Malawi 2004

Nutrition of Young Children and Mothers

Africa Nutrition Chartbooks

AFRICA NUTRITION CHARTBOOKS

NUTRITION OF YOUNG CHILDREN AND MOTHERS IN MALAWI

Findings from the 2004 Malawi Demographic and Health Survey

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Introduction

Malnutrition[1] is one of the most important health and welfare problems among infants and young children in Malawi. It is a result of both inadequate food intake and illness. Inadequate food intake is a consequence of insufficient food available at the household level, improper feeding practices, or both. Improper feeding practices include both the quality and quantity of foods offered to young children as well as the timing of their introduction. Poor sanitation puts young children at increased risk of illness, in particular diarrheal disease, which adversely affects their nutritional status. Both inadequate food intake and poor environmental sanitation reflect underlying social and economic conditions.

Malnutrition has significant health and economic consequences, the most serious of which is an increased risk of death. Other outcomes include an increased risk of illness and a lower level of cognitive development, which results in lower educational attainment. In adulthood, the accumulated effects of long-term malnutrition can be a reduction in workers' productivity and increased absenteeism in the workplace; these may reduce a person's lifetime earning potential and ability to contribute to the national economy. Furthermore, malnutrition can result in adverse pregnancy outcomes.

The data presented here are from the 2004 Malawi Demographic and Health Survey (MDHS 2004), a nationally representative survey of 13,664 households, conducted by National Statistical Office (NSO), Zomba in collaboration with Ministry of Health. ORC Macro furnished the technical assistance to the survey as part of the MEASURE DHS program, while funding was provided by the U.S. Agency for International Development (USAID), the Department for International Development (DFID), United Kingdom, United Nations Children's Fund (UNICEF), and United Nations Population Fund (UNFPA).

Of the 10,771 children age 0-59 months that were part of the study, there were 7,833 children who were alive whose mothers were interviewed and who had complete anthropometric data. All nutritional analysis includes these 7,833 children unless otherwise noted. Therefore, results may slightly differ from the MDHS 2004 report due to these differences in sub-sample selection. Nutritional data collected on these children include height, weight, age, breastfeeding history, and feeding patterns. Information was also collected on the prevalence of diarrhea and acute respiratory infection (ARI) in the two weeks prior to the survey and on relevant sociodemographic characteristics. For comparison, data are presented from Demographic and Health Surveys conducted in other sub-Saharan countries.

[1] The technical method of identifying a *malnourished* population as defined by the U.S. National Center for Health Statistics (NCHS), the Centers for Disease Control and Prevention (CDC), and the World Health Organization (WHO) is presented in Appendix 2.

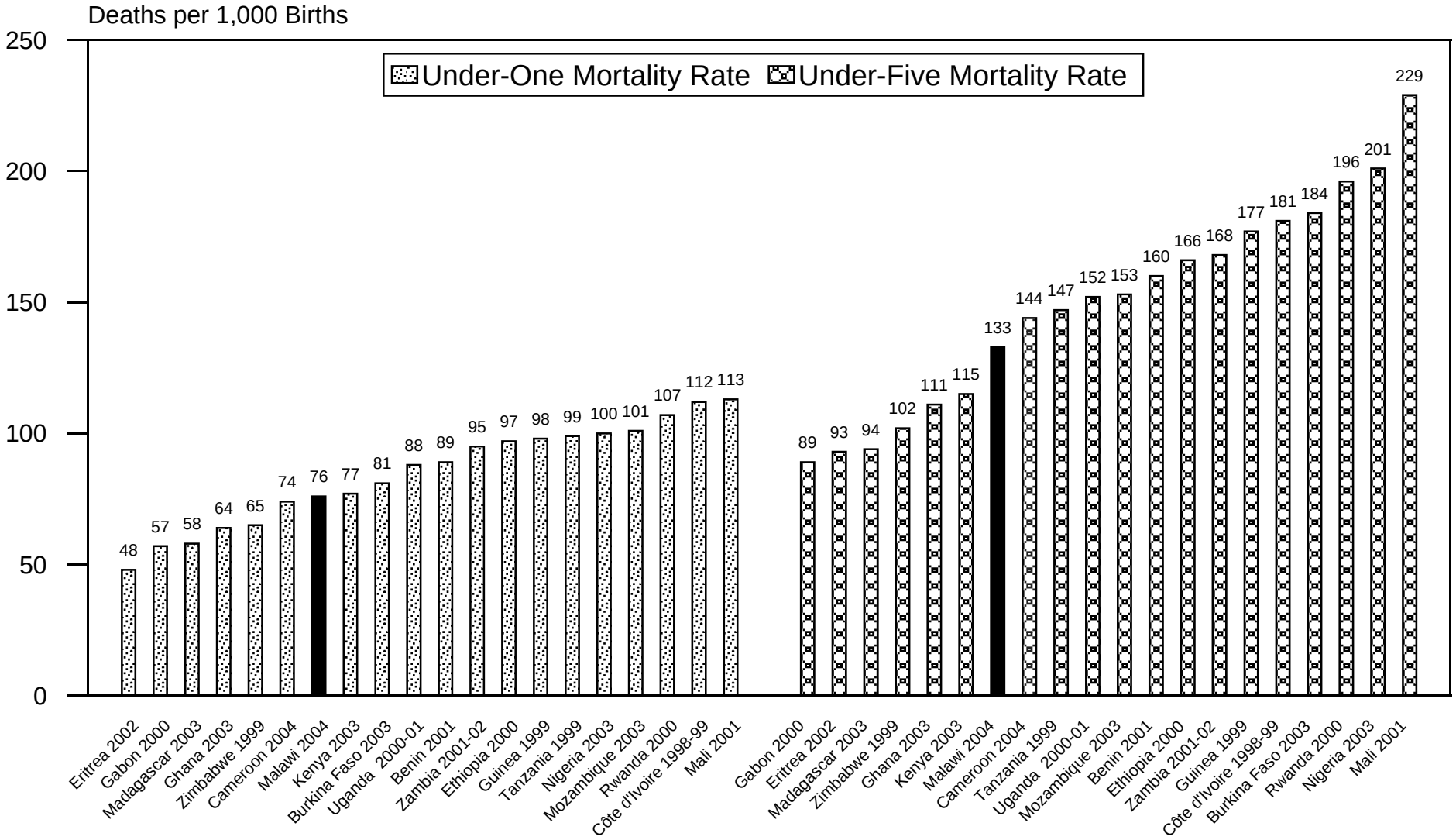
Figure 1: Infant and Child Mortality, Malawi Compared with Other Sub-Saharan Countries

Malnutrition compromises child health, making children susceptible to illness and death. Infectious diseases such as acute respiratory infections, diarrhea, and malaria account for the greatest proportion of infant and under-five mortality. The infant mortality rate (under-one rate) is a commonly used measure of infant health and is a sensitive indicator of the socioeconomic conditions of a country. The under-five mortality rate is another informative indicator of infant and child survival.

- **Malawi's under-one mortality rate (76 deaths per 1,000 births) indicates that 7 percent of children born in Malawi will die before their first birthday.** This rate is in the lower range of all the sub-Saharan countries surveyed.

- **Malawi's under-five mortality rate (133 deaths per 1,000 births) indicates that 13 percent of children born in Malawi will die before their fifth birthday.** This rate is near the lower end of the range of sub-Saharan countries surveyed.

Figure 1
Infant and Child Mortality, Malawi Compared with Other Sub-Saharan Countries



Source: DHS Surveys 1999-2004

Figure 2: Contribution of Undernutrition to Under-Five Mortality, Malawi

Undernutrition is an important factor in the death of many young children. Even if a child is only mildly malnourished, the mortality risk is increased. Under-five mortality is largely a result of infectious diseases and neonatal deaths in developing countries. Respiratory infections, diarrhea, malaria, measles, and other infectious diseases take their toll on children.

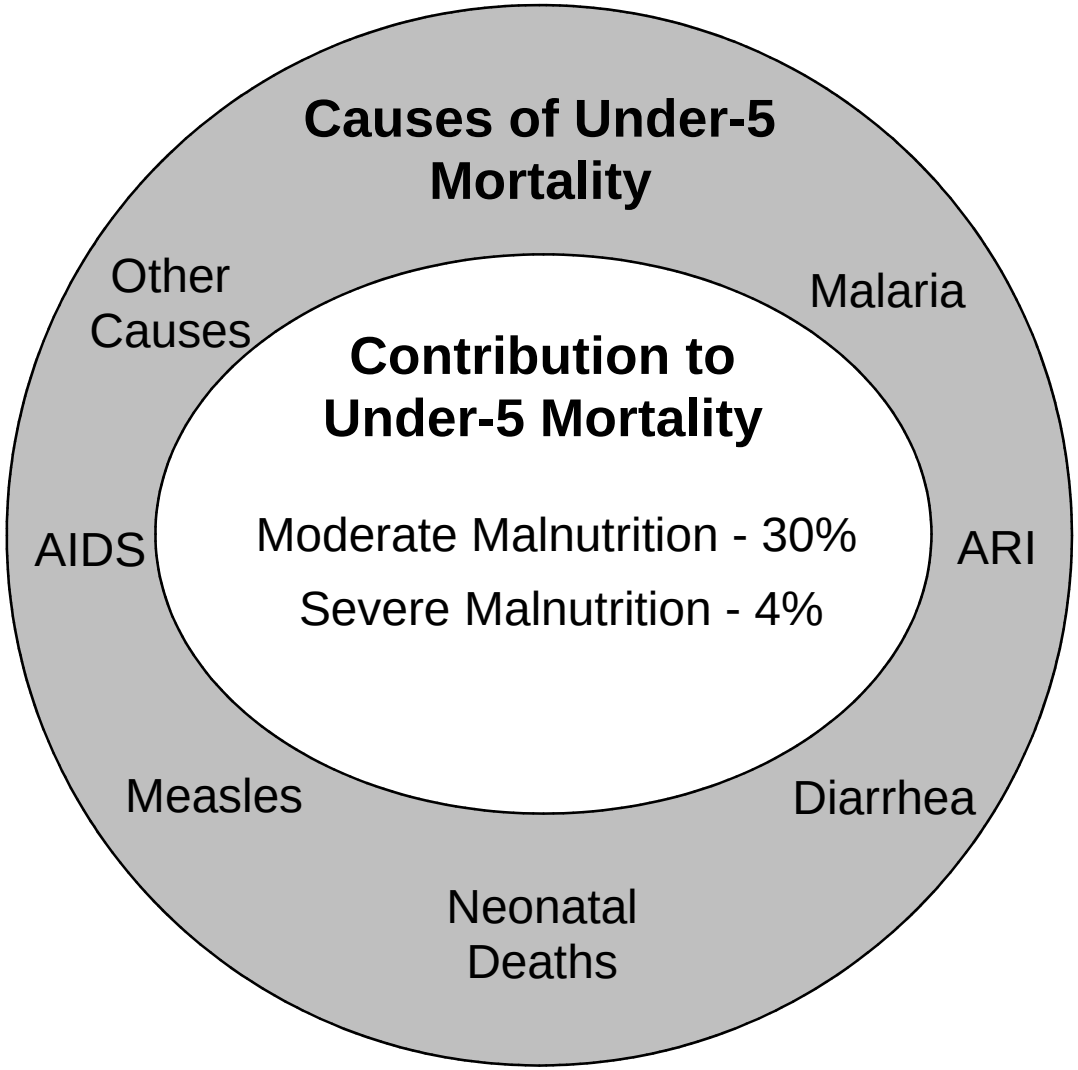
Formulas developed by Pelletier et al.[1] are used to quantify the contributions of moderate and severe malnutrition to under-five mortality.

In Malawi,

- **Thirty-four percent of all deaths that occur before age five are related to malnutrition (severe and moderate malnutrition).**
- Because of its extensive prevalence, **moderate malnutrition (30 percent) contributes to more deaths than does severe malnutrition (4 percent).**
- **Moderate malnutrition is implicated in 87 percent of the deaths associated with malnutrition.**

[1] Pelletier, D.L., E.A. Frongillo, Jr., D.G. Schroeder, and J.P. Habicht. 1994. A methodology for estimating the contribution of malnutrition to child mortality in developing countries. *Journal of Nutrition* 124 (10 Suppl.): 2106S-2122S.

Figure 2
Contribution of Undernutrition to Under-Five Mortality, Malawi



Note: Calculation based on Pelletier et al., 1994.

Source: MDHS 2004

Figure 3: Survival and Nutritional Status of Children, Malawi

Malnutrition and mortality both take a tremendous toll on young children. This figure illustrates the proportion of children who have died or are undernourished at each month of age.

In Malawi,

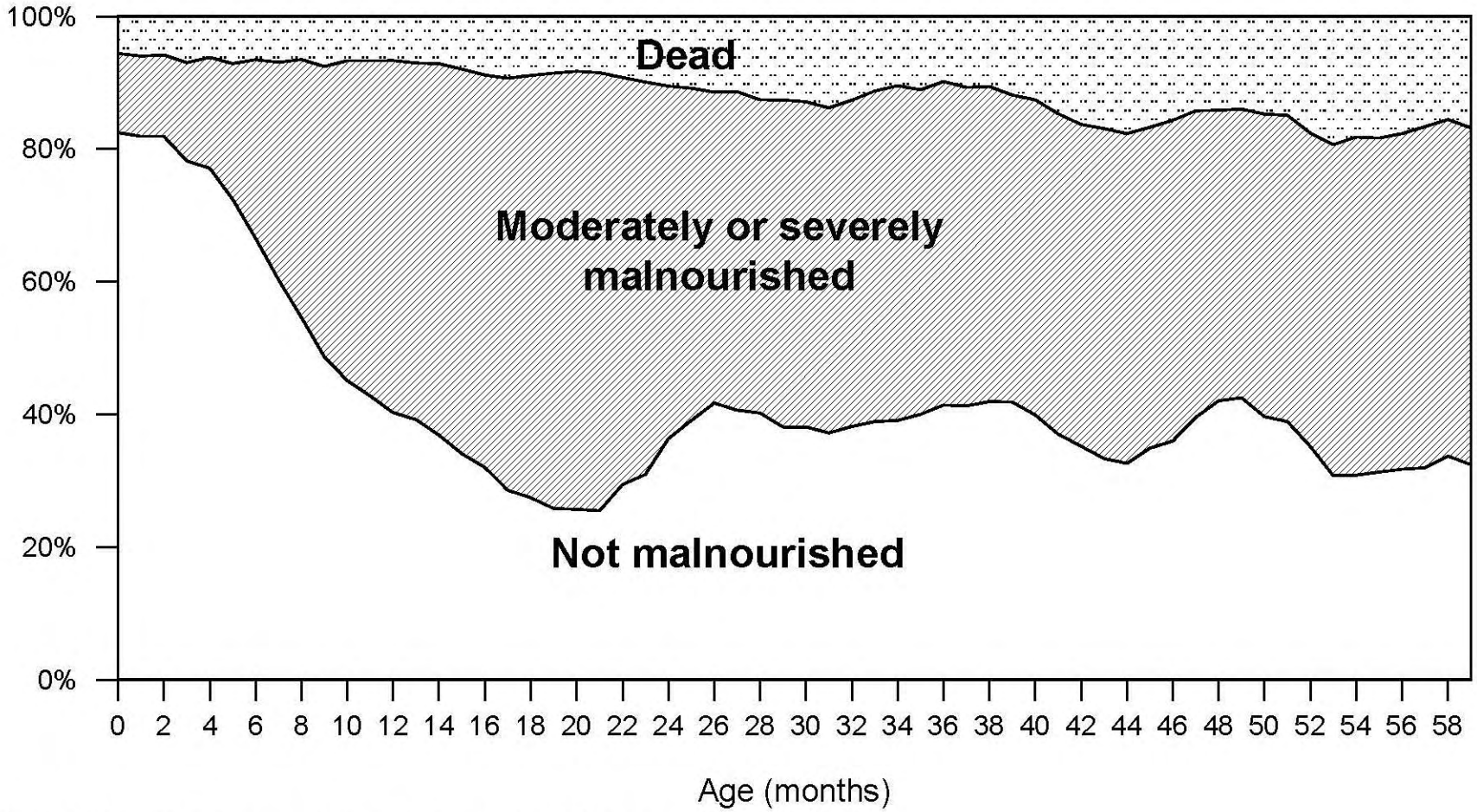
- **Between birth and 21 months of age, the percentage of living children who are not malnourished drops rapidly from about 82 percent to 25 percent.** The rate remains between 30 and 40 percent through 53 months; thereafter the rate stabilizes at around 30 percent at 59 months.

- **Between birth and 21 months of age, the percentage of children who are moderately or severely malnourished[1] increases dramatically from 12 percent to 66 percent.** This percentage then gradually declines to 50 percent at 59 months.

- **From birth until 21 months, the percentage of children who have died slightly increases** from 6 percent to 8 percent. However, the rate increases further to 17 percent by 59 months.

[1] A child with a Z-score below minus three standard deviations (-3 SD) on the reference standard is considered severely malnourished, while one with a Z-score between -2 SD and -3 SD is considered moderately malnourished.

Figure 3
Survival and Nutritional Status of Children, Malawi



Note: A child with a Z-score below -3 SD on the reference standard is considered severely malnourished (stunted, wasted, or underweight), while a child with a Z-score between -3 SD and -2 SD is considered moderately malnourished. Values have been smoothed using a five-month rolling average.

Source: MDHS 2004

Malnutrition in Malawi

Figure 4: Malnutrition among Children under Five Years, Malawi

In Malawi,

- **Forty-eight percent of children age 0-59 months are chronically malnourished. In other words, they are too short for their age, or *stunted.*[1]** The proportion of children who are stunted is 24 times the level expected in a healthy, well-nourished population.

- **Acute malnutrition, manifested by *wasting,*[2] results in a child being too thin for his or her height.** It affects 5 percent of children, which is 2.5 times the level expected in a healthy population.

- **Twenty-two percent of children under five years are *underweight*[3] for their age.** This is 11 times the level expected in a healthy, well-nourished population.

- **Six percent of children under five are *overweight.*[4]** This is 3 times of what is expected in a healthy, well-nourished population.

---

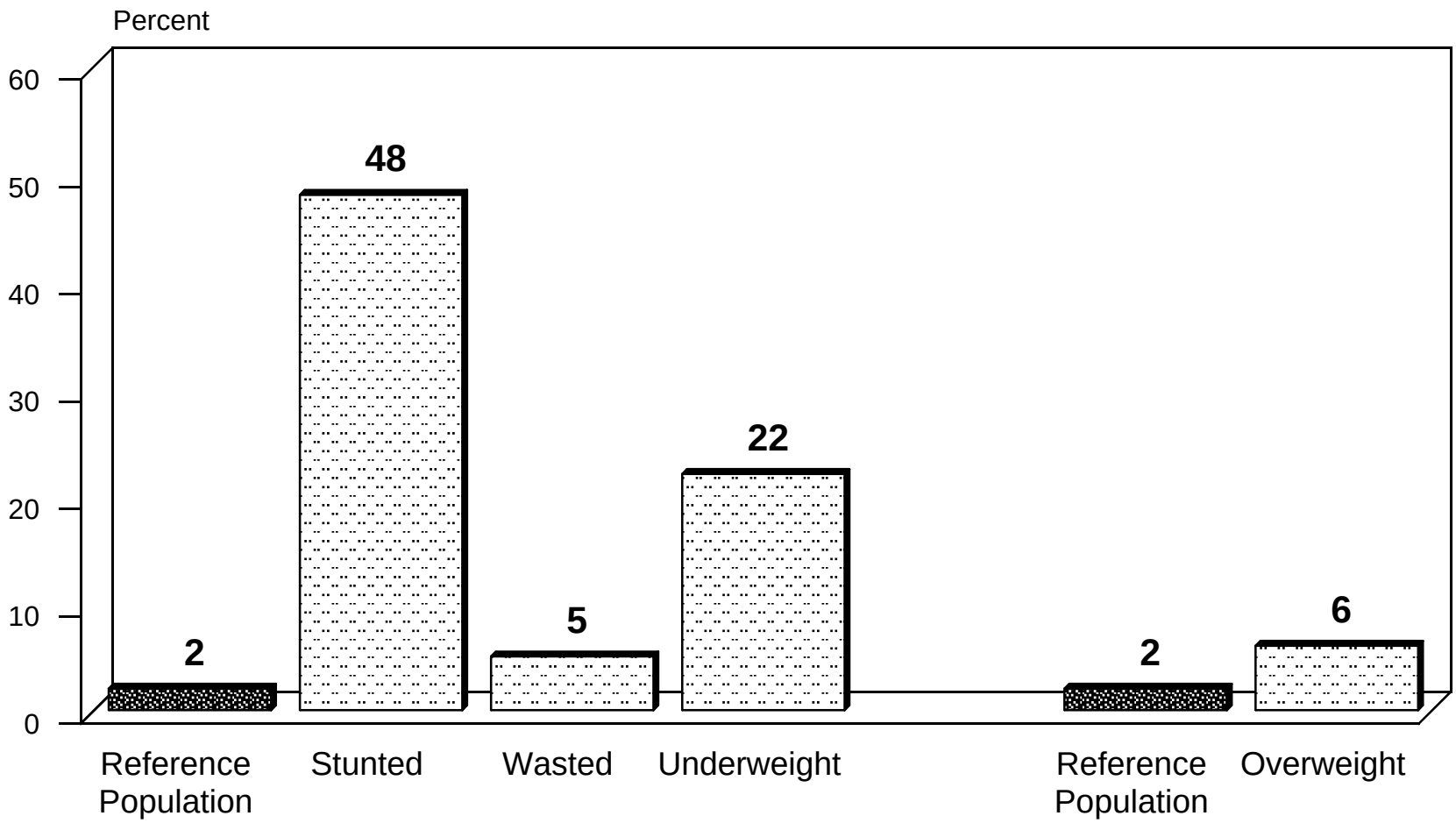
[1] A stunted child has a height-for-age Z-score that is below -2 SD based on the WHO/CDC/NCHS reference population. Chronic malnutrition is the result of an inadequate intake of food over a long period and may be exacerbated by chronic illness.

