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The TDHS-2003 obtained information relating to the nutritional status of children, including infant feeding practices, duration and intensity of breastfeeding, the types of the complimentary foods given, and whether or not a bottle with a nipple was used. To further assess the nutritional status of all children under the age of five and women age 15-49, anthropometric (height and weight) data were also collected.

Infant feeding practices affect the health of both the child and the mother. With respect to child, they relate directly to the nutritional status, which in turn influences the risk of morbidity and mortality of young children. In the case of the mother, breastfeeding has an effect on the period of postpartum amenorrhea, which in turn leads to longer birth intervals and lower fertility levels. The magnitude of the effects is influenced by both the duration and intensity of breastfeeding, and by the age at which the child receives supplemental foods and liquids.

Maternal nutrition status also has important implications for the health of the mother as well as that of the child. A woman who is in poor nutritional health has a greater risk of having an adverse pregnancy outcome and is more likely to give birth to underweight babies.

12.1 Initiation of Breastfeeding

Breastfeeding of infants is among the most important factors contributing to the maintenance of growth. Breast milk contains all the nutrients needed by children in the first 4-6 months of life. Moreover, breast milk is clean and always available at just the right temperature, and it promotes a close mother-child relationship. In addition, it provides some immunity to disease through the mother's antibodies, helps in reducing the prevalence of nutritional deficiencies, and food-borne infections.

Table 12.1 shows the percentage of children born in the five years before the survey according to breastfeeding status and the timing of the initial breastfeeding by selected background characteristics. Breastfeeding is almost universal in Turkey; 97 percent of all children are breastfed for some period of time. Due to the large percentage of children ever breastfed, differentials in the proportion of children breastfed by background characteristics are quite small.

Table 12.1 Initial breastfeeding

Percentage of children born in the five years preceding the survey who were ever breastfed, and among children ever breastfed, percentage who started breastfeeding within one hour and within one day of birth and percentage who received a prelacteal feed, by background characteristics, Turkey 2003

Background characteristic	Percentage ever breastfed	Number of children	Percentage breastfeeding:		Percentage who received a prelacteal feed ²	Number of children ever breastfed
			Within 1 hour of birth	Within 1 day of birth ¹		
Child's sex						
Male	96.4	2,132	53.7	83.2	40.3	2,056
Female	97.3	2,000	54.2	84.0	38.4	1,946
Residence						
Urban	96.9	2,722	57.2	86.1	38.3	2,639
Rural	96.7	1,410	47.6	78.7	41.3	1,363
Region						
West	96.5	1,342	60.4	89.6	31.5	1,295
South	97.3	557	50.0	81.5	41.0	542
Central	96.9	813	63.2	87.0	35.3	787
North	96.6	252	60.8	86.9	27.6	244
East	97.1	1,168	40.6	74.7	52.8	1,134
NUTS1 Region						
Istanbul	96.8	643	57.8	88.6	35.4	622
West Marmara	96.9	124	69.8	91.5	28.7	120
Aegean	97.1	392	56.2	85.9	31.9	380
East Marmara	95.0	328	68.8	89.6	30.3	311
West Anatolia	98.4	349	66.1	90.1	31.7	344
Mediterranean	97.3	557	50.0	81.5	41.0	542
Central Anatolia	96.5	232	58.6	88.6	39.4	224
West Black Sea	93.6	202	62.3	87.3	24.0	189
East Black Sea	98.3	137	59.0	86.0	30.0	135
Northeast Anatolia	95.5	185	45.9	92.2	22.1	177
Central East Anatolia	98.6	314	36.3	73.9	48.4	309
Southeast Anatolia	96.8	670	41.2	70.4	63.3	648
Education						
No education/Primary incom.	97.1	1,099	39.1	73.3	51.2	1,067
First level primary	96.7	2,112	59.2	86.6	34.8	2,041
Second level primary	97.7	307	57.1	91.2	30.0	299
High school and higher	96.6	615	60.8	88.0	38.4	594
Assistance at delivery						
Health professional ³	96.7	3,430	58.2	86.8	36.7	3,317
Traditional birth attendant	98.8	362	34.9	68.5	55.4	358
Other	96.2	305	31.3	68.7	51.6	294
No one	(93.8)	22	(46.2)	(85.0)	(40.2)	21
Missing	*	13	*	*	*	13
Place of delivery						
Health facility	96.6	3,234	58.5	86.8	36.3	3,124
At home	97.7	876	37.7	72.5	51.1	857
Other	*	13	*	*	*	12
Missing	*	9	*	*	*	9
Total	96,8	4,132	53.9	83.6	39.4	4,002

Note: Table is based on all births whether the children are living or dead at the time of interview.

¹ Includes children who started breastfeeding within one hour of birth.

² Children given something other than breast milk during the first three days of life before the mother started breastfeeding regularly.

³ Doctor, nurse/midwife, or auxiliary midwife

Note: An asterisk indicates a figure is based on fewer than 25 unweighted cases. Parentheses indicate a figure is based on 25-49 unweighted cases.

Early initiation of breastfeeding is of benefit to both mother and infant. Suckling stimulates production of oxytocin, a hormone that causes the mother's uterus to contract. The first breast milk, colostrum, protects the newborn infant from infections because of its high concentration of antibodies. Information from the TDHS-2003 on the timing of initiation of breastfeeding for all children indicates that initiation to breastfeeding is rather late (Table 12.1). Only 54 percent of ever-breastfed children were started breastfeeding as early as within one hour of birth, and 16 percent are not put to the breast within 24 hours of their birth. These proportions are almost identical to those reported in the TDHS-1998 indicating that there has been little recent change in the overall patterns with respect to the initiation of breastfeeding.

