

Burkina Faso 2003

**Nutrition of Young Children
and Mothers**



AFRICA NUTRITION CHARTBOOKS

NUTRITION OF YOUNG CHILDREN AND MOTHERS IN BURKINA FASO

Findings from the 2003 Burkina Faso Demographic and Health Survey

ORC Macro
11785 Beltsville Drive, Suite 300
Calverton, Maryland, USA

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Contents

INTRODUCTION.....	1
FIGURE 1: INFANT AND CHILD MORTALITY, BURKINA FASO COMPARED WITH OTHER SUB-SAHARAN COUNTRIES.....	2
FIGURE 2: CONTRIBUTION OF UNDERNUTRITION TO UNDER-FIVE MORTALITY, BURKINA FASO.....	4
FIGURE 3: SURVIVAL AND NUTRITIONAL STATUS OF CHILDREN, BURKINA FASO.....	6
MALNUTRITION IN BURKINA FASO	9
FIGURE 4: MALNUTRITION AMONG CHILDREN UNDER FIVE YEARS, BURKINA FASO	10
FIGURE 5: CHANGES IN UNDERNUTRITION RATES AMONG CHILDREN UNDER FIVE YEARS, BURKINA FASO 1993, 1998-99, AND 2003.....	12
FIGURE 6: STUNTING, WASTING, AND UNDERWEIGHT BY AGE, BURKINA FASO	14
FIGURE 7: UNDERNUTRITION AMONG CHILDREN UNDER FIVE YEARS WHO DO NOT RESIDE WITH THEIR MOTHER, BURKINA FASO.....	16
FIGURE 8: UNDERWEIGHT AMONG CHILDREN UNDER FIVE YEARS, BURKINA FASO COMPARED WITH OTHER SUB-SAHARAN COUNTRIES	18
FIGURE 9: STUNTING AMONG CHILDREN UNDER FIVE YEARS, BURKINA FASO COMPARED WITH OTHER SUB-SAHARAN COUNTRIES.....	20
CONCEPTUAL FRAMEWORK FOR NUTRITIONAL STATUS	22
IMMEDIATE INFLUENCES OF MALNUTRITION.....	25
FIGURE 10: CHILDREN UNDER FIVE YEARS LIVING IN HOUSEHOLDS WITH ADEQUATELY IODIZED SALT BY REGION, BURKINA FASO.....	26
FIGURE 11: NIGHT BLINDNESS AMONG MOTHERS OF CHILDREN UNDER FIVE YEARS, BURKINA FASO.....	28
FIGURE 12: VITAMIN A SUPPLEMENTATION AMONG MOTHERS OF CHILDREN UNDER FIVE YEARS BY REGION, BURKINA FASO	30
FIGURE 13: VITAMIN A SUPPLEMENTATION AMONG CHILDREN 6-59 MONTHS IN THE PAST SIX MONTHS BY REGION, BURKINA FASO	32
FIGURE 14: ANEMIA AMONG CHILDREN 6-59 MONTHS AND MOTHERS BY REGION, BURKINA FASO.....	34
FIGURE 15: IRON SUPPLEMENTATION AMONG MOTHERS OF CHILDREN UNDER FIVE YEARS, BURKINA FASO	36
FIGURE 16: DIARRHEA AND COUGH WITH RAPID BREATHING AMONG CHILDREN UNDER FIVE YEARS COMPARED WITH MALNUTRITION RATES, BURKINA FASO	38
UNDERLYING BIOLOGICAL AND BEHAVIORAL INFLUENCES OF MALNUTRITION.....	41
FIGURE 17: FERTILITY AND BIRTH INTERVALS, BURKINA FASO COMPARED WITH OTHER SUB-SAHARAN COUNTRIES.....	42
FIGURE 18: UNDERNUTRITION AMONG CHILDREN AGE 12-23 MONTHS BY MEASLES VACCINATION STATUS, BURKINA FASO	44

FIGURE 19:	MEASLES VACCINATION COVERAGE AMONG CHILDREN AGE 12-23 MONTHS, BURKINA FASO COMPARED WITH OTHER SUB-SAHARAN COUNTRIES	46
FIGURE 20:	FEEDING PRACTICES FOR INFANTS UNDER SIX MONTHS, BURKINA FASO	48
FIGURE 21:	INFANTS UNDER FOUR MONTHS WHO ARE EXCLUSIVELY BREASTFED AND THOSE WHO RECEIVE A BOTTLE, BURKINA FASO COMPARED WITH OTHER SUB-SAHARAN COUNTRIES.....	50
FIGURE 22:	FEEDING PRACTICES FOR INFANTS AGE 6-9 MONTHS, BURKINA FASO	52
FIGURE 23:	INFANTS AGE 6-9 MONTHS RECEIVING SOLID FOODS IN ADDITION TO BREAST MILK, BURKINA FASO COMPARED WITH OTHER SUB-SAHARAN COUNTRIES	54
FIGURE 24:	CHILDREN 10-23 MONTHS WHO CONTINUE TO BE BREASTFED, BURKINA FASO COMPARED WITH OTHER SUB-SAHARAN COUNTRIES	56
UNDERLYING SOCIAL AND ECONOMIC INFLUENCES OF MALNUTRITION		59
FIGURE 25:	STUNTING AND WASTING AMONG CHILDREN UNDER FIVE YEARS BY MOTHER’S EDUCATION, BURKINA FASO.....	60
FIGURE 26:	STUNTING AND WASTING AMONG CHILDREN UNDER FIVE YEARS BY SOURCE OF DRINKING WATER, BURKINA FASO.....	62
FIGURE 27:	STUNTING AND WASTING AMONG CHILDREN UNDER FIVE YEARS BY TYPE OF TOILET, BURKINA FASO	64
BASIC INFLUENCES		67
FIGURE 28:	STUNTING AND WASTING AMONG CHILDREN UNDER FIVE YEARS BY REGION, BURKINA FASO.....	68
FIGURE 29:	STUNTING AND WASTING AMONG CHILDREN UNDER FIVE YEARS BY URBAN-RURAL RESIDENCE, BURKINA FASO.....	70
MATERNAL NUTRITIONAL STATUS		73
FIGURE 30:	MALNUTRITION AMONG MOTHERS OF CHILDREN UNDER FIVE YEARS BY REGION, BURKINA FASO	74
FIGURE 31:	MALNUTRITION AMONG MOTHERS OF CHILDREN UNDER FIVE YEARS BY RESIDENCE, BURKINA FASO.....	76
FIGURE 32:	MALNUTRITION AMONG MOTHERS OF CHILDREN UNDER FIVE YEARS BY EDUCATION, BURKINA FASO.....	78
FIGURE 33:	MALNUTRITION AMONG MOTHERS OF CHILDREN UNDER FIVE YEARS, BURKINA FASO COMPARED WITH OTHER SUB-SAHARAN COUNTRIES	80
APPENDICES.....		83
APPENDIX 1	STUNTING, WASTING, UNDERWEIGHT, AND OVERWEIGHT RATES BY BACKGROUND CHARACTERISTICS, BURKINA FASO 2003	85
APPENDIX 2	NCHS/CDC/WHO INTERNATIONAL REFERENCE POPULATION COMPARED WITH THE DISTRIBUTION OF MALNUTRITION IN BURKINA FASO	86

Introduction

Malnutrition¹ is one of the most important health and welfare problems among infants and young children in Burkina Faso. 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 Burkina Faso Demographic and Health Survey (EDSBF-III), a nationally representative survey of 9,097 households, conducted by the Institut National de la Statistique et de la Démographie (INSD). 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 United Nations Population Fund (UNFPA), the World Bank, and the United Nations Children's Fund (UNICEF).

Of the 10,851 children age 0-59 months who were part of the study, there were 8,269 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, Burkina Faso 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.

- **Burkina Faso's under-one mortality rate (81 deaths per 1,000 births) indicates that 8 percent of children born in Burkina Faso will die before their first birthday.** This rate is in the mid-range of all sub-Saharan countries surveyed.
- **Burkina Faso's under-five mortality rate (184 deaths per 1,000 births) indicates that over 18 percent of children born in Burkina Faso will die before their fifth birthday.** This rate places Burkina Faso near the upper end of the sub-Saharan countries surveyed.

Figure 1

Infant and Child Mortality, Burkina Faso Compared with Other Sub-Saharan Countries

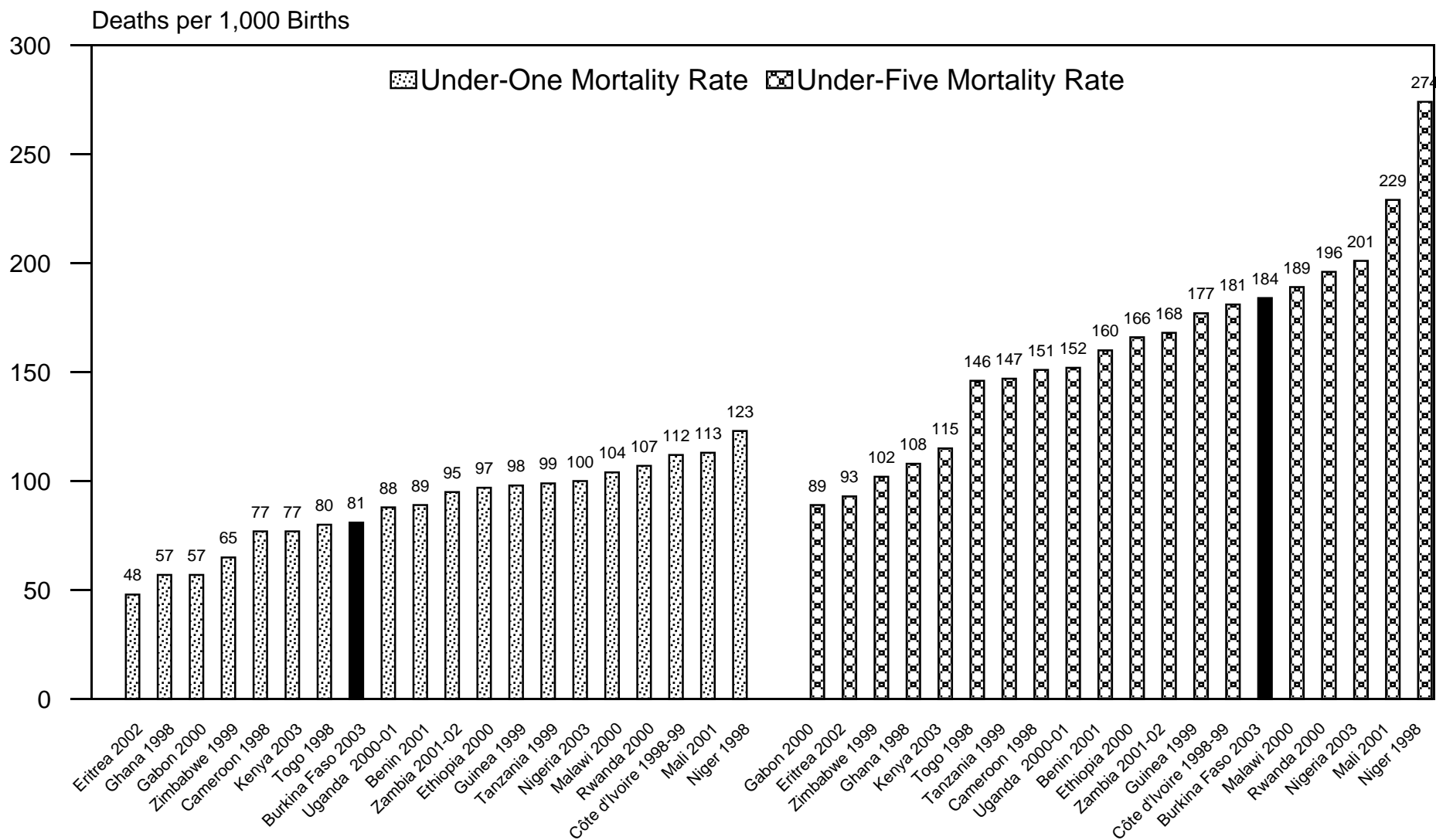


Figure 2: Contribution of Undernutrition to Under-Five Mortality, Burkina Faso

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.

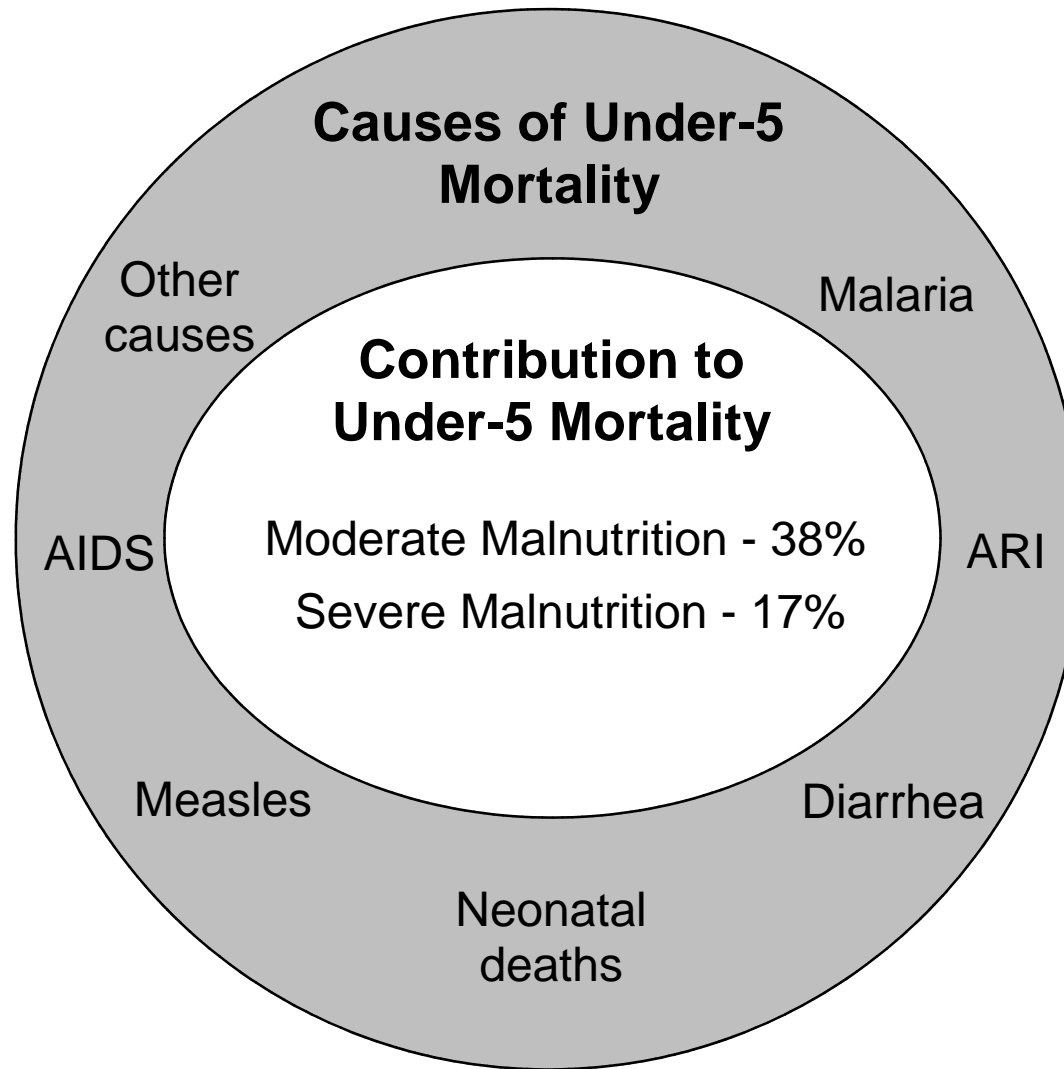
In Burkina Faso,

- **Fifty-five percent of all deaths that occur before age five are related to malnutrition (severe and moderate malnutrition).**
- **Because of its extensive prevalence, moderate malnutrition (38 percent) contributes to more deaths than severe malnutrition (17 percent).**
- **Moderate malnutrition is implicated in 69 percent of 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, Burkina Faso



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

Figure 3: Survival and Nutritional Status of Children, Burkina Faso

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.

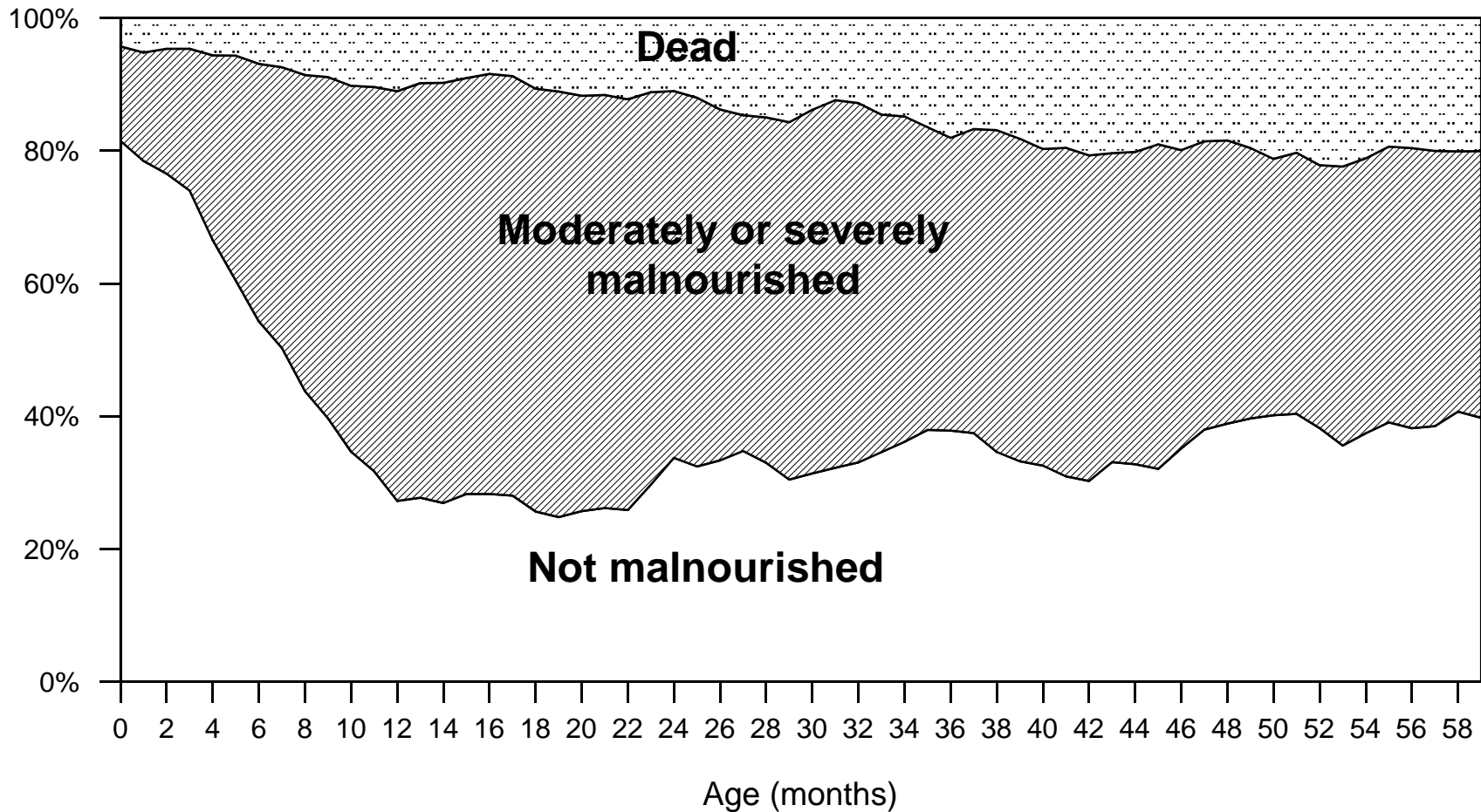
In Burkina Faso,

- **Between birth and 19 months of age, the percentage of children who are alive and not malnourished drops rapidly from about 80 percent to 25 percent.** Thereafter, the rate rises to 32 percent at 36 months and remains between 30 and 40 percent through 59 months.
- **Between birth and 19 months of age, the percentage of children who are moderately or severely malnourished¹ increases dramatically from 12 percent to 65 percent.** This percentage then declines to 55 percent at 36 months, and then slightly declines further to 50 percent at 59 months.
- **From birth until 59 months, the percentage of children who have died increases gradually,** ranging from 5 percent at birth to 10 percent at 19 months, the rate goes up to 15 percent at 36 months and then gradually increases to 18 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, Burkina Faso



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: EDSBF-III 2003

Malnutrition in Burkina Faso

Figure 4: Malnutrition among Children under Five Years, Burkina Faso

In Burkina Faso,

- **Thirty-nine percent of children ages 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 19 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 19 percent of children**, which is 9 times the level expected in a healthy population.
- **Thirty-eight percent of children under five years are *underweight***³ for their age. This is 19 times the level expected in a healthy, well-nourished population.
- **Only 3 percent of children under five are *overweight***.⁴ This is within normal expectations 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 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.

