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MATERNAL AND INFANT NUTRITION REVIEWS

ZAIRE

A Guide to the Literature

1981

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INTRODUCTION

This monograph reviews the available literature on maternal and infant nutritional status, beliefs, and practices in Zaire. 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.

Table 1 contains geographic tables that reveal the extent to which various regions and specific locations have been surveyed. Pages vi and vii 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 54 contain an annotated bibliography with each entry described in terms of type of study (original data or literature review), methodology, sample characteristics, and location.

Ron Israel
INCS Project Manager

MATERNAL AND INFANT NUTRITION REVIEWS

CLASSIFICATION SYSTEM

1. Nutrition and Health Status

    1.1 General
    1.2 Women, Pregnant
    1.3 Women, Lactating
    1.4 Infants 0-6 Months
    1.5 Infants 6-24 Months

2. Dietary Beliefs

    2.1 General
    2.2 About Pregnancy
    2.3 About Lactation
    2.4 About Breast Milk Substitutes (Including Bottle Feeding)
    2.5 About Illness and Cure

3. Dietary Practices

    3.1 General
    3.2 Women
        3.2.1 During Pregnancy
        3.2.2 During Lactation
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        3.3.1 Breastfeeding
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4. Nutrition Status Correlations

5. Nutrition and Health Programs

    5.1 Health Care
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6. Nutrition and Health Policies and Legislation

    6.1 Government (Host and Donor Countries)
    6.2 Non-government (Including International Agencies)
    6.3 Commentaries

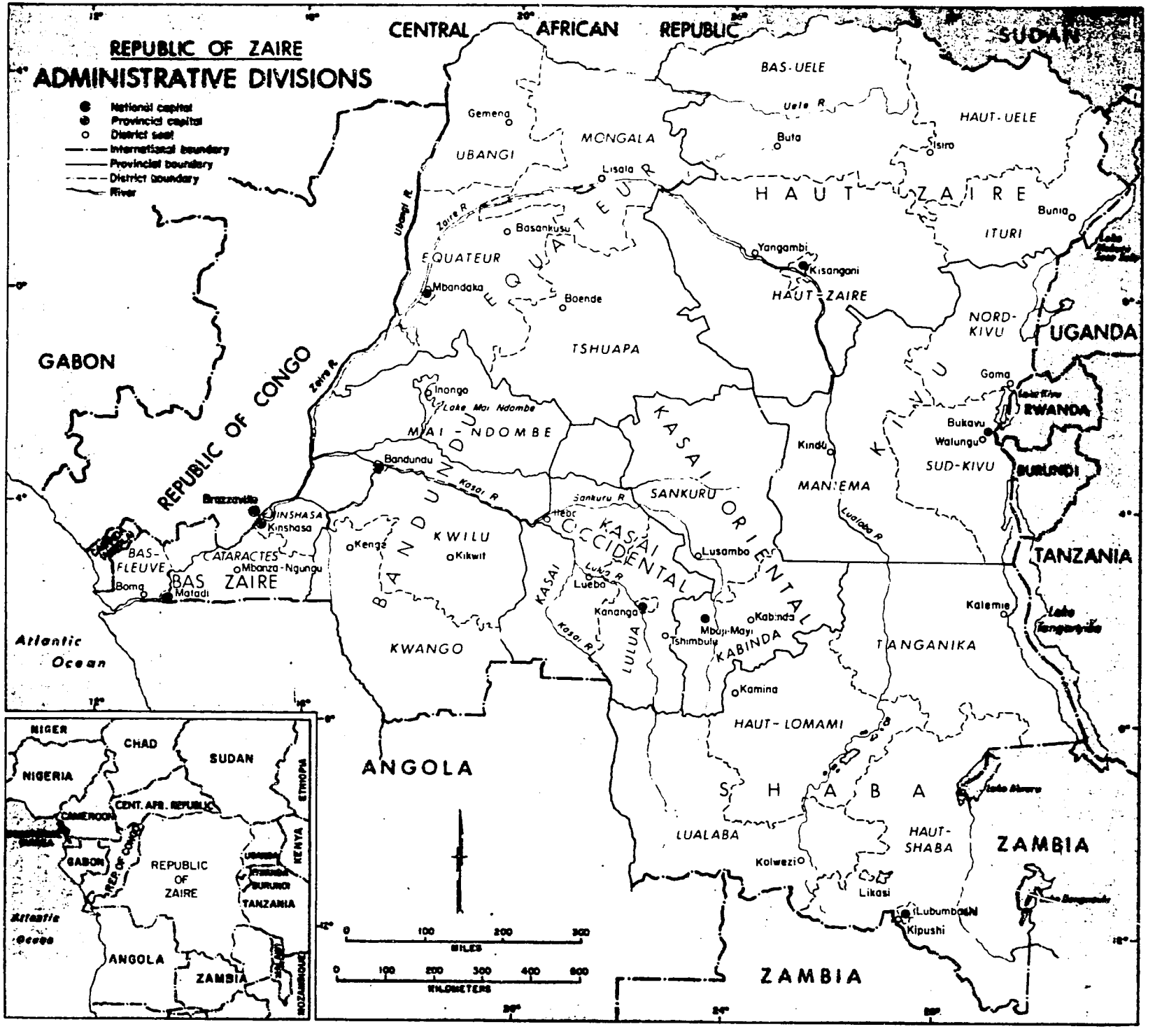
REPUBLIC OF ZAIRE
ADMINISTRATIVE DIVISIONS
National capital
Provincial capital
District seat
International boundary
Provincial boundary
District boundary
River
CENTRAL AFRICAN REPUBLIC
SUDAN
GABON
REPUBLIC OF CONGO
ANGOLA
ZAMBIA
UGANDA
RWANDA
BURUNDI
TANZANIA
Atlantic Ocean
BAS-UELE
HAUT-UELE
UBANGI
MONGALA
HAUT ZAIRE
ITURI
EQUATEUR
TSHUAPA
NORD-KIVU
SUD-KIVU
MAI-NDOMBE
BANDUNDU
KASAI ORIENTAL
KASAI OCCIDENTAL
SANKURU
MANIEMA
KWILU
KWANGO
LULUA
KABINDA
TANGANIKA
HAUT-LOMAMI
SHABA
LUALABA
HAUT-SHABA
BAS-FLEUVE
CATARACTES
BAS ZAIRE
Gemena
Buta
Isiro
Bunia
Lisala
Basankusu
Yangambi
Kisangani
Mbandaka
Boende
Inongo
Lake Mai Ndombe
Bandundu
Brazzaville
KINSHASA
Kinshasa
Boma
Matadi
Mbanza-Ngungu
Kenge
Kikwit
Lusambo
Luebo
Kananga
Tshimbulu
Mbuji-Mayi
Kabinda
Kindu
Goma
Bukavu
Walungu
Kalemie
Kamina
Kolwezi
Likasi
Lubumbashi
Kipushi
Uele R.
Ubangi R.
Zaire R.
Kasai R.
Sankuru R.
Lulua R.
Lualaba R.
Lake Mobutu Sese Seko
Lake Kivu
Lake Tanganyika
Lake Rukwa
Lake Mweru
Lake Bangweulu
0 100 200 300 MILES
0 100 200 300 400 500 KILOMETERS
NIGER
CHAD
SUDAN
NIGERIA
CENT. AFR. REPUBLIC
CAMEROON
ETHIOPIA
KENYA
GABON
REP. OF CONGO
REPUBLIC OF ZAIRE
UGANDA
RWANDA
BURUNDI
TANZANIA
ANGOLA
ZAMBIA
MOZAMBIQUE
Atlantic Ocean

TABLE I

Locations Studied

	Adelman, 1974	Baer, 1980	Brown, 1977	Brown, 1978	Carael, 1979	CEMUBAC, 1979	CEPLANUT, 1978	Ermolieff, 1979	FAO, 1977	Franklin, n.d.	Houyoux, 1973	Kabamba, 1980b	Kabamba, 1979b	Kabamba, 1978	Kasongo Project Team, 1981	Republic du Zaire, 1973	Rico-Velasco, 1978	Tandberg, 1980	Vis, 1978	Vis, 1975	WHO, 1979
BANDUNDU																					
Popokabaka							x														
Vanga		x																			
BAS ZAIRE							x					x		x							
Kinshasa	x						x		x	x	x		x				x	x			
EQUATEUR																					
HAUTE ZAIRE																					
KASAI OCCIDENTAL																					
Bulape			x	x																	
KASAI ORIENTAL																					
KIVU																					
Bukavu						x										x					
Highlands					x														x		
Idjwi Island																				x	
Kabara						x															
Tropical Forest					x																
Kasongo															x						
SHABA																					
Lubumbashi								x													
Not Specified																					x
Representative Whole Country Study																					

HIGHLIGHTS

1. **NUTRITION AND HEALTH STATUS:** Protein intake is one-half the FAO recommended allowance. Malnutrition is greatest in the largest cities, especially Kinshasa; in Kwilu, Kasai Oriental and South Kivu regions; and along the Angolan and Sudanese borders; the most severely affected area may be from Bandundu region to the Southern border. 50% of all pregnant women are anemic; infant mortality is 150 to 200 deaths per 1000 live births; cumulative childhood mortality through 5 years is as high as 500 deaths per 1000 live births. Infant weights follow European norms for about three months and then fall off; malnutrition is considered a primary or secondary cause of 60% of all childhood mortality and morbidity; there was an upward trend in incidence of PCM in 1976; there was no significant difference between Zairois and refugee populations' nutrition status.

2. **DIETARY BELIEFS:** Among several tribes, pregnant women are forbidden to eat eggs, beef, goat or pork. Pregnancy is the major reason given for weaning; "lack of milk" is the main reason given for supplementation; but complaints about inadequate milk supply are rare. In Kinshasa, 68.5% of mothers feel bottle feeding is good; 90% of urban mothers did not believe that their children were malnourished, although 32% to 47% were. Illness is attributed to harmful spirits or a village witch doctor. In rural areas, there are no special taboos on food for children and mothers; 72% of mothers of children under five feel it is good to have a home garden.

3. **DIETARY PRACTICES:** The usual meal pattern is one or two meals daily consisting of a large quantity of a staple carbohydrate (generally starchy roots and tubers such as manioc and plantain), green leafy vegetables and palm oil; when available, protein supplements are added to the diet, mainly in the form of dry beans and peanuts. Families often share one common food bowl; adult males are given first priority and young children lowest priority in food allocation; for the nation as a whole there are six staple foods: manioc, sweet potato, plantain, rice, corn, millet and sorghum. Dietary consumption data indicate a lack of basic nutrients such as total calories and protein; many nutrients are lost because of inappropriate cooking procedures, but relatively high consumption of fruits, vegetables and palm oil precludes many vitamin deficiencies common to many developing countries. The seasonal availability in the supply of protein rich foods is a problem. Half the food available in Kinshasa is consumed by 25% of the people and many low-priced nutritious foods (e.g. corn) are not as widely used as less nutritious, higher priced foods (e.g. manioc); between August 1978 and February 1979 there was a 200% increase in food prices in Kinshasa.

No mother reported that she had never breastfed her child; mothers who delivered in hospitals rarely reported being given gifts of free milk samples or free feeding bottles. In rural reas, supplementation with bananas, sorgum or manioc often begins by second or third week. Breastfeeding frequency is greater among rural women who don't work in the fields than among those who do; rural breastmilk production is low, rarely more than 600 ml. per day, but highest during harvest season. Abrupt weaning is the usual pattern in the urban areas where 20% of infants were bottle fed on powdered dry milk; 78% of bottle fed children were age birth to six months; but 91.5% of bottle fed children were also breasfeeding; 86.3% of urban mothers reported that the contents of the bottle included boiled water, sugar and a milk product; milk

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powders and other infant formula foods are extremely expensive, but most mothers with small children have such products in their home. Solid foods are generally added to the diet in the second or third month in urban areas; children fed mothers' milk plus part of the family meal weighed significantly more than children following other feeding practices. There is no special diet for children after weaning; young children receive bulky carbohydrate foods with relatively little protein.

4. **NUTRITION STATUS CORRELATIONS:** Malnutrition correlated with children of unmarried mothers in Bulape, in rural areas with mothers under 20 and over 35, with the wet season between October and December, and with parental separation and divorce; in the urban areas, chronic malnutrition correlated with low socioeconomic status and large family size; acute malnutrition correlated with low utilization of health services, lack of knowledge about diarrhea, and migration of the father to Kinshasa. Groups with highest provosion or utilization of prenatal care had the lowest prevalence and shortest duration of breastfeeding; the rural/urban difference in breastfeeding duration was most prevalent in the highland area where average duration is 7 months urban/22 months rural. No relationship was found between birth weight and prevalence of breastfeeding; or between breastfeeding prevalence and husband's age, education, occupation, employment status or whether he was presently residing with his wife. Absence of childhood illness correlated with mothers who had attended nutrition education classes. Production of staples declined from 1975 to 1979, and rampant inflation of food prices prevented the average family from purchasing adequate food.

5. **NUTRITION AND HEALTH PROGRAMS:** Twenty religious denominations supported at least 100 dispensaries; 13 maternity wards; 20 hospitals; one medical center; 3 mobile health units; training programs for nurses, medical assistants, nurses' aides and midwives; first aid stations; and clinics. The United Methodist Church and the United Methodist Committee operated a food for work nutrition project in central Zaire; Catholic Relief Services sponsored nutrition seminars for workers in clinics and centers. The National Nutrition Centre produced a series of radio and television nutrition spots on maternal and child nutrition and health issues aired in late 1980 and 1981; the Bulape Health Project had a health team which visited each village monthly for nutrition surveillance; the Department of Social Affairs had a Nutrition Education Program at the Centre de Protection Familiale et Maternale du Kinshasa. Catholic Relief Services administered U.S. government-donated P.L. 480 Title II foods to refugees from Angola and Uganda.

6. **NUTRITION AND HEALTH POLICIES AND LEGISLATION:** In 1973 President Mobutu designated health as one of our key national priorities; in 1979 the Ministry of Public Health accounted for 12% of the national budget; in 1978 the Zaire National Nutrition Planning Centre was created to coordinate nutrition efforts in Zaire. The labor code of Zaire requires all enterprises to pay for medical care related to pregnancy; under the Labor Code, pregnant women are eligible for 14 weeks leave at two-thirds their normal wage, with at least six weeks taken after the birth of their child. Since independence, the Belgian government has remained the single largest provider of bilateral assistance.

Health resources are poorly distributed, most facilities and manpower being located in the cities, rather than rural areas where 74% of the population lives; shortage of trained manpower remains one of the major

impediments to extending the national health care delivery system. A follow-up survey to test the effectiveness of the mass media broadcasts was recommended by an International Nutrition Communication Sevice consultant. Only 10% of mothers were aware of nutrition education services at MCH centers. Enrichment of cassava meal with corn and soy to increase protein levels has been recommended.