Increases in the proportions of children for whom breastfeeding was initiated early occurred in the West, Central and North regions since 1998 (data not shown in tables). Despite the increases, marked variations in the timing of initiation of breastfeeding still remain across regions and education subgroups. The percentage of children who started breastfeeding within one hour of birth is highest in the Central region (63 percent) and lowest in the East region (41 percent). The percentage of children of whom breastfeeding was initiated within an hour of birth varies from 39 percent for births to mothers with no education to 61 percent for births to mothers with at least high school education.

The proportion of children who started breastfeeding within first day of birth also varies by region and education. The East, where mothers are usually less educated and are more likely to give birth without the assistance of a medically trained person, has the lowest proportion; 25 percent of all children in this region were not put to the breast during the first day. Looking at the education patterns, 27 percent of children of mothers with no education did not start breastfeeding within first day of their birth compared with 12 percent of births to the most highly educated mothers.

Prelacteal feeding is the practice of giving other liquids to an infant during the period immediately after birth before mother's milk is flowing freely. Table 12.1 shows this practice is common in Turkey. Overall, forty percent of children were received a prelacteal feed. This percentage is highest for children living in the Southeast Anatolia (63 percent).

12.2 Breastfeeding Status by the Age of the Child

UNICEF and WHO recommend that children be exclusively breastfed (i.e, without receiving other liquids or solid foods or plain water) during the first 6 months of life and those children be given solid or mushy supplements beginning with the seventh month of life. While complementary feeding is acceptable after the first 6 months, breastfeeding is recommended to be continued through the second year of life. Use of bottles with nipples is not recommended at any age.

The percent distribution of living children by breastfeeding status at the time of the survey is shown in Table 12.2. The child's breastfeeding status is based on information collected in the survey on feeding practices in the last 24 hours before the interview. "Exclusively breastfed" refers to children who receive breast milk only. "Children who are fully breastfed" includes those who are exclusively breastfed and those who receive only plain water in addition

to breast milk. Table 12.2 also shows the percentage who drank anything from a bottle with a nipple in the day or night before the interview.

Age in months	Breastfeeding and consuming:						Total	Percentage using a bottle with a nipple	Number of children
	Not breastfeeding	Exclusively breastfed	Plain water only	Water-based liquids/juice	Other milk	Complementary foods			
<2	1.8	43.5	32.0	15.2	6.4	1.1	100.0	16.4	95
2-3	6.2	15.7	30.9	17.2	21.5	8.5	100.0	39.1	129
4-5	13.4	10.6	15.0	10.8	35.6	14.6	100.0	47.5	148
6-7	18.8	1.8	2.4	4.4	38.5	34.1	100.0	55.5	143
8-9	29.0	1.4	3.0	0.7	23.7	42.2	100.0	62.0	118
10-11	31.5	0.5	1.5	7.7	14.0	44.7	100.0	48.7	109
12-15	44.8	0.0	0.1	2.3	14.0	38.8	100.0	56.9	244
16-19	67.5	0.0	1.2	1.7	7.1	22.5	100.0	55.2	267
20-23	75.7	0.0	0.0	0.2	3.7	20.4	100.0	49.3	238
24-27	89.5	0.0	0.0	0.2	1.6	8.7	100.0	41.6	230
28-31	92.5	0.0	0.0	0.4	0.4	6.6	100.0	33.3	310
32-35	95.7	0.0	0.0	1.0	0.0	3.3	100.0	35.2	305
<6	7.9	20.8	24.9	14.2	23.2	9.0	100.0	36.6	372
6-9	23.4	1.7	2.6	2.7	31.9	37.7	100.0	58.4	261

Note: Breastfeeding status refers to a "24-hour" period (yesterday and last night). Children classified as *breastfeeding and consuming plain water only* consume no supplements. The categories of not breastfeeding, exclusively breastfed, breastfeeding and consuming plain water, water-based liquids/juice, other milk, and complementary foods (solids and semi-solids) are hierarchical and mutually exclusive, and their percentages add to 100 percent. Thus children who receive breast milk and water-based liquids and who do not receive complementary foods are classified in the water-based liquid category even though they may also get plain water. Any children who get complementary food are classified in that category as long as they are breastfeeding as well.

Table 12.2 indicates that complementary feeding is common among very young children. In the first two months of life, only 44 percent are exclusively breastfed, a figure which is low but significantly higher than that found in the TDHS-1998 (14 percent). The table also shows that a substantial proportion of children in this age range (47 percent) are predominantly breastfed (i.e., they receive only water, water-based liquids or juices in addition to breast milk). However, 23 percent of children are being given other supplements within the first two months of birth. By age 2-3 months, only 16 percent of children are exclusively breastfed. The percentage of children receiving supplements increases to 78 percent among children 2-3 months of age. The table shows that, after the sixth month, feeding with other milk and complementary foods is more common than breastfeeding. By 12-15 months, 45 percent of children are not breastfed. Early introduction of supplementary food increases the risk of gastrointestinal infections, which is one of the leading causes of infant mortality in Turkey.

Bottle-feeding is also discouraged among very young children, because it contributes to an increased risk of gastrointestinal infections. Table 12.2 shows that, among children less than six months of age the percentage of using a bottle with a nipple is 37 percent and that increases to a peak of 62 percent among children age 8-9 months.