[2] A wasted child has a weight-for-height Z-score that is below -2 SD based on the WHO/CDC/NCHS reference population. Acute malnutrition is the result of a recent failure to receive adequate nutrition and may be affected by acute illness, especially diarrhea.

[3] An underweight child has a weight-for-age Z-score that is below -2 SD based on the WHO/CDC/NCHS reference population. This condition can result from either chronic or acute malnutrition or a combination of both.

[4] An overweight child has a weight-for-height Z-score that is above +2 SD based on the WHO/CDC/NCHS reference population.

Figure 4
Malnutrition among Children under Five Years, Malawi



Note: *Stunting* reflects chronic malnutrition; *wasting* reflects acute malnutrition; *underweight* reflects chronic or acute malnutrition or a combination of both.

Source: MDHS 2004

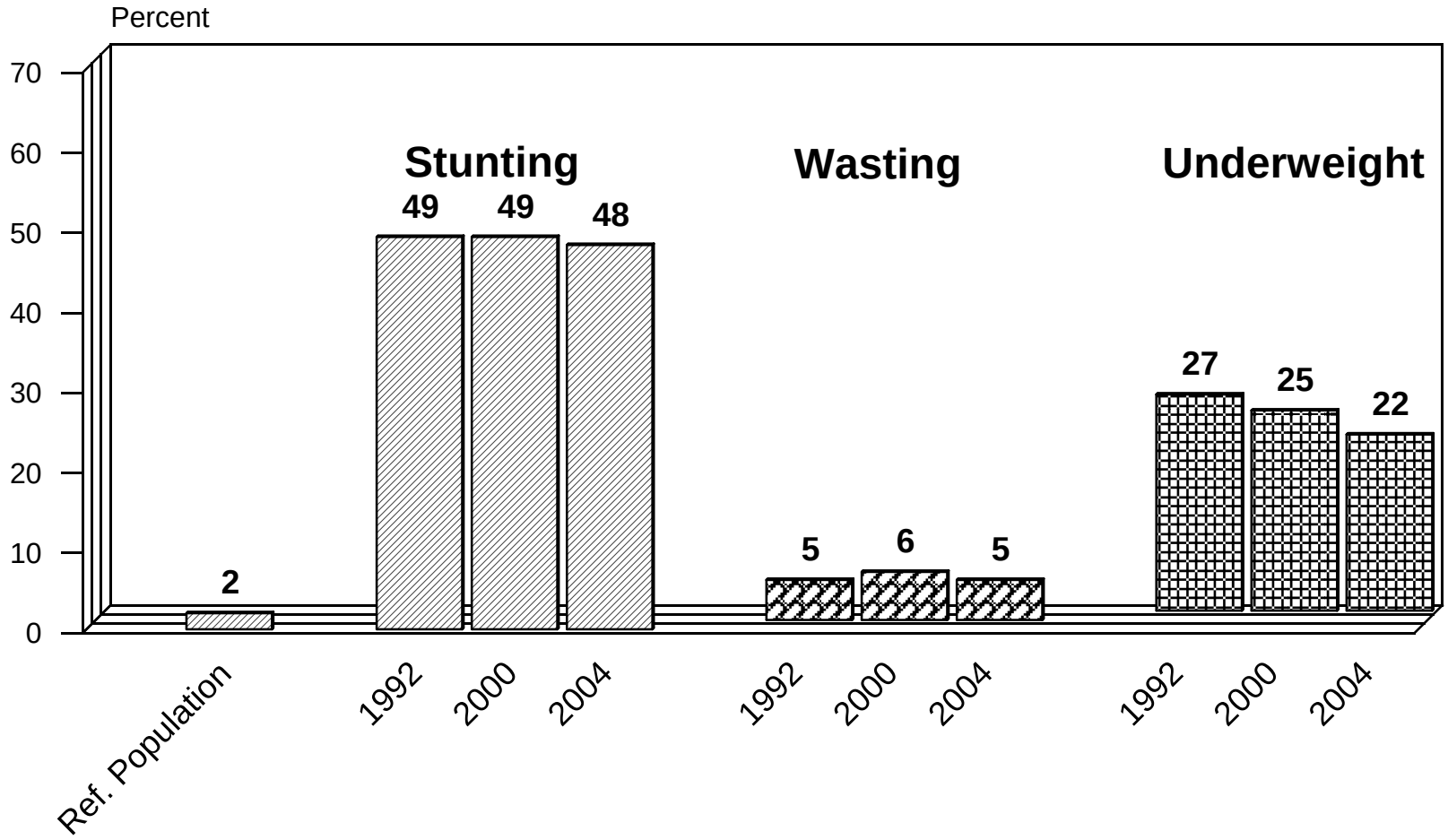
Figure 5: Changes in Undernutrition Rates among Children under Five Years, Malawi 1992, 2000, and 2004

The findings of the 2004 MDHS suggest that the nutritional status of children in Malawi has not changed appreciably since the 1992 and 2000 surveys.

- **Stunting (around 49 percent) and wasting (around 5 percent) have remained virtually unchanged** since the 1992 MDHS survey.

- The rate of underweight **has decreased from 27 percent in 1992 to 25 percent in 2000, and then declined further to 22 percent in 2004.** This decline in underweight children is statistically significant.

Figure 5
Changes in Undernutrition Rates among Children under Five Years, Malawi 1992, 2000, and 2004



Note: *Stunting* reflects chronic malnutrition; *wasting* reflects acute malnutrition; *underweight* reflects chronic or acute malnutrition or a combination of both.

Source: MDHS 1992, 2000, and 2004

Figure 6: Stunting, Wasting, and Underweight, by Age, Malawi

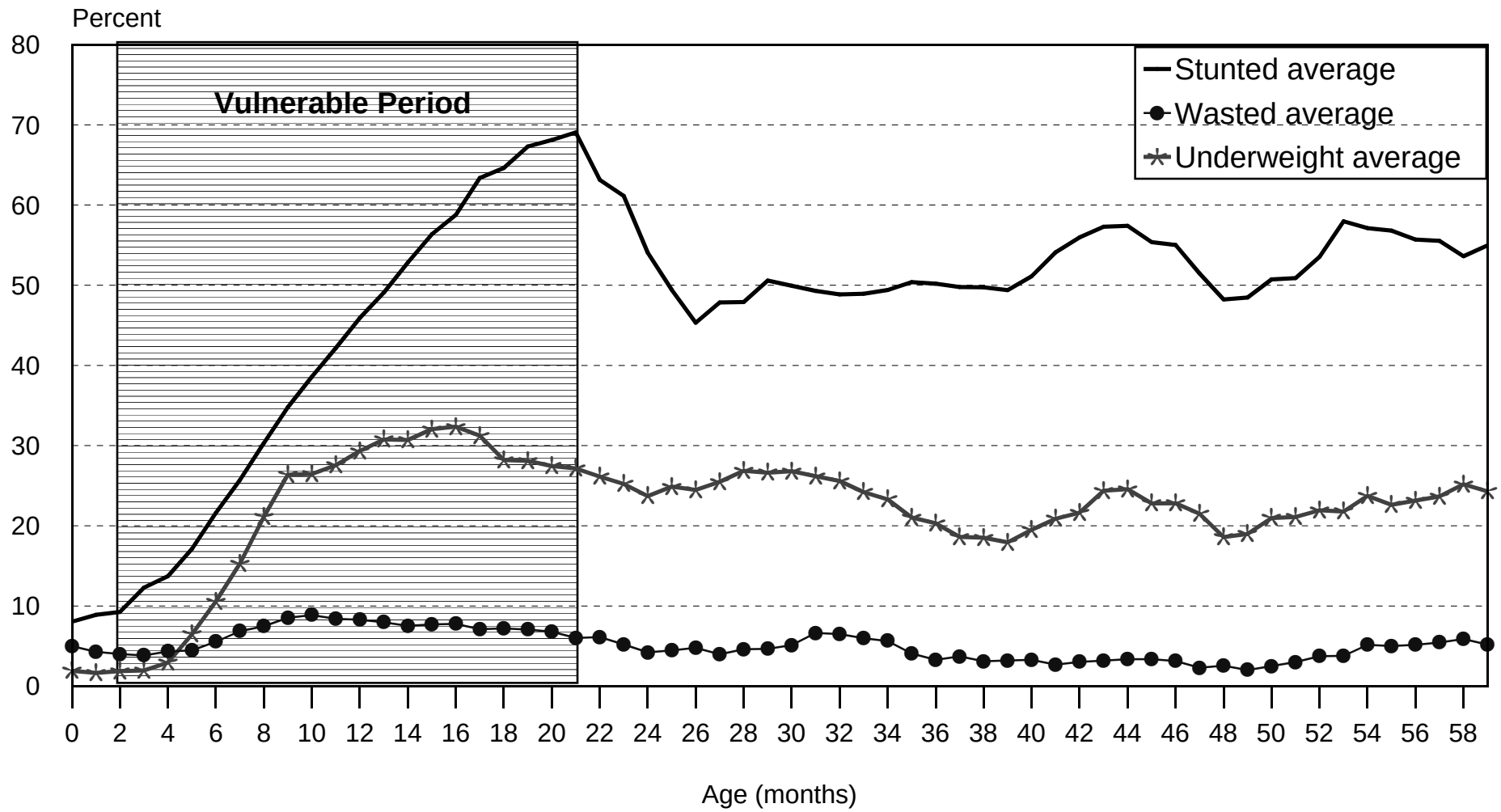
In Malawi, the time between 2 month and 21 months of age is a vulnerable period.

- **The proportion of children stunted rises sharply between 2 and 21 months of age, peaking at 69 percent.** The proportion of children stunted drops to 45 percent at 26 months, goes up again to 57 percent at 43 months, and then drops slightly to 54 percent at 59 months.

- **The proportion of children wasted rises between 4 and 10 months of age, peaking at 9 percent.** The proportion then slowly declines and levels off at around 2 percent through 49 months, then goes up again to 5 percent at 59 months.

- **The proportion of children underweight rises sharply to 26 percent at 9 months and increases further to a peak of 32 percent at 16 months.** Afterwards, the proportion varies between 18 and 28 percent and is 24 percent at 59 months.

Figure 6
Stunting, Wasting, and Underweight, by Age, Malawi



Note: *Stunting* reflects chronic malnutrition; *wasting* reflects acute malnutrition; *underweight* reflects chronic or acute malnutrition or a combination of both. Plotted values are smoothed by a five-month moving average.

Source: MDHS 2004

Figure 7: Undernutrition among Children under Five Years Who Do Not Reside with Their Mother, Malawi

Previously, anthropometric data from DHS surveys excluded children whose mother did not live in the household or was not present to be interviewed. Currently, all children in the household are measured, regardless of their mother's residence status. In the 2004 MDHS, 551 children under five years did not reside with their mother.

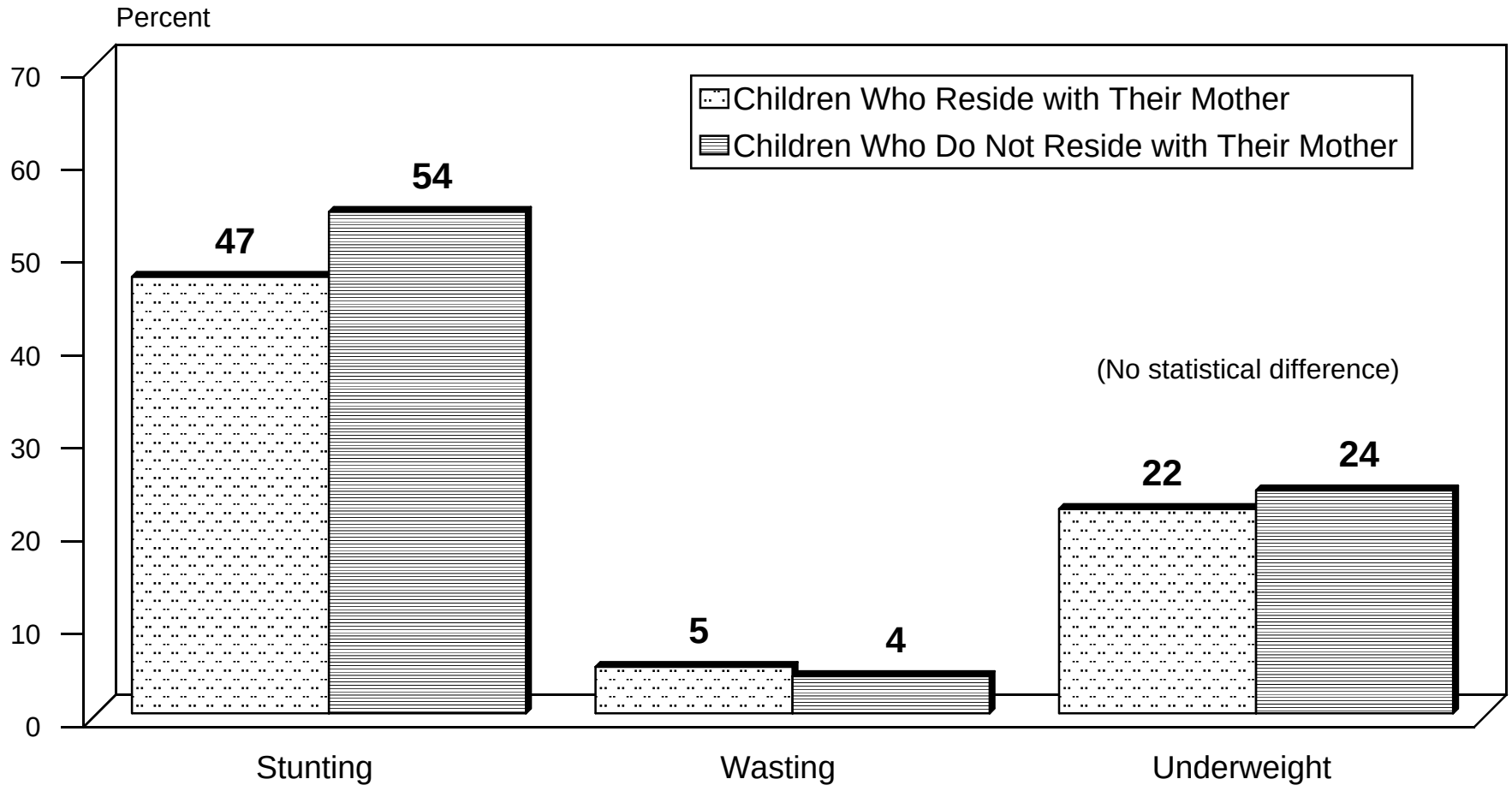
In Malawi,

- **A higher percentage of children who do not reside with their mother than those who do are stunted (54 percent and 47 percent, respectively).**

- **A lower percentage of children who do not reside with their mother than those who do are wasted (4 percent and 5 percent, respectively).** The difference in levels of wasting is statistically significant but is probably too small to be meaningful.

- **There is no relationship between underweight status and children's residence with their mother.**

Figure 7
Undernutrition among Children under Five Years Who Do Not Reside with Their Mother, Malawi



Note: *Stunting* reflects chronic malnutrition; *wasting* reflects acute malnutrition; *underweight* reflects chronic or acute malnutrition or a combination of both.

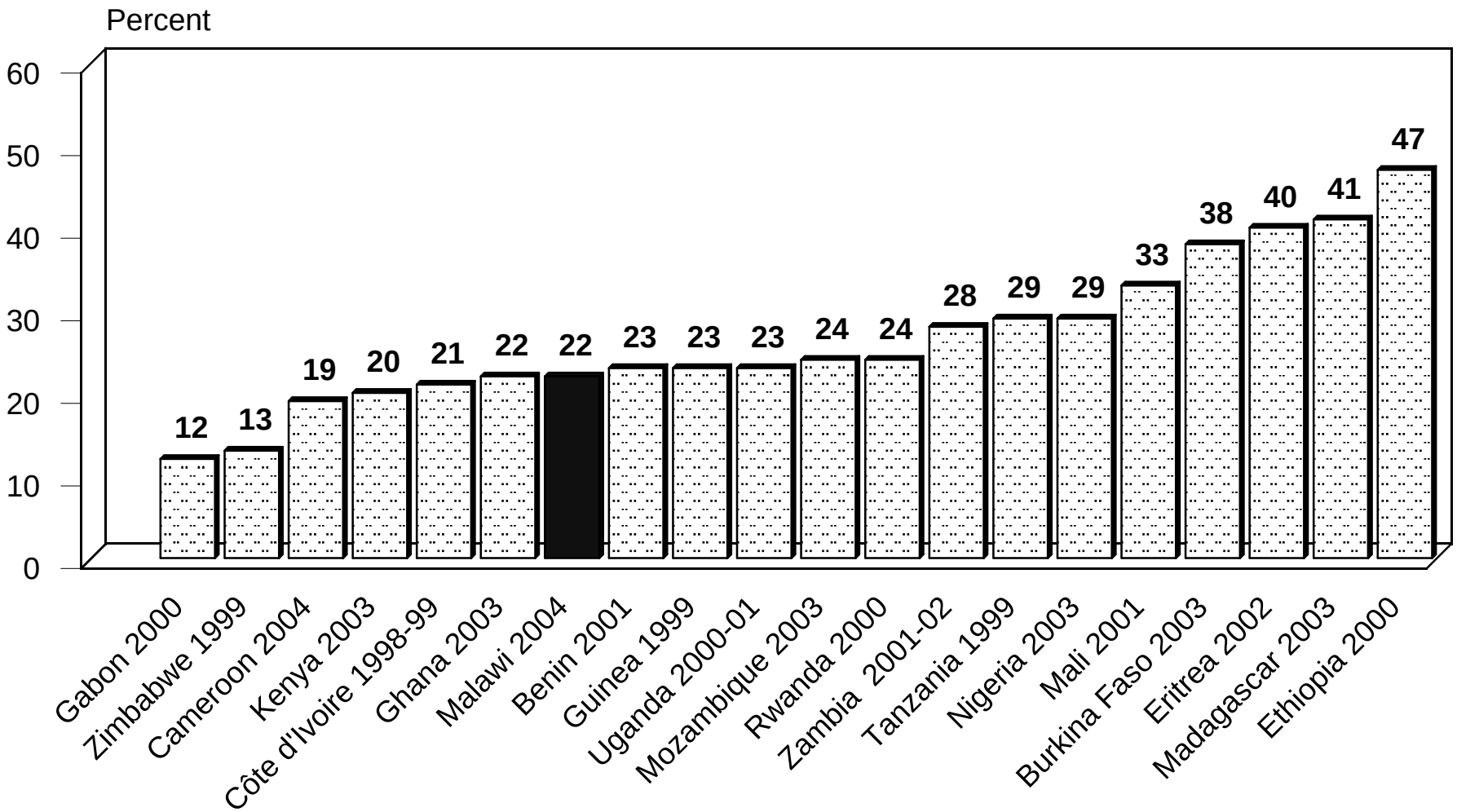
Source: MDHS 2004

Figure 8: Underweight among Children under Five Years, Malawi Compared with Other Sub-Saharan Countries

Among the sub-Saharan countries surveyed,

- The percentage of children **under five years** who are *underweight* ranges from 12 to 47 percent. **With 22 percent of children under five years of age who are underweight, Malawi is in the mid-range of the sub-Saharan countries surveyed.** Underweight status is indicative of children who suffer from chronic or acute malnutrition, or both, and may be influenced by both short- and long-term determinants of malnutrition. Underweight is often used as a general indicator of a population's health status.

