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INDICATORS OF CHILD DEPRIVATION IN SUB-SAHARAN AFRICA: LEVELS AND TRENDS FROM THE DEMOGRAPHIC AND HEALTH SURVEYS

DHS COMPARATIVE REPORTS 32



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- To provide decisionmakers in survey countries with information useful for informed policy choices
- To expand the international population and health database
- To advance survey methodology
- To develop in participating countries the skills and resources necessary to conduct high-quality demographic and health surveys

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Indicators of Child Deprivation in Sub-Saharan Africa: Levels and Trends from the Demographic and Health Surveys

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Preface

One of the most significant contributions of the MEASURE DHS program is the creation of an internationally comparable body of data on the demographic and health characteristics of populations in developing countries.

The DHS *Comparative Reports* series examines these data across countries in a comparative framework. The DHS *Analytical Studies* series focuses on specific topics. The principal objectives of both series are to provide information for policy formulation at the international level and to examine individual country results in an international context. *Comparative Reports* are primarily descriptive, while *Analytical Studies* take a more analytical approach.

The *Comparative Reports* series covers a variable number of countries, depending on the availability of data sets. Where possible, data from previous DHS surveys are used to evaluate trends over time. Each report provides detailed tables and graphs organized by region. Survey-related issues such as questionnaire comparability, survey procedures, data quality, and methodological approaches are addressed as needed.

It is anticipated that the availability of comparable information for a large number of developing countries will enhance the understanding of analysts and policymakers regarding important issues in the fields of international population and health.

Sunita Kishor
Project Director

Executive Summary

Access to basic human needs is essential to the development of children's full potential. This comparative report focuses on deprivation of basic human needs among children in sub-Saharan Africa. It examines disparities and illustrates changes in the prevalence of African children's exposure to deprivation. The data come from DHS surveys conducted in 30 countries between 2000 and 2011.

This report covers deprivation in five areas: food, health, water and sanitation, shelter, and education. It reports on indicators of deprivation among all children in these countries and in trends in these indicators. In addition, this report examines whether, and how much, the prevalence of deprivation in each country differs by the sex of the child, rural or urban residence, the sex of the head of the household in which the child lives, and the age of the head of the household (<50 years old versus age 50 and older). Knowing of these differences may help policymakers to focus strategies for improvements.

Prevalence of deprivation

Food: In all countries reporting, at least one-fourth of children are stunted (that is, too short for their age), indicating chronic malnutrition.

Health: In nearly half of countries, more than 40% of children had received no vaccinations. In all but one country, almost 40% to over 80% of children who had diarrhea in the two weeks before the latest survey received no medical advice.

Water and sanitation: The percentage of children's households using surface water, which may be polluted, varies widely, from less than 10% in six countries to close to 50% or more in four countries.

Shelter: In 16 of 24 countries, more than half of children live in homes with mud floors; only two countries have rates under 20%. In all countries the homes of more than half the children have no electricity, and in 18 of 24 countries the rate exceeds 80%.

Education: In 10 of 19 countries with data, less than 15% of children have no education. In nine of these countries less than 20% of children are not in school. In Burkina Faso and Mali, however, more than half of children have no schooling and more than half are not currently in school.

Disparities in a country: What makes a difference?

Disparities by sex of child: In every country underweight and stunting were more common among boys than girls, while in three-quarters of the countries girls were less likely than boys to receive medical care for diarrhea. Many countries had differences between boys and girls in the percentages lacking education. The pattern across countries was mixed, but in five countries—Benin, Chad, Cote d'Ivoire, Guinea, and Nigeria—girls who lacked education exceeded boys by 10 percentage points or more.

Rural-urban discrepancies: Rural areas are worse off than urban areas in most all countries for nearly most indicators. In every country rural areas posted higher rates of wasting, stunting, underweight, no EPI vaccination (except Burundi), no sanitation facilities, living more than 15 minutes walk from a water source (except Liberia), mud floors, and no electricity. The difference was less pervasive for diarrhea: Urban areas fared better than rural in half the countries. The percentage of children 7 to 17 years old who did not enroll in school was at least one percentile point higher in rural areas than in urban areas (except in Rwanda, Swaziland, and Uganda). We also found geographic disparities in the percentage of children who dropped out of school in Burkina Faso and Madagascar, where the differences were at least 6 percentile points higher in rural areas than in urban areas.

Sex of head of household: The sex of the head of the child’s household made a difference to many indicators. The pattern was mixed, but living with a male head of household was commonly associated with higher percentages for deprivation in more instances than living with a female head of household. Living with a male head of household meant a higher percentage of receiving no vaccinations in 14 countries, having no primary or secondary education in 18 countries, and lacking medical advice for recent diarrhea and living in a house with a mud floor in two-thirds of countries. Living with a male head of household also meant a higher percentage of children using surface water (Benin, Ethiopia, Ghana, Guinea, Liberia and Madagascar); without access to any sanitation services (Senegal, Burkina Faso, Benin, and Ghana); without electricity (Senegal); and not enrolled in school (Benin, Burkina Faso, Cameroon, Nigeria, and Senegal). Living with a female head of household was most often linked with a higher percentage of stunting (in 11 countries); underweight (one-third of these countries); recent diarrhea (in 13 countries); and children not enrolled in school (Chad).

Age of the head of household: As with sex, the age of the head of household made a difference to a number of deprivation indicators, but the pattern was mixed. For example, living with a head of household age 50 or older meant a greater percentage of stunting in 7 countries; underweight in half of the countries; no vaccinations in 17 countries; use of surface water (Cameroon, Kenya, Namibia and Nigeria); living more than a 15-minute walk from the primary water source (Namibia); living in a house with mud flooring (Namibia, Lesotho and Zambia); no electricity (Namibia and Uganda); no school (Benin, Burkina Faso, Ghana, Liberia, Madagascar, Mali, Niger and Tanzania); and dropping out of school (Burkina Faso).

Trends in deprivations

Over the past 13 years, a number of countries have made substantial progress in reducing the prevalence of deprivation in particular areas. Others have suffered setbacks.

Food: Burkina Faso, Ethiopia, and Rwanda made the greatest progress in reducing stunting—by nearly eight percentage points or more. In Benin and Senegal, however, the situation worsened.

Health: Many countries substantially decreased the percentage of children with no immunizations—Burkina Faso, Tanzania, and Uganda by over 30 percentage points. In contrast, the percentage in Zambia increased comparably. Burkina Faso, Kenya, Lesotho, Malawi, Nigeria, and Rwanda all decreased, by close to 20 percentage points or more, the percentage of children not receiving medical advice when they had diarrhea.

Water: Burkina Faso, Ghana, Kenya, Madagascar, and Malawi decreased the percentage of children using ground water by more than five percentage points. In contrast, the percentage using ground water increased by nearly 29 percentage points in Ethiopia, and increases also were large in Rwanda and Zimbabwe. Senegal decreased by over 28 percentage points the percentage of children living more than a 15-minute walk from their water source. Lesotho, Mali, and Nigeria made improvements of about 15 to 19 percentage points.

Sanitation: Ethiopia decreased the percentage of children with no access to sanitation facilities by nearly 25 percentage points.

Shelter: In Mozambique the percentage of children living in homes with mud floors decreased by more than 15 percentage points. The percentage of children in homes with electricity increased by about 10 to 12 percentage points in Ghana, Mozambique, and Senegal.

Education: Burkina Faso, Ethiopia, and Zambia decreased the percentage not in school by 15 to almost 19 percentage points. Benin, Ghana, Kenya, Senegal, and Zambia reduced their school drop-out rates among children age 13 to 17 by at least six percentage points.

1 Introduction and Methods

Focusing on the deprivation of children's basic human needs is imperative. More than half of the children in developing countries—more than one billion in all—suffer from deprivation in one or more of the following areas: health, water, sanitation, education, food, information, and shelter (Gordon, 2003). The problem is most severe in sub-Saharan Africa, where the rate of children suffering from at least one of these forms of deprivation reaches over 80% in some countries (Gordon, 2003). The problem is worst in rural areas, where in some sub-Saharan African countries more than 90% of children are deprived of one or more basic human needs. The high percentage of children in sub-Saharan Africa that experience each of these deprivations shows the alarming dimensions of the crisis. As estimated in 2003, 62% are deprived of shelter (198 million), 53% of water (167 million), 30% of education (50 million), 24% of health (84 million), and 19% of food (20 million) (Gordon, 2003).

This comparative report focuses on deprivation of basic human needs among children, defined as the condition of observable and demonstrable disadvantage that some children experience in relation to their counterparts at community, societal, or national levels (Townsend, 1987). Attaining their basic needs is essential if children are to achieve their full potential (Minujin, 2006). Global health leaders should take child deprivation into account in the growing dialogue on anti-poverty policies and in the current debate on the definition of poverty (Minujin, 2006). To address this concern, this report examines disparities and illustrates changes in the prevalence of African children's exposure to deprivation from 2000 to 2011. This document summarizes data from the Demographic and Health Surveys (DHS) collected on deprivation in five areas: food, water and sanitation, health, shelter, and education. The work of Gordon et al. (2003) guided the selection of these topics.

The following are the specific aims of this study:

- for each African country, to describe levels and changes in the prevalence of children's exposure to each type of vulnerability
- to determine for each country the extent to which children's exposure to each type of vulnerability differed by the child's sex and region of residence as well as the age and gender of the head of household.

1.1 Methods

Cross-sectional analyses were performed using nationally representative data from DHS surveys. The DHS project, initiated in 1984, has a key mandate to collect information on demographic, health, and nutrition indicators. Funded mainly by the United States Agency for International Development (USAID), the DHS survey has been administered in more than 90 developing countries around the world. In conducting a survey within a country, DHS staff work with an implementing agency (e.g., a national statistics office, ministry of health, or university) and provide technical assistance for the implementation of the survey, data analysis, report writing, and dissemination.

The DHS survey uses a multi-stage, stratified sampling design, with households as the sampling unit. Within each sample household, all women and men meeting the eligibility criteria are eligible to be interviewed. Because the surveys are not self-weighting, survey weights are calculated to account for unequal selection probabilities as well as survey non-response. With weights applied, survey findings represent the full target populations.

1.2 Data

Analyses were performed using DHS data collected in 30 countries from 2000 to 2011. Two types of data files were included:

- The **Household Listing Data – Household Member Recode (PR) files**. These files have *one record for every household member* and include variables such as sex, age, education, orphanhood, height and weight measurement, and hemoglobin level. The PR files also include the characteristics of the households where the child lived or was visiting. The unit of analysis (case) is the household member.
- The **Children (KR) files**. These files have *one record for every interviewed woman's child born in the five years preceding the survey* and contain information related to the mother's pregnancy and postnatal care and the child's immunization and health. The KR files include data on the mother of each of these children. The unit of analysis (case) is the child born to an interviewed woman in the preceding five years (age 0-59 months).

All countries included in this report are in sub-Saharan Africa, 11 countries are in the eastern region, 4 in the middle region, 3 in the southern region, and 10 in the western region. Table 1.1 lists the countries included in this report, the year(s) of fieldwork, and the sample sizes for each country survey by children's ages. Table 1.2 reports these same samples according to the child's sex, urban or rural residence, and the sex and age (<50 or ≥50 years) of the head of household. Not all countries collected data on all variables addressed in this report. The prevalence of each deprivation measurement was calculated using the most recent DHS data. Changes over time were calculated for countries that had DHS information available from two different data collection years.

1.3 Definition of Variables

This report covers five areas of child deprivation: food, water and sanitation, health, shelter, and education.

Food deprivation

This document identifies children suffering from food deprivation as those who were stunted, wasted, or underweight (more than –2 standard deviations below the reference population median). Analyses were performed using data on children less than age 5 from the **Household Member Recode (PR) files**. The following DHS variables were used:

- stunted: hc5
- wasted: hc11
- underweight: hc8

Water and sanitation deprivation

Households and children in households who were using surface water or had more than a 15 minute walk to their water source were considered severely deprived of water. The rationale for these dichotomous measures is that surface water can occasionally become polluted and unsafe, and a 15-minute walk to a water source (30 minutes round trip) means that it is highly likely that the child will have access to only a very limited quantity of water at home (Gordon, 2003). Children severely deprived of sanitation were defined as those who did not have access to any sanitation facilities whatsoever in or near their homes, including any connection to a public sewer, connection to a septic system, pour-flush

latrine, simple pit latrine, ventilated improved pit latrine, service or bucket latrines where excreta are removed manually, public latrines, or open latrine. Analyzes were performed using data on children less than age 5 from the **Household Member Recode (PR) files**. The following DHS variables were used:

- Use of surface water: hv201
- More than a 15-minute walk to their water source: hv204
- Lack of access to any sanitation facilities whatsoever in or near their homes: hv205

Health deprivation

Children severely deprived of health needs included children who had not received any of the eight EPI immunizations, who had diarrhea in the last two weeks, or who had diarrhea in the last two weeks without obtaining medical advice. Since immunizations start soon after birth, all children are eligible to meet the condition of having had no immunizations. Fully immunized status was not used; this would have excluded a large proportion of the children, since, following the recommended immunization schedule, no six-month-old is fully immunized (Gordon, 2003). Analyzes were performed using the data from the **children (KR) files**:

- have not received any of the eight EPI immunizations: h0, h2, h3, h4, h5, h6, h7, h8, and h9.
- had diarrhea in the last two weeks: h11
- had untreated diarrhea in the two weeks prior to the survey for which no medical advice was obtained: h12z

Shelter deprivation

This section includes analyses of children who lived in a dwelling that had a mud floor or that did not have electricity. Analyzes were performed using data on children less than age 18 from the **Household Member Recode (PR) files**. The following DHS variables were used:

- dwelling that had a mud floor: hv213
- dwelling that did not have electricity: hv206

Education deprivation

This section analyzes whether children ages 7 through 17 have received no education, were not attending school during the year of the interview, or had dropped out of school (had not attended school for the last two years). Analyzes were performed using data from the **Household Member Recode (PR) files**. The following DHS variables were used:

- have received no education: hv129, hv105
- were not attending school during the year of the interview: hv121, hv105
- had dropped out of school: hv105, hv121, hv125

Variables for stratified analyses

Analyses were stratified using the following sociodemographic characteristics:

Sex of the child: male / female: hv104

Age of the child: 0-4, 5-9, 10-14, 15-17: hv105

0-6, 7-17: hv105

Region of residence of the child: rural / urban: hv024

Sex of the head of the household: male / female: hv219

Age of the head of the household: less than age 50 / age 50 or more: hv220

Analyses

The first analysis describes the percentage of the child population in each country considered vulnerable in each of the five categories of deprivation. Then, analyses are presented separately by the child's sex, region of residence, and the sex and age of the head of household. Finally, changes over time are calculated for countries that have data from two data collection years. All data were weighted to ensure that nationally representative estimates were obtained. All analyses were conducted using Stata/SE 13. There may be trivial discrepancies in the percentages between tables because of rounding.

The structure of this document

Chapter 2 through Chapter 6 present information for each type of deprivation. Each chapter includes a brief literature review as well as the results of the analyses. First, the country prevalence of each component of deprivation is provided. Second, child's sex and regional disparities are presented. Third, tables present the prevalence of each component of the specific deprivation by the sex and age of the household head. Fourth, changes over time in the prevalence of each deprivation component are provided. Chapter 7 presents the conclusions of this study. Tables, figures, and maps are not interspersed with the text, but are placed at the end of each chapter for easier reference.

Table 1.1. Sample size, by child's age, in demographic and health surveys, sub-Saharan Africa, 2000-2011

Country	Year of data collection	Age of the child (in years)							
		0-4	5-9	10-14	15-17	0-17	7-12	13-17	7-17
Benin	2001	5,268	5,159	4,259	1,573	16,260	5,872	3,075	8,947
	2006	16,298	15,358	12,340	4,812	48,808	16,939	9,187	26,127
Burkina Faso	2003	10,159	9,738	8,313	4,107	32,317	11,059	7,252	18,311
	2010	14,830	13,852	11,531	4,515	44,728	15,572	8,711	24,283
Burundi	2010	7,651	6,288	5,443	2,892	22,274	6,843	5,101	11,944
Cameroon	2004	8,375	7,538	7,021	3,425	26,359	8,935	6,064	14,999
	2011	12,189	11,079	9,228	4,467	36,963	12,674	7,659	20,333
Chad	2004	5,500	5,321	4,005	1,729	16,554	5,683	3,120	8,803
Congo (Brazzaville)	2005	5,133	4,218	4,247	2,180	15,778	5,035	3,919	8,954
Congo Democratic Republic	2007	9,076	7,655	6,639	2,815	26,185	8,393	5,390	13,782
Cote d'Ivoire	2005	3,834	3,624	3,097	1,577	12,132	3,784	2,884	6,668
Ethiopia	2005	10,898	11,624	10,378	4,412	37,312	13,767	8,196	21,963
	2011	12,098	12,888	11,403	4,996	41,385	15,084	9,166	24,251
Ghana	2003	3,691	3,686	3,697	1,529	12,603	4,420	3,061	7,481
	2008	5,874	6,287	5,753	2,747	20,661	7,210	5,107	12,317
Guinea	2005	6,224	6,644	5,654	2,198	20,720	7,709	4,190	11,899
Kenya	2003	6,034	5,423	5,396	2,566	19,418	6,412	4,750	11,162
	2008-09	6,045	5,863	5,304	2,348	19,560	6,698	4,331	11,029
Lesotho	2004	4,331	4,679	5,355	2,946	17,311	5,972	5,214	11,186
	2009	4,695	4,902	5,542	3,083	18,222	6,146	5,387	11,533
Liberia	2007	6,074	5,554	4,553	1,657	17,837	6,099	3,385	9,485
Madagascar	2003-04	6,533	6,288	5,653	2,146	20,620	7,173	4,279	11,452
	2008-09	13,247	13,952	12,456	5,383	45,038	16,176	9,952	26,128
Malawi	2004	10,802	9,380	8,906	3,278	32,367	11,377	6,515	17,892
	2010	19,843	19,862	17,153	7,515	64,372	22,168	13,783	35,951
Mali	2001	12,302	11,064	9,442	3,503	36,310	12,456	6,914	19,370
	2006	13,933	12,332	10,134	4,553	40,951	13,490	8,284	21,775
Mozambique	2003	10,334	9,855	8,124	3,515	31,828	11,060	6,483	17,543
	2011	10,889	10,013	8,711	3,613	33,227	11,635	6,641	18,275
Namibia	2000	4,615	4,783	4,554	2,129	16,082	5,651	3,916	9,567
	2006-07	5,647	5,437	5,585	2,959	19,628	6,483	5,332	11,815
Niger	2006	9,402	8,928	6,709	2,217	27,256	9,720	4,426	14,146
Nigeria	2003	5,990	5,303	4,439	2,209	17,942	6,047	3,779	9,826
	2008	25,903	23,237	18,166	8,005	75,312	25,270	14,462	39,732
Rwanda	2005	8,210	7,243	6,416	3,321	25,191	8,186	5,930	14,116
	2010	9,074	8,653	7,375	3,770	28,872	9,659	6,564	16,222

(Continued...)

Table 1.1. – Continued

Country	Year of data collection	Age of the child (in years)							
		0 to 4	5 to 9	10 to 14	15 to 17	0 to 17	7 to 12	13 to 17	7 to 17
Sao Tomé and Príncipe	2008-09	2,120	1,975	1,856	868	6,819	2,289	1,609	3,898
Senegal	2005	10,822	9,509	8,587	4,578	33,495	10,885	7,898	18,783
	2010-11	12,562	11,274	9,448	4,431	37,716	12,364	7,991	20,355
Sierra Leone	2008	6,738	7,175	6,889	1,603	22,404	8,047	4,671	12,718
Swaziland	2006-07	3,316	3,224	3,447	1,792	11,779	3,962	3,216	7,177
Tanzania	2004-05	8,713	7,176	6,557	2,982	25,429	8,294	5,548	13,842
	2010	8,331	7,625	6,730	3,100	25,786	8,500	5,748	14,248
Uganda	2006	8,643	7,802	7,147	2,808	26,401	9,042	5,496	14,539
	2011	8,502	7,737	6,738	2,946	25,923	8,776	5,404	14,180
Zambia	2001-02	6,569	6,172	5,351	2,415	20,508	7,041	4,420	11,460
	2007	6,472	5,585	5,303	2,085	19,446	6,533	4,195	10,729
Zimbabwe	2005-06	5,930	6,360	6,195	2,801	21,285	7,368	5,360	12,728
	2010-11	6,083	5,692	5,811	2,562	20,148	7,046	4,780	11,826

Table 1.2. Sample size by sex of the child, region of residence, and sex and age of head of household

Country	Year of data collection	Sex of the child		Region of residence		Sex of household head		Age of household head	
		Male	Female	Urban	Rural	Male	Female	Less than age 50	Age 50 or more
Benin	2001	8,295	7,955	5,533	10,727	13,715	2,545	13,137	3,123
	2006	25,148	23,657	17,285	31,523	40,684	8,124	41,384	7,424
Burkina Faso	2003	16,616	15,696	4,891	27,426	30,458	1,859	25,130	7,187
	2010	22,861	21,867	8,386	36,342	41,376	3,352	36,506	8,222
Burundi	2010	10,862	11,411	1,924	20,349	17,492	4,781	20,282	1,991
Cameroon	2004	13,334	13,014	12,099	14,259	21,085	5,274	21,654	4,705
	2011	18,483	18,480	16,141	20,822	29,329	7,634	29,615	7,348
Chad	2004	8,351	8,200	3,192	13,362	14,295	2,260	14,408	2,146
Congo (Brazzaville)	2005	7,874	7,904	7,798	7,980	12,345	3,433	13,326	2,452
Congo Democratic Republic	2007	13,253	12,931	10,942	15,243	21,567	4,618	23,448	2,737
Cote d'Ivoire	2005	6,019	6,113	4,766	7,366	10,021	2,111	9,969	2,163
Ethiopia	2005	19,090	18,222	3,510	33,803	31,306	6,007	31,574	5,739
	2011	20,819	20,566	6,081	35,303	33,363	8,022	35,050	6,335
Ghana	2003	6,454	6,150	4,804	7,799	8,696	3,908	10,008	2,595
	2008	10,433	10,228	8,277	12,384	14,331	6,330	17,226	3,436
Guinea	2005	10,501	10,219	5,840	14,881	18,047	2,673	15,507	5,213
Kenya	2003	9,884	9,533	3,085	16,333	13,238	6,180	16,965	2,453
	2008-09	9,884	9,676	2,908	16,652	12,964	6,596	16,722	2,838
Lesotho	2004	8,810	8,501	2,558	14,753	11,240	6,071	12,728	4,582
	2009	9,024	9,198	3,655	14,567	12,100	6,122	13,673	4,549
Liberia	2007	9,042	8,795	6,561	11,276	12,249	5,588	15,549	2,288
Madagascar	2003-04	10,572	10,039	4,092	16,528	17,293	3,327	18,172	2,448
	2008-09	22,941	22,097	5,374	39,664	37,306	7,732	40,267	4,771
Malawi	2004	16,079	16,288	4,608	27,759	24,593	7,774	27,999	4,368
	2010	31,973	32,399	9,117	55,256	47,300	17,073	55,540	8,832
Mali	2001	18,141	18,165	9,075	27,235	33,324	2,986	30,255	6,055
	2006	20,608	20,343	11,631	29,320	37,145	3,806	33,473	7,478
Mozambique	2003	16,048	15,780	10,334	21,494	24,672	7,156	27,938	3,890
	2011	16,403	16,824	9,773	23,454	22,425	10,801	29,418	3,809
Namibia	2000	7,835	8,245	4,187	11,895	8,493	7,587	10,658	5,425
	2006-07	9,788	9,839	6,862	12,766	9,824	9,804	14,027	5,602
Niger	2006	13,814	13,442	4,513	22,743	22,936	4,320	21,178	6,078
Nigeria	2003	9,087	8,856	5,826	12,116	15,831	2,111	14,776	3,166
	2008	38,290	37,019	23,337	51,975	65,639	9,673	62,330	12,982

(Continued...)

Table 1.2. – Continued

Country	Year of data collection	Sex of the child		Region of residence		Sex of household head		Age of household head	
		Male	Female	Urban	Rural	Male	Female	Less than age 50	Age 50 or more
Rwanda	2005	12,543	12,647	3,620	21,570	17,805	7,385	22,428	2,762
	2010	14,508	14,364	3,394	25,478	20,615	8,258	25,913	2,959
Sao Tomé and Príncipe	2008-09	3,498	3,322	3,448	3,372	4,123	2,696	5,997	823
Senegal	2005	16,697	16,797	12,987	20,508	26,833	6,662	22,938	10,557
	2010-11	18,909	18,806	14,704	23,012	29,976	7,740	24,872	12,844
Sierra Leone	2008	11,392	11,011	7,093	15,311	17,375	5,029	16,917	5,486
Swaziland	2006-07	5,874	5,905	1,840	9,939	5,179	6,599	8,263	3,516
Tanzania	2004-05	12,833	12,596	5,411	20,019	20,120	5,309	21,274	4,155
	2010	12,822	12,963	5,279	20,507	20,247	5,539	21,211	4,575
Uganda	2006	13,071	13,330	2,910	23,491	18,984	7,417	22,773	3,628
	2011	13,113	12,809	3,114	22,809	18,620	7,303	22,601	3,322
Zambia	2001-02	10,260	10,248	7,066	13,442	16,573	3,935	17,777	2,731
	2007	9,573	9,873	6,387	13,059	15,370	4,076	17,142	2,304
Zimbabwe	2005-06	10,728	10,554	5,538	15,747	12,548	8,737	16,926	4,358
	2010-11	10,081	10,067	5,128	15,020	10,744	9,404	16,567	3,581

2 Food Deprivation

The first Millennium Development Goal (MDG), eradicating extreme poverty and hunger, as well as Goals 4 and 5, the reduction of child mortality and the improvement of maternal health, all recognize the crucial importance of adequate nutrition. Food deprivation is a major cause of disability and mortality; it is the top cause of the global burden of disease, as evidenced by its association with 53% of deaths in children under five years throughout the world (Bryce et al., 2005; Ezzati, 2003; Muller and Krawinkel, 2005; World Bank, 2006). In low-income and middle-income countries, stunting, severe wasting, and intrauterine growth retardation account for 2.2 million deaths each year and 21% of disability-adjusted life-years (DALYs) for children younger than 5 years (Black et al., 2008).

Food deprivation affects children, the global society, and future generations (Grantham-McGregor et al., 2007; Ramakrishnan et al., 1999; Victora et al., 2000). Child undernutrition has been linked to negative health consequences later in life, including impaired cognitive development, poor educational outcomes, and low human capital formation (Lanigan and Singhal, 2009; Victora et al., 2008). Food deprivation among children is associated with having parents with little education, living in an impoverished household, experiencing food insecurity, having a mother with depression, living in a rural area, receiving inadequate feeding, having a mother who lacks decision-making autonomy, living in an area where food is expensive, having many siblings under five years old, and having a mother who had a short previous birth interval (Bhutta et al., 2008; Engebretsen et al., 2008; Muller and Krawinkel, 2005; Wachs, 2008; Wachs et al., 2005). In Ghana Ehrhardt et al. (2006) found that food deprivation was a fundamental contributor to malaria-associated morbidity and anemia—a finding that suggests the need for comprehensive and concomitant nutrition and malaria-control programs.

This chapter focuses on children less than age 5 and includes three anthropometric measures of nutrition: weight-for-height (WHZ) to measure wasting, height-for-age (HAZ) to measure stunting, and weight-for-age (WAZ) to measure underweight. Like the World Health Organization (WHO) Global Database on Child Growth and Malnutrition (WHO, 2013), we used a Z-score cut-off point of <-2 standard deviations (SD) to classify low weight-for-height, low height-for-age, and low weight-for-age as moderate and severe undernutrition.

