

Present Situation in Turkey Regarding Malnutrition in Infants and Preschool Children - Types of Problems, Magnitude of Problems, Location *

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An assessment of the prevalence of malnutrition in infants and preschool children may be a part of the overall nutrition survey of a community. However, a specific survey of these vulnerable age groups should be carried out in rural and urban areas. Methods for assessment of the prevalence of malnutrition are age, specific mortality rate, anthropometric measurements, clinical signs, ecological factors and biochemical tests. At the present time there is no overall nutritional survey of the Turkish population. A few individual surveys of certain groups have been carried out in certain areas of the country. In these surveys one or two methods have been used to assess the nutritional status of young children. In this report some of the findings regarding malnutrition in infants and preschool children will be reviewed.

Studies of Infant and Child Mortality

In an earlier study of 2,713 children, the infant mortality rate was 168 per 1000 live births.¹ Results of the last Turkish Demographic Survey regarding infant and child mortality are shown in Table 1.² The sample size in this survey for each region was 60 villages and 60 blocks; for Ankara, Istanbul and Izmir 60, 40, and 30 blocks respectively. The average mortality rate was 154 and 40 per 1000 for infants and toddlers respectively. As shown in Table 1, infant and child mortality differs in different regions of the country and in the rural and urban areas.

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In the cities the infant mortality rate among the children of low socio-economic groups is much higher than in children of high socio-economic groups. The findings of a survey indicated that the infant mortality rate was 27, 150 and 65 per 1000 for the high socio-economic groups, and the low socio-economic groups of the city and a village close to the city respectively. ³

TABLE 1
INFANT MORTALITY IN TURKEY

Region and Area	Mortality Rate per 1000	
	Infants	1 to 4 years
Central Region		
Urban	140	36
Rural	204	71
Black Sea		
Urban	98	28
Rural	152	35
Western Region		
Urban	149	33
Rural	141	44
Southern Region		
Urban	83	37
Rural	172	57
Cities		
Ankara	113	18
Istanbul	123	9
Izmir	84	13

Statistics may not reflect the problem of infant mortality and the causes of mortality. Investigators found that collecting correct birth date data was very difficult. In the villages, birth certificates may not be obtained on time because of the parents' wish to delay the time of military service. In villages where there are no health centers and sometimes even no governmental organization, mortality may not be recorded. Therefore, it may be assumed that the mortality rate is higher than the figures indicate.

The most frequent serious complications of malnutrition were found to be diarrhea, which leads to dehydration and acidosis, and pneumonia (Table 2). ⁴ These problems cause death before doctor's care can be reached in most of the malnourished children.

Studies on Anthropometric Measurements and Clinical Signs

To establish the nutritional condition, the weight and height for age of small children are considered the most useful, easily

TABLE 2
CAUSES OF INFANT AND CHILD MORTALITY IN CENTRAL
ANATOLIAN VILLAGES⁴

Causes of Death	Per cent of Deaths	
	0 to 1 year	1 to 2 years
Acute loss of fluids and electrolytes, toxicosis	51.9	13.3
Pneumonia, bronchopneumonia	33.3	40.0
Tuberculous meningitis	—	20.0
Severe malnutrition	3.7	—

available and reliable parameters. When the weight and height of a given population are compared with the standard and the number or percentage of children falls below the given standard then they are considered to be malnourished.

Studies on determination of standard height and weight are carried out in many countries, but because these standards might not be directly applicable to Turkish children, weight and height standards were made by using a well-fed group of Turkish children.⁵

The weight and height of the children from two months to five years in the villages around Ankara have been compared with this standard.⁶ Children lower than the standard deviation are considered abnormal. As shown in Figures 1a and 1b, the percentages of children considered underweight were found to be 15, 29, 46, 52, 38, 35 and 16 for the age groups two to six months, seven to 12 months, 13 to 18 months, 19 to 24 months, 25 to 36 months, three to four years and four to five years respectively. Weight of children in the province of Muş in Eastern Turkey follows the same pattern (Figure 2).⁷ The percentage of children lower than the standard deviation was found to be 15, 16, 21, 59 and 44 for the age groups two to six months, seven to 12 months, 13 to 18 months, 18 to 24 months and 25 to 36 months respectively.

