CHAPTER 11

INFANT FEEDING PRACTICES AND NUTRITION STATUS OF WOMEN AND CHILDREN

This chapter covers three topics: breastfeeding of infants, nutritional status of children, and nutritional status of women. The findings presented are from the Demographic and Health Surveys (DHS) in Armenia, Kazakhstan, Kyrgyz Republic, Turkmenistan, and Uzbekistan and the Reproductive Health Survey (RHS) in Azerbaijan.[1]

11.1 Breastfeeding

Infant feeding practices influence the health of both the child and the mother. Breastfeeding is a primary determinant of an infant's nutritional status and its susceptibility to morbidity. Early initiation of breastfeeding—within an hour following birth—permits the newborn to benefit immediately from colostrum, which is highly nutritious and contains the antibodies necessary to protect babies from infection before their immune systems are fully mature. Early initiation also takes advantage of the newborn's sucking reflex and alertness immediately postpartum.

In early infancy, frequent breastfeeding, including night feeds, is important to ensure that the infant both receives sufficient breast milk and regains its birth weight as soon as possible. Current recommendations are that infants should be breastfed 8–10 times every 24 hours, and even more frequently during the first month of life. Frequent feeding also

[1] Information on breastfeeding practices and the nutritional status of children was obtained for births occurring in two different retrospective time periods in the DHS surveys. The surveys in Uzbekistan (1996) and the Kyrgyz Republic (1997) collected this information for births occurring in the 3 years preceding the survey. The surveys in Kazakhstan (1999), Turkmenistan (2000), and Armenia (2000) collected the data for births in the 5 years preceding the survey. For the sake of comparability, this chapter presents findings pertaining to the births in the 3-year period preceding each survey, for the DHS surveys.

ensures that a mother maintains her ability to produce sufficient quantities of breast milk.

The health of a woman is also affected by breastfeeding because it delays the return of ovulation and provides a period of time in which she is not susceptible to the risk of another pregnancy.

Optimal breastfeeding of infants includes:

- Initiation of breastfeeding within about 1 hour of birth;
- Frequent, on-demand feeding (including night feeds);
- Exclusive breastfeeding (defined as breast milk only and no other foods or liquids until the infant is about 6 months of age).

In the DHS, respondents were asked questions concerning breastfeeding practices for their recent births. Mothers were asked if they had breastfed their child and, if so, how soon after birth breastfeeding was initiated. Women were also asked if their children were still breastfeeding and the age at which supplemental feeding began. For children no longer breastfeeding, the age of the child at which breastfeeding stopped was asked.

Initiation of Breastfeeding

Table 11.1.1 indicates that 95% or more of infants in Azerbaijan, Kazakhstan, the Kyrgyz Republic, Turkmenistan, and Uzbekistan were breastfed, as were almost 90% in Armenia. Sixty percent or more of infants in each country except Azerbaijan (51%) and Uzbekistan (40%) received breast milk within the first day of life. However, less than 30% of children were breastfed within the first hour except in the case of the Kyrgyz Republic (41%).

Table 11.1.1 indicates that 85% or more of children under 6 months of age received breast milk six or more times in the 24 hours before the survey. In the five countries with data, the mean number of episodes of breastfeeding in the 24 hours before the survey was eight or more, with both daytime and nighttime feeding being the norm.

Duration of Breastfeeding

Table 11.1.2 shows data on the median durations of breastfeeding. The duration of any breastfeeding was shorter in Armenia (9 months), Azerbaijan (12 months) and Kazakhstan (14 months) than in the Kyrgyz Republic, Turkmenistan, and Uzbekistan (about 17 months in each). However, the duration of exclusive breastfeeding was short in each country (1 month or less). The durations of predominant breastfeeding (either exclusive breastfeeding or breastfeeding and plain water) were between 3 and 5 months in Armenia, Azerbaijan, Kazakhstan, and Turkmenistan but only 1 to 2 months in the Kyrgyz Republic and Uzbekistan.

