1.6%), and was 3.8% at 12-23 months, 4.0% at 24-35 months, 3.4% at 36-47 months, 2.6% at 48-59 months, and 3.9% at 60-71 months. (Government of Sri Lanka, 1976)

SEVERE MALNUTRITION (WEIGHT FOR AGE) BY AGE: Age distribution of survey children with second and third degree malnutrition (Gomez classifications) indicate a trend of increasing prevalence as the children's ages increase. Children in the 6-11 month age group have the lowest rates at 26.2% and those in the 60-71 month group have the highest prevalence at 57.3%. (Government of Sri Lanka, 1976)

MALNUTRITION: 38% of the 13,450 rural survey children 6-71 months of age were classified as malnourished (stunting, wasting, and both stunting and wasting) using Waterlow categories. This contrasts with the sample of 438 special Colombo children 48-71 months of age exhibiting only 4.8% malnourished and the National Academy of Science reference population exhibiting 1.3% malnourished. In the subsample of rural estate children (n=1130), 65% were malnourished. (Government of Sri Lanka, 1976)

MARASMUS AND KWASHIORKOR: Of 3,700 preschool children examined, 2% showed clinical marasmus and 0.5% presented with clinical kwashiorkor in a 1974 CARE survey of nine health districts. (Government of Sri Lanka, 1976)

MARASMUS AND KWASHIORKOR: Hospital admissions of children who showed signs of kwashiorkor increased between 1950 and 1954 and again between 1967 and 1974 in the Children's Hospital, Colombo. The proportion of admissions for marasmus remained stable in the 1967 to 1974 period, but the proportion of less severely undernourished children admitted showed a slight increase. (Government of Sri Lanka, 1976)

MALNUTRITION AND MORBIDITY: The incidence of morbidity due to malnutrition in Sri Lanka is apparently increasing. (Austin, 1981)
ANEMIA: The true prevalence of anemia in rural Sri Lanka cannot be determined from the nutrition survey data of 1976, since hemoglobin measurements appeared to be unreliable. High prevalences (7-25%) of anemia were determined in four of the SHS areas with the best anthropometric indices. The other 11 SHS areas had an average anemia prevalence of 3.8% with a range of 1.1% to 6.7%. The strongest conclusion that can be drawn appears to be that there are no practical differences in anemia prevalences between age groups or between village and estate sectors. (Government of Sri Lanka, 1976)

PAST VITAMIN A DEFICIENCY: A 1939-1942 study in the Civil Hospital in Kandy showed high levels of blindness in children caused by keratomalacia. A review of cases of blindness at a Jaffna eye clinic in 1950-2 showed a much lower proportion of blindness among children due to keratomalacia. Data from the Colombo eye clinic between 1964 and 1974 showed a decrease in the percentage of children with signs of keratomalacia and Bitot's spots. (Government of Sri Lanka, 1976)

MAJOR CAUSES OF MORBIDITY: Diarrheal diseases, respiratory infections, anemia and malnutrition, other infectious diseases and accidents, in descending order, are the major causes of disease among children 1 to 4 years of age. (UNICEF, 1980)

PARASITES: 50% of all children under ten years old have some kind of worm infestation which usually begins after the first year. Almost 100% of the children have other parasites. (Austin, 1981)

RURAL

ACUTE UNDERNUTRITION PREVALENCE: 1980 nutritional status surveys in six priority development districts showed the following prevalences of acute undernutrition (weight for height) among rural preschool children 6-59 months old: Vavuniya, 4.6%; Matale, 4.7%; Nuwara-Eliya, 5.6%; Kurunegala, 8.3%; Moneragala, 8.7%; and Puttalam, 10.2%. In Nuwara-Eliya, the estate sample had a 2.4% prevalence. (Food and Nutrition, 1980)

ACUTE UNDERNUTRITION PREVALENCE: In 1979 nutritional status surveys in Hambantota and Matara districts, the prevalences of acute undernutrition (weight for height) were 6.3% and 5.0% respectively. (Food and Nutrition, 1980)

ACUTE UNDERNUTRITION BY AGE: In the 1979-80 nutritional status surveys of 8 districts, the highest prevalences (6-17%) of acute undernutrition among 6-72 month old preschool children occurred during the 13-24 month age period in 4 of the 8 districts (Kurunegala, Matale, Puttalam, Moneragala and Matara). In two districts, the highest rates were among the 6-12 month old age group: Vavuniya, 18% and Nuwara-Eliya, 17% among the rural sector and 7% among the estate sector. In Hambantota district, the 25-36 month old age group had the highest rate, 14%. (Food and Nutrition, 1980)
ACUTE UNDERNUTRITION BY SECTOR: Acute malnutrition (weight for height below 80% of reference median) was found to be more prevalent in the rural estate sector (8.6%) than in the rural village sectors (6.3%). The prevalences were higher in five of the six age groups with the largest differences being in the 36-47 month and 12-23 month age groups. The estate sector comprised 8.4% (n=1,130) of the 13,450 total preschool sample, and is predominantly Indian Tamil peoples. (Government of Sri Lanka, 1976)

ACUTE UNDERNUTRITION PREVALENCE - MAHAWELI AREA: The average prevalence of acute undernutrition (<80% of NAS reference median weight for height) was 19.6% among a non-representative sample of 713 preschool children (6-59 months old) in the six study areas of the Mahaweli area in 1980. The rates ranged from 12.5% to 22.5%. These data are in sharp contrast to the 1975/6 national average of 6.6%, but the different survey methodologies preclude direct comparison. (Food and Nutrition, 1980)

APPARENT ACUTE UNDERNUTRITION TREND - KURUNEGALA: In the 1975/6 survey of Kurunegala health district, 5.7% of the preschool children examined had acute undernutrition, but in the 1980 survey, 8.3% of the preschool children were acutely undernourished. The different survey methodologies make clear comparisons impossible, but these figures suggest that the three year income-generating activities in the area have yet to affect environmental sanitation and health care. (Food and Nutrition, 1980)

CHRONIC UNDERNUTRITION (STUNTING): 34.7% of the total rural survey sample of 13,450 6-71 month old children were classified as stunted (height for age less than 90% of the reference median). Significant variations existed among the 15 SHS areas with Colombo and Puttalam (20.7% and 24.4% respectively) at the low extreme and Kandy and Badulla (49.6% and 49.4% respectively) at the high extreme. (Government of Sri Lanka, 1976)

CHRONIC UNDERNUTRITION PREVALENCE: Nutritional status surveys in six priority development districts during 1980 showed the following rural rates of "chronic undernutrition" (not defined) among preschool children: Puttalam, 15%; Kurunegala, 15.5%; Moneragala, 17.9%; Vavuniya, 22%; Matale, 22.1%; and Nuwara Eliya, 34.6%. In the estate sector of Nuwara Eliya, the rate of chronic undernutrition was 49.2%, suggesting that the nutritional situation is still worse in the estate sector. (Food and Nutrition, 1980)

CHRONIC UNDERNUTRITION PREVALENCE: Nutritional status surveys in Hambantota and Matara during 1979 showed a prevalence of chronic undernutrition (not defined) among preschool children 6-72 months old of 23.8% and 22% respectively. (Food and Nutrition, 1980)

CHRONIC UNDERNUTRITION PREVALENCE - MAHAWELI AREA: The average prevalence of chronic undernutrition (<90% of reference standard height for age) was 30.4% among a 1980 non-representative sample of 713 preschool children 6-59 months old in the six study areas of Mahaweli area. The rates ranged from 24.7% to 38.5%. (Food and Nutrition, 1980)
1.5 TARGET GROUP NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS (Cont.)

APPARENT CHRONIC UNDERNUTRITION TREND - KURUNEGALA: 30.4% of preschool children surveyed in the Kurunegala health district in 1975/6 were chronically undernourished, but in the 1980 survey, 15.5% were chronically undernourished. Although the different survey methodologies make the data not strictly comparable, there is good reason to suspect a real improvement given the vast income-generating activities that have been in operation for the last three years. (Food and Nutrition, 1980)

CONCURRENT ACUTE AND CHRONIC UNDERNUTRITION: Between 1.4% and 4.3% of the rural preschool children surveyed had concurrent acute and chronic undernutrition in the 8 districts studied. The district rates were 1.4% in Hambantota, 1.8% in Matara, 2.0% in Matale, 2.6% in both Kurunegala and Nuwara-Eliya, 3.1% in the estate sector of Nuwara-Eliya, 4.0% in Puttalam, and 4.3% in Vavuniya. (Food and Nutrition, 1980)

CONCURRENT ACUTE AND CHRONIC UNDERNUTRITION: In the rural population of Sri Lanka an average of 3.4% of the children 6-71 months of age suffered both stunting and wasting (as measured by height for age below 90% of the reference median and weight for height below 80% of reference median). There was a statistically significant variation among the SHS areas even though the overall prevalence was low: Jaffna at 1.6% and Puttalam and Colombo at 1.9% represented the low extreme and Kandy at 5.5% was the high extreme. (Government of Sri Lanka, 1976)

PEM PREVALENCE TREND -- KANDY: In the 1975/6 survey, the Kandy health district (which included the Nuwara-Eliya district) recorded the highest prevalence of PEM, due in part to the large estate population. The 1980 survey shows an apparent reduction in the rates of acute undernutrition and concurrent acute and chronic undernutrition among the preschool children of both the rural and estate sectors of Nuwara-Eliya, but the two survey methodologies do not allow clear comparisons. (Food and Nutrition, 1980)

APPARENT PEM PREVALENCE TREND: In Kurunegala and Puttalam districts, the prevalence of concurrent acute and chronic undernutrition has shown an apparent increase from the 1975/6 survey to the 1980 survey, but the different methodologies make clear comparisons impossible. (Food and Nutrition, 1980)

WEIGHT FOR AGE: An average of 42.0% of Sri Lanka's rural children aged 6-71 months suffered from Gomez classification second and third degree malnutrition (weight for age less than 75% of the reference median). Significant regional differences existed with Colombo, Jaffna and Puttalam having relatively low prevalences and Kandy and Badulla having high prevalences. Only 9.2% of the total sample were found to be normal and 48.8% had first degree malnutrition. (Government of Sri Lanka, 1976)

WEIGHT FOR AGE: The rates of severe malnutrition (as measured by combining second and third degree Gomez categories of weight for age) were 38.9% of village survey children and 63% of estate survey children. Whereas 10% of village children were considered anthropometrically
normal, only 3% of the estate children were so considered. In addition, the rate of third degree malnutrition was 9.1% in the estate sample and only 3.1% in the larger rural village sample. (Government of Sri Lanka, 1976)

ARM CIRCUMFERENCE FOR HEIGHT: 3.1% of the rural survey children had arm circumference for height below 82.5% of the U.S. Ten State Nutrition Survey reference median. The 12-23 month olds and the 60-71 month olds were the only age groups with higher than average prevalences (3.8% and 4.0% respectively). The same basic regional differences were found as with other anthropometric indices. (Government of Sri Lanka, 1976)

KWASHIORKOR: Of all the rural children surveyed (n=13,450), only 0.2% showed a key symptom of kwashiorkor, bilateral pedal edema. Among those children classified as concurrently stunted and wasted, 1.9% showed pedal edema. The country-wide prevalence was very low with no significant regional variation. (Government of Sri Lanka, 1976)

VITAMIN A DEFICIENCY: The overall prevalence of clinical signs of vitamin A deficiency (chiefly Bitot's spots) is low in the preschool populations of the 8 districts surveyed in 1979/80, below the prevalence rate considered by the WHO to be of "public health significance." (Food and Nutrition, 1980)

CLINICAL VITAMIN A DEFICIENCY: .05% of rural survey children experience unilateral or bilateral corneal scarring, possibly attributable to vitamin A deficiency. This low prevalence is one half the criterion prevalence considered significant by recent WHO guidelines. In addition, only 0.1% of all surveyed children had monocular or binocular blindness (due primarily to congenital causes). (Government of Sri Lanka, 1976)

