ANEMIA 12

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12.1 INTRODUCTION

Anemia is a condition characterized by a decrease in the concentration of hemoglobin in the blood. Hemoglobin is necessary for transporting oxygen to tissues and organs in the body. The reduction in oxygen available to organs and tissues when hemoglobin levels are low is responsible for many of the symptoms experienced by anemic people. The consequences of anemia include general body weakness, frequent tiredness, and lowered resistance to disease. Anemia can be a particularly serious problem for pregnant women, leading to premature delivery and low birth weight. It is of concern in children since anemia is associated with impaired mental and physical development. Overall, morbidity and mortality risks increase for individuals suffering from anemia (Sharmanov, 1998).

Hemoglobin testing is the primary method of anemia diagnosis. The TDHS 2000 included direct measurement of hemoglobin levels in all women 15-49 and their children age 5 and under (born since January 1995). The HemoCue system was used in the TDHS 2000 for hemoglobin testing. This system consists of a battery-operated photometer and a disposable microcuvette,[1] coated with a dried reagent that serves as the blood-collection device. After obtaining consent from each respondent (in the case of children, the consent of the child's mother), a drop of capillary blood taken from a person's fingertip or heel was drawn into a microcuvette. The blood in the microcuvette was analyzed using the photometer, which displayed the hemoglobin concentration (Sharmanov, 2000).

Medically trained personnel, primarily doctors, assigned to each of the TDHS teams conducted the testing. The personnel responsible for the testing received extensive classroom training and field practice prior to the survey.

During the fieldwork, each respondent was given the results of the test immediately. In cases in which the hemoglobin reading was below 7.0 g/dl (grams per deciliter), the respondent was referred to the local health care facilities for followup. With the permission of the respondent, the Ministry of Health and Medical Industry of Turkmenistan was also advised of the names of the individuals with a reading below 7.0 g/dl to help ensure that they would receive followup.

Anemia is classified as mild, moderate, or severe based on the concentrations of hemoglobin in the blood. Mild anemia corresponds to a level of hemoglobin concentration of 10.0-10.9 g/dl for pregnant women and children under age 5 and 10.0-11.9 g/dl for nonpregnant women. For all of the tested groups, moderate anemia corresponds to a level of 7.0-9.9 g/dl, while severe anemia corresponds to a level less than 7.0 g/dl.

[1] A *microcuvette* is a small, transparent laboratory vessel.

12.2 Prevalence of Anemia among Women Age 15-49

Table 12.1 shows anemia levels among the women 15-49 interviewed in the TDHS 2000. Almost every second woman had some degree of anemia. The level of anemia was severe in about 1 percent of the women, while 8 percent had a moderate level and 38 percent had mild anemia.

Age was associated with anemia levels, with older women being somewhat more likely to be moderately or severely anemic than younger women. The rate of moderate-to-severe anemia (moderate and severe anemia combined) among women age 35-49 is almost three times as high as among women age 15-19.

Table 12.1 Anemia among women

Percentage of women age 15-49 classified as having anemia, by background characteristics, Turkmenistan 2000

Background characteristic	Percentage of women with anemia			Number measured
	Severe anemia[1]	Moderate anemia[2]	Mild anemia[3]	
Age				
15-19	0.5	4.1	33.0	1,534
20-24	0.6	7.1	38.6	1,507
25-29	1.3	9.6	38.4	1,228
30-34	1.3	9.5	43.4	1,028
35-39	1.4	10.6	38.6	943
40-44	1.4	11.3	38.5	832
45-49	1.8	10.2	35.3	642
Residence				
Urban	1.1	7.6	36.7	3,528
Rural	1.0	9.0	38.7	4,186
Region				
Ashgabad City	0.8	5.0	31.0	928
Akhal	1.0	6.4	37.4	1,130
Balkan	1.8	12.8	44.9	705
Dashoguz	1.8	10.5	40.1	1,606
Lebap	0.9	6.4	30.6	1,601
Mary	0.6	9.5	43.4	1,774
Education				
Primary/secondary	1.1	8.7	38.3	5,678
Secondary-special	1.0	7.8	37.2	1,502
Higher	0.5	6.3	34.3	534
Ethnicity				
Turkmen	1.1	8.6	37.8	6,051
Uzbek	1.2	9.0	38.2	846
Other	1.0	5.9	37.2	817
Total	1.1	8.4	37.8	7,714

[1] Hemoglobin level less than 7g/dl
[2] Hemoglobin level 7-9.9 g/dl
[3] Hemoglobin level 10-11.9 g/dl (10-10.9 g/dl for pregnant women)

High rates of moderate and severe anemia were found among women living in the Balkan and Dashoguz regions (15 percent and 12 percent, respectively), while only 6 percent of women in Ashgabad City were diagnosed as having moderate or severe anemia.

Women with a higher education are less frequently anemic than women with a primary or secondary-special education. The rates of moderate and severe anemia are higher among ethnic Turkmen and Uzbek women (10 percent each) than among women of other ethnic groups (7 percent).