2.1 Wasting

The term *wasting* refers to a process, usually associated with starvation and/or disease, that leads to substantial weight loss. Wasting is calculated by comparing a child's weight-for-height with a reference population of well-nourished, healthy children. Researchers often use wasting to assess the severity of emergencies because of its strong relationship to mortality (WFP, 2013).

Table 2.1 shows that the prevalence of wasting among children less than age 5 ranged from about 2% in Rwanda and Zimbabwe to around 13% in Mali and Burkina Faso. Niger and Nigeria had wasting prevalence above 10% (see Map 2.1). All four countries with a prevalence of wasting above 10% are located in western Africa.

Sex and geographic disparities

Overall, there were no major sex disparities related to wasting in sub-Saharan Africa (see Figure 2.1). The largest differences occurred in Kenya and Niger, where the wasting prevalence was approximately 2 percentage points higher for boys than for girls.

As Figure 2.2 shows, in general, there was a lower prevalence of wasting among children in urban areas than in rural areas of sub-Saharan Africa. This difference was most pronounced in Cameroon, Ethiopia, Namibia, and Nigeria, countries where the prevalence of wasting in urban areas was at least 4

percentage points higher in rural areas than in urban areas (see Table 2.1). The inverse situation occurred in Liberia, where the prevalence of wasting was 8% in urban areas and 6% in rural areas—a discrepancy of 3 percentage points.

The role of the household head's sex and age

Overall, there were no marked differences in the wasting prevalence by the sex and age of the household head in sub-Saharan Africa (see Figures 2.3 and 2.4). The difference by sex of head of household was substantial only in Nigeria, where the wasting prevalence was 13% for children living with a male household head and 9% for children living with a female household head (a difference of 4 percentage points) (see Table 2.1). In Rwanda the wasting prevalence for children living with a household head less than age 50 (2%) was lower than that of children living with a household head who was at least age 50 (6%), a difference of 3 percentage points.

Variations during the last 13 years

The most important progress in reducing the wasting prevalence, in terms of percentage points, took place in Burkina Faso and Zimbabwe (see Table 2.2). The wasting prevalence in Burkina Faso was 19% in 2003 and 14% in 2010, a decrease of 5 percentage points. In Zimbabwe the reduction between surveys was 4 percentage points (2005-06: 6% and 2010-11: 3%). The opposite shift occurred in Mali and Nigeria, where rates of wasting increased by about 3 percentage points (Mali 2001: 11% and 2006: 14%; Nigeria 2003: 9% and 2008: 12%) (see Figures 2.5 and 2.6).

2.2 Stunting

The term *stunting* refers to shortness-for-age; an indicator of chronic malnutrition calculated by comparing the height-for-age of a child with a reference population of well-nourished, healthy children. Stunting could be a sign of failure to attain linear growth potential as a consequence of suboptimal health and/or nutritional conditions (WFP, 2013; WHO, 1995).

As Table 2.3 indicates, the stunting prevalence in Africa ranged from 50% in Niger and 51% in Burundi to 22% in Senegal. The Democratic Republic of Congo, Madagascar, and Malawi, as well as Niger and Burundi, had stunting prevalence above 40% (see Map 2.2.).

Sex and geographic disparities

In all countries, the prevalence of stunting among children less than age 5 was higher for males than for females (see Figure 2.7). This sex disparity was 6 percentage points higher for males than females in Burundi and 5 percentage points higher for males than females in Benin, Liberia, and Malawi (see Table 2.3).

In every country the stunting prevalence in rural areas was higher than that in urban areas (see Figure 2.8). This difference was most pronounced among children in Burundi and Niger, where the stunting prevalence was 20 percentage points greater in rural areas than in urban areas. The country of Sao Tomé and Príncipe had the lowest geographic variation—2 percentage points higher in rural than urban areas; see Table 2.3).

The role of the household head's sex and age

The sex of the household head played an important role in stunting prevalence, but the pattern was not consistent across countries. The stunting prevalence was at least one percentage point higher for children living with a male household head in 8 countries, but at least 1 percentage point higher for

children living with a female household head in 11 countries (see Figure 2.9). In Nigeria the stunting prevalence was 6 percentage points higher for children living with a male rather than a female household head (37% versus 31%) (see Table 2.3). In Burkina Faso (30% versus 26%) and Senegal (23% versus 19%), the stunting prevalence was approximately 4 percentage points higher for children living with a male rather than a female household head. The inverse situation occurred in such countries as the Democratic Republic of Congo (39% versus 46%) and Senegal (23% versus 19%), where the stunting prevalence was 7 and 4 percentage points higher for children living with a female household head.

The data also revealed differences in the stunting prevalence by the age of the household head, but again the pattern was not consistent across countries. We compared children living with household heads younger than age 50 with those residing with household heads who were at least age 50. In seven countries the stunting prevalence was at least one percentage point higher for children living with a household head age 50 or older. In 12 countries the stunting prevalence was at least one percentage point higher for children living with a household head younger than age 50 (see Figure 2.10).

We found the largest differences—at least 5 percentage points greater for a child living with an older household head—in Congo (Brazzaville) (25% versus 32%) and Kenya (29% versus 34%). In contrast, in Niger (51% versus 46%) and Uganda (29% versus 24%), the stunting prevalence was approximately five percentage points higher for children living with a household head younger than age 50.

Variations during the last 13 years

Overall, sub-Saharan Africa experienced a decrease in the prevalence of stunting. The greatest reductions—at least 7 percentage points—occurred in Ethiopia (2005: 47% and 2011: 39%) and Zambia (2001-02: 47% and 2007: 39%) (see Table 2.2). In the other direction, only Benin (2001: 31% and 2006: 38%) and Senegal (2005: 16% and 2010-11: 22%) experienced *increases* in the prevalence of stunting that measured at least 6 percentage points (see Figures 2.11 and 2.12).

2.3 Underweight

One can determine whether a child is *underweight* by comparing the weight-for-age of the child with that of a reference population of well-nourished, healthy children. An underweight child is in danger of having a low body mass relative to his or her chronological age. (Body mass is a function of both height and weight. Thus, the categorization of underweight does not distinguish between a child who is low in weight relative to his/her height and a child who is short relative to his/her age but normal in weight-for-height (WFP, 2013; WHO, 1995).)

As Table 2.4 shows, the prevalence of underweight among children less than age 5 in sub-Saharan Africa ranged from 13% in Zimbabwe to 44% in Niger. Burkina Faso, Burundi, Ethiopia, Guinea, Mali, Niger, and Nigeria had underweight prevalence above 30% (see Map 2.3).

Sex and geographic disparities

In every country, the prevalence of underweight was higher for males (see Figure 2.13) and children in rural areas than for females and children in urban areas (see Figure 2.14). Lesotho experienced the largest disparity by child's sex. The underweight prevalence in Lesotho was 19% among male children and 14% among female children, a difference of 5 percentage points (see Table 2.4).

Niger had the most pronounced geographic disparity. The prevalence of underweight in Niger was 27% in urban areas and 47% in rural areas, a discrepancy of 20 percentage points (see Table 2.4). The geographic disparity was also substantial in Ethiopia—20% in urban areas and 37% in rural areas, a

difference of 16 percentage points. Burkina Faso, Burundi, Cameroon, Mali, and Nigeria also had an underweight prevalence that was at least 10 percentage point higher in rural than in urban areas.

The role of the household head's sex and age

In one-third of these sub-Saharan African countries, the prevalence of underweight was higher for children living with a female household head than for children living with a male household head (see Figure 2.15). Namibia experienced the most variation, with an underweight prevalence of 28% among children living with a male household head and 20% among children living with a female household head, a difference of 8 percentage points (see Table 2.4).

The prevalence of underweight was higher for children living with a household head at least age 50 in half of these countries (see Figure 2.16). Burundi (household head under age 50: 34% versus household head age 50 or older: 40%) and Namibia (20% versus 26%) had the largest variation—around six percentage points (see Table 2.4).

Variations during the last 13 years

As Table 2.4 indicates, in the last 13 years the prevalence of underweight has decreased in all 18 countries with two surveys, with the exception of Kenya. The greatest reductions occurred in Burkina Faso (2003: 38% and 2010: 30%), Rwanda (2005: 23% and 2010: 15%), and Zambia (2001-02: 28% and 2007: 19%), a difference of more than 7 percentage points in each case (see Figures 2.17 and 2.18).

Table 2.1. Percentage of children less than age 5 who are wasted, by country, sex of child, and region of residence as well as sex and age of head of household^a

Country	Sex of the child			Region of residence			Sex of household head			Age of household head		
	Male	Female	Comparison	Urban	Rural	Comparison	Male	Female	Comparison	Less than	Age 50	All
	(a)	(b)	(b)-(a)	(c)	(d)	(d)-(c)	(e)	(f)	(f)-(e)	(g)	(h)	(h)-(g)
Benin	7.4	6.8	-0.6	6.4	7.5	1.1	7.3	6.0	-1.3	6.9	9.1	2.2
Burkina Faso	14.4	12.8	-1.6	11.5	14.0	2.5	13.6	13.4	-0.2	13.6	13.8	0.2
Burundi	5.2	4.9	-0.3	4.3	5.1	0.8	4.9	5.5	0.6	5.0	4.8	-0.2
Cameroon	5.4	4.0	-1.4	2.6	6.2	3.6	5.0	3.1	-1.9	4.9	3.1	-1.8
Ethiopia	9.4	7.5	-1.9	4.7	9.0	4.3	8.8	6.9	-1.9	8.6	7.5	-1.1
Ghana	8.2	7.6	-0.6	6.1	9.0	2.9	8.3	7.0	-1.3	8.0	7.3	-0.7
Guinea	10.3	8.9	-1.4	8.5	9.9	1.4	9.8	7.5	-2.3	9.3	10.9	1.6
Kenya	6.8	4.8	-2.0	4.5	6.0	1.5	6.1	5.1	-1.0	5.7	6.1	0.4
Lesotho	3.6	3.0	-0.6	2.7	3.4	0.7	3.1	3.7	0.6	3.2	3.6	0.4
Liberia	6.4	6.3	-0.1	8.2	5.6	-2.6	6.9	5.2	-1.7	6.5	5.1	-1.4
Malawi	4.1	3.4	-0.7	2.2	4.0	1.8	3.8	3.4	-0.4	3.7	4.1	0.4
Mali	13.8	12.9	-0.9	11.9	13.9	2.0	13.3	14.3	1.0	13.3	14.1	0.8
Mozambique	5.1	4.7	-0.4	3.2	5.6	2.4	4.9	4.8	-0.1	5.0	3.4	-1.6
Namibia	6.3	7.2	0.9	4.0	8.0	4.0	6.2	7.3	1.1	6.2	8.3	2.1
Niger	11.4	9.2	-2.2	8.3	10.7	2.4	10.1	11.4	1.3	10.1	11.2	1.1
Nigeria	12.8	12.0	-0.8	9.8	13.6	3.8	12.9	8.6	-4.3	12.7	10.2	-2.5
Rwanda	3.0	1.9	-1.1	2.7	2.4	-0.3	2.2	3.4	1.2	2.3	5.5	3.2
Senegal	8.5	9.0	0.5	8.2	9.1	0.9	8.6	9.0	0.4	8.8	8.6	-0.2
Tanzania	4.5	3.8	-0.7	4.6	4.0	-0.6	4.1	4.1	0.0	4.1	4.1	0.0
Uganda	3.8	3.4	-0.4	3.2	3.7	0.5	3.8	3.1	-0.7	3.7	1.9	-1.8
Zambia	5.2	4.4	-0.8	3.8	5.1	1.3	4.6	5.5	0.9	4.8	4.7	-0.1
Zimbabwe	3.0	2.3	-0.7	2.3	2.8	0.5	2.6	2.7	0.1	2.5	3.8	1.3

Note: Children who are more than -2 standard deviations below the reference population median are defined as wasted.

^a There may be trivial discrepancies between tables because of rounding error.

Table 2.2. Percentage of children less than age 5 who are stunted, wasted, or underweight, by country and year of data collection ^a

Country	Year of data collection			Wasted			Stunted			Underweight		
	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
			Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
Benin	2001	2006	7.4	7.2	31.0	38.4	7.4	23.1	22.7	23.1	22.7	-0.4
Burkina Faso	2003	2010	18.6	13.6	38.8	30.0	-8.8	37.7	30.4	37.7	30.4	-7.3
Cameroon	2004	2011	5.1	4.6	31.8	27.8	-3.9	18.0	17.7	18.0	17.7	-0.4
Ethiopia	2005	2011	10.6	8.5	46.6	39.0	-7.7	38.5	34.8	38.5	34.8	-3.7
Ghana	2003	2008	7.1	8.0	29.9	23.4	-6.4	22.1	17.6	22.1	17.6	-4.5
Kenya	2003	2008-09	5.6	5.8	30.4	29.7	-0.8	19.9	20.4	19.9	20.4	0.5
Lesotho	2004	2009	4.2	3.4	38.1	32.0	-6.1	19.8	16.5	19.8	16.5	-3.3
Malawi	2004	2010	5.1	3.8	47.8	41.5	-6.3	22.1	17.8	22.1	17.8	-4.3
Mali	2001	2006	10.5	13.5	38.4	34.1	-4.3	33.3	31.7	33.3	31.7	-1.6
Mozambique	2003	2011	4.0	4.9	41.0	36.9	-4.1	23.7	19.5	23.7	19.5	-4.2
Namibia	2000	2006-07	9.2	6.8	23.7	24.3	0.6	24.1	21.5	24.1	21.5	-2.6
Nigeria	2003	2008	9.4	12.4	38.6	36.8	-1.8	28.9	27.2	28.9	27.2	-1.6
Rwanda	2005	2010	4.0	2.5	45.5	37.2	-8.3	22.6	15.4	22.6	15.4	-7.2
Senegal	2005	2010-11	7.6	8.7	16.4	22.4	6.0	17.4	22.9	17.4	22.9	5.5
Tanzania	2004-05	2010	3.0	4.1	37.7	35.4	-2.3	21.9	20.6	21.9	20.6	-1.2
Uganda	2006	2011	5.4	3.6	32.5	28.5	-4.0	20.7	17.2	20.7	17.2	-3.5
Zambia	2001-02	2007	5.0	4.8	46.8	39.4	-7.4	28.2	19.4	28.2	19.4	-8.8
Zimbabwe	2005-06	2010-11	6.4	2.7	29.3	26.3	-3.1	16.7	13.3	16.7	13.3	-3.3

Note: Children suffering from food deprivation are those who are stunted, wasted, or underweight (more than -2 standard deviations below the reference population median).

^a There may be trivial discrepancies between tables because of rounding error.

Table 2.3. Percentage of children less than age 5 who are stunted, by country, sex of child, and region of residence as well as sex and age of head of household^a

Country	Sex of child			Region of residence			Sex of household head			Age of household head		
	Male	Female	Comparison	Urban	Rural	Comparison	Male	Female	Comparison	Less than age 50	Age 50 or more	All children
	(a)	(b)	(b)-(a)	(c)	(d)	(d)-(c)	(e)	(f)	(f)-(e)	(g)	(h)	(h)-(g)
Benin	40.8	35.6	-5.2	32.7	41.3	8.6	38.3	37.9	-0.4	37.9	41.4	3.5
Burkina Faso	31.6	28.0	-3.6	17.7	32.3	14.6	30.2	26.1	-4.1	29.9	29.1	-0.8
Burundi	54.0	47.3	-6.7	31.0	52.6	21.6	50.9	49.9	-1.0	50.7	51.0	0.3
Cameroon	29.2	26.4	-2.8	17.5	35.5	18.0	28.2	25.6	-2.6	28.0	26.4	-1.6
Congo (Brazzaville)	27.8	24.3	-3.5	22.4	29.2	6.8	25.8	27.4	1.6	25.2	31.6	6.4
Congo Democratic Republic	42.6	37.7	-4.9	31.9	45.6	13.7	39.0	45.8	6.8	40.4	36.3	-4.1
Ethiopia	39.5	38.1	-1.4	26.0	40.6	14.6	38.8	39.1	0.3	38.7	39.6	0.9
Ghana	24.1	22.5	-1.6	17.3	27.1	9.8	23.2	23.7	0.5	23.0	25.4	2.4
Guinea	36.6	33.1	-3.5	22.4	38.5	16.1	34.7	36.4	1.7	35.2	33.3	-1.9
Kenya	30.7	28.4	-2.3	21.5	31.2	9.7	28.9	31.4	2.5	29.1	34.4	5.3
Lesotho	34.4	29.5	-4.9	25.0	33.4	8.4	30.9	34.4	3.5	32.0	31.9	-0.1
Liberia	37.8	31.9	-5.9	25.9	38.9	13.0	35.2	34.5	-0.7	35.1	34.1	-1.0
Madagascar	47.7	43.0	-4.7	37.1	46.4	9.3	45.2	46.3	1.1	45.9	38.6	-7.3
Malawi	44.5	38.7	-5.8	34.7	42.8	8.1	41.5	42.4	0.9	41.7	39.2	-2.5
Mali	35.4	32.6	-2.8	23.8	38.0	14.2	34.2	31.9	-2.3	34.1	33.1	-1.0
Mozambique	37.9	35.4	-2.5	28.9	39.6	10.7	37.2	35.4	-1.8	36.9	33.5	-3.4
Namibia	25.2	23.2	-2.0	20.2	26.1	5.9	23.5	24.9	1.4	23.3	26.8	3.5
Niger	51.3	48.5	-2.8	31.3	53.2	21.9	49.6	51.8	2.2	50.9	45.9	-5.0
Nigeria	38.5	35.0	-3.5	27.4	41.2	13.8	37.4	31.3	-6.1	36.7	37.1	0.4
Rwanda	38.6	35.7	-2.9	20.5	39.4	18.9	37.2	37.1	-0.1	37.2	36.9	-0.3
Sao Tomé and Príncipe	25.5	24.7	-0.8	24.2	26.2	2.0	25.3	24.8	-0.5	25.3	22.4	-2.9
Senegal	23.2	21.5	-1.7	15.1	27.0	11.9	23.3	18.9	-4.4	22.8	21.6	-1.2
Sierra Leone	35.5	31.6	-3.9	26.3	36.2	9.9	33.3	34.6	1.3	33.2	34.9	1.7
Swaziland	26.5	21.9	-4.6	18.0	25.4	7.4	23.8	24.5	0.7	22.9	27.5	4.6
Tanzania	37.3	33.6	-3.7	25.6	37.8	12.2	35.2	36.5	1.3	35.4	35.5	0.1
Uganda	30.7	26.1	-4.6	14.3	30.5	16.2	28.8	27.3	-1.5	28.8	23.6	-5.2
Zambia	41.4	37.3	-4.1	33.4	41.7	8.3	39.4	39.2	-0.2	39.1	42.7	3.6
Zimbabwe	28.1	24.2	-3.9	22.2	27.4	5.2	25.2	27.4	2.2	26.1	26.6	0.5

Note: Children who are more than -2 standard deviations below the reference population median are defined as stunted.

^a There may be trivial discrepancies between tables because of rounding error.

Table 2.4. Percentage of children less than age 5 who are underweight, by country, sex of child, and region of residence as well as sex and age of head of household^a

Country	Sex of child			Region of residence			Sex of household head			Age of household head			
	Male (a)	Female (b)	Comparison (b)-(a)	Urban (c)	Rural (d)	Comparison (d)-(c)	Male (e)	Female (f)	Comparison (f)-(e)	Less than age 50 (g)	Age 50 or more (h)	Comparison (h)-(g)	All children
Benin	24.2	20.9	-3.3	18.2	24.9	6.7	22.8	20.9	-1.9	22.1	26.9	4.8	22.6
Burkina Faso	31.0	29.6	-1.4	19.7	32.4	12.7	30.6	27.5	-3.1	30.2	31.0	0.8	30.3
Burundi	35.6	32.3	-3.3	21.8	35.1	13.3	33.6	35.6	2.0	33.7	39.7	6.0	34.0
Cameroon	18.1	17.1	-1.0	9.4	23.9	14.5	18.6	12.7	-5.9	18.4	13.3	-5.1	17.6
Ethiopia	35.1	33.8	-1.3	20.3	36.5	16.2	34.8	32.9	-1.9	34.6	33.3	-1.3	34.5
Ghana	17.8	17.1	-0.7	14.2	19.5	5.3	17.6	17.2	-0.4	17.0	20.6	3.6	17.5
Guinea	27.0	24.9	-2.1	18.6	28.1	9.5	26.2	23.4	-2.8	26.0	25.7	-0.3	25.9
Kenya	20.7	19.8	-0.9	12.5	21.8	9.3	20.8	18.9	-1.9	20.1	22.0	1.9	20.2
Lesotho	18.9	13.8	-5.1	13.0	17.1	4.1	16.9	15.2	-1.7	16.5	16.0	-0.5	16.4
Liberia	24.3	23.1	-1.2	21.0	24.9	3.9	24.3	22.4	-1.9	23.7	24.0	0.3	23.7
Malawi	19.0	16.7	-2.3	14.8	18.4	3.6	17.6	20.2	2.6	17.8	17.4	-0.4	17.8
Mali	32.5	30.7	-1.8	24.1	34.5	10.4	31.6	32.0	0.4	32.0	28.7	-3.3	31.6
Mozambique	20.2	18.3	-1.9	13.8	21.3	7.5	19.3	19.0	-0.3	19.6	15.5	-4.1	19.2
Namibia	21.9	20.8	-1.1	15.2	24.3	9.1	19.7	23.1	3.4	19.7	25.8	6.1	21.4
Niger	44.8	43.8	-1.0	27.3	47.3	20.0	43.9	46.2	2.3	44.7	42.8	-1.9	44.3
Nigeria	28.0	26.3	-1.7	19.2	30.9	11.7	28.0	20.2	-7.8	27.5	24.7	-2.8	27.2
Rwanda	16.1	14.5	-1.6	9.7	16.1	6.4	15.0	16.3	1.3	15.1	19.5	4.4	15.3
Senegal	23.0	22.9	-0.1	17.6	26.4	8.8	23.8	19.7	-4.1	23.0	23.0	0.0	23.0
Tanzania	21.5	19.7	-1.8	15.6	21.9	6.3	20.2	22.6	2.4	20.7	20.1	-0.6	20.6
Uganda	17.6	16.4	-1.2	9.2	18.2	9.0	16.9	17.3	0.4	17.2	14.3	-2.9	17.0
Zambia	20.9	17.9	-3.0	16.8	20.4	3.6	19.5	19.0	-0.5	19.1	23.3	4.2	19.4
Zimbabwe	14.2	12.4	-1.8	10.2	14.3	4.1	13.2	13.4	0.2	13.0	15.3	2.3	13.3

Note: Children who are more than -2 standard deviations below the reference population median are defined as underweight.

^a There may be trivial discrepancies between tables because of rounding error.

Figure 2.1. Percentage of children less than age 5 who are wasted, by country and the child's sex

