MEASURING CHANGE IN NUTRITIONAL STATUS

Guidelines for Assessing the Nutritional Impact of Supplementary Feeding Programmes for Vulnerable Groups

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Contents

Preface

An unpublished document entitled "Measurement of Nutritional Impact" was issued by the World Health Organization in 1979 (document FAP/79.1) for field use in connexion with supplementary feeding programmes, particularly those supported by the World Food Programme. In view of the interest aroused by that document, it has been decided to revise it in the light of experience gained in many countries and to publish it for a wider audience.

The present, revised text was prepared by the following WHO staff members: Dr G. J. Lavoipierre (Food Aid Programmes), Dr W. Keller (Nutrition), Mr H. Dixon (Health Statistical Methodology), and Dr J.-P. Dustin (Food Aid Programmes); Mr G. ten Dam (Tuberculosis and Respiratory Infections) assisted in the preparation of Annex 2.

1. Objectives

The purpose of supplementary feeding programmes is to improve the nutritional status of vulnerable population groups. It has not always been possible, however, to measure as intensively and objectively as would have been desirable the impact of such programmes on the nutritional status of recipient groups. This state of affairs is not surprising if one considers that the budgetary and staff resources available in these programmes (whether national or international) are in general too limited for an adequate collection and analysis of the requisite data. Furthermore, the assessment of nutritional status is not always an easy undertaking.

In the preparation of these guidelines, therefore, the following considerations have constantly been borne in mind: the operational feasibility of the methods suggested in view of the limited resources already mentioned, and the selection of the minimum number of simple measurements which would allow evaluators to detect a positive change in the nutritional status of recipient populations.

Essentially, these guidelines have two objectives:

— to assist countries receiving food aid in identifying the presence and/or absence of nutritional changes in selected population groups benefiting from food supplements (infants, preschool children, and primary-school children); and

— to permit recipient countries to modify, as necessary, the scope and organization of supplementary feeding programmes based on the measurements carried out in pursuit of the first objective.

Even where generally accepted methods of assessment exist, they have to be adapted to the requirements and possibilities of the case in hand. The evaluation of feeding programmes needs an approach which differs from procedures that may be considered adequate for surveys of varying sizes and for varying purposes.

The methods suggested in these guidelines therefore have a very specific and limited purpose, which is that of verifying that the anticipated nutritional impact of food supplementation has actually taken place.

2. Population groups to whom the proposed methodology is applicable

The proposed methodology is aimed exclusively at programmes whose objective is to provide supplementary food to vulnerable groups *to improve their nutritional status.* Other kinds of assistance (e.g., food for work and food for emergency relief), which do not require to achieve the same specified nutritional impact, are not included.

Essentially, four categories of recipients of supplementary food are dealt with in this publication:

(1) Infants under 1 year of age.

(2) Children aged 1 to under 2 years.

(3) Preschool children aged 2 to under 6 years.

(4) Primary-school children aged 6–10 years.

Although there may be primary-school children whose age is above 10 years, it is advisable to exclude them from the evaluation, because anthropometric changes associated with puberty might bias the results. The methodology proposed below is not concerned with any other recipients or group of recipients.

It should be noted that pregnant and lactating women have also been excluded, because there are still some uncertainties about the best method to be utilized to evaluate their nutritional status using anthropometric indicators. Among the difficulties faced by evaluators in interpreting anthropometric data collected from pregnant and lactating women, the following three are the most pertinent:

(1) During pregnancy, weight gain is influenced by factors other than food intake and nutrition. In some ethnic groups, for example, women are well looked after during pregnancy and lactation and get extra food.

(2) During lactation, there are large individual variations in the amounts of milk produced and in the speed with which milk production declines. It may be impossible in practice to assess the metabolic stress of milk production or even the end of lactation.

(3) In many societies, only a small proportion of mothers breast-feed their children for more than 3 months after birth.

In the absence of a comparable control group of pregnant and lactating women, interpretation of anthropometric data would therefore be in the nature of guesswork.

3. Selection of measurements

The most important nutritional problem in the world today is that of protein-energy malnutrition (PEM) (*1*); it is also the deficiency which, in general, supplementary feeding is intended to correct. For this reason it is suggested that the following three measurements should be chosen to evaluate the presence or absence of nutritional impact in programmes aimed at feeding the vulnerable groups listed above in section 2:

— age,
— weight, and
— height: length supine for children aged less than 2 years
height standing for children aged 2 years or more.

(The change from measuring supine length to measuring standing height is made at 2 years because at that age children are generally able to stand up.)

These three measurements are combined to form three indicators of nutritional status:

— weight for age,
— weight for height, and
— height for age.

These indicators are compared with those obtained from an international reference population. The recommended data for this purpose are those collected by the United States National Center for Health Statistics (*2, 3*).

In addition to allowing for an evaluation of nutritional impact, the comparison would enable national medical authorities to diagnose the problem of malnutrition in an epidemiological sense (prior to requesting assistance for supplementary feeding); moreover, it would permit screening procedures to select within each age category individual children in need of food supplementation.

4. Methods of taking measurements

4.1 Age

Where there is general registration of births and where ages are generally known, the recording of age is a straightforward procedure, with age measured to the nearest month or year as the case may be. For example, an infant whose date of birth is 13 July 1981 could be recorded as being 6 months old if seen between 13 December 1981 and 12 January 1982 (both dates inclusive); similarly, a child born on 13 July 1975 could be recorded as 6 years old if seen between 13 July 1981 and 12 July 1982 (both dates inclusive). However, in order to reduce errors made by hasty calculations in the field, it is advisable to record both the date of birth and the date of examination and to calculate the age at a central station.

Where the date of birth is not recorded or such recording is irregular, two alternatives ought to be considered:

Alternative A — the child is under 2 years of age and the cultural pattern in the country is such that mothers usually recall the date on which they gave birth. In this case, by questioning the mother it should be possible to establish the month of the year in which the child was born and the age should be recorded to the nearest month. Example: the mother recalls that her baby was born in March 1980 and the child is seen on 13 January 1982. The date of birth is recorded as March 1980 and the age of the child is calculated to be 21 months.

Alternative B — irrespective of the age of the child, mothers find it difficult to remember the date on which they gave birth. In this case the age of the child is estimated by the investigator and the month and year of birth are entered on the record with the specification that the information is a clinical estimate.

4.2 Weight

Two types of measuring instrument are suggested:

- *For children below 6 years:* a Salter spring balance (Model 235 PBW) with the scale measuring up to a maximum of 25 kg with increments of 100 g. With this type of balance the child hangs in a specially designed "bag". The model is sturdy, compact and easily transported.
- *For children aged 6–10 years:* a bathroom scale on which the child is made to stand. The apparatus usually reads to a maximum of 100 kg with increments of 100 g.

In both age groups the readings are taken to the nearest 100 g.

4.3 Height

For older children—2 years and above—a vertical measuring rod can be employed. After removing the shoes the subject should stand on a flat surface by the scale with feet parallel and

with heels, buttocks, shoulders and back of head touching the upright. The head should be held comfortably erect, with the lower border of the orbit of the eye in the same horizontal plane as the external canal of the ear. The arms should be hanging loosely at the sides. The headpiece of the measuring device, which can be a metal bar or a wooden block, is gently lowered, crushing the hair and making contact with the top of the head. The presence of unusually thick hair requires to be taken into account. The measuring scale should be 175 cm high and capable of measuring to an accuracy of 0.1 cm.

For infants and children under 2 years of age, recumbent length (crown-heel length) has to be measured, since the measurement of standing height is either impossible or very inaccurate with an uncooperative child. This is usually carried out with a wooden length-board. An example is the baby length measurer designed by the Appropriate Health Resources and Technologies Action Group, Ltd. (AHRTAG) (Fig. 1).

The infant is laid on the board, which is itself on a flat surface. The head is positioned firmly against the fixed headboard, with the eyes looking vertically. The knees are extended, usually by firm pressure applied by an assistant, and the feet are flexed at right angles to the lower legs. The upright sliding footpiece is moved to obtain firm contact with the heels and the length read to the nearest 0.1 cm.

4.4 Standardization

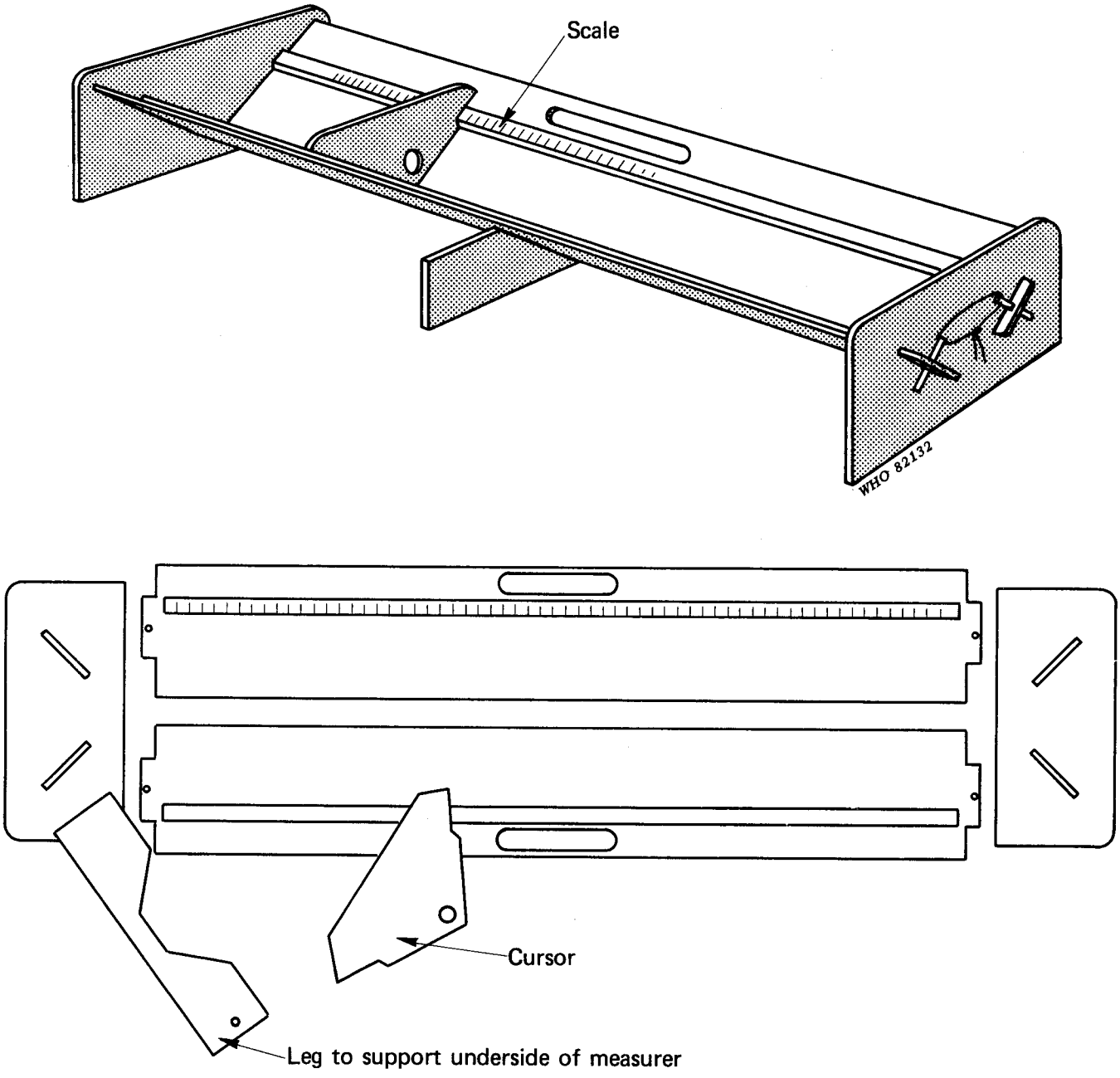
Height and weight are probably the two simplest measurements than can be taken to assess the nutritional status of a population. Like all measurements, however, they are subject to bias and errors in recording if they are not properly standardized. Four steps should be taken to obtain good standardized records:

- train the health personnel in the proper methods of using the measuring apparatus and scales;
- adjust the scales regularly before each measuring session;
- check for observer error; and
- whenever possible, rotate field workers among groups of subjects to be measured so as to reduce the effect of individual bias.

Scale adjustment of a spring balance (Salter type 235) is easily done by bringing the scale needle back to the exact zero mark using the side screw provided for this purpose. A similar adjusting device exists on bathroom scales. Accuracy should be checked before each measuring session (especially if the scale is used by a mobile team and subjected to rough handling in transport) by comparing the scale reading with a known weight (e.g., a 20-litre plastic container filled to the brim with water, which will weigh 20 kg).

The verification of observer error has been well described by Habicht ((*4*); see also Annex 1). The procedure is meant to determine how closely the measurements of height and weight taken by untrained observers approximate to the values of an accepted standard, and where the errors are being made so that they can be eliminated or at least minimized. It should always be utilized when staff are trained in the recording of height and weight measurements.

Fig. 1. Baby length measurer*



* Designed by the Appropriate Health Resources and Technologies Action Group, Ltd. (AHRTAG) for the World Health Organization.

5. Data collection and sampling

5.1 Frequency of measurements

Ideally, a series of 4 measurements per annum should be taken; however, in many projects this may constitute too heavy a work-load. Moreover, supplementary feeding programmes are, in general, organized for a period of 3 years, which is often extended for a further 2–3 years. In projects of long duration 6-monthly cycles of data collection are adequate. If care is taken to allow for seasonal variations in food supply, nutrient requirements or disease patterns, which can completely invalidate comparisons, the intervals between cycles are still sufficiently short to detect in time any unexpected behaviour in any particular group of children and to introduce corrective operational measures when necessary.

In a 3-year programme, a total of 7 measurements per group would thus be taken: the first at the beginning of the project and the remaining 6 at 6-monthly intervals thereafter.

5.2 Collection of data

It should be borne in mind that in most programmes aimed at feeding vulnerable groups, the food is distributed through health centres or through community centres. In the latter, personnel are not usually trained to measure children, and even in health centres anthropometric data are not always collected at maternal and child health clinics, especially in countries that are given priority for food aid or other types of supplementary feeding.

In the vast majority of cases and until further development has taken place, it is therefore reasonable to assume that anthropometric measurements for the evaluation of the nutritional impact of supplementary feeding programmes will, of necessity, have to be obtained by specially trained personnel through field surveys specifically designed for this purpose. In fact, in drafting relevant project summaries and plans of operation a limited financial provision should be made to help governments in organizing adequate data collection that will allow a periodic evaluation of the nutritional impact of the programme.

When a supplementary feeding programme is organized exclusively through a network of health centres where the required anthropometric data are routinely collected, the problem of evaluating nutritional impact becomes essentially one of organizing the data flow and its statistical processing. In those rare instances, one would sample records rather than individuals in order to proceed with the analysis of data as outlined in section 6.

5.3 Sampling design

Whether we consider individuals or records of individuals, it is not only wasteful but also unnecessary to process and analyse measurements collected from the total population covered by, for instance, a food aid scheme; a sample can provide all the information needed, with the required degree of precision, on condition that it is truly representative of the population concerned.

In theory, the simplest scheme would be to list all members of a vulnerable group receiving food supplements and then choose the required number by making use of a table of random numbers. Such "simple random sampling" would, in the case of actual supplementary feeding programmes, be costly and impracticable, particularly because the supplements are generally provided to two or more members of the same family.

The most feasible approach would be to use a multistage sampling procedure, as follows. The total population assisted by the project is first subdivided into a number of administrative subdivisions (e.g., districts or subdistricts) from which a random sample is drawn. These first-stage sampling units are further subdivided into small administrative divisions (e.g., villages and/or hamlets) from which another sample is selected at random. Finally, in each of the sampled villages or hamlets, all individuals within a family for which rations have been supplied are measured. After measurement, individuals in the sample are classified by age as described in section 6.2. This regrouping is recommended because of the wide variations of height and weight existing, for example, between 12- and 72-month-old beneficiaries. Consequently, the total number of families sampled should be such as to provide enough individuals in each age group for statistically sound conclusions to be reached.

There may be instances in which a particular programme is limited to a single large administrative subdivision (e.g., a province or a district). In such a case, the sampling should be limited to villages and to families which will constitute the ultimate sampling units.

This scheme is simply indicative. Sometimes it might be preferable to sample clusters of the population (i.e., households) direct, irrespective of their geographical location, either because the country is too small, or because the population receiving food supplements is too limited in numbers or considered to be too homogeneous to merit stratification.

In order to arrive at a realistic estimate of sample size, the proportion of malnourished children one expects to observe and the degree of change expected to result from the programme have to be defined. This may be done in the following manner:

- Reduction (specify level) in the proportion of newborn children weighing less than a specified weight (range 2200–2500 g).
- Reduction (specify level) in the number of children (specify age category or height class) falling below 2 standard deviation scores (or any specified figure) of the median weight for height of an international reference population.
- Reduction (specify level) in the proportion of children (specify age category or height class) belonging to the first *n* deciles (specify) of a weight-for-height distribution established by comparison with an international reference population.
- Reduction (specify level) in the proportion of children (specify age category) belonging to the first *n* deciles (specify) of a weight-for-age distribution established by comparison with an international reference population.

It is clear that the specific level of reduction will vary from one programme to another depending on a variety of factors, such as severity and prevalence of malnutrition, target population, and resources available. It should be equally clear that the above list is not exhaustive.

In any case it is recommended that expert statistical advice on sampling should be sought before an evaluation scheme is embarked on. For cases where such advice is not readily available, an attempt has been made in Annex 2 to provide the user of these guidelines with some essential information that will help him to organize the requisite sampling of the population in a satisfactory manner.

5.4 Control group

Ideally, a design for measuring impact should include a control group from a population living under identical conditions but not receiving supplementary food. A comparison of changes in

the programme population with those in a control group would indicate whether an observed improvement in nutritional status is in fact a result of the programme or whether it is due to changes unrelated to the programme. In many cases, however, to obtain a control group meeting these specifications would mean deliberately to exclude from the feeding programme a part of the needy population—a decision that would be unacceptable on ethical grounds. Even without a control group, an evaluation can still be carried out against precisely stated objectives and targets (see section 5.3). Additional information on socioeconomic change and on delivery of the programme may then be desirable to confirm the causal link to the programme.

5.5 Cross-sectional versus longitudinal studies

In organizing the collection of data to measure the nutritional impact of supplementary feeding programmes it could be argued, from a statistical standpoint, that the repeated measurement of the same individual—and therefore the selection of a longitudinal approach in the collection of data—has a distinct advantage. In longitudinal studies, for a given sample size, the precision of the estimated change between successive measurements of a nutritional indicator is greater; conversely, a smaller sample size would allow the same precision in estimating this change to be obtained as the one that would be derived by a cross-sectional study. Furthermore, longitudinal studies may allow one to verify exactly what modifications of the nutritional indicators occurred in the interval between two measurements, for each individual selected in the sample.

Unfortunately, these advantages are counterbalanced by the difficulties and constraints listed below:

(1) In general, smaller samples are examined in longitudinal studies because of the higher cost per individual examined as a result of:
- the need to collect more data on identification (e.g., information on parents, household, and place of residence);
- logistic reasons (time lost in contacting individuals, the need to maintain a register of the sampled individuals and to keep a record for each individual, recall visits, etc.); and
- the usual practice of having a more complex battery of measurements.

(2) Individuals must be precisely identified so that they can be traced back at each successive examination and the collected data interpreted correctly.

(3) Losses on the original sample are inevitable for a variety of reasons (e.g., death, change of residence or absence for any reason).

(4) The method of data analysis is more complex than is the case with simpler repeated cross-sectional examinations if one wants to benefit fully from the advantages of the longitudinal approach (e.g., linking changes in height and weight to other variables—school absenteeism, health history, sharing of rations, etc.—that also affect the nutritional indicators).

(5) The advantage gained by the smaller sample size that may be used in longitudinal studies is often offset by the need to have a sample large enough to be representative of the population benefiting from the feeding programme.

Consequently, in deciding which of the two types of study should be chosen to conduct the evaluation of nutritional impact, the more precise—but more complex—longitudinal method will have to be assessed under local conditions and in the light of available resources (money, staff, transport, etc.) and its merits weighed against the relative simplicity of repeated cross-sectional measurements.

Another important factor in determining the choice between the two types of study is the purpose of the evaluation. If the main interest lies in the public health impact of food supplementation on the target population as a whole (as is the case in supplementary feeding programmes) then the simpler and less costly cross-sectional survey method is well suited to the purpose of the evaluation; if, on the other hand, the aim is to conduct an "experiment" to assess the impact on children's growth of some specific combination of foods distributed, for example, via school meals, it might well be that the longitudinal type of follow-up would be the most suitable method.

In collecting data to evaluate the nutritional impact of supplementary feeding programmes, it is clear that the matter of cost is a predominant factor. In longitudinal studies, usually the repeated examination of the same sample of individuals cannot be conducted with the same ease, in the same amount of time and with the same resources as are needed for repeated cross-sectional examinations of different samples; therefore this latter approach is recommended.

6. Data analysis and interpretation

6.1 Choice of indicators

The recommended method of data analysis is based on the premise that programmes aimed at providing supplementary food to vulnerable groups as a rule combine the following three broad objectives:

(1) to correct or relieve an existing state of malnutrition in a population group;

(2) to prevent malnutrition in newborn children and infants through the feeding of women during pregnancy and lactation; and

(3) to prevent malnutrition in pregnant and lactating women.

As indicated earlier, protein-energy malnutrition (PEM) is, to all intents and purposes, the main type of malnutrition which food supplements are intended to correct or prevent. Two kinds of PEM can be considered: (*a*) acute malnutrition (or emaciation); and (*b*) chronic malnutrition (or stunting). The analysis should therefore include comparisons of the following three indicators:

— weight for age,
— height for age, and
— weight for height.

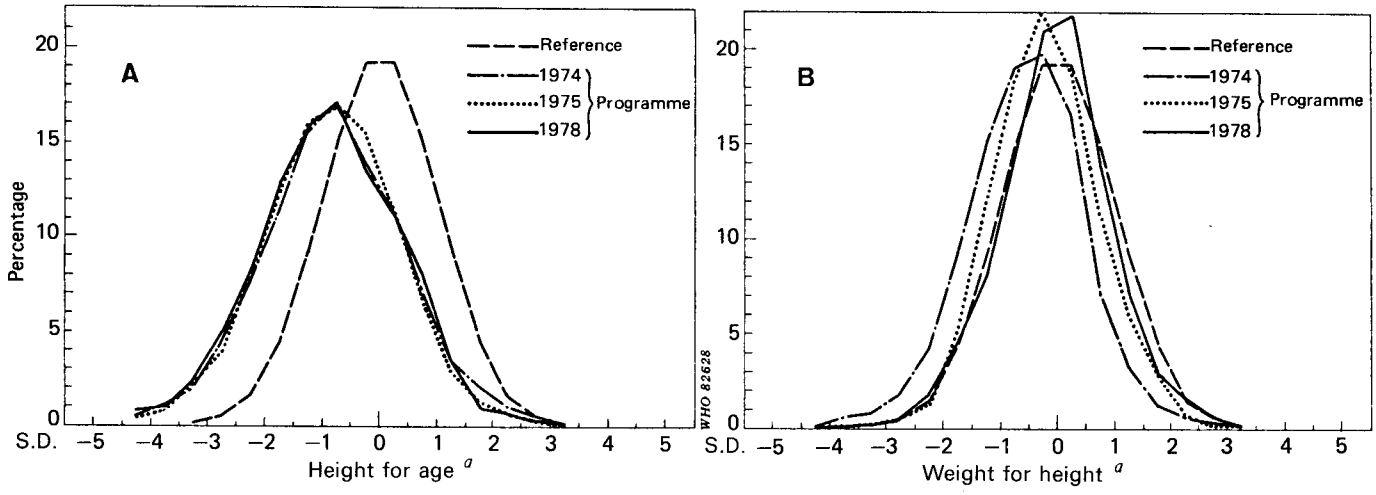
The need to measure at least three indicators is illustrated by the graphs in Fig. 2, which were constructed from cross-sectional data collected between 1974 and 1978 from a child population participating in a food aid programme. It can be seen that, whereas the distribution of height for age (curve A) showed no change between the three successive measurements of 1974, 1975 and 1978, the distribution of weight for height (curve B) showed a definite improvement between the 1974 and the 1978 data, with the latter being almost identical to that of the reference population.

6.2 Data processing

Where age is registered (or has been estimated on a clinical basis) it is suggested that a total of 7 age classes (or groups) should be considered for the presentation of anthropometric data. These would be:

Newborn children, infants and preschool children	0–< 6 months 6–< 12 months 12–< 24 months 24–< 48 months 48–< 72 months
Primary-school children	72–< 96 months 96–<120 months

Fig. 2. Frequency distribution of two nutritional indicators within a child population aged 0–35 months*



* Source: United Nations, General Assembly Document A/34/463, 17 September 1979.

a Sample sizes varied between 2500 and 3500 individuals.

If the project is not concerned with the feeding of primary-school children the last two groups need not be considered.

Where age is not routinely recorded, and no birth certificate is available, it is still possible to consider the first 3 groups (0–< 6 months, 6–< 12 months, 12–< 24 months) on the assumption that the date of delivery can be remembered with enough accuracy by the mother.

In processing the data, weight-for-height values should first be calculated and then analysed by arranging them into the 7 age classes given above.

Where age (registered or clinically estimated) is not available, calculated weight-for-height values should be grouped using height classes as an alternative. This will put the data into categories which are an approximation of age groupings and allow the identification of groups at risk or with special problems that otherwise would be masked by pooling all the data. The following 7 classes are suggested:

Height	< 65 cm (< 6 months)[1]
"	65–79.9 cm (6 to < 12 months)
"	80–94.9 cm (12 to < 24 months)
"	95–109.9 cm (24 to < 48 months)
"	110–124.9 cm (48 to < 72 months)
"	125–139.9 cm (72 to < 96 months)
"	≧ 140 cm (96 to < 120 months)

In the event that anthropometric data are routinely collected at centres where food is distributed, it may not be necessary to include all centres in the sample. The total number of records sampled should be such that the number of individuals included in each age group corresponds to the minimum sample size calculated (see Annex 2, page 48).

[1] Figures in parentheses give corresponding age groupings.

6.3 Data analysis

It is advisable to carry out two main types of analysis. In each case the data are compared with the distribution of the indicators in a reference population of well-nourished healthy children (preferably the reference population established by the United States National Center for Health Statistics). Tables of the distribution of the indicators in this reference population have been prepared by WHO (see Annex 3) and their use is described by Waterlow et al. (*2*). The analyses that should be carried out for the three indicators of nutritional status mentioned in section 6.1 are:

— the determination of the percentage of children in the sample with indicators at low levels as compared with the reference children; and
— the comparison of the distribution of the indicators within the sampled population with that of the reference population.

In addition, comparisons should be made between the findings of two successive surveys for each of these two analyses—i.e.:

— compare the percentage of children with indicators at low levels (in relation to the reference population) in survey A with that in survey B.
— compare the distribution of indicators (in relation to the reference population) in survey A with that in survey B).

(Examples of these analyses and of the presentations discussed in sections 6.3.1 and 6.3.2 below are given in Annex 1.)

6.3.1 *Proportion of children with indicators at low levels*

To determine these proportions, cut-off points have to be chosen beyond which the indicators (weight for age, height for age, and weight for height) are considered to be "low" or "not low". This choice is an arbitrary one which can vary from one programme to another. A suitable cut-off may be, for instance, the tenth centile of the weight distribution of the reference population at a certain age (i.e., the weight below which 10% of the reference children at that age are found); or it may be a weight which is one or two standard deviations (or any suitable number thereof) below the median of the reference children.

In this way a table with the percentages of children in each age group with "low" weight for age, height for age, and weight for height can be constructed. If ages are not known, this procedure will be limited to weight for height.

An illustration of the procedure using the weight-for-height indicator and the standard deviation of the reference population is given below. The chosen cut-off point in this case is 2 standard deviations or more below the median weight for height of the reference population:

Child No.	Age in months	Height in cm	Sex	Weight in kg	2 S.D. below median wt/ht for reference population[a]	Indicator level
1	36	96	M	15.2	12.1	Not low
2	38	99	M	12.1	12.8	Low
3	21	68	F	8.0	6.3	Not low
4	24	88	M	12.7	10.5	Not low
5	21	85	M	11.3	10.1	Not low
6	32	90	F	10.4	10.7	Low
7	18	65	F	7.4	5.7	Not low
8	39	100	M	12.0	13.0	Low
9	35	94	F	10.5	11.4	Low

[a] Figures for this column are found in Annex 3, Tables 26–29.

Example: In the sampled population, individual No. 1 is a boy aged 36 months whose height (standing) is 96 cm and weight 15.2 kg. In the case of weight-for-height distribution of the reference population, the median weight of a boy 96 cm tall is 14.7 kg and the value of 2 S.D. below the median is 12.1 kg (see Annex 3, Table 27):

Height in cm	−3 S.D.	−2 S.D.	−1 S.D.	Median	+1 S.D.	+2 S.D.	+3 S.D.
96	10.9	12.1	13.4	14.7	16.2	17.7	19.2

Child No. 1 is thus recorded as having a "not low" indicator level.

In performing this dichotomous type of analysis (low level of indicator versus adequate level) it is recommended that the data should be tabulated using different levels as cut-off points before a specific one is definitely chosen. This is illustrated below using height for age as indicator with three different cut-off classes: between −1 S.D. and median, between −2 S.D. and −1 S.D., and below −2 S.D. of the reference population.

Percentage[a] Height-for-Age Distribution

Age class in months	Between −1 S.D. and median	Between −2 S.D. and −1 S.D.	Below −2 S.D.
0 − < 6	37.2%	14.9%	1.0%
6 − < 12	49.1%	33.3%	4.7%
12 − < 24	24.4%	49.8%	4.5%
24 − < 48	30.3%	50.4%	14.3%
48 − < 72	31.7%	48.2%	14.0%
All age classes combined	31.9%	45.2%	10.7%
Expected values[b] for all age classes combined	34.14%	13.6%	2.27%

[a] These proportions refer to the total population surveyed (in this example 2816 individuals).
[b] Values for the reference population.

In the above example it would be advisable to choose the cut-off point at 2 S.D. below the median for the following two reasons:

(1) the distribution of height for age in the population is shifted to the left of the normal distribution (i.e., that of the reference population) with 87.8% of the individuals below the median; and

(2) the difference between the observed value (10.7%) and the expected value (2.27%) of the population distribution 2 S.D. or more below the median is sufficiently large to facilitate the necessary statistical calculations without having to draw an unduly large sample.

If the observed distribution of percentage height for age below the median had been the following:

Age classes combined	Between −1 S.D. and median	Between −2 S.D. and −1 S.D.	Below −2 S.D.
	32.3%	31.9%	5.5%

it would then have been more advisable to take as a cut-off point 1 S.D. below the median, since the shift is less obvious and it is easier to show a statistically significant difference when a proportion of 37.4% (31.9% + 5.5%) is reduced by one-fifth to 29.9% than when a proportion of 5.5% is reduced by one-fifth to 4.4%.

6.3.2 *Comparison of the distribution of indicators*

This analysis gives a more complete picture of the differences between the sampled population and the reference population, because it takes into consideration the whole range of the distribution. It can be performed using the decile distribution and/or the S.D. distribution around the median.

The procedure illustrated below uses the weight-for-height indicator and its decile distribution.

Example 1: Comparison of weight for height (decile distribution).

In a sampled population, individual No. 1 is a boy, 58 cm high and weighing 5 kg. In the case of weight for height the decile distribution of weights in the reference population for boys 58 cm in height is as follows (Annex 3, Table 27):

Deciles:	10	20	30	40	50	60	70	80	90
Weight in kg:	4.3	4.7	4.9	5.2	5.4	5.7	6.0	6.4	6.9

(This means that in the reference population of boys 58 cm high, 10% have a weight of less than 4.3 kg, 20% have a weight of less than 4.7 kg, etc.)

Individual No. 1 is therefore classified in the 30.0–39.9 decile bracket.

Individual No. 2 is a girl, 62 cm high and weighing 6.4 kg. In the reference population, the decile distribution of weights for girls 62 cm in height is as follows (Annex 3, Table 29):

Deciles:	10	20	30	40	50	60	70	80	90
Weight in kg:	5.4	5.8	6.1	6.3	6.6	6.9	7.2	7.6	8.1

Individual No. 2 is therefore classified in the 40.0–49.9 decile bracket.

This operation is repeated *n* times until all *n* individuals sampled have been classified. The tabulated data would look something like this:

Decile bracket	No. of individuals	Percentage	Cumulative percentage
0.0– 9.9	84	11.0	11.0
10.0–19.9	168	22.1	33.1
20.0–29.9	104	13.7	46.8
30.0–39.9	88	11.6	58.4
40.0–49.9	76	10.0	68.4
50.0–59.9	60	7.9	76.3
60.0–69.9	52	6.9	83.2
70.0–79.9	48	6.3	89.5
80.0–89.9	48	6.3	95.8
90.0–100	32	4.2	100
Total	760	100	—

Success or failure is judged, for example, by the change over a period of time in the proportion of children moving from the first 3 deciles to the others—i.e., the proportion of children with a low weight for their height as compared with the reference population frequency distribution. Alternatively, the data can be presented in graphic form (see Fig. 3). The horizontal line at 10% merely indicates that each decile of the reference population contains (by definition) 10% of the individuals in the reference population. The histogram shows that more of the tested population gathers within the lowest deciles, this being more pronounced in 1974 than in 1975.

Example 2: Comparison of weight for height (S.D. score distribution).

A further illustration of the method used to compare the distribution of indicators is presented below using weight for height and the S.D. score distributions around the median. The S.D. score of a nutritional indicator for an individual is given by the following formula:

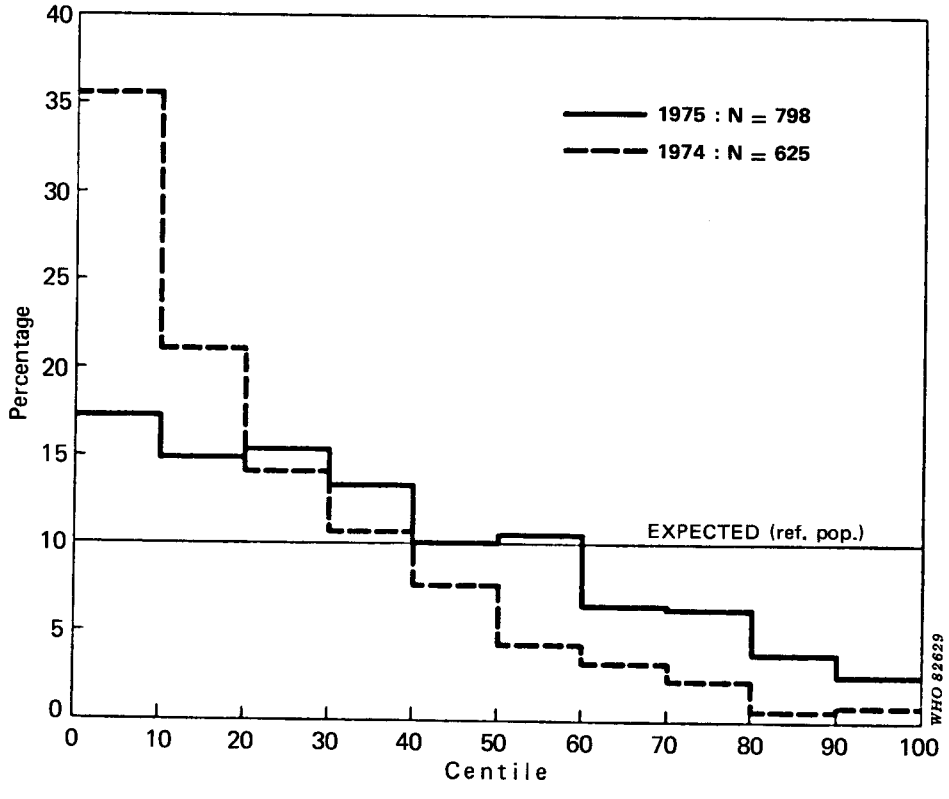
$$\text{S.D. score} = \frac{\text{Individual's value} - \text{median value of reference population}}{\text{S.D. value of reference population}}$$

In a sampled population, individual No. 1 is a boy, 69 cm high and weighing 6.3 kg. The S.D. distribution of weight for standing height in the reference population for boys 69 cm in height is as follows (Annex 3, Table 27):

Height in cm	−3 S.D.	−2 S.D.	−1 S.D.	Median	+1 S.D.	+2 S.D.	+3 S.D.
69	5.6	6.6	7.5	8.5	9.8	11.1	12.4

(It will be noted that the values of standard deviations below and above the median are different. This is explained by the fact that the distributions of weight in the reference population are not symmetrical and that separate standard deviations were calculated for the upper and lower halves of these distributions.)

Fig. 3. Percentage distribution of children by weight/height deciles: Sahel nutrition studies, 1974-1975*



* Source: Reference *5*.

The value of 1 S.D. below the median in the reference population = (8.5 − 7.5) = 1.0. Individual No. 1 is below the median. His standard deviation score corresponds to:

$$\text{S.D. score of individual No. 1} = \frac{\text{weight of subject} - \text{the median value of weight for height (of reference population)}}{\text{1 S.D. below median weight for height (of reference population)}} = \frac{6.3 - 8.5}{1.0} = -2.2$$

In the same sampled population, individual No. 2 is a girl, 93.5 cm high and weighing 17 kg. The S.D. distribution of weight for height in the reference population for girls 93.5 cm in height is as follows (Annex 3, Table 29):

Height in cm	−3 S.D.	−2 S.D.	−1 S.D.	Median	+1 S.D.	+2 S.D.	+3 S.D.
93.5	10.1	11.3	12.5	13.7	15.2	16.7	18.3

The value of 1 S.D. above the median in the reference population = (15.3 − 13.7) = 1.6. Individual No. 2 is therefore above the median. Her S.D. score corresponds to:

$$\text{S.D. score of individual No. 2} = \frac{\text{weight of subject} - \text{the median value of weight for height (of reference population)}}{\text{1 S.D. above median weight for height (of reference population)}}$$

$$\text{S.D. score of individual No. 2} = \frac{(17 - 13.7)}{1.6} = +2.06$$

The above operation is repeated for all individuals in the sample, who are then classified in the following manner:

Individual No.	S.D. score	Corresponding position along S.D. distribution values
1	−2.2	between −2.49 and −2.0
2	+2.06	" +2.0 and −2.49
3	−2.4	" −2.49 and −2.0
4	+1.5	" +1.5 and +1.95
5	−0.6	" −0.99 and −0.5

Using this distribution pattern appropriate histograms can be built for each of the three indicators, as illustrated in Fig. 4 with height for age and different age categories.

6.4 Interpretation of results

In forming group indicators with age, weight and height, three relationships are considered:

— weight for age,
— height for age, and
— weight for height.

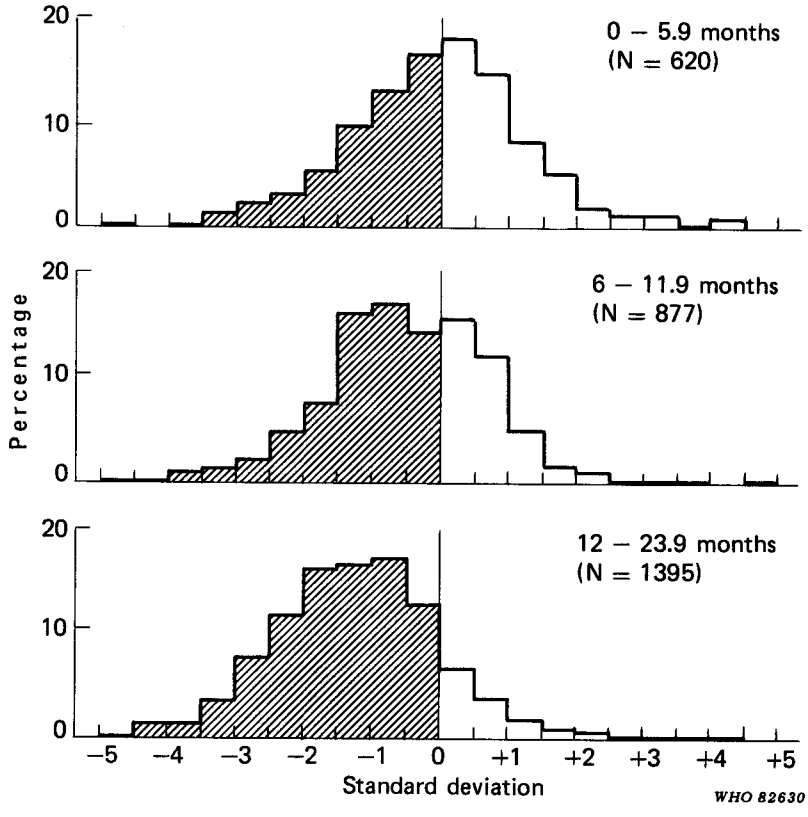
For each of these three indicators there are several possibilities of classification by comparison with a reference population, such as:

— normal,
— above normal (or high), and
— below normal (or low).

In the case of high and low classifications, various cut-off points (or class limits) can be established; these may vary from one programme to the next, depending on such factors as the level of precision chosen for the statistical analysis, the expected prevalence of protein-energy malnutrition (PEM) in the population, and the frequency of severe malnutrition.

In general a "low" weight for age can be taken as one which is more than 1 standard deviation below the median weight for age of the reference population; however, multiples of 1 standard deviation (e.g., −1.5, −2 or −2.5) can also be selected as cut-off points. Conversely, a "high" weight for age is in general more than 1 standard deviation above the median weight for age of the reference population. The same principle applies to the two other indicators: height for age and weight for height.

Fig. 4. Frequency distribution of height for age for various age categories



In interpreting the results obtained by these three indicators, it should be remembered that an acute lack of food will invariably produce thin children irrespective of their height or age, although in some cases the thinness may be masked by oedema. On the other hand, a prolonged lack of food not only will produce thin children but also will affect their growth and result in a reduced stature; this reduction of stature is usually noticeable even after food supplies have been brought up to normal and individuals are no longer thin. Likewise, successful supplementation of the diet can be expected to be noticeable first in a change in weight for height, but it may take one year or more to affect the height for age. These conditions can be determined by the combined use of the three indicators.

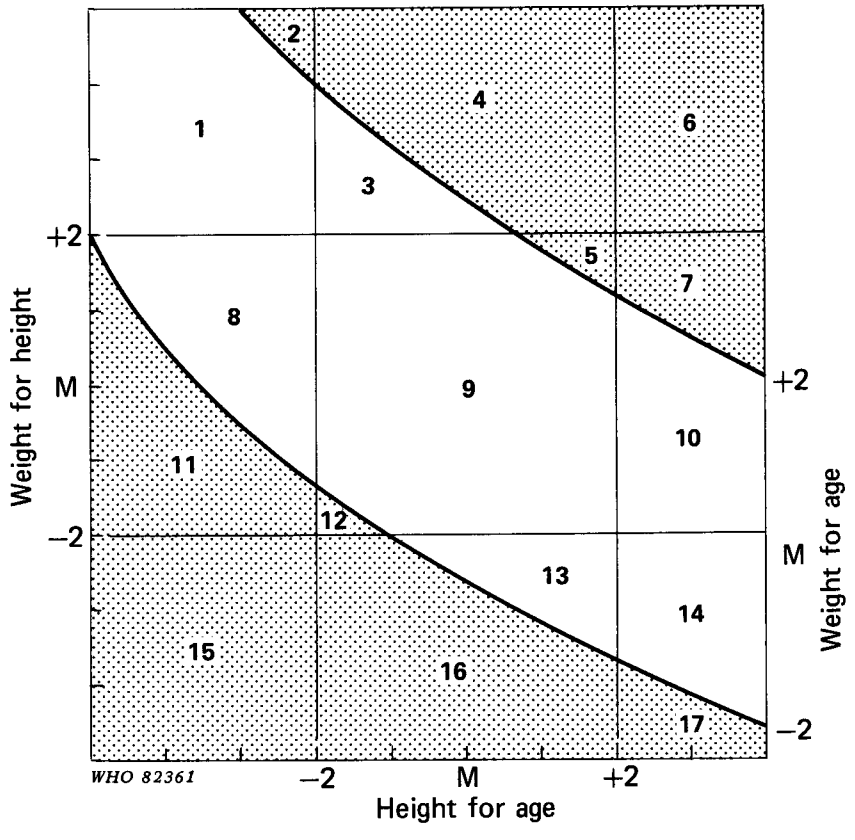
If one groups a child population into "low", "normal" and "high" according to the three indicators, certain contradictions occur, depending in part on the cut-off points chosen. In Fig. 5, the distribution of height for age is indicated on the horizontal axis by the median M and the cut-offs −2 S.D. and +2 S.D. Children to the left of −2 S.D. are classified as "short", those to the right of +2 S.D. as "tall", and those between the two cut-offs as "normal". In the same way the distribution of weight for height is indicated on the left vertical axis. "Short", "normal", and "tall" children may thus be "thin", "normal" or "obese" in terms of weight for height. The two cut-offs of weight for age run obliquely across those of height for age and weight for height. The intersections produce 17 areas that can be described by different combinations of "low", "normal" and "high" for the three indicators. Some of these combinations and their interpretations are listed in the table opposite.

Combinations of indicators	Interpretation of nutritional status
11. Normal wt/ht + low wt/age + low ht/age	Normally fed with past history of malnutrition
9. Normal wt/ht + normal wt/age + normal ht/age	Normal
7. Normal wt/ht + high wt/age + high ht/age	Tall, normally nourished
17. Low wt/ht + low wt/age + high ht/age	Currently underfed ++
16. Low wt/ht + low wt/age + normal ht/age	Currently underfed +
14. Low wt/ht + normal wt/age + high ht/age	Currently underfed
2. High wt/ht + high wt/age + low ht/age	Obese ++
1. High wt/ht + normal wt/age + low ht/age	Currently overfed with past history of malnutrition
4. High wt/ht + high wt/age + normal ht/age	Overfed but not necessarily obese

The most usual and widely recognized indicator of PEM is weight for age. In many countries provided with food aid, however, it is not infrequent to find situations where no age records (birth certificates) are available and/or where ages cannot be verified with sufficient precision: at best, age is a "guesstimate". In these situations the evaluation of nutritional impact on vulnerable groups given food supplements should rely essentially on the relationship between weight and height, which can only determine the present nutritional status without any reference to possible past episodes of malnutrition.

In other situations, some evaluators may be led to abandon the measurement of height because of lack of equipment and trained personnel, and will of necessity rely exclusively on the relationship between weight and age. As will be seen from the above table, a lot of precision is lost and misinterpretations are likely to occur—for example, there are three different interpretations for a group whose weight for age is normal (see combinations 9, 14 and 1).

Fig. 5. Relation between the classifications "low", "normal" and "high" for the indicators weight for height, height for age and weight for age with cut-offs at 2 standard deviations above and below the median*



*Calculated from the data for 18-month-old boys in the reference population (Annex 3).

These observations are especially important in the screening of children for participation in a feeding programme. If low weight for age is the criterion, the selected beneficiaries will include a proportion of small but not malnourished children who are likely not to respond to a feeding programme (combination 11), while other children who are malnourished but are relatively tall and thus have "normal" weight for age will not be able to participate in the programme (combination 14). Since in many countries the retardation in linear growth occurs in the first year of life (or even before birth) the group of beneficiaries thus selected is likely to include a large proportion of stunted children without actual malnutrition, particularly in the older age groups. For these reasons it is advisable to base screening for malnutrition and estimates of the prevalence of malnutrition in a population on indicators that include height.

When the selection indicator is weight for height it can be seen from an inspection of the above table that a much clearer picture emerges:

(1) All children with a *normal weight for height are not malnourished* whatever the classification of the other two indicators (combinations 7, 9 and 11).

(2) Similarly, all children with a *low weight for height are underfed,* some more than others depending on the values of the other two indicators (combinations 14, 16 and 17).

(3) Finally, all children with a *high weight for height* are overfed in varying degrees depending again on the values of the other two indicators (combinations 1, 2 and 4).

Finally it should be pointed out that the results of a survey can show that a supplementary feeding programme has had a positive impact (i.e., an improvement of the nutritional status of beneficiaries) which can be shown to be statistically significant; such an impact, however, may have very little—if any—public health significance. This point is best explained by an illustration.

At the beginning of a feeding programme 30% (150) of a sample of 500 children were found to be malnourished (e.g., having a weight for height of less than 2 standard deviations below the median of the reference population). After one year of operation of the programme a different sample of 500 children were measured and only 25.6% (128) of them were found to be malnourished. The difference is statistically significant at the 95% confidence level ($\chi^2 = 4.61$; $P < 0.05$); one can, however, question the public health significance of this result and the value of the feeding programme as a public health tool when it is seen that it has improved only 14.7% of the malnourished children (or 4.4% of the total).

7. Implications of findings

Measurement of the impact of a supplementary feeding programme on the nutritional status of the recipient population cannot be an end in itself. A positive finding, in addition to giving rise to satisfaction, should also serve as a bench-mark against which to measure a continuing or expanded programme. A negative finding, showing no improvement of the nutritional status, rather than create frustration, should stimulate efforts to improve a programme by identifying the causes and initiating corrective action. Measurement of impact provides information which should enable the programme management to adjust a project to the specific local conditions under which it operates.

It must be realized, however, that the measurement of nutritional impact as described here, while able to assess whether or not the ultimate objective of a programme is being attained, by itself will usually not allow also for the identification of the causes of success or failure. Impact measurement may be important and even essential for the evaluation of a programme, but it must be seen as only one element of the much wider process of evaluation usually carried out. In supplementary feeding programmes in particular, however, it should be considered a crucial and indispensable part of evaluation.

Obstacles to reaching the objective of improving nutritional status, in so far as they stem from the mode of operation of a project, are likely to be identified and rectified by the usual process of project evaluation. It must be realized, however, that a lack of success in many cases may not be due to less than perfect management and logistics but rather to factors that were overlooked or unknown at the time of programme formulation. Such factors might be: an unexpectedly low acceptance of particular foods, the failure of mothers—for a variety of reasons—to feed the intended recipients with sufficient amounts; partial or total replacement of the usual diet by the supplement; an environment causing recurrent febrile infections such as diarrhoea and thus chronic loss of appetite, especially in young preschool children; inadequate accompanying nutrition education, etc. Such cases may call for special in-depth studies before the programme can be redesigned or properly adjusted to meet specific local conditions. The additional cost in time and resources of such fact-finding efforts should not be a deterrent if seen in the context of the total expenditures involved both for governments and for the assisting agency.

8. Illustration of data analysis

8.1. Introduction

In order to facilitate the general use (particularly at field level) of the various methods prescribed in the previous sections of these guidelines, we now present an analysis of data pertaining to feeding schemes aimed at vulnerable groups in two populations (countries A and B), simulating situations often encountered in, for instance, food aid operations. In so doing, we have endeavoured, by using actual data collected in real programmes, to illustrate an analysis that would allow one to reach, at a minimum cost, scientifically valid conclusions concerning the nutritional impact of a supplementary feeding programme.

Furthermore, it is assumed that the collected data have already been summarized for each of the three suggested indicators, in the manner described on pages 21–25. In proceeding with the analysis, we have compared the "before intervention" and "after intervention" data according to the following plan, going from the general to the specific:

(1) For all ages and sexes combined:
- a general comparison of indicators;
- calculation of general prevalence of malnutrition;
- calculation of change in prevalence;

(2) Examination of data separated by sex (ages combined):
- calculation of general prevalence of malnutrition for each sex;
- calculation of change in prevalence;

(3) Examination of data by age classes (sexes combined):
- calculation of prevalence of malnutrition by age class;
- calculation of change in prevalence.

With reference to this plan of analysis, it should be noted that:

- the measurements did not include those of a control group for the reasons already stated on page 17;
- the "after intervention" measurements were taken after an interval sufficiently long for the programme to have produced a nutritional impact (the use of the term "after" does not imply that the programme is terminated);
- data were collected in each instance from a cross-sectional sample representative of the programme population;
- baseline data (the "before intervention" data in the tables below) had been collected.

In accordance with the plan of analysis suggested above the following minimum list of 8 tables and 3 figures were derived:

Table 1. Distribution of nutritional indicators before (1974) and after (1977) intervention.

Table 2. Prevalence of malnutrition before (1974) and after (1977) intervention.

Table 3. Reduction in prevalence of malnutrition after intervention (effectiveness of programme).

Table 4. Prevalences of low levels of nutritional indicators by sex.

Tables 5, 6, and 7. Prevalences of low levels of nutritional indicators by age classes.

Table 8. Centile distribution of nutritional indicators: all ages and both sexes combined.

Fig. 6. Centile distribution of weight for age, all ages and both sexes combined..., 1974–1977.

Fig. 7. Centile distribution of height for age, all ages and both sexes combined..., 1974–1977.

Fig. 8. Centile distribution of weight for height, all ages and both sexes combined..., 1974–1977.

8.2 Country A programme

8.2.1 *Description of the supplementary feeding programme*

In 1972 the Government of Country A, with international cooperation, introduced a supplementary feeding scheme aimed at vulnerable groups. The scheme covered 6 of the 14 administrative districts of the country. Food rations were distributed through maternal and child health (MCH) centres on a year-round basis to infants and children up to the age of 3 years and to pregnant women and lactating mothers over an 18-month period (last 6 months of pregnancy and the first 12 months post-partum). In all, 86 000 individuals (21 000 women and 65 000 children) were covered by the scheme.

In agreement with the international agency concerned, the health authorities of Country A had decided to measure the nutritional impact of the scheme at regular yearly intervals, the first collection of data beginning in the second year following the initiation of operations. By means of repeated cross-sectional surveys, data concerning sex, age, weight and height were collected on representative samples of the infant and child beneficiaries in 1974, 1975, 1976 and 1977. Samples sizes varied between 3700 and 2500 individuals. No data were collected from the 8 districts in which the scheme had not been implemented. The reason for this decision was that the population of these 8 districts was not comparable, from the nutritional and socioeconomic standpoints, with the population of the 6 districts covered by the scheme.

8.2.2 *Calculation of nutrition levels*

It was decided, in the case of the Country A supplementary feeding scheme, to focus the measurement of nutritional impact, at an initial stage, on a comparison of data collected in 1974 and 1977 so that the second set of figures would include the largest possible proportion of children who had participated in the programme for one year or more. It was felt that this time interval was necessary to allow for any anticipated impact to manifest itself.

The collected data are summarized in Table 1.

Table 1. Distribution of nutritional indicators before (1974) and after (1977) intervention

Nutrition level	Indicators					
	Weight for age		Height for age		Weight for height	
	Before	After	Before	After	Before	After
No. examined	3538	2695	3538	2695	3538	2695
No. below median −1 S.D.	1701	995	1519	1226	1130	421
% below median −1 S.D.	48.1	36.9	42.9	45.5	31.9	15.6
No. below median −2 S.D.	623	267	575	460	272	72
% below median −2 S.D.	17.6	9.9	16.2	17.1	7.7	2.7

In the reference population against which all data collected in the Country A surveys were compared there was a "normal" (or "expected") proportion of children, for each of the three

indicators, falling below the median −1 S.D. and below the median −2 S.D. These "expected" proportions were respectively: 15.9% (below median −1 S.D.) and 2.3% (below median −2 S.D.). These two figures have to be subtracted from the values observed in Table 1 to obtain Table 2. For example, looking at weight for age, the percentage below the median −2 S.D. in excess of the expected value (2.3%) at the end of the fifth year of intervention (i.e., 1977) is: 9.9%−2.3% = 7.6%.

Table 2. Prevalence of malnutrition before (1974) and after (1977) intervention*

Malnutrition level	Indicators					
	Weight for age		Height for age		Weight for height	
	Before (1)	After (2)	Before (3)	After (4)	Before (5)	After (6)
Excess below median −1 S.D.	32.2%	21.0%	27.0%	29.6%	16.0%	−0.3%[a]
Excess below median −2 S.D.	15.3%	7.6%	13.9%	14.8%	5.4%	0.4%

*Expressed as percentages in excess of the expected values.

[a] An artefact created by the subtraction of 15.9% from 15.6% and indicating a distribution of weight for height more favourable (i.e., closer to the median) than the one measured in the reference population.

Table 2 is a "true" measurement of the malnutrition problem in the 6 districts of Country A assisted by the feeding scheme. It should be borne in mind that the measurements presented in Table 2 are only an *estimate* based on two successive cross-sectional samples; the only *exact* measurements (in a statistical sense) would be those derived from an examination of the 65 000 children covered by the feeding scheme.

The next table (Table 3) is the one that provides the evaluator with a measurement of the general effectiveness of the programme, irrespective of the age and sex of the beneficiaries.

Table 3. Reduction in prevalence of malnutrition (effectiveness of programme)*

Malnutrition level	Indicators (% reduction)		
	Weight for age (1)	Height for age (2)	Weight for height (3)
No. below median −1 S.D.	34.8%	−9.6%[a]	101.9%
No. below median −2 S.D.	50.3%	−6.5%[a]	92.6%

*Expressed as percentages of the initial (1974) prevalences calculated in Table 2.

