

UNIVERSITY OF CAPE TOWN.

A NUTRITIONAL AND SOCIO-ECONOMIC STUDY OF PHILIPPI FARM  
CHILDREN AND THEIR MOTHERS DURING NOVEMBER 1986

by

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ABSTRACT.

A Community based survey to determine the nutritional status using anthropometric methods, of children and mothers and to assess certain socio-economic factors was carried out during November and December 1986 in Philippi, a predominantly vegetable farming area. Twenty one (43%) of the 49 vegetable farms which were included in the study were selected by stratified random sampling.

All children in the 0-6 year age group and their parents on the selected farms were included in the sample which consisted of 129 children and 212 parents. Questionnaires were administered and subjects weights and heights were measured.

It was found that 47% of children were below the National Centre for Health Statistics 5th percentile weight for age and 58% were under the 5th percentile height for age.

There were 47 child deaths out of 279 births over a six year period, thirty four of which had occurred in the first year of life.

Twenty eight percent of children had a birth weight of less than 2.5 kg.

The number of cases of tuberculosis (10%) and severe diarrhoea (31%) contracted within the first year of life is unacceptably high.

Twenty four percent of mothers were malnourished in terms of body mass index and fifty five percent of mothers were illiterate.

Fifty nine percent of mothers were regular farm workers who worked for an average of 10.2 hours per day and a wage of R0.44 per hour.

Grossly inadequate facilities existed for the care of children while the mothers worked.

The average amount spent on food was insufficient to maintain normal nutrition.

Although 91.5% of mothers breast fed their children and fed for a mean duration of 13.4 months, breast feeding was not exclusive.

Supplimentary feeding was introduced on average at 3 months of age. The long working hours of working mothers made it difficult for them to breast feed their children satisfactorily.

Acceptance of the family planning services was high and immunisation cover was good.

These statistics reflect the effects of extreme poverty and neglect of a community which is totally reliant on its employers for its livelihood. The parents poor educational level, coupled with their meagre financial and other physical resources gives them and their children little opportunity to improve their station in life and leaves them open to the scourge of malnutrition and disease. Similarly the dearth of educational and other child care facilities will ensure that this disasterous trend continues. A multidisciplinary approach, including active community involvement of both farmers and workers, to the many physical and social problems is urgently needed if the unacceptable human suffering is to be stopped.

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## INTRODUCTION.

Prior to this study a survey carried out by the nursing staff of the Philippi Cape Divisional Council Clinic during 1986 indicated that a large percentage of vegetable farm workers children were malnourished. These results were disputed by the local farmers who felt that there was little nutritionally wrong with their workers or their workers children (1).

As a result of the dispute the Medical Officer of health responsible for Philippi decided that a more detailed survey was required and the author was requested to carry out a Community based nutritional survey of the young children in the area.

Much of a child's well being is influenced by the family, the community and the environment. Morbidity and mortality generally reflect socio-economic factors. For many, ill health is the result of deficiencies in basic needs;

satisfactory water supply

sanitation

adequate food

health care facilities

Well being is also affected by a particular life style.

A study in Cali, Columbia, South America involving malnourished children showed that a group of children who received only adequate health care showed no improvement in their physical growth. Another group who in addition to health care, received a full and adequate diet managed to catch up physically with an elite control group from the same area, however they showed little change in intellectual levels. A third group which was offered a loving and stimulating environment in addition to health care and an improved diet caught up almost totally with the elite group (2).

Since physical and socio-economic factors are so important in the development of children it was decided to extend the scope of the study to include those socio-economic factors which may have an influence on the nutritional status of the children and to assess the nutritional status of the mothers which also has a bearing on child development.

## SECTION I PURPOSE OF STUDY

### 1.1 AIMs

To determine the nutritional status among vegetable farm workers children (aged 0 - 6 years) and their mothers, in the Philippi farming area and to measure certain socio-economic and environmental factors which may be associated with the observed nutritional status in order to make recommendations, if necessary which may lead to an improvement in the nutritional state of the Philippi children.

### 1.2 OBJECTIVES

1.2.1 To determine the nutritional status of farm workers children aged 0 - 6 years by calculating their:

- i) Weight for age ratio (NCHS reference)
- ii) Weight for height ratio (NCHS reference)

1.2.2 To determine the nutritional status of mothers on the basis of Body Mass Index values.

1.2.3 To determine the prevalence of the following outcome variables among children, (ie. variables which may have been influenced by the physical and socio-economic environment to which the children were exposed):

- i) Birth weights.
- ii) The occurrence of certain diseases during the first year of life:
  - Measles
  - Whooping cough
  - Tuberculosis
  - Severe diarrhoea.
  - Intestinal parasites infestation.

1.2.4 To determine the Immunisation coverage for DWT, polio, B.C.G. and measles of the children in the sample who were more than one year old.

1.2.5 To describe social and environmental factors affecting children and their mothers.:-

1.2.5.1 Socio-economic Status of parents by determining their:

- .2.5.1.1 Educational status.
- .2.5.1.2 Occupation.
- .2.5.1.3 Marital status.
- .2.5.2 Family disruption
- .2.5.3 Family demography in terms of:
  - .2.5.3.1 Size of families
  - .2.5.3.2 Ages of parents
  - .2.5.3.3 Ages of children
- .2.5.4 Available Resources in terms of:
  - .2.5.4.1 Income per person per week
  - .2.5.4.2 Expenditure per family per week spent on food alcohol and cigarettes
  - .2.5.4.3 Available Transport
  - .2.5.4.4 Child care facilities for working mothers.

1.2.6. To determine infant feeding practices used by mothers in the following respects:

- 1.2.6.1 Breast feeding practises.
- 1.2.6.2 Age at which solid food was introduced to infants.
- 1.2.7. To determine contraceptive practices used by mothers,
- 1.2.8. To determine the number of births and deaths of all children conceived by the mothers in the sample during the period 1978 to 1984.

### 1.3. STUDY DEFINITIONS

1.3.1 Malnutrition status is defined in terms of the National Centre for Health Statistics. (NCHS). Monthly and Vital Statistics Report, 25(1976). Supplement, as follows:

1.3.1.1 For children;

1.3.1.1.1 Acute: under the NCHS 5th percentile weight for age with or without clinical signs of malnutrition such as oedema, muscle wasting, skin lesions, hepatomegaly, or hair changes.

1.3.1.1.2 Chronic: Under the NCHS 5th percentile height for age with or without signs of malnutrition

1.3.1.1.3 For mothers with a body mass index of less than 20.

1.3.2. Immunisation status.

The immunisation schedule implemented according to legislation by the Cape Divisional Council is as follows:-

0 - 1 month	BCG
3, 4.5, 6 months	Polio; Diptheria, pertussis and whooping cough
Over 8 months	Measles
18 months	Booster diptheria, pertussis and whooping cough

A child was regarded appropriately immunised for age in terms of the following schedule:

B.C.G. at birth.

polio, Pertussis and Whooping cough immunisations at 3 month 4.5 months and 6 months.

measles immunisation at nine months.

1.3.3 Severe diarrhoea was defined as diarrhoea of such severity that the child had to be admitted to a hospital.

1.3.4 Illiterate: A person over 15 with less than standard 4 education.

1.3.5. Breast feeding: The feeding of a child on the breast regardless of whether supplementary feeds are given.

1.3.6 Family disorganisation/disruption: A family in which parents are not living together.

1.3.7 Dop: The practise of giving regular rations of alcoholic beverage in part-payment of service rendered.

## SECTION 2.

### 2. DESCRIPTION OF STUDY AREA

#### 2.1 The Philippi Farming area.

The Philippi farming area is situated approximately 14 Km from the centre of Cape Town (see Fig 1). In the area approximately 5000 hectares is under irrigation. Most of this is farmed by 49 registered vegetable farmers (who are classified as "town gardeners" and hence do not qualify for subsidies on housing for workers). (See Fig 2). (There are other farms in addition to vegetable farms (see section 2.4). In 1983, Philippi produced more than 80% of the vegetables supplied to the Cape Town markets (tomatoes and potatoes excluded). The total value of vegetables supplied by the Philippi area was R3,7 million (out of a total of R97 million produced by the whole of the Western Cape) (3).

#### 2.2. Vegetable farming methods

Plants are grown in nurseries and transplanted into the fields. Compost is made by mixing human faecal material (from sewage disposal) with animal manure and vegetable matter. This is left to mature for approximately three months. While maturing the compost is left in open heaps often near labourers' cottages. When mature it is ploughed into the ground. Various human parasites (eg. ascaris ova, tricuris tricuris etc.), have been detected in the compost. (1)

#### 2.3 Population on the Philippi vegetable farms.

This is composed of:

##### 2.3.1 Coloured farm workers and their children.

This population was determined during 1984 by a door-to-door census (Table I) carried out by Health Inspectors of the Cape Divisional Council.

Many of these people have worked in the area on the farms for generations. They live on the farms in houses supplied by the Philippi farmers.

##### 2.3.1 Vegetable farmers and their families.

These people are mainly of German extraction and have lived in the area for generations. They live in well constructed spacious brick houses supplied with electricity, with good water and toilet facilities.

#### 2.4. Housing and services survey.

A survey of the entire Philippi area (4). was undertaken by the Cape Divisional Council Housing Department during the latter part of 1986. The survey covered the whole of the Philippi farming area including vegetable and other farms. For completeness the results of the survey are given below.

#### 2.4.1 Families housed in the area.

Approximately 1200 families were enumerated of whom 240 (20%) were not involved in the farming activities but also reside in the area. The survey found that non-farm workers tend to occupy the better quality units.

There is a total of 650 housing units in Philippi of which 429 (66%) were constructed of brick, less than one-third of wood-and-iron while the balance 'other' included converted pig sties, truck bodies, caravans etc.

While 508 (53%) of the farm worker families occupied brick structures, 213 (89%) of the non-farm workers families occupied brick structures.

In terms of the Town Planning restrictions on the use of land in the Philippi area, the accommodation of non-farm workers on the farms is illegal. In view of the shortage of housing in the adjacent residential areas, farmers in the Philippi area are obtaining rental for units which should be occupied by the farm workers themselves.

Two hundred and sixty six (41%) of the structures were assessed as being in a poor condition. Those in a poor condition included nearly 141 (one-third) of all brick structures. In addition three quarters of the wood-and-iron structures are considered to be in a poor condition.

#### 2.4.2 Basic Services.

The Philippi land area is zoned rural and surrounded by built up suburbs.

The properties are classified by the Cape Divisional Council as undeveloped land. Consequently minimal infrastructural services are provided. The provision of services cannot be improved substantially without a large increase in rates. In addition the relatively low population density and extensive nature of landholdings makes upgrading of services difficult.

#### 2.4.2.1 Roads.

The road system provides a basic grid of tar and gravel roads. However due to the extensive area and large farms and lack of public or private means of transport movement of farm workers is severely restricted.

#### 2.4.2.2 Water supply.

In spite of a high water table and aquifer below ground level the water supply to Philippi is inadequate. While the abundance of natural water is the basis for Philippi being the Peninsula's vegetable garden, in the survey it was found that only 12 of approximately 350 farms were served by the Cape Divisional Council Water Supply. The balance were recorded as using 'what was available' or 'borehole' water. The annual rainfall in Philippi is 700 mm per year. This water sinks rapidly through the sandy soil and joins the Cape aquifer. At depths of 1.5 to 3 meter water can readily be pumped for irrigation. This is of considerable importance in terms of agriculture. Assuming 5000 hectare under irrigation and 1 metre of water per hectare 50 million cubic metres per annum would be required to replace Philippi's water supply. This represents one-third of the irrigation allowance from the Berg and Eerste River schemes combined.

In areas where there is no Municipal water supply underground water is pumped into dams and used for drinking purposes by both the farmers and the labourers. Labourers and farmers obtain their drinking water directly from the dams with no purification of the water taking place.

Most vegetable farmers use overhead irrigation for their vegetable crops although one farmer uses the Israeli drip method whereby pipes are laid next to rows of vegetables and water constantly drips from holes in the pipes onto the roots of the plants.

The upgrading of the water supply, as a basis to improving health and to reduce the time spent by children fetching and carrying water is only available at a cost. Extending the service to the farm boundaries would have to be paid for by increased rates being paid by the farmers as a whole while the extended pipe system to the workers housing would have to be borne by individual farmers. Estimated costs are :

- i supplying water to farms -forty million rand.
- ii supplying water on farms -seven and a half million rand.

#### 2.4.2.3 Sewage Disposal

No waterborne sewage disposal system is available in the area. From the survey most families recorded either using a pit latrine system or buckets and burying the slurry on site, some however recorded having no system!

The high water table hinders the use of pit latrine systems.

### 2.4.3 Health services in Philippi.

#### A. Preventive and promotive services.

These are organised and controlled by Community physicians who are employed by the Cape Divisional Council.

The following services are provided;

1. Maternal and child health (including ante-natal check ups, immunisation, well baby clinics, growth and developmental monitoring of preschool children, nutrition clinics and family planning including cancer screening ("Pap" smears).

2. Infectious disease control including the diagnosis and treatment of tuberculosis and typhoid, sexually transmitted disease clinics.

3. Health education.

#### B. Environmental services.

The services cover the following areas, water, sanitation, refuse disposal, housing and food handling.