1. NUTRITION AND HEALTH STATUS

1.1 NUTRITION AND HEALTH STATUS, GENERAL

NATIONAL

GEOGRAPHIC DISTRIBUTION OF MALNUTRITION: Malnutrition is greatest in the largest cities, especially Kinshasa; in Kwilu, Kasai Oriental, and South Kivu regions; and along the Angolan and Sudanese borders. The most severely affected area may be from Bandundu region to the southern border. (Lashman, 1975)

PROTEIN DEFICIENCY: Average daily protein intake is between 33 and 43 grams, half the U.N.F.A.O. recommended daily allowance, but varies among geographic areas. (Lashman, 1975)

PELLAGRA: Among 8000 patients seen in a dermatology clinic in 1977 and 1978, 231 (2.8%) had pellagra. (Ermolieff, 1979)

REGIONAL

GOITER: Serious shortages of iodine have been noted in the Kivu region. In Idjwi alone 70% of the population have goiters and the incidence of cretinism is 1%. (Lashman, 1979)

REFUGEES: There were no major differences in the nutritional status of the refugee population and their Zairois neighbors. (Kabamba, 1978)

RURAL

ANEMIA AND GOITER: Adult women are generally healthy; the only common nutrition problems are iron deficiency anemia or iodine deficiency goiter. Adult malnutrition is rare. (Brown, 1977)

DISEASE: In the equatorial forest area, vitamin deficiency diseases and kwashiorkor are rare. Prevalence of infectious and parasitic diseases is high. (Carael, 1979)

GOITER: Goiter is palpable (mild) in 15-20% of Tembo women but is not present in Ntomba. (Carael, 1979)

GOITER: In the eastern highlands, prevalence of goiter ranges from 20% to 30%. (Carael, 1979)

1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT

NATIONAL

CAUSES OF MATERNAL MORTALITY: Hemorrhage and infection are major causes of maternal mortality and are related to low levels of prenatal care. (Lashman, 1975)

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

MALNUTRITION, PARASITES, AND ANEMIA: 50% of all pregnant women are anemic, because of high rates of malnutrition and of parasitic infections. (Lashman, 1975)

MATERNAL MALNUTRITION AND INFANT DEATHS: High rates of perinatal and infant mortality are partly attributable to high rates of maternal malnutrition. (Lashman, 1975)

RURAL

MATERNAL MORTALITY: The maternal mortality rate in rural areas is 2 deaths per 1000 live births. (Lashman, 1975)

WEIGHT GAIN: Mothers in Kivu seldom gain more than 5 kilograms during pregnancy. (Vis and Hennart, 1978)

WEIGHT GAIN: Shi or Havu women gain at most 4-5 kg in pregnancy; weight gains average 2 to 3 kg. (Vis, 1979)

WEIGHT GAIN: A pregnant woman's weight increase depends on the time of year. The maximum gain is 4-5 kilograms and during some months of the year (the protein gap period) there is no weight increase. (Vis, 1975)

GOITER: Among women examined for goiter in the Bulape region, 40% showed some sign of goiter. (Brown, 1978)

URBAN

MATERNAL MORTALITY: The maternal mortality rate in urban areas is 1 death per 1000 live births. (Lashman, 1975)

ANEMIA: At Mama Yemo Hospital 60% of mothers arriving at the maternity ward have anemia. Of these, more than 80% have hemoglobin levels below 10 grams per 100 ml. (Lashman, 1975)

1.3 NUTRITION AND HEALTH STATUS, WOMEN, LACTATING

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS

NATIONAL

INFANT MORTALITY RATE: Infant mortality is estimated at 150 to 200 deaths per 1000 live births. (Lashman, 1975)

INFANT MORTALITY RATE: The infant mortality rate was 160 per 1000, a rank of 122 when compared with other countries of the world. (Sivard, 1979)

LOW BIRTH WEIGHT: Low birth weight babies (under 2.5 kg) were born to 8.2% of urban poor mothers, 7% of economically advantaged mothers, and 17.6% of rural mothers. (WHO, 1979)

REGIONAL

BIRTH WEIGHTS: Birth weights averaged 2.9 kilograms (6.38 lb.) for boys and 2.8 kilograms (6.16 lb.) for girls. Weights followed European norms to about three months and then fell off. (Vis, 1975)

LOW BIRTH WEIGHT: Incidence of low birth weight babies (under 2500 grams) increased in Tshela during the famine, but remained constant in Lukula in the 1977-78 period. Incidence of low birth weight in Bas Fleuve was 23% in 1977, 25% in 1978, and 20% in 1979. (Kabamba, 1980b)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

NATIONAL

MALNUTRITION, MORBIDITY, AND MORTALITY: Malnutrition is considered a primary or associated cause of 60% of all childhood morbidity and mortality. (Lashman, 1975)

MALNUTRITION MORTALITY IN HOSPITAL: At Vanga Mission in the Bandundu, malnutrition is estimated to be the primary cause of death of at least 50% of all children under 5 admitted to the hospital. (Lashman, 1975)

CHILD MORTALITY: Cumulative child mortality through 5 years of age is estimated to be as high as 500 deaths per 1000 births. (Lashman, 1975)

CAUSES OF DEATH: Major causes of death in children are malnutrition, malaria, and gastroenteritis, complicated by bronchial pneumonia, diarrhea, and infectious diseases such as measles and tuberculosis. (Lashman, 1975)

DISTRIBUTION OF KWASHIORKOR: Kwashiorkor is endemic in the northern and northeastern areas of the country, particularly in the areas of high consumption of manioc. Not confined to one geographic area or socioeconomic group, it has been documented in large urban, industrial, and rural areas. (Lashman, 1975)

REGIONAL

PCM IN KASAI: In the two Kasai regions in 1972 studies found that 50-60% of children suffered from PCM. Kwashiorkor and marasmus were cited as the most frequent childhood diseases in the area. (Lashman, 1975)

PCM IN BAS FLEUVE: Malnutrition was particularly severe during the famine period in the subregion of Bas Fleuve where one in every four children was affected. Clinically these children suffered the full spectrum of PCM including kwashiorkor (edema rate 17%) and marasmus. (Kabamba, 1978)

ACUTE MALNUTRITION BY REGION: 16% of the children sampled during a drought were acutely malnourished (on the basis of pedal edema, a sign of kwashiorkor, or of being less than 80% of the reference median weight for height). In the zones Tshela and Lukula, the figures were 26.0% and 21.1% respectively. (Kabamba, 1978)

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

ACUTE MALNUTRITION BY REGION: Of an estimated 31,000 acutely malnourished children under 6 years of age in the areas studied during a famine, 71% were found in the zones of Tshela and Lukula. (Kabamba, 1978)

MALNUTRITION AND BREASTFEEDING: 60% of children hospitalized for malnutrition aged one year or less were breast fed; 97% of all children under one year were breast fed. (Kabamba, 1978)

ANEMIA AND ILLNESSES: 31 of 71 malnourished children (44%) were anemic on the basis of clinical examination. This could well be due to parasites or malaria as there were concurrent findings of fever in 19, gastroenteritis in 34 and splenomegaly in 27 children. (Kabamba, 1978)

FEW VITAMIN DEFICIENCIES: In clinical examinations of 71 children with malnutrition little evidence was found of vitamin deficiencies. Six children had some signs associated with deficiency of riboflavin. No evidence was present for vitamin A, C, D or niacin deficiencies. (Kabamba, 1978)

RURAL

COMMON HEALTH PROBLEMS: Major health problems among children in Bulape are malnutrition, measles, and pneumonia-diarrhea complex. Protein calorie malnutrition occurs throughout the area. (Brown, 1977)

DECREASING WEIGHT FOR AGE: A survey of children under five years in one section of Bulape showed that nearly one fourth of them were less than 75% of Boston standard weight for age. Weight gains were good for first six months, but after that weights fell below standards and the gap widened steadily until the age of 24 months. From then until age 5 years weight curves paralleled the standard, though falling below it at roughly 80% of standard. (Brown, 1977)

PCM: In the eastern highlands protein calorie malnutrition affects 15-20% of children under 5 years. Prevalence of kwashiorkor is high. (Carael, 1979)

PCM: 4,798 children admitted to Bulape hospital in one year had primary diagnosis of protein-calorie malnutrition (PCM). (Brown, 1977)

CHANGES IN MALNUTRITION RATE: Late in 1976, hospital admissions for PCM rose, indicating a worsening nutritional situation in the villages. (Brown, 1977)

WEIGHT FOR HEIGHT: 2.9% of children in Tshela, and 3.6% of children in Lukula, were below 80% of the reference median weight for height in January-February 1980. In the baseline survey in 1978 during a famine, 11.4 and 11.6%, respectively, were found to be acutely malnourished. (Kabamba, 1980b)

WEIGHT FOR HEIGHT, 8.5% of children in rural Vanga were moderately malnourished (70 to 79% of standard weight for height). (Baer, 1980)

WEIGHT FOR HEIGHT: 5% of preschoolers in Idjwi and 32% in Kabare were below the fifth percentile of weight for height. (Vis, 1979)

WEIGHT FOR HEIGHT: 9.5% of children in the Vanga region were acutely malnourished (less than 80% of standard weight for height), and 1% were severely malnourished (less than 70% of standard weight for height). (Baer, 1980)

WEIGHT FOR HEIGHT: Weight for height measurements indicated nutritional wasting in the second year of life, when half of the children in Bulape weighed less than 90% of the expected weight for height, compared to the Boston standards. (Brown, 1977)

WEIGHT FOR HEIGHT AND EDEMA: 4.6% of children 6-59 months in Tshela and 5.7% in Lukula were below 80% of Harvard Standard Reference median weight for height or had edema in early 1980. These figures had been 26% and 21.1% in late 1978 during a famine. (Kabamba, 1980b)

EDEMA: 18.3% of children in Tshela and 15.5% in Lukula had edema in the 1978 baseline survey during a famine. By January-February 1980, only 1.9% in Tshela and 2.1% in Lukula had edema. (Kabamba, 1980b)

WEIGHT FOR AGE: 20 to 25% of preschoolers were found to be under the minimum curve on the Morley weight chart, among the 7000 preschoolers using the health services provided by the Baptiste de Zaire Ouest in 1977. In studies of the general population 30 to 45% of preschoolers were found to fall below this minimum curve. (Service Medical de la Communaute Baptiste, 1977)

WEIGHT FOR AGE: 4% of preschoolers in Idjwi and 23% in Kabare fell into the Gomez Class III category (weight for age below 60% of standard). (Vis, 1979)

WEIGHT: In a group of 1020 children 0 to 3 years old in Kivu, 20.4% showed a weight curve below the 5th centile for height. (Vis, 1975)

HEIGHT FOR AGE: Height progressed normally until 12 months of age. It then slowed relative to Boston standards and the gap continued to widen throughout the preschool years. (Brown, 1977)

WEIGHT, HEIGHT, AND AGE: 48.7% of children in Vanga had normal weight for height and normal height for age. 41.8% were stunted (normal weight for height and less than 90% standard height for age). 3.6% were wasted (less than 80% standard weight for height and normal height for age). 5.9% were both wasted and stunted. (Baer, 1980)

UNDERNUTRITION AMONG PYGMIES: In a study being conducted among the pygmies of the Ituri forest, prevalence of obvious undernutrition appears to be low. There is a high prevalence of clinical anemia among both the Efe and Lese and a significant frequency of goiter among the Lese. (Zaire Nutrition Planning Center, n.d.)

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

ANEMIA: 40% of children in Vanga had hemoglobins less than 10 gms/100 ml., and 8.3% had hemoglobins less than 7 gms/100 cc. 40.2% were found to have conjunctival anemia at physical exam. (Baer, 1980)

HOOKWORM: 49% of children in Vanga tested positive for hookworm. This high prevalence of hookworm is explained by the fact that 90% or more of the children go without shoes and that the presence of good latrines varies from 20 to 90% of households in villages. (Baer, 1980)

URBAN

MALNUTRITION RATES: 73% of children admitted to Mama Yemo Hospital were diagnosed as malnourished (kwashiorkor, marasmus, malnutrition), and 30% had malnutrition as the principal diagnosis in 1977, although the rate had been 6% in 1975. 30% of the children at Kalembelembe and 53% at Kintambo were diagnosed as malnourished. (CEPLANUT, 1978)

MALNUTRITION RATE: 9.59 children per 10,000 population were hospitalized with a diagnosis of malnutrition. (CEPLANUT, 1978)

MALNUTRITION AND HOSPITALS: In Kinshasa, malnutrition is the major diagnosis for about 30% of the children hospitalized. Malnutrition has risen from sixth place among the most frequent reasons for hospitalization in 1975 to first place in 1977 in one major hospital. (Varon, 1979)

MALNUTRITION AND HOSPITALS: In Kinshasa one out of every five children hospitalized in 1977 died, and malnutrition accounted for the highest proportion (30%) of the deaths. (Varon, 1979)

WEIGHT FOR HEIGHT: The rate of acute malnutrition (children less than 80% of the standard weight for height) doubled between September and December 1978 in Kinshasa. It is not known whether this is a seasonal variation or an effect of increasing food prices. (CEPLANUT, 1978)

WEIGHT FOR HEIGHT: 1.7% of children under 5 years fell below 60% of Harvard Standard weight for height; 1.3% were between 61 and 70%; and 5.9% were between 71 and 80% of standard. (Kabamba, 1979a)

WEIGHT FOR AGE: 11.1% of children under 5 years old were severely malnourished (below 60% of Harvard Standard weight for age). 9% were moderately malnourished (61-70% of standard), and 22.3% were mildly malnourished (71-80% of standard). (Kabamba, 1979b)

WEIGHT FOR AGE: Among children 7-12 months old in Kinshasa, 2.5% to 3.4% (depending on zone of city) fell below 80% of Harvard Standard weight for age; at 13-24 months, 6.9 to 10.1% fell below 80% of standard. (Kabamba, 1979b)

EDEMA: 1% of children in Lingwala had edema, none in Bumbu, and 2.8% in Kimbanseke. Kwashiorkor is not the common form of malnutrition, but chronic malnutrition with severe wasting is seen. (Kabamba, 1979b)

HEIGHT FOR AGE: 0.9% of children in Vanga were below 70% of the reference median for height for age, 4.9% had a height between 70 and 79% of standard, 42.2% had heights between 80 and 89%, 52.2% of the children were at or above the reference median. (Baer, 1980)

WEIGHT FOR AGE: Approximately 22% of children between 6 months and 4 years old in Kinshasa are malnourished in terms of weight for age. (Adelman, 1975)

SUPPLEMENTAL FOODS AND DISEASE: Children fed mother's milk plus a special meal have significantly lower frequency of disease than children with other feeding practices. Children who take mother's milk plus a family meal have a significantly greater frequency of disease. (Adelman, 1975)

MALNUTRITION AND WEANING: The rate of malnutrition (based on weight for age) in Kinshasa is 19% among children who have not been weaned, and 28% among children who have been weaned. (Adelman, 1975)

MALNUTRITION AND WEANING: After a child is weaned, the rate of malnutrition rises to 28%, having been 19% before weaning. (Adelman, 1975)

ANEMIA: 28.8% of children had hemoglobin values below 11 gm/100 ml. (Kabamba, 1979b)

ANEMIA: 22.8% of children studied had a clinical diagnosis of anemia. (Kabamba, 1979b)

ANEMIA: 19.9% of children examined in urban areas were found to be anemic. (CEPLANUT, 1978)

PARASITES: 57.6% of children examined were found to harbor parasites; 24% had more than one kind. (CEPLANUT, 1978)

ILLNESS: 15.2% of children in Kinshasa had skin infections, 5.9% upper respiratory tract infections, 5.0% had colds, 2% had lower respiratory tract infections, 6.9% had fever, 4% splenomegaly, 2.6% had gastroenteritis, and 1.3% had otitis media at clinical exam. (Kabamba, 1979b)

MEASLES: 55% of reported cases of measles occured before the age of 24 months. The period 7 to 21 months corresponded to the highest infection risk period. (Kasongo Project Team, 1981)

MEASLES FATALITIES: Of 1069 children with measles who were followed for at least two months, 6.1% died within a month of onset of measles. The case fatality rate was 6.2% in the group age 7 to 12 months, 9.8% among children 13 to 24 months, 4.3% among children 25 to 36 months, and 2.8% among children 37 to 60 months. (Kasongo Project Team, 1981)

DISEASE HISTORIES AND WEIGHT: 87% of mothers in Kinshasa reported their child had been sick. 71.2% had had one disease; 24.2% had had two diseases; 4.4%, three diseases. Children who had been sick weighed

significantly less than children who had never been sick. Diarrhea was especially significant, lowering weight in both weaned and unweaned children. (Adelman, 1975)

2. DIETARY BELIEFS

2.1 DIETARY BELIEFS, GENERAL

NATIONAL

IMPORTANCE OF CHILDREN: The Zairian views the child as the source of all true family wealth. The child's protection is therefore critical to the functioning of family and society. This belief explains the high demand for maternal and infant care clinics. (Lashman, 1975)

RURAL

NO FOOD TABOOS: There are no special taboos about food for children. (Brown, 1977)

