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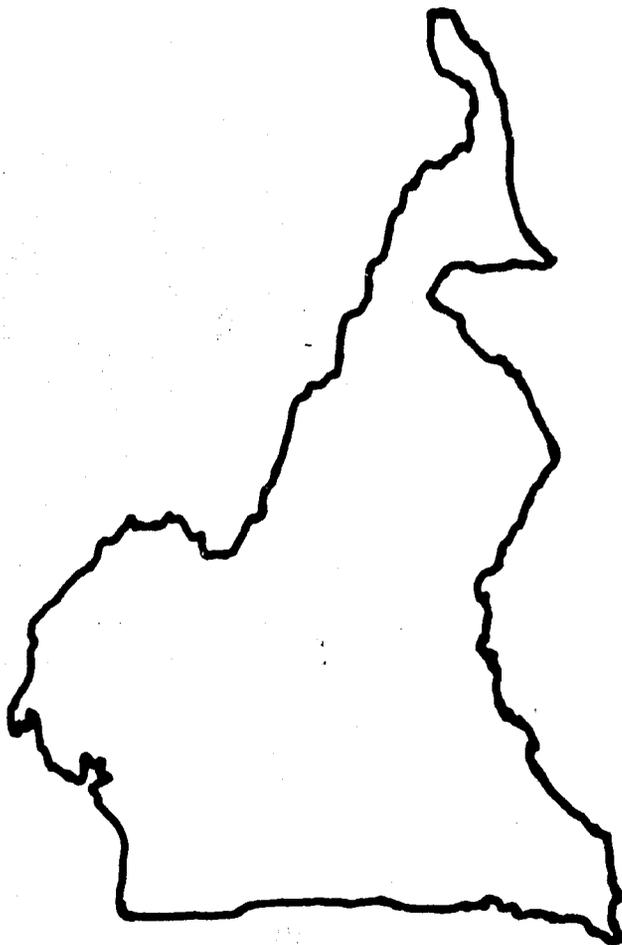
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United Republic of Cameroon

National Nutrition Survey

Summary Report and Recommendations



**Office of Nutrition
Development Support Bureau
Agency for International Development
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UNITED REPUBLIC OF CAMEROON
NATIONAL NUTRITION SURVEY

Undertaken By
The Government of Cameroon

SUMMARY
AND
RECOMMENDATIONS
OCTOBER 1978

With the Assistance of the
UCLA Nutrition Assessment Unit
Division of Population, Family and International Health
School of Public Health
University of California
Los Angeles, California, U.S.A.
In Cooperation With
The United States Agency for International Development

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1. PREFACE

A national nutrition survey was undertaken by the Government of Cameroon (GURC) with the assistance of the University of California, Los Angeles, Nutrition Assessment Unit (UCLA), in cooperation with the United States Agency for International Development. The UCLA Unit Director visited Cameroon in mid-April, 1977, when initial discussions took place concerning survey feasibility. Planning began immediately in Cameroon under the auspices of The Ministry of Economy and Planning with a thorough review of technical and administrative matters.

The survey, which took place from October, 1977, to April, 1978, was a result of the combined efforts of the Government of Cameroon, USAID, and UCLA.

Acknowledgement is made of all those who were involved in the intensive planning and preparation, field and post field phases of the survey. The work of the Ministry of Economy and Planning and the Technical and Interministerial Committees facilitated the survey's smooth implementation. The diligent efforts and high quality of work of the interviewers, supervisors, administrative staff, and drivers during the long field phase enabled the survey to be completed on time. Appreciation is extended to AID/Yaounde, particularly to the Division of Health, Nutrition and Population for their continued support, and to UCLA for their efforts during this entire endeavor.

3. TECHNICAL SUMMARY

The purposes of the Cameroon National Nutrition Survey were to provide an estimate of nutritional status of young children and their mothers in Cameroon, to compare nutritional status among selected areas and to provide information about certain factors associated with nutritional status such as diet, socio-economic factors, health and demographic variables.

Anthropometry (body measurements), clinical signs, and hemoglobin assessment provided a description of nutritional status. Interviews with the mother or her substitute were conducted to collect information on household and family characteristics, child health, and diet.