Figure 8
Underweight among Children under Five Years, Malawi Compared with Other Sub-Saharan Countries



Note: *Underweight* reflects chronic or acute malnutrition or a combination of both.

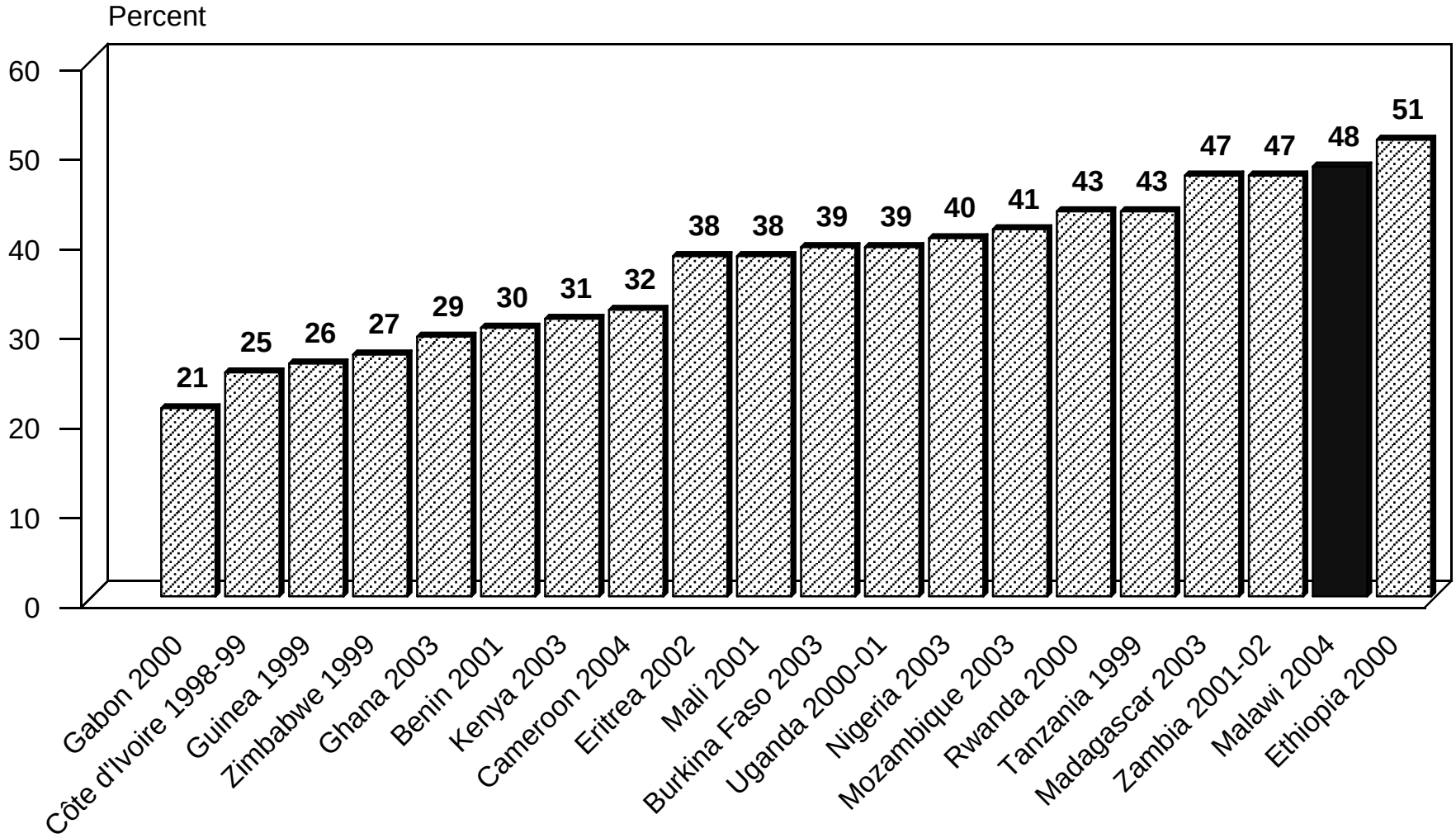
Source: DHS Surveys 1999-2004

Figure 9: Stunting among Children under Five Years, Malawi Compared with Other Sub-Saharan Countries

Among the sub-Saharan countries surveyed,

- The percentage of children **under five years** who are *stunted* ranges from 21 to 51 percent. **With 48 percent of children under five stunted, Malawi is the second highest of the sub-Saharan countries surveyed.** Stunting is a good long-term indicator of the nutritional status of a population because it is not markedly affected by short-term factors such as season of data collection, epidemic illnesses, acute food shortages, and recent shifts in social or economic policies.

Figure 9
Stunting among Children under Five Years, Malawi Compared with Other Sub-Saharan Countries



Note: *Stunting* reflects chronic malnutrition.

Source: DHS Surveys 1999-2004

Conceptual Framework for Nutritional Status

Nutrition is directly related to food intake and infectious diseases such as diarrhea, acute respiratory infection, malaria, and measles. Both food intake and infectious diseases reflect underlying social and economic conditions at the household, community, and national levels that are supported by political, economic, and ideological structures within a country.

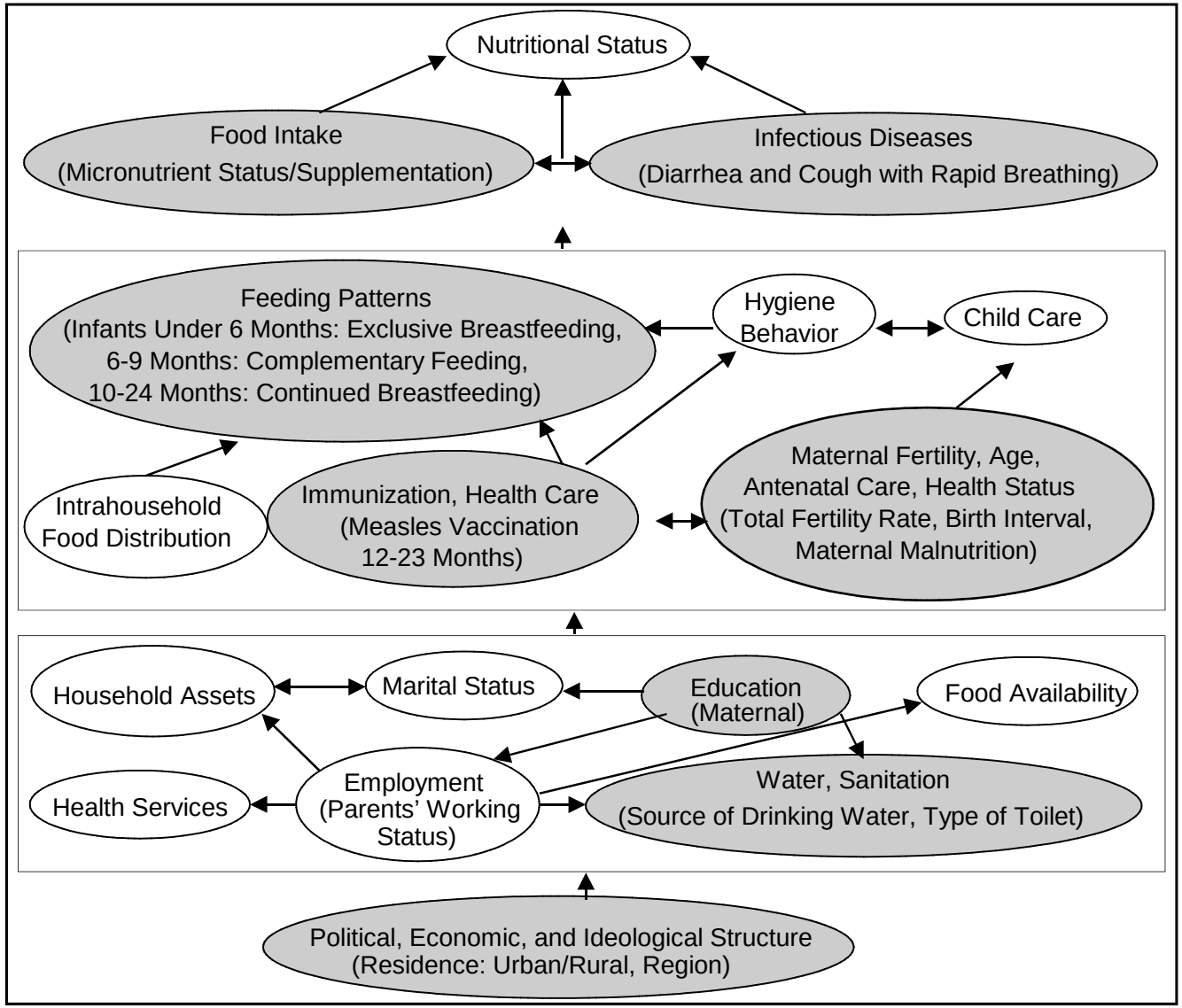
The following diagram is a conceptual framework for nutrition adapted from UNICEF.[1] It reflects relationships among factors and their influences on children's nutritional status. Although political, socioeconomic, environmental, and cultural factors (at the national and community levels) and poverty (at the household level) affect the nutritional status of women and children, the only variables included in this chartbook are those that can be collected as part of a national household survey. The highlighted areas of the framework depict selected factors.

These factors are—

- **Immediate influences,** such as food intake (micronutrient status and supplementation) and infectious diseases (diarrhea and respiratory infections)
- **Underlying biological and behavioral influences,** such as maternal fertility, measles vaccinations, and feeding patterns of children under two years
- **Underlying social and economic influences,** such as maternal education, drinking water, and sanitation
- **Basic influences,** such as area of residence.

[1] State of the World's Children, 1998

Conceptual Framework for Nutritional Status



Manifestations

Immediate Influences

Underlying Biological and Behavioral Influences

Underlying Social and Economic Influences

Basic Influences

Adapted from: UNICEF, State of the World's Children, 1998

Immediate Influences of Malnutrition

Figure 10: Night Blindness among Mothers of Children under Five Years, Malawi

Globally, vitamin A deficiency (VAD) is the leading cause of childhood blindness. The damage to vision (xerophthalmia) is only one of the harmful outcomes of VAD. Vitamin A is crucial for rapid growth and recovery from illness or infection. Children who are vitamin A deficient have reduced immunity and are less likely to recuperate from common childhood illnesses, such as diarrhea, ARI, and measles, and are twice as likely to die as children who are not vitamin A deficient.

A mother's vitamin A status during pregnancy can be an indicator of the vitamin A status of her child. One sign of VAD in women during pregnancy is night blindness.

- **In Malawi, 6 percent of all women who had given birth in the past five years reported having some form of night blindness during their last pregnancy.**

- **However, only 1 percent of women reported having trouble with their vision during the night but not during the day during their last pregnancy.** Although this figure corrects for women with vision problems, in general, it may slightly underestimate the rate of night blindness.

Figure 10
Night Blindness among Mothers of Children under Five Years, Malawi

Six percent of all women reported night blindness during their last pregnancy.

One percent of women had trouble with their vision during the night but not during the day during their last pregnancy.

Source: MDHS 2004

Figure 11: Vitamin A Supplementation among Mothers of Children under Five Years, by Region, Malawi

Recent studies show that pregnant women who are vitamin A deficient are at a greater risk of dying during or shortly after delivery of the child. Pregnancy and lactation strain women's nutritional status and their vitamin A stores. For women who have just given birth, vitamin A supplementation helps to bring their level of vitamin A storage back to normal, aiding recovery and avoiding illness.

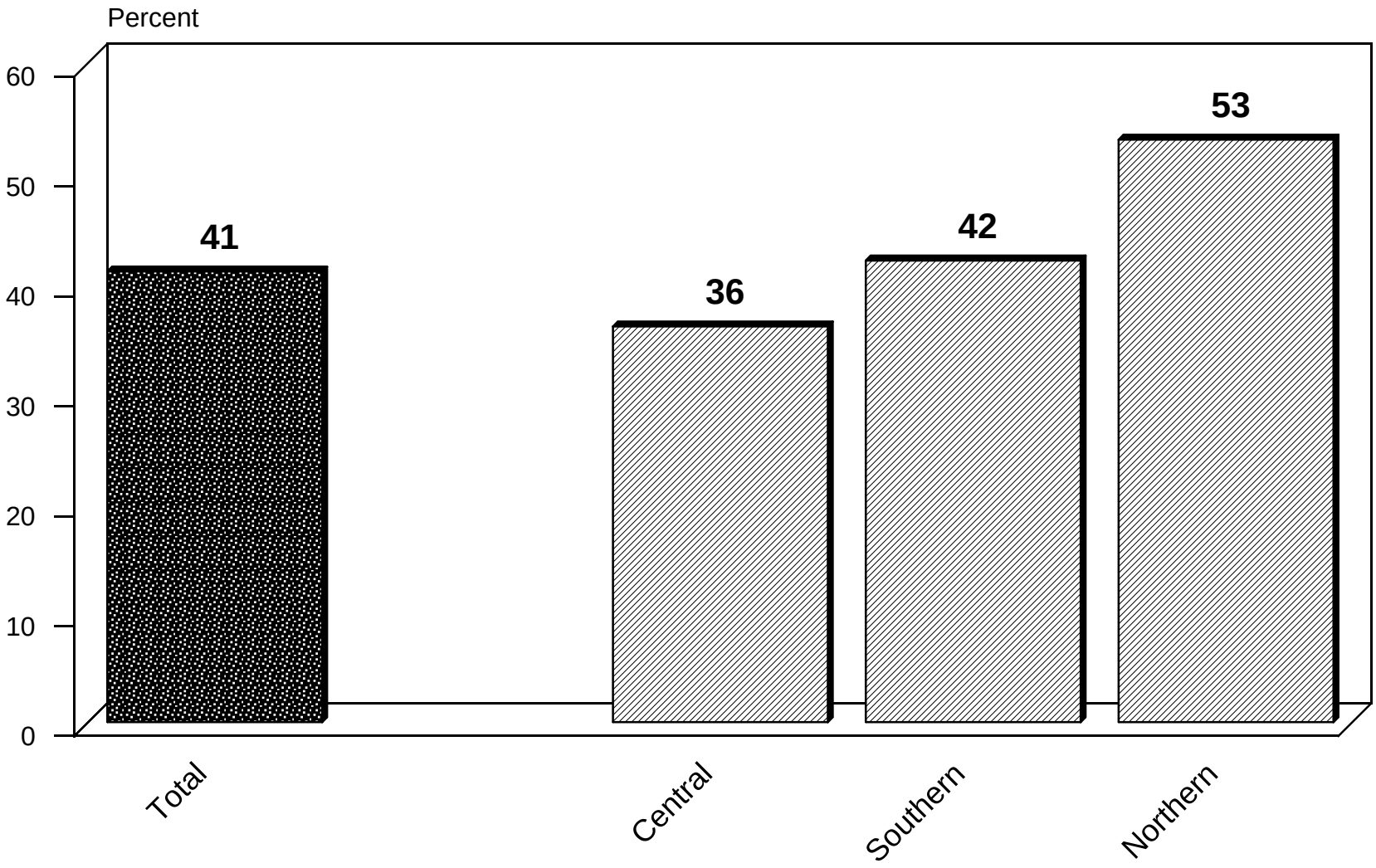
Vitamin A supplementation also benefits children who are breastfed. If mothers have vitamin A deficiency, their children can be born with low stores of vitamin A. Low birth weight babies are especially at risk. Additionally, infants often do not receive an adequate amount of vitamin A from breast milk when mothers are vitamin A deficient. Therefore, supplementation is important for postpartum women within the first eight weeks after childbirth.

In Malawi,

- **Forty-one percent of mothers received vitamin A supplements within two months after delivery.**

- **Fifty-three percent of the mothers in the Northern region received vitamin A supplementation compared with 36 percent and 42 percent of mothers in the Central and Southern regions, respectively.**

Figure 11
Vitamin A Supplementation among Mothers of Children under Five Years, by Region, Malawi



Source: MDHS 2004

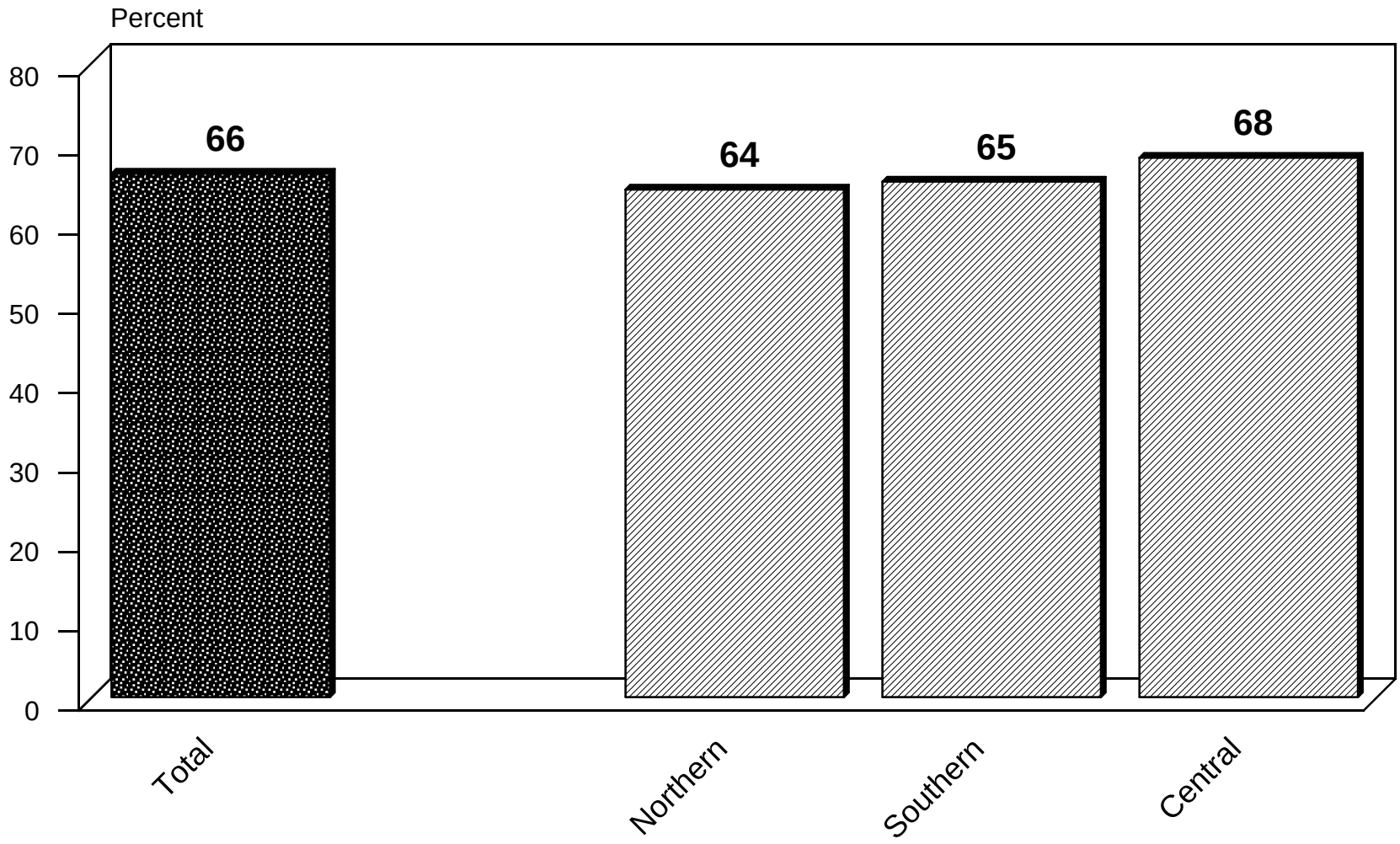
Figure 12: Vitamin A Supplementation among Children 6-59 Months in the Past Six Months, by Region, Malawi

Vitamin A deficiency (VAD) is common in dry environments where fresh fruits and vegetables are not readily available. Vitamin A is found in breast milk, other milks, liver, eggs, fish, butter, red palm oil, mangos, papayas, carrots, pumpkin, and dark leafy greens. Unlike iron or folate, vitamin A is a fat-soluble vitamin, which means that consumption of oils or fats are necessary for its absorption into the body. The liver can store an adequate amount of the vitamin for four to six months. Periodic dosing (every four to six months) with vitamin A supplements is a rapid, low-cost method of ensuring children at risk does not develop VAD. National Immunization Days for polio or measles vaccinations reach large numbers of children with vitamin A supplements as well.