[a] The minus sign corresponds to an increase in prevalence between 1974 and 1977: e.g., $\frac{(27.0-29.6)}{27.0} \times 100 = -9.63\%$.

Effectiveness can be expressed as a ratio, in which the numerator is a measure of the reduction in the prevalence of malnutrition produced by the feeding scheme and the denominator is a measure of the prevalence of malnutrition that should be reduced. For example, using weight for age as an indicator, the initial (1974) prevalence of malnutrition as shown in Table 2 is:

— at the level median −1 S.D.: 32.2%
— at the level median −2 S.D.: 15.3%.

The reduction in prevalence is:

— at the level median −1 S.D.: (32.2−21.0) = 11.2%
— at the level median −2 S.D.: (15.3−7.6) = 7.7%.

The effectiveness is:

— at the level median −1 S.D.: $\frac{11.2}{32.2} \times 100 = 34.8\%$.
— at the level median −2 S.D.: $\frac{7.7}{15.3} \times 100 = 50.3\%$.

The apparent increase in the proportion of unsatisfactory height for age (Table 2, columns 3 and 4) and the paradoxical negative effectiveness of the feeding scheme when measured by height for age (Table 3, column 2) are both explained by a systematic error in measurement on the part of the MCH staff involved, as discovered retrospectively by the evaluators. (In 1977 staff from several of the MCH centres were measuring infants and children with an error of 1-2 cm below their actual height.) The data were then examined for sex differences in malnutrition levels (Table 4).

Table 4. Prevalences* of low levels of nutritional indicators by sex

Malnutrition level	Girls						Boys					
	Weight/age		Height/age		Weight/height		Weight/age		Height/age		Weight/height	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Below median −1 S.D.	35.7	21.1	29.8	31.2	33.3	−0.8	29.7	20.9	24.6	28.1	27.8	0.4
Below median −2 S.D.	16.6	7.5	15.1	16.1	16.6	0.0	14.2	7.7	12.9	13.5	13.1	0.9
Number examined	Before: 1643; After: 1312						Before: 1895; After: 1383					

*Expressed as percentages in excess of the expected values (− 1 S.D.: 15.9%; − 2 S.D.: 2.3%).

As in the case of the data in Table 2, the effectiveness of the programme can be calculated separately for boys and girls. For example, using weight for height, the results are as follows:

Boys—Effectiveness (weight for height) median −1 S.D.: $\frac{(27.8-0.4)}{27.8} \times 100 = 98.5\%$

median −2 S.D.: $\frac{(13.1-0.9)}{13.1} \times 100 = 93.1\%$

Girls—Effectiveness (weight for height) median −1 S.D.: $\frac{(33.3-(-0.8))}{33.3} \times 100 = 102\%$

median −2 S.D.: $\frac{(16.6-0.0)}{16.6} \times 100 = 100\%$.

An examination of the prevalence of nutritional indicators by age was the next step of the analysis. This was done on the basis of Tables 5, 6 and 7 below, which express the prevalences as percentages in excess of the expected values (−1 S.D.: 15.9%; −2 S.D.: 2.3%).

Table 5. Prevalences of low levels of weight for age by age classes

Malnutrition level	Age classes (months)							
	0− < 6		6− < 12		12− < 24		24− < 36	
	Before	After	Before	After	Before	After	Before	After
Below median −1 S.D.	3.3	1.3	35.6	15.8	45.4	29.9	29.7	22.1
Below median −2 S.D.	3.8	0.8	15.7	7.3	21.5	12.6	14.0	5.3
Number examined	572	425	794	603	1219	947	953	720

Table 6. Prevalences of low levels of height for age by age classes

Malnutrition level	Age classes (months)							
	0− < 6		6− < 12		12− < 24		24− < 36	
	Before	After	Before	After	Before	After	Before	After
Below median −1 S.D.	−2.8	6.2	18.6	18.8	40.5	42.7	34.8	35.2
Below median −2 S.D.	0.3	4.5	7.6	8.1	21.2	23.6	18.1	14.8
Number examined	572	425	794	603	1219	947	953	720

Table 7. Prevalences of low levels of weight for height by age classes

Malnutrition level	Age classes (months)							
	0– < 6		6– < 12		12– < 24		24– < 36	
	Before	After	Before	After	Before	After	Before	After
Below median –1 S.D.	12.9	–6.5	22.3	–1.5	40.4	1.7	34.8	–4.2
Below median –2 S.D.	5.7	1.5	7.4	1.8	21.2	0.9	18.1	–1.2
Number examined	572	425	794	603	1 219	947	953	720

The last stage of the analysis consisted of looking at the same three nutritional indicators (weight/age; height/age; weight/height) arranged in a continuous distribution (in this case the centile distribution), which provides an overall view of the population benefiting from the supplementary feeding scheme, as opposed to the narrower approach of looking only at children suspected of being malnourished because their nutritional indicators show that they are below a certain level (in this case the median level). Table 8 and Fig. 6, 7 and 8 illustrate this continuous distribution of indicators.

Table 8. Centile distribution of nutritional indicators: all ages and both sexes combined

Nutritional indicators		Centile distribution									
		0.1–0.9	10–19.9	20–29.9	30–39.9	40–49.9	50–59.9	60–69.9	70–79.9	80–89.9	90–100
Weight for age	Before	38.3	14.2	11.1	8.8	6.5	5.8	4.4	4.2	3.1	3.8
	After	27.0	15.0	11.7	8.4	8.4	4.0	5.9	5.9	4.7	5.2
Height for age	Before	35.8	12.8	10.9	7.8	6.5	6.5	5.5	4.7	3.8	5.7
	After	37.6	13.6	10.8	7.8	6.2	6.9	5.1	5.7	3.5	2.8
Weight for height	Before	22.6	12.7	13.3	11.3	10.7	9.1	7.5	4.6	2.5	5.6
	After	10.1	7.7	10.1	10.8	11.8	11.2	10.6	8.6	6.2	10.9
Number examined		Before: 3 538; After: 2 695									

Fig. 6. Centile distribution of weight for age, all ages and both sexes combined, Country A vulnerable group feeding scheme, 1974–1977

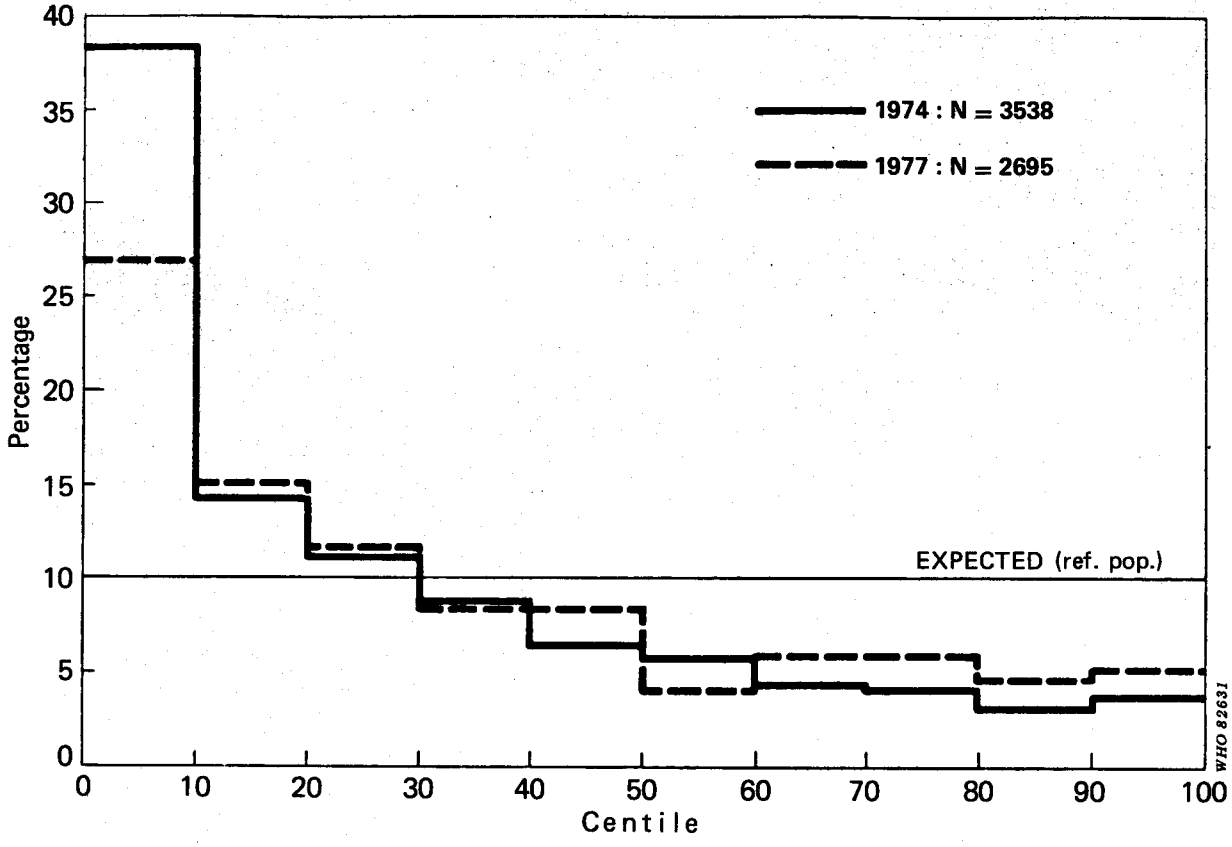


Fig. 7. Centile distribution of height for age, all ages and both sexes combined, Country A vulnerable group feeding scheme, 1974–1977

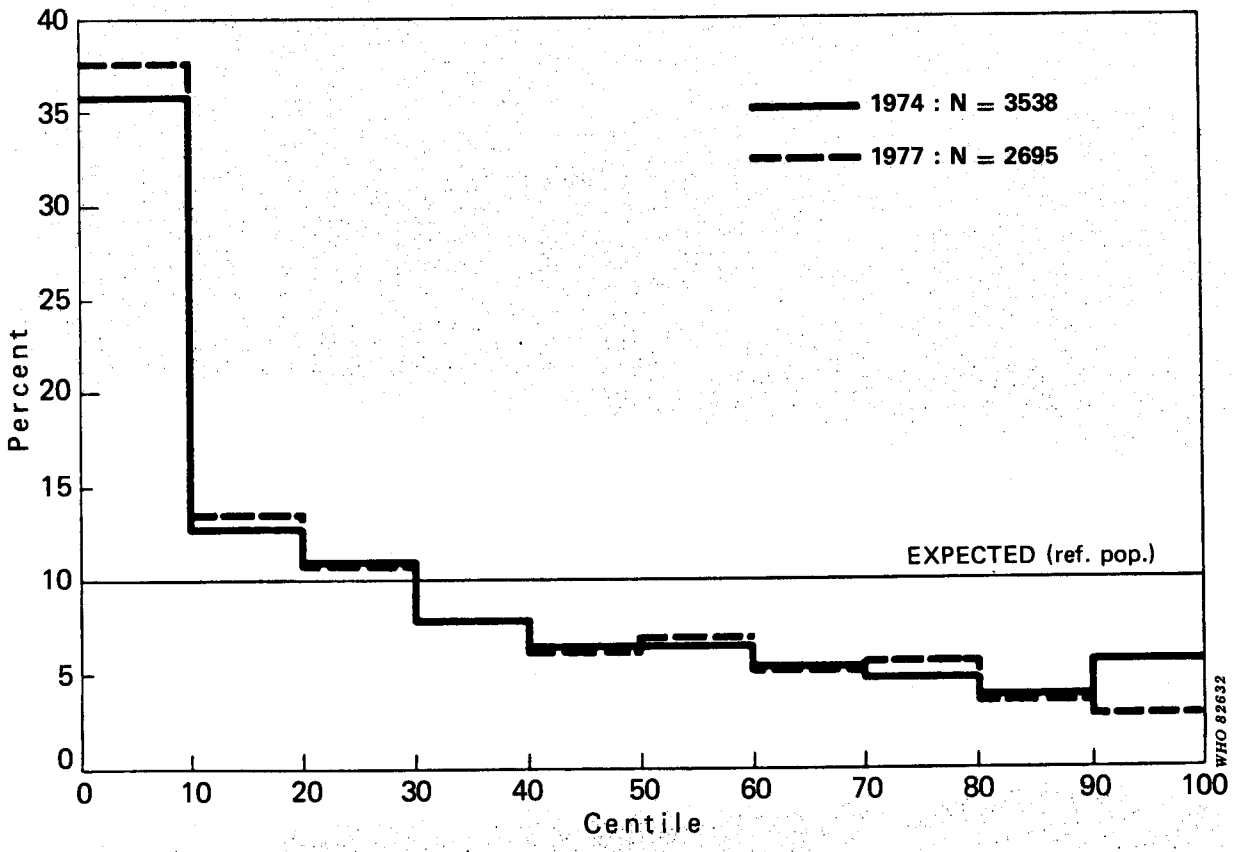


Fig. 8. Centile distribution of weight for height, all ages and both sexes combined, Country A vulnerable group feeding scheme, 1974–1977

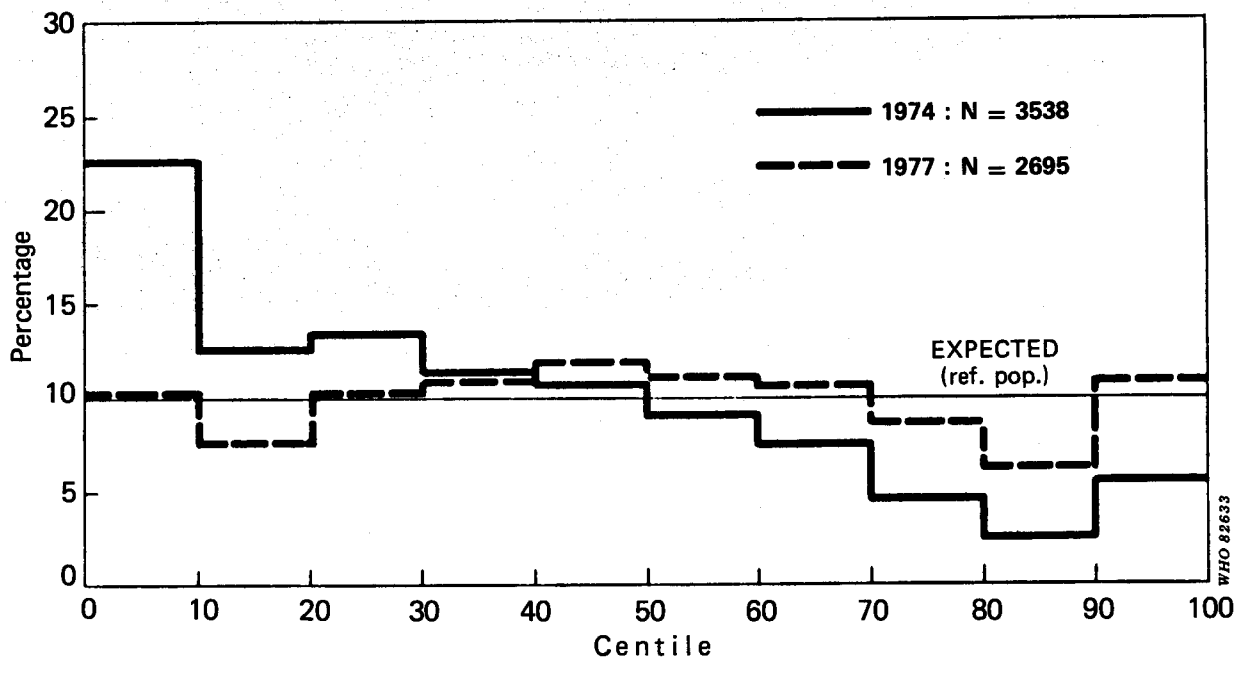


Table 8 illustrates one of the weaknesses of analysing data by the centile distribution method. It can be seen that the bulk of the "malnutrition problem" is clustered within the first 10 centiles. This finding is not specific to the Country A feeding scheme and is almost universal: hence the necessity of subdividing the 0.1–0.9 bracket into two other categories, 0.5–0.9 and < 0.5, which was not done in this case so as not to complicate the analysis unduly.

8.2.3 *Statistical analysis of data*

The search for a statistically significant difference can be carried out at 3 levels by comparing, for each nutritional indicator, the prevalence of malnourished children before and after intervention (i.e., in 1974, when the feeding scheme was less than 3 years old, and in 1977, when it had been in operation for approximately 5 years). These 3 levels of comparison are:

— overall prevalence (all ages and both sexes combined),
— prevalence by sex, and
— prevalence by age.

To facilitate the calculations which follow, malnutrition was defined as the number of children in the population falling below the median −2 S.D., by comparison with the reference population. This cut-off point (median −2 S.D.) may vary from one scheme to another, as indicated in section 6.3.1, page 21. In the example chosen, a score of 2 S.D. or more below the median was considered to reflect adequately the nutrition problems facing this particular population.

General prevalence

Using the data from Table 1, a 2 × 2 table was built for each indicator, thus:

Weight for height

Nutrition level	Intervention level		
	Before	After	Total
No. above median −2 S.D.	3 266	2 623	5 889
No. below median −2 S.D.	272	72	344
Total	3 538	2 695	6 233

Similar tables were worked out for weight for age and height for age.

A simple statistical test was then performed using the formula $\chi^2_{1d.f.} = \frac{\Sigma\,(o-e)^2}{e}$

where o = observed value,
e = expected value,
$d.f.$ = degrees of freedom.

In the case of weight for height the results were:

$$\chi^2 = \frac{(3266 - \frac{3538 \times 5889}{6233})^2}{(\frac{3538 \times 5889}{6233})} + \frac{(2623 - \frac{2695 \times 5889}{6233})^2}{(\frac{2695 \times 5889}{6233})} + \frac{(272 - \frac{3538 \times 344}{6233})^2}{(\frac{3538 \times 344}{6233})} + \frac{(72 - \frac{2695 \times 344}{6233})^2}{(\frac{2695 \times 344}{6233})}$$

$$= \frac{(-76.74)^2}{3342.74} + \frac{(+76.74)^2}{2546.25} + \frac{(76.74)^2}{195.26} + \frac{(-76.74)^2}{148.74}$$

$$= \frac{5889.03}{3342.74} + \frac{5889.03}{2546.25} + \frac{5889.03}{195.26} + \frac{5889.03}{148.74}$$

$$= 1.76 + 2.31 + 30.16 + 39.59$$

$$\chi^2 = 73.82$$

Reference to a χ^2 table shows that the difference between the two prevalences is statistically highly significant; the probability of this result occurring by chance is < 0.00001.

Likewise, χ^2 tests were performed for the two other indicators, with the following results:

Weight for age: $\chi^2 = 74.13$ (statistically highly significant: $P < 0.00001$).
Height for age: $\chi^2 = 0.74$ (statistically not significant: $P < 0.4$).

(It should be noted that because of the systematic error made in 1977 in recording heights slightly below their actual levels, the ratio weight for height was further improved in the 1977 measurements, thus explaining in part the good results obtained when comparing the "after" with the "before" data for the indicator.)

Prevalence by sex

Using the data from Table 4 two types of 2 × 2 tables can be built for each indicator:

— Girls before and after intervention; boys before and after intervention.
— Girls compared with boys before intervention; girls compared with boys after intervention.

Weight for height

Nutrition level	Girls		Total
	Before	After	
No. above median −2 S.D.	1 370	1 312	2 682
No. below median −2 S.D.	273	0	273
Total	1 643	1 312	2 955

Weight for height

Nutrition level	Numbers before intervention		Total
	Boys	Girls	
No. above median −2 S.D.	1 647	1 370	3 017
No. below median −2 S.D.	248	273	521
Total	1 895	1 643	3 538

Again, the χ^2 test was performed on all these tables, with the following results for the χ^2 value:

Girls, weight for age:	55.59[a]	Boys, weight for age:	33.65[a]
Girls, height for age:	0.55	Boys, height for age:	0.3
Girls, weight for height:	240.19[a]	Boys, weight for height:	163.45[a]

Before intervention		*After intervention*	
Boys versus girls, weight for age:	0.18	Boys versus girls, weight for age:	0.04
Boys versus girls, height for age:	3.62	Boys versus girls, height for age:	3.5
Boys versus girls, weight for height:	8.74[b]	Boys versus girls, weight for height:	11.43[b]

[a] Difference statistically highly significant: the probability of this result occurring by chance is < 0.00001.
[b] Difference statistically significant: the probability of this result occurring by chance is < 0.005.

Prevalence by age

The data for this statistical analysis are to be found in Tables 5, 6 and 7. For each indicator four 2 × 2 tables were constructed; an illustration of one of these tables, derived from Table 7 for the nutritional indicator weight for height, is given below:

Weight for height

Nutrition level	Age class 0–< 6 months		Total
	Before	After	
No. above median –2 S.D.	539	419	958
No. below median –2 S.D.	33	6	39
Total	572	425	997

As was done in the case of prevalences by sex, the χ^2 test was performed on these 12 tables with the following results:

Age class (months)	χ^2 values		
	Weight/Age	Height/Age	Weight/Height
0–< 6	11.16[a]	18.13[b]	13.50[c]
6–< 12	23.79[c]	0.09	23.83[c]
12–< 24	29.92[c]	1.62	206.17[c]
24–< 36	34.60[c]	3.52	[d]

[a] Difference statistically significant: the probability of this result occurring by chance is < 0.001.
[b] Significance is in favour of the "before" children with $P < 0.0005$.
[c] Difference statistically highly significant: the probability of this result occurring by chance is < 0.00001.
[d] Test not performed.

8.2.4 *Interpretation of results*

In general the data showed that the Country A supplementary feeding scheme has been quite effective in improving the nutritional status of beneficiaries, particularly for those who were the most malnourished (see Tables 2, 3 and 8 and Fig. 6, 7 and 8). The improvement is more striking when the nutritional indicator weight for height is examined.

The poor results associated with the indicator height for age have already been explained (section 8.2.2, page 33): they are a direct result of a systematic error of measurement.

The analysis by sex showed that the improvement in nutritional status (with the exception of height for age—for the reasons just stated) was equally satisfactory for girls and boys (Table 4). The data revealed, however, that for one nutritional indicator (weight for height) the proportion of malnourished boys when the feeding scheme began was lower than that of girls (13.1% as opposed to 16.6%) and that this difference was statistically significant (χ^2 value 8.74; $P < 0.001$); 3 years later this trend was reversed with the proportion of malnourished boys now being greater than that of girls (0.9% as opposed to 0%: χ^2 value 11.43; $P < 0.001$).

The analysis by age was the most interesting (Tables 5, 6 and 7). The following observations were made:

— no significant acute malnutrition was observed at any age in the 1977 data;

— malnutrition levels increased with age until the beginning of the third year of life, when they began to decrease (this trend was consistent throughout the data, whichever nutritional indicator was considered, and corresponds to the weaning period);

— malnutrition levels were highest in the age class 12–< 24 months and the levels were almost identical whichever nutritional indicator was considered;

— no conclusion can be drawn from the absence of a statistically significant difference between the "before" and "after" data for the indicator height for age (systematic error of measurement);

— the improvement in nutritional status, throughout all age groups (except that of < 6 months), was most evident when the weight-for-height indicator was examined.

It should be pointed out that on the basis of these findings the authorities of Country A, who had hitherto requested increased assistance so as to include children up to 5 years of age in the scheme, reversed their decision and chose instead to maintain the *status quo.*

It should also be noted that improvements other than the provision of supplementary food might have played a part in these results (e.g., improved environmental conditions, increased family revenues, better immunization coverage, and improved infant feeding practices). It is precisely the purpose of evaluation to determine the weight of each of these factors (if any) in achieving the measured results. Without the measurement of nutritional impact, however, evaluation becomes a strictly subjective exercise of somewhat limited value.

8.3 Country B programme

The Country B programme, initiated in 1969, was aimed at providing supplementary food to malnourished infants and children attending the network of MCH clinics covering that island country of some 5 million population. Unlike other feeding schemes aimed at vulnerable groups, the Country B programme was organized as a result of the findings of a countrywide nutrition survey conducted in 1968 which indicated the presence of a malnutrition problem of some significance among the child population under 5 years of age.

The scheme put into effect was quite simple. The Government estimated that some 70–80% of the pregnant women and lactating mothers in the country regularly attended MCH clinics (at least 4 times a year and, in the case of one-third of them, 6 times a year). A system of weight records already existed in some clinics. This was brought into general use, and MCH staff were invited to include in the supplementary feeding scheme infants and children whose weight for age was below the median −1 S.D.

In 1972, 3 years after the scheme had been in operation, a cross-sectional survey was conducted in 8 of the 21 administrative districts into which the island was subdivided. These 8 districts were considered to be representative of the various socioeconomic and ethnic groups and climatic conditions in Country B.

The results of the pre-programme survey (1968) and of the 1972 survey are summarized in Tables 9, 10 and 11.

Table 9. Distribution of indicators before (1968) and after (1972) intervention

Nutrition level	Indicators					
	Weight for age		Height for age		Weight for height	
	Before	After	Before	After	Before	After
No. examined	3023	3580	3023	3580	3023	3580
No. below median −1 S.D.	2740	3177	2497	2834	1883	2210
% below median −1 S.D.	90.6	88.7	82.6	79.0	62.3	61.7
No. below median −2 S.D.	1776	1965	1576	1608	441	488
% below median −2 S.D.	58.7	54.9	52.1	45.0	14.6	13.6

Table 10. Prevalence of malnutrition before (1968) and after (1972) intervention*

Malnutrition level	Indicators					
	Weight for age		Height for age		Weight for height	
	Before	After	Before	After	Before	After
Excess below median −1 S.D.	74.7%	72.8%	66.7%	63.1%	46.4%	45.8%
Excess below median −2 S.D.	56.4%	52.6%	49.8%	42.7%	12.3%	11.3%

*See Table 2, page 32, for details of calculation.

Table 11. Reduction in prevalence of malnutrition (effectiveness of project)*

Malnutrition level	Indicators (% reduction)		
	Weight for age	Height for age	Weight for height
Below median −1 S.D.	2.5%	5.4%	1.3%
Below median −2 S.D.	6.7%	14.3%	8.1%

*Expressed as percentages of the initial (1968) prevalences calculated in Table 10.

Statistical calculations of malnutrition levels (malnutrition = below median −2 S.D.) based on Table 9 gave the following values for χ^2:

Weight for age: 9.79[a]
Height for age: 32.55[b]
Weight for height: 1.16[c]

[a]Statistically significant; the probability of this result occurring by chance is < 0.005.
[b]Statistically highly significant; the probability of this result occuring by chance is < 0.00001.
[c]Not significant.

In contrast to the Country A data, the data collected in the course of the first two cross-sectional surveys[1] in Country B did not show very satisfactory results. In particular, the effectiveness of the project (Table 11) was at best mediocre.

The statistical analysis of the general prevalence of malnutrition has revealed a pitfall which must often be avoided in programmes of this nature—namely:

— the reduction in malnutrition levels observed after 3 years of operation is statistically significant for two indicators (weight for age and height for age);
— on the other hand, it would be completely erroneous to conclude that the effectiveness of the programme could have had any significant impact in reducing the public health problem of malnutrition in Country B.

The observed improvement in height for age may or may not have been due to the feeding scheme. One does not know the physiological significance of this finding and therefore one cannot draw the conclusion that it is a health benefit deriving from the feeding scheme.

In other words statistical significance is not synonymous with efficacy from a public health standpoint.

[1] We have purposely limited the analysis of the Country B data to the first three tables so as not to complicate this section unduly. Otherwise, the same procedure as for the Country A data should be followed.

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Annex 1

Standardization procedures for the collection of weight and height data in the field[1]

The procedures described here are aimed at helping a field investigator to answer the following questions about the anthropometric data that he is in the process of collecting:

(1) How do repeated but independent measurements of the same subject compare in precision? By this criterion, a worker may be truly precise and yet decidedly wrong at the same time—a not uncommon occurrence in other endeavours.

(2) How nearly correct and how accurate are the observers? In other words, how close do they come to the values of an accepted standard? Faced with this problem, field workers are commonly advised to use the average (mean) of measurements made by all observers. In reality the supervisor and his staff all recognize the value determined by the supervisor as the most reliable. He has the greater experience, he is able to evaluate his own accuracy by standardizing his measurements with those of colleagues with which he will eventually compare his data. The pragmatic practice of accepting the supervisor's measures as a standard simplifies calculations and the interpretation of results.

(3) Finally, where are the errors being made? Do they result just from carelessness? Is there a consistent error in taking the measurement? Or is the procedure itself fundamentally at fault?

This standardization procedure provides a prompt return of information, pinpointing errors so that correction can be made before sources of error become fixed. It signals when performance has reached a satisfactory degree. Because observers analyse their own findings, they quickly learn to appreciate the virtue of care. The supervisor learns what features need to be stressed to ensure precise and accurate measurements and what are fairly superfluous refinements.

1. Data collection

Ten subjects constitute the usual standardization series. Each observer measures each subject twice in such a way as to avoid being influenced by the first measurement; otherwise good agreement is likely to be spurious. The results of the initial measurement are noted on an appropriate record form and put aside until the second series of measurements is taken, in the same order as before. The results of a standardization series on the heights of 4-year-old children are shown in Table 12.

2. Calculations (see Tables 13 and 15)

Step 1 — The results of duplicate measurements are entered in the first 2 columns *a* and *b*.

[1] Adapted from: Habicht, J. P. Estandardización de métodos epidemiológicos cuantitativos sobre el terreno. *Boletín de la Oficina Sanitaria Panamericana*, **76**: 375-384 (1974).

Step 2 — In column d the figure corresponding to $(a-b)$ is entered with its appropriate sign.

Step 3 — In column d^2, $(a-b)$ is squared. Instead of squaring results, the approximate value of $(a-b)^2$ can be read directly from a table of approximations to squares (see Table 15) with no loss in satisfactory results. Its use also facilitates later steps and reduces errors of addition because only the digits necessary for later analysis are recorded. Directly adding the ds would also save the squaring step, but sensitivity is lessened and the results are difficult to interpret.

Step 4 — Pluses and minuses of $(a-b)$ are counted. The sum of the most frequently occurring sign constitutes the numerator of a fraction of which the total number of signs is the denominator. Zeros are ignored.

Step 5 — In column s, the sum of $(a+b)$ is entered.

These five steps are carried out simultaneously by all observers *and the supervisor.*

Step 6 — The s column of the supervisor's sheet is transferred to the sheet of each observer under column S.

Step 7 — The difference between the observer's s and the supervisor's S is entered in column D $(s-S)$ with the appropriate sign, and squared in column D^2.

Step 8 — Pluses and minuses of $(s-S)$ are counted. The sum of the most frequently occurring sign constitutes the numerator of a fraction of which the total number of signs is the denominator. Zeros are ignored.

Step 9 — The sums of d^2 and D^2 and the results of the sign counts are transferred to a single sheet of paper as in Table 14.

3. Evaluation of results (see Table 14)

The following general rules apply in the analysis of results:

(1) The supervisor's Σd^2 will usually be the smallest; his precision will be the greatest because of his expected greater competence.

(2) An observer's Σd^2 (inversely related to precision†) is arbitrarily no more than twice (this factor f should be smaller than 2.97 for theoretical reasons) the supervisor's Σd^2.

(3) An observer's ΣD^2 (inversely related to accuracy††) is arbitrarily no more than twice (this factor should be smaller than $2f$ for theoretical reasons) the supervisor's Σd^2.

(4) An observer's ΣD^2 should be larger than his Σd^2. If it is not, the data should be closely scrutinized and recalculated (see comments on Observer F, Table 14).

The first step in the evaluation is to inspect the summary of results as they are presented in Table 14, bearing in mind the four rules listed above. When inadequacies have been revealed (for example, an observer's Σd^2 which is more than twice the supervisor's Σd^2), the next step is to inspect the "sign" column on the worksheet (Table 13).

In theory there should be as many pluses as minuses and thus no statistically significant sign test. This is ascertained by checking the results under the "sign" column (Table 13) with the numbers given in Table 16 to see if there is any significance.

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† Precision = ability to repeat the measurement of the same subject with the minimum variation. Ideally Σd^2 should be equal to zero for both supervisor and observers.

†† Accuracy = ability to obtain a measurement which will duplicate as closely as possible that of the supervisor. Ideally an observer's ΣD^2 should be equal to zero.

A significant sign test for the *d* column (Table 13) indicates a probable difference between the first and second measurements; either the observer tired or the subject changed in some respect. The latter event occurs, for example, when a nude toddler urinates unnoticed between first and second weighings. The observer often tires when many children are measured and all first heights are determined before the second measurement begins. Effort and attention tend to wane the second time round and the children may appear to have grown.

A significant sign test for the *D* column indicates that the performance of the observer differs from that of the supervisor, either in too large values (more pluses than minuses) or too small (more minuses than pluses); *the observer has a systematic bias.*

In this particular exercise, not all the individual worksheets are printed. Table 13 gives the values obtained by Observer E as an example. We have drawn on the data presented in Tables 12, 13 and 14 to discuss certain results.

The supervisor (Table 14) does indeed possess the greatest precision: his Σd^2 is the smallest. Three staff workers show adequate precision: their Σd^2 is less than twice that of the supervisor (588). The three other workers do not show adequate precision because their Σd^2 is more than twice that of the supervisor.

Since none of the sign tests for *d* are significant, systematic differences between the first and second measurements were not to blame (Tables 14 and 16).

Inspection of the raw data (Table 12) reveals that Observer C's precision was not wholly satisfactory, owing to one poor duplicate. It may be hoped that this will not recur. Observer D's precision was poor throughout.

One of the observers—A—was consistently accurate (ΣD^2 less than 882 (Table 14)); all others were poor (D^2s too high). In part, this was because of poor precision (Observers C, D and F), and in part because of systematic bias, as indicated by sign tests (Observers B, D and E). Observer F's Σd^2 is larger than his ΣD^2. His performance demands special attention.

Inspection of calculation worksheets (Table 13 or raw data in Table 12) further reveals that Observers D and E were doing something basically wrong: they were systematically measuring more than 7 mm too high. Observer B had the same fault, but to a lesser degree (4 mm).

Observer F's poor accuracy was due to the first four measurements. He did not gain dependable ability until the fourth child examined on the first round; thereafter, his record was satisfactory. These faults explain the discrepancy between his $\Sigma d^2 = 1278$ and his $\Sigma D^2 = 1049$.

Observers learn eventually to interpret their own standardization results and to evaluate calculation worksheets (Table 13) as a means of improving performance. Under "Observations" in summary Table 14, the supervisor verifies such conclusions by his staff members.

The above analysis can be recapitulated as follows:

The summarizing figures Σd^2 and ΣD^2 of observers, when compared with the supervisor's Σd^2, yield a quick assessment of work performance. If an observer's Σd^2 is more than twice, or his ΣD^2 is more than thrice, the supervisor's Σd^2, individual columns are examined. A large Σd^2 indicates careless measuring, or fatigue, or changes in the subject over a period of time to be determined by inspection of signs or individual *d*s.

A large ΣD^2 indicates carelessness, or systematic bias (inspection of the signs of the individual *D*s), or single differences in qualitative judgement (single large *D*). Once the nature of the error is identified, correction is ordinarily simple.

Table 12. Raw data in a standardization test for measurements of height (in millimetres) of preschool children

Child No.	Supervisor		Observer											
			A		B		C		D		E		F	
	a	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*
1	828	822	819	826	841	834	833	828	838	825	842	837	836	819
2	838	846	846	846	842	854	849	856	850	856	861	854	860	845
3	860	856	863	861	856	865	*875*	*853*	882	872	862	858	873	860
4	862	860	862	850	866	855	854	864	856	869	875	865	874	854
5	820	820	825	823	827	826	826	822	836	828	826	827	818	827
6	856	854	857	862	855	860	856	864	862	873	864	860	858	856
7	823	824	824	825	826	824	827	826	832	825	820	835	818	827
8	876	876	880	875	877	875	873	878	879	887	884	882	876	874
9	801	806	810	804	811	810	809	808	811	800	820	815	800	797
10	853	865	858	852	859	860	857	860	856	856	866	870	852	856

Column *a* = First measurement.
Column *b* = Second measurement, independently made after an appropriate interval and recorded separately.

Table 13. Calculations of a standardization test (data of Observer E in Table 12)

Child No.	*a* 1st measurement	*b* 2nd measurement	*d* $(a-b)$	d^2 $(a-b)^2$	Sign	*s* Observer $(a+b)$	*S* Supervisor $(a+b)$	*D* $(s-S)$	D^2 $(s-S)^2$	Sign
1	842	837	+ 5	25	+	1 679	1 650	+ 29	841	+
2	861	854	+ 7	49	+	1 715	1 684	+ 31	961	+
3	862	858	+ 4	16	+	1 720	1 716	+ 4	16	+
4	875	865	+ 10	100	+	1 740	1 722	+ 18	324	+
5	826	827	− 1	1	−	1 653	1 640	+ 13	169	+
6	864	860	+ 4	16	+	1 724	1 710	+ 14	196	+
7	820	835	− 15	225	−	1 655	1 647	+ 8	64	+
8	884	882	+ 2	4	+	1 766	1 752	+ 14	196	+
9	820	815	+ 5	25	+	1 635	1 607	+ 28	784	+
10	866	870	− 4	16	−	1 736	1 718	+ 18	324	+
Sums			+ 17	477	7/10			+ 177	3875	10/10

Table 14. Summary of findings from a standardization test of height measures of preschool children

Measurers	Σd^2	"Signs"	ΣD^2	"Signs"	Observations (by supervisor)
Supervisor	294	4/8			Best precision, as expected
Observers A	324	6/9	524	7/10	Both precision and accuracy satisfactory.
B	431	6/10	1 195	8/9	Precision satisfactory. Accuracy deficient; values too great by 3.8 mm. Re-examine same children under supervision, with instruction.
C	774	5/10	1 024	7/10	Poor precision due to one poor duplicate: accuracy almost adequate. With adequate precision, accuracy can be expected to be adequate
D	893	5/9	3 655	9/10	Overall poor precision; measures 7.4 mm too long; poor attitude, careless. Talk to him and restandardize.
E	477	7/10	3 875	10/10	Precision satisfactory; doing something wrong systematically; 8.9 mm too long. (On repeating measurement, he is observed to stretch children while measuring them.)
F	1 278	7/10	1 040	6/10	Poor precision and accuracy due to first four measures. Thereafter satisfactory.

Supervisor's 2 x Σd^2 = 588.
Supervisor's 3 x Σd^2 = 882.

Table 15. Approximations to squares with less than 3.5% error

Number to be squared	Approximate square	Number to be squared	Approximate square
1	1	25	625
2	4	26	675
3	9	27	725
4	16	28	800
5	25	29	850
6	35	30	900
7	50	31	975
8	65	32	1 025
9	80	33-34	1 120
10	100	35	1 200
11	120	36-37	1 330
12	140	38-39	1 480
13	170	40	1 600
14	200	45	2 000
15	225	50	2 500
16	260	55	3 000
17	290	60	3 600
18	325	65	4 300
19	360	70	4 900
20	400	75	5 600
21	450	80	6 400
22	475	85	7 200
23	525	90	8 100
24	575	95	9 000
		100	10 000

Table 16. Given a prescribed number of subjects to be measured, the number of differences of the same sign that must occur to recognize a difference[a] between first and second measurements (*d*) or between supervisor and staff worker (*D*)

Number of subjects	Number of differences with same sign
5	At least: 5
6	6
7	7
8	7
9	8
10	9
11	9
12	10
13	10
14	11
15	12
16	12
17	13
18	13
19	14
20	15

[a]Two-tailed probability, $P < 0.1$; one-tailed probability, $P < 0.05$.

Annex 2

Statistical aspects of sampling

1. Introduction

In general, evaluation of the impact of supplementary feeding programmes on the nutritional status of vulnerable groups will focus on establishing whether or not the proportion of malnourished individuals (infants or preschool children) has decreased within a specified time period, "malnourishment" being defined by any one of the following three indicators, singly or in combination:

— weight for age
— height for age
— weight for height

} below a certain level as compared with the same indicators measured in a reference population.

As has already been stated in section 5.2 of the main text, information on which to base an assessment of the nutritional impact of supplementary feeding is rarely (if ever) collected in the course of programme implementation. On the other hand, data on the nutritional status of the population covered by the programme are a *sine qua non* if the essential objective of the programme (i.e., its nutritional impact) is to be evaluated in an objective way. It is therefore important to know the degree of precision and the reliability of the data collected, if these measurements are to be meaningful.

In order to obtain the requisite information on nutritional status it is unnecessary—and even inefficient—to examine the entire population benefiting from the supplementary feeding. Adequate data may be obained by examining a sample of the population. However, data collected in a sample cannot provide more than an estimate of the situation in the population from which the sample was selected. Such an estimate only has value if one knows how good it is; this depends entirely on the quality and the size of the sample.

Efficient sampling requires some expertise in statistics, and the participation of a statistician experienced in evaluation activities linked to the programme will usually be indispensable.

Statistical expertise, however, is not always readily available to the programme manager, and with this constraint in mind, the basic principles underlying sampling and the formulae for calculating the required sample size and the final value of the estimate derived from the sample are described below for general guidance. These principles and the correct use of the formulae are illustrated with a hypothetical example in the final section of this annex (page 53).

2. Basic considerations

Four basic questions have to be answered by the programme manager prior to organizing any sampling activity—namely:

(1) What are the resources at my disposal for an evaluation?

(2) What is the proportion of malnourished children in the population selected to receive food supplements?

(3) What reduction in the proportion of malnourished children would I expect this project to achieve?

(4) What precision do I require of the estimate derived from the sample?

Until these questions have been carefully considered and answers provided, it would be illusory to embark on a sampling exercise and assume that it would in the end supply the requisite information.

2.1 *Available resources*

These include such items as:

- personnel,
- transportation,
- data-processing equipment and facilities,
- equipment for field measurement (balances and measuring boards),
- sampling frame (list of administrative districts, census data, name and location of villages, lists of households, etc.).

(The list is not exhaustive.)

A first analysis of resources will allow one to establish the needs and to calculate an initial rough estimate of costs involved in the operation, assuming various sample sizes; it will also allow the programme manager to identify the existing constraints (e.g., lack of trained personnel, inadequate transport, insufficient demographic data, and inadequate measuring instruments) and to plan for their correction, if feasible. Alternatively, an analysis of resources could establish the maximum possible sample size in a situation in which some constraints cannot be removed and some resources cannot be expanded.

2.2 *Prevalence of malnourished children*

Usually this figure is not known with great precision—if it is known at all. In practice, an exact knowledge of the proportion of malnourished children existing in the population selected to receive supplementary feeding is not necessary at this stage. A rough estimate may give an entirely satisfactory approximation.

Sometimes a range of values may be given, a sort of well-informed guess—e.g., the proportion is estimated to be between the values 20% and 30%. In this case, it is advisable to start the computations with the value closer to 50% (i.e., 30%) because, for a given precision, the closer one gets to 50%, the larger the sample size that will be required (an explanation of this phenomenon will be found in section 3 of this annex). If it turns out that the measured value is in fact lower than 30%, then the precision of the estimate is improved. On the other hand, if computations of the sample size are based on the lower value and if the proportion obtained from the sample is higher, the precision of the estimate will be negatively affected and the sampling investigation may have proved wasteful.

In other instances it might even be necessary to organize a small *ad hoc* survey in order to obtain a rough "guesstimate" of the required range of values.

2.3 *Aimed-for reduction in the prevalence of malnourished children*

Even under the best of circumstances a reduction of 90% or more will rarely, if ever, be achieved (e.g., from a 40% prevalence to one of 4%). On the other hand, it is not unreasonable to

aim for a reduction in the range of 40-60%, if a programme is to make sense from a public health standpoint (i.e., from a 40% prevalence to one ranging between 16% and 24%). The exact level of reduction will vary from one project to the next; what matters is that a *minimum* figure should be selected by the programme management.

2.4 *The precision required of the estimate*

An estimate of the proportion of malnourished children in a particular population has little value if one cannot state how good an estimate it is. Short of counting and measuring the total population, the prevalence figure derived from a sample is always an approximation which, together with its precision, can define a range—or confidence interval—within which the true value should "most probably" be located.

The expression "most probably" can be defined quantitatively—for example, one can state a probability of 90%, 95%, 99%, etc. These probability levels, which are stipulated in advance, are referred to as "confidence levels". In most health investigations a 95% confidence level is assumed.

The range within which the true value should lie at the 95% confidence level is referred to as the "95% confidence interval" and the end-points of this interval are referred to as the "95% confidence limits".

3. Estimating the sample size

Before embarking on the selection of a sample and the collection of data, one has to know how many individuals should be included in the survey—i.e., the minimum sample size which would permit the estimation of the prevalence level (or proportion) of malnourished individuals for a predetermined (maximum) confidence interval. Because in preschool children the prevalence of malnutrition varies with age, it is necessary to estimate the minimum sample size separately for each age group. This estimate by age group depends on:

— the proportion of malnourished individuals one expects to observe in the sample, and
— the width of the confidence interval one is ready to accept.

The formula to calculate the confidence limits is the following:

$$\text{C.I.} = p \pm 2 \{p\,(100 - p)/n\}^{1/2},$$

where C.I. = the lower and upper limits of the confidence interval,
p = the percentage of malnourished individuals,
$100 - p$ = the percentage of well-nourished individuals,
2 = the approximate value associated with the 95% confidence interval (the exact figure is 1.96),
n = the number of individuals included in the sample.

From this formula the one to calculate the sample size can be derived. It may be seen that the width of the confidence interval (W) is in fact expressed by the term $\pm 2 \{p\,(100 - p)/n\}^{1/2}$. A second formula can thus be written, as follows:

$$W = 2 \times 2 \{p\,(100 - p)/n\}^{1/2},$$

from which n is derived by squaring both sides of the equation and multiplying by n:

$$W^2 \times n = 4 \times 4 \{p\ (100 - p)/n\} \times n,$$
$$n = 16\ p\ (100 - p)/W^2.$$

To obtain n it is therefore necessary to choose a value for W and to know the value of p. Determining the value of p is precisely the objective of the survey. For the present purpose it is not necessary to know the exact proportion and, as stated earlier, in section 2.2 of this annex, a rough estimate may give an entirely satisfactory approximation.

Example: Required precision for the estimate of change = ± 5%,
Width of confidence interval (W) = 10%,
Estimated p value = between 30% and 35%.
(Therefore the value closer to 50% (i.e., 35%) is selected.)

Substituting these values in the foregoing formula, we have:

$$n = 16 \times \frac{(35 \times 65)}{(10)^2} = 16 \times \frac{2275}{100} = 364.$$

Having repeated this operation for each age category with the appropriate estimated values (i.e., the percentage of malnourished children), one obtains a total sample size of $n = n_1 + n_2 + \ldots + n_j$, where j corresponds to the number of age groups chosen.
If one also expects malnutrition to differ by sex, then n has to be multiplied by 2.

The above two formulae call for the following five comments:

(1) The size of the population from which the sample is drawn does not seem to enter into the arithmetic and therefore does not seem to influence the estimate. This is because it has been assumed that the sample is drawn from an *infinite population.*

For a *finite population* a correction factor should be applied to the confidence interval. This factor is $\{1 - (n/N)\}^{1/2}$, where n = number in the sample and N = the "finite" population from which the sample is drawn. Thus when the sampling fraction n/N is small, the factor is almost 1 and therefore negligible; if the fraction is large (for instance ≧ 0.10) the correction factor should be taken into account, since it will improve the precision of the estimate.

Example: Required precision = ± 5%,
p = 50%,
$\frac{n}{N} = \frac{400}{3500} = 0.11$,
Correction factor = $(1 - 0.11)^{1/2} = 0.94$.

Applying this correction factor, we have:

C.I. = 50% ± (5% × 0.94)
= (45.3%, 54.7%).

(2) For a *finite population* and where the sampling fraction n/N appears to be large (for instance ≧ 0.10) a revised estimate of n can be calculated by applying the formula:

$$n \text{ revised} = \frac{n}{1 + (n/N)}.$$

In the example in (1) above, where $n = 400$;

$$n \text{ revised} = \frac{400}{1 + 0.11} = 360.$$

(3) The approximations provided will apply under most practical circumstances except those for extreme values (e.g., $p \leq 5\%$ or $p \geq 95\%$) and small samples when the distribution of confidence limits becomes asymmetric around the observed proportion.

At the end of this annex (Table 17) we have tabulated the 95% confidence intervals of binomial proportions between 1% and 45%, for sample sizes ranging from 30 to 3000.[1]

(4) The formulae only apply if the sample on which the estimate is based is representative of the population is which the prevalence of malnourished children is sought. This requisite is met by drawing the sample at random, so that:

— every person in the population that the sample is to represent has an equal chance of being included;
— the selection of an individual is independent of that of any other individual.

Theoretically the simplest way of meeting these two requirements is to list the whole population, allocate a number to each individual and draw a sample of the required size according to a list (or a table) of random numbers. This method is known as *simple random sampling.* In practice, especially when the population to be sampled is large, it may be prohibitively expensive to reach and examine all individuals thus selected.

(5) When the actual sample is drawn, one must verify that the various age (and sex) categories are adequately represented.

4. Cluster sampling

To reduce the cost and difficulties associated with the simple random sampling method, one can regroup the population into convenient groups (or clusters), draw a random sample of the groups and then examine all the individuals thus selected. Rather than a single person, a cluster of persons is the sampling unit. This method is known as *cluster sampling.*

As in the case of simple random sampling, it is also possible with cluster sampling to calculate the 95% confidence interval of the estimate derived from the sample (neglecting the correction for a finite population). The formula for this calculation is:

$$\text{C.I.} = p \pm 2 \left\{ \sum_{i=1}^{k} (p_i - p)^2 / [k\,(k-1)] \right\}^{1/2},$$

where p = the percentage of malnourished children found in the entire sample,
p_i = the percentage of malnourished children found in cluster i,
k = the number of clusters,
2 = the factor associated with the 95% confidence interval.

It can be seen that the confidence interval depends on the variations between clusters and on the number of clusters. The variation between clusters may arise in two ways:

(1) *The distribution of malnutrition is homogeneous*

There will still be a random variation between the selected clusters. The sampling error will be comparable to that which would have been obtained by simple random sampling and, on the average, the confidence interval of the estimate will be equal whether the first formula $\pm 2 \{p\,(100 - p)/n\}^{1/2}$ or the second formula $\pm 2 \left\{ \sum_{i=1}^{k} (p_i - p)^2 / [k\,(k-1)] \right\}^{1/2}$ is used.

[1] Source of tabulations: *Adequacy of sample size* (WHO unpublished document HSM/73.1).

(2) *The distribution of malnutrition is "patchy"*

Malnutrition levels are greater in some groups than in others and/or the levels differ from region to region. This heterogeneity will be reflected in the confidence interval: cluster sampling will give a larger confidence interval than simple random sampling, since, in addition to the sampling error, the real variation between clusters contributes to the error of the estimate.

In the case of cluster sampling the formula used to calculate the confidence interval cannot be applied to estimate the required sample size. In practice, if it is possible for the evaluators to make a "guesstimate" of the proportion of malnourished children as a whole in the population being assisted, it is extremely difficult—not to say impossible—to make a "guesstimate" of the proportion of malnourished children for each and all of the clusters which together will constitute the sample.

The method of procedure is then as follows:

(*a*) Calculate the required sample size using the following formula:

$n = 16\, c\, p\, (100 - p) / W^2$, where c = cluster factor (in most cases $c = 2$ will be adequate).

(*b*) Decide on the number m of individuals that would constitute a cluster (usually on the basis of practical considerations).

(*c*) Divide n by m to obtain k: the total number of clusters.

When deciding on the number and size of clusters to be selected, one can be guided by the following considerations:

(1) When the distribution of malnutrition in the population is *homogeneous,* the number of clusters can be relatively small.

(2) If the distribution of malnutrition is *"patchy"*, the number of clusters should be large.

(3) The daily output of the evaluation team is the best factor to determine the cluster size. In general, the size of a cluster should be such that it should be possible for an evaluation team to finish work in one cluster at the end of a working day—i.e., it should be possible to evaluate a cluster in 1, 2 or 3 or more days' work but not fractions of days (1½ days, 2⅓ days, 3¼ days).

Finally, it should be noted that owing to easier and more efficient supervision, cluster sampling has a definite advantage over simple random sampling in helping to reduce the frequency of nonsampling errors such as erroneous measurements, mistakes in recording and computing the data, lack of cooperation of the population, nonadherence to the sample design, and incomplete coverage.

5. Stratified sampling

The heterogeneity associated with clusters can be avoided if it is possible to divide the population into a number of categories (or strata) in which the variation in the proportion of malnourished children is small relative to that in the whole population of children. A number of clusters can then be allocated to each of the strata. Examples of strata are: different geographical or administrative areas; urban or rural populations; and different ethnic groups.

A gain in accuracy is obtained because the standard error of the estimate that can be made with the pooled clusters for each stratum will be smaller than that for the same number of clusters randomly selected. This is due to the homogeneity within the stratum.

The 95% confidence interval of the estimate derived from stratified sampling (neglecting the correction for a finite population) is given by the formula:

$$\text{C.I.} = p \pm 2 \left\{ \sum_{j=1}^{s} \sum_{i=1}^{k} (p_{ji} - p_j)^2 / [k\,(k-s)] \right\}^{1/2},$$

where p = the percentage of malnourished children found in the entire sample,
p_{ji} = the percentage of malnourished children found in cluster i of stratum j,
p_j = the percentage of malnourished children found in stratum j,
k = the total number of clusters,
s = the number of strata.

The above formula calls for the following comments:

(1) The differences between stratum estimates do not contribute to the standard error of the final estimate.

(2) The number of clusters allocated to each stratum is taken proportionally to the population in the various strata. In any case, at least 2 clusters should be selected in each stratum.

(3) The greater the homogeneity within strata and the greater the heterogeneity between strata, the more efficient will be the stratification. Therefore, stratification is indicated when these conditions are likely to be found.

6. Comparison of prevalences

To verify to what extent the food distributed has modified the nutritional status of beneficiaries it is necessary to compare the proportion (prevalence) of malnourished infants/children before (or at the beginning), during, and at the end of an intervention programme. For the comparisons to be meaningful and, in particular, to be achieved in a scientifically acceptable way the confidence limits of the differences observed must be established.

The confidence limits of the differences between two prevalences at the 95% probability level is given by the formula:

$$\text{C.I.}_{1,2} = (p_1 - p_2) \pm \frac{1}{2} (W_1^2 + W_2^2)^{1/2},$$

where p_1 and p_2 = the proportion of malnourished children observed respectively in the 1st and 2nd samples,
W_1 and W_2 = the width of the confidence intervals for the prevalence of malnourished children measured respectively in the 1st and 2nd samples.

Example: At baseline survey: $p_1 = 26\%$ and $W_1 = 8\%$.

After 2 years of operation a new survey is conducted with

$$p_2 = 14\% \quad \text{and} \quad W_2 = 6\%$$

$$\text{C.I.}_{1,2} = (26 - 14) \pm \frac{1}{2} (8^2 + 6^2)^{1/2}$$

$$= 12 \pm \frac{1}{2} (100)^{1/2}$$

$$= 12 \pm 5;$$

i.e., the confidence interval $= 7\% < (p_1 - p_2) < 17\%$.

From these figures it may be concluded that there is a 95% chance that the first prevalence was at least 7% greater than the second one. To put it in different and less precise terms, it may be said that the second prevalence is "significantly" smaller than the first (at the 95% confidence level). The more accurate statement should be preferred.

Similarly, an interval including only negative values would have indicated that the first prevalence had been x% smaller than the second. If it occurs that the confidence interval includes the value 0 (i.e., it includes both positive and negative values) then the difference between the two prevalences is not "significant" at the 95% confidence level.

It must be pointed out that if two prevalences are found not to differ significantly, this does not mean that they are "about the same". Such a conclusion would be justified only if both confidence limits of the difference between two prevalences were close to 0, in which case it would be immaterial whether one or both of the limits were positive or negative.

7. Example of sampling procedure

For the sake of clarification, the following simple hypothetical example has been worked out.

It has been decided to accept the request for food aid submitted by country X and to provide such aid for an initial period of 3 years to supplement school meals. At the beginning of the project, it was estimated—according to the best judgement of the local nutritionists—that the prevalence of malnourished schoolchildren in the age category 72–95 months (the illustration is limited to a single age category) was in the range of 30–35%. (Malnourished children in this case were defined as having a weight-for-height ratio of 2 S.D. below the median of the reference population.)

To verify this assumption, the medical authorities, with the assistance of the international agency concerned, decide to conduct a survey and to examine a sample of children in the age category 72-95 months. They want their estimate to have a precision of ± 5%.

The required sample size is calculated by using the formula:

$$n = 16 \times 2\, p\, (100 - p)/W^2$$

$$= 16 \times 2 \times 35 \times 65/100$$

$$= 728.$$

Participating in the programme are 35 000 schoolchildren, of whom 9000 fall into the age category 72–95 months. These 9000 children are distributed throughout the country in 81 primary schools. By a random process 6 schools[1] (clusters) are selected, giving a total sample population of 772 schoolchildren aged 72–95 months. The results of this first survey are the following:

Cluster No.	No. of children examined	No. of malnourished children	Percentage of malnourished children
1	64	22	34.4
2	98	34	34.7
3	144	56	38.9
4	134	44	32.8
5	170	68	40.0
6	162	64	39.5
	772	288	37.3

[1] A sample of 5 schools would have given a number of children below the desired sample size of 728.

