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Malnutrition remains one of the major public health and developmental problems that Malawians are challenged with. The extent of chronic malnutrition in Malawi has not changed for decades and specific micronutrient deficiencies of vitamin A, iron/folate, and iodine are high as confirmed by the National Micronutrient Survey 2001 (MOHP, 2003b), exerting an additional threat to child and maternal health, and development. There is also an increase in the non-communicable diseases related to nutrition, such as overweight and obesity. Women of reproductive age, infants, and young children are the most vulnerable groups to these diseases. Immediate causes of malnutrition are inadequate dietary intake of various nutrients and frequent infections due to household food insecurity, as well as poor access to high quality health care and environment.

In Malawi, the government and its collaborating partners recognise the consequences of malnutrition and are committed to improve the situation through development and implementation of policies, programmes, and interventions. Some of the interventions include improvement in maternal, infant, and young child feeding practices, increasing micronutrient intake through supplementation, fortification, dietary diversification, and public health measures.

This chapter covers infant and young child feeding practices including breastfeeding and complementary foods; micronutrient intake, anaemia and anthropometric assessment of the nutritional status of children under five years and of women age 15-49.

## **10.1 BREASTFEEDING**

Appropriate feeding practices are important for survival, growth and development of infants and young children and for the wellbeing of mothers. They are one of the major determinants of child nutritional status. Malnutrition in young children exposes them to greater risk of illness and death. The Malawi Ministry of Health promotes exclusive breastfeeding for the first six months of life and continued breastfeeding with appropriate complementary feeding up to two years or beyond. This policy applies to all children unless there are medical indications. This is in line with the UNICEF and WHO Global Strategy on Infant and Young Child Feeding (WHO, 2003). Breastfeeding is convenient and has nutritive and protective properties important for the child's nutritional status. Mothers benefit from breastfeeding through biological suppression of the return to fertile status which contributes to the duration of birth intervals and pregnancy outcomes. These effects are influenced by initiation, duration and intensity of breastfeeding, and by the age when the child receives supplementary foods and liquids.

### **10.1.1 Initiation of Breastfeeding**

Early initiation of breastfeeding (within one hour of birth) facilitates breast milk production and consumption of colostrum which appears right after delivery. Colostrum has a

high concentration of nutrients and antibodies which protect the baby from infection before the baby's immune system has matured. Early initiation also encourages bonding between the mother and the infant and helps to maintain body temperature. Prolactal feeds delay initiation and establishment of effective lactation. It is recommended that children be fed colostrum (the first breast milk) immediately after birth and continue to be exclusively fed at the breast even if regular breast milk has not started to flow.

Table 10.1 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 prolactal feed, by background characteristics, Malawi 2004

Background characteristic	Percentage ever breastfed	Number of children	Percentage who started breastfeeding		Percentage who received a prolactal feed <sup>2</sup>	Number of children ever breastfed
			Within 1 hour of birth	Within 1 day of birth <sup>1</sup>		
<b>Sex</b>						
Male	98.0	5,381	69.3	96.7	5.9	5,275
Female	98.7	5,390	70.4	96.4	5.0	5,318
<b>Residence</b>						
Urban	98.6	1,425	78.1	97.5	1.5	1,405
Rural	98.3	9,347	68.6	96.4	6.0	9,187
<b>Region</b>						
Northern	98.2	1,345	69.5	97.4	8.1	1,320
Central	98.5	4,494	68.4	95.0	8.6	4,426
Southern	98.3	4,933	71.2	97.8	1.8	4,847
<b>District</b>						
Blantyre	98.9	724	77.5	96.9	1.9	715
Kasungu	98.0	525	56.4	97.6	20.1	515
Machinga	98.5	441	79.4	98.8	0.9	434
Mangochi	97.9	636	78.4	96.9	3.4	622
Mzimba	98.4	676	70.6	98.0	14.7	665
Salima	98.9	312	79.9	97.6	9.5	308
Thyolo	98.4	575	62.0	98.4	1.9	565
Zomba	97.8	544	78.9	96.9	2.0	532
Lilongwe	98.7	1,489	76.6	94.6	4.0	1,470
Mulanje	97.6	437	68.4	98.9	2.3	427
Other districts	98.3	4,414	64.9	96.0	5.0	4,339
<b>Mother's education</b>						
No education	98.7	2,903	68.0	95.8	6.8	2,865
Primary 1-4	98.0	3,102	69.2	95.9	6.1	3,040
Primary 5-8	98.4	3,637	70.8	97.7	4.2	3,578
Secondary+	98.2	1,127	72.8	96.7	3.9	1,107
<b>Assistance at delivery</b>						
Health professional <sup>3</sup>	98.4	6,145	72.9	97.3	3.4	6,047
Traditional birth attendant	98.5	2,819	66.4	95.8	7.7	2,778
Other	97.8	1,531	65.8	96.0	7.9	1,496
No one	97.6	221	61.3	96.1	16.1	216
<b>Place of delivery</b>						
Health facility	98.4	5,990	72.6	97.2	3.5	5,891
At home	98.1	3,164	66.8	95.2	8.0	3,105
Other	98.7	1,603	65.9	97.4	7.8	1,582
<b>Wealth quintile</b>						
Lowest	98.9	2,099	66.0	96.6	6.5	2,076
Second	98.4	2,426	67.7	95.6	6.0	2,388
Middle	97.9	2,446	70.4	96.3	6.3	2,394
Fourth	98.1	2,091	70.9	97.3	4.8	2,052
Highest	98.4	1,709	75.3	97.5	3.0	1,682
Total	98.3	10,771	69.8	96.6	5.4	10,593

Note: Table is based on all births whether the children are living or dead at the time of interview. Total includes some children with no information on assistance at delivery and place of delivery.

<sup>1</sup> Includes children who started breastfeeding within one hour of birth.

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

<sup>3</sup> Doctor, clinical officer, nurse, midwife, or patient attendant

Table 10.1 shows that almost all (98 percent) children born in the five years preceding the survey were breastfed for some period of time. Almost all of these children were breastfed within 24 hours (97 percent), while 70 percent were breastfed within one hour of birth. There are minor differences according to background characteristics. However, urban children, children who were assisted at delivery by medically-trained health professionals, and those delivered in a health facility are more likely to be breastfed within the recommended one hour of birth. The likelihood of a child being breastfed within one hour after birth is positively related with the mother's education and wealth status.

Only 5 percent of children were given prelacteal feeds (Table 10.1). However, this is more than double the percentage reported in the 2000 MDHS (2 percent). There are variations within subgroups of children. Rural children, children in the Northern and Central Regions, children of less educated mothers, those who were born outside a health facility and in the lower wealth quintiles are more likely than other children to be given prelacteal feeds. Children whose mothers did not receive assistance from anyone during delivery are much more likely to receive prelacteal feeds (16 percent). It is interesting to note that children in Kasungu and Mzimba, both of which are in the Northern Region, are much more likely than children in other districts to be given prelacteal feeds (20 and 15 percent, respectively).

### **10.1.2 Age Pattern of Breastfeeding**

Breast milk contains all the nutrients and fluids needed by the baby in the first six months of life. Supplementing breast milk before six months is not necessary and is strongly discouraged because of the likelihood of contamination and resulting risk of diarrhoeal diseases. Early introduction of liquids and solids reduces breast milk output because the production and release of milk is influenced by the frequency and intensity of suckling. In line with UNICEF and WHO's recommendation, the Ministry of Health recommends that all children should be given breast milk with no supplementary liquid or solid food during the first six months of life. Children should be given solid or semisolid complementary food beginning in the seventh month of life unless medically indicated.

Table 10.2 and Figure 10.1 show data on the breastfeeding status of young children from birth up to three years of age. Table 10.2 shows that virtually all (99 percent) children are breastfed for at least a year. By 16-19 months, 92 percent of children are still breastfeeding and 80 percent are still breastfeeding toward their second birthday. While far fewer children are still being breastfed in the third year, 13 percent of children are still breastfeeding at age 32-35 months.

More than half (53 percent) of children under six months are exclusively breastfed, compared with 45 percent in the 2000 MDHS. This shows great improvement since the early 1990s when exclusive breastfeeding even for the first four months was almost non-existent (3 percent in the 1992 MDHS). The improvement in exclusive breastfeeding could be attributed to the continued support of the Ministry of Health and its key collaborators through programmes such as Baby Friendly Hospital Initiative (BFHI). It should also be noted that the questions about complementary feeding changed somewhat between the surveys.

A large increase is observed in the percentage of children under 4 months of age that are given plain water in addition to breast milk. Twenty-six percent of children 4-5 months are given plain water in 2004 compared with 3 percent in the 2000 MDHS. On the other hand, introduction of complementary foods to children 4-5 months has declined from 80 percent in the 2000 MDHS to 37 percent in the 2004 MDHS survey. These figures suggest that in 2004 children were much more likely to be given plain water than complementary foods as is the case in 2000.