CLINICAL VITAMIN A DEFICIENCY - BITOT'S SPOTS: Only 1.1% of rural survey children were found to have unilateral or bilateral Bitot's spots. This is one-half the percentage prevalence considered significant by recent WHO guidelines. The Kegalle and Matara areas had the highest prevalences (2.3 and 2.2% respectively), which exceeded the WHO minimum criteria (p<.05). There was also an increasing prevalence of Bitot's spots with increasing age among the rural survey children. (Government of Sri Lanka, 1976)

VITAMIN A DEFICIENCY BY SECTOR: Rural village estate sector prevalences of clinical vitamin A deficiency (as indicated by Bitot's spots) and symptoms of night blindness do not differ significantly. (Government of Sri Lanka, 1976)

DIARRHEA AND FEVER - MAHAWELE AREA: One third of the households surveyed had an incident of diarrhea, fever, or both during the previous month, among preschool children, according to the 1980 survey of 204 households in the Mahaweli area. (Food and Nutrition, 1980)
MALNUTRITION: 41% of the 32 preschool children sampled suffered from chronic malnutrition and 12.5% from acute malnutrition, according to a 1979 Medical Research Institute anthropometric survey in Kirillapone, Colombo. (Karunanayake, 1982)

SEASONAL MALNUTRITION - KIRRILLAPONE: Malnutrition among children 0-11 years old in Kirillapone increased during the month of July due to the heavy rains which result in low income generation, decreased availability of rice, coconuts and green vegetables with consequent higher prices, and increased diarrhea and upper respiratory diseases. (Berggren and Abeyakoon, 1981)

PEM PREVALENCE - KIRRILLAPONE: 38% of the 1 to 4 year old children of Kirillapone suffered second or third degree malnutrition (Gomez Classification) according to an October 1981 survey of 222 children. Another 40% showed first degree malnutrition. An urban development project with a supplementary feeding component had been in effect since May 1980. (Berggren and Abeyakoon, 1981)

PEM PREVALENCE - KIRRILLAPONE: 99% of preschool children (254 of 256) were suffering from first, second or third degree malnutrition (Gomez classification, weight for age) in an April 1980 survey of Kirillapone. (Ali Khan, 1981)

PEM AND THRIPOSHA - KIRRILLAPONE: In an April 1980 baseline survey of 184 preschool children, 11% were classed as normal (Gomez classification, weight for age), 52% were classed as having first degree malnutrition, 35% had second degree and 2% had third degree malnutrition. After 11 months of a Thriposha (high protein-fortified cereal) intervention (first as packets and then as prepared meals), only 5% of the children were still considered normal; 46% were classed as having first degree malnutrition; 48%, second degree; and 1%, third degree malnutrition. (Ali Khan, 1981)

WEIGHT - KIRRILLAPONE: In October 1981, 70% of preschool children under five years old in the Kirillapone project area had gained weight since their previous weighing. Of the 30% whose weight was faltering, recent diarrheas and upper respiratory infections accounted for a large part of the problem. Only 1% of preschool children had third degree malnutrition. (Berggren and Abeyakoon, 1981)

2. DIETARY BELIEFS

2.1 DIETARY BELIEFS, GENERAL

NATIONAL

FOOD BELIEFS: Cereals, rice and biscuits were considered better for children under 12 months of age than for older children by a majority of mothers regardless of income. However, with decreasing income, mothers expressed less confidence in the nutritional value of cereal foods for the youngest children. (Austin, 1981)

2.2 DIETARY BELIEFS ABOUT PREGNANCY

NATIONAL

MOTHER DIETING: Some mothers diet during pregnancy in the belief that this will avoid a large baby. (Senanayake, 1979)

2.3 DIETARY BELIEFS ABOUT LACTATION

NATIONAL

KNOWLEDGE AND ATTITUDES: Mothers did not know how long they should breast feed (although they did so for over a year), and they preferred to breast feed with some privacy within the home, according to 1979 interviews in one urban area and three rural areas. (Soysa, 1979b)

"TABOOS" FOR LACTATING MOTHERS: Food "taboos" mentioned for lactating mothers included fruits (such as pineapples and mangoes), crabs, blood fish, eggplant, certain yams like cassava, legumes, curd (yogurt) and beef. (Soysa, 1979a)

URBAN

ATTITUDES TOWARD BREAST FEEDING AND EMPLOYMENT: In discussions with women at 10 working locations around Kotte Urban Council area, women expressed the attitudes that nursing was a "personal matter" and that the workplace was not a suitable place to breast feed. Early weaning was accepted as a condition of employment. (Marchione and Helsing, 1981)

WORKING MOTHERS AND BREAST FEEDING: Women expressed a desire to breast feed, but participation in the work force with long commuting distances has caused an increasing number of mothers to be away from their infants for long periods. (Soysa, 1979a)

IDEAL DURATION OF BREAST FEEDING: A sample of 170 peri-urban mothers considered the ideal duration for breast feeding to be over 12 months, but a clear difference was apparent between the ideal and the actual practices. (Marchione and Helsing, 1981)
2.4 DIETARY BELIEFS ABOUT BREAST MILK SUBSTITUTES (INCLUDING BOTTLE FEEDING)

NATIONAL

ATTITUDES TOWARD BOTTLE FEEDING: Older women viewed bottle feeding as prestigious and a status symbol of the modern society. (Soysa, 1979a)

THRIPOSHA AS A FAMILY FOOD: Thriposha is considered a "supplementary food" for the whole family rather than for weaning purposes according to interviewed mothers. (Food and Nutrition, 1980)

URBAN

INFANT FORMULA ADVERTISING AND MOTHERS' ATTITUDES: Nearly all mothers (95%) were aware of infant formula food advertising: 34% saw it in the mass media, 40% in stores, and 26% in health institutions. Mothers in Kotte Urban Council area (Colombo) expressed a dependence on formula milk because they felt it was a more reliable source of milk than mother's milk due to erratic maternal diets. (Marchione and Helsing, 1981)

2.5 DIETARY BELIEFS ABOUT WEANING

NATIONAL

MILK AND RICE: Sri Lankan mothers believe that children should not be given milk when they start eating rice because the combination is thought to cause worm infestation. (Austin, 1981)
3. DIETARY PRACTICES

3.1 DIETARY PRACTICES, GENERAL

NATIONAL

STAPLE DIET: Rice is the staple for all income classes. In 1973, the per capita intake was 97 kg. Two meals of rice and curry are eaten daily, with an additional light breakfast of rice, wheat flour or yams. Milk consumption, although low, is increasing. (Austin, 1981)

STAPLE DIET: Boiled rice is consumed with curried vegetables, fish or meat, cooked with coconut milk and served with condiments. Lower income groups eat more rice and fewer dairy products. (Austin, 1981)

PREVALENCE OF CEREALS AND TUBERS IN THE DIET: 63% of all calories in the Sri Lankan diet come from starches, an unusually low proportion for Asian countries. (Gwatkin, 1979)

PATTERNS OF FOOD CONSUMPTION BY INCOME GROUPS: 32.7% of the average household's expenditures in 1980 were spent for cereals, 4.3% for fish and meat, 2.7% for milk, 7.2% for sugar and jaggery, and 8.9% for alcohol and tobacco. Among the poor income groups, the cereal share is about 34%, while for the upper income group, it is only about 19%. Conversely, only 3 to 4% of the poor's food expenditures were for fish and meat, while the figure for the upper income groups was 6 to 8%. Alcohol and tobacco have been accorded a high priority compared with valuable foods, particularly in the poor income groups. (Food and Nutrition, 1980)

USE OF FOOD STAMPS: Between 77% and 91% of food stamps were spent on rice (including paddy) in the six districts surveyed. Milk food purchases were low in all districts (2.7% to 15.2%). Low income households (<Rs 100) spent less than 5% of food stamps on milk, while among the higher income groups, the highest percent recorded for milk purchases was less than 30%. This suggests that the stamps are used to buy foods that can be consumed by the whole household rather than only by children. Sugar, another expensive commodity, was purchased by only 4% to 11% of households. (Food and Nutrition, 1980)

PROTEIN AVAILABILITY: Per capita protein availability has been estimated to be 40-45 grams per day, one of the lowest in Asia. Between the early 1960s and the mid 1970s, protein availability remained roughly constant, or slightly decreased. (Gwatkin, 1979)

FISH PROTEIN: Approximately 3.5 grams of fish protein are consumed daily per capita. (Gwatkin, 1979)

FISHING: Fishing supplies almost 70% of the islanders' animal protein food. (Lawton, 1979)

FRUIT CONSUMPTION: Approximately one third of the required vitamin C and almost all of the vitamin A requirement is provided through bananas, plantains and mangoes. These fruits contribute as much as 64 calories daily to the average diet. (Gwatkin, 1979)
3.1 DIETARY PRACTICES, GENERAL (Cont.)

FAT INTAKE: 45 grams of fat are consumed daily by the average Sri Lankan, including 40 grams from coconuts and coconut oil. (Gwatkin, 1979)

HOUSEHOLD FOOD EXPENDITURES: Preliminary data from 1980 suggest that 70% of the total household expenditure is spent on food. In the urban sector, the percentage is 63%; in the rural sector, 69.6%; and in the estate sector, 76.7%. (Food and Nutrition, 1980)

HOUSEHOLD FOOD EXPENDITURES: According to the Government’s Socio-Economic Survey in 1969-70, the average annual household food expenditure was 194 rupees, which was 61% of the average total household expenditure. For households with incomes under 200 rupees, 71% of the total expenditures were for food. For the income group 200-399 rupees, 65% of expenditures were for food. (Department of Census and Statistics, 1978)

PRIORITY OF FATHERS: Fathers tend to take the best part of the family meal, leaving the less valuable food for mothers and children. (Austin, 1981)

WOMEN’S WORK LOAD: Time allocation studies revealed that women usually started the day at 4:30 a.m., with the hours up to noon spent in food preparation, household tasks, caring for the children and attending to the needs of the husband. The pattern was repeated for the second half of the day with women retiring around 10:30 p.m. The amount of labor and effort extended by women in maintaining family life far exceeds that of men. (Dias, 1979)

CALORIE INTAKE: During the 1960s and early 1970s, the average per capita daily intake was estimated to be between 1950 and 2300 calories. Current intakes are equal to or lower than this amount. (Gwatkin, 1979)

CALORIE INTAKES: In a 1969/70 household consumption survey, per capita daily intake was about 2250 calories. Only 35% of the sample received less than 2200 calories daily and 5% had intakes less than 1900 calories. At the other extreme, 10% of the sample had intakes exceeding 2500 calories. (Gwatkin, 1979)

CALORIE INTAKE DECLINE: A 1973 household consumption survey showed a 15% decline in calorie intake from 1969/70, to a per capita intake of about 1950 calories daily. During this decline, an equitable pattern of distribution remained, with 3% of the sample receiving fewer than 1700 calories and 5% consuming more than 2200 calories. (Gwatkin, 1979)

PROTEIN AND CALORIE INTAKE: According to a 1969-70 survey, the per capita intake of protein was 89% of the recommended daily allowance of 45 grams. For families with incomes lower than 100 Rupees, the per capita calorie intake was 88% of the RDA of 2200 calories. Higher income groups appeared to have adequate intake. (Austin, 1981)
NUTRIENT INTAKE: According to the 1969-70 socioeconomic survey, the average consumption for all income groups is 72% of the RDA for calcium, 57% of the RDA for riboflavin, and 86% of the RDA for vitamin A. Calcium and riboflavin deficiencies are more pronounced among low income groups. (Austin, 1981)

RURAL

HOUSEHOLD FOOD EXPENDITURE: In 1969-70, the average household food expenditure was 62% of the average total household expenditure in the rural sector, and 68% of the average total expenditure in the estate sector. For the lowest income group, with under 200 rupees per month, 71% of expenditures were for food in both the rural and estate sectors. (Department of Census and Statistics, 1978)