In Malawi,

- **Sixty-six percent of children 6-59 months received a vitamin A dose in the past six months.**
- **The rate of vitamin A supplementation of children was highest in the Central region (68 percent).**

Figure 12
Vitamin A Supplementation among Children 6-59 Months in the Past Six Months, by Region, Malawi



Source: MDHS 2004

Figure 13: Anemia among Children 6-59 Months and Mothers, by Region, Malawi

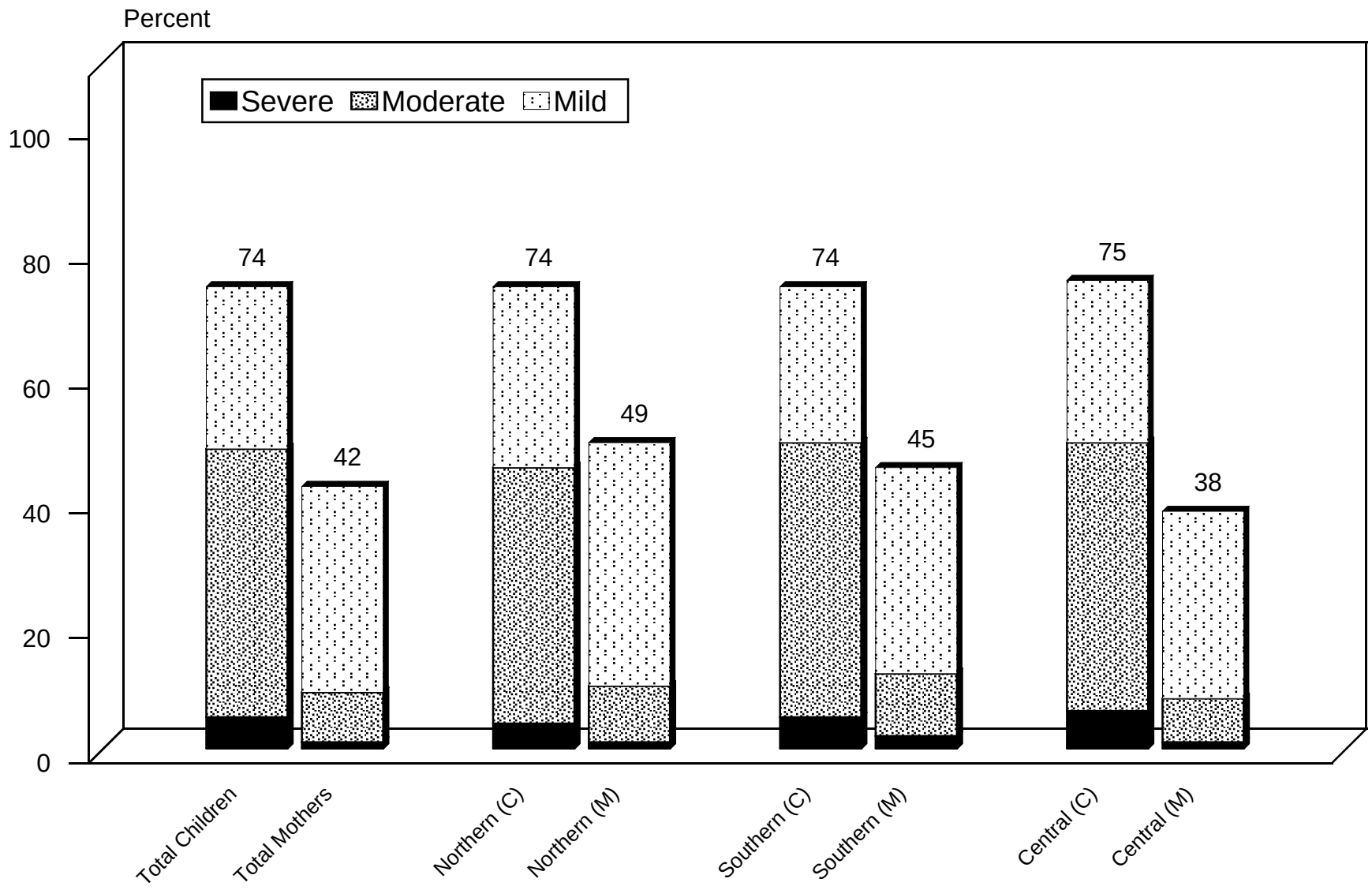
Anemia is the lack of an adequate amount of hemoglobin in the blood. It can be caused by several different health conditions; iron and folate deficiencies are some of the most prevalent conditions related to anemia. Vitamin B_{12} deficiency, protein deficiency, sickle cell disease, malaria, and parasite infection also cause anemia.

In Malawi,

- **Seventy-four percent of children age 6-59 months are anemic, and the prevalence is about the same in all three regions of the country.**

- **Forty-two percent of mothers are anemic, and the prevalence is highest in the Northern region (49 percent).**

Figure 13
Anemia among Children 6-59 Months and Mothers, by Region, Malawi



Source: MDHS 2004

Figure 14: Iron Supplementation among Mothers of Children under Five Years, Malawi

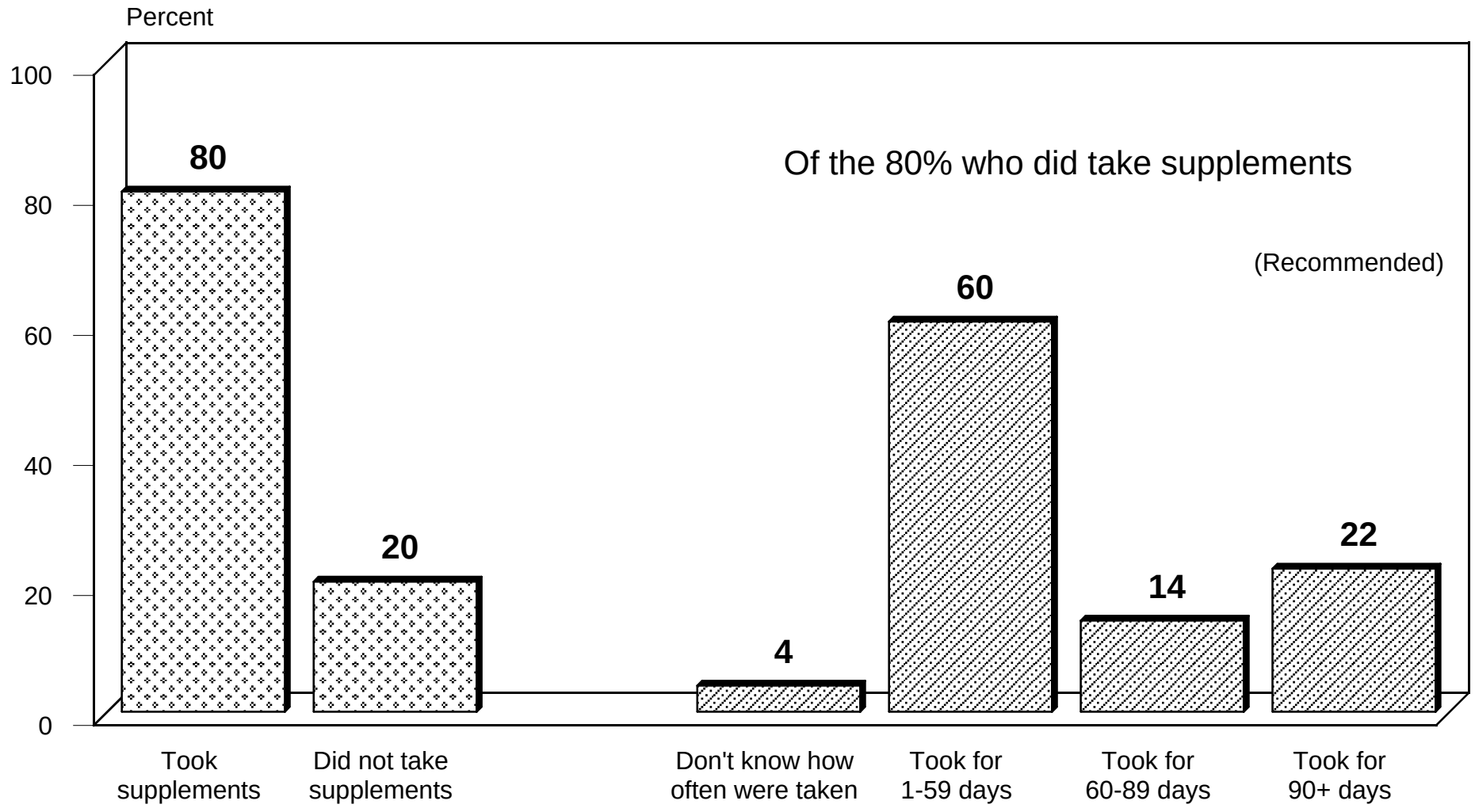
Iron-deficiency anemia is the most common form of nutritional deficiency worldwide. This type of nutritional deficiency develops slowly and does not manifest symptoms until anemia becomes severe. Diets that are heavily dependent on one grain or starch as the major staple often lack sufficient iron intake. Iron is found in meats, poultry, fish, grains, some cereals, and dark leafy greens (such as spinach). Foods rich in vitamin C increase absorption of iron into the blood. Tea, coffee, and whole-grain cereals can inhibit iron absorption. Anemia is common in children age 6-24 months who consume a purely milk diet and in women during pregnancy and lactation. Iron-deficiency anemia is related to decreased cognitive development in children, decreased work capacity in adults, and limited chances of child survival. Severe cases are associated with the low birth weight of babies, perinatal mortality, and maternal mortality. The worldwide anemia prevalence data indicate that normal dietary intakes of iron are insufficient to cover for these increased requirements for a significant proportion of pregnant women. Providing iron supplements to pregnant women during this critical period is one of the most widely practiced public health measure to prevent and treat anemia.

In Malawi,

- **Eighty percent of mothers took some iron supplementation during pregnancy.**

- **Of those women who received iron supplementation, 22 percent reported taking iron for the recommended minimum number of days during their pregnancy (90 or more days).**

Figure 14
Iron Supplementation among Mothers of Children under Five Years, Malawi



Source: MDHS 2004

Figure 15: Diarrhea and Cough with Rapid Breathing among Children under Five Years Compared with Malnutrition Rates, Malawi

Acute respiratory infection and dehydration due to diarrhea are major causes of morbidity and mortality in most sub-Saharan countries. To estimate the prevalence of ARI, mothers were asked whether their children under five years had been ill with coughing accompanied by short, rapid breathing in the past two weeks. For diarrhea, mothers were asked whether their children under five years had symptoms of diarrhea in the past two weeks. Early diagnosis and rapid treatment can reduce the rates of illness or death caused by these conditions.

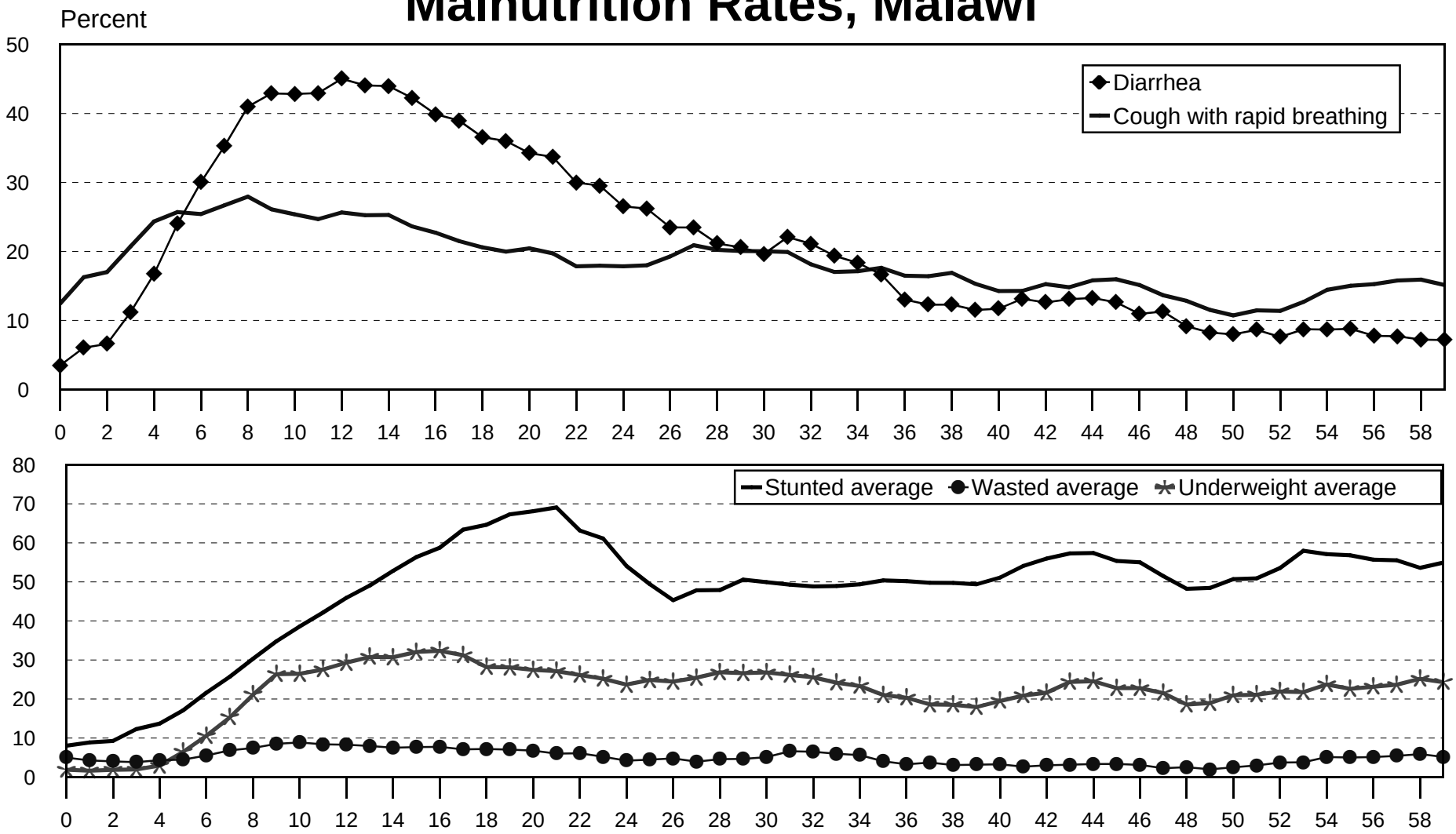
In Malawi,

- **Nineteen percent of children under five years of age experienced cough with rapid breathing in the two weeks preceding the survey.** Malawi's prevalence of cough with rapid breathing increases from 12 percent to 28 percent in the first 8 months and then gradually declines to 11 percent by 50 months. Afterwards, the prevalence goes up again to 15 percent by 59 months of age.

- **Twenty-three percent of children under five years of age had diarrhea in the two weeks preceding the survey.** The prevalence of diarrhea increases rapidly from 2 months (6 percent) to 12 months (45 percent), then declines to 20 percent by 30 months. Thereafter, the prevalence gradually declines to 7 percent by 59 months.

The rapid rise in the prevalence of diarrhea during infancy reflects the increased risk of pathogen contamination associated with the early introduction of water, other liquids, and solid foods. In addition, when infants begin to crawl and move around, they tend to put objects in their mouth, again increasing the risk of pathogen contamination.

Figure 15
Diarrhea and Cough with Rapid Breathing among Children under Five Years Compared with Malnutrition Rates, Malawi



Note: Plotted values are smoothed by a five-month moving average.

Source: MDHS 2004

Underlying Biological and Behavioral Influences of Malnutrition

Figure 16: Fertility and Birth Intervals, Malawi Compared with Other Sub-Saharan Countries

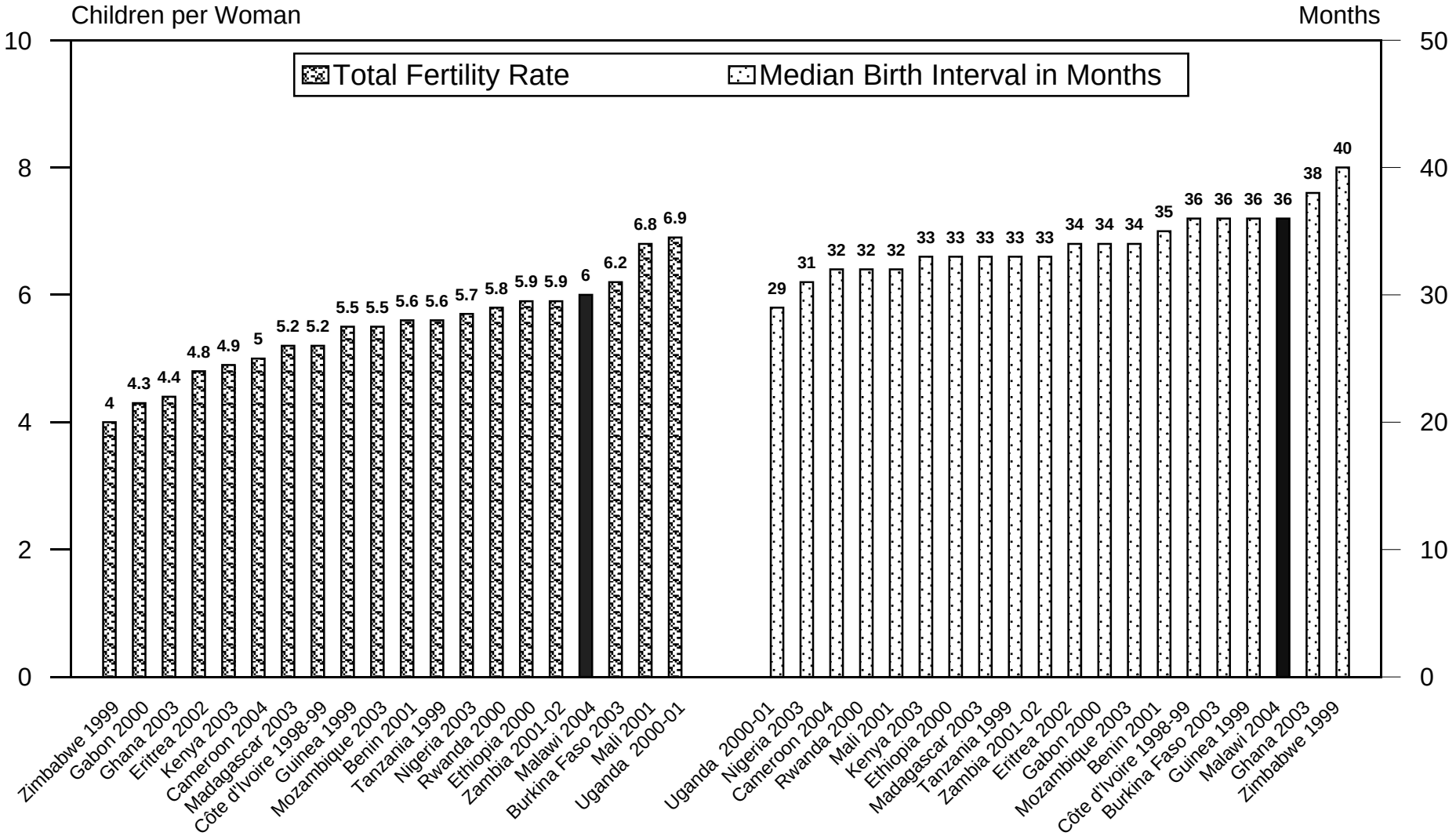
High fertility rates, especially when accompanied by short birth intervals, are detrimental to children's nutritional status. In most countries in sub-Saharan Africa, families have scarce resources to provide adequate nutrition and health care for their children. As the number of children per woman increases, fewer household resources are available for each child. High fertility also has a negative impact on maternal health, thus influencing a mother's ability to adequately care for her children. The most widely used measure of current fertility is the total fertility rate, which is defined as the number of children a woman would have by the end of her childbearing years if she were to pass through those years bearing children at the currently observed age-specific rates.

Information on the length of birth intervals provides insight into birth spacing patterns. Research has shown that children born too soon after a previous birth are at increased risk of poor nutrition and health and increased risk of mortality, particularly when that interval is less than 24 months. The odds of stunting and underweight have been shown to be higher when birth intervals are less than 36 months. Short birth intervals are associated with small birth size and low birth weight, both of which are precursors to poor nutritional status in early childhood.

- **At current fertility rates, a woman in Malawi will have an average of 6 children by the end of her childbearing years.** This rate is at the high end among the sub-Saharan countries surveyed between 1999 and 2004.

- **Malawi's mothers have a median birth interval of 36 months.** This interval is one of the highest of the countries surveyed.