A "special group" of 506 children under five years from selected areas in Douala were measured. These children were from families with a relatively high socio-economic status and it was assumed that their nutritional status was relatively superior to serve as a comparison for Cameroon. Their results were compared with those of an international reference group of children (1) to confirm that such a comparison was useful to Cameroon.

The survey sample for Cameroon was based on the results of the 1976 Population Census (2). The sample comprised 5689 children aged 3-59 months (up to five years), 3350 mothers and 3383 households. A multistage, cluster sampling technique was used, based on population proportions by province, as well as the major cities Yaounde/Douala combined. A cluster consisted of 30 children randomly sampled from 190 sites, each of which was within an enumeration area.

Statistically valid descriptions of undernutrition prevalence rates were obtained for five provinces and groupings (Central South, East, North, South-West/Littoral and North-West/West) and for the two major cities of Yaounde and Douala taken as one group. In addition, Cameroon (excluding Yaounde/Douala) was described in two

further ways: by urban and rural classifications and according to ecological areas as defined by the World Bank (3). Each area or grouping consisted of approximately 30 sites. From each site 30 children were sampled, providing a total of at least 900 children per province or provincial grouping. This is based on a methodology applied in several countries throughout the world, and recently reported in the Bulletin of the World Health Organization (4).

All national results were derived using a weighting factor (i.e. appropriate statistical adjustment) based on population proportionality. Thus prevalence rate estimates for children under five years (excluding 0-2 months) were based on the total number of these children in the United Republic of Cameroon, which constituted approximately 1.3 million out of a total population of 7.6 million.

The findings of the survey are briefly summarized in the pages that follow:

3.1 ANTHROPOMETRIC EXAMINATION OF CHILDREN UNDER FIVE YEARS OF AGE

a. Chronic Undernutrition (or Chronic Protein-Calorie Malnutrition)

A child measuring less than 90% of the expected height for a reference child of the same age was classified as being chronically undernourished. The proportion of children classified in this way gives an estimate of the prevalence rate of chronic undernutrition in any population.

Chronic undernutrition in young children reflects recurrent episodes or prolonged periods of nutrition deficiency for calories and/or protein available to the body tissues. This nutritional deficiency usually has an onset of at least six months prior to the time of examination. The deficiency is usually the result of poor diet and/or ill health.

In Cameroon, 22.1% of young children had chronic undernutrition, indicating a total number of about 250,000 children for the whole country. The prevalence rate was lowest in infancy, began to increase after 12 months of age and reached a plateau from 18 to 59 months. Using the same criteria, only 4.2% of children of the Douala special

group of relatively high socio-economic status, had chronic under-nutrition. The difference between the national prevalence rate (22.1%) and that of the special group (4.2%) represents the potential that could be reached with improvement in nutritional status.

The prevalence rates for chronic undernutrition were least in Yaounde/Douala (11.8%) and lower in Urban (19.4%) as compared with Rural Cameroon (22.4%). Among the provinces, the rate was highest in the West (30.8%). The actual numbers of children affected was highest in the North (70,000 - representing 28% of the 250,000 with chronic undernutrition in the whole country).

b. Acute Undernutrition (or Acute Protein-Calorie Malnutrition)

A child measuring less than 80% of the expected weight for a reference child of the same height was classified as acutely under-nourished. The proportion of children classified in this way gives an estimate of the prevalence rate of acute undernutrition in any population.

Acute undernutrition in young children reflects a recent period of nutritional deficiency of protein and/or calories available to the body tissues, the onset is usually not more than a few weeks prior to the time of examination. The prevalence of acute undernutrition is expected to be far less than that of chronic undernutrition. In a cross-sectional survey, a child is examined at one time only. Thus the acute episode determined by weight loss might not be present at that time. Evidence of cumulative episodes of acute undernutrition will be apparent through reduced growth in height.

In Cameroon, only 1.0% of young children had acute undernutrition. This prevalence rate was low throughout all areas of the country. No child in the special group had acute undernutrition.

This result indicates there was no famine nor near-famine situation in any area described at the time of the survey. It is highly probable that conditions at the time of the survey were relatively favorable and an adverse seasonal influence on nutrition at another time would not be reflected in the acute undernutrition

measure of this survey.