11.2 Nutrition of Children

In order to objectively assess the nutritional status of children, the height and weight of children were measured in the surveys. Those measurements, in conjunction with a child's age, allowed for the calculation of three standard measures of physical growth: height-for-age, weight-for-height, and weight-for-age.

The nutritional status of children as measured by these indices can be evaluated by comparing their distributions on a specific index to that of a well-nourished, healthy population of children. The use of a reference population to evaluate the nutrition status of children is based on the findings that well-nourished children in all populations exhibit similar distributions by height and weight for a given age (Habicht JP et al., 1974; Martorell R,and Habicht JP,1986). The reference

11.1.1
Initiation and Frequency of Breastfeeding
Among Children
Eastern Europe and Eurasia: A Comparative Report

Region and Country	Prevalence of Breastfeeding Time of Initiation: Ever Breastfed	Breastfed within 1 Hour	Breastfed within 1 Day
Caucasus			
Armenia, 2000	89	27	77
*Azerbaijan, 2001**	95	13	51
Central Asia			
Kazakhstan, 1999	95	27	62
Kyrgyz Rep., 1997	95	41	65
Turkmenistan, 2000	97	19	76
Uzbekistan, 1996	96	19	40

Region and Country	Frequency of Breastfeeding and Mean Number of Feeds: Percent breastfed 6 or more times in last 24 hours	Mean number of feeds: During daytime	Mean number of feeds: During nighttime
Caucasus			
Armenia, 2000	85	5	3
Central Asia			
Kazakhstan, 1999	89	6	3
Kyrgyz Rep., 1997	89	6	3
Turkmenistan, 2000	96	6	3
Uzbekistan, 1996	92	6	4

* For Azerbaijan, prevalence among children under 60 months of age.

11.1.2
Median Duration of Breastfeeding
Among Children under 36 Months of Age
Eastern Europe and Eurasia: A Comparative Report

Region and Country	Median Duration in Months*: Exclusive Breastfeeding	Predominant Breastfeeding†	Any Breastfeeding
Caucasus			
Armenia, 2000	1.4	3.1	9.1
Azerbaijan, 2001‡	0.4	3.7	11.6
Central Asia			
Kazakhstan, 1999	0.7	3.2	13.6
Kyrgyz Rep., 1997	0.7	1.8	16.9
Turkmenistan, 2000	0.5	4.5	17.5
Uzbekistan, 1996	0.4	0.7	17.3

* Medians are based on current status.
† Either exclusive breastfeeding or breastfeeding and plain water only.
‡ Mean duration in months.

population used in this study is that developed by the U.S. National Center for Health Statistics (NCHS) and accepted by the World Health Organization (WHO, 1995).

Height-for-age is a measure of physical growth over the child's life. A child whose height is more than 2 standard deviations below the median of the NCHS reference population is considered stunted or very short for his or her age. Stunting is a condition that results from prolonged inadequate food intake or from recurrent episodes of illness.

Weight-for-height indicates the appropriateness of a child's weight given his/her height. A child whose weight is more than 2 standard deviations below the NCHS reference median is referred to as wasted or too thin. This condition may reflect a recent period of inadequate food intake or a recent episode of illness.

Weight-for-age is a general indicator of a child's nutritional status. A child who falls more than 2 standard deviations below the NCHS reference median on this index is referred to as underweight. The child may have suffered from chronic malnutrition (stunting) or acute malnutrition (wasting) but this index does not distinguish between those conditions.

Even in the well-nourished NCHS reference population, 2% of children fell more than 2 standard deviations below the median value and 0.1% of children fell more than 3 standard deviations below the median value.

Anthropometric Data Collection

Height and weight measurements were made by specially trained members of the interviewing team. Children were weighed with a Seca digital scale graduated in units of 100 grams. Height was measured using a board manufactured by Shorr Productions graduated in tenths of a centimeter. Children age 24 months and older were measured standing, while children under age 24 months were measured lying down (recumbent length). Age was determined from the reported date of birth and date of the interview.

Malnutrition among Children

Table 11.2.1 shows the three indices of nutritional status for children under 3 years of age in five countries and under 5 years of age in Azerbaijan. The statistic shown for each index is the percentage of children who were more than 2 standard deviations below the median value for the NCHS reference population.