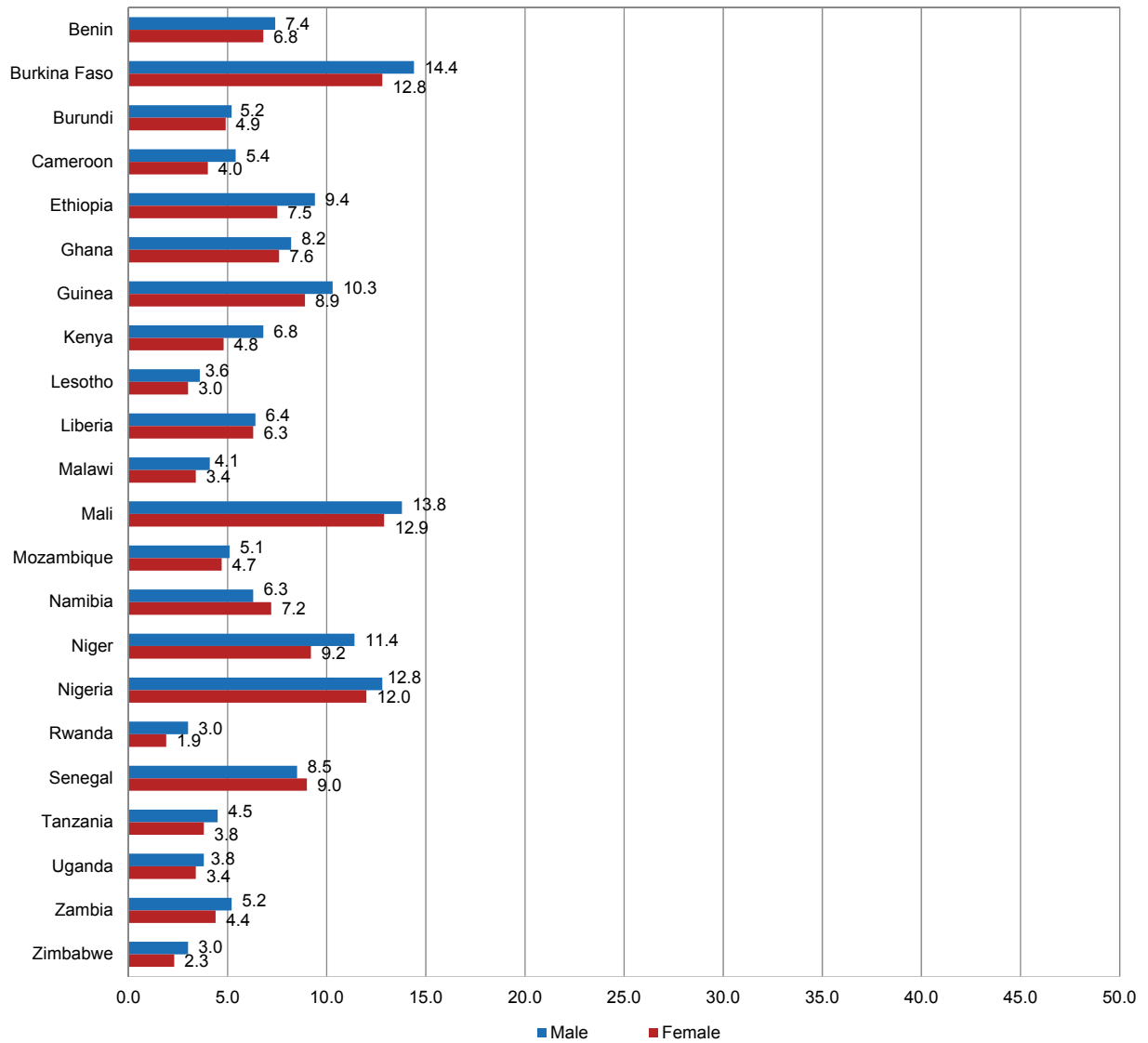
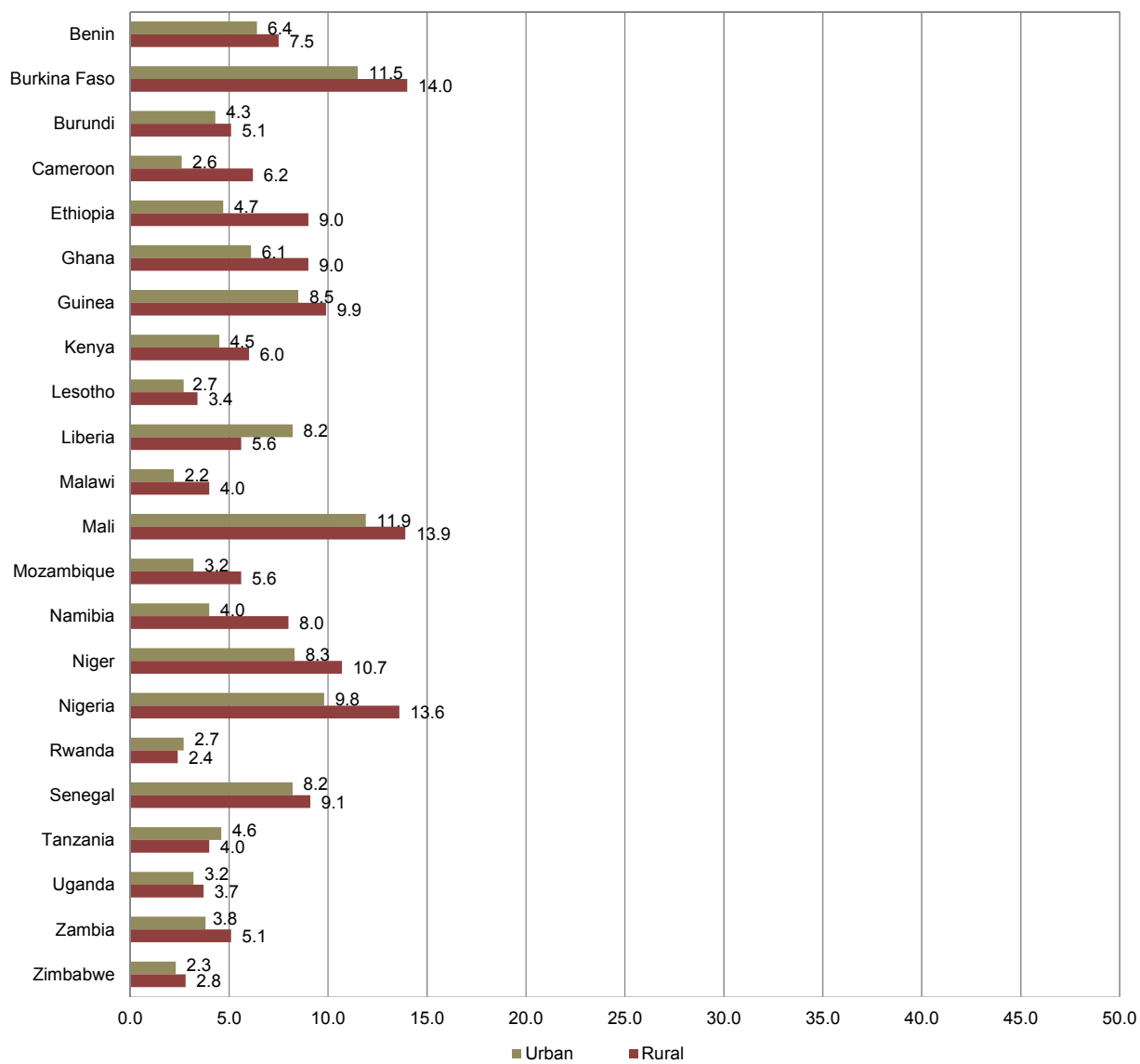
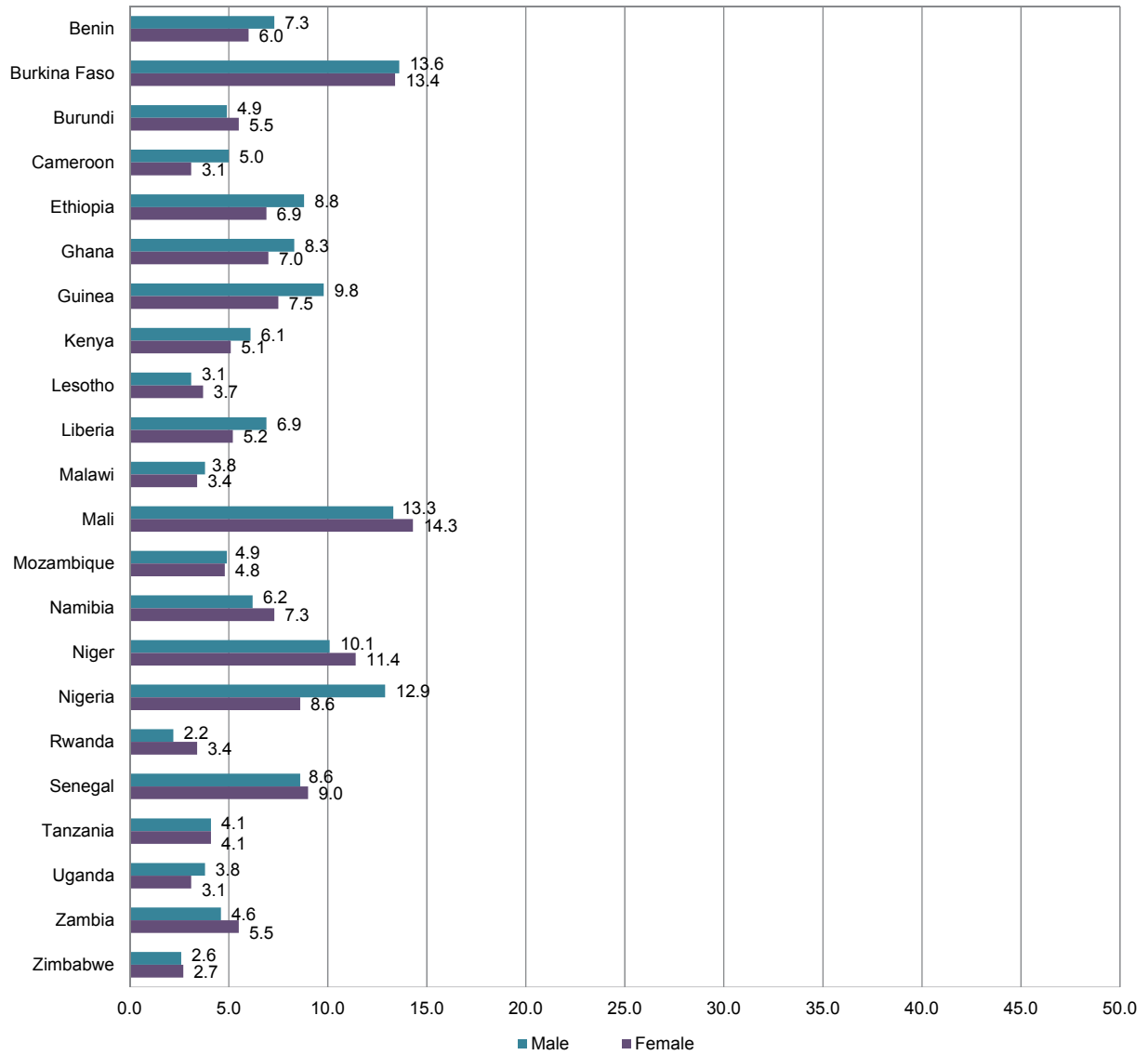


Figure 2.2. Percentage of children less than age 5 who are wasted, by country and region of residence



**Figure 2.3. Percentage of children less than age 5 who are wasted ,
by country and the sex of the household head**



**Figure 2.4. Percentage of children less than age 5 who are wasted ,
by country and the age of the household head**

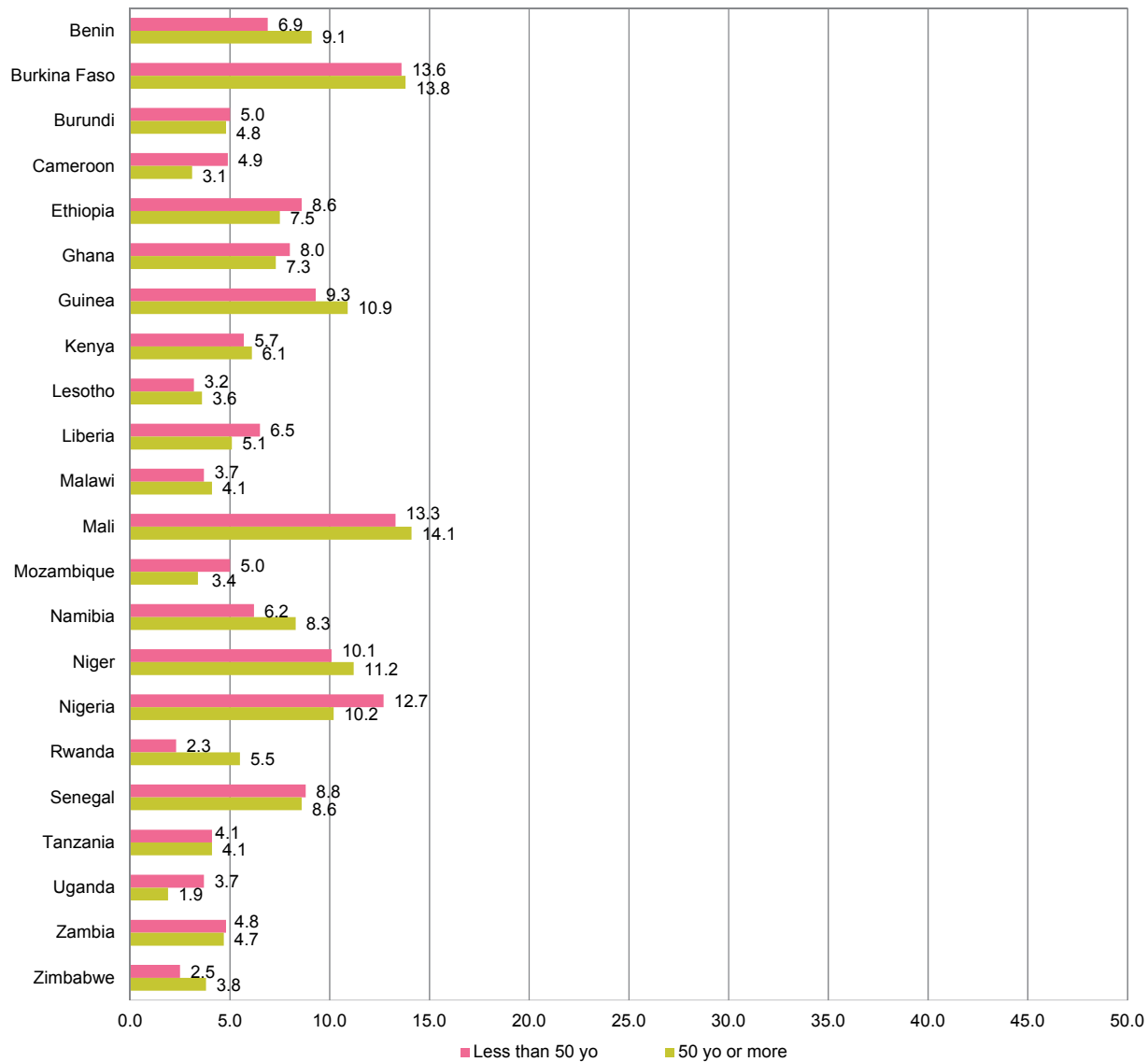


Figure 2.5. Changes in the percentage of children less than age 5 who are wasted

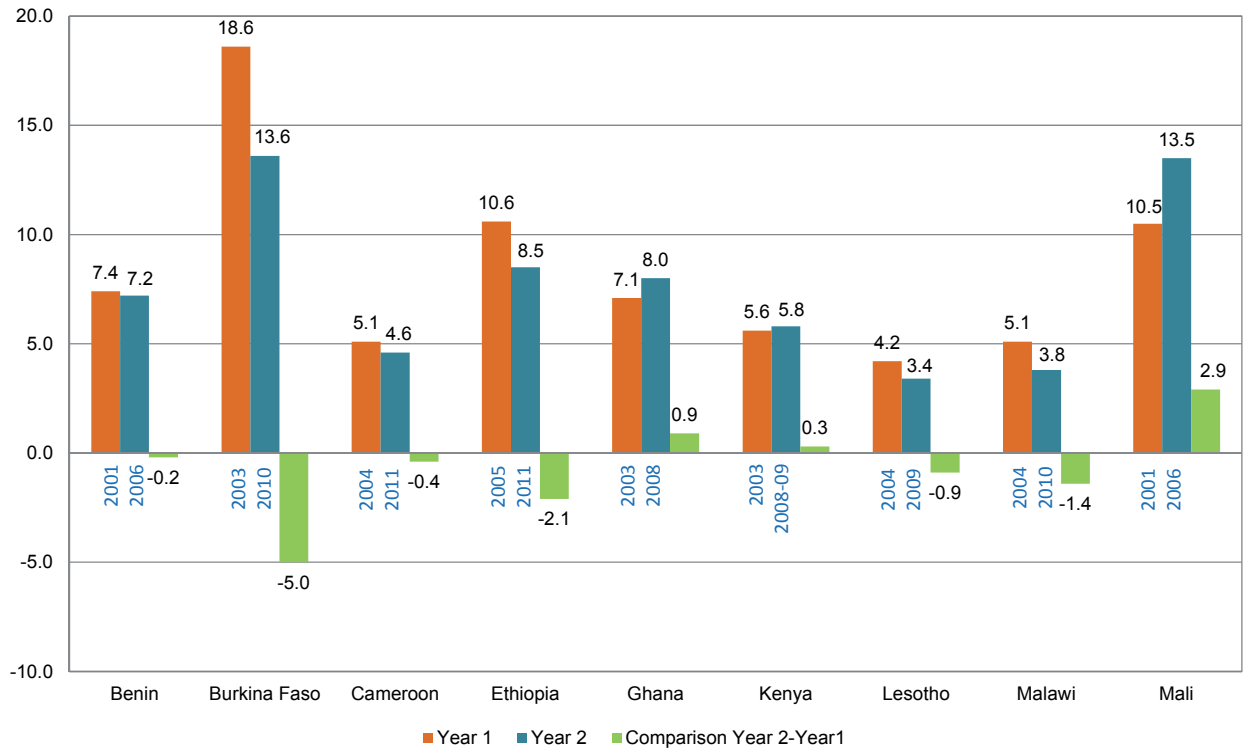


Figure 2.6. Changes in the percentage of children less than age 5 who are wasted

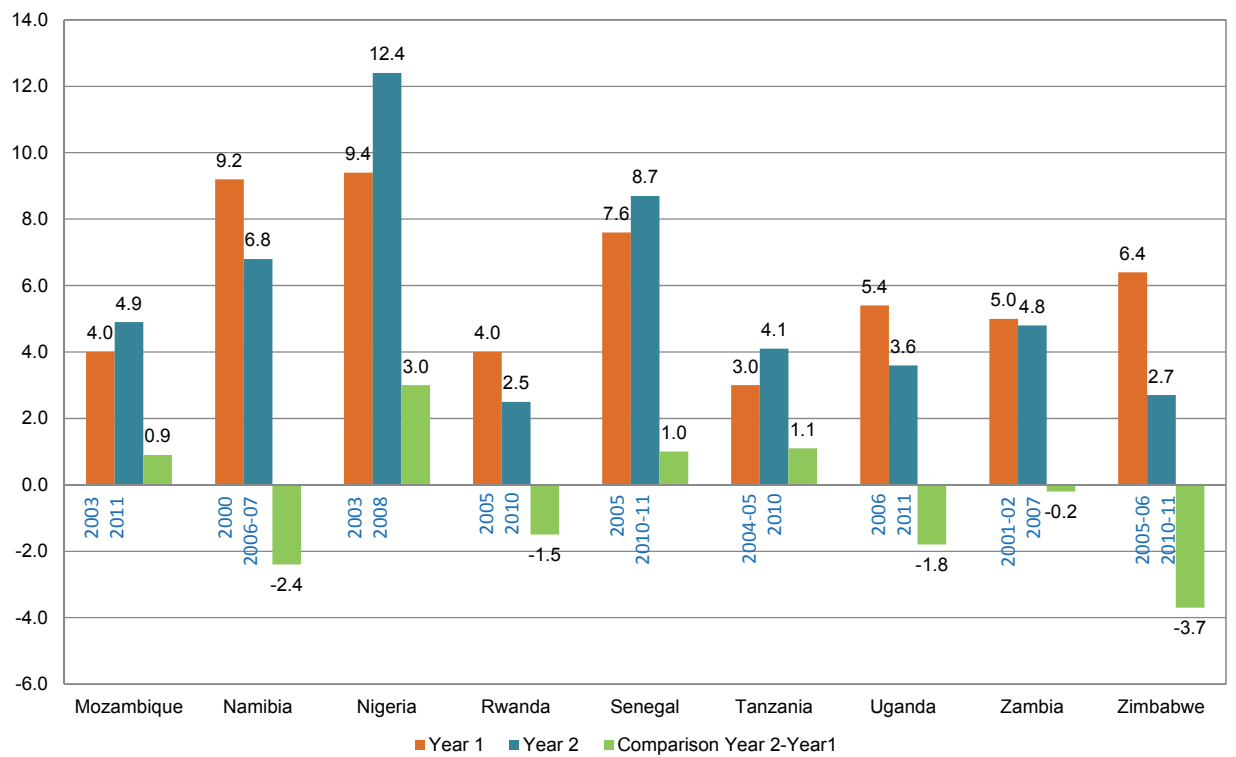


Figure 2.7. Percentage of children less than age 5 who are stunted, by country and the child's sex

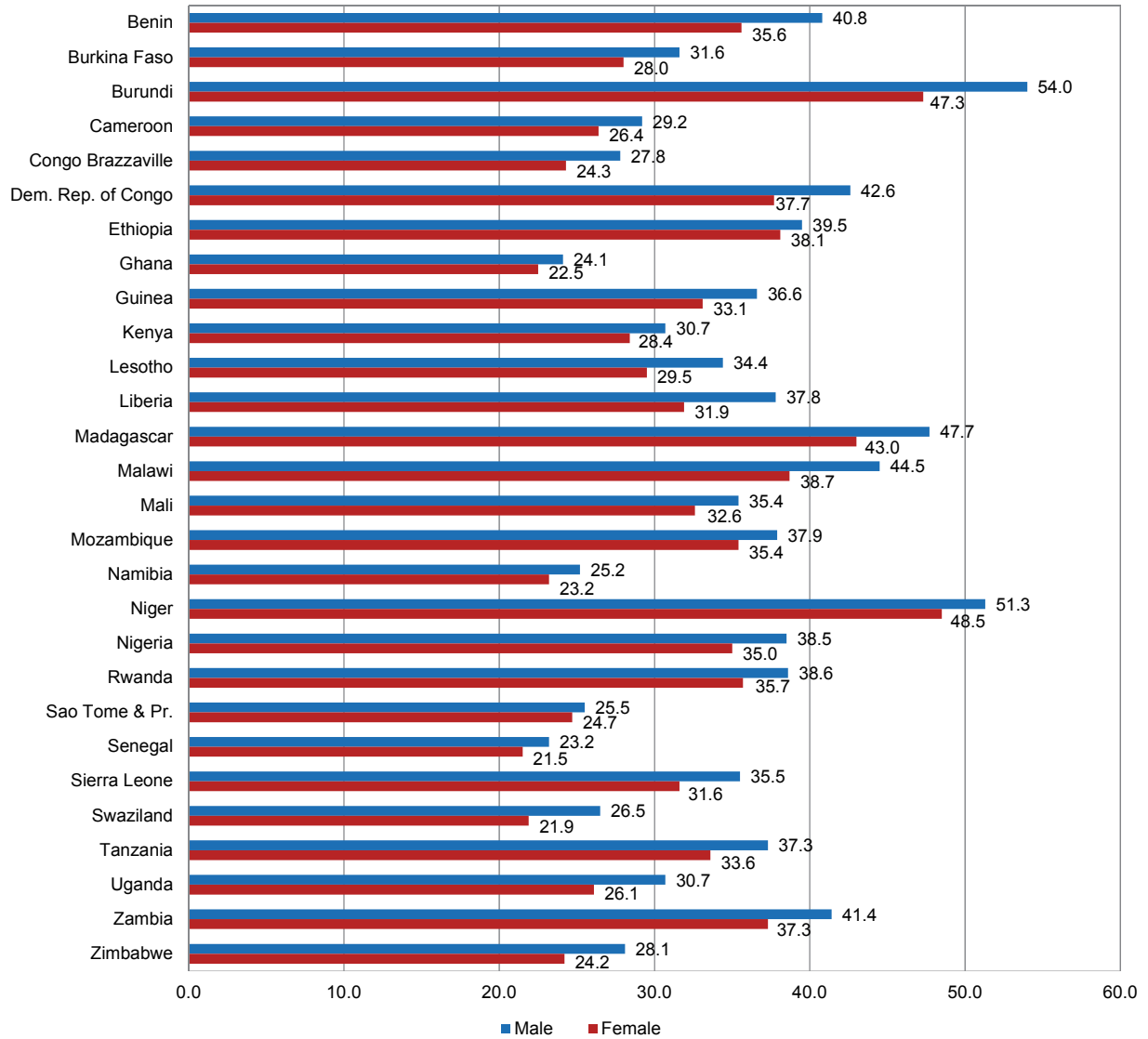


Figure 2.8. Percentage of children less than age 5 who are stunted, by country and the region of residence

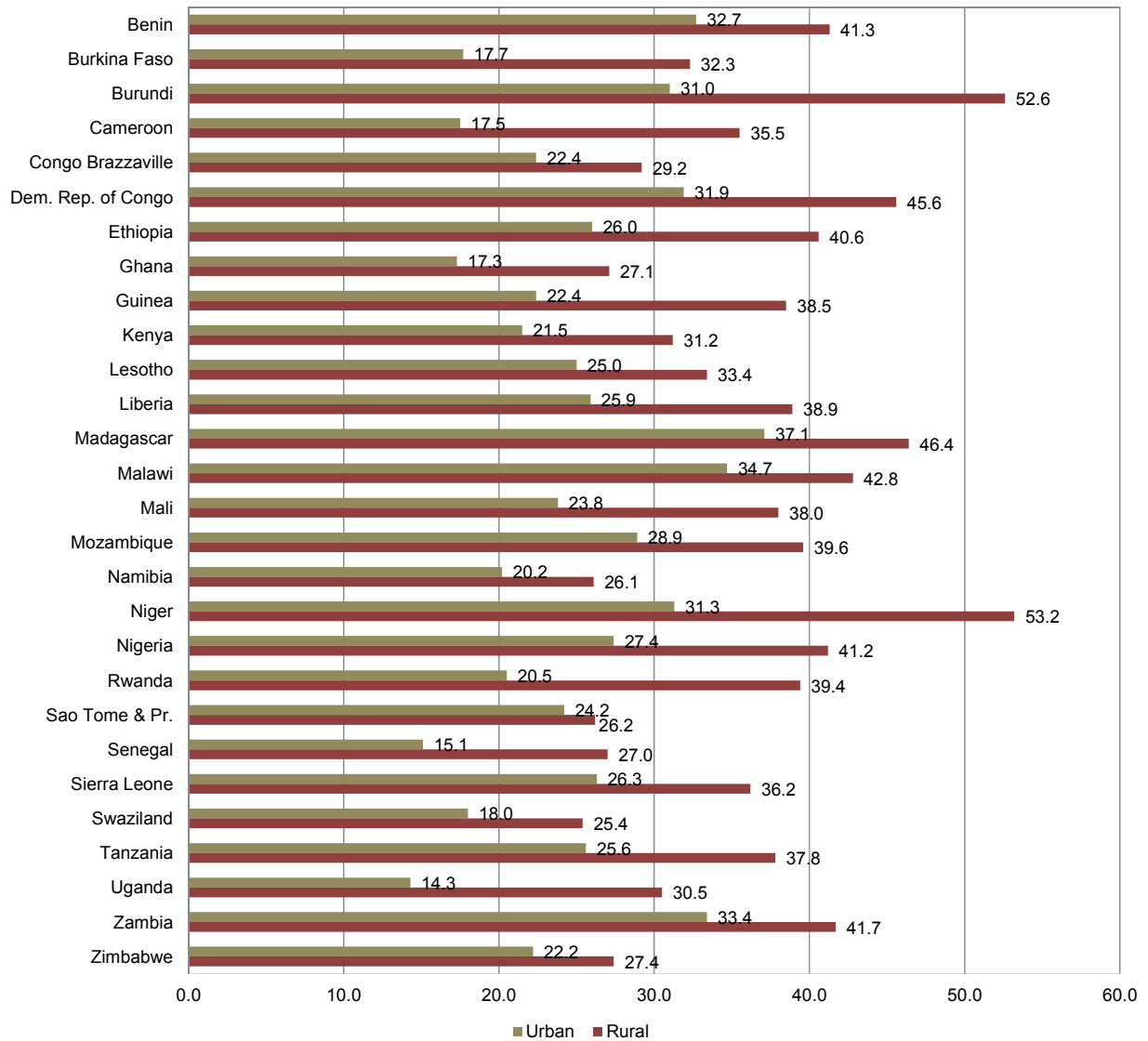


Figure 2.9. Percentage of children less than age 5 who are stunted, by country and the sex of the household head

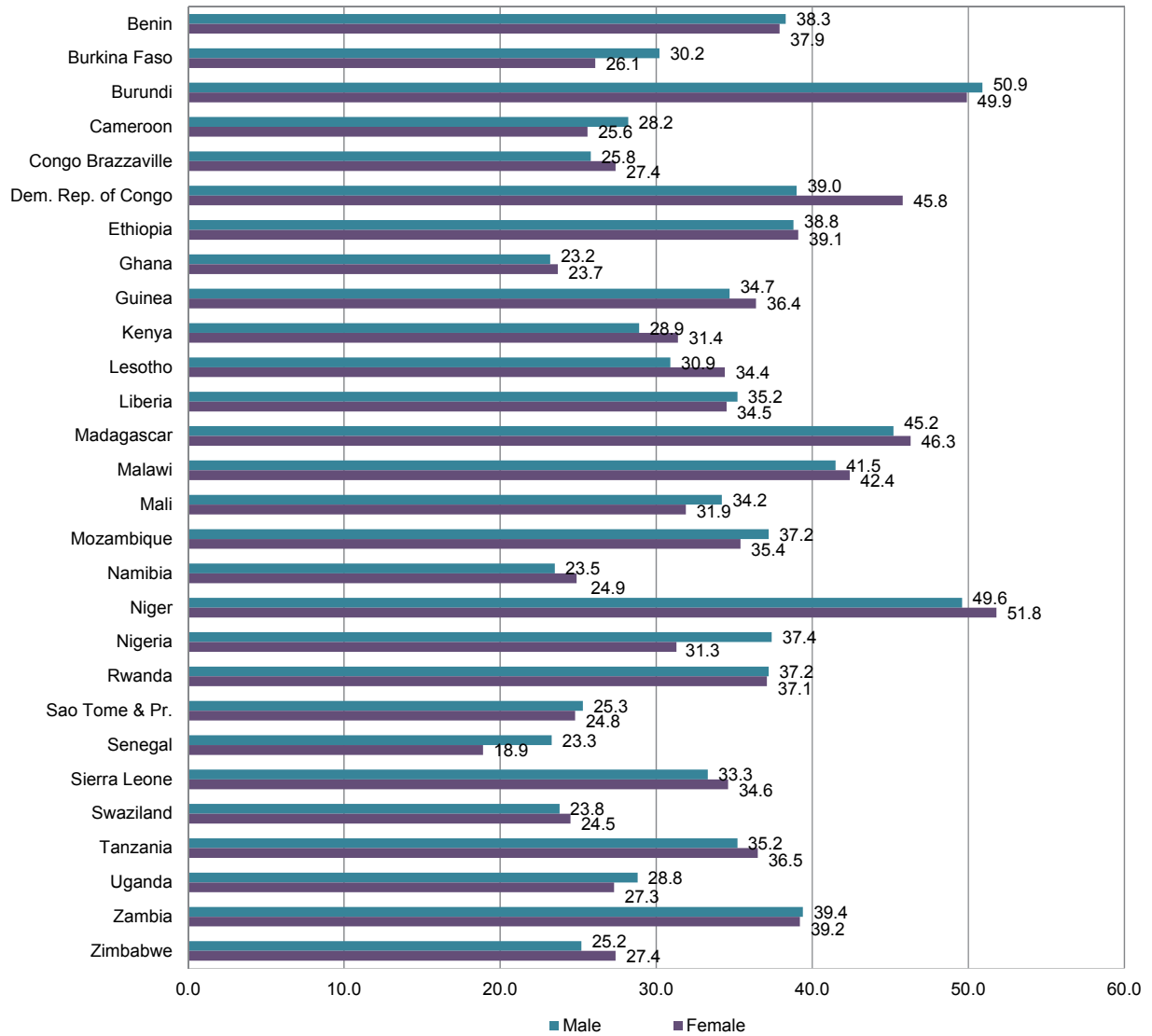


Figure 2.10. Percentage of children less than age 5 who are stunted, by country and the age of the household head