Table 10.2 Breastfeeding status by age

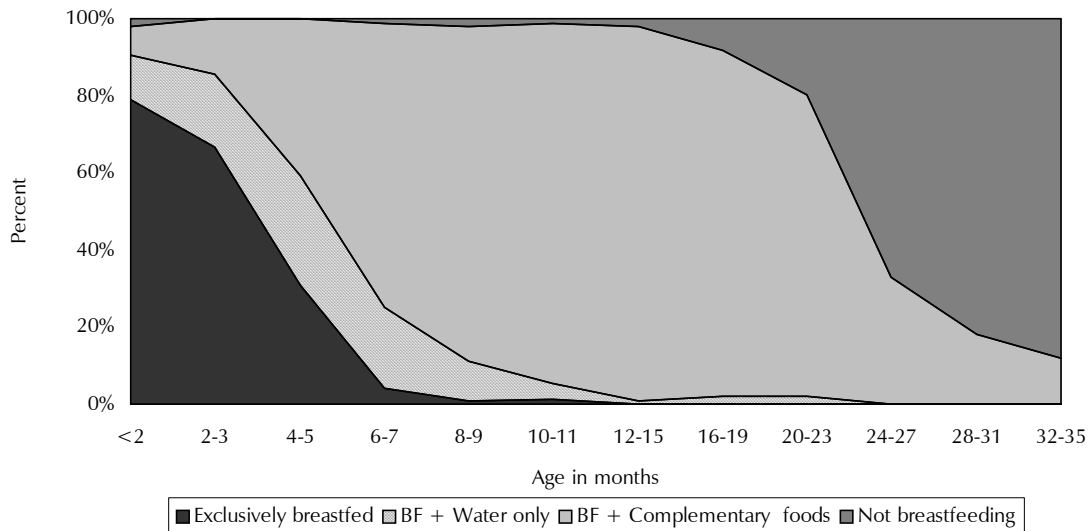
Percent distribution of youngest children under three years living with the mother by breastfeeding status and percentage of children under three years using a bottle with a nipple, according to age in months, Malawi 2004

Age in months	Breastfeeding and consuming:						Total	Number of children	Percentage using a bottle with a nipple <sup>1</sup>	Number of children
	Not breast-feeding	Exclusively breastfed	Plain water only	Water-based liquids/juice	Other milk	Complementary foods				
<2	1.6	75.2	11.2	3.9	1.7	6.5	100.0	316	1.6	326
2-3	0.0	59.2	17.2	6.7	3.9	13.1	100.0	415	2.9	419
4-5	0.5	27.5	26.1	6.6	2.0	37.1	100.0	361	3.4	363
6-7	1.2	3.8	20.0	4.3	0.9	69.9	100.0	416	6.3	420
8-9	1.5	0.9	10.3	1.0	0.0	86.3	100.0	400	4.9	402
10-11	1.2	1.0	4.4	1.9	0.6	91.0	100.0	364	8.2	366
12-15	2.3	0.3	1.1	0.7	0.0	95.5	100.0	783	4.6	795
16-19	7.9	0.3	2.0	0.2	0.2	89.4	100.0	709	5.3	740
20-23	19.7	0.0	1.5	0.0	0.2	78.6	100.0	615	5.0	660
24-27	66.6	0.0	0.3	0.0	0.0	33.1	100.0	465	2.5	584
28-31	82.4	0.1	0.0	0.0	0.0	17.5	100.0	437	3.4	597
32-35	87.4	0.1	0.6	0.0	0.0	11.9	100.0	358	2.2	562
<6	0.6	53.3	18.4	5.9	2.6	19.1	100.0	1,092	2.7	1,109
6-9	1.4	2.4	15.2	2.7	0.5	77.9	100.0	815	5.6	822

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.

<sup>1</sup>Based on all children under three years

**Figure 10.1 Distribution of Children by Breastfeeding (BF) Status, According to Age**



MDHS 2004

Another indicator of infant feeding in Table 10.2 is the percentage of children who are fed using a bottle with a nipple. Bottle-feeding is not recommended in Malawi even when breastfeeding is contraindicated, as when a mother who is HIV positive has chosen replacement feeding. Replacement feeds are supposed to be given using a cup and not a bottle with a nipple. The use of a bottle with a nipple, regardless of the contents requires hygienic handling and causes nipple confusion in breastfeeding children. The 2004 MDHS findings indicate that use of feeding bottles in children under age 6 months has remained at the same level as in the 2000 MDHS (about 3 percent).

Table 10.3 shows that the median duration of breastfeeding in Malawi is 23.2 months, one month shorter than in the 2000 MDHS. The median duration of exclusive breastfeeding is 2.5 months, whereas the median for predominant breastfeeding is 4.8 months, twice as long as that reported in 2000 (2-4 months).

Overall, 98 percent of breastfed children are breastfeeding on demand (six or more times in the last 24 hours) with a median of 8.9 times during the day and 6.6 times at night. There are small differences in the frequency of breastfeeding across background characteristics. However, children in the Northern Region are fed less frequently than children in the Central and Southern regions. For example, children in the Northern Region are fed on average 7.3 times during the day, compared with 9 or more times in the other two regions. Children in Blantyre, Mangochi, Salima, and Lilongwe are in general breastfed more frequently than children in other districts.

Table 10.3 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, Malawi 2004

Background characteristic	Median duration (months) of breastfeeding <sup>1</sup>			Number of children	Breastfeeding children under six months <sup>2</sup>			
	Any breastfeeding	Exclusive breastfeeding	Predominant breastfeeding <sup>3</sup>		Percentage breastfed 6+ times in past 24 hours	Mean number of day feeds	Mean number of night feeds	Number of children
<b>Sex</b>								
Male	23.4	2.1	4.6	3,340	96.8	9.0	6.7	552
Female	23.0	3.0	5.0	3,375	98.4	8.9	6.5	546
<b>Residence</b>								
Urban	22.8	3.2	4.3	910	98.4	9.6	7.1	121
Rural	23.2	2.4	4.9	5,805	97.5	8.9	6.5	977
<b>Region</b>								
Northern	23.1	2.6	5.3	824	97.6	7.3	5.2	127
Central	23.0	2.2	4.6	2,816	97.6	9.3	6.7	482
Southern	23.4	2.8	4.8	3,075	97.6	9.0	6.9	488
<b>District</b>								
Blantyre	23.8	1.3	4.5	440	97.5	11.8	8.5	76
Kasungu	23.3	0.8	5.8	314	95.3	8.0	5.3	52
Machinga	24.6	3.2	4.3	272	96.6	8.0	5.9	50
Mangochi	23.4	3.0	5.5	407	97.2	10.5	8.7	71
Mzimba	23.7	2.1	4.6	413	95.1	7.3	4.8	62
Salima	22.8	1.8	2.9	201	100.0	11.0	7.1	31
Thyolo	23.3	3.4	4.7	351	96.2	6.8	4.5	53
Zomba	23.0	4.0	5.3	337	94.2	6.9	5.6	51
Lilongwe	22.9	3.4	5.0	944	96.3	10.3	7.0	166
Mulanje	22.8	4.0	5.1	273	97.4	8.4	7.8	43
Other districts	22.9	2.1	4.6	2,763	99.3	8.5	6.5	444
<b>Mother's education</b>								
No education	24.1	1.9	4.8	1,697	99.1	8.9	6.7	262
Primary 1-4	23.1	2.6	4.5	1,951	95.0	8.9	6.6	326
Primary 5-8	22.9	2.6	5.1	2,295	98.1	8.9	6.6	387
Secondary+	22.6	3.2	4.7	771	99.4	9.1	6.2	122
<b>Wealth quintile</b>								
Lowest	24.8	2.6	4.6	1,328	95.2	9.1	6.3	227
Second	22.9	2.0	4.4	1,550	98.4	8.5	6.5	267
Middle	23.2	2.2	5.0	1,492	98.2	8.9	6.5	236
Fourth	22.9	3.0	5.2	1,278	98.0	9.0	6.8	202
Highest	22.8	3.2	4.7	1,066	98.3	9.5	6.9	166
Total	23.2	2.5	4.8	6,715	97.6	8.9	6.6	1,098
Mean for all children	23.1	3.6	5.9	na	na	na	na	na

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

na = Not applicable

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

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

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

## 10.2 COMPLEMENTARY FEEDING

Breastfeeding alone is not adequate to meet child's nutritional needs after the age of six months. Mothers are encouraged to introduce adequate, safe and high quality complementary foods to the child after six months. Any food or drink given to a child before six months of age is considered to be a supplement. Complementary foods are only those that are given to the child from six months of age. This is a critical stage as the child is put at increased risk of malnutrition and illness if foods are introduced before six months of age or if foods are exposed to unhygienic conditions. On the other hand, delays in introduction of complementary foods can cause the child's growth to falter. It is recommended that by nine months all children are given complementary foods and from 6-18 months children should be fed meals that are both energy and nutrient dense and easy to digest at least four times daily.

### 10.2.1 Type of Complementary Foods

In Malawi, most of the complementary foods are made from grains or cereal and prepared in the form of porridge where a legume, milk or milk products, meat, and oil may be added to enrich it. Table 10.4 shows that 91 percent of breastfeeding children 6-9 months are fed some semi-solid or solid foods. Most children age 6-9 months receive foods made from grains (73 percent), while 50 percent are fed fruits and vegetables, 16 percent are fed foods made from legumes, and 11 percent receive foods made from roots and tubers. Almost half (48 percent) of children 6-9 months are given fruits and vegetables rich in vitamin A, while over one-fifth are given meat, fish, poultry, or eggs.