Approximately 10% of children were classified as stunted in Armenia and Kazakhstan while more than 20% were stunted in the Kyrgyz Republic, Turkmenistan, and Uzbekistan (25%, 24%, and 31%, respectively). The percentage of children found to be underweight in Armenia and Kazakhstan (2% and 5%) did not differ greatly from the 2.3% value in the NCHS reference population, but the percentages were much higher in Azerbaijan, the Kyrgyz Republic, Turkmenistan, and Uzbekistan (7%, 11%, 13%, and 19%). Finally, in terms of weight-for-height, the percentage of children suffering wasting in Armenia, Azerbaijan, Kazakhstan, and the Kyrgyz Republic (3%, 2%, 2%, and 3 %) were essentially the same as for the NCHS reference population, while the levels of wasting were much higher in Turkemenistan and Uzbekistan (6% and 12%).

It is quite clear that substantially fewer children were classified as undernourished on these indices in Armenia, Azerbaijan, and Kazakhstan than in the Kyrgyz Republic, Turkmenistan, and Uzbekistan.

11.2.1
Percent of Children Classified as Undernourished by Three Anthropopmetric Indices* Among Children under 36 Months of Age
Eastern Europe and Eurasia: A Comparative Report

Region and Country	Anthropometric Index		
	Stunted (height-for-age)	Wasted (weight-for-height)	Underweight (weight-for-age)
Caucasus			
Armenia, 2000	11	3	3
Azerbaijan, 2001†	13	2	7
Central Asia			
Kazakhstan, 1999	10	2	5
Kyrgyz Rep., 1997	25	3	11
Turkmenistan, 2000	24	6	13
Uzbekistan, 1996	31	12	19

* Percentages are for children at least 2 standard deviations below the median of the NCHS/CDC/WHO International Growth Reference Population (WHO, 1995).
† Children aged 3–59 months.

Comparative International Data

Table 11.2.2 shows mean values of child nutritional indicators from 19 DHS surveys conducted in less developed countries in various areas of the world in the late 1980s (Sommerfelt AE, and Stewart MK, 1994). Those indicators pertain to children 3–35 months of age rather than all children under 3 years of age as reported above. Thus, they are closely, but not perfectly, comparable to the statistics for Armenia and the Central Asian republics.

In the case of Armenia, Azerbaijan, Kazakhstan, the Kyrgyz Republic, and Turkmenistan, the nutritional status indicators, particularly the indicators of stunting and underweight, compare favorably with the mean values of the 19 other countries. The mean values for these 19 comparative countries are 29% of children stunted and 22% of children underweight. Those values are greater by a factor of 3 or 4 than the comparable statistics for Armenia and Kazakhstan and greater by a factor of 2 than the comparable statistics for Azerbaijan, the Kyrgyz Republic, and Turkmenistan.

On the other hand, for Uzbekistan the percentage of children who are stunted (31%) and underweight (19%) are about the same as the mean values for these 19 countries, while the level of wasting (12%) is decidedly higher than the mean value for these 19 countries (4%).

Malnutrition Differentials

Differentials in nutritional status of children by demographic characteristics (age, sex, and birth order) and socioeconomic characteristics (urban-rural residence) can provide information about population subgroups in particular need. Differentials in terms of the stunting and underweight indices are shown in Tables 11.2.3 and 11.2.4. Differentials in terms of the wasting index were minor and are not shown.

In terms of the stunting index, there is a clear trend of increasing levels of malnutrition between infants (less than 6 months and 6–11 months of age) and older children (12–23 and 23–35 months of age). The percentage of children classified as malnourished is typically

11.2.2
Mean Percentages of Children Undernourished by Three Anthropopmetric Indices*
Among Children 3-35 Months of Age from DHS Surveys in 19 Countries
Eastern Europe and Eurasia: A Comparative Report

Region	Anthropometric Index		
	Stunted (height-for-age)	Wasted (weight-for-height)	Underweight (weight-for-age)
8 African Countries	33	6	27
5 North African/Asian Countries	24	5	20
6 Latin American Countries	29	2	15
19 Countries Worldwide	29	4	22

* Percentages are for children at least 2 standard deviations below the median of the NCHS/CDC/WHO International Growth Reference Population (WHO, 1995).
Source: Sommerfelt AE and Stewart MK, 1994.