In a study in the Istanbul area, weights and heights of children from different socio-economic backgrounds were measured.⁸ The growth rate of the children from high socio-economic groups in the city followed the same pattern as the American standard. Growth rates of the children of low socio-economic groups in Istanbul and in a nearby village were found to be significantly lower than in the children of high socio-economic groups. Table 3 shows bone-ages to be retarded in higher percentages of children in rural areas and in the low socio-economic groups in the city.

WEIGHT IN KILOGRAMS

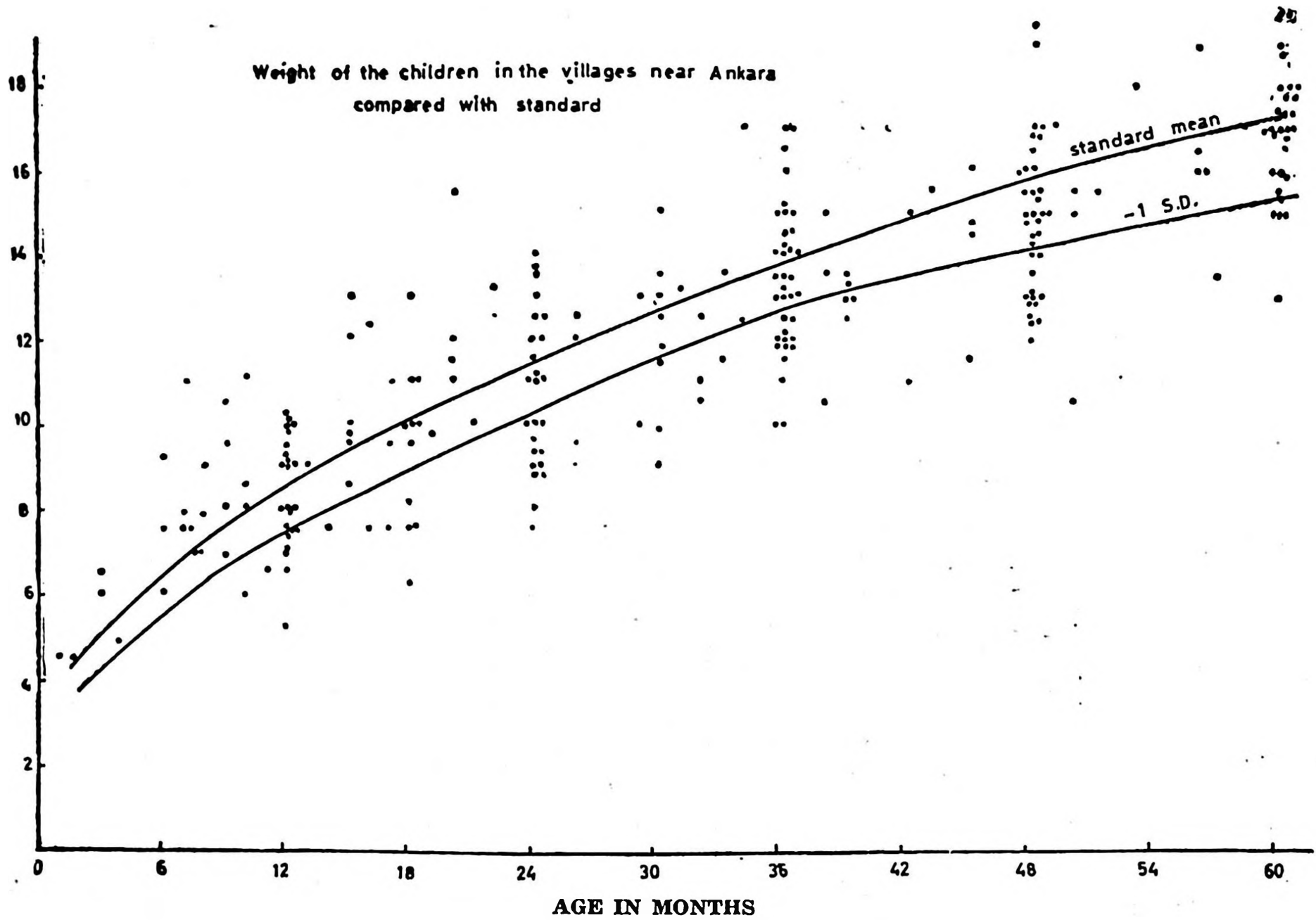
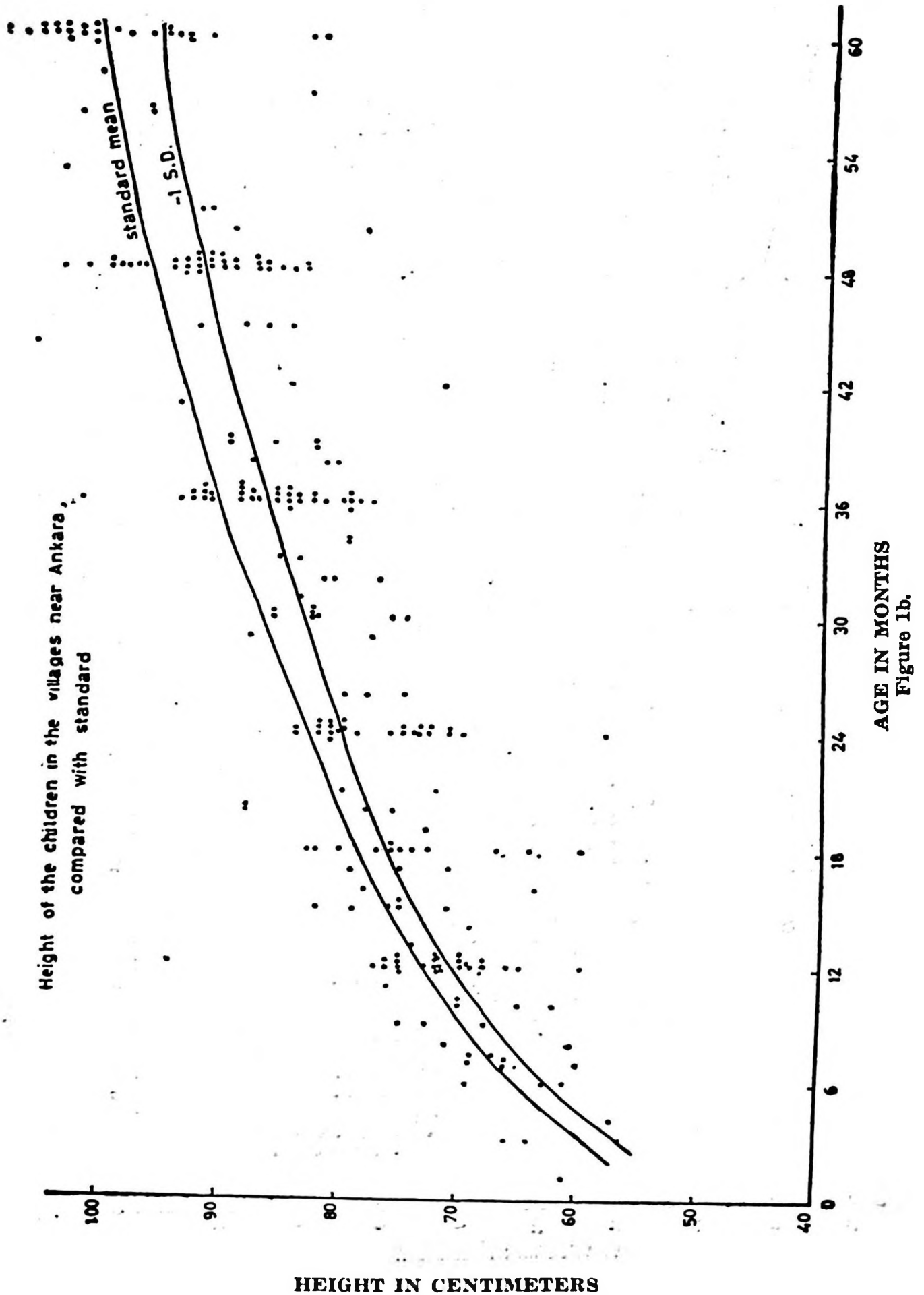