There are differentials in the anemia rates by nutritional and reproductive health characteristics. Table 12.2 shows that the prevalence of moderate-to-severe anemia is higher among women with a body mass index (BMI) less than 18.5 (11 percent) than among women with a higher BMI (9 percent). The prevalence of moderate-to-severe anemia among women with two or more births (12 percent) is twice as high as that among women with fewer than two births or no pregnancies (6 and 5 percent, respectively). There is a relatively small association between the birth intervals and the rate of anemia.

Studies also suggest that IUD use can lead to iron depletion and iron-deficiency anemia. Table 12.2 also shows that among women who are using intrauterine devices as a method of contraception, the prevalence of moderate-to-severe anemia (12 percent) is higher than among women who are not using the IUD (9 percent). According to the TDHS 2000 data, 25 percent of women age 15-49 in Turkmenistan were using an IUD at the time of the survey, i.e., when they were tested for anemia.

Table 12.2 Anemia among women by nutritional status, reproductive history, and IUD use

Percentage of women age 15-49 years classified as having anemia by nutritional status, reproductive history, and IUD use, Turkmenistan 2000

Characteristic	Iron-deficiency anemia			
	Severe anemia[1]	Moderate anemia[2]	Mild anemia[3]	Number measured
Nutritional status				
BMI <18.5	1.3	9.8	39.2	732
BMI >18.5	1.0	8.3	37.8	6,954
Reproductive history				
No pregnancies	0.5	4.9	34.0	2,765
Number of births <2	0.5	5.9	35.6	3,658
Number of births ≥2	1.6	10.6	40.0	4,036
Average birth interval <24 months	1.9	10.4	39.1	1,516
Average birth interval >24 months	1.5	12.0	41.5	1,340
Use of IUD				
Currently using	1.7	9.8	44.0	1,923
Currently not using	0.9	7.9	35.9	5,771
Total	1.1	8.4	37.9	7,694

[1] Hemoglobin level less than 7g/dl
[2] Hemoglobin level 7-9.9 g/dl
[3] Hemoglobin level 10-11.9 g/dl (10-10.9 g/dl for pregnant women)

12.3 Iron Supplementation during Pregnancy

Supplementation of iron during pregnancy is one of the main components of the Anemia Control and Prevention Strategy of the UNICEF Area Office for Central Asian Republics. The government of Turkmenistan supports this program by promoting iron supplementation during pregnancy and the postpartum period.

The recommended dosage of iron supplementation for pregnant women is currently 60 mg per day for six months. This dosage may be increased to 120 mg if the duration of supplementation is short. In addition to the iron supplementation, supplementation of 400 mg of folic acid around the time of conception not only prevents megaloblastic anemia but also significantly reduces the incidence of neural tube defects, which are severe birth defects (Stoltzfus and Dreyfuss, 1998).

In the TDHS 2000 women were asked whether they received iron pills during their last pregnancy. As shown in Table 12.3, 32 percent of women in Turkmenistan received iron pills during their last pregnancy. On average, women took iron pills for 14 days. Iron supplementation is most common in Dashoguz region in terms of the percentage of women taking iron pills: 70 percent. The Akhal region has the lowest percentage of women who took iron pills during their last pregnancy (10 percent). However, the average length of the iron supplementation among the women in Akhal region (19 days) was greater than in any other survey region of Turkmenistan.

Table 12.3 Iron supplementation

Percentage of women who were given or bought iron tablets during current or last pregnancy and average number of days women took iron tablets during the last pregnancy by background characteristics, Turkmenistan 2000

Background characteristic	Iron supplementation for current pregnancy or last birth: Percentage who took iron pills	Average number of days	Weighted number of women
Age			
15-19	(32.9)	(8.1)	42
20-24	33.9	13.6	579
25-29	30.7	15.2	831
30-34	33.1	13.1	581
35-39	33.5	14.0	304
40-44	29.9	15.1	107
46-49	(30.0)	(10.0)	26
Residence			
Urban	31.5	15.4	1,052
Rural	33.0	12.9	1,417
Region			
Ashgabad City	36.2	18.5	266
Akhal	10.3	18.8	352
Balkan	17.4	10.6	215
Dashoguz	69.6	15.1	520
Lebap	29.7	11.9	513
Mary	18.9	11.1	603
Education			
Primary/secondary	31.4	14.1	1,715
Secondary-special	34.3	13.0	560
Higher	35.1	15.6	194
Ethnicity			
Turkmen	29.3	13.8	1,992
Uzbek	53.4	14.5	295
Other	31.5	14.7	182
Total	32.3	14.0	2,470

Note: Figures in parentheses are based on 25-49 unweighted cases.

Iron supplementation is more common among Uzbek women (53 percent) than among Turkmen women or women of other ethnicities (29 and 32 percent, respectively). There was no significant difference in the percentage of women who received iron supplements by their age, type of residence, and level of education.

Thus, despite efforts promoting iron supplementation, more than half of the women in Turkmenistan did not receive iron supplements during their last pregnancy. Even women who received iron pills took them for a shorter period than recommended.

12.4 Anemia Prevalence among Children

Table 12.4 presents anemia rates for children in Turkmenistan by background characteristics. Thirty-six percent of the children under the age of five suffer from some degree of anemia; 16 percent have moderate anemia, and 1 percent are severely anemic.