When a milder degree of acute undernutrition was considered (less than 85% of the expected weight for a reference child with the same height), it was apparent that children aged 3-59 months in the North had a higher prevalence rate than all other areas. This may suggest that the problem of acute undernutrition lies just under the surface and that any deterioration of the present circumstances at any other time of the year may be sufficient to tip the balance.

c. Underweight (Protein-Calorie Malnutrition of Unspecified Duration)

A child measuring less than 80% of the expected weight for a reference child of the same age was classified as underweight. The proportion of children classified in this way gives an estimate of the prevalence rate of underweight in any population.

Underweight-for-age in young children reflects a nutritional deficiency of protein and/or calories available to the body tissues, but the onset and duration is not known. Because the the bony skeleton contributes greatly to the weight of a child, the prevalence of underweight might be similar to that of chronic undernutrition, especially when the prevalence of acute undernutrition (i.e. low weight-for-height) is relatively low.

In Cameroon, 21.1% of young children were underweight which is far higher than that of the special group (3.6%). The prevalence rate of underweight was lowest in children aged 3-5 months, began to increase after 6 months and reached a peak at 15-20 months, maintained a plateau throughout the second year of life and reduced slightly after this up to 59 months.

The underweight prevalence rate was least in Yaounde/Douala (10.8%), and much less in Urban (13.6%), as compared with Rural Cameroon (23.0%). The North clearly had the highest prevalence rate as well as the highest number of children with underweight of all Cameroon.

d. Variables Related to Undernutrition

The following variables for the total country sample were found to be related to a significantly higher prevalence rate of chronic undernutrition or underweight in the child; i.e. they may be considered as "at-risk" factors for undernutrition.

i/Demographic

- Household size more than 10 members
- High number (i.e. 4+) of dependents (children under 5 years) in household.

ii/Socio-Economic

- Household head a farmer
- Household structure traditional or improved
- Family owned more cattle, sheep or goats
- Someone other than mother cared for the child
- Mother illiterate (cannot read French, English or other language).

iii/Health and Health Service Utilization

- Child not born in a hospital
- Child with no birth nor clinic record (i.e. calendar of events or declaration required for age determination).
- Recent onset of fever, diarrhea or illness.

iv/Diet

- Child aged 3-5 and 6-11 months receiving no food other than milk
- Child aged 6-11 and 12-23 months who received no family food
- Child aged 12-23 months still being breast-fed (assuming inadequate additional foods other than milk)
- Children of all ages who received less number of total. energy-containing and protein-rich food groups

No relationship was found between sex of the child, age of the mother or birth order of the child, with higher undernutrition rates.

Many of the factors listed which were related to a higher prevalence rate of undernutrition in young children were consistent for the results for rural as compared with urban areas (excluding Yaounde/Douala) reported in the section on undernutrition by area. These factors include a low socio-economic status, illiteracy, recent ill health, poorer access to services, poorer diet and perhaps overcrowding.

Due to lack of sufficient sample size, it was not possible to fully investigate the relationship between these and other factors and undernutrition for each province. For example, in the North, almost all mothers were illiterate, hence this factor was not applied to discriminate the undernourished from normal children.

Further studies, on a longitudinal basis, would be required to investigate actual causal factors.

3.2 EDEMA IN YOUNG CHILDREN

The proportion of children with edema was low (0.6%). This was consistent with the low prevalence rate of acute undernutrition. Edema identifies only a certain type of severe undernutrition, namely florid Kwashiorkor.

3.3 ANEMIA IN YOUNG CHILDREN

In Cameroon, 38.1% of children aged 6-59 months were anemic as defined by WHO criteria (5). The prevalence rates were similar in children aged 6-23, and 24-50 months. There was little difference in the extent of anemia throughout the country, with the exception of the West Plateau where the rate was 23.1%. An unexpected finding considering the lower undernutrition prevalence rate was the absence of a difference between the special group, Yaounde/Douala, and the rest of the country. If this were a valid result, it might be explained by the prevalence of some common factors such as malaria affecting anemia and to a lesser extent, undernutrition. Malaria endemicity is probably less severe in the Western Plateau Highlands where anemia rates were lower.