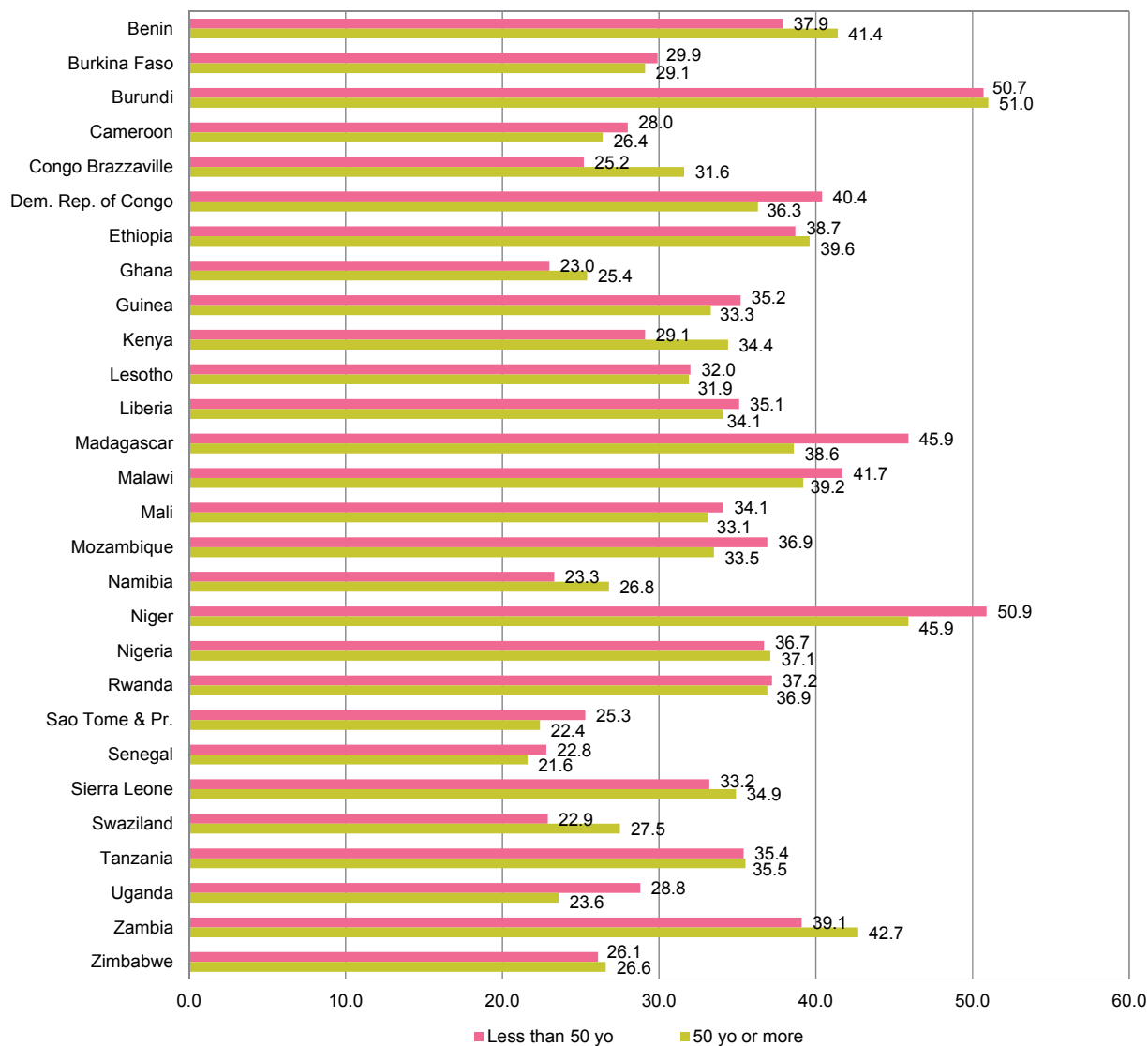


Figure 2.11. Changes in the percentage of children less than age 5 who are stunted

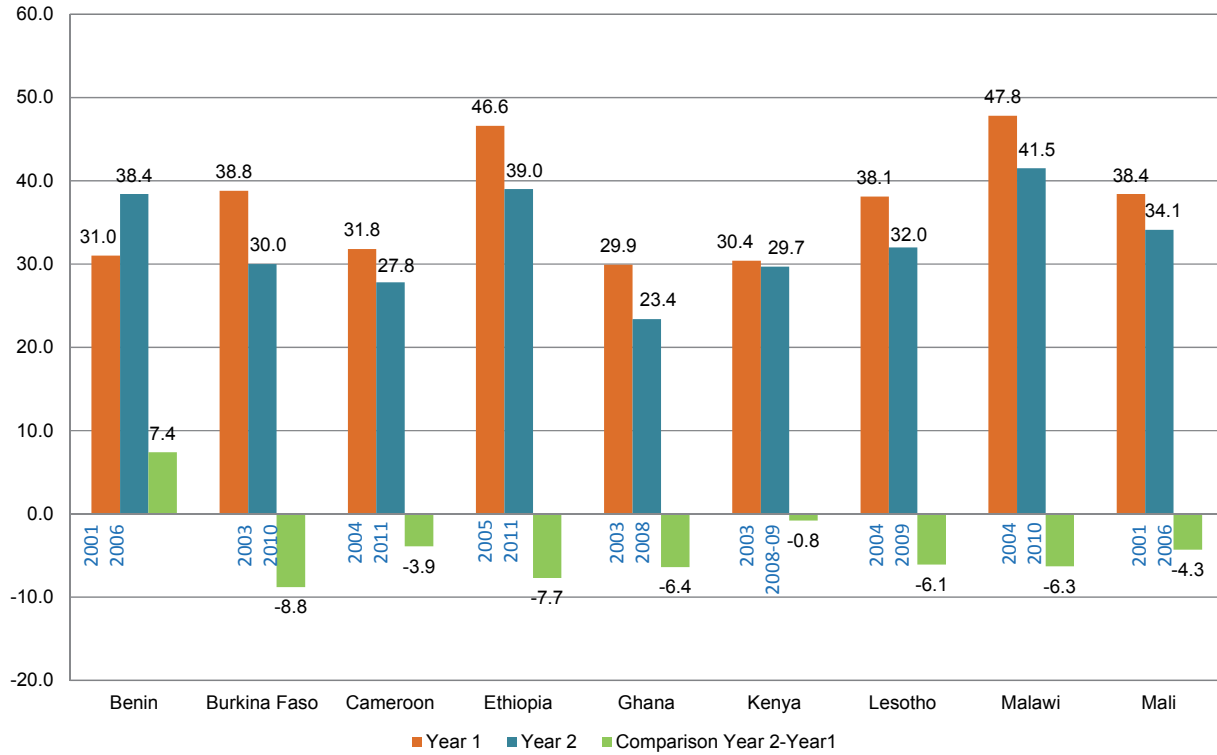


Figure 2.12. Changes in the percentage of children less than age 5 who are stunted

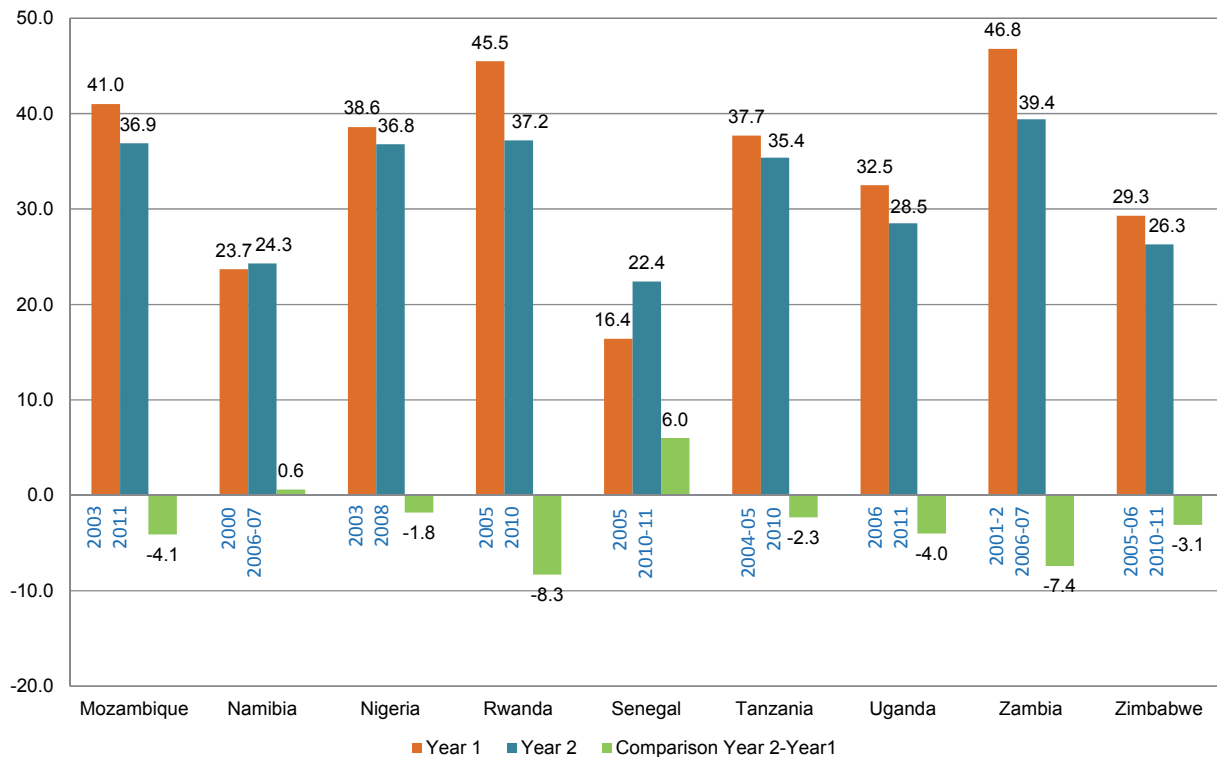


Figure 2.13. Comparison of the percentage of children less than age 5 who are underweight, by country and the child's sex

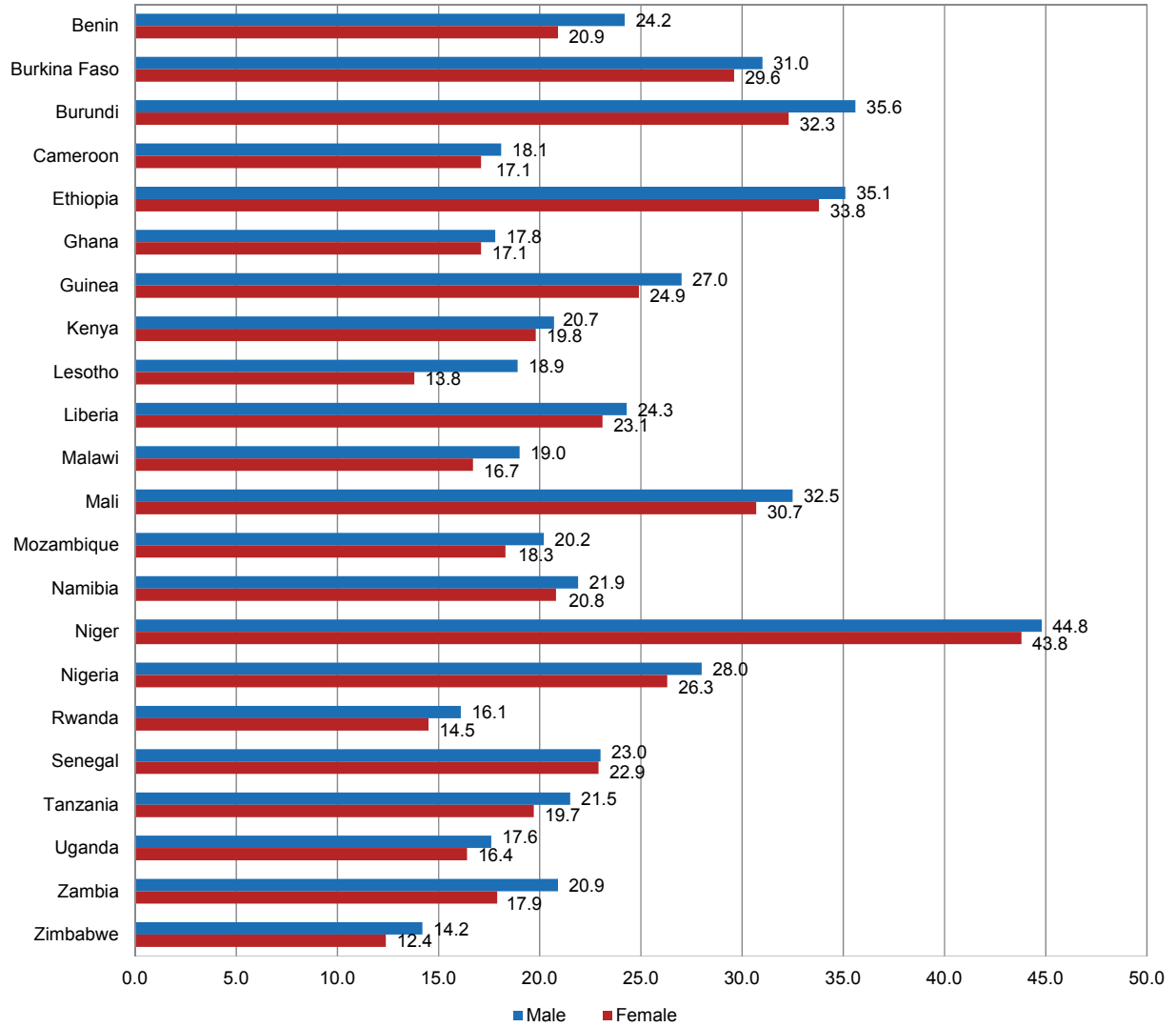


Figure 2.14. Comparison of the percentage of children less than age 5 who are underweight, by country and region of residence

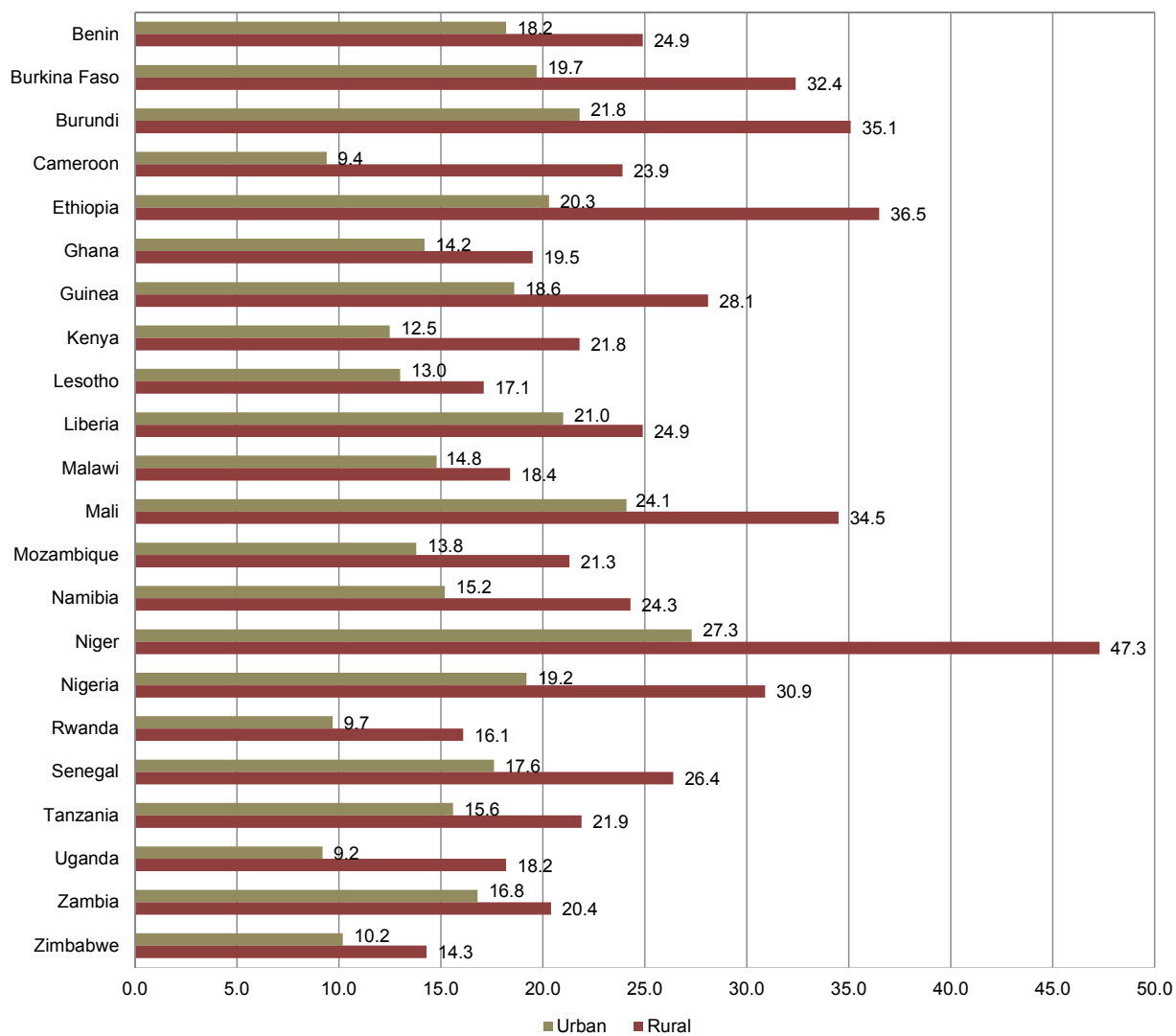


Figure 2.15. Comparison of the percentage of children less than age 5 who are underweight, by country and the sex of the household head

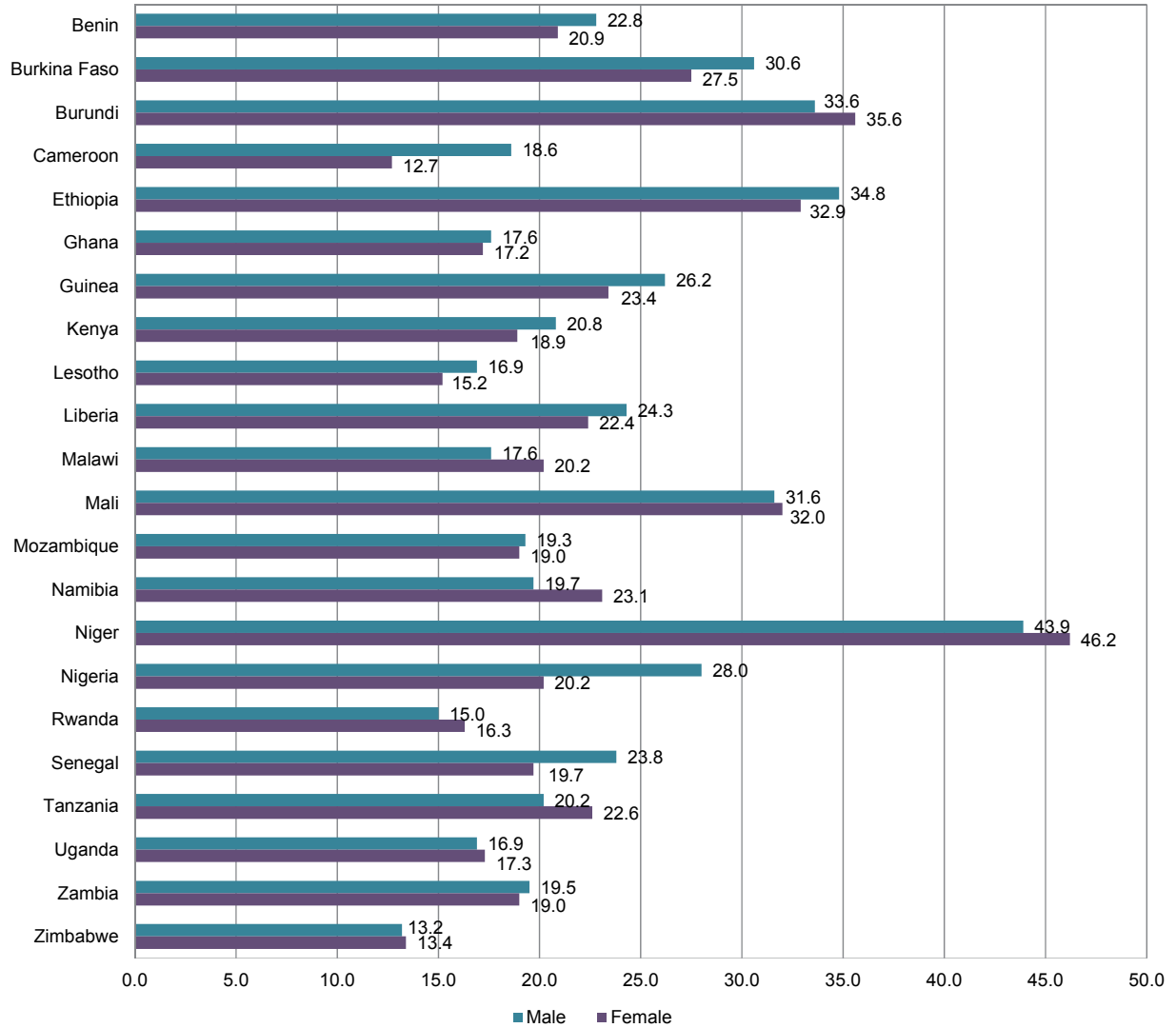


Figure 2.16. Comparison of the percentage of children less than age 5 who are underweight, by country and the age of the household head

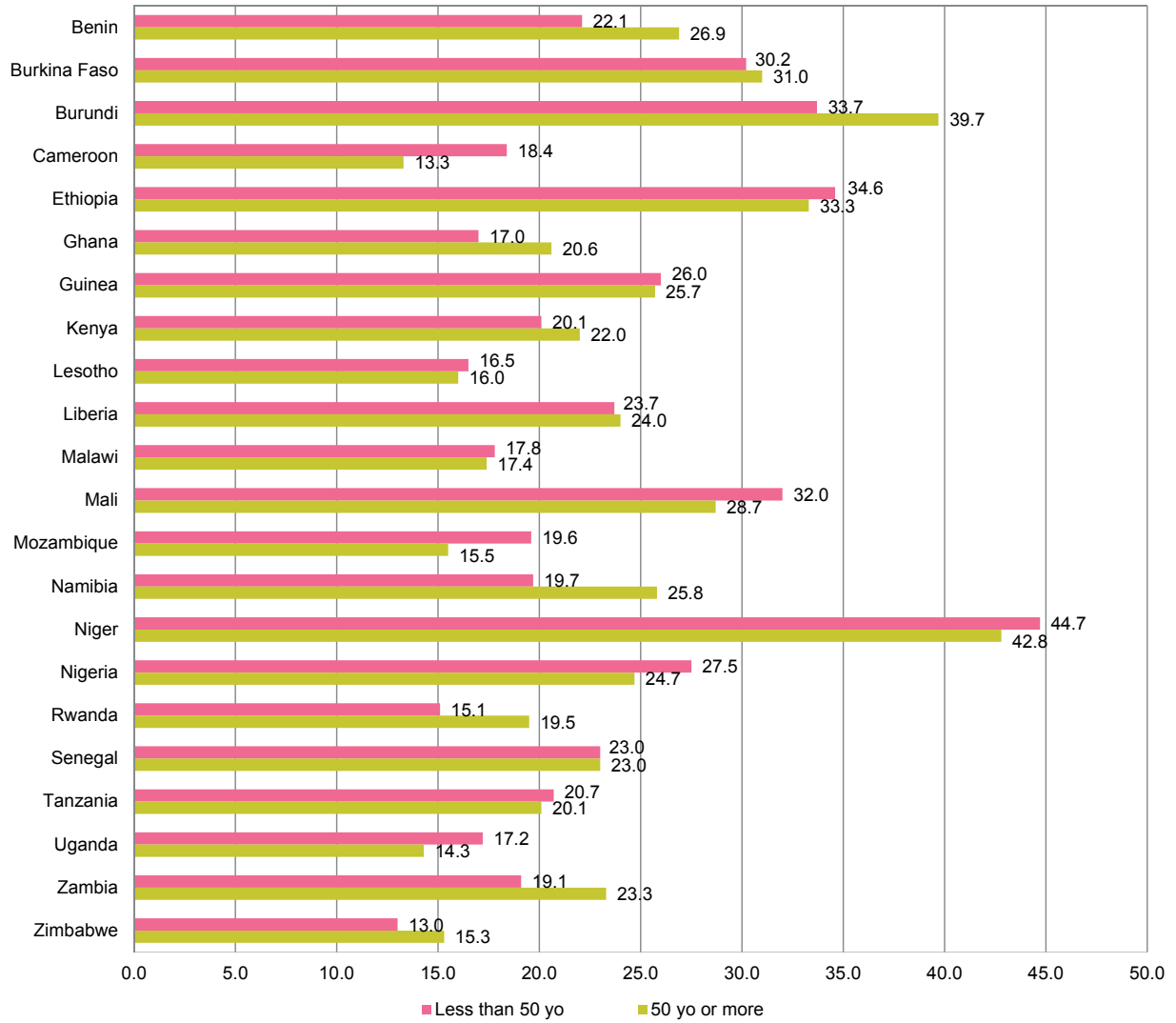


Figure 2.17. Changes in the percentage of children less than age 5 who are underweight