11.2.3
Percentage of Children Classified as Stunted by Selected Characteristics
Among Children under 36 Months
Eastern Europe and Eurasia: A Comparative Report

Characteristic	Caucasus		Central Asia			
	Armenia 2000	Azerbaijan 2001*	Kazakhstan 1999	Kyrgyz Rep. 1997	Turkmenistan 2000	Uzbekistan 1996
Total	11	13	10	25	24	31
Age (months)						
< 6	4	U	6	5	9	8
6–11	6	U	5	16	20	26
12–23	15	10	17	34	34	44
24–35	12	13	7	30	23	30
Sex						
Male	10	13	8	28	24	34
Female	12	14	11	22	23	29
Residence						
Urban	8	11	7	15	19	33
Rural	13	16	11	28	26	31
Education Level						
Secondary Incomplete	19	16	(14)	(29)	21	25
Secondary Complete	12	15	11	33	25	35
Technicum	10	9	9	15	21	29
Postsecondary	5	4	5	19	16	21
Birth Order						
1	8	U	7	22	22	27
2	12	U	8	24	24	31
3+	17	U	15	30	25	38

* Children aged 3–59 months.
( ) Numbers in parentheses may be unreliable estimates due to small sample size.
U = Unavailable.

twice as great among older children, especially for the age group 12–23 months where levels are as high as 34% to 44% in the Kyrgyz Republic, Turkmenistan, and Uzbekistan. Greater levels of malnutrition are also evident among children of higher birth orders and in rural as opposed to urban areas. As might be expected, the percentage of children classified as stunted was higher among children of less educated women than children of more educated women. Finally, differentials by the sex of the child were relatively minor and not consistent across countries.

In terms of the underweight index (Table 11.2.4), there are differences in the pattern of the differentials between Armenia, Azerbaijan, and Kazakhstan, where levels of malnutrition are relatively low (3%,5%, and 7%), and the Kyrgyz Republic, Turkmenistan, and Uzbekistan where levels are much higher (11%, 13%, and 19%). There is little pattern in the differentials for Armenia, Azerbaijan, and Kazakhstan. On the other hand, for the Kyrgyz Republic, Turkmenistan, and Uzbekistan, patterns similar to those observed for the stunting index are evident. The percentage of children classified as underweight increases with age and is especially high for children 12–23 months of age. Levels of underweight also tend to be greater among children who are higher order births, reside in rural areas, and whose mothers are less educated.

11.2.4
Percentage of Children Classified as Underweight by Selected Characteristics Among Children under 36 Months
Eastern Europe and Eurasia: A Comparative Report

	Caucasus		Central Asia			
	Armenia	Azerbaijan	Kazakhstan	Kyrgyz Rep.	Turkmenistan	Uzbekistan
Characteristic	2000	2001*	1999	1997	2000	1996
Total	3	7	5	11	13	19
Age (months)						
< 6	2	U	4	0	5	6
6–11	2	U	5	10	14	18
12–23	3	9	6	19	20	25
24–35	3	6	3	9	11	18
Sex						
Male	3	6	5	13	13	21
Female	2	8	4	9	13	17
Residence						
Urban	2	6	6	6	12	17
Rural	3	8	4	13	14	20
Education Level						
Secondary Incomplet	7	11	(7)	(19)	11	20
Secondary Complete	1	7	4	12	14	25
Technicum	4	5	4	10	11	10
Postsecondary	0	2	7	8	10	5
Birth Order						
1	1	U	5	10	12	12
2	3	U	4	10	13	20
3+	8	U	7	14	17	27

* Children aged 3–59 months.
( ) Numbers in parentheses may be unreliable estimates due to small sample size.
U = Unavailable.