URBAN

TYPICAL MEAL PATTERN: A typical family in the urban shanty Kirillapone consumes only one adequate meal per day, in the evening, an inadequate breakfast (tea or milk and bread), and perhaps no lunch. Thriposha gruel or "snack" biscuits distributed at midday are consumed by small children in many families, but distribution is incomplete, and portions of distributed foods are sold. (Berggren and Abeyakoon, 1981)

HOUSEHOLD FOOD EXPENDITURES: The average urban household food expenditure was 248 rupees in 1969-70, which was 53% of the average total household expenditure. Among the low income groups (under 200 rupees and 200-399 rupees) the average food expenditures were 69% and 65% of the total household expenditure. (Department of Census and Statistics, 1978)

FOOD PRICE INFLATION: The price of rice doubled from September 1979 to November 1981 in the Kirillapone Shanty area of Colombo. (Berggren and Abeyakoon, 1981)

3.2 DIETARY PRACTICES, WOMEN

3.2.1 DIETARY PRACTICES, WOMEN, DURING PREGNANCY

3.2.2 DIETARY PRACTICES, WOMEN, DURING LACTATION

URBAN

WORKING MOTHERS AND BREAST FEEDING: Women expressed a desire to breast feed, but participation in the work force with long commuting distances has caused an increasing number of mothers to be away from their infants for long periods. (Soysa, 1979a)
3.3 DIETARY PRACTICES, INFANTS, 0-24 MONTHS

3.3.1 DIETARY PRACTICES, INFANTS 0-24 MONTHS, BREAST FEEDING

**NATIONAL**

**INITIATION OF BREAST FEEDING:** In the World Fertility Survey of 3223 children under one year of age, 96.2% of the children were breast fed. For the 2698 children four years old and older, 94.3% had been breast fed. No rural-urban differences seemed to exist. (Popkin et al., 1979)

**INITIATION OF BREAST FEEDING:** Using the World Fertility Survey data on 1146 children less than four years of age and on 4148 children four years and older (all next-to-last closed intervals), 94.4% and 94.5% respectively, were initially breast fed. (Popkin et al., 1979)

**DURATION OF BREAST FEEDING:** The mean of length of breast feeding was 17 months among 5,099 women interviewed in a 1975 fertility survey. Only 5% of the women claimed not to have breast fed their next-to-last child at all. 10% reported breast feeding for 6 months or less. A total of 50% of mothers were not lactating by the end of the first year. 13% reported breast feeding for 18 months; 18% reported breast feeding for 18 to 24 months and 14% claimed to have breast fed for longer than 24 months. (International Statistical Institute, 1978)

**DURATION OF BREAST FEEDING:** A 1975 study carried out by the Family Health Bureau found that 88% of children were breast fed for at least six months, 72% were breast fed for twelve months or more, and 56% were breast fed for at least 18 months. In another study of 50 children, 50% were breast fed for over six months and 10% were breast fed for less than two months. (Senanayake, 1979)

**TRENDS IN DURATION OF BREAST FEEDING:** Among the World Fertility Survey sample of children who had been breast fed, the mean duration of breast feeding the next-to-last (closed interval) child declined from 18.8 months for those born four or more years earlier to 13.0 months for children born less than four years earlier. (Popkin et al., 1979)

**BREAST FEEDING AND REGION:** The mean duration of breast feeding varied from 10.3 months in metropolitan Colombo to 16.5 months in the districts of Trincomalee, Batticaloa and part of Amparai. In the southwestern lowlands, the mean duration was 12.7 months; in Zone III, 14.9 months; Zone V, 14.6 months; and in Zone VI, 15.4 months. (International Statistical Institute, 1978)

**DURATION OF BREAST FEEDING AND RELIGION:** Hindu and Muslim mothers breast fed for a mean of 15 to 15.5 months while Buddhist mothers averaged 14 months, and Christian mothers averaged 12.5 months. (International Statistical Institute, 1978)

**DURATION OF BREAST FEEDING AND ETHNIC GROUPS:** The mean duration of breast feeding within each of the four ethnic groups was: Sinhalese 13.8 months, Sri Lanka Tamil 14.7 months; Indian Tamil 15.2 months; and Sri Lanka Moor 15.7 months. (International Statistical Institute, 1978)
DURATION OF BREAST FEEDING AND EDUCATION: There was an inverse relationship between duration of breast feeding and level of education: mothers with no education breast fed for an average of 16.2 months; mothers with from 1 to 5 years of education breast fed an average of 15.2 months; from 6 to 9 years of education, 12.5 months; and 10 or more years of education, 10.1 months. (International Statistical Institute, 1978)

DURATION OF BREAST FEEDING AND MOTHER'S AGE: The mean duration of breast feeding decreased as the age of the mother increased, from 19.4 months for mothers aged 45 to 49 to 14.2 for mothers under 25 years old. This pattern probably reflects a historical decline in the popularity of prolonged breast feeding, though no trend toward exclusive reliance on bottle feeding is discernible. (International Statistical Institute, 1978)

BREAST FEEDING AND AGE: Over half of all babies ever breast fed were still being breast fed at 24 months of age. 89% were being breast fed at 6 months of age, 77% at 12 months, 70% at 18 months and 39% were still being breast fed at 36 months, according to data from the World Fertility Survey. (Popkin et al., 1979)

BREAST FEEDING AND AGE: In a 1974 study, 30% of children up to the age of 12 months were exclusively breast fed; 21% were partially breast fed and partially artificially fed; 14% were partially breast fed and also given solids; 21% were given a combination of partial breast feeding, artificial feeding and solids; and 14% did not receive breast milk. Of the children 13-24 months old, 6% were exclusively breast fed and an additional 48% were partially breast fed. In the 24-36 month age group, only 1% of the children were exclusively breast fed and 8% were partially breast fed. (Senanayake, 1979)

PRELACTAL FEEDINGS: In the 1940s, infants were customarily fed only castor oil and sugar for the first three days after birth. This often resulted in severe digestive disturbances and interfered with the mother's lactation. (Patel, 1980)

VOLUME OF BREAST MILK: There has been a trend towards a decreasing volume of breast milk from around 6-8 months, whereas previously the decrease in volume had been observed at around 10-14 months. (Senanayake, 1979)

RURAL

BREAST FEEDING INITIATION: The majority of mothers breast fed immediately after birth in a study of Tamil, Sinhala and Muslim villages. Others gave water, glucose and water, or milk. 52% fed on demand and 37% on schedule. (Soysa, 1979a)
3.3.1 DIETARY PRACTICES, INFANTS 0-24 MONTHS, BREAST FEEDING (Cont.)

BREAST FEEDING IMMEDIATELY AFTER BIRTH: In Pindeniya, 94% of mothers (N=84) breast fed their youngest child immediately after birth; in Wattegedara, 60% of mothers (N=60) did, and in Jaffna, only 28% of mothers (N=76) did. (Soysa, 1979b)

PRELACTAL FEEDS: All mothers reported prelactal feeds after birth for their youngest child in the three rural villages surveyed. Water was used in 96% of cases in Jaffna, 37% in Pindeniya and 30% in Wattegedara. Glucose in water was used in 1%, 42%, and 42% of the cases in Jaffna, Pinedniya and Wattegedara respectively. Milk formula was used in 3%, 21% and 27% of the cases respectively. (Soysa, 1979b)

FEEDING SCHEDULES: Most of the mothers interviewed who were still breast feeding were feeding on demand in Jaffna and Wattegedara, but a majority of the mothers in Pinedniya were feeding on schedule, according to 1979 field studies. (Soysa, 1979b)

BREAST FEEDING PERCENTAGE BY AGE: Among the World Fertility Survey sample of children who had ever been breast fed, 90% of the rural 6 month olds, 80% of the 12 month olds, 74% of the 18 month olds, 57% of the 24 month olds and 41% of the 36 month old children were breast fed. (Popkin et al., 1979)

DURATION OF BREAST FEEDING: The mean duration of breast feeding the next-to-last child four or more years old was 18.8 months in the rural areas. For the child less than four years of age, the figure declined to 13.3 months, according to an analysis of data from the World Fertility Survey. (Popkin et al., 1979)

DURATION OF BREAST FEEDING: The mean duration of breast feeding was 15.2 months among the total rural sample of the World Fertility Survey. (International Statistical Institute, 1978)

DURATION OF BREAST FEEDING: In Pindeniya, babies were breast fed for an average of 87 weeks, in Jaffna, for 65.4 weeks, and in Wattegedara, for 63.6 weeks, according to 1979 field studies. (Soysa, 1979b)

URBAN

BREAST FEEDING PATTERNS: In Borella, 93% of women (N=94) breast fed their youngest child immediately after birth. All mothers offered prelactal feeds after birth: 30% with water, 60% with glucose and 11% with milk formula. The average duration of breast feeding was 77.6 weeks. Of the 9 mothers who were presently breast feeding children under two, 6 were feeding on schedule, only one fed less than three times during working hours, and all fed at least twice during the mother's sleeping hours. (Soysa, 1979b)

INITIATION OF BREAST FEEDING: Over 90% of the 170 mothers surveyed in a peri-urban area of Colombo initiated breast feeding. (Marchione and Helsing, 1981)
EXCLUSIVE BREAST FEEDING: At the time of the survey, 24% of the 170 0-24 month old infants were exclusively breast fed among a sample of 170 mother-infant dyads in a peri-urban area around Colombo. Only one third of the total sample exclusively breast fed for more than one month. (Marchione and Helsing, 1981)

BREAST FEEDING AND AGE: Among the World Fertility Survey sample of children who had ever been breast fed, 81% of the urban six month olds, 62% of the twelve month olds, 54% of the 18 month olds, 37% of the 24 month olds and 27% of the 36 month old children were still breast fed. (Popkin et al., 1979)

BREAST FEEDING AND INCOME: 10% of the upper and middle income mothers did not initiate breast feeding, 30% breast fed up to 3 months and 50% up to 6 months. Reasons given for not breast feeding were that mothers worked or had no milk, as reported in a Colombo study. (Soysa, 1979a)

DURATION OF BREAST FEEDING: The mean duration of breast feeding the next-to-last child four or more years old was 15.1 months in the urban areas. For the child less than four years of age, the figure declined to 12.0 months, according to data from the World Fertility Survey. (Popkin et al., 1979)

DURATION OF BREAST FEEDING: The mean duration of breast feeding was 11.9 months among the total urban sample in the fertility survey. (International Statistical Institute, 1978)

MIXED FEEDING: 58% of the 170 peri-urban mothers sampled were combining breast and artificial feeding of their 0-24 month old children at the time of the survey. (Marchione and Helsing, 1981)

3.3.2 DIETARY PRACTICES, INFANTS 0-24 MONTHS, WEANING FOODS

NATIONAL

MALNUTRITION AND WEANING: The highest incidence of malnutrition occurs in children after weaning, usually around the first birthday. There is no traditional weaning practice or local weaning food. Milk foods are imported in the form of dry milk. (Austin, 1981)

ANIMAL MILK: Animal milk is used in the north and in the hills, where it is available for infant feeding. (Soysa, 1979a)

INTRODUCTION OF BOTTLE FEEDING: Once maternity leave expired during the child's second month, mothers commenced supplementation of breast feeding with bottles among a small survey sample. Even at one year, 50% of mothers started bottle feeding with powdered milk when breast feeding was stopped. (Soysa, 1979a)

INTRODUCTION OF SUPPLEMENTS: The introduction of supplements occurred at around six months of age in most cases in four areas studied in 1979. (Soysa, 1979b)
WEANING FOODS - RICE CUNJEE AND KOLA KANDE: The most common traditional weaning food in Sri Lanka is rice Cunjee. It is prepared by cleaning, washing, and then cooking (preferably par boiled) rice in twice the volume of water required for cooking regular rice. Salt is added to taste, after the grains are cooked to a consistency for pureeing. The Cunjee is poured into a bowl and a coconut shell spoon is used to mash it. Kola Fanda is a similar food to which green vegetable leaves are added. The purees are commonly given to infants 4-5 months old. In season, scrapings of locally available fruits may be gradually introduced as snacks for 4-5 month olds. (Berggren and Abeyakoon, 1981)

