Mozambique 2003

Nutrition of Young Children and Mothers

Africa Nutrition Chartbooks

AFRICA NUTRITION CHARTBOOKS

NUTRITION OF YOUNG CHILDREN AND MOTHERS IN MOZAMBIQUE

Findings from the 2003 Mozambique Demographic and Health Survey

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March 2006

This chartbook was produced by the MEASURE DHS program, which is funded by the U.S. Agency for International Development (USAID) through the Bureau for Global Health, Office of Health, Infectious Diseases and Nutrition (GH/HIDN). The chartbook benefited from funds provided by the USAID Bureau for Africa through its Office of Sustainable Development. Copies of this chartbook may be obtained by contacting the MEASURE DHS program, ORC Macro, at the above address, by telephone at (301) 572-0200, by fax at (301) 572-0999, or on the web at www.measuredhs.com

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Contents

Introduction

Malnutrition[1] is one of the most important health and welfare problems among infants and young children in Mozambique. 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 2003 Mozambique Demographic and Health Survey (MDHS 2003), a nationally representative survey of 12,315 households, conducted by the National Statistical Institute (INE), Ministry of Health, Maputo, Mozambique. 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).

Of the 10,620 children age 0-59 months that were part of the study, there were 8,224 who were alive, whose mothers were interviewed and who had complete anthropometric data. All nutritional analysis includes these children unless otherwise noted. 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.

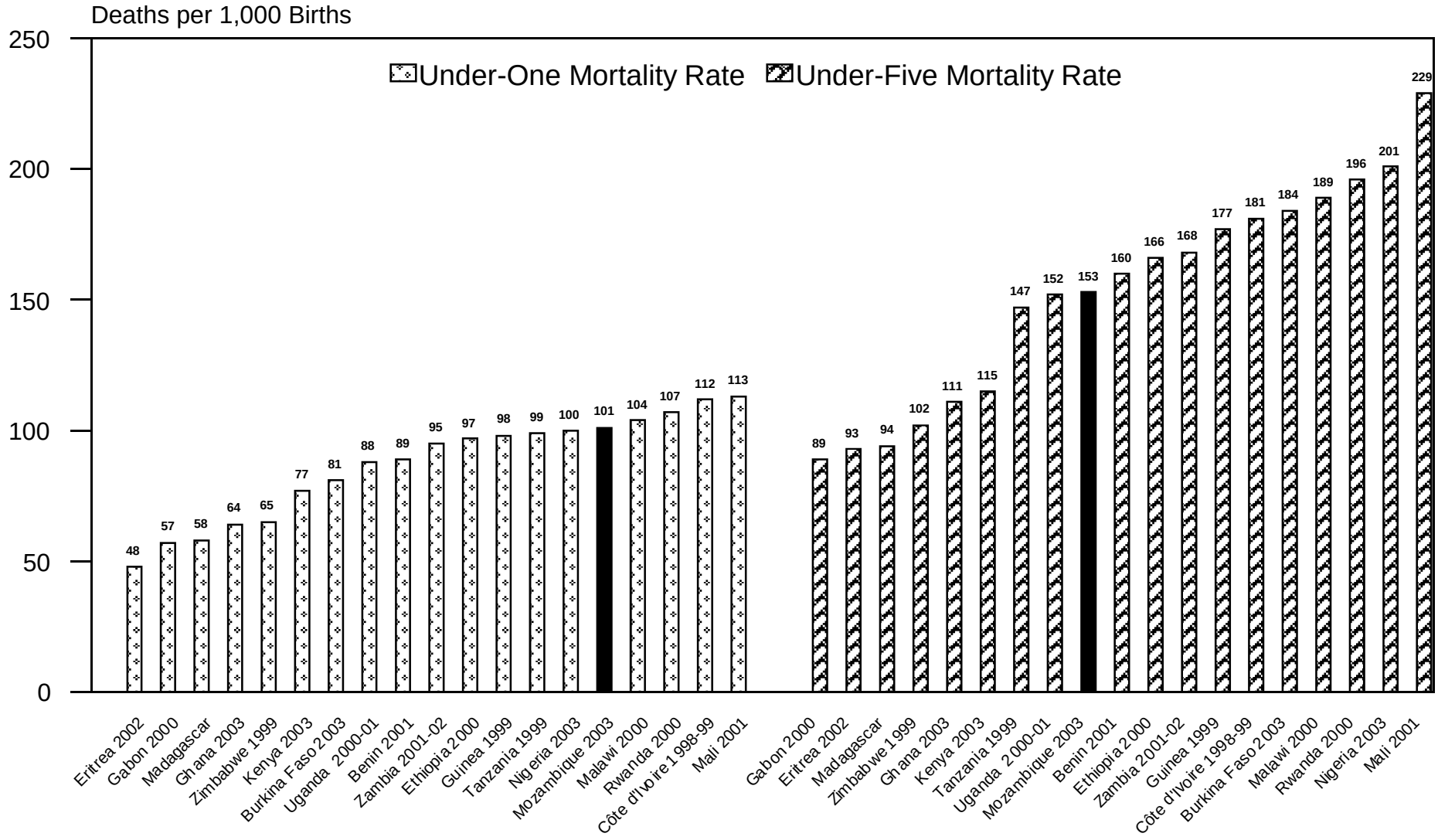
Figure 1: Infant and Child Mortality, Mozambique Compared with Other Sub-Saharan Countries

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.

- **Mozambique's under-one mortality rate (124 deaths per 1,000 births) indicates that 12 percent of children born in Mozambique will die before their first birthday.** This rate is the highest of all sub-Saharan countries surveyed.

- **Mozambique's under-five mortality rate (153 deaths per 1,000 births) indicates that 18 percent of children born in Mozambique will die before their fifth birthday.** This rate is in the mid-range of the sub-Saharan countries surveyed.

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



Source: DHS Surveys 1999-2004

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

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.[2] are used to quantify the contributions of moderate and severe malnutrition to under-five mortality.

In Mozambique,

- **Thirty-six percent of all deaths that occur before age five are related to malnutrition (severe and moderate malnutrition).[3]**

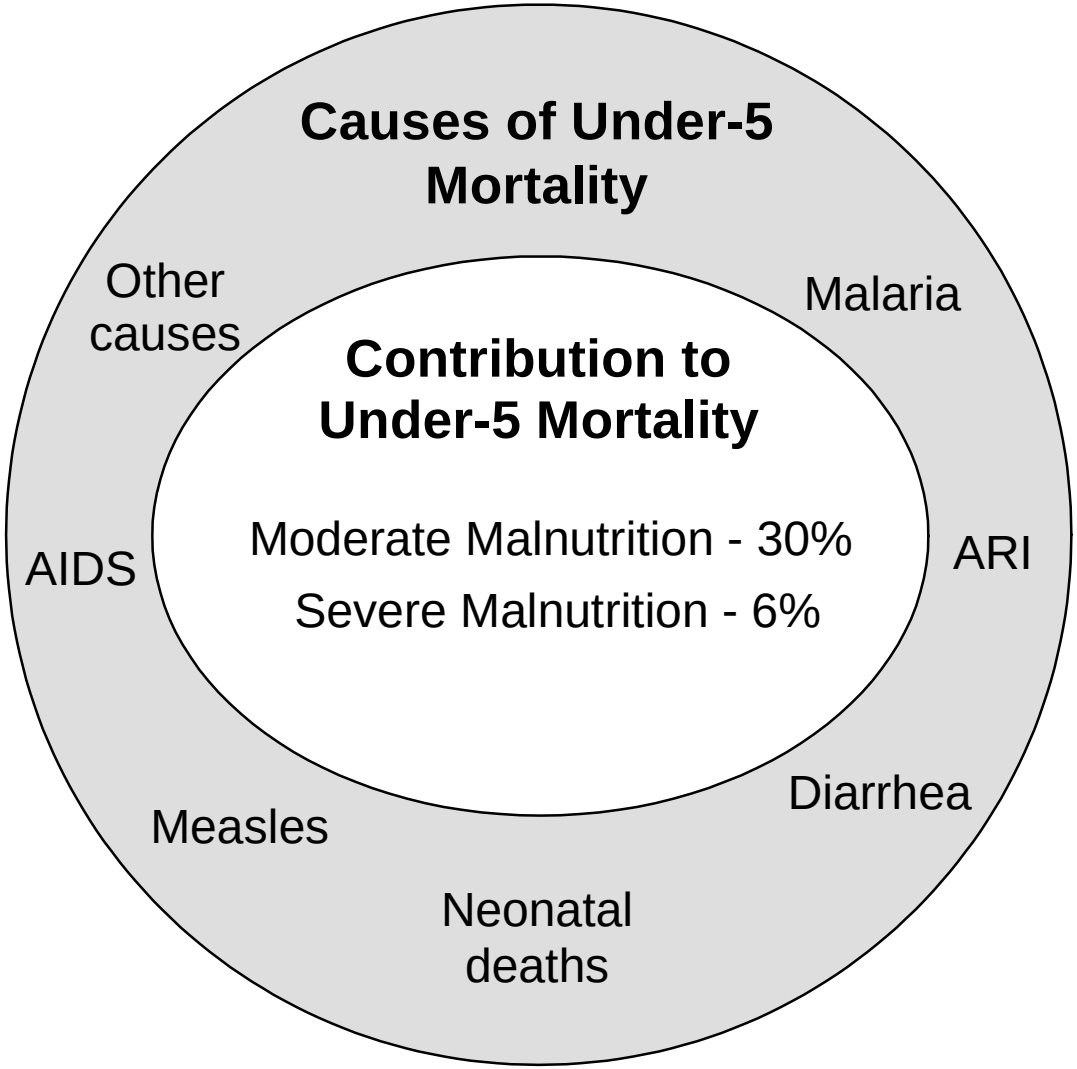
- Because of its extensive prevalence, **moderate malnutrition (30 percent) contributes to more deaths than severe malnutrition (6 percent).**

- **Moderate malnutrition is implicated in 83 percent of deaths associated with malnutrition.**

[2] 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.

[3] 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 2
Contribution of Undernutrition to Under-Five Mortality, Mozambique



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

Source: MDHS 2003

Figure 3: Survival and Nutritional Status of Children, Mozambique

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 Mozambique,

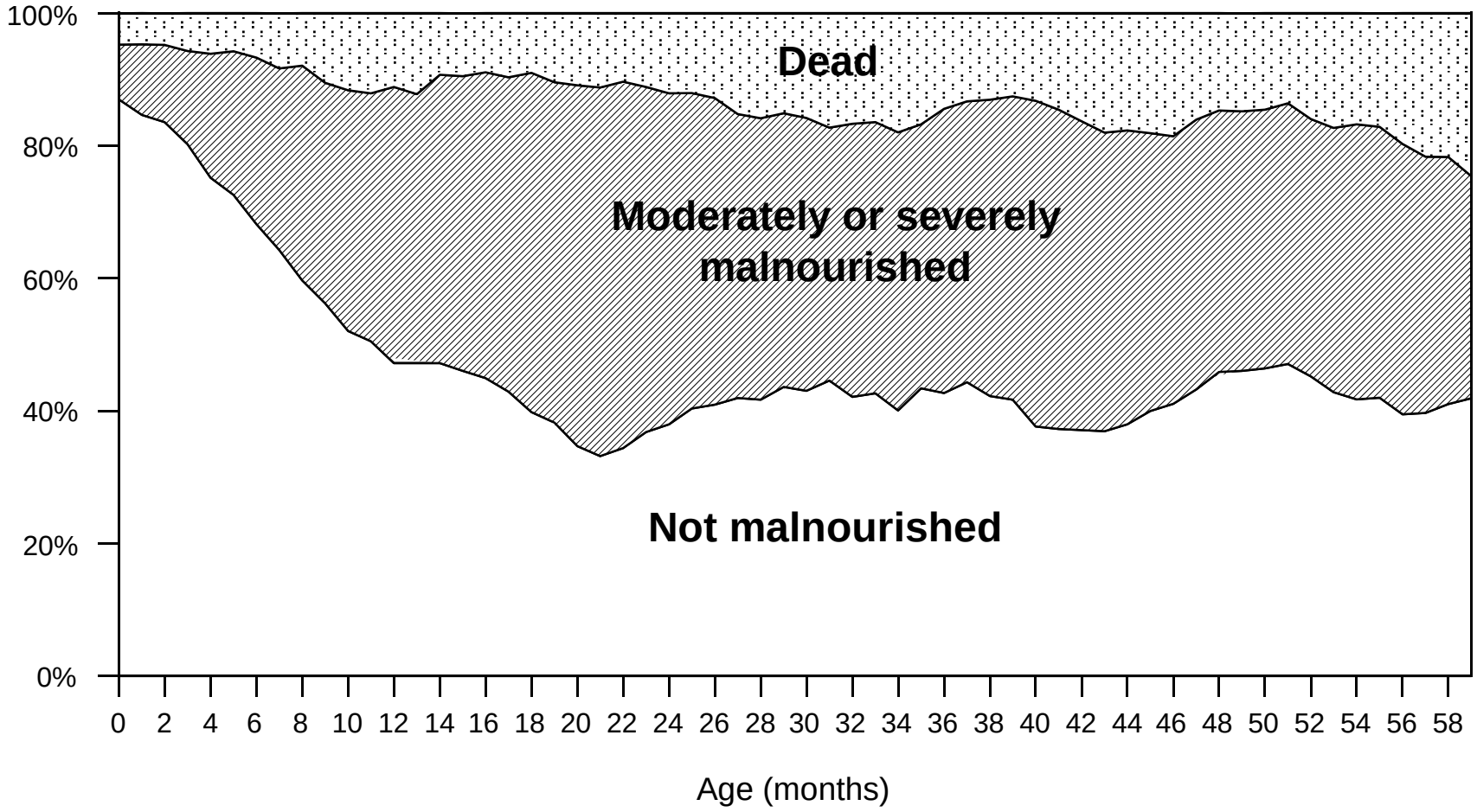
- **Between birth and 21 months of age, the percentage of children who are alive and not malnourished drops rapidly from 89 percent to 33 percent.** Thereafter, the rate varies between 37 percent and 47 percent through 59 months.

- **Between birth and 21 months of age, the percentage of children who are moderately or severely malnourished[4] increases dramatically from 8 percent to 56 percent.** Thereafter, the percentage varies between 40 percent and 48 percent until 50 months, and drops down to 34 percent at 59 months.

- **From birth until 59 months, the percentage of children who have died increases gradually from** 5 percent at birth to 11 percent at 21 months, and to 25 percent by 59 months.

[4] 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, Mozambique



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 2003

Malnutrition in Mozambique

Figure 4: Malnutrition among Children under Five Years, Mozambique

In Mozambique,

- **Forty-one percent of children ages 0-59 months are chronically malnourished.** In other words, they are too short for their age, or ***stunted.***[5] The proportion of children who are stunted is almost 20 times the level expected in a healthy, well-nourished population.

- **Acute malnutrition,** manifested by ***wasting,***[6] results in a child being too thin for his or her height. **It affects 4 percent of children,** which is twice the level expected in a healthy population.

- **Twenty-four percent of children under five years are *underweight***[7] for their age. This is about 12 times the level expected in a healthy, well-nourished population.

- **Three percent of children under five years are *overweight.***[8] This is 1.5 times what is expected in a healthy, well-nourished population.

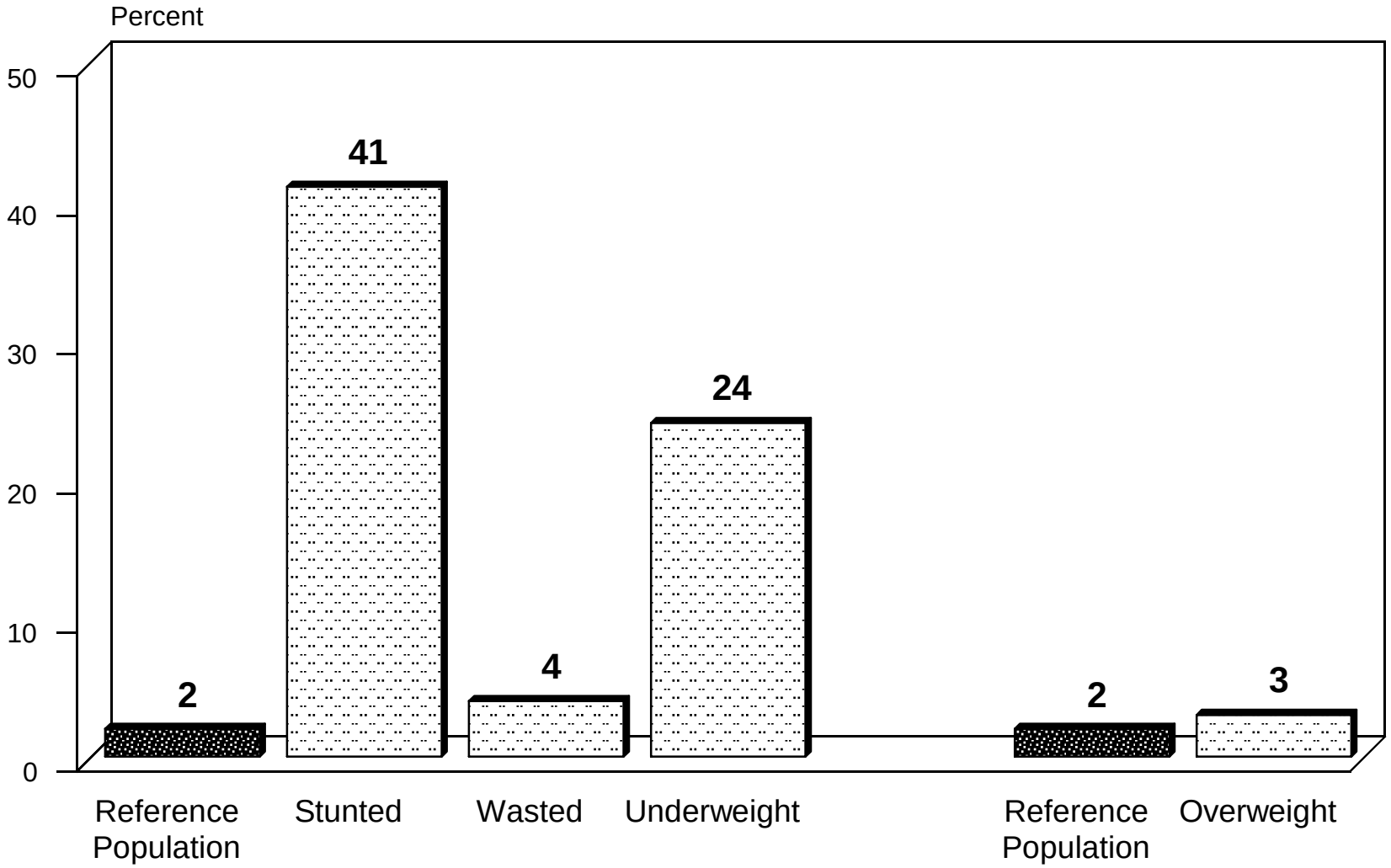
[5] A stunted child has a height-for-age Z-score that is below -2 SD based on the NCHS/CDC/WHO reference population. Chronic malnutrition is the result of an inadequate intake of food over a long period and may be exacerbated by chronic illness.