The confidence interval of this proportion of malnourished children, p_1, is given by the formula:

$$\text{C.I.}_1 = p_1 \pm 2 \left\{ \sum_{i=1}^{k} (p_i - p_1)^2/[k\,(k-1)] \right\}^{1/2}$$

$$\sum_{i-1}^{6} (p_i - p_1)^2 = (34.4 - 37.3)^2 + (34.7 - 37.3) + (38.9 - 37.3)^2 + (32.8 - 37.3)^2 + (40.0 - 37.3) + (39.5 - 37.3)^2$$

$$= 50.11.$$

$$\text{C.I.}_1 = 37.3 \pm 2\,\{50.11/(6 \times 5)\}^{1/2}$$

$$= 37.3 \pm 2.6.$$

(Although these 772 children have been drawn from a relatively small "finite" population, the correction factor $\{1 - (n/N)\}^{1/2}$ does not apply. The sampling fraction $W/N = 722/9000 = 0.08$ and is therefore small enough to be neglected.

Two years later, with the assistance of the schoolteachers, a second sample survey is conducted with children in the age bracket 72–95 months so as to compare children in the same age bracket and assess the nutritional impact of a well-balanced school meal supplied for 175 days out of a 365-day year. It should be noted that something like half of these children will have received food supplements for 1 year or less, while the other half will have benefited from food supplements for 2 years.

The evaluators aim for a reduction of 40% in the proportion of malnourished children and therefore expect a prevalence figure of 22% (i.e., $40 \times 37.3/100 = 14.9$; $37.3 - 14.9 = 22.4$) and are ready to accept a precision of $\pm$ 4% at the confidence level of 95%.

The required sample size is: $16 \times 2 \times 22 \times 78/8^2 = 858$.

By the same process of random cluster sampling the following results are observed:

Cluster	No. of children examined	No. of malnourished children	Percentage of malnourished children
A	122	34	27.9
B	130	50	38.5
C	144	44	30.6
D	146	50	34.2
E	98	28	28.6
F	132	24	18.2
G	100	20	20.0
	872	250	28.7

The confidence interval of this proportion of malnourished children, p_2, is given by the same formula used to calculate the confidence interval of p_1; so that $\text{C.I.}_2 = 28.7 \pm 5.5$.

The difference between the two estimated prevalences is

$$p_1 - p_2 = 37.3 - 28.7$$

$$= 8.6.$$

The confidence limits of this difference are given by the formula:

$$\text{C.I.}_{1,2} = (p_1 - p_2) \pm \frac{1}{2}(W_1^2 + W_2^2)^{1/2}$$

$$= 8.6 \pm \frac{1}{2}(5.2^2 + 11.0^2)^{1/2}$$

$$= 8.6 \pm 6.1;$$

i.e., limits of 2.5% to 14.7%.

The conclusion is that the first prevalence figure is at least 2.5% greater than the second one at the 95% confidence level and the aimed-for 40% reduction was not achieved.

TABLE 17. CONFIDENCE INTERVALS FOR BINOMIAL PROPORTIONS AT THE 95% PROBABILITY LEVEL

SAMPLE SIZE	OBSERVED PERCENTAGE								
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
100	0.02– 5.45	0.24– 7.04	0.62– 8.52	1.10– 9.93	1.64–11.29	2.23–12.61	2.86–13.90	3.51–15.16	4.19–16.40
200	0.12– 3.57	0.54– 5.05	1.10– 6.42	1.74– 7.73	2.42– 9.01	3.13–10.25	3.88–11.47	4.64–12.67	5.42–13.85
300	0.20– 2.90	0.73– 4.31	1.38– 5.62	2.08– 6.89	2.82– 8.12	3.59– 9.32	4.38–10.51	5.19–11.67	6.01–12.83
400	0.27– 2.54	0.86– 3.91	1.56– 5.19	2.30– 6.42	3.08– 7.62	3.88– 8.80	4.70– 9.96	5.53–11.11	6.38–12.25
500	0.32– 2.32	0.96– 3.65	1.68– 4.90	2.46– 6.11	3.26– 7.30	4.08– 8.46	4.92– 9.61	5.77–10.74	6.64–11.86
600	0.36– 2.17	1.03– 3.47	1.78– 4.70	2.58– 5.90	3.39– 7.07	4.23– 8.21	5.09– 9.35	5.95–10.47	6.83–11.59
700	0.40– 2.05	1.09– 3.34	1.86– 4.55	2.67– 5.73	3.50– 6.89	4.35– 8.03	5.22– 9.15	6.09–10.27	6.98–11.38
800	0.43– 1.97	1.14– 3.23	1.93– 4.43	2.75– 5.60	3.59– 6.75	4.45– 7.88	5.33– 9.00	6.21–10.11	7.10–11.21
900	0.45– 1.89	1.19– 3.15	1.98– 4.34	2.81– 5.50	3.67– 6.64	4.53– 7.76	5.42– 8.88	6.31– 9.98	7.21–11.07
1000	0.48– 1.84	1.22– 3.08	2.03– 4.26	2.87– 5.41	3.73– 6.54	4.60– 7.66	5.49– 8.77	6.39– 9.86	7.29–10.95
1500	0.56– 1.65	1.35– 2.85	2.19– 4.00	3.06– 5.13	3.95– 6.23	4.85– 7.33	5.76– 8.42	6.67– 9.50	7.60–10.57
2000	0.61– 1.54	1.43– 2.72	2.29– 3.85	3.18– 4.96	4.08– 6.05	5.00– 7.14	5.92– 8.21	6.84– 9.28	7.78–10.35
2500	0.64– 1.48	1.48– 2.63	2.36– 3.75	3.26– 4.85	4.17– 5.93	5.10– 7.01	6.03– 8.08	6.96– 9.14	7.90–10.20
3000	0.67– 1.43	1.53– 2.57	2.41– 3.68	3.32– 4.77	4.24– 5.85	5.17– 6.92	6.11– 7.98	7.05– 9.03	8.00–10.09

TABLE 17. CONFIDENCE INTERVALS FOR BINOMIAL PROPORTIONS AT THE 95% PROBABILITY LEVEL (*continued*)

SAMPLE SIZE	OBSERVED PERCENTAGE								
	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0
60	3.7–20.5	4.3–21.8	5.0–23.0	5.7–24.2	6.4–25.4	7.1–26.6	7.8–27.8	8.5–28.9	9.2–30.1
70	4.1–19.6	4.7–20.8	5.4–22.0	6.1–23.2	6.8–24.4	7.5–25.6	8.3–26.8	9.0–27.9	9.8–29.1
80	4.4–18.8	5.1–20.0	5.8–21.2	6.5–22.4	7.2–23.6	8.0–24.8	8.7–25.9	9.5–27.1	10.3–28.2
90	4.6–18.2	5.3–19.4	6.1–20.6	6.8–21.8	7.5–23.0	8.3–24.1	9.1–25.3	9.9–26.4	10.7–27.5
100	4.9–17.7	5.6–18.9	6.3–20.1	7.1–21.2	7.8–22.4	8.6–23.6	9.4–24.7	10.2–25.9	11.0–27.0
200	6.2–15.1	7.0–16.2	7.8–17.4	8.6–18.5	9.5–19.6	10.3–20.8	11.2–21.9	12.0–23.0	12.9–24.1
300	6.8–14.0	7.7–15.1	8.5–16.3	9.4–17.4	10.2–18.5	11.1–19.6	12.0–20.7	12.9–21.8	13.8–22.9
400	7.2–13.4	8.1–14.5	8.9–15.6	9.8–16.7	10.7–17.8	11.6–18.9	12.5–20.0	13.4–21.1	14.3–22.2
500	7.5–13.0	8.4–14.1	9.2–15.2	10.1–16.3	11.0–17.4	11.9–18.5	12.9–19.6	13.8–20.6	14.7–21.7
600	7.7–12.7	8.6–13.8	9.5–14.9	10.4–16.0	11.3–17.1	12.2–18.2	13.1–19.2	14.0–20.3	15.0–21.4
700	7.8–12.5	8.7–13.6	9.6–14.7	10.6–15.8	11.5–16.8	12.4–17.9	13.3–19.0	14.2–20.0	15.2–21.1
800	8.0–12.3	8.9–13.4	9.8–14.5	10.7–15.6	11.6–16.6	12.6–17.7	13.5–18.8	14.4–19.8	15.4–20.9
900	8.1–12.2	9.0–13.3	9.9–14.3	10.8–15.4	11.8–16.5	12.7–17.5	13.6–18.6	14.6–19.7	15.5–20.7
1000	8.2–12.1	9.1–13.1	10.0–14.2	10.9–15.3	11.9–16.3	12.8–17.4	13.7–18.5	14.7–19.5	15.6–20.6
2000	8.7–11.4	9.6–12.5	10.6–13.5	11.5–14.6	12.5–15.6	13.4–16.7	14.4–17.7	15.3–18.8	16.3–19.8
3000	8.9–11.2	9.9–12.2	10.8–13.3	11.8–14.3	12.7–15.3	13.7–16.4	14.7–17.4	15.6–18.4	16.6–19.5

TABLE 17. CONFIDENCE INTERVALS FOR BINOMIAL PROPORTIONS AT THE 95% PROBABILITY LEVEL (*continued*)

SAMPLE SIZE	OBSERVED PERCENTAGE								
	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0
30	7.0–37.5	7.7–38.6	8.3–39.7	9.0–40.9	9.7–42.0	10.4–43.1	11.1–44.1	11.8–45.2	12.5–46.3
40	8.3–34.5	9.0–35.7	9.7–36.8	10.4–37.9	11.2–39.0	11.9–40.1	12.7–41.2	13.4–42.3	14.2–43.4
50	9.3–32.6	10.0–33.8	10.7–34.9	11.5–36.0	12.2–37.1	13.0–38.2	13.8–39.3	14.6–40.4	15.4–41.5
60	10.0–31.2	10.7–32.4	11.5–33.5	12.3–34.6	13.1–35.7	13.9–36.8	14.7–37.9	15.5–39.0	16.3–40.1
70	10.6–30.2	11.3–31.3	12.1–32.4	12.9–33.5	13.7–34.6	14.6–35.7	15.4–36.8	16.2–37.9	17.0–39.0
80	11.0–29.4	11.8–30.5	12.7–31.6	13.5–32.7	14.3–33.8	15.1–34.9	15.9–36.0	16.8–37.1	17.6–38.1
90	11.5–28.7	12.3–29.8	13.1–30.9	13.9–32.0	14.7–33.1	15.6–34.2	16.4–35.3	17.3–36.4	18.1–37.4
100	11.8–28.1	12.6–29.2	13.5–30.3	14.3–31.4	15.1–32.5	16.0–33.6	16.8–34.7	17.7–35.8	18.6–36.8
200	13.8–25.2	14.6–26.3	15.5–27.3	16.4–28.4	17.3–29.5	18.2–30.6	19.1–31.6	20.0–32.7	20.9–33.8
300	14.7–24.0	15.6–25.0	16.5–26.1	17.4–27.2	18.3–28.2	19.2–29.3	20.2–30.3	21.1–31.4	22.0–32.4
400	15.2–23.2	16.1–24.3	17.1–25.4	18.0–26.4	18.9–27.5	19.9–28.5	20.8–29.6	21.7–30.6	22.7–31.7
500	15.6–22.8	16.5–23.8	17.5–24.9	18.4–25.9	19.3–27.0	20.3–28.0	21.2–29.1	22.2–30.1	23.1–31.2
600	15.9–22.4	16.8–23.5	17.8–24.5	18.7–25.6	19.6–26.6	20.6–27.7	21.5–28.7	22.5–29.7	23.4–30.8
700	16.1–22.1	17.1–23.2	18.0–24.3	18.9–25.3	19.9–26.3	20.8–27.4	21.8–28.4	22.7–29.5	23.7–30.5
800	16.3–21.9	17.2–23.0	18.2–24.0	19.1–25.1	20.1–26.1	21.0–27.2	22.0–28.2	23.0–29.2	23.9–30.3
900	16.4–21.8	17.4–22.8	18.3–23.9	19.3–24.9	20.2–25.9	21.2–27.0	22.2–28.0	23.1–29.0	24.1–30.1
1000	16.6–21.6	17.5–22.7	18.5–23.7	19.4–24.7	20.4–25.8	21.3–26.8	22.3–27.8	23.3–28.9	24.2–29.9
2000	17.3–20.8	18.2–21.9	19.2–22.9	20.2–23.9	21.1–24.9	22.1–26.0	23.1–27.0	24.0–28.0	25.0–29.0
3000	17.6–20.5	18.5–21.5	19.5–22.5	20.5–23.6	21.5–24.6	22.4–25.6	23.4–26.6	24.4–27.6	25.4–28.7

TABLE 17. CONFIDENCE INTERVALS FOR BINOMIAL PROPORTIONS AT THE 95% PROBABILITY LEVEL (*continued*)

SAMPLE SIZE	OBSERVED PERCENTAGE								
	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0	36.0
30	13.2–47.3	13.9–48.4	14.7–49.4	15.5–50.5	16.2–51.5	17.0–52.5	17.8–53.5	18.6–54.5	19.4–55.5
40	14.9–44.5	15.7–45.5	16.5–46.6	17.3–47.6	18.1–48.7	18.9–49.7	19.8–50.7	20.6–51.7	21.4–52.7
50	16.2–42.5	17.0–43.6	17.8–44.6	18.6–45.7	19.5–46.7	20.3–47.8	21.2–48.8	22.0–49.8	22.9–50.8
60	17.1–41.1	18.0–42.2	18.8–43.2	19.7–44.3	20.5–45.3	21.4–46.4	22.2–47.4	23.1–48.4	24.0–49.5
70	17.9–40.1	18.7–41.1	19.6–42.2	20.4–43.2	21.3–44.3	22.2–45.3	23.1–46.3	23.9–47.4	24.8–48.4
80	18.5–39.2	19.4–40.3	20.2–41.3	21.1–42.4	22.0–43.4	22.8–44.5	23.7–45.5	24.6–46.5	25.5–47.5
90	19.0–38.5	19.9–39.6	20.7–40.6	21.6–41.7	22.5–42.7	23.4–43.7	24.3–44.8	25.2–45.8	26.1–46.8
100	19.4–37.9	20.3–39.0	21.2–40.0	22.1–41.1	23.0–42.1	23.9–43.2	24.8–44.2	25.7–45.2	26.6–46.3
200	21.9–34.8	22.8–35.9	23.7–36.9	24.6–37.9	25.6–39.0	26.5–40.0	27.4–41.1	28.4–42.1	29.3–43.1
300	22.9–33.5	23.9–34.5	24.8–35.6	25.8–36.6	26.7–37.7	27.7–38.7	28.6–39.7	29.6–40.7	30.5–41.8
400	23.6–32.7	24.6–33.8	25.5–34.8	26.5–35.8	27.4–36.9	28.4–37.9	29.3–38.9	30.3–39.9	31.2–41.0
500	24.1–32.2	25.0–33.2	26.0–34.3	26.9–35.3	27.9–36.3	28.8–37.4	29.8–38.4	30.8–39.4	31.7–40.4
600	24.4–31.8	25.4–32.9	26.3–33.9	27.3–34.9	28.2–35.9	29.2–37.0	30.2–38.0	31.1–39.0	32.1–40.0
700	24.7–31.5	25.6–32.6	26.6–33.6	27.5–34.6	28.5–35.6	29.5–36.7	30.5–37.7	31.4–38.7	32.4–39.7
800	24.9–31.3	25.8–32.3	26.8–33.3	27.8–34.4	28.7–35.4	29.7–36.4	30.7–37.4	31.7–38.5	32.6–39.5
900	25.0–31.1	26.0–32.1	27.0–33.2	27.9–34.2	28.9–35.2	29.9–36.2	30.9–37.2	31.8–38.3	32.8–39.3
1000	25.2–30.9	26.2–32.0	27.1–33.0	28.1–34.0	29.1–35.0	30.0–36.1	31.0–37.1	32.0–38.1	33.0–39.1
2000	26.0–30.1	27.0–31.1	28.0–32.1	28.9–33.1	29.9–34.1	30.9–35.2	31.9–36.2	32.9–37.2	33.9–38.2
3000	26.4–29.7	27.3–30.7	28.3–31.7	29.3–32.7	30.3–33.7	31.3–34.8	32.3–35.8	33.3–36.8	34.2–37.8

TABLE 17. CONFIDENCE INTERVALS FOR BINOMIAL PROPORTIONS AT THE 95% PROBABILITY LEVEL (*continued*)

SAMPLE SIZE	OBSERVED PERCENTAGE								
	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0	45.0
30	20.2–56.5	21.0–57.5	21.8–58.5	22.6–59.4	23.4–60.4	24.3–61.4	25.1–62.3	26.0–63.2	26.9–64.2
40	22.3–53.7	23.1–54.7	24.0–55.7	24.8–56.7	25.7–57.7	26.6–58.7	27.4–59.6	28.3–60.6	29.2–61.5
50	23.7–51.9	24.6–52.9	25.5–53.9	26.4–54.9	27.3–55.9	28.1–56.8	29.0–57.8	30.0–58.8	30.9–59.8
60	24.8–50.5	25.7–51.5	26.6–52.5	27.5–53.5	28.4–54.5	29.3–55.5	30.2–56.5	31.2–57.5	32.1–58.4
70	25.7–49.4	26.6–50.4	27.5–51.4	28.4–52.4	29.3–53.4	30.3–54.4	31.2–55.4	32.1–56.4	33.0–57.4
80	26.4–48.6	27.3–49.6	28.2–50.6	29.2–51.6	30.1–52.6	31.0–53.6	31.9–54.6	32.9–55.6	33.8–56.6
90	27.0–47.9	27.9–48.9	28.8–49.9	29.8–50.9	30.7–51.9	31.6–52.9	32.6–53.9	33.5–54.9	34.4–55.9
100	27.5–47.3	28.4–48.3	29.4–49.3	30.3–50.3	31.2–51.3	32.2–52.3	33.1–53.3	34.0–54.3	35.0–55.3
200	30.3–44.1	31.2–45.2	32.2–46.2	33.1–47.2	34.1–48.2	35.0–49.2	36.0–50.2	37.0–51.2	37.9–52.2
300	31.5–42.8	32.4–43.8	33.4–44.8	34.4–45.8	35.3–46.8	36.3–47.9	37.3–48.9	38.3–49.9	39.2–50.9
400	32.2–42.0	33.2–43.0	34.1–44.0	35.1–45.0	36.1–46.0	37.1–47.0	38.0–48.1	39.0–49.1	40.0–50.1
500	32.7–41.4	33.7–42.5	34.7–43.5	35.6–44.5	36.6–45.5	37.6–46.5	38.6–47.5	39.6–48.5	40.5–49.5
600	33.1–41.0	34.1–42.1	35.0–43.1	36.0–44.1	37.0–45.1	38.0–46.1	39.0–47.1	39.9–48.1	40.9–49.1
700	33.4–40.7	34.3–41.8	35.3–42.8	36.3–43.8	37.3–44.8	38.3–45.8	39.3–46.8	40.2–47.8	41.2–48.8
800	33.6–40.5	34.6–41.5	35.6–42.5	36.5–43.5	37.5–44.5	38.5–45.5	39.5–46.6	40.5–47.6	41.5–48.6
900	33.8–40.3	34.8–41.3	35.8–42.3	36.7–43.3	37.7–44.3	38.7–45.3	39.7–46.3	40.7–47.4	41.7–48.4
1000	34.0–40.1	34.9–41.1	35.9–42.1	36.9–43.2	37.9–44.2	38.9–45.2	39.9–46.2	40.9–47.2	41.8–48.2
2000	34.8–39.2	35.8–40.2	36.8–41.2	37.8–42.2	38.8–43.2	39.8–44.2	40.8–45.2	41.8–46.2	42.8–47.3
3000	35.2–38.8	36.2–39.8	37.2–40.8	38.2–41.8	39.2–42.8	40.2–43.8	41.2–44.8	42.2–45.8	43.2–46.8

Annex 3

Reference data for the weight and height of children

Introduction

In 1975 a working group was convened to advise WHO on the use of anthropometric indicators of nutritional status in surveys and for nutritional surveillance. After several meetings the working group produced detailed recommendations on the use of children's height and weight data[1] which included the use of a reference population for international comparison. A reference population should meet the following conditions:

(1) The measurements should be drawn from a well-nourished population.

(2) The sample should include at least 200 individuals in each age and sex group.

(3) The sample should be cross-sectional, since it will be used for comparisons of a cross-sectional nature.

(4) The sampling procedures should be defined and reproducible.

(5) The measurements should be carefully taken and recorded by observers trained in anthropometric techniques using equipment of well-tested design and calibrated at frequent intervals.

(6) The measurements should include all the anthropometric variables that will be used in the evaluation of nutritional status.

(7) The data from which reference graphs and tables are prepared should be available for anyone wishing to use them and the procedure used for smoothing curves and preparing tables should be adequately described and documented. After having applied these criteria to the several series of data available, the working group considered that the data assembled by the United States National Center for Health Statistics[2] were the best suited for use as an international reference population since they met most of the above criteria.

The following tables give the distributions of data on weight, stature, and weight by stature in a presentation that follows the recommendations of the working group and allows its use as recommended by the group. Centile distributions are given in decades of centiles. The third, fifth, ninety-fifth, and ninety-seventh centiles are also shown. All values are based on observed data except for the two outer centiles, which were calculated. In addition, the medians plus and minus 1, 2 and 3 standard deviations are tabulated. Since the distributions of weight are not symmetrical, separate standard deviations were calculated for the upper and lower halves of these distributions. These additional statistical tasks were carried out by the United States Centers for Disease Control.

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[1] See: Waterlow, J. C. et al. The presentation and use of height and weight data for comparing the nutritional status of groups of children under the age of 10 years. *Bulletin of the World Health Organization,* **55**: 489-498 (1977).

[2] United States, Public Health Service, Health Resources Administration. *NCHS growth charts,* Rockville, MD, 1976 (HRA 76-1120, 25, 3).

There are separate sets of tables for the age groups 0–36 months and 2–18 years giving height and weight (Tables 18–25); figures for weight by height (up to 145 cm) are also listed (Tables 26–29). The tables are compiled from data from two different child populations: in the case of the age group 0–36 months, from studies of the Fels Research Institute, Yellow Springs, Ohio, and in that of the group 2–18 years, from national samples of the National Center for Health Statistics. Furthermore, recumbent body length is given for the former group, and standing height (stature) for the latter. This accounts for minor inconsistencies at points of overlap.

The data published as charts by the National Center for Health Statistics, which are intended for use within the United States of America, cover children and adolescents up to 18 years of age. With approaching sexual maturity hormonal influences begin to act on body build. Because there are considerable differences in the age of onset of puberty in different populations, the working group did not recommend the use of height and weight data for comparing the nutritional status of groups of children beyond the age of 10. Therefore, although the present tables contain weights and heights of children up to 18 years of age, the figures for the last 8 years should not be used as reference data for comparisons of nutritional status.

Tables in Annex 3

TABLE 18. LENGTH (CM) BY AGE OF BOYS AGED 0–36 MONTHS

AGE MONTHS	CENTILES													STANDARD DEVIATIONS							AGE MONTHS
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
0	46.2	46.7	47.6	48.6	49.3	49.9	50.5	51.1	51.7	52.4	53.4	54.2	54.8	43.6	45.9	48.2	50.5	52.8	55.1	57.4	0
1	49.9	50.5	51.4	52.5	53.3	53.9	54.6	55.2	55.9	56.6	57.7	58.6	59.2	47.2	49.7	52.1	54.6	57.0	59.5	61.9	1
2	53.2	53.9	54.8	55.9	56.7	57.4	58.1	58.7	59.4	60.2	61.4	62.3	62.9	50.4	52.9	55.5	58.1	60.7	63.2	65.8	2
3	56.1	56.8	57.7	58.9	59.7	60.4	61.1	61.8	62.5	63.3	64.5	65.5	66.1	53.2	55.8	58.5	61.1	63.7	66.4	69.0	3
4	58.6	59.3	60.3	61.4	62.3	63.0	63.7	64.4	65.1	66.0	67.1	68.1	68.7	55.6	58.3	61.0	63.7	66.4	69.1	71.7	4
5	60.8	61.5	62.5	63.6	64.5	65.2	65.9	66.6	67.3	68.2	69.4	70.3	71.0	57.8	60.5	63.2	65.9	68.6	71.3	74.0	5
6	62.8	63.4	64.4	65.6	66.4	67.1	67.8	68.5	69.2	70.1	71.3	72.2	72.9	59.8	62.4	65.1	67.8	70.5	73.2	75.9	6
7	64.5	65.1	66.1	67.2	68.1	68.8	69.5	70.2	70.9	71.7	72.9	73.9	74.5	61.5	64.1	66.8	69.5	72.2	74.8	77.5	7
8	66.0	66.6	67.6	68.7	69.6	70.3	71.0	71.6	72.4	73.2	74.4	75.3	76.0	63.0	65.7	68.3	71.0	73.6	76.3	78.9	8
9	67.4	68.0	68.9	70.1	70.9	71.7	72.3	73.0	73.7	74.6	75.7	76.7	77.3	64.4	67.0	69.7	72.3	75.0	77.6	80.3	9
10	68.7	69.3	70.2	71.4	72.2	73.0	73.6	74.3	75.0	75.9	77.0	78.0	78.6	65.7	68.3	71.0	73.6	76.3	78.9	81.6	10
11	69.9	70.5	71.5	72.6	73.5	74.2	74.9	75.6	76.3	77.1	78.3	79.3	79.9	66.9	69.6	72.2	74.9	77.5	80.2	82.9	11
12	71.0	71.6	72.6	73.8	74.7	75.4	76.1	76.8	77.5	78.4	79.5	80.5	81.2	68.0	70.7	73.4	76.1	78.8	81.5	84.2	12
13	72.1	72.7	73.7	74.9	75.8	76.5	77.2	77.9	78.7	79.5	80.7	81.7	82.4	69.0	71.8	74.5	77.2	80.0	82.7	85.5	13
14	73.1	73.8	74.8	76.0	76.9	77.6	78.3	79.1	79.8	80.7	81.9	82.9	83.6	70.0	72.8	75.6	78.3	81.1	83.9	86.7	14
15	74.1	74.7	75.8	77.0	77.9	78.7	79.4	80.1	80.9	81.8	83.1	84.1	84.8	70.9	73.7	76.6	79.4	82.3	85.1	88.0	15
16	75.0	75.7	76.7	78.0	78.9	79.7	80.4	81.2	82.0	82.9	84.2	85.2	85.9	71.7	74.6	77.5	80.4	83.4	86.3	89.2	16
17	75.9	76.6	77.6	78.9	79.9	80.7	81.4	82.2	83.0	83.9	85.3	86.3	87.0	72.5	75.5	78.5	81.4	84.4	87.4	90.4	17
18	76.7	77.4	78.5	79.8	80.8	81.6	82.4	83.2	84.0	85.0	86.3	87.4	88.1	73.3	76.3	79.4	82.4	85.4	88.5	91.5	18
19	77.5	78.2	79.4	80.7	81.7	82.6	83.3	84.1	85.0	86.0	87.3	88.4	89.2	74.0	77.1	80.2	83.3	86.4	89.5	92.7	19
20	78.3	79.0	80.2	81.6	82.6	83.4	84.2	85.0	85.9	86.9	88.3	89.5	90.2	74.7	77.9	81.1	84.2	87.4	90.6	93.8	20
21	79.1	79.8	81.0	82.4	83.4	84.3	85.1	85.9	86.8	87.8	89.3	90.4	91.2	75.4	78.7	81.9	85.1	88.4	91.6	94.8	21
22	79.8	80.6	81.8	83.2	84.3	85.2	86.0	86.8	87.7	88.7	90.2	91.4	92.2	76.1	79.4	82.7	86.0	89.3	92.5	95.8	22
23	80.6	81.3	82.6	84.0	85.1	86.0	86.8	87.7	88.6	89.6	91.1	92.3	93.1	76.8	80.2	83.5	86.8	90.2	93.5	96.8	23
24	81.3	82.1	83.3	84.8	85.9	86.8	87.6	88.5	89.4	90.5	92.0	93.2	94.0	77.5	80.9	84.3	87.6	91.0	94.4	97.7	24
25	82.1	82.9	84.1	85.6	86.7	87.6	88.5	89.3	90.2	91.3	92.8	94.0	94.8	78.3	81.7	85.1	88.5	91.8	95.2	98.6	25
26	82.8	83.6	84.9	86.4	87.5	88.4	89.2	90.1	91.0	92.1	93.6	94.9	95.7	79.0	82.4	85.8	89.2	92.7	96.1	99.5	26
27	83.6	84.4	85.6	87.1	88.2	89.2	90.0	90.9	91.8	92.9	94.4	95.7	96.5	79.8	83.2	86.6	90.0	93.4	96.9	100.3	27
28	84.4	85.2	86.4	87.9	89.0	89.9	90.8	91.7	92.6	93.7	95.2	96.4	97.2	80.5	83.9	87.4	90.8	94.2	97.6	101.1	28
29	85.1	85.9	87.2	88.7	89.8	90.7	91.6	92.4	93.3	94.4	95.9	97.2	98.0	81.3	84.7	88.1	91.6	95.0	98.4	101.8	29
30	85.8	86.7	87.9	89.4	90.5	91.4	92.3	93.2	94.1	95.2	96.7	97.9	98.7	82.0	85.4	88.9	92.3	95.7	99.2	102.6	30
31	86.6	87.4	88.6	90.1	91.2	92.2	93.0	93.9	94.8	95.9	97.4	98.7	99.5	82.7	86.2	89.6	93.0	96.5	99.9	103.3	31
32	87.3	88.1	89.3	90.9	91.9	92.9	93.7	94.6	95.5	96.6	98.2	99.4	100.2	83.4	86.9	90.3	93.7	97.2	100.6	104.1	32
33	88.0	88.8	90.0	91.6	92.6	93.6	94.5	95.3	96.3	97.4	98.9	100.1	100.9	84.1	87.6	91.0	94.5	97.9	101.4	104.8	33
34	88.6	89.4	90.7	92.2	93.3	94.3	95.2	96.0	97.0	98.1	99.6	100.9	101.7	84.7	88.2	91.7	95.2	98.6	102.1	105.6	34
35	89.3	90.1	91.4	92.9	94.0	95.0	95.8	96.7	97.7	98.8	100.3	101.6	102.4	85.4	88.8	92.3	95.8	99.3	102.8	106.3	35
36	89.9	90.7	92.0	93.5	94.7	95.6	96.5	97.4	98.4	99.5	101.0	102.3	103.2	85.9	89.4	93.0	96.5	100.1	103.6	107.1	36

TABLE 19. STATURE (CM) BY AGE OF BOYS AGED 2–18 YEARS

AGE YRS	AGE MTHS	CENTILES													STANDARD DEVIATIONS							AGE YRS	AGE MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
2	0	79.6	80.4	81.5	82.9	83.9	84.8	85.6	86.4	87.3	88.3	89.7	90.8	91.6	76.0	79.2	82.4	85.6	88.8	92.0	95.2	2	0
2	1	80.3	81.1	82.3	83.7	84.7	85.6	86.4	87.2	88.1	89.2	90.6	91.8	92.5	76.7	79.9	83.2	86.4	89.7	92.9	96.2	2	1
2	2	81.0	81.8	83.0	84.5	85.5	86.4	87.2	88.1	89.0	90.0	91.5	92.7	93.5	77.3	80.6	83.9	87.2	90.6	93.9	97.2	2	2
2	3	81.7	82.5	83.8	85.2	86.3	87.2	88.1	88.9	89.8	90.9	92.4	93.6	94.4	78.0	81.3	84.7	88.1	91.4	94.8	98.1	2	3
2	4	82.4	83.2	84.5	86.0	87.1	88.0	88.9	89.7	90.7	91.7	93.2	94.5	95.3	78.6	82.0	85.4	88.9	92.3	95.7	99.1	2	4
2	5	83.1	83.9	85.2	86.7	87.8	88.8	89.7	90.5	91.5	92.6	94.1	95.4	96.2	79.2	82.7	86.2	89.7	93.1	96.6	100.1	2	5
2	6	83.8	84.6	85.9	87.5	88.6	89.5	90.4	91.3	92.3	93.4	94.9	96.2	97.1	79.9	83.4	86.9	90.4	94.0	97.5	101.0	2	6
2	7	84.5	85.3	86.6	88.2	89.3	90.3	91.2	92.1	93.1	94.2	95.8	97.1	97.9	80.5	84.1	87.6	91.2	94.8	98.3	101.9	2	7
2	8	85.2	86.0	87.3	88.9	90.1	91.0	92.0	92.9	93.9	95.0	96.6	97.9	98.8	81.1	84.7	88.3	92.0	95.6	99.2	102.8	2	8
2	9	85.8	86.7	88.0	89.6	90.8	91.8	92.7	93.6	94.6	95.8	97.4	98.8	99.6	81.7	85.4	89.0	92.7	96.4	100.1	103.7	2	9
2	10	86.5	87.3	88.7	90.3	91.5	92.5	93.5	94.4	95.4	96.6	98.2	99.6	100.5	82.3	86.0	89.7	93.5	97.2	100.9	104.6	2	10
2	11	87.1	88.0	89.4	91.0	92.2	93.2	94.2	95.1	96.2	97.4	99.0	100.4	101.3	82.9	86.7	90.4	94.2	98.0	101.7	105.5	2	11
3	0	87.8	88.7	90.0	91.7	92.9	94.0	94.9	95.9	96.9	98.1	99.8	101.2	102.1	83.5	87.3	91.1	94.9	98.7	102.5	106.3	3	0
3	1	88.4	89.3	90.7	92.4	93.6	94.7	95.6	96.6	97.7	98.9	100.6	102.0	102.9	84.1	87.9	91.8	95.6	99.5	103.3	107.2	3	1
3	2	89.0	89.9	91.3	93.1	94.3	95.4	96.3	97.3	98.4	99.6	101.3	102.7	103.7	84.7	88.6	92.4	96.3	100.2	104.1	108.0	3	2
3	3	89.6	90.6	92.0	93.7	95.0	96.0	97.0	98.0	99.1	100.4	102.1	103.5	104.4	85.2	89.2	93.1	97.0	101.0	104.9	108.8	3	3
3	4	90.2	91.2	92.6	94.4	95.6	96.7	97.7	98.7	99.8	101.1	102.8	104.3	105.2	85.8	89.8	93.8	97.7	101.7	105.7	109.7	3	4
3	5	90.9	91.8	93.3	95.0	96.3	97.4	98.4	99.4	100.5	101.8	103.6	105.0	106.0	86.4	90.4	94.4	98.4	102.4	106.4	110.5	3	5
3	6	91.5	92.4	93.9	95.7	97.0	98.1	99.1	100.1	101.2	102.5	104.3	105.7	106.7	86.9	91.0	95.0	99.1	103.1	107.2	111.2	3	6
3	7	92.0	93.0	94.5	96.3	97.6	98.7	99.7	100.8	101.9	103.2	105.0	106.5	107.4	87.5	91.6	95.7	99.7	103.8	107.9	112.0	3	7
3	8	92.6	93.6	95.1	96.9	98.2	99.4	100.4	101.4	102.6	103.9	105.7	107.2	108.2	88.0	92.1	96.3	100.4	104.5	108.7	112.8	3	8
3	9	93.2	94.2	95.7	97.5	98.9	100.0	101.0	102.1	103.2	104.6	106.4	107.9	108.9	88.6	92.7	96.9	101.0	105.2	109.4	113.5	3	9
3	10	93.8	94.8	96.3	98.2	99.5	100.6	101.7	102.8	103.9	105.2	107.1	108.6	109.6	89.1	93.3	97.5	101.7	105.9	110.1	114.3	3	10
3	11	94.4	95.4	96.9	98.8	100.1	101.3	102.3	103.4	104.5	105.9	107.7	109.3	110.3	89.6	93.9	98.1	102.3	106.6	110.8	115.0	3	11
4	0	94.9	95.9	97.5	99.4	100.7	101.9	102.9	104.0	105.2	106.5	108.4	110.0	111.0	90.2	94.4	98.7	102.9	107.2	111.5	115.7	4	0
4	1	95.5	96.5	98.1	100.0	101.3	102.5	103.6	104.7	105.8	107.2	109.1	110.6	111.6	90.7	95.0	99.3	103.6	107.9	112.2	116.5	4	1
4	2	96.0	97.1	98.6	100.5	101.9	103.1	104.2	105.3	106.4	107.8	109.7	111.3	112.3	91.2	95.5	99.9	104.2	108.5	112.8	117.2	4	2
4	3	96.6	97.6	99.2	101.1	102.5	103.7	104.8	105.9	107.1	108.4	110.4	111.9	113.0	91.7	96.1	100.4	104.8	109.1	113.5	117.8	4	3
4	4	97.1	98.2	99.8	101.7	103.1	104.3	105.4	106.5	107.7	109.1	111.0	112.6	113.6	92.2	96.6	101.0	105.4	109.8	114.2	118.5	4	4
4	5	97.7	98.7	100.3	102.3	103.7	104.9	106.0	107.1	108.3	109.7	111.6	113.2	114.3	92.7	97.1	101.6	106.0	110.4	114.8	119.2	4	5
4	6	98.2	99.2	100.9	102.8	104.2	105.4	106.6	107.7	108.9	110.3	112.2	113.9	114.9	93.2	97.7	102.1	106.6	111.0	115.4	119.9	4	6
4	7	98.7	99.8	101.4	103.4	104.8	106.0	107.1	108.3	109.5	110.9	112.9	114.5	115.5	93.7	98.2	102.7	107.1	111.6	116.1	120.5	4	7
4	8	99.2	100.3	101.9	103.9	105.3	106.6	107.7	108.8	110.1	111.5	113.5	115.1	116.2	94.2	98.7	103.2	107.7	112.2	116.7	121.2	4	8
4	9	99.8	100.8	102.5	104.5	105.9	107.1	108.3	109.4	110.6	112.1	114.1	115.7	116.8	94.7	99.2	103.7	108.3	112.8	117.3	121.8	4	9
4	10	100.3	101.3	103.0	105.0	106.4	107.7	108.8	110.0	111.2	112.7	114.7	116.3	117.4	95.2	99.7	104.3	108.8	113.4	117.9	122.5	4	10
4	11	100.8	101.9	103.5	105.5	107.0	108.2	109.4	110.5	111.8	113.2	115.2	116.9	118.0	95.7	100.2	104.8	109.4	114.0	118.5	123.1	4	11
5	0	101.3	102.4	104.0	106.1	107.5	108.8	109.9	111.1	112.3	113.8	115.8	117.5	118.6	96.1	100.7	105.3	109.9	114.5	119.1	123.7	5	0
5	1	101.8	102.9	104.5	106.6	108.0	109.3	110.5	111.6	112.9	114.4	116.4	118.1	119.2	96.6	101.2	105.8	110.5	115.1	119.7	124.3	5	1
5	2	102.3	103.4	105.1	107.1	108.6	109.8	111.0	112.2	113.4	114.9	117.0	118.6	119.7	97.1	101.7	106.4	111.0	115.6	120.3	124.9	5	2
5	3	102.8	103.9	105.6	107.6	109.1	110.4	111.5	112.7	114.0	115.5	117.5	119.2	120.3	97.5	102.2	106.9	111.5	116.2	120.9	125.5	5	3
5	4	103.2	104.3	106.0	108.1	109.6	110.9	112.1	113.2	114.5	116.0	118.1	119.8	120.9	98.0	102.7	107.4	112.1	116.8	121.4	126.1	5	4
5	5	103.7	104.8	106.5	108.6	110.1	111.4	112.6	113.8	115.1	116.5	118.6	120.3	121.4	98.4	103.2	107.9	112.6	117.3	122.0	126.7	5	5

TABLE 19. STATURE (CM) BY AGE OF BOYS AGED 2–18 YEARS (*continued*)

AGE YRS	AGE MTHS	CENTILES													STANDARD DEVIATIONS							AGE YRS	AGE MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
5	6	104.2	105.3	107.0	109.1	110.6	111.9	113.1	114.3	115.6	117.1	119.2	120.9	122.0	98.9	103.6	108.4	113.1	117.8	122.6	127.3	5	6
5	7	104.7	105.8	107.5	109.6	111.1	112.4	113.6	114.8	116.1	117.6	119.7	121.4	122.6	99.3	104.1	108.9	113.6	118.4	123.1	127.9	5	7
5	8	105.1	106.3	108.0	110.1	111.6	112.9	114.1	115.3	116.6	118.1	120.2	122.0	123.1	99.8	104.6	109.3	114.1	118.9	123.7	128.4	5	8
5	9	105.6	106.7	108.5	110.6	112.1	113.4	114.6	115.8	117.1	118.7	120.8	122.5	123.6	100.2	105.0	109.8	114.6	119.4	124.2	129.0	5	9
5	10	106.0	107.2	108.9	111.1	112.6	113.9	115.1	116.3	117.6	119.2	121.3	123.0	124.2	100.7	105.5	110.3	115.1	119.9	124.7	129.6	5	10
5	11	106.5	107.6	109.4	111.5	113.1	114.4	115.6	116.8	118.1	119.7	121.8	123.6	124.7	101.1	105.9	110.8	115.6	120.4	125.3	130.1	5	11
6	0	107.0	108.1	109.9	112.0	113.5	114.9	116.1	117.3	118.6	120.2	122.3	124.1	125.2	101.5	106.4	111.2	116.1	121.0	125.8	130.7	6	0
6	1	107.4	108.6	110.3	112.5	114.0	115.3	116.6	117.8	119.1	120.7	122.8	124.6	125.8	101.9	106.8	111.7	116.6	121.5	126.3	131.2	6	1
6	2	107.8	109.0	110.8	112.9	114.5	115.8	117.1	118.3	119.6	121.2	123.3	125.1	126.3	102.4	107.3	112.2	117.1	122.0	126.9	131.8	6	2
6	3	108.3	109.4	111.2	113.4	115.0	116.3	117.5	118.8	120.1	121.7	123.8	125.6	126.8	102.8	107.7	112.6	117.5	122.5	127.4	132.3	6	3
6	4	108.7	109.9	111.7	113.9	115.4	116.8	118.0	119.3	120.6	122.2	124.3	126.1	127.3	103.2	108.1	113.1	118.0	123.0	127.9	132.8	6	4
6	5	109.2	110.3	112.1	114.3	115.9	117.2	118.5	119.7	121.1	122.7	124.8	126.6	127.8	103.6	108.6	113.5	118.5	123.4	128.4	133.4	6	5
6	6	109.6	110.8	112.6	114.8	116.3	117.7	119.0	120.2	121.6	123.1	125.3	127.1	128.3	104.0	109.0	114.0	119.0	123.9	128.9	133.9	6	6
6	7	110.0	111.2	113.0	115.2	116.8	118.1	119.4	120.7	122.0	123.6	125.8	127.6	128.8	104.4	109.4	114.4	119.4	124.4	129.4	134.4	6	7
6	8	110.4	111.6	113.4	115.7	117.2	118.6	119.9	121.1	122.5	124.1	126.3	128.1	129.3	104.8	109.8	114.9	119.9	124.9	129.9	134.9	6	8
6	9	110.9	112.1	113.9	116.1	117.7	119.1	120.3	121.6	123.0	124.6	126.8	128.6	129.8	105.2	110.3	115.3	120.3	125.4	130.4	135.4	6	9
6	10	111.3	112.5	114.3	116.5	118.1	119.5	120.8	122.1	123.4	125.0	127.3	129.1	130.3	105.6	110.7	115.7	120.8	125.8	130.9	136.0	6	10
6	11	111.7	112.9	114.7	117.0	118.6	120.0	121.2	122.5	123.9	125.5	127.7	129.6	130.8	106.0	111.1	116.2	121.2	126.3	131.4	136.5	6	11
7	0	112.1	113.3	115.2	117.4	119.0	120.4	121.7	123.0	124.4	126.0	128.2	130.1	131.3	106.4	111.5	116.6	121.7	126.8	131.9	137.0	7	0
7	1	112.5	113.7	115.6	117.8	119.5	120.8	122.1	123.4	124.8	126.4	128.7	130.6	131.8	106.8	111.9	117.0	122.1	127.3	132.4	137.5	7	1
7	2	112.9	114.1	116.0	118.3	119.9	121.3	122.6	123.9	125.3	126.9	129.2	131.0	132.3	107.2	112.3	117.5	122.6	127.7	132.9	138.0	7	2
7	3	113.3	114.6	116.4	118.7	120.3	121.7	123.0	124.3	125.7	127.4	129.6	131.5	132.7	107.6	112.7	117.9	123.0	128.2	133.3	138.5	7	3
7	4	113.7	115.0	116.8	119.1	120.8	122.2	123.5	124.8	126.2	127.8	130.1	132.0	133.2	108.0	113.1	118.3	123.5	128.7	133.8	139.0	7	4
7	5	114.1	115.4	117.3	119.5	121.2	122.6	123.9	125.2	126.6	128.3	130.6	132.5	133.7	108.3	113.5	118.7	123.9	129.1	134.3	139.5	7	5
7	6	114.5	115.8	117.7	120.0	121.6	123.0	124.4	125.7	127.1	128.8	131.0	132.9	134.2	108.7	113.9	119.1	124.4	129.6	134.8	140.0	7	6
7	7	114.9	116.2	118.1	120.4	122.0	123.5	124.8	126.1	127.5	129.2	131.5	133.4	134.7	109.1	114.3	119.6	124.8	130.0	135.3	140.5	7	7
7	8	115.3	116.6	118.5	120.8	122.5	123.9	125.2	126.6	128.0	129.7	132.0	133.9	135.1	109.5	114.7	120.0	125.2	130.5	135.8	141.0	7	8
7	9	115.7	117.0	118.9	121.2	122.9	124.3	125.7	127.0	128.4	130.1	132.4	134.4	135.6	109.8	115.1	120.4	125.7	131.0	136.2	141.5	7	9
7	10	116.1	117.4	119.3	121.6	123.3	124.8	126.1	127.4	128.9	130.6	132.9	134.8	136.1	110.2	115.5	120.8	126.1	131.4	136.7	142.0	7	10
7	11	116.5	117.8	119.7	122.1	123.7	125.2	126.5	127.9	129.3	131.0	133.4	135.3	136.6	110.6	115.9	121.2	126.5	131.9	137.2	142.5	7	11
8	0	116.9	118.2	120.1	122.5	124.2	125.6	127.0	128.3	129.8	131.5	133.8	135.8	137.0	110.9	116.3	121.6	127.0	132.3	137.7	143.0	8	0
8	1	117.3	118.6	120.5	122.9	124.6	126.0	127.4	128.8	130.2	131.9	134.3	136.2	137.5	111.3	116.7	122.0	127.4	132.8	138.2	143.5	8	1
8	2	117.7	119.0	120.9	123.3	125.0	126.5	127.8	129.2	130.7	132.4	134.8	136.7	138.0	111.6	117.0	122.4	127.8	133.2	138.6	144.0	8	2
8	3	118.1	119.3	121.3	123.7	125.4	126.9	128.3	129.6	131.1	132.8	135.2	137.2	138.5	112.0	117.4	122.8	128.3	133.7	139.1	144.5	8	3
8	4	118.4	119.7	121.7	124.1	125.8	127.3	128.7	130.1	131.6	133.3	135.7	137.7	139.0	112.4	117.8	123.2	128.7	134.1	139.6	145.0	8	4
8	5	118.8	120.1	122.1	124.5	126.3	127.7	129.1	130.5	132.0	133.7	136.1	138.1	139.4	112.7	118.2	123.7	129.1	134.6	140.1	145.6	8	5
8	6	119.2	120.5	122.5	124.9	126.7	128.2	129.6	131.0	132.4	134.2	136.6	138.6	139.9	113.1	118.6	124.1	129.6	135.1	140.6	146.1	8	6
8	7	119.6	120.9	122.9	125.3	127.1	128.6	130.0	131.4	132.9	134.6	137.1	139.1	140.4	113.4	118.9	124.5	130.0	135.5	141.1	146.6	8	7
8	8	120.0	121.3	123.3	125.7	127.5	129.0	130.4	131.8	133.3	135.1	137.5	139.6	140.9	113.8	119.3	124.9	130.4	136.0	141.5	147.1	8	8
8	9	120.4	121.7	123.7	126.2	127.9	129.4	130.9	132.3	133.8	135.6	138.0	140.0	141.4	114.1	119.7	125.3	130.9	136.4	142.0	147.6	8	9
8	10	120.7	122.1	124.1	126.6	128.3	129.9	131.3	132.7	134.2	136.0	138.5	140.5	141.9	114.5	120.1	125.7	131.3	136.9	142.5	148.1	8	10
8	11	121.1	122.4	124.5	127.0	128.8	130.3	131.7	133.2	134.7	136.5	139.0	141.0	142.3	114.8	120.4	126.1	131.7	137.4	143.0	148.7	8	11

TABLE 19. STATURE (CM) BY AGE OF BOYS AGED 2–18 YEARS (*continued*)

AGE YRS	AGE MTHS	CENTILES													STANDARD DEVIATIONS							AGE YRS	AGE MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
9	0	121.5	122.8	124.9	127.4	129.2	130.7	132.2	133.6	135.1	136.9	139.4	141.5	142.8	115.1	120.8	126.5	132.2	137.8	143.5	149.2	9	0
9	1	121.9	123.2	125.3	127.8	129.6	131.2	132.6	134.0	135.6	137.4	139.9	142.0	143.3	115.5	121.2	126.9	132.6	138.3	144.0	149.7	9	1
9	2	122.2	123.6	125.7	128.2	130.0	131.6	133.0	134.5	136.0	137.9	140.4	142.5	143.8	115.8	121.6	127.3	133.0	138.8	144.5	150.3	9	2
9	3	122.6	124.0	126.1	128.6	130.5	132.0	133.5	134.9	136.5	138.3	140.9	143.0	144.3	116.2	121.9	127.7	133.5	139.2	145.0	150.8	9	3
9	4	123.0	124.4	126.5	129.0	130.9	132.4	133.9	135.4	137.0	138.8	141.4	143.5	144.8	116.5	122.3	128.1	133.9	139.7	145.5	151.3	9	4
9	5	123.4	124.8	126.9	129.4	131.3	132.9	134.4	135.8	137.4	139.3	141.8	144.0	145.3	116.8	122.7	128.5	134.4	140.2	146.0	151.9	9	5
9	6	123.7	125.1	127.3	129.9	131.7	133.3	134.8	136.3	137.9	139.8	142.3	144.5	145.9	117.2	123.1	128.9	134.8	140.7	146.6	152.4	9	6
9	7	124.1	125.5	127.7	130.3	132.1	133.8	135.3	136.7	138.4	140.2	142.8	145.0	146.4	117.5	123.4	129.3	135.3	141.2	147.1	153.0	9	7
9	8	124.5	125.9	128.1	130.7	132.6	134.2	135.7	137.2	138.8	140.7	143.3	145.5	146.9	117.8	123.8	129.7	135.7	141.6	147.6	153.5	9	8
9	9	124.9	126.3	128.5	131.1	133.0	134.6	136.1	137.7	139.3	141.2	143.8	146.0	147.4	118.2	124.2	130.2	136.1	142.1	148.1	154.1	9	9
9	10	125.3	126.7	128.9	131.5	133.4	135.1	136.6	138.1	139.8	141.7	144.3	146.5	147.9	118.5	124.5	130.6	136.6	142.6	148.7	154.7	9	10
9	11	125.6	127.1	129.3	131.9	133.9	135.5	137.1	138.6	140.2	142.2	144.8	147.0	148.5	118.8	124.9	131.0	137.1	143.1	149.2	155.3	9	11
10	0	126.0	127.5	129.7	132.4	134.3	136.0	137.5	139.1	140.7	142.7	145.3	147.6	149.0	119.2	125.3	131.4	137.5	143.6	149.7	155.9	10	0
10	1	126.4	127.9	130.1	132.8	134.7	136.4	138.0	139.5	141.2	143.2	145.9	148.1	149.6	119.5	125.7	131.8	138.0	144.1	150.3	156.4	10	1
10	2	126.8	128.2	130.5	133.2	135.2	136.9	138.4	140.0	141.7	143.7	146.4	148.6	150.1	119.8	126.0	132.2	138.4	144.6	150.8	157.0	10	2
10	3	127.2	128.6	130.9	133.7	135.6	137.3	138.9	140.5	142.2	144.2	146.9	149.2	150.7	120.2	126.4	132.7	138.9	145.2	151.4	157.6	10	3
10	4	127.5	129.0	131.3	134.1	136.1	137.8	139.4	141.0	142.7	144.7	147.4	149.7	151.2	120.5	126.8	133.1	139.4	145.7	152.0	158.3	10	4
10	5	127.9	129.4	131.7	134.5	136.5	138.2	139.9	141.5	143.2	145.2	148.0	150.3	151.8	120.8	127.2	133.5	139.9	146.2	152.5	158.9	10	5
10	6	128.3	129.8	132.1	135.0	137.0	138.7	140.3	141.9	143.7	145.7	148.5	150.8	152.3	121.2	127.6	133.9	140.3	146.7	153.1	159.5	10	6
10	7	128.7	130.2	132.6	135.4	137.4	139.2	140.8	142.4	144.2	146.2	149.1	151.4	152.9	121.5	127.9	134.4	140.8	147.2	153.7	160.1	10	7
10	8	129.1	130.6	133.0	135.8	137.9	139.6	141.3	142.9	144.7	146.8	149.6	152.0	153.5	121.8	128.3	134.8	141.3	147.8	154.3	160.8	10	8
10	9	129.5	131.0	133.4	136.3	138.3	140.1	141.8	143.4	145.2	147.3	150.2	152.5	154.1	122.2	128.7	135.2	141.8	148.3	154.9	161.4	10	9
10	10	129.9	131.4	133.8	136.7	138.8	140.6	142.3	143.9	145.7	147.8	150.7	153.1	154.7	122.5	129.1	135.7	142.3	148.9	155.5	162.1	10	10
10	11	130.3	131.8	134.2	137.2	139.3	141.1	142.8	144.5	146.3	148.4	151.3	153.7	155.3	122.8	129.5	136.1	142.8	149.4	156.1	162.7	10	11
11	0	130.6	132.2	134.7	137.6	139.8	141.6	143.3	145.0	146.8	148.9	151.9	154.3	155.9	123.1	129.9	136.6	143.3	150.0	156.7	163.4	11	0
11	1	131.0	132.6	135.1	138.1	140.2	142.1	143.8	145.5	147.3	149.5	152.5	154.9	156.5	123.5	130.2	137.0	143.8	150.5	157.3	164.1	11	1
11	2	131.4	133.1	135.5	138.5	140.7	142.6	144.3	146.0	147.9	150.0	153.0	155.5	157.1	123.8	130.6	137.5	144.3	151.1	157.9	164.8	11	2
11	3	131.8	133.5	136.0	139.0	141.2	143.1	144.8	146.5	148.4	150.6	153.6	156.1	157.8	124.1	131.0	137.9	144.8	151.7	158.6	165.5	11	3
11	4	132.2	133.9	136.4	139.5	141.7	143.6	145.3	147.1	149.0	151.2	154.2	156.8	158.4	124.5	131.4	138.4	145.3	152.3	159.2	166.2	11	4
11	5	132.6	134.3	136.8	139.9	142.2	144.1	145.8	147.6	149.5	151.8	154.8	157.4	159.0	124.8	131.8	138.8	145.8	152.9	159.9	166.9	11	5
11	6	133.0	134.7	137.3	140.4	142.7	144.6	146.4	148.2	150.1	152.3	155.5	158.0	159.7	125.1	132.2	139.3	146.4	153.5	160.5	167.6	11	6
11	7	133.5	135.1	137.7	140.9	143.2	145.1	146.9	148.7	150.7	152.9	156.1	158.7	160.4	125.5	132.6	139.8	146.9	154.1	161.2	168.4	11	7
11	8	133.9	135.6	138.2	141.4	143.7	145.6	147.4	149.3	151.2	153.5	156.7	159.3	161.0	125.8	133.0	140.2	147.4	154.7	161.9	169.1	11	8
11	9	134.3	136.0	138.6	141.9	144.2	146.1	148.0	149.8	151.8	154.1	157.3	160.0	161.7	126.1	133.4	140.7	148.0	155.3	162.6	169.9	11	9
11	10	134.7	136.4	139.1	142.3	144.7	146.7	148.5	150.4	152.4	154.7	158.0	160.7	162.4	126.5	133.8	141.2	148.5	155.9	163.3	170.6	11	10
11	11	135.1	136.9	139.6	142.8	145.2	147.2	149.1	151.0	153.0	155.4	158.6	161.3	163.1	126.8	134.2	141.7	149.1	156.5	164.0	171.4	11	11
12	0	135.5	137.3	140.0	143.3	145.7	147.8	149.7	151.6	153.6	156.0	159.3	162.0	163.8	127.1	134.6	142.1	149.7	157.2	164.7	172.2	12	0
12	1	136.0	137.7	140.5	143.8	146.2	148.3	150.2	152.1	154.2	156.6	159.9	162.7	164.5	127.5	135.1	142.6	150.2	157.8	165.4	172.9	12	1
12	2	136.4	138.2	141.0	144.3	146.8	148.8	150.8	152.7	154.8	157.2	160.6	163.4	165.2	127.8	135.5	143.1	150.8	158.4	166.1	173.7	12	2
12	3	136.8	138.6	141.4	144.8	147.3	149.4	151.3	153.3	155.4	157.8	161.2	164.0	165.9	128.2	135.9	143.6	151.3	159.1	166.8	174.5	12	3
12	4	137.3	139.1	141.9	145.3	147.8	149.9	151.9	153.9	156.0	158.5	161.9	164.7	166.6	128.5	136.3	144.1	151.9	159.7	167.5	175.3	12	4
12	5	137.7	139.5	142.4	145.9	148.4	150.5	152.5	154.5	156.6	159.1	162.5	165.4	167.3	128.9	136.8	144.6	152.5	160.3	168.2	176.0	12	5