WEANING FOODS: At 6 months, rice cunjee and vegetable soups were introduced. Biscuits and bread were also popular weaning foods at this age. (Soysa, 1979a)

WEANING FOODS: Cheap rusks are often fed to weaned children as a milk substitute, along with other foods of poor nutritive value. (Austin, 1981)

WEANING FOODS: Rice or coriander water was given to infants in the early months of life. Semi-solids were given in the second six months of life. Usually they consisted of rice gruel or curry cooked in coconut oil before hot spices were added; parboiled rice was used in some areas, kurakican (Eleusine coracana) was used in poorer areas. Hindus used cow's milk when available, but Buddhists did not. (Jelliffe, 1968)

WEANING FOODS - MULTIMIXES: Mung-Kiri-Bath is a traditional multimix which is introduced around 5-6 months of age. This gruel consists of rice, green gram flour, milk and water. Oil may be added. (Berggren and Abeyakoon, 1981)

SHORTAGE OF WEANING FOODS: Since 1974, there has been an acute shortage of artificial milk products. In addition, the usual cheap sources of weaning foods such as dhals (pulses), small fish, fresh milk, coconut (fat) and even cereal preparations have become either unavailable or expensive. (Senanayake, 1979)

COCONUT: Traditionally, coconut is added to children's diet when they are about one year old. (Berggren and Abeyakoon, 1981)

RURAL

LATE INTRODUCTION OF WEANING FOODS: A major problem, especially among rural mothers, was prolonged breast feeding without supplementation and the sudden termination of breast feeding without recourse to suitable weaning foods. (Karunanayake, 1982)

WEANING FOODS: Milk or milk-based products were the most popular replacement for breast milk in the Jaffna, Pindeniya and Wattegedara villages surveyed in 1979. The other popular weaning foods were the
local cereal–rice cunjee, animal protein foods, legumes, other vegetables
and commercial cereals. (Soysa, 1979b)

**URBAN**

**INFANT MILK PRODUCTS:** Visits to 20 retail outlets around Colombo
revealed that 21 brands of milk powder were available for infant feeding,
and sweetened condensed milk was readily available. Besides the local
milk powder product, Lakspray, seven brands of formula milk were imported
and received government subsidies in 1979 which were removed in 1980.
(Marchione and Helsing, 1981)

**WEANING FOODS:** The most popular supplementary foods used in Borilla were
milk or milk-based products, animal protein foods, the local cereal–rice
cunjee and vegetables. (Soysa, 1979b)

**WEANING PATTERNS:** The average calorie consumption of children aged 0–4
years from 20 randomly visited houses in Kirillapone Shanty was 876 kcals
per day, which is grossly inadequate. No extra meals are prepared for
children in the weaning age group. The traditional weaning foods, such
as Kola Kanda (similar to rice Kanjee with vegetable leaves added) have
disappeared from the diet. The Thriposha supplements provide the noon
meal, which is otherwise shipped. (Berggren and Abeyakoon, 1981)

**RICE CEREALS:** Rice cereal (cunjē) was introduced to infants before the
sixth month by 25% of the 170 sampled mothers in a peri-urban study.
(Marchione and Helsing, 1981)

**COSTS OF WEANING DIET:** With about 4 rupees per day a mother in
Kirillapone can provide adequate calories for a one year old child. If
she still breast feeds her child two to three times a day, the cost would
be three rupees per day. Average monthly income per household was about
450 rupees, which is 15 rupees per day for the whole family for all
expenses, according to a survey of 20 households. (Berggren and
Abeyakoon, 1981)

**ARTIFICIAL FEEDING:** At the time of the survey, 18% of the 170 sampled
mothers in a peri-urban area were feeding their 0–24 month old infants
only formula. 17% of the mothers had introduced formula before the child
was one month of age. (Marchione and Helsing, 1981)

**INFANT FOODS BY INCOME:** Among poor urban mothers with monthly incomes of
100 to 200 rupees, 26.4% fed their infants under one year of age a diet
composed primarily of powdered milk, 16.3% of bananas, 14.4% rice, 12.7%
fresh milk, and 4.6% fed them cereal foods. Among mothers with incomes of
200–400 rupees per month, 27.4% fed their children one year old
primarily powdered milk, 15.9% primarily cereal foods, 14.5% bananas,
13.8% fresh milk, and 10.5% rice. Among mothers with incomes above 400
rupees per month, 24.8% fed their one year olds primarily powdered milk,
20.3% cereal foods, 15.1% bananas, 11.2% rice, and 9.3% fresh milk. 80%
of all mothers surveyed who were not using cereal foods said they would
do so if the foods were cheaper. (Austin, 1981)
3.3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS, AFTER WEANING

NATIONAL

INFANT MILK FOODS: Lakspray, a full cream powdered milk locally packed for toddlers, was the most popular brand of milk food in all households, according to a 1979 survey of one urban and three rural areas. (Soysa, 1979b)

FATHER'S HELP: Fathers in all areas surveyed appeared to help mothers in all aspects of child rearing, including feeding. (Soysa, 1979b)

3.4 DIETARY PRACTICES, HEALTH AND MEDICINE

NATIONAL

MOTHER'S HEALTH AND FOOD PREPARATION: Mothers who are in poor health or overworked tend not to prepare food for their children in a palatable way. (Austin, 1981)

HOME BIRTHS: 35% (87 of 248) of the mothers interviewed had had their last delivery at home. Of these home deliveries, 61% were attended by "untrained" traditional birth attendants, and only 22% were attended by trained personnel, in the health Divisions of Batticaloa and Ampara. 34% of the Muslims, 17% of the Sinhalese and 13% of the Tamil mothers interviewed were attended by trained personnel. (UNICEF, 1980)

BIRTHS: Over 63% of all babies are delivered in one of over 500 institutions with trained staff in attendance. Only 3% of home births have no trained attendants at delivery. There are over 2000 public health midwives serving as field workers in rural areas. (Soysa, 1979b)

DISTRIBUTION OF HEALTH CARE: 2,149 Ayurvedic (traditional) health facilities are distributed within 0.8 miles from the average home, which suggests a fairly wide distribution. A western medical facility is within 3 miles of the average home. (Soysa, 1979b)

UTILIZATION OF HEALTH SERVICES: Only around 30% of the population utilize the MCH clinic services at the periphery of the health care system. (Soysa, 1979b)

CLINIC USAGE: 120,000 infants and preschool children (8% of a total 1.5 million) visited health clinics in 1968. Visits increased in 1973 to about 300,000 (10%) of an eligible infant/preschool population of 2 million. (Austin, 1981)

REGISTRATION RATES: The rate of registration of rural survey children with a midwife or health center ranged from a low of 38.1% in Anuradhapura to a high of 86.0% in the rural area of Colombo (the average rate was 64.3%). (Government of Sri Lanka, 1976)

IMMUNIZATION PROGRAMS: Many children have not been vaccinated against poliomyelitis, whooping cough, diphtheria, tetanus, tuberculosis, and
smallpox, and outbreaks such as poliomyelitis still occur. (Austin, 1981)
4. NUTRITION STATUS CORRELATIONS

NATIONAL

MALNUTRITION AND WEANING: The highest incidence of malnutrition occurs in children after weaning, usually around the first birthday. There is no traditional weaning practice or local weaning food. Milk foods are imported in the form of dry milk. (Austin, 1981)

STUNTING, WASTING, AND HOUSEHOLD SIZE: The average household size of rural survey children classified as stunted (below 85% of the height for age reference median) was significantly larger than that of those classified as normal (6.8 persons vs. 6.3). The difference of average household size between children classified as wasted (below 80% of weight for age reference median) and as normal was not significant (6.4 vs. 6.3). Those classified as both stunted and wasted averaged 6.7 members per household. (Government of Sri Lanka, 1976)

STUNTING, WASTING, AND BIRTH ORDER: The average birth order of children classified as stunted (below 85% of height for age reference median) was significantly higher than those classified as normal (4.1 vs. 3.4). For the total survey sample, the average birth order was 3.7. No significant birth order differences were found for the wasting or the wasting and stunting categories although these were also higher than for the children classified normal (3.6 and 4.1 respectively). (Government of Sri Lanka, 1976)

MALNUTRITION AND PARTICIPATION IN THE THRIPOSHA PROGRAM: Participation in the CARE-Sri Lanka Thriposha feeding program was found to be positively related to poor anthropometric status; that is, whereas 11.9% of survey children classified as normal were participating in the program, 13.1%, 15.3% and 15.8% respectively of those classified as stunted, wasted and both stunted and wasted were participating at the time of the survey. This information is insufficient to allow an unambiguous interpretation of the value of Thriposha participation. (Government of Sri Lanka, 1976)

MALNUTRITION AND REGISTRATION WITH A MIDWIFE OR HEALTH FACILITY: Whether or not a survey child was registered with a midwife or health facility was statistically related to nutrition status, but the practical value of this finding is questionable. 66.5% of nutritionally normal children were registered, 59.7% of the stunted children, 68.2% of the wasted children and 62.1% of the children both wasted and stunted were registered. (Government of Sri Lanka, 1976)

INFANT MORTALITY AND POVERTY: Low socioeconomic status and poor sanitation were found to be associated with high mortality in a special study of infant mortality. The study confirmed that childhood death rates have not fallen significantly in recent years. Children of couples who work on tea and rubber estates die at a rate nearly twice the national average. (World Fertility Survey Staff, 1980)

INFANT MORTALITY AND FOOD SUPPLY: Infant mortality rose from 43.1 in 1971 to 48.5 in 1974 as food availability declined from a per capita mean
4. **NUTRITION STATUS CORRELATIONS (Cont.)**

of 2250 calories daily to 1950 calories per day. Most of this increase was among the infants of estate workers who depend on the market for food. (Gwatkin, 1979)

**INFANT MORTALITY AND THE HEALTH BUDGET:** The infant mortality rate declined from the 1945 rate of 150 per 1000 to 49 per 1000 in 1975. Public health expenditures rose almost threefold between 1955 and 1975. The most rapid increases occurred after 1966. (Patel, 1980)

**INFANT MORTALITY AND THE HEALTH BUDGET:** Since 1961, the national infant mortality rate has been stable at about 50 deaths per 1000 live births despite subsequent increases in the health budget. (Patel, 1980)

**INFANT MORTALITY AND WATER SUPPLY:** The source of water was found to be the most significant variable associated with infant mortality. For 69% of households well water is the main source of drinking water. Regional use of well water is negatively associated with regional infant mortality \( r = -.82, p < .01 \); that is, high use of well water is associated with low incidence of infant mortality. High use of river water is strongly associated with high rates of infant mortality \( r = -.80 \) and use of tap water is not associated with infant mortality. (Patel, 1980)

**INFANT MORTALITY AND LATRINE USE:** There was a strong negative correlation \( r = -.79 \) between latrine availability and infant mortality throughout the country when the tea estate sector was excluded from the calculation. (Patel, 1980)

**BREAST FEEDING AND COST OF LIVING:** Among the urban poor, the apparent decline in breast feeding was thought to be due to the high cost of living which forced both parents to seek employment. The mother who goes out to work prolongs the intervals between feeds and thus reduces the volume of breast milk. (Senanayake, 1979)

**MORBIDITY AND SANITATION:** 40% of all morbidity is caused by poor sanitation. Almost 100% of children under 10 have intestinal parasites. (Austin, 1981)

**NUTRITIONAL STATUS AND LITERACY:** The overall literacy rate is 80%; 85% of the men and 70% of the women are able to read and write. Education provides mothers with a basis for recognizing that low weights are not normal for children and introduces women to basic nutritional concepts. (Gwatkin, 1979)

**WOMEN’S HEALTH AND LITERACY LEVELS:** Women’s greater susceptibility to disease and death has been related to poor literacy levels and low awareness and utilization of free health facilities, especially among Muslim and South Indian women. (Soysa, 1979b)