12.3 Duration and Frequency of Breastfeeding

Table 12.3 shows the median duration of any, exclusive and predominant breastfeeding. The median duration of breastfeeding for all children is 14 months, which is two months longer from the median reported in 1998. There are some differences in breastfeeding durations among subgroups. Women living in the East are breastfeeding their children 15 months, longer than any other region while in the West and North regions, median durations of less than 11 months are observed. Women who never attended school are breastfeeding for nearly 15 months, at least 5 months longer on average than more educated women. The median durations of any breastfeeding in İstanbul and Southeast Anatolia (14.6 and 14.4 months respectively) are higher than the median found for all children born in the three years preceding the survey.

Median durations for exclusive breastfeeding are very short, around less than one month for all subgroups. There are small variations in the median duration of predominant breastfeeding. Male children, children living in rural areas, children from the East region, and those whose mothers have no education are likely to have a somewhat longer period of predominant breastfeeding.

The frequency of breastfeeding also influences the health of mothers and children through its effect on the length of postpartum amenorrhea. Table 12.3 presents information on the frequency of breastfeeding as indicated by the percentage of children under 6 months of age who were breastfed six or more times in the 24 hours preceding the survey. Ninety-one percent of children under 6 months of age were breastfed 6 times or more in the 24-hour period preceding the survey. The percentage of children breastfed 6 times or more is lowest in the South region (85 percent) and highest among children of mothers who completed second level primary education (99 percent). On the average, children were breastfed 6 times in day time and 5 times at evening and night.

Table 12.3 Median duration and frequency of breastfeeding

Median duration of any breastfeeding, exclusive breastfeeding, and predominant breastfeeding among children born in the three years preceding the survey, percentage of breastfeeding children under six months living with the mother who were breastfed six or more times in the 24 hours preceding the survey, and mean number of feeds (day/night), by background characteristics, Turkey 2003

	Median duration (months) of breastfeeding ¹				Breastfeeding children under 6 months ²			
	Any	Ex-clusive	Predom-inant ³	Number of children	Percentage breastfed 6+ times in last 24 hours	Mean number of day feeds	Mean number of night feeds	Number of children
Child's sex								
Male	14.1	0.7	3.4	1,248	92.5	6.2	5.1	181
Female	14.0	0.6	2.9	1,154	88.5	6.0	4.7	158
Residence								
Urban	13.8	0.7	2.9	1,585	93.1	6.3	5.0	217
Rural	14.2	0.7	3.7	817	86.2	5.8	4.8	121
Region								
West	10.5	0.8	3.1	794	88.4	5.6	4.7	104
South	13.9	0.5	3.0	321	(85.4)	(5.8)	(5.2)	40
Central	15.2	0.7	3.0	459	(92.5)	(5.4)	(4.2)	66
North	10.8	0.5	0.7	147	(86.1)	(5.1)	(7.4)	21
East	14.7	0.6	3.7	680	94.5	7.4	5.6	106
Selected NUTS 1 Regions								
Istanbul	14.6	0.6	2.7	367	(97.5)	(6.1)	(4.5)	42
Southeast Anatolia	14.4	0.6	3.1	401	96.5	7.7	5.8	66
Education								
No education/Prim. incom.	14.5	0.6	4.0	602	92.3	7.1	5.1	81
First level primary	14.2	0.7	3.3	1,236	87.4	5.7	4.7	174
Second level primary	15.2	0.7	2.6	178	(98.8)	(6.4)	(6.0)	34
High school and higher	10.6	0.5	2.2	386	93.6	5.8	4.7	49
Median for all children	14.0	0.7	3.2	2,402	90.6	6.1	4.9	338
Mean for all children	14.9	2.1	4.8	NA	NA	NA	NA	NA

Note: Median and mean durations are based on current status.

NA = Not applicable

¹It is assumed that non-last-born children and last-born children not currently living with the mother are not currently breastfeeding.

²Excludes children who do not have a valid answer on the number of times breastfed

³Either exclusively breastfed or received breast milk and plain water, water-based liquids, and/or juice only (excludes other milk)

Note: Parentheses indicate a figure is based on 25-49 unweighted cases.

12.4 Types of Complementary Foods

Table 12.4 shows the percentage of breastfeeding and non-breastfeeding children who received different types of supplements. Because children may have received more than one type of supplement, the percentages do not add to 100. Among children who are breastfeeding and younger than 6 months, 18 percent received infant formula. The percentage that were given infant formula peaks at 32 percent for infants age 6-7 months and then decreases to 21 percent for those age 8-9 months who are increasingly being given other fluids. For non-breastfeeding children, the numbers of observations are small for the first year of life; however, the results for this group also suggest that infant formula is commonly given in the first months of life, with other types of milk being given more often as baby grows older.

In summary, although breastfeeding is universal in Turkey, exclusive breastfeeding is not widely practiced. In the first six months, only one child out of five is exclusively breastfed. Early introduction of infant formula and other liquids is common, and bottle-feeding is a comparatively popular feeding practice. Results of the TDHS-2003 imply that ongoing efforts of national and international organizations to promote appropriate infant feeding practices must be increased.