Figure 16
Fertility and Birth Intervals, Malawi Compared with Other Sub-Saharan Countries



Source: DHS Surveys 1999-2004

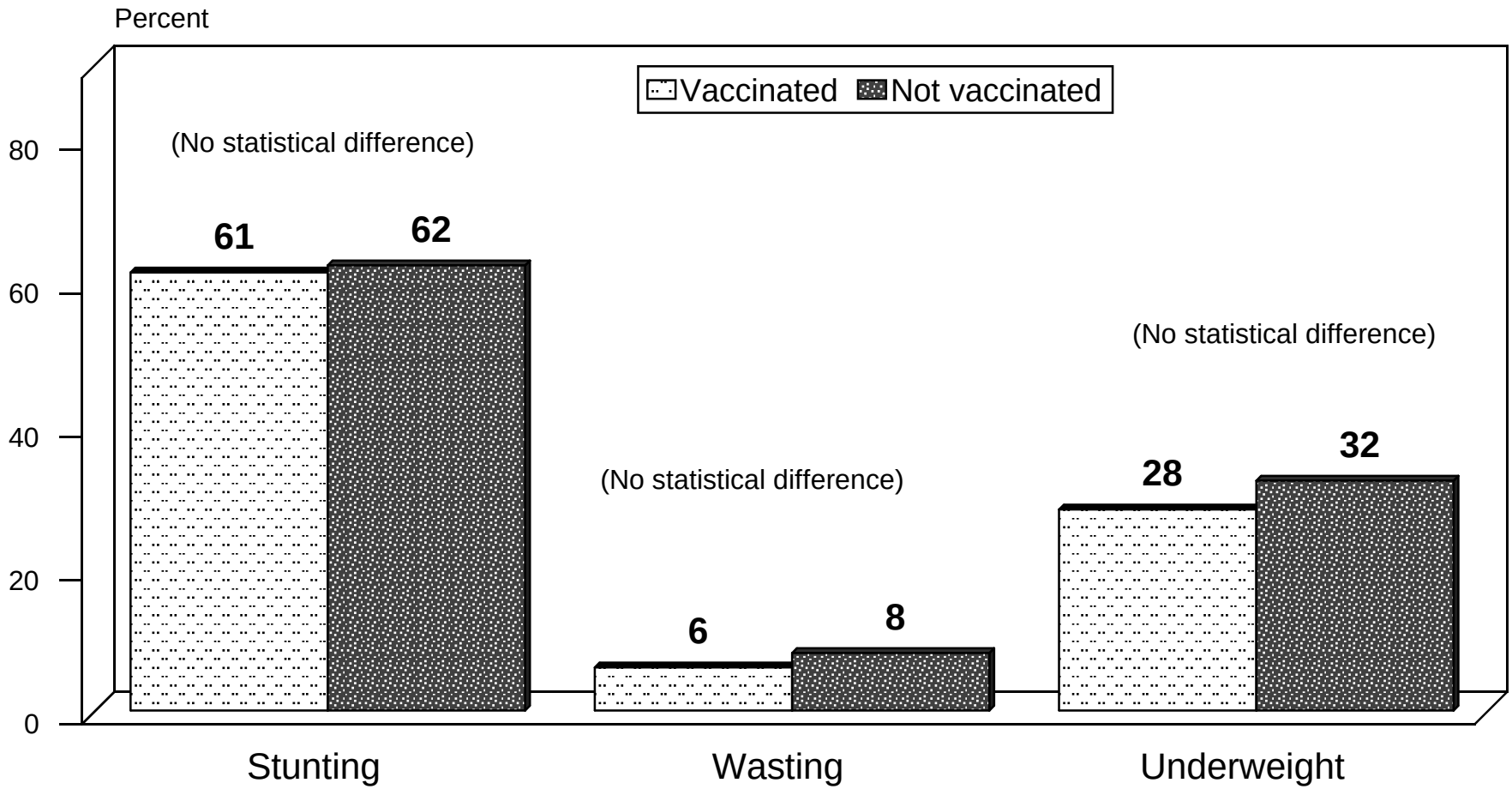
Figure 17: Undernutrition among Children Age 12-23 Months, by Measles Vaccination Status, Malawi

Measles is estimated to kill two million children a year, all in developing countries. It is one of the most common diseases during childhood in areas with low immunization coverage. Measles not only increases the risk of death but is also a direct cause of malnutrition. The occurrence of measles in poor environments is associated with faltering growth, vitamin A deficiency, and immune suppression. Although infants are not protected from measles after birth by their mother's breast milk, they are protected while in the womb by their mother's measles antibodies. These antibodies can last up to 15 months in infants, but due to malnutrition, last only eight or nine months in children in developing countries. Therefore, measles vaccination is an important child health strategy.

In Malawi,

- **Stunting, wasting, and underweight are not related to measles vaccination status of children.**

Figure 17
Undernutrition among Children Age 12-23 Months, by Measles Vaccination Status, Malawi



Note: *Stunting* reflects chronic malnutrition; *wasting* reflects acute malnutrition; *underweight* reflects chronic or acute malnutrition or a combination of both.

Source: MDHS 2004

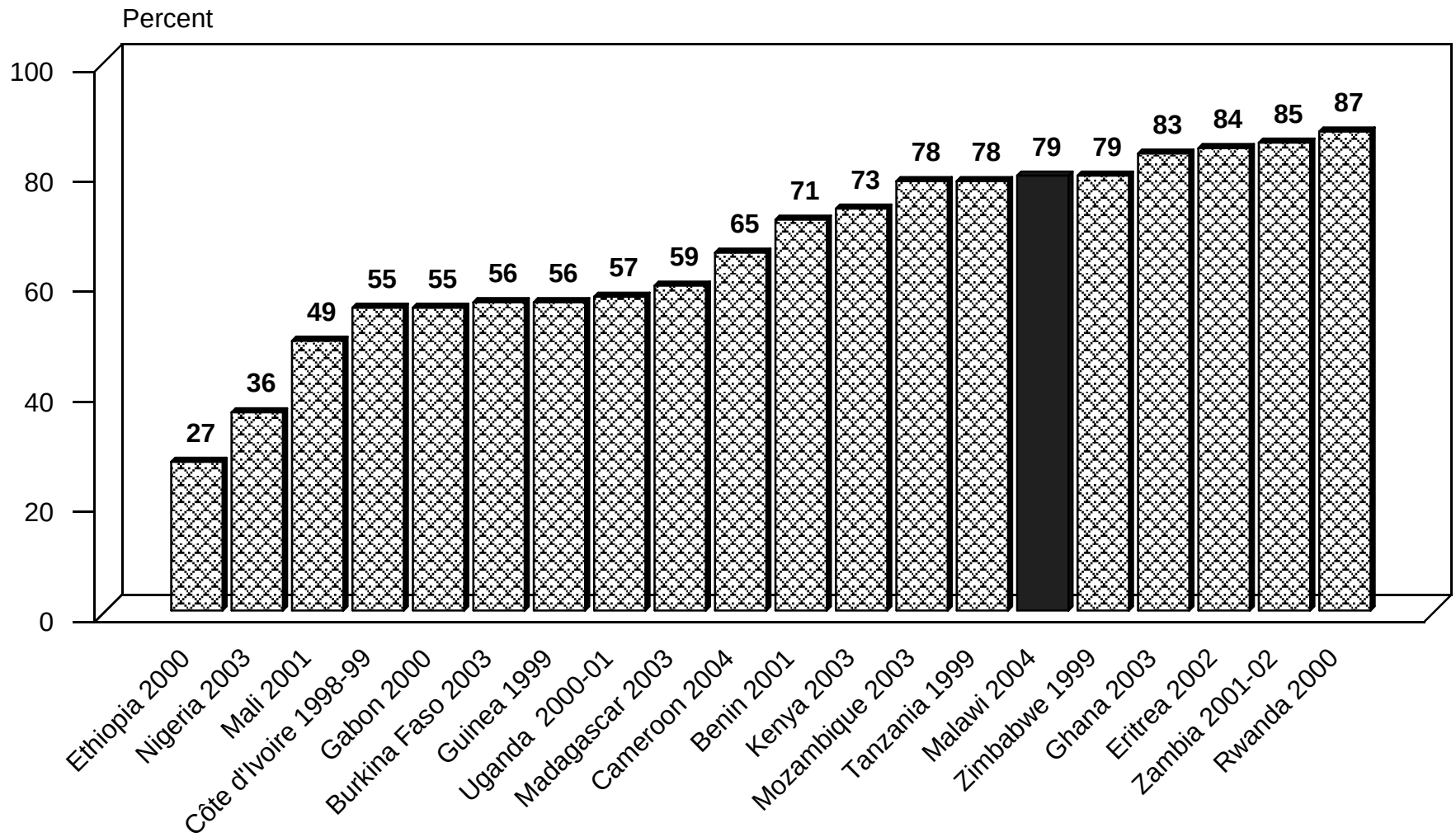
Figure 18: Measles Vaccination Coverage among Children Age 12-23 Months, Malawi Compared with Other Sub-Saharan Countries

Among the sub-Saharan countries surveyed, measles vaccination ranges from 27 to 87 percent.

In Malawi,

- **Seventy-nine percent of children age 12-23 months have been vaccinated against measles.** This level of coverage is in the mid-range of the sub-Saharan countries surveyed.

Figure 18
Measles Vaccination Coverage among Children Age 12-23 Months, Malawi Compared with Other Sub-Saharan Countries



Source: DHS Surveys 1999-2004

Figure 19: Feeding Practices for Infants under Six Months, Malawi

Improper feeding practices, in addition to diarrheal disease, are important determinants of malnutrition. WHO and UNICEF recommend that *all infants should be exclusively breastfed from birth until six months of age.* In other words, infants should be fed only breast milk during the first six months of life.

In Malawi, the introduction of liquids, such as water, sugar water, and juice, formula, and solid foods takes place earlier than the recommended age of about six months. This practice has a deleterious effect on nutritional status for a number of reasons. First, the liquids and solid foods offered are nutritionally inferior to breast milk. Second, the consumption of liquids and solid foods decreases the infant's intake of breast milk, which in turn reduces the mother's supply of milk. (Breast milk production is determined, in part, by the frequency and intensity of suckling.) Third, feeding young infants liquids and solid foods increases their exposure to pathogens, thus putting them at greater risk of diarrheal disease.

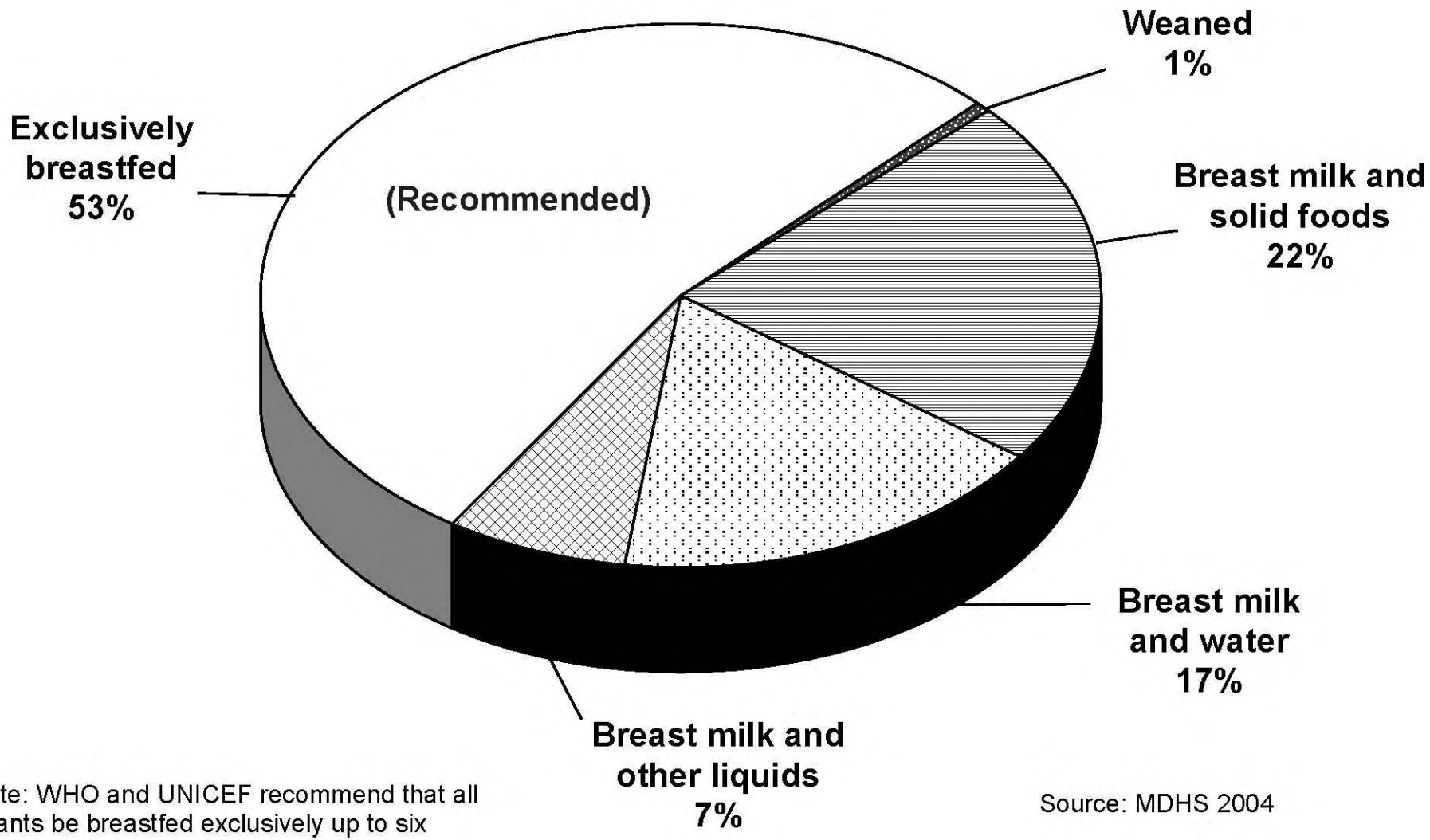
In Malawi,

- **Fifty-three percent of children under the age of six months are exclusively breastfed, as is recommended by WHO and UNICEF.**

- **Seventeen percent of infants under six months of age are given a combination of breast milk and water. Additionally, 7 percent of infants under six months are given liquids other than water, and 22 percent receive solid food in addition to breast milk and/or water.**

- **One percent of infants under six months of age are fully weaned.**

Figure 19
Feeding Practices for Infants under Six Months, Malawi



Note: WHO and UNICEF recommend that all infants be breastfed exclusively up to six months of age.

Source: MDHS 2004

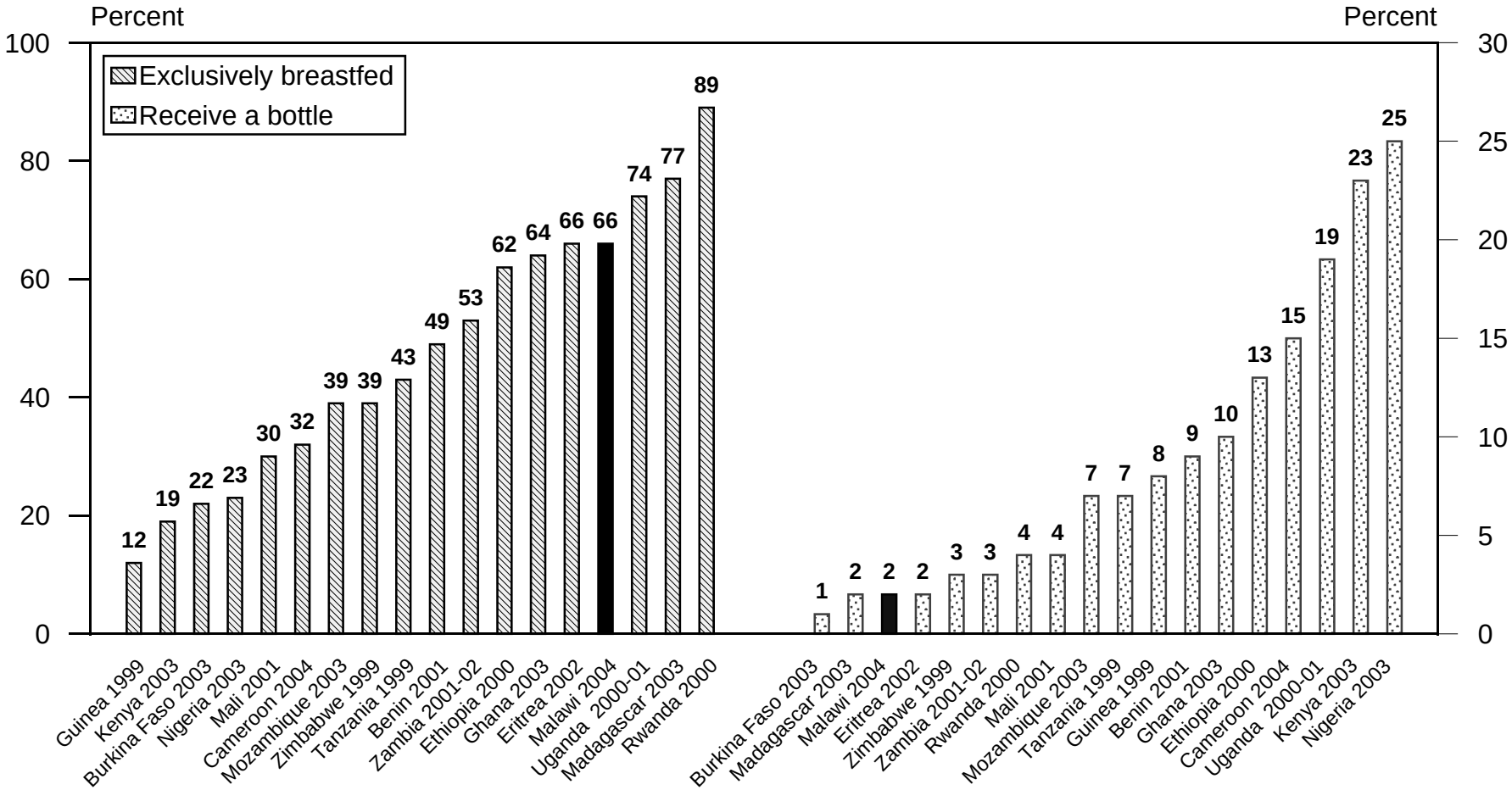
Figure 20: Infants under Four Months Who Are Exclusively Breastfed and Those Who Receive a Bottle, Malawi Compared with Other Sub-Saharan Countries

The failure to exclusively breastfeed young infants and the introduction of liquids and solid foods at too early an age increases the risk of diarrheal disease, an important cause of mortality in Africa.

- In most of the sub-Saharan countries surveyed, relatively very few mothers of infants under four months follow the recommended practice of breastfeeding exclusively. **In Malawi, 66 percent of mothers breastfeed their young infants exclusively.** This puts Malawi in the upper range of the sub-Saharan countries surveyed.

- **Bottle-feeding is provided to 2 percent of infants under four months in Malawi.** This rate is one of the lowest of the Sub-Saharan countries surveyed. **Bottle-feeding is not recommended** because improper sanitation and formula preparation with bottle-feeding can introduce pathogens to infants, putting them at a greater risk of illness and malnutrition.

Figure 20
Infants under Four Months Who Are Exclusively Breastfed and Those Who Receive a Bottle, Malawi Compared with Other Sub-Saharan Countries



Note: Information on feeding practices is based on the 24 hours before the survey. WHO and UNICEF recommend that all infants should receive nothing but breast milk up to six months of age.

Source: DHS Surveys 1999-2004

Figure 21: Feeding Practices for Infants Age 6-9 Months, Malawi

UNICEF and WHO recommend that solid foods be introduced to infants around the age of six months because breast milk alone is no longer sufficient to maintain a child's optimal growth. Thus, *all infants over six months of age should receive solid foods* along with breast milk.