**INCOME DISTRIBUTION:** By 1978, the lowest 10% of the population (based on income) received 12.3% of the country’s total income, while the top 10% received 39%. This suggests a worsening trend in the pattern of income
distribution, especially since the 1973 comparable figures were 15% and 30% respectively. (Food and Nutrition, 1980)

**URBAN**

**ARTIFICIAL FEEDING AND EMPLOYMENT:** 61% of formally-employed women were solely artificially feeding their infants compared to 21% in the non-employed group. The artificially fed infants of the employed women were much more likely to fall short of expected weight gains than any other sub-group (i.e. artificially fed, mixed fed, or breast fed non-employed, or breast fed or mixed fed, formally-employed) among the groups of 170 mother-infant dyads studied in Kotte Urban Council area. (Marchione and Helsing, 1981)
5. NUTRITION AND HEALTH POLICIES AND PROGRAMS

5.1 NUTRITION AND HEALTH POLICIES

NATIONAL

NATIONAL FOOD POLICY CO-ORDINATION COMMITTEE: A National Food Policy Coordination Committee (NFPC), consisting of Secretaries of 5 key Ministries (Finance and Planning, Plan Implementation, Trade and Shipping, Food and Co-operatives, and Agriculture) and the Secretary to the Cabinet as Chairman, was established by Cabinet decision in March 1979. Its goal is to bring about better inter-sectoral coordination in the food, agriculture and import sectors. The committees coordinate all aspects of food distribution, pricing, procurement, processing, imports, exports, buffer stocks, and distribution. They also advise the Cabinet on food policy. (Food and Nutrition, 1980)

NATIONAL FOOD AND NUTRITION CO-ORDINATING COMMITTEE: A National Food and Nutrition Co-ordinating Committee, consisting of Secretaries of the Ministries of Agriculture, Food, Health, Education, Fisheries, Planning and Plan Implementation and other internal and external representatives and chaired by the Deputy Minister of Agriculture, was established in January 1980. The Committee advises the government on food and nutrition policy matters, monitors the major intervention programs and nutrition activities, and coordinates food and nutrition functions at the inter-ministerial level. The Committee is serviced by 9 specialized panels. To date, 5 meetings have been held, but the results have not been promising. (Food and Nutrition, 1980)

NATIONAL HEALTH DEVELOPMENT COMMITTEE: This committee functions under the Ministry of Health, and is directly responsible to the National Health Council of Ministers chaired by the Prime Minister. It is chaired by the Secretary of Health, and consists of the Secretary of Higher Education, the Secretary of Local Government and Health, the Director of Health Services, the Commissioner of Ayurveda (traditional medicine), Deans of the Faculty of Medicine, Director of National Planning, WHO Program Coordinator, and senior medical personnel. It gives some coverage to the subject of nutrition and child care. (Food and Nutrition, 1980)

FAMILY HEALTH BUREAU: In 1972, the Maternal and Child Health Bureau was strengthened, and renamed the Family Health Bureau (FHB). In 1978, a separate Ministry of Family Health was established to supervise the activities of the FHB and to give increased importance to the National Family Health Program. The objective of the program is to improve the health of mothers and children by provision of improved MCH/FP services. It aims to coordinate the following related health activities: medical supervision, immunization, family planning, nutrition, school health, and health education. (UNICEF, 1980)

NATIONAL FOOD ADVISORY COMMITTEE: This committee was established within the purview of the Health Ministry and is under the chairmanship of the Director of Health Services. It deals with food law, its enforcement and
implementation, food quality control and surveillance of the food control system. (Food and Nutrition, 1980)

DISTRICT FOOD, NUTRITION AND POPULATION COMMITTEES: Food, Nutrition and Population Committees have been established in all districts under a Cabinet directive by the President of the country. Their main purpose will be to coordinate food, nutrition and population functions. (Food and Nutrition, 1980)

FOOD AND NUTRITION POLICY: No explicit nutrition policy has been developed by the government, yet the provision of adequate food to all sections of the population has been a central government focus. As a result of this focus, an extensive public food distribution system has been developed. (Gwatkin, 1979)

GOVERNMENT FOOD POLICY: The Government of Sri Lanka had assumed responsibility for guaranteeing a basic food supply for its population. The Five Year Plan of 1972-76 placed high priority on improving diets of the rural and urban poor by encouraging production of fish, milk, meat and soybeans. (Austin, 1981)

GOVERNMENT FOOD POLICY: In 1978, eligibility for rations was restricted to the bottom 50% of the income distribution scale to cut program costs. A food stamp program has now replaced the original ration system. (Rogers et al., 1981)

OVERALL DEVELOPMENT PATTERN: Food and nutrition efforts in Sri Lanka have been intimately associated with health and education activities and more importantly have been products of the larger politically induced general government orientation. (Gwatkin, 1979)

FOOD SUBSIDIES BUDGET: 27% of the 1969 Sri Lanka Government budget was spent on food subsidies. This decreased to 19% in 1973 and to 16.2% in the 1974 budget. (Austin, 1981)

HEALTH CARE BUDGET: 3% of Sri Lanka's GNP is spent on health care. (Gwatkin, 1979)

HEALTH CARE BUDGET: Expenditures for health decreased from 16% to 15% of the total government budget between 1969 and 1973 then rose to 16% of the budget for 1974. (Austin, 1981)

GOVERNMENT BAN ON ADVERTISING: The Commissioner of Internal Trade issued Direction No. 24 in November 1980 that banned all forms of advertising of infant milk foods and the sale of infant milk foods in containers which do not state "breast feeding is best," according to a November 10, 1980 Health Ministry official statement. Violators of the ban are liable to a fine of 3,000 rupees (about $170) or three months in jail. The action was taken in response to the recent WHO recommendations to discourage the use of artificial infant milk foods. (IBFAN News, 1980)
SMALL FARMER AGRICULTURAL DEVELOPMENT: Policy measures have emphasized increased domestic food production, mainly rice, by focusing on the poor small farmers who grow most of the food. They include guaranteed producer prices, provision of credit and technical inputs, extensive irrigation programs and tenancy reforms. (Gwatkin, 1979)

MATERNITY LEGISLATION: As of 1978, the Maternity Benefits Ordinance included: 1) a guarantee of paid maternity leave for a period of 14 days before and 28 days after confinement; 2) protection from dismissal during this period; 3) prohibition of dangerous employment for a period 3 months before and 3 months after confinement; 4) two half-hour nursing breaks during working hours for all women nursing children under one year of age; and 5) provisions for employers of more than a prescribed number of women workers to provide a creche for children under 6 years old. This regulation has been enforced only on estates. (Jayaweera, 1979)

MATERNITY BENEFITS: Women who have worked for an employer for a minimum of 3 months prior to making a claim are eligible for a maximum of 6 weeks (2 weeks prior to confinement and 4 weeks after) maternity benefits which include leave with pay and job security, as set out in the Maternity Benefits Ordinance, the Maternity Benefits (Amendment) Act, and the Shop and Office Employees (Amendment) Act. Alternative maternity benefits (if approved by the Commissioner of Labor), may be provided for female employees working on an estate in lieu of the above benefits. (Senanayake, 1979)

MATERNITY BENEFITS - LABOR ON ESTATES: Alternative maternity benefits may be provided for female employees working on an estate in lieu of the benefits set forth in statute if approved by the Commissioner of Labor. The Medical Wants Ordinance No. 9 of 1912 and the relevant regulations enacted welfare measures for resident labor on estates including one month leave with full pay and food and lodging for every female laborer who gives birth. The food entitlement was 12 ounces of rice (or substitute) per day and a sum of Rs. 21 per week for a month after the birth. All children under one year of age are entitled to free "care and nourishment" which includes free milk for one year. (Senanayake, 1979)

EDUCATION: The government has emphasized education, increasing the overall literacy rate to 80%. The special emphasis on education for women seems to have exerted an influence on the diet composition by helping to heighten nutrition awareness. (Gwatkin, 1979)

STATUS OF WOMEN: In 1931, women of Sri Lanka were given the right to vote in an effort to encourage low fertility and to decrease the mortality rate. Women in Sri Lanka have gradually come to have equal educational and employment opportunities and socioeconomic and political emancipation. (Senanayake, 1979)
5.2 NUTRITION AND HEALTH PROGRAMS

NATIONAL

FOOD AND NUTRITION POLICY AND PLANNING DIVISION - NUTRITION PROGRAMS: Current nutrition programs of the Food and Nutrition Policy Planning Division of the Ministry of Plan Implementation include: 1) mass media programs on nutrition with documentary films, nutrition jingles, panel discussions and talks; 2) adult nutrition education pilot project in selected villages in six districts; 3) nutrition curriculum development project to revitalize the teaching of nutrition in primary school; and 4) school farm projects in 65 schools to develop small demonstration plots of 1/2 to 1 1/2 acres. (Food and Nutrition, 1980)

COMMUNITY LEVEL NUTRITION INTERVENTIONS: There are currently about a dozen non-government organizations engaged in community-level nutrition interventions, including Lanka Jathika Sarvodaya Sangamaya; Redd Barna, the Norwegian Save the Children Fund; the Central Council of the Young Mon's Christian Association; the Lanka Mahila Samiti; the International Year of the Child Secretariat, the University of Ceylon; the Young Women's Christian Association; World Vision International; and the Freedom from Hunger Campaign. (Karunanayake, 1982)

NUTRITION EDUCATION: The main agencies involved in nutrition education programs are the Ministries of Health, Education, Agricultural Development and Research, and Higher Education, and non-government organizations. Most of these programs offer inadequate or inappropriate nutrition education because it is not practical in nature and/or not taught by knowledgeable people. (Food and Nutrition, 1980)

SOCIAL SERVICE PACKAGE - FOOD, EDUCATION AND HEALTH: The food distribution system has been part of a larger social service package that has included education and health activities. The government spends about $7.00 per capita on education and 3% of the GNP on health. (Gwatkin, 1979)

FOOD SUBSIDIES: Children over one year old are eligible for a rice ration (free for non-taxpayers, subsidized for taxpayers), but infants under one year are not eligible. Children receive two "nutritious" biscuits daily under CARE/GOSL school feeding program. (Senanayake, 1979)

FOOD DISTRIBUTION SYSTEMS: The food subsidy program is a major item in the government budget, accounting for 12 to 15% of the annual expenditures (more than five times the defense budget). A nationwide network of government-controlled retail outlets distribute food (rice, wheat, sugar) to the public on a rationed basis. In the early 1970s, each Sri Lankan was entitled to two to four pounds of rice a week, one to two of which were free and the remainder available at subsidized prices one half to two thirds of the open market price. The government purchases food from local farmers (mainly rice) and from abroad (rice, wheat and sugar). (Gwatkin, 1979)
FOOD STAMP SCHEME: In September 1979, the State-sponsored rationing and distribution scheme was replaced by the food stamp scheme. Food stamps (and kerosene stamps) are issued to households with incomes below 300 rupees per month (about 50% of the population) and are interchangeable for rice, paddy, wheat flour, bread, sugar, milk foods and dried fish. After the start of this scheme, the State-administered prices of imported rice, wheat flour, and sugar were permitted to rise to world levels. (Food and Nutrition, 1980)

FOOD STAMP SCHEME CRITERIA: The basic criterion for eligibility for food stamps was low household income (not per capita income), but a mechanism was built in to discriminate against the large, poor family. In addition, monthly entitlements were based on age, with children under 8 years old getting Rs 25 per month, children 8-12 years old, Rs 20 per month, and those over 12 years, Rs 15 per month. (Food and Nutrition, 1980)

FOOD STAMP RECIPIENTS: 90% of eligible households in the six areas surveyed (N=3435) received food stamps. 38% of households receiving food stamps had incomes of Rs 201-300 per month and 37.6% of households had incomes of Rs 101-200 per month. In Vavuniya, 90% of the 150 households had incomes less than Rs 100 per month. In households with less than Rs 100 per month, the value of food stamps received exceeded 100% of their income. (Food and Nutrition, 1980)