Table 12.4 Types of food received by children in the preceding 24 hours

Percentage of youngest children under three years of age living with the mother who received specific types of food in the 24 hours before the interview, by breastfeeding status and child's age in months, Turkey 2003

Age (in months)	Infant formula	Other milk/cheese/yoghurt	Other liquids ¹	Any solid or semisolid food	Number of children
BREASTFEEDING CHILDREN					
<2	4.6	3.1	17.7	1.2	94
2-3	15.1	16.9	28.3	7.5	121
4-5	30.7	37.8	46.7	16.8	127
6-7	31.8	66.3	70.5	42.0	116
8-9	21.0	78.4	82.5	58.2	83
10-11	14.7	66.4	89.3	65.2	74
12-15	15.3	76.5	95.5	69.6	134
16-19	10.1	75.5	93.3	70.5	87
20-23	0.8	78.6	98.8	83.8	48
24-35	9.3	65.0	98.3	84.0	48
<6	18.0	20.9	32.2	9.2	342
6-9	27.3	71.3	75.5	48.7	199
NON-BREASTFEEDING CHILDREN					
<2	*	*	*	*	3
2-3	*	*	*	*	8
4-5	(58.3)	(68.2)	(50.0)	(16.9)	25
6-7	(49.6)	(81.5)	(71.1)	(37.7)	30
8-9	(42.9)	(82.5)	(80.3)	(30.1)	37
10-11	(26.0)	(82.0)	(68.3)	(57.0)	40
12-15	17.6	89.5	92.1	78.9	116
16-19	6.6	84.4	90.8	72.3	195
20-23	3.2	78.9	94.2	78.6	195
24-35	2.7	80.4	95.4	83.6	820
<6	(57.9)	(63.5)	(42.8)	(11.7)	36
6-9	45.9	82.1	76.2	33.5	67

Note: Breastfeeding status and food consumed refer to a "24-hour" period (yesterday and last night). An asterisk indicates a figure is based on fewer than 25 unweighted cases. Parentheses indicate a figure is based on 25-49 unweighted cases.

¹ Does not include plain water

12.5 Iodization of Household Salt

The disorders induced by dietary iodine deficiency constitute a major global nutrition concern contributing to higher rates of childhood morbidity and mortality. Iodine deficiency is one of the main causes of children's mental retardation and psycho-motor growth. In addition, iodine deficiency has been shown to increase the probability of stillbirth and miscarriage during pregnancy. It also results in low level of school success and insufficiency in working performance because of its negative effects on mental growth. The international convention to overcome the problem of iodine deficiency is the salt iodization.

About half of the sampled households in the TDHS-2003 were asked questions about the use of salt and the medium within which it is kept. Firstly, information was received on the kind of pot in which salt used for cooking was kept. Then a small sample of the salt was taken and tested to find out whether salt was iodized. In the situations that there was no iodide in the salt, it was examined for iodate. The changes in the color of salt after dropping test solution and degree of change in color were recorded. The test results are presented in Table 12.5.

Table 12.5 Iodization of household salt

Percent distribution of households (subsample) with salt tested for iodine content, by level of iodine in salt (parts per million), percentage of households tested, and percentage of households with no salt, according to background characteristics, Turkey 2003

Background characteristic	Iodine content among households tested						Number of households	Percentage with salt tested	Percentage with salt not tested	Percentage with no salt/missing information	Total	Number of households
	None	Po-tassium iodized	<15 ppm Po-tassium iodate	>=15 ppm Po-tassium iodate	Missing	Total						
Residence												
Urban	21.2	69.3	4.7	4.1	0.7	100.0	3,762	97.7	2.1	0.2	100.0	3,850
Rural	50.9	33.4	9.0	6.1	0.5	100.0	1,541	96.5	2.9	0.6	100.0	1,596
Region												
West	19.2	70.7	5.8	4.0	0.4	100.0	2,273	97.8	1.9	0.3	100.0	2,325
South	38.9	50.1	5.0	5.1	0.9	100.0	670	96.3	3.6	0.2	100.0	696
Central	36.0	54.7	4.5	4.2	0.7	100.0	1,224	98.2	1.4	0.4	100.0	1,246
North	14.4	70.9	5.5	7.6	1.7	100.0	400	96.4	3.5	0.1	100.0	415
East	52.8	31.1	9.8	6.0	0.4	100.0	735	96.3	3.2	0.5	100.0	763
NUTS 1 Region												
Istanbul	9.5	82.9	2.6	4.3	0.6	100.0	945	96.7	3.2	0.0	100.0	977
West Marmara	23.1	63.6	8.5	3.7	1.1	100.0	279	98.8	0.8	0.4	100.0	282
Aegean	28.5	57.9	10.2	3.4	0.0	100.0	811	98.6	0.8	0.6	100.0	823
East Marmara	25.6	65.8	2.5	6.1	0.0	100.0	480	98.0	2.0	0.0	100.0	489
West Anatolia	24.8	66.5	3.7	4.2	0.9	100.0	541	98.5	1.1	0.4	100.0	549
Mediterranean	38.9	50.1	5.0	5.1	0.9	100.0	670	96.3	3.6	0.2	100.0	696
Central Anatolia	57.3	34.8	4.9	2.8	0.3	100.0	294	97.0	2.0	0.9	100.0	303
West Black Sea	25.3	60.1	6.8	5.8	1.9	100.0	346	98.1	1.9	0.0	100.0	353
East Black Sea	17.4	71.2	3.4	6.3	1.7	100.0	202	95.7	4.1	0.2	100.0	211
Northeast Anatolia	42.3	41.1	11.1	5.2	0.2	100.0	146	96.5	2.7	0.7	100.0	151
Central East Anatolia	58.0	28.9	10.4	2.7	0.0	100.0	212	94.6	5.1	0.3	100.0	224
Southeast Anatolia	53.9	28.4	8.9	8.1	0.6	100.0	377	97.1	2.2	0.6	100.0	388
Total	29.8	58.9	5.9	4.7	0.6	100.0	5,302	97.4	2.3	0.3	100.0	5,446

In the TDHS-2003, a salt test was completed successfully in 97 percent of the households eligible for the test. It was found that in 30 percent of the households, where test was done, the salt did include neither iodide nor iodate. In other words, in these households, salt was not iodized. In 59 percent of the households, the household was observed to have salt with potassium iodide while in 5 percent of the households the salt contained potassium iodate (≥ 15 ppm).