PROTEIN SOURCES: Animal protein sources are greatly overvalued by the poor in Kinshasa, while commonly available sources of vegetable proteins are substantially undervalued. (Wheeler, 1978)

BIDIA: Bulape adults consider a large amount of bidia (cassava balls) an indispensable part of every meal. Regardless of the variety or value of other foods served, they admit they do not feel satisfied unless their stomachs are full of bidia. They assume that children feel the same way: that is, they want and need to fill up on bidia, although bidia is a low-density food in terms of calories and nutrients. (Brown, 1977)

FOOD AND MONEY: Residents of Bulape feel that daily food is not something to be bought with money, so food purchasing is negligible. (Brown, 1977)

PYGMIES: Pygmies equate hunger with noise and laziness, which are rational explanations for poor hunting and gathering. (Turnbull, 1965)

PYGMY DIET: The adult pygmy diet is composed of fruits, nuts and roots found in the forest as well as vegetables taken from village plantations. Collected food also includes honey, mushrooms, insects, and hunted animals. (Turnbull, 1965)

URBAN

KNOWLEDGE OF NUTRITION: In Kinshasa, mothers of young children indicated a rather high degree of nutrition knowledge, although they had had little education as a group -- 16% had no education at all and only 2% had completed 6 years of secondary education. Lack of nutrition knowledge is a less likely cause of malnutrition than is lack of income. (Tandberg, 1980)

TABOOS ON FOODS OF ANIMAL ORIGIN: In studies in the city of Popokabaka, numerous taboos on foods of animal origin aggravated the widespread problem of anemia by limiting foods high in iron, imperiling the nutritional status of infants during gestation, lactation, and weaning. (CEPLANUT, 1978)

2.2 DIETARY BELIEFS ABOUT PREGNANCY

NATIONAL

FOOD TABOOS: Among several tribes pregnant women are forbidden to eat eggs, beef, goat, or pork. (Lashman, 1975)

RURAL

FOOD AVOIDANCE: Most pregnant women and some nursing mothers will name one or two foods which they do not eat because of family rules or personal preferences, but other nutritionally equivalent foods are always available. (Brown, 1977)

URBAN

PROTEIN FOOD AVOIDANCES: 25% of mothers of young children in Kinshasa believed that there were certain foods women should avoid during pregnancy. The foods to be avoided included fish (27%), monkey (19%), pork (19%), and eggs (15%). (Tandberg, 1980)

2.3 DIETARY BELIEFS ABOUT LACTATION

RURAL

MILK ADEQUACY: Mothers' complaints of inadequate milk supply are rare. (Brown, 1977)

URBAN

BREAST IS BEST: 99% of mothers of children under five in Kinshasa said that breastfeeding is best for the infant. 36% said that breastfeeding should be supplemented with bottle feeding and 63% said it should not. (Tandberg, 1980)

DURATION OF BREASTFEEDING: 12% of mothers felt breastfeeding should cease at 7 to 12 months, 61% felt it should stop between 13 and 18 months, and 25% felt it should stop between 19 and 24 months. (Tandberg, 1980)

SUFFICIENT MILK: When asked if they had sufficient milk, 78% of the mothers responded that they did. (CEPLANUT, 1978)

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

2.5 DIETARY BELIEFS ABOUT WEANING

NATIONAL

REASONS FOR SUPPLEMENTATION: The main reasons for supplementing breastfeeding were "lack of milk" and that the child was crying or seemed hungry. (WHO, 1979)

REASONS FOR WEANING: Pregnancy was the major reason given by all groups. 51% of urban poor and 57% of rural mothers stopped breastfeeding because of a new pregnancy. 13% of urban poor mothers and 26% of rural mothers stopped breastfeeding because the child was "too big" and the child ate well. (WHO, 1979)

URBAN

TIME TO INTRODUCE FOODS: 4% of Kinshasa women felt foods in addition to breast milk should be added before 3 months; 40%, at 3-4 months; 33% at 4-5 months; 10% at 5 to 6 months; 12% at 6-7 months; and 1% at over 7 months. (Tandberg, 1980)

FIRST FOODS: 35% of mothers in Kinshasa believed that fufu should be the first food introduced (11% of these respondents said that nothing else needed to be added to the child's diet during weaning); 4% stated that groundnuts should be the first food, 6% said carterpillars, 11% maize gruel, 5% soya gruel, 9% manioc leaves, 14% other green leaves, 3% dried fish, and 13% stated other foods should be the first introduced. (Tandberg, 1980)

BOTTLE FEEDING: 68.5% of mothers in Kinshasa felt that bottle feeding was good, 23.4% felt is was bad or unnecessary, or they had never used it. 8.1% had no opinion. Among mothers who had ever bottle fed, 88.8% of those currently bottle feeding thought the bottle was good, compared to 79.4% of those who had discontinued bottle feeding. 58.7% of those who had never used the bottle expressed a positive attitude towards bottle feeding. (Franklin, n.d.)

NUMBER OF MEALS PER DAY: 5% of respondents in Kinshasa felt that children under five years should have one meal per day; 60%, 2 meals per day; and 35% said they should have 3 meals per day. (Tandberg, 1980)

IMPORTANCE OF FAMILY GARDEN: 72% of mothers of children under five felt it was good to have a garden in improving children's diets, 26% said it was not important and 2% did not know. (Tandberg, 1980)

2.6 DIETARY BELIEFS ABOUT ILLNESS AND CURE

NATIONAL

CAUSES OF DISEASE: Illnesses which befall a person are believed to be inevitable, uncontrollable, and the results of harmful spirits or curses by the village witch doctor. (Lashman, 1975)

URBAN

STOP FEEDING ILL CHILD: 1% of mothers of young children in Kinshasa believed that you should stop feeding a sick child until he feels better, but 99% believed you should not stop feeding the sick child. (Tandberg, 1980)

BELIEFS ABOUT MALNUTRITION: 90% of mothers interviewed believed that none of their children were malnourished, but an anthropometic study of

2.6 DIETARY BELIEFS ABOUT ILLNESS AND CURE (CONTINUED)

their children found 32 to 47% of the children malnourished. (CEPLANUT, 1978)

SIGNS OF MALNUTRITION: When asked how one knows if a child is malnourished, most mothers said anemia was the primary sign of malnutrition. Weight loss and fatigue were also mentioned. Fewer than 10% mentioned edema and red hair. (Kabamba, 1979b)

SIGNS OF MALNUTRITION: 74% of mothers of young children said (correctly) that if a child's hair starts to turn red it is a sign of malnutrition/kwashiorkor; 19% said it was a sign of intestinal parasites; 1% said anemia and 6% said they did not know what it meant. (Tandberg, 1980)

SIGNS OF MALNUTRITION: 90% of mothers in Kinshasa knew that if a little child had a pot belly it might be malnourished; 7% said it was well nourished, and 3% did not know. (Tandberg, 1980)

MEASURES TO COMBAT MALNUTRITION: 44 to 71% of mothers in different zones of Kinshasa said it was important to provide a child with proper food to combat malnutrition. The next most common answer was to give medicines to increase appetite. Mothers lacked knowledge about what specific types of food are lacking in their diets and how food preparation relates to deficiencies. (Kabamba, 1979b)

BOILING WATER: 100% of mothers of young children in Kinshasa said that it was necessary to boil drinking water to prevent disease. When asked about practices, 11% said they always boiled drinking water, 33% said sometimes, and 56% never boiled drinking water. (Tandberg, 1980)

CAUSES OF DIARRHEA: 23% of mothers believed that children got diarrhea because they ate with dirty hands; 12% because the child did not wash his hands after having been to the bathroom, 22% because the child ate contaminated foods or drank contaminated water; 3% said it was fate, 36% had other reasons, and 4% did not know. (Tandberg, 1980)

3. DIETARY PRACTICES

3.1 DIETARY PRACTICES, GENERAL

NATIONAL

INFLATION AND DIET: Rampant inflation in food prices has effectively precluded the aveage family from purchasing sufficient quantities of food. (Lashman, 1975)

ECONOMY AND FOOD SUPPLIES: Rather than keeping up with population growth, agricultural production has been lagging. Production in 1977 was 15% less per capita than in 1974, and nine percent less than in 1972. Food production, including palm oil, stagnated in 1975, increased marginally in 1976, and fell by about 10% in 1977. Production of staples such as maize and rice never attained the 1974 level during the crisis of the Zairian economy from 1975 to 1979. (Varon, 1979)

BASIC DIET VARIES BY REGION: The basic diet in Zaire is as varied as the tribes. Even within the same tribe the diet may vary in quantity and quality. The staple varies by region and may be manioc, rice, banana or a combination of all three. (Kabamba, 1979a)

STAPLE FOODS: For the nation as a whole there are six staple foods: manioc, sweet potato, plantain, rice, corn, millet, and sorghum. Manioc prepared as fufu is the national dish. (Lashman, 1975)

FOOD PREPARATION: Bananas are peeled, boiled, and eaten whole or mashed. Bidia or shime is prepared using fresh or boiled manioc. Corn is grilled or boiled. Bidia (or musa) is made from a mixture of manioc flour and corn, boiled to form a pancake. (Kabamba, 1979a)

FOOD PREPARATION: Bitoto is a porridge made from bananas and either beans or manioc leaves. Bugali is prepared like Bitoto except in the Northeast part of Kivu where the base is millet flour, banana flour, or manioc flour alone. (Kabamba, 1979a)

PREPARATION OF CHIKWANGUE FROM MANIOC: Chikwangue is prepared by different methods in different regions. In Bandundu it is made by soaking manioc tubers in water for two or three days. After removal, it is wrapped in tree leaves and cooked. In the area of lake Mai-Ndombe the preparation calls for many steps. The fresh manioc is put in water for about five days, then boiled, dried, ground into a fine powder, wrapped in small packages, and finally steamed. (Kabamba, 1979a)

COOKING FACILITIES: Cooking is generally done outdoors. In the few areas where kitchens are built, they are usually small separate units behind the main residence. (Lashman, 1975)

SOURCES OF PROTEIN: 10% of animal protein consumed is obtained from insects. 30% is provided by hunting, 48% from fishing, 10% from livestock, 2% from poultry. (Kabamba, 1979a)

3.1 DIETARY PRACTICES, GENERAL (CONTINUED)

NUTRIENTS LOST: Nutrients are lost because of inappropriate cooking procedures including failure to presoak and sufficiently cook beans; oversoaking and boiling of meat and then discarding cooking water; failure to mix mashed manioc with sufficient amounts of water, leaving the dough heavy and hard to digest; and cooking foods in oil at high temperatures (Lashman, 1975)

CALORIE AND PROTEIN SUPPLY: Per capita calorie supply in 1978 was 2312 calories (ranking 75th among the countries of the world) and protein supply was 36 grams per capita (ranking 132nd among the countries of the world. (Sivard, 1979)

PROTEIN DEF[illegible] The main nutritional problem is protein deficiency. The avera[illegible] calorie intake is estimated to be 85% of the requirements determined by FAO. Estimates of average daily per capita protein intake range from 32.7 to 43.4 grams, or only half of the FAO recommended daily intake of 70 grams of protein per person. (Lashman, 1975)

PROTEIN DEFICIT: Animal protein is absent, fresh milk is rare, and eggs are used for hatching. Poultry is not readily available and usually used only for adult consumption. Goat meat, used for feasts, is also confined to adults. Vegetable sources of protein include corn, peanuts, and manioc greens. Beans are not widely used. (Lashman, 1975)

VITAMIN INTAKE: The relatively high consumption of fruits and vegetables by the population precludes many vitamin deficiencies common to many developing countries. The large consumption of palm oil also provides an ideal source of vitamin A. (Lashman, 1975)

REGIONAL

MEAL PATTERNS: The usual dietary pattern is one or two meals daily consisting of a large quantity of a staple carbohydrate (generally starchy roots and tubers such as manioc and plantain), green leafy vegetables and palm oil. To this is added a small amount of protein supplement(s) in the form of dry beans, peanuts and dried smoked fish when available. (Kabamba, 1978)

FAMILY MEALS: Families often share one common food bowl. The adult male is given first priority in the food allocation, whereas the young child has lowest priority. (Kabamba, 1978)

REGIONAL DIET: In the region of Bas Zaire the staple is bitoto (a mixture of bananas, beans, manioc leaves and fish) or manioc in different forms. Also eaten are manioc leaves, beans, mangos, avocado, pineapple, papaya, guava, sweet potato, beetle larva, fish, pork, beef, lamb, goat, palm wine, pepper and onion. (Kabamba, 1979a)

DROUGHT: Bas Zaire's food production in 1978 was about half of the normal level. In 1978 agricultural output was adversely affected by the severe drought in the Bas Zaire region and part of the Bandundu region early in the year. (Varon, 1979)

DROUGHT VICTIMS: The Bas Zaire region is inhabited by the Bakonge which includes the Yombe tribe living in areas most severely hit by drought and famine. (Kabamba, 1978)

FOODS CONSUMED: Protein rich foods such as dry beans and peanuts were reported consumed by only 37% of villagers, animal products other than milk by 21%, and cereals by only 12% of the population due largely to the current inflated price in the markets which is 9 to 10 times the official price due to famine. Use of palm oil or home-produced palm cream was reported by 72% of villagers. (Kabamba, 1978)

DIETARY DEFICITS: Data from a dietary consumption study indicate a definite lack of basic nutrients, total calories, and protein. (Kabamba, 1978)

LOW CALORIE DIET: 9% of villagers and hospital respondents reported eating no calorie-rich staple foods during the previous day. (Kabamba, 1978)

PROTEIN DEFICIT: 19% of village families and 35% of hospital respondents, including children, reported consuming no milk, other animal products, dry beans, or cereals as a source of protein during the previous day. (Kabamba, 1978)

UNAVAILABLE FOODS: In response to questions regarding foods not currently available during a drought, 70% of respondents listed banana plantain, 66% manioc, and 24% dried fish during a drought. (Kabamba, 1978)

MANIOC: Some manioc was reported consumed the previous day by 40% of the sample. (Kabamba, 1978)

PALM OIL: Palm oil consumption was reported by 72% of villagers. Drought and decreased money available for food led villagers in the savannah area of Bas Zaire to consume less oil. Bas Zaire is a supplier of palm oil to other regions. (Kabamba, 1978)

REGIONAL DIET: In the Shaba region, diet is based on Bukari (a cereal of corn and manioc leaves). Also eaten are fish, meat, poultry, pork, palm oil, manioc leaves, pepper, and onion. (Kabamba, 1979a)

REGIONAL DIET: In the Kivu region, the staples include banana and Bugari (prepared from millet, manioc or banana flour). Other frequently used foods are manioc leaves, amaranthus, banana, peanuts, orange, mango, avocado, sweet potato, fish, poultry, pork, goat, alcoholic drinks, pepper and palm oil. (Kabamba, 1979a)

FOOD CONSUMPTION: In Bukavu, the estimated household food consumption per capita per month was 3370 grams of cereal, 15,100 grams of starchy roots, 510 grams of sugar, 2140 grams of pulses, 2310 grams of vegetables, 390 grams of fruit, 1030 grams of meat, 640 grams of fish, 50 grams of milk, 600 grams of oil, 230 grams of spices, and 1770 grams of beverages (from National Institute of Statistics in 1971). (FAO, 1979)

3.1 DIETARY PRACTICES, GENERAL (CONTINUED)

CALORIE DEFICIT: In the Kivu area caloric intake is 80-90% of requirements. (Varon, 1979)

REGIONAL DIET: In the region of Haut Zaire the staples are banana and rice. Other foods used include manioc leaves, potatoes, cabbage, mangos, pineapple, papaya, guava, oranges, sweet potato, fish, poultry, game, beer, palm wine, palm oil and pepper. (Kabamba, 1979a)

REGIONAL DIET: There are two distinct areas in the region of Kasai Oriental. In Sankuru, rice is the basis of the diet. In the rest of the region, bidia, prepared from cassava, is the staple. In Sankuru, a secondary food, lohata, is eaten in periods of want or before the rice harvest. (Kabamba, 1979a)