The prevalence rate for sickle cell disease as determined by hemoglobin genotype, was 0.9%. It is known that sickle cell disease is an important cause of severe anemia, but a relatively uncommon cause of anemia for older ages because of its high mortality effect for earlier ages. The prevalence rate for sickle cell trait, was 15.6%.

3.4 MEASLES IN YOUNG CHILDREN

Measles was found to be widespread throughout Cameroon and contributed to approximately 25% of all deaths in young children.

There was a positive relationship found between undernutrition of the young child measured in the survey and historical measles mortality of young siblings in the same families.

3.5 MATERNAL GOITER

Obvious maternal goiter of Grade II or III by WHO criteria (6), was seen in 4.4% of all mothers examined. Goiter rates were highest in the East Province (16.8%), but were also relatively important in the North (5.6%), North-West (3.4%), and Central-South Provinces (3.1%). Apart from the East and certain populous areas of the North, goiter was found in this survey in various pockets, e.g. in the Central South (northern part near Yoko, near Bafia and Bokito); in the North-West Province north of the Bamenda Plateau and to a lesser extent around Bamenda; and in scattered areas of the West Province around Dschang and Bafoussam.

Although the prevalence rate of goiter was highest in the East, the actual number of mothers affected was highest in the North Province. It should be noted that only obviously visible goiter was considered in this survey. If goiter of all grades were included, the prevalence rates would have been much higher.

Clearly there is a significant problem of goiter in Cameroon especially in the East and in other areas. Methods used in other

countries to reduce goiter prevalence, such as salt iodization, iodized oil by injection or oral administration are described in this report.

3.6 ANTHROPOMETRIC EXAMINATION OF MOTHERS

Maternal nutritional status is more difficult to define using anthropometric measures than the status of young children.

In this study, 13.1% of all mothers were "short" (i.e. height less than 152 cm. or five feet). Short mothers were most common in the East and North-West Provinces (24.8% and 22.5%) and "tall" mothers (over 165 cm. i.e. 5'5") were most common in the North (17.7%). Compared with the remaining provinces the average height was highest in the Yaounde/Douala (159.8 cm. i.e. 5'3") and the North (159.4 cm. i.e. 5'2 3/4").

Maternal stature was considered to reflect the genetic contribution of stature in young children. Based on the survey's findings the prevalence rate of chronic undernutrition in children of the North may be an underestimate, since their mothers were taller than those in the other provinces. That environmental factors are still the most important determinant of a young child's growth (i.e. stature) were supported by the general results of this survey. In Cameroon 33% of the young children of short mothers and 19% of those with mothers who were not short, had chronic undernutrition. More than 86% of children with chronic undernutrition had mothers who were not short.

It should also be noted that maternal stature might also reflect nutrition-related environmental factors which influenced her growth in her childhood.

The correlation coefficient between stature of mothers and percentage height for age of their children was 0.20. This low value suggests that the genetic effect on short stature in children was not a predominant factor, when compared with other factors, such as diet and poor health.

In Cameroon, 7.3% of mothers had evidence of arm wasting (less than 23 cm. arm circumference) and 13.6% had evidence of fat wasting (less than 7.5 mm. fatfold). In the North Province, mothers showed the highest prevalence of arm (11.6%) and fat wasting (23.7%). This might suggest that a higher proportion of Northern mothers have undernutrition as compared with those of the rest of the country. An important reason for this may be diet. It should be noted that other factors, such as activity may influence maternal arm measures.

3.7 DIET METHODS

a. Introduction

All methodology used for the study of diet was based on the recommendations of the National Academy of Sciences, USA (7), and adapted to Cameroonian needs. This methodology assumes that information on consumption derived for the types of foods eaten throughout a country would be feasible and could provide useful data for nutrition policies and programs.