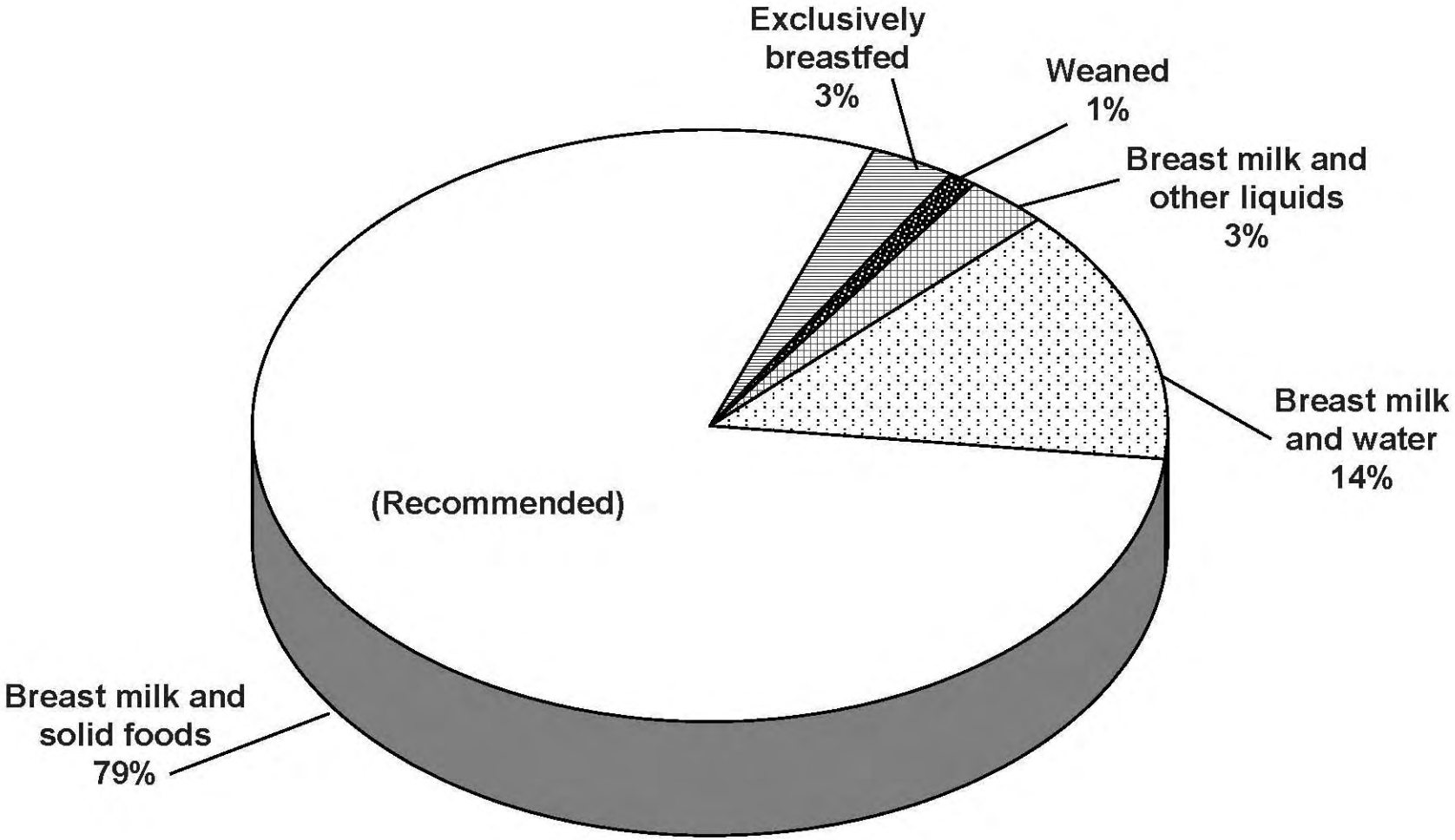
In Malawi,

- **Seventy-nine percent of infants age 6-9 months are fed solid foods in addition to breast milk.** This means that more than two-thirds of all infants age 6-9 months are fed according to the recommended practice.

- **Twenty percent of infants age 6-9 months are not fed solid foods in addition to breast milk, putting these children at risk of malnutrition.**

- **One percent of infants are fully weaned** and are thus not receiving the additional nutritional and emotional support of breastfeeding.

Figure 21
Feeding Practices for Infants Age 6-9 Months, Malawi



Note: WHO and UNICEF recommend that all infants be breastfed exclusively up to six months of age.

Source: MDHS 2004

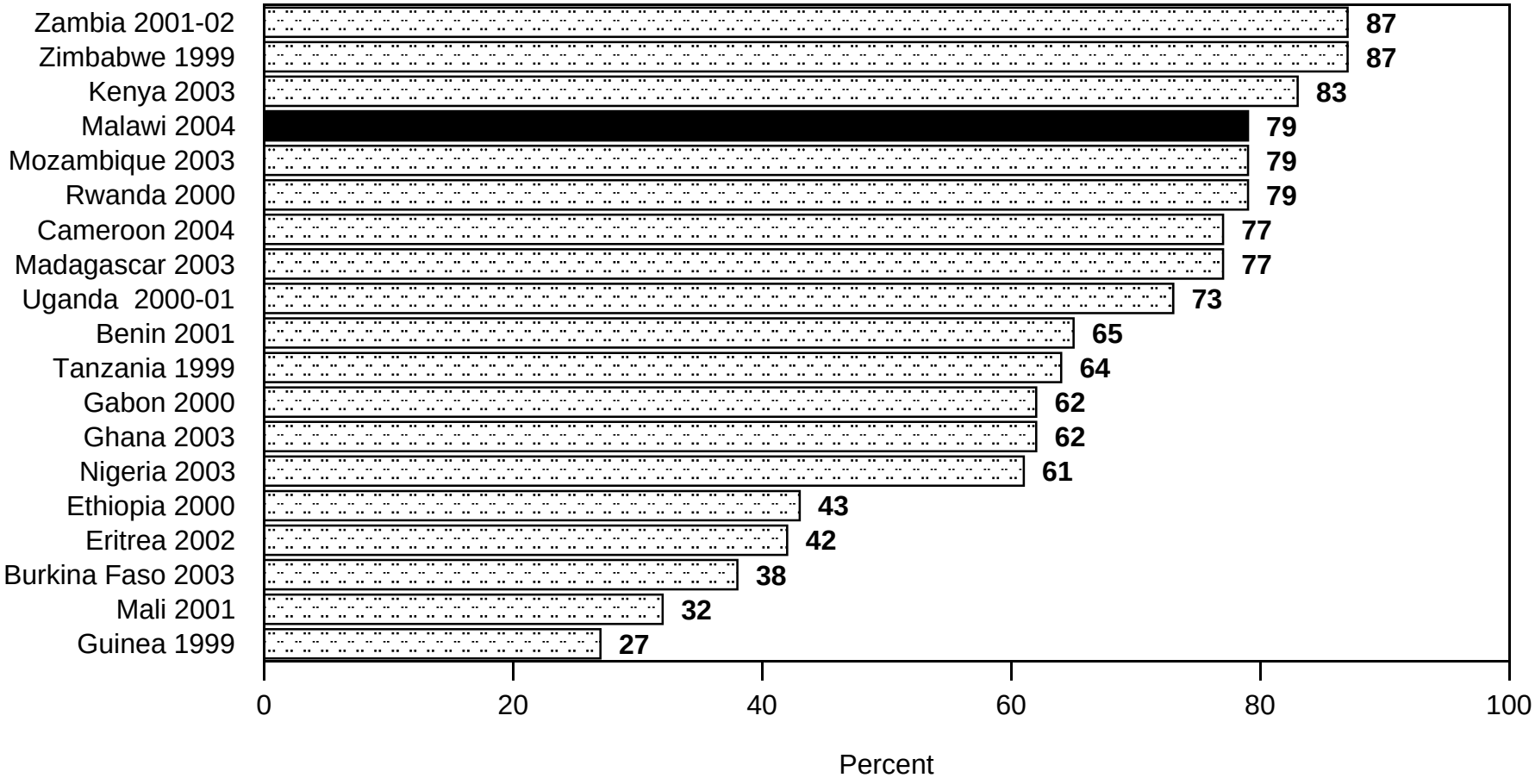
Figure 22: Infants Age 6-9 Months Receiving Solid Foods in Addition to Breast Milk, Malawi Compared with Other Sub-Saharan Countries

Optimal infant feeding practices include the introduction of complementary foods at about six months of age. The introduction of complementary feeding is necessary because breast milk is no longer sufficient to satisfy the developing infant's energy, protein, and micronutrient needs. All infants age 6-9 months should receive complementary foods in addition to breast milk.

- **The percentage of infants age 6-9 months receiving solid food in addition to breast milk ranges from 27 to 87** percent among the sub-Saharan countries surveyed.

- In Malawi, **79 percent of infants age 6-9 months receive solid food in addition to breast milk.** This puts Malawi in the upper range of the sub-Saharan countries surveyed.

Figure 22
Infants Age 6-9 Months Receiving Solid Foods in Addition to Breast Milk, Malawi Compared with Other Sub-Saharan Countries



Note: WHO and UNICEF recommend that by the age of six months all infants should receive solid foods and liquids in addition to breast milk.

Source: DHS Surveys 1999-2004

Figure 23: Children Age 10-23 Months Who Continue to Be Breastfed, Malawi Compared with Other Sub-Saharan Countries

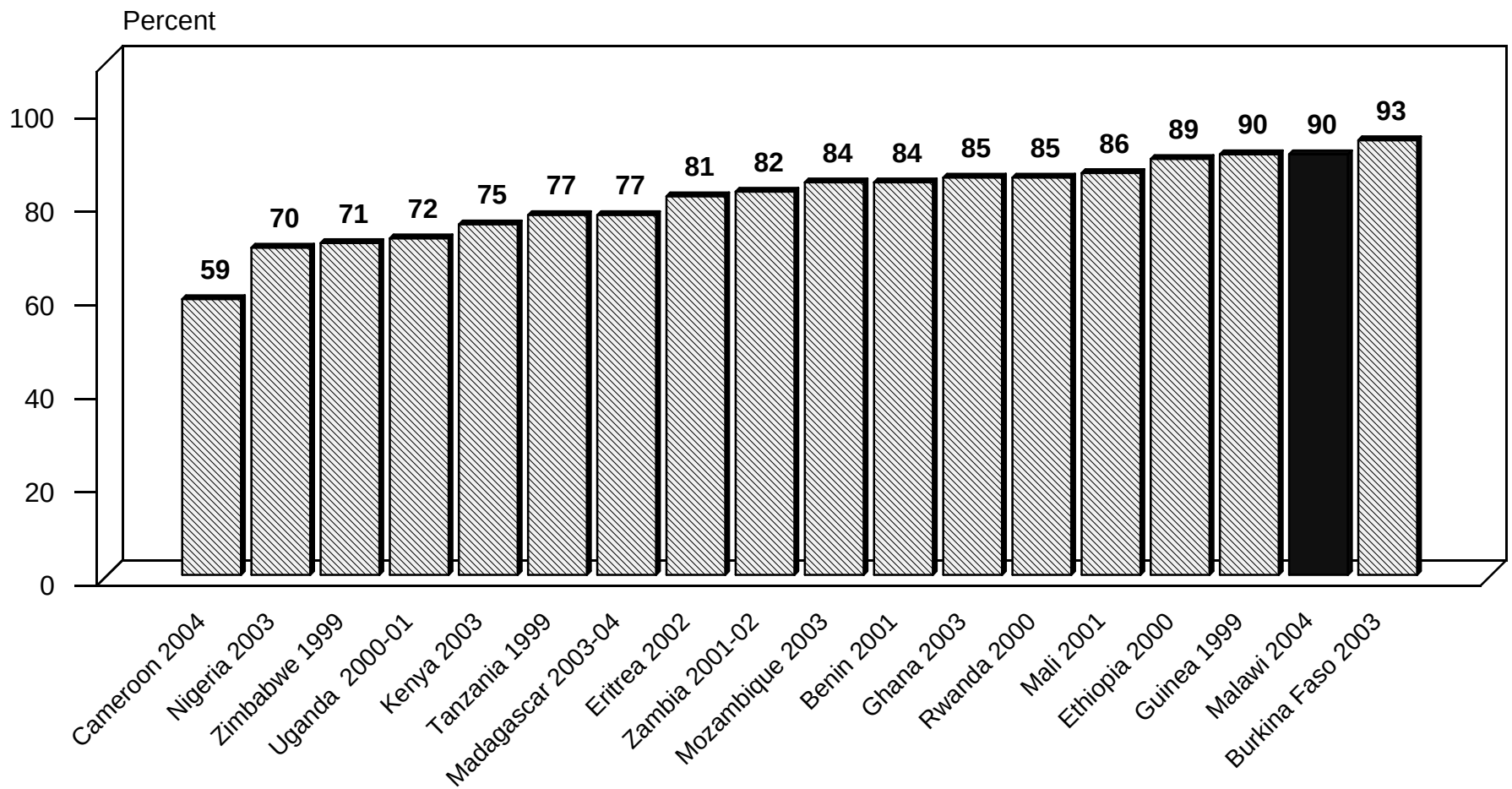
For older infants and toddlers, breast milk continues to be an important source of energy, protein, and micronutrients. Studies have shown that, in some populations, breast milk is the most important source of vitamin A and fat among children over 12 months of age. Breastfeeding older infants also reduce their risk of infection, especially diarrhea.

Additionally, breastfeeding up to 24 months can help reduce a woman's fertility, especially in areas where contraception is limited. Women who breastfeed for longer periods have lower fertility rates than women who breastfeed for shorter periods.

In Malawi,

- **Ninety percent of children age 10-23 months are still given breast milk.** This rate is second highest of the sub-Saharan countries surveyed.

Figure 23
Children Age 10-23 Months Who Continue to Be Breastfed, Malawi Compared with Other Sub-Saharan Countries



Note: Information on feeding practices is based on the 24 hours before the survey. WHO and UNICEF recommend that all children should continue to be breastfed up to 24 months of age.

Source: DHS Surveys 1999-2004

Underlying Social and Economic Influences of Malnutrition

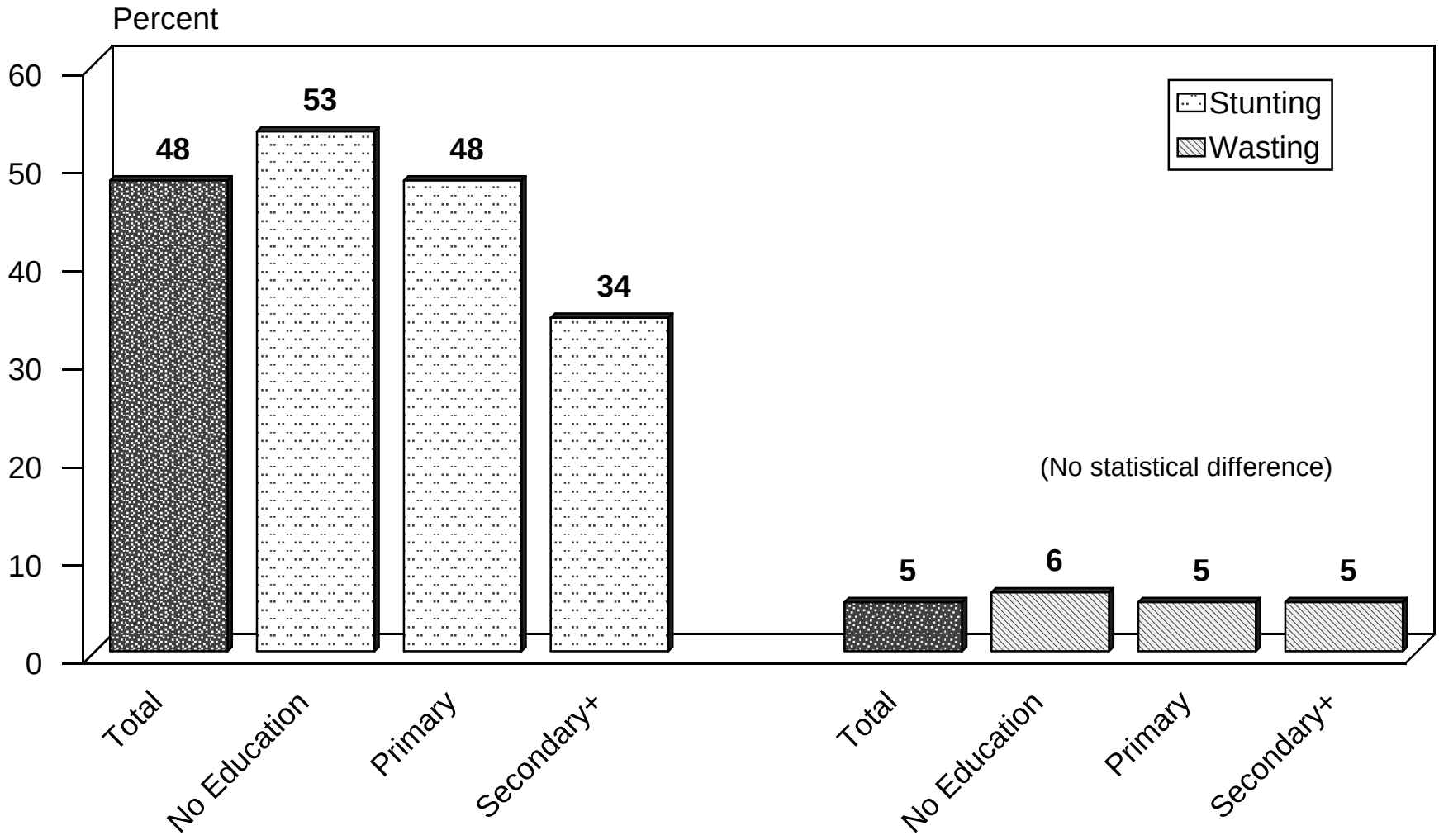
Figure 24: Stunting and Wasting among Children under Five Years, by Mother's Education, Malawi

Maternal education is related to knowledge of good child care practices and to household wealth. In Malawi, 26 percent of the mothers of children under five years of age have never attended school, while 64 percent have some primary education and 10 percent have a secondary or higher education. There are variations in school attendance, especially between urban and rural areas. In rural areas, 95 percent of the mothers have never attended school, 88 percent have attended primary school, and 64 percent have gone to secondary school or higher. Among mothers in urban areas, 5 percent have no education, 12 percent have a primary education, and 36 percent have attended secondary school or higher. Sixteen percent of mothers in the Northern region have received at least a secondary education compared with less than 10 percent of mothers in the Central and Southern regions.

- **Maternal education has an inverse relationship with stunting in Malawi. As the level of maternal education increases, the level of stunting decreases.** The difference in the level of stunting between children of mothers with no education and those whose mothers have a primary education is 5 percentage points. The difference between children of mothers with no education and children of mothers with secondary education or higher is 19 percentage points.

- **There is no difference in the level of wasting between children of mothers with no education compared with children of mothers with primary education and secondary or higher education.**

Figure 24
Stunting and Wasting among Children under Five Years, by Mother's Education, Malawi



Note: *Stunting* reflects chronic malnutrition; *wasting* reflects acute malnutrition.

Source: MDHS 2004

Figure 25: Stunting and Wasting among Children under Five Years, by Source of Drinking Water, Malawi

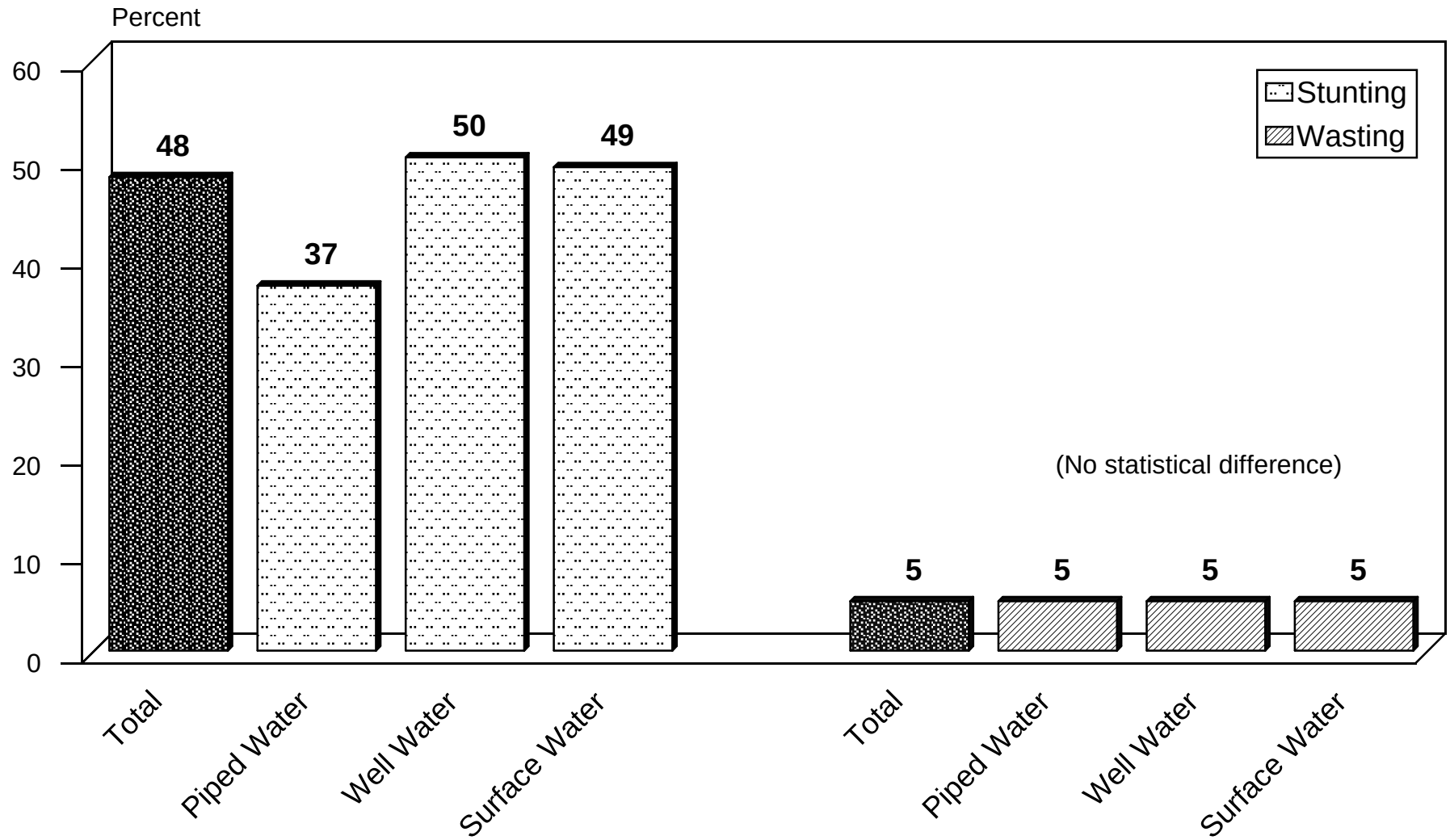
A household's source of drinking water is linked with its socioeconomic status. Poor households are more likely to obtain drinking water from contaminated sources such as surface water or open wells. Without an adequate supply of good-quality water, the risks of food contamination, diarrheal disease, and malnutrition rise. Infants and children in households that do not have a private tap are at greater risk of being malnourished than are those in households with this amenity. Among the households surveyed with children under five years, 17 percent use piped water, 71 percent obtain their drinking water from a well, and 12 percent use surface water.