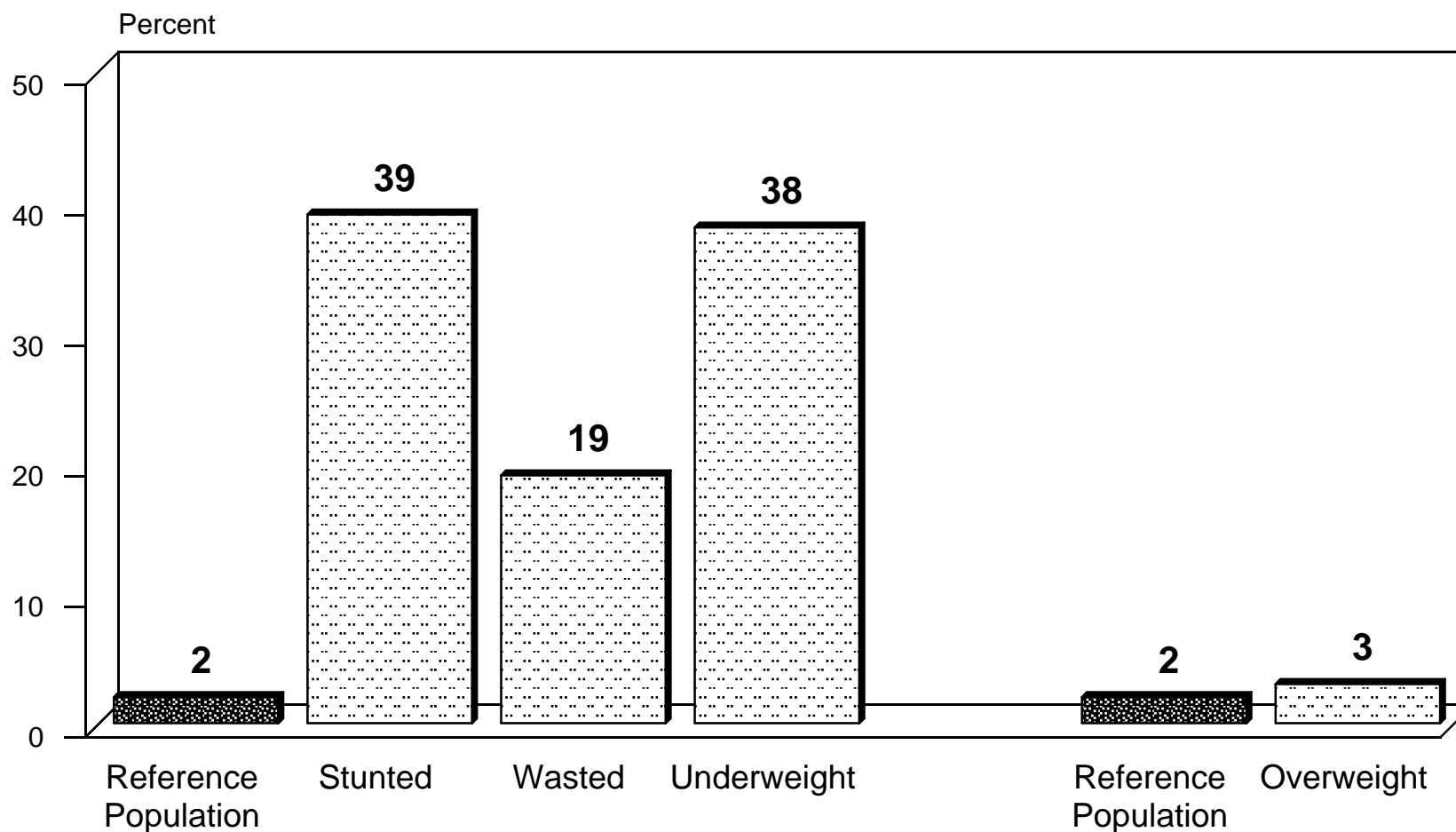
² A wasted child has a weight-for-height Z-score that is below -2 SD based on the NCHS/CDC/WHO reference population. Acute malnutrition is the result of a recent failure to receive adequate nutrition and may be affected by acute illness, especially diarrhea.

³ 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.

⁴ 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, Burkina Faso



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

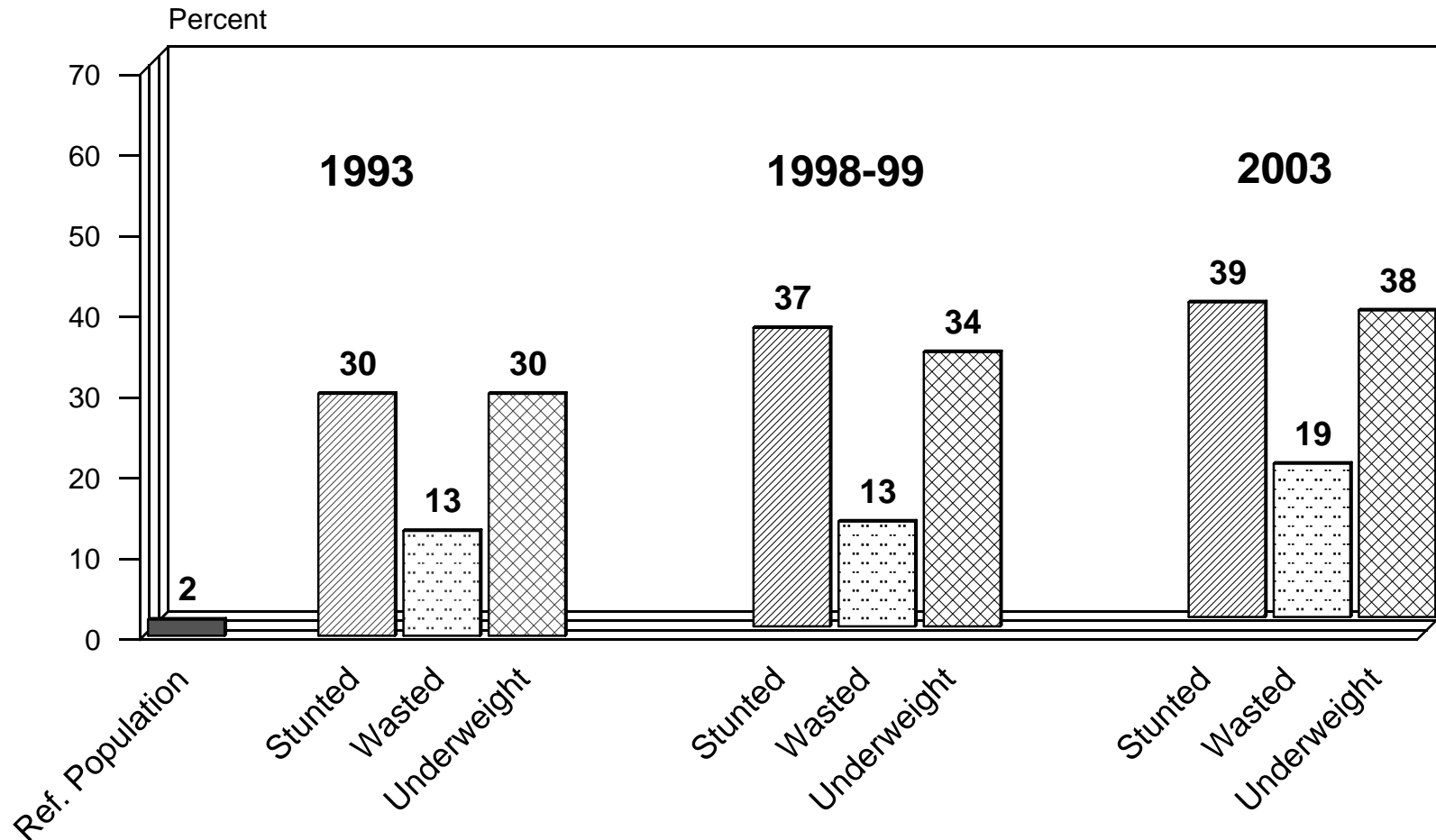
Source: EDSBF-III 2003

Figure 5: Changes in Undernutrition Rates among Children under Five Years, Burkina Faso 1993, 1998-99, and 2003

- The findings of the 2003 EDSBF-III suggest that **both acute and chronic malnutrition rates in Burkina Faso have gone up from the 1993 and 1998-99 surveys.**
- From 1993 to 1998-99, there was a 7 and 4 percentage point increase in stunting and underweight, respectively. The rate of stunting increased by another 2 percentage points in 2003 and the underweight rate increased by 4 percentage points over the same period. From 1998-99 to 2003 an increase of 6 percentage points was observed for wasting. All the increases in undernutrition rates are statistically significant, except the rate for wasting between 1993 and 1998-99.

Figure 5

Changes in Undernutrition Rates among Children under Five Years, Burkina Faso 1993, 1998-99, and 2003



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

Source: EDSBF-I 1993, EDSBF-II 1998-99, and EDSBF-III 2003

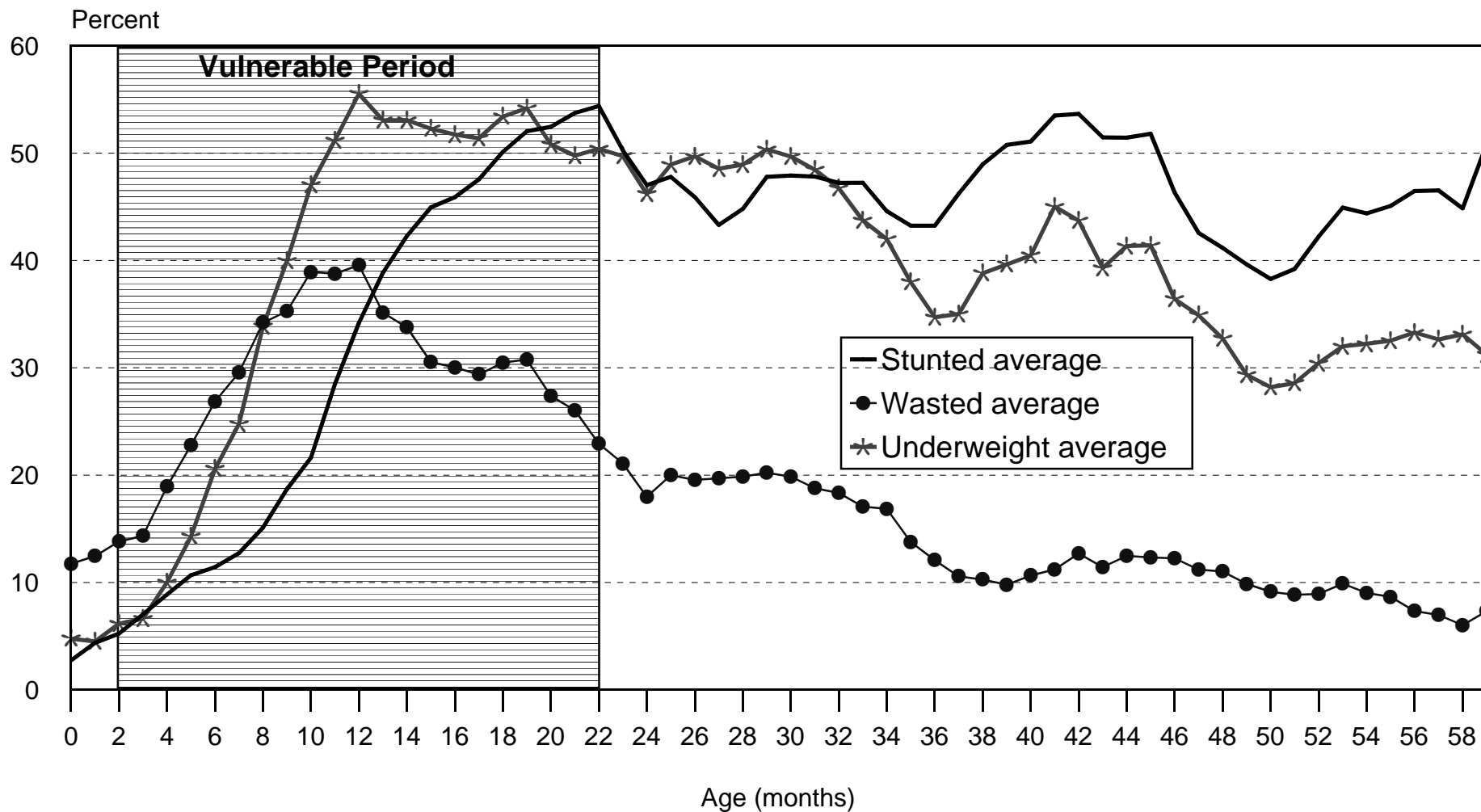
Figure 6: Stunting, Wasting, and Underweight by Age, Burkina Faso

In Burkina Faso, the time from 2 months of age until 22 months of age is a vulnerable period.

- **The proportion of children stunted rises sharply from 2 to 22 months of age, peaking at 54 percent.** Stunting then declines to 43 percent at 36 months, rises to 54 percent at 40 months, and then declines.
- **The proportion of children wasted rises to 40 percent at 12 months and then declines slowly to 10 percent at 38 months.** Wasting continues to decline, reaching 6 percent at 59 months.
- **The proportion of children underweight rises sharply from 3 to 12 months of age, peaking at 56 percent.** Underweight then declines to a low of 29 percent at 49 months, then rises again to 31 percent at 59 months.

Figure 6

Stunting, Wasting, and Underweight by Age, Burkina Faso



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: EDSBF-III 2003

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

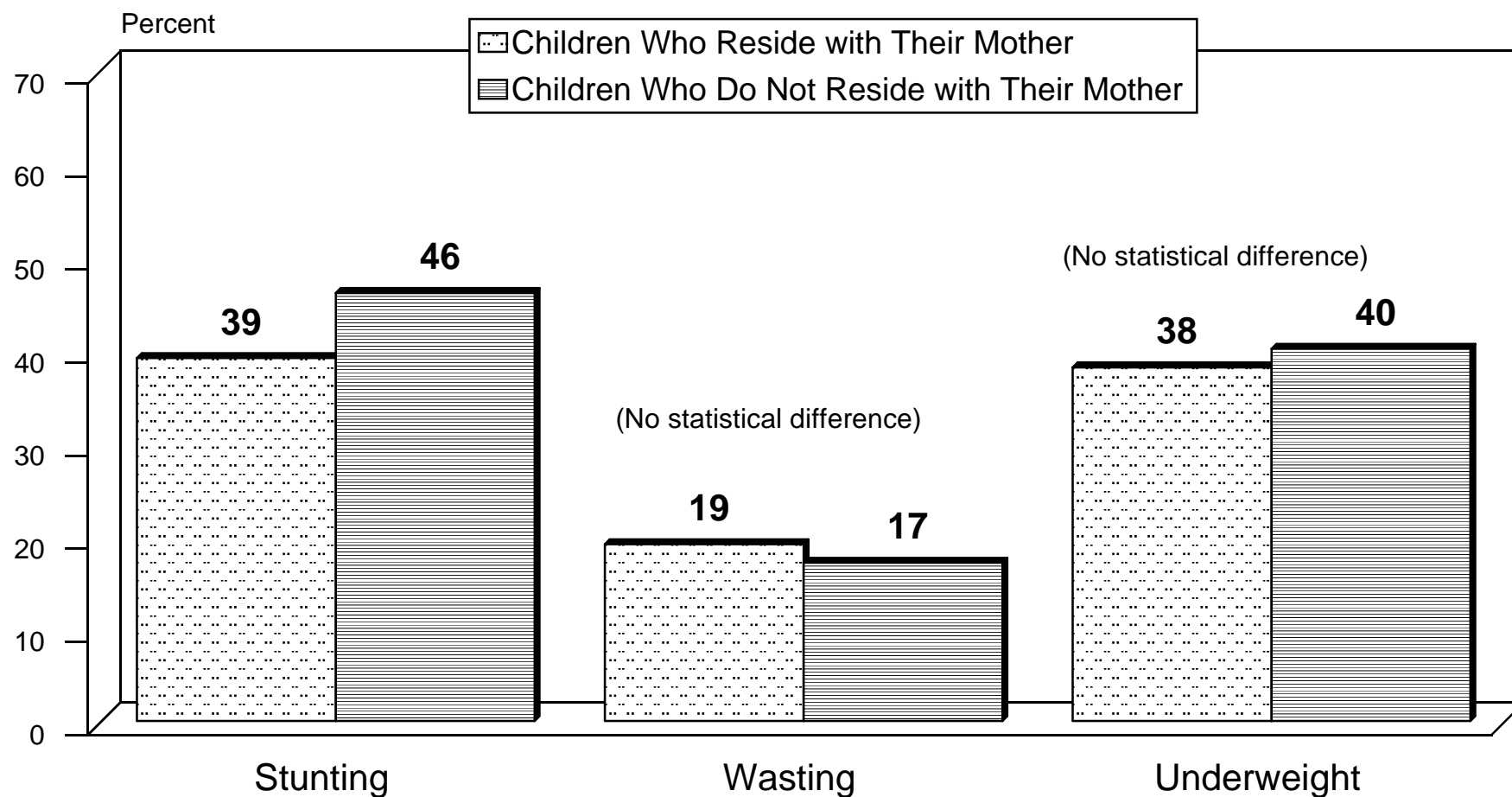
Previously, anthropometric data from DHS surveys excluded children whose mother did not live in the household or was not present to be interviewed. Currently, all children in the household are measured, regardless of their mother's residence status. In the EDSBF-III 2003, 236 children under five years did not reside with their mother.

In Burkina Faso,

- **Stunting is higher in children who do not reside with their mother.**
- There is no statistical relationship between wasting and underweight and children's residence with their mother.