#### C. Curative services (excluding infectious disease control).

No curative services exist in Philippi except for the provision of simple medication by local authority sisters for the treatment of minor ailments. These are given by Cape Divisional Council as a free service. No easily accessible hospitals or day hospitals are available. The nearest hospital is Victoria Hospital 12 kilometers away.

The above services are provided at the Cape Divisional Council Philippi clinic or on the farms from a mobile clinic.

### SECTION 3 MEASUREMENT OF NUTRITIONAL STATUS.

A large number of factors influence the growth of an individual. These include genetic, socio-economic, physical, environmental (including nutritional influences), disease and geographic factors (5). Many methods have been used to evaluate nutritional outcome. Growth status is probably the best indicator of the overall nutritional status of children (6).

#### 3.1 Anthropometric measures.

Anthropometric measures are used to assess growth. A number of different anthropometric measures are available. The indicators used in this study were ;

- i) weight for age and,
- ii) height for age.

These indicators were chosen because the ages of the children were accurately known and under these conditions they give an accurate assessment of both acute and chronic malnutrition.

##### 3.1.1 Weight for age.

Weight for age is a good indicator of acute malnutrition, it is sensitive to small changes and is an objective and repeatable measure. It may however overestimate acute malnutrition by including those small for age (7,8).

##### 2.1.2 Height for age.

Height for age is a good indicator of the nutritional history of the child. (7,8).

#### 2.2 Reference Growth Charts.

The detection of malnourished children may be carried out by comparing the anthropometric measurements determined in a sample population against a reference population of normal healthy children. Since the growth of privileged children in developing countries, (eg. South Africa), does not differ significantly from healthy normal children in industrial countries (9), international growth charts may be used to assess the nutritional state of underprivileged communities.

Three sets of internationally applicable growth charts are available as a reference for nutritional monitoring programmes :

- i) NCHS (National Centre for Health Statistics) charts.
- ii) Boston charts.
- iii) Tanner Charts.

These charts were constructed from data obtained in either cross sectional or longitudinal studies. Differences among these three reference growth charts are however minor.

NCHS charts were obtained by cross sectional studies and indicate the mean sample rate of growth (and not the mean individual rate of growth) (10). They are recommended by the World Health Organisation (11). For this reasons NCHS growth charts were chosen as a reference in this study.

## SECTION 4 RESEARCH METHODS

### 4.1 STUDY POPULATION.

#### 4.1.1 Philippi Vegetable Farms.

A list of vegetable farms in the Philippi area was obtained from the Divisional Council Health Inspectors Office. Farms were stratified in terms of worker population size as follows:

Stratum A. Farms with less than 20 workers

Stratum B. Farms with 20-50 workers.

Stratum c. Farms with more than 50 workers.

From each stratum 40% of farms were randomly selected.

There were 49 farms in the study population. Twenty one (43%) were included in the sample with as far as possible equal numbers from each sample.

#### 4.1.2 Children and parents.

All farm workers children in the 0-6 year age group on the selected farms were included in the study. Children were well known to the Philippi Cape Divisional Council Maternal and Child Health Clinic staff who also keep accurate records of all farm children on clinic cards which are filed under the farm name on which they live. Lists of children were obtained from this source. This was used to confirm that all children in the required age range were included in the sample.

All mothers/guardians of these children were included in the study.

Information concerning fathers was obtained from mothers and/or guardians.

##### 4.1.2.1 Locating Children and their Mothers.

Since the clinic staff regularly visit the farms as part of their duties they have come to know the farm labourers and their children well.

If a child could not be located at a particular visit, the farm was revisited until the child was located. In a small number of cases families had left that particular farm - in these cases the children were excluded from the sample. However families with children in the required age range who had recently moved to the farms were included in the study population.

## 4.2. Data Collection.

### 4.2.1 Questionnaires

Face to face interviews were conducted by a trained data collecting team consisting of 3 registered nurses and 3 health workers using a specially developed questionnaire (see annexure A). The questionnaire was designed to measure factors influencing the socio-economic environment to which mothers and children were exposed. In addition it was to be used to record appropriate medical information obtained from clinic records as well as anthropometric data.

#### 4.2.1.1 Demographic data.

Questions were asked to obtain family size and contraceptive practices, marital status, educational level, occupation and age of parents in addition to information concerning births deaths and transport available to farm workers.

#### 4.2.1.2 Family income and expenditure.

This information was obtained by direct questioning about the income and expenditure of the previous week.

#### 4.2.1.3 Alcohol consumption.

The quantity of alcohol consumed during the previous week was obtained by questioning. In order to assess the amount of alcohol consumed by families, standard volume wine bottles were shown to mothers as units of volume. Volumes of wine reported to have been consumed were then converted to litres.

#### 4.2.1.4 Disease in the first year of life.

Direct questions, clinic cards and road to health cards were used to obtain this data.

#### 4.2.1.5 Infant feeding practices

Questions related to the length of breast feeding periods and to the age at which solids were introduced.

#### 4.2.3 Anthropometric measurements

Anthropometric measurements were made during the farm visits after the interview had been completed. (See section 4.2.2).

##### 4.2.3.1 Weight measurement.

Children and mothers were weighed using a Krups Medico foot scale which was placed on a levelled flat hardboard. Children less than 2 kg were weighed using a Detecto beam scale measured in kilograms to the nearest 0.5 kg.

Children were weighed in light clothing. Mothers were weighed without shoes or jackets. The scales were checked after every ten patients and zero adjusted and every day the scale was standardised against a weight of 9.5 Kg.

##### 4.2.3.2 Height measurement.

Height was measured with the mother or child standing on a flat board without shoes against a sheet of hardboard held vertically by means of a permanently attached metre stick located at an appropriate height. Young children were measured on a hard, flat surface with knees extended.

#### 4.2.4 DATA FROM CLINIC RECORDS.

##### 4.2.4.1 Demographic and Health related data.

Road to Health Cards (RTH) were used to obtain birth weights, diseases past and current and birth dates. RTH cards are kept by the mothers.

On seven occasions the mother did not have a RTH card for her child. On these occasions clinic record cards were used. These were taken on the mobile clinics when the farms were visited. Clinic records are available for farm workers children in the area.

##### 4.2.4.2 Immunisation status

A record is made by the nursing staff on the child's Road to Health card and clinic record cards of all immunisations which have been given. These cards were examined during the interview and dates of immunisation recorded.

#### 4.2.5 RELIABILITY AND VALIDITY.

##### 4.2.5.1 Training of Data Collecting Team.

Attempts to decrease bias.

Interviewer variation was reduced by training sessions over a period of a week which included role play in an attempt to standardise the technique used in the administration of the questionnaire. All questions were discussed separately. Possible sources of ambiguity or other misinterpretations were identified and standardised interpretations to a question were identified. Later during the study, if a different interpretation was identified, it was discussed by the team and a standardised interpretation was agreed to.

Language used by interviewers.

Interviewers used either English or Afrikaans depending on the home language of the mother. The importance of a unified interpretation of questions in either English or Afrikaans was stressed.

#### 4.2.5.2 Pilot studies.

The questionnaire was pretested in a number of pilot studies ambiguities were identified and corrected and the questionnaire modified accordingly. The final questionnaire (Annexure A) was used to obtain the information outlined in the objectives (3.2)

#### 4.2.5.3 Detection of incomplete questionnaires.

Questionnaires were checked for errors and omissions. If identified the relevant mother was contacted and the questionnaire completed.

#### 4.2.5.4 Interobserver bias.

Eleven (10%) of mothers were reinterviewed. The results of the two interviews were compared. Although in two questionnaires some answers differed slightly, the differences were considered to be insignificant.

#### 4.2.5.5 Income and expenditure statement.

Questions were asked to account for discrepancies between income and expenditure. Additional information obtained in this manner was recorded and used in the analysis. In order to assess the validity of the answers, comparison was made of the salaries of people with similar occupation. No discrepancies were found.

#### 4.2.5.6 Reliability of measurement.

Anthropometric measurements were taken at the end of the interview in order to limit bias. Measurements were made by the same two team members throughout the study. Twelve children and eleven mothers (10%) anthropometric measurements were repeated by the author. Differences were found in 2 children and three mothers measurements. No difference was however found to be greater than 0,08% and this was considered to be insignificant.

## ETHICS.

### 4.2.6 Permission to proceed with study

Farmers, whose farms were selected in the study, were contacted in order to obtain their co-operation and consent. All gave permission for the study to be conducted among their workers. Mothers were informed of the details of the study and were given the opportunity to participate or not. There were no refusals.

### 4.2.7 Time period of study.

The selected 21 farms were visited during the period 1st November 1986 to 16 of December 1986. Visits were conducted from 9h00 to 13h00 on weekdays during the study period by means of a mobile clinic. The mobile clinic was a converted Toyota 'Hi Ace' which normally carries the equipment used by the clinic staff during their routine farm visits.

SECTION 5

SUMMARY OF RESULTS.

THE RESULTS ARE PRESENTED IN A SUMMARY FORM IN ORDER TO FACILITATE DISCUSSION. DETAILED RESULTS ARE REFLECTED IN TABLES I TO XXII.

## STUDY POPULATION.

TWENTY ONE OF THE 49 VEGETABLE FARMS (43%) WERE INCLUDED IN THE STUDY.

129 CHILDREN IN THE AGE RANGE 0-6 YEARS AND THEIR PARENTS, WHO NUMBERED 212, WERE INCLUDED IN THE SAMPLE.

## DEMOGRAPHY.

### EDUCATION

AS INDICATED IN TABLE V, 79% OF FATHERS AND 81% OF MOTHERS WERE ILLITERATE.

### MARITAL STATUS

20% OF PARENTS WERE LEGALLY MARRIED AND 22% WERE LIVING APART (TABLES III, IV).

### OCCUPATION AND EARNINGS AND EXPENDITURE

63 (59%) OF MOTHERS WERE FARM WORKERS (TABLE VI) WHO WORK FOR R.0.44 PER HOUR FOR 10.2 HOURS PER DAY (TABLE VIII).

FATHERS EARN R0.55 PER HOUR AND WORK FOR 10.2 HOURS PER DAY.

MEAN FAMILY INCOME PER WEEK IS R54.00 (TABLE VIII)

MEAN FAMILY WEEKLY EXPENDITURE ON FOOD IS R26.77 (TABLE IX).

### WINE CONSUMPTION.

62 (58%) OF FATHERS AND 37 (35%) OF MOTHERS ADMITTED TO DRINKING ALCOHOL.

MEAN WINE CONSUMPTION OF DRINKING PARENTS PER WEEK IS (TABLE X):

FATHERS 8.3 LITRES.

MOTHERS 5.5 LITRES.

## NUTRITIONAL STATUS OF CHILDREN AND MOTHERS

### CHILDREN (TABLE XVI).

129 CHILDREN WERE INCLUDED IN THE STUDY.

61 (47%) WERE LESS THAN THE 5TH CENTILE (WEIGHT FOR AGE)

68 (58%) WERE LESS THAN THE 5TH CENTILE (HEIGHT FOR AGE)

NO STATISTICAL DIFFERENCE WAS FOUND IN THE NUTRITIONAL STATUS (WEIGHT FOR AGE) BETWEEN THE FOLLOWING GROUPS OF CHILDREN:

1. CHILDREN WHOSE MOTHERS WERE HOUSE WIVES VERSUS CHILDREN WITH FARM WORKER MOTHERS (TABLE XVI).

2. CHILDREN WITH LITERATE MOTHERS VERSUS CHILDREN WITH ILLITERATE MOTHERS (TABLE XVI).

SIMILARLY THE NUTRITIONAL STATUS OF THE FOLLOWING GROUPS OF CHILDREN WAS FOUND TO BE SIMILAR TO EACH OTHER AND TO THE SAMPLE MEAN (TABLE XVI);

CHILDREN WHO HAD:

SEVERE DIARRHOEA IN THE FIRST YEAR OF LIFE,  
A BIRTH WEIGHT OF LESS THAN 2.5 KG.

THE MEAN BIRTH WEIGHT OF THE SAMPLE OF CHILDREN IN THE 0-6 YEAR AGE RANGE WAS 2.53KG.

36 (26%) HAD A BIRTH WEIGHT OF LESS THAN 2.5 KG. (TABLE XVI)

### MOTHERS.

TWENTY FIVE OF THE MOTHERS (24%) WERE MALNOURISHED. THEIR BODY MASS INDEX WAS LESS THAN 20 (TABLE XVI).

BREAST FEEDING.

118 (91.5%) OF THE CHILDREN WERE BREAST FED FOR AN AVERAGE DURATION OF 13.4 MONTHS. SOLIDS WERE INTRODUCED ON AVERAGE AT 3 MONTHS (TABLE XI).

PROMOTIVE AND PREVENTIVE SERVICES.

IMMUNISATION COVER FOR BCG POLIO AND DWT=93%  
MEASLES IMMUNISATION COVER = 93% (TABLE XIII)

NINETY FOUR PERCENT OF MOTHERS INDICATED THAT THEY HAD BEEN ON SOME FORM OF CONTRACEPTIVE (TABLE XII).

CHILD BIRTHS.