As was the case with women, there are substantial differences in the anemia rates among children by residence, region, level of mother's education, and ethnicity. The prevalence of moderate-to-severe anemia among children living in urban areas is higher than among children living in rural areas (18 and 15 percent, respectively). As with the women, the rate of moderate-to-severe anemia is highest among children living in Balkan and Dashoguz regions (24 and 25 percent, respectively). Prevalence of moderate-to-severe anemia is relatively low among children living in Mary and Akhal regions: 7 and 10 percent, respectively. As in Ashgabad City, in Mary and Akhal regions, no cases of severe anemia were diagnosed among children. Intermediate levels of moderate-to-severe anemia were found among children in Ashgabad City and Lebap Region: 19 and 20 percent, respectively.

Table 12.4 Anemia among children

Percentage of children under five years of age classified as having anemia, by background characteristics, Turkmenistan 2000

Background characteristic	Iron-deficiency anemia			
	Severe anemia[1]	Moderate anemia[2]	Mild anemia[3]	Number measured
Residence				
Urban	0.3	18.0	22.6	1,115
Rural	0.8	14.6	17.2	1,835
Region				
Ashgabad City	0.0	19.3	20.8	228
Akhal	0.0	10.1	20.4	444
Balkan	1.2	23.2	25.8	258
Dashoguz	1.3	23.9	27.0	574
Lebap	0.9	19.3	21.6	683
Mary	0.0	6.7	8.1	763
Education				
Primary/secondary	0.6	15.1	18.8	2,076
Secondary-special	0.7	16.3	21.8	667
Higher	0.1	22.5	16.0	207
Ethnicity				
Turkmen	0.5	15.3	18.4	2,444
Uzbek	1.4	18.9	25.3	340
Other	0.3	18.8	19.8	166
Total	0.6	15.9	19.3	2,950

[1] Hemoglobin level less than 7g/dl
[2] Hemoglobin level 7-9.9 g/dl
[3] Hemoglobin level 10-10.9 g/dl

Table 12.4 also shows that children of mothers who have a primary or secondary education are less likely to have anemia than children whose mother has a higher education. The rate of moderate-to-severe anemia among Turkmen children (16 percent) is relatively lower than among children of Uzbek and other ethnicities (20 and 19 percent, respectively).

Table 12.5 presents anemia rates for children in Turkmenistan by demographic and nutritional characteristics. The results show that moderate-to-severe anemia is more common

Table 12.5 Anemia among children by demographic characteristics and nutritional status

Percentage of children under five years of age classified as having anemia by demographic characteristics, Turkmenistan 2000

Demographic characteristic	Iron-deficiency anemia			
	Severe anemia[1]	Moderate anemia[2]	Mild anemia[3]	Number measured
Sex of child				
Male	0.8	17.4	18.2	1,492
Female	0.3	14.3	20.4	1,458
Age of child				
0-24 months	0.5	18.0	19.3	601
24-59 months	0.6	15.4	19.2	2,349
Birth order				
1	0.7	15.4	17.7	985
2-3	0.4	16.8	19.2	1,366
4-5	0.9	15.0	22.8	426
6+	0.4	13.6	19.7	174
Birth interval				
First birth	0.7	15.4	17.8	990
< 24 months	0.7	16.6	19.7	706
24-47 months	0.5	16.0	20.1	869
48+ months	0.2	15.7	20.4	384
Weight at birth				
< 2.5 kg	2.5	21.2	20.5	138
≥ 2.5 kg	0.5	15.6	19.2	2,812
Height for age				
Below -2 SD[4]	1.1	21.6	19.5	660
-2 SD or above	0.4	14.2	19.2	2,290
Weight for height				
Below -2 SD[4]	0.7	18.6	15.4	173
-2 SD or above	0.6	15.7	19.5	2,777
Weight for age				
Below -2 SD[4]	1.2	24.5	22.7	348
-2 SD or above	0.5	14.7	18.8	2,602
Total	0.6	15.9	19.3	2,950

[1] Hemoglobin level less than 7g/dl
[2] Hemoglobin level 7-9.9 g/dl
[3] Hemoglobin level 10-10.9 g/dl
[4] Includes children who are below -3 SD

among male children than among female children (18 and 15 percent, respectively) and among younger children up to 24 months of age (19 percent) than among children age 24 months and older (16 percent). No significant differences in the children's anemia rates were observed by birth order or birth interval. Looking at children's weight at birth (according to their mother's recollection), the rate of moderate-to-severe anemia was higher among children with a weight at birth less than 2.5 kg (24 percent) than among children with a birth weight of more than 2.5 kg (16 percent).

Considering differentials by child's nutritional status, the greatest variation in moderate-to-severe anemia is observed for height-for-age (stunting) and weight-for-age. The rate of moderate-to-severe anemia among children with height-for-age below -2 SD was 23 percent, compared with 15 percent among children with height-for-age -2 SD or above. The moderate-to-severe anemia rate among children with weight-for-age below -2 SD was 26 percent, compared with 15 percent among the children with weight-for-age -2 SD or above.