Figure 7

Undernutrition among Children under Five Years Who Do Not Reside with Their Mother, Burkina Faso



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

Source: EDSBF-III 2003

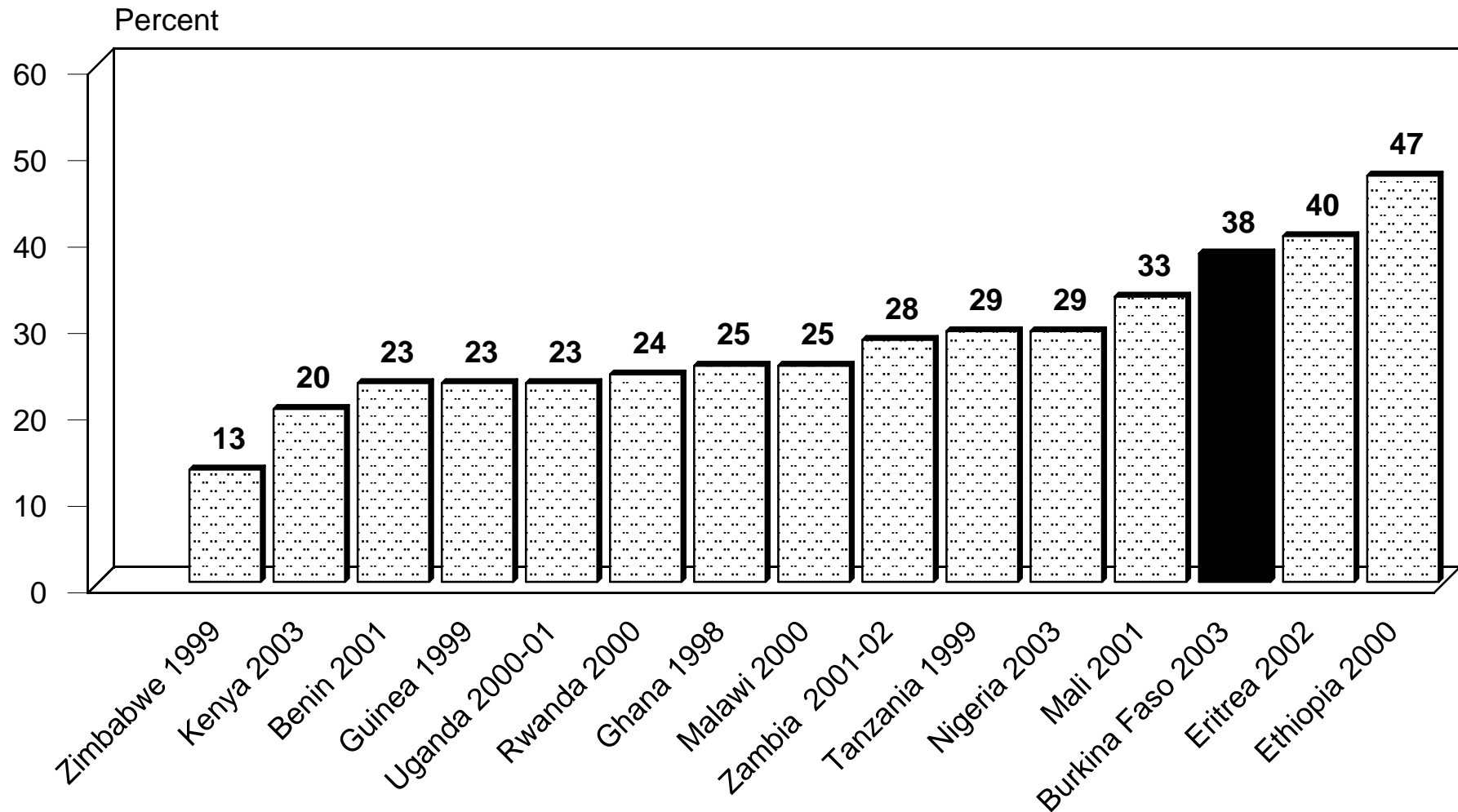
Figure 8: Underweight among Children under Five Years, Burkina Faso Compared with Other Sub-Saharan Countries

Among the sub-Saharan countries surveyed,

- The percentage of children **under five years** who are *underweight* ranges from 13 to 47 percent. **With 38 percent of children under five years being underweight, Burkina Faso is the third highest 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, Burkina Faso Compared with Other Sub-Saharan Countries



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

Source: DHS Surveys 1998-2003

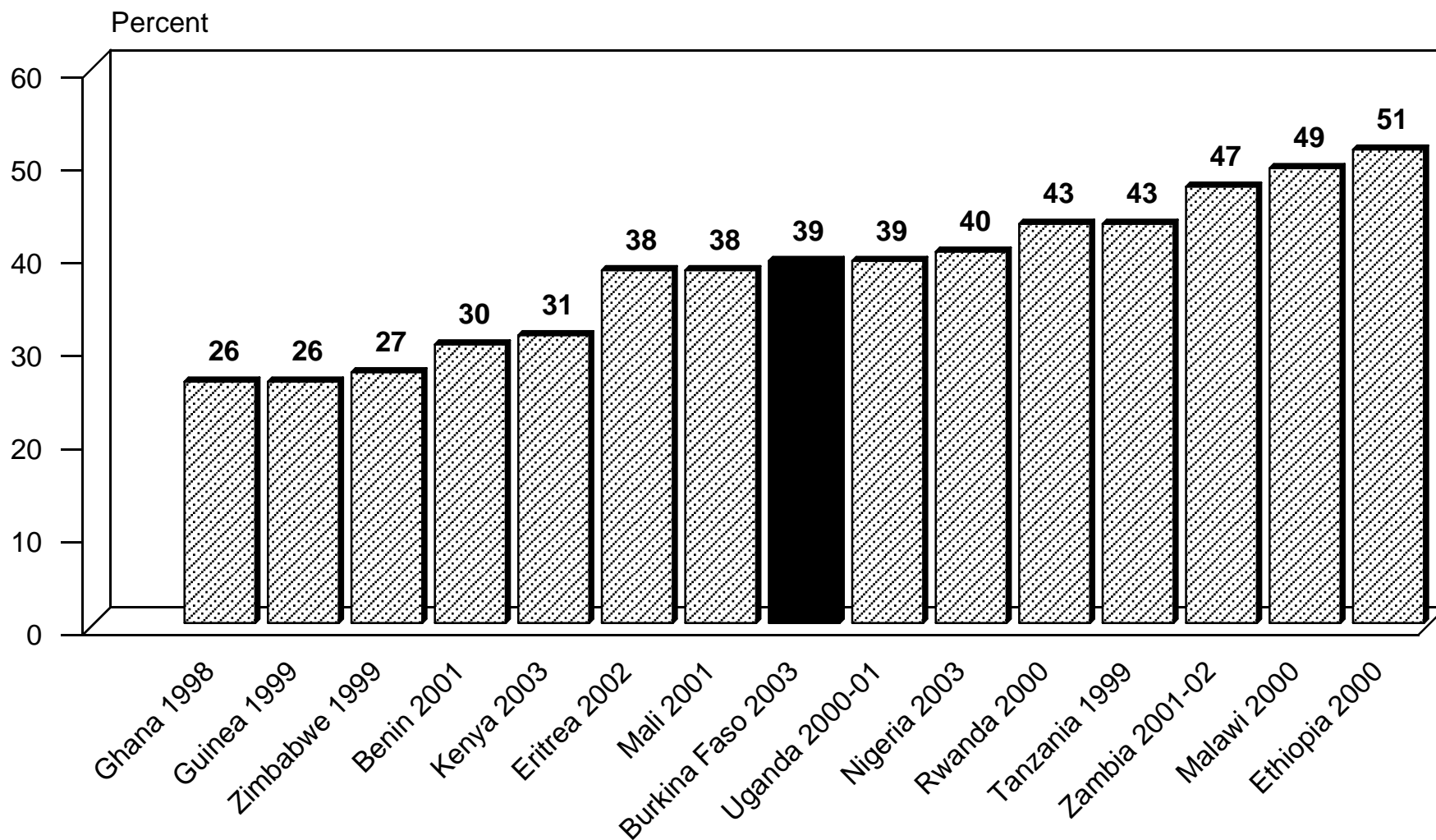
Figure 9: Stunting among Children under Five Years, Burkina Faso Compared with Other Sub-Saharan Countries

Among the sub-Saharan countries surveyed,

- The percentage of children **under five years** who are *stunted* ranges from 26 to 51 percent. **At 39 percent, the proportion of children under five years who are stunted in Burkina Faso 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, Burkina Faso Compared with Other Sub-Saharan Countries



Note: *Stunting* reflects chronic malnutrition.

Source: DHS Surveys 1998-2003

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.

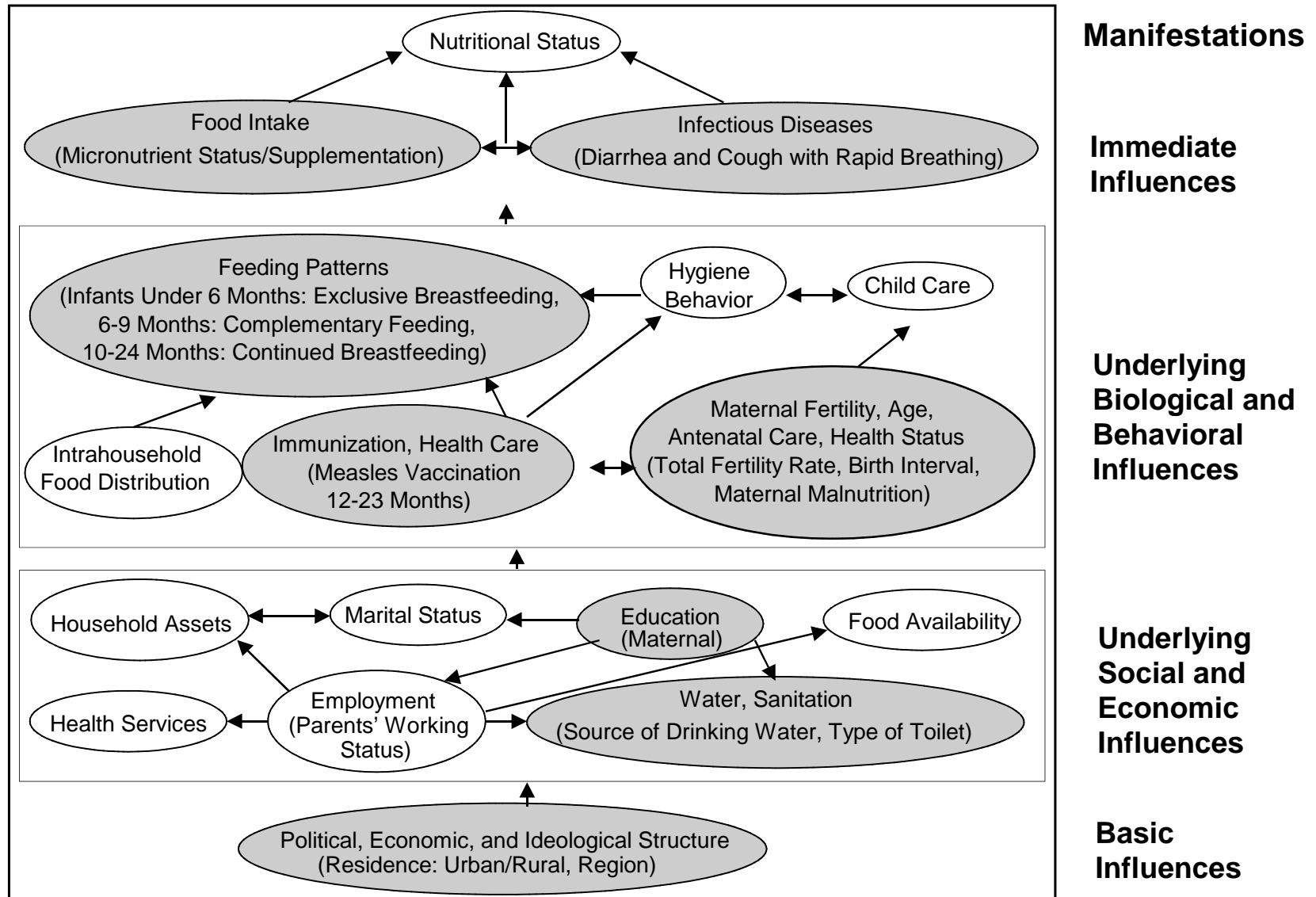
The following diagram is a conceptual framework for nutrition adapted from UNICEF.¹ It reflects relationships among factors and their influences on children's nutritional status. Although political, socioeconomic, environmental, and cultural factors (at the national and community levels) and poverty (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



Immediate Influences of Malnutrition

Figure 10: Children under Five Years Living in Households with Adequately Iodized Salt by Region, Burkina Faso

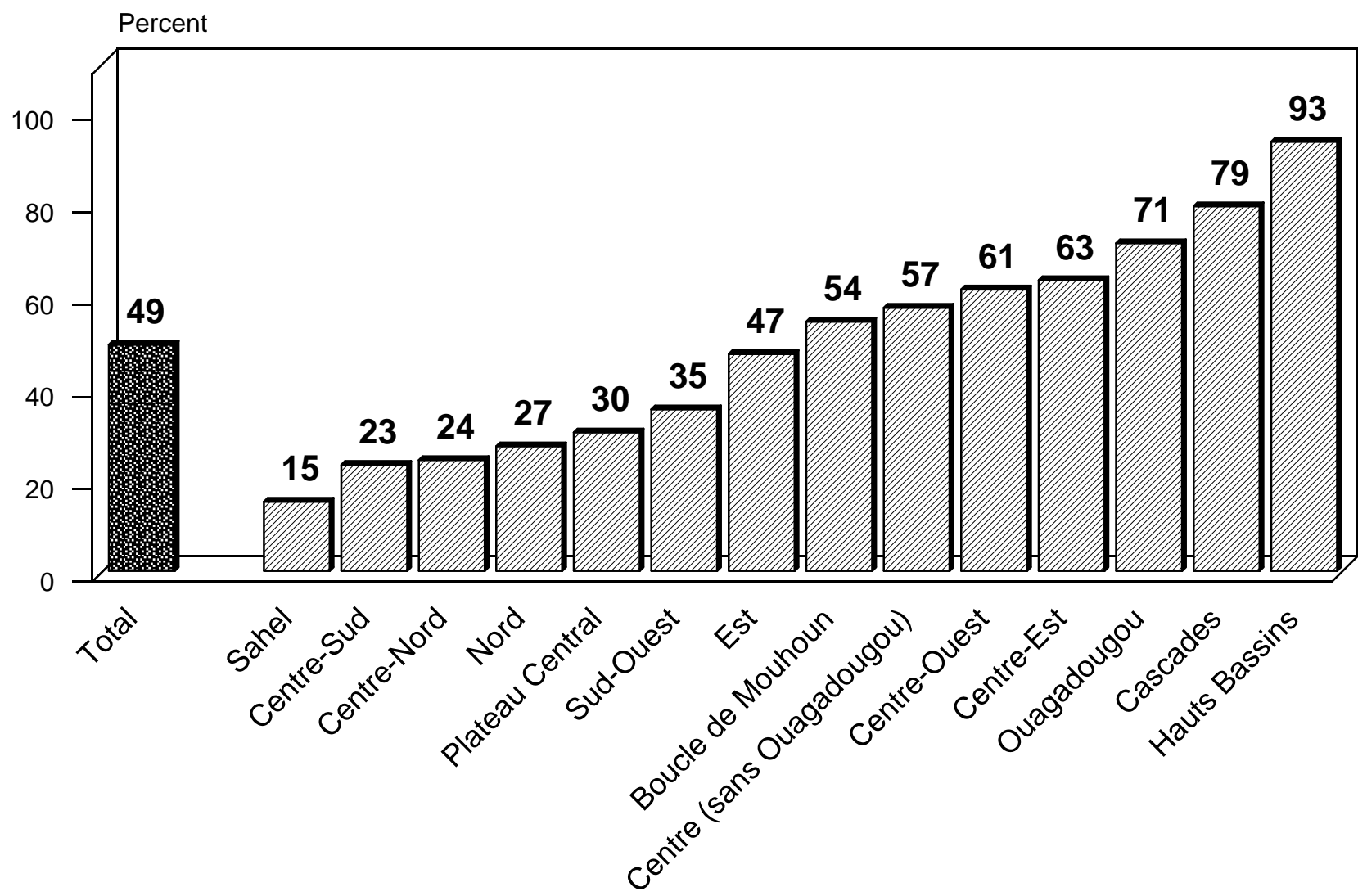
Iodine deficiency is known to cause goiter, cretinism (a severe form of neurological defect), spontaneous abortion, premature birth, infertility, stillbirth, and increased child mortality. One of the most serious consequences to child development is mental retardation caused by iodine deficiency disorder (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. It 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 tool 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 Burkina Faso, 49 percent of children under five years live in households that use salt containing adequate iodine (≥ 15 ppm).** Use of iodized salt is lowest in the Sahel region (15 percent) and is highest in Hauts Bassins (93 percent).

Figure 10

Children under Five Years Living in Households with Adequately Iodized Salt by Region, Burkina Faso



Note: Adequately Iodized salt is ≥ 15 ppm

Source: EDSBF- III 2003

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

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 Burkina Faso, 13 percent of women who gave birth in the past five years reported having some form of night blindness during their last pregnancy.**
- **However, 7 percent of women reported having trouble with their vision during the night but not during the day during their last pregnancy.** While this 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, Burkina Faso

Thirteen percent (13%) of all women reported night blindness during their last pregnancy.

Seven percent (7%) of women had trouble with their vision during the night but not during the day during their last pregnancy.



Source: EDSBF-III 2003

Figure 12: Vitamin A Supplementation among Mothers of Children under Five Years by Region, Burkina Faso

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.

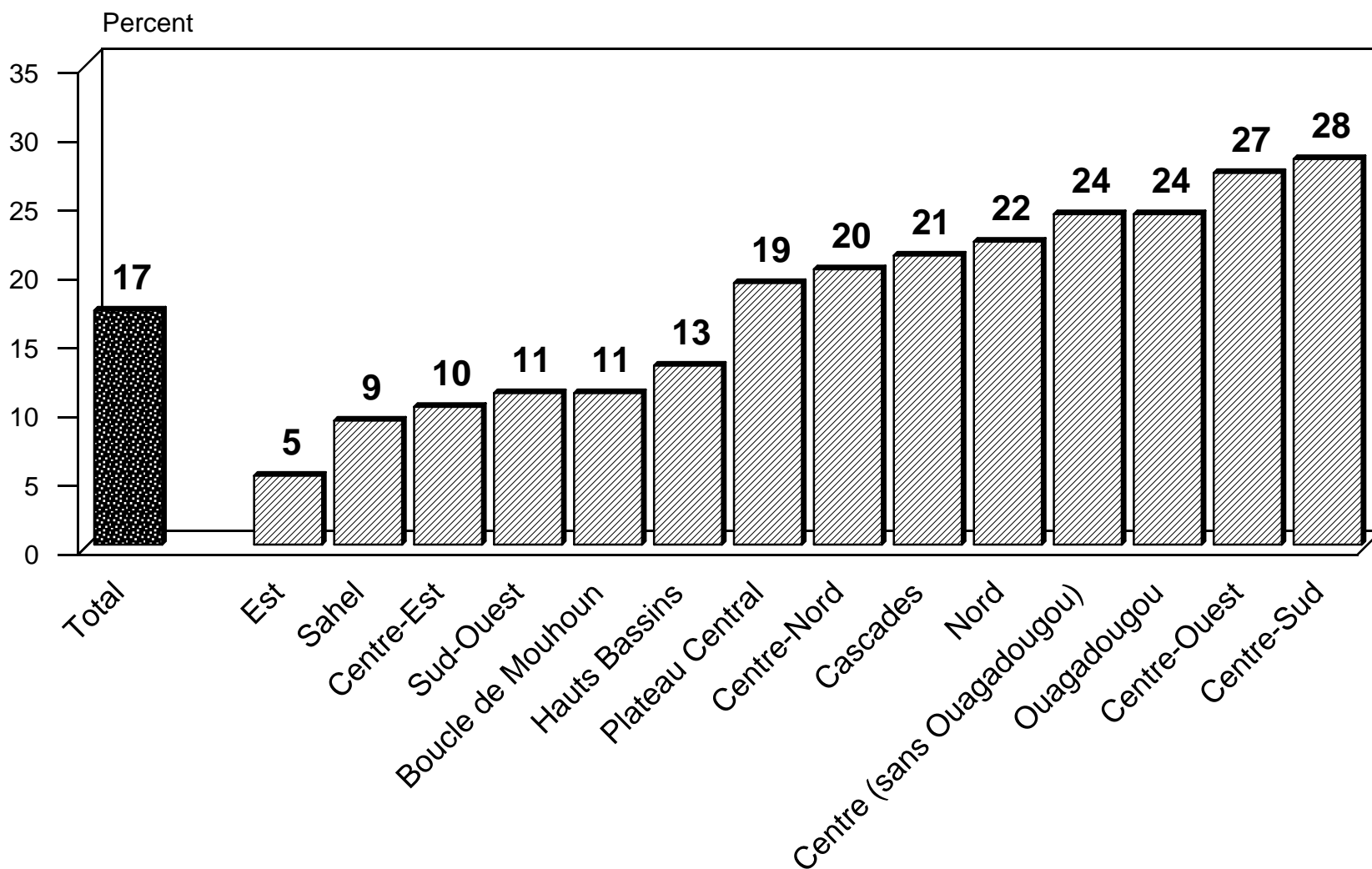
Vitamin A supplementation also benefits children who are breastfed. If mothers have vitamin A deficiency, their children can be born with low stores of vitamin A. Low birth weight babies are especially at risk. Additionally, infants often do not receive an adequate amount of vitamin A from breast milk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

In Burkina Faso,

- **Seventeen percent of mothers received vitamin A supplements within two months after delivery.**
- **Vitamin A supplementation of mothers varies by region.** Only 5 percent of mothers in the Est region received vitamin A, while 28 percent of mothers in Centre-Sud did.