Figure 1a.



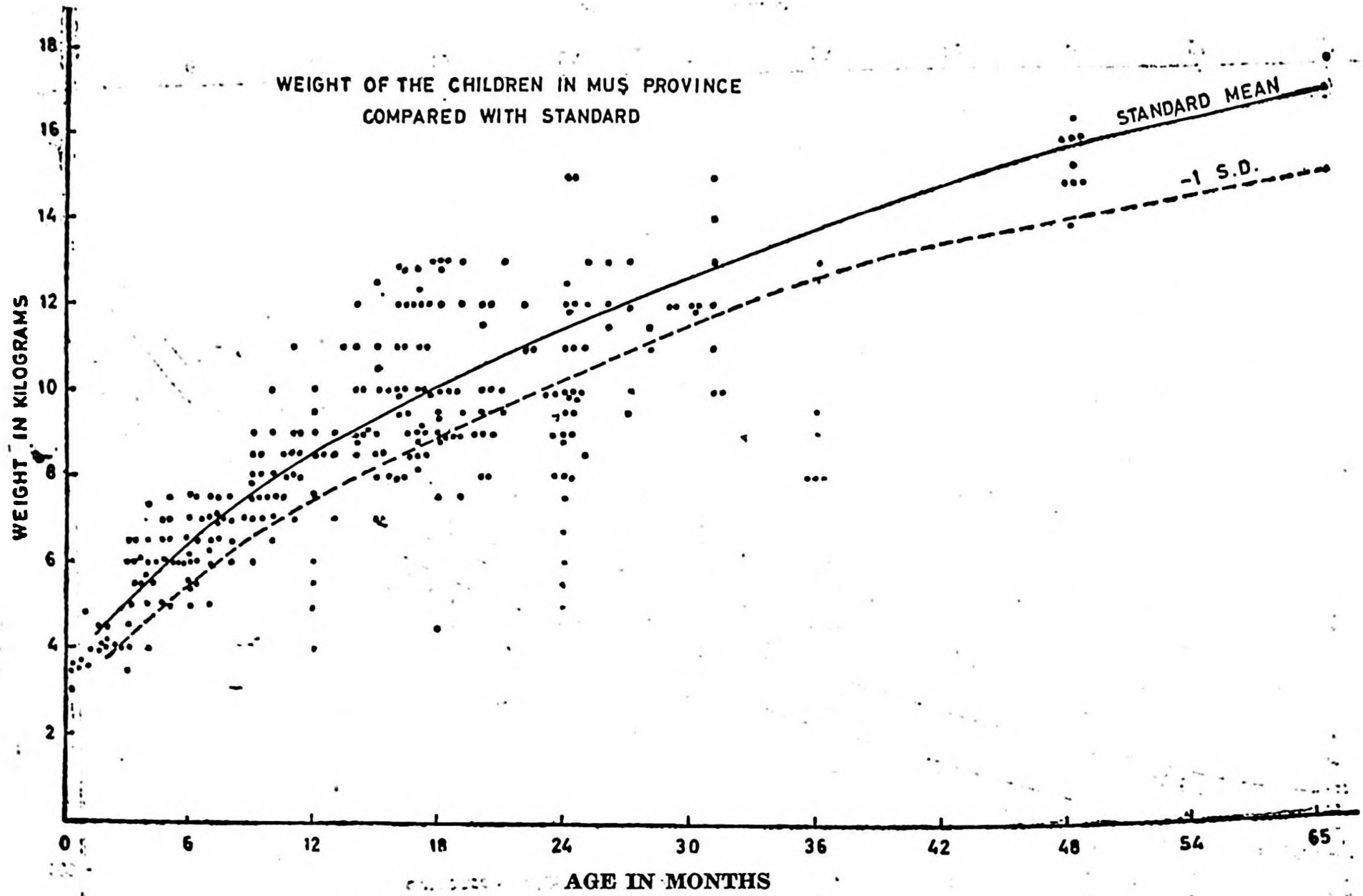


TABLE 3
BONE-AGE IN RURAL AND LOW SOCIO-ECONOMIC GROUPS OF
INFANTS AND CHILDREN IN THE ISTANBUL AREA.³

Age Group	Mean Chronologic Age		Mean Bone-age		Mean Bone-age (Per cent of normal)	
	Rural	Urban	Rural	Urban	Rural	Urban
6-12 months	11.0 mos	10.0 mos	6.5 mos	10.8 mos	58.8	108.0
13-24 months	20.5 mos	20.6 mos	14.7 mos	21.9 mos	81.8	100.3
2-4 years	3.3 yrs	3.4 yrs	2.7 yrs	2.8 yrs	71.7	82.4
5-7 years	6.1 yrs	6.1 yrs	4.2 yrs	4.8 yrs	68.8	78.7
8-10 years	9.3 yrs	8.7 yrs	8.8 yrs	7.8 yrs	94.6	89.6
11-14 years	11.9 yrs	11.7 yrs	11.5 yrs	11.7 yrs	96.6	91.5

In a study at the Hacettepe Children's Hospital in Ankara,⁸ weight measurements of children under the age of two years were evaluated by the Gomez system. In this system, children between 85 per cent and 75 per cent of the standard weight are considered to have first degree malnutrition, those between 75 per cent and 61 per cent to have second degree and 60 per cent and below to have third degree. In this study, children lower than 50 per cent are classified as having fourth degree malnutrition. In this classification, 43 per cent of the children under the age of two years seen in the clinic as outpatients were malnourished. According to a survey of children in the Istanbul area⁹ 30 per cent in the low socio-economic groups of the city and those of a nearby village were malnourished when compared with children from high socio-economic groups.

Recent studies indicate that the average birth weight in Turkey is comparable to that in Europe and the United States.^{3 10-11} In general, retardation in growth starts after six months of age and reaches the highest degree between 18 and 24 months (Figures 1a, 1b and 2). As a child stops growing it begins to waste away and becomes irritable and unappealing. This picture is defined as nutritional marasmus. Among the village children classified as malnourished on the basis of height and weight, 0.7 per cent exhibited a very severe degree of protein-calorie deficiency symptoms.⁹ Relatively few severely malnourished infants and small children showed signs of kwashiorkor. The majority of the cases of severe malnutrition had marasmus.

Other clinical signs of malnutrition among infants and preschool children besides marasmus are anemia and rickets. Twenty-five per cent of the children from zero to three years of age in the