REGIONAL DIET: In Kasai Oriental, the dietary staple is bidia (a preparation of manioc) in some areas and rice in Sankuru. Other foods include manioc leaves, tomato, peanuts, oranges, banana, beans, manioc, sweet potato, beetle larvas, fish, chicken, goat, game, lamb, palm wine, pepper, onions and palm oil. (Kabamba, 1979a)

REGIONAL DIET: In the region of Equator, the staples are banana, manioc and rice. Other foods include manioc leaves, cabbage, hibiscus, orange, mango, banana, sweet potato, yams, fish either fresh or dried, game, palm wine, pepper, onion and palm oil. (Kabamba, 1979a)

FOOD PREPARATION: In the Equator Region Chikwangue is called Ntuka, Binguele, or Madabo, and the method of preparation is different from other regions. Pieces of manioc are placed atop a small bunch of leaves and put on the surface of boiling water, then covered with more leaves and cooked. Ntuka is kneaded and wrapped in leaves before cooking. (Kabamba, 1979a)

REGIONAL DIET: In the region of Kasai Occidental the staple is bidia or musa which are made from manioc. Other foods include manioc leaves, sweet potato leaves, banana, mango and orange, sweet potatoes, beetles, smoked and dried fish, goat, poultry, game, alcoholic drinks, pepper and palm oil. Kabamba, 1979a)

REGIONAL DIET: In Bandundu, in the subregion of Kwilu, the staple is luku (made of corn and manioc) or chikwangue (a preparation of manioc). The vegetables include manioc leaves, spinach and cabbage. Fruits are pineapple, mango, banana, oranges and guave. The diet also includes yams, manioc, sweet potato, potato, caterpillars, bettles, grubs, dried and salt fish, duck, goat, chicken, game, pork, plam wine and pineapple wine, pepper, onion and palm oil. Diet in the subregion of Mai-Ndumbe is very similar. (Kabamba, 1979a)

RURAL

COMMON FOODS: Twenty-seven principal foods account for approximately 70% of the average food budget for poor families. The first ten foods in the preference ranking of poor families are: smoked, dried fish; lake fish; cassava pods; bread; beef; cassava flour; palm oil; cassava bread; beans; and cassava loaves. (Wheeler, 1978)

STAPLES' AVAILABILITY: Staples in Bulape include cassava meal and maize meal. These are the basic ingredients of bidia mush which is a necessary part of every meal. 95% of families had cassava on hand in every month of the year: 85-95% of families had maize meal on hand, except in December when only 70% had it. (Brown, 1977)

BIDIA INGREDIENTS: Bidia is generally made with a maize:cavassa ratio of 1:3 or 1:4 by weight so that the low-protein cassava far outweighs the higher protein maize. (Brown, 1977)

ANIMAL PROTEIN AVAILABILITY: 20-40% of households in Bulape had at least one type of animal protein on hand each month from January through September. Toward the end of the year, percentages were higher, reaching nearly 80% in November. Types of animal protein included: antelope, goat, chicken, fish, caterpillars, and insects. (Brown, 1977)

SEASONAL AVAILABILITY OF PROTEIN: In the eastern highlands there are seasonal fluctuations which result in a deficiency in protein supplies from July to September. (Carael, 1979)

BEANS AND PEANUTS AVAILABILITY: Beans were found in more than half of the households from March through November. Peanuts were on hand in over half the households from January to October: in April 95% had peanuts. 85-95% of households had some protein food on hand every month, except December, when only 60% had. (Brown, 1977)

FOODS AVAILABLE IN THE HIGHLANDS: Beans and sweet potatoes provide half the supply of energy and 70% of the supply of protein. Cassava, bananas and ground-nuts are also grown. At higher altitudes, sorghum and maize are most important. Milk is prized but plays a minor role in nutrition. The absence of meat, fish and palm oil explains the inadequacy of protein and fat supplies. Energy is estimated at 2000-2200 calories per person and proteins at 6% of energy supply. Fats supply 5% of energy intake. (Carael, 1979)

FOOD STORAGE: In Bulape foods are preserved by drying and smoking. Maize, rice, beans, and peanuts are dried in the sun, then stored on overhead racks in the family kitchen building. Smoke from the wood cooking fires permeates the food supplies keeping them dry and reducing insect damage. Some food is lost to rats and insects but probably not large proportions. (Brown, 1977)

PYGMY MEAL PATTERNS: There is no set meal time and any one person eating alone is likely to attract friends who will want to share the food. A family eating together by the hearth will be undisturbed. (Turnbull, 1965)

PYGMY DIET-VEGETABLES: Vegetable foods formed the bulk of the pygmies' forest diet (entirely discounting village influence). (Turnbull, 1965)

PYGMY DIET-GATHERING: At all times of year the forest provides abundant mushrooms, roots, berries, nuts, herbs, fruit, and vegetables. (Turnbull, 1965)

3.1 DIETARY PRACTICES, GENERAL (CONTINUED)

PYGMY DIET-ANIMALS: Abundant game was available throughout the year, including antelope, birds, monkey, grubs, and insects. (Turnbull, 1965)

PYGMY DIET-TRADE: Pygmies trade wild game for foods grown by villagers, including, manioc, banana, nuts, corn, rice, and beans. (Turnbull, 1965)

TRIBAL DIETS: The traditional Tutsi diet was based mainly on dairy products with milk at morning, midday, and evening meals. Late meals included bananas, beans, and bread made of sorghum. Rarely was meat eaten. The Hutu took 2 meals - midday and evening. They used porridge of peas, beans, or maize, as well as sweet potatoes. (Maquet, 1961)

CALORIES: In Tembo average daily dietary intake is 2000 calories per person, slightly below the recommended level. 13% of the calories come from protein (2% from animal protein), 38% from fats and 49% from carbohydrates. (Carael, 1979)

CALORIES AND PROTEIN: In the village of Ntomba, mean supplies of energy fulfill 100% of the FAO/WHO standards. Proteins represent 15% of energy supply; 4% are animal protein. Fats represent 30% of the energy supply. (Carael, 1979)

URBAN

FAMILY CONSUMPTION: 62% of families had eaten animal products on the day prior to the interview; 49% had legumes; 82% had tubers and cereals; 30% had fruits; 54% had vegetables; and 95% used palm oil in cooking. (Kabamba, 1979a)

FAMILY MEAL PATTERN: The usual family meal consisted of fufu, (manioc flour and water), green vegetables and, to a lesser extent, legumes. The diet occasionally included small amounts of fish. All family members ate an average of one meal per day. (Kabamba, 1979a)

POLYGAMY AND CHILD NUTRITION: A man was allowed to have several wives, a sign of wealth, but these wives would have to share what was often a very limited income. Further, a woman afraid of losing her husband to another woman would spend her scarce economic resources on efforts to look beautiful and please her husband instead of feeding her children adequately. (Tandberg, 1980)

FOOD AVAILABILITY: Availability of many food items, including cassava, varies in spite of relatively constant demand. Transportation problems create insufficient and unstable supplies of all goods. Prices fluctuate tremendously but never drop substantially. (Tandberg, 1980)

FOOD SHORTAGES: Market surveys and responses of mothers who were interviewed indicated that there were sporadic food shortages in Kinshasa. Sometimes the shortages resulted from seasonal changes in food production; others were explained by dependence on imported food items which were frequently in insufficient supply. (Kabamba, 1979a)

MALDISTRIBUTION OF FOOD: A 1970 study found that half of the food available in Kinshasa is consumed by 25% of the people, leaving only about 50% of total foodstuffs for the remaining 75% of the population. (Lashman, 1975)

FOOD SELECTION: Many low priced nutritious foods were not as widely used as less nutritious, higher-priced foods. For example, dried corn and manioc were approximately the same price, and corn is 8 1/2 times richer in protein and slightly richer in calories, yet corn was eaten much less frequently than manioc. (Kabamba, 1979a)

FOOD CONSUMPTION AND NUTRITIVE VALUE: Food consumption studies showed that many foods of high nutritive value were not eaten as often as foods of lesser nutritive value and greater cost, indicating lack of knowledge about the nutritive value of foods and their relation to health. (CEPLANUT, 1978)

FOODS USED AND PRICES: The most common foods in the diet in Kinshasa were fufu, plantain, sweet potato and bread, which are generally the least expensive foods available in the market. Many protein-rich foods such as meat, fish, eggs and milk are too expensive for families. Maize, soyflour and ground nuts are much less expensive sources of protein. (Tandberg, 1980)

PRICE OF FOOD: A market basket survey found a 200% increase in food prices from August 1978 to February 1979. (Kabamba, 1979a)

COST OF FOOD: The average monthly salary was 100 Zaires, and the average cost of a minimum diet for four (including no animal products) was 241 Zaires, based on FAO recommended daily allowances. (Kabamba, 1979a)

FOOD CONSUMPTION AND INCOME: In Kinshasa economic level determines food consumption. Only households with an income greater than 60 Zaires had a satisfactory diet. Even at this level calorie needs were not completely covered but met 99.2% of requirements. 71% of households having an income of 15 to 60 Zaires were undernourished. In households with incomes less than 15 Zaires each month, intakes of calories, Vitamins B_1 and B_2, and niacin did not reach even 50% of requirements. (Houyoux, 1973)

FOOD EXPENDITURE AND INCOME: In poor families food expenditure was a higher percentage of total expenditure than in well-to-do families. Food expenditure rose as amount of income available rose. For example, in families with a total budget of 244 makuta per person per month, 195 makuta were spent on food. In households with a total expenditure of 1179 makutas, food expenditure was 670 (from Houyoux, 1973). (FAO, 1979)

FOOD EXPENDITURE AND INCOME: In households with expenditures of less than 15 Zaires, 79.9% was spent for food. In households with expenditures over 60 Zaires, 56.8% was spent for food. (Houyoux, 1973)

FOOD EXPENDITURES: In Kinshasa in 1978 the average family of four spent 232 Zarois for food in one month. 45 Zarois were spent on fufu, 24 for rice, 30 for vegetables, 30 for beans, 5 for peanuts, 30 for fish, 15 for

3.1 DIETARY PRACTICES, GENERAL (CONTINUED)

oil, 6 for onion, 6 for tomatoes, 5 for milk, 18 for sugar and 18 for bread or doughnuts. (Kabamba, 1979a)

FOOD EXPENDITURE: The average Kinshasa household spent 2119 makutas on food, out of a total of 3142. The expenditure on cereals was 251, for tubers 296, sugar 55, pulses 83, vegetables 201, fruits 24, fish 459, condiments 41, meat 382, alcoholic beverages 128, milk 52, oil 87, beverages 30, meals eaten outside the home 21 makutas. (Houyoux, 1973)

BEER: 12% of families drank beer, an integral part of Zairian life. 19% of families drank beer in Lingwala, a more affluent zone, and 8% in Bumbu, indicating that more families would drink beer if they could afford to do so. (Kabamba, 1979a)

SUGAR: Sugar is usually considered in soft drinks and added to breakfast tea. 20% of families consumed no sugar from January to April 1979, reflecting its unavailability and high cost during this period. (Kabamba, 1979a)

DIETARY INADEQUACIES: The average adult in Kinshasa met 68% of his needs for calories, 86% of his needs for protein, 99% for calcium, 77% for phosphorus, 136% for iron, 647% for Vitamin A, 76% for Vitamin B_1, 68% for Vitamin B_2, 72% for niacin and 310% for Vitamin C. (Houyoux, 1973)

DIETARY DEFICITS: A nutrition survey in Kinshasa conducted by the Institute for Economic and Social Research confirmed deficits in consumption of protein, calories, phosphorus, and vitamins B_1, B_2, and niacin. Of 1471 families surveyed, 13.6% met minimum daily requirements for protein and calories; 86.4% were malnourished. (Lashman, 1975)

PROTEIN INTAKE: The protein content of the average diet is 148 grams per day, which surpasses the FAO recommended intake of 103 grams. Of the total protein, 43 grams, or 29%, are from animal sources, including dried fish and milk. (Kabamba, 1979a)

CALORIE CONTENT OF FAMILY DIET: The average family of four in Kinshasa received 7632 calories per day, which is 858 calories short of the FAO recommendation of 8490. (Kabamba, 1979a)

3.2 DIETARY PRACTICES, WOMEN

3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS

3.3.1 DIETARY PRACTICES, INFANTS 0-24 MONTHS, BREASTFEEDING

NATIONAL

UNIVERSAL BREASTFEEDING: In Zaire no mother reported that she had never breastfed her child, in a study of 1782 mother-child pairs from urban and rural areas and upper and lower socioeconomical status. Failure to breastfeed was practically never encountered in any group; thus breastfeeding was universal through 6 months of age. (WHO, 1979)

PREVALENCE OF BREASTFEEDING: All children up to 6 months of age were breastfed. (WHO, 1979)

NO FREE FORMULA: Mothers who delivered in hospital rarely reported being given gifts of free milk samples or free feeding bottles while there. (WHO, 1979)

RURAL

EXTENDED EXCLUSIVE BREASTFEEDING: 2.1% of rural children were receiving only breast milk at 12 to 13 months of age. (WHO, 1979)

PREFERENCE FOR BREASTFEEDING: When mothers were asked whether they preferred breastfeeding or bottle feeding for a child aged 3-6 months nearly 100% of rural Zaire mothers favored breastfeeding. (WHO, 1979)

PREVALENCE OF BREASTFEEDING: All children up to 6 months of age were breastfed. At 12 months, 95.8% of rural mothers were still breastfeeding, and at 15 months, 87.5%. (WHO, 1979)

PREVALENCE OF BREASTFEEDING: 95% to 97% of mothers studied had breastfed their last child. (Kabamba, 1979a)

PREVALENCE OF BREASTFEEDING: All children are breastfed, but by the second or third week they are supplemented with bananas, sorghum or manioc. At the age of one year, 60% are still breastfed. (Vis, 1979)

PREVALENCE OF BREASTFEEDING: In Ntomba mean duration of lactation is 16.9 months; 54% of the women completely wean their children between 15 and 18 months. (Carael, 1979)

PREVALENCE OF BREASTFEEDING: Among the Havu, in the highlands, mean duration of lactation is 22 months. Among children 12 months of age, only 8% have been weaned from the breast. (Carael, 1979)

DURATION OF BREASTFEEDING: In Tembo the mean duration of lactation is 22 months. 50% of mothers are still breastfeeding when the child is 21 months. It is customary to breastfeed up to the next pregnancy. (Carael, 1979)

DURATION OF BREASTFEEDING: In the Vanga region all children are breastfed at birth. At 12 months 20% have been taken off the breast. Fifty percent of the children have completed weaning by 30 months of age and nearly 100% are weaned by the age of four years. It is not unusual to see a child being nursed at the age of 3 or 4 years but it is generally because the mother is breastfeeding a younger sibling and thus has available milk. (Baer, 1980)

DURATION OF BREASTFEEDING: 62 to 63% of children were breastfed to 18-24 months; 19% in Tshela and 23.5% in Lukulu were breastfed beyond 25 months. (Kabamba, 1979a)

DURATION OF BREASTFEEDING: Among the Havu on Idjwi Island, in Kivu, a longitudinal study of 200 male infants aged 0 to 2 years showed that 99%

were still breastfed at age one year and 60% at age two. A similar pattern was found for girls. (Vis, 1975)

BREASTFEEDING FREQUENCY: 91% of rural mothers of children age 9 to 11 months and 90% of mothers of children age 15 to 17 months reported breastfeeding the children four or more times per day. (WHO, 1979)

BREASTFEEDING FREQUENCY: The mother of an infant 8 months old who did not go to the fields that day was observed to nurse 32 times during the day, spending 110 minutes nursing the child. A 7 month old whose mother was in her fields for 10 hours that day nursed only in early morning and evening, 8 times, total 51 minutes. (Brown, 1977)

BREASTFEEDING FREQUENCY: In home visits of young children, 41% of children 19 to 24 months had been nursed in the preceeding four hours. (Brown, 1977)