Figure 12

Vitamin A Supplementation among Mothers of Children under Five Years by Region, Burkina Faso



Source: EDSBF- III 2003

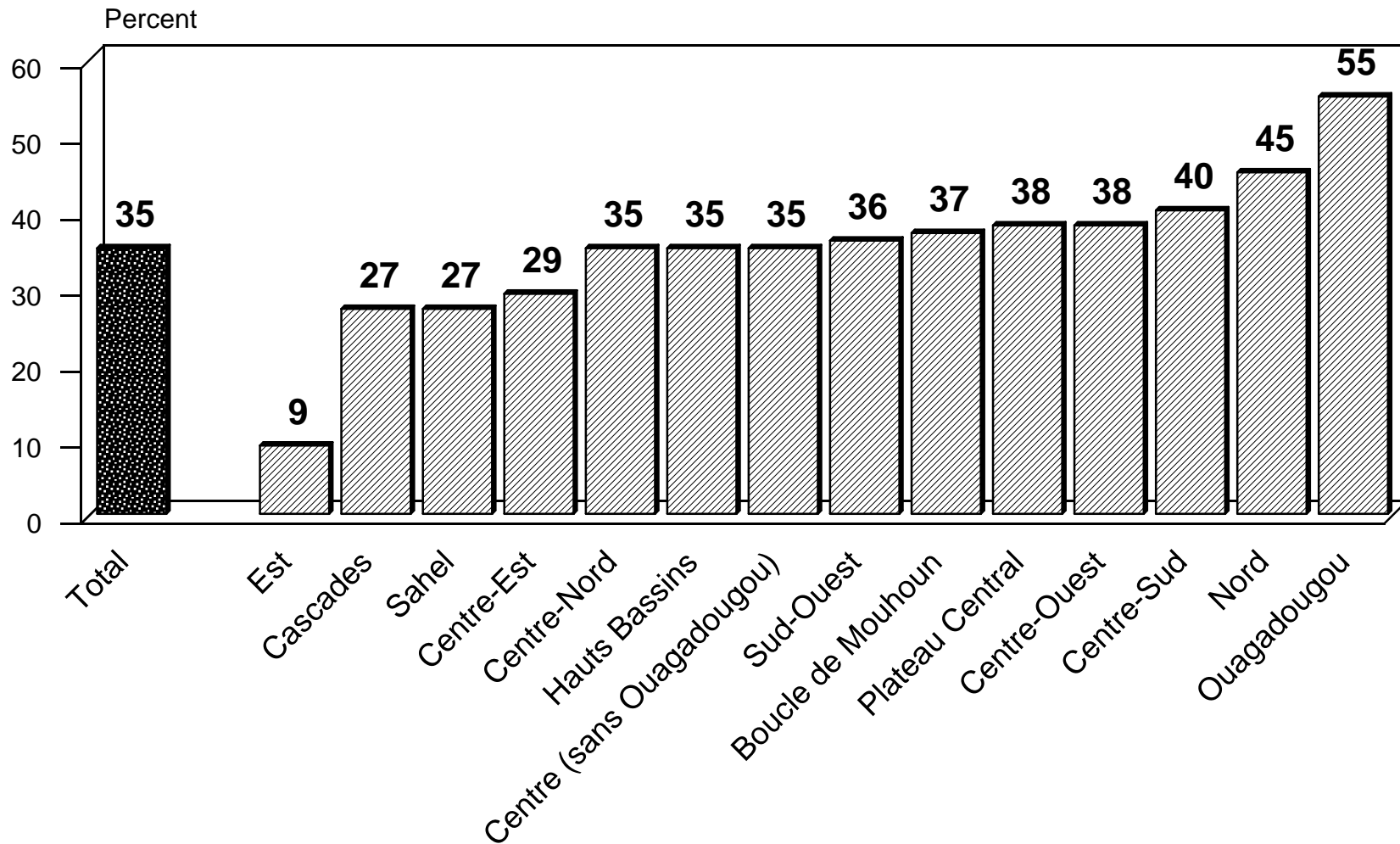
Figure 13: Vitamin A Supplementation among Children 6-59 Months in the Past Six Months by Region, Burkina Faso

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 do not develop VAD. National Immunization Days for polio or measles vaccinations reach large number of children with vitamin A supplements as well.

In Burkina Faso,

- **Thirty-five percent of children 6-59 months received a vitamin A dose in the last six months.**
- **Vitamin A supplementation among children varies by region.** Supplementation is lowest in the Est region (9 percent) and highest in Ouagadougou (55 percent).

Figure 13
Vitamin A Supplementation among Children 6-59 Months in
the Past Six Months by Region, Burkina Faso



Source: EDSBF- III 2003

Figure 14: Anemia among Children 6-59 Months and Mothers by Region, Burkina Faso

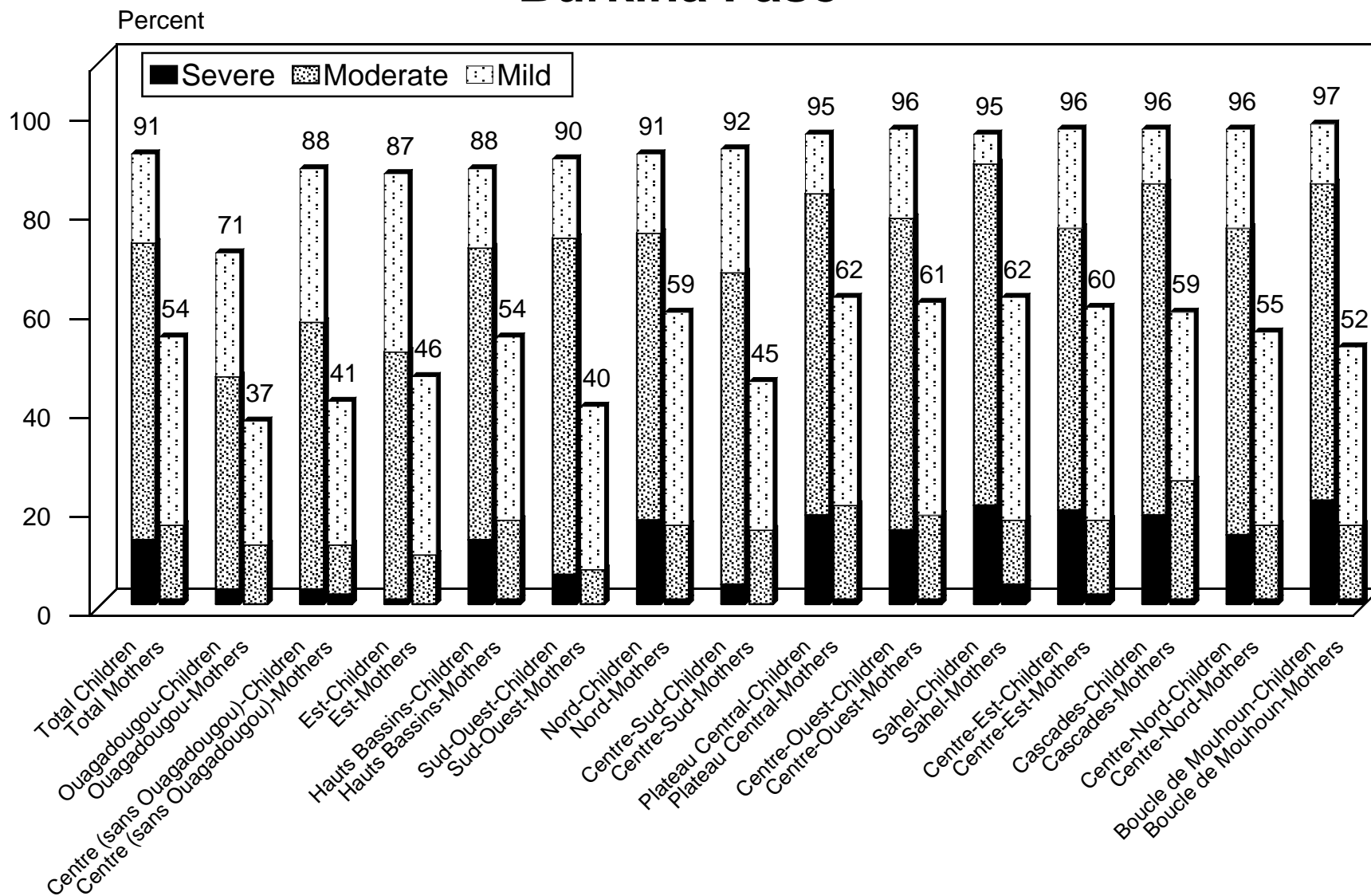
Anemia is the lack of an adequate amount of hemoglobin in the blood. It can be caused by several different health conditions; iron and folate deficiencies are some of the most prevalent conditions related to anemia. Vitamin B₁₂ deficiency, protein deficiency, sickle cell disease, malaria, and parasite infection also cause anemia.

In Burkina Faso,

- **Ninety-one percent of children age 6-59 months and 54 percent of mothers are anemic.**
- **Anemia rates for children are highest in the Boucle de Mouhoun region (97 percent) and lowest in the Ouagadougou region (71 percent).**
- **Anemia rates for mothers are highest in the Plateau-Central and Sahel regions (62 percent) and lowest in the Ouagadougou region (37 percent).**

Figure 14

Anemia among Children 6-59 Months and Mothers by Region, Burkina Faso



Source: EDSBF-III 2003

Figure 15: Iron Supplementation among Mothers of Children under Five Years, Burkina Faso

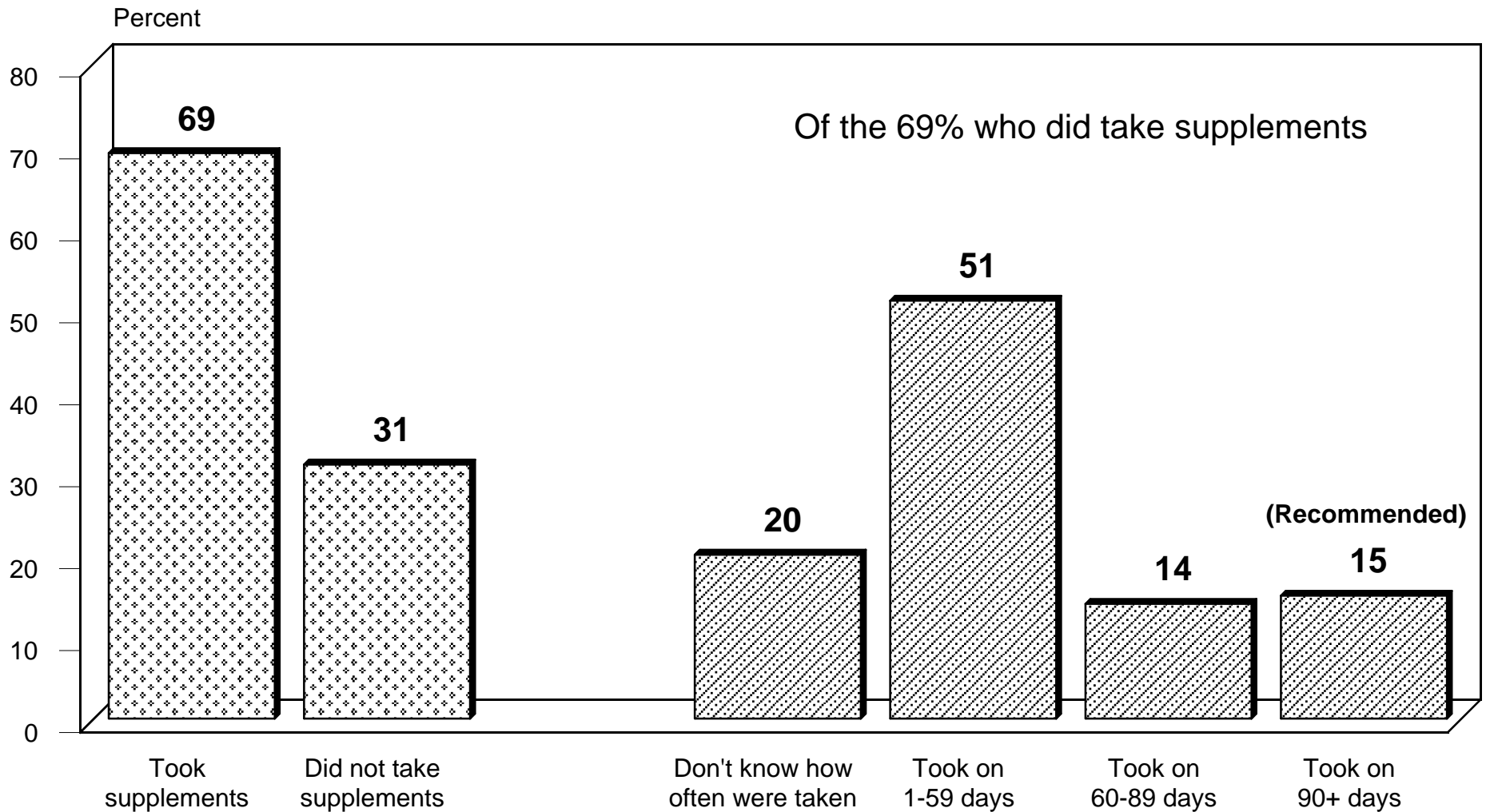
Iron-deficiency anemia is the most common form of nutritional deficiency worldwide. This type of nutritional deficiency develops slowly and does not manifest symptoms until anemia becomes severe. Diets that are heavily dependent on one grain or starch as the major staple often lack sufficient iron intake. 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 6-24 months of age who consume purely a 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 Burkina Faso,

- **Sixty-nine percent of mothers took some iron supplementation during pregnancy.**
- **Of those women who received iron supplementation, 15 percent reported taking iron the recommended minimum number of days during their pregnancy (90 or more days).**

Figure 15

Iron Supplementation among Mothers of Children under Five Years, Burkina Faso



Source: EDSBF-III 2003

Figure 16: Diarrhea and Cough with Rapid Breathing among Children under Five Years Compared with Malnutrition Rates, Burkina Faso

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.

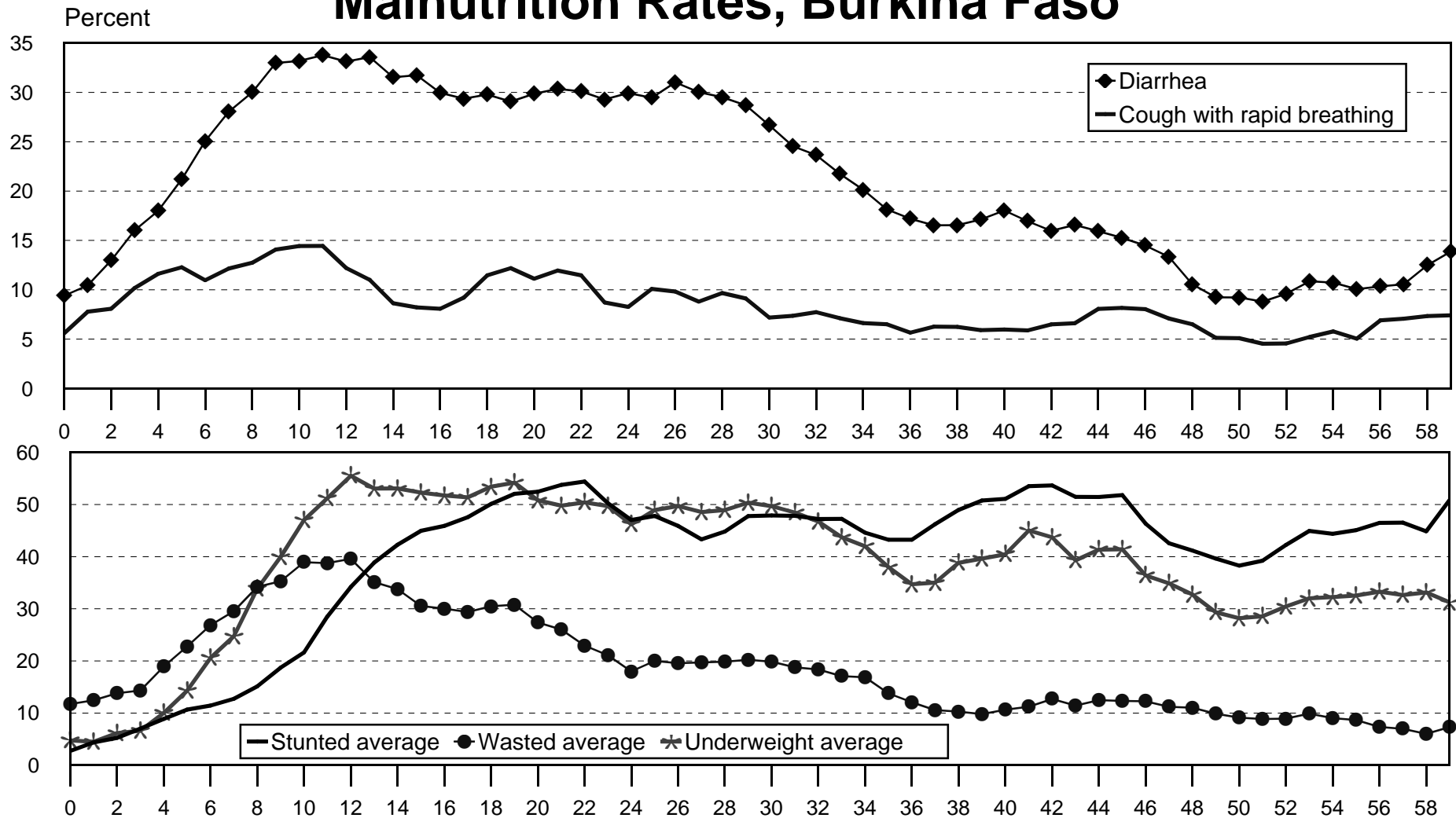
In Burkina Faso,

- **Eight percent of children under five years of age experienced cough with rapid breathing in the two weeks preceding the survey.** The prevalence of cough with rapid breathing in Burkina Faso increases from 5 to 15 percent in the first 10 months and then declines to 8 to 12 percent between 12 and 30 months. Thereafter, it declines to 5 to 8 percent between 36 and 59 months of age.
- **Twenty-one percent of children under five years of age had diarrhea in the two weeks preceding the survey.** The prevalence of diarrhea increases rapidly from birth to 10 months, reaching almost 35 percent, then decreases and plateaus at 30 percent between 16 and 28 months. Thereafter, the rate decreases steadily to 10 percent by 56 months, and then increases to 14 percent.