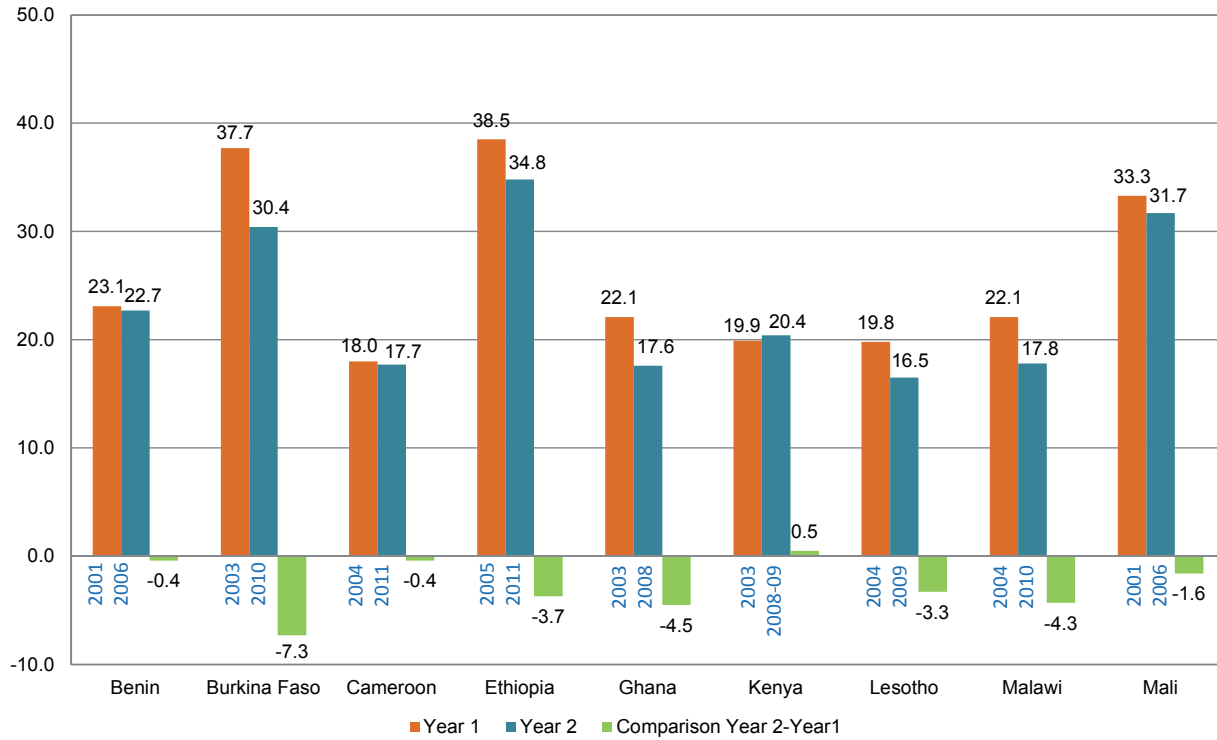
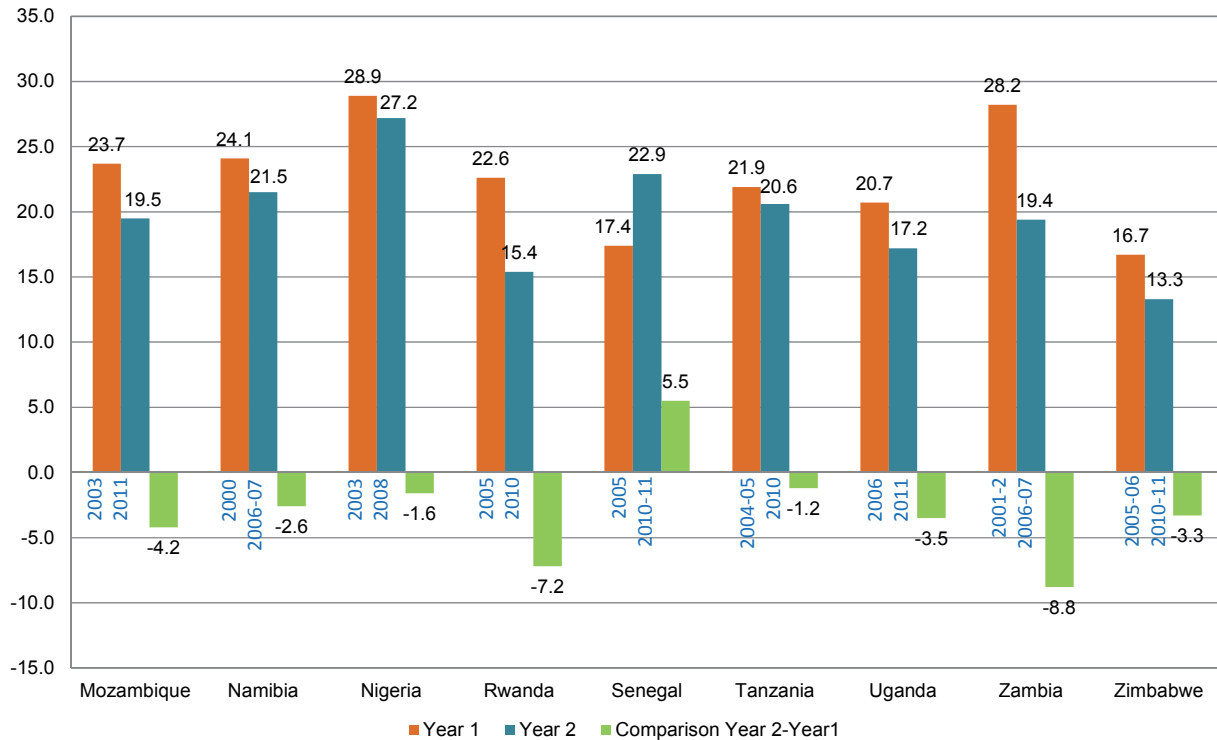
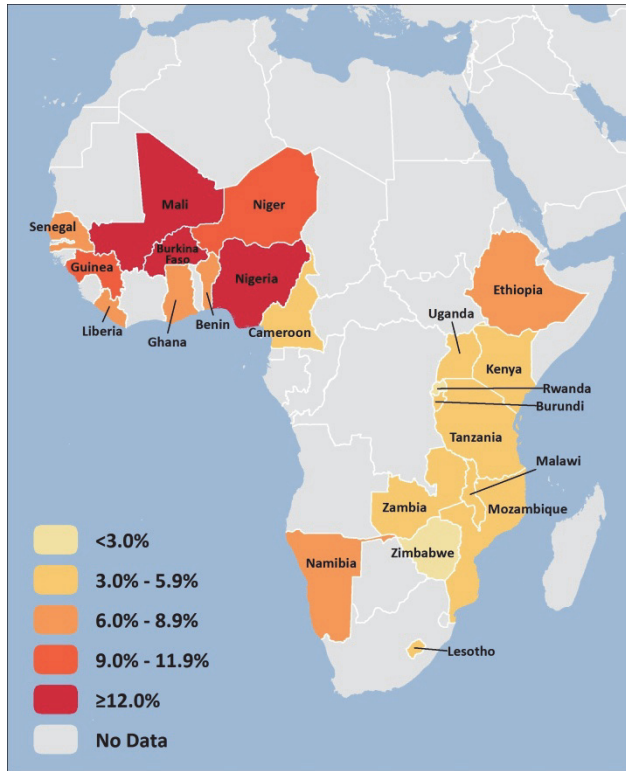


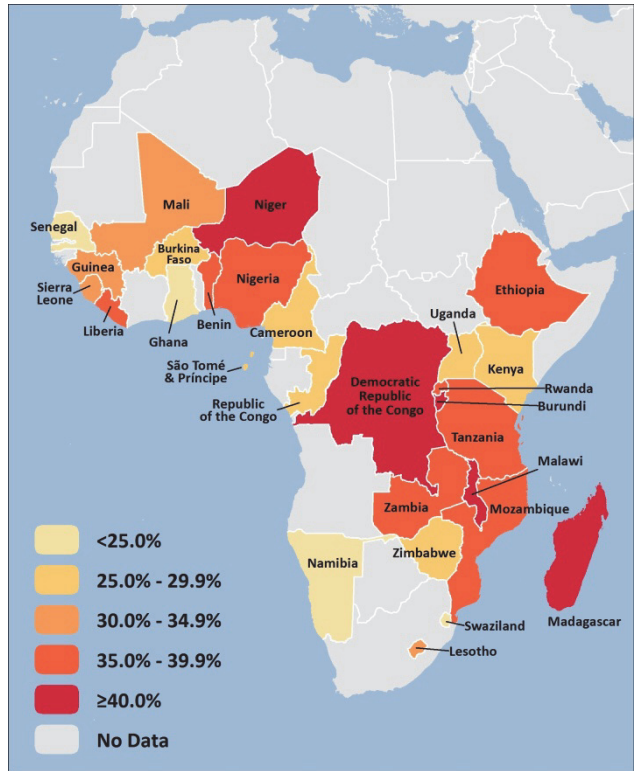
Figure 2.18. Changes in the percentage of children less than age 5 who are underweight



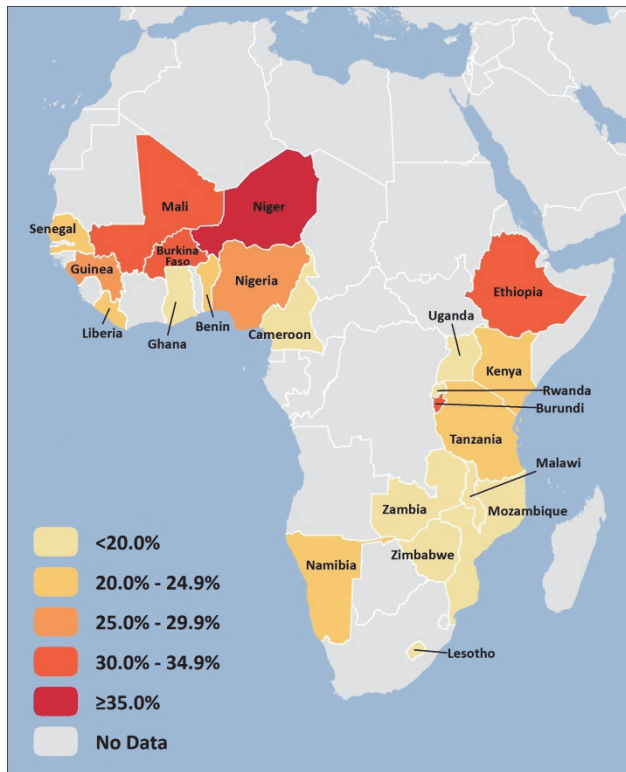
Map 2.1 Percentage of children less than age 5 who are wasted



Map 2.2 Percentage of children less than age 5 who are stunted



Map 2.3 Percentage of children less than age 5 who are underweight



3 Health Deprivation

3.1 Expanded Program on Immunization

Even though immunization is one of the most cost-effective public health strategies for reducing child morbidity and mortality; in 2010 about 1.5 million people died worldwide from diseases that could have been prevented with vaccinations (Bloom, 2011; Centers for Disease Control and Prevention, 2006). African governments in particular face multiple barriers that limit levels of child vaccination, including the need for vaccine promotion campaigns, irregular demand for immunization, problems with quality of service delivery, public mistrust of the health system, insufficient personnel, insufficient access to vaccines, timeliness of vaccinations, lack of infrastructure, and insufficient program monitoring and evaluation (Rainey et al., 2011; Wiysonge et al., 2012). On the level of the individual, researchers have associated the lack of immunization with poverty, uneducated parents, insufficient parental access to the media, and mothers with little health-seeking behavior (Favin et al., 2012). Clustering effects for non-immunization are present at both community and country levels, which is to say that children in the same community tend to have similar immunization status (Favin et al., 2012).

The eight recommended EPI vaccines include the following:

- the BCG vaccine, which protects against tuberculosis (TB) and is given only once
- the oral polio vaccine (OPV), given in four doses numbered 0 to 3
- the diphtheria, pertussis, tetanus vaccine (DPT), combined in a single preparation with the hepatitis B vaccine and the *Haemophilus influenzae* type B vaccine to constitute the pentavalent vaccine, and given to children in three doses
- the measles vaccine, given only once

This section focuses on children less than age 5 who did not receive any of the eight vaccines included in the WHO Expanded Program on Immunization (EPI). Since immunizations start soon after birth, any child, regardless of age, could be counted in the category of those who received no immunizations. Because of the recommended vaccination schedule, no six month old is fully immunized. For this reason, we did not include the *fully immunized* status (nine EPI vaccines) in the report, because it excluded a large proportion of the children (Gordon et al., 2003).

As shown in Map 3.1, there were wide inter- and intra-country differences in the percentage of children who did not receive any of the EPI vaccines. The percentage of children who did not receive any vaccine ranged from 11% in Rwanda to 77% in Ethiopia (see Table 3.1). Over half of the children in seven sub-Saharan African countries had not received any vaccines. This problem was most severe in Ethiopia, Niger, Nigeria, and Zambia, where more than 70% of children had not received any vaccine. Rwanda (11%) and Burundi (14%) had the lowest percentage of children who had not received any EPI vaccines.

Sex and geographic disparities

Overall, the percentages of boys and girls who had not received any EPI vaccines were similar in these countries (Table 3.1, Figure 3.1). Only Zimbabwe and Liberia showed as much as a two percentage point difference between the sexes.

In every country except Burundi, the percentage of children who had not received any EPI vaccine was higher in rural areas than in urban areas (Figure 3.2). This inequality was most pronounced in Ethiopia, Liberia, Niger, and Nigeria, all with percentage point differences of 25 or more between urban

and rural children (Table 3.1). This geographic disparity was absent in Burundi, where 14% of children in urban areas and 14% in rural areas had not received any EPI vaccine.

The role of the household head's sex and age

In over half of these countries, the percentage of children who had not received any EPI vaccine was lower for children living with a female household head than for children living with a male household head (Figure 3.3). This difference proved most pronounced in Benin (8 percentage points), Cameroon (9 percentage points), and Nigeria (11 percentage points) (see Table 3.1). Conversely, the percentage of children who had not received any EPI vaccines was four percentage points higher for children living with a female household head than with a male household head in Guinea and Uganda and six percentage points higher in Madagascar. The difference between children living with a female household head and those living with a male household head was less than one percentage point in Ethiopia, Lesotho, Namibia, Niger, Zambia, and Zimbabwe.

In 17 countries the percentage of children who had not received any EPI vaccines was higher for those living with a household head at least age 50 than for children living with a household head who was younger than age 50 (Figure 3.4). This difference was most pronounced in Kenya (10 percentage points) and Madagascar (8 percentage points) (see Table 3.1). The percentages of children in Benin, Burkina Faso, Guinea, Lesotho, and Tanzania who had not received any EPI vaccines differed less than one percentage point by the age of the head of household.

Variations during the last 13 years

With two exceptions, every country saw a reduction in the percentage of children who had not received any EPI vaccines. The exceptions were Zambia (2001-02: 40% and 2007: 70%, an increase of 31 percentage points) and Benin (2001: 41% and 2006: 46%, an increase of 4 percentage points) (see Table 3.2). Lesotho did not experience any change between 2004 and 2009. Substantial reductions—more than 30 percentage points—in the percentage of children who had not received any EPI vaccines took place in Burkina Faso (2003: 56% and 2010: 23), Tanzania (2004-05: 63% and 2010: 26%), and Uganda (2006: 82% and 2011: 41%) (see Figures 3.5 and 3.6).

3.2 Diarrhea

Diarrhea¹ is one of the principal causes of morbidity and mortality among children in the developing world (Kosek et al., 2003). Infectious diarrhea, the most common form of diarrhea worldwide, may result from one of several viruses (e.g., rotavirus, enteric adenovirus, norovirus, enteroviruses, caliciviruses, and astroviruses), bacteria (e.g., enterotoxigenic *Escherichia coli* (ETEC) and *Campylobacter jejuni*), or protozoa (e.g., *Cryptosporidium parvum*, *Giardia lamblia*, and *Entamoeba histolytica*) (Cooke, 2010; Nkrumah and Nguah, 2011; Vilchez et al., 2009). Non-infectious diarrhea may originate from toxins, poisons, drugs, or food allergens (Njume and Goduka, 2012).

Each year an estimated nine million children around the world, most of them less than age 5, die due to diarrhea (WHO, 2009). Worldwide, more young children die from diarrhea than from malaria, acquired immunodeficiency syndrome (AIDS), and tuberculosis combined (Mwambete and Joseph,

¹ According to Guerrant et al. (2001), “*Diarrhea* is an alteration in a normal bowel movement characterized by an increase in the water content, volume, or frequency of stools. A decrease in consistency (i.e., soft or liquid) and an increase in frequency of bowel movements to >3 stools per day have often been used as a definition for epidemiological investigations. *Infectious diarrhea* is diarrhea due to an infectious etiology, often accompanied by symptoms of nausea, vomiting, or abdominal cramps. *Acute diarrhea* is an episode of diarrhea of <14 days in duration. *Persistent diarrhea* is diarrhea of ≥14 days in duration.

2010). Acute diarrhea can lead to severe dehydration; persistent diarrhea can predispose children to malnutrition and make them more vulnerable to other infectious diseases (Briend, 1990; Peterson Zwane and Kremer, 2007). HIV status; the socioeconomic status of the family; and community factors such as immunization coverage, health care access, and the quality of water and the availability of sanitation services all can have great impact on diarrheal mortality and childhood nutrition (Kosek et al., 2003). Findings from randomized, controlled trials suggested that vaccination, breastfeeding, and micronutrient supplementation can reduce the incidence of diarrhea, and, when diarrhea occurs, oral rehydration therapy can reduce the risk of dehydration (Peterson Zwane and Kremer, 2007).

As Table 3.3 indicates, in the two weeks before the survey, the prevalence of diarrhea among children less than age 5 was quite different across countries, ranging from 8% in Madagascar to 25% in Burundi. Seven countries—Burundi, Cameroon, Ghana, Liberia, Niger, Senegal, and Uganda—experienced a level of child diarrhea above 20% (see Map 3.2).

Sex and geographic disparities

Overall, we did not find child's sex disparities related to child diarrhea (see Figure 3.7). However, in Guinea (males: 18% and females: 15%) and Zimbabwe (males: 15% and females: 13%), the prevalence of diarrhea was two percentage points higher for boys than for girls (see Table 3.3).

In half of the countries, the prevalence of diarrhea among children less than age 5 was higher in rural areas than in urban areas (see Figure 3.8). Five countries had a diarrhea prevalence that was at least four percentage points higher in rural areas than in urban areas—Burundi (urban: 22% and rural: 26%), Cameroon (urban: 19% and rural: 24%), Ghana (urban: 18% and rural: 22%), Mali (urban: 10% and rural: 15%), and Niger (urban: 18% and rural: 22%). In contrast, in Senegal (urban: 24% and rural: 20%) and Tanzania (urban: 19% and rural: 14%), the prevalence of diarrhea was at least four percentage points higher in urban areas (see Table 3.3).

The role of the household head's sex and age

In 13 of 23 countries, the diarrhea prevalence was higher for children living with a female household head than for children living with a male household head (see Figure 3.9). This difference was more than 3 percentage points higher in three countries—Rwanda (13% versus 16%), Senegal (21% versus 24%), and Tanzania (15% versus 17%) (see Table 3.3). The inverse situation occurred in Nigeria and Cameroon. In Nigeria the prevalence of diarrhea was 3 percentage points higher among children living with a male household head (11% versus 8%). This difference was more extreme in Cameroon, where the diarrhea prevalence was 23% for children living with a male household head and 17% for children living with a female household head, a difference of 7 percentage points.

In Burundi, Kenya, and Uganda, the age of the household head played an important role in the prevalence of diarrhea among children less than age 5 (see Figure 3.10). As Table 3.3 shows, in Burundi the percentage who had had diarrhea in the past two weeks was 25% for children whose head of household was younger than age 50 and 31% for children whose head of household was at least age 50 (a difference of 6 percentage points). In Uganda 24% of children who lived with a household head younger than age 50 had had diarrhea recently, compared with 30% of those who lived with an older head of household—a difference of 6 percentage points.

Variations during the last 13 years

Six countries—Cameroon, Ghana, Kenya, Namibia, Tanzania, and Zimbabwe—have experienced an increase in the prevalence of diarrhea among children less than age 5 (see Table 3.2). This increase

was more than four percentage points in Cameroon (2004: 17% and 2011: 22%) and Ghana (2003: 16 % and 2008: 21%) (see Figures 3.11 and 3.12).

3.3 Medical Treatment of Diarrhea

Seeking medical care for a child's diarrhea is important because some treatments, such as antimicrobial chemotherapy, can shorten both bacterial excretion and the duration of the illness (Mandomando et al., 2007). Oral rehydration salt (ORS) and zinc tablets, when administered appropriately, are useful, cost-effective primary interventions for reducing diarrhea morbidity (Aggarwal et al., 2007; Bhatnagar et al., 2004; Fontaine, 2006; Gregorio et al., 2007). Unfortunately, however, many children do not obtain these medical treatments, even in areas where these services are available (Fischer Walker et al., 2009). In some instances people living in economically deprived neighborhoods are less likely than others to seek medical care (Aremu et al., 2011). A study by Aremu et al. (2011) that used DHS data from 11 countries in sub-Saharan Africa suggested that highly educated caregivers are more likely to utilize medical centers to manage childhood diarrhea. A major concern related to the treatment of diarrhea is that diarrheal pathogens are becoming resistant to antimicrobial agents; and some of the treatments for diarrhea, such as oral rehydration solutions, may not decrease the quantity of stool or the length of the disease. To address these issues, clinicians are employing combination therapies for managing diarrheal diseases, but that translates into an increased pill burden and longer therapy (Bardhan, 2007; Njume and Goduka, 2012).

As Map 3.3 shows, in 21 of 23 countries, at least 4 of every 10 children who had diarrhea in the two weeks prior to the survey did not receive medical advice. Benin (79%), Cameroon (76%), Mali (82%), and Niger (83%) had the highest percentages of children whose parents who did not seek medical advice (see Table 3.4). Malawi (38%) had the lowest percentage.

Sex and geographic disparities

In 17 of 23 countries, the percentage of children who did not receive medical advice was higher for girls than for boys (see Figure 3.13). This difference was greatest—at least 6 percentage points—in Rwanda (females: 66% and males: 60%), Lesotho (females: 50% and males: 43%), and Mali (females: 86% and males: 79%) (see Table 3.4).

Two-thirds of the sub-Saharan African countries experienced rural–urban disparities in the use of medical treatment for diarrhea (see Figure 3.14). Geographic disparities in lack of receiving medical advice for diarrhea were greatest—at least 15 percentage points—in Niger (urban: 70% and rural: 85%), Mali (urban: 70% and rural: 85%), Madagascar (urban: 50% and rural: 68%), Guinea (urban: 57% and rural: 78%), and Ethiopia (urban: 47% and rural: 70%) (see Table 3.4).

The role of the household head's sex and age

In two-thirds of these sub-Saharan African countries, the percentage of children who did not receive medical advice for diarrhea was higher for children living with a male head of household than for children living with a female head of household (see Figure 3.15). This difference was greatest—more than 6 percentage points—in Mozambique (46% versus 40%), Guinea (74% versus 67%), Cameroon (77% versus 70%), and Nigeria (58% versus 47%) (see Table 3.4). The situation was reversed in Ghana (56% versus 62%) and Rwanda (61% versus 69%), where the percentage of children who did not receive medical advice was at least 6 percentage points higher for children living with a female head of household than for children living with a male head of household.

In half of these sub-Saharan African countries, the percentage of children who did not receive medical advice for diarrhea was higher for children living with a household head younger than age 50

than for those living with an older head of household (see Figure 3.16). This difference was most pronounced—more than 16 percentage points—in Mozambique (45% versus 29%) and Namibia (44% versus 28%) (see Table 3.4). In contrast, in Rwanda the percentage of children who did not receive medical advice for diarrhea was 10 percentage points higher for children living with an older household head (62% if the head of household was younger versus 72% if the head of household was older). In Senegal and Lesotho the percentage of children who did not receive medical advice for their diarrhea was similar regardless of the household head's age.

Variations during the last 13 years

The percentage of children who had diarrhea in the two weeks prior to the survey and did not receive medical advice decreased in every sub-Saharan African country except Benin (see Table 3.2). Burkina Faso (2003: 82% and 2010: 53%) and Malawi (2004: 67% and 2010: 38%) showed the largest decreases in percentage points (about 30 points) (see Figures 3.17 and 3.18).

Table 3.1. Percentage of children less than age 5 who have not received any of the eight EPI immunizations, by country, sex of child, and region of residence as well as sex and age of head of household

Country	Sex of child			Region of residence			Sex of household head			Age of household head		
	Male (a)	Female (b)	Comparison (b)-(a)	Urban (c)	Rural (d)	Comparison (d)-(c)	Male (e)	Female (f)	Comparison (f)-(e)	Less than age 50 (g)	Age 50 or more (h)	Comparison (h)-(g)
Benin	44.9	46.0	1.1	36.6	50.1	13.5	46.4	38.5	-7.9	45.4	46.3	0.9
Burkina Faso	22.3	23.1	0.8	18.8	23.5	4.7	22.9	20.4	-2.5	22.7	22.5	-0.2
Burundi	14.2	13.4	-0.8	14.1	13.8	-0.3	14.1	12.4	-1.7	13.6	19.6	6.0
Cameroon	41.3	41.3	0.0	29.6	49.9	20.3	42.8	33.6	-9.2	41.0	43.4	2.4
Ethiopia	76.8	76.5	-0.3	55.1	79.8	24.7	76.7	76.8	0.1	76.5	78.6	2.1
Ghana	29.6	28.0	-1.6	25.5	30.9	5.4	29.3	27.4	-1.9	28.4	32.2	3.8
Guinea	59.5	60.2	0.7	45.2	64.0	18.8	59.4	63.7	4.3	59.9	59.5	-0.4
Kenya	30.3	29.5	-0.8	24.8	31.0	6.2	29.2	31.7	2.5	29.2	38.9	9.7
Lesotho	33.6	34.1	0.5	31.3	34.5	3.2	33.8	33.7	-0.1	33.7	34.3	0.6
Liberia	64.0	61.8	-2.2	44.7	70.7	26.0	63.8	60.8	-3.0	63.0	61.8	-1.2
Madagascar	40.3	38.9	-1.4	24.1	41.5	17.4	38.8	44.8	6.0	39.2	47.1	7.9
Malawi	22.1	21.7	-0.4	19.2	22.3	3.1	22.0	21.5	-0.5	21.8	23.6	1.8
Mali	49.3	52.1	2.8	38.6	55.2	16.6	50.4	53.4	3.0	50.3	54.8	4.5
Mozambique	34.2	33.8	-0.4	24.9	37.4	12.5	34.9	31.9	-3.0	34.2	31.2	-3.0
Namibia	25.1	24.8	-0.3	21.9	26.9	5.0	25.1	24.8	-0.3	24.5	26.9	2.4
Niger	76.0	74.9	-1.1	48.4	80.5	32.1	75.6	74.9	-0.7	75.3	76.4	1.1
Nigeria	72.6	72.1	-0.5	54.4	80.4	26.0	73.4	62.2	-11.2	72.1	74.9	2.8
Rwanda	9.8	11.6	1.8	8.9	10.9	2.0	10.3	12.3	2.0	10.8	8.5	-2.3
Senegal	28.3	29.2	0.9	24.5	31.4	6.9	29.6	25.4	-4.2	29.0	28.4	-0.6
Tanzania	25.3	27.2	1.9	11.3	30.0	18.7	26.4	25.8	-0.6	25.5	31.9	6.4
Uganda	41.2	41.6	0.4	33.8	42.5	8.7	40.5	44.6	4.1	41.0	47.4	6.4
Zambia	70.4	70.1	-0.3	64.2	72.6	8.4	70.2	70.6	0.4	70.1	72.7	2.6
Zimbabwe	48.1	45.3	-2.8	41.4	48.7	7.3	46.3	47.2	0.9	46.4	49.7	3.3

Table 3.2. Percentage of children less than age 5 who have not received any of the eight EPI immunizations, who had diarrhea in the two weeks prior to the survey, or who have had diarrhea in the two weeks prior to the survey for which no medical advice was obtained, by country and year of data collection

Country	Year of data collection		Have not received any of the eight EPI immunizations		Comparison		Had diarrhea in the two weeks prior to the survey		Comparison		Had diarrhea in the two weeks prior to the survey for which no medical advice was obtained		Comparison	
	Year 1	Year 2	Year 1	Year 2	Year 2-Year1	Year 2-Year1	Year 1	Year 2	Year 2-Year1	Year 2-Year1	Year 1	Year 2	Year 2-Year1	Year 2-Year1
Benin	2001	2006	41.1	45.5	4.4		13.9	9.3	-4.6		75.8	79.2	3.4	
Burkina Faso	2003	2010	55.5	22.7	-32.8		21.3	15.1	-6.2		82.2	52.8	-29.4	
Cameroon	2004	2011	46.9	41.3	-5.5		17.4	22.3	4.9		78.6	76.4	-2.2	
Ethiopia	2005	2011	84.9	76.7	-8.1		18.3	13.9	-4.5		77.6	67.8	-9.8	
Ghana	2003	2008	37.1	28.9	-8.2		15.9	20.5	4.6		74.1	58.0	-16.1	
Kenya	2003	2008-09	43.2	30.1	-13.1		16.6	17.3	0.6		70.5	51.1	-19.3	
Lesotho	2004	2009	34.0	33.8	-0.2		14.7	11.9	-2.7		70.1	46.2	-23.9	
Madagascar	2003-04	2008-09	50.0	39.7	-10.4		10.1	8.5	-1.6		69.3	65.2	-4.2	
Malawi	2004	2010	38.6	21.9	-16.7		22.9	17.9	-5.0		67.0	37.6	-29.4	
Mali	2001	2006	69.6	50.7	-18.9		18.9	13.9	-5.0		88.0	82.3	-5.6	
Mozambique	2003	2011	46.7	34.1	-12.7		14.5	11.5	-3.0		50.7	44.3	-6.4	
Namibia	2000	2006-07	33.1	25.0	-8.1		14.0	14.4	0.4		50.4	40.8	-9.6	
Nigeria	2003	2008	83.0	72.2	-10.8		19.6	10.5	-9.0		76.4	56.9	-19.5	
Rwanda	2005	2010	25.7	10.7	-15.0		14.5	13.5	-1.0		84.8	62.7	-22.1	
Senegal	2005	2010-11	46.0	28.8	-17.2		23.4	21.4	-2.0		78.3	65.4	-12.9	
Tanzania	2004-05	2010	63.3	26.3	-37.0		13.3	15.0	1.7		51.8	46.6	-5.2	
Uganda	2006	2011	81.7	41.5	-40.2		27.3	24.8	-2.5		29.8	27.7	-2.1	
Zambia	2001-02	2007	39.5	70.4	30.9		21.9	16.0	-6.0		57.0	40.7	-16.3	
Zimbabwe	2005-06	2010-11	59.4	46.8	-12.6		12.9	14.1	1.2		69.8	65.1	-4.7	