THE MEAN NUMBER OF CHILDREN PER MOTHER IN THE SAMPLE WAS 2.6 (TABLE XIV)

MORTALITY AND MORBIDITY.

DISEASES IN THE FIRST YEAR OF LIFE. (TABLE XV):  
40 (31%) OF CHILDREN HAD HAD SEVERE DIARRHOEA.  
13 (10%) " " " " TUBERCULOSIS.  
6 (4.6%) " " " " MEASLES.

THERE WERE 47 CHILD DEATHS OUT OF 279 LIVE BIRTHS TO THE 109 MOTHERS IN THE SAMPLE (TABLE XIV) DURING THE PERIOD 1978 TO 1984.

## DISCUSSION OF RESULTS

The results give evidence of high levels of deprivation in many spheres within the sample, which is representative of coloured farm workers and their families in the Philippi area.

### 6.1 NUTRITIONAL STATUS OF:

#### 6.1.1 Children

62 of children (48%) were under the National Centre for Health Statistics fifth percentile for weight for age (Table XVI). This measure is a good indicator of acute malnutrition (2.1.1).

68 (56%) of children were under the 5th centile weight for height (Table XVI). This indicator is an accurate measure of the chronic malnutrition (2.1.2).

These figures are higher than those found in other nutritional studies in South Africa (12). Some examples of these studies are given below.

Power in 1982 found that 24% of a group of middle classed coloured children in Cape Town were under the 5th percentile for weight and 20% under that for height (13).

Kibel and Jacobs in a study carried out in Namaqualand in 1987 found that in a group of coloured children 2-6 years old 30% were under the 5th percentile for weight. (The percentages for weight for height were similar in the two studies i.e. 56% in Philippi and 57% in the Namaqualand study.) (12).

There are a number of serious implications related to malnutrition in the first two years of life. Some of these are:

i) retarded mental development (14)

ii) decreased head circumference, brain size and numbers of brain cells as well as reduced amounts of neurotransmitters and enzymes (15)

iii) increased morbidity and mortality.

Fortunately, the effects of acute malnutrition are reversible if there is adequate treatment and sustained improvement in dietary intake, social circumstances and mental stimulation. (16)

Should nothing be done about the acute malnutrition, as it would seem in this case, chronic malnutrition will result.

iii) Chronic malnourishment can cause early death, physical stunting, inadequate brain growth likely to make schooling difficult. (17) Many malnourished children will grow up without the degree of mental development necessary for life in the twenty first century (11)

#### 6.1.2 Nutritional outcome in selected groups of Philippi farm children.

No statistical difference was detected between number of malnourished children belonging to the following categories of mothers:

a) illiterate mothers compared with literate mothers.

b) mothers who are house wives compared with farm worker mothers. There are however so many adverse conditions operating in Philippi simultaneously that it is difficult to find a child who is not exposed to a least one potentially detrimental socio-economic factor. Most are exposed to many. Hence comparison of the effects of different socio-economic factors on Philippi children is very difficult to evaluate. The similarity of the nutritional status of the different groups of children (Table XVI) indicates that the high prevalence of malnutrition in Philippi is multifactorial in aetiology. This implies that resolution will only be possible by multidisciplinary interventions.

### 6.1.3 Birth Weight.

Table XIV shows the average birth weight among farm workers children to be 2.53 Kg. This is very close to low birth weight defined as less than 2500 grams.

Table XVI shows that 45 (35%) of the study population had a birth weight of less than 2500g. This figure is higher than that found for the South African population as a whole which is 12 % (18) and for the coloured population of Cape Town in general which is 15% (19).

Low birth weight children are especially at risk from birth because low birth weight is associated with negative effects on a child's social and intellectual development. Low birth weight is also a major contributor to the tragic cycle of malnutrition; ill health, impaired mental and physical development, and perpetuated malnutrition. (20).

### 6.1.4 Maternal Weight.

25 (24%) of the 106 mothers were malnourished in terms of Body Mass Index (Table XVI).

The foetus and future child of a malnourished mother is at risk because malnutrition is aggravated in pregnancy by insufficient food compounded by hard physical work. The mother-to-be will be unable to gain enough weight during the nine months of gestation for adequate fetal growth and an adequate energy bank to cope with the needs of child birth, breast feeding and the thousand-and-one demands of looking after a new child. If the malnutrition of the mother is severe and weight gain in pregnancy is minimal, then the quality, quantity and duration of breast feeding can also be affected. (20)

## 6.2 PHYSICAL AND SOCIO-ECONOMIC VARIABLES.

As stated previously morbidity and mortality generally reflect socio-economic factors. For many ill health is the result of a deficiency in basic needs. Hence the following variables, in all probability, have an effect on the nutritional and health status of the people of Philippi.

Knowledge of socio-economic factors also gives insight into the social and physical environment highlighting possible influences which may contribute to the overall plight of the workers as well as support systems which may assist in alleviating some of the problems in the area.

### 6.2.1 Marital status of parents.

Only 21 (20%) of parents were legally married (Table III). In addition 23 (22%) of parents are living apart (Table IV) These figures indicate high levels of family disorganisation. Studies have shown a strong association between malnutrition and family disorganisation (20), the mechanism being lack of mothering and parental support. This mechanism could well play a significant role within the Philippi area. In addition a study of children with chronic malnutrition carried out in Buphuthatswana showed an association between unmarried mothers and malnutrition among their children (22).

### 6.2.2 Parental Education.

Eighty percent of parents are illiterate. (Table 5) This high rate of illiteracy among parents is of concern and is undoubtedly a source of morbidity and distress among the farm working population, for example it has been shown that illiteracy is associated with malnutrition. (23)

### 6.2.3 Occupation of mothers.

Fifty nine percent of mothers work (Table VI) for an average of 10.2 hours per day (Table VIII). The interaction between mother and child has been shown to be crucial for normal development of children (24) as well as the child's nutritional well being (25) (26) (7)

Philippine mothers not only work long hours but they generally do not have care minders to care for their children while they work. This is emphasised by the fact that 17 (30%) of regular farm working mothers (Table VII) have to take their children into the fields with them while they work. Under these conditions children cannot be given the nurturing and care they require to grow normally.

### 6.2.4 Resources.

#### 6.2.4.1 Financial

Table IX indicates that the average family expenditure on food is only R26.77 per week for the whole family. Considering a family of five, having three meals per day, this means that on average R0-36 is spent on food per person per meal. According to standards used by the Department of Health and Population Development as at March 1986, for very low income groups, (27) the amounts shown in Table IX B should be spent on food by family members in order to meet nutritional needs.

Hence a family of 2 parents and 3 children should spend approximately R195 per month on food. This equals R48 per week which is 78% more than the average family in Philippines is able to spend on food. Even taking into account that free vegetables are given to workers it is highly unlikely that the money available for food is sufficient to achieve a normal nutritional state.

#### 6.2.4.2 Wine consumption.

Table X shows that wine consumption among farm workers is high and that the "dop" system is operating in the area. The effect of the "dop" system on the farm workers and their families will not be discussed, neither will other sources by which farm workers obtain alcohol, namely the shebeen, the bottle store, or other illicit sources. This aspect requires a full investigation which is beyond the scope of this study. It must be mentioned however that maternal heavy drinking during pregnancy has severe adverse effects on offspring eg. the foetal alcohol syndrome (26). Studies have also shown associations between moderate alcohol consumption and characteristics such as low birth weight, tremor, poor alertness and mental and motor deficits (28-32). These factors indicate that an urgent investigation into the whole aspect of alcohol consumption among farm workers should be undertaken.

### 6.2.5. Breast feeding.

The rate of breast feeding appears to be excellent, (91% of children were breast fed for an average of 13.4 months see table 11). The advantages of breast feeding are well known and stressed by numerous authors. Breast feeding is protective against malnutrition, infection and has many other beneficial effects. It is far superior to artificial feeding. (33) (34) (35) Human milk provides adequate amounts of protein and energy as well as iron and vitamins to fulfill the needs of the body for 4 to 6 months. It is unwise to start weaning babies before 4 months. (36) Solids should be offered in addition to breast milk at this time. In Philippi most mothers indicated that they introduced solids (usually cereal) to their children at three months. Early and faulty weaning is an important cause of childhood malnutrition. (37) If breast feeding is not exclusive during the first few months the child may simply be taking a comforting suck of the nipple and not really breast feeding. However underprivileged should be encouraged to breast feed for as long a period as possible even 2 years or longer. One third of the infants protein can be obtained during the second year of life as breast milk does not substantially change its composition. Working mothers should be given time off to breast feed their infants. In Philippi the long working hours which the farm worker mothers work (Table VIII) does not allow time for successful breast feeding. Another problem is that a large proportion of mothers are malnourished (Table XVI). This also influences the breast milk adversely (20). Anything which interferes with the intensity, frequency and duration of the child's suckling may diminish the many different kinds of protection which breast feeding provides (33). This will explain the high rates of infection and malnutrition which occur in the area in the face of an apparently high rate of breast feeding.

### 6.2.6 Contraceptive usage.

Family planning appears to be well accepted. (Table XII). Only 6% of women of child bearing age reported never being on family planning. The relatively low number of births (Table XIV) by the 102 mothers amounts to 3.2 children per mother. This is similar to the total fertility rate of 3.54 for the Coloured Group in the total Cape Divisional Council area (38) indicating that the family planning services are functioning adequately in Philippi.

### 6.2.7 Immunisations.

One hundred and twenty one (93%) of the children in the sample had been immunised according to the Cape Divisional Council immunisation schedules (Table XII). This compares favourably with other Western countries and is much higher than in many areas in South Africa (38,39,40).

### 6.3 MORBIDITY AND MORTALITY.

#### 6.3.1 Infections and infestations in Philippi.

The percentage of children in the study group who had measles in the first year of life was 4.6% (Table XV). This was found to be lower than the notification rates of the 'so called' coloured people in Cape Town. (40) Notifications rely on reports from medical officers and is generally lower than the number of cases in the community. Since the cases reported in this study were the result of direct questioning of the mother it is suggested that the measles rate in Philippi is much lower than that in other coloured areas in Cape Town..

This state of affairs in Philippi with regard to measles may in fact be related to the highly motivated local authority clinic which has good contact with the community.

The whooping cough rate of 4.6 % (Table XV) among children in the first year of life is unexpectedly high in view of the good immunisation cover in the area. It may however reflect misreporting by the mothers due to misdiagnosis in the area.

During a recent study of an amoebiasis outbreak in the area it was found on stool examination that 90% of Philippi farm children were infected by intestinal parasites. (41)

Assuming that most cases of infantile diarrhoea are due to infections, Table 15 shows that 40/129 (31%) of the children had diarrhoea of such severity in the first year of life that they had to be admitted to hospital. The incidence of diarrhoea of lesser severity is undoubtedly much higher.

Ten percent of children had tuberculosis in the first year of life (Table XV). This figure is higher than that in other Cape Divisional Council areas (42) and may reflect a high tuberculosis rate among adults and the poor socio-economic conditions which prevail in the area.

The above statistics indicate that there is a high prevalence of infection among the Philippi farm children. During each infective episode the child uses its energy stores to recover from the illness. This is a blow to the child's nutritional status. Each blow of this kind will make the child more vulnerable to another infection. Disease is recognised as one of the three major causes of malnutrition and in many cases of child malnutrition, infection is the prime cause (7). Measles, whooping cough, tuberculosis and especially frequent bouts of diarrhoea, along with fevers, respiratory infections, and internal parasites depress the appetite, consume energy, decrease body weight of the child, and lead to malnutrition.

#### 6.3.2 Child deaths.

Table XIV shows that of the 279 live births which the 109 mothers produced there were 47 child deaths. These occurred at various ages (from 0-6 years) This amounts to 144 child deaths per 1000 births. Although this figure is not directly comparable with conventional mortality rates, such as infant mortality rate which is among the coloured people in the Western Cape it appears to be unacceptably high. It has been established that malnourished children are at risk of death (17). Consequently further investigations into this aspect are urgently required.

#### 6.4 CONCLUSION.

The results of this study show clearly that major problems exist in the Philippi area. The alarmingly high levels of malnutrition among children and mothers is a cause of great concern. This coupled with gross poverty, illiteracy, poor housing and poor environmental conditions paints a very depressing picture but indicates that the poor nutritional status is multifactorial in aetiology.

The high immunisation rate and low measles rate associated with high contraceptive cover shows active local authority service intervention. However in the face of overwhelming environmental conditions they cannot significantly improve the health status of the children or their parents.

In fact a paradox exists in the area where adequate preventive health services are provided for people working on vegetable farms which produce an abundance of food but where high levels of malnutrition prevail.

Conditions of extreme deprivation have existed in Philippi for generations. A poverty cycle has been established in which the people have become used to the poor conditions and accept them as normal. They no longer recognise the problems associated with them.. The extreme deprivation and poverty to which the workers are exposed prevents them from helping themselves.

## 7 RECOMMENDATIONS

Essential for the success of any interventive programme is the co-operation of the farmers. It is important that they recognise the problems as they exist and the benefits which would accrue to them if the lot of the farm worker was substantially improved. It is the author's opinion that if all the farmers of the area worked towards improving the socio-economic conditions of their workers to levels which are acceptable by modern standards, for example those achieved by wine farmers in the Constantia area and certain farms in the Stellenbosch area (43), the majority of the health and social problems revealed in this study would be resolved.