Diet assessment was conducted on two groups of children. The person interviewed was asked questions about every index child's feeding patterns. A more detailed 24-hour dietary assessment was conducted on every child 3-24 months of age and for the person feeding the child to give an index of family food patterns. A total of 2235 paired dietary listings were analyzed.

b. Breast Feeding

The practice of breast feeding was almost universal (98% of all infants) throughout Cameroon (including Yaounde/Douala) up to 11 months of age. It was commonly practiced in the second year of life. At 21 months of age, 50% of all children still received breast milk. This percent was even higher in the North (70%). These results compare favorably with those of other African countries.

c. Other Milk

Fresh milk consumption was limited almost entirely to the North where 7% of all children aged 3-23 months received it. Artificial or commercial milk feeding was common in Yaounde/Douala (i.e. 25% of infants) and far less common in the rest of the country (i.e. 3% of infants). Bottle-feeding was frequently used for infants in Yaounde/Douala (30%), for children aged 3-5 months in Central South province (24%), and in the Western provinces (10%). About 50% of bottles used were reported as sterilized, and the remainder as "clean".

d. Food Received

In Cameroon 46% of children aged 3-5 months, 80% aged 6-11 months and 95% in the second year of life received some food other than milk. These rates for infants were less in rural Cameroon, particularly in the North and East provinces, and higher in Urban areas.

Approximately 40% of infants in Cameroon received specially prepared foods (such as paps) from 3-11 months. The prevalence rate decreased to 25% in the second year of life. Just over half the children aged 6-11 months in the second year received food shared with the family. More children in the North received special foods (e.g. millet/sorghum pap) which was far longer than the children in the other provinces. They also received the family food less often.

By far the most common special food in most provinces other than the North was "corn pap". Imported bread/wheat was most commonly eaten in the Central South Province and Yaounde/Douala. Commercial weaning foods were eaten by 30% of infants aged 3-11 months in Yaounde/Douala and almost 15% in the Central South Province.

The proportion of families who ate any vegetable protein (beans, seeds or nuts) was 60-70%; animal protein (meat, fish or eggs) was 60-70%; dark green leafy vegetables, 40%; a fruit or vegetable, about 50%; and oil, 50-90% depending on the area of the country.

Of the children aged 6-11 months in these families, less than 40% received any vegetable protein; less than 30% had any animal protein; 20% ate dark green leafy vegetables, 20% had a fruit or vegetable and 20-60% had an oil depending on the area of the country. By 18 months most children received the same types of food as the family.

It should be noted that the quantity of food eaten, and whether foods were eaten together or separately, were unknown.

It appears there are two major problems: food unavailability to the family and distribution of foods to the young child, even when available to the family.

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3.9 PARTICIPATING ORGANIZATIONS

The Cameroon National Nutrition Survey was administered by the Ministry of Economy and Planning (MINEP). The following Ministries participated:

Ministry of Health
Ministry of Social Affairs
Ministry of Agriculture
Ministry of Education
Ministry of Armed Forces

As well as direct involvement, certain ministries participated through their technical organizations. These include the Scientific and Technical National Research Office and Direction Of Statistics (Ministry of Economy and Planning); and the University Center for Health Sciences (Ministry of Education).

Non-governmental agencies which participated in the survey included UNDP, UNICEF and WHO.

3.10 CONCLUSIONS

Children less than five years of age were chosen on this survey because they are known to be at the greatest risk of serious undernutrition. Whenever high prevalence rates of undernutrition are found within this age group, there is an indication that the problem concerns the community at large.

1. Approximately two hundred and fifty thousand children under five years of age in Cameroon were chronically undernourished (1) at the time of this survey.

The problem of undernutrition :

- * Exists throughout the nation
- * Is more prevalent in children aged six months to five years
- * Is more prevalent in those living in rural areas
- * Is more prevalent in the North, West and East Provinces

Undernutrition was found to be related to :

lower socio-economic status
 overcrowding
 illiteracy
 inadequate child care
 lack of important foods in the diet
 recent child illness
 lesser utilization and lack of health services

With regards to diet :

- * Breast feeding is adequate at present
- * Up to 30% of children from 6-11 months of age (particularly in the North and East Provinces) do not receive any food other than milk

(1) Defined as a long-term marked impairment of growth when compared with a well-nourished population of children of the same age.