TABLE 19. STATURE (CM) BY AGE OF BOYS AGED 2–18 YEARS (*continued*)

AGE YRS	MTHS	CENTILES												STANDARD DEVIATIONS							AGE YRS	MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
12	6	138.1	140.0	142.9	146.4	148.9	151.0	153.0	155.0	157.2	159.7	163.2	166.1	167.9	129.3	137.2	145.1	153.0	161.0	168.9	176.8	12	6
12	7	138.6	140.5	143.4	146.9	149.4	151.6	153.6	155.6	157.8	160.3	163.9	166.8	168.6	129.6	137.6	145.6	153.6	161.6	169.6	177.6	12	7
12	8	139.0	140.9	143.9	147.4	150.0	152.1	154.2	156.2	158.4	161.0	164.5	167.4	169.3	130.0	138.1	146.1	154.2	162.2	170.3	178.3	12	8
12	9	139.5	141.4	144.4	147.9	150.5	152.7	154.8	156.8	159.0	161.6	165.2	168.1	170.0	130.4	138.5	146.6	154.8	162.9	171.0	179.1	12	9
12	10	140.0	141.9	144.9	148.4	151.0	153.3	155.3	157.4	159.6	162.2	165.8	168.8	170.7	130.8	139.0	147.2	155.3	163.5	171.7	179.8	12	10
12	11	140.4	142.4	145.4	149.0	151.6	153.8	155.9	158.0	160.2	162.8	166.4	169.4	171.4	131.2	139.4	147.7	155.9	164.1	172.4	180.6	12	11
13	0	140.9	142.9	145.9	149.5	152.1	154.4	156.5	158.6	160.8	163.4	167.1	170.1	172.0	131.6	139.9	148.2	156.5	164.7	173.0	181.3	13	0
13	1	141.4	143.3	146.4	150.0	152.7	154.9	157.0	159.1	161.4	164.0	167.7	170.7	172.7	132.1	140.4	148.7	157.0	165.4	173.7	182.0	13	1
13	2	141.9	143.8	146.9	150.6	153.2	155.5	157.6	159.7	162.0	164.7	168.3	171.4	173.4	132.5	140.9	149.2	157.6	166.0	174.4	182.7	13	2
13	3	142.3	144.3	147.4	151.1	153.8	156.0	158.2	160.3	162.6	165.3	169.0	172.0	174.0	132.9	141.3	149.8	158.2	166.6	175.0	183.4	13	3
13	4	142.8	144.8	147.9	151.6	154.3	156.6	158.7	160.9	163.2	165.9	169.6	172.6	174.6	133.4	141.8	150.3	158.7	167.2	175.6	184.1	13	4
13	5	143.3	145.3	148.4	152.2	154.8	157.1	159.3	161.4	163.7	166.4	170.2	173.3	175.3	133.8	142.3	150.8	159.3	167.8	176.3	184.8	13	5
13	6	143.8	145.9	148.9	152.7	155.4	157.7	159.9	162.0	164.3	167.0	170.8	173.9	175.9	134.3	142.8	151.3	159.9	168.4	176.9	185.4	13	6
13	7	144.4	146.4	149.5	153.2	155.9	158.2	160.4	162.6	164.9	167.6	171.4	174.5	176.5	134.8	143.3	151.9	160.4	168.9	177.5	186.0	13	7
13	8	144.9	146.9	150.0	153.8	156.5	158.8	161.0	163.1	165.4	168.2	171.9	175.0	177.1	135.3	143.9	152.4	161.0	169.5	178.1	186.6	13	8
13	9	145.4	147.4	150.5	154.3	157.0	159.3	161.5	163.7	166.0	168.7	172.5	175.6	177.6	135.8	144.4	152.9	161.5	170.1	178.6	187.2	13	9
13	10	145.9	148.0	151.1	154.8	157.6	159.9	162.1	164.2	166.5	169.3	173.0	176.1	178.2	136.3	144.9	153.5	162.1	170.6	179.2	187.8	13	10
13	11	146.5	148.5	151.6	155.4	158.1	160.4	162.6	164.8	167.1	169.8	173.6	176.7	178.7	136.9	145.4	154.0	162.6	171.2	179.7	188.3	13	11
14	0	147.0	149.0	152.1	155.9	158.6	161.0	163.1	165.3	167.6	170.3	174.1	177.2	179.2	137.4	146.0	154.6	163.1	171.7	180.2	188.8	14	0
14	1	147.6	149.6	152.7	156.5	159.2	161.5	163.6	165.8	168.1	170.8	174.6	177.7	179.7	138.0	146.5	155.1	163.6	172.2	180.8	189.3	14	1
14	2	148.1	150.1	153.2	157.0	159.7	162.0	164.2	166.3	168.6	171.4	175.1	178.2	180.2	138.6	147.1	155.6	164.2	172.7	181.2	189.8	14	2
14	3	148.7	150.7	153.8	157.5	160.2	162.5	164.7	166.8	169.1	171.8	175.6	178.7	180.7	139.2	147.7	156.2	164.7	173.2	181.7	190.2	14	3
14	4	149.3	151.3	154.3	158.1	160.8	163.0	165.2	167.3	169.6	172.3	176.1	179.1	181.1	139.8	148.2	156.7	165.2	173.7	182.1	190.6	14	4
14	5	149.8	151.8	154.9	158.6	161.3	163.6	165.7	167.8	170.1	172.8	176.5	179.6	181.6	140.4	148.8	157.3	165.7	174.1	182.6	191.0	14	5
14	6	150.4	152.4	155.4	159.1	161.8	164.1	166.2	168.3	170.6	173.3	177.0	180.0	182.0	141.0	149.4	157.8	166.2	174.6	183.0	191.4	14	6
14	7	151.0	152.9	156.0	159.7	162.3	164.6	166.7	168.8	171.1	173.7	177.4	180.4	182.4	141.6	150.0	158.3	166.7	175.0	183.4	191.7	14	7
14	8	151.6	153.5	156.5	160.2	162.8	165.1	167.2	169.3	171.5	174.1	177.8	180.8	182.8	142.3	150.6	158.9	167.2	175.5	183.8	192.1	14	8
14	9	152.1	154.1	157.1	160.7	163.3	165.5	167.6	169.7	172.0	174.6	178.2	181.2	183.1	142.9	151.1	159.4	167.6	175.9	184.1	192.4	14	9
14	10	152.7	154.6	157.6	161.2	163.8	166.0	168.1	170.2	172.4	175.0	178.6	181.6	183.5	143.5	151.7	159.9	168.1	176.3	184.5	192.7	14	10
14	11	153.3	155.2	158.1	161.7	164.3	166.5	168.6	170.6	172.8	175.4	179.0	181.9	183.8	144.2	152.3	160.4	168.6	176.7	184.8	192.9	14	11
15	0	153.8	155.7	158.7	162.2	164.8	167.0	169.0	171.0	173.2	175.8	179.3	182.3	184.2	144.8	152.9	160.9	169.0	177.1	185.1	193.2	15	0
15	1	154.4	156.3	159.2	162.7	165.2	167.4	169.4	171.5	173.6	176.2	179.7	182.6	184.5	145.5	153.5	161.4	169.4	177.4	185.4	193.4	15	1
15	2	155.0	156.8	159.7	163.2	165.7	167.9	169.9	171.9	174.0	176.5	180.0	182.9	184.8	146.1	154.0	161.9	169.9	177.8	185.7	193.6	15	2
15	3	155.5	157.4	160.2	163.7	166.2	168.3	170.3	172.3	174.4	176.9	180.3	183.2	185.1	146.7	154.6	162.4	170.3	178.1	186.0	193.8	15	3
15	4	156.1	157.9	160.7	164.1	166.6	168.7	170.7	172.7	174.8	177.2	180.7	183.5	185.3	147.3	155.1	162.9	170.7	178.5	186.2	194.0	15	4
15	5	156.6	158.4	161.2	164.6	167.0	169.1	171.1	173.0	175.1	177.6	181.0	183.8	185.6	148.0	155.7	163.4	171.1	178.8	186.5	194.2	15	5
15	6	157.1	158.9	161.7	165.0	167.5	169.5	171.5	173.4	175.5	177.9	181.3	184.0	185.8	148.6	156.2	163.8	171.5	179.1	186.7	194.4	15	6
15	7	157.6	159.4	162.2	165.5	167.9	169.9	171.8	173.8	175.8	178.2	181.5	184.3	186.1	149.2	156.7	164.3	171.8	179.4	187.0	194.5	15	7
15	8	158.1	159.9	162.6	165.9	168.3	170.3	172.2	174.1	176.1	178.5	181.8	184.5	186.3	149.8	157.2	164.7	172.2	179.7	187.2	194.7	15	8
15	9	158.6	160.4	163.1	166.3	168.7	170.7	172.6	174.4	176.4	178.8	182.1	184.8	186.5	150.3	157.7	165.2	172.6	180.0	187.4	194.8	15	9
15	10	159.1	160.8	163.5	166.7	169.1	171.0	172.9	174.8	176.8	179.1	182.3	185.0	186.7	150.9	158.2	165.6	172.9	180.2	187.6	194.9	15	10
15	11	159.6	161.3	163.9	167.1	169.4	171.4	173.2	175.1	177.0	179.3	182.5	185.2	186.9	151.4	158.7	166.0	173.2	180.5	187.8	195.0	15	11

TABLE 19. STATURE (CM) BY AGE OF BOYS AGED 2–18 YEARS (*continued*)

AGE YRS	MTHS	CENTILES													STANDARD DEVIATIONS							AGE YRS	MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
16	0	160.0	161.7	164.3	167.5	169.8	171.7	173.5	175.4	177.3	179.6	182.8	185.4	187.1	152.0	159.2	166.4	173.5	180.7	187.9	195.1	16	0
16	1	160.4	162.1	164.7	167.9	170.1	172.0	173.8	175.7	177.6	179.8	183.0	185.6	187.2	152.5	159.6	166.7	173.8	181.0	188.1	195.2	16	1
16	2	160.9	162.5	165.1	168.2	170.4	172.4	174.1	175.9	177.8	180.1	183.2	185.7	187.4	153.0	160.0	167.1	174.1	181.2	188.2	195.3	16	2
16	3	161.3	162.9	165.5	168.5	170.7	172.6	174.4	176.2	178.1	180.3	183.4	185.9	187.6	153.4	160.4	167.4	174.4	181.4	188.4	195.4	16	3
16	4	161.6	163.3	165.8	168.8	171.0	172.9	174.7	176.4	178.3	180.5	183.6	186.1	187.7	153.9	160.8	167.7	174.7	181.6	188.5	195.5	16	4
16	5	162.0	163.6	166.1	169.1	171.3	173.2	174.9	176.7	178.5	180.7	183.7	186.2	187.8	154.3	161.2	168.1	174.9	181.8	188.7	195.5	16	5
16	6	162.3	163.9	166.4	169.4	171.6	173.4	175.2	176.9	178.7	180.9	183.9	186.4	188.0	154.7	161.5	168.3	175.2	182.0	188.8	195.6	16	6
16	7	162.7	164.2	166.7	169.7	171.8	173.7	175.4	177.1	178.9	181.1	184.0	186.5	188.1	155.1	161.8	168.6	175.4	182.1	188.9	195.7	16	7
16	8	162.9	164.5	167.0	169.9	172.1	173.9	175.6	177.3	179.1	181.2	184.2	186.6	188.2	155.4	162.1	168.9	175.6	182.3	189.0	195.7	16	8
16	9	163.2	164.8	167.2	170.1	172.3	174.1	175.8	177.4	179.3	181.4	184.3	186.7	188.3	155.8	162.4	169.1	175.8	182.4	189.1	195.8	16	9
16	10	163.5	165.0	167.4	170.3	172.5	174.2	175.9	177.6	179.4	181.5	184.4	186.8	188.4	156.0	162.7	169.3	175.9	182.6	189.2	195.8	16	10
16	11	163.7	165.2	167.6	170.5	172.6	174.4	176.1	177.8	179.5	181.6	184.5	186.9	188.5	156.3	162.9	169.5	176.1	182.7	189.3	195.9	16	11
17	0	163.9	165.4	167.8	170.7	172.8	174.6	176.2	177.9	179.7	181.8	184.6	187.0	188.6	156.5	163.1	169.7	176.2	182.8	189.4	195.9	17	0
17	1	164.0	165.6	168.0	170.8	172.9	174.7	176.3	178.0	179.8	181.9	184.7	187.1	188.7	156.7	163.2	169.8	176.3	182.9	189.4	196.0	17	1
17	2	164.2	165.7	168.1	171.0	173.0	174.8	176.4	178.1	179.9	181.9	184.8	187.2	188.7	156.9	163.4	169.9	176.4	183.0	189.5	196.0	17	2
17	3	164.3	165.8	168.2	171.1	173.1	174.9	176.5	178.2	180.0	182.0	184.9	187.3	188.8	157.0	163.5	170.0	176.5	183.1	189.6	196.1	17	3
17	4	164.4	165.9	168.3	171.1	173.2	175.0	176.6	178.3	180.0	182.1	185.0	187.3	188.9	157.1	163.6	170.1	176.6	183.1	189.6	196.2	17	4
17	5	164.4	166.0	168.3	171.2	173.3	175.0	176.7	178.3	180.1	182.2	185.0	187.4	188.9	157.1	163.7	170.2	176.7	183.2	189.7	196.2	17	5
17	6	164.5	166.0	168.4	171.2	173.3	175.1	176.7	178.4	180.1	182.2	185.1	187.5	189.0	157.2	163.7	170.2	176.7	183.2	189.8	196.3	17	6
17	7	164.5	166.0	168.4	171.3	173.3	175.1	176.8	178.4	180.2	182.3	185.1	187.5	189.0	157.2	163.7	170.2	176.8	183.3	189.8	196.3	17	7
17	8	164.5	166.1	168.4	171.3	173.4	175.1	176.8	178.5	180.2	182.3	185.2	187.5	189.1	157.2	163.7	170.3	176.8	183.3	189.9	196.4	17	8
17	9	164.5	166.1	168.4	171.3	173.4	175.2	176.8	178.5	180.2	182.3	185.2	187.6	189.1	157.2	163.7	170.3	176.8	183.4	189.9	196.5	17	9
17	10	164.5	166.0	168.4	171.3	173.4	175.2	176.8	178.5	180.3	182.3	185.2	187.6	189.2	157.1	163.7	170.3	176.8	183.4	189.9	196.5	17	10
17	11	164.5	166.0	168.4	171.3	173.4	175.2	176.8	178.5	180.3	182.4	185.3	187.6	189.2	157.1	163.7	170.2	176.8	183.4	190.0	196.6	17	11
18	0	164.4	166.0	168.4	171.3	173.4	175.2	176.8	178.5	180.3	182.4	185.3	187.7	189.2	157.0	163.6	170.2	176.8	183.4	190.0	196.6	18	0

TABLE 20. LENGTH (CM) BY AGE OF GIRLS AGED 0–36 MONTHS

AGE MONTHS	CENTILES													STANDARD DEVIATIONS							AGE MONTHS
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
0	45.8	46.3	47.1	48.0	48.7	49.3	49.9	50.4	51.0	51.7	52.6	53.4	53.9	43.4	45.5	47.7	49.9	52.0	54.2	56.4	0
1	49.2	49.8	50.6	51.6	52.3	53.0	53.5	54.1	54.8	55.5	56.5	57.3	57.9	46.7	49.0	51.2	53.5	55.8	58.1	60.4	1
2	52.2	52.8	53.7	54.7	55.5	56.1	56.8	57.4	58.0	58.8	59.8	60.7	61.3	49.6	52.0	54.4	56.8	59.2	61.6	64.0	2
3	54.9	55.5	56.4	57.5	58.2	58.9	59.5	60.2	60.9	61.6	62.7	63.6	64.2	52.1	54.6	57.1	59.5	62.0	64.5	67.0	3
4	57.2	57.8	58.7	59.8	60.6	61.3	62.0	62.6	63.3	64.1	65.2	66.2	66.8	54.3	56.9	59.4	62.0	64.5	67.1	69.6	4
5	59.2	59.8	60.7	61.9	62.7	63.4	64.1	64.7	65.4	66.3	67.4	68.4	69.0	56.3	58.9	61.5	64.1	66.7	69.3	71.9	5
6	61.0	61.6	62.5	63.7	64.5	65.3	65.9	66.6	67.3	68.2	69.3	70.3	70.9	58.0	60.6	63.3	65.9	68.6	71.2	73.9	6
7	62.5	63.2	64.1	65.3	66.2	66.9	67.6	68.3	69.0	69.8	71.0	72.0	72.6	59.5	62.2	64.9	67.6	70.2	72.9	75.6	7
8	64.0	64.6	65.6	66.8	67.6	68.4	69.1	69.7	70.5	71.3	72.5	73.5	74.2	60.9	63.7	66.4	69.1	71.8	74.5	77.2	8
9	65.3	66.0	66.9	68.1	69.0	69.8	70.4	71.1	71.9	72.8	74.0	74.9	75.6	62.2	65.0	67.7	70.4	73.2	75.9	78.7	9
10	66.6	67.2	68.2	69.5	70.3	71.1	71.8	72.5	73.2	74.1	75.3	76.3	77.0	63.5	66.2	69.0	71.8	74.5	77.3	80.1	10
11	67.8	68.5	69.5	70.7	71.6	72.4	73.1	73.8	74.5	75.4	76.6	77.7	78.3	64.7	67.5	70.3	73.1	75.9	78.7	81.5	11
12	69.0	69.6	70.7	71.9	72.8	73.6	74.3	75.0	75.8	76.7	77.9	79.0	79.6	65.8	68.6	71.5	74.3	77.1	80.0	82.8	12
13	70.1	70.8	71.8	73.1	74.0	74.8	75.5	76.2	77.0	77.9	79.2	80.2	80.9	66.9	69.8	72.6	75.5	78.4	81.2	84.1	13
14	71.2	71.9	72.9	74.2	75.1	75.9	76.7	77.4	78.2	79.1	80.4	81.4	82.1	67.9	70.8	73.7	76.7	79.6	82.5	85.4	14
15	72.2	72.9	74.0	75.3	76.2	77.0	77.8	78.5	79.3	80.3	81.6	82.6	83.3	68.9	71.9	74.8	77.8	80.7	83.7	86.6	15
16	73.2	73.9	75.0	76.3	77.3	78.1	78.9	79.6	80.4	81.4	82.7	83.8	84.5	69.9	72.9	75.9	78.9	81.8	84.8	87.8	16
17	74.2	74.9	76.0	77.4	78.3	79.1	79.9	80.7	81.5	82.5	83.8	84.9	85.6	70.8	73.8	76.9	79.9	82.9	86.0	89.0	17
18	75.1	75.9	77.0	78.3	79.3	80.1	80.9	81.7	82.5	83.5	84.9	86.0	86.7	71.7	74.8	77.9	80.9	84.0	87.1	90.1	18
19	76.1	76.8	77.9	79.3	80.3	81.1	81.9	82.7	83.5	84.5	85.9	87.0	87.8	72.6	75.7	78.8	81.9	85.0	88.1	91.2	19
20	77.0	77.7	78.8	80.2	81.2	82.1	82.9	83.7	84.5	85.5	86.9	88.0	88.8	73.4	76.6	79.7	82.9	86.0	89.2	92.3	20
21	77.8	78.6	79.7	81.1	82.1	83.0	83.8	84.6	85.5	86.5	87.9	89.0	89.8	74.3	77.4	80.6	83.8	87.0	90.2	93.4	21
22	78.7	79.4	80.6	82.0	83.0	83.9	84.7	85.5	86.4	87.4	88.8	90.0	90.8	75.1	78.3	81.5	84.7	87.9	91.1	94.4	22
23	79.5	80.3	81.4	82.9	83.9	84.8	85.6	86.4	87.3	88.3	89.8	90.9	91.7	75.9	79.1	82.4	85.6	88.9	92.1	95.3	23
24	80.3	81.1	82.3	83.7	84.8	85.6	86.5	87.3	88.2	89.2	90.7	91.9	92.6	76.6	79.9	83.2	86.5	89.8	93.0	96.3	24
25	81.1	81.9	83.1	84.5	85.6	86.5	87.3	88.2	89.1	90.1	91.6	92.8	93.5	77.4	80.7	84.0	87.3	90.6	93.9	97.2	25
26	81.9	82.7	83.9	85.4	86.4	87.3	88.2	89.0	89.9	91.0	92.4	93.6	94.4	78.2	81.5	84.8	88.2	91.5	94.8	98.1	26
27	82.7	83.5	84.7	86.2	87.2	88.1	89.0	89.8	90.7	91.8	93.3	94.5	95.3	78.9	82.3	85.6	89.0	92.3	95.7	99.0	27
28	83.4	84.2	85.5	86.9	88.0	88.9	89.8	90.6	91.5	92.6	94.1	95.3	96.1	79.7	83.0	86.4	89.8	93.1	96.5	99.9	28
29	84.2	85.0	86.2	87.7	88.8	89.7	90.6	91.4	92.3	93.4	94.9	96.1	96.9	80.4	83.8	87.2	90.6	93.9	97.3	100.7	29
30	84.9	85.7	86.9	88.4	89.5	90.5	91.3	92.2	93.1	94.2	95.7	96.9	97.7	81.1	84.5	87.9	91.3	94.7	98.1	101.5	30
31	85.6	86.4	87.7	89.2	90.3	91.2	92.1	92.9	93.9	95.0	96.5	97.7	98.5	81.8	85.2	88.6	92.1	95.5	98.9	102.4	31
32	86.3	87.1	88.4	89.9	91.0	91.9	92.8	93.7	94.6	95.7	97.2	98.5	99.3	82.4	85.9	89.3	92.8	96.3	99.7	103.2	32
33	87.0	87.8	89.1	90.6	91.7	92.6	93.5	94.4	95.3	96.4	98.0	99.2	100.1	83.1	86.6	90.0	93.5	97.0	100.5	104.0	33
34	87.6	88.4	89.7	91.3	92.4	93.3	94.2	95.1	96.1	97.2	98.7	100.0	100.8	83.7	87.2	90.7	94.2	97.7	101.2	104.7	34
35	88.2	89.1	90.4	91.9	93.0	94.0	94.9	95.8	96.8	97.9	99.4	100.7	101.6	84.3	87.8	91.4	94.9	98.4	102.0	105.5	35
36	88.8	89.7	91.0	92.6	93.7	94.7	95.6	96.5	97.4	98.6	100.2	101.5	102.3	84.8	88.4	92.0	95.6	99.1	102.7	106.3	36

TABLE 21. STATURE (CM) BY AGE OF GIRLS AGED 2–18 YEARS

AGE YRS	AGE MTHS	CENTILES												STANDARD DEVIATIONS							AGE YRS	AGE MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
2	0	78.5	79.2	80.4	81.8	82.8	83.7	84.5	85.3	86.2	87.2	88.6	89.8	90.5	74.9	78.1	81.3	84.5	87.7	90.9	94.1	2	0
2	1	79.2	80.0	81.2	82.6	83.6	84.5	85.4	86.2	87.1	88.1	89.5	90.7	91.5	75.6	78.8	82.1	85.4	88.6	91.9	95.1	2	1
2	2	80.0	80.8	82.0	83.4	84.5	85.4	86.2	87.0	87.9	89.0	90.5	91.7	92.4	76.3	79.6	82.9	86.2	89.5	92.8	96.2	2	2
2	3	80.7	81.5	82.7	84.2	85.3	86.2	87.0	87.9	88.8	89.9	91.4	92.6	93.4	77.0	80.3	83.7	87.0	90.4	93.8	97.1	2	3
2	4	81.4	82.3	83.5	85.0	86.1	87.0	87.9	88.7	89.7	90.7	92.2	93.5	94.3	77.6	81.0	84.5	87.9	91.3	94.7	98.1	2	4
2	5	82.2	83.0	84.2	85.8	86.9	87.8	88.7	89.5	90.5	91.6	93.1	94.4	95.2	78.3	81.8	85.2	88.7	92.1	95.6	99.0	2	5
2	6	82.9	83.7	85.0	86.5	87.6	88.6	89.5	90.3	91.3	92.4	93.9	95.2	96.0	79.0	82.5	86.0	89.5	93.0	96.5	100.0	2	6
2	7	83.6	84.4	85.7	87.3	88.4	89.3	90.2	91.1	92.1	93.2	94.8	96.1	96.9	79.6	83.2	86.7	90.2	93.8	97.3	100.9	2	7
2	8	84.3	85.1	86.4	88.0	89.1	90.1	91.0	91.9	92.9	94.0	95.6	96.9	97.7	80.3	83.8	87.4	91.0	94.6	98.2	101.7	2	8
2	9	84.9	85.8	87.1	88.7	89.8	90.8	91.7	92.7	93.6	94.8	96.4	97.7	98.6	80.9	84.5	88.1	91.7	95.4	99.0	102.6	2	9
2	10	85.6	86.5	87.8	89.4	90.6	91.6	92.5	93.4	94.4	95.6	97.2	98.5	99.4	81.5	85.2	88.8	92.5	96.1	99.8	103.4	2	10
2	11	86.3	87.1	88.5	90.1	91.3	92.3	93.2	94.1	95.1	96.3	97.9	99.3	100.1	82.1	85.8	89.5	93.2	96.9	100.6	104.3	2	11
3	0	86.9	87.8	89.1	90.8	92.0	93.0	93.9	94.9	95.9	97.0	98.7	100.0	100.9	82.8	86.5	90.2	93.9	97.6	101.4	105.1	3	0
3	1	87.6	88.4	89.8	91.5	92.6	93.7	94.6	95.6	96.6	97.8	99.4	100.8	101.7	83.4	87.1	90.9	94.6	98.4	102.1	105.9	3	1
3	2	88.2	89.1	90.4	92.1	93.3	94.3	95.3	96.3	97.3	98.5	100.1	101.5	102.4	84.0	87.7	91.5	95.3	99.1	102.9	106.6	3	2
3	3	88.8	89.7	91.1	92.8	94.0	95.0	96.0	96.9	98.0	99.2	100.9	102.2	103.1	84.5	88.4	92.2	96.0	99.8	103.6	107.4	3	3
3	4	89.4	90.3	91.7	93.4	94.6	95.7	96.6	97.6	98.6	99.9	101.6	103.0	103.9	85.1	89.0	92.8	96.6	100.5	104.3	108.2	3	4
3	5	90.0	90.9	92.3	94.0	95.3	96.3	97.3	98.3	99.3	100.5	102.2	103.6	104.6	85.7	89.6	93.4	97.3	101.2	105.0	108.9	3	5
3	6	90.6	91.5	92.9	94.7	95.9	97.0	97.9	98.9	100.0	101.2	102.9	104.3	105.3	86.3	90.2	94.0	97.9	101.8	105.7	109.6	3	6
3	7	91.2	92.1	93.5	95.3	96.5	97.6	98.6	99.6	100.6	101.9	103.6	105.0	105.9	86.8	90.7	94.7	98.6	102.5	106.4	110.3	3	7
3	8	91.8	92.7	94.1	95.9	97.1	98.2	99.2	100.2	101.3	102.5	104.3	105.7	106.6	87.4	91.3	95.3	99.2	103.1	107.1	111.0	3	8
3	9	92.3	93.3	94.7	96.5	97.7	98.8	99.8	100.8	101.9	103.2	104.9	106.3	107.3	87.9	91.9	95.8	99.8	103.8	107.8	111.7	3	9
3	10	92.9	93.9	95.3	97.1	98.3	99.4	100.4	101.4	102.5	103.8	105.6	107.0	107.9	88.4	92.4	96.4	100.4	104.4	108.4	112.4	3	10
3	11	93.5	94.4	95.9	97.6	98.9	100.0	101.0	102.1	103.1	104.4	106.2	107.6	108.6	89.0	93.0	97.0	101.0	105.1	109.1	113.1	3	11
4	0	94.0	95.0	96.4	98.2	99.5	100.6	101.6	102.7	103.8	105.0	106.8	108.3	109.2	89.5	93.5	97.6	101.6	105.7	109.7	113.8	4	0
4	1	94.6	95.5	97.0	98.8	100.1	101.2	102.2	103.3	104.4	105.6	107.4	108.9	109.9	90.0	94.1	98.1	102.2	106.3	110.4	114.4	4	1
4	2	95.1	96.1	97.5	99.3	100.7	101.8	102.8	103.8	105.0	106.3	108.1	109.5	110.5	90.5	94.6	98.7	102.8	106.9	111.0	115.1	4	2
4	3	95.6	96.6	98.1	99.9	101.2	102.3	103.4	104.4	105.5	106.9	108.7	110.2	111.1	91.0	95.1	99.3	103.4	107.5	111.6	115.8	4	3
4	4	96.1	97.1	98.6	100.5	101.8	102.9	104.0	105.0	106.1	107.5	109.3	110.8	111.8	91.5	95.6	99.8	104.0	108.1	112.3	116.4	4	4
4	5	96.6	97.6	99.2	101.0	102.3	103.5	104.5	105.6	106.7	108.0	109.9	111.4	112.4	92.0	96.1	100.3	104.5	108.7	112.9	117.1	4	5
4	6	97.2	98.1	99.7	101.5	102.9	104.0	105.1	106.2	107.3	108.6	110.5	112.0	113.0	92.4	96.7	100.9	105.1	109.3	113.5	117.7	4	6
4	7	97.7	98.7	100.2	102.1	103.4	104.6	105.6	106.7	107.9	109.2	111.1	112.6	113.6	92.9	97.1	101.4	105.6	109.9	114.1	118.4	4	7
4	8	98.1	99.2	100.7	102.6	104.0	105.1	106.2	107.3	108.4	109.8	111.7	113.2	114.2	93.4	97.6	101.9	106.2	110.5	114.8	119.0	4	8
4	9	98.6	99.7	101.2	103.1	104.5	105.7	106.7	107.8	109.0	110.4	112.3	113.8	114.9	93.8	98.1	102.4	106.7	111.1	115.4	119.7	4	9
4	10	99.1	100.1	101.7	103.6	105.0	106.2	107.3	108.4	109.6	111.0	112.9	114.4	115.5	94.3	98.6	102.9	107.3	111.6	116.0	120.3	4	10
4	11	99.6	100.6	102.2	104.2	105.5	106.7	107.8	109.0	110.1	111.5	113.5	115.1	116.1	94.7	99.1	103.5	107.8	112.2	116.6	121.0	4	11
5	0	100.1	101.1	102.7	104.7	106.1	107.3	108.4	109.5	110.7	112.1	114.0	115.7	116.7	95.1	99.5	104.0	108.4	112.8	117.2	121.6	5	0
5	1	100.5	101.6	103.2	105.2	106.6	107.8	108.9	110.0	111.3	112.7	114.6	116.3	117.3	95.5	100.0	104.5	108.9	113.4	117.8	122.3	5	1
5	2	101.0	102.1	103.7	105.7	107.1	108.3	109.5	110.6	111.8	113.2	115.2	116.8	117.9	96.0	100.5	105.0	109.5	113.9	118.4	122.9	5	2
5	3	101.5	102.5	104.2	106.2	107.6	108.8	110.0	111.1	112.4	113.8	115.8	117.4	118.5	96.4	100.9	105.4	110.0	114.5	119.1	123.6	5	3
5	4	101.9	103.0	104.6	106.7	108.1	109.4	110.5	111.7	112.9	114.4	116.4	118.0	119.1	96.8	101.4	105.9	110.5	115.1	119.7	124.2	5	4
5	5	102.4	103.4	105.1	107.1	108.6	109.9	111.0	112.2	113.5	114.9	117.0	118.6	119.7	97.2	101.8	106.4	111.0	115.7	120.3	124.9	5	5

AGE YRS	AGE MTHS	CENTILES												STANDARD DEVIATIONS							AGE YRS	AGE MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
5	6	102.8	103.9	105.6	107.6	109.1	110.4	111.6	112.7	114.0	115.5	117.5	119.2	120.3	97.6	102.2	106.9	111.6	116.2	120.9	125.5	5	6
5	7	103.2	104.3	106.1	108.1	109.6	110.9	112.1	113.3	114.5	116.0	118.1	119.8	120.9	98.0	102.7	107.4	112.1	116.8	121.5	126.2	5	7
5	8	103.7	104.8	106.5	108.6	110.1	111.4	112.6	113.8	115.1	116.6	118.7	120.4	121.5	98.4	103.1	107.9	112.6	117.3	122.1	126.8	5	8
5	9	104.1	105.2	107.0	109.1	110.6	111.9	113.1	114.3	115.6	117.1	119.2	121.0	122.1	98.8	103.5	108.3	113.1	117.9	122.7	127.5	5	9
5	10	104.5	105.7	107.4	109.6	111.1	112.4	113.6	114.8	116.1	117.7	119.8	121.6	122.7	99.1	104.0	108.8	113.6	118.4	123.3	128.1	5	10
5	11	105.0	106.1	107.9	110.0	111.6	112.9	114.1	115.4	116.7	118.2	120.4	122.1	123.3	99.5	104.4	109.3	114.1	119.0	123.9	128.7	5	11
6	0	105.4	106.5	108.3	110.5	112.1	113.4	114.6	115.9	117.2	118.8	120.9	122.7	123.9	99.9	104.8	109.7	114.6	119.6	124.5	129.4	6	0
6	1	105.8	107.0	108.8	111.0	112.5	113.9	115.1	116.4	117.7	119.3	121.5	123.3	124.5	100.2	105.2	110.2	115.1	120.1	125.1	130.0	6	1
6	2	106.2	107.4	109.2	111.4	113.0	114.4	115.6	116.9	118.3	119.9	122.1	123.9	125.1	100.6	105.6	110.6	115.6	120.6	125.7	130.7	6	2
6	3	106.6	107.8	109.7	111.9	113.5	114.9	116.1	117.4	118.8	120.4	122.6	124.5	125.7	101.0	106.0	111.1	116.1	121.2	126.3	131.3	6	3
6	4	107.0	108.2	110.1	112.3	114.0	115.3	116.6	117.9	119.3	120.9	123.2	125.0	126.2	101.3	106.4	111.5	116.6	121.7	126.8	131.9	6	4
6	5	107.4	108.7	110.5	112.8	114.4	115.8	117.1	118.4	119.8	121.5	123.7	125.6	126.8	101.7	106.8	112.0	117.1	122.3	127.4	132.6	6	5
6	6	107.9	109.1	111.0	113.3	114.9	116.3	117.6	118.9	120.4	122.0	124.3	126.2	127.4	102.0	107.2	112.4	117.6	122.8	128.0	133.2	6	6
6	7	108.3	109.5	111.4	113.7	115.4	116.8	118.1	119.5	120.9	122.5	124.8	126.7	128.0	102.4	107.6	112.9	118.1	123.4	128.6	133.9	6	7
6	8	108.7	109.9	111.8	114.2	115.8	117.3	118.6	120.0	121.4	123.1	125.4	127.3	128.6	102.7	108.0	113.3	118.6	123.9	129.2	134.5	6	8
6	9	109.1	110.3	112.3	114.6	116.3	117.8	119.1	120.5	121.9	123.6	125.9	127.9	129.1	103.1	108.4	113.8	119.1	124.4	129.8	135.1	6	9
6	10	109.5	110.7	112.7	115.1	116.8	118.2	119.6	121.0	122.4	124.1	126.5	128.5	129.7	103.4	108.8	114.2	119.6	125.0	130.4	135.8	6	10
6	11	109.9	111.2	113.1	115.5	117.2	118.7	120.1	121.5	122.9	124.7	127.0	129.0	130.3	103.8	109.2	114.7	120.1	125.5	131.0	136.4	6	11
7	0	110.3	111.6	113.6	116.0	117.7	119.2	120.6	122.0	123.4	125.2	127.6	129.6	130.9	104.1	109.6	115.1	120.6	126.1	131.5	137.0	7	0
7	1	110.7	112.0	114.0	116.4	118.2	119.7	121.1	122.5	124.0	125.7	128.1	130.2	131.5	104.5	110.0	115.5	121.1	126.6	132.1	137.6	7	1
7	2	111.1	112.4	114.4	116.9	118.6	120.1	121.5	123.0	124.5	126.2	128.7	130.7	132.0	104.8	110.4	116.0	121.5	127.1	132.7	138.3	7	2
7	3	111.5	112.8	114.8	117.3	119.1	120.6	122.0	123.5	125.0	126.8	129.2	131.3	132.6	105.2	110.8	116.4	122.0	127.7	133.3	138.9	7	3
7	4	111.9	113.2	115.3	117.7	119.5	121.1	122.5	124.0	125.5	127.3	129.8	131.8	133.2	105.5	111.2	116.8	122.5	128.2	133.9	139.5	7	4
7	5	112.2	113.6	115.7	118.2	120.0	121.6	123.0	124.4	126.0	127.8	130.3	132.4	133.8	105.9	111.6	117.3	123.0	128.7	134.4	140.1	7	5
7	6	112.6	114.0	116.1	118.6	120.5	122.0	123.5	124.9	126.5	128.3	130.9	133.0	134.3	106.2	112.0	117.7	123.5	129.2	135.0	140.8	7	6
7	7	113.0	114.4	116.5	119.1	120.9	122.5	124.0	125.4	127.0	128.9	131.4	133.5	134.9	106.5	112.4	118.2	124.0	129.8	135.6	141.4	7	7
7	8	113.4	114.8	116.9	119.5	121.4	123.0	124.5	125.9	127.5	129.4	132.0	134.1	135.5	106.9	112.7	118.6	124.5	130.3	136.2	142.0	7	8
7	9	113.8	115.2	117.4	120.0	121.8	123.4	124.9	126.4	128.0	129.9	132.5	134.6	136.0	107.2	113.1	119.0	124.9	130.8	136.7	142.6	7	9
7	10	114.2	115.6	117.8	120.4	122.3	123.9	125.4	126.9	128.5	130.4	133.0	135.2	136.6	107.6	113.5	119.5	125.4	131.4	137.3	143.2	7	10
7	11	114.6	116.0	118.2	120.9	122.8	124.4	125.9	127.4	129.0	130.9	133.6	135.8	137.2	107.9	113.9	119.9	125.9	131.9	137.9	143.9	7	11
8	0	115.0	116.5	118.7	121.3	123.2	124.9	126.4	127.9	129.5	131.5	134.1	136.3	137.7	108.3	114.3	120.4	126.4	132.4	138.4	144.5	8	0
8	1	115.4	116.9	119.1	121.8	123.7	125.3	126.9	128.4	130.1	132.0	134.7	136.9	138.3	108.6	114.7	120.8	126.9	132.9	139.0	145.1	8	1
8	2	115.8	117.3	119.5	122.2	124.1	125.8	127.4	128.9	130.6	132.5	135.2	137.4	138.9	109.0	115.1	121.2	127.4	133.5	139.6	145.7	8	2
8	3	116.2	117.7	119.9	122.6	124.6	126.3	127.8	129.4	131.1	133.0	135.7	138.0	139.4	109.4	115.5	121.7	127.8	134.0	140.2	146.3	8	3
8	4	116.7	118.1	120.4	123.1	125.1	126.7	128.3	129.9	131.6	133.5	136.3	138.5	140.0	109.7	115.9	122.1	128.3	134.5	140.7	146.9	8	4
8	5	117.1	118.5	120.8	123.6	125.5	127.2	128.8	130.4	132.1	134.1	136.8	139.1	140.6	110.1	116.3	122.6	128.8	135.0	141.3	147.5	8	5
8	6	117.5	119.0	121.2	124.0	126.0	127.7	129.3	130.9	132.6	134.6	137.3	139.6	141.1	110.4	116.7	123.0	129.3	135.6	141.9	148.1	8	6
8	7	117.9	119.4	121.7	124.5	126.5	128.2	129.8	131.4	133.1	135.1	137.9	140.2	141.7	110.8	117.1	123.5	129.8	136.1	142.4	148.8	8	7
8	8	118.3	119.8	122.1	124.9	126.9	128.7	130.3	131.9	133.6	135.6	138.4	140.7	142.2	111.2	117.5	123.9	130.3	136.6	143.0	149.4	8	8
8	9	118.7	120.2	122.6	125.4	127.4	129.1	130.8	132.4	134.1	136.1	139.0	141.3	142.8	111.6	118.0	124.4	130.8	137.2	143.6	150.0	8	9
8	10	119.1	120.7	123.0	125.8	127.9	129.6	131.2	132.9	134.6	136.7	139.5	141.8	143.4	111.9	118.4	124.8	131.2	137.7	144.1	150.6	8	10
8	11	119.6	121.1	123.4	126.3	128.3	130.1	131.7	133.4	135.1	137.2	140.0	142.4	143.9	112.3	118.8	125.3	131.7	138.2	144.7	151.2	8	11

TABLE 21. STATURE (CM) BY AGE OF GIRLS AGED 2–18 YEARS (*continued*)

AGE YRS	MTHS	CENTILES													STANDARD DEVIATIONS							AGE YRS	MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
9	0	120.0	121.5	123.9	126.8	128.8	130.6	132.2	133.9	135.6	137.7	140.6	142.9	144.5	112.7	119.2	125.7	132.2	138.7	145.3	151.8	9	0
9	1	120.4	122.0	124.3	127.2	129.3	131.1	132.7	134.4	136.2	138.2	141.1	143.5	145.0	113.1	119.6	126.2	132.7	139.3	145.8	152.4	9	1
9	2	120.9	122.4	124.8	127.7	129.8	131.6	133.2	134.9	136.7	138.8	141.7	144.0	145.6	113.5	120.1	126.7	133.2	139.8	146.4	153.0	9	2
9	3	121.3	122.9	125.3	128.2	130.3	132.1	133.7	135.4	137.2	139.3	142.2	144.6	146.2	113.9	120.5	127.1	133.7	140.3	146.9	153.5	9	3
9	4	121.7	123.3	125.7	128.6	130.7	132.5	134.2	135.9	137.7	139.8	142.7	145.1	146.7	114.3	121.0	127.6	134.2	140.9	147.5	154.1	9	4
9	5	122.2	123.8	126.2	129.1	131.2	133.0	134.7	136.4	138.2	140.3	143.3	145.7	147.3	114.7	121.4	128.1	134.7	141.4	148.1	154.7	9	5
9	6	122.6	124.2	126.7	129.6	131.7	133.5	135.2	136.9	138.7	140.9	143.8	146.2	147.8	115.2	121.8	128.5	135.2	141.9	148.6	155.3	9	6
9	7	123.1	124.7	127.1	130.1	132.2	134.0	135.7	137.4	139.3	141.4	144.4	146.8	148.4	115.6	122.3	129.0	135.7	142.5	149.2	155.9	9	7
9	8	123.6	125.2	127.6	130.6	132.7	134.5	136.2	138.0	139.8	141.9	144.9	147.3	148.9	116.0	122.8	129.5	136.2	143.0	149.7	156.5	9	8
9	9	124.0	125.6	128.1	131.1	133.2	135.0	136.8	138.5	140.3	142.5	145.4	147.9	149.5	116.4	123.2	130.0	136.8	143.5	150.3	157.1	9	9
9	10	124.5	126.1	128.6	131.6	133.7	135.6	137.3	139.0	140.8	143.0	146.0	148.5	150.1	116.9	123.7	130.5	137.3	144.1	150.9	157.7	9	10
9	11	125.0	126.6	129.1	132.1	134.2	136.1	137.8	139.5	141.4	143.5	146.5	149.0	150.6	117.3	124.2	131.0	137.8	144.6	151.4	158.2	9	11
10	0	125.4	127.1	129.5	132.6	134.7	136.6	138.3	140.0	141.9	144.1	147.1	149.6	151.2	117.8	124.6	131.5	138.3	145.1	152.0	158.8	10	0
10	1	125.9	127.6	130.0	133.1	135.2	137.1	138.8	140.6	142.4	144.6	147.6	150.1	151.7	118.3	125.1	132.0	138.8	145.7	152.5	159.4	10	1
10	2	126.4	128.1	130.6	133.6	135.8	137.6	139.4	141.1	143.0	145.1	148.2	150.7	152.3	118.7	125.6	132.5	139.4	146.2	153.1	160.0	10	2
10	3	126.9	128.6	131.1	134.1	136.3	138.1	139.9	141.6	143.5	145.7	148.7	151.2	152.8	119.2	126.1	133.0	139.9	146.8	153.7	160.5	10	3
10	4	127.4	129.1	131.6	134.6	136.8	138.7	140.4	142.2	144.0	146.2	149.3	151.8	153.4	119.7	126.6	133.5	140.4	147.3	154.2	161.1	10	4
10	5	127.9	129.6	132.1	135.1	137.3	139.2	140.9	142.7	144.6	146.8	149.8	152.3	154.0	120.2	127.1	134.0	140.9	147.9	154.8	161.7	10	5
10	6	128.5	130.1	132.6	135.7	137.9	139.7	141.5	143.2	145.1	147.3	150.4	152.9	154.5	120.7	127.6	134.6	141.5	148.4	155.3	162.3	10	6
10	7	129.0	130.6	133.1	136.2	138.4	140.3	142.0	143.8	145.7	147.9	150.9	153.4	155.1	121.2	128.2	135.1	142.0	149.0	155.9	162.8	10	7
10	8	129.5	131.2	133.7	136.7	138.9	140.8	142.6	144.3	146.2	148.4	151.5	154.0	155.6	121.8	128.7	135.6	142.6	149.5	156.4	163.4	10	8
10	9	130.1	131.7	134.2	137.3	139.5	141.4	143.1	144.9	146.8	149.0	152.0	154.5	156.2	122.3	129.2	136.2	143.1	150.1	157.0	163.9	10	9
10	10	130.6	132.2	134.8	137.8	140.0	141.9	143.7	145.4	147.3	149.5	152.6	155.1	156.7	122.8	129.8	136.7	143.7	150.6	157.6	164.5	10	10
10	11	131.2	132.8	135.3	138.4	140.6	142.5	144.2	146.0	147.9	150.1	153.1	155.6	157.3	123.4	130.3	137.3	144.2	151.2	158.1	165.1	10	11
11	0	131.7	133.4	135.9	138.9	141.1	143.0	144.8	146.5	148.4	150.6	153.7	156.2	157.8	123.9	130.9	137.8	144.8	151.7	158.7	165.6	11	0
11	1	132.3	133.9	136.4	139.5	141.7	143.6	145.3	147.1	149.0	151.2	154.2	156.8	158.4	124.5	131.5	138.4	145.3	152.3	159.2	166.2	11	1
11	2	132.9	134.5	137.0	140.1	142.3	144.2	145.9	147.7	149.5	151.8	154.8	157.3	159.0	125.1	132.0	139.0	145.9	152.8	159.8	166.7	11	2
11	3	133.4	135.1	137.6	140.6	142.8	144.7	146.5	148.2	150.1	152.3	155.4	157.9	159.5	125.7	132.6	139.5	146.5	153.4	160.3	167.3	11	3
11	4	134.0	135.7	138.2	141.2	143.4	145.3	147.0	148.8	150.7	152.9	155.9	158.4	160.1	126.3	133.2	140.1	147.0	154.0	160.9	167.8	11	4
11	5	134.6	136.2	138.8	141.8	144.0	145.9	147.6	149.4	151.2	153.4	156.5	159.0	160.6	126.9	133.8	140.7	147.6	154.5	161.4	168.4	11	5
11	6	135.2	136.8	139.3	142.4	144.6	146.4	148.2	149.9	151.8	154.0	157.0	159.5	161.2	127.5	134.4	141.3	148.2	155.1	162.0	168.9	11	6
11	7	135.8	137.4	139.9	142.9	145.1	147.0	148.8	150.5	152.4	154.6	157.6	160.1	161.7	128.1	135.0	141.9	148.8	155.6	162.5	169.4	11	7
11	8	136.4	138.0	140.5	143.5	145.7	147.6	149.3	151.1	152.9	155.1	158.1	160.6	162.3	128.7	135.6	142.4	149.3	156.2	163.1	170.0	11	8
11	9	137.0	138.6	141.1	144.1	146.3	148.1	149.9	151.6	153.5	155.7	158.7	161.2	162.8	129.3	136.1	143.0	149.9	156.7	163.6	170.5	11	9
11	10	137.5	139.2	141.6	144.7	146.8	148.7	150.4	152.2	154.0	156.2	159.2	161.7	163.3	129.9	136.7	143.6	150.4	157.3	164.1	171.0	11	10
11	11	138.1	139.7	142.2	145.2	147.4	149.2	151.0	152.7	154.6	156.7	159.7	162.2	163.8	130.5	137.3	144.1	151.0	157.8	164.7	171.5	11	11
12	0	138.7	140.3	142.8	145.8	147.9	149.8	151.5	153.2	155.1	157.3	160.3	162.7	164.4	131.1	137.9	144.7	151.5	158.3	165.2	172.0	12	0
12	1	139.2	140.9	143.3	146.3	148.5	150.3	152.1	153.8	155.6	157.8	160.8	163.3	164.9	131.6	138.4	145.2	152.1	158.9	165.7	172.5	12	1
12	2	139.8	141.4	143.9	146.9	149.0	150.9	152.6	154.3	156.1	158.3	161.3	163.8	165.4	132.2	139.0	145.8	152.6	159.4	166.2	173.0	12	2
12	3	140.3	141.9	144.4	147.4	149.5	151.4	153.1	154.8	156.6	158.8	161.8	164.2	165.8	132.8	139.5	146.3	153.1	159.9	166.6	173.4	12	3
12	4	140.9	142.5	144.9	147.9	150.1	151.9	153.6	155.3	157.1	159.3	162.3	164.7	166.3	133.3	140.1	146.8	153.6	160.4	167.1	173.9	12	4
12	5	141.4	143.0	145.4	148.4	150.6	152.4	154.1	155.8	157.6	159.8	162.7	165.2	166.8	133.8	140.6	147.3	154.1	160.8	167.6	174.3	12	5

TABLE 21. STATURE (CM) BY AGE OF GIRLS AGED 2–18 YEARS (*continued*)

AGE YRS	AGE MTHS	CENTILES												STANDARD DEVIATIONS							AGE YRS	AGE MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
12	6	141.9	143.5	145.9	148.9	151.0	152.9	154.6	156.3	158.1	160.2	163.2	165.6	167.2	134.4	141.1	147.8	154.6	161.3	168.0	174.8	12	6
12	7	142.4	144.0	146.4	149.4	151.5	153.3	155.0	156.7	158.6	160.7	163.7	166.1	167.7	134.9	141.6	148.3	155.0	161.8	168.5	175.2	12	7
12	8	142.9	144.5	146.9	149.8	152.0	153.8	155.5	157.2	159.0	161.1	164.1	166.5	168.1	135.4	142.1	148.8	155.5	162.2	168.9	175.6	12	8
12	9	143.3	144.9	147.3	150.3	152.4	154.2	155.9	157.6	159.4	161.6	164.5	166.9	168.5	135.8	142.5	149.2	155.9	162.6	169.3	176.0	12	9
12	10	143.8	145.3	147.8	150.7	152.8	154.6	156.3	158.0	159.9	162.0	164.9	167.3	168.9	136.3	143.0	149.7	156.3	163.0	169.7	176.4	12	10
12	11	144.2	145.8	148.2	151.1	153.2	155.1	156.7	158.4	160.2	162.4	165.3	167.7	169.3	136.7	143.4	150.1	156.7	163.4	170.1	176.8	12	11
13	0	144.6	146.2	148.6	151.5	153.6	155.4	157.1	158.8	160.6	162.7	165.7	168.1	169.7	137.1	143.8	150.5	157.1	163.8	170.5	177.1	13	0
13	1	144.9	146.5	148.9	151.9	154.0	155.8	157.5	159.2	161.0	163.1	166.0	168.5	170.0	137.5	144.2	150.8	157.5	164.2	170.8	177.5	13	1
13	2	145.3	146.9	149.3	152.2	154.3	156.1	157.8	159.5	161.3	163.4	166.4	168.8	170.4	137.8	144.5	151.2	157.8	164.5	171.2	177.8	13	2
13	3	145.6	147.2	149.6	152.6	154.7	156.5	158.2	159.8	161.7	163.8	166.7	169.1	170.7	138.2	144.8	151.5	158.2	164.8	171.5	178.1	13	3
13	4	145.9	147.5	149.9	152.9	155.0	156.8	158.5	160.2	162.0	164.1	167.0	169.4	171.0	138.5	145.1	151.8	158.5	165.1	171.8	178.5	13	4
13	5	146.2	147.8	150.2	153.2	155.3	157.1	158.8	160.4	162.3	164.4	167.3	169.7	171.3	138.8	145.4	152.1	158.8	165.4	172.1	178.7	13	5
13	6	146.5	148.1	150.5	153.4	155.5	157.3	159.0	160.7	162.5	164.6	167.6	170.0	171.6	139.0	145.7	152.4	159.0	165.7	172.4	179.0	13	6
13	7	146.8	148.3	150.8	153.7	155.8	157.6	159.3	161.0	162.8	164.9	167.8	170.3	171.8	139.3	146.0	152.6	159.3	166.0	172.6	179.3	13	7
13	8	147.0	148.6	151.0	153.9	156.0	157.8	159.5	161.2	163.0	165.1	168.1	170.5	172.1	139.5	146.2	152.9	159.5	166.2	172.9	179.5	13	8
13	9	147.2	148.8	151.2	154.1	156.3	158.1	159.8	161.5	163.3	165.4	168.3	170.7	172.3	139.8	146.4	153.1	159.8	166.4	173.1	179.8	13	9
13	10	147.4	149.0	151.4	154.4	156.5	158.3	160.0	161.7	163.5	165.6	168.5	171.0	172.5	140.0	146.6	153.3	160.0	166.7	173.3	180.0	13	10
13	11	147.6	149.2	151.6	154.6	156.7	158.5	160.2	161.9	163.7	165.8	168.7	171.2	172.7	140.1	146.8	153.5	160.2	166.9	173.5	180.2	13	11
14	0	147.8	149.4	151.8	154.7	156.9	158.7	160.4	162.1	163.9	166.0	168.9	171.4	172.9	140.3	147.0	153.7	160.4	167.0	173.7	180.4	14	0
14	1	147.9	149.5	152.0	154.9	157.0	158.8	160.5	162.2	164.0	166.2	169.1	171.5	173.1	140.5	147.2	153.8	160.5	167.2	173.9	180.6	14	1
14	2	148.1	149.7	152.1	155.1	157.2	159.0	160.7	162.4	164.2	166.3	169.3	171.7	173.3	140.6	147.3	154.0	160.7	167.4	174.1	180.8	14	2
14	3	148.2	149.8	152.3	155.2	157.3	159.1	160.8	162.5	164.4	166.5	169.4	171.9	173.5	140.7	147.4	154.1	160.8	167.6	174.3	181.0	14	3
14	4	148.4	149.9	152.4	155.3	157.5	159.3	161.0	162.7	164.5	166.6	169.6	172.0	173.6	140.9	147.6	154.3	161.0	167.7	174.4	181.1	14	4
14	5	148.5	150.1	152.5	155.5	157.6	159.4	161.1	162.8	164.6	166.8	169.7	172.2	173.8	141.0	147.7	154.4	161.1	167.8	174.5	181.3	14	5
14	6	148.6	150.2	152.6	155.6	157.7	159.5	161.2	162.9	164.8	166.9	169.8	172.3	173.9	141.1	147.8	154.5	161.2	168.0	174.7	181.4	14	6
14	7	148.7	150.3	152.7	155.7	157.8	159.6	161.3	163.0	164.9	167.0	170.0	172.4	174.0	141.2	147.9	154.6	161.3	168.1	174.8	181.5	14	7
14	8	148.8	150.4	152.8	155.8	157.9	159.7	161.4	163.2	165.0	167.1	170.1	172.5	174.1	141.3	148.0	154.7	161.4	168.2	174.9	181.6	14	8
14	9	148.9	150.5	152.9	155.9	158.0	159.8	161.5	163.2	165.1	167.2	170.2	172.6	174.2	141.3	148.1	154.8	161.5	168.3	175.0	181.8	14	9
14	10	148.9	150.5	153.0	156.0	158.1	159.9	161.6	163.3	165.2	167.3	170.3	172.7	174.3	141.4	148.1	154.9	161.6	168.4	175.1	181.8	14	10
14	11	149.0	150.6	153.1	156.0	158.2	160.0	161.7	163.4	165.2	167.4	170.4	172.8	174.4	141.5	148.2	155.0	161.7	168.5	175.2	181.9	14	11
15	0	149.1	150.7	153.1	156.1	158.2	160.1	161.8	163.5	165.3	167.5	170.4	172.9	174.5	141.5	148.3	155.0	161.8	168.5	175.3	182.0	15	0
15	1	149.2	150.8	153.2	156.2	158.3	160.1	161.9	163.6	165.4	167.5	170.5	173.0	174.5	141.6	148.4	155.1	161.9	168.6	175.3	182.1	15	1
15	2	149.2	150.8	153.3	156.2	158.4	160.2	161.9	163.6	165.5	167.6	170.6	173.0	174.6	141.7	148.4	155.2	161.9	168.7	175.4	182.2	15	2
15	3	149.3	150.9	153.3	156.3	158.4	160.3	162.0	163.7	165.5	167.7	170.6	173.1	174.7	141.7	148.5	155.2	162.0	168.7	175.5	182.2	15	3
15	4	149.3	150.9	153.4	156.4	158.5	160.3	162.0	163.7	165.6	167.7	170.7	173.1	174.7	141.8	148.5	155.3	162.0	168.8	175.5	182.3	15	4
15	5	149.4	151.0	153.4	156.4	158.5	160.4	162.1	163.8	165.6	167.8	170.7	173.2	174.8	141.9	148.6	155.3	162.1	168.8	175.6	182.3	15	5
15	6	149.5	151.1	153.5	156.5	158.6	160.4	162.1	163.8	165.7	167.8	170.8	173.2	174.8	141.9	148.7	155.4	162.1	168.9	175.6	182.3	15	6
15	7	149.5	151.1	153.6	156.5	158.7	160.5	162.2	163.9	165.7	167.8	170.8	173.2	174.8	142.0	148.7	155.5	162.2	168.9	175.6	182.4	15	7
15	8	149.6	151.2	153.6	156.6	158.7	160.5	162.2	163.9	165.8	167.9	170.8	173.3	174.9	142.1	148.8	155.5	162.2	168.9	175.7	182.4	15	8
15	9	149.7	151.2	153.7	156.6	158.8	160.6	162.3	164.0	165.8	167.9	170.9	173.3	174.9	142.1	148.9	155.6	162.3	169.0	175.7	182.4	15	9
15	10	149.7	151.3	153.7	156.7	158.8	160.6	162.3	164.0	165.8	168.0	170.9	173.3	174.9	142.2	148.9	155.6	162.3	169.0	175.7	182.4	15	10
15	11	149.8	151.4	153.8	156.7	158.9	160.7	162.4	164.1	165.9	168.0	170.9	173.4	174.9	142.3	149.0	155.7	162.4	169.0	175.7	182.4	15	11