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

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

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

Figure 4
Malnutrition among Children under Five Years, Mozambique



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

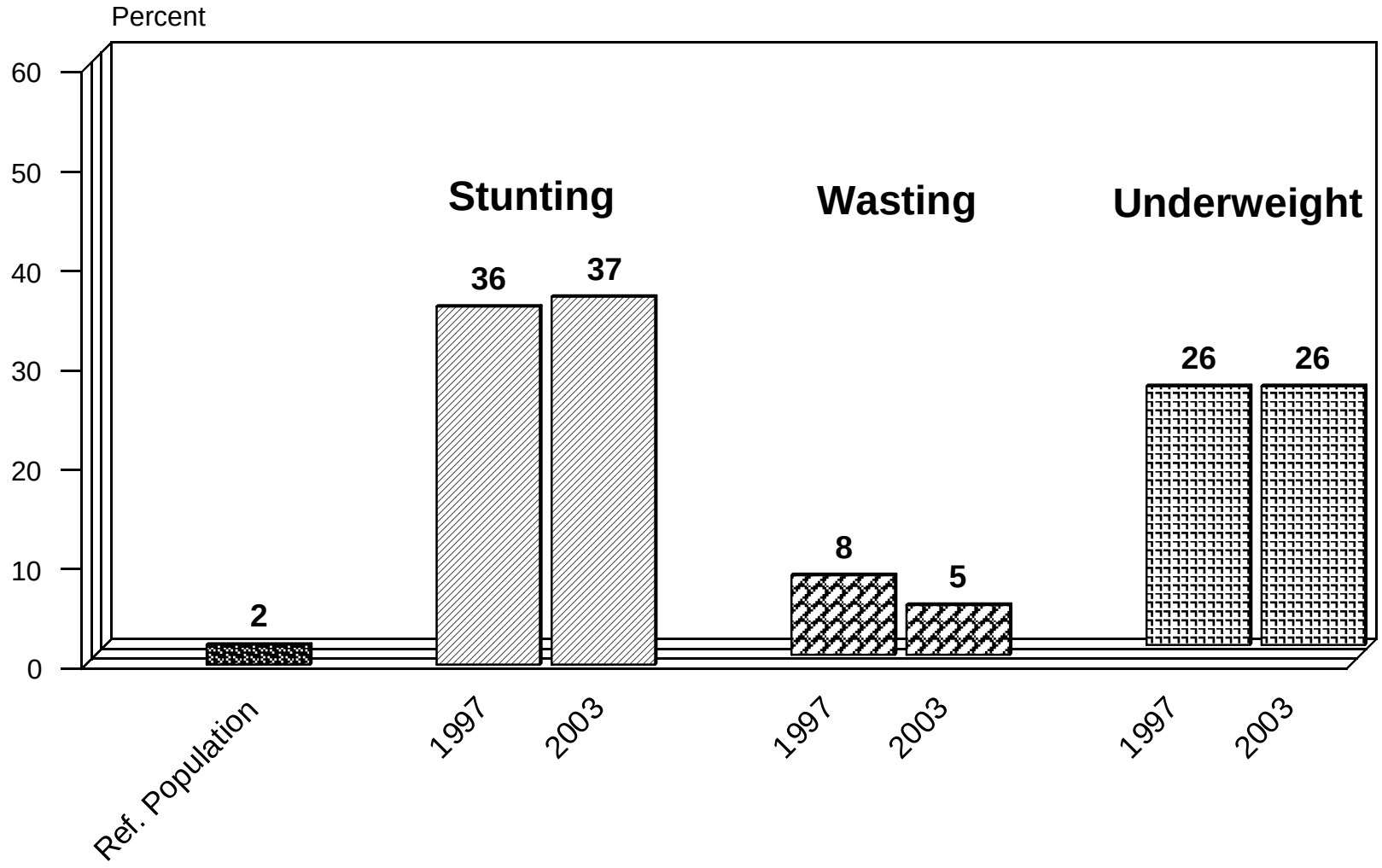
Source: MDHS 2003

Figure 5: Changes in Undernutrition Rates among Children under Three Years, Mozambique 1997 and 2003

The findings of the 2003 MDHS suggest that **the nutritional status of children in Mozambique has not changed much since the 1997 MDHS survey.**

- The rates of stunting and underweight remained about the same in 2003 (37 and 26 percent) as they were in 1997 (36 and 26 percent). There has been a decrease of three percentage points in the rate of wasting since 1997 (from 8 to 5 percent). However, because of the seasonality of wasting, meaningful interpretation of these figures cannot be made.

Figure 5
Changes in Undernutrition Rates among Children under Three Years, Mozambique 1997 and 2003



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

Source: MDHS 1997 and MDHS 2003

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

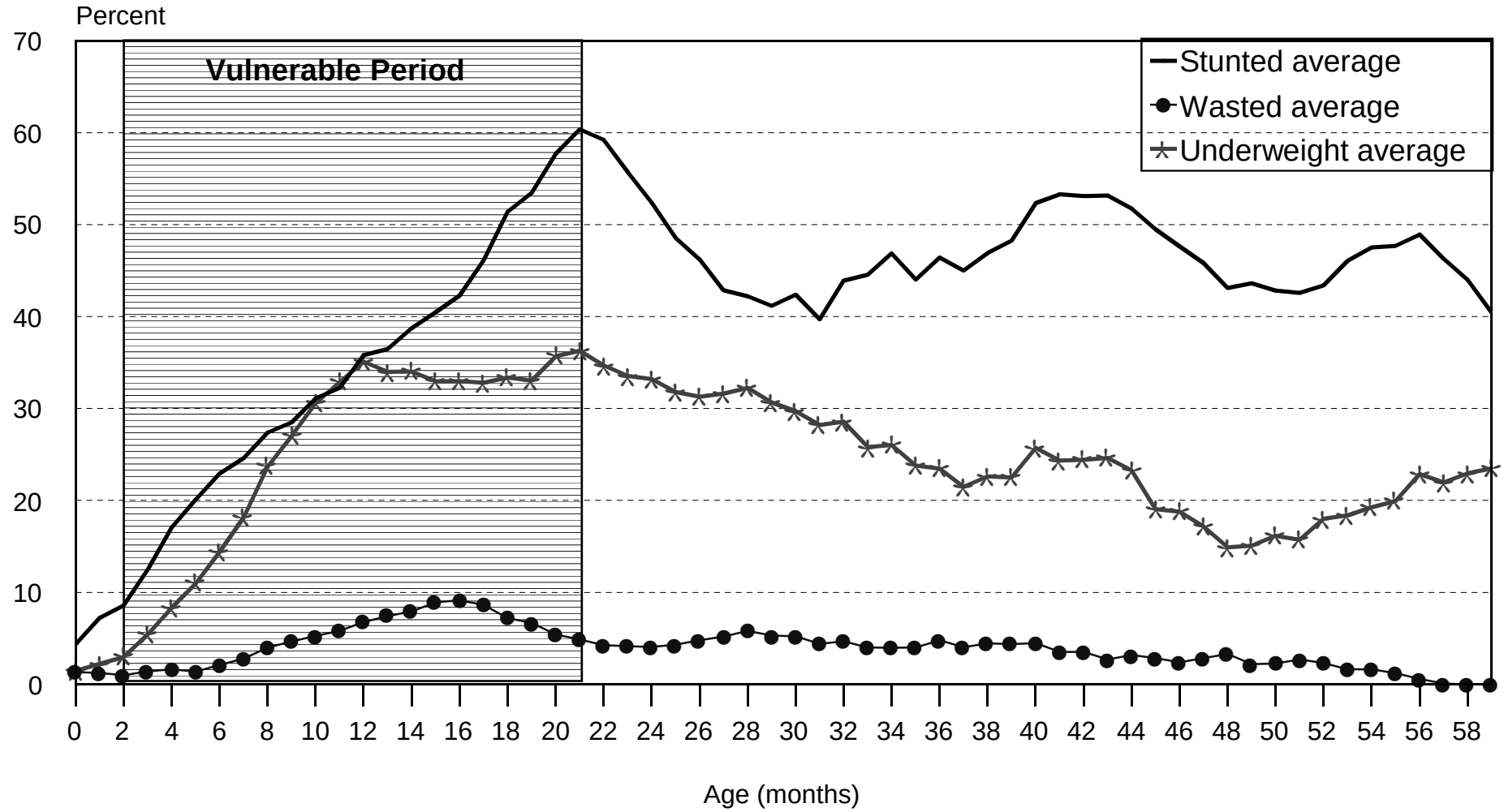
In Mozambique, **the time between 2 months and 21 months of age is a vulnerable period.**

- **The proportion of children stunted rises sharply from 2 to 21 months of age, peaking at 60 percent.** After 21 months the proportion drops to 40 percent at 31 months, goes up again to 53 percent between 40 and 44 months. Thereafter, the proportion of stunting varies between 43 and 50 percent through 59 months.

- **The proportion of children wasted rises from 2 to 16 months of age, when it peaks at 9 percent.** The proportion then gradually declines to less than 1 percent from 54 months onwards.

- **The proportion of children underweight rises sharply to 35 percent at 12 months.** Thereafter, the proportion remains about the same through 21 months and then declines to 15 percent by 48 months. The rate rises again to 23 percent by 59 months.

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



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 2003

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

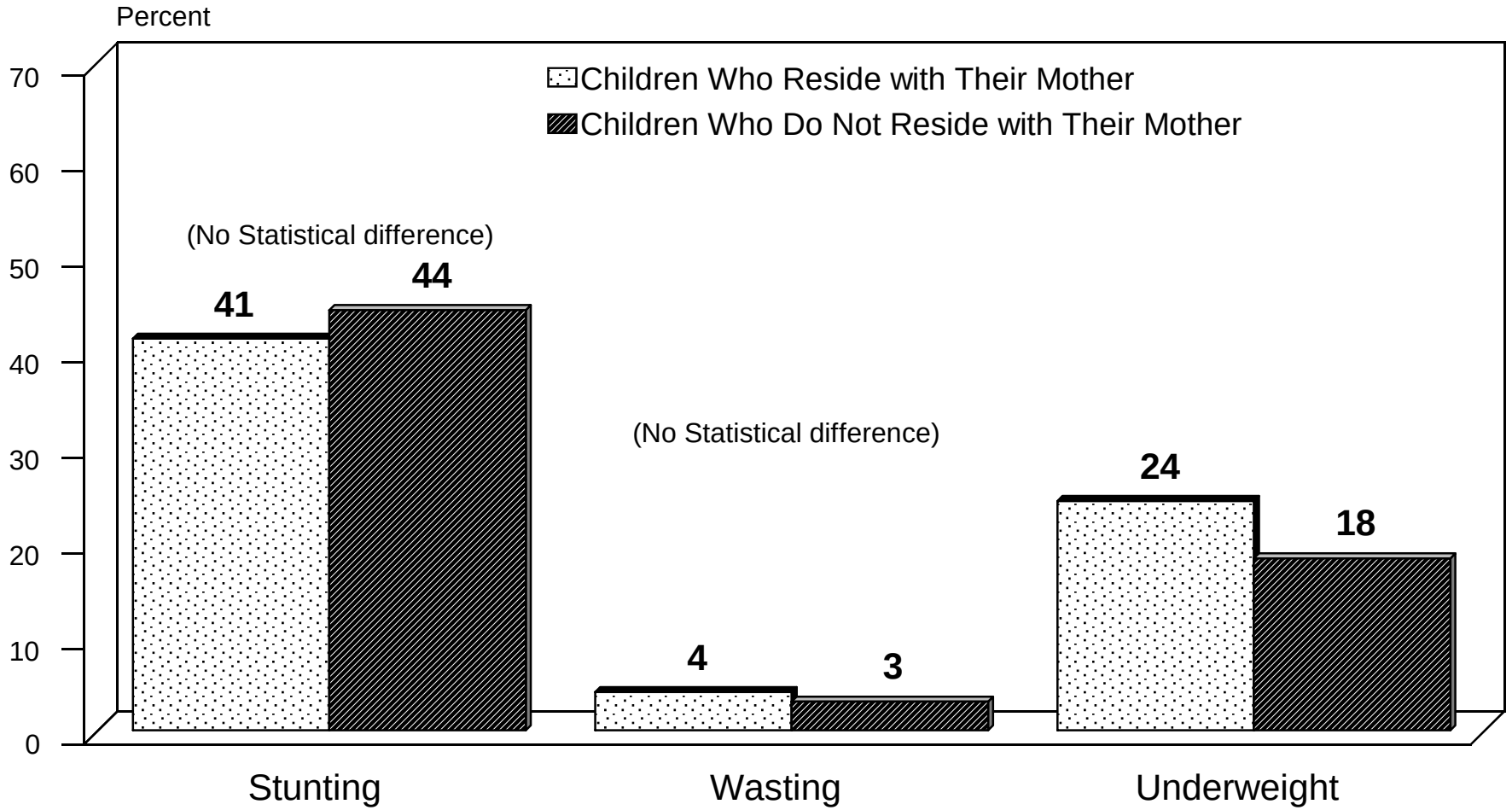
Previously, anthropometric data from DHS surveys excluded children whose mother did not live in the household or was not present to be interviewed. Currently, all children in the household are measured, regardless of their mother's residence status. In the 2003 MDHS, 497 children under five years did not reside with their mother.

In Mozambique,

- **There is no statistical relationship between stunting and wasting rates and children's residence with their mother.**

- Contrary to what was expected, children who reside with their mother have higher prevalence of underweight (24 percent) compared with those who do not reside with their mother (18 percent).

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



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

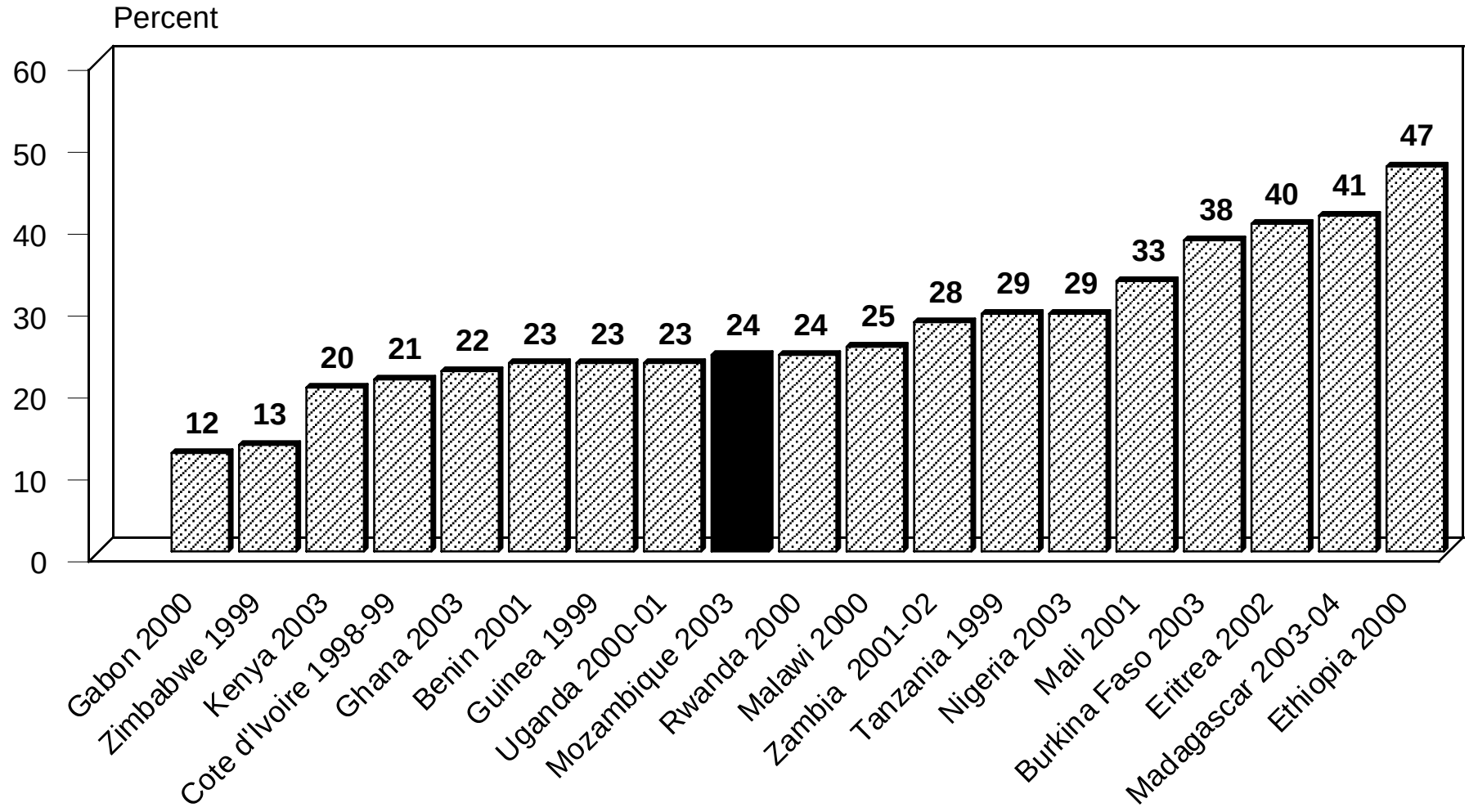
Source: MDHS 2003

Figure 8: Underweight among Children under Five Years, Mozambique 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 24 percent of children under five years of age who are underweight, Mozambique 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, Mozambique Compared with Other Sub-Saharan Countries