There are important differences among the types of place of residences and regions in terms of the availability of iodized salt. Iodized salt is not used in about half of rural households. In contrast, in urban areas, four-fifths of households use iodized salt. Use of iodized salt is more common in the West and the North regions when compared with other regions. In İstanbul, 9 of every 10 households use iodized salt. In contrast, less than half of the households in Central East and Southeast Anatolia use iodized salt.

12.6 Nutritional Status of Children

One of the major contributions of the TDHS to the study of child health status is the anthropometric data collected for all children under five years of age. Both weight and height (length) measurements were obtained for each child. Employing this information, standard indices are used to describe the nutritional status of the children: height-for-age, weight-for-height, and weight-for-age.

In any large population, there is obviously a natural variation in height and weight. This variation approximates a normal distribution. For purposes of analyzing anthropometric data, it is standard practice, thus, to use a reference population. The reference population serves as a point of comparison, facilitating the examination of differences in the anthropometric status of subgroups in a population and of changes in nutritional status over time. For the TDHS-2003 the nutritional status of children in the survey population is compared against an international reference population defined by the U.S. National Center for Health Statistics (NCHS) and accepted by the U.S. Centers for Disease Control (CDC) and the World Health Organization (WHO). The use of the international reference population is based on the finding that well-nourished young children of all population groups (for which data exist) follow very similar growth patterns before puberty.

As recommended by the World Health Organization (WHO) the evaluation of nutritional status involves three indices. The height-for-age index provides an indicator of linear growth retardation among children. Children who are more than two standard deviations below the median of the reference population in terms of height-for-age may be considered stunted (short for their age), or chronically malnourished. Children who are below minus three standard deviations (-3 SD) from the median of the reference population are considered severely stunted. Stunting reflects the outcome of a failure to receive adequate balanced nutrition over a long period of time and is also affected by recurrent and chronic illness. Thus, height-for-age, represents a measure of the long-term effects of malnutrition in a population and does not vary appreciably according to the season of data collection. Stunted children are not immediately obvious in a population; a stunted three-year-old child could look like a well-fed two-year-old.

The weight-for-height index measures body mass in relation to body length. Children who are more than two standard deviations below the median of the reference population in terms of their weight-for-height may be considered too thin (“wasted”) or acutely malnourished. Severe wasting represents the failure to receive adequate balanced nutrition in the period immediately before the survey and may be the result of recent illness episodes, especially diarrhea, or of seasonal variations in food supply.

Weight-for-age index takes into account both acute and chronic malnutrition and often is used to monitor nutritional status on a longitudinal basis. It is a useful tool in clinical settings for continuous assessment of nutritional progress and growth. Children whose weight-for-age is below minus two standard deviations from the median of the reference population are classified as "underweight".

Table 12.6 shows how the percentage of children under five years of age classified as malnourished according to the height-for-age, weight-for-height, and weight-for-age indices varies with the child's age and selected demographic characteristics. For purposes of comparison in the reference population, only 2.3 percent of children fall below minus two (-2 SD) for each of the three indices.

In the TDHS-2003, all children under five years of age whose mother was interviewed are included in the anthropometric data collection. However, not all eligible children are included in the results presented here; height or weight measurements are missing for 8 percent of eligible children (see Table D.3 in Appendix D). In addition, since two of the indices (height-for-age and weight-for-age) are influenced by the accuracy of the reporting of the child's age, only one percent of children were excluded from the calculation because the month and year of birth was not known. Hence, height and weight data are shown for 92 percent of the eligible children.

Table 12.6 shows that one in 8 children under age 5 is stunted (i.e. short for their age) with more than one-quarter of these children classified as severely stunted. On the other hand comparatively few children are wasted; less than one percent of children under age five have a weight-for-height z-score below -2SDs. Looking at the weight-for-age index, 4 percent of children under age 5 are underweight.

Figure 12.1 and Table 12.6 shows the percentages of children under five years classified as malnourished according to three anthropometric indices of nutritional status of children by child's age in months. Plotted values in the figure are smoothed by a five-month moving average. The proportion of children stunted increases sharply in the first year of life, then remains in the 10-15 percent range until age three when it exceeds 15 percent. The proportion underweight increases to 5 percent at the end of age one and stabilize around 3-7 percent levels. Finally the figure shows, the percentages of children who are wasted are at very low levels across all ages.