The pattern of food consumption among children 6-9 months is similar to that reported in the 2000 MDHS, with a slight decrease in the consumption of foods rich in vitamin A from 54 percent in the 2000 MDHS to 48 percent in the 2004 MDHS and a slight increase in consumption of other fruits and vegetables. The decline in the consumption of food groups like grains, may be partly due to a less detailed questionnaire used in the 2004 MDHS. In the 2000 MDHS, two specific types of foods are listed in the questionnaire, porridge and *thobwa*. These items are not listed separately in 2004. The sharpest percentage change is in the consumption of liquids other than milk.

Only 4 percent of breastfeeding children age 6-9 months were fed infant formula. Effective utilisation of vitamin A in the body requires oil-rich foods. Figures in Table 10.4 show that complementary feeding is still a problem in Malawi, in that consumption of high energy and nutrient dense foods such as legumes, meats, fish eggs, milk and milk products, and oil is very low. This means that children are unable to get the required nutrients from the foods they consume, which may result in long-term nutrition problems.

Table 10.4 Foods consumed by children in the day or night preceding the interview

Percentage of youngest children under three years of age living with the mother who consumed specific foods in the day or night preceding the interview, by breastfeeding status and age, Malawi 2004

Age in months	Infant formula	Other milk/cheese/yoghurt	Other liquids <sup>1</sup>	Food made from grains	Fruits/vegetables <sup>2</sup>	Food made from roots/tubers	Food made from legumes	Meat/fish/shellfish/poultry/eggs	Food made with oil/fat/butter	Fruits and vegetables rich in vitamin A <sup>3</sup>	Any solid or semisolid food	Number of children
BREASTFEEDING CHILDREN												
<2	1.2	4.4	6.2	4.6	1.5	0.4	0.1	1.3	1.4	1.5	8.1	311
2-3	4.2	2.8	10.0	10.6	3.6	1.2	2.7	1.7	1.7	3.6	24.3	415
4-5	3.0	4.7	17.5	30.8	13.1	2.6	7.2	5.6	1.4	12.3	62.1	359
6-7	3.9	7.6	23.0	64.7	38.0	7.0	11.7	16.8	2.1	35.6	87.6	411
8-9	4.4	9.0	25.2	81.6	63.1	15.4	21.1	28.5	4.5	60.2	95.2	394
10-11	5.0	10.5	30.6	86.8	72.6	24.4	26.2	32.9	5.1	69.9	96.8	360
12-15	3.8	11.1	33.2	92.8	85.2	31.0	35.1	39.1	7.7	81.2	99.3	765
16-19	5.4	9.0	30.9	91.8	88.9	35.9	34.7	43.6	6.5	87.5	98.8	653
20-23	3.3	11.2	33.9	93.8	89.2	29.7	36.0	44.7	7.9	87.5	99.0	493
24-35	2.2	9.1	29.6	94.7	91.6	37.3	33.7	39.3	6.0	90.2	98.8	277
<6	2.9	3.9	11.4	15.6	6.1	1.4	3.5	2.9	1.5	5.9	32.1	1,086
6-9	4.2	8.3	24.1	73.0	50.3	11.1	16.3	22.5	3.3	47.6	91.3	804
NONBREASTFEEDING CHILDREN												
<15	(27.2)	(17.4)	(51.0)	(62.3)	(60.2)	(27.3)	(26.9)	(23.4)	(3.0)	(60.2)	(88.6)	40
16-19	13.8	23.8	43.9	97.0	93.7	35.0	35.9	54.4	17.9	92.6	98.1	56
20-23	5.1	13.1	41.9	96.4	91.4	39.9	26.8	57.6	6.5	89.6	100.0	121
24-35	6.1	18.4	39.1	97.2	92.6	42.0	41.3	51.8	7.7	91.1	99.8	982

Note: Breastfeeding status and food consumed refer to a '24-hour' period (yesterday and last night). Figures in parentheses are based on 25-49 un-weighted cases.

<sup>1</sup>Does not include plain water

<sup>2</sup>Includes fruits and vegetables rich in vitamin A

<sup>3</sup>Includes pumpkin, red or yellow yams or squash, carrots, red sweet potatoes, green leafy vegetables, mangoes, papayas, and other locally grown fruits and vegetables that are rich in vitamin A

## 10.2.2 Frequency of Foods Consumed by Children

Table 10.5 shows the frequency of foods consumed by children in the day and night preceding the survey. The table shows that children 6-9 months consumed foods made from grain and fruits and vegetables rich in vitamin A at least once in the past 24 hours. Consumption of other types of foods is very infrequent.

Nonbreastfeeding children are more likely to eat solid food than breastfeeding children. These children on average ate foods made from grains two times a day, fruits and vegetables four times, and fruits and vegetables rich in vitamin A three times a day. Foods which are sources of protein are consumed less than once a day.



Table 10.5 Frequency of foods consumed by children in the day or night preceding the interview

Mean number of times specific foods were consumed in the day or night preceding the interview by youngest children under three years of age living with the mother, according to breastfeeding status and age, Malawi 2004

Age in months	Infant formula	Other milk/cheese/yoghurt	Other liquids <sup>1</sup>	Food made from grains	Fruits/vegetables <sup>2</sup>	Food made from roots/tubers	Food made from legumes	Meat/fish/shellfish/poultry/eggs	Food made with oil/fat/butter	Fruits and vegetables rich in vitamin A <sup>3</sup>	Number of children
BREASTFEEDING CHILDREN											
<2	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	311
2-3	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.1	415
4-5	0.0	0.2	0.3	0.6	0.4	0.0	0.1	0.1	0.0	0.3	359
6-7	0.0	0.1	0.4	1.2	1.0	0.1	0.2	0.2	0.0	0.7	411
8-9	0.1	0.2	0.5	1.6	1.6	0.2	0.3	0.4	0.1	1.3	394
10-11	0.1	0.2	0.6	1.8	2.2	0.3	0.4	0.5	0.1	1.8	360
12-15	0.1	0.2	0.7	2.1	2.8	0.5	0.5	0.6	0.1	2.2	765
16-19	0.1	0.2	0.6	2.1	3.0	0.5	0.5	0.7	0.1	2.5	653
20-23	0.0	0.2	0.8	2.2	3.2	0.4	0.5	0.7	0.1	2.7	493
24-35	0.0	0.1	0.6	2.2	3.3	0.6	0.6	0.6	0.1	2.7	277
<6	0.1	0.1	0.3	0.3	0.2	0.0	0.1	0.0	0.0	0.1	1,086
6-9	0.1	0.2	0.4	1.4	1.3	0.1	0.2	0.3	0.0	1.0	804
NONBREASTFEEDING CHILDREN											
<15	(0.1)	(0.0)	(0.1)	(0.0)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	40
16-19	0.2	0.5	1.0	2.5	4.0	0.7	0.5	0.8	0.3	3.2	56
20-23	0.1	0.3	0.8	2.5	3.5	0.5	0.4	0.9	0.1	2.8	121
24-35	0.1	0.3	0.8	2.4	3.8	0.6	0.6	0.8	0.1	3.1	982

Note: Breastfeeding status and food consumed refer to a 24-hour period (yesterday and last night). Figures in parentheses are based on 25-49 unweighted cases.

<sup>1</sup>Does not include plain water

<sup>2</sup>Includes fruits and vegetables rich in vitamin A

<sup>3</sup>Includes pumpkin, red or yellow yams or squash, carrots, red sweet potatoes, green leafy vegetables, mangoes, papayas, and other locally grown fruits and vegetables rich in vitamin A

### 10.3 MICRONUTRIENTS

In Malawi micronutrient deficiencies of vitamin A, iodine, and iron/folate are public health concerns. According to the 2001 National Micronutrient Survey (MOHP, 2003b), about 60 percent of children under five, 57 percent of nonpregnant women, and 38 percent of men and school-age children have sub-clinical vitamin A deficiency. The survey also reported that 80 percent of children under five, 27 percent of nonpregnant women, and 17 percent of men have anaemia. Sixty percent of anaemia among children under three years of age was due to iron deficiency. The government and its collaborating partners have developed an action plan which promotes supplementation, fortification, and dietary diversification as strategies to deal with micronutrient deficiencies. The 2004 MDHS collected data that will be used to assess the coverage of vitamin A and iron/folate supplementation, consumption of foods rich in vitamin A, and of vitamin A status of mothers through the assessment of night blindness.

### 10.3.1 Micronutrient Intake among Children

Vitamin A is essential for good vision, resistance to infections, growth, and development. Vitamin A is believed to improve immunity and has been shown to contribute to the reduction of morbidity and mortality. The Ministry of Health's policy is to supplement children age 6-59 months with a vitamin A capsule once every six months. Table 10.6 shows that 65 percent of children under age three had consumed fruits and vegetables rich in vitamin A in the 24 hours preceding the survey and 65 percent of children had received a vitamin A capsule in the last six months preceding the survey.