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

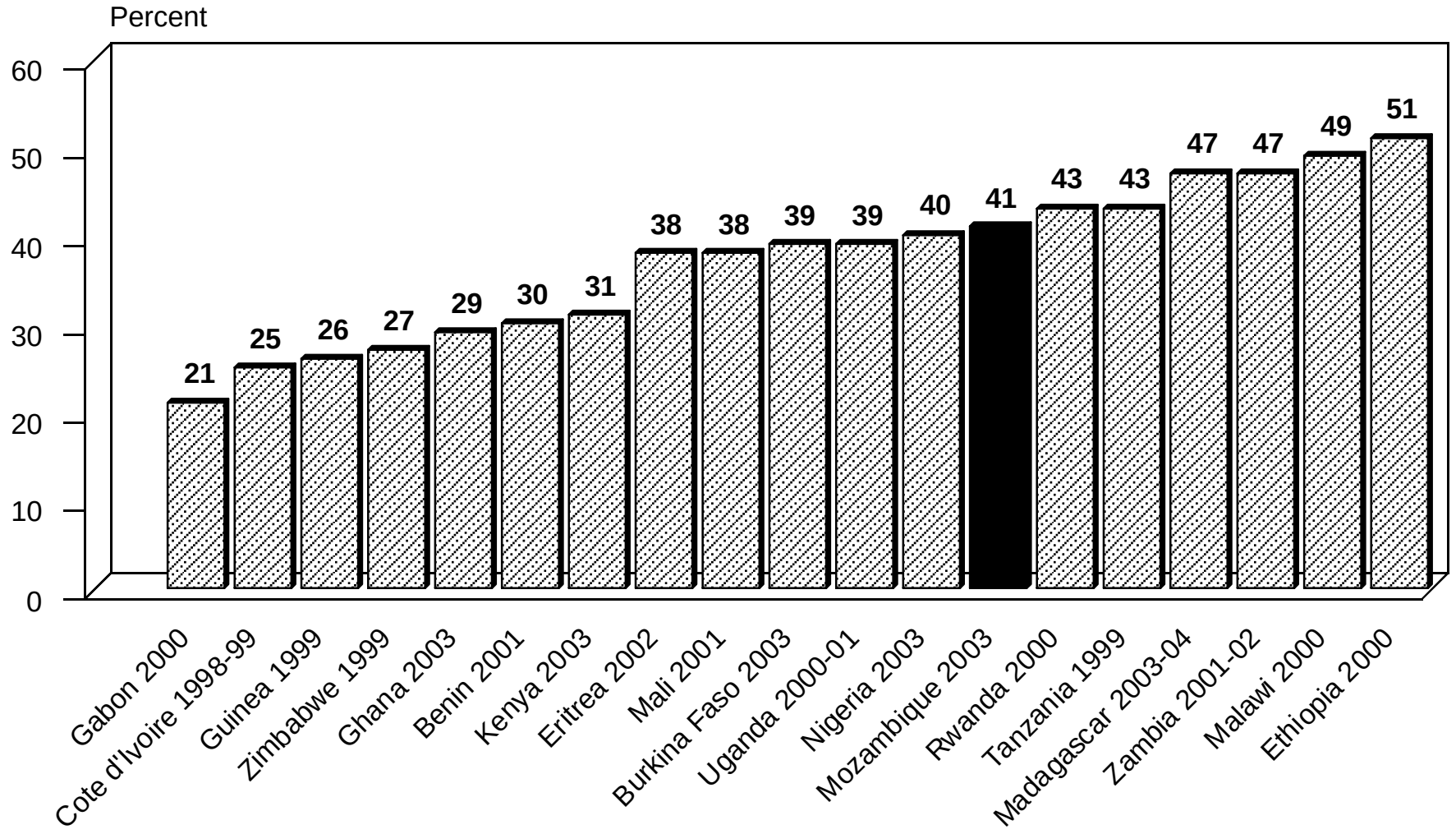
Source: DHS Surveys 1999-2004

Figure 9: Stunting among Children under Five Years, Mozambique 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 41 percent of children under five years of age who are stunted, Mozambique is in the mid-range 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, Mozambique 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.[9] 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)

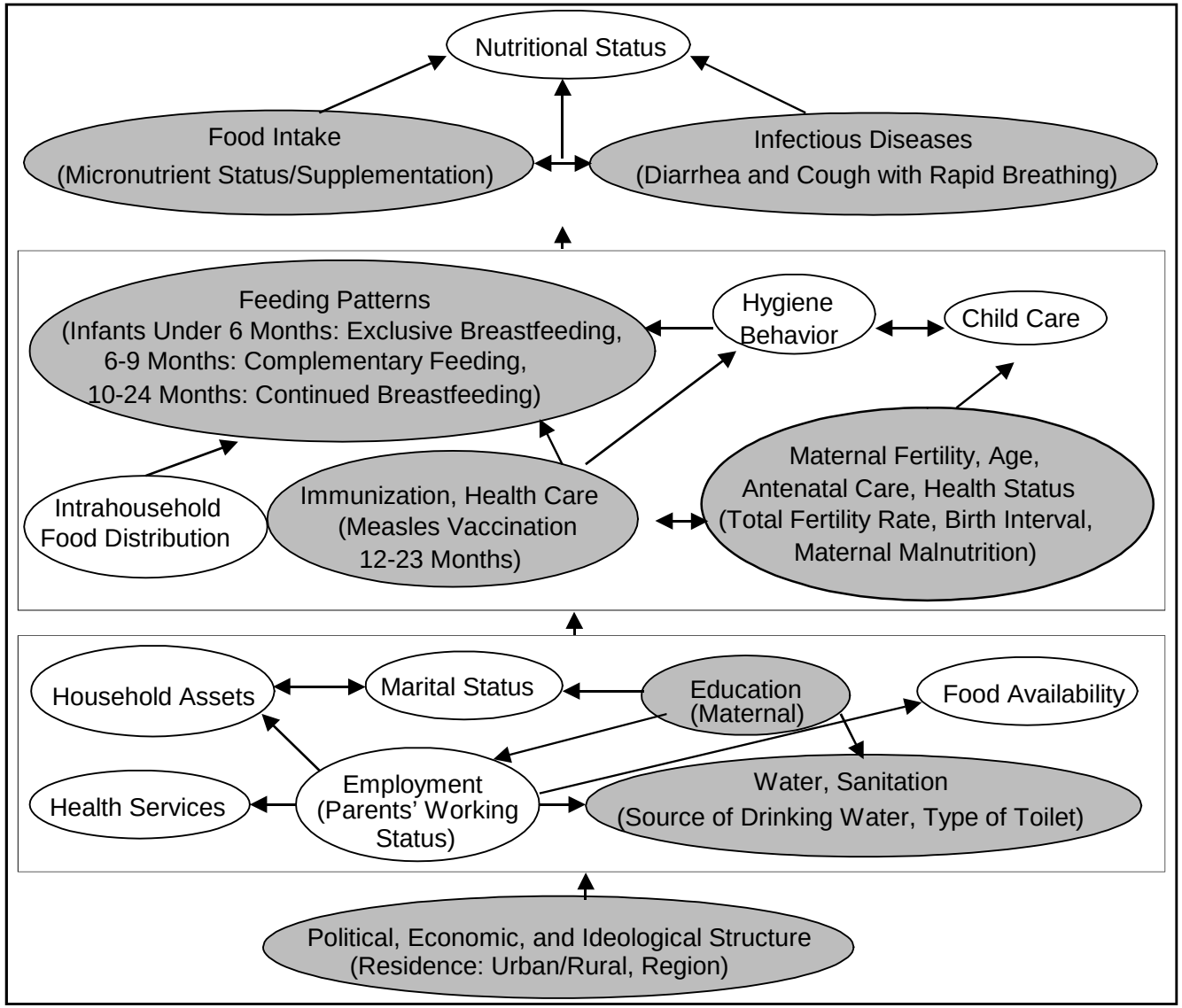
- **Underlying biological and behavioral influences,** such as maternal fertility, measles vaccinations, and feeding patterns of children under two years

- **Underlying social and economic influences,** such as maternal education, drinking water, and sanitation

- **Basic influences,** such as area of residence.

[9] 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**

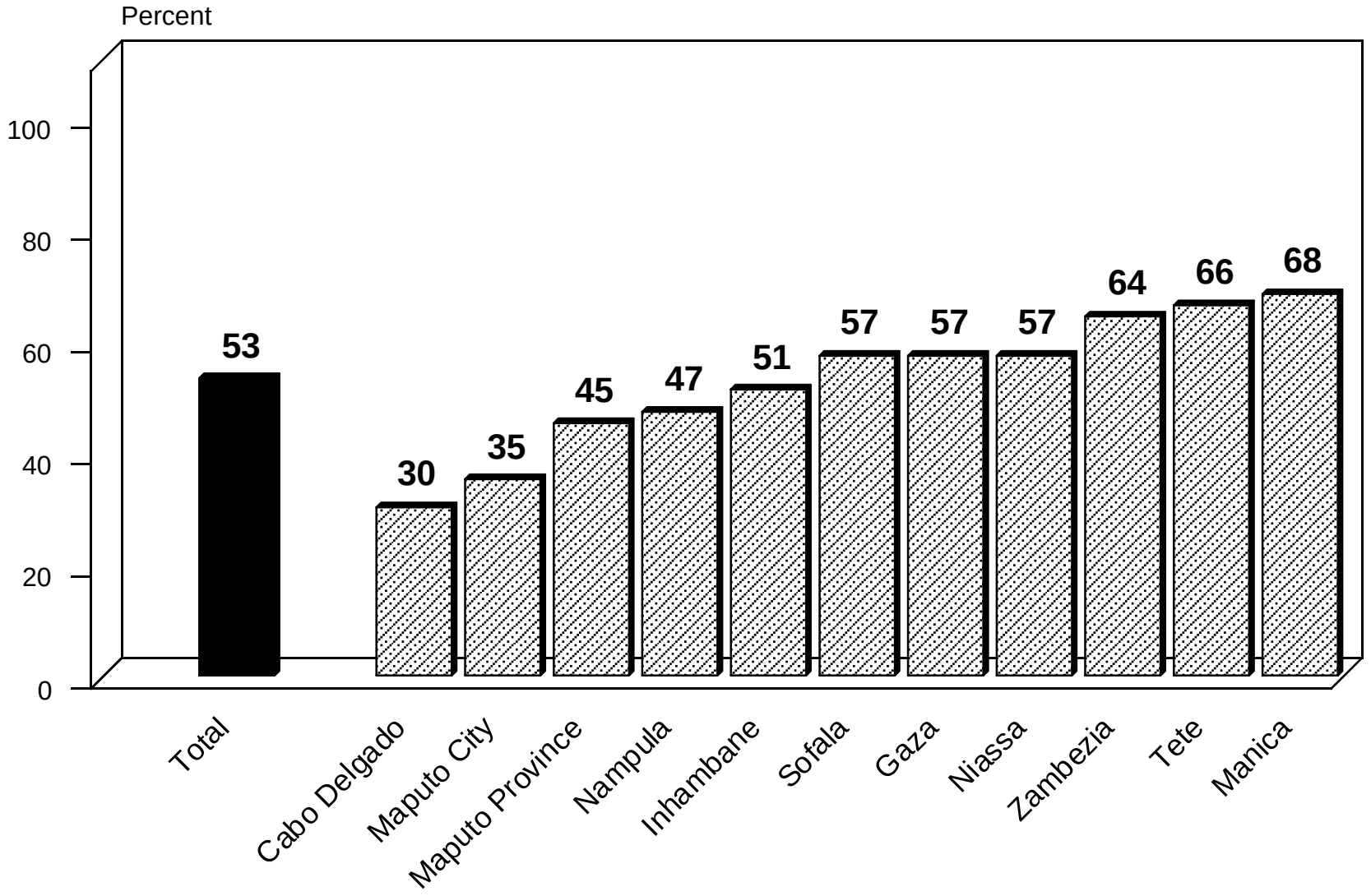
Figure 10: Children under Five Years Living in Households with Iodized Salt by Province, Mozambique

Iodine deficiency is known to cause goiter, cretinism (a severe form of neurological defect), spontaneous abortion, premature birth, infertility, stillbirth, and increased child mortality. One of the most serious consequences to child development is mental retardation caused by iodine deficiency disorder (IDD), which puts at stake social investments in health and education. IDD is the single most common cause of preventable mental retardation and brain damage in the world. IDD decreases the production of hormones vital to growth and development. Children with IDD can grow up stunted; apathetic; mentally retarded; and incapable of normal movement, speech, or hearing. IDD in pregnant women may cause miscarriage, stillbirth, and mental retardation in infants.

The remedy for IDD is relatively simple. A teaspoon of iodine is all a person requires in a lifetime. Since iodine cannot be stored for long periods by the body, tiny amounts are needed regularly. In areas of endemic iodine deficiency, where soil and therefore crops and grazing animals do not provide sufficient dietary iodine to the population, food fortification and supplementation have proven to be highly successful and sustainable interventions. The fortification of salt or oil with iodine is the most common approach to prevent IDD. Iodized salt that is commercially packaged in plastic sacks and not stored properly can lose its concentration of iodine. Proper packaging and storage of iodized salt is essential to ensure that the population benefits from iodine fortification.

- **In Mozambique, 53 percent of children under five years live in households that use salt containing some level of iodine.** Use of iodized salt is lowest in the Cabo Delgado province (30 percent) and is highest in Manica province (68 percent).

Figure 10
Children under Five Years Living in Households with Iodized Salt by Province, Mozambique



Source: MDHS 2003

Figure 11: Night Blindness among Mothers of Children under Five Years, Mozambique

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 Mozambique,

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

Figure 11
Night Blindness among Mothers of Children under Five Years, Mozambique

Five 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 2003

Figure 12: Vitamin A Supplementation among Mothers of Children under Five Years by Province, Mozambique

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.

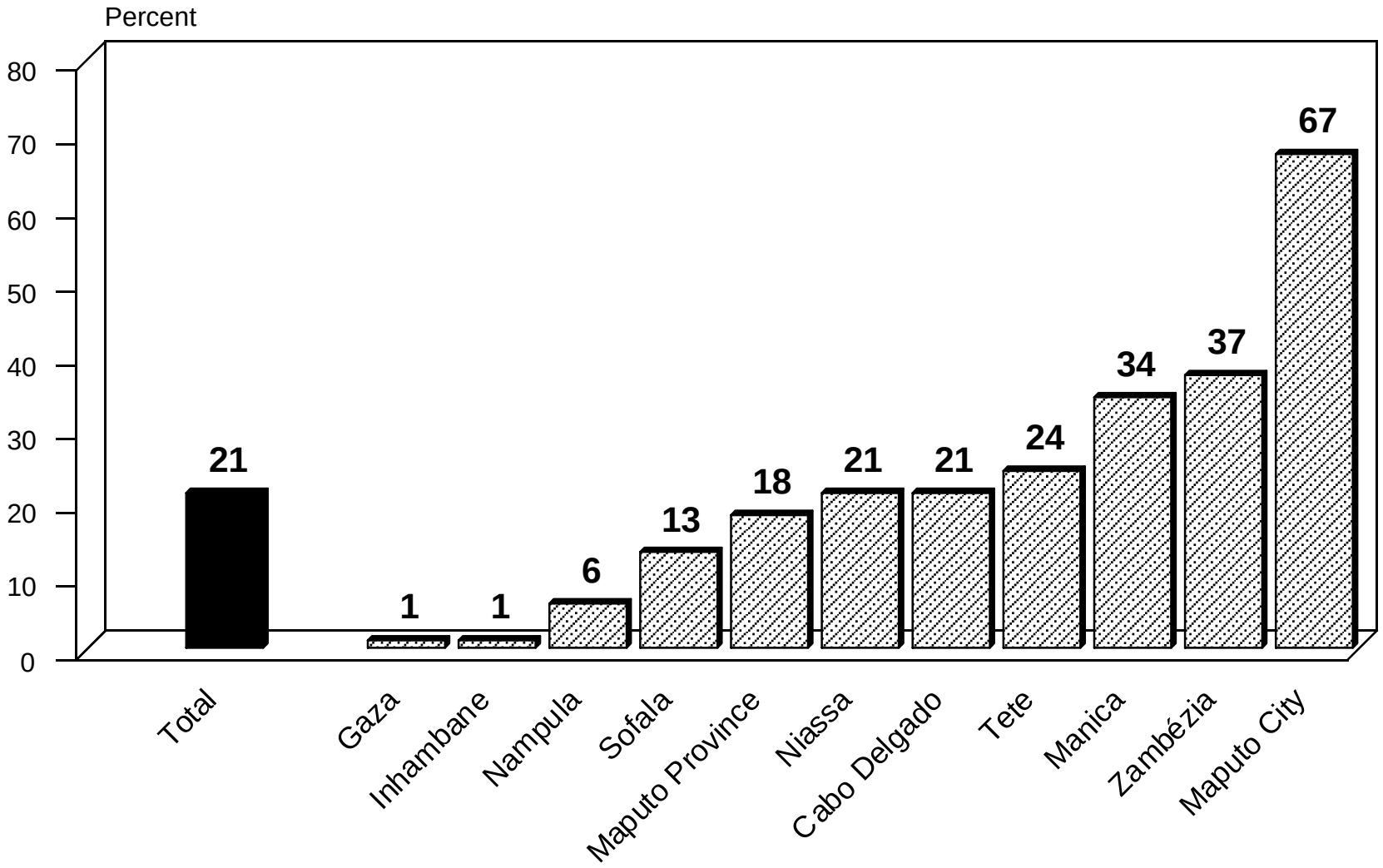
Vitamin A supplementation also benefits children who are breastfed. If mothers have vitamin A deficiency, their children can be born with low stores of vitamin A. Low birth weight babies are especially at risk. Additionally, infants often do not receive an adequate amount of vitamin A from breast milk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

In Mozambique,

- **Twenty-one percent of mothers received vitamin A supplements during the two months following delivery.**

- **Vitamin A supplementation of mothers varies by province.** Only 1 percent of mothers in the Gaza and Inhambane provinces received vitamin A, compared with 67 percent in Maputo City.