BREASTFEEDING FREQUENCY: In Kivu most infants were breastfed 13 times per day during the first 12 months. (Vis and Hennart, 1978)

DEMAND FEEDING: 100% of rural mothers reported feeding children 3 to 5 months old on demand. (WHO, 1979)

NIGHT BREAST FEEDS: Most rural mothers in Zaire reported breastfeeding their child four or more times during the night. (WHO, 1979)

STOPPING LACTATION: In Ntomba, according to custom, the child is weaned at about 18 months. If a woman is pregnant, she stops lactating before the normal weaning time out of fear "to poison" the baby. (Carael, 1979)

MALNUTRITION AND WEANING: Complete weaning by age 19 to 24 months was significantly related to malnutrition among children studied in Bulape: among 16 healthy children, 15 were still nursing, and one was not; among 23 children so seriously malnourished that they attended the hospital nutrition rehabilitation unit, 7 still nursed and 16 did not. (Brown, 1977)

PREGNANCY AND WEANING: Bulape mothers report that shortly after they discover they are pregnant again they completely wean their nursing children. In half the cases in Bulape the mother conceives by 22 months postpartum and weans the child by the time he is 24 months old. In Bulape complete weaning before 24 months is closely related to malnutrition. (Brown, 1977)

QUANTITY OF BREAST MILK: The average quantity of breast milk was 406 grams per 24 hours in rural Kabare. Infants were put to the breast an average of 9.3 times for a total of 164 minutes in each 24 hour period. (Cemubac, 1979)

QUANTITY OF BREAST MILK BY SEASON: Mother's milk amounted to 600 to 650 grams a day during the harvest season in South Kivu and was 400 to 450 grams during the other season. Within a given season, the quantity of milk remains constant during the first 12 to 15 months whether the infant is exclusively breast fed or given a supplement. (Cemubac, 1979)

QUANTITY OF BREAST MILK: Milk production is low, rarely more than 600 ml per day. (Vis, 1975)

URBAN

EXCLUSIVE BREASTFEEDING: 76% of children are exclusively breastfed through 2 months. Exclusive breastfeeding falls to 25% at 6-8 months. (CEPLANUT, 1978)

EXTENDED EXCLUSIVE BREASTFEEDING: 9.5% of urban children from low socioeconomic status families were receiving only breast milk at 12 to 13 months of age; 1.3% still had only breast milk at 18 months of age. (WHO, 1979)

PREVALENCE OF BREASTFEEDING: Breastfeeding was universal at birth in Kinshasa and 80% of all infants were still breastfeeding at one year. (CEPLANUT, 1978)

PREVALENCE OF BREASTFEEDING: At 15 months 80% of children in urban areas studied were still breastfed; at 18 months, 40%; and at 24 months from 8 to 12% were still breastfed. (CEPLANUT, 1978)

PREVALENCE OF BREASTFEEDING: All children up to 6 months of age were breastfed. At 12 months, 80% of economically advantaged mothers and 84% of urban poor mothers were still breastfeeding. At 15 months, the rates dropped to 64% and 80% respectively. (WHO, 1979)

DURATION OF BREASTFEEDING: 19% of mothers in Kinshasa reported that they had stopped breastfeeding when their infants were between 7 and 12 months old, 53% stopped between 13 and 18 months and 24% stopped between 19 and 24 months. (Tandberg, 1980)

DURATION OF BREASTFEEDING: Almost all children were breastfed at birth. 80% still breastfed at 15 months but only a small percent breastfed beyond 24 months. (Kabamba, 1979b)

DURATION OF BREASTFEEDING: In the city of Bukavu, all the children were breastfed on demand, similar to rural areas, but the duration of breastfeeding was 12 to 24 months, shorter than in rural areas. (Cemubac, 1979)

DURATION OF BREASTFEEDING: Breastfeeding is universal at birth and about 90% of children continue to breastfeed through nine months of age. About 80% of children continue to breastfeed through 13 months, 50% are still breastfed at 16 months and less than 10% at 23 months. Only rarely are children breastfed after 24 months. (Franklin, n.d.)

BREASTFEEDING FREQUENCY: Mothers of children age 9 to 11 months who reported breastfeeding them four or more times per day included 77% of advantaged urban mothers and 90% of poor urban mothers. Among mothers of infants 15 to 17 months old, the rates were 84% and 68%. (WHO, 1979)

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

DEMAND FEEDING: 97.3% of urban poor mothers reported feeding children 3 to 5 months old on demand. Among advantaged mothers, 16% of infants were fed on schedule. (WHO, 1979)

COMPLETION OF WEANING: 6% of infants in Kinshasa are completely weaned by 6 months of age, 42% by 12 months, and 91% by 18 months. (Adelman, 1975)

AGE AT WEANING: 25% of children were weaned at 12 months, 41% were weaned by 15 months, 71% had completed weaning by 18 months, and 97% of children were weaned by 2 years. (CEPLANUT, 1978)

REASONS FOR WEANING: 64% of mothers stopped breastfeeding because they felt the child was old enough; 6 to 10% stopped because of a new pregnancy; 6% because child refused the breast; and 4 to 6% because the child was ill. (Kabamba, 1980b)

REASONS FOR WEANING: 48% to 65% of mothers in Khishasa (depending on zone) stopped breastfeeding because they felt the child was old enough to eat; 9 to 12% due to illness of mother or child; 2 to 6% due to cracked nipples; 2 to 6% due to pregnancy; less than 2% because mother had to return to work; and 3 to 4% said they did not have enough milk. (Kabamba, 1979b)

REASONS FOR WEANING: 55.1% of mothers stopped breastfeeding because the child had a well established solid food diet. No other single response accounted for more than 12% of the total. (Franklin, n.d.)

REASONS FOR WEANING: 55% of mothers reported they weaned their children because they were old enough to take solid foods; 17% due to bad health of mother; 12% due to poor health of the infants; 1% due to insufficient milk; and 7% due to mother's pregnancy. (CEPLANUT, 1978)

REASONS FOR NOT BREASTFEEDING: 96.4% of mothers had breastfed their last child. The main reasons for not nursing were health problems of mother or child, perceived lack of milk, or the child would not suck. (Kabamba, 1979b)

METHOD OF WEANING: 80% of children were abruptly weaned, 14% were weaned gradually, and 6% of the mothers reported that the child himself had refused the breast. (CEPLANUT, 1978)

ABRUPT WEANING: 68.8% of mothers in Lingwala, 76.3% in Bumbu and 72.6% in Kimbanseke weaned abruptly. (Kabamba, 1979b)

ABRUPT WEANING: Abrupt weaning is the commonly reported method. Reasons to stop breastfeeding are: child old enough, child refuses breast, poor health (mother or child), pregnancy, mother works, or insufficient milk. Weaned children eat family meals. (Kabamba, 1979b)

ABRUPT WEANING: Abrupt weaning was most commonly practiced but a number of mothers believed in gradual weaning. (CEPLANUT, 1978)

ABRUPT WEANING: 79.7% of mothers said they weaned abruptly, 14.2% reported that weaning was gradual and 6.2% said child himself refused the breast. (Franklin, n.d.)

MALNUTRITION AND WEANING: The rate of malnutrition (based on weight for age) in Kinshasa is 19% among children who have not been weaned, and 28% among children who have been weaned. (Adelman, 1975)

QUANTITY OF BREAST MILK: Average quantity of breast milk among urban women was 575 grams. On average, the child was put to the breast 11 times for 144 minutes in each 24 hour period. (Cemubac, 1979)

QUANTITY OF BREAST MILK: In urban Kadatu in Bukavu the quantity of milk is constant for the first 6-7 months, about 600 grams per day, but then the amount falls rapidly to about 459 grams per 24 hours at 12-14 months post partum. It is at 6 to 7 months that the growth curve falls off also. (Cemubac, 1979)

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

NATIONAL

SUPPLEMENTARY FOODS: Animal products were introduced to about 30% of supplemented babies by 6-8 months. One-third of the mothers gave vegetables and fruits in the first three months, and their use was universal by the end of the first year. (WHO, 1979)

RURAL

FORMULA UNAVAILABLE: Canned infant formulas and special cereals are not sold in the Bulape area. (Brown, 1977)

BOTTLE FEEDING: Bottles and other related items are scarce. (Kabamba, 1979a)

REASONS FOR SUPPLEMENTATION: Mothers gave supplemental feedings of boiled bananas, sorghum, or millet to infants 15-21 days old because they believed the children were crying from hunger. (Vis and Hennart, 1978)

WORKING MOTHERS: Since women are the primary agricultural workers in Bulape, mothers generally return to their farm work within four to six weeks after giving birth. They never take their infants or small children to the fields or forest with them. Beginning at the age of one to two months, the infants are left in the village with grandmothers, aunts, fathers, or older children. (Brown, 1977)

CHILDREN OF WORKING MOTHERS: When a child is under six months old it is nearly always left in the care of women or girls. After 6 months about one third of the children are left in the care of men or boys. Children are fed equally by their mothers, or female or male caretakers. About 60% of each group of caretakers reported that their children had received milk or other protein foods in the preceeding 4 hours and an additional

30% had eaten a low protein meal of maize, manioc and greens. Mothers prepare food before leaving home or arrange for female relatives or neighbors to cook for their young children. (Brown, 1977)

EARLY WEANING AND WORKING MOTHERS: Even very young infants of 1-3 months did not always receive breast milk regularly throughout the day, usually because the mothers were away from home. Many of then had eaten a porridge of maize or manioc meal. Thus, while complete weaning does not occur for most children until after 24 months, partial weaning and supplementary feeding begin as early as one month of age. (Brown, 1977)

MEAL FREQUENCY: Except for one newborn who only breastfed, each child studied ate 2 or 3 meals and from one to five snacks daily. (Brown, 1977)

MEAL FREQUENCY: In a total of 468 home visits only four times was a child reported to have had no milk and no food at all during the preceeding four hours. (Brown, 1977)

FIRST FOODS: 95% of children receive solids between 4 and 6 months. Tubers, manioc and taro are the most common first foods. (Kabamba, 1980b)

SUPPLEMENTARY FOODS: Animal milk is rarely used by rural mothers. 70% of rural mothers gave cereals during the first six months; use increased to 80 to 90% during the second year. About 80% of rural mothers gave legumes at the end of the first year. (WHO, 1979)

SUPPLEMENTARY FOODS: At 15 days to 3 weeks the mothers introduce a supplement of boiled bananas, sorghum or cassava. (Vis and Hennart, 1978)

SUPPLEMENTARY FOODS: In Tembo from the first weeks of life, the child is fed a pre-chewed porridge of banana flour and water. At about two months, most mothers introduce a supplement. At 5 months 50% of the children eat cassava paste and fish. At 9 months 80% are sharing meals with the adults. (Carael, 1979)

SUPPLEMENTARY FOODS: When Ntomba infants reach 5-6 months of age, lactation is supplemented with a porridge of cassava paste and sugar (fufu) containing more than 50% of water and starch. At 10-12 months the infant receives the adult diet. (Carael, 1979)

SUPPLEMENTARY FOODS: 4% of rural mothers gave occasional supplements to their breastfed babies at 6-7 months; 72% gave regular supplements. 97.9% of rural mothers of 12 month old babies were giving them regular supplements. (WHO, 1979)

COMMON FOODS: Monthly home visits showed that during the previous four hours, 81% of children had received a protein food (breast milk, meat, or legume), and 81% had received bidia (cassava). (Brown, 1977)

FOODS EATEN: The categories of foods children were reported to have eaten in the previous 24 hours ranked as follows: corn enriched luku

(eaten by 73%), plain luku, a porridge made of manioc flour (18%), greens (68%), palm oil (58%), beans, nuts and grains (60%), breast milk (50%), animal protein (40%), fruits (7%), and powdered milk (6%). In the three northernmost villages 91% of the children ate non-enriched luku, in the remaining villages 88% of the children received corn enriched luku. (Baer, 1980)

USE OF WEANING FOODS: At 12 months of age 76% of children in Vanga were receiving weaning foods. (Baer, 1980)

HAND FEEDING: Mothers in South Kivu fed children with their hands after prechewing the food. Sorgum and bananas were usually given and, less frequently, manioc. (Vis, 1979)

FEEDING PROBLEMS: Porridges and bidia are too thick for children to eat easily. Protein foods are not adequately mashed. (Brown, 1977)

PROTEIN FOODS: Children are discouraged from eating too much of the protein foods which are highly valued in the community. When meat is served at a meal each child receives a piece, but it is usually a very small one. For snacks, small children are given peanuts but only a very few. Children are not expected or encouraged to eat much of these foods. (Brown, 1977)

ANIMAL PROTEIN AND MALNUTRITION: 6.6% of children who were reported to have eaten animal protein the day before were acutely malnourished (below 80% of standard weight for height). 11.3% of the children who were not reported to have consumed animal protein were acutely malnourished. (Baer, 1980)

PYGMY WEANING FOODS: Among the Lese, sombe (a food prepared from manioc leaves and palm oil) is the most important weaning food. (Zaire Nutrition Planning Center, n.d.)

URBAN

BOTTLE FEEDING: 20% of mothers bottle fed their children with powdered milk. Fresh milk was usually unavailable. (Kabumba, 1979b)

BOTTLE FEEDING: About one third of the sample had used the bottle at some time, but only 11% were currently using the bottle. (CEPLANUT, 1978)

BOTTLE FEEDING: 10.7% of mothers reported that they were currently bottle feeding their child, and 26.8% reported previous use of bottles. Less than 10% bottle fed at birth. About one third bottle fed at two to three months and the percent bottle feeding dropped off after six months. Fewer than 1% were bottle fed after 14 months. (Franklin, n.d.)

AGE AT BOTTLE FEEDING: 78% of bottle fed children were age birth to 6 months, 9% were 7 to 12 months, and 4% were over 12 months. (Kabamba, 1979b)

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

USE OF BREAST AND BOTTLE: 91.5% of children reported to be bottle fed were also breastfeeding. (Franklin, n.d.)

USE OF BREAST AND BOTTLE: 44.3% of mothers in Lingwala used the bottle while continuing to breastfeed; 37.4% of mothers in Bumbu and 35.4% in Kimbanseke did so. (Kabamba, 1979b)

USE OF BREAST AND BOTTLE: Less than 1% of mothers used only bottle feeding. 89% had used mixed breast and bottle at some time but only 11-15% relied on mixed breast and bottle regularly. (CEPLANUT, 1978)

REASONS FOR BOTTLE FEEDING: 34% of mothers started to use the bottle because of prolonged absence of the mother, 24% due to insufficient milk, and 24% due to bad health of mother or child. (CEPLANUT, 1978)

REASONS FOR BOTTLE FEEDING: 34% of mothers began to use bottle feeding because they were absent for several hours during the day, 24% because they felt that breast milk quantity or quality was insufficient, 12.5% because the child cried a lot, 6.4% because mother was ill, 2.3% because it was suggested by a physician and 20.9% did not specify a reason. (Franklin, n.d.)

BOTTLE PREPARATION: 43% of the mothers had learned how to prepare bottles at a health center, and 30% had learned by themselves. (CEPLANUT, 1978)

BOTTLE PREPARATION: 86.3% of mothers reported that the contents of the bottle included boiled water, sugar and a milk product. 11% used boiled water and milk alone. It was not reported what the remainder used in the bottle. (Franklin, n.d.)