There are small differences in vitamin A supplementation across children's background characteristics. Consumption of foods rich in vitamin A increases with age. Whereas less than half of the children 6-9 months (47 percent) consumed foods rich in vitamin A, nine in ten children 24-35 months did. Non-breastfeeding children, children in urban areas, and children in the highest wealth quintile are more likely to consume foods rich in vitamin A than other children. Vitamin A supplementation is higher than the national average in most of the oversampled districts. However, the coverage is only 53 percent in Machinga and Mzimba.

The coverage of vitamin A supplementation declines after the child's second year of life. This is a reflection of reduced attendance at Growth Monitoring and Promotion Centres where supplementation is done routinely as part of the Expanded Programme on Immuni-

Table 10.6 Micronutrient intake among children

Percentage of youngest children under age three living with the mother who consumed fruits and vegetables rich in vitamin A in the 24 hours preceding the survey, and percentage of children age 6-59 months who received vitamin A supplements in the six months preceding the survey, by background characteristics, Malawi 2004

Background characteristic	Foods rich in vitamin A <sup>1</sup>	Number of children	Vitamin A supplements in the past 6 months	Number of children
<b>Age in months</b>				
<6	5.9	1,092	na	0
6-9	47.2	815	65.8	822
10-11	70.2	364	73.3	366
12-23	85.5	2,107	75.6	2,194
24-35	90.9	1,259	67.5	1,743
36-47	na	0	58.8	1,741
48-59	na	0	55.6	1,802
<b>Sex</b>				
Male	64.3	2,809	65.2	4,281
Female	65.2	2,829	65.6	4,388
<b>Birth order</b>				
1	64.8	1,232	64.6	2,019
2-3	64.4	2,130	66.9	3,197
4-5	65.7	1,242	66.1	1,893
6+	64.6	1,035	62.5	1,560
<b>Breastfeeding status</b>				
Breastfeeding	58.0	4,438	73.0	3,432
Not breastfeeding	89.8	1,186	60.5	5,194
<b>Residence</b>				
Urban	73.5	799	68.3	1,217
Rural	63.3	4,839	64.9	7,451
<b>Region</b>				
Northern	68.2	703	63.9	1,108
Central	63.7	2,323	66.8	3,586
Southern	64.8	2,612	64.6	3,973
<b>District</b>				
Blantyre	62.8	385	68.9	594
Kasungu	64.8	266	60.5	419
Machinga	62.8	229	53.4	355
Mangochi	63.4	331	66.7	495
Mzimba	67.9	360	52.8	567
Salima	60.6	165	79.7	250
Thyolo	70.5	292	65.1	458
Zomba	67.5	290	70.6	448
Lilongwe	66.4	783	67.9	1,210
Mulanje	70.0	223	69.9	332
Other districts	63.2	2,315	65.5	3,541
<b>Mother's education</b>				
No education	63.8	1,405	60.9	2,331
Primary 1-4	62.1	1,610	65.9	2,477
Primary 5-8	66.2	1,937	66.1	2,923
Secondary+	69.0	685	73.1	936
<b>Mother's age at birth</b>				
<20	65.8	1,035	63.5	1,779
20-24	64.7	1,971	68.1	2,967
25-29	62.7	1,187	66.4	1,774
30-34	66.8	777	63.7	1,152
35-49	64.9	668	61.2	997
<b>Wealth quintile</b>				
Lowest	58.6	1,100	60.8	1,660
Second	64.3	1,271	64.5	1,901
Middle	65.5	1,242	66.1	1,970
Fourth	65.4	1,092	67.7	1,710
Highest	71.0	933	68.3	1,427
Total	64.8	5,638	65.4	8,668

Note: Information on vitamin A supplements is based on mother's recall. Total includes some children with missing information on breastfeeding status.  
na = Not applicable

<sup>1</sup>Includes pumpkin, red or yellow yams or squash, carrots, red sweet potatoes, green leafy vegetables, mango, papaya, and other locally grown fruits and vegetables that are rich in vitamin A

zation (EPI). It has been established that most children above two years of age do not attend under-five clinics regularly. The Ministry of Health and its partners complement routine services with campaigns or child health days to achieve the target that 80 percent of children under five receive vitamin A supplementation every six months by 2009.

### 10.3.2 Micronutrient Intake among Women

Provision of vitamin A supplements to women after delivery of a child is intended to boost stores and ensure adequate delivery of this essential micronutrient to the child in breast milk. In the 2004 MDHS, women who had a live birth in the five years before the survey were asked whether they had received a vitamin A supplement in the two-month period after delivery of their last child.<sup>1</sup> The women were also asked whether they had experienced any vision problems during the night time and (in a separate question) during the day.<sup>2</sup> Night blindness in pregnancy is a common manifestation of vitamin A deficiency (VAD).

Table 10.7 shows that 41 percent of women received a vitamin A supplement during the postnatal period. This is the same level as that reported in the 2000 MDHS. Variations in postpartum vitamin A supplementation by age of the mother and child's birth order are minimal. Supplementation is higher in urban areas, in the Northern Region, among women with more education, and among women in the higher wealth quintiles. Larger variations are found among the districts, ranging from 32 percent in Lilongwe to 53 percent in Mzimba.

Table 10.7 also shows that about 6 percent of women with a recent birth experienced night blindness, an indicator of VAD. The small percentages make it difficult to examine variations among subgroups of women.

Iron-deficiency anaemia is a major threat to maternal health; it contributes to low birth weight, lowered resistance to infection, poor cognitive development, and decreased work capacity. Further, anaemia increases morbidity from infections because it adversely affects the body's immune response. The 2004 MDHS collected data from women who had a recent birth about whether they had received or purchased any iron tablets during their last pregnancy. If so, the woman was asked to report the number of days that the tablets were actually taken during that pregnancy. Interviewers assisted the respondent in converting responses provided on a daily or weekly basis to total number of days over the course of the pregnancy. Table 10.7 shows that 18 percent of women reported taking iron supplements on at least 90 days during the pregnancy, as recommended. This is an increase from 12 percent reported in the 2000 MDHS. Iron supplementation coverage is highest in Thyolo (24 percent) and lowest in Salima and Mangochi (7 and 10 percent, respectively).

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<sup>1</sup>When the question was asked, the interviewer showed a vitamin A capsule to the respondent.

<sup>2</sup>Women are considered to experience night blindness if they report vision problems during the night, but not during the day.

Table 10.7 Micronutrient intake among mothers

Percentage of women with a birth in the five years preceding the survey who received a vitamin A dose in the first two months after delivery, percentage who reported night blindness during pregnancy, and percentage who took iron tablets for specific number of days, by background characteristics, Malawi 2004

Background characteristic	Received vitamin A dose postpartum <sup>1</sup>	Night blindness during pregnancy		Number of days iron tablets taken during pregnancy				Number of women
		Reported	Adjusted <sup>2</sup>	None	<60	60-89	90+	
<b>Age at birth</b>								
<20	40.1	4.9	1.6	19.4	48.8	10.7	18.3	1,293
20-24	41.2	5.1	1.2	16.9	49.3	11.3	19.0	2,429
25-29	41.4	6.1	1.0	23.5	47.3	11.1	15.6	1,545
30-34	40.7	5.7	1.1	23.9	44.5	12.6	16.0	1,005
35-49	41.1	8.6	1.3	22.7	45.3	9.9	18.3	1,000
<b>Number of children ever born</b>								
1	39.5	4.6	1.3	17.5	47.5	11.7	20.8	1,518
2-3	41.7	5.1	1.2	19.1	49.1	11.2	17.0	2,659
4-5	40.8	5.7	1.2	22.8	47.3	10.7	15.7	1,622
6+	41.4	8.4	1.3	23.6	45.1	10.9	17.6	1,473
<b>Residence</b>								
Urban	45.1	2.2	0.4	16.3	41.6	15.1	20.8	1,041
Rural	40.3	6.4	1.4	21.2	48.6	10.5	17.1	6,231
<b>Region</b>								
Northern	53.0	4.6	0.9	8.7	55.8	10.0	19.9	924
Central	35.9	7.0	1.4	24.0	46.9	10.4	16.1	2,959
Southern	42.1	5.1	1.2	20.7	46.0	12.1	18.4	3,389
<b>District</b>								
Blantyre	50.3	3.1	0.9	21.4	47.2	12.1	16.5	520
Kasungu	42.5	5.6	0.9	15.9	59.9	10.2	10.2	330
Machinga	39.9	3.7	1.0	27.2	39.1	12.4	19.7	284
Mangochi	42.3	6.8	1.9	29.4	49.4	6.8	9.8	411
Mzimba	53.2	3.8	0.8	8.5	60.9	12.9	12.6	464
Salima	43.9	5.8	1.5	25.8	59.4	6.6	7.1	199
Thyolo	41.9	6.0	1.8	15.0	42.0	17.0	23.9	386
Zomba	45.5	5.1	0.3	15.5	48.2	14.1	16.6	389
Lilongwe	32.3	6.9	0.9	27.8	40.4	11.4	17.2	1,013
Mulanje	36.6	4.3	1.3	17.6	54.2	10.0	16.1	296
Other districts	39.7	6.6	1.5	19.7	46.4	10.4	20.7	2,981
<b>Education</b>								
No education	36.4	6.9	1.1	27.8	43.1	9.7	16.7	1,885
Primary 1-4	38.1	7.4	1.6	21.6	48.8	10.9	16.2	2,021
Primary 5-8	44.3	4.7	1.2	16.4	50.7	11.5	18.0	2,485
Secondary+	48.3	2.9	0.8	14.2	45.4	13.8	22.0	880
<b>Wealth quintile</b>								
Lowest	34.5	7.3	1.7	22.8	47.4	9.2	18.0	1,380
Second	39.5	6.3	1.3	24.1	48.8	10.4	14.8	1,579
Middle	41.5	7.4	1.6	20.7	50.0	10.3	16.1	1,610
Fourth	43.2	4.3	0.8	18.4	48.2	11.7	18.5	1,432
Highest	46.8	3.2	0.7	15.7	42.5	14.6	21.8	1,271
Total	41.0	5.8	1.2	20.5	47.6	11.1	17.6	7,271

Note: For women with two or more live births in the five-year period, data refer to the most recent birth.