11.3 Nutrition of Women

The nutritional status of women in the childbearing ages is useful as an indicator of overall health, as a predictor of the risk of adverse pregnancy outcomes, and as an indicator of the risk of morbidity and mortality following childbirth. In the surveys, anthropometric measurements of the height and weight of all women aged 15–49 were made and, based on those data, two indices of nutritional status have been calculated: height and body mass index (BMI).

Maternal height is one measure of past nutritional status and reflects in part the cumulative effect of lack of access to nutritional foods during childhood and adolescence. It is a predictor of difficult deliveries, since small stature is often associated with small pelvis size and a greater likelihood of obstructed labor. Short stature is also correlated with low birth weight in infants and high risks of miscarriage and stillbirth. The height below which a woman is considered to be at nutritional risk is in the range of 140 to 150 centimeters.

Body mass index (BMI) is a measure which utilizes both the height and weight of a women to determine if she is underweight, overweight, or obese. BMI is defined as weight in kilograms divided by the square of the height in meters (kg/m^2) and is considered to provide a better measure of nutritional status than weight alone. A value of BMI of less than 18.5 has been used to indicate chronic energy deficiency among nonpregnant women. Values of 24.0 to 29.9 are indicative of being overweight, and a value of 30.0 or higher is an indicator of obesity. To avoid bias in the measurement of nutritional status, pregnant women and women who had given birth in the 2 months preceding the survey were excluded from the analysis of maternal nutrition.

Malnutrition Among Women

Table 11.3.1 shows statistics on the mean height of survey respondents and the proportion of women that are less than 145 centimeters tall in the five DHS surveys. The mean height of women is similar in all of the surveys and varies only between 158 and 160 centimeters. Additionally, the proportion of women less than 145 centimeters tall is only about 1% in each of the surveys.

Table 11.3.1 also shows the values of the BMI for women age 15–49. The estimated level of chronic energy deficiency (BMI < 18.5) is lowest for Armenia (4%), intermediate for Kazakhstan and the Kyrgyz Republic (7% for each) and highest in Turkmenistan and Uzbekistan (10% each). These levels are somewhat higher than those found in surveys in South America and the North Africa but lower than those characteristic of sub-Saharan Africa (Loaiza E, 1997).

In terms of the obesity index (BMI 30.0+), a distinctly higher proportion of women were found to be obese in Armenia, Kazakhstan, the Kyrgyz Republic, and Turkmenistan (between 9% and 14%) than in Uzbekistan (5%).

Malnutrition Differentials

Table 11.3.2 shows the proportions of women classified as underweight or overweight by age, residence, and education. There is a strong pattern in each survey of decreasing levels of underweight with increasing age. Even more evident is the pattern of increasing levels of obesity with increasing age. To some extent, these patterns reflect the common weight gain experienced with age in virtually all populations. However, the levels of obesity among women 45–49 in these countries is very high, reaching approximately 30% in Armenia, Kazakhstan, the Kyrgyz Republic, and

11.3.1
Mean Height and Percent of Women under 145 Centimeters and Mean Body Mass Index (BMI)* and Percent of Women Chronically Energy Deficient and Obese Among Women Aged 15-49†
Eastern Europe and Eurasia: A Comparative Report

	Anthropometric Index				
	Height		Body Mass Index		
	Mean	Percent	Mean	Percent	Percent
Region and Country	(cm)	< 145 cm	(kg/m²)	< 18.5	> 30.0
Caucasus					
Armenia, 2000	157.7	1	24.9	4	14
Central Asia					
Kazakhstan, 1999	159.6	1	24.1	7	13
Kyrgyz Rep., 1997	157.9	1	23.4	7	9
Turkmenistan, 2000	159.0	1	23.5	10	10
Uzbekistan, 1996	159.3	1	22.7	10	5

* BMI is defined as weight in kilograms divided by the height in meters (kg/m^2) and is considered to provided a better measure of nutritional status than weight alone.
† BMI statistics are exclusive of women who are pregnant or less than 2 months postpartum.