low socio-economic areas of Ankara had signs of anemia. Study of the causes of this anemia revealed that 19 per cent were due to inadequate iron intake.¹⁰ In infants and in children from one to two years of age in the villages of Central Anatolia, the percentages showing signs of anemia were 2.8 and 7.6 respectively.⁴ Iron deficiency anemia was reported as a common nutritional problem in pregnant and lactating women as well as in infants and children. Early marriages, frequent pregnancies and inadequate iron supplies were reported as the main causes of anemia.^{11 12} When a mother was anemic, usually the baby was born with an insufficient iron supply and the condition worsened with a diet very poor in iron and protein. Other factors related to the high incidence of iron deficiency anemia were intestinal parasites and pica. It has been reported that 64 per cent of the children with pica were anemic.¹³ Anemia among children without pica was 17 per cent. Pica is a medical problem among the preschool children of low socio-economic groups in Turkey, especially in the summer months when children are left by themselves and eat whatever they find. Pica is most common among preschool children. Intestinal parasites are other factors which cause anemia. One survey¹⁴ indicated that 87 per cent of the preschool children in the Black Sea region had parasites. The problem of parasites is more common among children of low socio-economic groups.

In the study of village children in Central Anatolia, rickets was found to be one of the main causes of morbidity.⁴ In this study it was reported that 14.6 per cent of the infants and 11.5 per cent of the children 12 to 24 months of age had signs of rickets. Rickets was found to be manifested as early as three months of age.¹⁵ Early cases of rickets seem to be more common among the babies of osteomalacic mothers and the babies born in the winter in the villages. Many infants in the villages and in poor sections of the city seem to start walking at a relatively late age. They have fewer teeth and open anterior fontanelles. One can see the result of late calcification in the growing long bones of the children when they start walking. A clinical observation in the villages revealed that one-third of the children had bowlegs.⁷

It was reported that specific signs of vitamin deficiency were common among school age children. The predominant signs were cheilosis, angular stomatitis, dry hair and thickened and pigmented conjunctivae.¹⁶ These signs are attributed mostly to riboflavin and vitamin A deficiencies. The result of a survey of school children in the Izmir area indicated that a high incidence of avitaminosis occurs.

among village children.¹⁷ Table 4 shows the percentages of school children with signs of avitaminosis in various socio-economic groups.

In a nutritional survey of 180 village families with small children near Ankara,⁸ the clinical signs predominantly observed were cheilosis, angular stomatitis, conjunctival change and bleeding gums. However, there was very poor correlation between the clinical signs, weight and height measurements and dietary intake. Some of the observed signs in skin and hair may be due to very poor personal hygiene, and for this reason one cannot be sure whether all of the clinical signs observed were due to malnutrition.

TABLE 4
INCIDENCE OF AVITAMINOSIS IN SCHOOLCHILDREN¹⁷

Groups	Per cent of children with signs of avitaminosis		
	Vitamin A	Vitamin B	Vitamin C
High socio-economic	2.8	0.5	2.3
Middle socio-economic	14.4	1.8	10.1
Low socio-economic	23.2	4.3	19.9
Village socio-economic	37.8	19.9	27.2

Studies on Ecological Factors

The nutritional status of children in the first year of life depends on the method of feeding and the nutrients stored in the fetal period. In the first years of life, children depend on some other person to meet their nutritional needs. For this reason it is very important that the person responsible for the child have some knowledge of nutritional requirements.

For the purpose of studying feeding patterns of young children in various parts of the country, data were collected from approximately 700 mothers through personal interviews.¹⁸ Most mothers in Turkey breast-feed their babies, however, the breast-feeding period is too long in most cases. As shown in Table 5, a long period of breast-feeding (24 months or longer) is common in Eastern Turkey and in the rural areas. One of the reasons for this long period of breast-feeding is to prevent another pregnancy.

Although most mothers breast-feed their babies, the milk may not meet the nutritional needs of the baby, especially after four months. It has been reported that 43 per cent of the malnutrition cases were breast-fed and 42 per cent mixed-fed infants.¹⁹ Frequent childbirth, hard physical work and inadequate diet may influence

TABLE 5
LENGTH OF BREAST-FEEDING PERIOD¹⁸

Region	Per cent of infants breast-fed				
	None	6 months	12 months	18 months	24 months or longer
Aegean	0	10	15	39	36
Marmara	17	13	27	34	11
Central	0	16	21	22	41
Black Sea	10	33	19	30	8
Eastern	4	11	20	26	39
Southeastern	9	7	12	16	56
Ankara					
Urban	11	48	22	13	6
Rural	4	14	29	18	31

the capacity of the mother to produce milk. Almost all mothers felt that their milk was not enough for the fourth or fifth child. Table 6 shows at what age supplementary food was given to the children. Mothers in urban areas and in Western Turkey start to give supplementary foods earlier than those of the rural and Eastern parts of the country. This difference may be due to the fact that mothers in urban areas and in Western Turkey have more education.