In addition it must be remembered that ordinary people with simple information can prevent and treat most common health problems in their own homes. Hence basic health care must be encouraged rather than delivered. The positive aspects of health care cannot be imposed on people without their personal involvement. However steps must be taken to provide the facilities with which the people can help themselves.

### 7.1 APPROACH TO ALLEVIATING MALNUTRITION IN THE PHILIPPI AREA USING A COMBINED PRIMARY, SECONDARY AND TERTIARY INTERVENTIVE APPROACH

It is suggested that a combined primary secondary and tertiary interventive approach be adopted (44).

#### 7.1.1. Primary level intervention.

This involves the provision of:  
money in the form of adequate salaries/wages which are necessary to alleviate poverty.  
education.  
housing.  
water.  
transport  
health services using the GOBIFFF approach (ie.growth monitoring, oral rehydration, breast feeding, immunisations, female education, family spacing, and food supplementation).  
This approach is currently used by the C.D.C. in Philippi. Children are routinely weighed and immunised all children, and issued with Road to Health cards. Health Education is given to mothers attending clinics and to mothers on the farms during mobile clinic visits.

##### 7.1.1.1 Alleviation of poverty.

Section 6.2.4.1 showed that only R26.77 was available for food per family per week. This amounted to R0.36 per person per meal. These figures indicate that the wages of the workers are inadequate and must be increased if the workers and their children are to become normally nourished. This obviously relies on the co-operation of the farmers.

### 7.1.1.2 Food supplementation.

#### i) Pregnant Woman.

It has been established that a major factor contributing to low birth weight was the mothers own malnutrition. (20) As a general rule, a total supplement 10,000 calories for a severely malnourished pregnant woman during the last three months can increase her babies weight by 50g. An average of 600 calories per day could for those three months lead to an increase in birth weight of 300g. A 300g increase in birth weight would do much to decrease the high proportion of low birth weight infants (28%) in the area.

In the light of the above, it is recommended that a food supplement programme directed towards malnourished women should be developed in the area. There should be community involvement in collaboration with the health authorities. Simple surveillance can involve portable weighing scales carried on mobile clinics and weight gain cards kept by the mother-to-be in her own home. Once pregnant women at risk have been identified, the supplementary foods should be found cheaply and based as much as possible on local production in order to minimise dependence. If such food supplements are actually to be eaten by the women who need them, then education about the importance of diet in pregnancy and lactation will be necessary not just for the woman themselves but for the whole community.

The distribution of iron and folic acid tablets can also help to counteract specific nutrient deficiencies. But the most important task is to help create a new recognition among families and communities that pregnancy and infancy are vital and vulnerable times and deserve priority in the allocation of food which is available.

If food supplements for woman at risk can be extended to the period of lactation, the protection which breast feeding affords can be extended further across the child's life.

#### ii) Malnourished Children.

The Cape Divisional Council has, since October 1986, provided milk powder for malnourished children at cost price. However considerable difficulty has been experienced in implementing the scheme because some farmers are not co-operative. Fortunately there are farmers who co-operate with the Health authorities and assist with the distribution of subsidised milk powder. Until all farmers in the area work towards improving the living and working conditions of their workers, Philippi will remain an area of great deprivation.

### 7.1.1.3 Providing more education.

The low levels of adult education (table V) are disturbing and perhaps under the circumstances existing in the area little can be done to significantly improve the situation. However the possibility of some form of extramural adult education should be investigated. Every effort however should be made to educate the children of the area.

All children must be sent to school and methods must be developed to ensure that truancy is kept to a minimum. The adequacy of the schools in the area should be investigated and if necessary resources provided so that each child is provided with education to meet his needs. Educational authorities must be involved in this aspect of the community development. Transport problems will have to be addressed to facilitate the transport of children to school.

Mothers must be given health education covering such areas as nutrition and budget, family planning, oral rehydration, treatment of minor ailments, etc. Although this is presently provided by health workers in the area it is not given frequently enough and to all mothers. It is important to gain the co-operation of the farmers and their families particularly their wives if all farm worker mothers are to be reached.

Nutrition education for the families with at-risk women can play a vital role in protecting health and growth during the weaning months. The weaning food itself should be based on foods which are easily available and easy to make-preferably food from the family pot including, wherever possible, peas, beans, green leafy vegetables, cereals, fruit, groundnuts, yoghurt and milk.

#### 7.1.1.4 Home Gardens.

Farmers should be encouraged to provide workers with small areas of land where they can produce nutritional crops to supplement their food supplies. The introduction of a scheme similar to Valley Trust (45) which has had considerable success in improving the nutritional status of severely malnourished children should be investigated.

#### 7.1.1.5 Township development.

One of the difficulties of coping with the many health problems of the area relates to the large area of Philippi and the fact that farm workers are spread over a large area. This is aggravated by the lack of personal and public transport (Table VII). In order to provide workers with adequate facilities (environmental, housing, educational, creches, child care and health) on each farm would be costly and many farmers are perhaps reluctant to outlay the required capital.

Maughn-Brown (46) suggests that in view of the difficulties outlined above, the Philippi farm workers should be provided with a township consisting of good housing, sanitation, electricity, piped water, creche facilities and other normal community facilities of the 1980's

This would relieve farmers of many of their responsibilities, provided the problems of low salaries and long working hours were addressed.

Farmers should be involved in the development and financing of such a venture. In return they would have a healthy, motivated, easily accessible workforce without the persistent, seemingly insoluble, indefensible problems associated with human suffering which they have at present.

## 7.1.2 Secondary level intervention.

### 7.1.2.1 Detection and treatment of malnourished children.

Malnutrition can be detected by growth monitoring (section 2.1). Growth monitoring is carried out routinely by the Cape Divisional Council nursing staff but unfortunately due to limited resources when malnourished children are detected, there is little that can be done at present to supplement the meagre resources of farm workers and their children. Treatment should however be along the following lines.

#### 7.1.2.1.1 Treatment of moderate malnutrition.

This would involve food supplements for moderately malnourished children and regular monthly follow up of patients coupled with health education, social work intervention where necessary and assistance in nutritional problems.

#### 7.1.2.1.2 Severe malnutrition.

A nutritional rehabilitation unit to admit severely malnourished children and their mothers should be established (47) in order to improve the nutritional status of the child and to educate the mother in the basics of nutrition, hygiene and home economics. Such a unit could be established at the local Regional hospital (Victoria Hospital), which presently admits severely malnourished children. Input could be given from the Regional Office of the Department of Health and Population Development which could provide the nutritional education, advice and follow-up required.

#### 7.1.2.1.3 Treatment of acute diarrhoea.

The high rate of severe diarrhoea (table XV) is a serious problem in Philippi because diarrhoea is the deadliest killer of small children in the world (45). In addition it is a major cause of malnutrition. One of the problems associated with diarrhoea is associated with the tendency of mothers to withhold food during an episode of diarrhoea or the child's disinclination to eat. In addition the diarrhoea reduces the absorption of nutrients from the food that is eaten.

Cases can be cured by the early administration of oral rehydration solution costing only a few cents and administered promptly by mouth. The recipe for oral rehydration solution is very simple and can easily be taught by health educators.

The adequate administration of oral rehydration solution halts the immediate effects of the loss of water and salt from the body. To counteract the protein energy malnutrition which may follow the episode of diarrhoea, the mother must encourage her child to eat. In the case of a baby, she must breast feed more, not less. Fortunately the child is capable of gaining weight up to several times the normal rate in the convalescent period.

Simply by doubling the normal calorie intake with a relatively moderate protein intake maximum growth rates will be achieved. A full recovery will then only take one to two days for each day of illness.

The question arises, can the poor families in the Philippi area afford more food for their sick children? The answer at present is no (section 6.3.4.1). Until wages are increased, the Philippi farm workers will remain disadvantaged and at risk of repeated episodes of disease.

Although the Philippi health staff offers health education which covers oral rehydration therapy, an evaluative study should be undertaken to measure the knowledge of mothers in this regard. If found lacking, efforts to improve the situation will have far reaching beneficial effects.

Most cases of diarrhoea are due to infection which in its turn can lead malnutrition. The vicious synergism of malnutrition and infection must be resisted with an equally determined and powerful synergism of services. Both the infection and the malnourishment must be addressed so that each intervention enhances the impact of the other.

### 7.1.3 Tertiary level intervention.

This would involve the rehabilitation of acute and chronically malnourished children of all grades of severity. Once detected and treated, ongoing surveillance of the patient and his environment should be undertaken by health officials, farmers, farm workers and community leaders. Treatment should be provided by the nutritional rehabilitation centre (7.1.2.1.2), the Local Authority and the local branch of the Child Welfare Society, (which is presently very active in the area). Where possible the causes of malnourishment must be determined and addressed. Measures similar to those outlined under secondary intervention are necessary and be seen to be implemented. A very important requirement is the co-operation and support of farmers as well as the involvement and co-operation of farm workers and their families.

### 7.1.4. A MULTIDISCIPLINARY APPROACH.

This study has shown that the aetiology of malnutrition in Philippi is multifaceted and complex. Any successful intervention must involve a co-ordinated multidisciplinary approach involving educators, engineers, health professionals, among others, with "community involvement" and the active presence of both labourers and farmers.

### 7.2 SUMMARY OF RECOMENDATIONS.

A combined primary, secondary and tertiary interventive programme should be adopted using a multidisciplinary approach with active community involvement.

At the primary level, farmers should be encouraged, as a matter of urgency, to increase salaries/wages so that at least R48-00 per week is available per family of five for food. Food supplements should be given to high risk groups such as pregnant women and malnourished children. This programme should be implemented immediately. A surveillance programme should be developed, as soon as possible, in order to detect and monitor these high risk groups.

Farmers should be encouraged to provide workers with small areas of land so that home gardens can be developed.

The educational facilities in the area should be upgraded immediately so that education is provided to all children in the area. Pre-school educational and day care facilities should be made available and accessible as soon as possible to farm workers children. Adult education should be made available to parents and should cover such subjects as nutrition, hygiene and oral rehydration therapy.

Housing should be improved and the feasibility of developing a township for workers with good environmental facilities should be investigated.

At the secondary care level, malnourished children should be looked for and detected by a regular growth monitoring programme. Moderately malnourished children should be treated by food supplementation and regular follow up. Severely malnourished children should be treated at a nutritional rehabilitation unit. The feasibility of developing such a unit at Victoria hospital should be investigated.

Acute infantile diarrhoea should be treated by oral rehydration therapy. An intensive educational programme directed at the mothers of farm worker children should be developed as a matter of urgency. Acute infections should be actively treated by C.D.C. staff or referred to the local hospitals as necessary.

At the tertiary care level, malnourished children should be actively followed up by the multidisciplinary team.

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TABULATED RESULTS OF THE STUDY.

TABLE I-X REFLECT DEMOGRAPHIC AND SOCIO-ECONOMIC DATA.

TABLE XI - XIII SHOW SOME ASPECTS OF PROMOTIVE HEALTH CARE

TABLE XIV-XVI PRESENT INFORMATION CONCERNING MORBIDITY, MORTALITY  
AND NUTRITIONAL STATUS DATA.

TABLE 1. POPULATION OF COLOURED FARM WORKERS IN PHILIPPI (1984)

	NO.
MALES	572
FEMALES	656
CHILDREN (<15 YRS)	770

---

 1998

=====

TABLE II DESCRIPTIVE VARIABLES.

NUMBER OF VEGETABLE FARMS IN THE AREA	49		
NUMBER OF VEGETABLE FARMS IN THE STUDY	21 (43%)		
AVERAGE FAMILY SIZE ( MEAN AND MODE )	5		
		MALES	FEMALES
NUMBER OF CHILDREN AGED 0-6 YEARS IN THE SAMPLE:	65	64	129
NUMBER OF PARENTS IN THE SAMPLE (INCLUDES			
PARENTS WHO ARE SEPARATED).	106	106	212
AVERAGE AGE OF PARENTS (YEARS)	27.8	31.8.	

TABLE III. MARITAL STATUS OF PARENTS.

	NUMBER	PERCENTAGE.
LEGALLY MARRIED	21	20
COMMON LAW	49	46
UNMARRIED	36	34
	----	----
	106	100
	====	====

TABLE IV. FAMILY DISRUPTION.

	NUMBER	PERCENTAGE.
LIVING TOGETHER	83	78
LIVING APART	23	22
	----	----
	106	100
	====	====

TABLE V. EDUCATIONAL STANDARD OF PARENTS.

LEVEL	NO. OF FATHERS.	PERCENTAGE %.	NO. OF MOTHERS.	PERCENTAGE %
NIL	61	57	41	38
SUB A-STD 3	23	22	45	43
STD 4 +	22	21	100	19
	-----		-----	
	106		106	
	=====		=====	

PARENTS WITH LESS THAN STD. 4:

FATHERS = 84

MOTHERS = 86

-----

170

=====

HENCE % ILLITERATE = 170 X 100

-----

212

= 80%

=====

TABLE VI OCCUPATION OF MOTHERS.