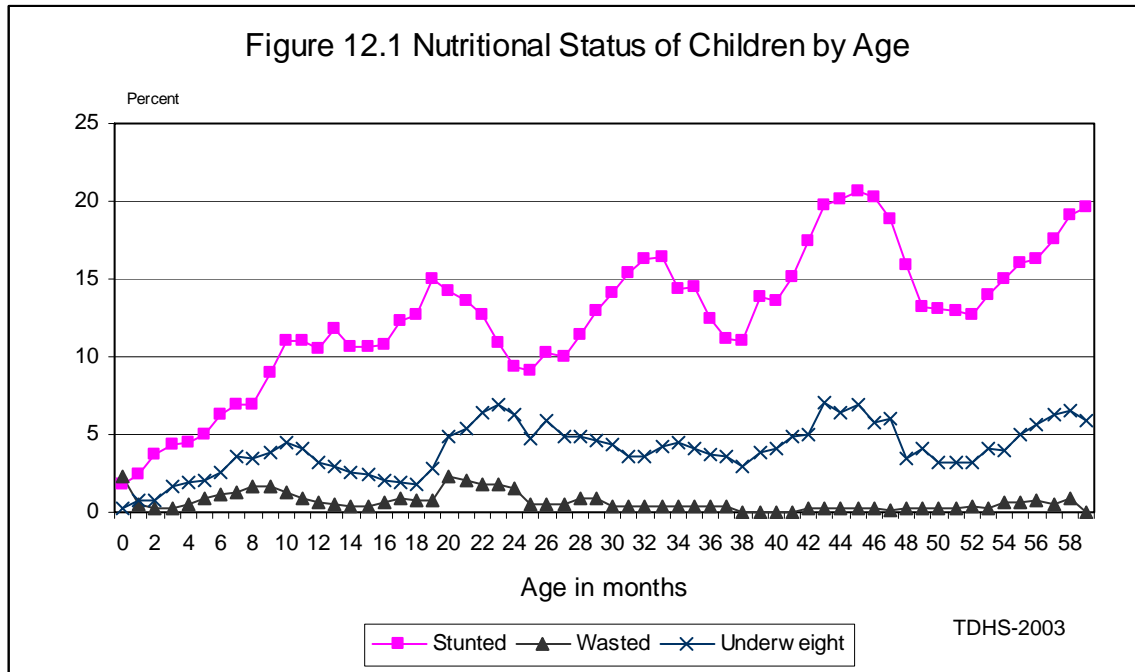
Table 12.6 Nutritional status of children by background characteristics

Percentage of children under five years of age who are classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by selected background characteristics, Turkey 2003

Background characteristic	Height-for-age		Weight-for-height		Weight-for-age		Number of children
	Percentage below -3 SD	Percentage below -2 SD ¹	Percentage below -3 SD	Percentage below -2 SD ¹	Percentage below -3 SD	Percentage below -2 SD ¹	
Child's age (in months)							
<6	0.3	2.2	0.4	1.2	0.2	0.8	334
6-9	3.0	5.6	0.0	0.8	0.0	1.7	247
10-11	2.8	10.8	0.4	1.5	1.9	5.7	103
12-23	1.4	12.4	0.4	0.8	0.5	2.9	702
24-35	3.5	12.2	0.7	1.0	1.3	5.2	755
36-47	6.0	15.4	0.0	0.3	0.3	5.1	750
48-59	5.3	15.4	0.2	0.3	0.6	4.1	777
Sex of child							
Male	2.9	10.9	0.4	1.0	0.6	3.2	1,890
Female	4.5	13.6	0.1	0.4	0.7	4.7	1,778
Birth order							
1	2.0	7.2	0.3	0.5	0.3	2.1	1,225
2-3	2.4	10.3	0.2	0.7	0.5	3.3	1,614
4-5	7.4	21.1	0.8	1.7	2.1	8.2	468
6+	9.7	26.0	0.0	0.4	1.0	7.1	361
Birth interval							
First birth	2.0	7.2	0.3	0.5	0.3	2.1	1,239
Under 24 months	7.7	21.0	0.5	1.4	2.0	7.0	1,614
24-47 months	4.9	16.0	0.0	0.7	0.3	5.2	468
48+ months	1.7	8.9	0.3	0.5	0.6	2.8	361
Residence							
Urban	2.6	9.0	0.3	0.7	0.6	2.8	2,414
Rural	5.6	18.4	0.3	0.8	0.8	5.9	1,254
Region							
West	0.6	5.5	0.5	0.7	0.5	1.9	1,186
South	2.7	10.4	0.2	0.4	0.2	2.8	499
Central	2.6	9.5	0.3	0.8	0.8	2.9	727
North	3.7	13.0	0.2	0.7	0.0	2.2	218
East	8.3	22.5	0.1	0.8	1.1	7.7	1,038
NUTS 1 Region							
Istanbul	0.9	6.1	0.3	0.7	0.4	1.3	572
West Marmara	1.0	7.3	0.7	0.7	0.7	6.3	113
Aegean	1.6	6.6	0.0	0.8	0.8	1.2	346
East Marmara	0.4	3.4	1.1	1.6	1.1	3.0	284
West Anatolia	2.2	9.8	0.4	0.4	0.4	2.7	311
Mediterranean	2.7	10.4	0.2	0.4	0.2	2.8	499
Central Anatolia	1.6	9.6	0.4	0.4	0.8	2.4	204
West Black Sea	3.1	9.1	0.0	0.6	0.0	3.0	182
East Black Sea	4.3	16.9	0.3	0.3	0.0	2.3	118
Northeast Anatolia	6.7	16.8	0.2	1.3	0.9	6.7	166
Central East Anatolia	10.1	26.6	0.0	0.3	1.3	9.6	280
Southeast Anatolia	8.0	22.1	0.2	0.9	1.0	7.1	592
Education							
No education/Prim. incom.	9.1	25.3	0.1	1.0	1.1	8.3	975
First level primary	2.1	9.0	0.3	0.6	0.6	2.7	1,895
Second level primary	1.7	5.6	0.8	0.8	0.0	1.8	275
High school and higher	0.2	2.9	0.2	0.5	0.2	0.9	524
Total	3.6	12.2	0.3	0.7	0.6	3.9	3,668

Note: Figures are for children born in the period 0-59 months preceding the survey. Each index is expressed in terms of the number of standard deviation (SD) units from the median of the NCHS/CDC/WHO international reference population. Children are classified as malnourished if their z-scores are below minus two or minus three standard deviations (-2 SD or -3 SD) from the median of the reference population.