Figure 12
Vitamin A Supplementation among Mothers of Children under Five Years by Province, Mozambique



Source: MDHS 2003

Figure 13: Vitamin A Supplementation among Children 6-59 Months in the Past Six Months by Province, Mozambique

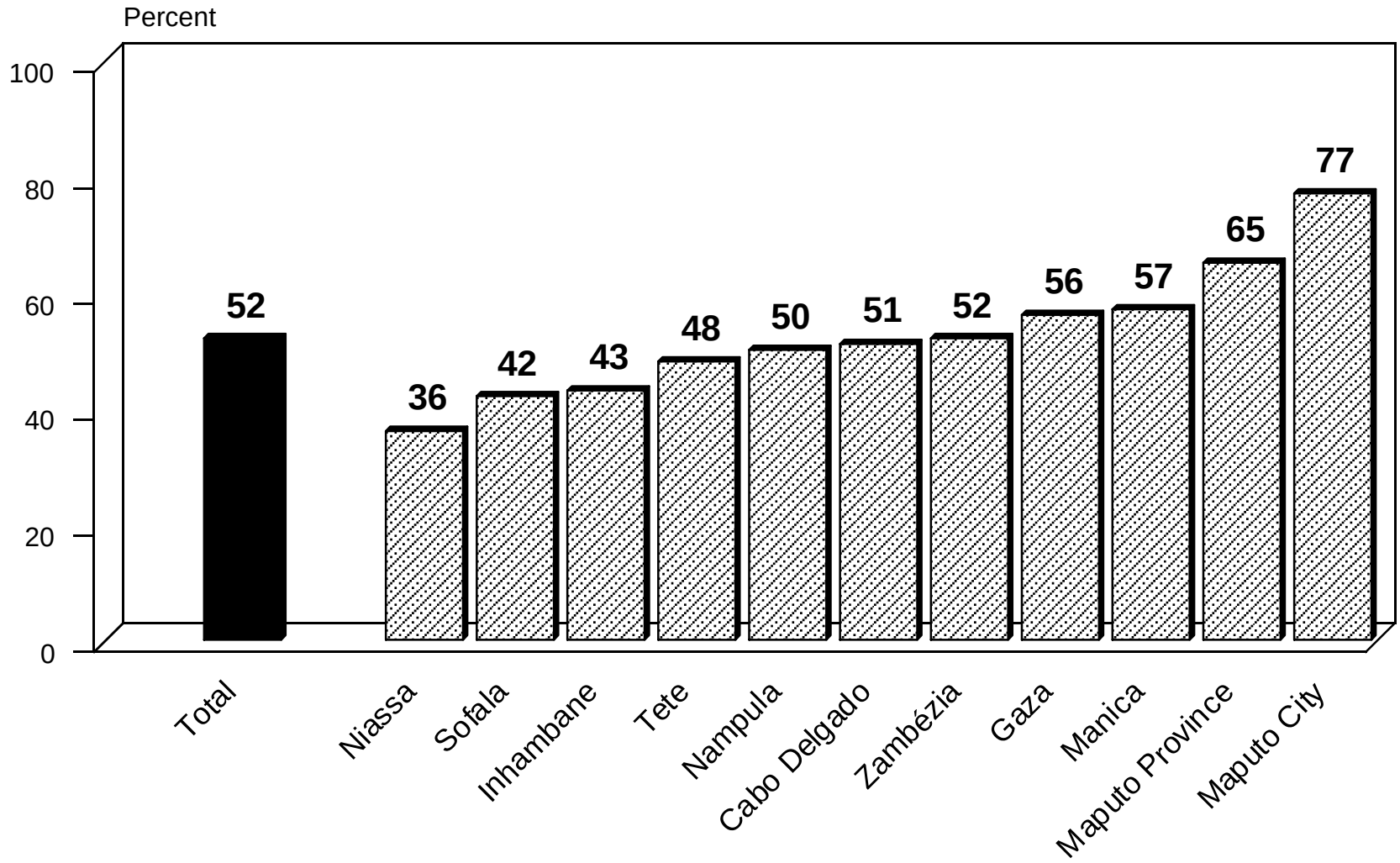
Vitamin A deficiency (VAD) is common in dry environments where fresh fruits and vegetables are not readily available. Vitamin A is found in breast milk, other milks, liver, eggs, fish, butter, red palm oil, mangos, papayas, carrots, pumpkin, and dark leafy greens. Unlike iron or folate, vitamin A is 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 Mozambique,

- **Fifty-two percent of children 6-59 months received a vitamin A dose in the past six months.**

- **The rate of vitamin A supplementation among children varies throughout Mozambique.** The rate is lowest in the Niassa province (36 percent) and highest in Maputo City (77 percent).

Figure 13
Vitamin A Supplementation among Children 6-59 Months in the Past Six Months by Province, Mozambique



Source: MDHS 2003

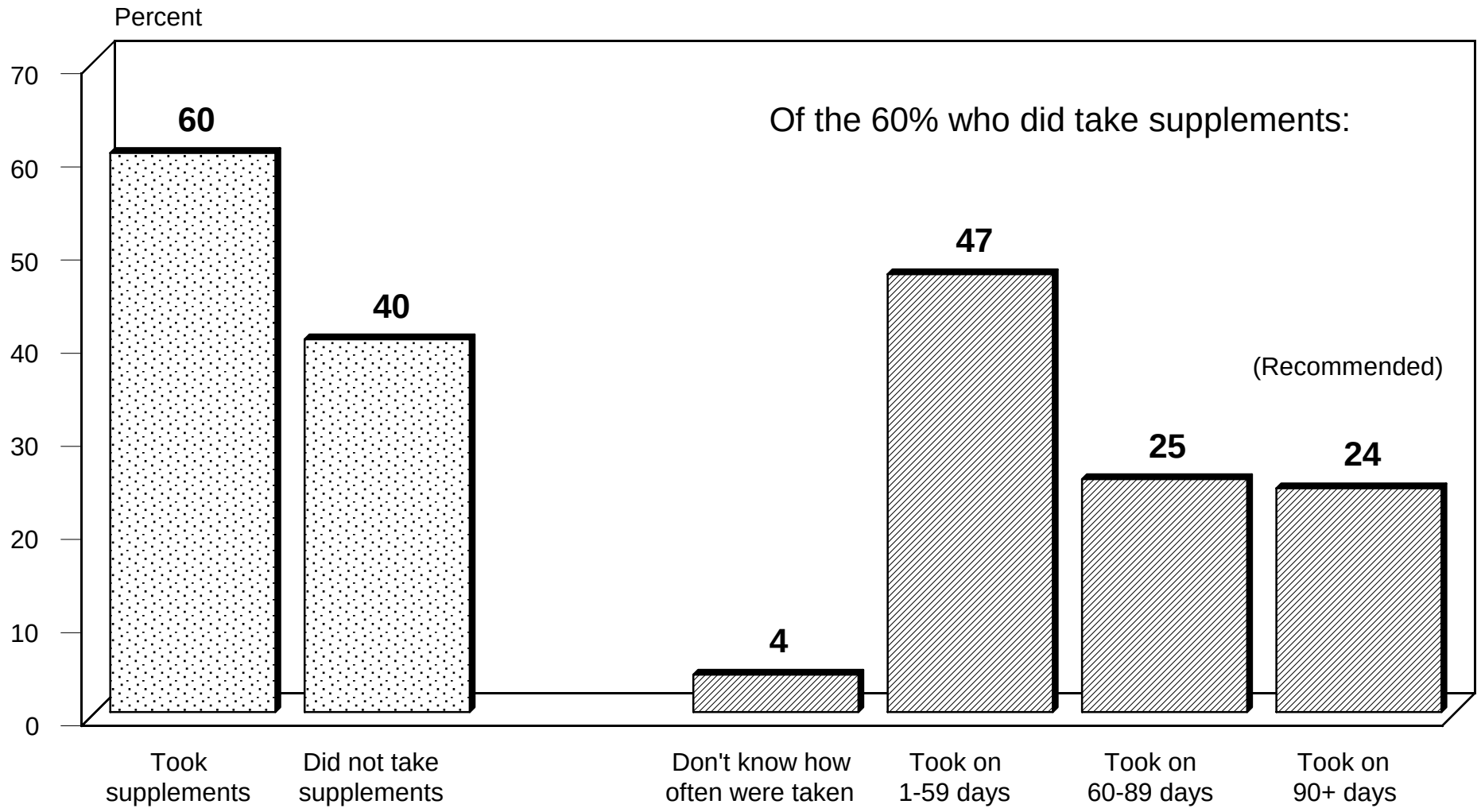
Figure 14: Iron Supplementation among Mothers of Children under Five Years, Mozambique

Iron-deficiency anemia is the most common form of nutritional deficiency worldwide. This type of nutritional deficiency develops slowly. Symptoms are not manifested 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 the absorption of iron into the blood. Tea, coffee, and whole-grain cereals can inhibit iron absorption. Anemia is common in children 6-24 months of age who consume purely milk based 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 Mozambique,

- **Sixty percent of mothers took some form of iron supplementation during pregnancy.**
- **Of those women who received iron supplementation, 24 percent reported taking iron the recommended minimum number of days (90 or more days) during their pregnancy.**

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



Source: MDHS 2003

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

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.

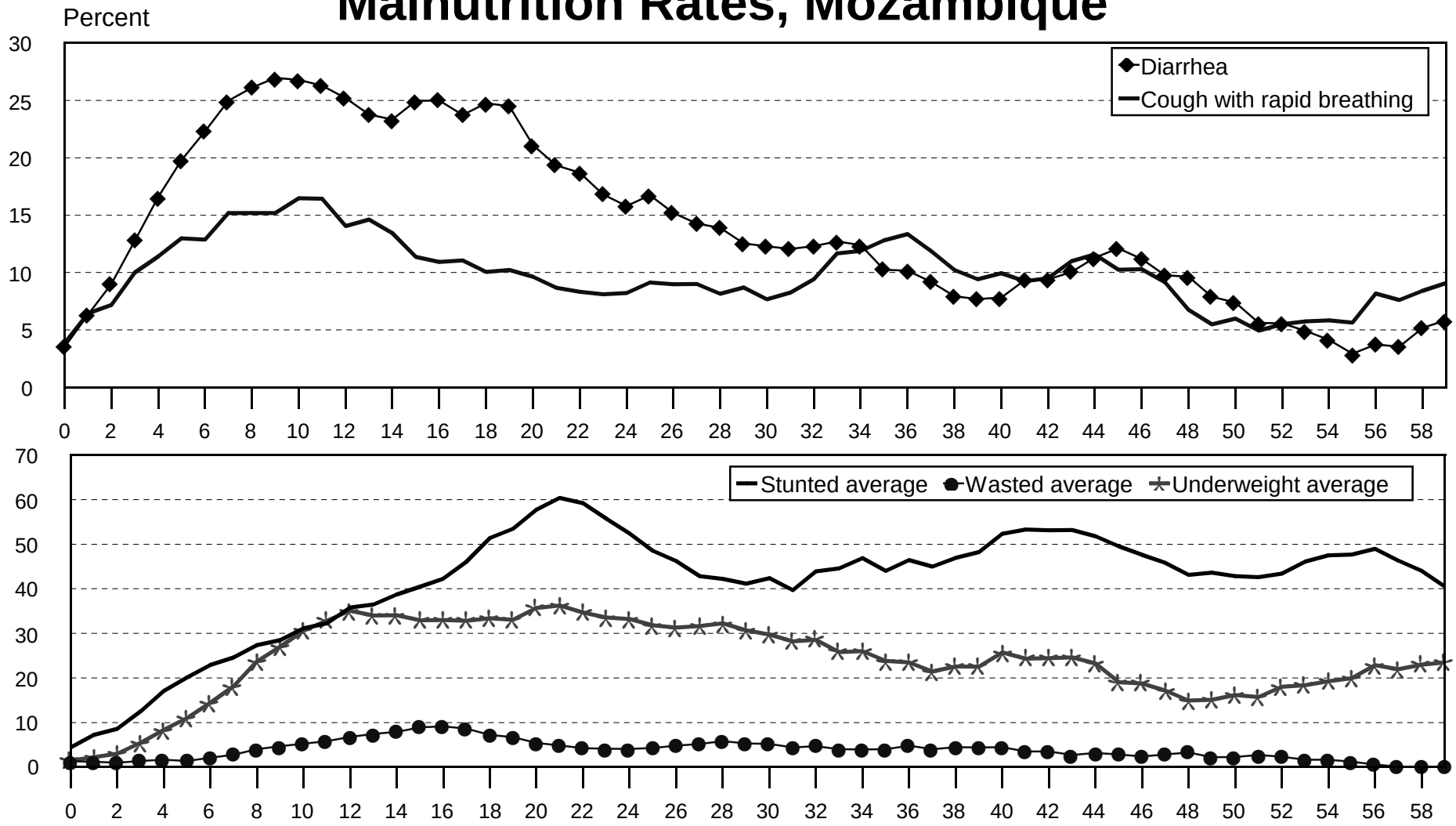
In Mozambique,

- **Fifteen percent of children under five years of age experienced diarrhea in the two weeks preceding the survey.** Prevalence of diarrhea increased from 4 percent to 27 percent in the first 10 months and then gradually declined to 6 percent by 59 months of age.

- **Ten percent of children under five years of age had cough with rapid breathing in the two weeks preceding the survey.** The prevalence of cough with rapid breathing increased rapidly from 2 to 10 months then it varied between 8 and 12 percent through 48 months. Thereafter, it declined from 5 to 9 percent between 48 and 59 months of age.

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, Mozambique



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

Source: MDHS 2003

Underlying Biological and Behavioral Influences of Malnutrition

Figure 16: Fertility and Birth Intervals, Mozambique 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.

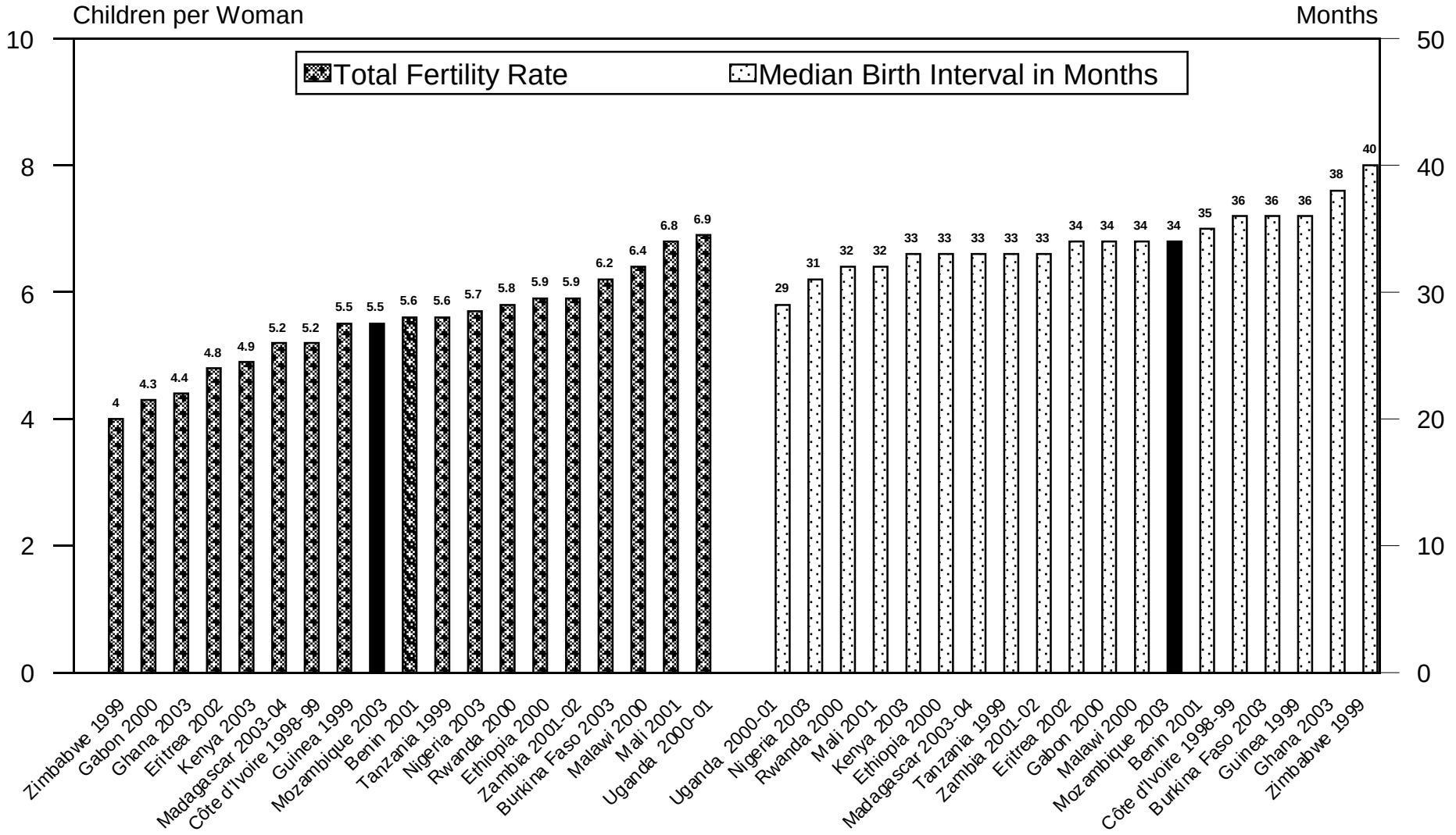
Information on the length of birth intervals provides insight into birth spacing patterns. Research has shown that children born too soon after a previous birth are at increased risk of poor nutrition and health and increased risk of mortality, particularly when that interval is less than 24 months. 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.