In Malawi,

- **Children whose drinking water is well water or surface water are more likely to be stunted (50 percent and 49 percent, respectively) than are children with access to piped water (37 percent).**

- There is no statistical difference in wasting levels by source of drinking water.

Figure 25
Stunting and Wasting among Children under Five Years, by Source of Drinking Water, Malawi



Note: *Stunting* reflects chronic malnutrition; *wasting* reflects acute malnutrition.

Source: MDHS 2004

Figure 26: Stunting and Wasting among Children under Five Years, by Type of Toilet, Malawi

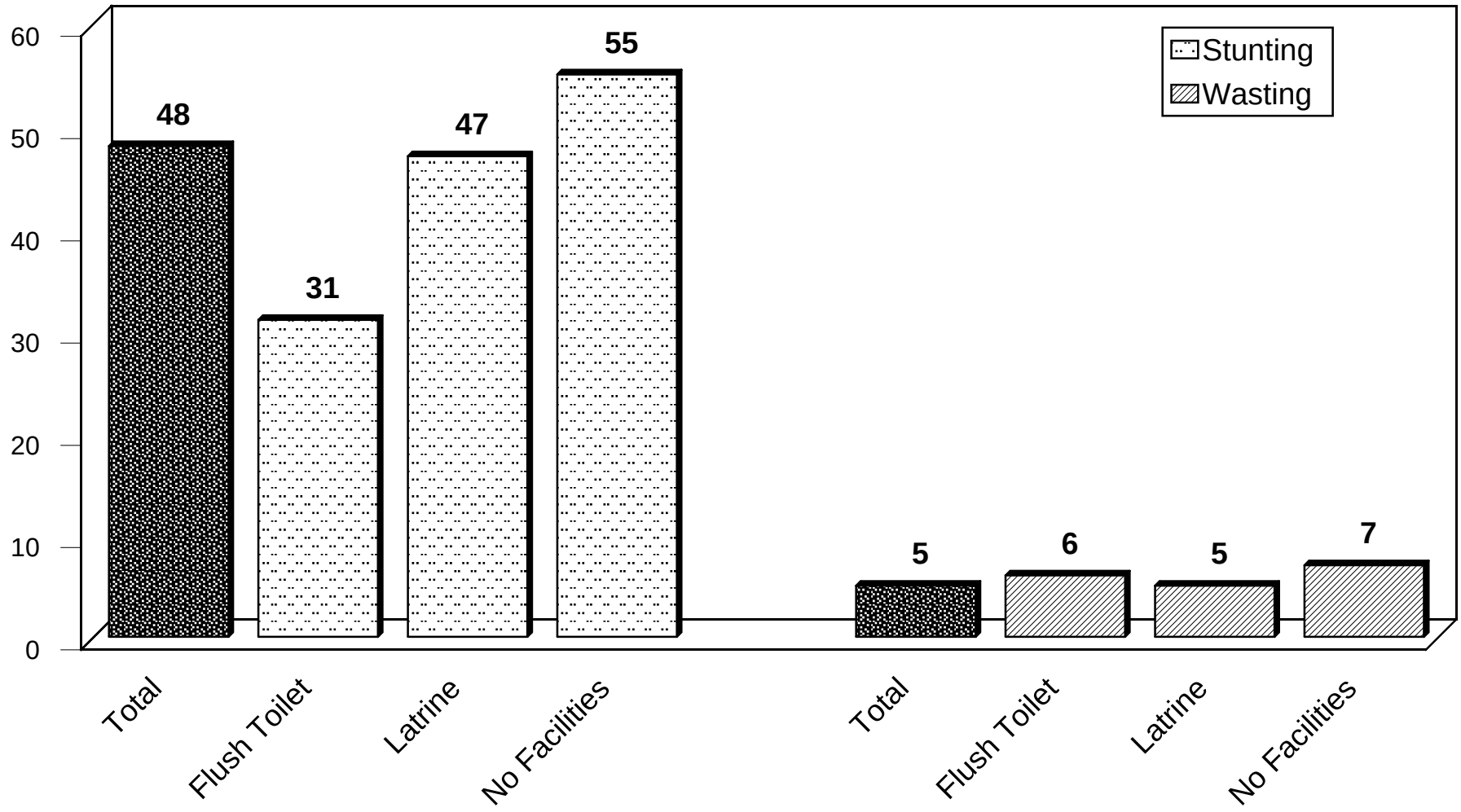
The type of toilet used by a household reflects its wealth, and poor households are less likely to have adequate toilet facilities. Inadequate sanitation facilities result in an increased risk of diarrheal disease, which contributes to malnutrition. Infants and children in households that do not have ready access to a flush toilet are at greater risk of being malnourished than children in households with this amenity. In Malawi, 81 percent of households surveyed with at least one child under five years have access to a latrine, 17 percent have no facilities, and 2 percent of surveyed households have access to a flush toilet.

In Malawi,

- **Children who have no access to toilet facilities and those who have access to a latrine are much more likely to be stunted (55 percent and 47 percent, respectively)** than are children who have access to a flush toilet (31 percent).

- **Children who have no access to toilet facilities are more likely to be wasted** (7 percent) than are children using pit latrines (6 percent). There are too few cases of wasting in children who have access to flush toilets to be reported.

Figure 26
Stunting and Wasting among Children under Five Years, by Type of Toilet, Malawi



Note: *Stunting* reflects chronic malnutrition; *wasting* reflects acute malnutrition.

Source: MDHS 2004

Basic Influences

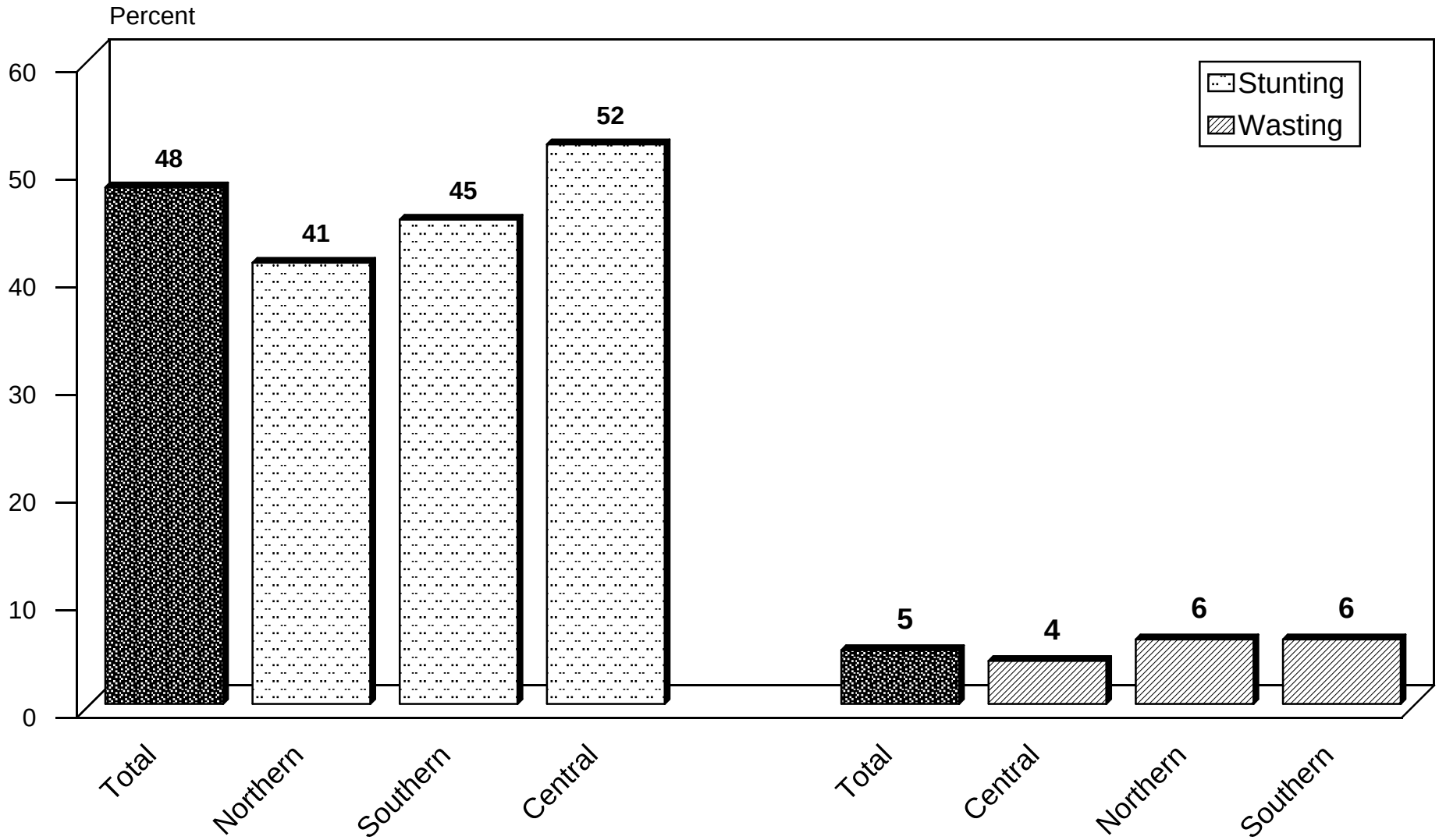
Figure 27: Stunting and Wasting among Children under Five Years, by Region, Malawi

In Malawi,

- **Stunting ranges from 41 to 52 percent among children in the 3 regions.** Stunting rates are the highest in the Central region.

- **Wasting ranges from 4 to 6 percent among children in the 3 regions.** Wasting rates are the lowest in the Central region.

Figure 27
Stunting and Wasting among Children under Five Years, by Region, Malawi



Note: *Stunting* reflects chronic malnutrition; *wasting* reflects acute malnutrition.

Source: MDHS 2004

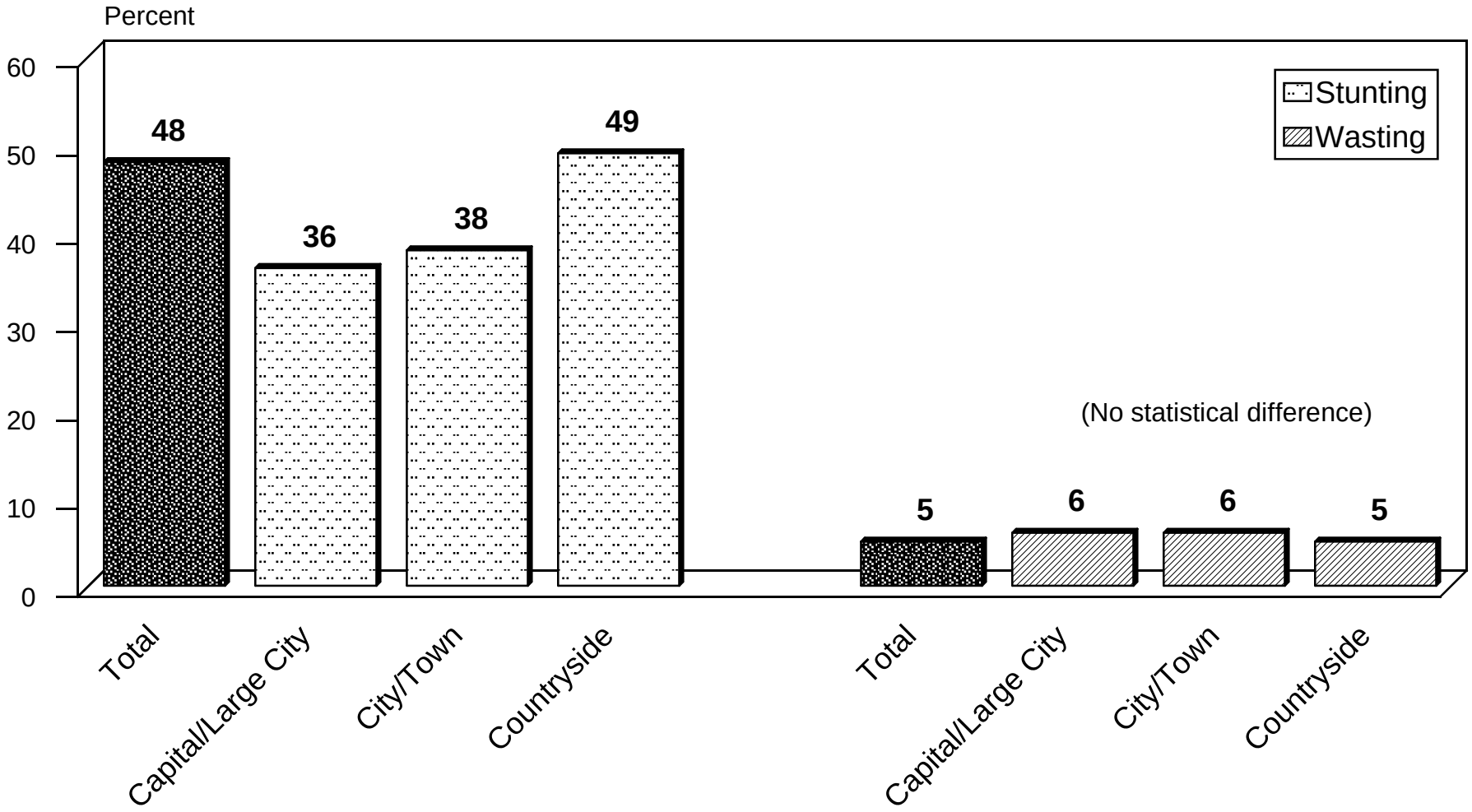
Figure 28: Stunting and Wasting among Children under Five Years, by Urban-Rural Residence, Malawi

In Malawi,

- **Forty-eight percent of children are stunted. In capital/large city areas, 36 percent of children are affected by chronic malnutrition, compared with 38 percent in city/town areas.** The highest rate of stunting is in the countryside (49 percent).

- **Place of residence has no influence on the wasting levels in children.**

Figure 28
Stunting and Wasting among Children under Five Years, by Urban-Rural Residence, Malawi



Source: MDHS 2004

Note: *Stunting* reflects chronic malnutrition; *wasting* reflects acute malnutrition.

Maternal Nutritional Status

Figure 29: Malnutrition among Mothers of Children under Five Years, by Region, Malawi

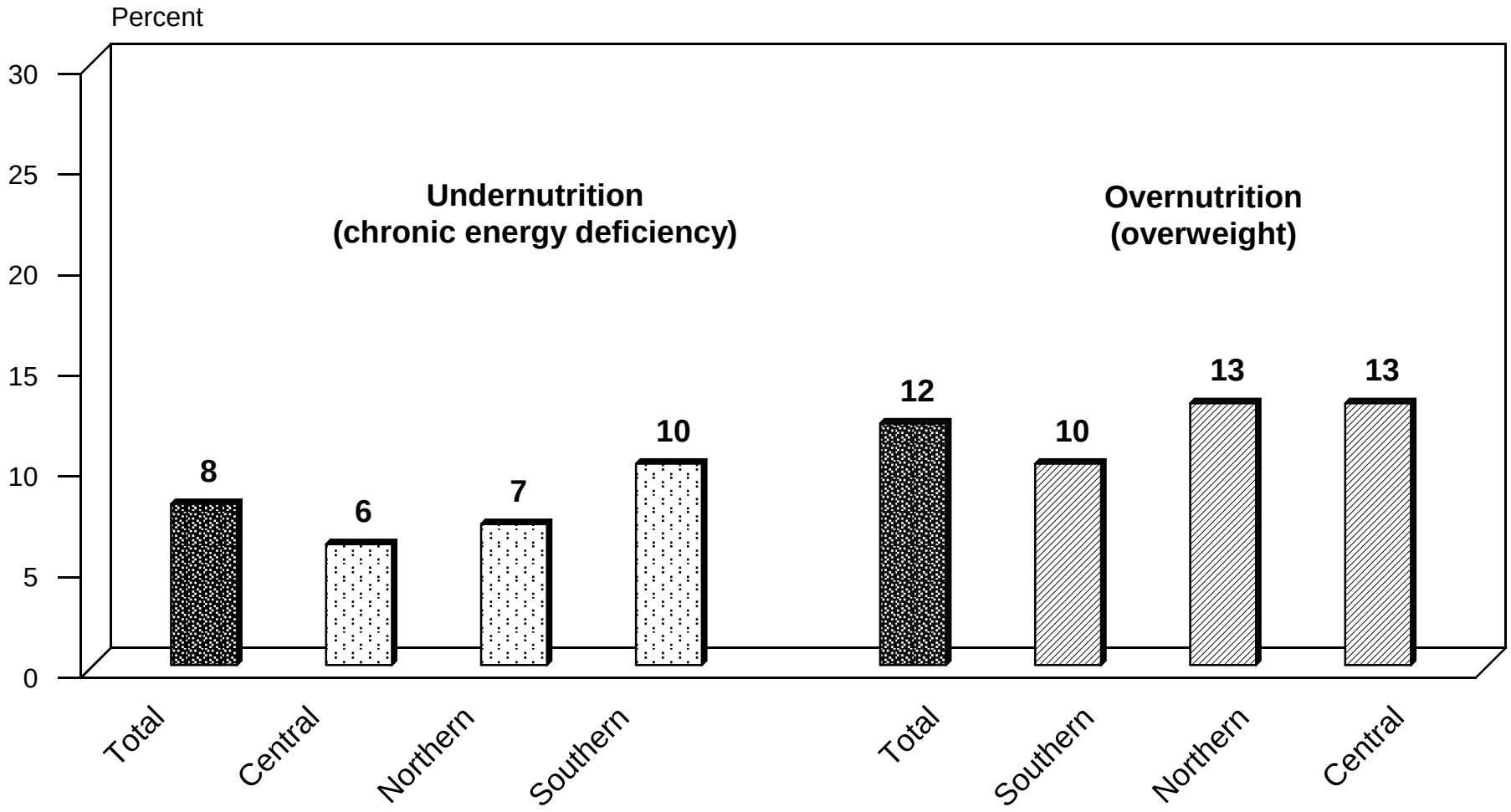
Besides being of concern in its own right, a mother's nutritional status affects her ability to successfully carry, deliver, and care for her children. There are generally accepted standards for indicators of malnutrition among adult women that can be applied.

Malnutrition in women can be assessed using the body mass index (BMI), which is defined as a woman's weight in kilograms divided by the square of her height in meters. Thus, BMI=kg/m^2. When the BMI is below the suggested cutoff point of 18.5, this indicates chronic energy deficiency or undernutrition for nonpregnant, nonlactating women. When the BMI is above 25, women are considered overweight.

- **Eight percent of mothers of children under age five in Malawi are undernourished.** The highest level of maternal undernutrition is in the Southern region (10 percent).

- **Twelve percent of mothers of children under five are overweight.** The level of maternal overnutrition is lowest in the Southern region (10 percent).

Figure 29
Malnutrition among Mothers of Children under Five Years, by Region, Malawi



Note: Maternal undernutrition is the percentage of mothers whose BMI (kg/m^2) is less than 18.5. Maternal overnutrition is the percentage of mothers whose BMI is greater than 25.