	NUMBER	PERCENTAGE
REGULAR FARM WORKERS	63	59
SQUATTERS (I.E. NOT FARM WORKERS)	8	8
HOUSEWIVES	34	32
UNSURE	1	1
	-----	-----
	106	100
	=====	=====

TABLE VII COMMUNITY FACILITIES.

NUMBER OF CRECHES	NIL
PUBLIC TRANSPORT	NIL
MOTHERS WHO TAKE CHILDREN INTO FIELDS WHEN WORKING	19 (N=63).
NUMBER OF FAMILIES WITH OWN TRANSPORT	2
(1 CAR AND 1 BICYCLE).	

TABLE VIII WORKING HOURS AND WAGES.

	FATHER	MOTHER
MEAN WEEKLY WAGE	R32.68	R21.43
MEAN LENGTH OF WORKING DAY	11.9 HRS	10.2 HRS
WAGE PER HOUR	RO.55	RO.44
MEAN FAMILY INCOME PER WEEK	R54.00	
MEAN LENGTH OF SERVICE	7.3 YRS	5.3 YRS

TABLE IX

A) MEAN WEEKLY EXPENDITURE OF FAMILIES.

AMOUNT SPENT ON FOOD	R26.77
AMOUNT SPENT ON ALCOHOL	3.03
AMOUNT SPENT ON CIGARETTES	1.93
RENT	0.00 (GENERALLY FREE)

SOME WORKERS ARE ALLOWED TO TAKE VEGETABLES FREE OF CHARGE.  
CONSIDERING A FAMILY OF 5 HAVING 3 MEALS PER DAY THE AVERAGE AMOUNT  
SPENT PER PERSON PER MEAL IS RO.36.

B) ESTIMATED MINIMUM AMOUNT WHICH SHOULD BE SPENT ON FOOD .

( see section 6.2.4.1)

ADULT MALE	R50-00	PER MONTH
ADULT FEMALE	R45-00	PER MONTH (R55-00 IF LACTATING)
CHILDREN (1-3 YRS)	R30-00	PER MONTH
ESTIMATED MINIMUM EXPENDITURE FOR A FAMILY OF 5 = R195 PER MONTH.		

TABLE X WINE CONSUMPTION.

	Father n=62		Mother n=37	
	total	dop.	total	dop
Mean weekly consumption of drinking parents	8.3 l	6.1 l	5.5 l	4.4 l

TABLE X1 BREAST FEEDING (THOSE WHO PUT THE CHILD TO THE BREAST REGARDLESS OF DURATION OR QUALITY OF FEEDING)..

	Number	%
NO. OF CHILDREN BREAST FED	118	91.5
NO. OF CHILDREN NOT BREAST FED	11	8.5
	-----	-----
	129	100
	=====	=====
Average duration of breast feeding		13.4 months
Range		5 weeks to 23 months
Average age at which solids were introduced		3 months

TABLE XII CONTRACEPTIVE USE

	Number	Percent
Mothers using contraceptives at present	64	61
Mothers " " in past	35	33
Mothers who never used contraceptives	7	6
	-----	-----
	106	100
	=====	=====

TABLE XIII IMMUNISATION COVER

SAMPLE SIZE ( AGE 1 YEAR OR MORE)	=129	
COMPLETED BCG,POLIO,DWT, SCHEDULE 0-6YR. AGE GROUP WERE IMMUNISED..	=121	(93% OF CHILDREN IN THE
COMPLETED MEASLES IMMUNISATION 0-6YR. AGE GROUP WERE IMMUNISED.	=121	(93% OF CHILDREN IN THE

TABLE XIV BIRTHS AND DEATHS OF CHILDREN BORN TO MOTHERS IN SAMPLE.  
(N=106 ) NOVEMBER 1979 TO 1986).

Number of live births (presently living + child deaths)	279
Number of children per mother	2.6
Average birth weight	2.53 kg
No of children with birth weights less than 2.5kg	45 (36%)
Number of child deaths	47
Number of deaths within the first year of life	(34)
All deaths occurred before the 5th birthday	

TABLE XV DISEASES IN THE FIRST YEAR OF LIFE. (N=129).

	No of children affected.	%.
Measles	6	4.6
Whooping cough	4	4.6
Tuberculosis	13	10.0
Serere diarrhoea	40	31.0

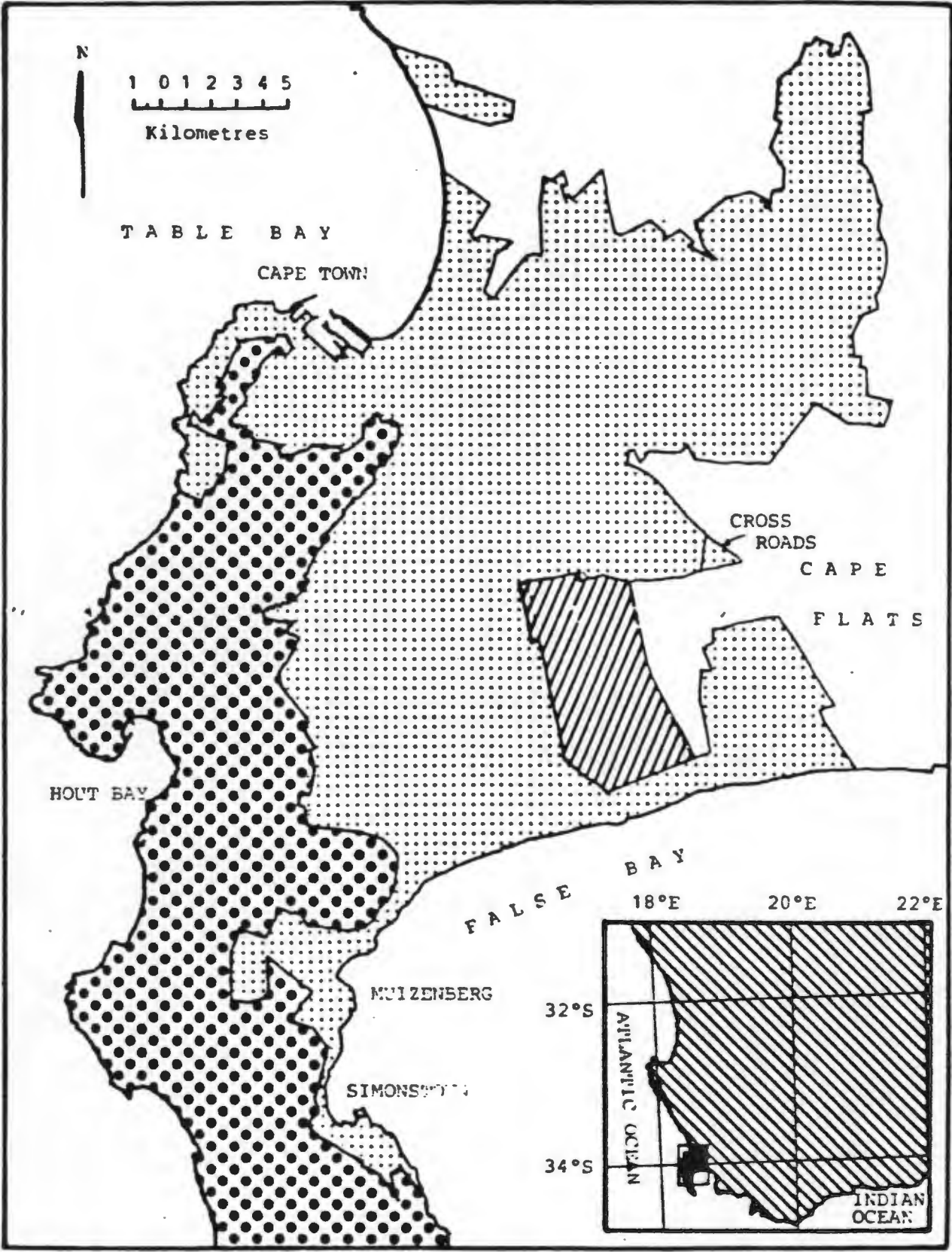
TABLE XVI MATERNAL AND CHILD WEIGHTS.




Number of mothers (n=106) with a body mass index of less than 20 = 25 (24%)

<u>CLASSIFICATION OF CHILDREN.</u>	<u>Tot.</u>	<u>No.&lt;5th.</u>	<u>% &lt; 5th.</u>
<u>1 WEIGHT FOR AGE</u>			
All	129	62	48
Mothers are housewives	56	22	39
Mothers are farm workers	74	35	47
Mothers are drinkers	24	11	46
Had serere diarrhoea in first year	41	19	46
Had birth weight less than 2.5 kg	45	23	51
Had mothers with < Std.4 education	101	53	52
Had mothers with > Std.4 education	28	9	32
=====			
<u>2 WEIGHT FOR HEIGHT</u>			
All children	122	68	56
=====			

APPENDIX

**FIG. 1** LOCATION OF THE PHILIPPI FARMING AREA



 METROPOLITAN AREA       STUDY AREA       MOUNTAIN AREAS

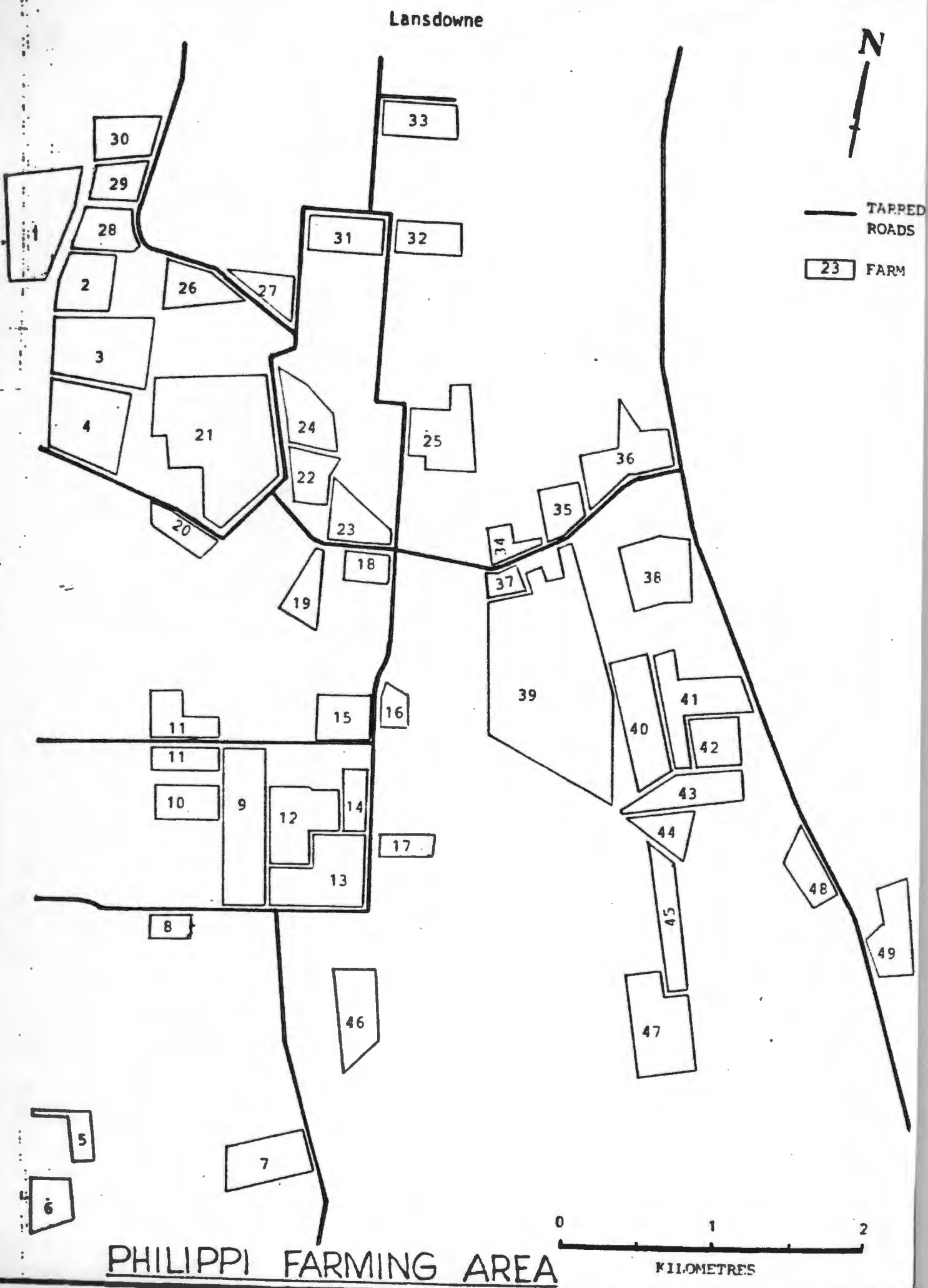


FIGURE 3 BOYS WEIGHT FOR AGE (0-2 YEARS).

N: 39

NATIONAL CENTER FOR HEALTH STATISTICS

Figure IV. Weight by age percentiles for boys aged birth-36 months.