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 16

Diarrhea and Cough with Rapid Breathing among Children under Five Years Compared with Malnutrition Rates, Burkina Faso



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

Source: EDSBF-III 2003

Underlying Biological and Behavioral Influences of Malnutrition

Figure 17: Fertility and Birth Intervals, Burkina Faso Compared with Other Sub-Saharan Countries

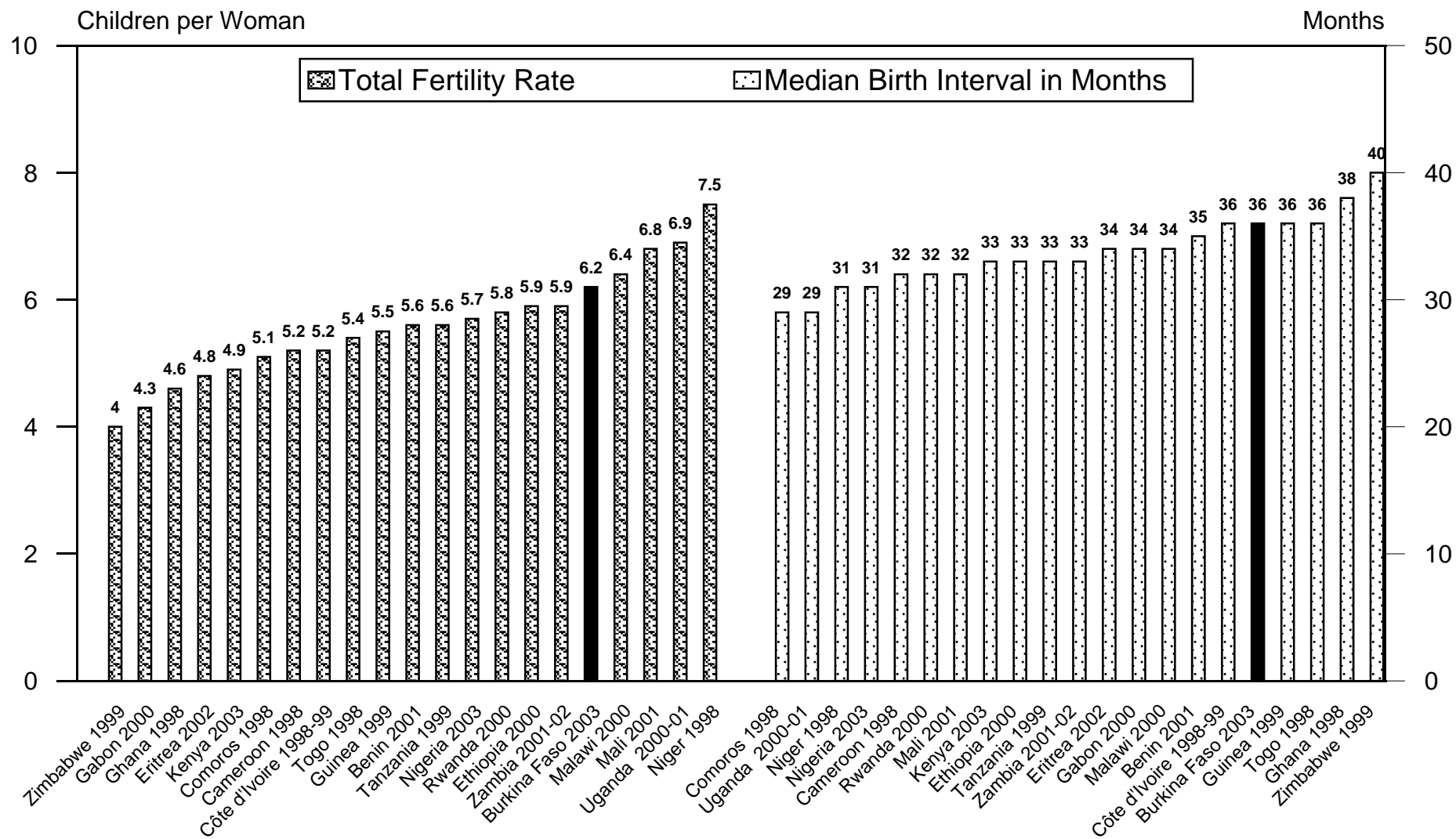
High fertility rates, especially when accompanied by short birth intervals, are detrimental to children's nutritional status. In most countries in sub-Saharan Africa, families have scarce resources to provide adequate nutrition and health care for their children. As the number of children per woman increases, 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 Burkina Faso will have an average of 6.2 children by the end of her childbearing years.** This rate puts Burkina Faso at the high end of the sub-Saharan countries surveyed between 1998 and 2003.
- **Burkina Faso's mothers have a median birth interval of 36 months.** This interval is in the upper range of the countries surveyed.

Figure 17

Fertility and Birth Intervals, Burkina Faso Compared with Other Sub-Saharan Countries



Source: DHS Surveys 1998-2003

Figure 18: Undernutrition among Children Age 12-23 Months by Measles Vaccination Status, Burkina Faso

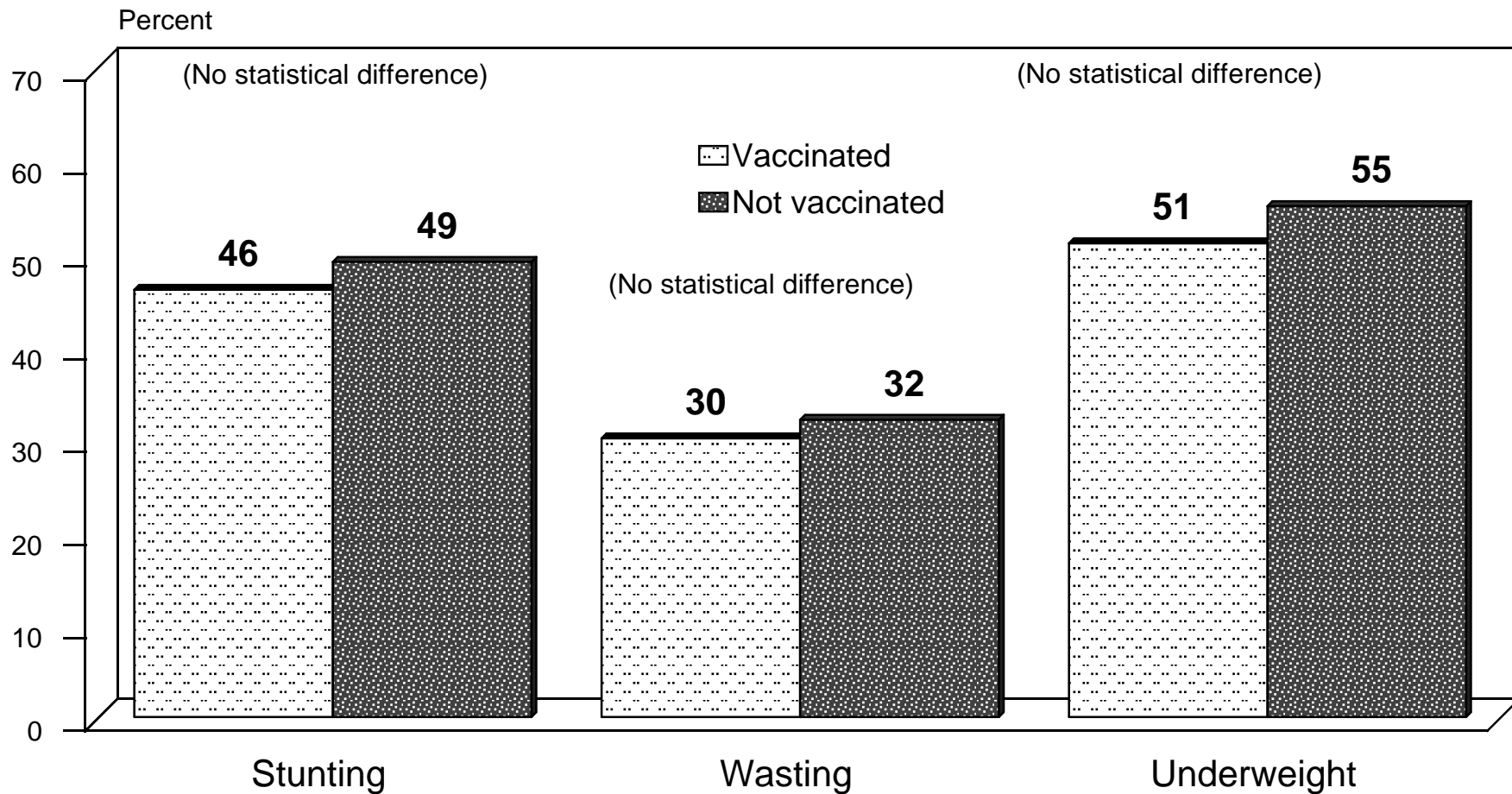
Measles is estimated to kill two million children a year, all in developing countries. It is one of the most common diseases during childhood in areas with low immunization coverage. Measles not only increases the risk of death but is also a direct cause of malnutrition. The occurrence of measles in 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 Burkina Faso,

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

Figure 18

Undernutrition among Children Age 12-23 Months by Measles Vaccination Status, Burkina Faso



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

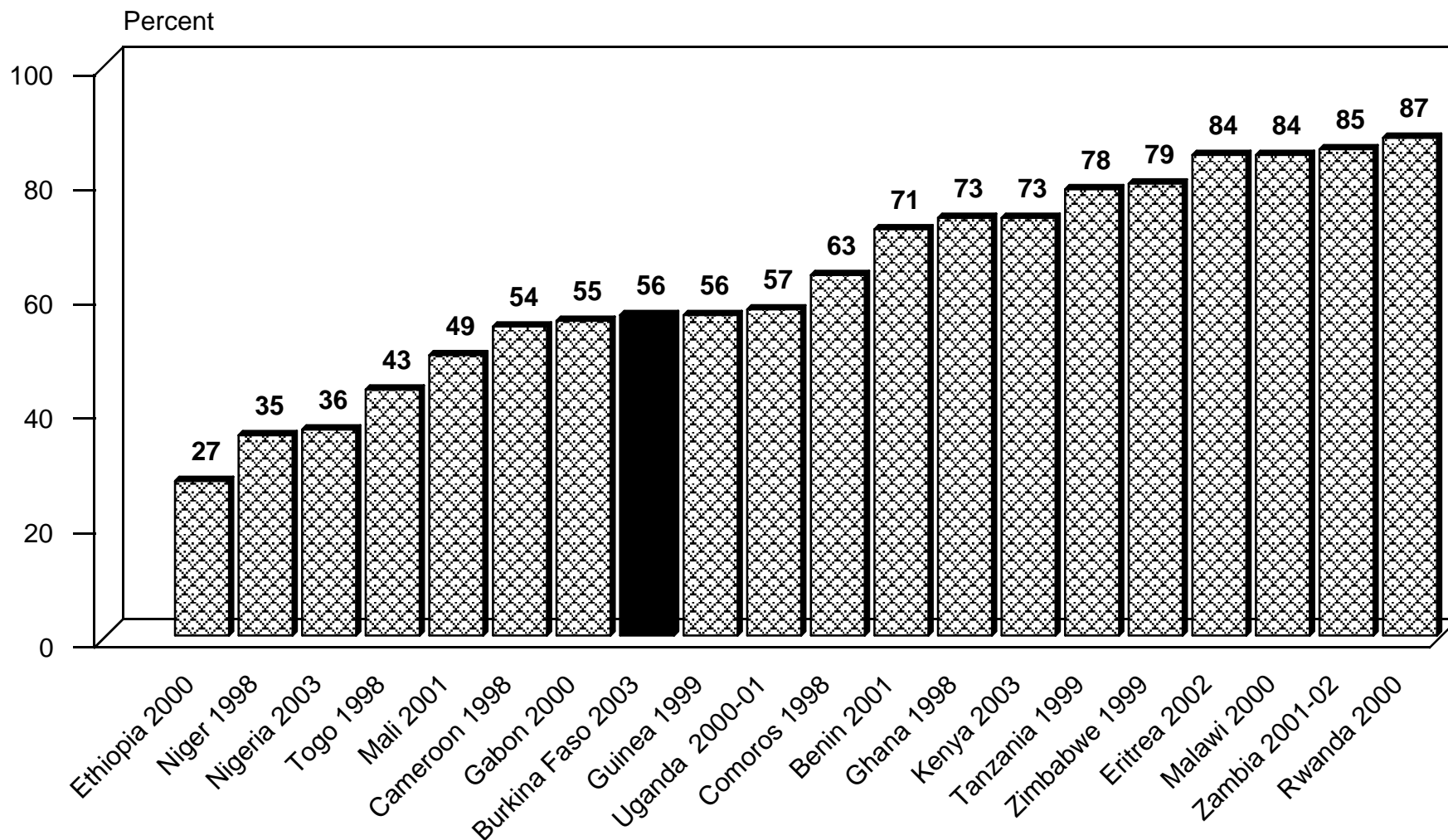
Source: EDSBF-III 2003

Figure 19: Measles Vaccination Coverage among Children Age 12-23 Months, Burkina Faso Compared with Other Sub-Saharan Countries

- Measles vaccination ranges from 27 to 87 percent among the sub-Saharan countries surveyed.
- **In Burkina Faso, 56 percent of children 12-23 months of age have been vaccinated against measles.** This level of coverage is in the mid-range among the sub-Saharan countries surveyed.

Figure 19

Measles Vaccination Coverage among Children Age 12-23 Months, Burkina Faso Compared with Other Sub-Saharan Countries



Source: DHS Surveys 1998-2003

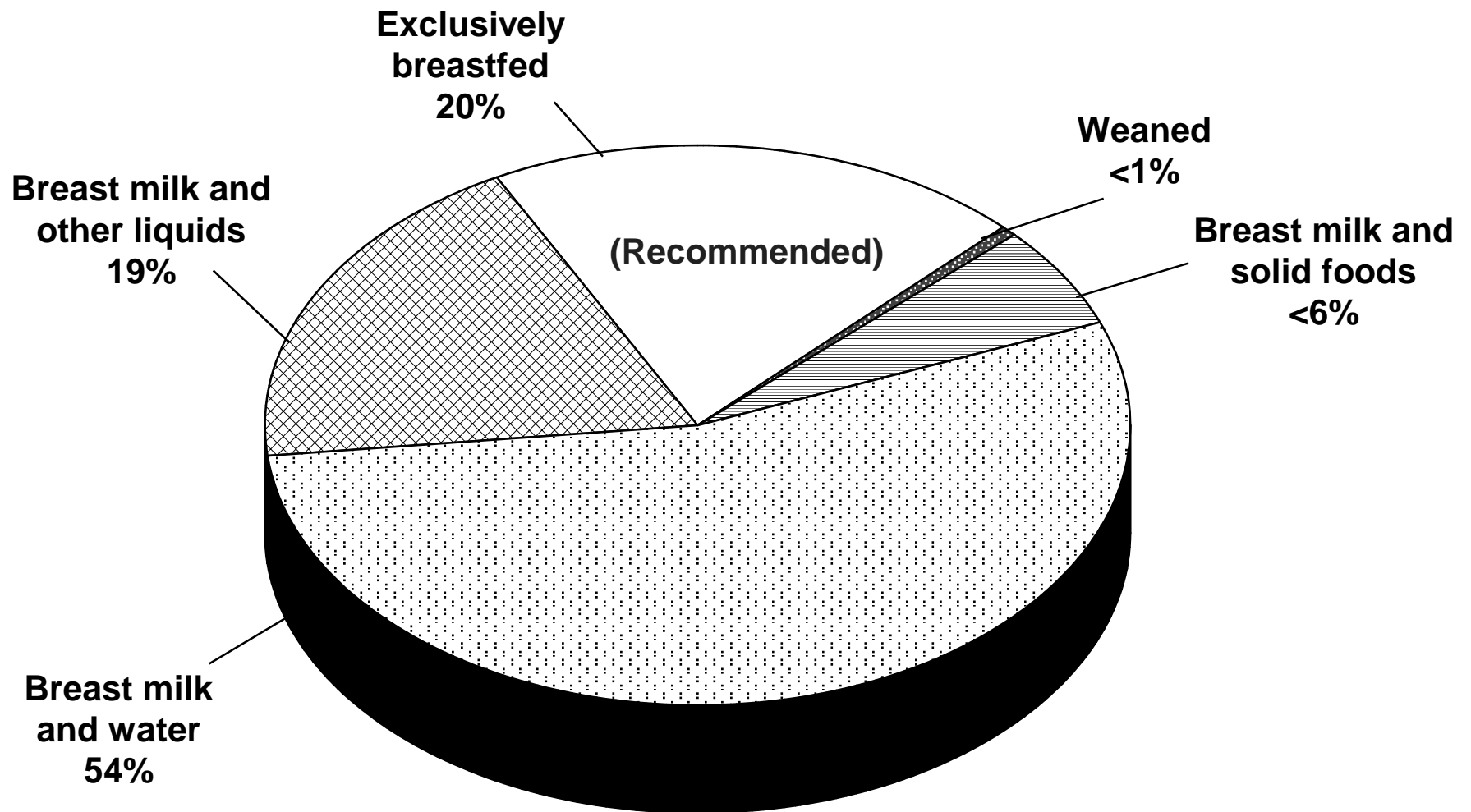
Figure 20: Feeding Practices for Infants under Six Months, Burkina Faso

Improper feeding practices, in addition to diarrheal disease, are important determinants of malnutrition. 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 Burkina Faso, the introduction of liquids, such as water, sugar water, juice, and formula, and the introduction of 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 Burkina Faso, 20 percent of children under the age of six months are exclusively breastfed, as is recommended by WHO and UNICEF.**
- **Fifty-four percent of infants under six months of age are given a combination of breast milk and water. Additionally, 19 percent of infants under six months are given liquids other than water, and less than 6 percent receive solid food other than breast milk and/or water.**
- **Less than 1 percent of infants under six months of age are fully weaned.**

Figure 20
Feeding Practices for Infants under Six Months,
Burkina Faso



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

Source: EDSBF-III 2003

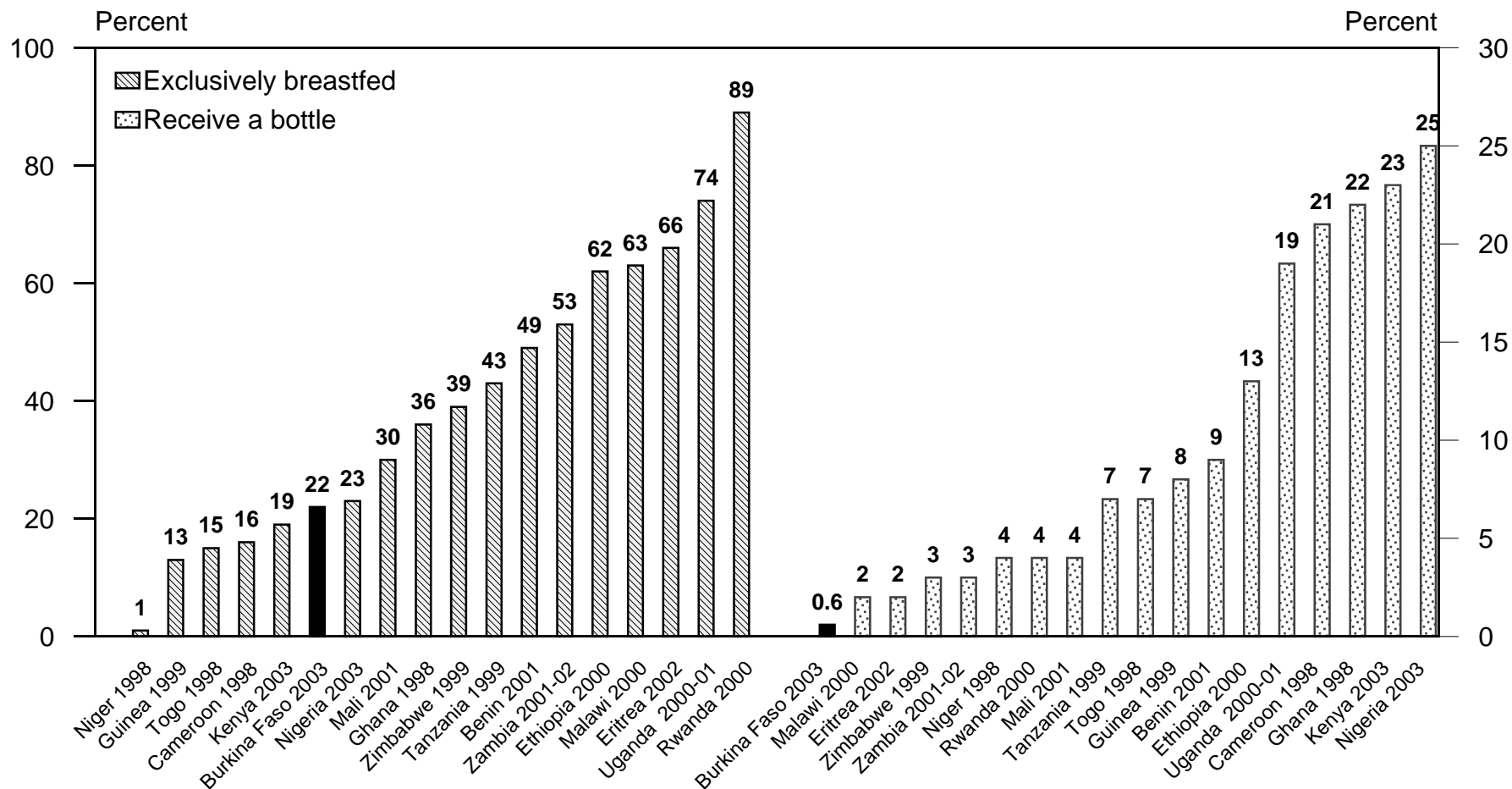
Figure 21: Infants under Four Months Who Are Exclusively Breastfed and Those Who Receive a Bottle, Burkina Faso Compared with Other Sub-Saharan Countries

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 Burkina Faso, 22 percent of mothers breastfeed their young infants exclusively.** This puts Burkina Faso in the lower range among the sub-Saharan countries surveyed.
- **Less than 1 percent of infants under four months in Burkina Faso are bottlefed.** This rate is the lowest among the countries surveyed. **Bottle-feeding is not recommended** because improper sanitation and formula preparation with bottle-feeding can introduce pathogens to the infant, putting the child at a greater risk of illness and malnutrition.