TABLE 21. STATURE (CM) BY AGE OF GIRLS AGED 2–18 YEARS (*continued*)

AGE YRS	AGE MTHS	CENTILES												STANDARD DEVIATIONS							AGE YRS	AGE MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
16	0	149.9	151.4	153.9	156.8	158.9	160.7	162.4	164.1	165.9	168.0	171.0	173.4	175.0	142.4	149.1	155.7	162.4	169.1	175.7	182.4	16	0
16	1	150.0	151.5	153.9	156.9	159.0	160.8	162.5	164.1	165.9	168.1	171.0	173.4	175.0	142.5	149.2	155.8	162.5	169.1	175.8	182.4	16	1
16	2	150.0	151.6	154.0	156.9	159.0	160.8	162.5	164.2	166.0	168.1	171.0	173.4	175.0	142.6	149.3	155.9	162.5	169.1	175.8	182.4	16	2
16	3	150.1	151.7	154.1	157.0	159.1	160.9	162.6	164.2	166.0	168.1	171.0	173.4	175.0	142.8	149.4	156.0	162.6	169.2	175.8	182.4	16	3
16	4	150.2	151.8	154.2	157.1	159.2	160.9	162.6	164.3	166.1	168.2	171.0	173.4	175.0	142.9	149.5	156.0	162.6	169.2	175.8	182.3	16	4
16	5	150.3	151.9	154.3	157.2	159.2	161.0	162.7	164.3	166.1	168.2	171.1	173.4	175.0	143.0	149.6	156.1	162.7	169.2	175.8	182.3	16	5
16	6	150.4	152.0	154.4	157.2	159.3	161.1	162.7	164.4	166.1	168.2	171.1	173.5	175.0	143.2	149.7	156.2	162.7	169.2	175.8	182.3	16	6
16	7	150.6	152.1	154.5	157.3	159.4	161.1	162.8	164.4	166.2	168.2	171.1	173.5	175.0	143.3	149.8	156.3	162.8	169.3	175.8	182.3	16	7
16	8	150.7	152.2	154.5	157.4	159.4	161.2	162.8	164.5	166.2	168.3	171.1	173.5	175.0	143.4	149.9	156.4	162.8	169.3	175.8	182.2	16	8
16	9	150.8	152.3	154.6	157.5	159.5	161.3	162.9	164.5	166.3	168.3	171.1	173.5	175.0	143.6	150.0	156.5	162.9	169.3	175.8	182.2	16	9
16	10	150.9	152.4	154.7	157.6	159.6	161.3	162.9	164.6	166.3	168.3	171.2	173.5	175.0	143.7	150.1	156.5	162.9	169.3	175.8	182.2	16	10
16	11	151.0	152.5	154.8	157.6	159.7	161.4	163.0	164.6	166.3	168.4	171.2	173.5	175.0	143.9	150.3	156.6	163.0	169.4	175.7	182.1	16	11
17	0	151.1	152.6	154.9	157.7	159.7	161.5	163.1	164.7	166.4	168.4	171.2	173.5	175.0	144.1	150.4	156.7	163.1	169.4	175.7	182.1	17	0
17	1	151.3	152.7	155.0	157.8	159.8	161.5	163.1	164.7	166.4	168.4	171.2	173.5	175.0	144.2	150.5	156.8	163.1	169.4	175.7	182.0	17	1
17	2	151.4	152.9	155.1	157.9	159.9	161.6	163.2	164.8	166.5	168.5	171.2	173.5	175.0	144.4	150.6	156.9	163.2	169.4	175.7	182.0	17	2
17	3	151.5	153.0	155.2	158.0	160.0	161.7	163.2	164.8	166.5	168.5	171.2	173.5	175.0	144.5	150.8	157.0	163.2	169.5	175.7	181.9	17	3
17	4	151.6	153.1	155.3	158.1	160.0	161.7	163.3	164.9	166.5	168.5	171.2	173.5	175.0	144.7	150.9	157.1	163.3	169.5	175.7	181.9	17	4
17	5	151.7	153.2	155.4	158.1	160.1	161.8	163.3	164.9	166.6	168.5	171.3	173.5	175.0	144.8	151.0	157.2	163.3	169.5	175.7	181.9	17	5
17	6	151.8	153.3	155.5	158.2	160.2	161.8	163.4	165.0	166.6	168.6	171.3	173.5	174.9	145.0	151.1	157.3	163.4	169.5	175.7	181.8	17	6
17	7	152.0	153.4	155.6	158.3	160.3	161.9	163.5	165.0	166.7	168.6	171.3	173.5	174.9	145.1	151.2	157.3	163.5	169.6	175.7	181.8	17	7
17	8	152.1	153.5	155.7	158.4	160.3	162.0	163.5	165.0	166.7	168.6	171.3	173.5	174.9	145.3	151.4	157.4	163.5	169.6	175.7	181.7	17	8
17	9	152.2	153.6	155.8	158.5	160.4	162.0	163.6	165.1	166.7	168.6	171.3	173.5	174.9	145.4	151.5	157.5	163.6	169.6	175.7	181.7	17	9
17	10	152.3	153.7	155.9	158.5	160.5	162.1	163.6	165.1	166.8	168.7	171.3	173.5	174.9	145.6	151.6	157.6	163.6	169.6	175.6	181.7	17	10
17	11	152.4	153.8	156.0	158.6	160.5	162.1	163.7	165.2	166.8	168.7	171.3	173.5	174.9	145.7	151.7	157.7	163.7	169.7	175.6	181.6	17	11
18	0	152.5	153.9	156.1	158.7	160.6	162.2	163.7	165.2	166.8	168.7	171.4	173.5	174.9	145.8	151.8	157.7	163.7	169.7	175.6	181.6	18	0

TABLE 22. WEIGHT (KG) BY AGE OF BOYS AGED 0–36 MONTHS

AGE MONTHS	CENTILES													STANDARD DEVIATIONS							AGE MONTHS
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
0	2.5	2.6	2.7	2.9	3.1	3.2	3.3	3.4	3.5	3.7	3.9	4.1	4.2	2.0	2.4	2.9	3.3	3.8	4.3	4.8	0
1	3.0	3.2	3.4	3.7	3.9	4.1	4.3	4.5	4.6	4.9	5.1	5.4	5.6	2.2	2.9	3.6	4.3	5.0	5.6	6.3	1
2	3.6	3.8	4.1	4.5	4.7	5.0	5.2	5.4	5.6	5.9	6.2	6.5	6.7	2.6	3.5	4.3	5.2	6.0	6.8	7.6	2
3	4.2	4.4	4.8	5.2	5.5	5.7	6.0	6.2	6.4	6.7	7.1	7.4	7.6	3.1	4.1	5.0	6.0	6.9	7.7	8.6	3
4	4.8	5.1	5.4	5.8	6.2	6.4	6.7	6.9	7.2	7.5	7.9	8.2	8.4	3.7	4.7	5.7	6.7	7.6	8.5	9.4	4
5	5.4	5.7	6.0	6.5	6.8	7.0	7.3	7.5	7.8	8.1	8.5	8.9	9.1	4.3	5.3	6.3	7.3	8.2	9.2	10.1	5
6	6.0	6.2	6.6	7.0	7.3	7.6	7.8	8.1	8.4	8.7	9.1	9.4	9.7	4.9	5.9	6.9	7.8	8.8	9.8	10.8	6
7	6.5	6.7	7.1	7.5	7.8	8.1	8.3	8.6	8.9	9.2	9.6	10.0	10.2	5.4	6.4	7.4	8.3	9.3	10.3	11.3	7
8	7.0	7.2	7.5	8.0	8.3	8.5	8.8	9.0	9.3	9.6	10.1	10.5	10.7	5.9	6.9	7.8	8.8	9.8	10.8	11.8	8
9	7.4	7.6	7.9	8.4	8.7	8.9	9.2	9.4	9.7	10.1	10.5	10.9	11.1	6.3	7.2	8.2	9.2	10.2	11.3	12.3	9
10	7.7	7.9	8.3	8.7	9.0	9.3	9.5	9.8	10.1	10.4	10.9	11.3	11.5	6.6	7.6	8.6	9.5	10.6	11.7	12.7	10
11	8.0	8.2	8.6	9.0	9.3	9.6	9.9	10.1	10.4	10.8	11.3	11.6	11.9	6.9	7.9	8.9	9.9	10.9	12.0	13.1	11
12	8.2	8.5	8.8	9.3	9.6	9.9	10.2	10.4	10.7	11.1	11.6	12.0	12.2	7.1	8.1	9.1	10.2	11.3	12.4	13.5	12
13	8.5	8.7	9.1	9.5	9.9	10.1	10.4	10.7	11.0	11.4	11.9	12.3	12.5	7.3	8.3	9.4	10.4	11.5	12.7	13.8	13
14	8.7	8.9	9.3	9.8	10.1	10.4	10.7	10.9	11.3	11.6	12.1	12.6	12.8	7.5	8.5	9.6	10.7	11.8	13.0	14.1	14
15	8.8	9.1	9.5	10.0	10.3	10.6	10.9	11.2	11.5	11.9	12.4	12.8	13.1	7.6	8.7	9.8	10.9	12.0	13.2	14.4	15
16	9.0	9.2	9.6	10.1	10.5	10.8	11.1	11.4	11.7	12.1	12.6	13.0	13.3	7.7	8.8	10.0	11.1	12.3	13.5	14.7	16
17	9.1	9.4	9.8	10.3	10.7	11.0	11.3	11.6	11.9	12.3	12.8	13.3	13.6	7.8	9.0	10.1	11.3	12.5	13.7	14.9	17
18	9.3	9.5	10.0	10.5	10.9	11.2	11.5	11.8	12.1	12.5	13.0	13.5	13.8	7.9	9.1	10.3	11.5	12.7	13.9	15.2	18
19	9.4	9.7	10.1	10.6	11.0	11.4	11.7	12.0	12.3	12.7	13.3	13.7	14.0	8.0	9.2	10.5	11.7	12.9	14.1	15.4	19
20	9.5	9.8	10.3	10.8	11.2	11.5	11.8	12.2	12.5	12.9	13.5	13.9	14.2	8.1	9.4	10.6	11.8	13.1	14.4	15.6	20
21	9.7	10.0	10.4	11.0	11.4	11.7	12.0	12.4	12.7	13.1	13.7	14.1	14.4	8.3	9.5	10.8	12.0	13.3	14.6	15.8	21
22	9.8	10.1	10.6	11.1	11.5	11.9	12.2	12.5	12.9	13.3	13.9	14.3	14.6	8.4	9.7	10.9	12.2	13.5	14.8	16.0	22
23	9.9	10.3	10.7	11.3	11.7	12.1	12.4	12.7	13.1	13.5	14.1	14.5	14.8	8.5	9.8	11.1	12.4	13.7	15.0	16.3	23
24	10.1	10.4	10.9	11.5	11.9	12.3	12.6	12.9	13.3	13.7	14.2	14.7	15.0	8.6	9.9	11.3	12.6	13.9	15.2	16.5	24
25	10.2	10.5	11.0	11.6	12.1	12.4	12.8	13.1	13.5	13.9	14.4	14.9	15.2	8.7	10.1	11.4	12.8	14.1	15.4	16.7	25
26	10.4	10.7	11.2	11.8	12.2	12.6	13.0	13.3	13.6	14.1	14.6	15.1	15.4	8.8	10.2	11.6	13.0	14.3	15.6	16.9	26
27	10.5	10.8	11.3	12.0	12.4	12.8	13.1	13.5	13.8	14.2	14.8	15.3	15.6	8.9	10.3	11.7	13.1	14.5	15.8	17.1	27
28	10.6	11.0	11.5	12.1	12.6	13.0	13.3	13.7	14.0	14.4	15.0	15.5	15.8	9.1	10.5	11.9	13.3	14.6	16.0	17.3	28
29	10.8	11.1	11.7	12.3	12.7	13.1	13.5	13.8	14.2	14.6	15.2	15.7	16.0	9.2	10.6	12.1	13.5	14.8	16.2	17.5	29
30	10.9	11.3	11.8	12.4	12.9	13.3	13.7	14.0	14.4	14.8	15.4	15.9	16.2	9.3	10.8	12.2	13.7	15.0	16.4	17.7	30
31	11.1	11.4	12.0	12.6	13.1	13.5	13.8	14.2	14.6	15.0	15.6	16.1	16.4	9.4	10.9	12.4	13.8	15.2	16.6	17.9	31
32	11.2	11.6	12.1	12.8	13.2	13.6	14.0	14.4	14.7	15.2	15.8	16.3	16.6	9.5	11.0	12.5	14.0	15.4	16.8	18.2	32
33	11.3	11.7	12.3	12.9	13.4	13.8	14.2	14.5	14.9	15.4	16.0	16.5	16.8	9.7	11.2	12.7	14.2	15.6	17.0	18.4	33
34	11.5	11.8	12.4	13.1	13.6	14.0	14.4	14.7	15.1	15.6	16.2	16.7	17.0	9.8	11.3	12.8	14.4	15.8	17.2	18.6	34
35	11.6	12.0	12.5	13.2	13.7	14.1	14.5	14.9	15.3	15.7	16.4	16.9	17.3	9.9	11.4	13.0	14.5	16.0	17.4	18.9	35
36	11.8	12.1	12.7	13.4	13.9	14.3	14.7	15.1	15.5	15.9	16.6	17.1	17.5	10.0	11.6	13.1	14.7	16.2	17.7	19.1	36

TABLE 23. WEIGHT (KG) BY AGE OF BOYS AGED 2–18 YEARS

AGE YRS	AGE MTHS	CENTILES													STANDARD DEVIATIONS							AGE YRS	AGE MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
2	0	10.2	10.5	10.9	11.4	11.8	12.1	12.3	12.8	13.2	13.8	14.5	15.1	15.5	9.0	10.1	11.2	12.3	14.0	15.7	17.4	2	0
2	1	10.3	10.6	11.0	11.6	11.9	12.2	12.5	13.0	13.4	14.0	14.7	15.3	15.7	9.0	10.2	11.4	12.5	14.2	15.9	17.6	2	1
2	2	10.4	10.7	11.2	11.7	12.1	12.4	12.7	13.2	13.6	14.2	14.9	15.5	15.9	9.1	10.3	11.5	12.7	14.4	16.1	17.8	2	2
2	3	10.6	10.9	11.3	11.9	12.3	12.6	12.9	13.4	13.8	14.4	15.1	15.7	16.1	9.1	10.4	11.7	12.9	14.6	16.3	18.0	2	3
2	4	10.7	11.0	11.5	12.0	12.4	12.8	13.1	13.6	14.0	14.6	15.3	16.0	16.4	9.2	10.5	11.8	13.1	14.8	16.6	18.3	2	4
2	5	10.8	11.1	11.6	12.2	12.6	13.0	13.3	13.8	14.2	14.8	15.5	16.2	16.6	9.3	10.6	12.0	13.3	15.1	16.8	18.5	2	5
2	6	10.9	11.2	11.7	12.3	12.8	13.2	13.5	14.0	14.4	15.0	15.7	16.4	16.8	9.4	10.7	12.1	13.5	15.3	17.0	18.7	2	6
2	7	11.0	11.4	11.9	12.5	13.0	13.3	13.7	14.1	14.6	15.2	15.9	16.6	17.0	9.4	10.9	12.3	13.7	15.5	17.2	19.0	2	7
2	8	11.1	11.5	12.0	12.7	13.1	13.5	13.9	14.3	14.8	15.4	16.1	16.8	17.2	9.5	11.0	12.4	13.9	15.7	17.4	19.2	2	8
2	9	11.3	11.6	12.2	12.8	13.3	13.7	14.1	14.5	15.0	15.6	16.4	17.0	17.4	9.6	11.1	12.6	14.1	15.9	17.6	19.4	2	9
2	10	11.4	11.7	12.3	13.0	13.5	13.9	14.3	14.7	15.2	15.8	16.6	17.2	17.6	9.7	11.2	12.7	14.3	16.0	17.8	19.6	2	10
2	11	11.5	11.9	12.4	13.1	13.6	14.0	14.4	14.9	15.4	16.0	16.8	17.4	17.8	9.7	11.3	12.9	14.4	16.2	18.0	19.8	2	11
3	0	11.6	12.0	12.6	13.3	13.8	14.2	14.6	15.1	15.6	16.2	17.0	17.6	18.0	9.8	11.4	13.0	14.6	16.4	18.3	20.1	3	0
3	1	11.7	12.1	12.7	13.4	13.9	14.4	14.8	15.3	15.8	16.3	17.2	17.8	18.2	9.9	11.5	13.2	14.8	16.6	18.5	20.3	3	1
3	2	11.9	12.3	12.9	13.6	14.1	14.6	15.0	15.4	15.9	16.5	17.3	18.0	18.5	10.0	11.7	13.3	15.0	16.8	18.7	20.5	3	2
3	3	12.0	12.4	13.0	13.7	14.3	14.7	15.2	15.6	16.1	16.7	17.5	18.2	18.7	10.1	11.8	13.5	15.2	17.0	18.9	20.7	3	3
3	4	12.1	12.5	13.1	13.9	14.4	14.9	15.3	15.8	16.3	16.9	17.7	18.4	18.9	10.2	11.9	13.6	15.3	17.2	19.1	21.0	3	4
3	5	12.2	12.6	13.3	14.0	14.6	15.1	15.5	16.0	16.5	17.1	17.9	18.6	19.1	10.3	12.0	13.8	15.5	17.4	19.3	21.2	3	5
3	6	12.4	12.8	13.4	14.2	14.8	15.2	15.7	16.2	16.7	17.3	18.1	18.8	19.3	10.4	12.1	13.9	15.7	17.6	19.5	21.4	3	6
3	7	12.5	12.9	13.6	14.3	14.9	15.4	15.8	16.3	16.9	17.5	18.3	19.0	19.5	10.5	12.3	14.1	15.8	17.8	19.7	21.7	3	7
3	8	12.6	13.0	13.7	14.5	15.1	15.6	16.0	16.5	17.0	17.7	18.5	19.2	19.7	10.6	12.4	14.2	16.0	18.0	19.9	21.9	3	8
3	9	12.7	13.2	13.8	14.6	15.2	15.7	16.2	16.7	17.2	17.9	18.7	19.4	19.9	10.7	12.5	14.4	16.2	18.2	20.1	22.1	3	9
3	10	12.9	13.3	14.0	14.8	15.4	15.9	16.4	16.9	17.4	18.0	18.9	19.7	20.1	10.8	12.6	14.5	16.4	18.4	20.4	22.4	3	10
3	11	13.0	13.4	14.1	14.9	15.5	16.1	16.5	17.0	17.6	18.2	19.1	19.9	20.3	10.9	12.8	14.6	16.5	18.6	20.6	22.6	3	11
4	0	13.1	13.6	14.3	15.1	15.7	16.2	16.7	17.2	17.8	18.4	19.3	20.1	20.5	11.0	12.9	14.8	16.7	18.7	20.8	22.8	4	0
4	1	13.2	13.7	14.4	15.2	15.9	16.4	16.9	17.4	17.9	18.5	19.5	20.3	20.8	11.1	13.0	14.9	16.9	18.9	21.0	23.1	4	1
4	2	13.4	13.8	14.5	15.4	16.0	16.5	17.0	17.6	18.1	18.8	19.7	20.5	21.0	11.2	13.1	15.1	17.0	19.1	21.2	23.3	4	2
4	3	13.5	14.0	14.7	15.5	16.2	16.7	17.2	17.7	18.3	19.0	19.9	20.7	21.2	11.3	13.3	15.2	17.2	19.3	21.4	23.6	4	3
4	4	13.6	14.1	14.8	15.7	16.3	16.9	17.4	17.9	18.5	19.2	20.1	20.9	21.4	11.4	13.4	15.4	17.4	19.5	21.7	23.8	4	4
4	5	13.8	14.2	15.0	15.8	16.5	17.0	17.5	18.1	18.7	19.4	20.3	21.1	21.6	11.5	13.5	15.5	17.5	19.7	21.9	24.1	4	5
4	6	13.9	14.4	15.1	16.0	16.6	17.2	17.7	18.2	18.8	19.5	20.5	21.3	21.8	11.6	13.7	15.7	17.7	19.9	22.1	24.3	4	6
4	7	14.0	14.5	15.2	16.1	16.8	17.3	17.9	18.4	19.0	19.7	20.7	21.5	22.1	11.8	13.8	15.8	17.9	20.1	22.3	24.6	4	7
4	8	14.2	14.6	15.4	16.3	16.9	17.5	18.0	18.6	19.2	19.9	20.9	21.8	22.3	11.9	13.9	16.0	18.0	20.3	22.6	24.8	4	8
4	9	14.3	14.8	15.5	16.4	17.1	17.7	18.2	18.8	19.4	20.1	21.1	22.0	22.5	12.0	14.0	16.1	18.2	20.5	22.8	25.1	4	9
4	10	14.4	14.9	15.7	16.6	17.3	17.8	18.3	18.9	19.6	20.3	21.3	22.2	22.7	12.1	14.2	16.3	18.3	20.7	23.0	25.4	4	10
4	11	14.6	15.1	15.8	16.7	17.4	18.0	18.5	19.1	19.8	20.5	21.6	22.4	23.0	12.2	14.3	16.4	18.5	20.9	23.3	25.6	4	11
5	0	14.7	15.2	16.0	16.9	17.6	18.1	18.7	19.3	19.9	20.7	21.8	22.6	23.2	12.3	14.4	16.6	18.7	21.1	23.5	25.9	5	0
5	1	14.8	15.3	16.1	17.0	17.7	18.3	18.8	19.5	20.1	20.9	22.0	22.9	23.4	12.4	14.6	16.7	18.8	21.3	23.7	26.2	5	1
5	2	15.0	15.5	16.2	17.2	17.9	18.5	19.0	19.6	20.3	21.1	22.2	23.1	23.7	12.6	14.7	16.9	19.0	21.5	24.0	26.5	5	2
5	3	15.1	15.6	16.4	17.3	18.0	18.6	19.2	19.8	20.5	21.3	22.4	23.3	23.9	12.7	14.8	17.0	19.2	21.7	24.2	26.7	5	3
5	4	15.2	15.7	16.5	17.5	18.2	18.8	19.3	20.0	20.7	21.5	22.6	23.6	24.2	12.8	15.0	17.1	19.3	21.9	24.5	27.0	5	4
5	5	15.4	15.9	16.7	17.6	18.3	18.9	19.5	20.2	20.9	21.7	22.8	23.8	24.4	12.9	15.1	17.3	19.5	22.1	24.7	27.3	5	5

TABLE 23. WEIGHT (KG) BY AGE OF BOYS AGED 2–18 YEARS (*continued*)

AGE YRS	MTHS	CENTILES													STANDARD DEVIATIONS							AGE YRS	MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
5	6	15.5	16.0	16.8	17.8	18.5	19.1	19.7	20.3	21.1	21.9	23.1	24.0	24.7	13.0	15.2	17.4	19.7	22.3	25.0	27.6	5	6
5	7	15.6	16.2	17.0	18.0	18.7	19.3	19.8	20.5	21.2	22.1	23.3	24.3	24.9	13.1	15.4	17.6	19.8	22.5	25.2	27.9	5	7
5	8	15.8	16.3	17.1	18.1	18.8	19.4	20.0	20.7	21.4	22.3	23.5	24.5	25.2	13.2	15.5	17.7	20.0	22.7	25.5	28.2	5	8
5	9	15.9	16.4	17.3	18.3	19.0	19.6	20.2	20.9	21.6	22.5	23.7	24.8	25.4	13.4	15.6	17.9	20.2	23.0	25.7	28.5	5	9
5	10	16.0	16.6	17.4	18.4	19.1	19.8	20.3	21.1	21.8	22.7	24.0	25.0	25.7	13.5	15.8	18.0	20.3	23.2	26.0	28.9	5	10
5	11	16.2	16.7	17.5	18.6	19.3	19.9	20.5	21.2	22.0	22.9	24.2	25.3	25.9	13.6	15.9	18.2	20.5	23.4	26.3	29.2	5	11
6	0	16.3	16.8	17.7	18.7	19.5	20.1	20.7	21.4	22.2	23.2	24.5	25.5	26.2	13.7	16.0	18.4	20.7	23.6	26.6	29.5	6	0
6	1	16.4	17.0	17.8	18.9	19.6	20.3	20.9	21.6	22.4	23.4	24.7	25.8	26.5	13.8	16.2	18.5	20.9	23.8	26.8	29.8	6	1
6	2	16.6	17.1	18.0	19.0	19.8	20.4	21.0	21.8	22.6	23.6	24.9	26.0	26.8	13.9	16.3	18.7	21.0	24.1	27.1	30.2	6	2
6	3	16.7	17.3	18.1	19.2	20.0	20.6	21.2	22.0	22.8	23.8	25.2	26.3	27.0	14.0	16.4	18.8	21.2	24.3	27.4	30.5	6	3
6	4	16.8	17.4	18.3	19.3	20.1	20.8	21.4	22.2	23.0	24.0	25.4	26.6	27.3	14.1	16.5	19.0	21.4	24.5	27.7	30.9	6	4
6	5	17.0	17.5	18.4	19.5	20.3	20.9	21.6	22.4	23.2	24.3	25.7	26.9	27.6	14.2	16.7	19.1	21.6	24.8	28.0	31.2	6	5
6	6	17.1	17.7	18.6	19.7	20.4	21.1	21.7	22.6	23.5	24.5	25.9	27.1	27.9	14.3	16.8	19.3	21.7	25.0	28.3	31.6	6	6
6	7	17.2	17.8	18.7	19.8	20.6	21.3	21.9	22.8	23.7	24.7	26.2	27.4	28.2	14.4	16.9	19.4	21.9	25.3	28.6	31.9	6	7
6	8	17.4	18.0	18.9	20.0	20.8	21.5	22.1	23.0	23.9	25.0	26.5	27.7	28.5	14.6	17.1	19.6	22.1	25.5	28.9	32.3	6	8
6	9	17.5	18.1	19.0	20.1	21.0	21.6	22.3	23.2	24.1	25.2	26.7	28.0	28.8	14.7	17.2	19.7	22.3	25.8	29.2	32.7	6	9
6	10	17.6	18.2	19.2	20.3	21.1	21.8	22.5	23.4	24.3	25.5	27.0	28.3	29.1	14.8	17.3	19.9	22.5	26.0	29.5	33.1	6	10
6	11	17.8	18.4	19.3	20.5	21.3	22.0	22.7	23.6	24.6	25.7	27.3	28.6	29.4	14.9	17.5	20.1	22.7	26.3	29.9	33.5	6	11
7	0	17.9	18.5	19.5	20.6	21.5	22.2	22.9	23.8	24.8	25.9	27.6	28.9	29.8	15.0	17.6	20.2	22.9	26.5	30.2	33.9	7	0
7	1	18.0	18.7	19.6	20.8	21.6	22.4	23.0	24.0	25.0	26.2	27.8	29.2	30.1	15.1	17.7	20.4	23.0	26.8	30.5	34.3	7	1
7	2	18.2	18.8	19.8	21.0	21.8	22.6	23.2	24.2	25.2	26.5	28.1	29.5	30.4	15.1	17.8	20.5	23.2	27.1	30.9	34.7	7	2
7	3	18.3	18.9	19.9	21.1	22.0	22.7	23.4	24.4	25.5	26.7	28.4	29.8	30.8	15.2	18.0	20.7	23.4	27.3	31.2	35.1	7	3
7	4	18.4	19.1	20.1	21.3	22.2	22.9	23.6	24.6	25.7	27.0	28.7	30.2	31.1	15.3	18.1	20.9	23.6	27.6	31.6	35.5	7	4
7	5	18.6	19.2	20.2	21.5	22.4	23.1	23.8	24.9	26.0	27.2	29.0	30.5	31.5	15.4	18.2	21.0	23.8	27.9	31.9	36.0	7	5
7	6	18.7	19.4	20.4	21.6	22.5	23.3	24.0	25.1	26.2	27.5	29.3	30.8	31.8	15.5	18.4	21.2	24.0	28.2	32.3	36.4	7	6
7	7	18.8	19.5	20.5	21.8	22.7	23.5	24.2	25.3	26.4	27.8	29.6	31.2	32.2	15.6	18.5	21.4	24.2	28.5	32.7	36.9	7	7
7	8	18.9	19.6	20.7	22.0	22.9	23.7	24.4	25.5	26.7	28.1	30.0	31.5	32.5	15.7	18.6	21.5	24.4	28.7	33.0	37.3	7	8
7	9	19.1	19.8	20.9	22.2	23.1	23.9	24.7	25.8	27.0	28.3	30.3	31.9	32.9	15.8	18.7	21.7	24.7	29.0	33.4	37.8	7	9
7	10	19.2	19.9	21.0	22.3	23.3	24.1	24.9	26.0	27.2	28.6	30.6	32.2	33.3	15.8	18.9	21.9	24.9	29.3	33.8	38.3	7	10
7	11	19.3	20.1	21.2	22.5	23.5	24.3	25.1	26.2	27.5	28.9	30.9	32.6	33.7	15.9	19.0	22.0	25.1	29.6	34.2	38.8	7	11
8	0	19.5	20.2	21.3	22.7	23.7	24.5	25.3	26.5	27.7	29.2	31.3	33.0	34.1	16.0	19.1	22.2	25.3	30.0	34.6	39.3	8	0
8	1	19.6	20.3	21.5	22.9	23.9	24.7	25.5	26.7	28.0	29.5	31.6	33.3	34.5	16.1	19.2	22.4	25.5	30.3	35.0	39.8	8	1
8	2	19.7	20.5	21.6	23.0	24.1	24.9	25.7	27.0	28.3	29.8	32.0	33.7	34.9	16.1	19.3	22.5	25.7	30.6	35.4	40.3	8	2
8	3	19.8	20.6	21.8	23.2	24.3	25.1	26.0	27.2	28.6	30.1	32.3	34.1	35.3	16.2	19.5	22.7	26.0	30.9	35.9	40.8	8	3
8	4	20.0	20.8	22.0	23.4	24.5	25.4	26.2	27.5	28.8	30.4	32.7	34.5	35.7	16.3	19.6	22.9	26.2	31.2	36.3	41.3	8	4
8	5	20.1	20.9	22.1	23.6	24.7	25.6	26.4	27.7	29.1	30.8	33.0	34.9	36.1	16.3	19.7	23.1	26.4	31.6	36.7	41.9	8	5
8	6	20.2	21.0	22.3	23.8	24.9	25.8	26.7	28.0	29.4	31.1	33.4	35.3	36.5	16.4	19.8	23.2	26.7	31.9	37.2	42.4	8	6
8	7	20.4	21.2	22.4	24.0	25.1	26.0	26.9	28.3	29.7	31.4	33.8	35.7	37.0	16.5	19.9	23.4	26.9	32.3	37.6	43.0	8	7
8	8	20.5	21.3	22.6	24.2	25.3	26.2	27.1	28.5	30.0	31.7	34.1	36.1	37.4	16.5	20.1	23.6	27.1	32.6	38.1	43.5	8	8
8	9	20.6	21.5	22.8	24.4	25.5	26.5	27.4	28.8	30.3	32.1	34.5	36.5	37.9	16.6	20.2	23.8	27.4	32.9	38.5	44.1	8	9
8	10	20.7	21.6	22.9	24.5	25.7	26.7	27.6	29.1	30.6	32.4	34.9	37.0	38.3	16.6	20.3	24.0	27.6	33.3	39.0	44.7	8	10
8	11	20.9	21.7	23.1	24.7	25.9	26.9	27.9	29.3	30.9	32.8	35.3	37.4	38.8	16.7	20.4	24.2	27.9	33.7	39.5	45.2	8	11

TABLE 23. WEIGHT (KG) BY AGE OF BOYS AGED 2–18 YEARS (*continued*)

AGE YRS	MTHS	CENTILES												STANDARD DEVIATIONS							AGE YRS	MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
9	0	21.0	21.9	23.3	24.9	26.1	27.2	28.1	29.6	31.2	33.1	35.7	37.8	39.2	16.8	20.5	24.3	28.1	34.0	39.9	45.8	9	0
9	1	21.1	22.0	23.4	25.1	26.4	27.4	28.4	29.9	31.5	33.4	36.1	38.3	39.7	16.8	20.7	24.5	28.4	34.4	40.4	46.4	9	1
9	2	21.3	22.2	23.6	25.3	26.6	27.7	28.6	30.2	31.9	33.8	36.5	38.7	40.2	16.9	20.8	24.7	28.6	34.8	40.9	47.0	9	2
9	3	21.4	22.3	23.8	25.5	26.8	27.9	28.9	30.5	32.2	34.2	36.9	39.2	40.6	16.9	20.9	24.9	28.9	35.2	41.4	47.6	9	3
9	4	21.5	22.5	24.0	25.8	27.0	28.2	29.2	30.8	32.5	34.5	37.3	39.6	41.1	17.0	21.0	25.1	29.2	35.5	41.9	48.2	9	4
9	5	21.7	22.6	24.1	26.0	27.3	28.4	29.5	31.1	32.8	34.9	37.7	40.1	41.6	17.0	21.2	25.3	29.5	35.9	42.4	48.9	9	5
9	6	21.8	22.8	24.3	26.2	27.5	28.7	29.7	31.4	33.2	35.3	38.2	40.6	42.1	17.1	21.3	25.5	29.7	36.3	42.9	49.5	9	6
9	7	22.0	23.0	24.5	26.4	27.8	28.9	30.0	31.7	33.5	35.6	38.6	41.0	42.6	17.2	21.4	25.7	30.0	36.7	43.4	50.1	9	7
9	8	22.1	23.1	24.7	26.6	28.0	29.2	30.3	32.0	33.9	36.0	39.0	41.5	43.1	17.2	21.6	25.9	30.3	37.1	43.9	50.7	9	8
9	9	22.2	23.3	24.9	26.8	28.2	29.4	30.6	32.3	34.2	36.4	39.5	42.0	43.6	17.3	21.7	26.1	30.6	37.5	44.4	51.4	9	9
9	10	22.4	23.5	25.1	27.1	28.5	29.7	30.9	32.6	34.6	36.8	39.9	42.5	44.1	17.4	21.9	26.4	30.9	37.9	45.0	52.0	9	10
9	11	22.5	23.6	25.3	27.3	28.7	30.0	31.1	33.0	34.9	37.2	40.3	43.0	44.6	17.4	22.0	26.6	31.1	38.3	45.5	52.7	9	11
10	0	22.7	23.8	25.5	27.5	29.0	30.3	31.4	33.3	35.3	37.6	40.8	43.4	45.2	17.5	22.1	26.8	31.4	38.7	46.0	53.3	10	0
10	1	22.9	24.0	25.7	27.8	29.3	30.5	31.7	33.6	35.6	38.0	41.2	43.9	45.7	17.6	22.3	27.0	31.7	39.2	46.6	54.0	10	1
10	2	23.0	24.1	25.9	28.0	29.5	30.8	32.0	34.0	36.0	38.4	41.7	44.4	46.2	17.6	22.4	27.2	32.0	39.6	47.1	54.6	10	2
10	3	23.2	24.3	26.1	28.2	29.8	31.1	32.4	34.3	36.4	38.8	42.2	44.9	46.8	17.7	22.6	27.5	32.4	40.0	47.7	55.3	10	3
10	4	23.3	24.5	26.3	28.5	30.1	31.4	32.7	34.6	36.7	39.2	42.6	45.5	47.3	17.8	22.8	27.7	32.7	40.4	48.2	56.0	10	4
10	5	23.5	24.7	26.5	28.7	30.3	31.7	33.0	35.0	37.1	39.6	43.1	46.0	47.8	17.9	22.9	27.9	33.0	40.9	48.8	56.7	10	5
10	6	23.7	24.9	26.7	29.0	30.6	32.0	33.3	35.3	37.5	40.0	43.6	46.5	48.4	18.0	23.1	28.2	33.3	41.3	49.3	57.3	10	6
10	7	23.9	25.1	27.0	29.3	30.9	32.3	33.6	35.7	37.9	40.5	44.0	47.0	48.9	18.1	23.2	28.4	33.6	41.8	49.9	58.0	10	7
10	8	24.0	25.3	27.2	29.5	31.2	32.6	33.9	36.0	38.3	40.9	44.5	47.5	49.5	18.1	23.4	28.7	33.9	42.2	50.4	58.7	10	8
10	9	24.2	25.5	27.4	29.8	31.5	32.9	34.3	36.4	38.7	41.3	45.0	48.0	50.0	18.2	23.6	28.9	34.3	42.6	51.0	59.4	10	9
10	10	24.4	25.7	27.7	30.1	31.8	33.2	34.6	36.8	39.1	41.8	45.5	48.6	50.6	18.3	23.8	29.2	34.6	43.1	51.6	60.1	10	10
10	11	24.6	25.9	27.9	30.3	32.1	33.6	35.0	37.1	39.5	42.2	46.0	49.1	51.1	18.5	24.0	29.5	35.0	43.6	52.2	60.8	10	11
11	0	24.8	26.1	28.1	30.6	32.4	33.9	35.3	37.5	39.9	42.6	46.5	49.6	51.7	18.6	24.1	29.7	35.3	44.0	52.7	61.5	11	0
11	1	25.0	26.3	28.4	30.9	32.7	34.2	35.6	37.9	40.3	43.1	47.0	50.2	52.3	18.7	24.3	30.0	35.6	44.5	53.3	62.2	11	1
11	2	25.2	26.6	28.7	31.2	33.0	34.5	36.0	38.3	40.7	43.5	47.5	50.7	52.8	18.8	24.5	30.3	36.0	45.0	53.9	62.9	11	2
11	3	25.4	26.8	28.9	31.5	33.3	34.9	36.4	38.7	41.1	44.0	48.0	51.3	53.4	18.9	24.7	30.5	36.4	45.4	54.5	63.6	11	3
11	4	25.6	27.0	29.2	31.8	33.6	35.2	36.7	39.0	41.5	44.4	48.5	51.8	54.0	19.0	24.9	30.8	36.7	45.9	55.1	64.3	11	4
11	5	25.9	27.3	29.4	32.1	34.0	35.6	37.1	39.4	42.0	44.9	49.0	52.4	54.6	19.2	25.2	31.1	37.1	46.4	55.7	65.0	11	5
11	6	26.1	27.5	29.7	32.4	34.3	35.9	37.5	39.8	42.4	45.4	49.5	52.9	55.1	19.3	25.4	31.4	37.5	46.9	56.3	65.7	11	6
11	7	26.3	27.8	30.0	32.7	34.6	36.3	37.8	40.2	42.8	45.8	50.0	53.5	55.7	19.5	25.6	31.7	37.8	47.3	56.9	66.4	11	7
11	8	26.6	28.0	30.3	33.0	35.0	36.6	38.2	40.6	43.3	46.3	50.5	54.0	56.3	19.6	25.8	32.0	38.2	47.8	57.5	67.1	11	8
11	9	26.8	28.3	30.6	33.3	35.3	37.0	38.6	41.1	43.7	46.8	51.1	54.6	56.9	19.8	26.1	32.3	38.6	48.3	58.1	67.8	11	9
11	10	27.0	28.5	30.9	33.6	35.7	37.4	39.0	41.5	44.1	47.3	51.6	55.2	57.5	19.9	26.3	32.6	39.0	48.8	58.7	68.5	11	10
11	11	27.3	28.8	31.2	34.0	36.0	37.8	39.4	41.9	44.6	47.7	52.1	55.7	58.1	20.1	26.5	33.0	39.4	49.3	59.3	69.2	11	11
12	0	27.6	29.1	31.5	34.3	36.4	38.1	39.8	42.3	45.0	48.2	52.6	56.3	58.7	20.3	26.8	33.3	39.8	49.8	59.9	69.9	12	0
12	1	27.8	29.4	31.8	34.7	36.7	38.5	40.2	42.8	45.5	48.7	53.2	56.9	59.3	20.5	27.1	33.6	40.2	50.3	60.5	70.6	12	1
12	2	28.1	29.7	32.1	35.0	37.1	38.9	40.6	43.2	46.0	49.2	53.7	57.4	59.9	20.7	27.3	34.0	40.6	50.8	61.1	71.3	12	2
12	3	28.4	30.0	32.4	35.4	37.5	39.3	41.0	43.6	46.4	49.7	54.3	58.0	60.5	20.9	27.6	34.3	41.0	51.3	61.7	72.0	12	3
12	4	28.7	30.3	32.7	35.7	37.9	39.7	41.4	44.1	46.9	50.2	54.8	58.6	61.1	21.1	27.9	34.6	41.4	51.9	62.3	72.7	12	4
12	5	29.0	30.6	33.1	36.1	38.3	40.1	41.8	44.5	47.4	50.7	55.3	59.2	61.7	21.3	28.2	35.0	41.8	52.4	62.9	73.4	12	5

TABLE 23. WEIGHT (KG) BY AGE OF BOYS AGED 2–18 YEARS (*continued*)

AGE YRS	MTHS	CENTILES													STANDARD DEVIATIONS							AGE YRS	MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
12	6	29.3	30.9	33.4	36.5	38.6	40.5	42.3	45.0	47.8	51.2	55.9	59.8	62.3	21.5	28.4	35.4	42.3	52.9	63.5	74.1	12	6
12	7	29.6	31.2	33.8	36.8	39.0	40.9	42.7	45.4	48.3	51.7	56.4	60.3	62.9	21.8	28.7	35.7	42.7	53.4	64.1	74.9	12	7
12	8	29.9	31.6	34.1	37.2	39.4	41.4	43.1	45.9	48.8	52.2	57.0	60.9	63.5	22.0	29.0	36.1	43.1	53.9	64.8	75.6	12	8
12	9	30.2	31.9	34.5	37.6	39.9	41.8	43.6	46.3	49.3	52.8	57.5	61.5	64.1	22.3	29.4	36.5	43.6	54.5	65.4	76.3	12	9
12	10	30.5	32.2	34.8	38.0	40.3	42.2	44.0	46.8	49.8	53.3	58.1	62.1	64.7	22.5	29.7	36.9	44.0	55.0	66.0	77.0	12	10
12	11	30.9	32.6	35.2	38.4	40.7	42.7	44.5	47.3	50.3	53.8	58.7	62.7	65.3	22.8	30.0	37.3	44.5	55.5	66.6	77.7	12	11
13	0	31.2	32.9	35.6	38.8	41.1	43.1	45.0	47.8	50.8	54.3	59.2	63.3	65.9	23.1	30.4	37.7	45.0	56.1	67.2	78.3	13	0
13	1	31.6	33.3	36.0	39.2	41.6	43.6	45.4	48.3	51.3	54.9	59.8	63.9	66.5	23.3	30.7	38.1	45.4	56.6	67.8	79.0	13	1
13	2	31.9	33.7	36.4	39.6	42.0	44.0	45.9	48.7	51.8	55.4	60.3	64.4	67.1	23.6	31.1	38.5	45.9	57.2	68.5	79.7	13	2
13	3	32.3	34.1	36.8	40.1	42.4	44.5	46.4	49.2	52.3	55.9	60.9	65.0	67.7	23.9	31.4	38.9	46.4	57.7	69.1	80.4	13	3
13	4	32.7	34.5	37.2	40.5	42.9	44.9	46.8	49.7	52.8	56.5	61.5	65.6	68.3	24.2	31.8	39.3	46.8	58.3	69.7	81.1	13	4
13	5	33.1	34.8	37.6	40.9	43.3	45.4	47.3	50.2	53.3	57.0	62.0	66.2	68.9	24.6	32.2	39.7	47.3	58.8	70.3	81.8	13	5
13	6	33.4	35.2	38.0	41.4	43.8	45.9	47.8	50.7	53.9	57.5	62.6	66.8	69.5	24.9	32.5	40.2	47.8	59.4	70.9	82.5	13	6
13	7	33.8	35.6	38.4	41.8	44.3	46.3	48.3	51.2	54.4	58.1	63.2	67.4	70.2	25.2	32.9	40.6	48.3	59.9	71.5	83.2	13	7
13	8	34.2	36.1	38.9	42.3	44.7	46.8	48.8	51.7	54.9	58.6	63.8	68.0	70.8	25.6	33.3	41.0	48.8	60.5	72.1	83.8	13	8
13	9	34.6	36.5	39.3	42.7	45.2	47.3	49.3	52.3	55.4	59.2	64.3	68.6	71.4	25.9	33.7	41.5	49.3	61.0	72.8	84.5	13	9
13	10	35.0	36.9	39.7	43.2	45.7	47.8	49.8	52.8	56.0	59.7	64.9	69.2	72.0	26.3	34.1	41.9	49.8	61.6	73.4	85.2	13	10
13	11	35.4	37.3	40.2	43.6	46.1	48.3	50.3	53.3	56.5	60.2	65.5	69.8	72.6	26.6	34.5	42.4	50.3	62.1	74.0	85.8	13	11
14	0	35.9	37.7	40.6	44.1	46.6	48.8	50.8	53.8	57.0	60.8	66.0	70.4	73.2	27.0	34.9	42.8	50.8	62.7	74.6	86.5	14	0
14	1	36.3	38.2	41.1	44.6	47.1	49.3	51.3	54.3	57.5	61.3	66.6	70.9	73.8	27.4	35.3	43.3	51.3	63.2	75.2	87.1	14	1
14	2	36.7	38.6	41.5	45.0	47.6	49.7	51.8	54.8	58.1	61.9	67.2	71.5	74.4	27.7	35.7	43.8	51.8	63.8	75.8	87.8	14	2
14	3	37.1	39.0	41.9	45.5	48.0	50.2	52.3	55.3	58.6	62.4	67.7	72.1	75.0	28.1	36.2	44.2	52.3	64.3	76.4	88.4	14	3
14	4	37.5	39.4	42.4	46.0	48.5	50.7	52.8	55.8	59.1	63.0	68.3	72.7	75.5	28.5	36.6	44.7	52.8	64.9	77.0	89.1	14	4
14	5	38.0	39.9	42.8	46.4	49.0	51.2	53.3	56.3	59.6	63.5	68.8	73.3	76.1	28.9	37.0	45.1	53.3	65.4	77.6	89.7	14	5
14	6	38.4	40.3	43.3	46.9	49.5	51.7	53.8	56.9	60.2	64.0	69.4	73.8	76.7	29.2	37.4	45.6	53.8	66.0	78.2	90.4	14	6
14	7	38.8	40.7	43.7	47.3	50.0	52.2	54.3	57.4	60.7	64.6	70.0	74.4	77.3	29.6	37.8	46.0	54.3	66.5	78.8	91.0	14	7
14	8	39.2	41.2	44.2	47.8	50.4	52.7	54.8	57.9	61.2	65.1	70.5	75.0	77.9	30.0	38.3	46.5	54.8	67.0	79.3	91.6	14	8
14	9	39.7	41.6	44.6	48.3	50.9	53.1	55.2	58.4	61.7	65.6	71.1	75.5	78.4	30.4	38.7	47.0	55.2	67.6	79.9	92.2	14	9
14	10	40.1	42.1	45.1	48.7	51.4	53.6	55.7	58.9	62.2	66.2	71.6	76.1	79.0	30.8	39.1	47.4	55.7	68.1	80.5	92.9	14	10
14	11	40.5	42.5	45.5	49.2	51.8	54.1	56.2	59.4	62.7	66.7	72.1	76.6	79.6	31.2	39.5	47.9	56.2	68.6	81.1	93.5	14	11
15	0	40.9	42.9	46.0	49.6	52.3	54.6	56.7	59.9	63.2	67.2	72.7	77.2	80.1	31.6	39.9	48.3	56.7	69.2	81.6	94.1	15	0
15	1	41.4	43.3	46.4	50.1	52.8	55.1	57.2	60.4	63.7	67.7	73.2	77.7	80.7	31.9	40.4	48.8	57.2	69.7	82.2	94.7	15	1
15	2	41.8	43.8	46.8	50.6	53.2	55.5	57.7	60.8	64.2	68.2	73.7	78.3	81.2	32.3	40.8	49.2	57.7	70.2	82.7	95.3	15	2
15	3	42.2	44.2	47.3	51.0	53.7	56.0	58.1	61.3	64.7	68.7	74.2	78.8	81.8	32.7	41.2	49.7	58.1	70.7	83.3	95.9	15	3
15	4	42.6	44.6	47.7	51.4	54.1	56.4	58.6	61.8	65.2	69.2	74.8	79.3	82.3	33.1	41.6	50.1	58.6	71.2	83.8	96.4	15	4
15	5	43.0	45.0	48.1	51.9	54.6	56.9	59.1	62.3	65.7	69.7	75.3	79.9	82.9	33.5	42.0	50.5	59.1	71.7	84.4	97.0	15	5
15	6	43.4	45.4	48.5	52.3	55.0	57.3	59.5	62.7	66.2	70.2	75.8	80.4	83.4	33.8	42.4	51.0	59.5	72.2	84.9	97.6	15	6
15	7	43.8	45.8	49.0	52.7	55.5	57.8	60.0	63.2	66.6	70.7	76.3	80.9	83.9	34.2	42.8	51.4	60.0	72.7	85.4	98.2	15	7
15	8	44.2	46.2	49.4	53.2	55.9	58.2	60.4	63.6	67.1	71.2	76.8	81.4	84.4	34.6	43.2	51.8	60.4	73.2	85.9	98.7	15	8
15	9	44.6	46.6	49.8	53.6	56.3	58.7	60.8	64.1	67.6	71.6	77.3	81.9	84.9	35.0	43.6	52.2	60.8	73.6	86.5	99.3	15	9
15	10	45.0	47.0	50.2	54.0	56.7	59.1	61.3	64.5	68.0	72.1	77.7	82.4	85.4	35.3	44.0	52.6	61.3	74.1	87.0	99.8	15	10
15	11	45.4	47.4	50.6	54.4	57.1	59.5	61.7	65.0	68.4	72.5	78.2	82.9	85.9	35.7	44.3	53.0	61.7	74.6	87.5	100.3	15	11

TABLE 23. WEIGHT (KG) BY AGE OF BOYS AGED 2–18 YEARS (*continued*)

AGE YRS	MTHS	CENTILES													STANDARD DEVIATIONS							AGE YRS	MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
16	0	45.7	47.8	51.0	54.8	57.5	59.9	62.1	65.4	68.9	73.0	78.7	83.4	86.4	36.0	44.7	53.4	62.1	75.0	87.9	100.9	16	0
16	1	46.1	48.2	51.3	55.2	57.9	60.3	62.5	65.8	69.3	73.4	79.1	83.8	86.9	36.4	45.1	53.8	62.5	75.5	88.4	101.4	16	1
16	2	46.5	48.5	51.7	55.6	58.3	60.7	62.9	66.2	69.7	73.8	79.6	84.3	87.4	36.7	45.4	54.2	62.9	75.9	88.9	101.9	16	2
16	3	46.8	48.9	52.1	55.9	58.7	61.1	63.3	66.6	70.1	74.3	80.0	84.7	87.8	37.0	45.8	54.5	63.3	76.3	89.4	102.4	16	3
16	4	47.2	49.2	52.4	56.3	59.1	61.4	63.7	67.0	70.5	74.7	80.4	85.2	88.3	37.4	46.1	54.9	63.7	76.8	89.8	102.9	16	4
16	5	47.5	49.6	52.8	56.6	59.4	61.8	64.0	67.4	70.9	75.1	80.9	85.6	88.7	37.7	46.5	55.3	64.0	77.2	90.3	103.4	16	5
16	6	47.8	49.9	53.1	57.0	59.8	62.2	64.4	67.7	71.3	75.5	81.3	86.1	89.2	38.0	46.8	55.6	64.4	77.6	90.7	103.9	16	6
16	7	48.2	50.2	53.4	57.3	60.1	62.5	64.7	68.1	71.7	75.9	81.7	86.5	89.6	38.3	47.1	55.9	64.7	78.0	91.2	104.4	16	7
16	8	48.5	50.6	53.8	57.6	60.4	62.8	65.1	68.4	72.0	76.2	82.1	86.9	90.0	38.6	47.4	56.2	65.1	78.3	91.6	104.8	16	8
16	9	48.8	50.9	54.1	58.0	60.8	63.2	65.4	68.8	72.4	76.6	82.5	87.3	90.4	38.9	47.7	56.6	65.4	78.7	92.0	105.3	16	9
16	10	49.1	51.2	54.4	58.3	61.1	63.5	65.7	69.1	72.7	77.0	82.8	87.7	90.8	39.2	48.0	56.9	65.7	79.1	92.4	105.8	16	10
16	11	49.3	51.4	54.7	58.6	61.4	63.8	66.0	69.4	73.0	77.3	83.2	88.1	91.2	39.4	48.3	57.2	66.0	79.4	92.8	106.2	16	11
17	0	49.6	51.7	54.9	58.8	61.7	64.1	66.3	69.7	73.4	77.6	83.5	88.4	91.6	39.7	48.6	57.4	66.3	79.8	93.2	106.6	17	0
17	1	49.9	52.0	55.2	59.1	61.9	64.3	66.6	70.0	73.7	77.9	83.9	88.8	92.0	39.9	48.8	57.7	66.6	80.1	93.6	107.1	17	1
17	2	50.1	52.2	55.4	59.4	62.2	64.6	66.8	70.3	74.0	78.3	84.2	89.1	92.3	40.2	49.1	57.9	66.8	80.4	93.9	107.5	17	2
17	3	50.3	52.4	55.7	59.6	62.4	64.8	67.1	70.5	74.2	78.5	84.5	89.5	92.7	40.4	49.3	58.2	67.1	80.7	94.3	107.9	17	3
17	4	50.6	52.7	55.9	59.8	62.7	65.1	67.3	70.8	74.5	78.8	84.8	89.8	93.0	40.6	49.5	58.4	67.3	81.0	94.6	108.3	17	4
17	5	50.8	52.9	56.1	60.1	62.9	65.3	67.6	71.0	74.8	79.1	85.1	90.1	93.4	40.8	49.7	58.6	67.6	81.3	95.0	108.7	17	5
17	6	51.0	53.1	56.3	60.3	63.1	65.5	67.8	71.3	75.0	79.4	85.4	90.4	93.7	41.0	49.9	58.9	67.8	81.5	95.3	109.1	17	6
17	7	51.2	53.3	56.5	60.5	63.3	65.7	68.0	71.5	75.2	79.6	85.7	90.7	94.0	41.2	50.1	59.0	68.0	81.8	95.6	109.4	17	7
17	8	51.3	53.5	56.7	60.7	63.5	65.9	68.2	71.7	75.5	79.9	86.0	91.0	94.3	41.3	50.3	59.2	68.2	82.1	95.9	109.8	17	8
17	9	51.5	53.6	56.9	60.8	63.7	66.1	68.4	71.9	75.7	80.1	86.2	91.3	94.6	41.5	50.5	59.4	68.4	82.3	96.2	110.1	17	9
17	10	51.7	53.8	57.1	61.0	63.9	66.3	68.6	72.1	75.9	80.3	86.5	91.5	94.8	41.6	50.6	59.6	68.6	82.5	96.5	110.5	17	10
17	11	51.8	54.0	57.2	61.2	64.0	66.4	68.7	72.3	76.1	80.5	86.7	91.8	95.1	41.8	50.8	59.7	68.7	82.7	96.8	110.8	17	11
18	0	52.0	54.1	57.4	61.3	64.2	66.6	68.9	72.4	76.3	80.7	86.9	92.0	95.3	41.9	50.9	59.9	68.9	82.9	97.0	111.1	18	0