In Mozambique,

- **At current fertility rates, a woman will have an average of 5.5 children by the end of her childbearing years.** This rate is in the mid-range of the sub-Saharan countries surveyed between 1999 and 2004.

- **Mothers have a median birth interval of 34 months.** This interval is in the mid-range of the sub-Saharan countries surveyed.

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



Source: DHS Surveys 1999-2004

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

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.

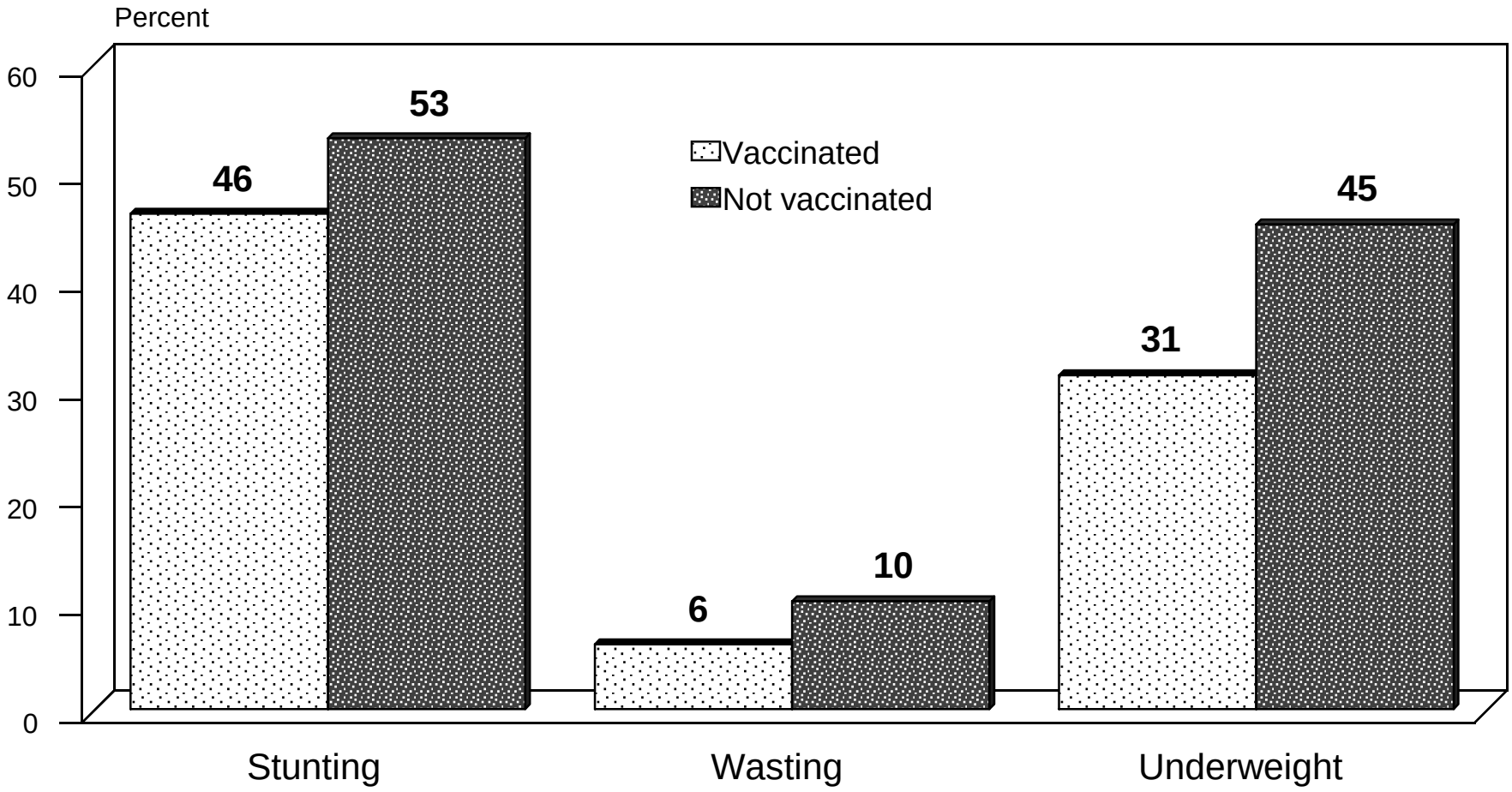
In Mozambique,

- **Stunting is higher (by 7 percentage points) among children who did not receive measles vaccination** than among children who did.

- **Wasting is higher (by 4 percentage points) among children who did not receive measles vaccination** than among children who did.

- **Underweight is higher (by 14 percentage points) among children who did not receive measles vaccination** than among children who did.

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



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

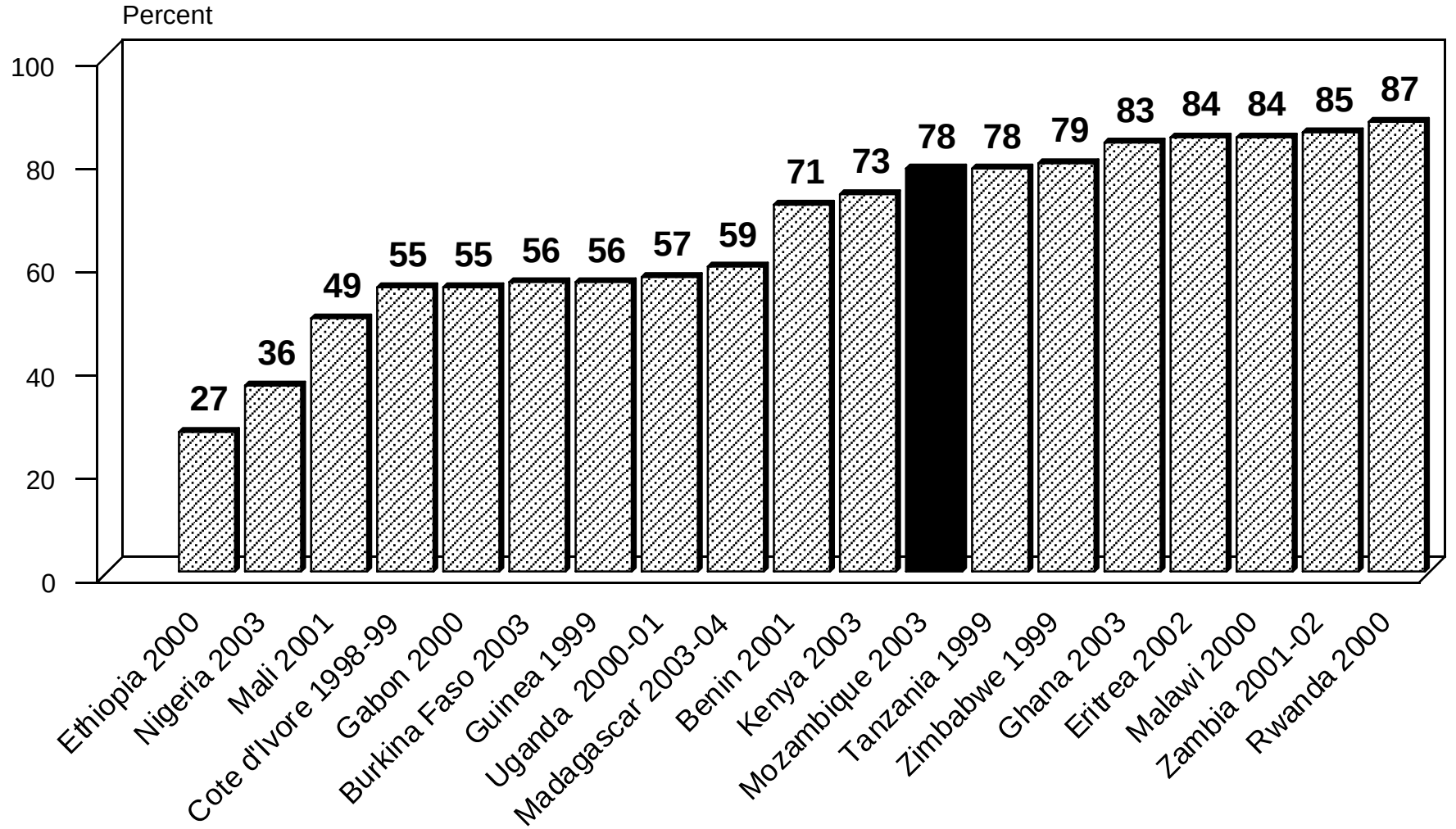
Source: MDHS 2003

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

- Measles vaccination ranges from 27 to 87 percent among the sub-Saharan countries surveyed.

- **In Mozambique, 78 percent of children 12-23 months of age have been vaccinated against measles.** This level of coverage is toward the higher range of the sub-Saharan countries surveyed.

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



Source: DHS Surveys 1999-2004

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

Improper feeding practices is a major cause of malnutrition in infants. WHO and UNICEF recommend that *all infants 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 Mozambique, 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.

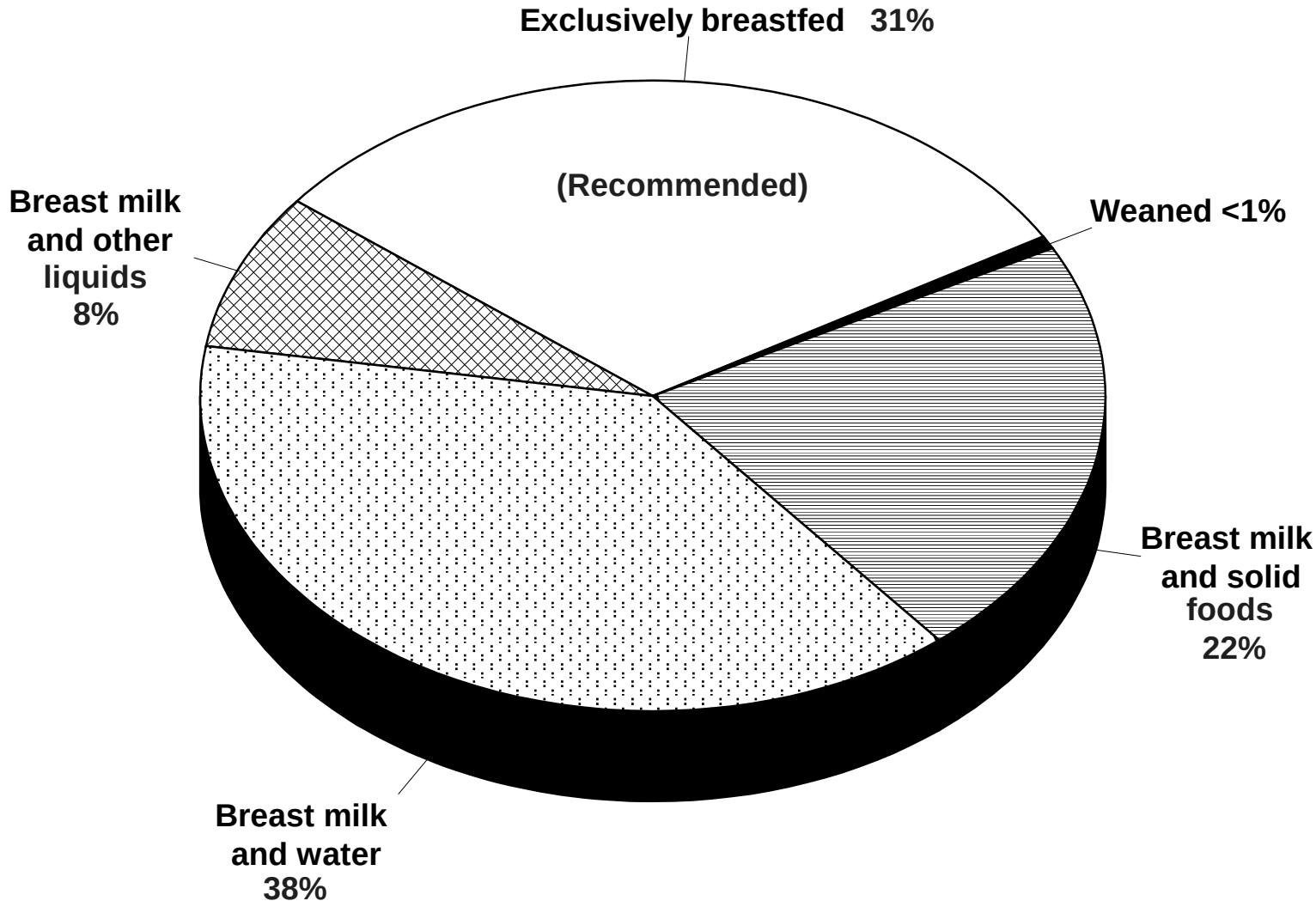
In Mozambique,

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

- **Thirty-eight percent of infants under six months of age are given a combination of breast milk and water.** Additionally, 8 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.

- **Less than 1 percent of infants under six months of age are fully weaned.**

Figure 19
Feeding Practices for Infants under Six Months, Mozambique



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

Source: MDHS 2003

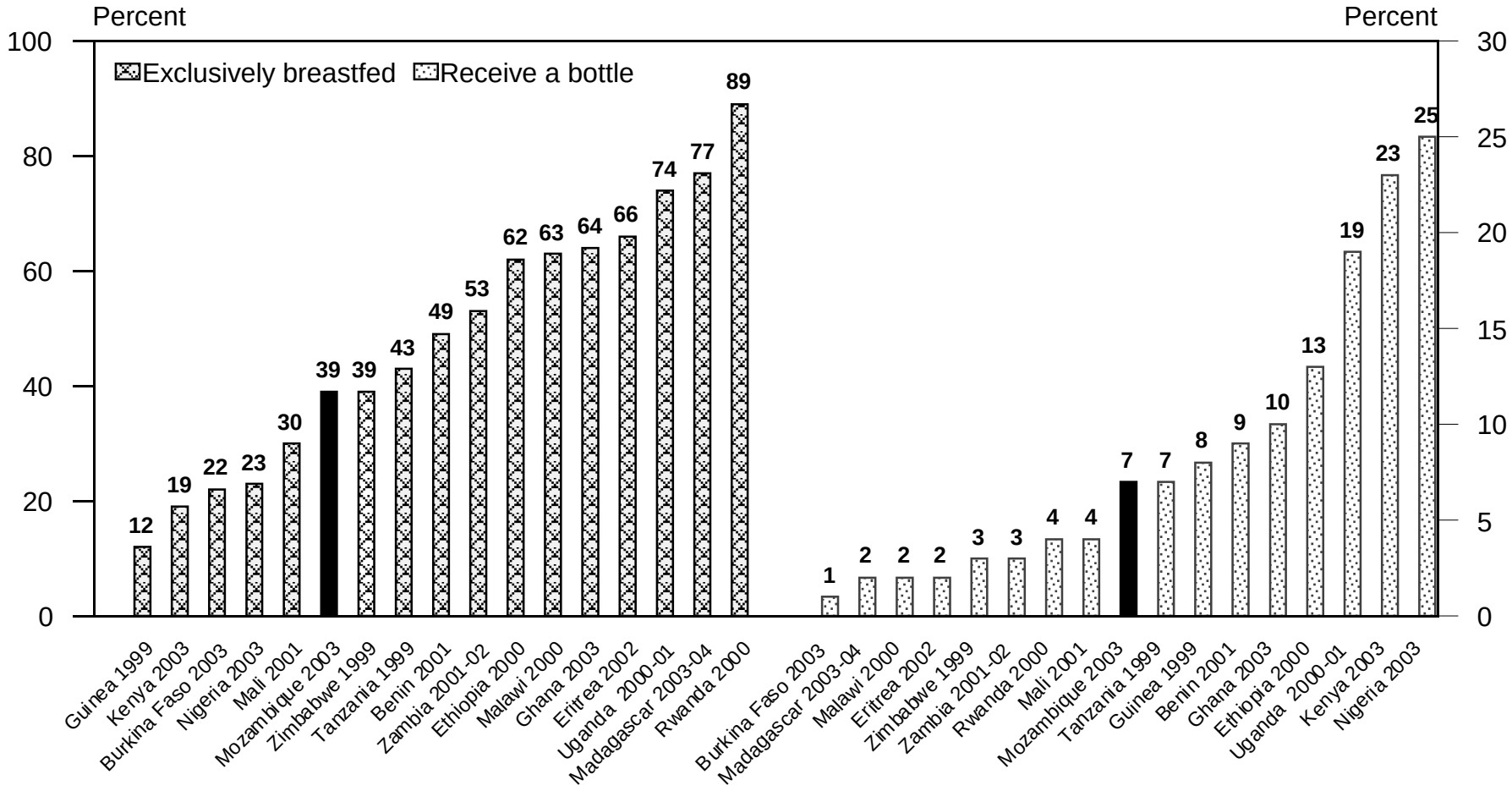
Figure 20: Infants under Four Months Who Are Exclusively Breastfed and Those Who Receive a Bottle, Mozambique Compared with Other Sub-Saharan Countries

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 few mothers of infants under four months follow the recommended practice of breastfeeding exclusively. **In Mozambique, 39 percent of mothers breastfeed their young infants exclusively.** This puts Mozambique in the lower range among the sub-Saharan countries surveyed.

- **Seven percent of infants under four months in Mozambique are bottlefed.** This rate puts Mozambique at the mid-range among the sub-Saharan countries surveyed. **Bottle-feeding is not recommended** because poor sanitation and (improper) formula preparation with bottle-feeding can introduce pathogens to the infant, putting the child at a greater risk of illness and malnutrition.

Figure 20
Infants under Four Months Who Are Exclusively Breastfed and Those Who Receive a Bottle, Mozambique 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, Mozambique

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.