Figure 21

Infants under Four Months Who Are Exclusively Breastfed and Those Who Receive a Bottle, Burkina Faso 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 1998-2003

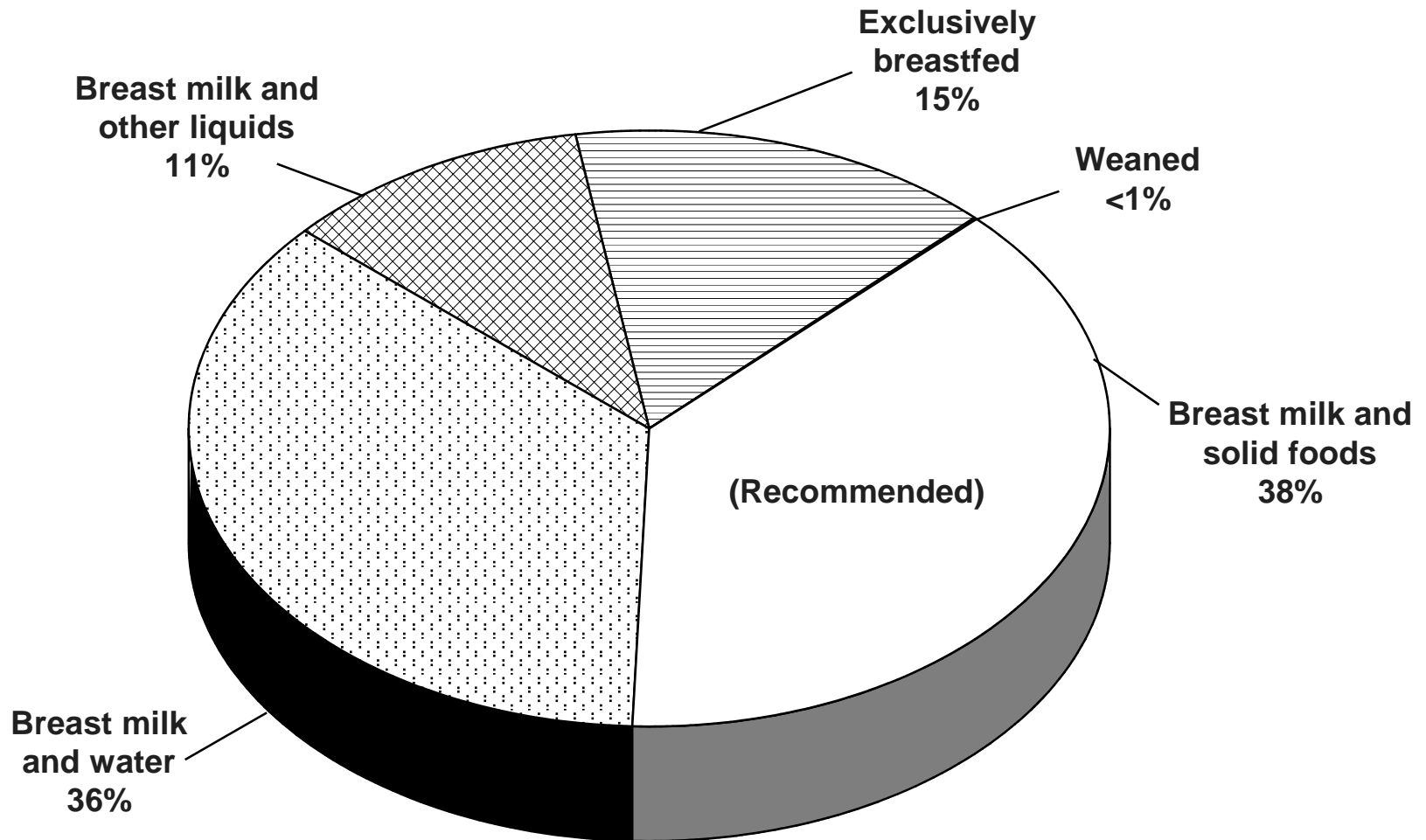
Figure 22: Feeding Practices for Infants Age 6-9 Months, Burkina Faso

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 Burkina Faso, 38 percent of infant's ages 6-9 months are fed solid foods in addition to breast milk.** This means that only about one-third of all infants age 6-9 months are fed according to the recommended practice.
- **Sixty-two 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 1 percent of infants age 6-9 months are fully weaned** and thus are not receiving the additional nutritional and emotional support of breastfeeding.

Figure 22

Feeding Practices for Infants Age 6-9 Months, Burkina Faso



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

Source: EDSBF-III 2003

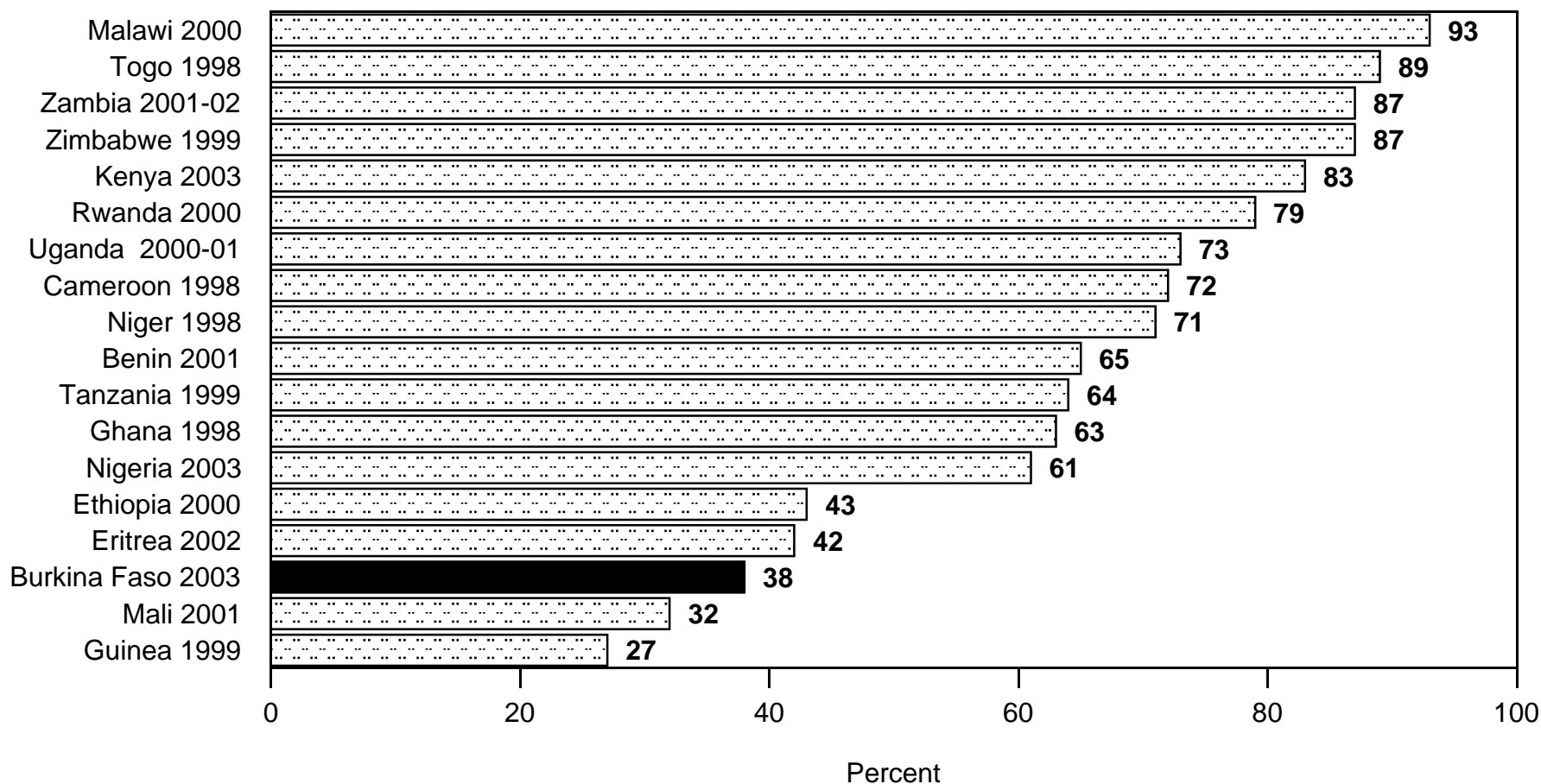
Figure 23: Infants Age 6-9 Months Receiving Solid Foods in Addition to Breast Milk, Burkina Faso Compared with Other Sub-Saharan Countries

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 93 percent among the sub-Saharan countries surveyed.
- In Burkina Faso, **38 percent of infants age 6-9 months receive solid food in addition to breast milk.** This is one of the lowest levels among the sub-Saharan countries surveyed.

Figure 23

Infants Age 6-9 Months Receiving Solid Foods in Addition to Breast Milk, Burkina Faso 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 1998-2003

Figure 24: Children 10-23 Months Who Continue to Be Breastfed, Burkina Faso 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.

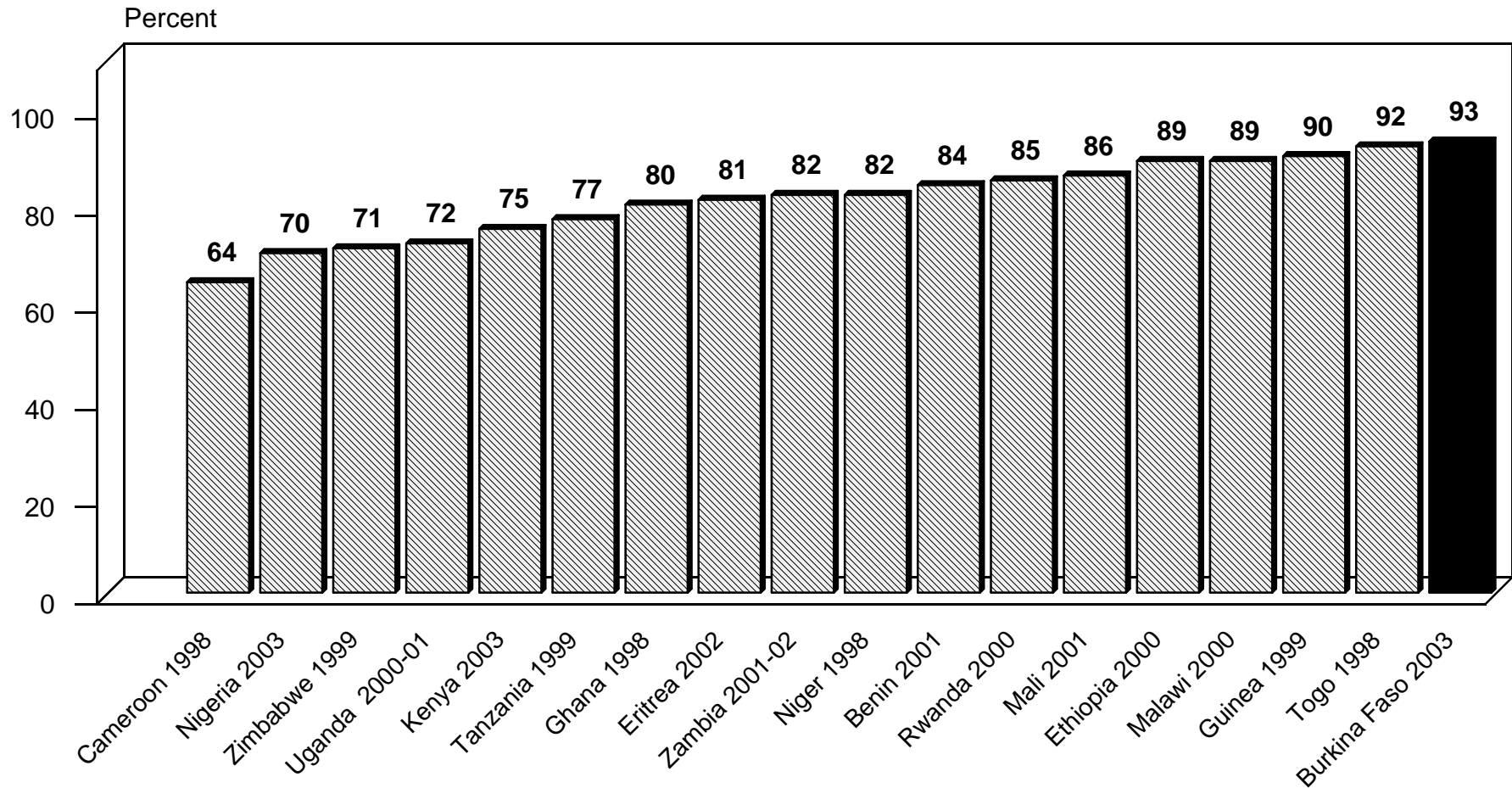
Additionally, breastfeeding up to 24 months can help reduce a woman's fertility, especially in areas where contraception is limited. Women who breastfeed for longer periods have lower fertility rates than women who breastfeed for shorter periods.

In Burkina Faso,

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

Figure 24

Children Age 10-23 Months Who Continue to Be Breastfed, Burkina Faso 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 1998-2003

Underlying Social and Economic Influences of Malnutrition

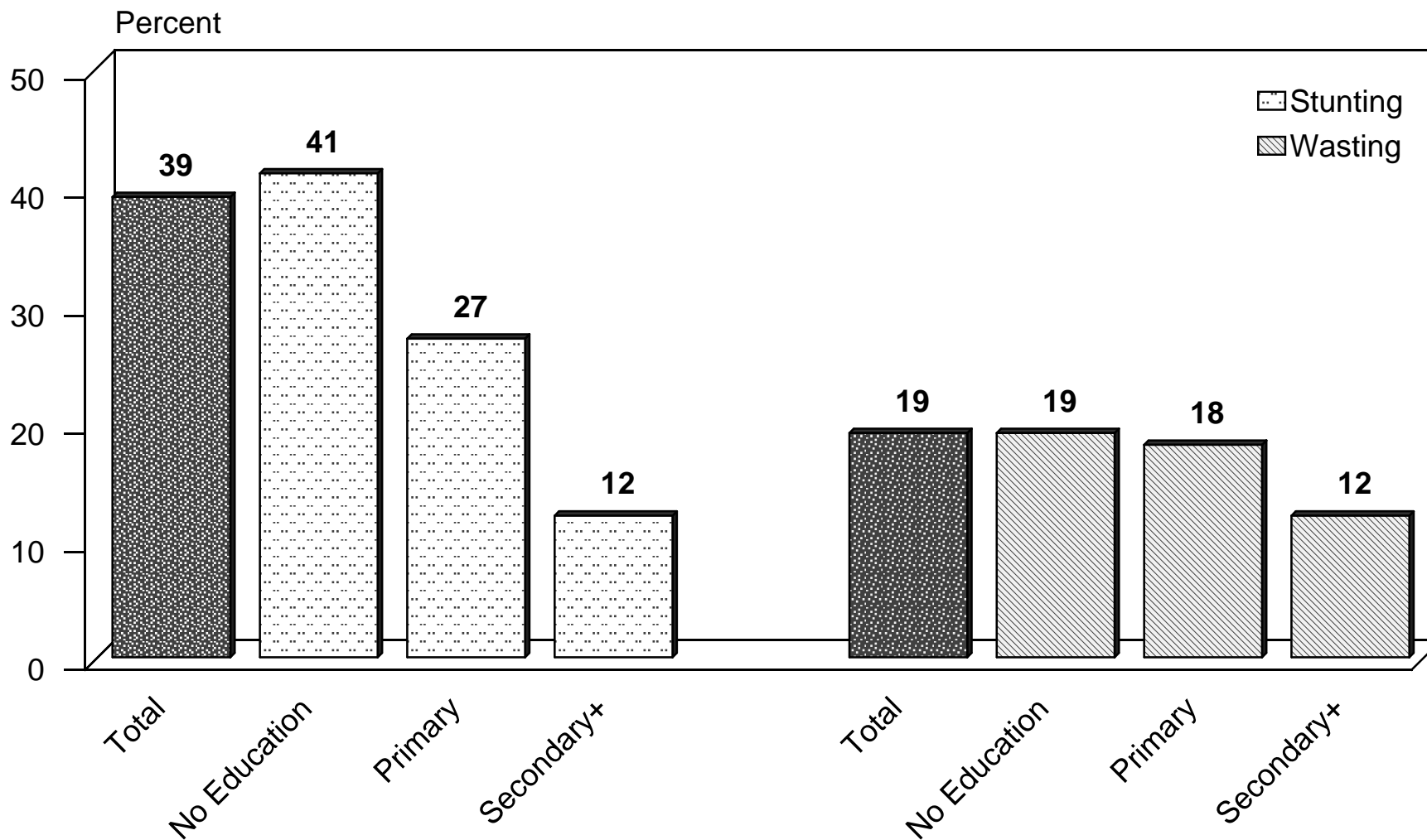
Figure 25: Stunting and Wasting among Children under Five Years by Mother's Education, Burkina Faso

Maternal education is related to knowledge of good child care practices and to household wealth. In Burkina Faso, 82 percent of the mothers of children under five years of age have never attended school, while 8 percent have some primary education and 4 percent have a secondary or higher education. There are variations in school attendance, especially between urban and rural areas. In the rural areas, 93 percent of the mothers have never attended school, 6 percent have attended primary school, and only 1 percent have gone to secondary school or higher. In contrast, 45 percent of mothers in the capital and large cities and 62 percent of the mothers in small cities and towns have never attended school. Thirty-two percent of mothers in the capital and large cities and 16 percent in small cities and towns have gone to secondary school or higher. Mothers in Ouagadougou were most likely to have received at least a secondary school education (27 percent), compared with 1 to 4 percent of mothers in the rest of Burkina Faso's regions.

- Maternal education has an inverse relationship with stunting and wasting in Burkina Faso. **As the level of maternal education increases, the level of stunting and wasting decreases.**
- The difference in the level of stunting between children of mothers with no education and those whose mothers have a primary education is 14 percentage points. The difference between children of mothers with no education and children of mothers with secondary education or higher is 29 percentage points.
- The difference in the level of wasting between children of mothers with no education and those with secondary education or higher is 7 percentage points.