TABLE 6
TIME OF STARTING SUPPLEMENTARY FOOD¹⁸

Region	Per cent of infants				
	1 month	3-4 months	5-7 months	8-10 months	11-12 months
Aegean	37	28	14	3	18
Marmara	18	25	25	5	26
Central	25	30	20	5	20
Black Sea	29	34	17	3	17
Eastern	16	10	21	3	50
Southeastern	8	8	17	8	63
Ankara					
Urban	11	25	26	14	22
Rural	10	4	41	23	22

The kind of supplementary food is very important in child feeding. It can be seen in Table 7 that starch, sugar and cereal are the main supplementary foods given to babies in Turkey. Nearly 50 per cent of the children do not get milk and milk products. Meat and eggs are seldom given. Although most children get supplementary

foods, the amount of food given usually is not enough to meet protein and calorie needs. The average calculated milk consumption was about 100 grams, sugar and starch 20 grams and cereal products 10 grams (Table 8), this perhaps explains the high prevalence of marasmus rather than kwashiorkor. The problem is not only inadequate protein but also inadequate calories. Sugar and starch usually come from a packaged mixture sold as baby food. The sugar-starch mixtures (Paro, Arı) are highly advertised as the best foods for growth and development of babies and are relatively inexpensive. High quality baby foods (SMA, Bebefe) prescribed by doctors are not popular among the majority of families because of their high price. Packaged baby foods are used more by the families in urban areas than those in rural areas, and in the Western part of the country where communication and income are on higher levels (Tables 9 and 10).

TABLE 7
KINDS OF SUPPLEMENTARY FOODS CONSUMED ¹⁸

Region	Per cent of infants consuming food						
	Milk Yo- gurt	Meat Eggs	Cereal Products	Sugar Starch	Fruits Vegetables	Only meal juice	Noth- ing
Aegean	45	2	23	60	14	3	14
Marmara	55	21	16	66	23	2	18
Central	62	2	9	60	4	12	7
Black Sea	73	17	17	78	15	0	7
Eastern	49	2	28	28	13	6	17
Southeastern	33	2	26	26	9	4	36
Ankara							
Urban	42	5	69	40	49	—	—
Rural	62	3	50	46	17	—	—

TABLE 8
APPROXIMATE AVERAGE AMOUNT OF SUPPLEMENTARY
FOOD CONSUMED PER INFANT PER DAY ¹⁸

Region	Milk Yogurt	Meat Eggs	Cereal Products	Sugar Starch
Aegean	76 gm	Little	13 gm	30 gm
Marmara	136 gm	7 gm	9 gm	26 gm
Central	93 gm	Little	9 gm	22 gm
Black Sea	167 gm	4 gm	10 gm	21 gm
Eastern	78 gm	Little	12 gm	14 gm
Southeastern	40 gm	Little	17 gm	12 gm

TABLE 9
CONSUMPTION LEVEL OF PACKAGED BABY FOODS ¹⁸

Region	Per cent of infants consuming food		
	Paro	Ari	SMA-Bebefe
Aegean	16	20	7
Marmara	26	38	2
Central	21	11	2
Black Sea	27	42	10
Eastern	15	3	3
Southeastern	7	6	2
Ankara			
Rural	22	26	8
Urban	7	2	1

TABLE 10
CALCULATED NUTRITIVE VALUE AND PRICE OF COMMON BABY FOODS ¹⁸
(per 100 grams)