<sup>1</sup> In the first two months after delivery

<sup>2</sup> Women who reported night blindness but did not report difficulty with vision during the day

## 10.4 PREVALENCE OF ANAEMIA IN CHILDREN

Anaemia is a serious concern for young children because it can result in impaired cognitive performance, behavioural and motor development, coordination, language development, and scholastic achievement, as well as increased morbidity from infectious diseases. Information on the prevalence of anaemia can be useful for the development of health intervention programmes designed to prevent anaemia, such as iron fortification programmes.

Table 10.8 shows that 73 percent of children age 6-59 months are anaemic, 26 percent have mild anaemia, 42 percent with moderate anaemia, while 5 percent showed severe anaemia. No substantial differences were reported among girls and boys. However, the level of severe anaemia decreases with the age of the child. For example, 19 percent of children age 10-11 months were found to be severely anaemic compared to 2 percent among children age 48-59 months. Anaemia is related to the child's birth order and the interval with their older siblings. First births tend to have severe anaemia compared with their siblings. Similarly, children of sixth or higher birth order and children born 48 months or more after a previous sibling are more likely to have severe anaemia. Children from rural areas, children in the Central Region, children whose mother have no education, and children of young mothers are more susceptible to severe anaemia compared with other children. Severe anaemia is most prevalent in Thyolo, Lilongwe, and Salima Districts (7 percent or higher).

Background characteristic	Any anaemia	Anaemia status			Number of children
		Mild (10.0-10.9 g/dl)	Moderate (7.0-9.9 g/dl)	Severe (below 7.0 g/dl)	
<b>Age in months</b>					
6-9	91.3	15.9	62.4	13.0	160
10-11	88.0	21.2	47.5	19.4	82
12-23	83.8	20.8	55.7	7.3	552
24-35	73.6	27.6	43.0	3.0	446
36-47	62.5	28.1	33.0	1.3	471
48-59	62.2	34.7	25.7	1.8	463
<b>Sex</b>					
Male	73.9	25.4	43.4	5.0	1,060
Female	72.5	27.3	40.6	4.6	1,113
<b>Birth order<sup>1</sup></b>					
1	74.2	29.8	37.6	6.7	393
2-3	73.9	22.9	47.1	3.9	720
4-5	73.4	27.8	41.1	4.5	471
6+	75.0	24.5	43.3	7.2	372
<b>Birth interval in months</b>					
First birth <sup>2</sup>	74.1	29.6	37.8	6.7	396
<24	72.0	26.9	41.6	3.5	226
24-47	73.5	24.5	44.4	4.6	980
48+	76.6	24.3	46.0	6.3	354
<b>Residence</b>					
Urban	65.4	22.8	40.8	1.8	231
Rural	74.1	26.8	42.1	5.2	1,942
<b>Region</b>					
Northern	71.7	29.5	38.9	3.2	309
Central	74.0	26.6	42.1	5.3	824
Southern	73.0	25.3	42.8	4.9	1,040

Continued ...

Table 10.8 Prevalence of anaemia in children (continued)

Percentage of children age 6-59 months classified as having anaemia, by background characteristics, Malawi 2004

Background characteristic	Any anaemia	Anaemia status			Number of children
		Mild (10.0-10.9 g/dl)	Moderate (7.0-9.9 g/dl)	Severe (below 7.0 g/dl)	
<b>District</b>					
Blantyre	69.0	26.8	36.7	5.6	128
Kasungu	74.9	26.3	46.0	2.7	116
Machinga	71.1	20.8	44.2	6.1	93
Mangochi	73.0	25.8	44.3	2.9	131
Mzimba	73.6	29.3	41.4	2.9	159
Salima	81.9	27.9	47.1	6.9	68
Thyolo	70.0	22.2	40.0	7.9	109
Zomba	76.4	22.9	47.6	5.9	119
Lilongwe	72.8	21.4	44.7	6.7	180
Mulanje	80.3	26.7	51.0	2.7	86
Other districts	72.5	28.2	39.7	4.6	985
<b>Mother's education</b>					
No education	75.4	24.3	44.9	6.2	560
Primary 1-4	77.6	29.2	44.6	3.8	573
Primary 5-8	72.2	24.4	42.3	5.5	681
Secondary+	64.5	26.0	33.8	4.7	200
<b>Mother's age<sup>3</sup></b>					
15-19	80.2	22.2	46.3	11.7	115
20-24	75.6	24.8	46.1	4.7	625
25-29	70.5	24.6	42.3	3.7	532
30-34	72.4	31.3	34.5	6.6	373
35-49	75.4	25.8	45.2	4.4	371
<b>Mother's status</b>					
Mother interviewed	74.0	25.8	43.0	5.2	1,956
Mother not interviewed, but in household	68.9	31.1	35.8	1.9	60
Mother not interviewed, and not in household <sup>4</sup>	64.2	31.9	31.5	0.8	158
<b>Wealth quintile</b>					
Lowest	78.2	27.3	45.8	5.1	414
Second	77.2	25.0	45.5	6.7	490
Middle	72.6	24.9	42.5	5.3	537
Fourth	72.4	28.1	39.8	4.6	454
Highest	60.9	27.6	32.7	0.6	280
Total	73.2	26.4	42.0	4.8	2,173

Note: Table is based on children who stayed in the household the night before the interview in a subsample of households. Prevalence is adjusted for altitude using formulas recommended by CDC (CDC, 1989).

g/dl = grams per deciliter

<sup>1</sup>Excludes children whose mothers were not interviewed

<sup>2</sup>First born twins (triplets, etc.) are counted as first births because they do not have a previous birth interval.

<sup>3</sup>For women who are not interviewed, information is taken from the Household Questionnaire. Excludes children whose mothers are not listed in the household schedule

<sup>4</sup>Includes children whose mothers are deceased

### 10.4.1 Prevalence of Anaemia in Women

A woman's nutritional status has important implications for the health status of the woman herself as well as that of her children. A woman who has poor nutritional status has a greater risk of adverse pregnancy outcomes as well as underweight babies. Table 10.9 shows that 44 percent of women are anaemic; 32 percent have mild anaemia, 11 percent have moderate anaemia, and 2 percent have severe anaemia. There are small differences in severe the levels of anaemia by the woman's background characteristics.

### 10.4.2 Prevalence of Anaemia in Children by Anaemia Status of Mother

Mother's nutritional status is strongly associated with their children's. Table 10.10 shows that among the children who are anaemic, 82 percent have mothers who are anaemic. Mother's severity of anaemia is consistent with their children's. For instance, children with mild anaemia tend to have mothers with mild anaemia, and children with moderate anaemia tend to have mothers with moderate anaemia.

Table 10.9 Prevalence of anaemia in women

Percentage of women age 15-49 with anaemia, by background characteristics, Malawi 2004