Figure 25

Stunting and Wasting among Children under Five Years by Mother's Education, Burkina Faso



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

Source: EDSBF-III 2003

Figure 26: Stunting and Wasting among Children under Five Years by Source of Drinking Water, Burkina Faso

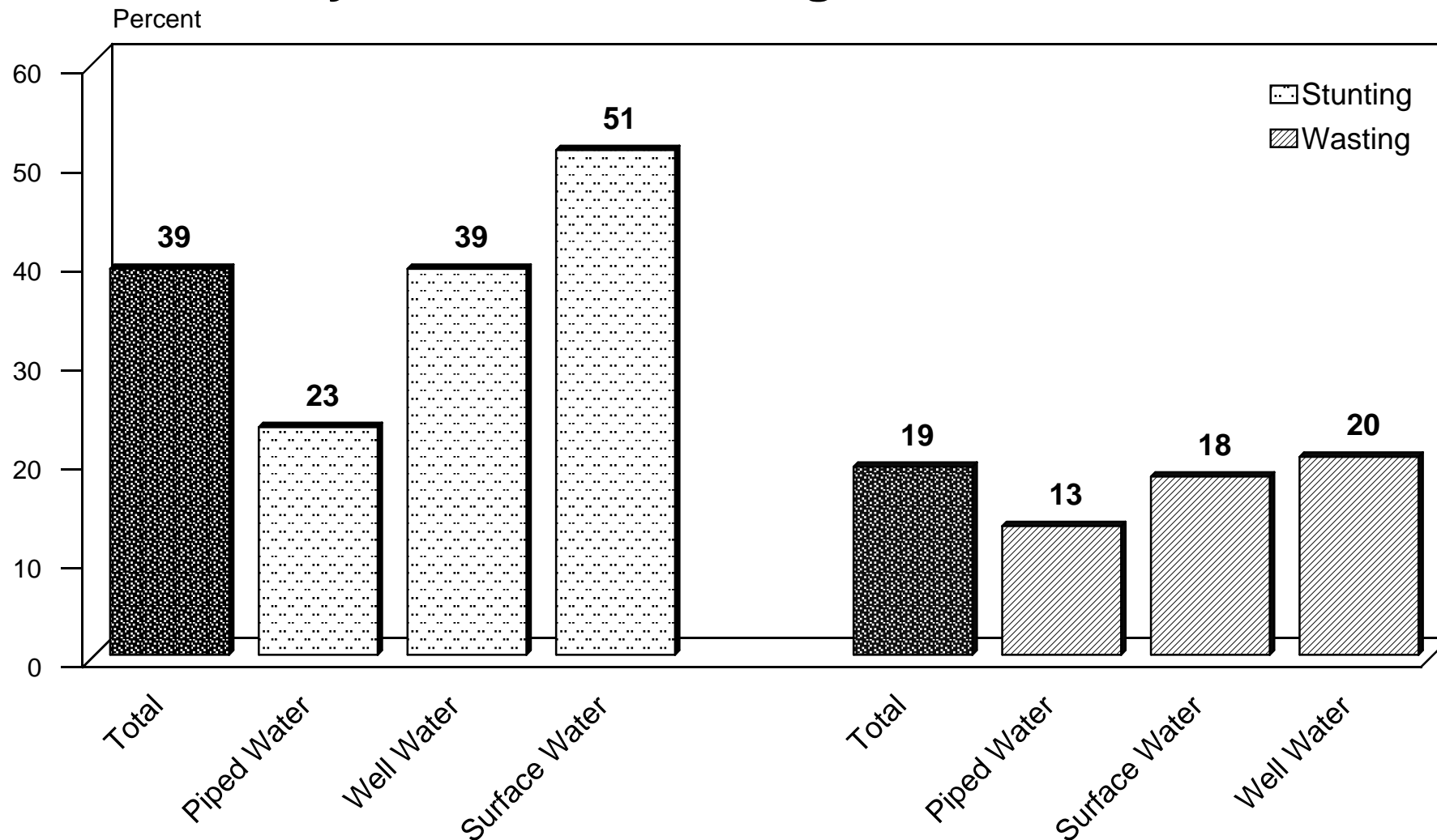
A household's source of drinking water is linked with its socioeconomic status. Poor households are more likely to obtain drinking water from contaminated sources such as surface water or open wells. Without an adequate supply of good-quality water, the risks of food contamination, diarrheal disease, 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, 13 percent use piped water, 72 percent obtain their drinking water from a well, and 15 percent use surface water.

In Burkina Faso,

- **Children whose drinking water is well water or surface water are more likely to be stunted (39 percent and 51 percent, respectively) than children with access to piped water (23 percent).**
- **Children whose drinking water is well water or surface water are more likely to be wasted (20 percent and 18 percent, respectively) than children with access to piped water (13 percent).**

Figure 26

Stunting and Wasting among Children under Five Years by Source of Drinking Water, Burkina Faso



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

Source: EDSBF-III 2003

Figure 27: Stunting and Wasting among Children under Five Years by Type of Toilet, Burkina Faso

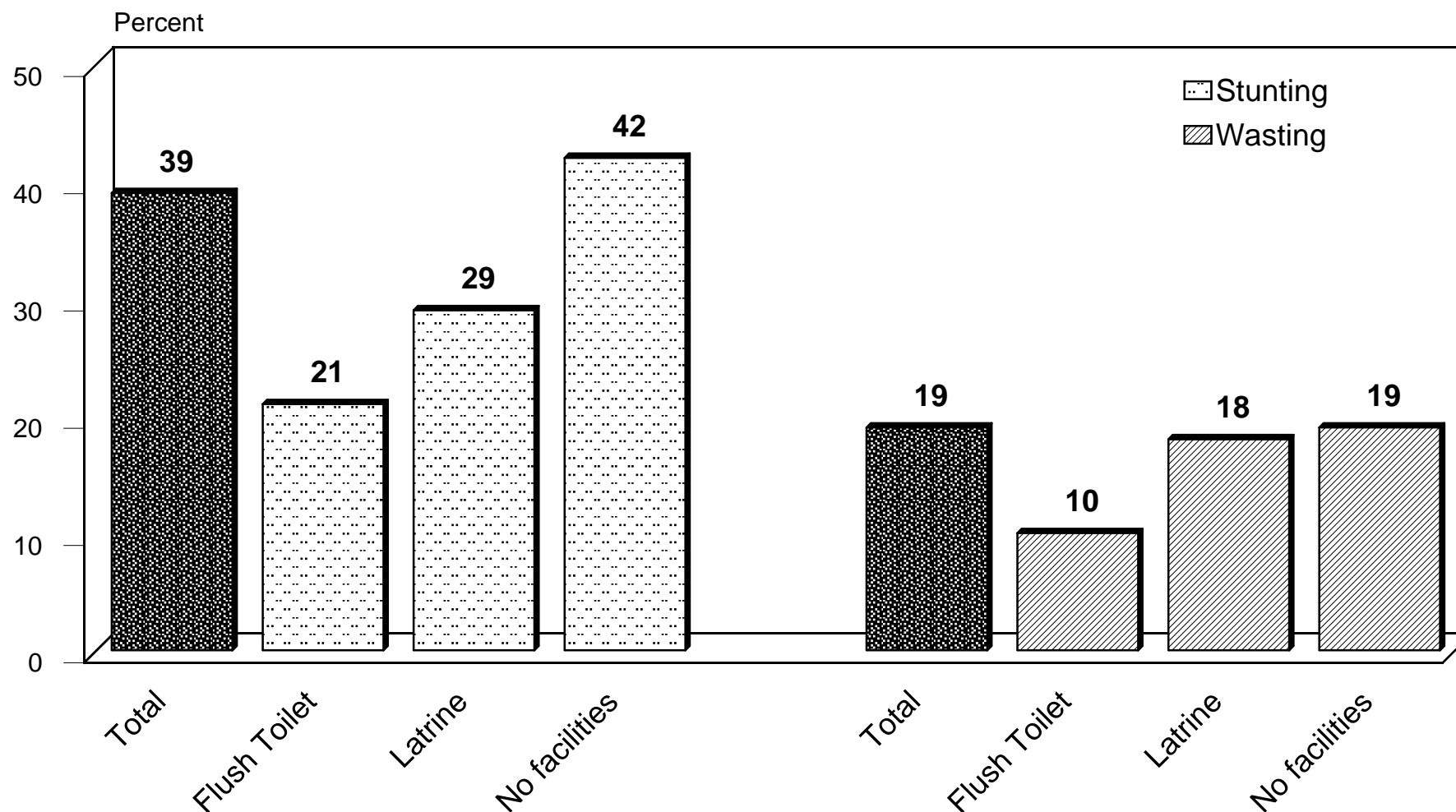
The type of toilet used by a household reflects its wealth, and poor households are less likely to have adequate toilet facilities. Inadequate sanitation facilities result in an increased risk of diarrheal disease, which contributes to malnutrition. Infants and children from households that do not have ready access to a flush toilet are at greater risk of being malnourished than children from households with this amenity. In Burkina Faso, 25 percent of households surveyed with at least one child under five years have access to a latrine, 73 percent have no facilities, and only 1 percent of surveyed households have access to a flush toilet.

In Burkina Faso,

- Children who have no access to toilet facilities and those who have access to a latrine are more likely to be stunted (42 percent and 29 percent, respectively) than children with access to a flush toilet (21 percent).
- Children who have no access to toilet facilities and those who have access to a latrine are more likely to be wasted (19 percent and 18 percent, respectively) than children with access to a flush toilet (10 percent).

Figure 27

Stunting and Wasting among Children under Five Years by Type of Toilet, Burkina Faso



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

Source: EDSBF-III 2003

Basic Influences

Figure 28: Stunting and Wasting among Children under Five Years by Region, Burkina Faso

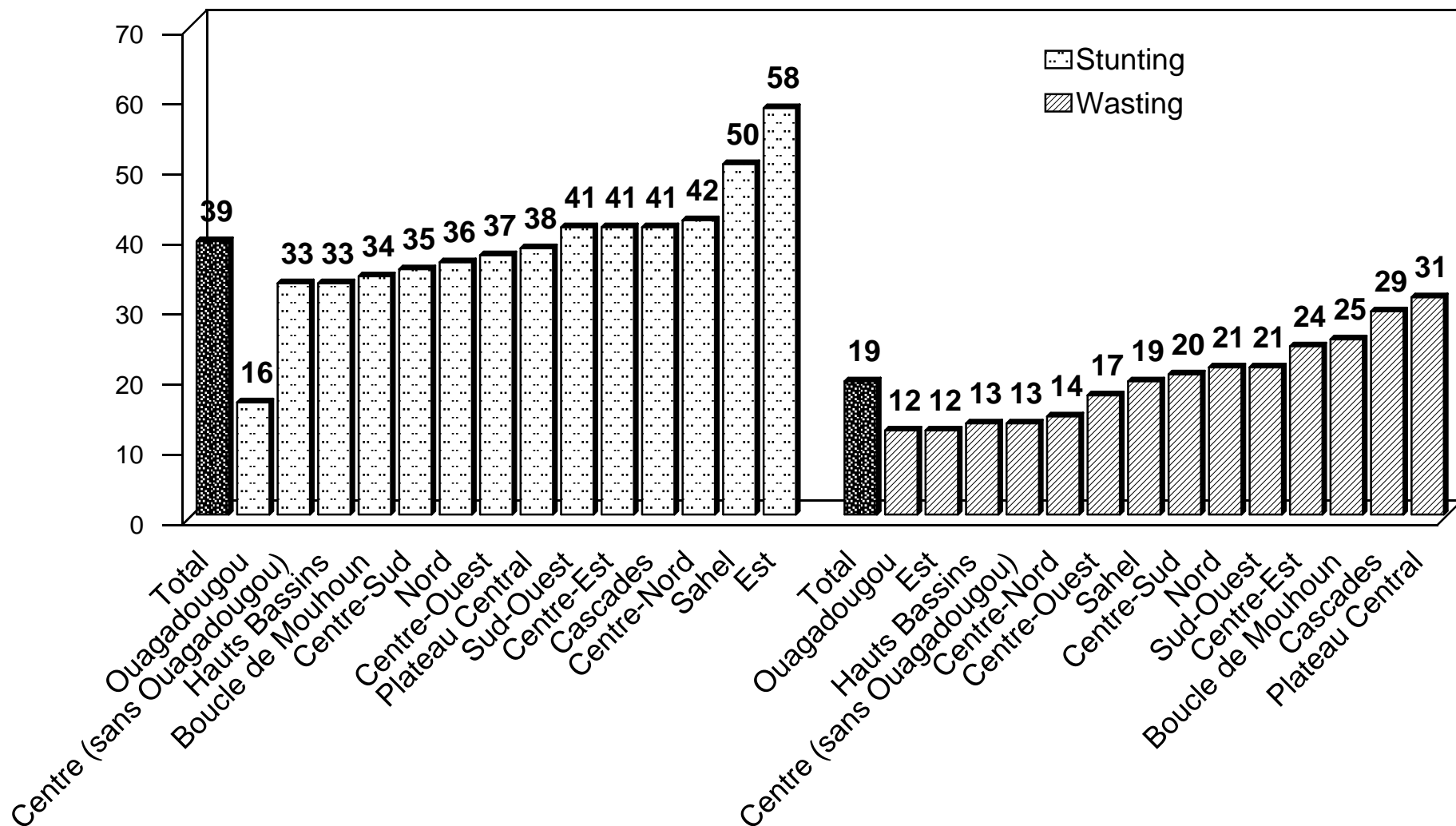
In Burkina Faso,

- **Stunting ranges from 16 to 58 percent among children in the 14 regions.** Stunting rates are lowest in Ouagadougou (16 percent) and highest in the Est region (58 percent).
- **Wasting ranges from 12 to 31 percent among children in the 14 regions.** Wasting rates are lowest in the Ouagadougou and Est regions (12 percent) and highest in the Plateau Central region (31 percent).

Figure 28

Stunting and Wasting among Children under Five Years by Region, Burkina Faso

Percent



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

Source: EDSBF-III 2003

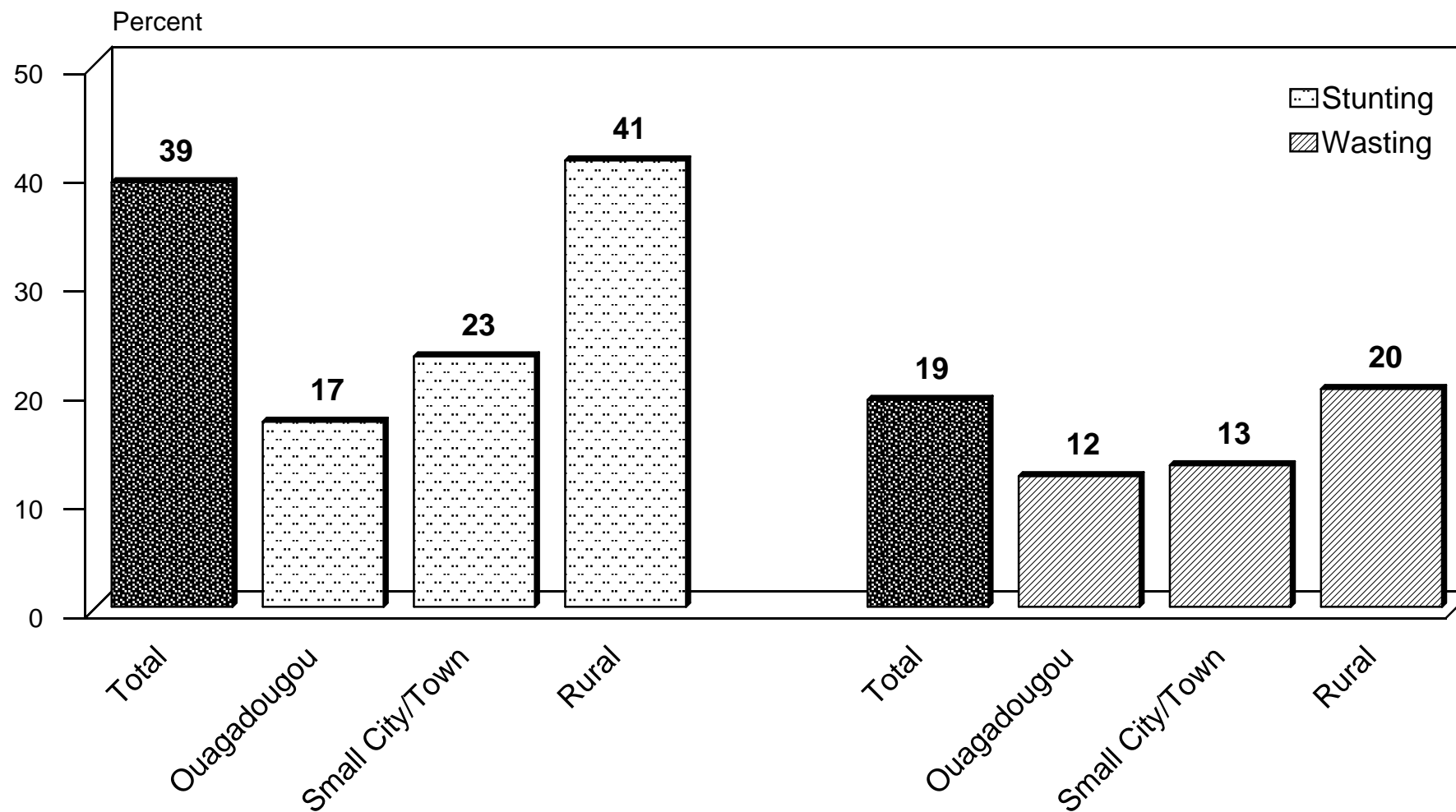
Figure 29: Stunting and Wasting among Children under Five Years by Urban-Rural Residence, Burkina Faso

In Burkina Faso,

- **Forty-one percent of rural children are stunted.** In the capital, Ouagadougou, 17 percent of children are affected by chronic malnutrition, and in other urban areas (small cities or towns), the rate of stunting is 23 percent.
- **Twenty percent of rural children are wasted.** In Ouagadougou, 12 percent of children are affected by acute malnutrition, and in other urban areas (small cities or towns), the rate of wasting is 13 percent.