TABLE 24. WEIGHT (KG) BY AGE OF GIRLS AGED 0–36 MONTHS

AGE MONTHS	CENTILES													STANDARD DEVIATIONS							AGE MONTHS
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
0	2.3	2.4	2.6	2.8	3.0	3.1	3.2	3.3	3.4	3.5	3.7	3.8	3.9	1.8	2.2	2.7	3.2	3.6	4.0	4.3	0
1	2.9	3.0	3.2	3.5	3.7	3.8	4.0	4.1	4.3	4.4	4.7	4.9	5.0	2.2	2.8	3.4	4.0	4.5	5.1	5.6	1
2	3.4	3.6	3.8	4.1	4.4	4.5	4.7	4.9	5.1	5.3	5.6	5.8	6.0	2.7	3.3	4.0	4.7	5.4	6.1	6.7	2
3	4.0	4.2	4.4	4.8	5.0	5.2	5.4	5.6	5.8	6.1	6.4	6.7	6.9	3.2	3.9	4.7	5.4	6.2	7.0	7.7	3
4	4.6	4.7	5.0	5.4	5.6	5.8	6.0	6.3	6.5	6.8	7.1	7.4	7.6	3.7	4.5	5.3	6.0	6.9	7.7	8.6	4
5	5.1	5.3	5.6	6.0	6.2	6.4	6.7	6.9	7.1	7.4	7.8	8.1	8.3	4.1	5.0	5.8	6.7	7.5	8.4	9.3	5
6	5.6	5.8	6.1	6.5	6.8	7.0	7.2	7.4	7.7	8.0	8.4	8.7	8.9	4.6	5.5	6.3	7.2	8.1	9.0	10.0	6
7	6.0	6.2	6.5	6.9	7.2	7.5	7.7	7.9	8.2	8.5	8.9	9.3	9.5	5.0	5.9	6.8	7.7	8.7	9.6	10.5	7
8	6.4	6.6	7.0	7.4	7.7	7.9	8.2	8.4	8.7	9.0	9.4	9.8	10.0	5.3	6.3	7.2	8.2	9.1	10.1	11.1	8
9	6.7	7.0	7.3	7.7	8.1	8.3	8.6	8.8	9.1	9.4	9.8	10.2	10.4	5.7	6.6	7.6	8.6	9.6	10.5	11.5	9
10	7.0	7.3	7.6	8.1	8.4	8.7	8.9	9.2	9.4	9.8	10.2	10.6	10.8	5.9	6.9	7.9	8.9	9.9	10.9	11.9	10
11	7.3	7.6	7.9	8.4	8.7	9.0	9.2	9.5	9.8	10.1	10.6	10.9	11.2	6.2	7.2	8.2	9.2	10.3	11.3	12.3	11
12	7.6	7.8	8.2	8.6	9.0	9.3	9.5	9.8	10.1	10.4	10.9	11.2	11.5	6.4	7.4	8.5	9.5	10.6	11.6	12.7	12
13	7.8	8.0	8.4	8.9	9.2	9.5	9.8	10.1	10.3	10.7	11.1	11.5	11.8	6.6	7.6	8.7	9.8	10.8	11.9	13.0	13
14	8.0	8.2	8.6	9.1	9.5	9.8	10.0	10.3	10.6	10.9	11.4	11.8	12.0	6.7	7.8	8.9	10.0	11.1	12.2	13.2	14
15	8.1	8.4	8.8	9.3	9.7	10.0	10.2	10.5	10.8	11.2	11.6	12.0	12.3	6.9	8.0	9.1	10.2	11.3	12.4	13.5	15
16	8.3	8.6	9.0	9.5	9.9	10.2	10.4	10.7	11.0	11.4	11.9	12.3	12.5	7.0	8.2	9.3	10.4	11.5	12.6	13.7	16
17	8.5	8.7	9.2	9.7	10.0	10.3	10.6	10.9	11.2	11.6	12.1	12.5	12.7	7.2	8.3	9.5	10.6	11.8	12.9	14.0	17
18	8.6	8.9	9.3	9.8	10.2	10.5	10.8	11.1	11.4	11.8	12.3	12.7	13.0	7.3	8.5	9.7	10.8	12.0	13.1	14.2	18
19	8.8	9.1	9.5	10.0	10.4	10.7	11.0	11.3	11.6	12.0	12.5	12.9	13.2	7.5	8.6	9.8	11.0	12.2	13.3	14.5	19
20	8.9	9.2	9.7	10.2	10.6	10.9	11.2	11.5	11.8	12.2	12.7	13.1	13.4	7.6	8.8	10.0	11.2	12.4	13.5	14.7	20
21	9.1	9.4	9.8	10.4	10.7	11.1	11.4	11.7	12.0	12.4	12.9	13.3	13.6	7.7	9.0	10.2	11.4	12.6	13.8	15.0	21
22	9.3	9.5	10.0	10.5	10.9	11.2	11.5	11.9	12.2	12.6	13.1	13.6	13.9	7.9	9.1	10.3	11.5	12.8	14.0	15.2	22
23	9.4	9.7	10.2	10.7	11.1	11.4	11.7	12.0	12.4	12.8	13.3	13.8	14.1	8.0	9.3	10.5	11.7	13.0	14.2	15.5	23
24	9.6	9.9	10.3	10.9	11.3	11.6	11.9	12.2	12.6	13.0	13.6	14.0	14.3	8.2	9.4	10.7	11.9	13.2	14.5	15.8	24
25	9.7	10.0	10.5	11.0	11.4	11.8	12.1	12.4	12.8	13.2	13.8	14.2	14.6	8.3	9.6	10.8	12.1	13.4	14.7	16.0	25
26	9.9	10.2	10.6	11.2	11.6	11.9	12.3	12.6	13.0	13.4	14.0	14.5	14.8	8.5	9.7	11.0	12.3	13.6	14.9	16.3	26
27	10.1	10.3	10.8	11.4	11.8	12.1	12.4	12.8	13.1	13.6	14.2	14.7	15.0	8.6	9.9	11.2	12.4	13.8	15.2	16.6	27
28	10.2	10.5	11.0	11.5	11.9	12.3	12.6	13.0	13.3	13.8	14.4	14.9	15.2	8.8	10.1	11.3	12.6	14.0	15.4	16.8	28
29	10.4	10.7	11.1	11.7	12.1	12.4	12.8	13.1	13.5	14.0	14.6	15.1	15.5	8.9	10.2	11.5	12.8	14.2	15.6	17.1	29
30	10.5	10.8	11.3	11.8	12.3	12.6	12.9	13.3	13.7	14.2	14.8	15.3	15.7	9.1	10.3	11.6	12.9	14.4	15.9	17.3	30
31	10.6	11.0	11.4	12.0	12.4	12.8	13.1	13.5	13.9	14.4	15.0	15.6	15.9	9.2	10.5	11.8	13.1	14.6	16.1	17.6	31
32	10.8	11.1	11.6	12.2	12.6	12.9	13.3	13.7	14.1	14.6	15.2	15.8	16.1	9.3	10.6	11.9	13.3	14.8	16.3	17.8	32
33	10.9	11.2	11.7	12.3	12.7	13.1	13.4	13.8	14.2	14.7	15.4	16.0	16.3	9.4	10.7	12.1	13.4	15.0	16.5	18.1	33
34	11.0	11.4	11.9	12.5	12.9	13.3	13.6	14.0	14.4	14.9	15.6	16.2	16.6	9.5	10.9	12.2	13.6	15.2	16.7	18.3	34
35	11.2	11.5	12.0	12.6	13.0	13.4	13.8	14.2	14.6	15.1	15.8	16.4	16.8	9.6	11.0	12.4	13.8	15.4	16.9	18.5	35
36	11.3	11.6	12.1	12.7	13.2	13.6	13.9	14.3	14.8	15.3	16.0	16.6	17.0	9.7	11.1	12.5	13.9	15.5	17.1	18.8	36

TABLE 25. WEIGHT (KG) BY AGE OF GIRLS AGED 2–18 YEARS

AGE YRS	MTHS	CENTILES												STANDARD DEVIATIONS							AGE YRS	MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
2	0	9.6	9.9	10.3	10.8	11.2	11.5	11.8	12.2	12.5	13.0	13.6	14.1	14.4	8.3	9.4	10.6	11.8	13.2	14.6	16.0	2	0
2	1	9.7	10.0	10.5	11.0	11.4	11.7	12.0	12.4	12.8	13.2	13.9	14.4	14.8	8.4	9.6	10.8	12.0	13.5	14.9	16.4	2	1
2	2	9.9	10.2	10.6	11.2	11.6	11.9	12.2	12.6	13.0	13.5	14.2	14.7	15.1	8.5	9.8	11.0	12.2	13.7	15.2	16.8	2	2
2	3	10.1	10.4	10.8	11.4	11.8	12.1	12.4	12.8	13.3	13.7	14.4	15.0	15.4	8.6	9.9	11.2	12.4	14.0	15.6	17.1	2	3
2	4	10.2	10.5	11.0	11.6	12.0	12.3	12.6	13.0	13.5	14.0	14.7	15.3	15.7	8.8	10.1	11.3	12.6	14.2	15.9	17.5	2	4
2	5	10.4	10.7	11.1	11.7	12.1	12.5	12.8	13.3	13.7	14.2	15.0	15.6	16.0	8.9	10.2	11.5	12.8	14.5	16.1	17.8	2	5
2	6	10.5	10.8	11.3	11.9	12.3	12.7	13.0	13.5	13.9	14.5	15.2	15.8	16.2	9.0	10.3	11.7	13.0	14.7	16.4	18.1	2	6
2	7	10.6	11.0	11.5	12.1	12.5	12.9	13.2	13.7	14.1	14.7	15.5	16.1	16.5	9.1	10.5	11.9	13.2	15.0	16.7	18.5	2	7
2	8	10.8	11.1	11.6	12.2	12.7	13.0	13.4	13.9	14.3	14.9	15.7	16.3	16.8	9.2	10.6	12.0	13.4	15.2	17.0	18.8	2	8
2	9	10.9	11.3	11.8	12.4	12.8	13.2	13.6	14.0	14.5	15.1	15.9	16.6	17.0	9.4	10.8	12.2	13.6	15.4	17.2	19.1	2	9
2	10	11.1	11.4	11.9	12.6	13.0	13.4	13.8	14.2	14.7	15.3	16.2	16.8	17.3	9.5	10.9	12.3	13.8	15.6	17.5	19.4	2	10
2	11	11.2	11.5	12.1	12.7	13.2	13.6	13.9	14.4	14.9	15.5	16.4	17.1	17.5	9.6	11.0	12.5	13.9	15.8	17.8	19.7	2	11
3	0	11.3	11.7	12.2	12.9	13.3	13.7	14.1	14.6	15.1	15.7	16.6	17.3	17.8	9.7	11.2	12.6	14.1	16.1	18.0	20.0	3	0
3	1	11.5	11.8	12.4	13.0	13.5	13.9	14.3	14.8	15.3	15.9	16.8	17.5	18.0	9.8	11.3	12.8	14.3	16.3	18.3	20.2	3	1
3	2	11.6	11.9	12.5	13.2	13.6	14.1	14.4	15.0	15.5	16.1	17.0	17.8	18.3	9.9	11.4	12.9	14.4	16.5	18.5	20.5	3	2
3	3	11.7	12.1	12.6	13.3	13.8	14.2	14.6	15.1	15.7	16.3	17.2	18.0	18.5	10.0	11.5	13.1	14.6	16.7	18.7	20.8	3	3
3	4	11.8	12.2	12.8	13.4	13.9	14.4	14.8	15.3	15.9	16.5	17.4	18.2	18.7	10.1	11.6	13.2	14.8	16.9	19.0	21.1	3	4
3	5	12.0	12.3	12.9	13.6	14.1	14.5	14.9	15.5	16.0	16.7	17.6	18.4	18.9	10.2	11.8	13.3	14.9	17.0	19.2	21.3	3	5
3	6	12.1	12.5	13.0	13.7	14.2	14.7	15.1	15.6	16.2	16.9	17.8	18.6	19.1	10.3	11.9	13.5	15.1	17.2	19.4	21.6	3	6
3	7	12.2	12.6	13.2	13.9	14.4	14.8	15.2	15.8	16.4	17.1	18.0	18.8	19.4	10.4	12.0	13.6	15.2	17.4	19.6	21.8	3	7
3	8	12.3	12.7	13.3	14.0	14.5	15.0	15.4	15.9	16.5	17.3	18.2	19.0	19.6	10.5	12.1	13.7	15.4	17.6	19.8	22.1	3	8
3	9	12.4	12.8	13.4	14.1	14.7	15.1	15.5	16.1	16.7	17.4	18.4	19.3	19.8	10.6	12.2	13.9	15.5	17.8	20.1	22.3	3	9
3	10	12.5	12.9	13.5	14.3	14.8	15.2	15.7	16.3	16.9	17.6	18.6	19.5	20.0	10.7	12.3	14.0	15.7	18.0	20.3	22.6	3	10
3	11	12.6	13.0	13.7	14.4	14.9	15.4	15.8	16.4	17.0	17.8	18.8	19.7	20.2	10.8	12.4	14.1	15.8	18.1	20.5	22.8	3	11
4	0	12.8	13.2	13.8	14.5	15.1	15.5	16.0	16.6	17.2	18.0	19.0	19.9	20.4	10.9	12.6	14.3	16.0	18.3	20.7	23.1	4	0
4	1	12.9	13.3	13.9	14.7	15.2	15.7	16.1	16.7	17.4	18.1	19.2	20.0	20.6	10.9	12.7	14.4	16.1	18.5	20.9	23.3	4	1
4	2	13.0	13.4	14.0	14.8	15.3	15.8	16.2	16.9	17.5	18.3	19.4	20.2	20.8	11.0	12.8	14.5	16.2	18.7	21.1	23.5	4	2
4	3	13.1	13.5	14.1	14.9	15.5	15.9	16.4	17.0	17.7	18.5	19.5	20.4	21.0	11.1	12.9	14.6	16.4	18.9	21.3	23.8	4	3
4	4	13.2	13.6	14.3	15.0	15.6	16.1	16.5	17.2	17.8	18.6	19.7	20.6	21.2	11.2	13.0	14.8	16.5	19.0	21.5	24.0	4	4
4	5	13.3	13.7	14.4	15.2	15.7	16.2	16.7	17.3	18.0	18.8	19.9	20.8	21.4	11.3	13.1	14.9	16.7	19.2	21.7	24.3	4	5
4	6	13.4	13.8	14.5	15.3	15.9	16.4	16.8	17.5	18.2	19.0	20.1	21.0	21.6	11.4	13.2	15.0	16.8	19.4	21.9	24.5	4	6
4	7	13.5	13.9	14.6	15.4	16.0	16.5	17.0	17.6	18.3	19.1	20.3	21.2	21.8	11.5	13.3	15.1	17.0	19.6	22.2	24.8	4	7
4	8	13.6	14.1	14.7	15.5	16.1	16.6	17.1	17.8	18.5	19.3	20.5	21.4	22.1	11.5	13.4	15.2	17.1	19.7	22.4	25.0	4	8
4	9	13.7	14.2	14.8	15.7	16.3	16.8	17.2	17.9	18.6	19.5	20.7	21.6	22.3	11.6	13.5	15.4	17.2	19.9	22.6	25.3	4	9
4	10	13.8	14.3	15.0	15.8	16.4	16.9	17.4	18.1	18.8	19.7	20.8	21.8	22.5	11.7	13.6	15.5	17.4	20.1	22.8	25.5	4	10
4	11	13.9	14.4	15.1	15.9	16.5	17.0	17.5	18.2	19.0	19.8	21.0	22.0	22.7	11.8	13.7	15.6	17.5	20.3	23.0	25.8	4	11
5	0	14.0	14.5	15.2	16.0	16.7	17.2	17.7	18.4	19.1	20.0	21.2	22.2	22.9	11.9	13.8	15.7	17.7	20.4	23.2	26.0	5	0
5	1	14.1	14.6	15.3	16.2	16.8	17.3	17.8	18.5	19.3	20.2	21.4	22.5	23.1	11.9	13.9	15.9	17.8	20.6	23.5	26.3	5	1
5	2	14.2	14.7	15.4	16.3	16.9	17.5	18.0	18.7	19.5	20.4	21.6	22.7	23.3	12.0	14.0	16.0	18.0	20.8	23.7	26.5	5	2
5	3	14.3	14.8	15.5	16.4	17.1	17.6	18.1	18.8	19.6	20.5	21.8	22.9	23.6	12.1	14.1	16.1	18.1	21.0	23.9	26.8	5	3
5	4	14.4	14.9	15.7	16.5	17.2	17.7	18.3	19.0	19.8	20.7	22.0	23.1	23.8	12.2	14.2	16.2	18.3	21.2	24.1	27.1	5	4
5	5	14.5	15.0	15.8	16.7	17.3	17.9	18.4	19.2	20.0	20.9	22.2	23.3	24.0	12.2	14.3	16.4	18.4	21.4	24.4	27.4	5	5

AGE YRS	AGE MTHS	CENTILES												STANDARD DEVIATIONS							AGE YRS	AGE MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
5	6	14.6	15.1	15.9	16.8	17.5	18.0	18.6	19.3	20.1	21.1	22.4	23.6	24.3	12.3	14.4	16.5	18.6	21.6	24.6	27.7	5	6
5	7	14.7	15.2	16.0	16.9	17.6	18.2	18.7	19.5	20.3	21.3	22.7	23.8	24.5	12.4	14.5	16.6	18.7	21.8	24.9	28.0	5	7
5	8	14.9	15.4	16.1	17.1	17.7	18.3	18.9	19.7	20.5	21.5	22.9	24.0	24.8	12.5	14.6	16.7	18.9	22.0	25.1	28.3	5	8
5	9	15.0	15.5	16.3	17.2	17.9	18.5	19.0	19.8	20.7	21.7	23.1	24.3	25.0	12.5	14.7	16.9	19.0	22.2	25.4	28.6	5	9
5	10	15.1	15.6	16.4	17.3	18.0	18.6	19.2	20.0	20.9	21.9	23.3	24.5	25.3	12.6	14.8	17.0	19.2	22.4	25.7	28.9	5	10
5	11	15.2	15.7	16.5	17.5	18.2	18.8	19.4	20.2	21.1	22.1	23.6	24.8	25.5	12.7	14.9	17.1	19.4	22.6	25.9	29.2	5	11
6	0	15.3	15.8	16.6	17.6	18.3	19.0	19.5	20.4	21.3	22.3	23.8	25.0	25.8	12.8	15.0	17.3	19.5	22.9	26.2	29.6	6	0
6	1	15.4	15.9	16.8	17.8	18.5	19.1	19.7	20.6	21.5	22.6	24.1	25.3	26.1	12.8	15.1	17.4	19.7	23.1	26.5	29.9	6	1
6	2	15.5	16.0	16.9	17.9	18.7	19.3	19.9	20.7	21.7	22.8	24.3	25.6	26.4	12.9	15.2	17.5	19.9	23.3	26.8	30.2	6	2
6	3	15.6	16.2	17.0	18.1	18.8	19.5	20.0	20.9	21.9	23.0	24.6	25.8	26.7	13.0	15.3	17.7	20.0	23.6	27.1	30.6	6	3
6	4	15.7	16.3	17.2	18.2	19.0	19.6	20.2	21.1	22.1	23.2	24.8	26.1	27.0	13.0	15.4	17.8	20.2	23.8	27.4	31.0	6	4
6	5	15.8	16.4	17.3	18.4	19.1	19.8	20.4	21.3	22.3	23.5	25.1	26.4	27.3	13.1	15.5	18.0	20.4	24.1	27.7	31.4	6	5
6	6	15.9	16.5	17.4	18.5	19.3	20.0	20.6	21.5	22.6	23.7	25.4	26.7	27.6	13.2	15.7	18.1	20.6	24.3	28.0	31.8	6	6
6	7	16.1	16.7	17.6	18.7	19.5	20.2	20.8	21.8	22.8	24.0	25.7	27.0	27.9	13.2	15.8	18.3	20.8	24.6	28.4	32.2	6	7
6	8	16.2	16.8	17.7	18.8	19.7	20.3	21.0	22.0	23.0	24.2	25.9	27.3	28.3	13.3	15.9	18.4	21.0	24.9	28.7	32.6	6	8
6	9	16.3	16.9	17.9	19.0	19.8	20.5	21.2	22.2	23.3	24.5	26.2	27.7	28.6	13.4	16.0	18.6	21.2	25.1	29.1	33.0	6	9
6	10	16.4	17.0	18.0	19.2	20.0	20.7	21.4	22.4	23.5	24.8	26.6	28.0	29.0	13.4	16.1	18.8	21.4	25.4	29.4	33.5	6	10
6	11	16.5	17.2	18.2	19.3	20.2	20.9	21.6	22.7	23.8	25.1	26.9	28.4	29.3	13.5	16.2	18.9	21.6	25.7	29.8	33.9	6	11
7	0	16.7	17.3	18.3	19.5	20.4	21.1	21.8	22.9	24.0	25.4	27.2	28.7	29.7	13.6	16.3	19.1	21.8	26.0	30.2	34.4	7	0
7	1	16.8	17.4	18.5	19.7	20.6	21.4	22.1	23.1	24.3	25.7	27.5	29.1	30.1	13.6	16.5	19.3	22.1	26.3	30.6	34.9	7	1
7	2	16.9	17.6	18.6	19.9	20.8	21.6	22.3	23.4	24.6	26.0	27.9	29.5	30.5	13.7	16.6	19.4	22.3	26.6	31.0	35.4	7	2
7	3	17.0	17.7	18.8	20.1	21.0	21.8	22.5	23.7	24.9	26.3	28.2	29.8	30.9	13.8	16.7	19.6	22.5	27.0	31.4	35.9	7	3
7	4	17.2	17.9	19.0	20.3	21.2	22.0	22.8	23.9	25.1	26.6	28.6	30.2	31.3	13.9	16.8	19.8	22.8	27.3	31.8	36.4	7	4
7	5	17.3	18.0	19.1	20.5	21.4	22.2	23.0	24.2	25.4	26.9	28.9	30.6	31.7	13.9	16.9	20.0	23.0	27.6	32.3	36.9	7	5
7	6	17.4	18.2	19.3	20.7	21.6	22.5	23.3	24.5	25.7	27.2	29.3	31.0	32.2	14.0	17.1	20.2	23.3	28.0	32.7	37.5	7	6
7	7	17.6	18.3	19.5	20.9	21.9	22.7	23.5	24.7	26.0	27.6	29.7	31.5	32.6	14.1	17.2	20.4	23.5	28.3	33.2	38.0	7	7
7	8	17.7	18.5	19.6	21.1	22.1	23.0	23.8	25.0	26.4	27.9	30.1	31.9	33.1	14.1	17.3	20.6	23.8	28.7	33.6	38.6	7	8
7	9	17.9	18.6	19.8	21.3	22.3	23.2	24.0	25.3	26.7	28.3	30.5	32.3	33.5	14.2	17.5	20.8	24.0	29.1	34.1	39.2	7	9
7	10	18.0	18.8	20.0	21.5	22.5	23.4	24.3	25.6	27.0	28.6	30.9	32.8	34.0	14.3	17.6	21.0	24.3	29.5	34.6	39.8	7	10
7	11	18.2	19.0	20.2	21.7	22.8	23.7	24.6	25.9	27.3	29.0	31.3	33.2	34.5	14.3	17.7	21.2	24.6	29.8	35.1	40.4	7	11
8	0	18.3	19.1	20.4	21.9	23.0	24.0	24.8	26.2	27.7	29.4	31.7	33.7	35.0	14.4	17.9	21.4	24.8	30.2	35.6	41.0	8	0
8	1	18.4	19.3	20.6	22.1	23.3	24.2	25.1	26.5	28.0	29.7	32.2	34.2	35.4	14.5	18.0	21.6	25.1	30.6	36.1	41.6	8	1
8	2	18.6	19.5	20.8	22.4	23.5	24.5	25.4	26.8	28.3	30.1	32.6	34.6	35.9	14.6	18.2	21.8	25.4	31.0	36.6	42.2	8	2
8	3	18.8	19.6	21.0	22.6	23.8	24.8	25.7	27.1	28.7	30.5	33.0	35.1	36.5	14.6	18.3	22.0	25.7	31.4	37.1	42.9	8	3
8	4	18.9	19.8	21.2	22.8	24.0	25.0	26.0	27.5	29.0	30.9	33.5	35.6	37.0	14.7	18.5	22.2	26.0	31.8	37.7	43.5	8	4
8	5	19.1	20.0	21.4	23.1	24.3	25.3	26.3	27.8	29.4	31.3	33.9	36.1	37.5	14.8	18.6	22.5	26.3	32.2	38.2	44.1	8	5
8	6	19.2	20.2	21.6	23.3	24.5	25.6	26.6	28.1	29.8	31.7	34.4	36.6	38.0	14.9	18.8	22.7	26.6	32.7	38.7	44.8	8	6
8	7	19.4	20.3	21.8	23.5	24.8	25.9	26.9	28.5	30.1	32.1	34.8	37.1	38.5	14.9	18.9	22.9	26.9	33.1	39.3	45.5	8	7
8	8	19.6	20.5	22.0	23.8	25.1	26.2	27.2	28.8	30.5	32.5	35.3	37.6	39.1	15.0	19.1	23.1	27.2	33.5	39.8	46.1	8	8
8	9	19.7	20.7	22.2	24.0	25.3	26.5	27.5	29.1	30.9	32.9	35.8	38.1	39.6	15.1	19.2	23.4	27.5	33.9	40.4	46.8	8	9
8	10	19.9	20.9	22.4	24.3	25.6	26.8	27.8	29.5	31.3	33.3	36.2	38.6	40.2	15.2	19.4	23.6	27.8	34.4	41.0	47.5	8	10
8	11	20.1	21.1	22.6	24.5	25.9	27.1	28.1	29.8	31.6	33.8	36.7	39.1	40.7	15.3	19.6	23.9	28.1	34.8	41.5	48.2	8	11

TABLE 25. WEIGHT (KG) BY AGE OF GIRLS AGED 2–18 YEARS (*continued*)

AGE YRS	AGE MTHS	CENTILES													STANDARD DEVIATIONS							AGE YRS	AGE MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
9	0	20.2	21.3	22.9	24.8	26.2	27.4	28.5	30.2	32.0	34.2	37.2	39.7	41.3	15.4	19.7	24.1	28.5	35.3	42.1	48.9	9	0
9	1	20.4	21.5	23.1	25.0	26.5	27.7	28.8	30.5	32.4	34.6	37.7	40.2	41.8	15.5	19.9	24.3	28.8	35.7	42.7	49.6	9	1
9	2	20.6	21.7	23.3	25.3	26.7	28.0	29.1	30.9	32.8	35.1	38.2	40.7	42.4	15.5	20.1	24.6	29.1	36.2	43.2	50.3	9	2
9	3	20.8	21.9	23.5	25.6	27.0	28.3	29.4	31.3	33.2	35.5	38.7	41.3	43.0	15.6	20.2	24.8	29.4	36.6	43.8	51.0	9	3
9	4	21.0	22.1	23.8	25.8	27.3	28.6	29.8	31.6	33.6	35.9	39.2	41.8	43.5	15.7	20.4	25.1	29.8	37.1	44.4	51.7	9	4
9	5	21.2	22.3	24.0	26.1	27.6	28.9	30.1	32.0	34.0	36.4	39.7	42.4	44.1	15.8	20.6	25.4	30.1	37.6	45.0	52.5	9	5
9	6	21.3	22.5	24.3	26.4	27.9	29.2	30.5	32.4	34.4	36.8	40.2	42.9	44.7	15.9	20.8	25.6	30.5	38.0	45.6	53.2	9	6
9	7	21.5	22.7	24.5	26.7	28.2	29.6	30.8	32.7	34.8	37.3	40.7	43.5	45.3	16.0	21.0	25.9	30.8	38.5	46.2	53.9	9	7
9	8	21.7	22.9	24.7	26.9	28.5	29.9	31.1	33.1	35.2	37.7	41.2	44.0	45.9	16.1	21.1	26.1	31.1	39.0	46.8	54.6	9	8
9	9	21.9	23.1	25.0	27.2	28.8	30.2	31.5	33.5	35.7	38.2	41.7	44.6	46.5	16.2	21.3	26.4	31.5	39.4	47.4	55.3	9	9
9	10	22.1	23.4	25.2	27.5	29.1	30.5	31.8	33.9	36.1	38.6	42.2	45.1	47.0	16.4	21.5	26.7	31.8	39.9	48.0	56.1	9	10
9	11	22.3	23.6	25.5	27.8	29.4	30.9	32.2	34.3	36.5	39.1	42.7	45.7	47.6	16.5	21.7	27.0	32.2	40.4	48.6	56.8	9	11
10	0	22.5	23.8	25.7	28.1	29.8	31.2	32.5	34.7	36.9	39.6	43.2	46.2	48.2	16.6	21.9	27.2	32.5	40.9	49.2	57.5	10	0
10	1	22.7	24.0	26.0	28.4	30.1	31.5	32.9	35.0	37.3	40.0	43.7	46.8	48.8	16.7	22.1	27.5	32.9	41.4	49.8	58.3	10	1
10	2	23.0	24.2	26.2	28.7	30.4	31.9	33.3	35.4	37.8	40.5	44.3	47.4	49.4	16.8	22.3	27.8	33.3	41.8	50.4	59.0	10	2
10	3	23.2	24.5	26.5	28.9	30.7	32.2	33.6	35.8	38.2	40.9	44.8	47.9	50.0	16.9	22.5	28.1	33.6	42.3	51.0	59.7	10	3
10	4	23.4	24.7	26.8	29.2	31.0	32.6	34.0	36.2	38.6	41.4	45.3	48.5	50.6	17.1	22.7	28.3	34.0	42.8	51.6	60.4	10	4
10	5	23.6	25.0	27.0	29.5	31.4	32.9	34.4	36.6	39.0	41.9	45.8	49.1	51.2	17.2	22.9	28.6	34.4	43.3	52.2	61.2	10	5
10	6	23.8	25.2	27.3	29.8	31.7	33.3	34.7	37.0	39.5	42.3	46.3	49.6	51.8	17.3	23.1	28.9	34.7	43.8	52.8	61.9	10	6
10	7	24.0	25.4	27.6	30.1	32.0	33.6	35.1	37.4	39.9	42.8	46.9	50.2	52.4	17.5	23.3	29.2	35.1	44.3	53.4	62.6	10	7
10	8	24.3	25.7	27.8	30.5	32.3	34.0	35.5	37.8	40.3	43.3	47.4	50.7	52.9	17.6	23.6	29.5	35.5	44.8	54.0	63.3	10	8
10	9	24.5	25.9	28.1	30.8	32.7	34.3	35.8	38.2	40.8	43.8	47.9	51.3	53.5	17.8	23.8	29.8	35.8	45.2	54.6	64.1	10	9
10	10	24.7	26.2	28.4	31.1	33.0	34.7	36.2	38.6	41.2	44.2	48.4	51.9	54.1	17.9	24.0	30.1	36.2	45.7	55.2	64.8	10	10
10	11	25.0	26.4	28.7	31.4	33.3	35.0	36.6	39.0	41.6	44.7	48.9	52.4	54.7	18.1	24.2	30.4	36.6	46.2	55.8	65.5	10	11
11	0	25.2	26.7	28.9	31.7	33.7	35.4	37.0	39.4	42.1	45.2	49.4	53.0	55.3	18.2	24.5	30.7	37.0	46.7	56.4	66.2	11	0
11	1	25.4	26.9	29.2	32.0	34.0	35.7	37.3	39.8	42.5	45.6	50.0	53.5	55.9	18.4	24.7	31.0	37.3	47.2	57.0	66.9	11	1
11	2	25.7	27.2	29.5	32.3	34.4	36.1	37.7	40.2	42.9	46.1	50.5	54.1	56.4	18.5	24.9	31.3	37.7	47.7	57.6	67.6	11	2
11	3	25.9	27.5	29.8	32.6	34.7	36.4	38.1	40.6	43.4	46.6	51.0	54.6	57.0	18.7	25.2	31.6	38.1	48.2	58.2	68.3	11	3
11	4	26.2	27.7	30.1	33.0	35.0	36.8	38.5	41.0	43.8	47.0	51.5	55.2	57.6	18.9	25.4	31.9	38.5	48.6	58.8	69.0	11	4
11	5	26.4	28.0	30.4	33.3	35.4	37.2	38.8	41.4	44.2	47.5	52.0	55.7	58.2	19.0	25.6	32.2	38.8	49.1	59.4	69.7	11	5
11	6	26.7	28.3	30.7	33.6	35.7	37.5	39.2	41.9	44.7	48.0	52.5	56.3	58.7	19.2	25.9	32.6	39.2	49.6	60.0	70.3	11	6
11	7	26.9	28.5	31.0	33.9	36.1	37.9	39.6	42.3	45.1	48.4	53.0	56.8	59.3	19.4	26.1	32.9	39.6	50.1	60.5	71.0	11	7
11	8	27.2	28.8	31.3	34.3	36.4	38.3	40.0	42.7	45.5	48.9	53.5	57.4	59.9	19.6	26.4	33.2	40.0	50.5	61.1	71.7	11	8
11	9	27.5	29.1	31.6	34.6	36.8	38.6	40.4	43.1	46.0	49.3	54.0	57.9	60.4	19.8	26.6	33.5	40.4	51.0	61.7	72.3	11	9
11	10	27.7	29.4	31.9	34.9	37.1	39.0	40.8	43.5	46.4	49.8	54.5	58.4	61.0	20.0	26.9	33.8	40.8	51.5	62.2	73.0	11	10
11	11	28.0	29.6	32.2	35.3	37.5	39.4	41.1	43.9	46.8	50.3	55.0	58.9	61.5	20.2	27.2	34.2	41.1	52.0	62.8	73.6	11	11
12	0	28.3	29.9	32.5	35.6	37.8	39.7	41.5	44.3	47.2	50.7	55.5	59.5	62.0	20.4	27.4	34.5	41.5	52.4	63.3	74.2	12	0
12	1	28.5	30.2	32.8	35.9	38.2	40.1	41.9	44.7	47.7	51.2	56.0	60.0	62.6	20.6	27.7	34.8	41.9	52.9	63.9	74.8	12	1
12	2	28.8	30.5	33.1	36.3	38.5	40.5	42.3	45.1	48.1	51.6	56.5	60.5	63.1	20.8	28.0	35.1	42.3	53.4	64.4	75.5	12	2
12	3	29.1	30.8	33.4	36.6	38.9	40.9	42.7	45.5	48.5	52.1	56.9	61.0	63.6	21.0	28.2	35.5	42.7	53.8	64.9	76.1	12	3
12	4	29.4	31.1	33.7	36.9	39.3	41.2	43.1	45.9	48.9	52.5	57.4	61.5	64.1	21.2	28.5	35.8	43.1	54.3	65.5	76.7	12	4
12	5	29.7	31.4	34.1	37.3	39.6	41.6	43.5	46.3	49.4	52.9	57.9	62.0	64.6	21.5	28.8	36.1	43.5	54.7	66.0	77.2	12	5

TABLE 25. WEIGHT (KG) BY AGE OF GIRLS AGED 2–18 YEARS (*continued*)

AGE YRS	AGE MTHS	CENTILES												STANDARD DEVIATIONS							AGE YRS	AGE MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
12	6	30.0	31.7	34.4	37.6	40.0	42.0	43.8	46.7	49.8	53.4	58.4	62.5	65.1	21.7	29.1	36.5	43.8	55.2	66.5	77.8	12	6
12	7	30.2	32.0	34.7	38.0	40.3	42.3	44.2	47.1	50.2	53.8	58.8	63.0	65.6	21.9	29.4	36.8	44.2	55.6	67.0	78.4	12	7
12	8	30.5	32.3	35.0	38.3	40.7	42.7	44.6	47.5	50.6	54.2	59.3	63.4	66.1	22.2	29.6	37.1	44.6	56.0	67.5	78.9	12	8
12	9	30.8	32.6	35.3	38.6	41.0	43.1	45.0	47.9	51.0	54.7	59.7	63.9	66.6	22.4	29.9	37.5	45.0	56.5	68.0	79.5	12	9
12	10	31.1	32.9	35.7	39.0	41.4	43.4	45.4	48.3	51.4	55.1	60.2	64.4	67.1	22.7	30.2	37.8	45.4	56.9	68.5	80.0	12	10
12	11	31.4	33.2	36.0	39.3	41.7	43.8	45.7	48.7	51.8	55.5	60.6	64.8	67.6	22.9	30.5	38.1	45.7	57.3	68.9	80.6	12	11
13	0	31.7	33.5	36.3	39.7	42.1	44.2	46.1	49.0	52.2	55.9	61.0	65.3	68.0	23.1	30.8	38.4	46.1	57.8	69.4	81.1	13	0
13	1	32.0	33.8	36.6	40.0	42.4	44.5	46.5	49.4	52.6	56.3	61.5	65.7	68.5	23.4	31.1	38.8	46.5	58.2	69.9	81.6	13	1
13	2	32.3	34.1	36.9	40.3	42.8	44.9	46.8	49.8	53.0	56.7	61.9	66.2	68.9	23.6	31.4	39.1	46.8	58.6	70.3	82.1	13	2
13	3	32.6	34.4	37.2	40.7	43.1	45.2	47.2	50.2	53.4	57.1	62.3	66.6	69.4	23.9	31.7	39.4	47.2	59.0	70.8	82.6	13	3
13	4	32.9	34.7	37.6	41.0	43.5	45.6	47.6	50.6	53.8	57.5	62.7	67.0	69.8	24.2	32.0	39.8	47.6	59.4	71.2	83.1	13	4
13	5	33.2	35.0	37.9	41.3	43.8	45.9	47.9	50.9	54.1	57.9	63.1	67.4	70.3	24.4	32.2	40.1	47.9	59.8	71.7	83.5	13	5
13	6	33.5	35.3	38.2	41.6	44.1	46.3	48.3	51.3	54.5	58.3	63.5	67.9	70.7	24.7	32.5	40.4	48.3	60.2	72.1	84.0	13	6
13	7	33.8	35.6	38.5	42.0	44.5	46.6	48.6	51.6	54.9	58.7	63.9	68.3	71.1	24.9	32.8	40.7	48.6	60.6	72.5	84.4	13	7
13	8	34.0	35.9	38.8	42.3	44.8	46.9	49.0	52.0	55.2	59.0	64.3	68.7	71.5	25.2	33.1	41.0	49.0	60.9	72.9	84.9	13	8
13	9	34.3	36.2	39.1	42.6	45.1	47.3	49.3	52.3	55.6	59.4	64.7	69.0	71.9	25.4	33.4	41.3	49.3	61.3	73.3	85.3	13	9
13	10	34.6	36.5	39.4	42.9	45.4	47.6	49.6	52.7	55.9	59.8	65.1	69.4	72.3	25.7	33.7	41.7	49.6	61.7	73.7	85.7	13	10
13	11	34.9	36.8	39.7	43.2	45.8	47.9	50.0	53.0	56.3	60.1	65.4	69.8	72.7	26.0	34.0	42.0	50.0	62.0	74.1	86.2	13	11
14	0	35.2	37.1	40.0	43.5	46.1	48.2	50.3	53.3	56.6	60.5	65.8	70.2	73.0	26.2	34.2	42.3	50.3	62.4	74.5	86.6	14	0
14	1	35.5	37.4	40.3	43.8	46.4	48.6	50.6	53.7	57.0	60.8	66.1	70.5	73.4	26.5	34.5	42.6	50.6	62.7	74.8	86.9	14	1
14	2	35.8	37.7	40.6	44.1	46.7	48.9	50.9	54.0	57.3	61.1	66.5	70.9	73.7	26.7	34.8	42.9	50.9	63.0	75.2	87.3	14	2
14	3	36.0	37.9	40.9	44.4	47.0	49.2	51.2	54.3	57.6	61.5	66.8	71.2	74.1	27.0	35.1	43.1	51.2	63.4	75.5	87.7	14	3
14	4	36.3	38.2	41.2	44.7	47.3	49.5	51.5	54.6	57.9	61.8	67.1	71.6	74.4	27.3	35.3	43.4	51.5	63.7	75.9	88.1	14	4
14	5	36.6	38.5	41.4	45.0	47.6	49.8	51.8	54.9	58.2	62.1	67.4	71.9	74.8	27.5	35.6	43.7	51.8	64.0	76.2	88.4	14	5
14	6	36.8	38.8	41.7	45.3	47.8	50.0	52.1	55.2	58.5	62.4	67.8	72.2	75.1	27.8	35.9	44.0	52.1	64.3	76.5	88.7	14	6
14	7	37.1	39.0	42.0	45.5	48.1	50.3	52.4	55.5	58.8	62.7	68.1	72.5	75.4	28.0	36.1	44.3	52.4	64.6	76.8	89.1	14	7
14	8	37.4	39.3	42.2	45.8	48.4	50.6	52.7	55.8	59.1	63.0	68.4	72.8	75.7	28.3	36.4	44.5	52.7	64.9	77.1	89.4	14	8
14	9	37.6	39.5	42.5	46.1	48.7	50.9	52.9	56.0	59.4	63.2	68.6	73.1	76.0	28.5	36.6	44.8	52.9	65.2	77.4	89.7	14	9
14	10	37.9	39.8	42.7	46.3	48.9	51.1	53.2	56.3	59.6	63.5	68.9	73.4	76.3	28.8	36.9	45.0	53.2	65.5	77.7	90.0	14	10
14	11	38.1	40.0	43.0	46.6	49.2	51.4	53.4	56.5	59.9	63.8	69.2	73.6	76.5	29.0	37.1	45.3	53.4	65.7	78.0	90.3	14	11
15	0	38.3	40.3	43.2	46.8	49.4	51.6	53.7	56.8	60.1	64.0	69.4	73.9	76.8	29.2	37.4	45.5	53.7	66.0	78.3	90.6	15	0
15	1	38.6	40.5	43.5	47.1	49.6	51.9	53.9	57.0	60.4	64.3	69.7	74.1	77.1	29.5	37.6	45.8	53.9	66.2	78.5	90.8	15	1
15	2	38.8	40.7	43.7	47.3	49.9	52.1	54.1	57.3	60.6	64.5	69.9	74.4	77.3	29.7	37.9	46.0	54.1	66.4	78.8	91.1	15	2
15	3	39.0	41.0	43.9	47.5	50.1	52.3	54.4	57.5	60.8	64.7	70.1	74.6	77.5	29.9	38.1	46.2	54.4	66.7	79.0	91.3	15	3
15	4	39.3	41.2	44.1	47.7	50.3	52.5	54.6	57.7	61.0	64.9	70.4	74.8	77.8	30.2	38.3	46.4	54.6	66.9	79.2	91.5	15	4
15	5	39.5	41.4	44.4	47.9	50.5	52.7	54.8	57.9	61.2	65.1	70.6	75.1	78.0	30.4	38.5	46.6	54.8	67.1	79.4	91.8	15	5
15	6	39.7	41.6	44.6	48.1	50.7	52.9	55.0	58.1	61.4	65.3	70.8	75.3	78.2	30.6	38.7	46.8	55.0	67.3	79.6	92.0	15	6
15	7	39.9	41.8	44.7	48.3	50.9	53.1	55.1	58.3	61.6	65.5	71.0	75.4	78.4	30.8	38.9	47.0	55.1	67.5	79.8	92.2	15	7
15	8	40.1	42.0	44.9	48.5	51.1	53.3	55.3	58.4	61.8	65.7	71.1	75.6	78.5	31.0	39.1	47.2	55.3	67.7	80.0	92.3	15	8
15	9	40.3	42.2	45.1	48.7	51.2	53.4	55.5	58.6	61.9	65.9	71.3	75.8	78.7	31.2	39.3	47.4	55.5	67.8	80.2	92.5	15	9
15	10	40.5	42.4	45.3	48.8	51.4	53.6	55.6	58.7	62.1	66.0	71.5	75.9	78.9	31.4	39.5	47.6	55.6	68.0	80.3	92.7	15	10
15	11	40.6	42.5	45.4	49.0	51.5	53.7	55.8	58.9	62.2	66.2	71.6	76.1	79.0	31.6	39.7	47.7	55.8	68.1	80.5	92.8	15	11

TABLE 25. WEIGHT (KG) BY AGE OF GIRLS AGED 2–18 YEARS (*continued*)

AGE YRS	MTHS	CENTILES												STANDARD DEVIATIONS							AGE YRS	MTHS
		3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.		
16	0	40.8	42.7	45.6	49.1	51.7	53.9	55.9	59.0	62.4	66.3	71.7	76.2	79.1	31.8	39.8	47.9	55.9	68.2	80.6	93.0	16	0
16	1	41.0	42.8	45.8	49.3	51.8	54.0	56.0	59.1	62.5	66.4	71.9	76.3	79.3	32.0	40.0	48.0	56.0	68.4	80.7	93.1	16	1
16	2	41.1	43.0	45.9	49.4	51.9	54.1	56.1	59.2	62.6	66.5	72.0	76.5	79.4	32.2	40.2	48.1	56.1	68.5	80.8	93.2	16	2
16	3	41.2	43.1	46.0	49.5	52.0	54.2	56.2	59.3	62.7	66.6	72.1	76.6	79.5	32.4	40.3	48.3	56.2	68.6	81.0	93.3	16	3
16	4	41.4	43.3	46.1	49.6	52.1	54.3	56.3	59.4	62.8	66.7	72.2	76.7	79.6	32.5	40.4	48.4	56.3	68.7	81.0	93.4	16	4
16	5	41.5	43.4	46.3	49.7	52.2	54.4	56.4	59.5	62.9	66.8	72.2	76.7	79.7	32.7	40.6	48.5	56.4	68.7	81.1	93.5	16	5
16	6	41.6	43.5	46.4	49.8	52.3	54.4	56.4	59.6	62.9	66.9	72.3	76.8	79.7	32.8	40.7	48.6	56.4	68.8	81.2	93.6	16	6
16	7	41.8	43.6	46.5	49.9	52.4	54.5	56.5	59.6	63.0	66.9	72.4	76.9	79.8	33.0	40.8	48.7	56.5	68.9	81.3	93.6	16	7
16	8	41.9	43.7	46.6	50.0	52.5	54.6	56.6	59.7	63.0	67.0	72.4	76.9	79.8	33.1	40.9	48.7	56.6	68.9	81.3	93.7	16	8
16	9	42.0	43.8	46.6	50.1	52.5	54.6	56.6	59.7	63.1	67.0	72.5	77.0	79.9	33.3	41.1	48.8	56.6	69.0	81.4	93.7	16	9
16	10	42.1	43.9	46.7	50.1	52.6	54.7	56.6	59.8	63.1	67.1	72.5	77.0	79.9	33.4	41.2	48.9	56.6	69.0	81.4	93.8	16	10
16	11	42.2	44.0	46.8	50.2	52.6	54.7	56.7	59.8	63.2	67.1	72.5	77.0	80.0	33.6	41.3	49.0	56.7	69.0	81.4	93.8	16	11
17	0	42.3	44.1	46.9	50.2	52.7	54.7	56.7	59.8	63.2	67.1	72.6	77.1	80.0	33.7	41.3	49.0	56.7	69.1	81.5	93.8	17	0
17	1	42.3	44.1	46.9	50.3	52.7	54.8	56.7	59.8	63.2	67.1	72.6	77.1	80.0	33.8	41.4	49.1	56.7	69.1	81.5	93.9	17	1
17	2	42.4	44.2	47.0	50.3	52.7	54.8	56.7	59.9	63.2	67.1	72.6	77.1	80.0	33.9	41.5	49.1	56.7	69.1	81.5	93.9	17	2
17	3	42.5	44.3	47.0	50.4	52.8	54.8	56.7	59.9	63.2	67.1	72.6	77.1	80.0	34.0	41.6	49.2	56.7	69.1	81.5	93.9	17	3
17	4	42.6	44.3	47.1	50.4	52.8	54.8	56.7	59.9	63.2	67.1	72.6	77.1	80.0	34.1	41.7	49.2	56.7	69.1	81.5	93.9	17	4
17	5	42.6	44.4	47.1	50.4	52.8	54.8	56.7	59.9	63.2	67.1	72.6	77.1	80.0	34.2	41.7	49.2	56.7	69.1	81.5	93.9	17	5
17	6	42.7	44.4	47.2	50.4	52.8	54.8	56.7	59.9	63.2	67.1	72.6	77.1	80.0	34.3	41.8	49.3	56.7	69.1	81.5	93.8	17	6
17	7	42.7	44.5	47.2	50.5	52.8	54.8	56.7	59.8	63.2	67.1	72.6	77.1	80.0	34.4	41.9	49.3	56.7	69.1	81.5	93.8	17	7
17	8	42.8	44.5	47.2	50.5	52.8	54.8	56.7	59.8	63.2	67.1	72.5	77.0	80.0	34.5	41.9	49.3	56.7	69.1	81.4	93.8	17	8
17	9	42.8	44.6	47.2	50.5	52.8	54.8	56.7	59.8	63.2	67.1	72.5	77.0	79.9	34.6	42.0	49.3	56.7	69.0	81.4	93.8	17	9
17	10	42.9	44.6	47.3	50.5	52.8	54.8	56.7	59.8	63.1	67.1	72.5	77.0	79.9	34.7	42.0	49.3	56.7	69.0	81.4	93.7	17	10
17	11	42.9	44.6	47.3	50.5	52.8	54.8	56.6	59.8	63.1	67.0	72.5	77.0	79.9	34.8	42.0	49.3	56.6	69.0	81.4	93.7	17	11
18	0	42.9	44.7	47.3	50.5	52.8	54.8	56.6	59.7	63.1	67.0	72.5	76.9	79.9	34.8	42.1	49.4	56.6	69.0	81.3	93.7	18	0

TABLE 26. WEIGHT (KG) BY LENGTH OF BOYS 49–103 CM IN HEIGHT

LENGTH CM	CENTILES													STANDARD DEVIATIONS							LENGTH CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
49.0	2.5	2.6	2.7	2.9	3.0	3.1	3.1	3.3	3.4	3.6	3.8	4.0	4.1	2.1	2.5	2.8	3.1	3.7	4.2	4.7	49.0
49.5	2.5	2.6	2.8	2.9	3.0	3.1	3.2	3.4	3.5	3.7	3.9	4.1	4.2	2.1	2.5	2.9	3.2	3.7	4.3	4.8	49.5
50.0	2.6	2.7	2.8	3.0	3.1	3.2	3.3	3.4	3.6	3.7	4.0	4.2	4.3	2.2	2.5	2.9	3.3	3.8	4.4	4.9	50.0
50.5	2.6	2.7	2.9	3.1	3.2	3.3	3.4	3.5	3.7	3.8	4.1	4.3	4.4	2.2	2.6	3.0	3.4	3.9	4.5	5.0	50.5
51.0	2.7	2.8	2.9	3.1	3.3	3.4	3.5	3.6	3.8	3.9	4.2	4.4	4.5	2.2	2.6	3.1	3.5	4.0	4.6	5.1	51.0
51.5	2.8	2.9	3.0	3.2	3.3	3.5	3.6	3.7	3.9	4.0	4.3	4.5	4.6	2.3	2.7	3.1	3.6	4.1	4.7	5.2	51.5
52.0	2.8	2.9	3.1	3.3	3.4	3.6	3.7	3.8	4.0	4.1	4.4	4.6	4.7	2.3	2.8	3.2	3.7	4.2	4.8	5.4	52.0
52.5	2.9	3.0	3.2	3.4	3.5	3.7	3.8	3.9	4.1	4.3	4.5	4.7	4.9	2.4	2.8	3.3	3.8	4.3	4.9	5.5	52.5
53.0	3.0	3.1	3.3	3.5	3.6	3.8	3.9	4.0	4.2	4.4	4.6	4.8	5.0	2.4	2.9	3.4	3.9	4.5	5.0	5.6	53.0
53.5	3.0	3.2	3.3	3.6	3.7	3.9	4.0	4.1	4.3	4.5	4.7	5.0	5.1	2.5	3.0	3.5	4.0	4.6	5.2	5.8	53.5
54.0	3.1	3.3	3.4	3.7	3.8	4.0	4.1	4.3	4.4	4.6	4.9	5.1	5.2	2.6	3.1	3.6	4.1	4.7	5.3	5.9	54.0
54.5	3.2	3.3	3.5	3.8	3.9	4.1	4.2	4.4	4.5	4.7	5.0	5.2	5.4	2.6	3.2	3.7	4.2	4.8	5.4	6.0	54.5
55.0	3.3	3.4	3.6	3.9	4.1	4.2	4.3	4.5	4.7	4.9	5.1	5.4	5.5	2.7	3.3	3.8	4.3	5.0	5.6	6.2	55.0
55.5	3.4	3.5	3.7	4.0	4.2	4.3	4.5	4.6	4.8	5.0	5.3	5.5	5.6	2.8	3.3	3.9	4.5	5.1	5.7	6.3	55.5
56.0	3.5	3.7	3.9	4.1	4.3	4.4	4.6	4.7	4.9	5.1	5.4	5.6	5.8	2.9	3.5	4.0	4.6	5.2	5.9	6.5	56.0
56.5	3.6	3.8	4.0	4.2	4.4	4.6	4.7	4.9	5.0	5.3	5.5	5.8	5.9	3.0	3.6	4.1	4.7	5.4	6.0	6.6	56.5
57.0	3.7	3.9	4.1	4.3	4.5	4.7	4.8	5.0	5.2	5.4	5.7	5.9	6.1	3.1	3.7	4.3	4.8	5.5	6.1	6.8	57.0
57.5	3.8	4.0	4.2	4.5	4.7	4.8	5.0	5.1	5.3	5.5	5.8	6.1	6.2	3.2	3.8	4.4	5.0	5.6	6.3	7.0	57.5
58.0	4.0	4.1	4.3	4.6	4.8	5.0	5.1	5.3	5.5	5.7	6.0	6.2	6.4	3.3	3.9	4.5	5.1	5.8	6.4	7.1	58.0
58.5	4.1	4.2	4.4	4.7	4.9	5.1	5.2	5.4	5.6	5.8	6.1	6.4	6.5	3.4	4.0	4.6	5.2	5.9	6.6	7.3	58.5
59.0	4.2	4.3	4.6	4.9	5.0	5.2	5.4	5.6	5.7	6.0	6.3	6.5	6.7	3.5	4.1	4.8	5.4	6.1	6.7	7.4	59.0
59.5	4.3	4.5	4.7	5.0	5.2	5.4	5.5	5.7	5.9	6.1	6.4	6.7	6.8	3.6	4.2	4.9	5.5	6.2	6.9	7.6	59.5
60.0	4.4	4.6	4.8	5.1	5.3	5.5	5.7	5.8	6.0	6.2	6.6	6.8	7.0	3.7	4.4	5.0	5.7	6.4	7.1	7.8	60.0
60.5	4.6	4.7	5.0	5.3	5.5	5.6	5.8	6.0	6.2	6.4	6.7	7.0	7.1	3.8	4.5	5.1	5.8	6.5	7.2	7.9	60.5
61.0	4.7	4.9	5.1	5.4	5.6	5.8	5.9	6.1	6.3	6.5	6.9	7.1	7.3	4.0	4.6	5.3	5.9	6.7	7.4	8.1	61.0
61.5	4.8	5.0	5.2	5.5	5.7	5.9	6.1	6.3	6.5	6.7	7.0	7.3	7.4	4.1	4.8	5.4	6.1	6.8	7.5	8.3	61.5
62.0	5.0	5.1	5.4	5.7	5.9	6.1	6.2	6.4	6.6	6.8	7.2	7.4	7.6	4.2	4.9	5.6	6.2	7.0	7.7	8.4	62.0
62.5	5.1	5.3	5.5	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.3	7.6	7.8	4.3	5.0	5.7	6.4	7.1	7.8	8.6	62.5
63.0	5.2	5.4	5.6	5.9	6.2	6.4	6.5	6.7	6.9	7.1	7.5	7.7	7.9	4.5	5.2	5.8	6.5	7.3	8.0	8.8	63.0
63.5	5.4	5.5	5.8	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.6	7.9	8.1	4.6	5.3	6.0	6.7	7.4	8.2	8.9	63.5
64.0	5.5	5.7	5.9	6.2	6.5	6.6	6.8	7.0	7.2	7.5	7.8	8.1	8.2	4.7	5.4	6.1	6.8	7.6	8.3	9.1	64.0
64.5	5.6	5.8	6.1	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.9	8.2	8.4	4.9	5.6	6.3	7.0	7.7	8.5	9.3	64.5
65.0	5.8	6.0	6.2	6.5	6.7	6.9	7.1	7.3	7.5	7.8	8.1	8.4	8.6	5.0	5.7	6.4	7.1	7.9	8.7	9.4	65.0
65.5	5.9	6.1	6.3	6.7	6.9	7.1	7.3	7.5	7.7	7.9	8.3	8.5	8.7	5.1	5.8	6.5	7.3	8.0	8.8	9.6	65.5
66.0	6.1	6.2	6.5	6.8	7.0	7.2	7.4	7.6	7.8	8.1	8.4	8.7	8.9	5.3	6.0	6.7	7.4	8.2	9.0	9.8	66.0
66.5	6.2	6.4	6.6	6.9	7.2	7.4	7.6	7.8	8.0	8.2	8.6	8.9	9.0	5.4	6.1	6.8	7.6	8.3	9.1	9.9	66.5
67.0	6.3	6.5	6.8	7.1	7.3	7.5	7.7	7.9	8.1	8.4	8.7	9.0	9.2	5.5	6.2	7.0	7.7	8.5	9.3	10.1	67.0
67.5	6.5	6.6	6.9	7.2	7.5	7.7	7.8	8.0	8.3	8.5	8.9	9.2	9.4	5.7	6.4	7.1	7.8	8.6	9.5	10.3	67.5
68.0	6.6	6.8	7.0	7.4	7.6	7.8	8.0	8.2	8.4	8.7	9.0	9.3	9.5	5.8	6.5	7.3	8.0	8.8	9.6	10.4	68.0
68.5	6.7	6.9	7.2	7.5	7.7	7.9	8.1	8.3	8.6	8.8	9.2	9.5	9.7	5.9	6.6	7.4	8.1	8.9	9.8	10.6	68.5
69.0	6.9	7.0	7.3	7.6	7.9	8.1	8.3	8.5	8.7	9.0	9.3	9.6	9.8	6.0	6.8	7.5	8.3	9.1	9.9	10.7	69.0
69.5	7.0	7.2	7.4	7.8	8.0	8.2	8.4	8.6	8.8	9.1	9.5	9.8	10.0	6.2	6.9	7.7	8.4	9.2	10.1	10.9	69.5