Background characteristic	Any anaemia	Anaemia status			Number of women
		Mild	Moderate	Severe	
<b>Age<sup>1</sup></b>					
15-19	42.2	28.9	10.5	2.7	506
20-24	42.0	30.2	10.4	1.5	649
25-29	41.1	30.0	10.3	0.9	478
30-34	47.7	36.2	9.6	1.9	341
35-39	49.9	34.5	12.2	3.2	265
40-44	47.4	36.4	10.4	0.5	218
45-49	49.5	35.7	12.8	1.1	162
<b>Children ever born<sup>2</sup></b>					
None	45.6	29.6	12.7	3.2	488
1	38.9	25.5	12.6	0.8	399
2-3	44.2	33.6	9.1	1.5	690
4-5	42.8	32.4	8.7	1.7	522
6+	49.0	36.5	11.0	1.4	521
<b>Preganacy/breastfeeding status<sup>2</sup></b>					
Pregnant	47.3	22.5	22.9	1.9	352
Breastfeeding	41.5	33.3	6.5	1.6	1,022
Neither	45.8	33.5	10.5	1.8	1,246
<b>Residence</b>					
Urban	38.8	24.8	12.4	1.6	375
Rural	45.2	33.2	10.3	1.8	2,246
<b>Region</b>					
Northern	47.4	36.0	10.2	1.2	431
Central	41.7	30.2	9.7	1.8	946
Southern	45.3	31.9	11.5	1.9	1,243
<b>District</b>					
Blantyre	31.5	22.8	7.4	1.3	198
Kasungu	39.2	24.9	11.4	2.9	128
Machinga	44.8	29.6	11.4	3.8	110
Mangochi	52.5	35.8	14.3	2.5	135
Mzimba	47.2	36.7	9.8	0.7	203
Salima	47.6	32.9	12.3	2.4	83
Thyolo	43.2	31.1	10.4	1.8	144
Zomba	44.0	35.3	8.3	0.5	132
Lilongwe	42.1	28.2	11.3	2.6	215
Mulanje	47.0	33.0	13.6	0.5	110
Other Districts	45.6	33.6	10.5	1.6	1,162
<b>Education<sup>1</sup></b>					
No education	46.8	33.8	10.1	2.9	637
Primary 1-4	47.2	34.2	11.4	1.5	662
Primary 5-8	41.4	30.1	10.1	1.3	948
Secondary+	42.3	29.6	11.5	1.3	372
<b>Wealth quintile</b>					
Lowest	43.9	33.4	8.1	2.4	443
Second	45.6	33.7	10.6	1.3	530
Middle	45.4	33.1	10.2	2.1	571
Fourth	44.5	30.9	12.2	1.4	570
Highest	41.8	28.9	11.4	1.5	506
Total	44.3	32.0	10.6	1.7	2,620

Note: Table is based on women who stayed in the household the night before the interview. Prevalence is adjusted for altitude and for smoking status if known, using CDC formulas (CDC, 1989). Women with <7.0 g/dl of haemoglobin have severe anaemia, women with 7.0-9.9 g/dl have moderate anaemia, and pregnant women with 10.0-10.9 g/dl and nonpregnant women with 10.0-11.9 g/dl have mild anaemia. Total includes five cases with missing information on mother's smoking status.

<sup>1</sup> For women who are not interviewed, information is taken from the Household Questionnaire.

<sup>2</sup> Excludes women who were not interviewed.

Table 10.10 Prevalence of anaemia in children by anaemia status of mother

Percentage of children age 6-59 months classified as having anaemia, by anaemia status of mother, Malawi 2004

Anaemia status of mother	Any anaemia	Anaemia status of child			Number of children
		Mild (10.0-10.9 g/dl)	Moderate (7.0-9.9 g/dl)	Severe (below 7.0 g/dl)	
Any anaemia	81.4	26.1	49.0	6.3	737
<b>Anaemia status</b>					
Mild anaemia	81.3	28.2	47.1	6.0	571
Moderate anaemia	83.3	20.3	56.2	6.7	145
Severe anaemia	(72.3)	(10.1)	(51.5)	(10.7)	21
Total	73.8	25.7	43.3	4.7	1,756

Note: Table is based on children who stayed in the household the night before the interview. Prevalence is adjusted for altitude (and for smoking in the case of mothers with information on smoking status) using formulas in CDC, 1989. Table includes only cases with anaemia measurements for both mothers and children. Figures in parentheses are based on 25-49 unweighted cases.

## 10.5 NUTRITIONAL STATUS

### 10.5.1 Nutritional Status of Children

Nutritional status is an important health indicator as it allows evaluation of the susceptibility of the population to disease, impaired mental development, and early death. Three standard indicators of growth for children are used in this report, based on the relationship between height, weight, and age. The indicators are height-for-age, weight-for-height, and weight-for-age. A child is considered stunted if he is too short for his age, which indicates chronic undernutrition, typically due to poor nutrition over an extended period. A child is considered wasted if he is too thin, i.e., weighs too little for his height. Wasting is an indicator of acute or recent nutritional deficits and is closely tied to mortality risk. Finally, a child is considered underweight if he weighs too little for his age. A child can be underweight for his age because he is stunted, wasted, or both.

To allow standardised measurement over time and between settings, height and weight data are routinely compared to a reference population. The World Health Organisation (WHO) recommends using the child population data maintained by the NCHS (U.S. National Center for Health Statistics) as reference. 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. The data from the reference population have been normalised to produce a distribution in which the mean coincides with the median. The use of the international reference population is based on the finding that well-nourished children of all population groups for which data exist follow very similar growth patterns before puberty.

A presentation of anthropometric status of young children complements the information on feeding practices. Nutritional status, along with mortality rates, represents an outcome measure. The status of a child with regard to stunting, wasting, and underweight is determined by how many statistical units, called standard deviations, the child is measured below the mean of the NCHS reference population. If a child is between two and three standard deviations below the mean, the child is considered moderately malnourished (stunted, wasted, or underweight); if



the child is three or more standard deviations below the mean, the child is considered severely malnourished.

In the 2004 MDHS, the height and weight of children under age five were measured in order to estimate their nutritional status. Table 10.11 shows that 48 percent of children under five in Malawi are stunted, or too short for their age, 5 percent of children are wasted or too thin, and 22 percent are underweight. Data in Table 10.11 indicate further that 22 percent of children are severely stunted. Children's nutritional status in 2004 is similar to the status in 1992 and 2000, indicating that there has been no improvement in the nutritional status of children under five since 1992.

In general, there are only small differences in nutritional status between boys and girls. However, stunting varies substantially across subgroups of children. Older children, children born less than 24 months after their older sibling, children whose birth size is small, children who live in rural areas or in the Central Region, children whose mothers have less education, children not living with their mothers, and children in the lower wealth quintiles are more likely than other children to be stunted. Stunting ranges from 42 percent in Zomba to 56 percent in Kasungu.

Variations in wasting across subgroups of children are less notable than those for stunting. Variations in underweight, however, are more apparent. For example, children whose mothers are uneducated are twice as likely to be underweight as children whose mothers have secondary or higher education (26 and 13 percent, respectively). Similarly, children in the lowest wealth quintile are twice as likely to be underweight as children in the highest quintile (28 and 13 percent, respectively).

Table 10.11 Nutritional status of children

Percentage of children under five years classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by background characteristics, Malawi 2004

Background characteristic	Height-for-age			Weight-for-height			Weight-for-age			Number of children
	Percentage below -3 SD	Percentage below -2 SD <sup>1</sup>	Mean Z-score (SD)	Percentage below -3 SD	Percentage below -2 SD <sup>1</sup>	Mean Z-score (SD)	Percentage below -3 SD	Percentage below -2 SD <sup>1</sup>	Mean Z-score (SD)	
<b>Age in months</b>										
<6	1.9	11.6	(0.3)	0.9	4.0	0.7	0.5	2.1	0.4	758
6-9	7.2	28.6	(1.1)	3.2	6.9	0.2	3.1	18.2	(0.7)	657
10-11	15.4	40.3	(1.6)	2.0	10.7	(0.1)	7.1	32.4	(1.3)	299
12-23	30.3	60.7	(2.2)	1.8	6.8	(0.1)	7.4	28.8	(1.4)	1,886
24-35	24.2	47.7	(1.9)	1.9	5.3	(0.1)	5.4	25.1	(1.2)	1,588
36-47	24.8	52.9	(2.0)	1.1	3.1	0.1	3.9	20.3	(1.2)	1,645
48-59	25.0	53.5	(2.1)	1.3	4.1	0.0	3.1	21.8	(1.3)	1,689
<b>Sex</b>										
Male	23.8	50.0	(1.9)	1.9	5.5	0.0	4.5	22.4	(1.1)	4,221
Female	20.7	45.6	(1.8)	1.4	4.8	0.1	4.5	21.6	(1.0)	4,299
<b>Birth order<sup>2</sup></b>										
1	19.4	47.1	(1.8)	1.8	5.5	0.1	4.6	21.5	(1.1)	1,666
2-3	20.8	45.4	(1.8)	1.9	5.7	0.1	4.3	20.7	(1.0)	2,916
4-5	23.3	50.1	(1.9)	1.6	5.1	0.0	4.4	24.0	(1.1)	1,758
6+	24.4	48.7	(1.9)	0.9	4.0	0.0	5.5	23.1	(1.1)	1,433
<b>Birth interval in months<sup>2</sup></b>										
First birth <sup>3</sup>	19.7	47.4	(1.8)	1.8	5.5	0.1	4.6	21.6	(1.1)	1,681
<24	28.2	51.6	(2.0)	0.9	5.3	0.1	4.8	24.4	(1.1)	823
24-47	21.6	47.7	(1.8)	1.8	5.3	0.0	4.7	22.4	(1.1)	3,797
48+	20.7	44.6	(1.7)	1.5	4.5	0.1	4.0	20.4	(1.0)	1,471
<b>Size at birth<sup>2</sup></b>										
Very small	26.7	53.2	(2.0)	1.7	9.0	(0.3)	10.5	35.7	(1.4)	240
Small	27.2	54.6	(2.1)	2.8	6.3	(0.1)	7.6	31.7	(1.4)	853
Average or larger	20.6	46.1	(1.8)	1.5	5.0	0.1	3.9	20.2	(1.0)	6,502
<b>Residence</b>										
Urban	15.8	37.8	(1.5)	1.6	5.9	0.0	3.2	16.8	(0.9)	1,071
Rural	23.1	49.2	(1.9)	1.6	5.1	0.1	4.7	22.8	(1.1)	7,449
<b>Region</b>										
Northern	19.0	42.4	(1.6)	1.2	5.9	0.1	4.3	17.7	(1.0)	1,210
Central	24.8	52.7	(2.0)	0.9	3.6	0.2	4.2	22.5	(1.1)	3,330
Southern	21.1	45.3	(1.8)	2.4	6.3	(0.0)	4.9	23.0	(1.1)	3,980
<b>District</b>										
Blantyre	18.1	40.2	(1.6)	2.8	4.8	0.1	3.6	17.0	(0.9)	579
Kasungu	27.0	56.1	(2.1)	0.8	4.0	0.2	5.1	21.3	(1.1)	447
Machinga	19.6	44.8	(1.7)	1.4	6.0	(0.1)	3.8	21.4	(1.1)	376
Mangochi	24.2	48.3	(2.0)	0.1	2.5	0.1	5.7	23.6	(1.2)	512
Mzimba	23.0	46.8	(1.8)	1.1	4.1	0.3	4.2	17.9	(0.9)	614
Salima	23.8	49.3	(2.0)	1.0	5.2	0.3	4.9	20.6	(1.0)	264
Thyolo	24.3	48.1	(1.8)	3.1	8.7	(0.1)	5.0	22.2	(1.1)	414
Zomba	19.8	42.3	(1.6)	2.6	7.6	0.1	3.6	22.0	(1.0)	476
Lilongwe	24.3	52.3	(1.9)	1.1	4.7	0.1	3.0	24.5	(1.1)	952
Mulanje	23.3	50.5	(1.9)	1.9	6.0	(0.1)	6.4	26.5	(1.2)	329
Other districts	21.5	47.5	(1.8)	1.7	5.1	0.0	4.9	22.5	(1.1)	3,557