Figure 29

Stunting and Wasting among Children under Five Years by Urban-Rural Residence, Burkina Faso



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

Source: EDSBF-III 2003

Maternal Nutritional Status

Figure 30: Malnutrition among Mothers of Children under Five Years by Region, Burkina Faso

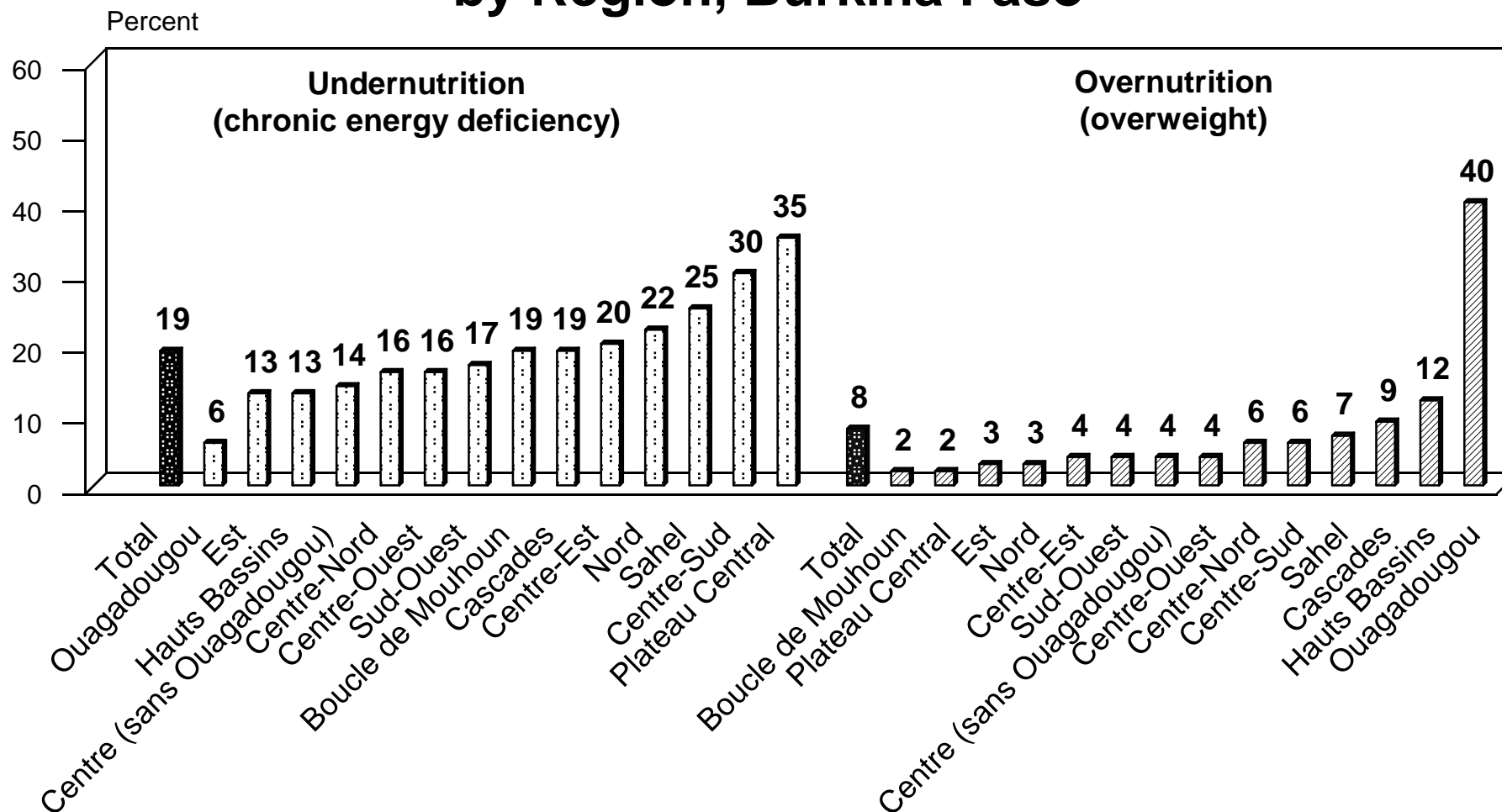
Besides being of concern in its own right, a mother's nutritional status affects her ability to successfully carry, deliver, and care for her children. There are generally accepted standards for indicators of malnutrition among adult women that can be applied.

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, $BMI = \text{kg}/\text{m}^2$. When the BMI is below the suggested cutoff point of 18.5, this indicates chronic energy deficiency or undernutrition for non-pregnant, non-lactating women. When the BMI is above 25, women are considered overweight.

- **Nineteen percent of mothers of children under age five in Burkina Faso are undernourished.** The highest level of maternal undernutrition is in the Plateau Central region (35 percent). The lowest level is in Ouagadougou (6 percent).
- **Eight percent of mothers of children under five are overweight.** The highest level of maternal overnutrition is in Ouagadougou (40 percent). The lowest level is in the Boucle de Mouhoun region (2 percent).

Figure 30

Malnutrition among Mothers of Children under Five Years by Region, Burkina Faso



Note: Maternal undernutrition is the percentage of mothers whose BMI (kg/m²) is less than 18.5. Maternal overnutrition is the percentage of mothers whose BMI is greater than 25.

Source: EDSBF-III 2003

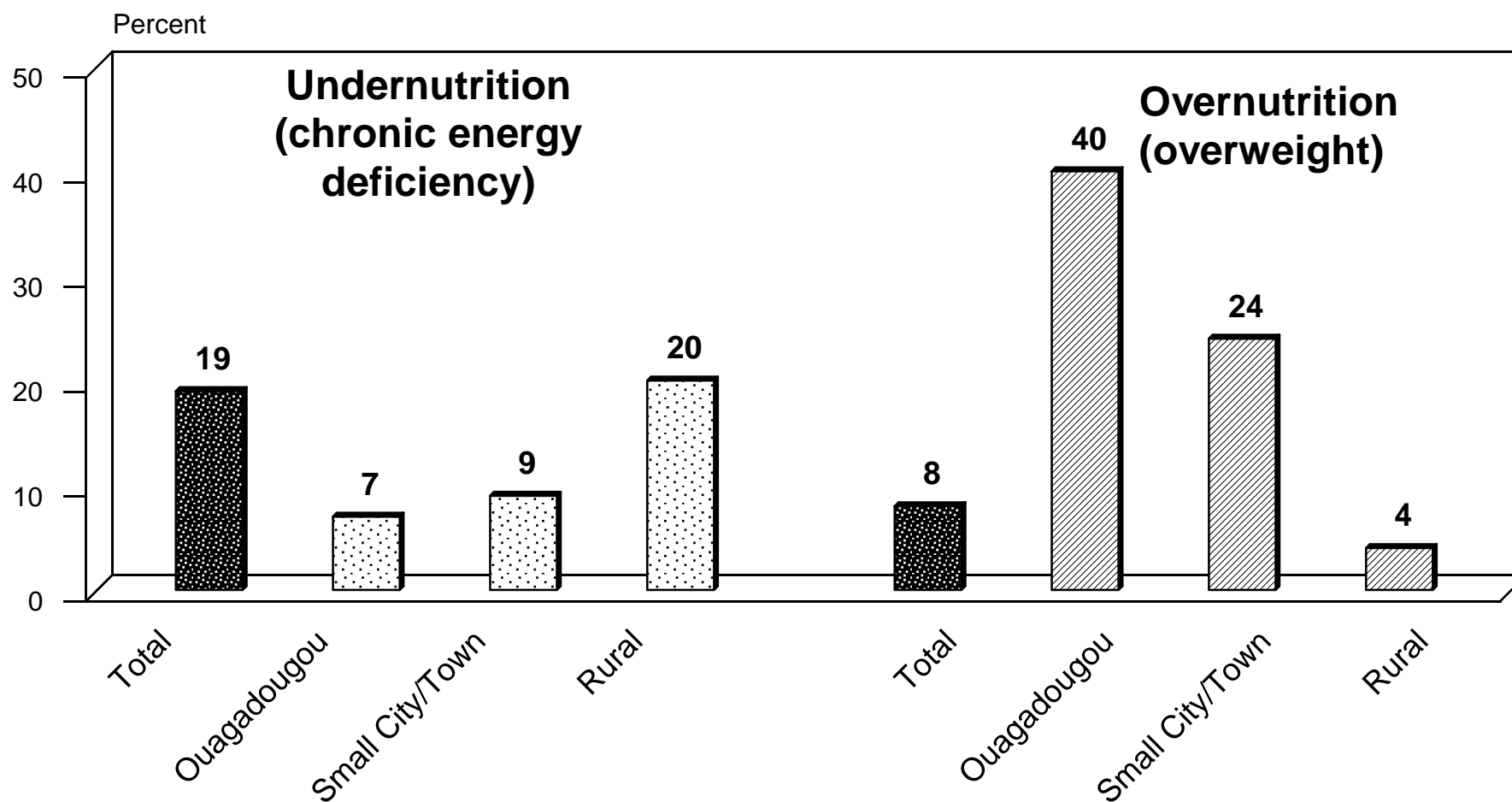
Figure 31: Malnutrition among Mothers of Children under Five Years by Residence, Burkina Faso

In Burkina Faso,

- The undernutrition rate (chronic energy deficiency) for mothers of children under five is **7 percent in the capital (Ouagadougou), 9 percent in small cities and towns, and 20 percent in rural areas.**
- The overnutrition rate (overweight) for mothers of children under five is **lowest in rural areas (4 percent) and highest in the capital (Ouagadougou) and other large cities (40 percent).**

Figure 31

Malnutrition among Mothers of Children under Five Years, by Residence, Burkina Faso



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: EDSBF-III 2003

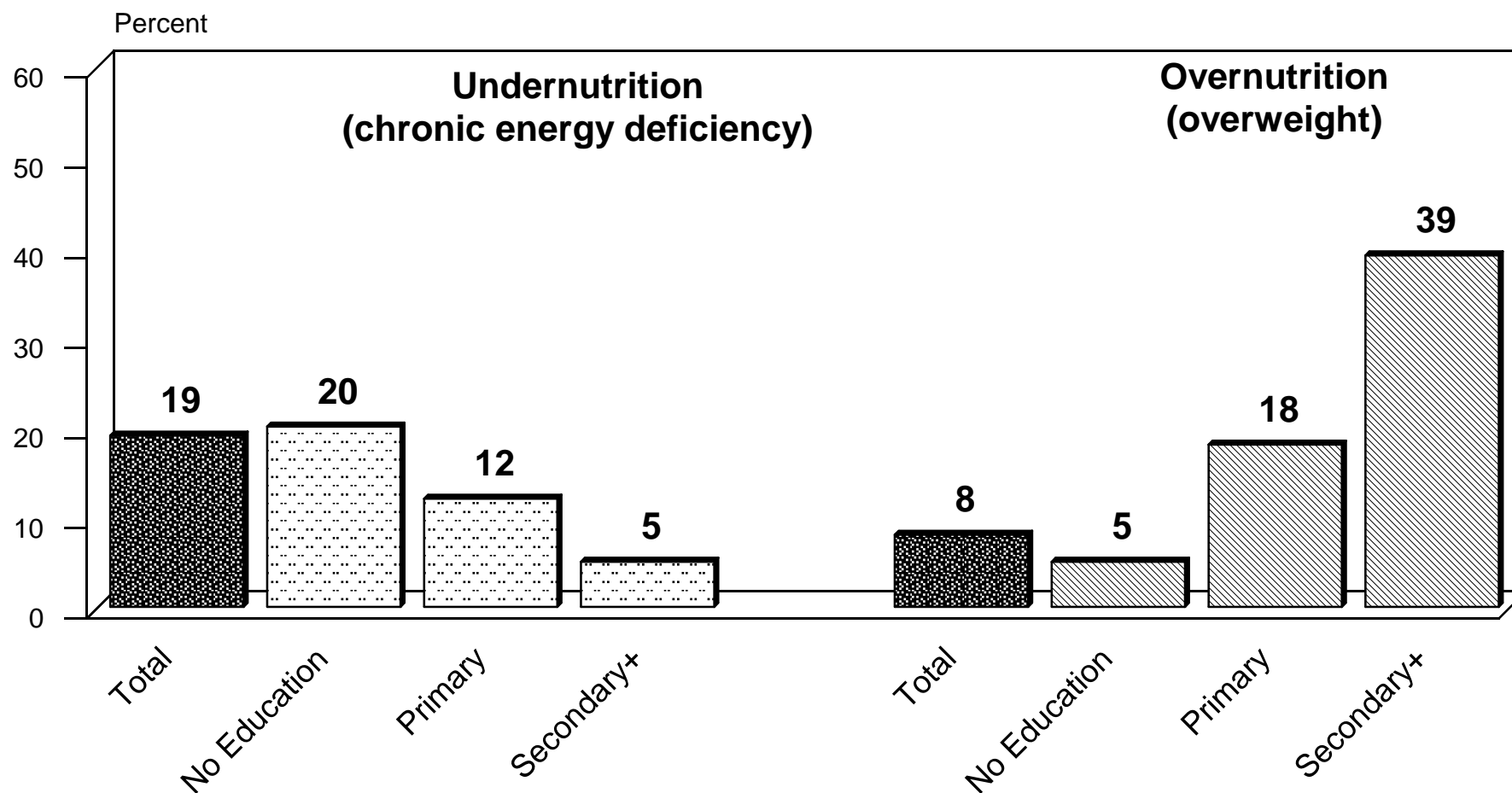
Figure 32: Malnutrition among Mothers of Children under Five Years by Education, Burkina Faso

In Burkina Faso,

- The rate of maternal undernutrition is **highest among women with no education (20 percent) and lowest among those with at least a secondary school education (5 percent).**
- The rate of maternal overnutrition is **highest among women with at least a secondary school education (39 percent) and lowest among those with no education (5 percent).**

Figure 32

Malnutrition among Mothers of Children under Five Years, by Education, Burkina Faso



Note: Maternal undernutrition is the percentage of mothers whose BMI (kg/m²) is less than 18.5. Maternal overnutrition is the percentage of mothers whose BMI is greater than 25.

Source: EDSBF-III 2003

Figure 33: Malnutrition among Mothers of Children under Five Years, Burkina Faso Compared with Other Sub-Saharan Countries

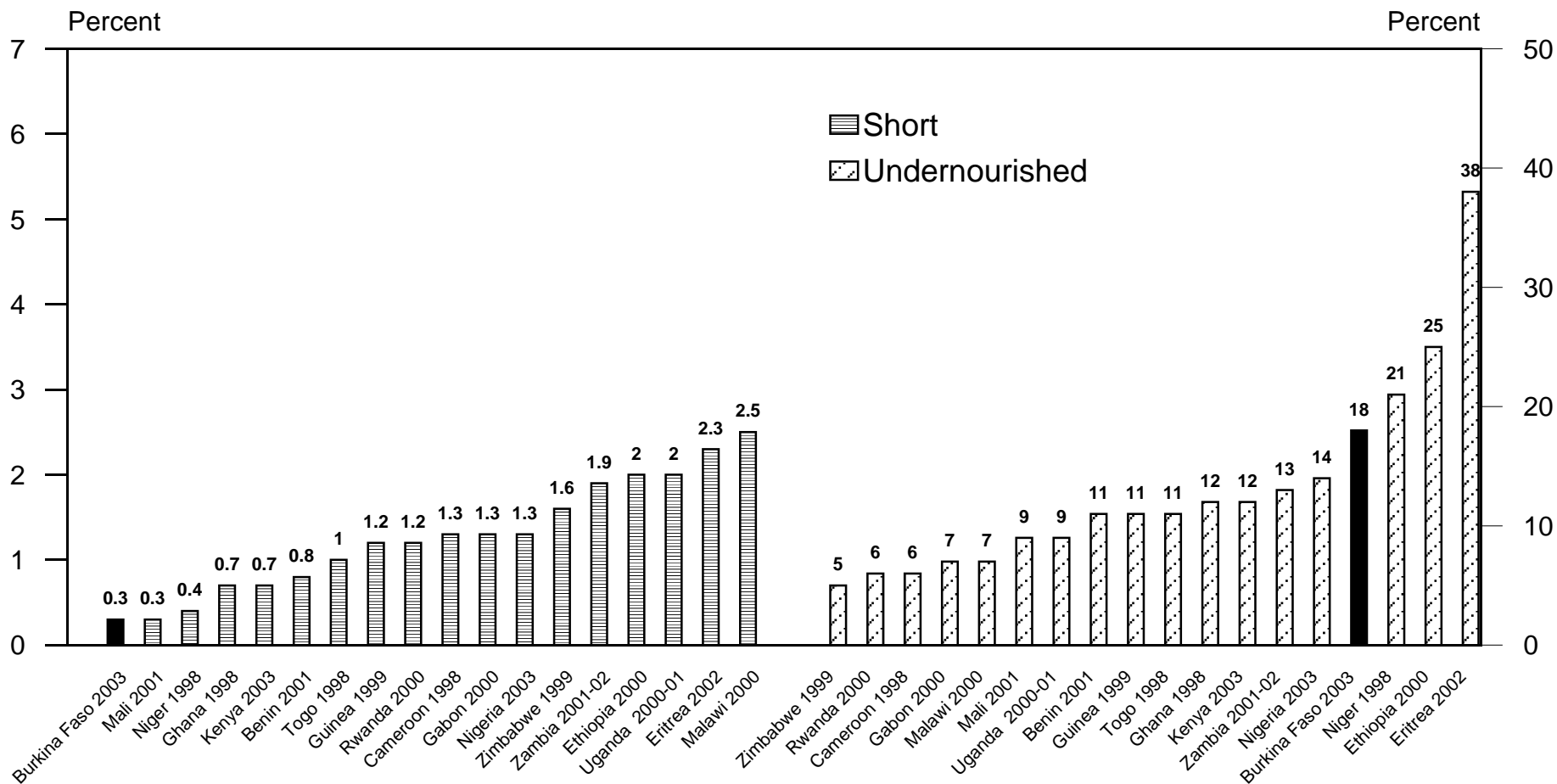
Malnutrition among mothers is likely to have a major impact on their ability to care for themselves and their children. Women less than 145 centimeters in height are considered too short. Mothers who are too short (a condition largely due to stunting during childhood and adolescence) may have difficulty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

- **Less than 1 percent of mothers of children under five are too short (<145 cm).** This proportion is the lowest of the sub-Saharan countries surveyed.
- **Eighteen percent of mothers of children under five are undernourished (BMI<18.5).** This proportion puts Burkina faso in the upper third of the sub-Saharan countries surveyed.

Figure 33

Malnutrition among Mothers of Children under Five Years, Burkina Faso 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/m²) is less than 18.5. Pregnant women and those who are less than two months postpartum are excluded from BMI calculation.

Appendices

Appendix 1
Stunting, Wasting, Underweight, and Overweight Rates by Background Characteristics
Burkina Faso 2003

Background characteristic	Stunted	Wasted	Underweight	Overweight	Background characteristic	Stunted	Wasted	Underweight	Overweight
Child's age in months					Regions				
0-5	6.4	14.7	6.7	6.6	Boucle de Mouhoun	33.7	25.1	42.6	1.2
6-11	17.5	33.4	35.7	3.8	Cascades	41.4	28.8	48.6	3.5
12-17	42.2	33.8	53.6	2.8	Centre (sans Ouagadougou)	32.7	13.2	31.0	1.9
18-23	53.6	27.9	51.1	3.0	Centre-Est	40.6	23.5	42.6	2.6
24-29	44.9	19.5	50.2	1.1	Centre-Nord	42.1	14.3	31.8	5.0
30-35	46.7	17.7	45.5	1.7	Centre-Quest	37.3	16.8	38.4	0.9
36-47	49.7	11.1	39.4	1.6	Center-Sud	35.1	19.8	34.1	2.9
48-59	42.1	8.7	30.5	2.5	Est	58.4	12.5	36.7	*
					Hauts Bassins	32.9	12.9	29.3	1.1
					Nord	36.5	20.8	39.4	1.9
					Plateau Central	37.8	30.8	49.9	2.0
					Ouagadougou	16.5	12.3	17.9	3.3
					Sahel	49.6	18.8	48.6	0.9
					Sud-Quest	40.5	21.0	44.0	0.9
	p<0.000 n=8,270	p<0.000 n=8,268	p<0.000 n=8,269	p<0.000 n=8,270		p<0.000 n=8,270	p<0.000 n=8,267	p<0.000 n=8,269	p<0.000 n=8,270
Gender of child					Urban-rural residence				
Female	36.8	19.0	37.0	2.7	Capital or large city	16.5	12.3	17.9	3.3
Male	40.2	18.5	38.2	2.9	Small city or town	22.5	12.6	22.5	1.8
					Rural	41.4	19.7	40.3	2.9
	p=0.002 n=8,268	NS n=8,270	NS n=8,268	NS n=8,268		p<0.000 n=8,269	p<0.000 n=8,269	p<0.000 n=8,270	NS n=8,270
Overall	38.6	18.7	37.6	2.8	Overall	38.6	18.7	37.6	2.8

Note: Level of significance is determined using the chi-square test.

NS=Not significant at p≤0.05

* Data inconclusive

Appendix 2

NCHS/CDC/WHO International Reference Population Compared with the Distribution of Malnutrition in Burkina Faso

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 the normal curve. The weight-for-height, height-for-age and weight-for-age curves are shifted to the left of the standard curve indicating that there is a large number of malnourished children. 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

NCHS/CDC/WHO International Reference Population Compared with the Distribution of Malnutrition in Burkina Faso