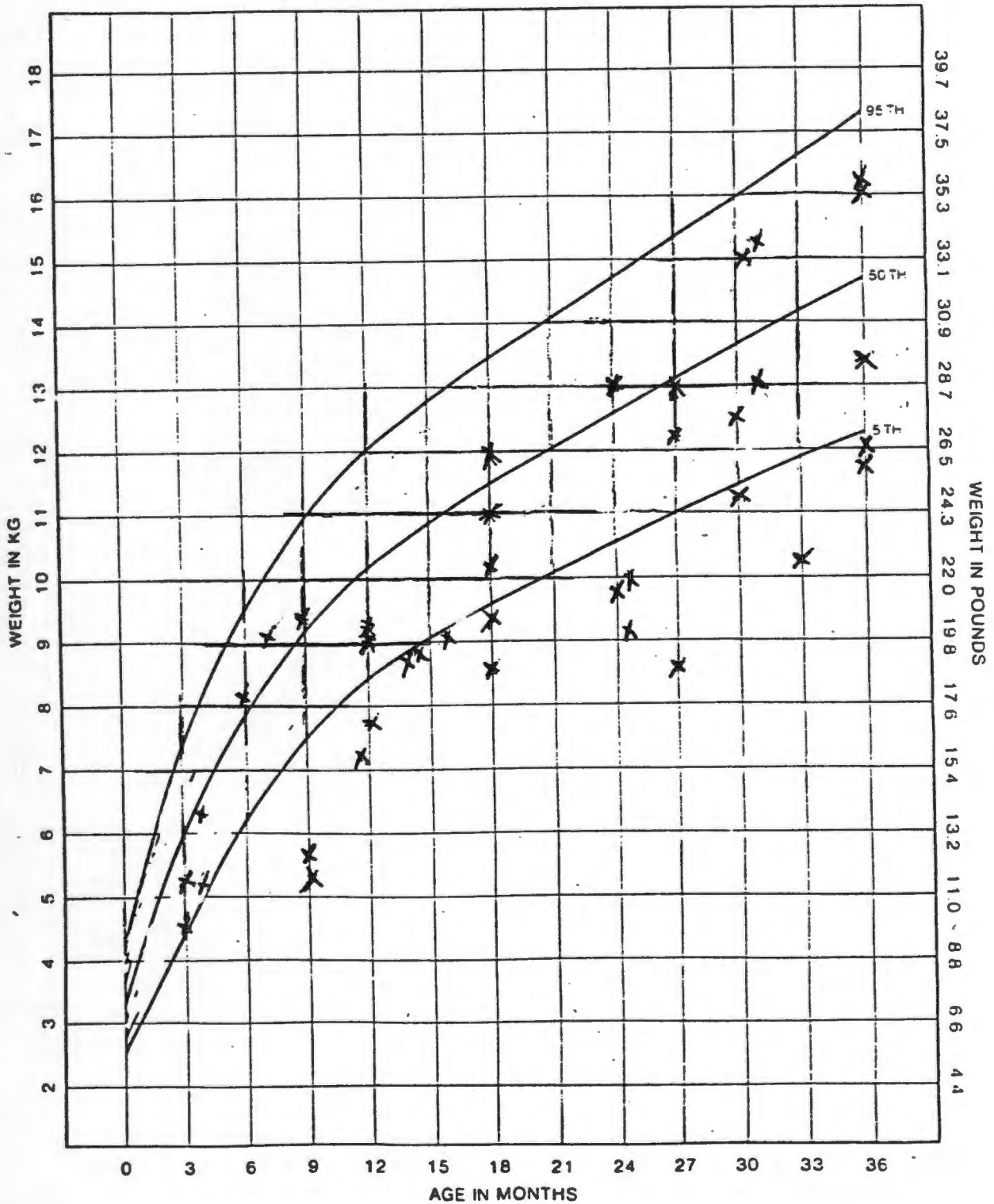


FIGURE 4 BOYS WEIGHT FOR AGE (3-6 YEARS).

N = 26

NATIONAL CENTER FOR HEALTH STATISTICS

Weight by age percentiles for boys aged 2 to 18 years.

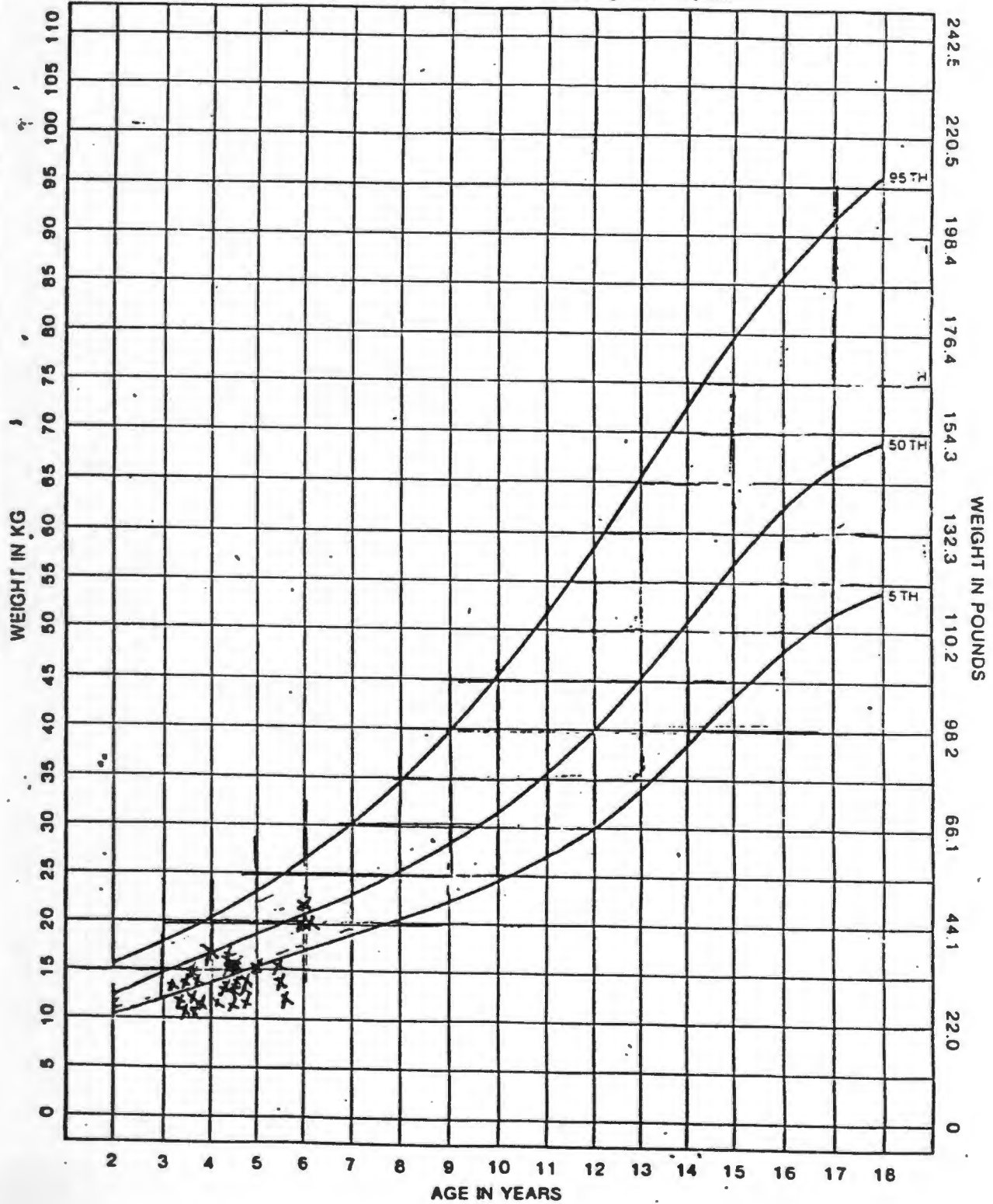


FIGURE 5 GIRLS WEIGHT FOR AGE (0-2 YEARS). N = 30

NATIONAL CENTER FOR HEALTH STATISTICS

Weight by age percentiles for girls aged birth-36 months.

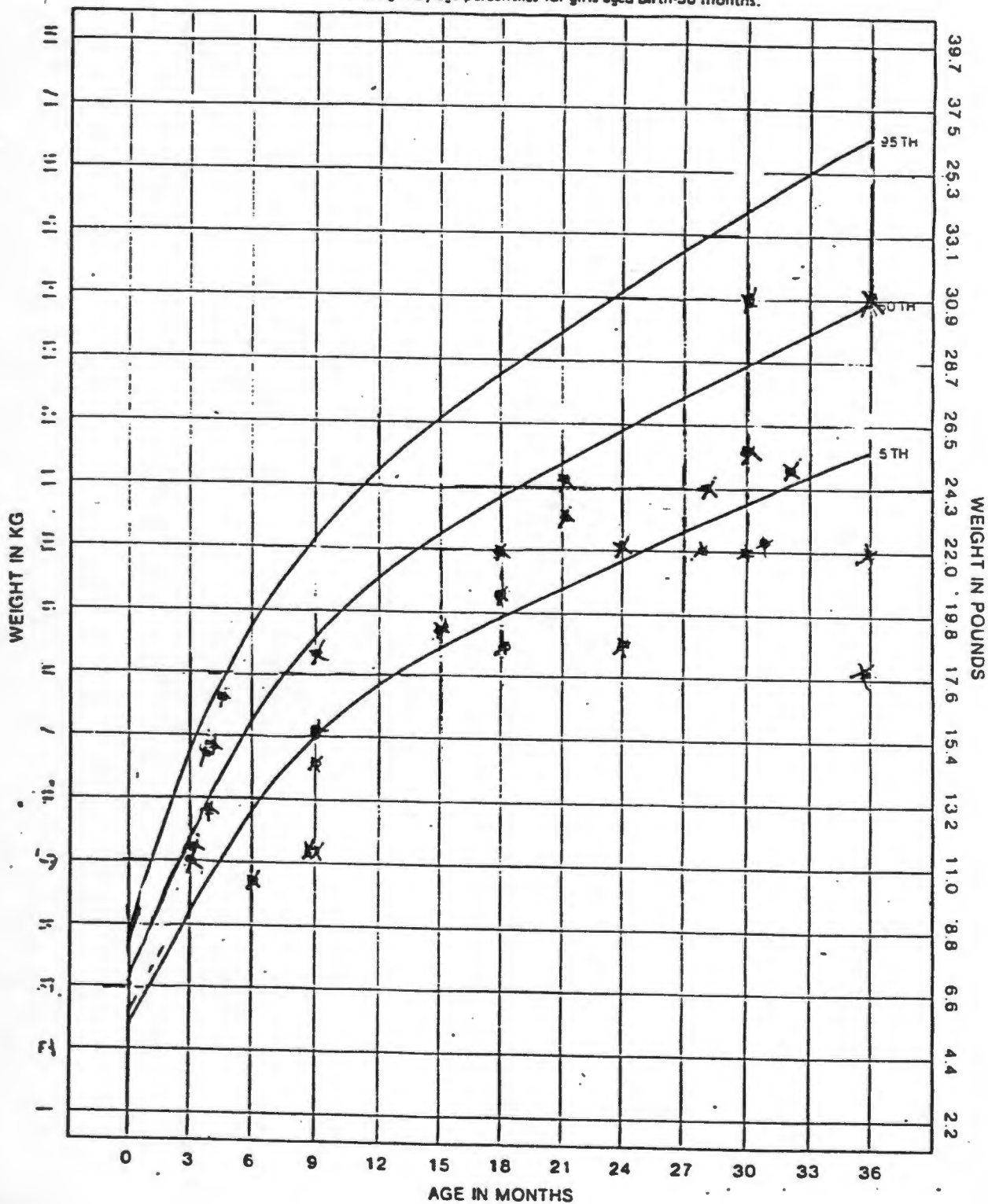


FIGURE 6 GIRLS WEIGHT FOR AGE 3-6 YEARS. N = 34

NATIONAL CENTER FOR HEALTH STATISTICS

Weight by age percentiles for girls aged 2 to 18 years.