PREFERENCE FOR FOOD PROGRAMS: 22% to 46% of households in the six districts surveyed expressed a preference for the previous food ration scheme, 16% to 32% of households preferred the food stamp scheme, and the rest expressed no preference. (Food and Nutrition, 1980)

FOOD STAMP SCHEME: The operational cost of the Food Stamp Scheme in 1980 has been estimated at Rs 2000 million, or 20% of the Government's current expenditure, which compares with a similar percentage under the previous food subsidy program. (Food and Nutrition, 1980)

COSTS OF FOOD DISTRIBUTION: The estimated actual value cost of the Food Stamp Scheme for the year 1979-1980 was Rs 1540 million, while the 1978 cost of the net food subsidy for the Food Ration Scheme was 38% higher at Rs 2132 million. The cost per beneficiary of the Food Stamp Scheme appears to be Rs 211 per year (based on 7.3 million recipients) and the cost per household is about Rs 962 per year. 22% of the 7.3 million beneficiaries were less than 8 years old. (Food and Nutrition, 1980)

FOOD IMPORTS: In 1978, Sri Lanka imported about $200 million worth of food. (Lawton, 1979)

FOOD IMPORTS: Sri Lanka is not self-sufficient in food; slightly over one third of both calories and proteins are imported from world markets. (Gwatkin, 1979)

CARE THRIPOSHA PROJECT: CARE, in conjunction with the Ministry of Health, has been involved in the design, production, and distribution of
5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

Thriposha, an indigenous high protein cereal product provided to about 450,000 preschool children. Thriposha consists of U.S. PL 480 Instant Corn Soy Milk, 20% local cereal and 5% local soybean. Ultimately, the contents will be 100% local foods. Nutrition education is included at clinics as a project component. Health cards, media materials, and weighing scales have been provided to 1000 clinics. CARE is also involved in a soy bean development project. (TAICH, 1978)

THRIPOSHA FORTIFIED FOOD PROJECT: The Thriposha Fortified Food Project was formulated in 1972 in cooperation with CARE at the request of the Ministry of Plan Implementation, and implemented in 1973. Medical selection is a prerequisite for the receipt of thriposha by the five beneficiary categories (pregnant women, lactating mothers, infants, preschool children and ward patients). Thriposha is distributed at health clinics, estate clinics, outlets of the Social Services Department and certain voluntary agencies. In 1979 and 1980, 54% and 46% of the targeted beneficiaries received Thriposha. Of those beneficiaries, 61% were preschool children 1-5 years old, 36% were pregnant and lactating mothers, and 10% were infants. In the initial phase of the project, a 70:21:9 ratio of donated instant corn soya milk powder, locally obtained pre-cooked maize and soya are used. The goal is to phase in pre-cooked local cereals to replace the imported materials. (Food and Nutrition, 1980)

THRIPOSHA FORTIFIED FOOD PROGRAM: About 34% of the 865,000 moderate to severely malnourished children 6-60 months old received Thriposha in September 1980, according to figures from the Medical Research Institute. The highest coverage was in the districts of Vavuniya/Mannar/Mullativu (76%), Colomb (61%), Kandy (Nuwara Eliya) and Jaffna (50%). The lowest coverage of malnourished children was in the districts of Ratnapura, Puttalam and Matale/Polonnaruwa (18%), according to the Medical Research Institute. (UNICEF, 1980)

THRIPOSHA INGREDIENTS: Basic Thriposha consists of a centrally-processed (extruded) mixture of 61% maize, 30% soya, 6% dry skimmed milk and 3% vitamin A, folic acid, vitamin B12 and iron. One packet every two weeks equals 750 grams or 214 calories per day. In the Save the Children Kirillapone project, the modified Thriposha contains 353 to 360 calories per day. At present, 60% of the basic Thriposha ingredients come from the U.S., but the Government of Sri Lanka plans to take over the entire supply gradually. (Berggren and Abeyakoon, 1981)

THRIPOSHA PROGRAM COSTS: In FY 1981, the Government of Sri Lanka paid CARE and the U.S. Government nearly RS 22 million. Over the last seven years, the average annual expense has been about Rs 12 million. (Food and Nutrition, 1980)

THRIPOSHA PROGRAM COSTS: The government paid over Rs 21 million to CARE and the U.S. Government in FY 1981 for the supply of 1.2 million packets of Thriposha per month for the year. The distribution costs are not known, but the school biscuit distribution cost Rs 43 million in 1980. (Karunanayake, 1982)
THRIPOSHA EVALUATION: Even though medical selection criteria are used to determine eligibility for receiving Thriposha, there is no ongoing systematic monitoring and evaluation of the status of pregnant women or the weights of preschool children. Thriposha impact is not measurable given the lack of regular evaluation data. (Food and Nutrition, 1980)

COMMERCIAL MARKETING OF THRIPOSHA: The commercial marketing of Thriposha by the Ministry of Health and CARE/Sri Lanka with the assistance of Lever Brothers (Ceylon) Limited, began in October 1980, and is currently retailing approximately 48,000 454-gram boxes monthly through 2,000 retail outlets in four test market districts. Consumer surveys in the test areas showed that 84% of randomly selected households were Thriposha users. 52% of users had monthly incomes of 300 rupees (316.06) or less. Consumer knowledge and acceptability of the maize/soya Thriposha blend was high. (LEC, 1981)

THRIPOSHA MARKET STUDY: The amount of commercial Thriposha sold is inversely related to the amount of Thriposha distributed free. The highest percentage of households using Thriposha existed in regions where sales were lowest and the amount of free distribution was the highest. These were the main conclusions of a 7-month market research study of 1200 households in four regions selected on the basis of demographic and income data to give results generalizable to the rest of the country. (LEC, 1982)

SARVODAYA SENGAMAYA PRESCHOOL NUTRITION PROGRAM: The base of the Sarvodaya nutrition intervention is the preschool program, which includes preschool centers, community kitchens and mothers' groups. The immediate objectives are to provide food for young children and to help maintain healthy pregnancies. The 2385 volunteer workers in charge of the village preschool program centers are usually young women who are given 3 1/2 months' preparatory training by Sarvodaya, but the quality of the training is low. There are about 2200 centers serving about 30,000 children under five years with about 60,000 Thriposha packets per month. This nutrition intervention is without selection criteria, and without the use of growth charts and monitoring. The centers offer the opportunity for rural mothers to get systematic nutrition education. (Karunanayake, 1982)

SARVODAYA NUTRITION PROGRAM COSTS: The direct cost for the national preschool nutrition program for food and the stipend cost paid to the voluntary worker is 6 to 7 million rupees per year. About 2,385 of the 4,481 village workers receive a monthly allowance of Rs 100 (Rs 2.88 million per year). The Thriposha costs about Rs 3 per packet for a total of about Rs 2.16 million per year. The overhead costs are about 25%. Thus, the Sarvodaya program costs about Rs 230 per beneficiary per year. The Sarvodaya program as a whole has a heavy administrative infrastructure and now has a large dependence on foreign donations. (Karunanayake, 1982)
SARVODAYA SANGAMAYA DAY-CARE CENTERS: 1500 to 2000 children under 2 1/2 years old are served by 86 day-care centers, mostly in villages in the plantation areas. In addition to physical care from 8 A.M. to 5 P.M., infants receive several nutrition meals. Sarvodaya trains the staff and manages the centers through volunteers who receive a monthly stipend (about Rs 100) paid by the relevant government departments. Government assistance comes from the Department of Probation and Child Care Services, the Social Services Department and local agencies. (Karunanayake, 1982)

EVALUATION OF SARVODAYA NUTRITION INTERVENTION PROGRAM: An evaluation of the Sarvodaya nutrition intervention program by the International Council of Education Development from the U.S. and Sarvodaya's own researchers concluded: 1) that the combination of preschool center, community kitchen and mothers' group (the standard program) offers a unique opportunity for widespread community health education and makes available important educational, nutritional and health services for mothers and children, and 2) that the non-selective nutrition intervention is weakened by the lack of regular growth monitoring and evaluation of beneficiaries and by the low quality of training given to the volunteer workers. (Karunanayake, 1982)

NORWEGIAN SAVE THE CHILDREN (REDD BARNA): The Norwegian branch of Save the Children established the Redd Barna program in 1974 in the District of Jaffna. In 1979, a formal agreement of cooperation with the Government of Sri Lanka through the Ministry of Plan Implementation was signed, which allows Redd Barna to help implement projects to benefit the welfare of children. The two types of projects initiated were settlement projects and integrated community development projects. There are currently 12 projects administered by Redd Barna; 7 have health and nutrition components. (Karunanayake, 1982)

REDD BARNA SUPPLEMENTARY FEEDING PROGRAM: The Redd Barna nutrition programs are directed mainly toward nutrition education and such applied nutrition programs as home gardens and poultry keeping. The supplementary feeding program, using two indigenous mixtures (rice, soy and flour; and rice, soy, green gram and sugar, both fortified with vitamins and minerals), is conceived of as a short term intervention for use as an urgent rehabilitative measure. 2000 packets, each weighing 500 grams, were produced in March 1980 at a cost of Rs 4/50 per packet. Less than 100 packets per month have been distributed free to malnourished children under age 12 years and to pregnant and lactating mothers. The health and nutrition programs concentrate on educating mothers in the use of cereal-pulse mixtures, with frequent use of soybean preparations, and the identification and rehabilitation of malnourished children at home. These programs aim at working through existing health networks where available. (Karunanayake, 1982)

UNICEF HEALTH AND NUTRITION ASSISTANCE: UNICEF health and nutrition support has focused on strengthening rural MCH clinics, immunization, health services improvements in the estates region, the nutritional component of the Family Health Services, midwife services, training of
community health workers, nutrition research, nutrition policy planning, development of weaning foods, nutrition surveys and nutrition education. (Ignatieff, 1978)

UNICEF EXPENDITURES: Of the $3.5 million dollars UNICEF spent in 1978, 72% was spent in the water supply sector, 12% in health, 9% in child care, 6% in education, and less than 1% in nutrition. (Ignatieff, 1978)

LANKA JATHIKA SARVODAYA SANGAMAYA: The Lanka Jathika Sarvodaya Sangamaya is a private, non-profit organization established in 1958 to mobilize voluntary labor for village construction. It is now national in character, with village development projects in over 2000 villages. In 1972, a pre-school project to meet the educational needs of rural children was begun. Now the children's services department (one of twelve departments) integrates three services: preschool, nutrition and community health care. (Karunanayake, 1982)

POPULATION SERVICES INTERNATIONAL: In 1977 the Population Services International funded a project to assess the interrelationships between family planning and infant nutrition in order to see whether complementary programs could be developed. (TAICH, 1978)

WORLD VISION RELIEF ORGANIZATION: Assistance in education and nutrition for children is provided as part of the community development projects in 15 rural villages by the World Vision Relief Organization. (TAICH, 1978)

FAMILY HEALTH EDUCATION ACTION PROGRAM: This program implemented by the Health Education Bureau of the Ministry of Health uses village health volunteers trained by local health workers to identify the health needs and to educate a number of families around their own residences. There were about 600 villages with 12,000 volunteers in 1979/80. (UNICEF, 1980)

HOSPITAL FACILITIES: In the early 1960s there was one hospital bed available for every 300-400 people, and a maternity center for every 400 expectant mothers. As a result, 98% of mothers received prenatal care. (Gwatkin, 1979)

ABU DHABI FUND FISHING: The United Arab Emirates, through the Abu Dhabi Fund, has advanced $5.2 million to Sri Lanka to improve fishing boats. The loan will be used to design, build and equip 150 34-foot craft and 2 50-foot craft. (Lawton, 1979)

RURAL

UNICEF RURAL MATERNAL AND CHILD HEALTH SERVICES PROJECT: In 1979, a project to improve the existing family health services was established in the health division of Anuradhapura with the help of UNICEF. The Family Health Bureau of the Ministry of Health was in charge of implementation, which began in January 1980. Ten Maternity Home and Central Dispensaries and all Maternal and Child Health Clinics were included in Phase I of the project. The objectives were to reduce mortality rates, morbidity rates
and the prevalence of PEM among infants and children through increased attendance at health facilities for prenatal care, delivery and child care. (UNICEF, 1980)