11.3.2
Percentage of Women 15-49 with a Body Mass Index of Less Than 18.5 or More Than 30.0 by Selected Characteristics
Eastern Europe and Eurasia: A Comparative Report

	Body Mass Index (BMI) (%)									
	Armenia, 2000		Kazakhstan, 1999		Kyrgyz Rep., 1997		Turkmenistan, 2000		Uzbekistan, 1996	
Characteristic	< 18.5	30.0+	< 18.5	30.0+	< 18.5	30.0+	< 18.5	30.0+	< 18.5	30.0+
Total	4	14	7	13	7	9	10	10	10	5
Age										
15–19	6	2	14	‡	15	‡	16	2	2	‡
20–24	7	3	13	2	8	1	12	3	12	2
25–29	4	7	12	7	7	2	11	7	12	3
30–34	3	13	3	13	6	9	8	12	8	6
35–39	1	17	4	16	3	15	6	15	4	8
40–44	1	27	2	25	3	17	5	21	3	12
45–49	1	33	2	30	1	28	3	28	6	18
Residence										
Urban	4	13	8	12	7	9	9	12	12	8
Rural	3	15	7	13	7	8	10	9	9	5
Education Level										
Secondary Incomplete	6	10	8	11	15	10	14	7	15	4
Secondary Complete	4	17	8	12	6	8	9	11	8	5
Technicum	3	15	7	15	5	9	8	13	11	7
Postsecondary	2	12	6	10	7	7	8	11	10	11

* BMI is defined as weight in kilograms divided by the height in meters (kg/m^2) and is considered to provided a better measure of nutritional status than weight alone.
† BMI statistics are exclusive of women who are pregnant or less than 2 months postpartum.
‡ Less than 0.5%.

Turkmenistan and 19% in Uzbekistan. These levels of obesity are indicative of sedentary and unhealthy lifestyles.

Education also displays distinctive patterns, particularly in terms of the chronic energy deficiency indicator. Women who had not completed secondary school were decidedly thinner than women in the other education categories, among which there were no discernable differences.

There were no significant differences in BMI values between women residing in urban and rural areas.

11.4 Summary of Findings

- The chapter presents information on breastfeeding practices for births in recent years preceding each survey. In Azerbaijan, Kazakhstan, the Kyrgyz Republic, Turkmenistan, and Uzbekistan, in excess of 95% of infants were breastfed, and in Armenia almost 90% were breastfed. These levels of breastfeeding are similar to those characteristic of many countries of Asia, Latin America, and the Near East but somewhat lower than the levels in many countries of sub-Saharan Africa. Breastfeeding was initiated within the first day of giving birth for over 60% of births in each country, with the exception of Azerbiajan and Uzbekistan where only 51% and 40% of infants were given breast milk within the first day of life.

- Anthropometric measures of physical growth were presented to assess the nutritional status of children. Significant differences were found between Armenia, Azerbaijan, and Kazakhstan as opposed to the Kyrgyz Republic, Turkmenistan, and Uzbekistan. In terms of the stunting index (children who are short for their age), 13% or fewer children were classified as malnourished in Armenia and Kazakhstan, while 24% or more children were classified as stunted in the Kyrgyz Republic, Turkmenistan, and Uzbekistan. Similarly, levels of underweight (weight-for-age) were less than 6% in Armenia and Kazakhstan but greater than 10% in the Kyrgyz Republic, Turkmenistan, and Uzbekistan.

- The level of undernutrition among certain groups of children is a matter of particular concern in the Kyrgyz Republic, Turkmenistan, and Uzbekistan. Undernutrition levels in terms of the stunting index were, in general, between 25% and 40% for children of birth order three and higher, children residing in rural areas, and children whose mothers did not complete secondary school. In terms of the underweight index, again in the Kyrgyz Republic, Turkmenistan, and Uzbekistan, relatively high percentages of children in these categories were underweight.

- Two nutritional status indicators for women were presented: height and the body mass index. The proportion of women measured as less than 145 centimeters, the cutoff for small stature which is associated with problematic pregnancy outcomes for both the mother and her child, was 1% in each of the five surveys. This is about the same as has been found for many countries in the Near East and North Africa and decidedly less than is typical of Latin America.