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Table 10.11 Nutritional status of children (continued)

Percentage of children under five years classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by background characteristics, Malawi 2004

Background characteristic	Height-for-age			Weight-for-height			Weight-for-age			Number of children
	Percent-age below -3 SD	Percent-age below -2 SD <sup>1</sup>	Mean Z-score (SD)	Percent-age below -3 SD	Percentage below -2 SD <sup>1</sup>	Mean Z-score (SD)	Percent-age below -3 SD	Percent-age below -2 SD <sup>1</sup>	Mean Z-score (SD)	
<b>Mother's education<sup>4</sup></b>										
No education	25.6	52.4	(2.0)	2.1	5.8	(0.0)	6.6	26.2	(1.2)	2,130
Primary 1-4	25.2	52.2	(1.9)	1.8	5.3	0.1	4.2	24.4	(1.1)	2,276
Primary 5-8	18.6	43.8	(1.7)	1.4	4.8	0.1	4.1	19.2	(1.0)	2,718
Secondary+	13.0	33.1	(1.4)	1.2	4.8	0.1	2.1	12.9	(0.8)	841
<b>Mother's age<sup>4</sup></b>										
15-19	15.6	41.6	(1.5)	2.8	7.3	0.1	4.1	21.9	(0.9)	493
20-24	21.4	46.9	(1.8)	1.7	5.1	0.1	4.9	21.0	(1.0)	2,510
25-29	20.0	46.5	(1.8)	1.7	5.4	0.0	3.4	20.6	(1.1)	2,171
30-34	24.6	51.0	(1.9)	1.6	5.5	0.0	5.9	25.0	(1.2)	1,321
35-49	24.5	48.1	(1.9)	1.2	4.1	0.0	4.9	22.6	(1.2)	1,475
<b>Mother's status</b>										
Mother interviewed	21.7	47.4	(1.8)	1.6	5.2	0.1	4.6	22.1	(1.1)	7,773
Mother not interviewed, but in household	22.5	44.4	(1.8)	2.1	5.4	0.2	5.2	14.4	(0.9)	196
Mother not interviewed, and not in household <sup>5</sup>	29.1	53.9	(2.0)	0.9	4.2	0.1	3.8	24.2	(1.1)	551
<b>Wealth quintile</b>										
Lowest	29.2	53.9	(2.1)	2.2	6.1	(0.0)	7.1	28.4	(1.3)	1,680
Second	24.7	53.1	(2.0)	1.7	5.1	0.1	4.7	24.4	(1.1)	1,813
Middle	24.3	51.8	(1.9)	1.5	4.6	0.1	4.2	22.8	(1.1)	1,916
Fourth	18.5	44.4	(1.7)	1.3	5.0	0.0	4.0	20.1	(1.0)	1,732
Highest	12.2	32.0	(1.4)	1.5	4.9	0.1	2.4	12.6	(0.8)	1,380
Total	22.2	47.8	(1.8)	1.6	5.2	0.1	4.5	22.0	(1.1)	8,520

Note: Table is based on children who stayed in the household the night before the interview. Each of the indices is expressed in standard deviation units (SD) from the median of the NCHS/CDC/WHO International Reference Population. The percentage of children who are more than three or more than two standard deviations below the median of the International Reference Population (-3 SD and -2 SD) are shown according to background characteristics. Table is based on children with valid dates of birth (month and year) and valid measurement of both height and weight. Figures in parentheses are based on 25-49 unweighted cases.

<sup>1</sup>Includes children who are below -3 standard deviations (SD) from the International Reference Population median.

<sup>2</sup>Excludes children whose mothers were not interviewed

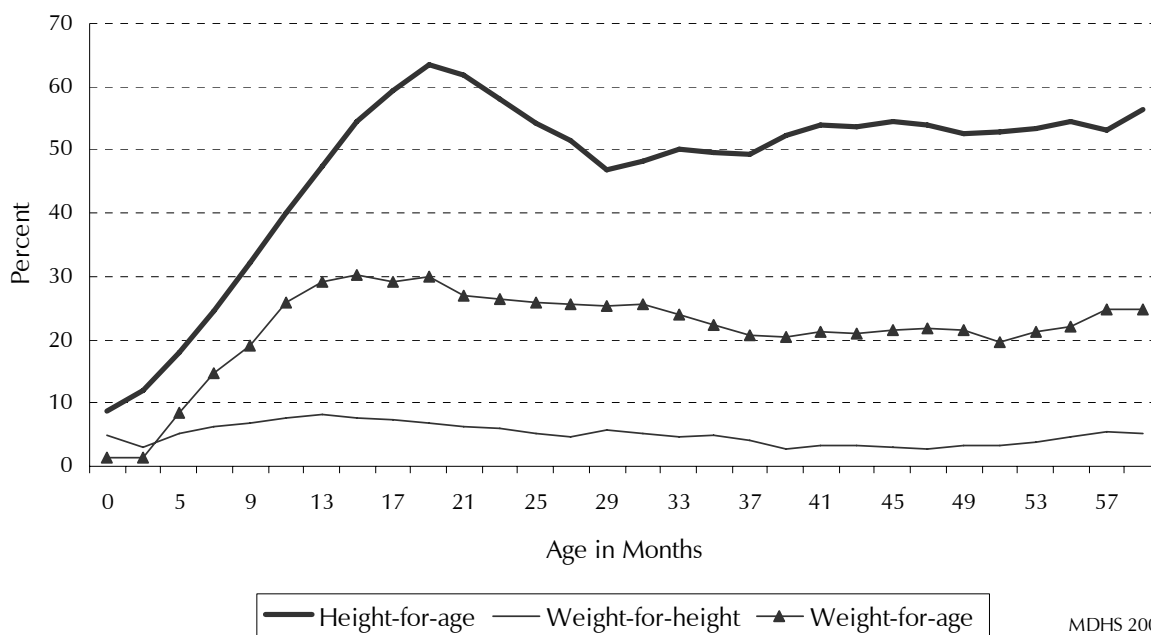
<sup>3</sup>First born twins (triplets, etc.) are counted as first births because they do not have a previous birth interval.

<sup>4</sup>For women who are not interviewed, information is taken from the Household Questionnaire. Excludes children whose mothers are not listed in the household schedule.

<sup>5</sup>Includes children whose mothers are deceased

Figure 10.2 shows the percentage of children under age five who are stunted, wasted, and underweight by age in months. Stunting is lowest among children under six months and peaks at age 18-19 months (63 percent). Wasting is highest at age 10-15 months (8 percent), after which it fluctuates between 3-6 percent. The extent of underweight is less than 10 percent among children under 6 months and is highest among children 12-10 months (30 percent).

**Figure 10.2 Percentage of Children with Low Height-for-Age, Weight-for-Height, and Weight-for-Age, by Age of Child**



MDHS 2004

## 10.6 NUTRITIONAL STATUS OF WOMEN

Data on height and weight of all women aged 15-49 were collected in the 2004 MDHS to assess the nutritional status of women. Two indices are used, namely height and body mass index (BMI) which combines the height and weight measures. A woman's height is related to socio-economic status and nutrition during childhood and adolescence. Maternal height is also used to predict the risk of difficult delivery; small stature is always associated with small pelvis size and the potential for obstructed labour (NSO and ORC Macro, 2001). The risk of low birth weight is also increased in short women. The optimal cutoff point, below which a woman is identified as at risk, is in the range of 140 to 150 centimetres.