¹ Includes children who are below -3 SD



As a whole, the youngest children show little evidence of malnutrition. However, the proportion classified as stunted exhibits a steady increase starting in the first year of life. Among children 24-59 months of age, around 15 percent are classified as stunted. By age 5, around 15 percent of the children are chronically malnourished, with five percent considered as severely stunted. These patterns reflect inadequate unbalanced feeding practices and/or the presence of recurrent and chronic infections.

The fact that the undernutrition percentages increase with the increasing birth order is important. For example, a little more than one-fourth of children of birth order six or above and one-fifth of children of birth orders four and five are stunted. Birth interval also is related to the prevalence of stunting. Children who are born with an interval of less than two years are much more prone to be stunted. Of these children, 21 percent are stunted and 8 percent are severely stunted.

Table 12.6 also shows the percentage of children under five years of age classified as malnourished according to the three anthropometric indices by selected socio-economic characteristics. There are particularly striking differences in the percentage classified as stunted according to the mother's level of education. The percentage of children whose mothers have a high school education or higher who are below the -2 SD cut-off point (3 percent) is close to that seen for the reference population (2.3 percent). In contrast, almost one-fourth of children whose mothers lack formal education are classified as stunted. There are also urban-rural and regional differences. Stunting is more common in rural (18 percent) than in urban residences (9 percent). The highest level of stunting is seen in the East region (23 percent) and the lowest

levels are in the West and Central regions (6 and 10 percent, respectively). Similar trends are observed for the weight-for-height and weight-for-age indices.

A comparison of the TDHS-2003 findings with the results of the TDHS-1998 indicates that there has been an improvement in the nutritional status of children in Turkey during the five-year period between the surveys. For example, the proportion found to be stunted in the TDHS-2003 survey is 4 percentage points lower than the level observed in TDHS-1998 (16 percent). Further improvements in the nutritional status of Turkish children are dependent upon reducing the numbers of children exposed to the key risk factors, especially short birth intervals and high parity. An intersectoral approach is necessary to discourage mothers from introducing supplementary food too early, to train mothers on the timely introduction of appropriate supplementation, and to assist couples to keep the number of children within their desired limits and ensure optimal birth spacing through effective family planning.

12.7 Nutritional Status of Mothers

In order to assess women's nutritional status, women who had given birth in the five-year period before the interview were weighed and their heights measured using the same equipment used to obtain children's measurements (i.e. an electronic scale and wooden height board).

For all women with a birth in the five-year period before the survey Table 12.7 presents the distributions as well as the means and standard deviations for three anthropometric indicators for eligible women: height, weight, and body mass index.

Indicators based on a woman's weight-for-height exclude pregnant women and women with a birth within the 2 months preceding the interview. The table shows that anthropometric

Table 12.7 Anthropometric indicators of maternal nutritional status

Percent distribution and mean and standard deviation for women who had a birth in the five years preceding the survey, by selected anthropometric indicators (height, weight, and body mass index (BMI)), Turkey 2003

Indicator	Total	Total plus missing
Height (cm)		
135-139.9	0.1	0.1
140-144.9	1.7	1.7
145-149.9	9.7	9.5
150-154.9	26.3	25.8
155-159.9	34.8	34.0
160-164.9	19.0	18.6
165-169.9	6.8	6.7
170-174.9	1.4	1.4
>= 180	0.0	0.0
Missing	-	2.2
Total	100.0	100.0
Mean	156.7	-
Standard deviation	5.7	-
Number of women	3,094	3,164
Weight (kg)		
35-39.9	0.2	0.2
40-49.9	8.7	8.5
50-59.9	31.0	30.4
60-69.9	28.1	27.5
>= 70	32.0	31.3
Missing	-	2.1
Total	100.0	100.0
Mean	65.0	-
Standard deviation	12.7	-
Number of women	2,782	2,843
BMI (kg/m²)		
12.0-15.9 (Severe)	-	-
16.0-16.9 (Moderate)	0.0	0.0
17.0-18.4 (Mild)	1.8	1.8
18.5-20.4 (Normal)	7.6	7.4
20.5-22.9 (Normal)	17.8	17.4
23.0-24.9 (Normal)	15.8	15.5
25.0-26.9 (Overweight)	16.3	15.9
27.0-28.9 (Overweight)	12.7	12.4
29.0-29.9 (Overweight)	5.3	5.2
>= 30.0 (Obese)	22.7	22.3
Missing	-	2.1
Total	100.0	100.0
Mean	26.5	-
Standard deviation	5.1	-
Number of women	2,782	2,843

Note: The weight and BMI measures exclude pregnant women and those who are less than 3 months postpartum.

measures are available for most of the eligible women, with height or weight measurements missing for 2 percent of respondents.