TABLE 26. WEIGHT (KG) BY LENGTH OF BOYS 49–103 CM IN HEIGHT (*continued*)

LENGTH CM	CENTILES													STANDARD DEVIATIONS							LENGTH CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
70.0	7.1	7.3	7.6	7.9	8.2	8.4	8.5	8.8	9.0	9.3	9.6	9.9	10.1	6.3	7.0	7.8	8.5	9.4	10.2	11.1	70.0
70.5	7.3	7.4	7.7	8.0	8.3	8.5	8.7	8.9	9.1	9.4	9.8	10.1	10.3	6.4	7.2	7.9	8.7	9.5	10.4	11.2	70.5
71.0	7.4	7.6	7.8	8.2	8.4	8.6	8.8	9.0	9.3	9.5	9.9	10.2	10.4	6.5	7.3	8.1	8.8	9.7	10.5	11.4	71.0
71.5	7.5	7.7	8.0	8.3	8.5	8.8	8.9	9.2	9.4	9.7	10.1	10.4	10.6	6.7	7.4	8.2	8.9	9.8	10.7	11.5	71.5
72.0	7.6	7.8	8.1	8.4	8.7	8.9	9.1	9.3	9.5	9.8	10.2	10.5	10.7	6.8	7.5	8.3	9.1	9.9	10.8	11.7	72.0
72.5	7.7	7.9	8.2	8.6	8.8	9.0	9.2	9.4	9.7	9.9	10.3	10.6	10.9	6.9	7.7	8.4	9.2	10.1	11.0	11.8	72.5
73.0	7.9	8.0	8.3	8.7	8.9	9.1	9.3	9.6	9.8	10.1	10.5	10.8	11.0	7.0	7.8	8.6	9.3	10.2	11.1	12.0	73.0
73.5	8.0	8.2	8.5	8.8	9.0	9.3	9.5	9.7	9.9	10.2	10.6	10.9	11.1	7.1	7.9	8.7	9.5	10.3	11.2	12.1	73.5
74.0	8.1	8.3	8.6	8.9	9.2	9.4	9.6	9.8	10.0	10.3	10.7	11.0	11.3	7.2	8.0	8.8	9.6	10.5	11.4	12.3	74.0
74.5	8.2	8.4	8.7	9.0	9.3	9.5	9.7	9.9	10.2	10.5	10.9	11.2	11.4	7.3	8.1	8.9	9.7	10.6	11.5	12.4	74.5
75.0	8.3	8.5	8.8	9.1	9.4	9.6	9.8	10.0	10.3	10.6	11.0	11.3	11.5	7.4	8.2	9.0	9.8	10.7	11.6	12.5	75.0
75.5	8.4	8.6	8.9	9.3	9.5	9.7	9.9	10.2	10.4	10.7	11.1	11.4	11.7	7.5	8.3	9.1	9.9	10.8	11.8	12.7	75.5
76.0	8.5	8.7	9.0	9.4	9.6	9.8	10.0	10.3	10.5	10.8	11.2	11.6	11.8	7.6	8.4	9.2	10.0	11.0	11.9	12.8	76.0
76.5	8.6	8.8	9.1	9.5	9.7	10.0	10.2	10.4	10.6	10.9	11.3	11.7	11.9	7.7	8.5	9.3	10.2	11.1	12.0	12.9	76.5
77.0	8.7	8.9	9.2	9.6	9.8	10.1	10.3	10.5	10.8	11.1	11.5	11.8	12.0	7.8	8.6	9.4	10.3	11.2	12.1	13.1	77.0
77.5	8.8	9.0	9.3	9.7	9.9	10.2	10.4	10.6	10.9	11.2	11.6	11.9	12.2	7.9	8.7	9.5	10.4	11.3	12.3	13.2	77.5
78.0	8.9	9.1	9.4	9.8	10.0	10.3	10.5	10.7	11.0	11.3	11.7	12.0	12.3	8.0	8.8	9.7	10.5	11.4	12.4	13.3	78.0
78.5	9.0	9.2	9.5	9.9	10.2	10.4	10.6	10.8	11.1	11.4	11.8	12.2	12.4	8.1	8.9	9.8	10.6	11.6	12.5	13.5	78.5
79.0	9.1	9.3	9.6	10.0	10.3	10.5	10.7	10.9	11.2	11.5	11.9	12.3	12.5	8.2	9.0	9.9	10.7	11.7	12.6	13.6	79.0
79.5	9.2	9.4	9.7	10.1	10.4	10.6	10.8	11.1	11.3	11.6	12.0	12.4	12.6	8.2	9.1	10.0	10.8	11.8	12.7	13.7	79.5
80.0	9.3	9.5	9.8	10.2	10.5	10.7	10.9	11.2	11.4	11.7	12.2	12.5	12.7	8.3	9.2	10.1	10.9	11.9	12.9	13.8	80.0
80.5	9.4	9.6	9.9	10.3	10.6	10.8	11.0	11.3	11.5	11.8	12.3	12.6	12.9	8.4	9.3	10.1	11.0	12.0	13.0	14.0	80.5
81.0	9.5	9.7	10.0	10.4	10.7	10.9	11.1	11.4	11.6	11.9	12.4	12.7	13.0	8.5	9.4	10.2	11.1	12.1	13.1	14.1	81.0
81.5	9.6	9.8	10.1	10.5	10.8	11.0	11.2	11.5	11.7	12.1	12.5	12.9	13.1	8.6	9.5	10.3	11.2	12.2	13.2	14.2	81.5
82.0	9.7	9.9	10.2	10.6	10.9	11.1	11.3	11.6	11.8	12.2	12.6	13.0	13.2	8.7	9.6	10.4	11.3	12.3	13.3	14.3	82.0
82.5	9.8	10.0	10.3	10.7	11.0	11.2	11.4	11.7	12.0	12.3	12.7	13.1	13.3	8.8	9.6	10.5	11.4	12.4	13.4	14.4	82.5
83.0	9.8	10.1	10.4	10.8	11.1	11.3	11.5	11.8	12.1	12.4	12.8	13.2	13.4	8.8	9.7	10.6	11.5	12.5	13.5	14.6	83.0
83.5	9.9	10.1	10.5	10.9	11.2	11.4	11.6	11.9	12.2	12.5	12.9	13.3	13.5	8.9	9.8	10.7	11.6	12.6	13.7	14.7	83.5
84.0	10.0	10.2	10.6	11.0	11.3	11.5	11.7	12.0	12.3	12.6	13.0	13.4	13.6	9.0	9.9	10.8	11.7	12.8	13.8	14.8	84.0
84.5	10.1	10.3	10.7	11.1	11.4	11.6	11.8	12.1	12.4	12.7	13.1	13.5	13.8	9.1	10.0	10.9	11.8	12.9	13.9	14.9	84.5
85.0	10.2	10.4	10.8	11.2	11.4	11.7	11.9	12.2	12.5	12.8	13.3	13.6	13.9	9.2	10.1	11.0	11.9	13.0	14.0	15.0	85.0
85.5	10.3	10.5	10.8	11.3	11.5	11.8	12.0	12.3	12.6	12.9	13.4	13.7	14.0	9.3	10.2	11.1	12.0	13.1	14.1	15.1	85.5
86.0	10.4	10.6	10.9	11.4	11.6	11.9	12.1	12.4	12.7	13.0	13.5	13.8	14.1	9.3	10.3	11.2	12.1	13.2	14.2	15.3	86.0
86.5	10.5	10.7	11.0	11.4	11.7	12.0	12.2	12.5	12.8	13.1	13.6	14.0	14.2	9.4	10.4	11.3	12.2	13.3	14.3	15.4	86.5
87.0	10.6	10.8	11.1	11.5	11.8	12.1	12.3	12.6	12.9	13.2	13.7	14.1	14.3	9.5	10.5	11.4	12.3	13.4	14.4	15.5	87.0
87.5	10.7	10.9	11.2	11.6	11.9	12.2	12.4	12.7	13.0	13.3	13.8	14.2	14.4	9.6	10.5	11.5	12.4	13.5	14.6	15.6	87.5
88.0	10.8	11.0	11.3	11.7	12.0	12.3	12.5	12.8	13.1	13.4	13.9	14.3	14.5	9.7	10.6	11.6	12.5	13.6	14.7	15.7	88.0
88.5	10.8	11.1	11.4	11.8	12.2	12.4	12.7	12.9	13.2	13.5	14.0	14.4	14.6	9.8	10.7	11.7	12.7	13.7	14.8	15.8	88.5
89.0	10.9	11.2	11.5	11.9	12.3	12.5	12.8	13.0	13.3	13.7	14.1	14.5	14.8	9.9	10.8	11.8	12.8	13.8	14.9	16.0	89.0
89.5	11.0	11.3	11.6	12.0	12.4	12.6	12.9	13.1	13.4	13.8	14.2	14.6	14.9	10.0	10.9	11.9	12.9	13.9	15.0	16.1	89.5
90.0	11.1	11.4	11.7	12.2	12.5	12.7	13.0	13.2	13.5	13.9	14.3	14.7	15.0	10.0	11.0	12.0	13.0	14.0	15.1	16.2	90.0
90.5	11.2	11.5	11.8	12.3	12.6	12.8	13.1	13.4	13.6	14.0	14.5	14.8	15.1	10.1	11.1	12.1	13.1	14.2	15.2	16.3	90.5

TABLE 26. WEIGHT (KG) BY LENGTH OF BOYS 49–103 CM IN HEIGHT (*continued*)

LENGTH CM	CENTILES													STANDARD DEVIATIONS							LENGTH CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	–3S.D.	–2S.D.	–1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
91.0	11.3	11.6	11.9	12.4	12.7	12.9	13.2	13.5	13.8	14.1	14.6	15.0	15.2	10.2	11.2	12.2	13.2	14.3	15.3	16.4	91.0
91.5	11.4	11.7	12.0	12.5	12.8	13.1	13.3	13.6	13.9	14.2	14.7	15.1	15.3	10.3	11.3	12.3	13.3	14.4	15.5	16.5	91.5
92.0	11.5	11.8	12.1	12.6	12.9	13.2	13.4	13.7	14.0	14.3	14.8	15.2	15.5	10.4	11.4	12.4	13.4	14.5	15.6	16.7	92.0
92.5	11.7	11.9	12.3	12.7	13.0	13.3	13.5	13.8	14.1	14.4	14.9	15.3	15.6	10.5	11.5	12.5	13.5	14.6	15.7	16.8	92.5
93.0	11.8	12.0	12.4	12.8	13.1	13.4	13.7	13.9	14.2	14.6	15.0	15.4	15.7	10.6	11.6	12.6	13.7	14.7	15.8	16.9	93.0
93.5	11.9	12.1	12.5	12.9	13.2	13.5	13.8	14.0	14.3	14.7	15.2	15.6	15.8	10.7	11.7	12.8	13.8	14.9	15.9	17.0	93.5
94.0	12.0	12.2	12.6	13.0	13.4	13.6	13.9	14.2	14.5	14.8	15.3	15.7	15.9	10.8	11.9	12.9	13.9	15.0	16.1	17.1	94.0
94.5	12.1	12.3	12.7	13.2	13.5	13.8	14.0	14.3	14.6	14.9	15.4	15.8	16.1	10.9	12.0	13.0	14.0	15.1	16.2	17.3	94.5
95.0	12.2	12.4	12.8	13.3	13.6	13.9	14.1	14.4	14.7	15.1	15.5	15.9	16.2	11.0	12.1	13.1	14.1	15.2	16.3	17.4	95.0
95.5	12.3	12.6	12.9	13.4	13.7	14.0	14.3	14.5	14.8	15.2	15.7	16.1	16.3	11.2	12.2	13.2	14.3	15.4	16.4	17.5	95.5
96.0	12.4	12.7	13.1	13.5	13.8	14.1	14.4	14.7	15.0	15.3	15.8	16.2	16.4	11.3	12.3	13.3	14.4	15.5	16.6	17.7	96.0
96.5	12.5	12.8	13.2	13.6	14.0	14.3	14.5	14.8	15.1	15.4	15.9	16.3	16.6	11.4	12.4	13.5	14.5	15.6	16.7	17.8	96.5
97.0	12.7	12.9	13.3	13.8	14.1	14.4	14.7	14.9	15.2	15.6	16.1	16.4	16.7	11.5	12.5	13.6	14.7	15.7	16.8	17.9	97.0
97.5	12.8	13.0	13.4	13.9	14.2	14.5	14.8	15.1	15.4	15.7	16.2	16.6	16.8	11.6	12.7	13.7	14.8	15.9	17.0	18.1	97.5
98.0	12.9	13.2	13.5	14.0	14.4	14.7	14.9	15.2	15.5	15.8	16.3	16.7	17.0	11.7	12.8	13.9	14.9	16.0	17.1	18.2	98.0
98.5	13.0	13.3	13.7	14.2	14.5	14.8	15.1	15.3	15.6	16.0	16.5	16.9	17.1	11.8	12.9	14.0	15.1	16.2	17.2	18.3	98.5
99.0	13.1	13.4	13.8	14.3	14.6	14.9	15.2	15.5	15.8	16.1	16.6	17.0	17.3	11.9	13.0	14.1	15.2	16.3	17.4	18.5	99.0
99.5	13.3	13.5	13.9	14.4	14.8	15.1	15.4	15.6	15.9	16.3	16.8	17.1	17.4	12.0	13.1	14.2	15.4	16.4	17.5	18.6	99.5
100.0	13.4	13.7	14.1	14.6	14.9	15.2	15.5	15.8	16.1	16.4	16.9	17.3	17.6	12.1	13.3	14.4	15.5	16.6	17.7	18.8	100.0
100.5	13.5	13.8	14.2	14.7	15.1	15.4	15.7	15.9	16.2	16.6	17.1	17.4	17.7	12.2	13.4	14.5	15.7	16.7	17.8	18.9	100.5
101.0	13.6	13.9	14.3	14.8	15.2	15.5	15.8	16.1	16.4	16.7	17.2	17.6	17.9	12.3	13.5	14.7	15.8	16.9	18.0	19.1	101.0
101.5	13.8	14.0	14.5	15.0	15.4	15.7	16.0	16.2	16.5	16.9	17.4	17.8	18.0	12.5	13.6	14.8	16.0	17.1	18.1	19.2	101.5
102.0	13.9	14.2	14.6	15.1	15.5	15.8	16.1	16.4	16.7	17.0	17.5	17.9	18.2	12.6	13.8	14.9	16.1	17.2	18.3	19.4	102.0
102.5	14.0	14.3	14.7	15.3	15.7	16.0	16.3	16.6	16.9	17.2	17.7	18.1	18.3	12.7	13.9	15.1	16.3	17.4	18.5	19.6	102.5
103.0	14.2	14.4	14.9	15.4	15.8	16.1	16.5	16.7	17.0	17.4	17.8	18.2	18.5	12.8	14.0	15.2	16.5	17.5	18.6	19.7	103.0

TABLE 27. WEIGHT (KG) BY STATURE OF BOYS 55–145 CM IN HEIGHT

STATURE CM	CENTILES													STANDARD DEVIATIONS							STATURE CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
55.0	2.9	3.1	3.3	3.7	3.9	4.1	4.3	4.6	4.9	5.3	5.9	6.3	6.6	2.0	2.8	3.6	4.3	5.5	6.7	7.9	55.0
55.5	3.0	3.2	3.5	3.8	4.1	4.3	4.5	4.8	5.1	5.5	6.0	6.5	6.8	2.2	2.9	3.7	4.5	5.7	6.9	8.1	55.5
56.0	3.2	3.4	3.7	4.0	4.3	4.5	4.7	5.0	5.3	5.7	6.2	6.7	6.9	2.3	3.1	3.9	4.7	5.9	7.1	8.3	56.0
56.5	3.3	3.5	3.8	4.2	4.4	4.7	4.9	5.2	5.5	5.9	6.4	6.8	7.1	2.4	3.2	4.1	4.9	6.1	7.3	8.4	56.5
57.0	3.5	3.7	4.0	4.3	4.6	4.8	5.0	5.3	5.7	6.0	6.6	7.0	7.3	2.6	3.4	4.2	5.0	6.2	7.4	8.6	57.0
57.5	3.6	3.8	4.1	4.5	4.8	5.0	5.2	5.5	5.8	6.2	6.7	7.2	7.4	2.7	3.5	4.4	5.2	6.4	7.6	8.8	57.5
58.0	3.8	4.0	4.3	4.7	4.9	5.2	5.4	5.7	6.0	6.4	6.9	7.3	7.6	2.8	3.7	4.5	5.4	6.6	7.8	9.0	58.0
58.5	3.9	4.1	4.4	4.8	5.1	5.3	5.5	5.8	6.2	6.5	7.1	7.5	7.8	3.0	3.8	4.7	5.5	6.7	7.9	9.1	58.5
59.0	4.1	4.3	4.6	5.0	5.2	5.5	5.7	6.0	6.3	6.7	7.2	7.7	7.9	3.1	4.0	4.8	5.7	6.9	8.1	9.3	59.0
59.5	4.2	4.4	4.7	5.1	5.4	5.6	5.9	6.2	6.5	6.9	7.4	7.8	8.1	3.2	4.1	5.0	5.9	7.1	8.2	9.4	59.5
60.0	4.4	4.6	4.9	5.3	5.6	5.8	6.0	6.3	6.6	7.0	7.6	8.0	8.3	3.4	4.3	5.1	6.0	7.2	8.4	9.6	60.0
60.5	4.5	4.7	5.0	5.4	5.7	6.0	6.2	6.5	6.8	7.2	7.7	8.1	8.4	3.5	4.4	5.3	6.2	7.4	8.6	9.8	60.5
61.0	4.6	4.8	5.2	5.6	5.9	6.1	6.3	6.6	7.0	7.3	7.9	8.3	8.6	3.6	4.5	5.4	6.3	7.5	8.7	9.9	61.0
61.5	4.8	5.0	5.3	5.7	6.0	6.3	6.5	6.8	7.1	7.5	8.0	8.5	8.7	3.8	4.7	5.6	6.5	7.7	8.9	10.1	61.5
62.0	4.9	5.1	5.5	5.9	6.2	6.4	6.6	6.9	7.3	7.6	8.2	8.6	8.9	3.9	4.8	5.7	6.6	7.8	9.0	10.2	62.0
62.5	5.0	5.3	5.6	6.0	6.3	6.5	6.8	7.1	7.4	7.8	8.3	8.8	9.1	4.0	4.9	5.9	6.8	8.0	9.2	10.4	62.5
63.0	5.2	5.4	5.7	6.1	6.4	6.7	6.9	7.2	7.6	7.9	8.5	8.9	9.2	4.1	5.1	6.0	6.9	8.1	9.3	10.6	63.0
63.5	5.3	5.5	5.9	6.3	6.6	6.8	7.1	7.4	7.7	8.1	8.6	9.1	9.4	4.3	5.2	6.1	7.1	8.3	9.5	10.7	63.5
64.0	5.4	5.7	6.0	6.4	6.7	7.0	7.2	7.5	7.8	8.2	8.8	9.2	9.5	4.4	5.3	6.3	7.2	8.4	9.6	10.9	64.0
64.5	5.6	5.8	6.1	6.5	6.8	7.1	7.3	7.7	8.0	8.4	8.9	9.4	9.7	4.5	5.5	6.4	7.3	8.6	9.8	11.0	64.5
65.0	5.7	5.9	6.3	6.7	7.0	7.2	7.5	7.8	8.1	8.5	9.1	9.5	9.8	4.6	5.6	6.5	7.5	8.7	9.9	11.2	65.0
65.5	5.8	6.0	6.4	6.8	7.1	7.4	7.6	7.9	8.3	8.7	9.2	9.7	9.9	4.7	5.7	6.7	7.6	8.9	10.1	11.3	65.5
66.0	5.9	6.2	6.5	6.9	7.2	7.5	7.7	8.1	8.4	8.8	9.3	9.8	10.1	4.9	5.8	6.8	7.7	9.0	10.2	11.5	66.0
66.5	6.1	6.3	6.6	7.1	7.4	7.6	7.9	8.2	8.5	8.9	9.5	9.9	10.2	5.0	6.0	6.9	7.9	9.1	10.4	11.6	66.5
67.0	6.2	6.4	6.8	7.2	7.5	7.8	8.0	8.3	8.7	9.1	9.6	10.1	10.4	5.1	6.1	7.0	8.0	9.3	10.5	11.8	67.0
67.5	6.3	6.5	6.9	7.3	7.6	7.9	8.1	8.5	8.8	9.2	9.8	10.2	10.5	5.2	6.2	7.2	8.1	9.4	10.7	11.9	67.5
68.0	6.4	6.7	7.0	7.4	7.8	8.0	8.3	8.6	8.9	9.3	9.9	10.4	10.7	5.3	6.3	7.3	8.3	9.5	10.8	12.1	68.0
68.5	6.6	6.8	7.1	7.6	7.9	8.1	8.4	8.7	9.1	9.5	10.0	10.5	10.8	5.5	6.4	7.4	8.4	9.7	10.9	12.2	68.5
69.0	6.7	6.9	7.3	7.7	8.0	8.3	8.5	8.8	9.2	9.6	10.2	10.6	10.9	5.6	6.6	7.5	8.5	9.8	11.1	12.4	69.0
69.5	6.8	7.0	7.4	7.8	8.1	8.4	8.6	9.0	9.3	9.7	10.3	10.8	11.1	5.7	6.7	7.7	8.6	9.9	11.2	12.5	69.5
70.0	6.9	7.1	7.5	7.9	8.2	8.5	8.8	9.1	9.4	9.8	10.4	10.9	11.2	5.8	6.8	7.8	8.8	10.1	11.4	12.7	70.0
70.5	7.0	7.3	7.6	8.0	8.4	8.6	8.9	9.2	9.6	10.0	10.5	11.0	11.3	5.9	6.9	7.9	8.9	10.2	11.5	12.8	70.5
71.0	7.1	7.4	7.7	8.2	8.5	8.7	9.0	9.3	9.7	10.1	10.7	11.2	11.5	6.0	7.0	8.0	9.0	10.3	11.6	12.9	71.0
71.5	7.2	7.5	7.8	8.3	8.6	8.9	9.1	9.4	9.8	10.2	10.8	11.3	11.6	6.1	7.1	8.1	9.1	10.4	11.8	13.1	71.5
72.0	7.4	7.6	8.0	8.4	8.7	9.0	9.2	9.6	9.9	10.3	10.9	11.4	11.7	6.3	7.2	8.2	9.2	10.6	11.9	13.2	72.0
72.5	7.5	7.7	8.1	8.5	8.8	9.1	9.3	9.7	10.0	10.5	11.1	11.5	11.9	6.4	7.4	8.3	9.3	10.7	12.0	13.4	72.5
73.0	7.6	7.8	8.2	8.6	8.9	9.2	9.5	9.8	10.2	10.6	11.2	11.7	12.0	6.5	7.5	8.5	9.5	10.8	12.1	13.5	73.0
73.5	7.7	7.9	8.3	8.7	9.0	9.3	9.6	9.9	10.3	10.7	11.3	11.8	12.1	6.6	7.6	8.6	9.6	10.9	12.3	13.6	73.5
74.0	7.8	8.0	8.4	8.8	9.2	9.4	9.7	10.0	10.4	10.8	11.4	11.9	12.2	6.7	7.7	8.7	9.7	11.0	12.4	13.8	74.0
74.5	7.9	8.2	8.5	9.0	9.3	9.5	9.8	10.1	10.5	10.9	11.5	12.0	12.4	6.8	7.8	8.8	9.8	11.2	12.5	13.9	74.5
75.0	8.0	8.3	8.6	9.1	9.4	9.7	9.9	10.3	10.6	11.1	11.7	12.2	12.5	6.9	7.9	8.9	9.9	11.3	12.7	14.0	75.0
75.5	8.1	8.4	8.7	9.2	9.5	9.8	10.0	10.4	10.7	11.2	11.8	12.3	12.6	7.0	8.0	9.0	10.0	11.4	12.8	14.2	75.5

TABLE 27. WEIGHT (KG) BY STATURE OF BOYS 55–145 CM IN HEIGHT (*continued*)

STATURE CM	CENTILES													STANDARD DEVIATIONS							STATURE CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
76.0	8.2	8.5	8.8	9.3	9.6	9.9	10.1	10.5	10.9	11.3	11.9	12.4	12.7	7.1	8.1	9.1	10.1	11.5	12.9	14.3	76.0
76.5	8.3	8.6	8.9	9.4	9.7	10.0	10.2	10.6	11.0	11.4	12.0	12.5	12.9	7.2	8.2	9.2	10.2	11.6	13.0	14.4	76.5
77.0	8.4	8.7	9.1	9.5	9.8	10.1	10.4	10.7	11.1	11.5	12.1	12.7	13.0	7.3	8.3	9.3	10.4	11.8	13.2	14.5	77.0
77.5	8.6	8.8	9.2	9.6	9.9	10.2	10.5	10.8	11.2	11.6	12.3	12.8	13.1	7.4	8.4	9.4	10.5	11.9	13.3	14.7	77.5
78.0	8.7	8.9	9.3	9.7	10.0	10.3	10.6	10.9	11.3	11.8	12.4	12.9	13.2	7.5	8.5	9.6	10.6	12.0	13.4	14.8	78.0
78.5	8.8	9.0	9.4	9.8	10.1	10.4	10.7	11.0	11.4	11.9	12.5	13.0	13.3	7.6	8.6	9.7	10.7	12.1	13.5	14.9	78.5
79.0	8.9	9.1	9.5	9.9	10.3	10.5	10.8	11.2	11.5	12.0	12.6	13.1	13.5	7.7	8.7	9.8	10.8	12.2	13.6	15.1	79.0
79.5	9.0	9.2	9.6	10.0	10.4	10.6	10.9	11.3	11.6	12.1	12.7	13.2	13.6	7.8	8.8	9.9	10.9	12.3	13.8	15.2	79.5
80.0	9.1	9.3	9.7	10.1	10.5	10.8	11.0	11.4	11.8	12.2	12.8	13.4	13.7	7.9	8.9	10.0	11.0	12.4	13.9	15.3	80.0
80.5	9.2	9.4	9.8	10.2	10.6	10.9	11.1	11.5	11.9	12.3	13.0	13.5	13.8	8.0	9.0	10.1	11.1	12.6	14.0	15.4	80.5
81.0	9.3	9.5	9.9	10.4	10.7	11.0	11.2	11.6	12.0	12.4	13.1	13.6	13.9	8.1	9.1	10.2	11.2	12.7	14.1	15.5	81.0
81.5	9.4	9.6	10.0	10.5	10.8	11.1	11.3	11.7	12.1	12.6	13.2	13.7	14.1	8.2	9.2	10.3	11.3	12.8	14.2	15.7	81.5
82.0	9.5	9.7	10.1	10.6	10.9	11.2	11.5	11.8	12.2	12.7	13.3	13.8	14.2	8.3	9.3	10.4	11.5	12.9	14.3	15.8	82.0
82.5	9.6	9.8	10.2	10.7	11.0	11.3	11.6	11.9	12.3	12.8	13.4	13.9	14.3	8.4	9.4	10.5	11.6	13.0	14.5	15.9	82.5
83.0	9.7	9.9	10.3	10.8	11.1	11.4	11.7	12.0	12.4	12.9	13.5	14.1	14.4	8.5	9.5	10.6	11.7	13.1	14.6	16.0	83.0
83.5	9.8	10.0	10.4	10.9	11.2	11.5	11.8	12.2	12.5	13.0	13.6	14.2	14.5	8.6	9.6	10.7	11.8	13.2	14.7	16.1	83.5
84.0	9.9	10.1	10.5	11.0	11.3	11.6	11.9	12.3	12.7	13.1	13.8	14.3	14.6	8.7	9.7	10.8	11.9	13.3	14.8	16.2	84.0
84.5	10.0	10.2	10.6	11.1	11.4	11.7	12.0	12.4	12.8	13.2	13.9	14.4	14.7	8.8	9.8	10.9	12.0	13.5	14.9	16.4	84.5
85.0	10.1	10.3	10.7	11.2	11.5	11.8	12.1	12.5	12.9	13.3	14.0	14.5	14.9	8.9	9.9	11.0	12.1	13.6	15.0	16.5	85.0
85.5	10.2	10.4	10.8	11.3	11.7	12.0	12.2	12.6	13.0	13.5	14.1	14.6	15.0	8.9	10.0	11.1	12.2	13.7	15.1	16.6	85.5
86.0	10.3	10.5	10.9	11.4	11.8	12.1	12.3	12.7	13.1	13.6	14.2	14.7	15.1	9.0	10.1	11.2	12.3	13.8	15.3	16.7	86.0
86.5	10.4	10.6	11.0	11.5	11.9	12.2	12.5	12.8	13.2	13.7	14.3	14.9	15.2	9.1	10.2	11.3	12.5	13.9	15.4	16.8	86.5
87.0	10.5	10.7	11.1	11.6	12.0	12.3	12.6	12.9	13.3	13.8	14.4	15.0	15.3	9.2	10.3	11.5	12.6	14.0	15.5	16.9	87.0
87.5	10.6	10.8	11.2	11.7	12.1	12.4	12.7	13.1	13.4	13.9	14.6	15.1	15.4	9.3	10.4	11.6	12.7	14.1	15.6	17.1	87.5
88.0	10.7	10.9	11.3	11.8	12.2	12.5	12.8	13.2	13.6	14.0	14.7	15.2	15.5	9.4	10.5	11.7	12.8	14.3	15.7	17.2	88.0
88.5	10.8	11.0	11.5	12.0	12.3	12.6	12.9	13.3	13.7	14.1	14.8	15.3	15.7	9.5	10.6	11.8	12.9	14.4	15.8	17.3	88.5
89.0	10.9	11.1	11.6	12.1	12.4	12.7	13.0	13.4	13.8	14.3	14.9	15.4	15.8	9.6	10.7	11.9	13.0	14.5	16.0	17.4	89.0
89.5	11.0	11.2	11.7	12.2	12.5	12.9	13.1	13.5	13.9	14.4	15.0	15.5	15.9	9.7	10.8	12.0	13.1	14.6	16.1	17.5	89.5
90.0	11.1	11.3	11.8	12.3	12.6	13.0	13.3	13.6	14.0	14.5	15.1	15.7	16.0	9.8	10.9	12.1	13.3	14.7	16.2	17.6	90.0
90.5	11.2	11.4	11.9	12.4	12.8	13.1	13.4	13.7	14.1	14.6	15.3	15.8	16.1	9.9	11.0	12.2	13.4	14.8	16.3	17.8	90.5
91.0	11.3	11.5	12.0	12.5	12.9	13.2	13.5	13.9	14.3	14.7	15.4	15.9	16.2	9.9	11.1	12.3	13.5	15.0	16.4	17.9	91.0
91.5	11.4	11.7	12.1	12.6	13.0	13.3	13.6	14.0	14.4	14.8	15.5	16.0	16.4	10.0	11.2	12.4	13.6	15.1	16.5	18.0	91.5
92.0	11.5	11.8	12.2	12.7	13.1	13.4	13.7	14.1	14.5	15.0	15.6	16.1	16.5	10.1	11.3	12.5	13.7	15.2	16.7	18.1	92.0
92.5	11.6	11.9	12.3	12.8	13.2	13.5	13.9	14.2	14.6	15.1	15.7	16.3	16.6	10.2	11.4	12.6	13.9	15.3	16.8	18.3	92.5
93.0	11.7	12.0	12.4	12.9	13.3	13.7	14.0	14.3	14.7	15.2	15.9	16.4	16.7	10.3	11.5	12.8	14.0	15.4	16.9	18.4	93.0
93.5	11.8	12.1	12.5	13.1	13.4	13.8	14.1	14.5	14.9	15.3	16.0	16.5	16.9	10.4	11.6	12.9	14.1	15.6	17.0	18.5	93.5
94.0	11.9	12.2	12.6	13.2	13.6	13.9	14.2	14.6	15.0	15.5	16.1	16.6	17.0	10.5	11.7	13.0	14.2	15.7	17.2	18.6	94.0
94.5	12.0	12.3	12.7	13.3	13.7	14.0	14.3	14.7	15.1	15.6	16.2	16.8	17.1	10.6	11.8	13.1	14.3	15.8	17.3	18.8	94.5
95.0	12.1	12.4	12.8	13.4	13.8	14.1	14.5	14.8	15.2	15.7	16.4	16.9	17.2	10.7	11.9	13.2	14.5	15.9	17.4	18.9	95.0
95.5	12.2	12.5	13.0	13.5	13.9	14.3	14.6	15.0	15.4	15.8	16.5	17.0	17.4	10.8	12.0	13.3	14.6	16.1	17.5	19.0	95.5
96.0	12.3	12.6	13.1	13.6	14.0	14.4	14.7	15.1	15.5	16.0	16.6	17.1	17.5	10.9	12.1	13.4	14.7	16.2	17.7	19.2	96.0
96.5	12.4	12.7	13.2	13.7	14.2	14.5	14.8	15.2	15.6	16.1	16.7	17.3	17.6	11.0	12.2	13.5	14.8	16.3	17.8	19.3	96.5

TABLE 27. WEIGHT (KG) BY STATURE OF BOYS 55–145 CM IN HEIGHT (*continued*)

STATURE CM	CENTILES													STANDARD DEVIATIONS							STATURE CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
97.0	12.5	12.8	13.3	13.9	14.3	14.6	15.0	15.3	15.7	16.2	16.9	17.4	17.8	11.0	12.4	13.7	15.0	16.5	17.9	19.4	97.0
97.5	12.6	12.9	13.4	14.0	14.4	14.8	15.1	15.5	15.9	16.3	17.0	17.5	17.9	11.1	12.5	13.8	15.1	16.6	18.1	19.6	97.5
98.0	12.7	13.0	13.5	14.1	14.5	14.9	15.2	15.6	16.0	16.5	17.1	17.7	18.0	11.2	12.6	13.9	15.2	16.7	18.2	19.7	98.0
98.5	12.8	13.1	13.6	14.2	14.6	15.0	15.4	15.7	16.1	16.6	17.3	17.8	18.2	11.3	12.7	14.0	15.4	16.9	18.4	19.9	98.5
99.0	12.9	13.3	13.8	14.3	14.8	15.1	15.5	15.9	16.3	16.8	17.4	18.0	18.3	11.4	12.8	14.1	15.5	17.0	18.5	20.0	99.0
99.5	13.1	13.4	13.9	14.5	14.9	15.3	15.6	16.0	16.4	16.9	17.6	18.1	18.5	11.5	12.9	14.3	15.6	17.1	18.6	20.2	99.5
100.0	13.2	13.5	14.0	14.6	15.0	15.4	15.7	16.1	16.5	17.0	17.7	18.2	18.6	11.6	13.0	14.4	15.7	17.3	18.8	20.3	100.0
100.5	13.3	13.6	14.1	14.7	15.2	15.5	15.9	16.3	16.7	17.2	17.8	18.4	18.8	11.7	13.1	14.5	15.9	17.4	18.9	20.5	100.5
101.0	13.4	13.7	14.2	14.8	15.3	15.7	16.0	16.4	16.8	17.3	18.0	18.5	18.9	11.8	13.2	14.6	16.0	17.5	19.1	20.6	101.0
101.5	13.5	13.8	14.3	15.0	15.4	15.8	16.2	16.5	17.0	17.4	18.1	18.7	19.1	11.9	13.3	14.7	16.2	17.7	19.2	20.8	101.5
102.0	13.6	14.0	14.5	15.1	15.5	15.9	16.3	16.7	17.1	17.6	18.3	18.8	19.2	12.0	13.4	14.9	16.3	17.8	19.4	20.9	102.0
102.5	13.7	14.1	14.6	15.2	15.7	16.1	16.4	16.8	17.2	17.7	18.4	19.0	19.4	12.1	13.6	15.0	16.4	18.0	19.5	21.1	102.5
103.0	13.9	14.2	14.7	15.4	15.8	16.2	16.6	17.0	17.4	17.9	18.6	19.1	19.5	12.2	13.7	15.1	16.6	18.1	19.7	21.3	103.0
103.5	14.0	14.3	14.8	15.5	15.9	16.3	16.7	17.1	17.5	18.0	18.7	19.3	19.7	12.3	13.8	15.3	16.7	18.3	19.9	21.4	103.5
104.0	14.1	14.4	15.0	15.6	16.1	16.5	16.9	17.3	17.7	18.2	18.9	19.5	19.8	12.4	13.9	15.4	16.9	18.4	20.0	21.6	104.0
104.5	14.2	14.6	15.1	15.7	16.2	16.6	17.0	17.4	17.8	18.3	19.0	19.6	20.0	12.6	14.0	15.5	17.0	18.6	20.2	21.8	104.5
105.0	14.3	14.7	15.2	15.9	16.4	16.8	17.1	17.5	18.0	18.5	19.2	19.8	20.2	12.7	14.2	15.6	17.1	18.8	20.4	22.0	105.0
105.5	14.5	14.8	15.4	16.0	16.5	16.9	17.3	17.7	18.1	18.7	19.4	20.0	20.3	12.8	14.3	15.8	17.3	18.9	20.5	22.2	105.5
106.0	14.6	14.9	15.5	16.2	16.6	17.0	17.4	17.8	18.3	18.8	19.5	20.1	20.5	12.9	14.4	15.9	17.4	19.1	20.7	22.4	106.0
106.5	14.7	15.1	15.6	16.3	16.8	17.2	17.6	18.0	18.4	19.0	19.7	20.3	20.7	13.0	14.5	16.1	17.6	19.2	20.9	22.5	106.5
107.0	14.8	15.2	15.8	16.4	16.9	17.3	17.7	18.2	18.6	19.1	19.9	20.5	20.9	13.1	14.7	16.2	17.7	19.4	21.1	22.7	107.0
107.5	15.0	15.3	15.9	16.6	17.1	17.5	17.9	18.3	18.8	19.3	20.0	20.7	21.1	13.2	14.8	16.3	17.9	19.6	21.3	22.9	107.5
108.0	15.1	15.5	16.0	16.7	17.2	17.6	18.0	18.5	18.9	19.5	20.2	20.8	21.2	13.4	14.9	16.5	18.0	19.7	21.4	23.1	108.0
108.5	15.2	15.6	16.2	16.9	17.4	17.8	18.2	18.6	19.1	19.6	20.4	21.0	21.4	13.5	15.0	16.6	18.2	19.9	21.6	23.4	108.5
109.0	15.4	15.7	16.3	17.0	17.5	17.9	18.3	18.8	19.3	19.8	20.6	21.2	21.6	13.6	15.2	16.8	18.3	20.1	21.8	23.6	109.0
109.5	15.5	15.9	16.5	17.2	17.7	18.1	18.5	18.9	19.4	20.0	20.8	21.4	21.8	13.7	15.3	16.9	18.5	20.3	22.0	23.8	109.5
110.0	15.6	16.0	16.6	17.3	17.8	18.3	18.7	19.1	19.6	20.2	20.9	21.6	22.0	13.8	15.4	17.1	18.7	20.4	22.2	24.0	110.0
110.5	15.8	16.2	16.7	17.5	18.0	18.4	18.8	19.3	19.8	20.3	21.1	21.8	22.2	14.0	15.6	17.2	18.8	20.6	22.4	24.2	110.5
111.0	15.9	16.3	16.9	17.6	18.1	18.6	19.0	19.4	19.9	20.5	21.3	22.0	22.4	14.1	15.7	17.4	19.0	20.8	22.6	24.5	111.0
111.5	16.1	16.4	17.0	17.8	18.3	18.7	19.1	19.6	20.1	20.7	21.5	22.2	22.6	14.2	15.9	17.5	19.1	21.0	22.8	24.7	111.5
112.0	16.2	16.6	17.2	17.9	18.4	18.9	19.3	19.8	20.3	20.9	21.7	22.4	22.8	14.4	16.0	17.7	19.3	21.2	23.1	24.9	112.0
112.5	16.3	16.7	17.3	18.1	18.6	19.1	19.5	20.0	20.5	21.1	21.9	22.6	23.1	14.5	16.1	17.8	19.5	21.4	23.3	25.2	112.5
113.0	16.5	16.9	17.5	18.2	18.8	19.2	19.6	20.1	20.7	21.3	22.1	22.8	23.3	14.6	16.3	18.0	19.6	21.6	23.5	25.4	113.0
113.5	16.6	17.0	17.7	18.4	18.9	19.4	19.8	20.3	20.8	21.5	22.3	23.0	23.5	14.8	16.4	18.1	19.8	21.8	23.7	25.7	113.5
114.0	16.8	17.2	17.8	18.6	19.1	19.6	20.0	20.5	21.0	21.7	22.5	23.3	23.7	14.9	16.6	18.3	20.0	22.0	24.0	25.9	114.0
114.5	16.9	17.4	18.0	18.7	19.3	19.7	20.2	20.7	21.2	21.9	22.7	23.5	24.0	15.0	16.7	18.5	20.2	22.2	24.2	26.2	114.5
115.0	17.1	17.5	18.1	18.9	19.4	19.9	20.3	20.9	21.4	22.1	23.0	23.7	24.2	15.2	16.9	18.6	20.3	22.4	24.4	26.5	115.0
115.5	17.3	17.7	18.3	19.1	19.6	20.1	20.5	21.0	21.6	22.3	23.2	23.9	24.4	15.3	17.1	18.8	20.5	22.6	24.7	26.8	115.5
116.0	17.4	17.8	18.5	19.2	19.8	20.2	20.7	21.2	21.8	22.5	23.4	24.2	24.7	15.5	17.2	18.9	20.7	22.8	24.9	27.0	116.0
116.5	17.6	18.0	18.6	19.4	20.0	20.4	20.9	21.4	22.0	22.7	23.6	24.4	24.9	15.6	17.4	19.1	20.9	23.0	25.2	27.3	116.5
117.0	17.7	18.2	18.8	19.6	20.1	20.6	21.1	21.6	22.2	22.9	23.9	24.7	25.2	15.8	17.5	19.3	21.1	23.2	25.4	27.6	117.0
117.5	17.9	18.3	19.0	19.7	20.3	20.8	21.2	21.8	22.4	23.1	24.1	24.9	25.4	15.9	17.7	19.5	21.2	23.5	25.7	27.9	117.5

TABLE 27. WEIGHT (KG) BY STATURE OF BOYS 55–145 CM IN HEIGHT (*continued*)

STATURE CM	CENTILES													STANDARD DEVIATIONS							STATURE CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
118.0	18.1	18.5	19.1	19.9	20.5	21.0	21.4	22.0	22.6	23.3	24.3	25.2	25.7	16.1	17.9	19.6	21.4	23.7	26.0	28.2	118.0
118.5	18.2	18.7	19.3	20.1	20.7	21.2	21.6	22.2	22.8	23.6	24.6	25.4	26.0	16.2	18.0	19.8	21.6	23.9	26.2	28.5	118.5
119.0	18.4	18.8	19.5	20.3	20.9	21.3	21.8	22.4	23.0	23.8	24.8	25.7	26.2	16.4	18.2	20.0	21.8	24.2	26.5	28.8	119.0
119.5	18.6	19.0	19.7	20.5	21.0	21.5	22.0	22.6	23.3	24.0	25.1	25.9	26.5	16.6	18.4	20.2	22.0	24.4	26.8	29.2	119.5
120.0	18.8	19.2	19.9	20.7	21.2	21.7	22.2	22.8	23.5	24.2	25.3	26.2	26.8	16.7	18.5	20.4	22.2	24.6	27.1	29.5	120.0
120.5	18.9	19.4	20.0	20.8	21.4	21.9	22.4	23.0	23.7	24.5	25.6	26.5	27.1	16.9	18.7	20.6	22.4	24.9	27.4	29.8	120.5
121.0	19.1	19.5	20.2	21.0	21.6	22.1	22.6	23.2	23.9	24.7	25.8	26.7	27.3	17.0	18.9	20.7	22.6	25.1	27.6	30.2	121.0
121.5	19.3	19.7	20.4	21.2	21.8	22.3	22.8	23.4	24.1	25.0	26.1	27.0	27.6	17.2	19.1	20.9	22.8	25.4	27.9	30.5	121.5
122.0	19.5	19.9	20.6	21.4	22.0	22.5	23.0	23.7	24.4	25.2	26.4	27.3	27.9	17.4	19.2	21.1	23.0	25.6	28.3	30.9	122.0
122.5	19.7	20.1	20.8	21.6	22.2	22.7	23.2	23.9	24.6	25.5	26.6	27.6	28.2	17.5	19.4	21.3	23.2	25.9	28.6	31.2	122.5
123.0	19.8	20.3	21.0	21.8	22.4	22.9	23.4	24.1	24.9	25.7	26.9	27.9	28.6	17.7	19.6	21.5	23.4	26.2	28.9	31.6	123.0
123.5	20.0	20.5	21.2	22.0	22.6	23.2	23.6	24.3	25.1	26.0	27.2	28.2	28.9	17.9	19.8	21.7	23.6	26.4	29.2	32.0	123.5
124.0	20.2	20.7	21.4	22.2	22.8	23.4	23.9	24.6	25.3	26.2	27.5	28.5	29.2	18.0	20.0	21.9	23.9	26.7	29.5	32.4	124.0
124.5	20.4	20.9	21.6	22.4	23.1	23.6	24.1	24.8	25.6	26.5	27.8	28.8	29.5	18.2	20.2	22.1	24.1	27.0	29.9	32.7	124.5
125.0	20.6	21.1	21.8	22.6	23.3	23.8	24.3	25.1	25.9	26.8	28.1	29.1	29.8	18.4	20.4	22.3	24.3	27.2	30.2	33.1	125.0
125.5	20.8	21.3	22.0	22.9	23.5	24.0	24.5	25.3	26.1	27.1	28.4	29.5	30.2	18.6	20.5	22.5	24.5	27.5	30.5	33.5	125.5
126.0	21.0	21.5	22.2	23.1	23.7	24.3	24.8	25.5	26.4	27.3	28.7	29.8	30.5	18.7	20.7	22.8	24.8	27.8	30.9	33.9	126.0
126.5	21.2	21.7	22.4	23.3	23.9	24.5	25.0	25.8	26.6	27.6	29.0	30.1	30.9	18.9	20.9	23.0	25.0	28.1	31.2	34.4	126.5
127.0	21.4	21.9	22.6	23.5	24.2	24.7	25.2	26.0	26.9	27.9	29.3	30.5	31.2	19.1	21.1	23.2	25.2	28.4	31.6	34.8	127.0
127.5	21.6	22.1	22.8	23.7	24.4	25.0	25.5	26.3	27.2	28.2	29.6	30.8	31.6	19.2	21.3	23.4	25.5	28.7	32.0	35.2	127.5
128.0	21.8	22.3	23.0	24.0	24.6	25.2	25.7	26.6	27.5	28.5	30.0	31.2	31.9	19.4	21.5	23.6	25.7	29.0	32.3	35.6	128.0
128.5	22.0	22.5	23.2	24.2	24.9	25.4	26.0	26.8	27.7	28.8	30.3	31.5	32.3	19.6	21.7	23.8	26.0	29.3	32.7	36.1	128.5
129.0	22.2	22.7	23.5	24.4	25.1	25.7	26.2	27.1	28.0	29.1	30.6	31.9	32.7	19.8	21.9	24.1	26.2	29.7	33.1	36.5	129.0
129.5	22.4	22.9	23.7	24.7	25.3	25.9	26.5	27.4	28.3	29.4	31.0	32.2	33.1	19.9	22.1	24.3	26.5	30.0	33.5	37.0	129.5
130.0	22.6	23.1	23.9	24.9	25.6	26.2	26.8	27.7	28.6	29.8	31.3	32.6	33.5	20.1	22.3	24.5	26.8	30.3	33.9	37.5	130.0
130.5	22.8	23.3	24.1	25.1	25.8	26.5	27.0	27.9	28.9	30.1	31.7	33.0	33.9	20.3	22.5	24.8	27.0	30.7	34.3	37.9	130.5
131.0	23.0	23.5	24.4	25.4	26.1	26.7	27.3	28.2	29.2	30.4	32.0	33.4	34.3	20.4	22.7	25.0	27.3	31.0	34.7	38.4	131.0
131.5	23.2	23.8	24.6	25.6	26.4	27.0	27.6	28.5	29.5	30.7	32.4	33.8	34.7	20.6	22.9	25.2	27.6	31.3	35.1	38.9	131.5
132.0	23.4	24.0	24.8	25.9	26.6	27.3	27.8	28.8	29.9	31.1	32.8	34.2	35.1	20.8	23.1	25.5	27.8	31.7	35.5	39.4	132.0
132.5	23.6	24.2	25.1	26.1	26.9	27.5	28.1	29.1	30.2	31.4	33.2	34.6	35.5	21.0	23.3	25.7	28.1	32.1	36.0	39.9	132.5
133.0	23.8	24.4	25.3	26.4	27.1	27.8	28.4	29.4	30.5	31.8	33.5	35.0	35.9	21.1	23.6	26.0	28.4	32.4	36.4	40.4	133.0
133.5	24.1	24.6	25.5	26.6	27.4	28.1	28.7	29.7	30.8	32.1	33.9	35.4	36.4	21.3	23.8	26.2	28.7	32.8	36.9	40.9	133.5
134.0	24.3	24.9	25.8	26.9	27.7	28.4	29.0	30.1	31.2	32.5	34.3	35.8	36.8	21.5	24.0	26.5	29.0	33.2	37.3	41.5	134.0
134.5	24.5	25.1	26.0	27.2	28.0	28.7	29.3	30.4	31.5	32.9	34.7	36.3	37.3	21.6	24.2	26.7	29.3	33.5	37.8	42.0	134.5
135.0	24.7	25.3	26.3	27.4	28.2	29.0	29.6	30.7	31.9	33.2	35.1	36.7	37.7	21.8	24.4	27.0	29.6	33.9	38.2	42.5	135.0
135.5	24.9	25.6	26.5	27.7	28.5	29.3	29.9	31.0	32.2	33.6	35.6	37.2	38.2	22.0	24.6	27.3	29.9	34.3	38.7	43.1	135.5
136.0	25.2	25.8	26.8	28.0	28.8	29.6	30.2	31.4	32.6	34.0	36.0	37.6	38.7	22.1	24.8	27.5	30.2	34.7	39.2	43.7	136.0
136.5	25.4	26.0	27.0	28.2	29.1	29.9	30.6	31.7	33.0	34.4	36.4	38.1	39.1	22.3	25.0	27.8	30.6	35.1	39.7	44.2	136.5
137.0	25.6	26.3	27.3	28.5	29.4	30.2	30.9	32.1	33.3	34.8	36.8	38.5	39.6	22.4	25.3	28.1	30.9	35.5	40.2	44.8	137.0
137.5	25.8	26.5	27.5	28.8	29.7	30.5	31.2	32.4	33.7	35.2	37.3	39.0	40.1	22.6	25.5	28.4	31.2	36.0	40.7	45.4	137.5
138.0	26.0	26.7	27.8	29.1	30.0	30.8	31.6	32.8	34.1	35.6	37.7	39.5	40.6	22.8	25.7	28.6	31.6	36.4	41.2	46.0	138.0
138.5	26.3	27.0	28.1	29.4	30.3	31.1	31.9	33.1	34.5	36.0	38.2	40.0	41.1	22.9	25.9	28.9	31.9	36.8	41.7	46.6	138.5

TABLE 27. WEIGHT (KG) BY STATURE OF BOYS 55–145 CM IN HEIGHT (*continued*)

STATURE CM	CENTILES													STANDARD DEVIATIONS							STATURE CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
139.0	26.5	27.2	28.3	29.7	30.6	31.5	32.3	33.5	34.9	36.5	38.7	40.5	41.6	23.1	26.1	29.2	32.3	37.2	42.2	47.2	139.0
139.5	26.7	27.5	28.6	30.0	31.0	31.8	32.6	33.9	35.3	36.9	39.1	41.0	42.2	23.2	26.4	29.5	32.6	37.7	42.8	47.9	139.5
140.0	27.0	27.7	28.9	30.3	31.3	32.2	33.0	34.3	35.7	37.3	39.6	41.5	42.7	23.4	26.6	29.8	33.0	38.1	43.3	48.5	140.0
140.5	27.2	28.0	29.1	30.6	31.6	32.5	33.3	34.7	36.1	37.8	40.1	42.0	43.2	23.5	26.8	30.1	33.3	38.6	43.9	49.1	140.5
141.0	27.4	28.2	29.4	30.9	31.9	32.9	33.7	35.1	36.5	38.2	40.6	42.5	43.8	23.7	27.0	30.4	33.7	39.1	44.4	49.8	141.0
141.5	27.6	28.5	29.7	31.2	32.3	33.2	34.1	35.5	36.9	38.7	41.1	43.1	44.3	23.8	27.2	30.7	34.1	39.5	45.0	50.5	141.5
142.0	27.9	28.7	30.0	31.5	32.6	33.6	34.5	35.9	37.4	39.1	41.6	43.6	44.9	24.0	27.5	31.0	34.5	40.0	45.6	51.1	142.0
142.5	28.1	29.0	30.3	31.8	33.0	33.9	34.8	36.3	37.8	39.6	42.1	44.1	45.5	24.1	27.7	31.3	34.8	40.5	46.2	51.8	142.5
143.0	28.3	29.2	30.5	32.2	33.3	34.3	35.2	36.7	38.3	40.1	42.6	44.7	46.1	24.2	27.9	31.6	35.2	41.0	46.7	52.5	143.0
143.5	28.6	29.5	30.8	32.5	33.7	34.7	35.6	37.1	38.7	40.6	43.1	45.3	46.7	24.4	28.1	31.9	35.6	41.5	47.3	53.2	143.5
144.0	28.8	29.7	31.1	32.8	34.0	35.1	36.1	37.6	39.2	41.1	43.7	45.8	47.2	24.5	28.4	32.2	36.1	42.0	48.0	53.9	144.0
144.5	29.1	30.0	31.4	33.1	34.4	35.5	36.5	38.0	39.6	41.6	44.2	46.4	47.9	24.7	28.6	32.5	36.5	42.5	48.6	54.6	144.5
145.0	29.3	30.2	31.7	33.5	34.8	35.9	36.9	38.4	40.1	42.1	44.8	47.0	48.5	24.8	28.8	32.8	36.9	43.0	49.2	55.4	145.0