The nutritional status of women in Malawi has remained constant since 2000; the mean height of mothers is 156 centimetres and 3 percent of women are less than 145 centimetres in height (Table 10.12). The table also shows that women's height varies little according to their background characteristics.

To assess thinness and obesity the report uses the body mass index, defined as the weight in kilograms divided by the squared height in metres. A lower cut off point of 18.5 is used to define chronic energy deficiency. The table shows that the mean BMI among the weighed and measured women is 22, with 77 percent of women classified as normal. Nine percent of women have a BMI below 18.5, signifying a nutritional deficit.

Table 10.12 shows that rural women are almost twice as likely to be thin as urban women. Women in the Southern Region and women in Mangochi and Mulanje are more likely to be thin compared with women in other districts (see Figure 10.3). Women in the highest wealth quintile, on the other hand, are the least likely to be thin compared with other women.

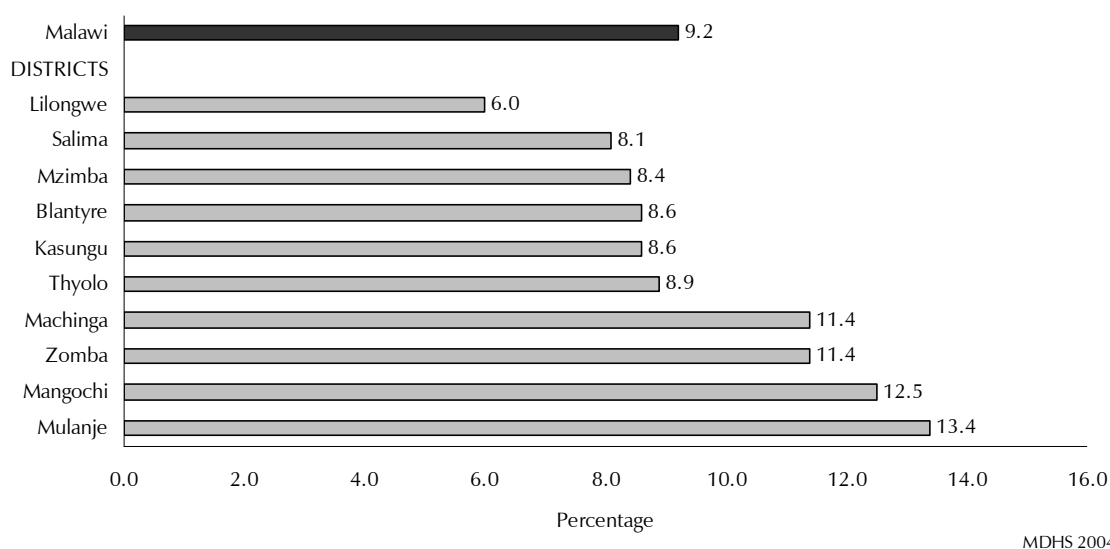
Table 10.12 Nutritional status of women

Among women age 15-49, mean height, percentage under 145 cm, mean body mass index (BMI), and percentage with specific BMI levels, by background characteristics, Malawi 2004

Background characteristic	Height			BMI (kg/m <sup>2</sup> )									Number of women
	Mean	Percentage <145 cm	Number of women	Mean BMI	18.5-24.9 (normal)	<18.5 (thin)	17.0-18.4 (mildly thin)	16.0-16.9 (moderately thin)	<16.0 (severely thin)	≥25.0 (overweight or obese)	25.0-29.9 (overweight)	≥30.0 (obese)	
<b>Age</b>													
15-19	154.4	4.7	2,212	21.0	79.7	13.8	9.1	2.8	1.9	6.5	5.6	0.8	1,911
20-24	155.8	2.3	2,658	21.8	81.4	8.1	6.2	1.3	0.7	10.4	9.2	1.3	2,097
25-29	156.1	3.2	2,018	22.0	79.5	7.3	5.8	1.1	0.4	13.1	11.4	1.7	1,667
30-34	156.5	2.8	1,386	22.3	76.0	8.0	5.9	1.4	0.7	16.1	13.4	2.7	1,139
35-39	156.3	2.7	1,063	22.8	69.5	8.4	6.9	0.8	0.7	22.2	17.5	4.6	956
40-44	156.9	2.0	868	22.8	69.5	8.8	6.6	1.6	0.6	21.7	15.9	5.8	821
45-49	156.2	3.5	706	22.5	72.2	8.5	6.1	1.4	1.0	19.3	14.4	4.8	689
<b>Residence</b>													
Urban	156.7	2.4	1,810	23.2	71.7	5.5	4.3	0.7	0.5	22.8	17.2	5.7	1,600
Rural	155.6	3.3	9,101	21.7	78.2	10.0	7.3	1.7	1.0	11.7	10.0	1.8	7,680
<b>Region</b>													
Northern	155.9	3.6	1,516	22.2	76.7	8.8	6.2	1.4	1.2	14.6	11.1	3.4	1,309
Central	156.1	3.1	4,203	22.1	77.9	7.2	5.6	0.8	0.9	14.9	12.5	2.3	3,532
Southern	155.6	3.0	5,192	21.8	76.6	11.0	7.9	2.2	0.9	12.4	10.2	2.2	4,439
<b>District</b>													
Blantyre	156.9	1.7	881	22.6	72.3	8.6	6.2	1.7	0.7	19.1	15.4	3.7	761
Kasungu	156.1	3.9	487	22.1	78.6	8.6	6.9	0.8	0.9	12.8	9.7	3.2	410
Machinga	155.0	3.3	413	21.3	81.3	11.4	8.4	2.7	0.3	7.3	6.5	0.8	356
Mangochi	155.3	3.1	580	21.4	79.3	12.5	8.2	2.6	1.7	8.2	6.8	1.4	500
Mzimba	156.3	2.3	763	22.2	77.5	8.4	6.2	1.0	1.2	14.1	10.5	3.6	653
Salima	156.5	2.1	294	22.0	78.7	8.1	6.5	1.1	0.5	13.2	11.0	2.2	241
Thyolo	154.6	4.6	576	21.8	81.4	8.9	7.1	1.2	0.6	9.8	7.0	2.7	486
Zomba	155.5	3.4	625	22.3	70.7	11.4	7.5	3.0	0.9	17.9	13.8	4.1	535
Lilongwe	156.1	3.8	1,300	22.2	77.9	6.0	4.7	0.7	0.6	16.1	13.9	2.2	1,119
Mulanje	155.3	2.4	478	21.5	75.6	13.4	9.3	2.9	1.2	11.0	7.9	3.1	403
Other districts	155.7	3.2	4,513	21.9	77.3	9.3	6.9	1.4	1.0	13.4	11.4	2.0	3,817
<b>Education</b>													
No education	155.4	4.2	2,551	21.8	78.8	8.9	7.0	1.2	0.7	12.3	10.8	1.5	2,181
Primary 1-4	155.4	3.5	2,804	21.7	77.3	10.5	7.6	1.7	1.2	12.2	10.1	2.1	2,301
Primary 5-8	155.8	2.8	3,896	21.9	77.5	9.7	6.8	1.7	1.1	12.8	10.3	2.5	3,330
Secondary+	157.2	1.8	1,658	22.8	73.3	6.9	5.2	1.3	0.4	19.8	15.6	4.2	1,467
<b>Wealth quintile</b>													
Lowest	155.5	3.9	1,897	21.4	81.3	10.3	7.3	2.1	1.0	8.4	7.7	0.7	1,610
Second	155.4	3.4	2,100	21.5	82.4	9.6	7.4	1.7	0.5	8.0	7.4	0.6	1,736
Middle	155.5	3.6	2,261	21.6	78.8	11.1	7.8	1.8	1.4	10.2	8.4	1.8	1,866
Fourth	155.7	2.5	2,246	22.0	75.8	9.7	6.9	1.6	1.2	14.4	12.4	2.1	1,918
Highest	156.8	2.3	2,407	23.2	69.4	6.1	5.0	0.7	0.5	24.5	18.4	6.1	2,150
Total	155.8	3.1	10,911	22.0	77.1	9.2	6.8	1.5	0.9	13.7	11.2	2.4	9,280

<sup>1</sup>Excludes pregnant women and women with a birth in the preceding 2 months

**Figure 10.3 Prevalence of Chronic Energy Deficiency (Percentage with BMI <18.5) Among Women Age 15-49, for Selected Districts**



The body mass index is also used to measure the percentage of women who are overweight or obese. Women are said to be overweight or obese if their BMI is 25 or higher. The 2004 MDHS indicates that 14 percent of women are overweight and 2 percent have a BMI of 30 or higher (severely overweight or obese). Women living in wealthier households are more likely to be overweight or obese. For example, 25 percent of women in the highest wealth quintile are overweight or obese compared with 8 percent of women in the lowest quintile. Urban women are also more likely to be overweight or obese than women in the rural areas (23 and 12 percent, respectively). There are large variations in BMI across districts. For overweight or obese women, the proportions range from 18 to 19 percent in Zomba and Blantyre to 7 percent in Machinga.