Balanced nutrition during childhood and the adolescent period has a positive impact on linear growth, whereas poor nutrition and experience of a severe illness, particularly in early childhood, can affect growth negatively. In turn, maternal height is useful in predicting the risk of delivery complications since short stature is frequently associated with a small pelvis size. The height below which women are considered to be at risk of such complications is in the range of 140-150 centimeters, with 145 centimeters being the widely accepted cutoff for identifying maternal malnutrition. According to the TDHS-2003 results (Table 12.8), the mean height for mothers was 157 centimeters, one centimeter higher than the mean reported in the TDHS-1998. Two percent of mothers were shorter than 145 centimeters, and 12 percent were below 150 centimeters. The mean maternal weight was 65 kilograms. Nearly one-third (32 percent) of mothers weighed more than 70 kilograms.

The body mass index (BMI) assesses the relation between height and weight and is calculated by dividing the weight in kilograms by the squared height in meters. A body mass index of less than 18.5 is used to identify cases of chronic malnutrition although there is no standard definition of obesity BMI higher than 25.0 is often used to identify women with problems of overweight and obesity. In the TDHS-2003, the mean BMI of non-pregnant mothers was 26.5. The mothers' BMI fell below 18.5 in less than 2 percent of cases. Fifty-seven percent of the mothers had a BMI above 25.0, including 23 percent who had a BMI of at least 30.

Table 12.8 shows the nutritional status of mothers by selected background characteristics. Younger generations of women appear to be taller than women age 35 and over. More educated women are taller compared to less educated women. Mothers who have had no education or did not complete primary education are, on the average, 3.4 centimeters shorter than those with high school education or more.

BMI increases rapidly with age exceeding 25.0 for the majority of women age 25 and older. Body mass index also appears to be related with the educational levels. Residential variations in the BMI are comparatively small; the mean BMI is highest in the North (27.2) and lowest in the West and East (26.2 in both regions). In İstanbul, the percentage of women with a BMI of 25 and higher is 58, which is almost the same as the percentage for all women in Turkey. Mothers with no education had an average BMI of 27 while mothers with high school education or more had an average BMI of 25.

Table 12.8 Nutritional status of women by background characteristics

Among ever-married women age 15-49, mean height, percentage under 145 cm, mean body mass index (BMI), and percentage with specific BMI levels, by background characteristics, Turkey 2003

Background characteristic	Height			BMI ¹ (kg/m ²)								Number of women
	Mean height in cm	Percentage below 145 cm	Number of women	BMI ¹ (kg/m ²)	18.5–24.9 (normal)	<18.5 (thin)	17.0 - 18.4 (mildly thin)	16.0 – 16.9 (moderately thin)	>= 25.0 (overweight/obese)	25.0 – 29.9 (overweight)	>= 30.0 (obese)	
Age												
15-19	158.3	0.0	114	23.3	65.6	4.8	4.8	0.0	29.5	27.3	2.2	94
20-24	157.2	1.8	755	24.7	54.9	3.2	3.2	0.0	42.0	30.5	11.4	645
25-29	157.1	2.1	1,021	25.9	44.3	1.8	1.7	0.1	53.9	35.9	18.0	916
30-34	156.3	1.1	712	27.5	31.8	1.1	1.1	0.0	67.1	38.6	28.5	660
35-39	155.7	2.7	343	29.2	24.7	0.5	0.5	0.0	74.8	31.4	43.4	323
40-44	155.5	3.3	123	29.1	25.2	0.5	0.5	0.0	74.3	34.5	39.8	120
45-49	151.3	7.7	26	31.9	16.9	2.3	2.3	0.0	80.8	16.2	64.6	25
Residence												
Urban	157.1	1.9	2,113	26.5	40.7	1.9	1.9	0.0	57.4	34.6	22.7	1,943
Rural	155.9	1.9	980	26.4	42.2	1.8	1.7	0.1	56.0	33.3	22.7	839
Region												
West	157.2	1.9	1,088	26.2	43.2	1.4	1.4	0.0	55.4	35.8	19.6	1,017
South	157.0	1.6	420	26.7	40.4	1.8	1.8	0.0	57.8	33.2	24.6	379
Central	156.4	1.5	662	26.9	37.3	3.0	3.0	0.0	59.8	34.1	25.7	601
North	156.1	2.4	185	27.4	36.1	1.4	1.4	0.0	62.5	34.3	28.2	171
East	156.3	2.1	738	26.2	43.5	1.7	1.5	0.1	54.8	32.5	22.3	615
Selected NUTS 1 Regions												
Istanbul	157.1	1.1	5,210	26.5	41.0	1.4	1.4	0.0	57.6	37.4	20.2	491
Southeast Anatolia	156.5	2.5	3,990	26.5	39.6	1.6	1.6	0.0	58.8	34.9	23.9	329
Education												
No educ./Prim. incom.	155.2	3.2	684	27.1	38.1	1.1	1.1	0.0	60.8	31.4	29.4	582
First level primary	156.5	1.8	1,635	26.9	37.4	1.9	1.8	0.1	60.8	36.5	24.3	1,477
Second level primary	158.2	1.6	258	25.3	49.9	2.2	2.2	0.0	47.9	33.3	14.6	242
High school and higher	158.6	0.3	517	25.2	52.2	2.5	2.5	0.0	45.3	31.1	14.2	481
Total	156.7	1.9	3,094	26.5	41.2	1.8	1.8	0.0	57.0	34.2	22.7	2,782

¹ Excludes pregnant women and women with a birth in the preceding 2 months