Baby Food	Price (T.L.)	Calorie	Prot. gm	Ca mg	Fe mg	Vit A mg	Vit B ₁ mg	Vit B ₂ mg	Niacin mg	Vit C mg
SMA	5.50	506	12.0	330	6.0	2650	0.71	1.06	—	52
Bebefe*	4.71	492	16.0	—	—	—	—	—	—	—
Ari	1.38	370	1.7	10	0.5	0	0.42	0.33	3.7	0
Paro	0.84	369	1.1	1	0.1	0	0.01	0	0.2	0

* Although on the package neither raw material nor the other nutrients are given, this product is powdered milk and has several kinds according to the fat content of powdered milk.

Several Factors Which Affect the Feeding Patterns of Children

One factor is the *cultural and educational background of the families*. In Turkey a large portion of the population lives in rural areas distributed into 34,597 villages. Some of these villages consist of a few residential units with long distances between them. It is very difficult to provide educational facilities in these small units of inhabitants. According to the latest statistics, the percentage of the population which can read and write is 63.5 for men and 32.3 for women. ²⁰ Our survey ¹⁸ indicated that 64 per cent of the mothers are illiterate, 20 per cent have completed five years of primary school, 14 per cent can just read and write and only two per cent have a secondary education.

The *socio-economic condition* of the family is another factor determining the nutrition of the children. The latest statistics report that the per capita national income is 2,180 Turkish lira (around 200 U.S. dollars).²¹ However, because of the poor distribution of this income, the buying power of many families is quite low. Naturally, this makes most families depend on cereals for nutritional needs.

In the villages, the value of an individual is measured by his ability to work. Small children are not able to work, therefore their social value depends on the parents' wish. The value of a child to his parents depends on whether it is a boy or a girl, the first or the last child and whether it was wanted or unwanted when born. In the families that have very little resources, children become a burden. In such a social environment, the health of children depends on nature. If the mother produces enough milk, the infant can get along fine until the time he must eat whatever he finds.

A child has the same social rôle when the family moves from the rural to the urban area. Since 1950, there has been a large movement from the villages to the cities. Certain changes take place when the family moves to the city. It becomes more difficult to take care of a large family, thus the infant mortality rate is higher. Since they cannot produce food, they buy inexpensive products, often those advertised on the radio. They may try to spend more money on clothing and housing than on food.

The third factor affecting child feeding practices is *the unavailability of high quality food at relatively low cost*. Even though we teach the families the nutritive value of various foods, if they cannot find them or grow them or buy them, no improvement can be anticipated in child nutrition. At present all of the baby foods of high quality are very expensive and most families cannot be expected to buy them. Relatively cheap food mixtures are very poor in nutritive value. Therefore the unavailability of baby foods of high quality at low cost becomes an important factor in the nutritional status of the infant.

Summary

No overall nutrition survey of the Turkish population has been carried out for the assessment of the nutritional status of various groups and few reports have been published concerning the prevalence of malnutrition among infants and preschool children. Findings of the reports available indicate that malnutrition is an important problem in child health.

The type, magnitude and location of the problem: The infant and child mortality rate is very high, with an average 154 and 40 per 1000 for infants and toddlers (one to four years of age) respectively; 30 to 50 per cent of infants and children are below standard weight and height; average birth weight is comparable with those in the United States and Europe; retardation in growth starts after three months of age and reaches its highest degree at 18 to 24 months; among growth-retarded children, one to four per cent are brought to the hospital with signs of severe marasmus; the main secondary complications of malnutrition are gastroenteritis and pneumonia; most malnourished children die from secondary infections and these are listed as the cause of death; other signs of malnutrition are anemia and rickets; malnutrition is more common among the children of low socio-economic groups of the cities and villages; and the most important factors affecting malnutrition are ignorance, unavailability of high quality, low cost infant food mixtures and poor socio-economic conditions.

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