TABLE 28. WEIGHT (KG) BY LENGTH OF GIRLS 49–101 CM IN HEIGHT

LENGTH CM	CENTILES													STANDARD DEVIATIONS							LENGTH CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	–3S.D.	–2S.D.	–1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
49.0	2.6	2.7	2.8	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.9	3.9	2.2	2.6	2.9	3.3	3.6	4.0	4.3	49.0
49.5	2.6	2.7	2.9	3.0	3.2	3.3	3.4	3.4	3.5	3.7	3.8	4.0	4.0	2.2	2.6	3.0	3.4	3.7	4.1	4.5	49.5
50.0	2.7	2.8	2.9	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.9	4.1	4.1	2.3	2.6	3.0	3.4	3.8	4.2	4.6	50.0
50.5	2.7	2.8	3.0	3.1	3.3	3.4	3.5	3.6	3.7	3.8	4.0	4.2	4.3	2.3	2.7	3.1	3.5	3.9	4.3	4.7	50.5
51.0	2.8	2.9	3.0	3.2	3.3	3.4	3.5	3.7	3.8	3.9	4.1	4.3	4.4	2.3	2.7	3.1	3.5	4.0	4.4	4.9	51.0
51.5	2.8	2.9	3.1	3.3	3.4	3.5	3.6	3.7	3.9	4.0	4.2	4.4	4.5	2.4	2.8	3.2	3.6	4.1	4.5	5.0	51.5
52.0	2.9	3.0	3.2	3.3	3.5	3.6	3.7	3.8	4.0	4.1	4.3	4.5	4.6	2.4	2.8	3.3	3.7	4.2	4.7	5.1	52.0
52.5	3.0	3.1	3.2	3.4	3.6	3.7	3.8	3.9	4.1	4.2	4.4	4.6	4.7	2.5	2.9	3.4	3.8	4.3	4.8	5.3	52.5
53.0	3.0	3.1	3.3	3.5	3.6	3.8	3.9	4.0	4.2	4.3	4.5	4.7	4.9	2.5	3.0	3.4	3.9	4.4	4.9	5.4	53.0
53.5	3.1	3.2	3.4	3.6	3.7	3.9	4.0	4.1	4.3	4.4	4.7	4.9	5.0	2.6	3.1	3.5	4.0	4.5	5.0	5.6	53.5
54.0	3.2	3.3	3.5	3.7	3.8	4.0	4.1	4.2	4.4	4.5	4.8	5.0	5.1	2.7	3.1	3.6	4.1	4.6	5.2	5.7	54.0
54.5	3.3	3.4	3.6	3.8	3.9	4.1	4.2	4.3	4.5	4.7	4.9	5.1	5.2	2.7	3.2	3.7	4.2	4.7	5.3	5.9	54.5
55.0	3.4	3.5	3.7	3.9	4.0	4.2	4.3	4.4	4.6	4.8	5.0	5.2	5.4	2.8	3.3	3.8	4.3	4.9	5.5	6.0	55.0
55.5	3.4	3.6	3.7	4.0	4.1	4.3	4.4	4.6	4.7	4.9	5.2	5.4	5.5	2.9	3.4	3.9	4.4	5.0	5.6	6.2	55.5
56.0	3.5	3.7	3.8	4.1	4.2	4.4	4.5	4.7	4.8	5.0	5.3	5.5	5.7	3.0	3.5	4.0	4.5	5.1	5.7	6.3	56.0
56.5	3.6	3.8	4.0	4.2	4.4	4.5	4.6	4.8	5.0	5.2	5.4	5.7	5.8	3.0	3.6	4.1	4.6	5.3	5.9	6.5	56.5
57.0	3.7	3.9	4.1	4.3	4.5	4.6	4.8	4.9	5.1	5.3	5.6	5.8	5.9	3.1	3.7	4.2	4.8	5.4	6.0	6.6	57.0
57.5	3.8	4.0	4.2	4.4	4.6	4.7	4.9	5.0	5.2	5.4	5.7	5.9	6.1	3.2	3.8	4.3	4.9	5.5	6.2	6.8	57.5
58.0	3.9	4.1	4.3	4.5	4.7	4.9	5.0	5.2	5.4	5.6	5.8	6.1	6.2	3.3	3.9	4.4	5.0	5.7	6.3	7.0	58.0
58.5	4.1	4.2	4.4	4.7	4.8	5.0	5.1	5.3	5.5	5.7	6.0	6.2	6.4	3.4	4.0	4.6	5.1	5.8	6.5	7.1	58.5
59.0	4.2	4.3	4.5	4.8	5.0	5.1	5.3	5.4	5.6	5.8	6.1	6.4	6.5	3.5	4.1	4.7	5.3	5.9	6.6	7.3	59.0
59.5	4.3	4.4	4.6	4.9	5.1	5.3	5.4	5.6	5.8	6.0	6.3	6.5	6.7	3.6	4.2	4.8	5.4	6.1	6.8	7.4	59.5
60.0	4.4	4.5	4.8	5.0	5.2	5.4	5.5	5.7	5.9	6.1	6.4	6.7	6.8	3.7	4.3	4.9	5.5	6.2	6.9	7.6	60.0
60.5	4.5	4.7	4.9	5.2	5.4	5.5	5.7	5.9	6.0	6.3	6.6	6.8	7.0	3.8	4.4	5.1	5.7	6.4	7.1	7.7	60.5
61.0	4.6	4.8	5.0	5.3	5.5	5.7	5.8	6.0	6.2	6.4	6.7	7.0	7.1	3.9	4.6	5.2	5.8	6.5	7.2	7.9	61.0
61.5	4.7	4.9	5.1	5.4	5.6	5.8	6.0	6.1	6.3	6.6	6.9	7.1	7.3	4.0	4.7	5.3	6.0	6.7	7.4	8.1	61.5
62.0	4.9	5.0	5.3	5.6	5.8	5.9	6.1	6.3	6.5	6.7	7.0	7.3	7.4	4.1	4.8	5.4	6.1	6.8	7.5	8.2	62.0
62.5	5.0	5.2	5.4	5.7	5.9	6.1	6.2	6.4	6.6	6.8	7.2	7.4	7.6	4.2	4.9	5.6	6.2	7.0	7.7	8.4	62.5
63.0	5.1	5.3	5.5	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.3	7.6	7.7	4.4	5.0	5.7	6.4	7.1	7.8	8.5	63.0
63.5	5.2	5.4	5.7	6.0	6.2	6.4	6.5	6.7	6.9	7.1	7.5	7.7	7.9	4.5	5.2	5.8	6.5	7.3	8.0	8.7	63.5
64.0	5.4	5.5	5.8	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.6	7.9	8.0	4.6	5.3	6.0	6.7	7.4	8.1	8.9	64.0
64.5	5.5	5.7	5.9	6.2	6.5	6.6	6.8	7.0	7.2	7.4	7.8	8.0	8.2	4.7	5.4	6.1	6.8	7.6	8.3	9.0	64.5
65.0	5.6	5.8	6.1	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.9	8.2	8.4	4.8	5.5	6.3	7.0	7.7	8.4	9.2	65.0
65.5	5.8	5.9	6.2	6.5	6.7	6.9	7.1	7.3	7.5	7.7	8.1	8.3	8.5	4.9	5.7	6.4	7.1	7.9	8.6	9.3	65.5
66.0	5.9	6.1	6.3	6.6	6.9	7.1	7.3	7.4	7.6	7.9	8.2	8.5	8.7	5.1	5.8	6.5	7.3	8.0	8.7	9.5	66.0
66.5	6.0	6.2	6.5	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.4	8.6	8.8	5.2	5.9	6.7	7.4	8.1	8.9	9.6	66.5
67.0	6.1	6.3	6.6	6.9	7.2	7.4	7.5	7.7	7.9	8.2	8.5	8.8	9.0	5.3	6.0	6.8	7.5	8.3	9.0	9.8	67.0
67.5	6.3	6.4	6.7	7.0	7.3	7.5	7.7	7.9	8.1	8.3	8.7	8.9	9.1	5.4	6.2	6.9	7.7	8.4	9.2	9.9	67.5
68.0	6.4	6.6	6.8	7.2	7.4	7.6	7.8	8.0	8.2	8.5	8.8	9.1	9.2	5.5	6.3	7.1	7.8	8.6	9.3	10.1	68.0
68.5	6.5	6.7	7.0	7.3	7.6	7.8	8.0	8.2	8.4	8.6	8.9	9.2	9.4	5.6	6.4	7.2	8.0	8.7	9.5	10.2	68.5
69.0	6.6	6.8	7.1	7.4	7.7	7.9	8.1	8.3	8.5	8.7	9.1	9.4	9.5	5.8	6.5	7.3	8.1	8.9	9.6	10.4	69.0
69.5	6.8	6.9	7.2	7.6	7.8	8.0	8.2	8.4	8.6	8.9	9.2	9.5	9.7	5.9	6.7	7.5	8.2	9.0	9.8	10.5	69.5

TABLE 28. WEIGHT (KG) BY LENGTH OF GIRLS 49–101 CM IN HEIGHT (*continued*)

LENGTH CM	CENTILES													STANDARD DEVIATIONS							LENGTH CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
70.0	6.9	7.1	7.4	7.7	8.0	8.2	8.4	8.6	8.8	9.0	9.4	9.6	9.8	6.0	6.8	7.6	8.4	9.1	9.9	10.7	70.0
70.5	7.0	7.2	7.5	7.8	8.1	8.3	8.5	8.7	8.9	9.2	9.5	9.8	10.0	6.1	6.9	7.7	8.5	9.3	10.1	10.8	70.5
71.0	7.1	7.3	7.6	8.0	8.2	8.4	8.6	8.8	9.0	9.3	9.6	9.9	10.1	6.2	7.0	7.8	8.6	9.4	10.2	11.0	71.0
71.5	7.2	7.4	7.7	8.1	8.3	8.6	8.8	9.0	9.2	9.4	9.8	10.0	10.2	6.3	7.1	8.0	8.8	9.5	10.3	11.1	71.5
72.0	7.3	7.5	7.8	8.2	8.5	8.7	8.9	9.1	9.3	9.6	9.9	10.2	10.4	6.4	7.2	8.1	8.9	9.7	10.5	11.2	72.0
72.5	7.5	7.7	8.0	8.3	8.6	8.8	9.0	9.2	9.4	9.7	10.0	10.3	10.5	6.5	7.4	8.2	9.0	9.8	10.6	11.4	72.5
73.0	7.6	7.8	8.1	8.4	8.7	8.9	9.1	9.3	9.6	9.8	10.1	10.4	10.6	6.6	7.5	8.3	9.1	9.9	10.7	11.5	73.0
73.5	7.7	7.9	8.2	8.5	8.8	9.0	9.3	9.5	9.7	9.9	10.3	10.6	10.7	6.7	7.6	8.4	9.3	10.0	10.8	11.6	73.5
74.0	7.8	8.0	8.3	8.7	8.9	9.2	9.4	9.6	9.8	10.0	10.4	10.7	10.9	6.8	7.7	8.5	9.4	10.2	11.0	11.8	74.0
74.5	7.9	8.1	8.4	8.8	9.0	9.3	9.5	9.7	9.9	10.2	10.5	10.8	11.0	6.9	7.8	8.6	9.5	10.3	11.1	11.9	74.5
75.0	8.0	8.2	8.5	8.9	9.1	9.4	9.6	9.8	10.0	10.3	10.6	10.9	11.1	7.0	7.9	8.7	9.6	10.4	11.2	12.0	75.0
75.5	8.1	8.3	8.6	9.0	9.3	9.5	9.7	9.9	10.1	10.4	10.7	11.0	11.2	7.1	8.0	8.8	9.7	10.5	11.3	12.1	75.5
76.0	8.2	8.4	8.7	9.1	9.4	9.6	9.8	10.0	10.2	10.5	10.9	11.2	11.3	7.2	8.1	8.9	9.8	10.6	11.4	12.3	76.0
76.5	8.3	8.5	8.8	9.2	9.5	9.7	9.9	10.1	10.3	10.6	11.0	11.3	11.5	7.3	8.2	9.0	9.9	10.7	11.6	12.4	76.5
77.0	8.4	8.6	8.9	9.3	9.6	9.8	10.0	10.2	10.5	10.7	11.1	11.4	11.6	7.4	8.3	9.1	10.0	10.8	11.7	12.5	77.0
77.5	8.5	8.7	9.0	9.4	9.7	9.9	10.1	10.3	10.6	10.8	11.2	11.5	11.7	7.5	8.4	9.2	10.1	11.0	11.8	12.6	77.5
78.0	8.6	8.8	9.1	9.5	9.8	10.0	10.2	10.4	10.7	10.9	11.3	11.6	11.8	7.6	8.5	9.3	10.2	11.1	11.9	12.7	78.0
78.5	8.7	8.9	9.2	9.6	9.9	10.1	10.3	10.5	10.8	11.0	11.4	11.7	11.9	7.7	8.6	9.4	10.3	11.2	12.0	12.9	78.5
79.0	8.8	9.0	9.3	9.7	10.0	10.2	10.4	10.6	10.9	11.1	11.5	11.8	12.0	7.8	8.7	9.5	10.4	11.3	12.1	13.0	79.0
79.5	8.9	9.1	9.4	9.8	10.1	10.3	10.5	10.7	11.0	11.2	11.6	11.9	12.1	7.9	8.7	9.6	10.5	11.4	12.2	13.1	79.5
80.0	8.9	9.2	9.5	9.9	10.1	10.4	10.6	10.8	11.1	11.3	11.7	12.0	12.2	8.0	8.8	9.7	10.6	11.5	12.3	13.2	80.0
80.5	9.0	9.2	9.6	10.0	10.2	10.5	10.7	10.9	11.2	11.4	11.8	12.1	12.3	8.0	8.9	9.8	10.7	11.6	12.4	13.3	80.5
81.0	9.1	9.3	9.7	10.1	10.3	10.6	10.8	11.0	11.3	11.5	11.9	12.2	12.4	8.1	9.0	9.9	10.8	11.7	12.6	13.4	81.0
81.5	9.2	9.4	9.8	10.1	10.4	10.7	10.9	11.1	11.4	11.6	12.0	12.3	12.6	8.2	9.1	10.0	10.9	11.8	12.7	13.5	81.5
82.0	9.3	9.5	9.8	10.2	10.5	10.8	11.0	11.2	11.5	11.7	12.1	12.5	12.7	8.3	9.2	10.1	11.0	11.9	12.8	13.7	82.0
82.5	9.4	9.6	9.9	10.3	10.6	10.9	11.1	11.3	11.6	11.8	12.2	12.6	12.8	8.4	9.3	10.2	11.1	12.0	12.9	13.8	82.5
83.0	9.5	9.7	10.0	10.4	10.7	10.9	11.2	11.4	11.7	11.9	12.3	12.7	12.9	8.5	9.4	10.3	11.2	12.1	13.0	13.9	83.0
83.5	9.6	9.8	10.1	10.5	10.8	11.0	11.3	11.5	11.7	12.0	12.4	12.8	13.0	8.6	9.5	10.4	11.3	12.2	13.1	14.0	83.5
84.0	9.7	9.9	10.2	10.6	10.9	11.1	11.4	11.6	11.8	12.1	12.5	12.9	13.1	8.7	9.6	10.5	11.4	12.3	13.2	14.1	84.0
84.5	9.8	10.0	10.3	10.7	11.0	11.2	11.5	11.7	11.9	12.2	12.6	13.0	13.2	8.7	9.6	10.6	11.5	12.4	13.3	14.2	84.5
85.0	9.8	10.1	10.4	10.8	11.1	11.3	11.6	11.8	12.0	12.3	12.7	13.1	13.3	8.8	9.7	10.6	11.6	12.5	13.4	14.3	85.0
85.5	9.9	10.2	10.5	10.9	11.2	11.4	11.7	11.9	12.1	12.4	12.9	13.2	13.4	8.9	9.8	10.7	11.7	12.6	13.5	14.5	85.5
86.0	10.0	10.2	10.6	11.0	11.3	11.5	11.8	12.0	12.2	12.5	13.0	13.3	13.5	9.0	9.9	10.8	11.8	12.7	13.6	14.6	86.0
86.5	10.1	10.3	10.7	11.1	11.4	11.6	11.8	12.1	12.3	12.6	13.1	13.4	13.6	9.1	10.0	10.9	11.8	12.8	13.7	14.7	86.5
87.0	10.2	10.4	10.8	11.2	11.5	11.7	11.9	12.2	12.4	12.8	13.2	13.5	13.7	9.2	10.1	11.0	11.9	12.9	13.9	14.8	87.0
87.5	10.3	10.5	10.9	11.3	11.6	11.8	12.0	12.3	12.6	12.9	13.3	13.6	13.9	9.3	10.2	11.1	12.0	13.0	14.0	14.9	87.5
88.0	10.4	10.6	11.0	11.4	11.7	11.9	12.2	12.4	12.7	13.0	13.4	13.7	14.0	9.4	10.3	11.2	12.2	13.1	14.1	15.0	88.0
88.5	10.5	10.7	11.1	11.5	11.8	12.0	12.3	12.5	12.8	13.1	13.5	13.8	14.1	9.4	10.4	11.3	12.3	13.2	14.2	15.2	88.5
89.0	10.6	10.8	11.2	11.6	11.9	12.1	12.4	12.6	12.9	13.2	13.6	14.0	14.2	9.5	10.5	11.4	12.4	13.3	14.3	15.3	89.0
89.5	10.7	10.9	11.3	11.7	12.0	12.2	12.5	12.7	13.0	13.3	13.7	14.1	14.3	9.6	10.6	11.5	12.5	13.4	14.4	15.4	89.5
90.0	10.8	11.0	11.4	11.8	12.1	12.3	12.6	12.8	13.1	13.4	13.8	14.2	14.4	9.7	10.7	11.6	12.6	13.6	14.5	15.5	90.0
90.5	10.9	11.1	11.5	11.9	12.2	12.4	12.7	12.9	13.2	13.5	14.0	14.3	14.5	9.8	10.8	11.7	12.7	13.7	14.7	15.7	90.5

TABLE 28. WEIGHT (KG) BY LENGTH OF GIRLS 49–101 CM IN HEIGHT (*continued*)

LENGTH CM	CENTILES													STANDARD DEVIATIONS							LENGTH CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	–3S.D.	–2S.D.	–1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
91.0	11.0	11.2	11.6	12.0	12.3	12.6	12.8	13.1	13.3	13.6	14.1	14.4	14.7	9.9	10.9	11.8	12.8	13.8	14.8	15.8	91.0
91.5	11.1	11.3	11.7	12.1	12.4	12.7	12.9	13.2	13.4	13.8	14.2	14.6	14.8	10.0	11.0	11.9	12.9	13.9	14.9	15.9	91.5
92.0	11.2	11.4	11.8	12.2	12.5	12.8	13.0	13.3	13.6	13.9	14.3	14.7	14.9	10.1	11.1	12.1	13.0	14.0	15.0	16.0	92.0
92.5	11.3	11.5	11.9	12.3	12.6	12.9	13.1	13.4	13.7	14.0	14.4	14.8	15.1	10.2	11.2	12.2	13.1	14.2	15.2	16.2	92.5
93.0	11.4	11.7	12.0	12.4	12.8	13.0	13.3	13.5	13.8	14.1	14.6	14.9	15.2	10.3	11.3	12.3	13.3	14.3	15.3	16.3	93.0
93.5	11.5	11.8	12.1	12.6	12.9	13.1	13.4	13.7	13.9	14.3	14.7	15.1	15.3	10.4	11.4	12.4	13.4	14.4	15.4	16.5	93.5
94.0	11.6	11.9	12.2	12.7	13.0	13.3	13.5	13.8	14.1	14.4	14.8	15.2	15.5	10.5	11.5	12.5	13.5	14.5	15.6	16.6	94.0
94.5	11.8	12.0	12.4	12.8	13.1	13.4	13.6	13.9	14.2	14.5	15.0	15.3	15.6	10.6	11.6	12.6	13.6	14.7	15.7	16.7	94.5
95.0	11.9	12.1	12.5	12.9	13.2	13.5	13.8	14.0	14.3	14.6	15.1	15.5	15.7	10.7	11.8	12.8	13.8	14.8	15.9	16.9	95.0
95.5	12.0	12.2	12.6	13.0	13.4	13.6	13.9	14.2	14.5	14.8	15.2	15.6	15.9	10.9	11.9	12.9	13.9	15.0	16.0	17.0	95.5
96.0	12.1	12.4	12.7	13.2	13.5	13.8	14.0	14.3	14.6	14.9	15.4	15.8	16.0	11.0	12.0	13.0	14.0	15.1	16.1	17.2	96.0
96.5	12.2	12.5	12.9	13.3	13.6	13.9	14.2	14.4	14.7	15.1	15.5	15.9	16.2	11.1	12.1	13.1	14.2	15.2	16.3	17.4	96.5
97.0	12.4	12.6	13.0	13.4	13.8	14.0	14.3	14.6	14.9	15.2	15.7	16.1	16.3	11.2	12.2	13.3	14.3	15.4	16.5	17.5	97.0
97.5	12.5	12.7	13.1	13.6	13.9	14.2	14.4	14.7	15.0	15.4	15.8	16.2	16.5	11.3	12.4	13.4	14.4	15.5	16.6	17.7	97.5
98.0	12.6	12.9	13.3	13.7	14.0	14.3	14.6	14.9	15.2	15.5	16.0	16.4	16.6	11.5	12.5	13.5	14.6	15.7	16.8	17.9	98.0
98.5	12.8	13.0	13.4	13.8	14.2	14.5	14.7	15.0	15.3	15.7	16.1	16.5	16.8	11.6	12.6	13.7	14.7	15.8	16.9	18.0	98.5
99.0	12.9	13.1	13.5	14.0	14.3	14.6	14.9	15.2	15.5	15.8	16.3	16.7	17.0	11.7	12.8	13.8	14.9	16.0	17.1	18.2	99.0
99.5	13.0	13.3	13.7	14.1	14.5	14.7	15.0	15.3	15.6	16.0	16.5	16.9	17.1	11.9	12.9	14.0	15.0	16.1	17.3	18.4	99.5
100.0	13.2	13.4	13.8	14.3	14.6	14.9	15.2	15.5	15.8	16.1	16.6	17.0	17.3	12.0	13.1	14.1	15.2	16.3	17.4	18.6	100.0
100.5	13.3	13.6	14.0	14.4	14.8	15.0	15.3	15.6	15.9	16.3	16.8	17.2	17.5	12.1	13.2	14.3	15.3	16.5	17.6	18.8	100.5
101.0	13.5	13.7	14.1	14.6	14.9	15.2	15.5	15.8	16.1	16.4	17.0	17.4	17.7	12.3	13.3	14.4	15.5	16.6	17.8	19.0	101.0

TABLE 29. WEIGHT (KG) BY STATURE OF GIRLS 55–137 CM IN HEIGHT

STATURE CM	CENTILES													STANDARD DEVIATIONS							STATURE CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
55.0	3.0	3.2	3.4	3.7	3.9	4.1	4.3	4.6	4.9	5.3	5.9	6.3	6.6	2.3	3.0	3.6	4.3	5.5	6.7	7.9	55.0
55.5	3.2	3.3	3.6	3.9	4.1	4.3	4.5	4.8	5.1	5.5	6.0	6.5	6.8	2.4	3.1	3.8	4.5	5.7	6.9	8.1	55.5
56.0	3.3	3.5	3.7	4.1	4.3	4.5	4.7	5.0	5.3	5.7	6.2	6.7	6.9	2.5	3.2	3.9	4.7	5.9	7.1	8.3	56.0
56.5	3.4	3.6	3.9	4.2	4.4	4.6	4.8	5.1	5.5	5.9	6.4	6.8	7.1	2.6	3.4	4.1	4.8	6.0	7.3	8.5	56.5
57.0	3.6	3.8	4.0	4.4	4.6	4.8	5.0	5.3	5.6	6.0	6.6	7.0	7.3	2.7	3.5	4.2	5.0	6.2	7.4	8.6	57.0
57.5	3.7	3.9	4.2	4.5	4.8	5.0	5.2	5.5	5.8	6.2	6.7	7.2	7.5	2.8	3.6	4.4	5.2	6.4	7.6	8.8	57.5
58.0	3.8	4.0	4.3	4.7	4.9	5.1	5.3	5.6	6.0	6.4	6.9	7.3	7.6	3.0	3.8	4.5	5.3	6.6	7.8	9.0	58.0
58.5	4.0	4.2	4.5	4.8	5.1	5.3	5.5	5.8	6.1	6.5	7.1	7.5	7.8	3.1	3.9	4.7	5.5	6.7	7.9	9.1	58.5
59.0	4.1	4.3	4.6	5.0	5.2	5.5	5.7	6.0	6.3	6.7	7.2	7.7	7.9	3.2	4.0	4.8	5.7	6.9	8.1	9.3	59.0
59.5	4.2	4.4	4.7	5.1	5.4	5.6	5.8	6.1	6.5	6.8	7.4	7.8	8.1	3.3	4.1	5.0	5.8	7.0	8.3	9.5	59.5
60.0	4.4	4.6	4.9	5.3	5.5	5.8	6.0	6.3	6.6	7.0	7.5	8.0	8.3	3.4	4.3	5.1	6.0	7.2	8.4	9.6	60.0
60.5	4.5	4.7	5.0	5.4	5.7	5.9	6.1	6.4	6.8	7.2	7.7	8.1	8.4	3.5	4.4	5.3	6.1	7.3	8.6	9.8	60.5
61.0	4.6	4.8	5.1	5.5	5.8	6.1	6.3	6.6	6.9	7.3	7.8	8.3	8.6	3.6	4.5	5.4	6.3	7.5	8.7	9.9	61.0
61.5	4.7	5.0	5.3	5.7	6.0	6.2	6.4	6.7	7.1	7.5	8.0	8.4	8.7	3.7	4.6	5.5	6.4	7.6	8.9	10.1	61.5
62.0	4.9	5.1	5.4	5.8	6.1	6.3	6.6	6.9	7.2	7.6	8.1	8.6	8.9	3.9	4.8	5.7	6.6	7.8	9.0	10.2	62.0
62.5	5.0	5.2	5.5	5.9	6.2	6.5	6.7	7.0	7.4	7.7	8.3	8.7	9.0	4.0	4.9	5.8	6.7	7.9	9.2	10.4	62.5
63.0	5.1	5.3	5.7	6.1	6.4	6.6	6.9	7.2	7.5	7.9	8.4	8.9	9.2	4.1	5.0	5.9	6.9	8.1	9.3	10.5	63.0
63.5	5.2	5.5	5.8	6.2	6.5	6.8	7.0	7.3	7.6	8.0	8.6	9.0	9.3	4.2	5.1	6.1	7.0	8.2	9.4	10.7	63.5
64.0	5.4	5.6	5.9	6.3	6.6	6.9	7.1	7.4	7.8	8.2	8.7	9.1	9.4	4.3	5.2	6.2	7.1	8.4	9.6	10.8	64.0
64.5	5.5	5.7	6.0	6.5	6.8	7.0	7.3	7.6	7.9	8.3	8.8	9.3	9.6	4.4	5.4	6.3	7.3	8.5	9.7	10.9	64.5
65.0	5.6	5.8	6.2	6.6	6.9	7.2	7.4	7.7	8.0	8.4	9.0	9.4	9.7	4.5	5.5	6.4	7.4	8.6	9.8	11.1	65.0
65.5	5.7	5.9	6.3	6.7	7.0	7.3	7.5	7.8	8.2	8.6	9.1	9.5	9.8	4.6	5.6	6.6	7.5	8.8	10.0	11.2	65.5
66.0	5.8	6.1	6.4	6.8	7.2	7.4	7.7	8.0	8.3	8.7	9.2	9.7	10.0	4.7	5.7	6.7	7.7	8.9	10.1	11.3	66.0
66.5	5.9	6.2	6.5	7.0	7.3	7.5	7.8	8.1	8.4	8.8	9.4	9.8	10.1	4.8	5.8	6.8	7.8	9.0	10.2	11.5	66.5
67.0	6.1	6.3	6.7	7.1	7.4	7.7	7.9	8.2	8.6	8.9	9.5	9.9	10.2	5.0	5.9	6.9	7.9	9.1	10.4	11.6	67.0
67.5	6.2	6.4	6.8	7.2	7.5	7.8	8.0	8.4	8.7	9.1	9.6	10.1	10.4	5.1	6.1	7.0	8.0	9.3	10.5	11.7	67.5
68.0	6.3	6.5	6.9	7.3	7.6	7.9	8.2	8.5	8.8	9.2	9.7	10.2	10.5	5.2	6.2	7.2	8.2	9.4	10.6	11.9	68.0
68.5	6.4	6.6	7.0	7.4	7.8	8.0	8.3	8.6	8.9	9.3	9.9	10.3	10.6	5.3	6.3	7.3	8.3	9.5	10.7	12.0	68.5
69.0	6.5	6.8	7.1	7.6	7.9	8.1	8.4	8.7	9.1	9.4	10.0	10.4	10.7	5.4	6.4	7.4	8.4	9.6	10.9	12.1	69.0
69.5	6.6	6.9	7.2	7.7	8.0	8.3	8.5	8.8	9.2	9.6	10.1	10.6	10.8	5.5	6.5	7.5	8.5	9.8	11.0	12.2	69.5
70.0	6.7	7.0	7.3	7.8	8.1	8.4	8.6	9.0	9.3	9.7	10.2	10.7	11.0	5.6	6.6	7.6	8.6	9.9	11.1	12.4	70.0
70.5	6.8	7.1	7.5	7.9	8.2	8.5	8.8	9.1	9.4	9.8	10.3	10.8	11.1	5.7	6.7	7.7	8.8	10.0	11.2	12.5	70.5
71.0	7.0	7.2	7.6	8.0	8.3	8.6	8.9	9.2	9.5	9.9	10.5	10.9	11.2	5.8	6.8	7.9	8.9	10.1	11.4	12.6	71.0
71.5	7.1	7.3	7.7	8.1	8.4	8.7	9.0	9.3	9.6	10.0	10.6	11.0	11.3	5.9	6.9	8.0	9.0	10.2	11.5	12.7	71.5
72.0	7.2	7.4	7.8	8.2	8.6	8.8	9.1	9.4	9.7	10.1	10.7	11.1	11.4	6.0	7.1	8.1	9.1	10.3	11.6	12.8	72.0
72.5	7.3	7.5	7.9	8.3	8.7	8.9	9.2	9.5	9.9	10.3	10.8	11.3	11.6	6.1	7.2	8.2	9.2	10.5	11.7	13.0	72.5
73.0	7.4	7.6	8.0	8.5	8.8	9.1	9.3	9.6	10.0	10.4	10.9	11.4	11.7	6.2	7.3	8.3	9.3	10.6	11.8	13.1	73.0
73.5	7.5	7.7	8.1	8.6	8.9	9.2	9.4	9.7	10.1	10.5	11.0	11.5	11.8	6.4	7.4	8.4	9.4	10.7	11.9	13.2	73.5
74.0	7.6	7.8	8.2	8.7	9.0	9.3	9.5	9.9	10.2	10.6	11.1	11.6	11.9	6.5	7.5	8.5	9.5	10.8	12.1	13.3	74.0
74.5	7.7	8.0	8.3	8.8	9.1	9.4	9.6	10.0	10.3	10.7	11.3	11.7	12.0	6.6	7.6	8.6	9.6	10.9	12.2	13.4	74.5
75.0	7.8	8.1	8.4	8.9	9.2	9.5	9.7	10.1	10.4	10.8	11.4	11.8	12.1	6.7	7.7	8.7	9.7	11.0	12.3	13.6	75.0
75.5	7.9	8.2	8.5	9.0	9.3	9.6	9.9	10.2	10.5	10.9	11.5	11.9	12.2	6.8	7.8	8.8	9.9	11.1	12.4	13.7	75.5

STATURE CM	CENTILES													STANDARD DEVIATIONS							STATURE CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
76.0	8.0	8.3	8.6	9.1	9.4	9.7	10.0	10.3	10.6	11.0	11.6	12.1	12.4	6.9	7.9	8.9	10.0	11.2	12.5	13.8	76.0
76.5	8.1	8.4	8.7	9.2	9.5	9.8	10.1	10.4	10.7	11.1	11.7	12.2	12.5	7.0	8.0	9.0	10.1	11.3	12.6	13.9	76.5
77.0	8.2	8.5	8.8	9.3	9.6	9.9	10.2	10.5	10.8	11.2	11.8	12.3	12.6	7.1	8.1	9.1	10.2	11.5	12.7	14.0	77.0
77.5	8.3	8.6	8.9	9.4	9.7	10.0	10.3	10.6	10.9	11.4	11.9	12.4	12.7	7.2	8.2	9.2	10.3	11.6	12.8	14.1	77.5
78.0	8.4	8.7	9.1	9.5	9.8	10.1	10.4	10.7	11.1	11.5	12.0	12.5	12.8	7.3	8.3	9.3	10.4	11.7	13.0	14.3	78.0
78.5	8.5	8.8	9.2	9.6	9.9	10.2	10.5	10.8	11.2	11.6	12.1	12.6	12.9	7.4	8.4	9.4	10.5	11.8	13.1	14.4	78.5
79.0	8.6	8.9	9.3	9.7	10.0	10.3	10.6	10.9	11.3	11.7	12.3	12.7	13.0	7.5	8.5	9.5	10.6	11.9	13.2	14.5	79.0
79.5	8.7	9.0	9.4	9.8	10.1	10.4	10.7	11.0	11.4	11.8	12.4	12.8	13.1	7.6	8.6	9.7	10.7	12.0	13.3	14.6	79.5
80.0	8.8	9.1	9.5	9.9	10.2	10.5	10.8	11.1	11.5	11.9	12.5	12.9	13.3	7.7	8.7	9.8	10.8	12.1	13.4	14.7	80.0
80.5	8.9	9.2	9.6	10.0	10.3	10.6	10.9	11.2	11.6	12.0	12.6	13.1	13.4	7.8	8.8	9.9	10.9	12.2	13.5	14.8	80.5
81.0	9.0	9.3	9.7	10.1	10.5	10.7	11.0	11.3	11.7	12.1	12.7	13.2	13.5	7.9	8.9	10.0	11.0	12.3	13.6	15.0	81.0
81.5	9.1	9.4	9.8	10.2	10.6	10.8	11.1	11.4	11.8	12.2	12.8	13.3	13.6	8.0	9.0	10.1	11.1	12.4	13.8	15.1	81.5
82.0	9.2	9.5	9.9	10.3	10.7	10.9	11.2	11.5	11.9	12.3	12.9	13.4	13.7	8.1	9.1	10.2	11.2	12.5	13.9	15.2	82.0
82.5	9.3	9.6	10.0	10.4	10.8	11.0	11.3	11.6	12.0	12.4	13.0	13.5	13.8	8.2	9.2	10.3	11.3	12.6	14.0	15.3	82.5
83.0	9.4	9.7	10.1	10.5	10.9	11.1	11.4	11.8	12.1	12.5	13.1	13.6	13.9	8.3	9.3	10.4	11.4	12.8	14.1	15.4	83.0
83.5	9.5	9.8	10.2	10.6	11.0	11.2	11.5	11.9	12.2	12.7	13.2	13.7	14.1	8.3	9.4	10.5	11.5	12.9	14.2	15.6	83.5
84.0	9.6	9.9	10.3	10.7	11.1	11.4	11.6	12.0	12.3	12.8	13.4	13.8	14.2	8.4	9.5	10.6	11.6	13.0	14.3	15.7	84.0
84.5	9.7	10.0	10.4	10.8	11.2	11.5	11.7	12.1	12.4	12.9	13.5	14.0	14.3	8.5	9.6	10.7	11.7	13.1	14.4	15.8	84.5
85.0	9.8	10.1	10.5	10.9	11.3	11.6	11.8	12.2	12.6	13.0	13.6	14.1	14.4	8.6	9.7	10.8	11.8	13.2	14.6	15.9	85.0
85.5	9.9	10.2	10.6	11.0	11.4	11.7	11.9	12.3	12.7	13.1	13.7	14.2	14.5	8.7	9.8	10.9	11.9	13.3	14.7	16.1	85.5
86.0	10.0	10.3	10.7	11.1	11.5	11.8	12.0	12.4	12.8	13.2	13.8	14.3	14.6	8.8	9.9	11.0	12.0	13.4	14.8	16.2	86.0
86.5	10.1	10.4	10.8	11.2	11.6	11.9	12.2	12.5	12.9	13.3	13.9	14.4	14.8	8.9	10.0	11.1	12.2	13.5	14.9	16.3	86.5
87.0	10.2	10.5	10.9	11.3	11.7	12.0	12.3	12.6	13.0	13.4	14.1	14.6	14.9	9.0	10.1	11.2	12.3	13.7	15.1	16.4	87.0
87.5	10.3	10.6	11.0	11.4	11.8	12.1	12.4	12.7	13.1	13.6	14.2	14.7	15.0	9.1	10.2	11.3	12.4	13.8	15.2	16.6	87.5
88.0	10.4	10.7	11.1	11.6	11.9	12.2	12.5	12.8	13.2	13.7	14.3	14.8	15.1	9.2	10.3	11.4	12.5	13.9	15.3	16.7	88.0
88.5	10.5	10.8	11.2	11.7	12.0	12.3	12.6	13.0	13.3	13.8	14.4	14.9	15.3	9.3	10.4	11.5	12.6	14.0	15.4	16.8	88.5
89.0	10.6	10.9	11.3	11.8	12.1	12.4	12.7	13.1	13.5	13.9	14.5	15.0	15.4	9.3	10.5	11.6	12.7	14.1	15.6	17.0	89.0
89.5	10.7	11.0	11.4	11.9	12.2	12.5	12.8	13.2	13.6	14.0	14.7	15.2	15.5	9.4	10.6	11.7	12.8	14.2	15.7	17.1	89.5
90.0	10.8	11.1	11.5	12.0	12.3	12.6	12.9	13.3	13.7	14.1	14.8	15.3	15.6	9.5	10.7	11.8	12.9	14.4	15.8	17.3	90.0
90.5	10.9	11.2	11.6	12.1	12.4	12.8	13.0	13.4	13.8	14.3	14.9	15.4	15.8	9.6	10.7	11.9	13.0	14.5	15.9	17.4	90.5
91.0	11.0	11.3	11.7	12.2	12.6	12.9	13.2	13.5	13.9	14.4	15.0	15.6	15.9	9.7	10.8	12.0	13.2	14.6	16.1	17.5	91.0
91.5	11.1	11.4	11.8	12.3	12.7	13.0	13.3	13.6	14.0	14.5	15.2	15.7	16.0	9.8	10.9	12.1	13.3	14.7	16.2	17.7	91.5
92.0	11.2	11.5	11.9	12.4	12.8	13.1	13.4	13.8	14.2	14.6	15.3	15.8	16.2	9.9	11.0	12.2	13.4	14.9	16.3	17.8	92.0
92.5	11.3	11.6	12.0	12.5	12.9	13.2	13.5	13.9	14.3	14.8	15.4	15.9	16.3	9.9	11.1	12.3	13.5	15.0	16.5	18.0	92.5
93.0	11.4	11.7	12.1	12.6	13.0	13.3	13.6	14.0	14.4	14.9	15.5	16.1	16.4	10.0	11.2	12.4	13.6	15.1	16.6	18.1	93.0
93.5	11.5	11.8	12.2	12.7	13.1	13.4	13.7	14.1	14.5	15.0	15.7	16.2	16.6	10.1	11.3	12.5	13.7	15.2	16.7	18.3	93.5
94.0	11.6	11.9	12.3	12.8	13.2	13.6	13.9	14.2	14.7	15.1	15.8	16.4	16.7	10.2	11.4	12.6	13.9	15.4	16.9	18.4	94.0
94.5	11.7	12.0	12.4	12.9	13.3	13.7	14.0	14.4	14.8	15.3	15.9	16.5	16.8	10.3	11.5	12.8	14.0	15.5	17.0	18.6	94.5
95.0	11.8	12.1	12.5	13.1	13.5	13.8	14.1	14.5	14.9	15.4	16.1	16.6	17.0	10.4	11.6	12.9	14.1	15.6	17.2	18.7	95.0
95.5	11.9	12.2	12.6	13.2	13.6	13.9	14.2	14.6	15.0	15.5	16.2	16.8	17.1	10.5	11.7	13.0	14.2	15.8	17.3	18.9	95.5
96.0	12.0	12.3	12.7	13.3	13.7	14.0	14.3	14.7	15.2	15.7	16.3	16.9	17.3	10.6	11.8	13.1	14.3	15.9	17.5	19.0	96.0
96.5	12.1	12.4	12.8	13.4	13.8	14.2	14.5	14.9	15.3	15.8	16.5	17.0	17.4	10.7	11.9	13.2	14.5	16.0	17.6	19.2	96.5

TABLE 29. WEIGHT (KG) BY STATURE OF GIRLS 55–137 CM IN HEIGHT (*continued*)

STATURE CM	CENTILES													STANDARD DEVIATIONS							STATURE CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	-3S.D.	-2S.D.	-1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
97.0	12.2	12.5	13.0	13.5	13.9	14.3	14.6	15.0	15.4	15.9	16.6	17.2	17.6	10.7	12.0	13.3	14.6	16.2	17.8	19.3	97.0
97.5	12.3	12.6	13.1	13.6	14.0	14.4	14.7	15.1	15.6	16.1	16.8	17.3	17.7	10.8	12.1	13.4	14.7	16.3	17.9	19.5	97.5
98.0	12.4	12.7	13.2	13.7	14.2	14.5	14.9	15.3	15.7	16.2	16.9	17.5	17.9	10.9	12.2	13.5	14.9	16.5	18.1	19.7	98.0
98.5	12.5	12.8	13.3	13.9	14.3	14.6	15.0	15.4	15.8	16.3	17.0	17.6	18.0	11.0	12.3	13.7	15.0	16.6	18.2	19.8	98.5
99.0	12.6	12.9	13.4	14.0	14.4	14.8	15.1	15.5	16.0	16.5	17.2	17.8	18.2	11.1	12.4	13.8	15.1	16.7	18.4	20.0	99.0
99.5	12.7	13.0	13.5	14.1	14.5	14.9	15.2	15.7	16.1	16.6	17.3	17.9	18.3	11.2	12.5	13.9	15.2	16.9	18.5	20.1	99.5
100.0	12.8	13.1	13.6	14.2	14.7	15.0	15.4	15.8	16.2	16.8	17.5	18.1	18.5	11.3	12.7	14.0	15.4	17.0	18.7	20.3	100.0
100.5	12.9	13.2	13.7	14.3	14.8	15.2	15.5	15.9	16.4	16.9	17.6	18.2	18.6	11.4	12.8	14.1	15.5	17.2	18.8	20.5	100.5
101.0	13.0	13.4	13.9	14.5	14.9	15.3	15.6	16.1	16.5	17.0	17.8	18.4	18.8	11.5	12.9	14.3	15.6	17.3	19.0	20.7	101.0
101.5	13.1	13.5	14.0	14.6	15.0	15.4	15.8	16.2	16.7	17.2	17.9	18.5	18.9	11.6	13.0	14.4	15.8	17.5	19.1	20.8	101.5
102.0	13.3	13.6	14.1	14.7	15.2	15.5	15.9	16.3	16.8	17.3	18.1	18.7	19.1	11.7	13.1	14.5	15.9	17.6	19.3	21.0	102.0
102.5	13.4	13.7	14.2	14.8	15.3	15.7	16.0	16.5	16.9	17.5	18.2	18.9	19.3	11.8	13.2	14.6	16.0	17.8	19.5	21.2	102.5
103.0	13.5	13.8	14.3	15.0	15.4	15.8	16.2	16.6	17.1	17.6	18.4	19.0	19.4	11.9	13.3	14.7	16.2	17.9	19.6	21.4	103.0
103.5	13.6	13.9	14.5	15.1	15.6	16.0	16.3	16.8	17.2	17.8	18.6	19.2	19.6	12.0	13.4	14.9	16.3	18.1	19.8	21.6	103.5
104.0	13.7	14.1	14.6	15.2	15.7	16.1	16.5	16.9	17.4	17.9	18.7	19.4	19.8	12.1	13.5	15.0	16.5	18.2	20.0	21.7	104.0
104.5	13.8	14.2	14.7	15.4	15.8	16.2	16.6	17.0	17.5	18.1	18.9	19.5	19.9	12.2	13.7	15.1	16.6	18.4	20.1	21.9	104.5
105.0	14.0	14.3	14.8	15.5	16.0	16.4	16.7	17.2	17.7	18.2	19.0	19.7	20.1	12.3	13.8	15.3	16.7	18.5	20.3	22.1	105.0
105.5	14.1	14.4	15.0	15.6	16.1	16.5	16.9	17.3	17.8	18.4	19.2	19.9	20.3	12.4	13.9	15.4	16.9	18.7	20.5	22.3	105.5
106.0	14.2	14.6	15.1	15.8	16.2	16.6	17.0	17.5	18.0	18.6	19.4	20.0	20.5	12.5	14.0	15.5	17.0	18.9	20.7	22.5	106.0
106.5	14.3	14.7	15.2	15.9	16.4	16.8	17.2	17.6	18.1	18.7	19.5	20.2	20.6	12.6	14.1	15.7	17.2	19.0	20.9	22.7	106.5
107.0	14.4	14.8	15.4	16.0	16.5	16.9	17.3	17.8	18.3	18.9	19.7	20.4	20.8	12.7	14.3	15.8	17.3	19.2	21.0	22.9	107.0
107.5	14.6	14.9	15.5	16.2	16.7	17.1	17.5	17.9	18.5	19.0	19.9	20.5	21.0	12.8	14.4	15.9	17.5	19.3	21.2	23.1	107.5
108.0	14.7	15.1	15.6	16.3	16.8	17.2	17.6	18.1	18.6	19.2	20.0	20.7	21.2	13.0	14.5	16.1	17.6	19.5	21.4	23.3	108.0
108.5	14.8	15.2	15.8	16.5	17.0	17.4	17.8	18.3	18.8	19.4	20.2	20.9	21.4	13.1	14.6	16.2	17.8	19.7	21.6	23.5	108.5
109.0	15.0	15.3	15.9	16.6	17.1	17.5	17.9	18.4	18.9	19.5	20.4	21.1	21.5	13.2	14.8	16.4	17.9	19.8	21.8	23.7	109.0
109.5	15.1	15.5	16.0	16.7	17.2	17.7	18.1	18.6	19.1	19.7	20.6	21.3	21.7	13.3	14.9	16.5	18.1	20.0	22.0	23.9	109.5
110.0	15.2	15.6	16.2	16.9	17.4	17.8	18.2	18.7	19.3	19.9	20.7	21.5	21.9	13.4	15.0	16.6	18.2	20.2	22.2	24.1	110.0
110.5	15.4	15.7	16.3	17.0	17.5	18.0	18.4	18.9	19.4	20.1	20.9	21.6	22.1	13.6	15.2	16.8	18.4	20.4	22.4	24.3	110.5
111.0	15.5	15.9	16.5	17.2	17.7	18.1	18.6	19.1	19.6	20.2	21.1	21.8	22.3	13.7	15.3	16.9	18.6	20.6	22.6	24.6	111.0
111.5	15.6	16.0	16.6	17.3	17.9	18.3	18.7	19.2	19.8	20.4	21.3	22.0	22.5	13.8	15.5	17.1	18.7	20.7	22.8	24.8	111.5
112.0	15.8	16.2	16.8	17.5	18.0	18.5	18.9	19.4	19.9	20.6	21.5	22.2	22.7	14.0	15.6	17.2	18.9	20.9	23.0	25.0	112.0
112.5	15.9	16.3	16.9	17.7	18.2	18.6	19.0	19.6	20.1	20.8	21.7	22.4	22.9	14.1	15.7	17.4	19.0	21.1	23.2	25.2	112.5
113.0	16.1	16.5	17.1	17.8	18.3	18.8	19.2	19.7	20.3	21.0	21.9	22.6	23.1	14.2	15.9	17.5	19.2	21.3	23.4	25.5	113.0
113.5	16.2	16.6	17.2	18.0	18.5	19.0	19.4	19.9	20.5	21.2	22.1	22.9	23.4	14.4	16.0	17.7	19.4	21.5	23.6	25.7	113.5
114.0	16.4	16.8	17.4	18.1	18.7	19.1	19.5	20.1	20.7	21.4	22.3	23.1	23.6	14.5	16.2	17.9	19.5	21.7	23.8	26.0	114.0
114.5	16.5	16.9	17.5	18.3	18.8	19.3	19.7	20.3	20.9	21.5	22.5	23.3	23.8	14.6	16.3	18.0	19.7	21.9	24.1	26.2	114.5
115.0	16.7	17.1	17.7	18.5	19.0	19.5	19.9	20.5	21.1	21.7	22.7	23.5	24.0	14.8	16.5	18.2	19.9	22.1	24.3	26.5	115.0
115.5	16.8	17.2	17.9	18.6	19.2	19.6	20.1	20.6	21.2	22.0	22.9	23.7	24.3	14.9	16.6	18.4	20.1	22.3	24.5	26.8	115.5
116.0	17.0	17.4	18.0	18.8	19.3	19.8	20.3	20.8	21.4	22.2	23.2	24.0	24.5	15.0	16.8	18.5	20.3	22.5	24.8	27.0	116.0
116.5	17.1	17.6	18.2	19.0	19.5	20.0	20.4	21.0	21.6	22.4	23.4	24.2	24.8	15.2	16.9	18.7	20.4	22.7	25.0	27.3	116.5
117.0	17.3	17.7	18.4	19.1	19.7	20.2	20.6	21.2	21.9	22.6	23.6	24.5	25.0	15.3	17.1	18.9	20.6	23.0	25.3	27.6	117.0
117.5	17.5	17.9	18.5	19.3	19.9	20.4	20.8	21.4	22.1	22.8	23.9	24.7	25.3	15.5	17.3	19.0	20.8	23.2	25.6	27.9	117.5

TABLE 29. WEIGHT (KG) BY STATURE OF GIRLS 55–137 CM IN HEIGHT (*continued*)

STATURE CM	CENTILES													STANDARD DEVIATIONS							STATURE CM
	3RD	5TH	10TH	20TH	30TH	40TH	50TH	60TH	70TH	80TH	90TH	95TH	97TH	−3S.D.	−2S.D.	−1S.D.	MEDIAN	+1S.D.	+2S.D.	+3S.D.	
118.0	17.6	18.1	18.7	19.5	20.1	20.6	21.0	21.6	22.3	23.0	24.1	25.0	25.5	15.6	17.4	19.2	21.0	23.4	25.8	28.2	118.0
118.5	17.8	18.2	18.9	19.7	20.3	20.8	21.2	21.8	22.5	23.3	24.3	25.2	25.8	15.8	17.6	19.4	21.2	23.7	26.1	28.5	118.5
119.0	18.0	18.4	19.1	19.9	20.5	20.9	21.4	22.0	22.7	23.5	24.6	25.5	26.1	15.9	17.7	19.6	21.4	23.9	26.4	28.9	119.0
119.5	18.1	18.6	19.2	20.1	20.6	21.1	21.6	22.3	22.9	23.7	24.9	25.8	26.4	16.1	17.9	19.8	21.6	24.1	26.7	29.2	119.5
120.0	18.3	18.7	19.4	20.2	20.8	21.3	21.8	22.5	23.2	24.0	25.1	26.1	26.7	16.2	18.1	20.0	21.8	24.4	27.0	29.6	120.0
120.5	18.5	18.9	19.6	20.4	21.0	21.6	22.0	22.7	23.4	24.2	25.4	26.4	27.0	16.4	18.3	20.1	22.0	24.7	27.3	29.9	120.5
121.0	18.6	19.1	19.8	20.6	21.2	21.8	22.2	22.9	23.7	24.5	25.7	26.7	27.3	16.5	18.4	20.3	22.2	24.9	27.6	30.3	121.0
121.5	18.8	19.3	20.0	20.8	21.5	22.0	22.5	23.2	23.9	24.8	26.0	27.0	27.6	16.7	18.6	20.5	22.5	25.2	27.9	30.7	121.5
122.0	19.0	19.5	20.2	21.0	21.7	22.2	22.7	23.4	24.1	25.0	26.3	27.3	27.9	16.8	18.8	20.7	22.7	25.5	28.3	31.1	122.0
122.5	19.2	19.7	20.4	21.2	21.9	22.4	22.9	23.6	24.4	25.3	26.6	27.6	28.3	17.0	19.0	20.9	22.9	25.8	28.6	31.5	122.5
123.0	19.4	19.8	20.6	21.5	22.1	22.6	23.1	23.9	24.7	25.6	26.9	27.9	28.6	17.1	19.1	21.1	23.1	26.1	29.0	31.9	123.0
123.5	19.6	20.0	20.8	21.7	22.3	22.9	23.4	24.1	24.9	25.9	27.2	28.3	29.0	17.3	19.3	21.3	23.4	26.4	29.3	32.3	123.5
124.0	19.7	20.2	21.0	21.9	22.5	23.1	23.6	24.4	25.2	26.2	27.5	28.6	29.3	17.4	19.5	21.6	23.6	26.7	29.7	32.8	124.0
124.5	19.9	20.4	21.2	22.1	22.8	23.3	23.9	24.6	25.5	26.5	27.8	29.0	29.7	17.6	19.7	21.8	23.9	27.0	30.1	33.2	124.5
125.0	20.1	20.6	21.4	22.3	23.0	23.6	24.1	24.9	25.8	26.8	28.2	29.3	30.1	17.8	19.9	22.0	24.1	27.3	30.5	33.7	125.0
125.5	20.3	20.8	21.6	22.5	23.2	23.8	24.3	25.2	26.1	27.1	28.5	29.7	30.5	17.9	20.1	22.2	24.3	27.6	30.9	34.2	125.5
126.0	20.5	21.0	21.8	22.8	23.5	24.0	24.6	25.4	26.4	27.4	28.9	30.1	30.9	18.1	20.2	22.4	24.6	28.0	31.3	34.7	126.0
126.5	20.7	21.2	22.0	23.0	23.7	24.3	24.9	25.7	26.7	27.8	29.3	30.5	31.3	18.2	20.4	22.7	24.9	28.3	31.7	35.2	126.5
127.0	20.9	21.4	22.2	23.2	23.9	24.6	25.1	26.0	27.0	28.1	29.6	30.9	31.8	18.4	20.6	22.9	25.1	28.6	32.2	35.7	127.0
127.5	21.1	21.6	22.5	23.5	24.2	24.8	25.4	26.3	27.3	28.4	30.0	31.3	32.2	18.6	20.8	23.1	25.4	29.0	32.6	36.2	127.5
128.0	21.3	21.9	22.7	23.7	24.5	25.1	25.7	26.6	27.6	28.8	30.4	31.8	32.6	18.7	21.0	23.3	25.7	29.4	33.1	36.8	128.0
128.5	21.5	22.1	22.9	24.0	24.7	25.3	25.9	26.9	27.9	29.1	30.8	32.2	33.1	18.9	21.2	23.6	25.9	29.7	33.6	37.4	128.5
129.0	21.7	22.3	23.2	24.2	25.0	25.6	26.2	27.2	28.3	29.5	31.2	32.7	33.6	19.0	21.4	23.8	26.2	30.1	34.0	37.9	129.0
129.5	21.9	22.5	23.4	24.5	25.2	25.9	26.5	27.5	28.6	29.9	31.7	33.1	34.1	19.2	21.6	24.1	26.5	30.5	34.5	38.6	129.5
130.0	22.1	22.7	23.6	24.7	25.5	26.2	26.8	27.9	29.0	30.3	32.1	33.6	34.6	19.4	21.8	24.3	26.8	30.9	35.1	39.2	130.0
130.5	22.4	23.0	23.9	25.0	25.8	26.5	27.1	28.2	29.3	30.7	32.5	34.1	35.1	19.5	22.1	24.6	27.1	31.3	35.6	39.8	130.5
131.0	22.6	23.2	24.1	25.2	26.1	26.8	27.4	28.5	29.7	31.1	33.0	34.6	35.6	19.7	22.3	24.8	27.4	31.8	36.1	40.5	131.0
131.5	22.8	23.4	24.4	25.5	26.3	27.1	27.7	28.9	30.1	31.5	33.5	35.1	36.1	19.9	22.5	25.1	27.7	32.2	36.7	41.1	131.5
132.0	23.0	23.6	24.6	25.8	26.6	27.4	28.0	29.2	30.5	31.9	33.9	35.6	36.7	20.0	22.7	25.4	28.0	32.6	37.2	41.8	132.0
132.5	23.2	23.9	24.9	26.1	26.9	27.7	28.4	29.6	30.8	32.3	34.4	36.1	37.3	20.2	22.9	25.6	28.4	33.1	37.8	42.6	132.5
133.0	23.5	24.1	25.1	26.3	27.2	28.0	28.7	29.9	31.2	32.8	34.9	36.7	37.8	20.4	23.1	25.9	28.7	33.6	38.4	43.3	133.0
133.5	23.7	24.4	25.4	26.6	27.5	28.3	29.0	30.3	31.6	33.2	35.4	37.3	38.4	20.5	23.4	26.2	29.0	34.0	39.0	44.0	133.5
134.0	23.9	24.6	25.7	26.9	27.8	28.6	29.4	30.7	32.1	33.7	36.0	37.8	39.0	20.7	23.6	26.5	29.4	34.5	39.7	44.8	134.0
134.5	24.1	24.8	25.9	27.2	28.2	29.0	29.7	31.0	32.5	34.2	36.5	38.4	39.7	20.8	23.8	26.8	29.7	35.0	40.3	45.6	134.5
135.0	24.4	25.1	26.2	27.5	28.5	29.3	30.1	31.4	32.9	34.6	37.0	39.0	40.3	21.0	24.0	27.0	30.1	35.5	41.0	46.4	135.0
135.5	24.6	25.3	26.5	27.8	28.8	29.6	30.4	31.8	33.4	35.1	37.6	39.6	41.0	21.2	24.3	27.3	30.4	36.0	41.6	47.2	135.5
136.0	24.9	25.6	26.7	28.1	29.1	30.0	30.8	32.2	33.8	35.6	38.2	40.3	41.6	21.3	24.5	27.6	30.8	36.5	42.3	48.1	136.0
136.5	25.1	25.9	27.0	28.4	29.5	30.3	31.1	32.6	34.3	36.1	38.8	40.9	42.3	21.5	24.7	27.9	31.1	37.1	43.0	49.0	136.5
137.0	25.3	26.1	27.3	28.8	29.8	30.7	31.5	33.1	34.7	36.7	39.4	41.6	43.0	21.7	25.0	28.2	31.5	37.6	43.7	49.9	137.0