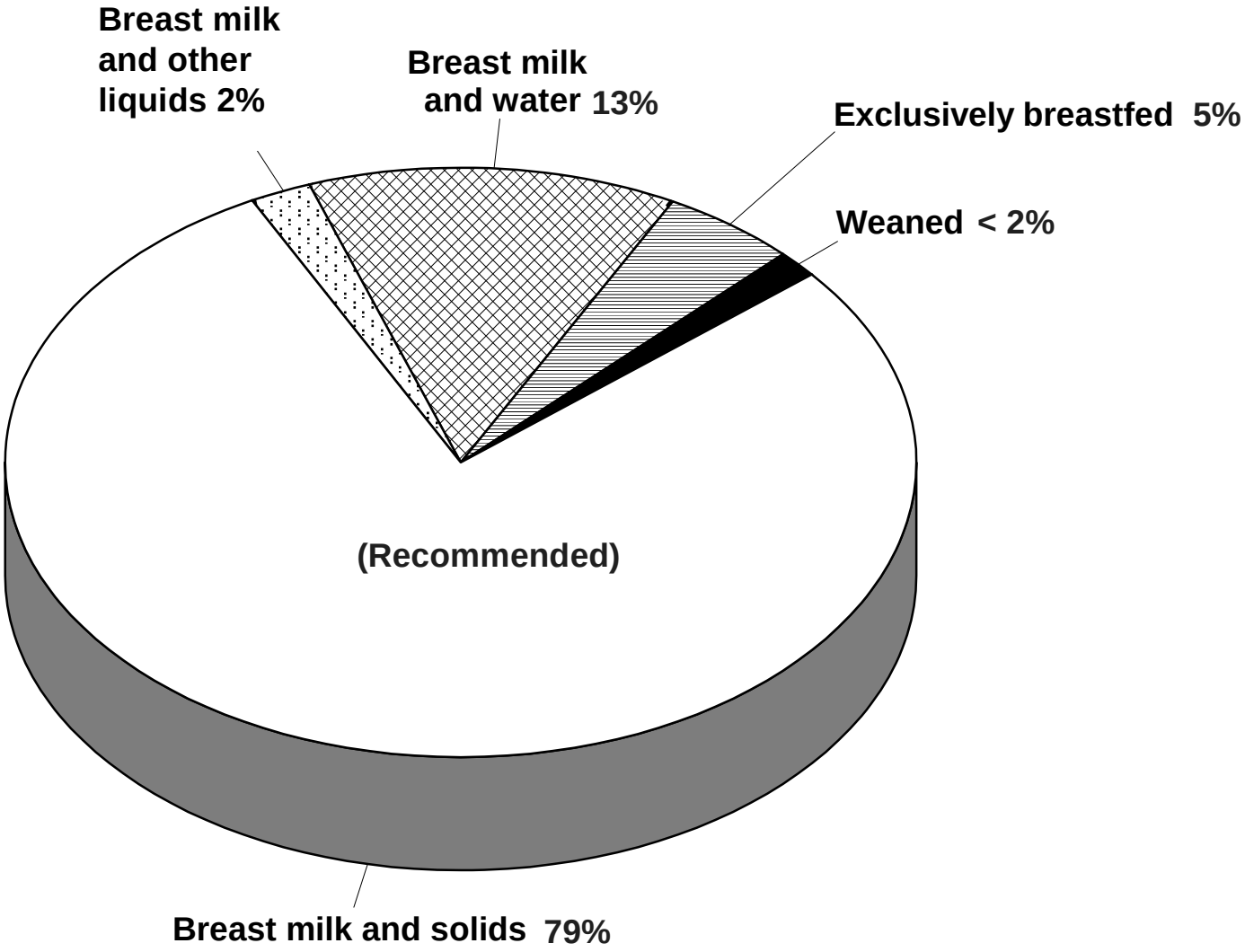
In Mozambique,

- **Seventy-nine percent of infants age 6-9 months are fed solid foods in addition to breast milk.** This means that more than three-fourths 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.**

- **Less than 2 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, Mozambique



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: MDHS 2003

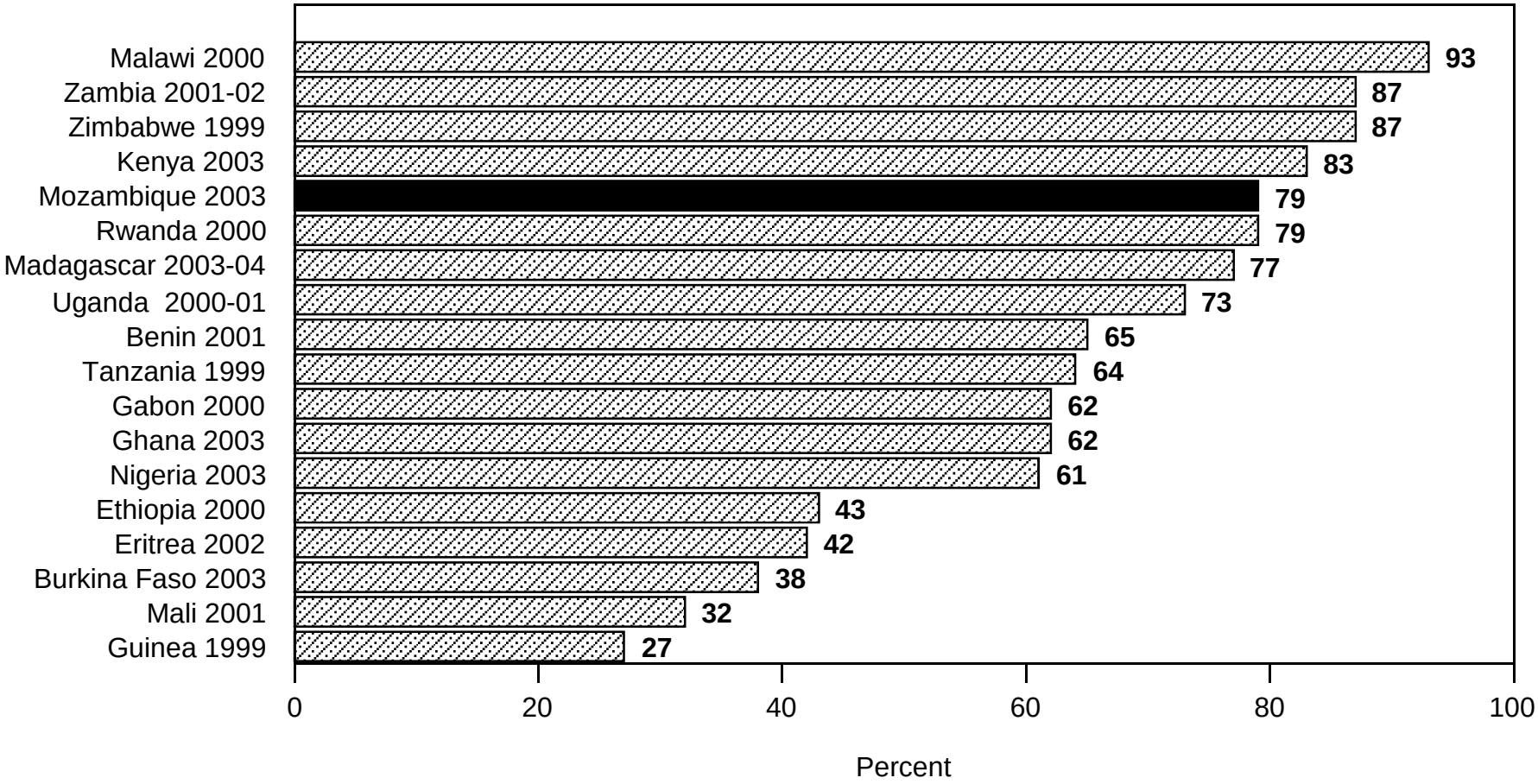
Figure 22: Infants Age 6-9 Months Receiving Solid Foods in Addition to Breast Milk, Mozambique Compared with Other Sub-Saharan Countries

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 6-9 months receiving **solid food in addition to breast milk ranges from 27 to 93 percent among the sub-Saharan countries surveyed.**

- In Mozambique, **79 percent of infant's ages 6-9 months receive solid food in addition to breast milk.** This rate is in the upper-range among the sub-Saharan countries surveyed.

Figure 22
Infants Age 6-9 Months Receiving Solid Foods in Addition to Breast Milk, Mozambique 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 10-23 Months Who Continue to Be Breastfed, Mozambique Compared with Other Sub-Saharan Countries

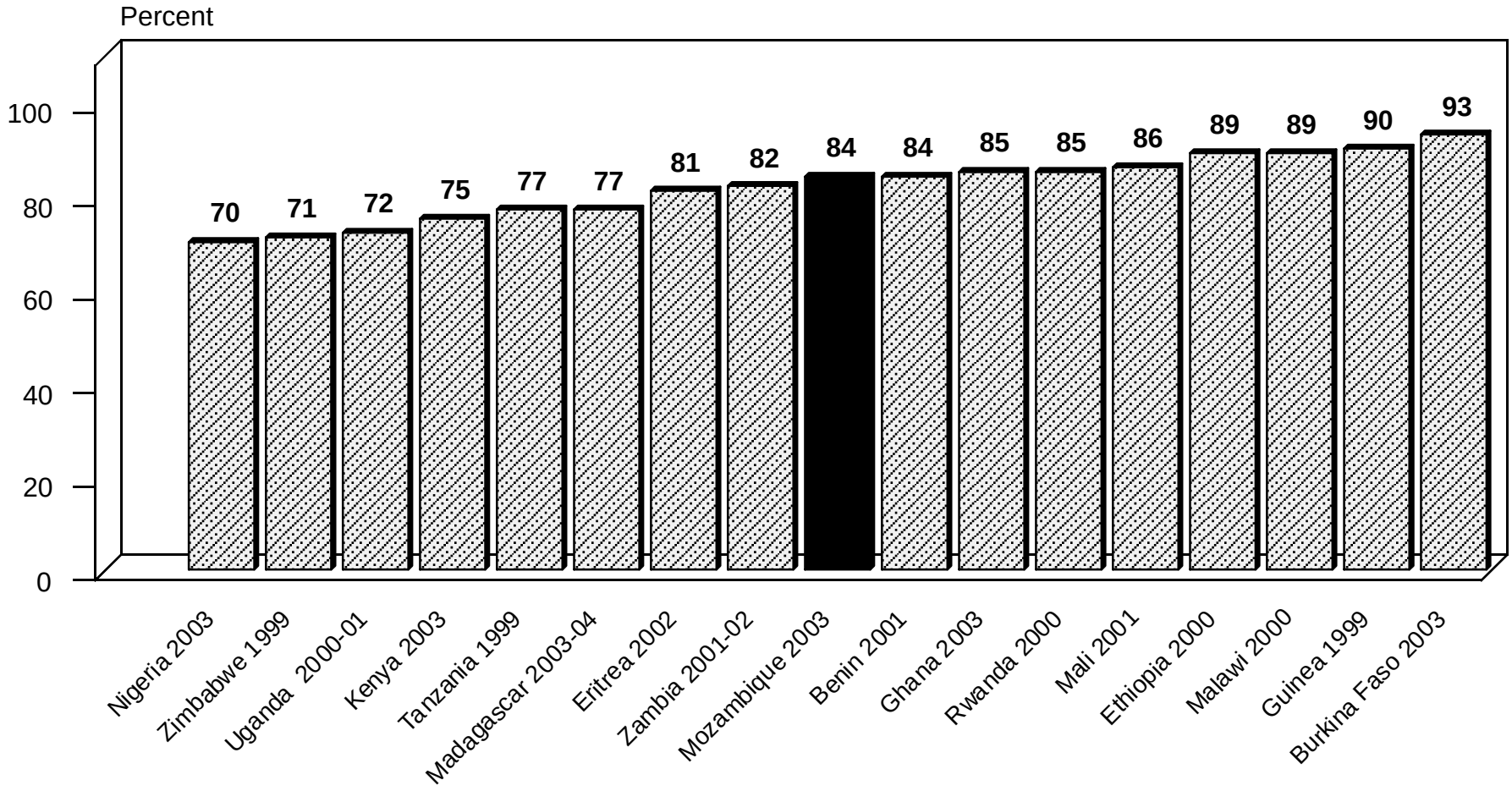
For older infants and toddlers, breast milk continues to be an important source of energy, protein, and micronutrients. Studies have shown that, in some populations, breast milk is the most important source of vitamin A and fat among children over 12 months of age. Breastfeeding older infants also reduce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

- **Eighty-four percent of children age 10-23 months are still given breast milk.** This rate is in the mid-range among the sub-Saharan countries surveyed.

Figure 23
Children 10-23 Months Who Continue to Be Breastfed, Mozambique 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, Mozambique

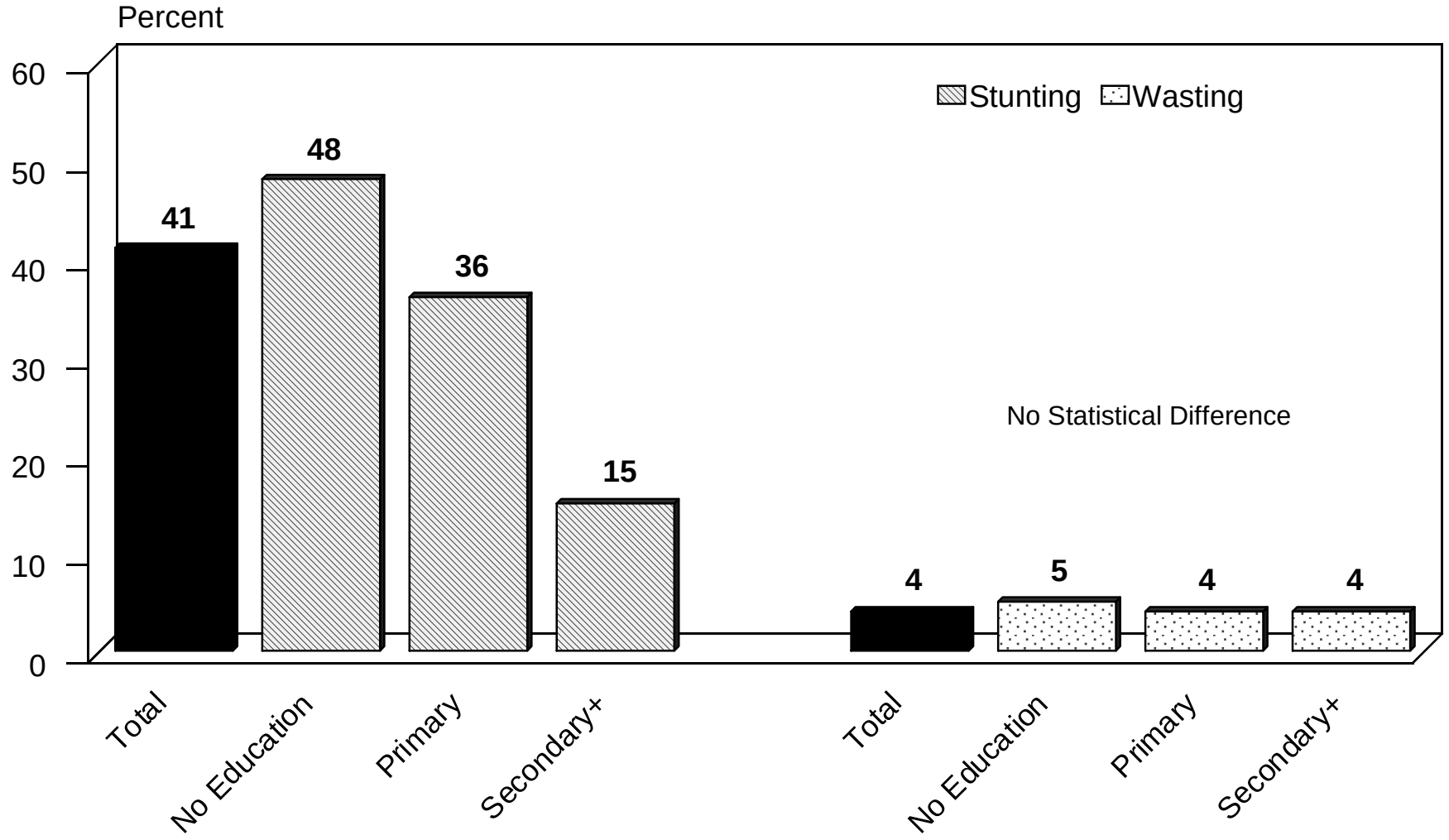
Maternal education is related to knowledge of good child care practices and to household wealth. In Mozambique, 44 percent of the mothers of children under five years of age have never attended school, while 51 percent have some primary education and 5 percent have secondary or higher education. There are variations in school attendance, especially between urban and rural areas. In the rural areas, 55 percent of the mothers have never attended school, 45 percent have attended primary school, and less than 1 percent have gone to secondary school or higher. In contrast, only 21 percent of mothers in urban areas have never attended school, while 65 percent and 13 percent, respectively, have gone to secondary school or higher. The Maputo City region has the highest percentage of mothers who have received at least a secondary school education (22 percent), compared with 1 to 5 percent in the rest of Mozambique's regions.

In Mozambique,

- **Mother's education is inversely related to the prevalence of stunting in children.** As mother's level of education increases, the rate of stunting in children goes down.