BOTTLE PREPARATION: Bottles were prepared with cold water, milk and sugar by 86% of mothers; 11% used cold water and milk only. Bottles were boiled before being used by 63% of mothers. (CEPLANUT, 1978)

FORMULA IS EXPENSIVE: Milk powders and other infant formula foods are extremely expensive, but most mothers with small children have such products in their home. (Tandberg, 1980)

BOTTLE FEEDING AND AGE: Among infants using bottles, 10% were under one month old, 81% were under three months, and 97% were under six months. After this period very few infants received bottles. (CEPLANUT, 1978)

BOTTLE FEEDING AND INSUFFICIENT MILK: Mothers who reported that they had insufficient milk were twice as likely (25.5%) to use an auxilliary bottle as women who felt their milk was sufficient (12.2%). (CEPLANUT, 1978)

WEANING FOODS QUALITY: The food consumption survey found weaning foods to be poor in nutritional quality and especially low in iron in the first year. (CEPLANUT, 1978)

SUPPLEMENTARY FOODS, Animal milk is rarely used by urban poor mothers. 60% of urban poor mothers gave cereals during the first six months; use

increased to 80 to 90% during the second year. About half of urban poor mothers gave legumes to infants from 3 to 6 months old. (WHO, 1979)

SUPPLEMENTARY FOODS: 32% of mothers in Kinshasa said the first food they introduced into the child's diet was fufu, 3% offered ground nuts first, 2% gave caterpillars, 8% gave maize gruel, 1% gave soya gruel, 13% offered manioc leaves and 11% offered other green leaves, 9% gave the child dried fish and 21% offered other foods first. (Tandberg, 1980)

SUPPLEMENTARY FOODS: Solid foods are generally added to the diet in the second or third month. Commercial baby foods are expensive and rarely used. Generally, weaned children are given family meals. They are usually given a gruel made of manioc, sometimes enriched with corn or soy meal. (Kabamba, 1979b)

SUPPLEMENTARY FOODS: 1% of all mothers introduced foods other than breast milk at one month, 4.7% at two months, 35.5% at three months, 30.7% at four months, and 28.1% at five months or more. (Franklin, n.d.)

SUPPLEMENTARY FOODS: 4% added foods other than breast milk at 3 months or younger, 33% at 3 to 4 months, 30% at 4 to 5 months, 14% at five to six months, 15% at 6 to 7 months; and 4% waited until child was 7 or more months. (Tandberg, 1980)

SUPPLEMENTARY FOODS: 12.8% of poor urban mothers gave occasional supplements to their breast fed babies age 6 to 7 months; 83% gave regular supplements. At 12 to 13 months, 16.7% gave occasional supplements, and 73.8% gave regular supplements. (WHO, 1979)

SUPPLEMENTARY FOODS: Introduction to solid foods generally began at 3-6 months. During this period 97% of children received some solid food, usually a porridge of cassava or maize, and were gradually introduced to the family's food. (CEPLANUT, 1978)

SUPPLEMENTARY FOODS: Between four and five months, 54% of children began to receive starches, 60% began legumes, 61.7% received animal products, and 48.9% began to get fruits. (CEPLANUT, 1978)

SUPPLEMENTARY FOODS: 97% of children were receiving solids by 6 months. (CEPLANUT, 1978)

SUPPLEMENTARY FOODS: Among children not yet weaned, 90.9% received mothers' milk and other food, 5.4% breastfed exclusively, and 3.7% got breast milk and artificial milk. Of children receiving food, 76% ate the family meal, and 24% were fed special foods for infants. (Adelman, 1975)

SUPPLEMENTARY FOODS: Among children still receiving mothers' milk, 76% got the same meal as the rest of the family, and 24% got special meals for infants. The family meal consists primarily of starchy foods and manioc, too low in protein for a growing child. (Adelman, 1975)

SUGAR AND SWEETENED BEVERAGES: 38.6% of chilren two months old had been fed sugar or sweet beverages the previous day. At 4 months, 85.4% had been fed sugar the previous day. (Franklin, n.d.)

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

SUPPLEMENTARY FOODS AND WEIGHT: Children fed mothers' milk plus part of the family meal weigh significantly more than children following other feeding practices. Children taking mothers' milk plus a special meal weigh significantly less than children with other feeding practices. (Adelman, 1975)

NUMBER OF MEALS: 14% of mothers gave their children under five years of age one meal per day, 65% gave them 2 meals and 21% gave 3 meals. (Tandberg, 1980)

MEAL FREQUENCY: 76.8% of children had been fed either one or two times on the previous day. (Franklin, n.d.)

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

REGIONAL

NO SPECIAL CHILD DIET: The same foods are consumed by small children and adults. Infants progress rapidly from an intake of breast milk only to the addition of regular table foods. (Kabamba, 1978)

RURAL

FOODS USED: At mealtime the children ate numerous balls of bidia dipped in palm oil sauce. If there was meat, they received one or two small pieces (3-4 cm cubes). Cassava greens (which contain iron and small amounts of protein) were usually left aside by small children because they did not like them or found them difficult to chew. (Brown, 1977)

POSTWEANING DIET INADEQUATE: Young children receive bulky carbohydrate foods and relatively little protein. Bulape children receive large amounts of bidia, which is primarily low-protein cassava, and relatively small amounts of protein foods. The diet is not sufficient in protein, even for children also receiving mothers' milk. (Brown, 1977)

3.4 DIETARY PRACTICES, HEALTH AND MEDICINE

URBAN

BOILING WATER: 100% of mothers of children under five years of age knew that it was necessary to boil drinking water to prevent disease. When asked about their behavior, 11% always boiled drinking water, 33% did so sometimes and 56% never boiled drinking water. (Tandberg, 1980)

4. NUTRITION STATUS CORRELATIONS (CONTINUED)

ACUTE MALNUTRITION AND AGE OF MOTHER: 16% of children were acutely malnourished (less than 80% of standard weight for height) among mothers under 20 years of age, 10.5% of children were acutely malnourished among mothers over 35 years of age, and 8.7% of children were acutely malnourished among mothers 20 to 34 years of age. (Baer, 1980)

MALNUTRITION AND PERCEIVED HEALTH STATUS OF MOTHER: 8.4% of children were below 80% of weight for height standards among mothers who reported that their health was excellent or good. 12.2% of children were below 80% of standards among mothers who reported their healh as fair or poor. (Baer, 1980)

MOTHERS' ABSENCE AND CHILDREN'S DIETS: Children are not fed less often or less well when their mothers are away: thus, the absence of the mother affects mainly the child's breast milk intake but not his supplementary diet. (Brown, 1977)

MALNUTRITION AND SEASON: Acute malnutrition is recognized in the Vanga areas as a seasonal disease which peaks during the months of November and December, the time when food reserves from the previous harvest are exhausted and the new crops are not yet harvested. The Nutritional Rehabilitation Center at Vanga found the number of children in residence at the center averaged 5 to 10 cases in January to September but in October through December increased to 25 to 30 cases. (Baer, 1980)

INTAKE AND SEASON: There is an annual season of plenty and one of scarcity. The first months of the rainy season, October to December, are the difficult period. The fields are prepared after the dry season and the first crops come in in January in Kivu. (Vis, 1979)

INTAKE AND SEASON: A survey of food consumption did not show a drop in the number of young children who ate maize and protein foods during the December food shortages, which therefore cannot be considered severe enough to be a major cause of the malnutrition seen in the Bulape area. (Brown, 1977)

MALNUTRITION AND DIVORCE: In one fifth of the malnutrition cases seen at the hospital, parental separation or divorce is a contributing factor. (Brown, 1977)

MALNUTRITION AND GARDENS: 55% of the mothers reported that they cultivated some form of vegetable garden in addition to their traditional role of planting, cultivating and harvesting the basic food crops such as manioc, peanuts, corn and squash. Prevalence of acute malnutrition (below 80% of standard weight for height) was not found to be associated with the absence of a garden. (Baer, 1980)

URBAN

FACTORS RELATED TO CHRONIC MALNUTRITION: Socioeconomic status, family size and utilization of health services were significantly related to chronic malnutrition (75-90% weight for age according to the Harvard standard) in a study of 2100 infants by multiple regression analysis. (CEPLANUT, 1978)

4. NUTRITION STATUS CORRELATIONS

NATIONAL

MALNUTRITION AND MOTHER'S MARITAL STATUS: Malnutrition strikes the children of unmarried mothers much more frequently than chidren of married women. (Lashman, 1975)

BREASTFEEDING AND PRENATAL CARE: Groups with the highest provision or utilization of prenatal care had the lowest prevalence and shortest durations of breastfeeding. (WHO, 1979)

BREASTFEEDING AND BIRTH WEIGHT: No relationship was found between birth weight and prevalence of breastfeeding. (WHO, 1979)

BREASTFEEDING AND CHARACTERISTICS OF HUSBAND: No independent relationships were found between the prevalence of breastfeeding or breastfeeding behavior and husband's age, education, occupation, or employment status, or whether he was presently residing with his wife. (WHO, 1979)

REGIONAL

BREASTFEEDING AND URBANIZATION: In the highlands, average duration of breastfeeding is 7 months in urban areas and 22 months in rural areas; but in the tropical forest there is no significant difference in the duration of breastfeeding. (Carael, 1979)

ELASTICITY OF DEMAND FOR NUTRITIOUS FOODS: A consumption study in Kivu showed that while the low subsistence level of income did not permit purchase of the quantity or type of food needed for a balanced diet, families would incorporate more nutritious foods into their diets with minimal increases in income. (Lashman, 1975)

RURAL

INFANT MORTALITY AND LIFESTYLE: Infant mortality ranges from 70 to 100 per 1000 live births in Idjwi and Lwiro; but in Ngweshe, where mothers leave their infants at home when they work in the fields and only breastfeed them in the morning and evening, the rate is 250 per 1000. In addition, overall energy intake is lower in the Ngweshe area. (Vis, 1979)

FOOD SUPPLY AND BREAST MILK QUANTITY: When beans were harvested and food was abundant, nursing mothers of infants up to 14 months old produced an average of 600-650 gm of milk daily. In periods when protein foods were scarce, the average quantity of milk fell to 400-450 gm per day among mothers of infants up to 14 months old. (Vis and Hennart, 1978)

BREASTFEEDING, HOSPITALS, AND TRADITIONAL VALUES: Among rural mothers, rooming-in after delivery was virtually absent. Nevertheless, prolonged breastfeeding was nearly universal suggesting that cultural habits may overcome the influence of hospital practices. (WHO, 1979)

FACTORS RELATED TO ACUTE MALNUTRITION: Knowledge about diarrhea, migration of the father to Kinshasa, knowledge of nutrition and utilization of health services were the factors which explained acute malnutrition (below 75% weight for height, or edema) in multiple regression analysis of data on 2100 children. (CEPLANUT, 1978)

MOTHER'S AGE AND CHILD'S HEALTH: Weight of a child already weaned increases significantly as age of mother increases, and frequency of disease decreases as age of mother increases. (Adelman, 1975)

NUTRITION EDUCATION AND DISEASE: 17% of mothers studied had attended nutrition education courses; 13% said they had been able to put it into practice. Children of mothers who had attended a nutrition education course had significantly fewer diseases. There was no significant difference in weights of children whose mothers had received nutrition education and those whose mothers had none. (Adelman, 1975)

5. NUTRITION AND HEALTH PROGRAMS

5.1 NUTRITION AND HEALTH PROGRAMS, HEALTH CARE

NATIONAL

HEALTH SYSTEM AND MALNUTRITION: The severity of malnutrition increased even before the food crisis of 1975-79, implicating health system problems as one factor. Traditionally Zaire has had a comprehensive preventive and curative health system-probably the most extensive in Africa-and malnutrition was rare, but the health system suffered greatly from upheavels following independence. (Varon, 1979)

MALDISTRIBUTION OF HEALTH CARE: Health resources are poorly distributed, most facilities and manpower being located in the cities, rather than rural areas where 74% of the population lives. Severe shortages of medical supplies and health personnel exist at all levels. Disincentives for working in public health care are great. (Lashman, 1975)

HEALTH CARE ACCESS: More than 75% of the total population remain outside the formal health care delivery system. (Lashman, 1975)

HEALTH EXPENDITURES: Public health expenditure on health was $1.00 (U.S.) per capita in 1976. (Sivard, 1979)

HEALTH SERVICES DATA: The Ministry of Health does not know how many public hospitals are functioning in the interior (since many doctors have left), nor how many doctors remain. The only reliable sources of information are generally reports from church missions and external aid agencies. The Zairian Ministry of Agriculture prepares some estimates of nutrition levels based on "apparent consumption" but these are insufficiently detailed and available only with a lag of almost two years. Therefore, little data is available on a national basis regarding nutrition status, intake, mortality rates, etc. (Varon, 1979)

HEALTH SERVICES: There was one doctor per 27,942 people and one hospital bed for every 341 people in 1976. (Sivard, 1979)

LACK OF MEDICINES: Shortages of medicine and the common practice of pilfering pharmaceuticals result in impairment of health delivery. (Lashman, 1975)

MEDICAL SUPPLIES DIVERTED: Of 944 tons of products and equipment shipped by the Central Medical Pharmaceutical Depot to the interior in 1977, only 637 tons --67%-- arrived at their destination. Lack of equipment was the major reason for the closing of 38 medical training centers between 1976 and 1978. (Varon, 1979)

HEALTH CARE TEAMS: Efforts to contain the deterioration of health through the creation of National Fund for Medical-Social Help (FONAMES) have had limited success. In 1977, of 47 FONAMES teams working in the interior, only 8 reported some success in reducing the incidence of diseases endemic to their regions. (Varon, 1979)

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5.1 NUTRITION AND HEALTH PROGRAMS, HEALTH CARE (CONTINUED)

MISSIONARY HEALTH CARE: Catholic and Protestant missionary groups account for 75% of health care delivery in rural areas. (Lashman, 1975)

MISSION PROGRAMS: Twenty denominations or other religious groups support at least 100 dispensaries; 13 maternity wards; 20 hospitals; one medical center; 3 mobile health units; training programs for nurses, medical assistants, nurses' aides, and midwives; first aid stations; and clinics. (TAICH, 1979)

MISSION HEALTH CARE: Medical Mission Sisters have a hospital and prenatal clinic. Their public health work includes weekly visits to villages for well baby and preschool children's clinics, hygiene instruction and cooking demonstrations. (TAICH, 1979)

MISSION NUTRITION CLINICS: Presbyterian Church in the United States operates several hospitals, two of which conduct nutrition clinics. (TAICH, 1979)

HERBALISTS: The guerisseur is a local practitioner who provides villagers with herbs to alleviate illness. (Lashman, 1975)

REGIONAL

COMBATTING KWASHIORKOR: The BWAKI committee in Kivu region works in the areas of health, nutrition, agriculture, and education to combat malnutrition. It introduced soy flour to fortify manioc and to combat bwaki (kwashiorkor). (Lashman, 1975)

DETERIORATION OF SERVICES: In Kivu the majority of health care facilities have deteriorated and government hospitals have virtually no medicines. (Varon, 1979)

MEDICAL PERSONNEL: Medical personnel and health care facilities have been very unevenly distributed in Zaire for a long time with Kinshasa accounting for most sevices. In 1977 Kinshasa had 1 doctor per 4045 inhabitants, but other ratios include: 1:52,434 for Kasai Occidental, 1:46,801 for Bandundu, 1:31,252 for Kivu, and 1:22,314 for Shaba. (Varon, 1979)

RURAL

USE OF HEALTH SERVICES: No prenatal care was received by 12.6% of rural mothers. (WHO, 1979)

HEALTH SYSTEM PROBLEMS: Since independence in 1960 there has been a breakdown of the extensive rural health system formerly maintained by the Belgian colonial adminstration. (Lashman, 1975)

[illegible]NARY HEALTH CENTERS: The Baptist Mission at Vanga runs an [illegible]ative and successful rural health program, including a hospital, rural outreach, and prevention in sanitation, maternal child health, nutrition, and family planning. Mobile teams are sent to the villages. (Lashman, 1975)

HOSPITAL OUTREACH: A mobile health team operates from a small Protestant hospital at Bulape. Village immunization and health education services began in 1967. Nutrition (mothercraft) centers were started in 1973. (Brown, 1979)

URBAN

USE OF HEALTH SERVICES: No prenatal care was received by 12% of urban poor mothers and 4.4% of urban economically advantaged mothers. (WHO, 1979)

5.2 NUTRITION AND HEALTH PROGRAMS, FOOD SUPPLEMENT PROGRAMS

NATIONAL

KWASHIORKOR PROGRAM: The United Methodist Church and United Methodist Committee on relief operate a food-for-work nutrition project which is aimed at alleviating kwashiorkor among children in central Zaire. (TAICH, 1979)