Table 3.3. Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey, by country, sex of child, and region of residence as well as sex and age of head of household

Country	Sex of child			Region of residence			Sex of household head			Age of household head			
	Male	Female	Comparison	Urban	Rural	Comparison	Male	Female	Comparison	Less than	Age 50	All	
	(a)	(b)	(b)-(a)	(c)	(d)	(d)-(c)	(e)	(f)	(f)-(e)	age 50	or more	children	
			(c)	(d)	(d)-(c)	(e)	(f)	(f)-(e)	(g)	(h)	(h)-(g)	(g)	
Benin	9.8	8.7	-1.1	7.9	9.9	2.0	9.3	9.3	0.0	8.9	13.0	4.1	9.3
Burkina Faso	15.1	14.9	-0.2	16.5	14.7	-1.8	14.9	16.3	1.4	14.9	15.9	1.0	15.0
Burundi	25.2	25.4	0.2	21.5	25.7	4.2	25.2	26.0	0.8	25.1	30.8	5.7	25.3
Cameroon	22.8	21.3	-1.5	18.9	24.4	5.5	23.1	16.5	-6.6	22.2	20.9	-1.3	22.0
Ethiopia	14.5	12.7	-1.8	11.2	14.0	2.8	13.6	14.1	0.5	13.7	12.8	-0.9	13.7
Ghana	20.2	20.5	0.3	17.9	21.9	4.0	20.0	21.5	1.5	20.4	20.6	0.2	20.4
Guinea	17.7	15.2	-2.5	15.9	16.6	0.7	16.5	16.3	-0.2	16.4	17.0	0.6	16.5
Kenya	18.1	16.2	-1.9	18.3	16.9	-1.4	17.6	16.0	-1.6	16.3	27.1	10.8	17.1
Lesotho	12.1	11.5	-0.6	11.3	11.9	0.6	12.1	10.8	-1.3	11.5	13.3	1.8	11.8
Liberia	21.8	21.2	-0.6	20.7	21.9	1.2	21.5	21.5	0.0	21.3	23.8	2.5	21.5
Madagascar	8.8	8.1	-0.7	11.7	8.1	-3.6	8.3	9.6	1.3	8.4	8.9	0.5	8.4
Malawi	18.7	17.0	-1.7	18.7	17.7	-1.0	18.0	17.0	-1.0	17.8	17.6	-0.2	17.8
Mali	14.0	13.5	-0.5	9.8	15.2	5.4	13.6	15.8	2.2	13.8	12.9	-0.9	13.7
Mozambique	11.7	10.9	-0.8	12.5	10.9	-1.6	11.4	11.1	-0.3	11.3	11.1	-0.2	11.3
Namibia	13.5	15.1	1.6	15.1	13.8	-1.3	13.3	15.5	2.2	14.1	15.1	1.0	14.3
Niger	20.9	22.1	1.2	18.1	22.1	4.0	21.3	22.7	1.4	21.4	21.8	0.4	21.5
Nigeria	11.0	10.0	-1.0	8.2	11.5	3.3	10.8	8.0	-2.8	10.6	9.8	-0.8	10.5
Rwanda	14.2	12.6	-1.6	14.1	13.4	-0.7	12.9	15.6	2.7	13.4	15.1	1.7	13.4
Senegal	21.8	20.7	-1.1	23.8	19.7	-4.1	20.7	23.6	2.9	21.0	21.8	0.8	21.3
Tanzania	15.7	14.3	-1.4	18.8	14.1	-4.7	14.6	17.1	2.5	15.3	13.2	-2.1	15.0
Uganda	25.2	23.9	-1.3	23.7	24.7	1.0	24.1	26.2	2.1	24.2	29.9	5.7	24.6
Zambia	16.1	15.7	-0.4	17.9	15.1	-2.8	16.2	14.7	-1.5	15.9	16.0	0.1	15.9
Zimbabwe	15.2	12.9	-2.3	16.3	13.2	-3.1	13.9	14.2	0.3	13.8	16.6	2.8	14.0

Table 3.4. Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey for which no medical advice was obtained, by country, sex of child, and region of residence as well as sex and age of head of household

Country	Sex of child			Region of residence			Sex of household head			Age of household head			
	Male (a)	Female (b)	Comparison (b)-(a)	Urban (c)	Rural (d)	Comparison (d)-(c)	Male (e)	Female (f)	Comparison (f)-(e)	Less than age 50 (g)	Age 50 or more (h)	Comparison (h)-(g)	All children
Benin	79.0	79.6	0.6	78.8	79.4	0.6	79.6	76.5	-3.1	78.4	86.5	8.1	79.3
Burkina Faso	51.0	54.6	3.6	47.1	54.1	7.0	52.6	54.8	2.2	52.3	56.8	4.5	52.7
Burundi	42.3	42.9	0.6	46.5	42.3	-4.2	42.0	45.3	3.3	42.6	42.0	-0.6	42.6
Cameroon	75.0	77.9	2.9	70.4	79.8	9.4	77.3	70.3	-7.0	76.9	73.0	-3.9	76.4
Ethiopia	67.9	67.6	-0.3	47.4	70.2	22.8	68.4	64.3	-4.1	67.5	72.5	5.0	67.8
Ghana	59.5	56.4	-3.1	62.3	55.8	-6.5	56.3	62.2	5.9	57.6	61.6	4.0	58.0
Guinea	72.1	74.2	2.1	56.7	77.5	20.8	73.7	67.1	-6.6	72.6	75.1	2.5	73.0
Kenya	49.4	53.3	3.9	51.9	51.1	-0.8	52.4	48.0	-4.4	51.4	49.9	-1.5	51.2
Lesotho	43.1	49.9	6.8	43.6	47.1	3.5	46.7	45.5	-1.2	46.4	46.4	0.0	46.4
Liberia	46.7	51.0	4.3	46.2	49.8	3.6	49.4	47.3	-2.1	48.1	55.0	6.9	48.8
Madagascar	64.6	65.9	1.3	50.3	67.8	17.5	65.1	66.0	0.9	65.1	67.5	2.4	65.2
Malawi	38.3	36.7	-1.6	43.7	36.5	-7.2	38.0	35.5	-2.5	37.1	46.1	9.0	37.5
Mali	78.8	86.2	7.4	69.8	85.4	15.6	82.1	85.5	3.4	82.5	81.2	-1.3	82.4
Mozambique	44.5	44.4	-0.1	34.4	48.7	14.3	46.3	39.8	-6.5	45.4	28.8	-16.6	44.4
Namibia	38.6	42.7	4.1	37.4	43.0	5.6	40.8	40.7	-0.1	44.3	27.9	-16.4	40.8
Niger	82.3	83.5	1.2	69.5	84.9	15.4	82.8	83.4	0.6	83.6	78.5	-5.1	82.9
Nigeria	56.8	57.3	0.5	48.6	59.7	11.1	57.8	47.1	-10.7	56.7	60.1	3.4	57.0
Rwanda	59.8	66.0	6.2	67.1	62.0	-5.1	60.8	69.1	8.3	62.1	72.4	10.3	62.7
Senegal	64.6	66.6	2.0	65.9	65.3	-0.6	66.7	61.6	-5.1	65.4	65.7	0.3	65.5
Tanzania	45.4	47.9	2.5	41.7	48.2	6.5	47.3	43.7	-3.6	46.4	48.0	1.6	46.6
Uganda	29.0	26.5	-2.5	29.7	27.5	-2.2	27.7	28.1	0.4	28.4	19.3	-9.1	27.8
Zambia	40.3	41.0	0.7	42.4	39.9	-2.5	40.6	41.3	0.7	40.3	46.4	6.1	40.7
Zimbabwe	66.5	63.5	-3.0	64.0	65.7	1.7	67.2	62.4	-4.8	65.9	59.2	-6.7	65.1

Figure 3.1. Percentage of children less than age 5 who have not received any of the eight EPI immunizations, by country and the child's sex

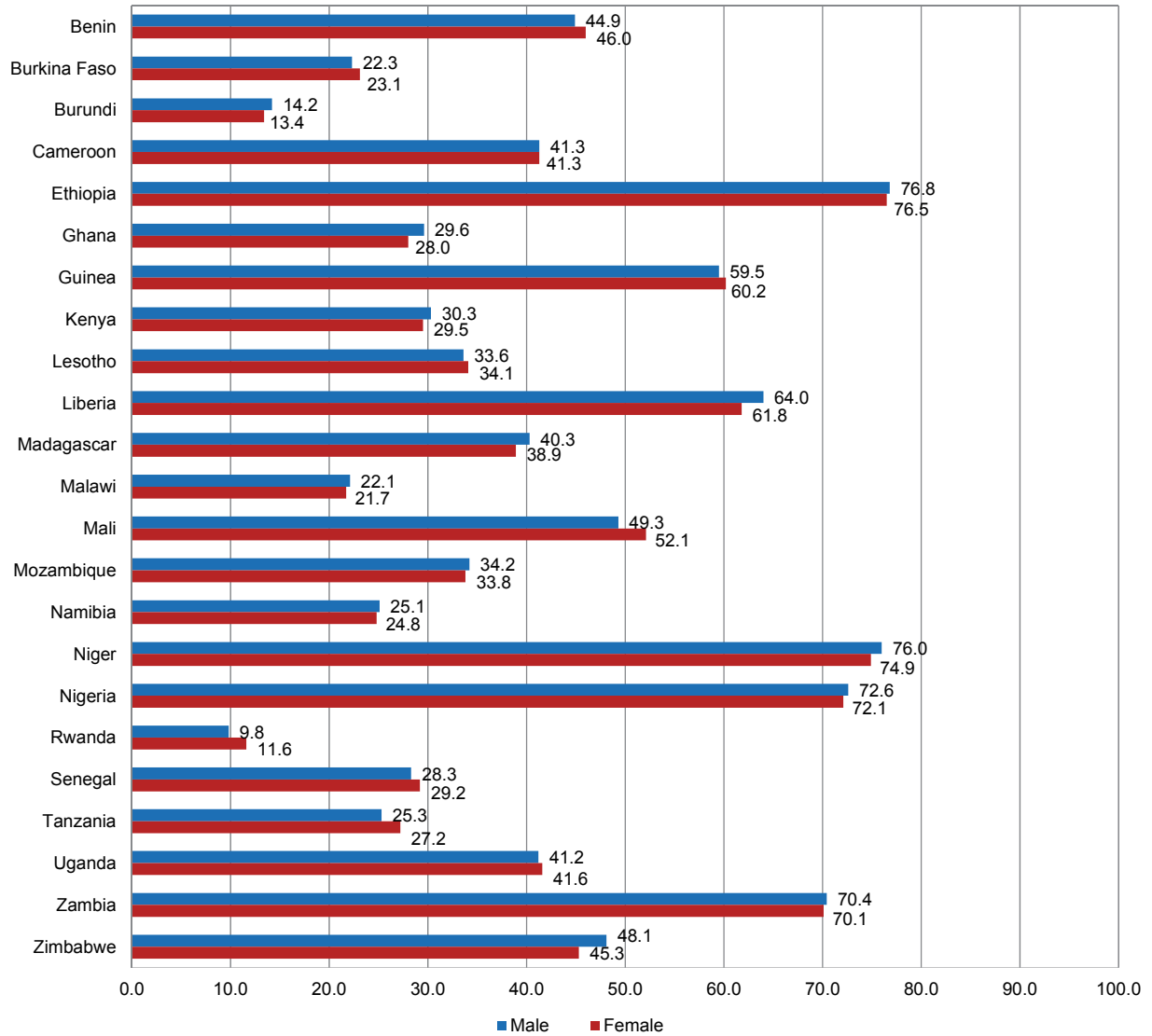


Figure 3.2. Percentage of children less than age 5 who have not received any of the eight EPI immunizations, by country and the region of residence

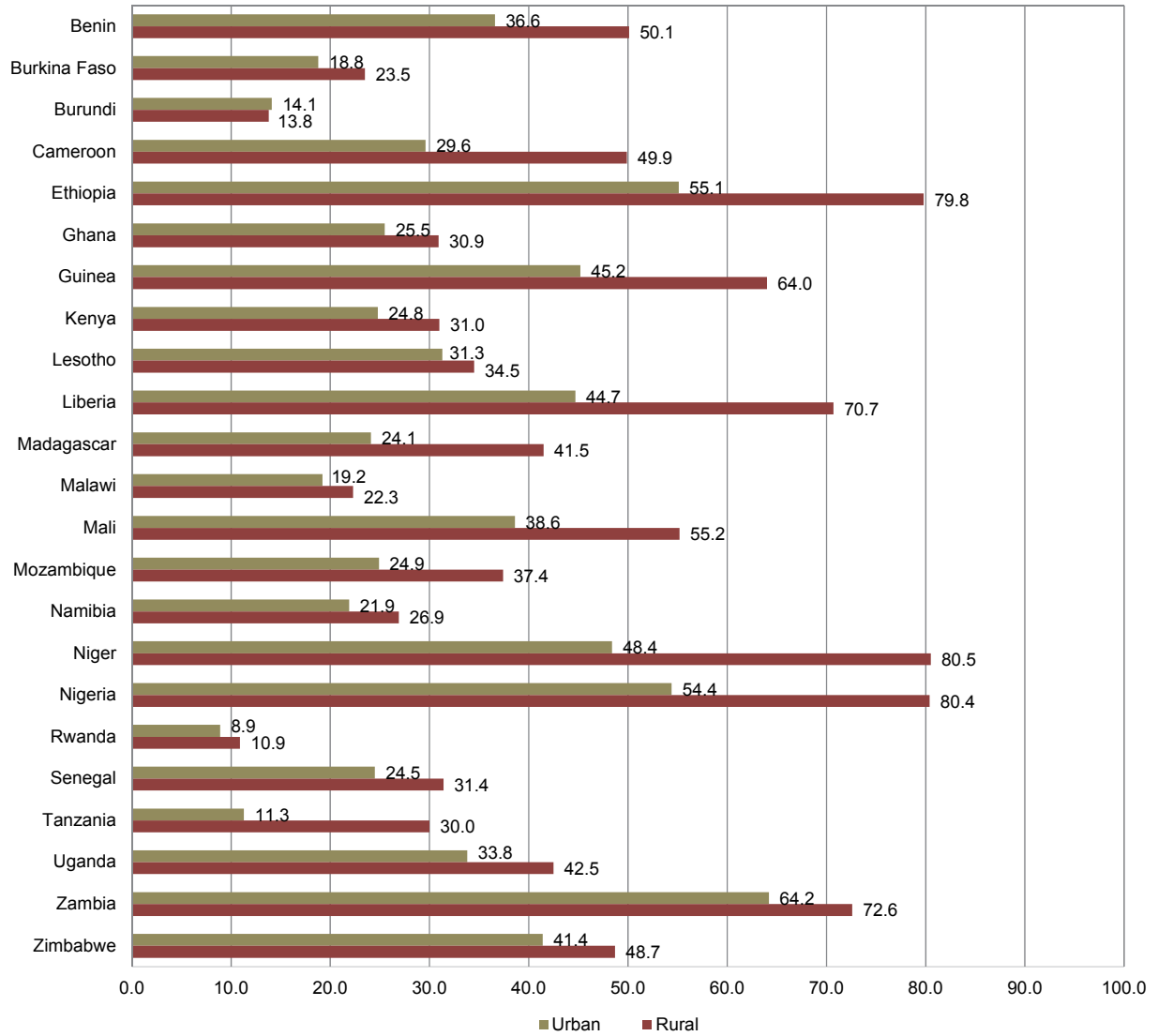


Figure 3.3. Percentage of children less than age 5 who have not received any of the eight EPI immunizations, by country and the sex of the household head

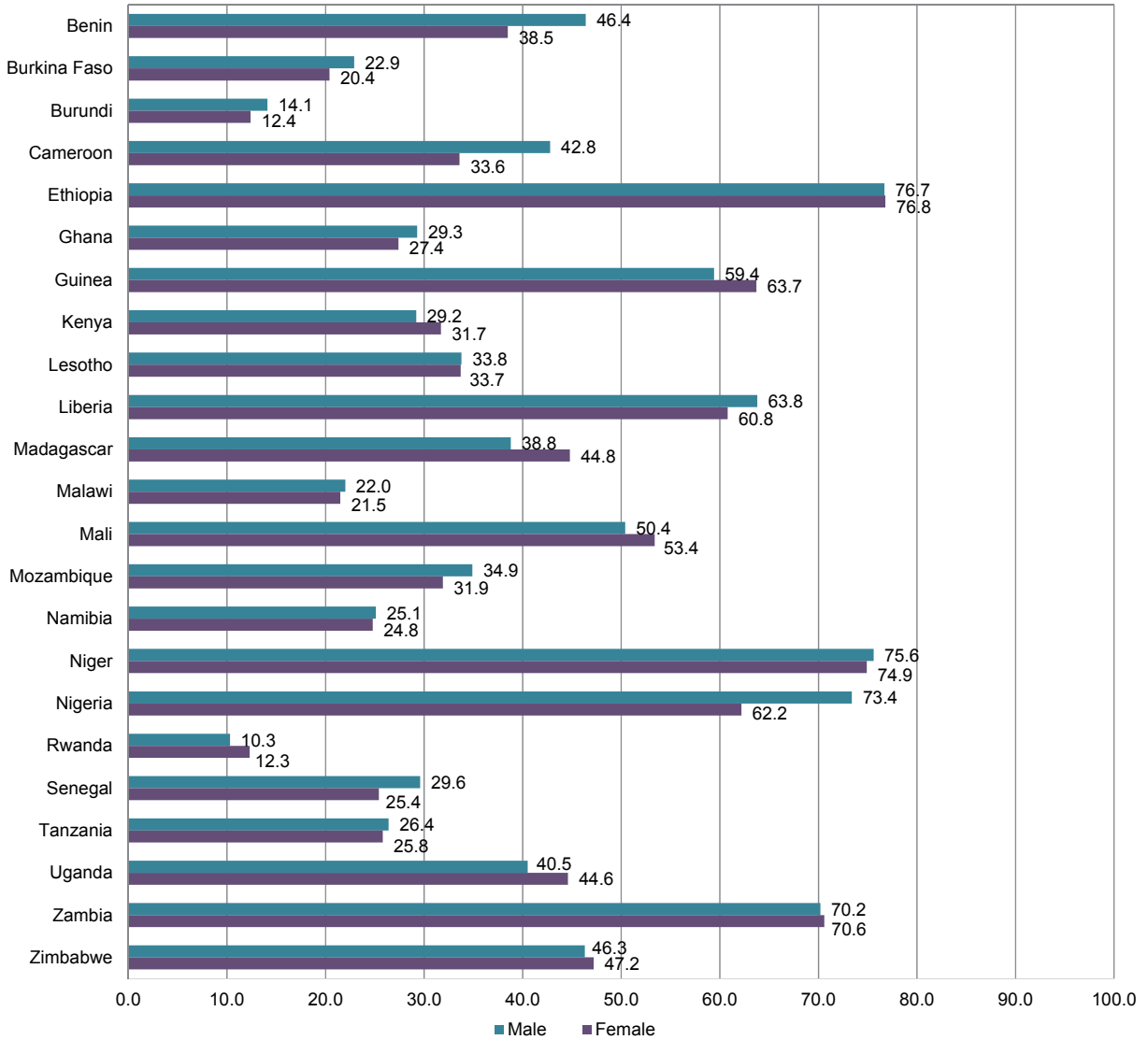


Figure 3.4. Percentage of children less than age 5 who have not received any of the eight EPI immunizations, by country and the age of the household head

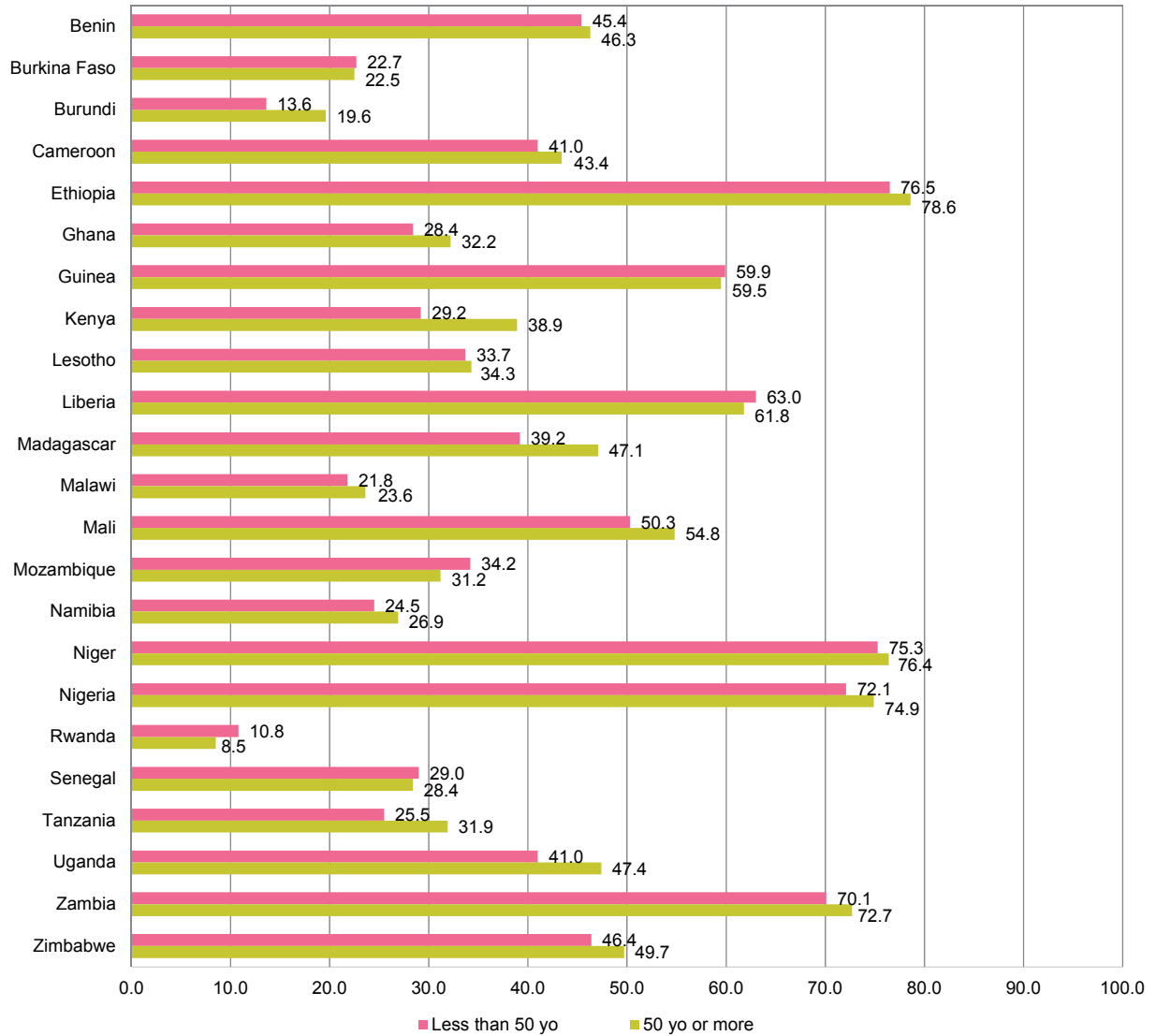


Figure 3.5. Changes in the percentage of children less than age 5 who have not received any of the eight EPI immunizations

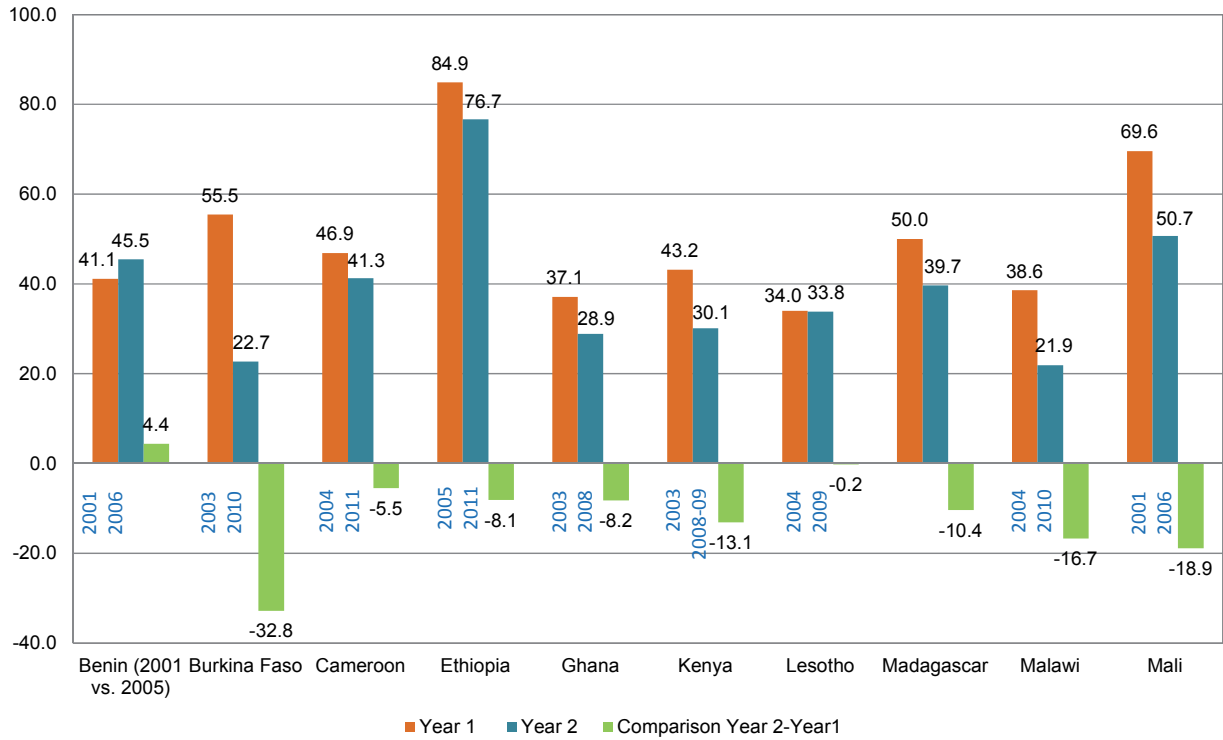


Figure 3.6. Changes in the percentage of children less than age 5 who have not received any of the eight EPI immunizations