- Differences in the rate of **wasting among children by mother's level of education are not statistically significant.**

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



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

Source: MDHS 2003

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

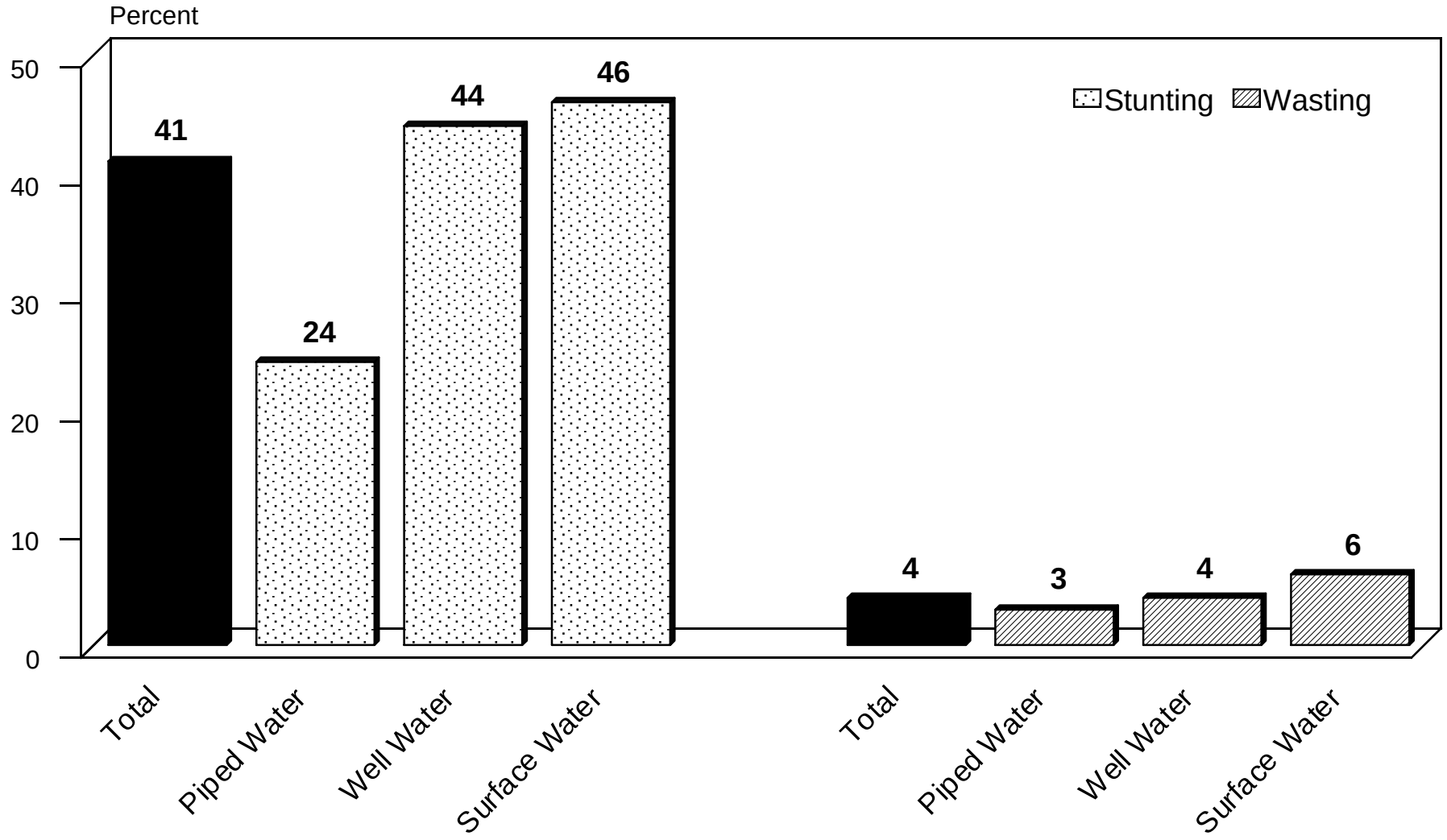
A household's source of drinking water is linked with its socioeconomic status. Poor households are more likely to obtain drinking water from contaminated sources such as surface water or open wells. Without an adequate supply of good-quality water, the risks of food contamination, diarrheal disease, and malnutrition rise. Infants and children from households that do not have a private tap are at greater risk of being malnourished than those from households with this amenity. Among the households surveyed with children under five years, 20 percent use piped water, 16 percent use protected well water, 46 percent obtain their drinking water from an open well, and 18 percent use surface water.

In Mozambique,

- **Children whose source of drinking water is surface water or well water are more likely to be stunted (46 percent and 44 percent)** than children with access to piped water (24 percent).

- **Children whose source of drinking water is surface water or well water are more likely to be wasted (6 percent and 4 percent)** than children with access to piped water (3 percent).

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



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

Source: MDHS 2003

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

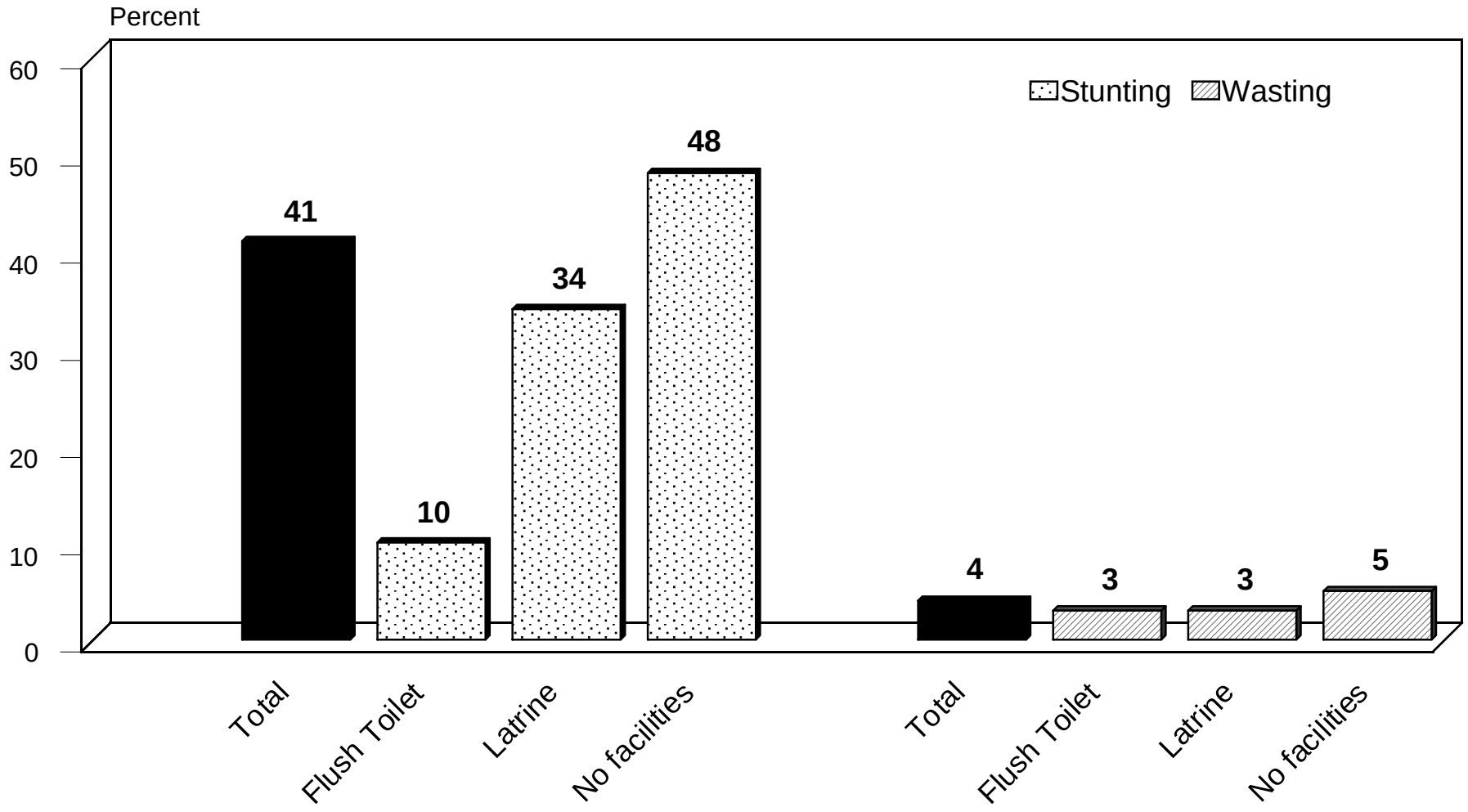
The type of toilet used by a household reflects its wealth, and poor households are less likely to have adequate toilet facilities. Inadequate sanitation facilities result in an increased risk of diarrheal disease, which contributes to malnutrition. Infants and children from households that do not have ready access to a flush toilet are at greater risk of being malnourished than children from households with this amenity. In Mozambique, 48 percent of households surveyed with at least one child under five years have access to a latrine, 51 percent have no facilities, and only 2 percent of surveyed households have access to a flush toilet.

In Mozambique,

- **Children who have no access to toilet facilities and those who have access to a latrine are more likely to be stunted** (48 percent and 34 percent, respectively) than children with access to a flush toilet (10 percent).

- **Children who have no access to toilet facilities and those who have access to a latrine are more likely to be wasted** (3 percent) compared with children who have access to a flush toilet (5 percent).

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



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

Source: MDHS 2003

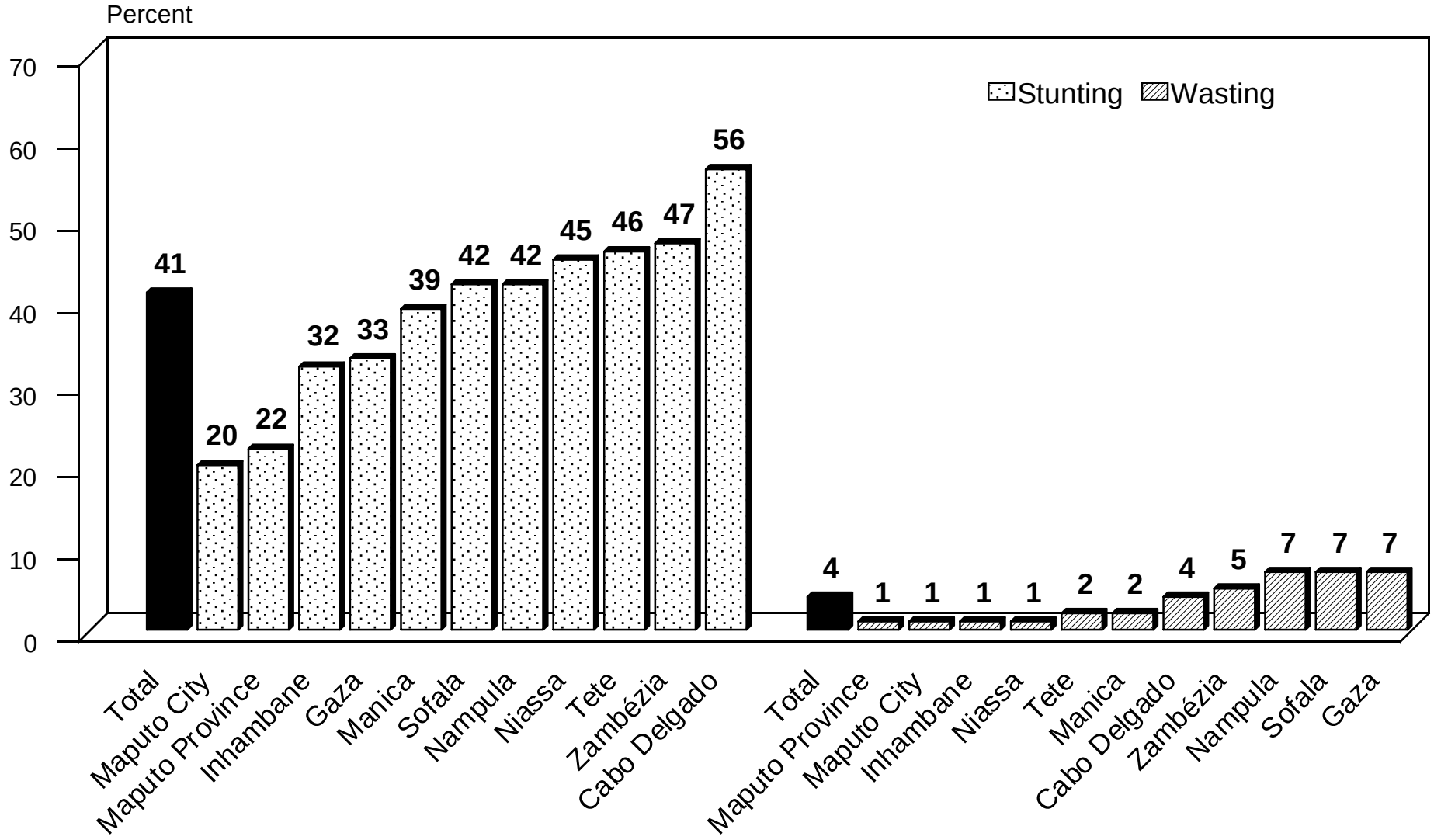
Figure 27: Stunting and Wasting among Children under Five Years by Province, Mozambique

In Mozambique,

- **Stunting ranges from 20 to 56 percent among children in the 11 regions.** Stunting rates are lowest in Maputo City (20 percent) and highest in the Cabo Delgado province (56 percent).

- **Wasting ranges from 1 to 7 percent among children in the 11 regions.** Wasting rates are lowest in Maputo province, Maputo City, and Inhambane and Niassa provinces (1 percent). The rate of wasting is highest in Nampula, Sofala, and Gaza provinces (7 percent).

Figure 27
Stunting and Wasting among Children under Five Years by Province, Mozambique



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

Source: MDHS 2003

Basic Influences

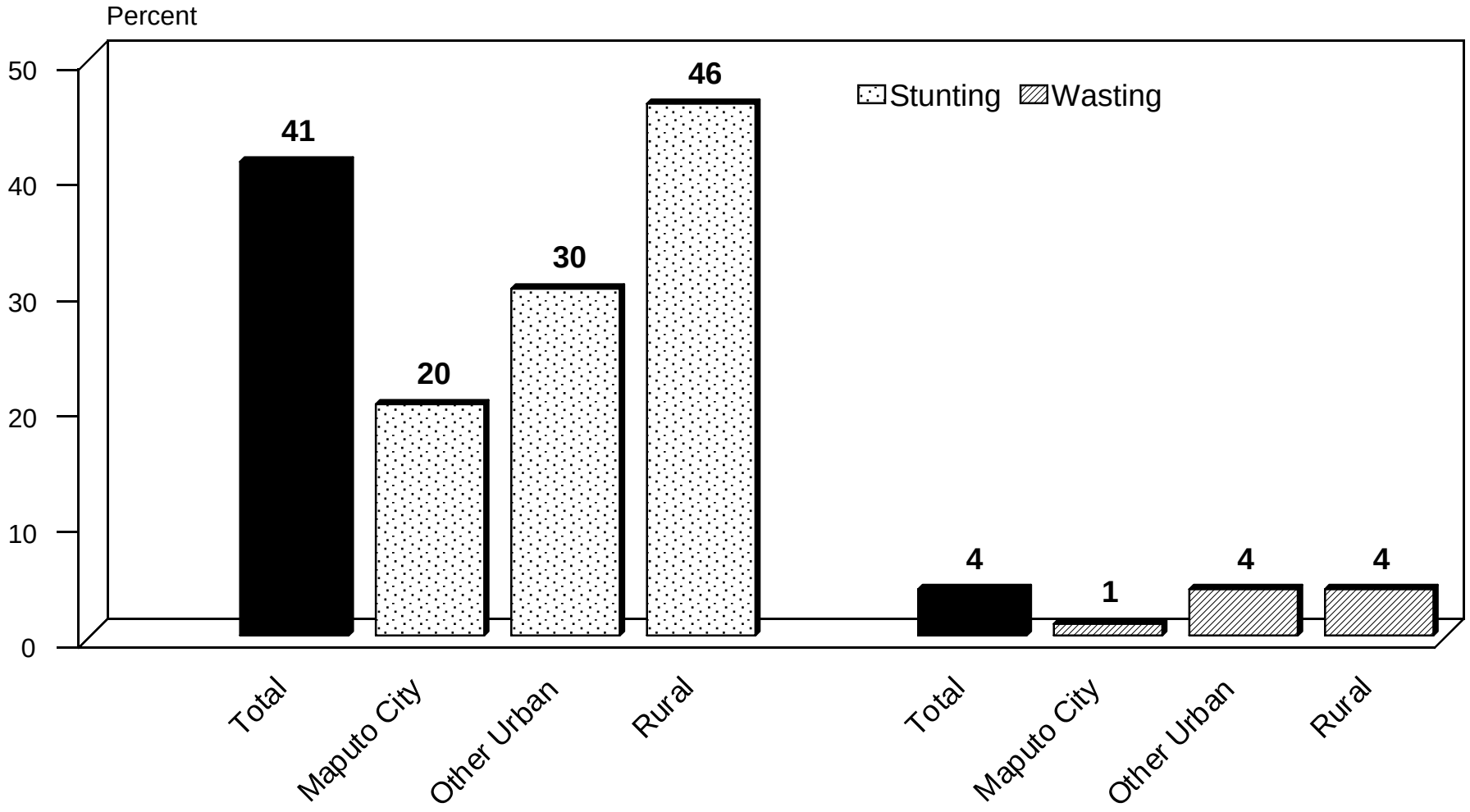
Figure 28: Stunting and Wasting among Children under Five Years by Urban-Rural Residence, Mozambique

In Mozambique,

- **The rate of stunting is lowest in the capital, Maputo City (20 percent).** In other urban areas it is 30 percent, and in rural areas it is 46 percent.

- **The rate of wasting is also lowest in Maputo City (1 percent),** while it is 4 percent in other urban areas and in rural areas.