CHURCH FOOD DISTRIBUTION: The Free Methodist Church of North America provides food through a dispensary at Baraka. (TAICH, 1979)

5.3 NUTRITION AND HEALTH PROGRAMS, NUTRITION EDUCATION PROGRAMS

NATIONAL

TRAINING NUTRITION EDUCATORS: Catholic Relief Services sponsors nutrition seminars for workers in clinics and centers. 325 Zairians have been trained in nutrition education. (Lashman, 1975)

TRAINING FOR MOTHERS OF MALNOURISHED CHILDREN: The Claretian Fathers have a home economics course for women which teaches home management and demonstrates the preparation of meals using soy beans and other nutritious foods. Mothers of children found to have nutritional deficiencies are channeled into the home economics program. (TAICH, 1979)

MASS MEDIA: The national nutrition center produced a series of radio and TV spots on maternal and child nutrition and health issues to be aired late in 1980 and early in 1981. (CEPLANUT, 1978)

MASS MEDIA: CEPLANUT and RENEPAC have worked together to produce radio and television nutrition education programs around 15 nutrition related themes. (Barnes-Kalunda, 1981)

EVALUATION OF MASS MEDIA CAMPAIGN: In evaluating the mass media campaign now underway in Zaire it was strongly recommended that a follow-up survey be implemented to test the effectiveness of the broadcasts, that messages be pretested before broadcasting, and that the creative talent available in Kinshasa be used in the production of radio and television programs for the development of a unifying creative theme. (Barnes-Kalunda, 1981)

5.3 NUTRITION AND HEALTH PROGRAMS, NUTRITION EDUCATION PROGRAMS (CONTINUED)

RURAL

WEANING FOODS DEMONSTRATIONS: The Bulape Health Project has a health team which visits each village monthly for nutrition surveillance, immunization, and nutrition education, with demonstrators who teach by word and example, including cooking demonstrations for preparing weaning foods. (Brown, 1979)

URBAN

NUTRITION EDUCATION FOR MOTHERS: The under-5 clinic at Mama Yemo Hospital in Kinshasa has mothers attend nutrition classes while their children attend the clinic. Education is given by non-nursing staff who demonstrate proper purchase and preparation of foods, encourage breastfeeding, and discourage use of the bottle. (Lashman, 1975)

NUTRITION EDUCATION FOR MOTHERS: The Department of Social Affairs developed a Nutrition Education Program at Centre de Protection Familiale et Maternale du Kinshasa. Food preparation classes were held for mothers, teaching the types, quantity, and quality of foods to give young children. (Lashman, 1975)

AWARENESS OF NUTRITION EDUCATION SERVICES: 10% of mothers of young children were aware of services in MCH centers other than prenatal care, maternity and pediatric services, and family planning. Of this 10%, only 85% were aware of the fact that nutrition education services were available at the health centers. (Tandberg, 1980)

PREFERRED TOPICS FOR NUTRITION EDUCATION: When asked about their preferences for nutrition topics, 21% of the 29 respondents said they would prefer more information on how to feed children under 5 years; 14%, choice and preparation of foods; 14%, information on treatment and prevention of diarrhea; 7%, information on kwashiorkor; 7%, use of local food resources; 7% breast and bottle feeding; 4%, nutrition education in general; 7%, information on other topics; and 18% were not interested. (Tandberg, 1980)

PREFERRED WAYS OF RECEIVING NUTRITION INFORMATION: Among 29 respondents who had recently been visited by a health agent, 31% preferred to receive nutrition education from a health visitor coming to their home; 21% preferred radio messages, 27% preferred group meetings of several mothers and 21% through the health center. (Tandberg, 1980)

5.4 NUTRITION AND HEALTH PROGRAMS, REFUGEE RELIEF

NATIONAL

PL 480 FOR REFUGEES: Catholic Relief Services distributes U.S. government-donated PL 480 Title II foods such as dried fish, rice, beans, and milk as well as medicine and clothes to Angolan refugees. (TAICH, 1979)

RESPONSE TO THE DROUGHT IN BAS ZAIRE: Seed aid and food relief were given by the Red Cross, local missionaries, CRS, AID, the Government of

Zaire, FAO, Belgium, World Vision, World Food Program, UNICEF, LICROSS, Holland, India, Japan, and other countries. Medical care was provided by the International Rescue Committee. (Kabamba, 1980b)

REFUGEE AID: The Christian and Missionary Alliance provides food, vitamins, and medical help for children affected by recent drought conditions. (TAICH, 1979)

REFUGEE AID: The International Rescue Committee. Doctors without Borders, and Catholic Relief Services provide food and clothing for Cabindan refugees who are along the border. (Kabamba, 1979)

REFUGEE AID: The Christian and Missionary Alliance provides assistance to refugees from Angola including food, vitamins, and medical help to children seriously affected by recent drought conditions. (TAICH, 1979)

REGIONAL

REFUGEES FROM UGANDA: Refugees from Uganda are arriving in Kivu. The CRS is starting a program to help the refugees with their nutritional problems. (Bertrand, 1981)

REFUGEE MEDICAL CARE: International Rescue Committee, Inc. expanded its medical and feeding program for refugees in Bas Fleuve to include a medical program for the local population suffering a drought. They provide medical care and supervise the region's 48 dispensaries. (TAICH, 1979)

KWASHIORKOR PROGRAM FOR REFUGEES: World Vision Relief Organization supports a feeding program for children suffering Kwashiorkor who live around refugee camps in Bas Zaire. (TAICH, 1979)

REFUGEE AID: The High Commission for Refugees brings food, clothes, and medical services to Cabindan refugees in camps and helps Angolan refugees in Songololo through Swiss help for food and clothing and Doctors without Borders for medical services. (Kabamba, 1978)

6. NUTRITION AND HEALTH POLICIES AND LEGISLATION

6.1 NUTRITION AND HEALTH POLICIES AND LEGISLATION, GOVERNMENT (HOST AND DONOR COUNTRIES)

NATIONAL

PRICE CONTROL AND FOOD SUPPLIES: Government maximum prices for agricultural products are often below true market value, discouraging production of key crops, including palm oil. (Lashman, 1975)

AGRICULTURAL PRODUCTION: During the 1967-74 growth period investment was allocated to the modern sectors and the urban sectors. Inadequate incentives and chronic underinvestment in the agricultural production resulted in expansion at less than half the rate of the GDP. (Varon, 1979)

HEALTH POLICY: In 1973 President Mobutu designated health as o[illegible] f four key national priorities. Since then, the Government of Zaire has given priority to the creation of a national maternal and child health program of preventive health activity, emphasizing improved maternity care, health education, and under-five clinics. (Lashman, 1975)

HEALTH BUDGET: Health care is allocated 6% of the government budget. (Lashman, 1975)

HEALTH BUDGET: The Ministry of Public Health in 1973-74 accounted for only .12% of the government budget. (Varon, 1979)

NATIONAL NUTRITION PROGRAMS: The Zaire National Nutrition Planning Project began in January 1978 as a cooperative effort between the Department of Public Health of the Government of Zaire and U.S. AID. In 1978 the Zaire National Nutrition Planning Center was created by a presidential ordinance to coordinate nutrition efforts in Zaire, collect data, disseminate information, investigate specific problems, and make recommendations for programs to alleviate malnutrition. (Kabamba, 1978)

NUTRITION PLANNING CENTER: The NPC (Nutrition Planning Center) plans to continue its program of surveillance and monitoring and to conduct nutrition education through the mass media. It will develop a small scale food distribution program, and determine food consumption patterns at the individual, family and community levels. The NPC intends to determine the availability and quality of primary health care in the City of Kinshasa and to institute a controlled experiment using antiparasite medicines and malaria prophylaxes to determine their impact on nutritional status. It will continue to train personnel. (Kabamba, 1980a)

HEALTH INSURANCE: The labor code of Zaire requires that all enterprises pay for medical, dental, surgical, pharmaceutical, and health care for sickness, accidents, pregnancy and confinement of all workers and their families. (Lashman, 1975)

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6.1 NUTRITION AND HEALTH POLICIES AND LEGISLATION, GOVERNMENT (HOST AND DONOR COUNTRIES) (CONTINUED)

PREGNANCY LEAVE: Under the G.O.Z. Labor Code, pregnant women are eligible for 14 weeks leave at two-thirds their normal wage, with at least 6 weeks taken after the birth of the child. (Lashman, 1975)

BELGIAN AID: Since independence, the Belgian government has remained the largest single provider of bilateral assistance, including health professionals. (Lashman, 1975)

6.3 NUTRITION AND HEALTH POLICIES AND LEGISLATION, COMMENTARIES

NATIONAL

MEDICAL PERSONNEL: The shortage of trained health manpower remains one of the major impediments to extending the national health care delivery system. Manpower is also maldistributed, favoring urban areas. (Lashman, 1975)

ALTERNATIVE SOURCES OF HEALTH CARE: With very few exceptions the medical centers run by religious missionary groups and private companies were better run, better equipped, received supplies more regularly, and were utilized by the patients more frequently than those run by the Government of Zaire. In several cases the government run facilities were almost completely empty with regard to patients, supplies, and equipment. (Kabamba, 1978)

URBAN

SUGGESTIONS FOR IMPROVING NUTRITION: Because the cost of food is very high in Kinshasa some changes in food consumption are necessary if the population is to be adequately nourished. Increase calorie intake through oil consumption to ensure sparing of the limited amount of protein available. Encourage increased peanut consumption. Develop a program of education to encourage the mixture of corn with cassava meal for fufu. Increase the use of soy flour, especially for weaning foods. Discourage use of commercial baby foods. (Kabamba, 1979a)

IMPROVING THE STAPLE FOOD: In Kinshasa the major source of calories is provided by fufu, which is very low in protein (1.6%). Enrichment of cassava meal with corn (10% protein) or small amounts of soy (36% protein) would increase the protein level and quality. (Kabamba, 1979a)

REFERENCES

Adelman, C.

1975 Health/Nutrition Survey Kinshasa, June 19 - July 20, 1974, conducted by ONRD and USAID, Jan. 3, 1975.

Original data.
Method: Children contacted while WHO conducted an intensive measles immunzation campaign.
Sample: 3,864 mothers, and 4,386 children from 6 months to 4 years (1.6% of total children in Kinshasa). Cross sectional, nonrandom, mothers willing to bring child for vaccination.
Geographic location: All 24 zones of Kinshasa.

In June-July 1974 a health and nutrition survey of children from 6 months to 4 years was conducted in Kinshasa. 22% were found to be malnourished on the basis of weight for age. Information also was gathered on frequency of disease, whether mother received nutrition education, and length of mother's stay in Kinshasa.

Barnes-Kalunda, S.

1981 Consultant report for Zaire (evaluation of the mass media component of A.I.D.'s nutrition planning project in Zaire). Unpublished.

This document provides a summary of the activities of CEPLANUT and RENAPAC to date and their joint efforts in creating mass media nutrition education programs for both radio and television. The author evaluates the programs, pointing out problems and the potential in this nutrition education effort.

Baer, F.C.; Franklin, R.R.; Bertrand, W.E.; Mather, F.J.; and Ktsanes, V.K

1980 Nutritional Surveys at Vanga, Zaire. A special report prepared for the Zaire National Nutrition Planning Center. Unpublished, mimeograph.

Method: A single pre-coded questionnaire collected information on demographics, socioeconomics, food consumption, anthropometry, physical exams and lab exams. A cross-sectional study providing base line data on the Vanga region.
Sample: Nine villages were selected and efforts were made to examine all children under five years. 596 children 0 to 60 months were included.
Geographic location: Nine rural villages in the vicinity of Vanga, in the Bandundu region.

Villages were surveyed to assess the nutritional status of children under five years of age. 9.5% were found to be acutely malnourished, and 48% were chronically malnourished.

Bertrand, W.E.

1981 Personal Communication.

Brown, J.E. and R.C. Brown

1979 "An evaluation of nutrition centre effectiveness by measurement of younger siblings." Transactions of the Royal Society of Tropical Medicine and Hygiene, 73(1): 70-73.

Original data.
Method: Malnourished children and their next sibling were compared to matched controls from the wider nutrition survey and their siblings. Siblings were weighed and measured at the same age as the older child had been weighed.
Sample: An area-wide survey of more than 300 children who were examined for weight and height; a subsample of 30 children, 8 to 24 months old, attending nutrition center in village or hospital were selected. The sample also included their siblings, plus a group of 17 matched controls and their siblings.
Geographic location: Rural Bulape.

Thirty children were measured when they entered nutrition centers. Their younger siblings were later measured at the same age. Over the same period a matched group of control children and their siblings were measured. The younger siblings of the Center participants showed the same growth patterns as the younger siblings of control children. Center teaching evidently had not affected the way mothers fed their younger children and thus it had no effect on their growth.

Brown, J. and R.C. Brown

1977 "Finding the causes of Protein-Calorie Malnutrition in a community Part III: The causes of malnutrition at Bulape." Journal of Tropical Pediatrics and Environmental Child Health, 23(5): 254-261.

Original data.
Method: Informal observation of probability sample. Interviews with mothers, caretakers, health workers, home visits conducted over course of one year.
Sample: Bakete tribe, subgroup of the Bakuba. Residents of Bulape, 217 children under 36 months, monthly home visits to 40-50 children, day long visits in 5 households, health workers in the area.
Geographic location: Rural, Bulape, Zaire located in Kasai Occidental region of central Zaire.

The following areas were examined: adequacy of household food supplies, agriculture and food procurement, purchasing, food use and feeding practices, maternal health, reproductive patterns, weaning, mothers' agricultural obligations, family disruption, number of meals a child received, breast feeding, supplemental diet, intra-family food distribution, customs and food taboos. Most important in causing child malnutrition were early weaning, short pregnancy intervals, diet of bulky carbohydrate foods with thick porridges and unmashed protein foods, custom of limiting protein foods fed to young children, prolonged absence of mother while she works, and other separation.

Brown, R.; Venzon, D. and T. Manchester

1978 "Control of endemic goitre by iodized oil in a community health programme." Transactions of the Royal Society of Tropical Medicine and Hygiene. 72(3): 274-276.

Original data.
Method: In 1976 a goitre survey was undertaken in nine representative villages as a part of the community health activities. The entire population of all these villages was examined by palpation and inspection.
Sample: 3,564 people in nine representative villages.
Geographic location: Bulape is located in the Mweka Zone of the West Kasai Region of Zaire.

A programme of iodized oil injection was carried out in an area of high goitre prevalence (28.5%) in rural Zaire. The iodized oil programme was undertaken as a part of a broader, pre-existing community health programme. No complications were encountered.

Carael, M.

1979 "Relations between birth intervals and nutrition in three central African populations (Zaire)" Nutrition and Human Reproduction, ed: W. Henry Mosley, Plenum Press, New York.

Original data.
Method: Cross-sectional and retrospective study.
Sample: In the equatorial forest, 285 women in 11 villages were interviewed and in Tembo (Province of Kivu) 148 women in 3 villages. In the highlands, 316 women from 4 hills were included.
Geographic location: Equatorial forest, highlands of Kivu.

This paper compares the relations between lactation and postpartum amenorrhea in two ecological areas. The population living in the highlands of Kivu was suffering from moderate protein energy malnutrition.

CEMUBAC

1979 Rapport Four L'Année 1979 Sur Les Activites de la Mission Médicale du CEMUBAC en Rébublique du Zaire, Notamment aupres du départment Médical de L'IRS et des Hopitaux Ruraux de Kirotshe, Masisi et Rutshuru. Centre Scientifique et Medical de l'Université de Bruxelles pour ses activités de Coopération.

Original data.
Method: Semi-longitudinal study of milk production and nutritional status of mother and child.
Sample: 419 urban and 101 rural mothers.
Geographic location: Kadutu in Bukavu (urban), Kabara (rural Kivu).