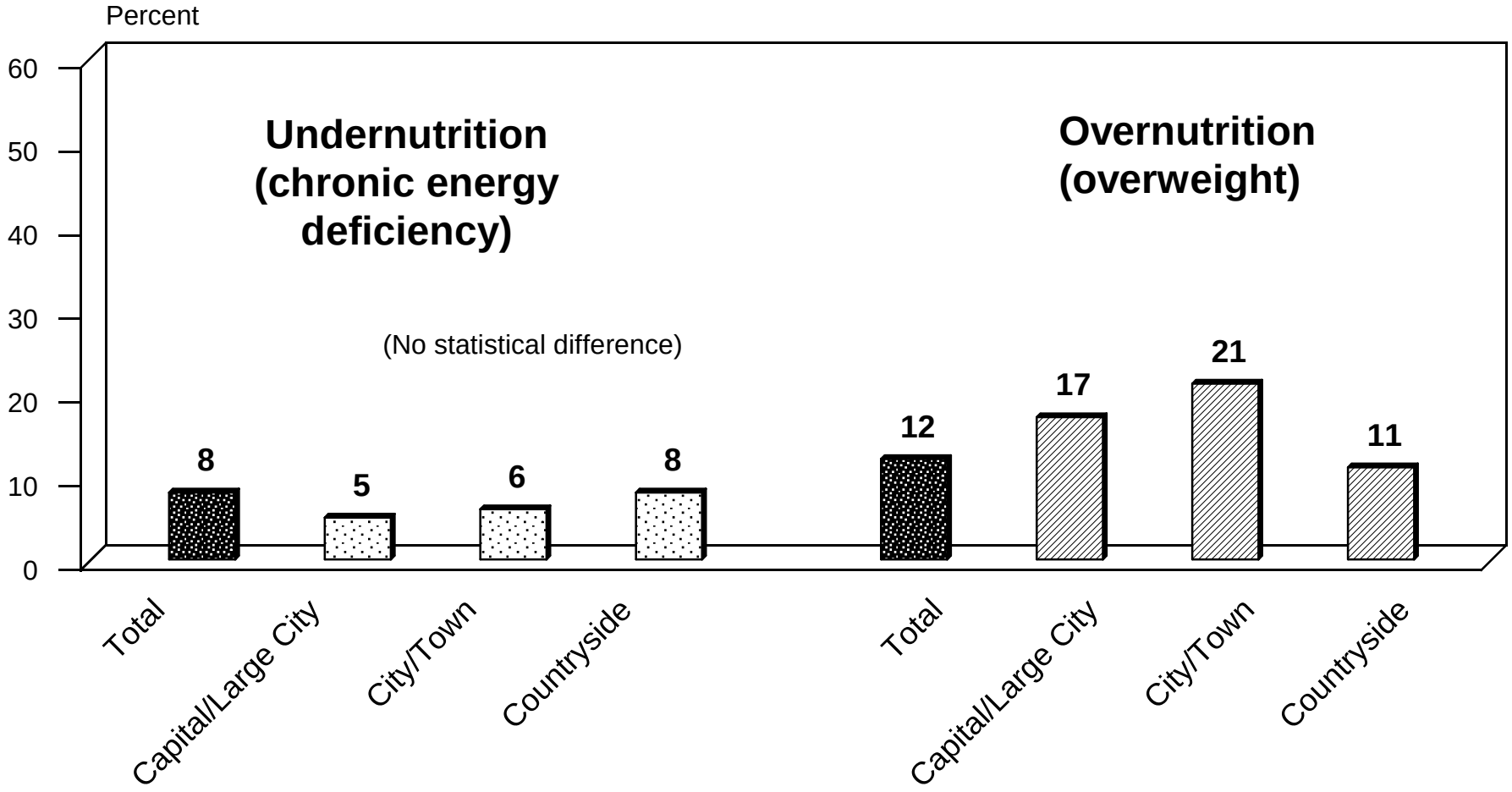
Source: MDHS 2004

Figure 30: Malnutrition among Mothers of Children under Five Years, by Residence, Malawi

In Malawi,

- There is no relationship between maternal undernutrition status and their place of residence.
- The overnutrition rate (overweight) for mothers of children under five **is highest in the city/town areas (21 percent), followed by capital/large city areas (17 percent), and is lowest in the countryside (11 percent).**

Figure 30
Malnutrition among Mothers of Children under Five Years, by Residence, Malawi



Note: Maternal undernutrition is the percentage of mothers whose BMI (kg/m^2) is less than 18.5. Maternal overnutrition is the percentage of mothers whose BMI is greater than 25.

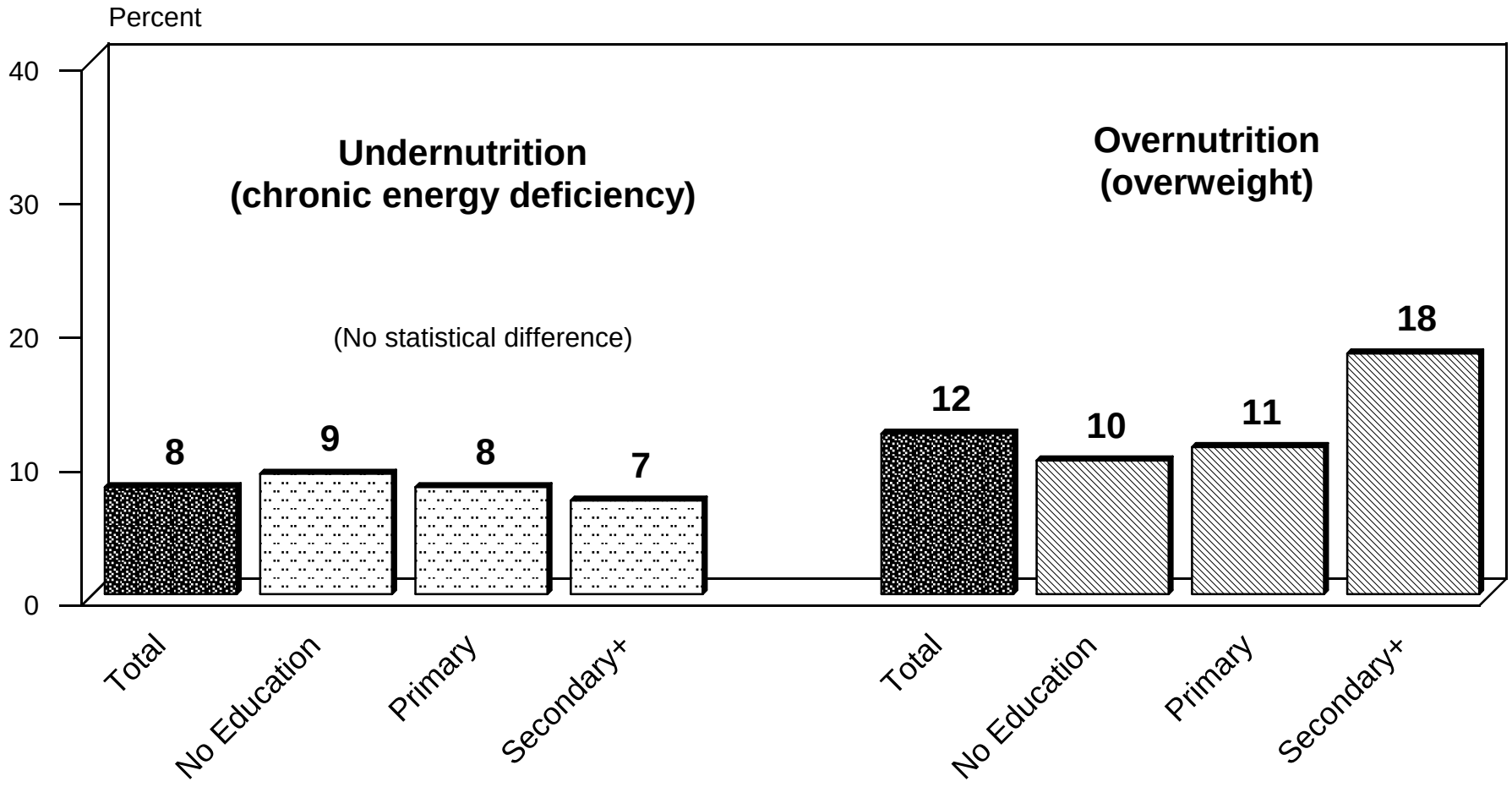
Source: MDHS 2004

Figure 31: Malnutrition among Mothers of Children under Five Years, by Education, Malawi

In Malawi,

- **There is no relationship between mother's educational status and maternal undernutrition.**
- **The rate of maternal overnutrition is highest among women with at least a secondary school education (18 percent).**

Figure 31
Malnutrition among Mothers of Children under Five Years, by Education, Malawi



Note: Maternal undernutrition is the percentage of mothers whose BMI (kg/m^2) is less than 18.5. Maternal overnutrition is the percentage of mothers whose BMI is greater than 25.

Source: MDHS 2004

Figure 32: Malnutrition among Mothers of Children under Five Years, Malawi Compared with Other Sub-Saharan Countries

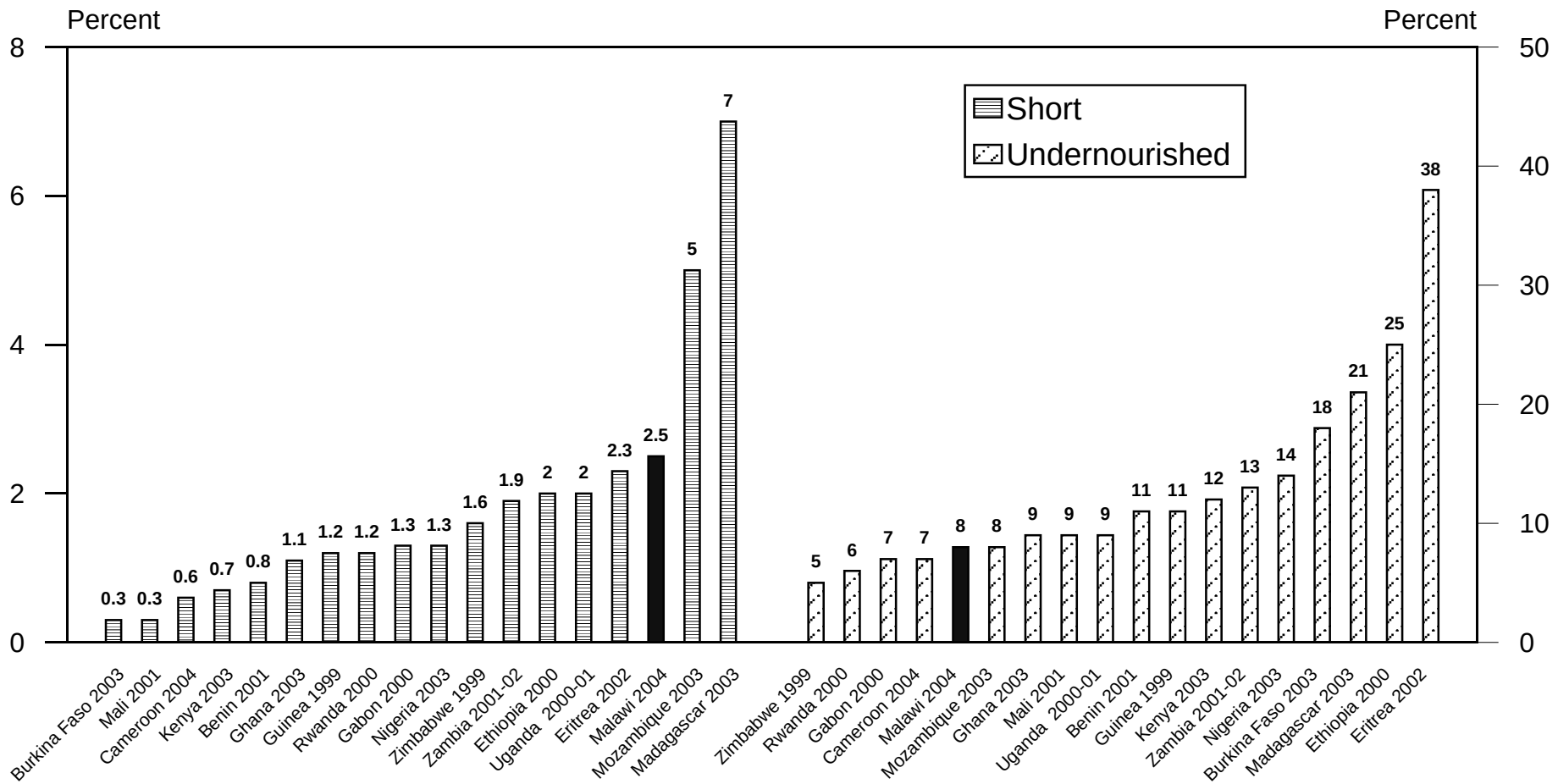
Malnutrition among mothers is likely to have a major impact on their ability to care for themselves and their children. Women less than 145 centimeters in height are considered too short. Mothers who are too short (a condition largely due to stunting during childhood and adolescence) may have difficulty during childbirth because of the small size of their pelvis. Evidence also suggests there is an association between maternal height and low birth weight. Underweight status in women assessed using the body mass index is also presented. Pregnant women are not included in the malnourished analysis due to weight considerations.

In Malawi,

- **Less than 3 percent (2.5 percent) of mothers of children under five are considered too short (<145 cm).** This proportion is the third highest of the sub-Saharan countries surveyed.

- **Eight percent of mothers of children under five are undernourished (BMI<18.5).** This proportion is in the low range of the sub-Saharan countries surveyed.

Figure 32
Malnutrition among Mothers of Children under Five Years, Malawi Compared with Other Sub-Saharan Countries



Note: Short is the percentage of mothers under 145 cm; undernourished is the percentage of mothers whose BMI (kg/m^2) is less than 18.5. Pregnant women and those who are less than two months postpartum are excluded from BMI calculation.

Source: DHS Surveys 1999-2004

Appendices

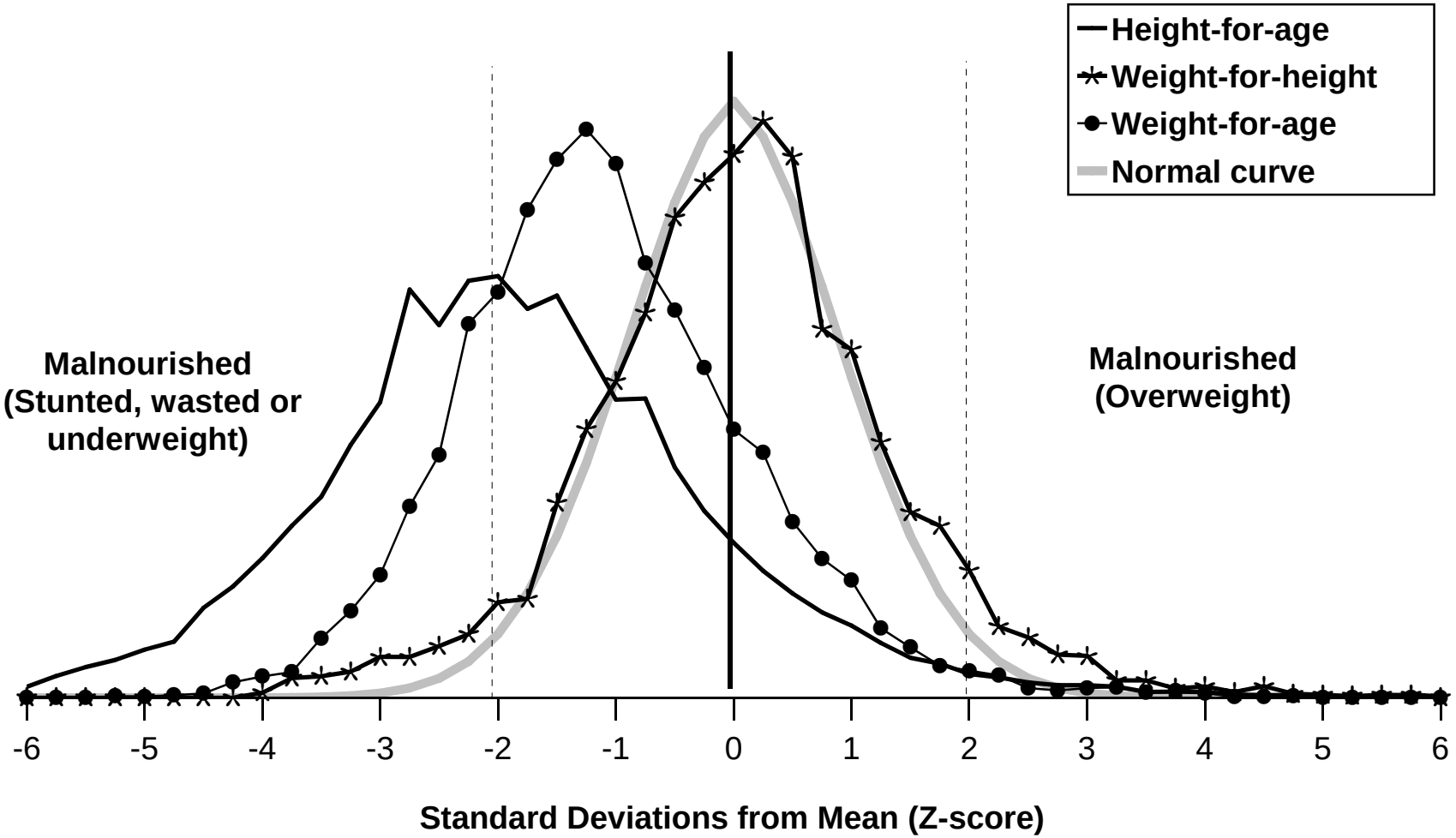
Appendix 1
Stunting, Wasting, Underweight, and Overweight Rates, by Background Characteristics, Malawi 2004

Background characteristic	Stunted	Wasted	Underweight	Overweight	Background characteristic	Stunted	Wasted	Underweight	Overweight
Child's age in months					**Region**				
0-5	11.7	4.0	2.0	17.6	Northern	40.9	5.7	17.0	6.0
6-11	32.0	8.1	22.9	10.2	Central	52.4	3.6	22.3	6.6
12-17	54.8	7.4	30.1	7.0	Southern	45.3	6.4	23.4	5.5
18-23	67.7	6.1	27.4	5.2					
24-29	47.0	4.5	25.2	2.7					
30-35	49.3	6.1	24.4	3.2					
36-47	52.7	3.1	20.5	3.3					
48-59	53.3	4.1	22.3	2.7					
	p<0.000 n=7,834	p<0.000 n=7,834	p<0.000 n=7,835	p<0.000 n=7,834		p<0.000 n=7,835	p<0.000 n=7,833	p<0.000 n=7,834	NS n=7,833
Gender of child					**Urban-rural residence**				
Female	45.4	5.0	21.9	6.7	Capital/Large City	36.2	5.6	12.2	6.6
Male	49.6	5.5	22.3	5.2	City/Town	37.7	5.8	18.4	7.9
					Countryside	49.0	5.1	22.9	5.8
	p<0.000 n=7,833	NS n=7,834	NS n=7,834	p<0.05 n=7,834		p<0.000 n=7,834	NS n=7,833	p<0.000 n=7,833	NS n=7,834
Overall	**47.5**	**5.2**	**22.1**	**6.0**	**Overall**	**47.5**	**5.2**	**22.1**	**6.0**

Note: Level of significance is determined using the chi-square test. NS=Not significant at p≤0.05

Appendix 2
NCHS/CDC/WHO International Reference Population Compared with the Distribution of Malnutrition in Malawi

The assessment of nutritional status is based on the concept that in a well-nourished population, the distributions of children's height and weight at a given age will approximate a normal distribution. This means that about 68 percent of children will have a weight within one standard deviation of the mean for children of that age or height and a height within one standard deviation of the mean for children of that age. About 14 percent of children will be between one and two standard deviations above the mean; these children are considered relatively tall or overweight for their age or relatively overweight for their height. Another 14 percent will be between one and two standard deviations below the mean; these children are considered relatively short or underweight for their age or relatively thin for their height. Of the remainder, 2 percent will be very tall or obese for their age or obese for their height; that is, they are more than two standard deviations above the mean. Another 2 percent will fall more than two standard deviations below the mean and will be considered moderately or severely malnourished. These children are very short (stunted), very underweight for their age, or very thin for their height (wasted). For comparative purposes, nutritional status has been determined using the International Reference Population defined by the United States National Center for Health Statistics (NCHS standard) as recommended by the World Health Organization and the Centers for Disease Control and Prevention.

Appendix 2 includes four curves—weight-for-age, height-for-age, and weight-for-height—graphed against the normal curve. The height-for-age and weight-for-age curves are shifted to the left of the standard curve, indicating that there is a significant number of malnourished children in Malawi. The weight-for-height curve is only slightly different from the standard curve, indicating that wasting is not prevalent. The implications are that interventions are necessary to address chronic malnutrition in order to improve child health. This will result in a shift of the curves closer to the reference standard.

Appendix 2
NCHS/CDC/ International Reference Population Compared with the Distribution of Malnutrition in Malawi