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



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

Source: MDHS 2003

Maternal Nutritional Status

Figure 29: Malnutrition among Mothers of Children under Five Years by Province, Mozambique

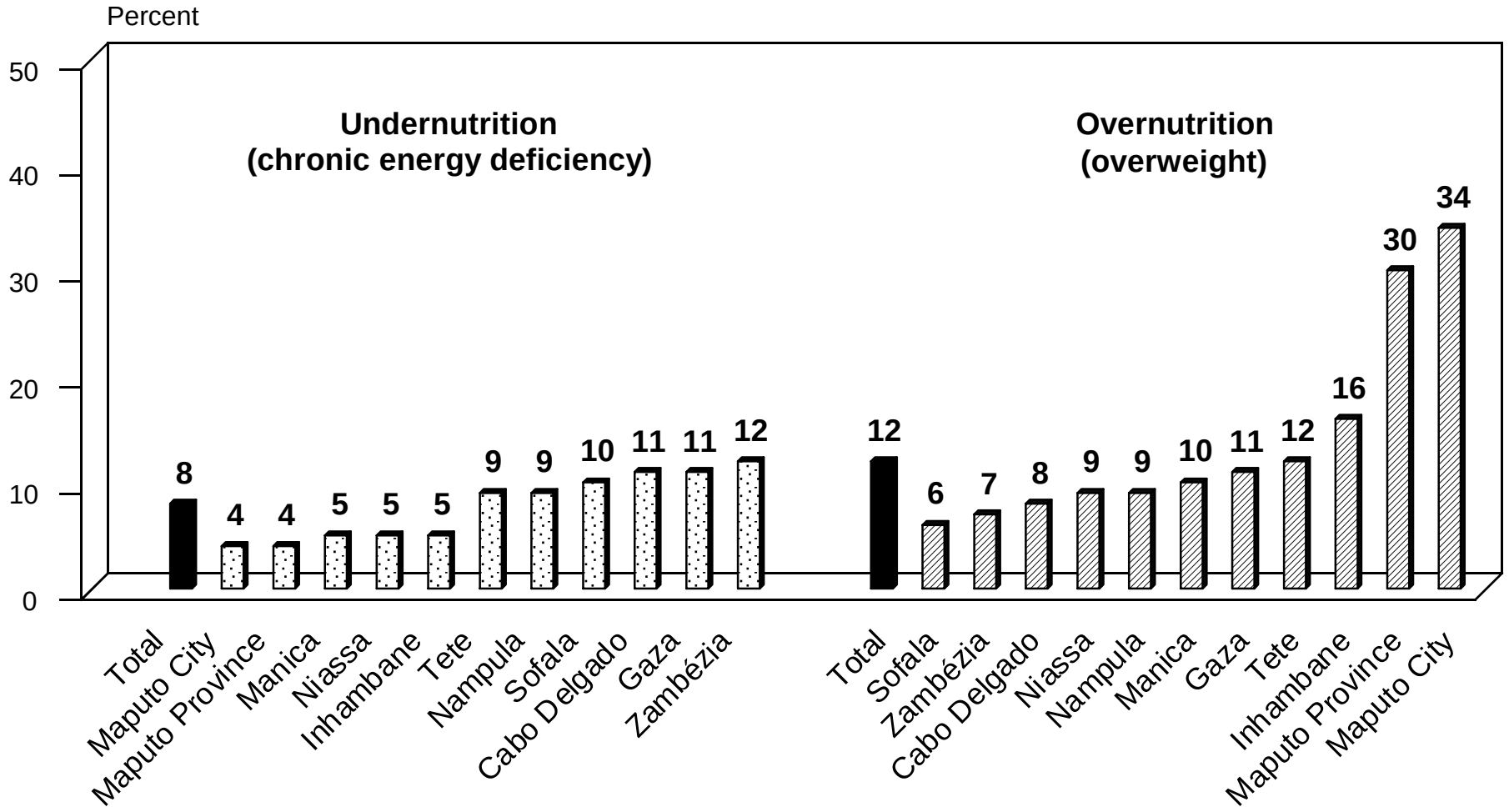
Besides being of concern in its own right, a mother's nutritional status affects her ability to successfully carry, deliver, and care for her children. There are generally accepted standards for indicators of malnutrition among adult women that can be applied.

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 Mozambique are undernourished.** Maternal undernutrition is highest in the Zambézia province (12 percent) and lowest in Maputo City (4 percent).

- **Twelve percent of mothers of children under five are overweight.** Maternal overnutrition is highest in Maputo City (34 percent) and lowest in the Sofala province (6 percent).

Figure 29
Malnutrition among Mothers of Children under Five Years by Province, Mozambique



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 2003

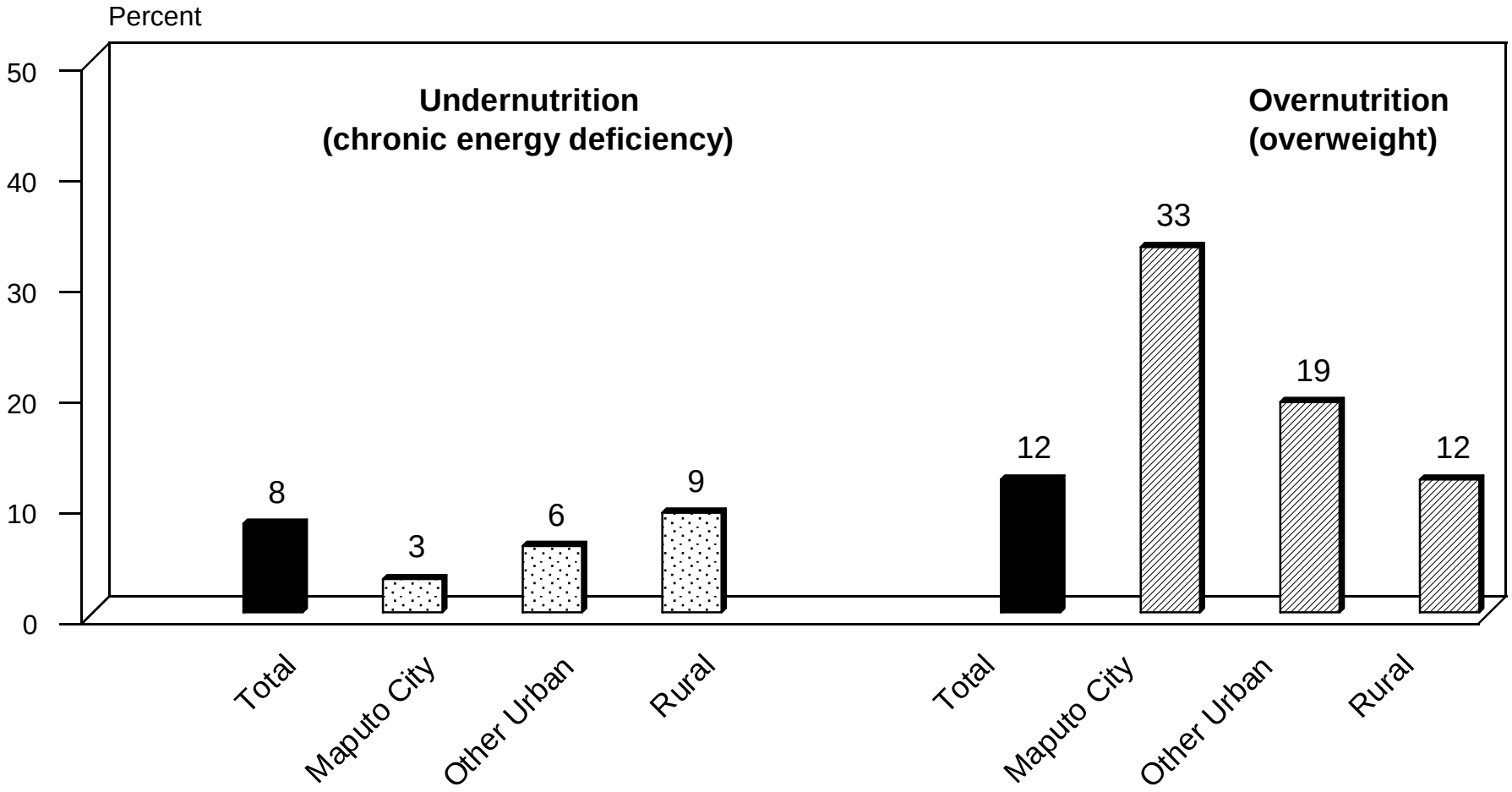
Figure 30: Malnutrition among Mothers of Children under Five Years by Urban-Rural Residence, Mozambique

In Mozambique,

- The undernutrition rate (chronic energy deficiency) for mothers of children under five is **6 percentage points higher in rural areas (9 percent) compared with Maputo City (3 percent).**

- The overnutrition rate (overweight) for mothers of children under five is almost **3 times higher in Maputo City (33 percent) compared with rural areas (12 percent).**

Figure 30
Malnutrition among Mothers of Children under Five Years, by Urban-Rural Residence, Mozambique



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 2003

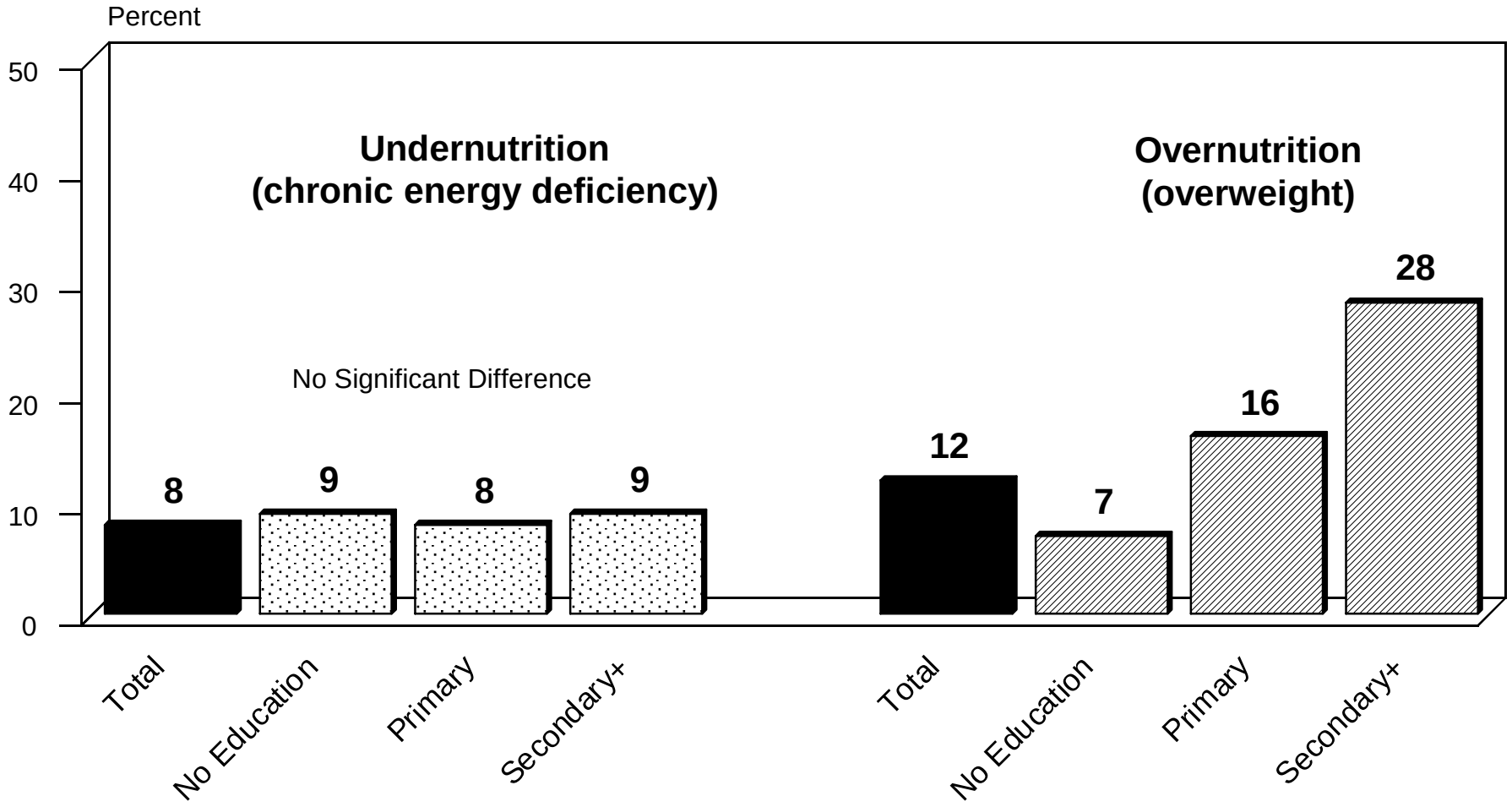
Figure 31: Malnutrition among Mothers of Children under Five Years by Education, Mozambique

In Mozambique,

- **Undernutrition among mothers of children under five is not related to level of education.**

- Overnutrition among mothers of children under five shows a linear relationship with increasing level of education. It is highest among women **with secondary education (28 percent) and lowest among those with no education (7 percent).**

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



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 2003

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

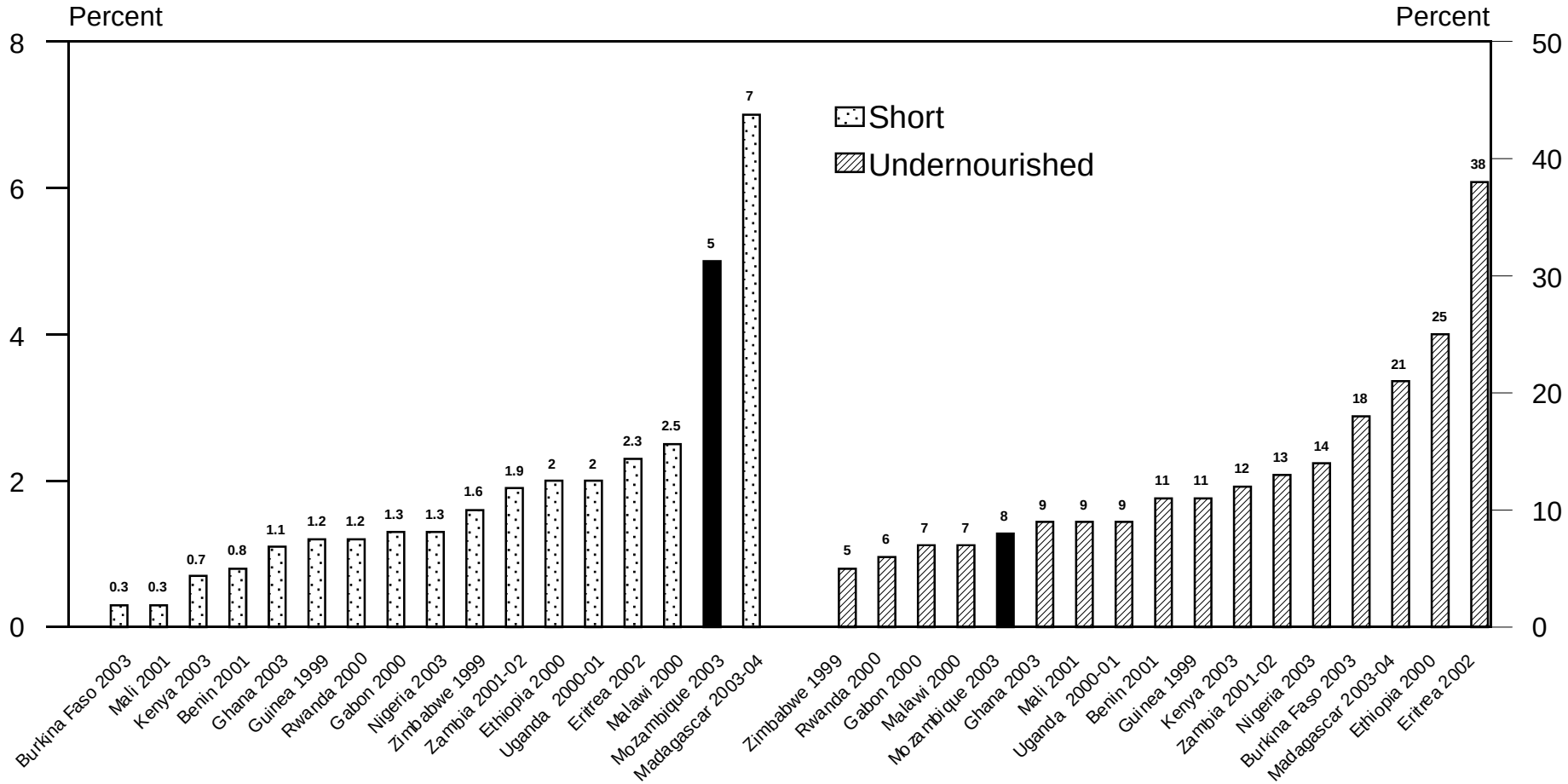
Malnutrition among mothers is likely to have a major impact on their ability to care for themselves and their children. Women less than 145 centimeters in height are considered too short. Mothers who are too short (a condition largely due to stunting during childhood and adolescence) may have difficulty 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 Mozambique,

- **Five percent of mothers of children under five are too short (<145 cm).** This proportion is the second highest among the sub-Saharan countries surveyed.

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

Figure 32
Malnutrition among Mothers of Children under Five Years, Mozambique 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
Mozambique 2003

Background characteristic	Stunted	Wasted	Underweight	Overweight	Background characteristic	Stunted	Wasted	Underweight	Overweight
Child's age in months					**Provinces**				
0-5	11.7	1.3	5.0	10.3	Niassa	45.2	1.4	24.3	1.9
6-11	28.3	4.3	24.3	4.9	Cabo Delgado	55.7	4.5	35.2	3.5
12-17	39.9	8.0	33.2	1.6	Nampula	42.3	6.6	29.1	3.3
18-23	57.0	5.7	35.6	2.2	Zambézia	47.2	5.0	26.8	3.6
24-29	44.9	4.7	30.7	0.6	Tete	45.9	1.6	25.3	2.0
30-35	43.9	4.8	27.9	1.6	Manica	39.3	2.4	22.1	2.4
36-47	49.6	3.5	22.4	2.3	Sofala	42.0	6.8	25.2	2.0
48-59	44.6	1.7	18.5	1.8	Inhambane	31.8	1.0	13.2	4.9
					Gaza	32.5	6.9	22.0	2.7
					Maputo Province	22.0	0.6	8.7	2.7
					Maputo City	20.2	0.8	7.5	4.5
	p<0.000 n=8,226	p<0.000 n=8,225	p<0.000 n=8,224	p<0.000 n=8,221		p<0.000 n=8,223	p<0.000 n=8,224	p<0.000 n=8,222	p<0.000 n=8,222
Gender of child					**Urban-rural residence**				
Female	38.8	4.0	22.8	3.1	Maputo City	20.2	0.8	7.5	4.5
Male	42.6	3.9	24.8	3.1	Other Urban	30.1	3.8	16.4	3.0
					Rural	45.7	4.3	27.4	3.1
	p<0.000 n=8,225	NS n=8,225	p<0.000 n=8,225	NS n=8,225		p<0.000 n=8,225	p<0.000 n=8,224	p<0.000 n=8,225	NS n=8,224
Overall	**40.7**	**4.0**	**23.8**	**3.1**	**Overall**	**40.7**	**4.0**	**23.8**	**3.1**

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

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

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 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 a normal curve. The height-for-age and weight-for-age curves are shifted towards the left of the standard curve indicating that there is large number of stunted and underweight children in Mozambique. However, weight-for-height curve for Mozambique is comparable to the expected normal distribution in a well-nourished population. The implications are that interventions are necessary to address widespread malnutrition in order to improve child health, which will result in a shift in the curves closer to the reference standard.

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