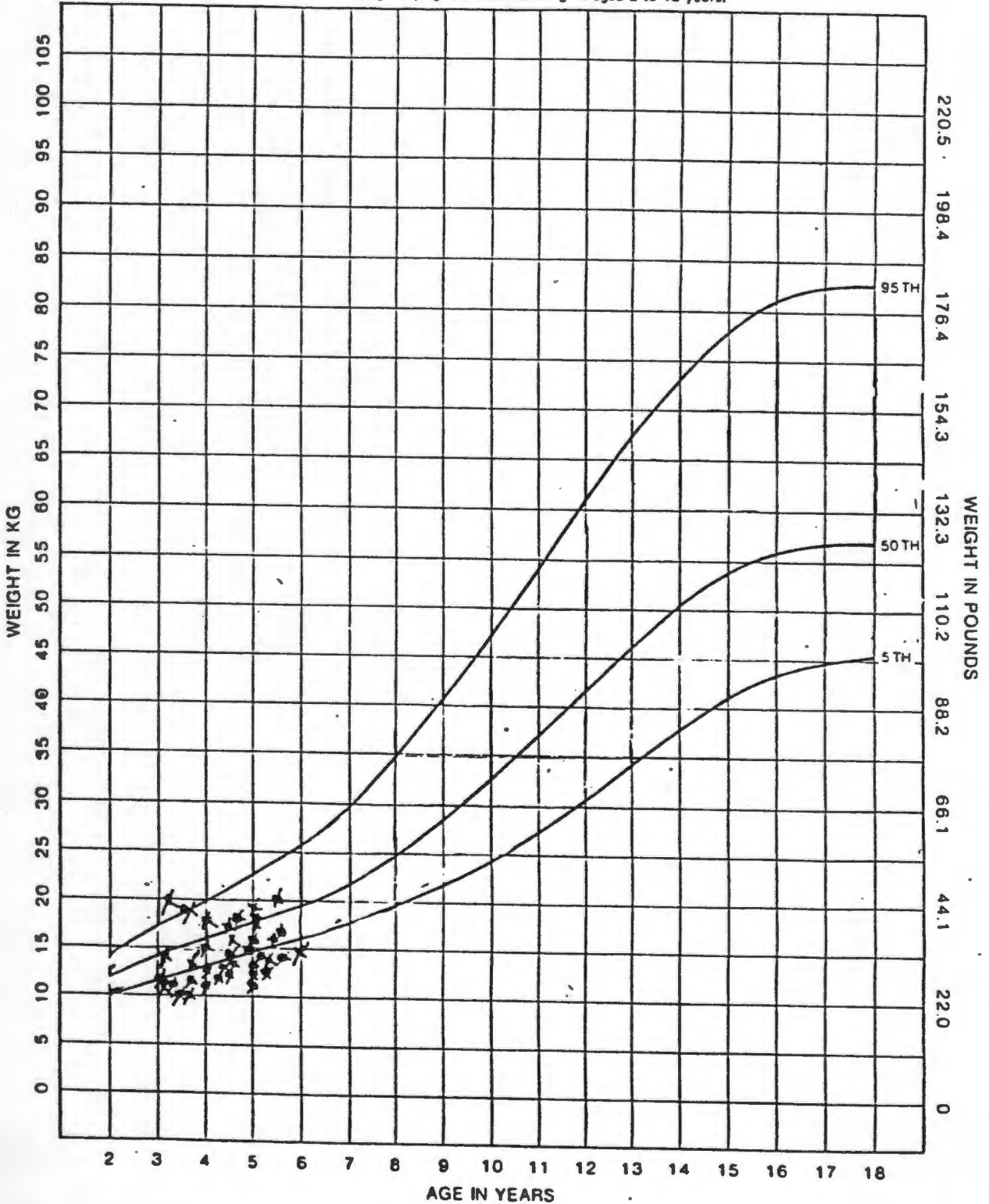


FIGURE 7 BOYS LENGTH FOR AGE (0-2 YEARS).

N = 39

NATIONAL CENTER FOR HEALTH STATISTICS

Length by age percentiles for boys aged birth-36 months.

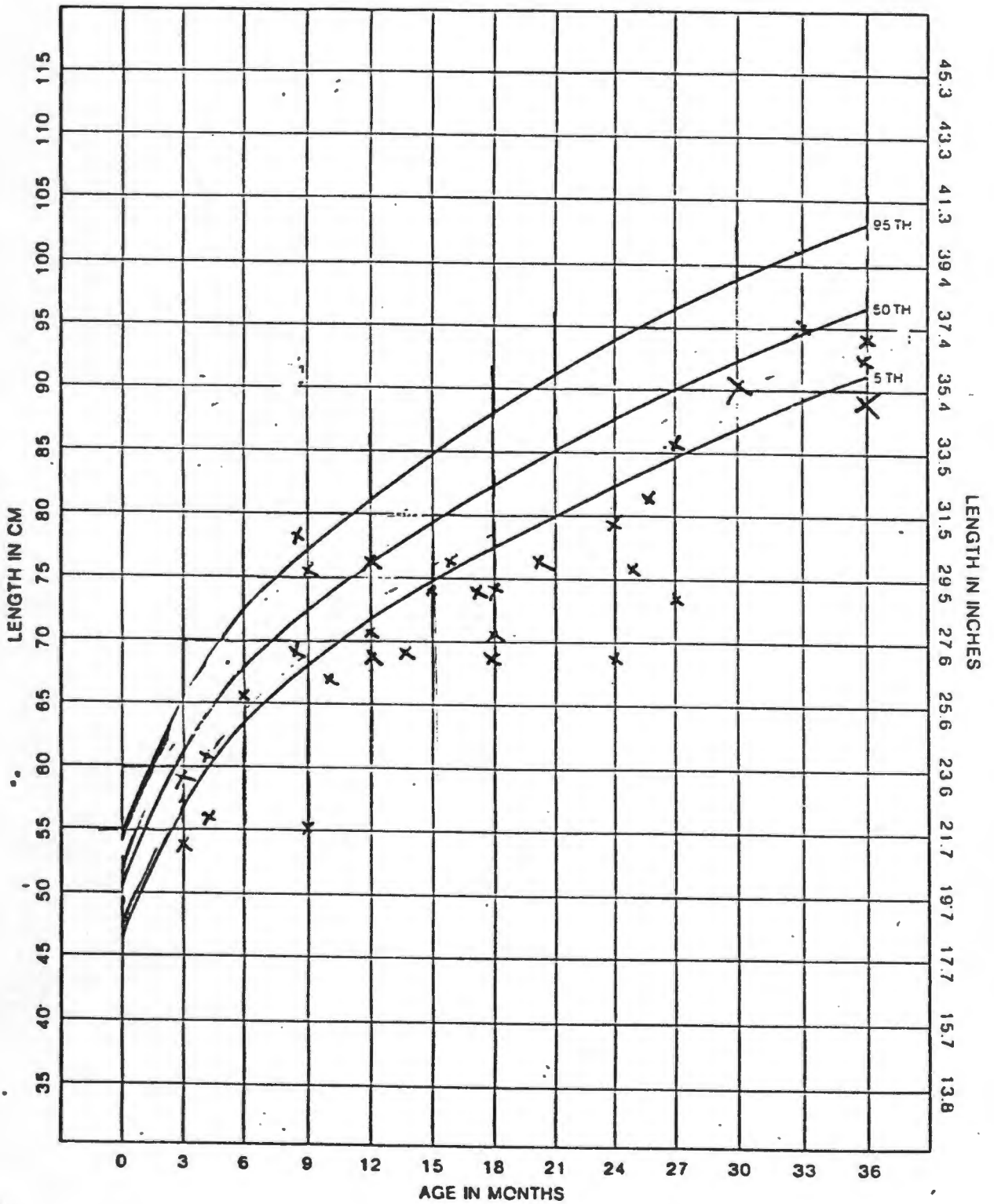
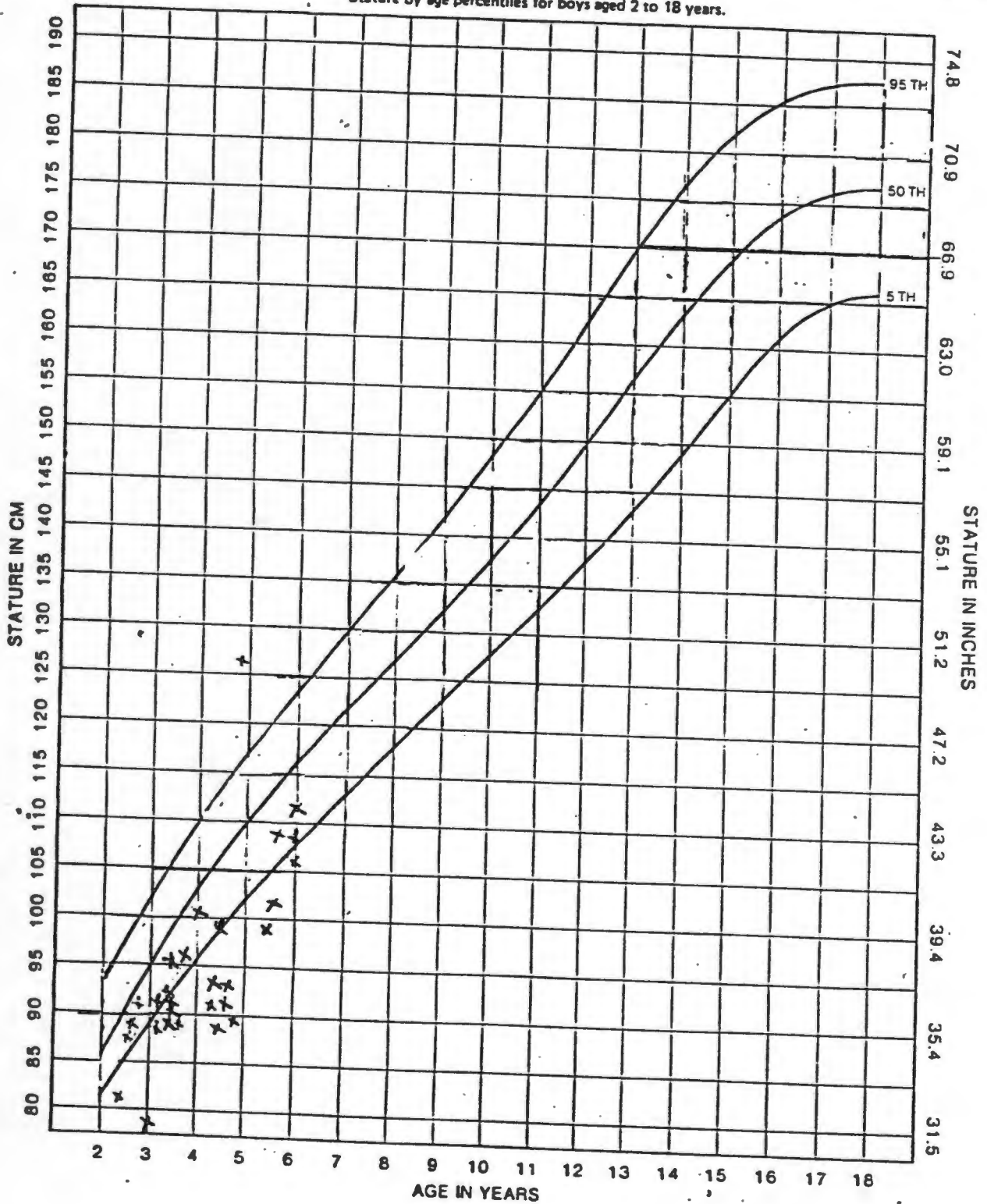


FIGURE 8 BOYS LENGTH FOR AGE (2-6 YEARS). N = 26

NATIONAL CENTER FOR HEALTH STATISTICS

Stature by age percentiles for boys aged 2 to 18 years.



**FIGURE 9 GIRLS LENGTH FOR AGE (0-2 YEARS).** N = 30

NATIONAL CENTER FOR HEALTH STATISTICS

Length by age percentiles for girls aged birth-36 months.