RURAL MATERNAL AND CHILD HEALTH SERVICES PROJECT EVALUATION: Although the project had not been in operation long enough to evaluate its impact on the target beneficiaries, a review panel made the following recommendations for improvement of the project: decentralize financial authority, better field supervision and monitoring, improved radio communication in Anuradhapura, greater reliance on para-professional personnel and appropriate training, and a better record-keeping and referral system. For future programming, there needs to be more emphasis upon prenatal care and family planning, increased attendance at clinics, more preventive school health services, and promotion of infant and young child nutrition. (UNICEF, 1980)

CARE THRIPOSHA PROGRAM: Supplementary feeding is provided in the Thriposha Program sponsored by CARE. Thriposha is a calorie-protein-mineral-vitamin rich mixture. 13.1% of survey children were participating in the Thriposha program at the time of the survey. This percentage ranged from a high of 27% in the areas of Colombo and Vavuniya to a low of 5% in Batticaloa and Ratnapura. (Government of Sri Lanka, 1976)

MILK DISTRIBUTION: Limited amounts of free milk are available to pregnant and nursing mothers and preschool children. (Senanayake, 1979)

URBAN

THRIPOSHA OUTREACH - KIRILLAPONE PROJECT: Only 43% of children in the Kirillapone project area were actually receiving Thriposha for more than 13 of the 30 days per month it was offered, according to the Field and Kannangara evaluation in May 1981. (Berggren and Abeyakoon, 1981)

CARE THRIPOSHA INTERVENTION PROJECT - KIRILLAPONE: In May 1980, a Thriposha intervention project in Kirillapone was begun with the support of CARE and Save the Children. 256 preschool children, 49 lactating mothers and 21 pregnant mothers were enrolled to receive 2 packets of Thriposha per month. In October 1980, the distribution was changed to a prepared Thriposha meal for all children (Rs 135 per day for 70 grams of Thriposha). Participating mothers helped to prepare the meals. Evaluation of the nutritional status of 184 preschool children after 11 months of the project showed some improvement among those with second and third degree malnutrition, but an increase of PEM among those in the normal and first degree range. As a result, a more intensive nutrition intervention was started in May 1981 using growth charts and targeted care. After one month, a 3% increase in health status was reported. (Ali Khan, 1981)

NUTRITION SURVEILLANCE - KIRILLAPONE PROJECT: 72% of the 69 0-23 month old children who were weighed in October 1981 showed weight gain since their last weighing and 28% showed no weight gain in the Kirillapone
shanty project. However, 25% of the 69 children remain in second or third degree malnutrition. (Berggren and Abeyakoon, 1981)

U.S. SAVE THE CHILDREN FUND (SCF): SCF began its first Sri Lankan integrated community development project in July 1979 in the urban slum and squatter settlement of Kirillapone, in Colombo. The health and nutrition program for the 439 families in the area uses trained health auxiliaries selected within the community to do family planning and referral activities, identify children needing urgent medical treatment, maintain periodic height and weight records, administer Thriposha, assist in the bimonthly pediatric clinic, monitor the regular deworming program, and make home visits. (Karunanayake, 1982)

SAVE THE CHILDREN FEDERATION PROJECT - KIRILLAPONE NUTRITION SURVEILLANCE: Children aged 0-11 years in the project area are weighed monthly by volunteer mothers known as "auxiliaries," who are selected by the community, as a means of monitoring their nutritional status. The mothers are given instruction in nutrition surveillance, counselling and supplementary feeding. (Berggren and Abeyakoon, 1981)

SAVE THE CHILDREN FEDERATION KIRILLAPONE PROJECT - SUPPLEMENTARY FEEDING: In May 1980, all children and most mothers in the Kirillapone project area began receiving Thriposha regardless of risk status. There appears to be an under-utilization of Thriposha by the target groups in Kirillapone because it was being used by the whole family or sold. Since December 1980, project workers have attempted to administer the gruel directly to children at risk. (Berggren and Abeyakoon, 1981)

U.S. SAVE THE CHILDREN FUND - SUPPLEMENTARY FEEDING PROGRAM: In October 1979, a supplementary feeding program was begun in the SCF project in Kirillapone. A community kitchen is open 3 1/2 hours per weekday. 70 grams of Thriposha is given to each child and eligible mother each day in a premixed form, either as a soup, a porridge, or a steamed or boiled solid food. 98% of the 600 eligible children attend the clinic on weekdays. The health auxiliaries are supposed to offer nutrition education as well. The direct cost of the nutrition program (stipends for 10 auxiliaries, Thriposha, food preparation) is about Rs 7,700 per month, for an average of Rs 13 per month, or Rs 156 per annum, per beneficiary. (Karunanayake, 1982)

URBAN DEVELOPMENT PROJECTS: Three Colombo urban development projects have been implemented to combat the problem of deprived urban areas: 1) UNICEF/Ministry of Local Government/Environmental Health and Community Health Development Program; 2) the Sarvodaya/Nagarodaya projects; and 3) the Save the Children project in Kirillapone shanty. (Berggren and Abeyakoon, 1981)
6. COMMENTARIES

NATIONAL

CAUSES OF CHRONIC MALNUTRITION (STUNTING): Stunting in rural Sri Lanka begins at an early age and affects all age groups. This suggests disproportionate food intake and availability over long periods of time. Agricultural production, food distribution, food subsidies, market prices, drought cycles, cash crops, and socioeconomic divisions may account for the extreme disparities in the prevalence of stunting in different areas of the country. (Government of Sri Lanka, 1976)

12-23 MONTH OLD CHILDREN AT HIGHEST RISK: The distribution of acute undernutrition by age groups indicates that children age 12-23 months are most at risk. This suggests that weaning foods may be inadequate, that the children may be unable to compete successfully for food among other family members, and that infectious diseases are most severe at this age period. (Government of Sri Lanka, 1976)

NURSERIES AND NURSING BREAKS: Site visits of workplaces around Colombo revealed neither nurseries at places of formal employment nor the use of nursing breaks, although both are legally required. (Marchione and Helsing, 1981)

BREAST MILK SUBSTITUTES: The Sri Lankan government exercises strict controls over imports, but foreign powdered milk substitutes for breast feeding are widely available. They are subsidized or marketed as intensively as they are elsewhere. There is no local powdered milk production. Existing demand outruns the imported supplies. Despite government restrictions, the demand is not created solely by mothers weaning their infants. (Senanayake, 1979)

FOOD DISTRIBUTION SYSTEM AND CONSUMPTION PATTERNS: The egalitarian food consumption patterns shown in the 1969-70 and 1973 household consumption surveys were probably due to the unique food rationing system that bought and distributed nearly one third of the country's nutrients. (Gwatkin, 1979)

THRIPOSHA: Thriposha was not used in Pindeniya village because there was no transport for it from the office of the Medical Officer of Health in Kegalle to the village health centers. (Soysa, 1979b)

SAVE THE CHILDREN FEDERATION KIRILLAPONE PROJECT - RECOMMENDATIONS: Based on a November 1981 site visit to the SCF Kirillapone project, the following recommendations on the nutrition component were made: 1) distribution of the centrally-processed Thriposha supplement at noon should be gradually replaced by new foods prepared by special mothers' groups in the area, and the Thriposha should be used only as a short-term intervention with "at risk" children and mothers; 2) once "catch up" growth occurs, children should be removed from the Thriposha and returned to the new weaning diets; 3) attempt to increase the calorie density of Thriposha; 4) use quarterly, not monthly, weighings for school age children; 5) education programs should include correct use of these foods; and 6) improve a traditional "snack" food by including a legume
mix for older preschool children, school age children and adults.  
(Berggren and Abeyakoon, 1981)

PHYSICAL QUALITY OF LIFE INDEX (PQLI): Sri Lanka has been considered a 
social development "success" in that the population as a whole has been 
experiencing some of the health and education benefits common in the 
developed countries. Sri Lanka has a PQLI of 82 (out of 100) despite a 
per capita income of less than $150. PQLI is a composite index of a 
country's average life expectancy, infant mortality rate and literacy 
rate. (Austin, 1981)

POPULAR POLITICAL PARTICIPATION: The political system has been unusually 
responsive to popular will and is considered to be the factor that has 
led the government toward its populistic orientation. The developmental 
strategy has emphasized the provision of social services directly to the 
poor and a turn away from traditional plantation, export-oriented 
agriculture toward a focus upon production for local consumption. 
(Gwatkin, 1979)

LOW INCOMES AND LOW MORTALITY RATES: Low mortality rates apparently can 
coexist with low incomes and limited overall food supply when the types 
of foods are varied and well balanced and when the food is distributed 
reasonably evenly. (Gwatkin, 1979)
BIBLIOGRAPHY

Ali Khan, M.


Original data.
Method: April 1980 baseline house to house survey; mothers interviewed; children weighed and examined; intervention program started May 1980 with distribution of Triposha packets but in October changed to a prepared Triposha meal; no control group; occasional weighing during 11-month project.
Sample: 256 children 6 months to 5 years of age for baseline survey; 184 for intervention.
Location: Kirillapone, an urban area in Colombo.

This report presents the results of an eleven month pilot nutrition intervention project using Triposha furnished by CARE. The quantitative data presented suggest that the project was not successful in reducing PEM, although the author argues that some improvements did occur. Another more intensive pilot intervention was initiated as a result, but no data are presented.

Austin, James E., Ed.


This case study describes the programs run by CARE in cooperation with the Government of Sri Lanka which provide supplementary foods to primary school and preschool children and pregnant and lactating mothers. A brief review of nutritional status statistics is given from an economic and agricultural production perspective summarizing nutritional problems and dietary patterns of the target groups.

Berggren, G.G. and Abeyakoon, D.R.


This document is a draft report of a technical assistance mission in November 1981 to Sri Lanka for the Save the Children Federation/Sri Lanka Field Office and for USAID/Sri Lanka. The scope of work was two-fold: 1) assessment of the potential for a home and village prepared weaning foods intervention; and 2) evaluation of the current nutritional component in the SCF project area of Kirillapone.
BIBLIOGRAPHY (Cont.)

Department of Census and Statistics


This publication compiles government statistics on population and vital statistics, economy and labor, health and nutrition, education, and housing and social service. The format is tabular and information is generally broken down by administrative districts. Most of the relevant health and nutrition data is from 1969-1976.

Dias, M.


In an attempt to understand the status of women in the social structure of Sri Lanka, the author argues it is necessary to examine some of the cultural and ideological factors relating to their position. Two points are advanced: 1) women are likely to be continually subordinated in relation to men in domestic situations regardless of traditional or modern context; and 2) even though women are likely to take a prominent role in extra-domestic situations, their status culturally is likely to continue as inferior to men. Topics discussed include ethnicity, caste and sex role differentiation.

Food and Nutrition, Policy and Planning Division, Ministry of Plan Implementation.


Original data.

Method: 1979 - two district point prevalence nutritional status surveys; 1980 - six districts plus the Mahaweli area, point prevalence nutritional status, food consumption and food stamp usage survey.

Sample: an undisclosed number of 6-72 month old children in the 1979 surveys and 6-59 month old children in the 1980 six district surveys; 713 6-59 month old children in the Mahaweli area survey.

Location: 1979 surveys in Hambantota and Matara districts rural sectors; 1980 surveys in the rural sectors of Kurunegala, Puttalam, Vavuniya, Matale, Moneragala and Nuwara Eliya (also the estate sector) districts and the Mahaweli area.