- * An additional 20-30% of children this age receive pap as their only source of food
- * The remaining children often ate a low variety of important foods
- * These problems continue to a lesser extent in the second year of life
- * Lack of certain foods, such as cereals, protein-rich foods and oils, stem from two major factors :
 - Inadequate family intake
 - Poor family food practices, resulting in the child not receiving foods eaten by the family

2. Approximately 40% of children under five years in Cameroon have anemia.

The survey highlighted the problem of lack of adequate iron-containing foods in the young child's diet. Sickle cell anemia did not seem to be a significant factor contributing to anemia, its prevalence rate being 0.9%. Other important causes of anemia not investigated in the survey include parasitic infestations, such as malaria, and infections.

3. Measles is widespread throughout Cameroon and contributes to 25% of all young child deaths.
4. Goiter in mothers seems to be endemic in the East Province and in certain localities of the North, North-West and Central-South Provinces.

3.11 RECOMMENDATIONS

Improved nutritional status throughout Cameroon will result in better health and productivity for the population at large, and will lead to a general improvement in the quality of life. The nutrition problem is related to many different sectors and concerns improvement in the quantity as well as the quality of foods eaten.

Improvement in the quantity and quality of the Cameroonian diet involves attention to agricultural production, processing, marketing, distribution and consumption of food. The sharing of foods within the family influences the differential food consumption by family members and affects young children and mothers. Nutrition education should be directed to correct these imbalances.

In another fashion, nutritional status is affected by the general state of health of the individual, and can thus be ameliorated through improved health services, such as immunization, improved water supply and environmental sanitation, and especially nutrition education.

Considering the multiplicity of sectors which must be taken into consideration in implementing an effective nutrition improvement strategy, it seems necessary that a multisectoral approach be used. In this sense, the solution of the nutrition problem in Cameroon will demand effective coordination and integration of a wide variety of policies and program activities in the concerned sectors.

Thus, following the results obtained from this survey, the participants of the final working group, including technicians, officials and members of international organizations, recommended:

A. In the short term:

- 1) The creation of a national structure responsible to study problems of food and nutrition

This structure could be designated to plan and coordinate activities in the nutrition sector. Such a structure should be composed of

representatives from various sectors concerned with the nutrition problem and should also have within it a permanant technical working group that could be responsible to implement programs assigned to it.

2) The convening of a seminar/workshop in Yaounde:

This seminar/workshop would serve essentially towards general consciousness raising and exchanges of ideas and information about the nutrition problem in Cameroon. It could also serve as a basis for a future nutrition strategy to follow. Later, its format could be extended to regional seminars and workshops.

3) The eradication of goiter:

One activity which is important to begin is the study and design of a goiter intervention strategy to form the basis for remedial action against this problem in identified areas. This activity could entail the creation of a system for producing and distributing iodized salt throughout the country. Once action has begun, a surveillance team could be organized to ensure the proper attainment of the goals, by planning, execution, and development of alternative methods and strategies.

4) The intensification of vaccination campaigns against measles:

Because of the significance of measles as it relates to mortality of children, it is of high priority that existing immunization programs be strengthened and expanded to cover the entire country.

5) The preparation of a program of promotion and nutrition education:

This action could be coordinated by the Ministry of Economic Affairs and Planning in collaboration with the Ministries of Public Health, Agriculture (e.g. Direction of Community Development), Social Affairs, and other services, where outreach attains the family level. These actions could, in conjunction with the Ministry of Information and Culture, be reinforced through the utilization of mass media.

B. Activities in the long term:

1) The formation of qualified personnel at all levels:

This formation could be assisted by the teaching of nutrition in all scholastic institutions from primary school to university.

2) Research:

Because of the cross-sectional nature of this survey, it may be necessary to conduct future longitudinal surveys of nutritional status, as a means of refining existing information, and of increasing knowledge of seasonal and regional problems. These surveys could be initiated on a pilot basis as soon as possible. They could provide information for the planning of surveillance strategies in certain priority areas.

The problem of anemia, which is particularly complex, should be investigated by further studies. These studies could be carried out by existing institutions such as the University of Yaounde, ONAREST, OCEAC, and the health service system.

3) The creation of dietetic experimentation and rehabilitation centers:

These centers could integrate the four elements of dietetic research, experimentation of novel nutritional concepts, recuperation and finally, practical formation of health workers.