This report summarizes the medical and research activities of CEMUBAC (Centre Scientifique et Medical de l'Universite Libre de Bruxelles pour ses Activities de Cooperation) in Zaire.

CEPLANUT

1978 Reports from Centre National de Planification de Nutrition Humaine, (CEPLANUT), Kinshasa. (unpublished)

Original data.
Method: Cross-sectional survey to provide baseline data on nutrition. Includes anthropometry, biochemical and clinical data, intakes, socioeconomic status survey and material from hospital records.
Sample: Randomly selected households, 1378 assessed for food consumption, 293 children used to assess biochemical indicators, and 707 children used to gather clinical data.
Geographic location: Urban areas of Zaire.

This document is a collection of reports from CEPLANUT investigating nutrition in Zaire. It includes information on breast and bottle feeding, supplementary foods and weaning, anthropometry and socioeconomic and household variables. There is a description of projects undertaken and plans of CEPLANUT.

Ermolieff, S. and Grosshans E.

1979 La Pellagre: Maladie en Résurgence au Zaire. Ann. Dermatol. Venereol. (Paris) 106 (6-7):591-595

Original data.
Method: among new patients using a dermatology clinic, incidence of pellagra was noted, based on dermatological signs.
Sample: 8000 dermatology clinic patients.
Geography: Lubumbashi in the province of Shaba.

231 cases of pellagra among 8,000 consulting patients were observed between May 1977 and June 1978 in the Dermatological Dispensary of the Hospital G.E.C.A. Mines of Lubumbashi (Zaire). The disease, caused by deficiency, can be easily recognized through its dermatological symptomatology. It occurred mainly in young patients fed solely on maize, but the most severe cases have been observed in prisoners. Three age groups seemed particularly prone to pellagra: children after weaning, pubescent adolescents and pregnant and lactating women. The incidence of pellagra worsened after the war of May 1978, reaching 7 per 100 among the population around the main towns of the province Shaba; the paper does not make clear whether "population" refers to clinic patients or the entire local population.

FAO

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

This volume reviews food surveys conducted between 1963 and 1976.

Franklin, R.R.; Bertrand, W.E.; Kabamba, N.; Mock, N.H.; and McCaw, A.

n.d. Feeding patterns of infants and young children in Zaire. Unpublished.

Method: 24 hour dietary recall for mothers of young children. Retrospective, cross-sectional study.
Sample: 1155 mothers were interviewed; 80% had children less than three years of age. Every 20th household in three zones of Kinshasa was selected for interview.
Geographic location: Three zones of Kinshasa: Lingwala, Bumbu, and Kimbanseke.

A twenty-four hour qualitative dietary recall survey of the children of 1,155 women of lower socioeconomic class showed that over 80% of the children were still breastfed at 13 months of age and 50% at 16 months. Bottle feeding was seen in less than 40% of any age group and was rare after 14 months. Bottle feeding was almost always (approximately 90%) accompanied by breastfeeding and was not found to be statistically associated with the cessation of breastfeeding. Other dietary patterns are discussed.

Houyoux, J.

1973 Budgets Menagers, nutrition et mode de vie à Kinshasa. Kinshasa: Presses Universitaires du Zaire.

Original data.
Method: Random sample of households (household defined as a group of people eating from a common pot). Interviews were conducted concerning demography, household budget, and sociological variables.
Sample: 8,631 residents of 1,471 households.
Geographic location: City of Kinshasa.

This study gathered information on household budgets, nutrition, and standard of living. Information is presented on salaries and income, expenditures in different categories, and on nutrition.

Kabamba, N.; Kinjanja, K.; Gluckenberg, H.; Rico-Velasco, J.; Carter, J.; and Bertrand, W.

1980(a) "Report on Interventions and Related Activities of the Nutrition Planning Center." Report No. XV, Department of Health, Zaire National Nutrition Planning Center, Box 2429, Kinshasa.

This document discusses the plans for activities of the Nutrition Planning Center of Zaire.

Kabamba, N.; Makwala ma Mavambu ye Beda; Franklin, R.; Rico-Velasco, J.; Carter, J.; Bertrand, W.; and Schanper, J.

1980(b) "The Improvement in Nutritional Status of the Population of Bas Zaire Secondary to Relief Efforts and the End of the Drought." Report No. XIV, Department of Health, Zaire National Nutrition Planning Center, Box 2429, Zaire.

Original data.
Method: Follow-up on baseline study, children examined every 2 months for weight, height, and presence of edema. Longitudinal from August 1979 to February 1980. Registers of hospitals and dispensaries were reviewed for diagnosis of PEM and low birth weights.
Sample: Children 6-59 months randomly selected in the drought area.
Geographic location: Bas Zaire, zones of Tshela and Lukula.

This report describes the drought in Bas Zaire and the recovery from that drought. The drought, from December 1977 to October 1978, was probably the worst in this century, and was complicated by an influx of refugees from Cabinda and Angola. Malnutrition was widespread. Aid was begun and the drought areas were monitored. The situation improved considerably by February 1980 with a sharp reduction in the number of acutely malnourished children. This reduction was due to community response, better climate conditions, improved agricultural production, and emergency aid.

Kabamba, N.

1979(a) "Some aspects of Alimentation and Nutrition in Zaire." Kinshasa: Zaire National Human Nutrition Planning Center.

Review - not original data.

This report describes the geography, climate, and ecology of Zaire as they relate to nutrition. Information on demography, education, economics, and agriculture is reviewed in light of nutritional needs. Food consumption baseline data is presented by region. Biochemical values of commonly used foods are displayed. Commentary and analysis of material for further nutritional action are presented.

Kabamba, N.; Makwala ma Mavambu ye Beda; Franklin, R.; Rico-Velasco, J.; Lusamba Dikassa Carter, J.; and Bertrand, W.

1979(b) "Preliminary Results of the Nutritional Studies in Kinshasa with Recommendations for Interventions." Kinshasa: Republic of Zaire Department of Health, Zaire National Nutrition Planning Center.

Original data.
Method: Anthropometric and clinical examination, laboratory analysis. Cross-sectional, baseline data.
Sample: For anthropometry: 5,195 children in Lingwala under age 5; 10,850 in Bumbu, and 17,374 in Kimbansek. (These are zones representative of the city as a whole.) Subsample for clinical

examination: 152 children for stool samples, 271 for hemoglobins, food consumption data. About 6000 interviewed on socioeconomic data. Geographic location: 3 zones of Kinshasa, Lingwala, Bumbu, Kimbanseke.

This document reports studies conducted on children in Kinshasa to provide baseline data on extent, severity, and types of malnutrition. It includes socioeconomic data and food consumption data on households with children under 5 years of age.

Kabamba, N.; Makwala ma Mavambu ye Beda; Franklin, R.; Rico-Velasco, J.; Carter, J.; and W. Bertrand

1978 Investigation of Nutritional Consequences of the Drought in Bas Zaire, 1978. Kinshasa: Department of Health, Zaire National Nutrition Planning Center, Report No. VIII.

Original data.
Method: Measures of anthropometry of children under 6 years; examination of crop production in fields; physical examination of selected severely malnourished children in hospitals and villages; interviews with mothers about dietary patterns; review of hospital records; interviews with health officials.
Sample: Stratified multistage sampling technique of 1277 children in 39 villages. Random sample enriched with two underrepresented groups; refugees and residents of larger urban areas (15 villages, 773 children).
Geographic location: 8 of 16 zones in Bas Zaire.

Acute malnutrition exists throughout the area but is most severe in two zones of Bas Fleuve, Tshela and Lukula. Production of food crops fell by 60% in 1978. A sudden rise in malnutrition occurred following the drought, which began in 1977. Dietary data indicate deficiencies of protein and calories. Health centers run by missionaries and private groups were better run than those of the Government of Zaire. Bas Zaire is receiving refugees from Angola and Cabinda.

Kasongo Project Team

1981 Influence of measles vaccination on survival pattern of 7 to 35 month old children in Kasongo, Zaire. Lancet 1(8223):764-767.

Original data.
Method: Longitudinal study of health status and influence of measles vaccination on mortality. Each subject was visited every 3 months.
Sample: All children under five years in the study area: 7092 children.
Geography: Kasongo, a rural town in the east of Zaire.

In a zone with a high measles case fatality rate the risk of dying between the ages of 7 and 35 months for a vaccinated population was compared with that for an unvaccinated control group. Life table analysis for both groups showed that measles vaccination reduced the risk of dying at the age of maximum exposure to measles, but the gain

in survival probability tended to diminish afterwards, to approach that of the unvaccinated group.

Lashman, K.E.

1975 Syncrisis: The Dynamics of Health. An Analytic Series on the Interactions of Health and Socioeconomic Development. XIV Zaire. Rockville, MD: Public Health Service, Office of International Health. DHEW/Pub/OS-75-50019.

Not original data, review.

Zaire is rich in resources but poor in productivity. The tropical climate provides a vast incubator for numerous debilitating diseases. Morbidity and mortality are especially high among children under 5 years, but could be reduced through preventive health, environmental sanitation and improved availability of food. Malnutrition is widespread and may be increasing. The authors feel development of integrated public health delivery systems is very important, especially in providing coverage for rural people.

Protein-Calorie Advisory Group (PAG) of the United Nations System

1977 "Women in Food Production, Food Handling and Nutrition with Special Emphasis on Africa: Final Report." Unpublished.

Not original data.

This review stresses the importance of considering women as major producers of food when assessing the situation in Africa. The authors stress that the African woman may be "the" person in subsistence agriculture, providing food for her family while her husband is working on cash crops. Added to this are her responsibilities in caring for her house and children, cooking and preparing food, harvesting food and obtaining fuel and water. Until the burden of these many responsibilities is recognized, it will be difficult to plan appropriate nutrition and development programs.

République du Zaire

1973 Rapport sur l'Enquête des Budgets Familiaux en Milieu Africain-Ville de Bukavu-1971. (Summarized in FAO Food and Nutrition Paper.) Kinshasa: Institut National de la Statistique, Republique du Zaire.

Original data.
Method: Stratified two stage sampling design. Interview with questionnaire. Each household visited twice a day.
Sample: 295 households in the city of Bukavu.
Geographic location: City of Bukavu.

The FAO paper gives one summary table from the Report, and summarizes the results of the survey.

Rico-Velasco, J.; Franklin, R.; and K. Nkamany

1978 An Ecological Analysis of Malnutrition among Hospitalized Children in Kinshasa. Kinshasa: Zaire National Human Nutrition Planning Program, May 1978.

Method: Researchers looked at records of 4 hospitals and a clinic. They recorded principal diagnosis for admission or primary cause and cross tabulated it with the zone of residence.
Sample: Hospitalized children in year 1977.
Geographic location: Kinshasa (urban).

Zones with high rates of hospitalization for malnutrition included Banda, Lunwa, Bumbu, Kinbanseke, Kintambo, Limete, Makula, Masina, Ngiringiri, and Selambao.

Service Medical de la Communaute Baptiste de Zaire Ouest, Vanga sur Kwilu, Zaire

1977 Rapport Annuel 1977. Vanga sur Kwilu, Zaire: Départment de Santé Publique , Hopital Evangelique.

Not original data.

The Communaute Baptiste de Zaire Ouest (BZO) provides integrated medical services to a population of 100,000 in the zone of Bulungu Zaire through a network of 12 health centers and a number of subcenters. This 1977 report outlines the BZO activities and accomplishments in the areas of pre-school health, prenatal care, family planning, environmental health, nutrition, vaccination, tuberculosis control, and auxiliary training.

Sivard, R.L.

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

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

TAICH

1979 Country Report: ZAIRE. American Council of Volunteer Agencies for Foreign Service, Inc., Technical Assistance Information Clearing House.

This report describes the programs of 56 private, non-profit U.S. organizations which provide the people of Zaire with development assistance and material aid.

Tandberg, Asbjorn

1980 "Summer Project 1980: Final Report on the Participation in the Implementation of the Mass Media Nutrition Education Project in Kinshasa, Zaire." NTR. 799 Special Studies: Field Research Study, October, 1980. Nutrition Department, School of Public Health and Tropical Medicine, Tulane University, New Orleans, Louisiana.

Original data.
Method: Baseline data for mass media project, questionnaire.
Sample: 298 mothers in Kinshasa with one or more children under five years of age: 200 mothers from Kinbanseke zone, 48 from Lingwala, and 50 from Bumbu.
Geographic location: Urban Kinshasa.

This report describes the planning of a mass media campaign to improve nutrition. A pretest was given to urban mothers in Kinshasa to establish a baseline of nutrition knowledge — the women were quite knowledgable about nutrition. Scripts of some of the radio and television programs are given as examples.

Turnbull, C.M.

1962 The Forest People: A Study of the Pygmies of the Congo. New York: Simon and Schuster.

This book provides an ethnographic account of the lives and feelings of the Pygmies of the Ituri Forest.

Varon, B.; Eguren, A.; and P. Lazar

1980 Zaire: Current Economic Situation and Constraints. Washington, D.C.: The World Bank, East Africa Regional Office, May 1980.

This report presents an analysis of the difficulties of the Zairian economy from 1975 to 1979.

Vis, H.L.; and Hennart, P., et.al.

1979 Documents de Base Préparés par le Départment Médical de l'IRS (LWIRO) en Association avec la mission médicale du CEMUBAC au Kivu pour le Symposium sur l'avenir de l'enfant dans le Kivu d'altitude. Bukavu, du 26 an 29, Novembre, 1979.

This document reports on already published work of IRS and CEMUBAC concerning the Kivu region. It reports on studies of food consumption, socioeconomic factors, breastfeeding, supplementation, and lactation amenorrhea.

Vis H. and P. Hennart

1978 "Decline in breast feeding: about some of its causes." Acta Pediatrica Belg. 31, 195-206.

Original data.
Method: Not specified.
Sample: Shi and Havu tribes.
Geographic location: Highlands of Kivu.

Both quality and quantity of breast milk are reported. The authors also review the history of child feeding in Europe and compare it to feeding of children in Africa.

/is, H.L.; Bossuyt, M.; Hennart, P.; and Carael, M.

1975 "The Health of Mother and Child in Rural Central Africa," Studies in Family Planning, 6: 437-441.

Original data.
Method: Not specified.
Sample: Shi and Havu peoples using child care center on Idjwi Island in Kivu.
Geographic location: Kivu, easternmost province of Zaire.

The author discusses data collected on women and children using MCH centers in Kivu. He discusses pregnancy, breastfeeding, weaning, postpartum amenorrhea and mothers' agricultural labor.

/heeler, David

1978 Do the poor need nutrition education? Some methodological issues and suggestive evidence from Kinshasa, Zaire. Boston University, African Studies Center Working Papers, No. 2.

Analysis of collected data.
Method: Collection of data on food purchases and family income and production of economic model to test rationality of use of money availbale for food.
Sample: Poor families, no other description given.
Geographic location: Kinshasa.

The author concludes that most food expenditures are optimal in terms of calories and protein for money spent, except that use of animal protein is overemphasized relative to possible use of vegetable protein. His calculations demonstrate overexpenditure on infant needs relative to adults'. He concludes that there is not enough money to go around and that families have made fairly good choices in terms of what is available. Since the author is an economist, he made a large number of simplifying assumptions which may obscure dietary deficits of vitamins and minerals.

orld Health Organization

1979 WHO collaborative study on breastfeeding. Methods and main results of the first phase of the study. Preliminary Report, MCH/79.3.

Original data.
Method: Cross-sectional, questionnaire, interview.

Sample: 1782 mothers and children under 24 months.
Geographic location: Urban and rural, not specified.

This study describes breastfeeding patterns among mothers of infant pairs in urban and rural areas, and examines the relationships among breastfeeding; supplemental feeding; and maternal, family, and socioeconomic characteristics. It examines the views of mothers on breastfeeding, duration, and reasons for not breastfeeding or stopping breastfeeding.

Zaire Nutrition Planning Center

n.d. Final Report, USAID Project, Zaire Nutrition Planning Center, Unpublished.

This document reports on the work carried out by Tulane University and CEPLANUT in Zaire.