This large document is an Interim Report of the Food and Nutrition Policy Planning Division of the Ministry of Plan Implementation, which was given new life in 1978. The main purpose of this report is to apprise the Government of the latest findings on the malnutrition problem, its socioeconomic determinants and the short-term measures.
that can be taken to prevent further aggravation of the problem. The report highlights the results of the 8 district nutritional status studies which, while not directly comparable to the 1975/6 CDC Nutrition Survey results, suggest that the malnutrition problem has not improved and may have even deteriorated in 1979/80. In addition, discussion of the preliminary evaluations done on the major nutrition intervention programs such as the food stamp scheme, thriposha program and the school biscuit feeding project are included. Recommendations and specific policy proposals are presented for the Government's consideration. The final report was due in March/April 1981 after completion of the ongoing research evaluations and surveys in 6 new districts. Support for the surveys came from UNICEF, FAO and USAID.

Government of Sri Lanka, Ministry of Health

1976  
  

Original data.
Method: Cross-sectional study; cluster sampling of the 15 health districts with 30 children from 30 selected sample units for each district; Anthropometric measures, blood samples and signs of Vitamin A deficiency were recorded; a questionnaire on demographic and descriptive factors was used.
Sample: 13,450 children aged 6-71 months; a special reference group of urban children represents the highest level of nutritional health in the country.
Location: national sampling in each of the 15 health districts (SHS); included rural and estate children but excluded urban children; the special group was selected from Colombo private pregrade schools.

The major objectives of the national survey were: 1) to provide a statistically valid assessment of the nutritional status of the preschool population, 6-71 months of age; 2) to fulfill the need for a reliable reference data base for planning and monitoring nutrition intervention programs; and 3) to help develop the capacity of Sri Lankan personnel to conduct such a survey.

Gwatkin, D.R.

1979  
Food Policy, Nutrition Planning, and Survival in Kerala and Sri Lanka,
  
Food Policy, November, 1979.

The author attempts to answer the question "to what extent can food policies and nutrition planning efforts account for the unusually favourable mortality rate given the low per capita incomes in Sri Lanka and Kerala?" In reviewing the available literature he concludes that food and nutrition policies cannot be viewed outside the political, social and economic context of development. In both cases,
the overriding commitment to a basic needs developmental strategy came first and then food and nutrition considerations followed naturally.

IBFAN (International Baby Foods Action Network)


The IFBAN News is a monthly newsletter put out by the International Baby Foods Action Network. The network consists of public service groups working to monitor infant food industry marketing throughout the Third World. This article reports on a recent Ministry of Health ban on advertising of infant foods.

Ignatieff, P.


The first half of this document briefly reviews UNICEF's efforts to assist children in Sri Lanka during 1978. It touches upon activities in health, nutrition, education, child care, water supply, urban development, and cyclone emergency.

International Statistical Institute


Original data.
Method: Nationally representative probability sample based upon a two stage design-census block samples and within these housing unit samples; World Fertility Survey Core Questionnaire translated; interviews by trained interviewers on knowledge, attitudes and practices of fertility, breast feeding duration and demographic data; fieldwork period August to October, 1975.
Sample: about 7000 ever-married women between the ages 12 to 49 years; subsample of 2400 for background variable.
Location: 750 census blocks throughout the country systematically sampled.

The Sri Lanka Fertility Survey (SLFS), carried out by the Sri Lanka Department of Census and Statistics of the Ministry of Planning and Economic Affairs, is part of the International World Fertility Survey project undertaken by the International Statistical Institute. The immediate objectives were to provide accurate and comparable up-to-date data on 1) fertility levels, patterns and correlates, 2) contraceptive knowledge and use and fertility intentions, and 3) the interactions of fertility and other social and economic factors. Of prime importance for our project is the data on the duration of breast feeding for both mothers' last child and their next-to-last child.
Jayaweera, S.


This chapter attempts to evaluate the economic participation of women in Sri Lanka as an index of their status. The economic profiles of women have been examined from all possible aspects with assistance from data from national level surveys, area studies, and from the views of employers and women workers. The findings of the different studies are synthesized to present as complete a picture as possible of the economic activities of women and to highlight the issues and problems which affect the economic status of women in Sri Lanka.

Jelliffe, D.B.


This classic work in the field of infant nutrition covers a wide range of issues. Scattered throughout the book are country-specific statements on feeding beliefs and practices.

Karunanayake, H.C.


This article describes and evaluates three representative non-governmental organizations involved in community-level nutrition interventions: the Lanka Jathika Sarvodaya Sangamaya, Redd Barna (the Norwegian Save the Children program), and the U.S. Save the Children Fund. The Sarvodaya program is nationwide in 2000 villages and suggests that successful planning at the village level initially requires external motivation and resources. The smaller Redd Barna program stresses working within existing networks to increase nutrition awareness within the communities. The U.S. Save the Children Fund program is a single urban program with an almost case-work approach. The strengths and weaknesses of each are highlighted.

Lawton, John


This brief report describes several Arab-supported development projects in Sri Lanka, and highlights the role of Arab aid throughout the Third World. The main nutrition related project in Sri Lanka is an improvement of the fishing fleet.
LEC


The LEC (low-cost extrusion cooker) Newsletter is published by the Department of Agricultural and Chemical Engineering, Colorado State University, Fort Collins, Colorado. This column presents the results of a seven-month test of commercial marketing of Thriposha in four representative regions of Sri Lanka. Results of a consumer survey conducted at 1200 randomly selected urban and rural households in the four regions are also briefly presented.

LEC


The LEC Newsletter is a summary of activities on the testing and application of low-cost extrusion cookers for the production of nutritious foods. This column briefly reviews the recent commercial marketing of Thriposha in Sri Lanka.

Marchione, T. and Helsing, E. (eds.)


Original data.

Method: Multi-method research; household survey interviews; in-depth study of a subsample of women interviewed; visits to 25 work sites; focused group discussions with women's groups; anthropometric measurements; and background literature review.

Sample: Random sample of 170 women with children 6 to 24 months of age; subsample of about 30 women for in-depth study; of the 170 women, 120 were housewives, 4 were informally employed and 46 were formally employed.

Location: Kotte Urban Council area, about 6 miles from Colombo, is a peri-urban area undergoing rapid change.

The Sri Lanka investigation presented in this collaborative study was carried out from December 1979 to November 1980 by an interdisciplinary team coordinated by Dr. Priyani Soysa, Department of Pediatrics, University of Colombo. The objectives of the study were similar to the overall project and included: 1) to investigate women's opportunities to breast feed in a changing urban area; 2) to make practical information available for legislative action, and 3) to stimulate action to remove the negative material constraints on breast feeding. The data presented and the analyses done are only
preliminary. Policy implications await further analyses and interpretation of data.

Patel, Mahesh


Summary data.

Methods: Four methods of analysis were used in determining the relative influences on infant mortality of different health services and environmental factors, with graphic comparisons of cross-sectional and time series data: 1) government health expenditures per capita over time are compared to national IMR's over time; 2) the relationship between the national percentage of unsupervised births with the 1961-68 national IMR is examined; 3) a cross-sectional analysis of regional health expenditures and regional infant mortality is made; 4) the relationship between geographically based regional IMR's to selected strong determinants of environmental status is analyzed for the year of the national census (1971).

The study found large regional variations in infant mortality and concluded that these differences are more strongly associated with regional variations in environmental determinants of mortality than with regional variations in public health expenditure. The most significant environmental factor associated with interregional differences in infant mortality is the nature of water supply ($R=0.82$), with a weak ($r=0.08$) correlation between health expenditures and infant death rates.

Popkin, B.M., Bilsborrow, R.E., Yamamoto, M.E., and Akin, J.


This paper examines available information on breast feeding patterns in low-income nations and discusses the possible effects of individual, household, and community factors on breast feeding. The information points to a pervasive decline in the duration of breast feeding, especially in Latin American and Caribbean urban areas. However, the evidence presented suggests continuing, almost universal breast feeding for the first year of life in most Asian and African countries reviewed. Data from Sri Lanka shows a high prevalence and duration of breast feeding, but implies a decline in duration is occurring over time.
BIBLIOGRAPHY (Cont.)

Rogers, B.L., Overholt, C.A., Kennedy, E., Sanchez, F., Chavez, A., Belding, T.K., Timmer, C.P., and Austin, J.E.


This document on consumer food price subsidies and pricing policy is part of a series of seven studies produced by the Harvard Institute for International Development which examines the major types of nutrition programs operating in developing countries. It discusses the key elements which should be considered in the design of such policies. Although price policy has both micro and macro-economic aspects, the primary focus is upon the household level effects of food prices. A brief discussion of Sri Lanka's food consumption subsidy is included.

Senanayake, P.


This paper was submitted after the conference at the request of delegates. The portions of the report on Sri Lanka review the social welfare laws and population policies as well as data on fertility and breast feeding trends. The major breast feeding study reviewed is an island-wide sample survey conducted in 1959. Other studies included a 1956 breast milk composition study, a 1974 feeding study and a 1975 Family Health Bureau duration study. No methodological information is presented on the studies.

Soysa, P.E.

1979a Breastfeeding Patterns in Sri Lanka. Workshop on Breast-Feeding and Supplementary Foods, Bangkok, Thailand.

Review of three studies.
Methods: not reviewed, dates not given.
Sample: Study 1, 405 women in 4 villages; Study 2, 274 in four villages; Study 3, 50 consecutive patients in a post natal clinic and in private nursing homes in Colombo; women of Sinhala, Tamil and Muslim ethnic groups.
Location: Urban areas of Borella, Dematagoda and Colombo; rural areas of Pindenija, Wattagedera, Jaffna, Danagama, Madduvil and Saint Lannarathu.

This brief document is an outline of an oral presentation made by the author at the 1979 Thailand workshop. It is incomplete in that data presented in slides at the presentation are not written out as tables.
Only the major points are highlighted, but some useful information on breast feeding practices is presented.

Soysa, P.E.


Original data.  
Method: cross sectional; questionnaire  
Sample: 105 households in Pindeniya (Sinhalese), 100 households in Wattegedera (Moors), 100 households in Jaffna (Tamils), and 99 households in Borella.  
Location: Pindeniya in Kegalla district, Wattegedra in Kandy, Borella (urban) in Colombo, and Sirupiddy in Jaffna. All three villages were close to urban centers.

This chapter reviews existing statistics on the health status of women in Sri Lanka. It also reports on the data collected from field studies in four areas. Indicators of the nutritional status of women were highlighted. Breast feeding and weaning practices were also covered in the field studies.

TAICH


This report describes the assistance programs for Sri Lanka of 25 private, non-profit U.S. organizations. The information given on each organization is based on the data supplied to TAICH by that organization itself. TAICH, under contract to the U.S. Agency for International Development, functions as a center for information on the socioeconomic development programs of U.S. non-profit organizations.

UNICEF


This document presents a Project Implementation Review of the first phase of this UNICEF-assisted project to improve and extend the Maternal and Child Health Services offered at 10 Maternity Home and Central Dispensaries and all MCH clinics in the Superintendent of Health Services (SHS) Division of Anuradhapura. A partial description of the project is given, but reference is made to the detailed Action Plan document. The project was not implemented until January 1980 and thus the implementation review is limited to project content, financing, staffing, administrative structure and monitoring and

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control procedures. Background health information is presented. The recommendations of the Review Panel are presented as well.

WHO (World Health Organization)


This document reviews 306 readily available references at WHO on nutritional anemias throughout the world. Nutritional anemia is one of the most commonly observed syndromes in the world, and is defined by WHO as "a condition in which the hemoglobin content of the blood is lower than normal as a result of a deficiency of one or more essential nutrients, regardless of the cause of such deficiency." Its significance, aggravating factors and a regional and country-specific breakdown of its frequency are presented.

World Fertility Survey Staff


This ten-page mimeographed document briefly summarizes the results of nine country WFS reports and answers a series of general questions from the basis of the country reports.

OTHER REFERENCES OF INTEREST

Ali Khan, M.


Dissanayake, D.


Field, J.O. and Kannangara, N.


International Statistical Institute


Jansen, G.R. and Harper, J.M.

Jayasekera, P.


National Science Council


Simeonov, L.A.


Skjønsberg, E.

in  Caste and Sex: A Village Study from Sri Lanka. press

Wijayaratne, C.M., Gunawardana, A.M. and S. Asmar