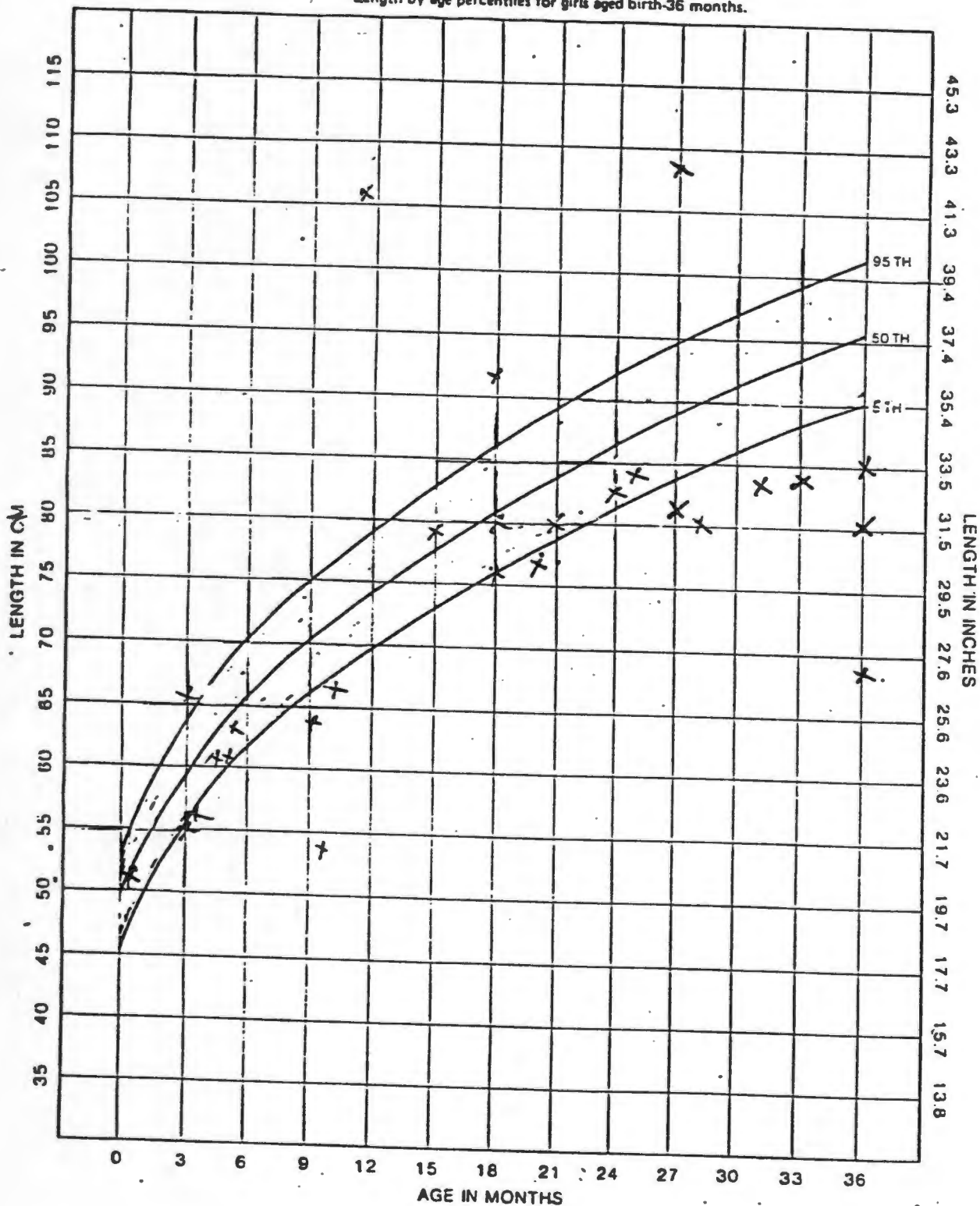
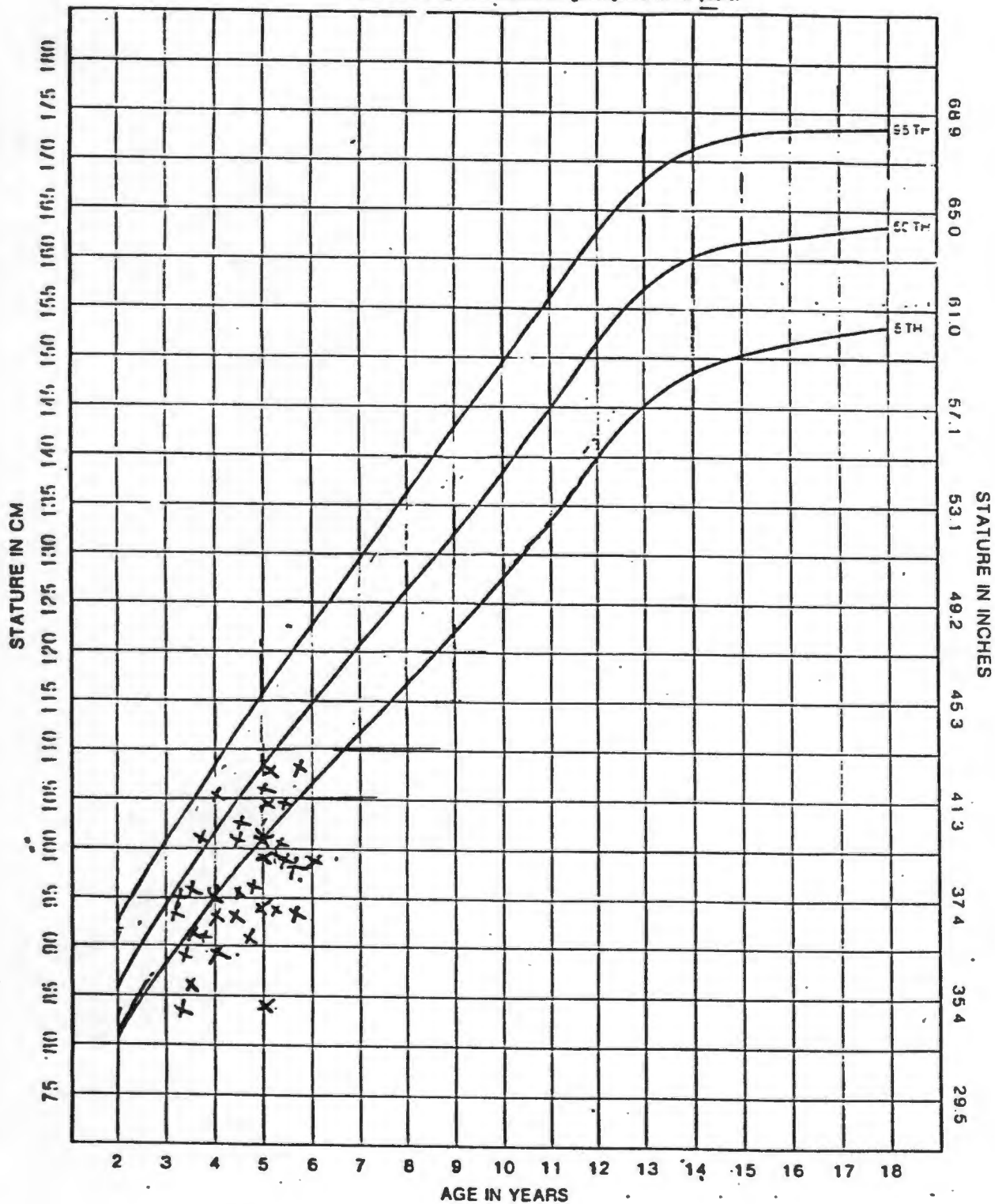


FIGURE 10 GIRLS FOR AGE (3-6 YEARS). N = 34

NATIONAL CENTER FOR HEALTH STATISTICS

Stature by age percentiles for girls aged 2 to 18 years.



HOUSEHOLD FACTORS PERTAINING TO CHILDREN AGED 0-5 YRS. IN PHILIPPI.  
QUESTIONNAIRE FOR PARENTS/GUARDIANS/CARETAKERS OF CHILDREN AGED 0-5  
YEARS.

FARM NAME.....NO..... DATE.....

FARMERS NAME.....HOUSEHOLD NO.....

FORM NO.....

	FATHER	MOTHER
SURNAME	.....	.....
FIRST NAME	.....	.....
DATE OF BIRTH	.....	.....
AGE IN YEARS	.....	.....
FATHER LIVES IN SAME HOUSE ( Y/N )	.....	.....
STATUS (tick appropriate space):		
REGULAR FARM WORKER	.....	.....
SEASONAL WORKER	.....	.....
SQUATTER	.....	.....
OCCUPATION	.....	.....
WORKING HOURS	.....	.....
DAYS USUALLY WORKED/WEEK	.....	.....
HOW LONG IN PRESENT JOB	.....	.....
<u>HOUSEHOLD INCOME ( H.I. ) : ( IF MOTHER A BOARDER GIVE TOTAL H.I. ) .</u>		
MOTHERS WAGES/WEEK		R.....
FATHERS EARNINGS	R.....CONTR. TO H. I	R.....
GRANTS eg.maintenance,disability		R.....
PENSIONS		R.....
CONTR.OTHER H.HOLD MEMBERS(spec).....		R.....
OTHER INCOME (spec).....		R.....
INCOME FROM CHILDREN (name & age ).....		R.....
TOTAL HOUSEHOLD INCOME/WEEK		R.....

\*\*\*\*\*

PAGE 2

EXPENDITURE (IF MOTHER A BOARDER GIVE TOTAL H.HOLD EXPENDITURE):

RENT/WEEK R.....  
 AMT. SPENT ON FOOD/WEEK R.....  
 AMT. SPENT ON ALC/WEEK R.....  
 AMT. SPENT ON CIGS/WEEK R.....  
 OTHER EXPENSES 1FUEL.....R.....  
 2.....R.....  
 3.....R.....  
 TOTAL EXPENSES/WEEK.....R.....

=====

FREE FOOD OBTAINED/WK.Y/N .....

VALUE R.....

SPECIFY .....

EDUCATION: FATHER ..... MOTHER .....

ALC.CONSUMED/WEEK:	WINE		SPIRITS		BEER	
	FATHER	MOTHER	FATHER	MOTHER	FATHER	MOTHER
SHEBEEN	.....	.....	.....	.....	.....	.....
SHOP	.....	.....	.....	.....	.....	.....
DOP	.....	.....	.....	.....	.....	.....

CIGS.SMOKED/WEEK MOTHER.....FATHER.....

TOBACCO SMOKED PER WEEK (BAGS 250g) MOTHER.....FATHER.....

HOW MARRIED? (tick) LEGALLY.....COMMON LAW (>5YRS).....UNMARRIED ...

RELATIONSHIP BREAKUP: IN PAST (>6MTHS).....(Y/N) PRESENT.....(Y/N)

MATERNAL WEIGHT .....KG. HEIGHT.....CM.

NO.OF CHILDREN IN HOUSE :OWN..... OTHERS.....

NO.OF PEOPLE IN HOUSE.....CHILDREN 6-16.....CHILDREN AT SCHOOL....

NO.OF LIVE BIRTHS .....NO.CHILD DEATHS.....AGE AT DTH.....

PAGE 3.

FAMILY PLANNING (PAST.....(Y/N)      PRESENT.....Y/N)  
 PREG NOW Y/N.....OTHERS IN HOUSE PREGNANT NOW Y/N.....  
 WHO ?.....(RELATIONSHIP).AGE.....  
 OWN TRANSPORT Y/N.....DISTANCE TO TRANSPORT.....KM.

SECTION B. DISEASE PROFILE OF FAMILY AFFECTING CHILDRENS WELLBEING.

i      DISEASES IN ANY HOUSEHOLD MEMBER

	NAME	RELATION	WHEN Dx	Rx. STARTED
ii)	TUBERCULOSIS	.....	.....	.....
	.....	.....	.....	.....
	.....	.....	.....	.....
	.....	.....	.....	.....
ii)	OTHER DISEASES	.....	.....	.....
	.....	.....	.....	.....
	.....	.....	.....	.....
	.....	.....	.....	.....
ii	PHYSICAL HANDICAP (must have:			
	a) DISABILITY GRANT	.....	.....	.....
	b) OR BE HOUSEBOUND)	.....	.....	.....
iii	MENTAL HANDICAP ( must have:			
	a) REG.MED.TREATMENT)	.....	.....	.....

page 4/.

PAGE 4

## 2. CHILDREN FORM(S) (ONLY CHILDREN 0-5 YEARS).

FARM NAME.....

FARMER NAME.....

FARM NO.....

DATE.....

CHILDREN (IN BIRTH ORDER):

A

B

C

SURNAME	.....	.....	.....
FIRST NAME	.....	.....	.....
D.O.B.	.....	.....	.....
AGE	.....	.....	.....
SEX	.....	.....	.....
BIRTH WT.	.....	.....	.....
PHYS. HANDICAP (Y/N)	.....	.....	.....
SPECIFY	.....	.....	.....
MENTAL HANDICAP (Y/N)	.....	.....	.....
SPECIFY	.....	.....	.....
BREAST FED (Y/N)	.....	.....	.....
HOW LONG ? (MTHS.)	.....	.....	.....
BOTTLE FED (Y/N)	.....	.....	.....
WHEN INTRODUCED	.....	.....	.....
INTRO. OF SOLIDS (AGE)	.....	.....	.....
TYPE	.....	.....	.....
<u>DISEASES IN FIRST YEAR ( Y/N ) :</u>			
MEASLES	.....	.....	.....
WHOOPING COUGH	.....	.....	.....
SEVER DIAR (ADMIS)	.....	.....	.....
T.B.	.....	.....	.....
MALNUTRITION (spec)	.....	.....	.....
<u>CURRENT DISEASE ( Y/N )</u>			
DIAR. >24 HRS. LST. 2 WKS.	.....	.....	.....
OTHER (spec.)	.....	.....	.....

PAGE 5.

	A	B	C
<b>LOC. OF CHILD WHEN M. WORKING:</b>			
<b>(FIELDS OR CARETAKER)</b>			
A) IN GOOD WEATHER	.....	.....	.....
IN BAD WEATHER	.....	.....	.....
CARETAKER IF M. NOT AVAIL.....	.....	.....	.....
<b>IMMUNISATIONS:</b>			
BCG 1 (DATE)	.....	.....	.....
2	.....	.....	.....
POLIO 1	.....	.....	.....
2	.....	.....	.....
3	.....	.....	.....
DTP. 1	.....	.....	.....
2	.....	.....	.....
3	.....	.....	.....
BOOSTER 1	.....	.....	.....
2	.....	.....	.....
MEASLES 1	.....	.....	.....
2	.....	.....	.....
UP TO DATE RTH CARD.....	.....	.....	.....
<b>(2X&lt;3YRS. 3X&lt;2YRS)</b>			

PAGE 6.

SECTION B MEDICAL EXAMINATION.

WEIGHT(kg &amp; centile).....

LINE U.//.D. ....

HEIGHT .....

HAS THE CURVE BEEN CONSISTANTLY UNDER THE THIRD CENTILE...

AT APR.2 YRS.WAS THEIR A SUDDEN DROP IN WT.OVER MONTHS.....

DOES THE CHILD HAVE:

MISERABLE EXPRESSION Y/N..... OLD MANS FACE.....

HAIR CHANGES ..... NORMAL HAIR .....

THIN MUSCLES WITH FAT ..... THIN MUSCLES NO FAT.....

SKIN CHANGES ..... (SPECIFY.....)

OEDEMA .....

UNDER WEIGHT ..... VERY UNDERWEIGHT .....

BCG SCAR (Y/N) .....

APR.M.STONES (Y/N) .....

SPECIFY .....

HEARING NORMAL ? .....

SIGHT NORMAL ? .....

CXR NORNAL (IF APL).....