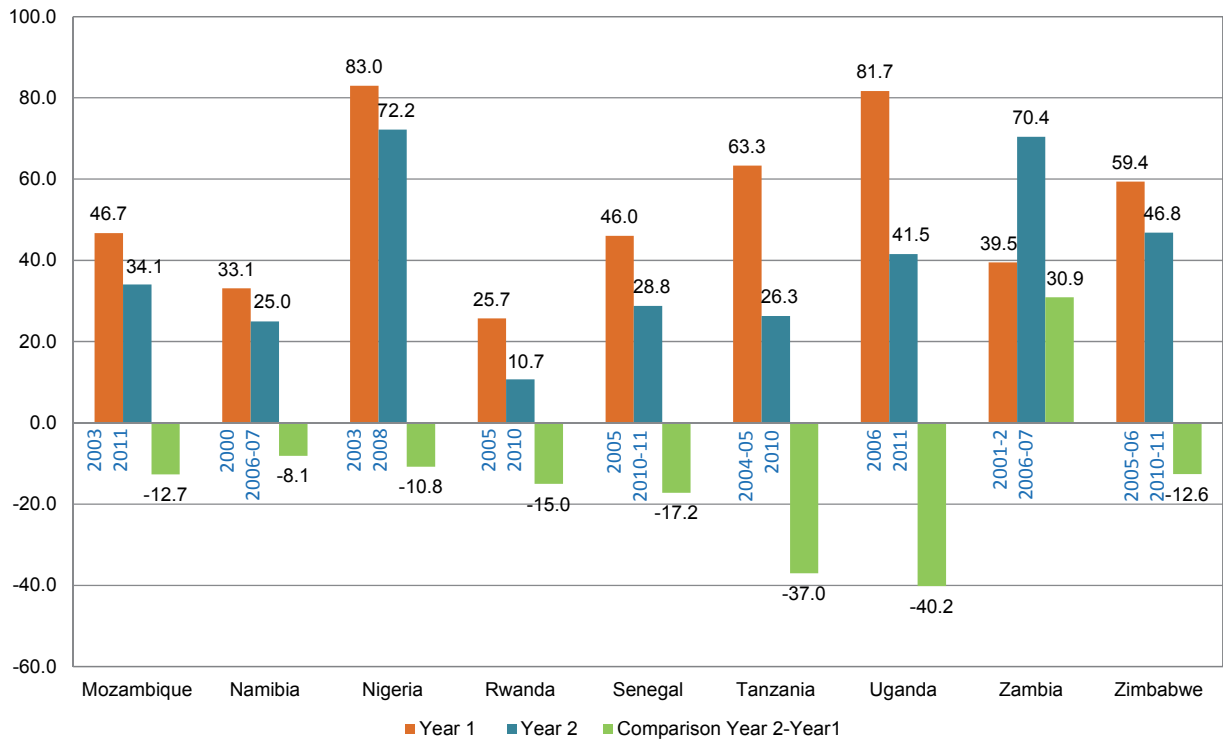


Figure 3.7. Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey, by country and the child's sex

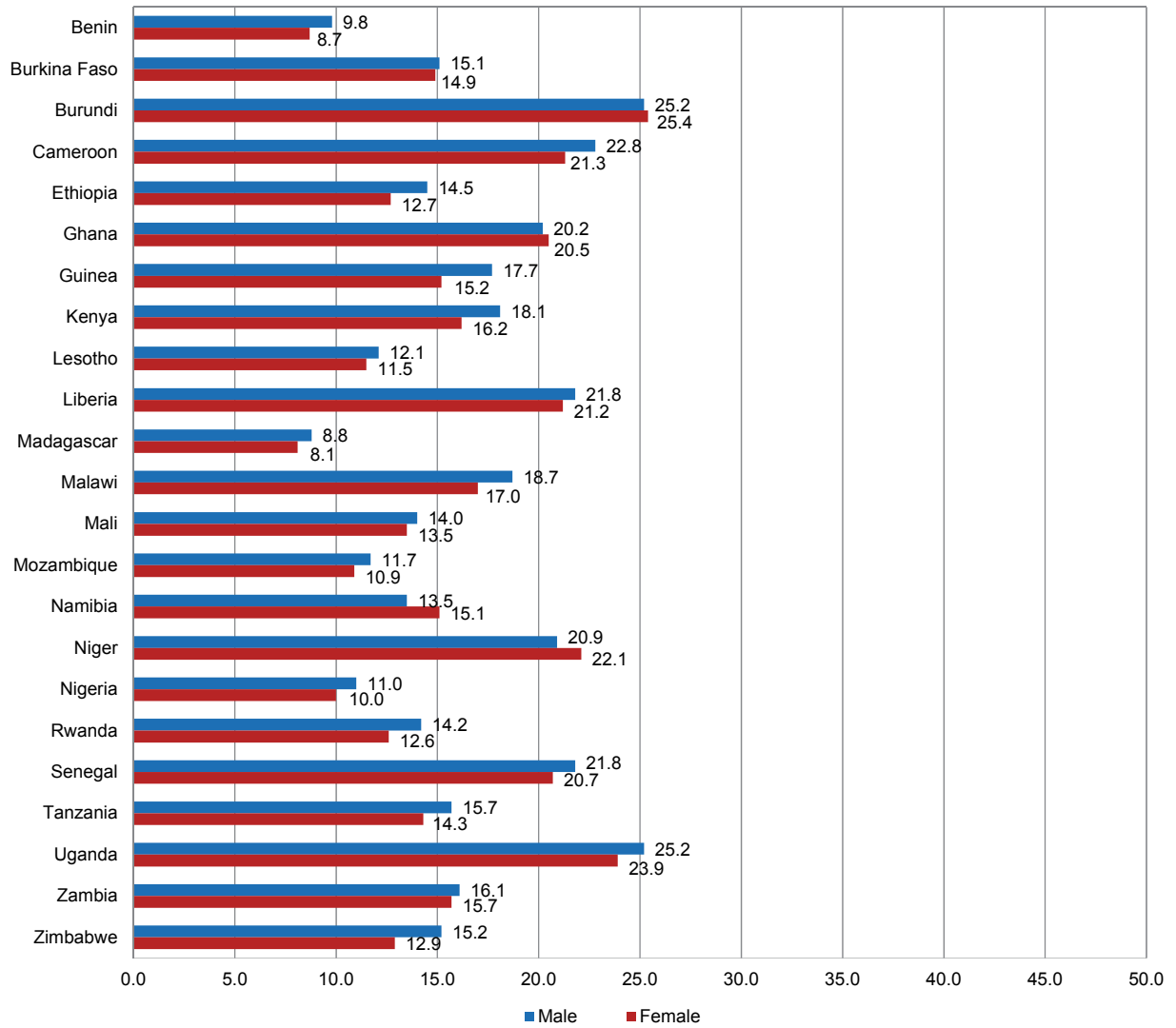


Figure 3.8. Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey, by country and the region of residence

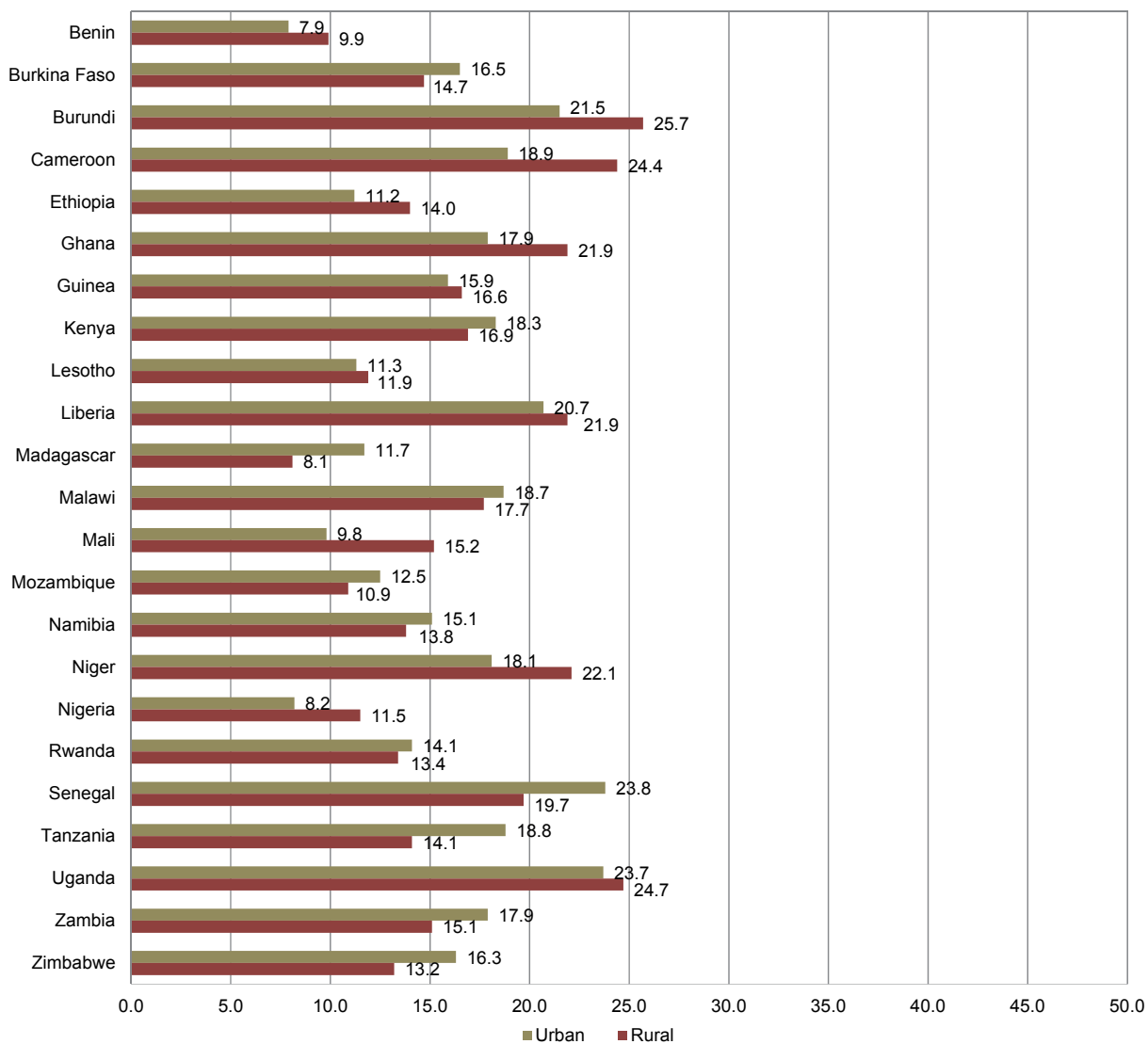


Figure 3.9. Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey, by country and the sex of the household head

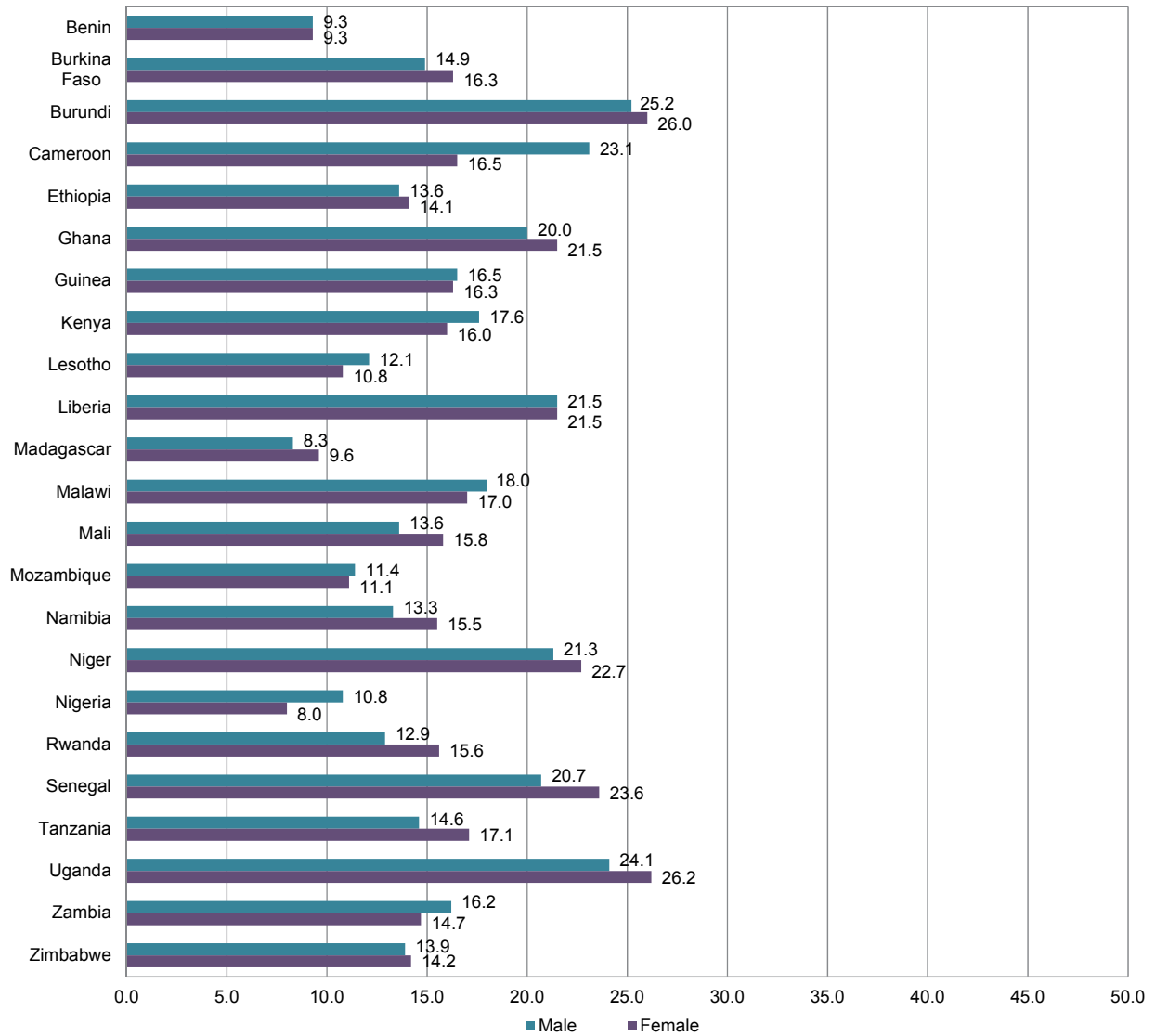


Figure 3.10. Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey, by country and the age of the household head

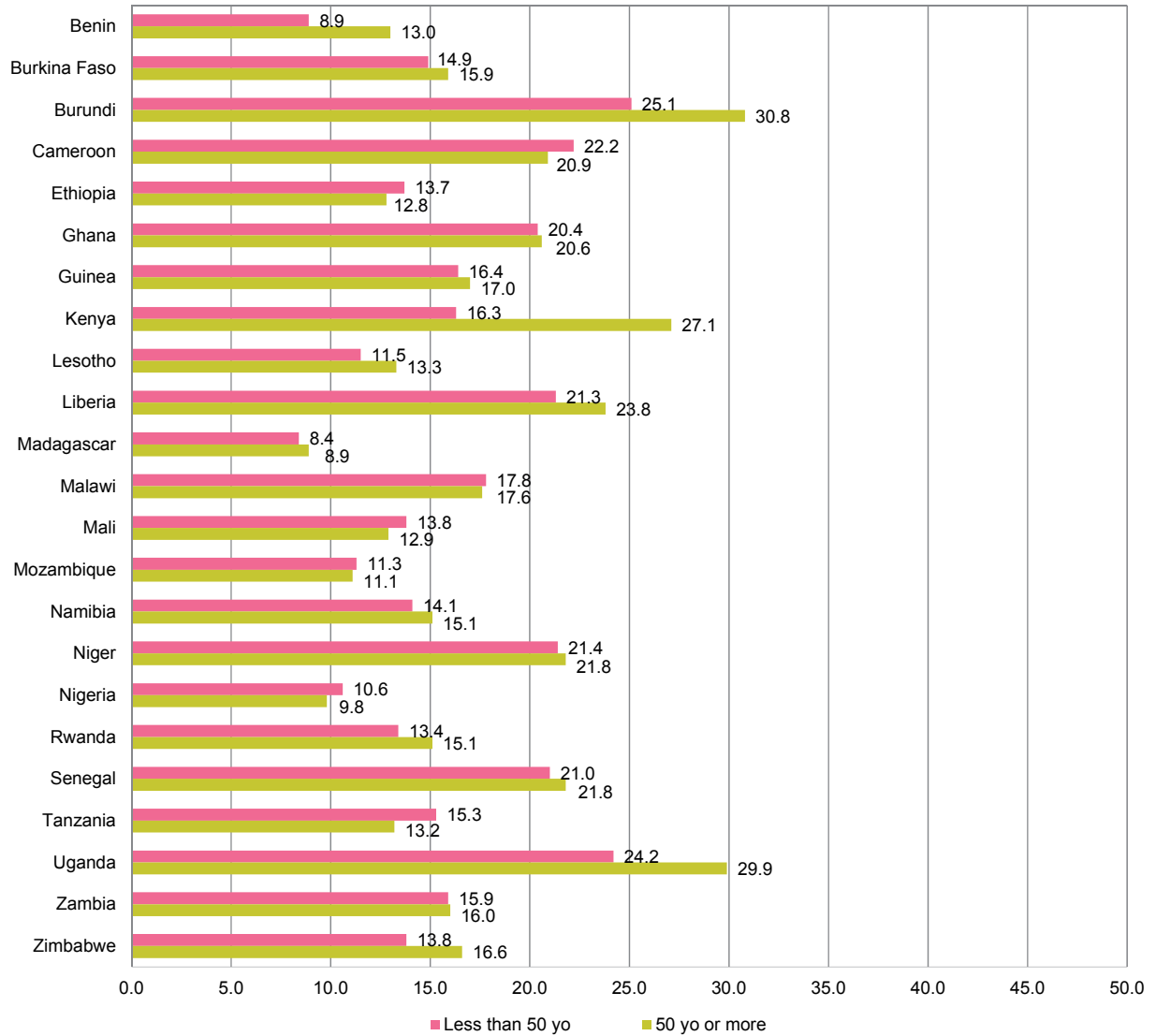


Figure 3.11. Changes in the percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey

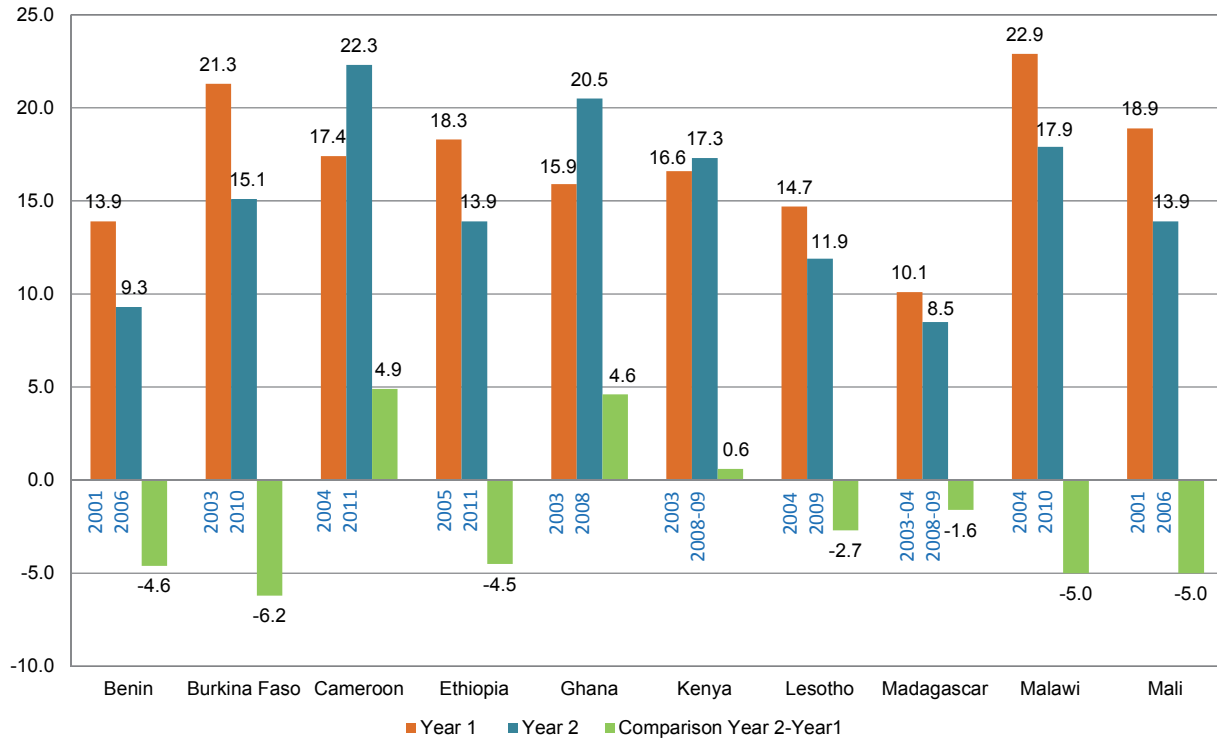


Figure 3.12. Changes in the percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey

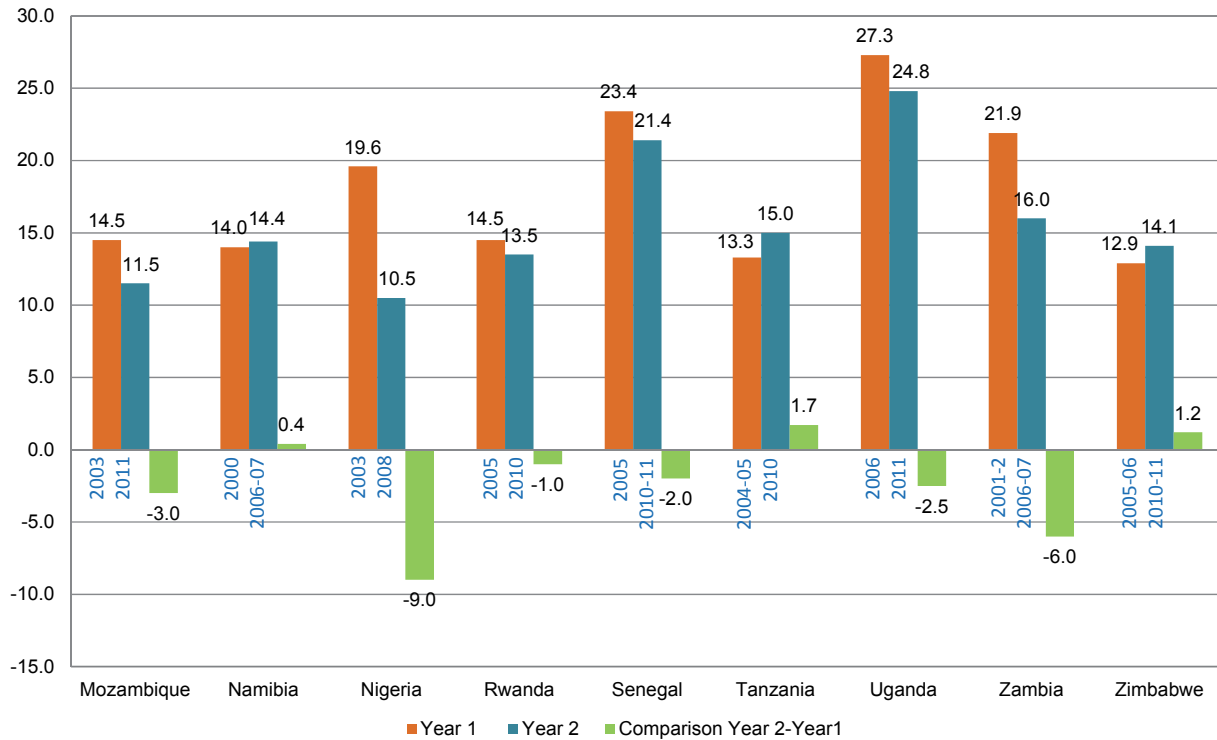


Figure 3.13. Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey for which no medical advice was obtained, by country and the child's sex

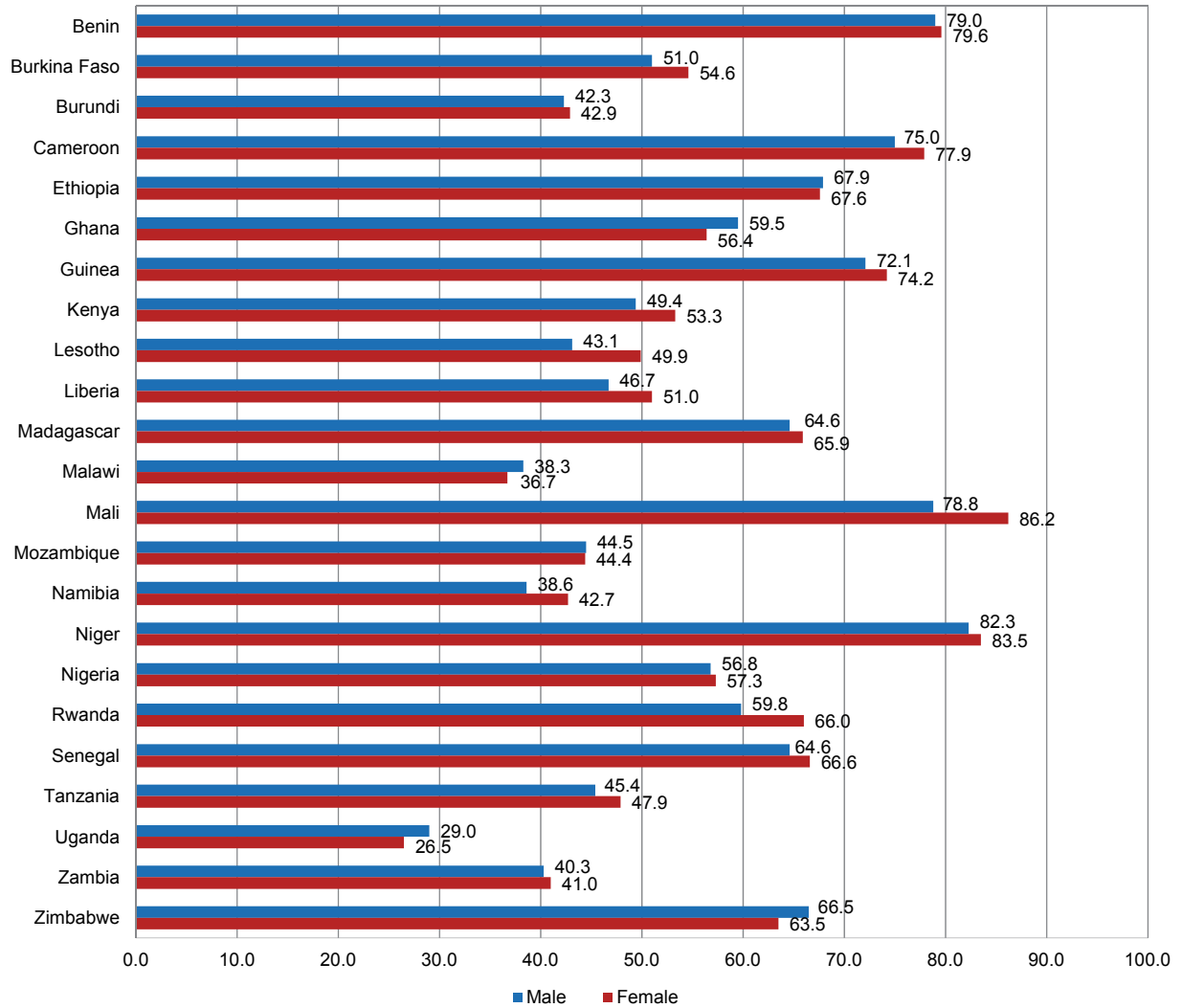


Figure 3.14. Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey for which no medical advice was obtained, by country and the region of residence

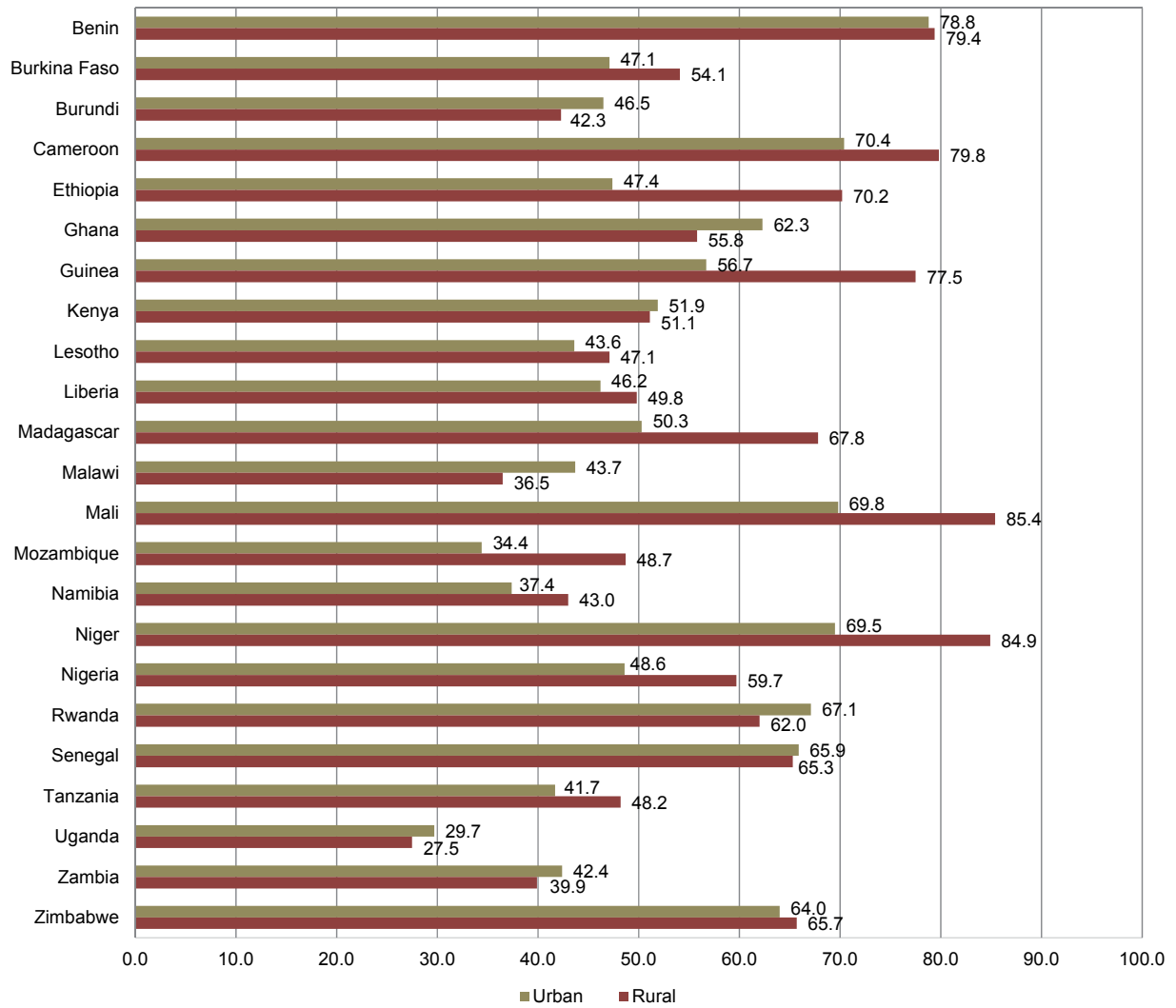


Figure 3.15. Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey for which no medical advice was obtained, by country and the sex of the household head

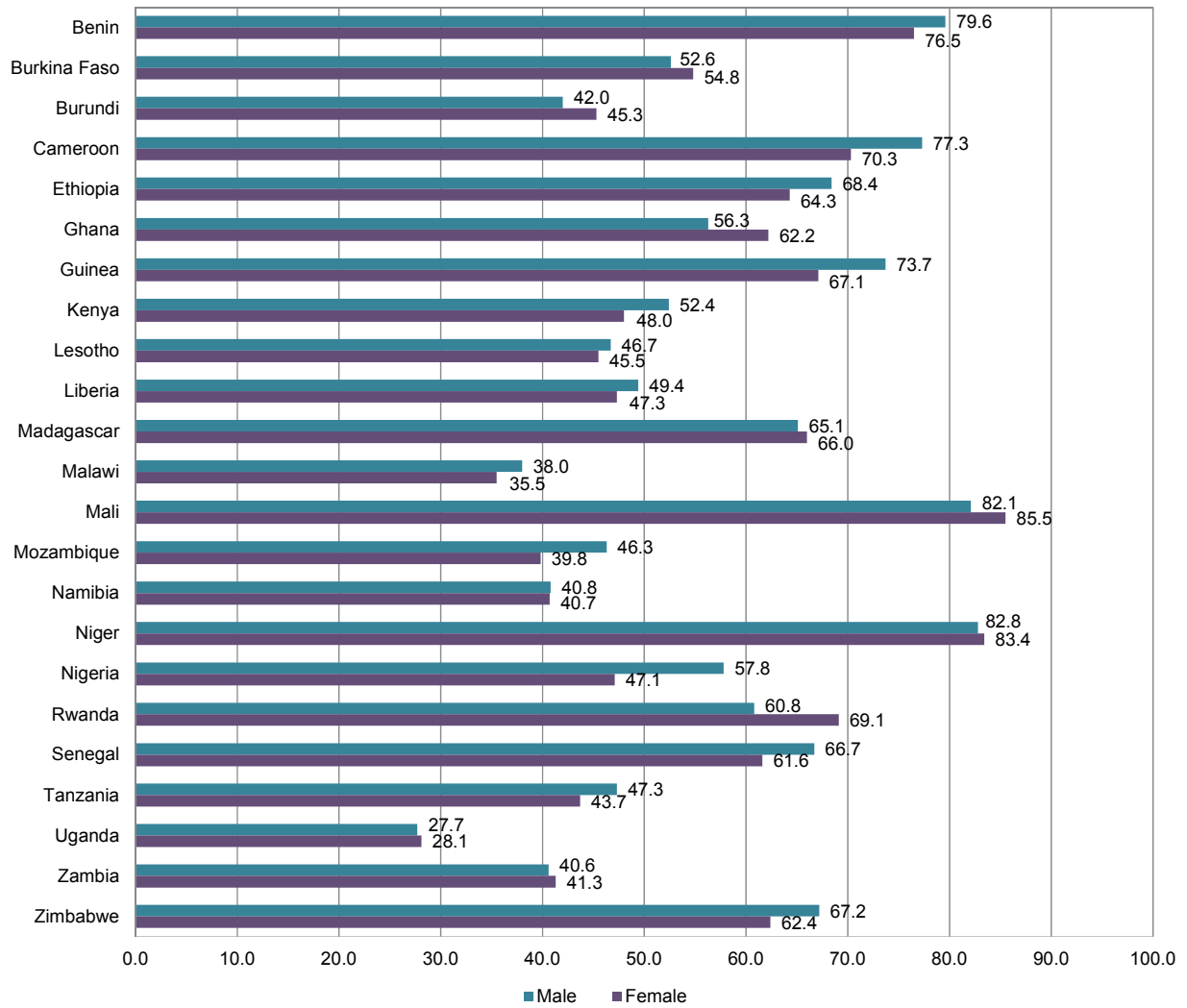


Figure 3.16. Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey for which no medical advice was obtained, by country and the age of the household head

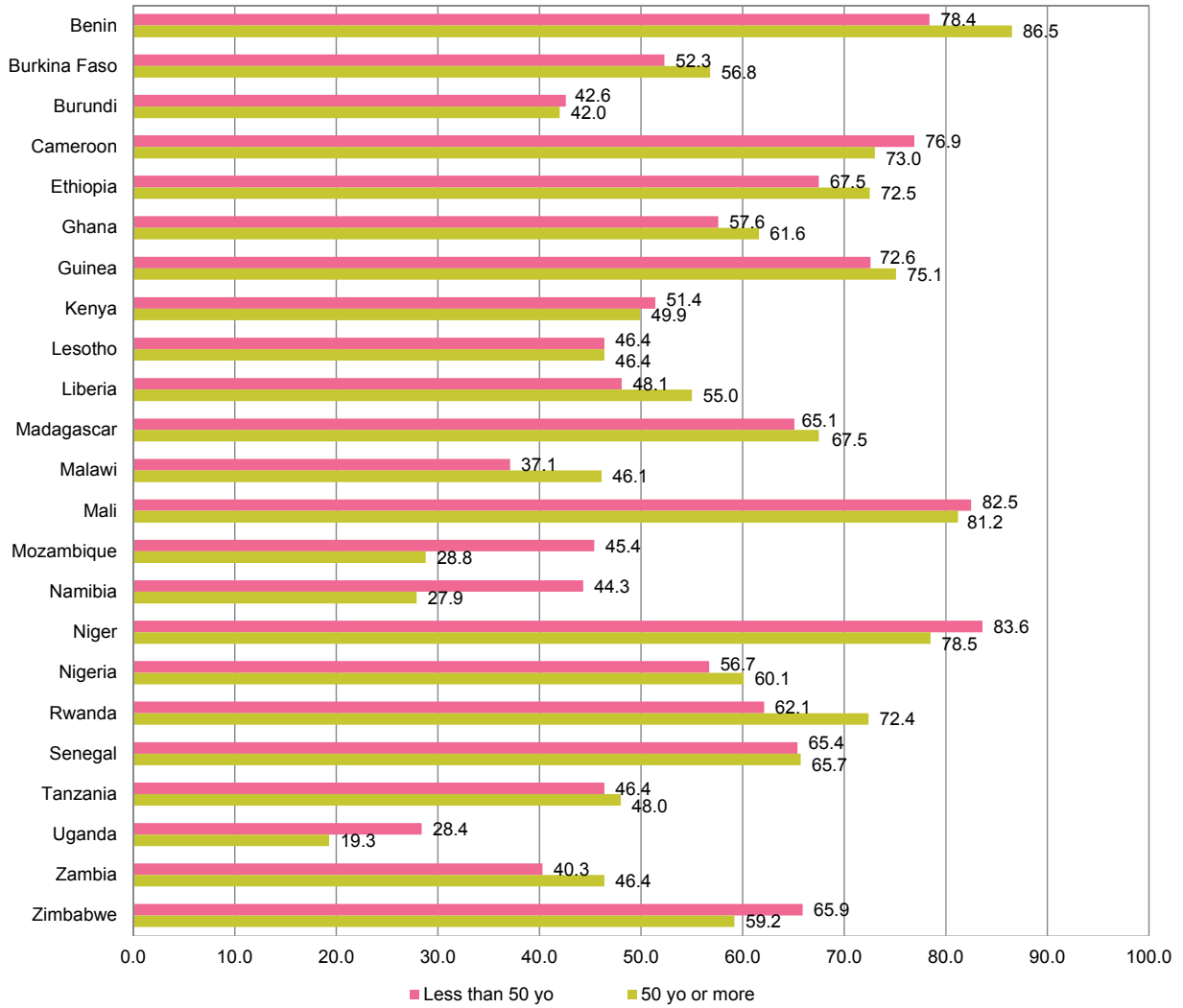


Figure 3.17. Changes in the percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey for which no medical advice was obtained

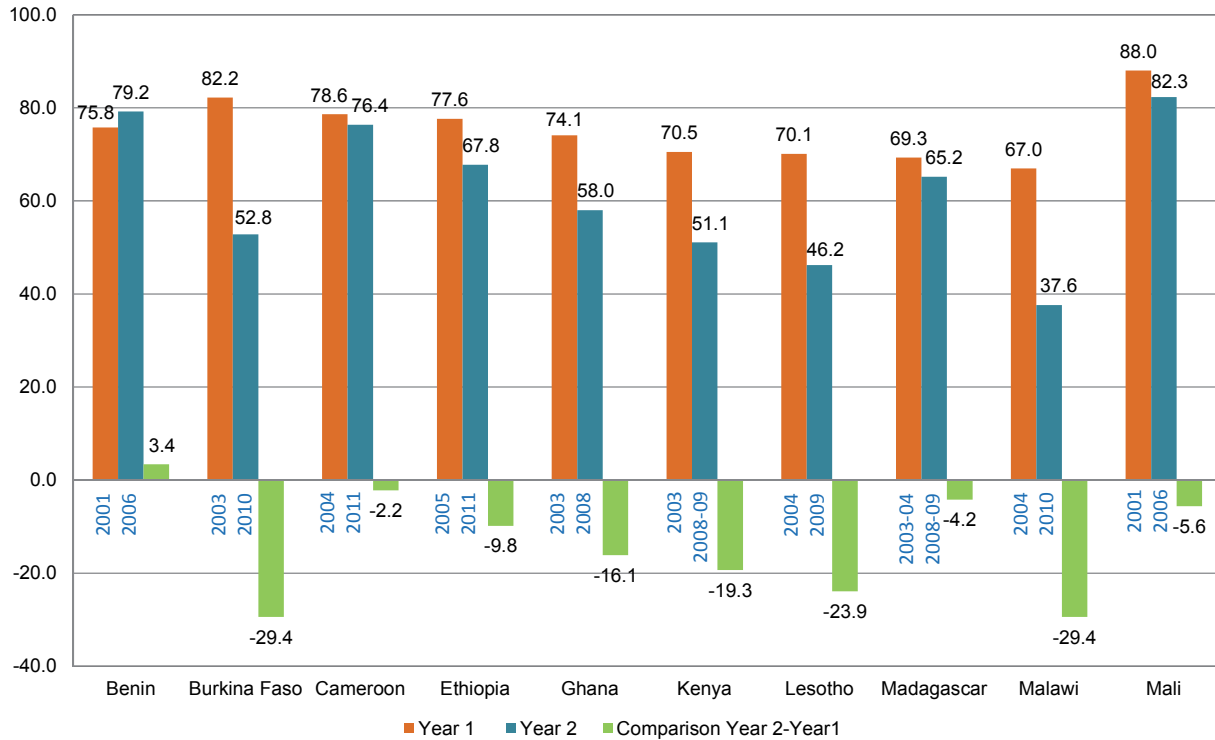
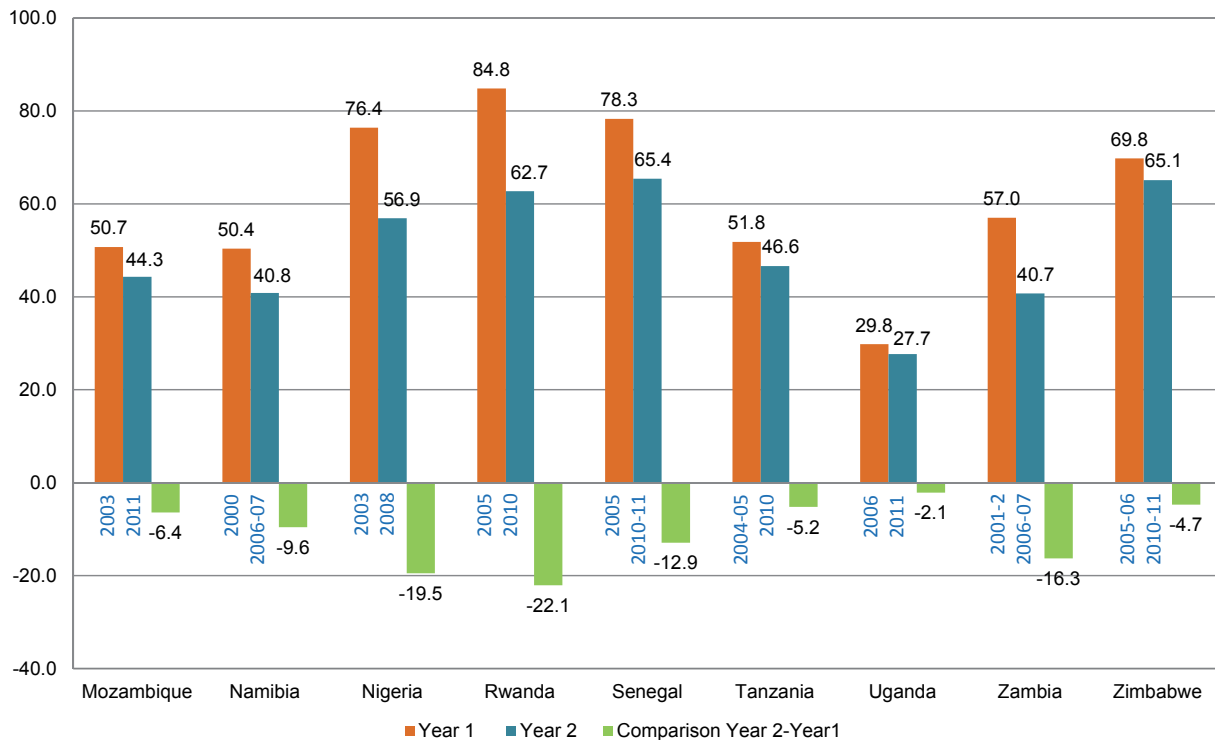
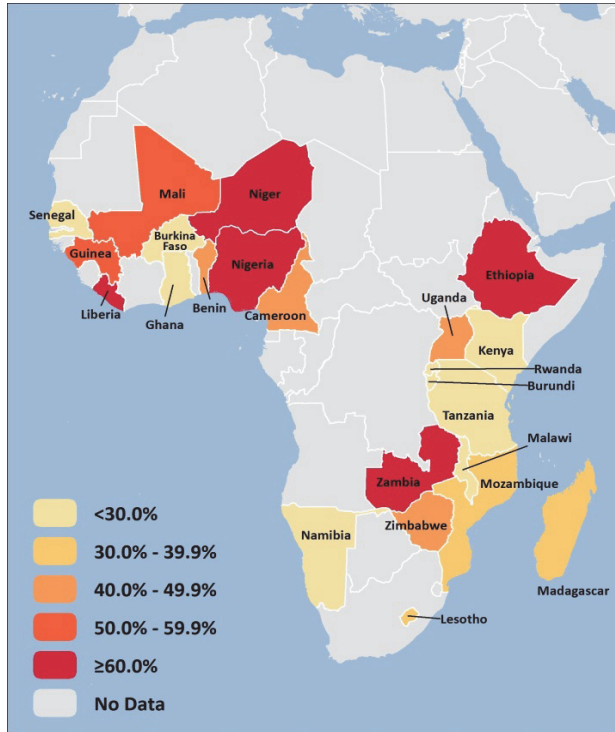


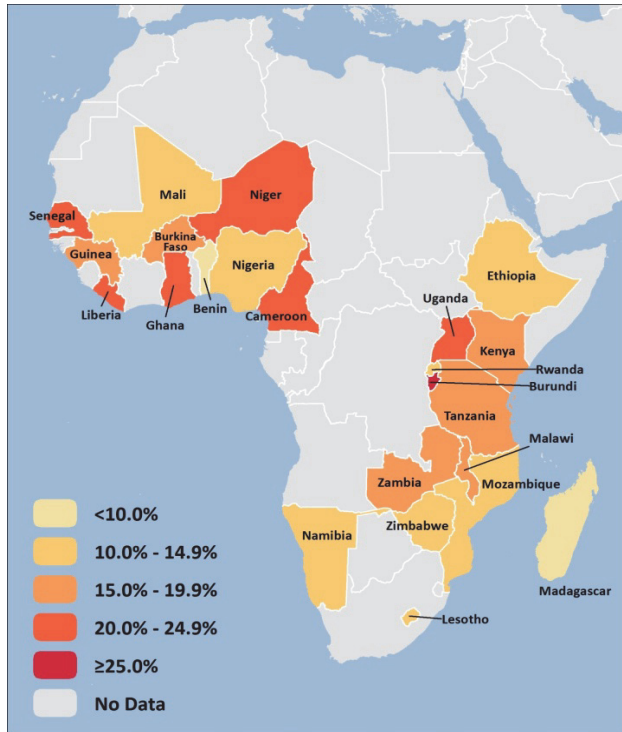
Figure 3.18. Changes in the percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey for which no medical advice was obtained



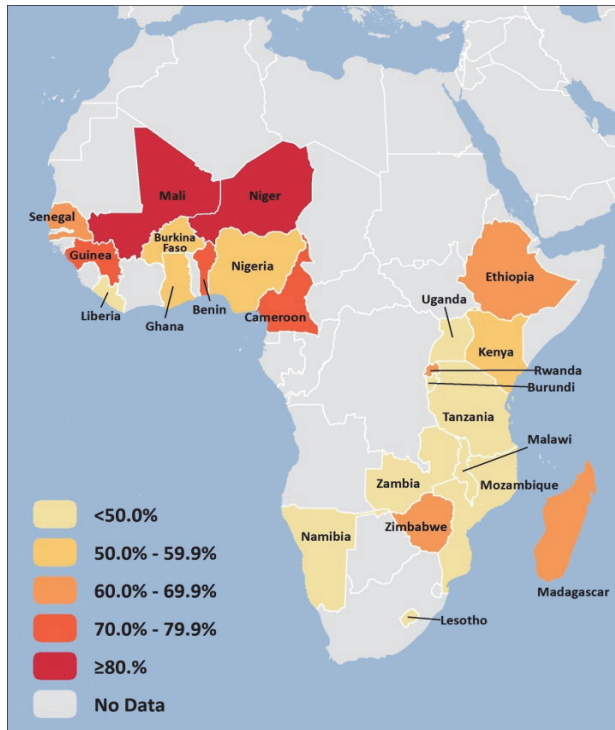
Map 3.1 Percentage of children less than age 5 who have not received any of the eight EPI immunizations



Map 3.2 Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey



Map 3.3 Percentage of children less than age 5 who had diarrhea in the two weeks prior to the survey for which no medical advice was obtained



4 Water and Sanitation Deprivation

This chapter presents stratified percentages of children considered severely deprived of water because they lived in households that used surface water or had more than a 15-minute walk to their water source. The rationales for these two measures is that surface water can become polluted and thus dangerous, and a 15-minute walk to a water source (30 minutes round trip) means that the child likely will have access to only a severely limited quantity of water at home (Gordon et al., 2003).

Information regarding sanitation deprivation focuses on the percentage of children who do not have access to any sanitation facilities in or near their homes, including any connection to a public sewer or connection to a septic system or access to a pour-flush latrine, simple pit latrine, ventilated improved pit latrine, service or bucket latrines where excreta are removed manually, public latrines, or open latrines. We conducted the analyses using data for children up to age 17.

4.1 Use of Surface Water

To reduce diarrheal disease and, consequently, child mortality, the Millennium Development Goals call for reducing by half the proportion of people without sustainable access to safe drinking water (Peterson Zwane and Kremer, 2007). One-sixth of the world's population (884 million people) have no access to improved sources of drinking water such as piped household water connections, public standpipes, boreholes, protected dug wells, protected springs, or rainwater collection (Mara, 2003; WHO and UNICEF, 2010). People without access to improved sources of drinking water generally use surface water instead, including water from dams, rivers, and streams. Unfortunately, surface water is frequently contaminated with pathogens, including bacteria, viruses, and parasites, due to contact with human and livestock waste (Effler et al., 2001; Fong and Lipp, 2005; Kistemann et al., 2002; Peterson Zwane and Kremer, 2007). For this reason, surface water often transmits waterborne and water-related diseases when used for domestic purposes.

The use of surface water for human consumption is a global health concern because there are approximately 3.5 billion episodes of diarrhea per year and 1.87 million childhood deaths per year worldwide linked to waterborne and water-related diseases (Arnold and Colford, 2007; Boschi-Pinto et al., 2008; Effler et al., 2001; Fong and Lipp, 2005; Kistemann et al., 2002; Peterson Zwane and Kremer, 2007). According to the *United Nations World Water Development Report 3: Water in a Changing World*, more than half of malnutrition cases in Africa result from recurring diarrhea or intestinal nematode infections resulting from consuming contaminated water. In the developing world several recent epidemics related to the lack of safe drinking water have resulted from toxigenic *Vibrio cholerae*, *Salmonella*, *Shigella*, *Escherichia coli* pathotypes, *Cryptosporidium*, and *Giardia* (Bielaszewska et al., 2011; Centers for Disease Control and Prevention, 2012; Chigor et al., 2012; Mills-Robertson et al., 2003; Stewart-Tull, 2001; Zahid et al., 2008).

Our analyses found vast differences among sub-Saharan countries in the percentage of children less than age 18 who used surface water (see Map 4.1). For instance, less than 2% of children used surface water in Senegal and Niger. In contrast, more than 60% of children in Burundi and 50% in Rwanda used surface water (see Table 4.1).

Sex and geographic disparities

Overall, we did not find child's sex disparities related to the use of surface water in sub-Saharan Africa (see Figure 4.1). We did find geographic disparities, however (see Figure 4.2). In all these countries a higher percentage of children used surface water in rural areas than in urban areas. Geographic disparities were greatest in Burundi (urban: 15% and rural: 72%) and Ethiopia (urban: 8% and rural:

64%)—differences of more than 50 percentage points. In Kenya (urban: 6% and rural: 51%) and Madagascar (urban: 7% and rural: 55%), the disparity was over 45 percentage points.

The role of the household head's sex and age

The percentage of children using surface water was at least five percentage points higher for children living with a male household head than for children living with a female household head in six countries—Benin (12% versus 7%), Ethiopia (58% versus 48%), Ghana (15% versus 8%), Guinea (28% versus 20%), Liberia (23% versus 15%), and Madagascar (51% versus 43%) (see Table 4.1 and Figure 4.3).

Additionally, the percentage of children using surface water was at least three percentage points higher for children living with a household head at least age 50 than for children living with a younger household head in four countries—Cameroon (25% versus 29%), Kenya (44% versus 48%), Namibia (7% versus 14%), and Nigeria (23% versus 27%) (see Table 4.1 and Figure 4.4).

Variations during the last 13 years

Ethiopia, with an increment of 29 percentage points, experienced the greatest increase in the percentage of children less than age 18 that used surface water (2005: 29% and 2011: 57%) (see Table 4.2). Other countries that experienced relatively large increases included Rwanda, with an increase of 11 percentage points (2005: 52% and 2010: 11%) and Zimbabwe, with an increase of 8 percentage points (2005-06: 3% and 2010-11: 11%).

Conversely, Madagascar experienced the greatest decrease on the continent, from 61% in 2003-04 to 51% in 2008-09, a 11 percentage point decrease (see Figures 4.5 and 4.6). An additional five countries—Burkina Faso, Ghana, Kenya, Madagascar, and Malawi—experienced a decrease in use of surface water of more than 5 percentage points.

4.2 15-Minute Walk to the Water Source

Collecting water from a source away from the household incurs three primary costs: health damage resulting from the physical burden of carrying water; the expenditure of energy on carrying water; and the opportunity cost of time spent fetching water (Rosen and Vincent, 1999).

Women and girls, who are usually the water carriers, also experience health and safety risks when exposed to water-based diseases at the water source (e.g., schistosomiasis) and diseases spread by insects at or near the water source; because of the increased likelihood of accidents, drowning, attack, and assault at and on the way to and from the water source; as well as skeletal damages from carrying heavy loads of water frequently over long periods of time (Rosen and Vincent, 1999). Also, studies have found an association between other child health issues and living far from a primary water source. For instance, a cross-sectional study of children less than 36 months of age in the Kilimanjaro region of Tanzania found that long distance to a water source independently predicted a child's categorization as underweight (Abubaka et al., 2012). In Amhara, Oromiya, and the Southern Nations, Nationalities, and Peoples Region of Ethiopia, the time taken to collect water was related to malaria risk (Ayele et al., 2012).

There was a large variation in the percentage of children under age 18 living more than a 15 minute walk from a water source in sub-Saharan Africa. These percentages ranged from 12% in Mali to 70% in Uganda and 70% in Ethiopia and Rwanda (see Map 4.2). More than half of children in Chad, Mozambique, Tanzania, Malawi, and Burundi must walk more than 15 minutes to their water source (see Table 4.3).

Sex and geographic disparities

In general, there was no sex disparities related to the distance to the water source in sub-Saharan Africa (see Figure 4.7). In Chad, however, the percentage of children who were living more than a 15-minute walk from the water source was more than 2 percentage points higher for females (58%) than for males (56%) (see Table 4.3).

In every country with the exception of Liberia, a greater proportion of rural children than urban children lived more than a 15-minute walk from a water source (see Figure 4.8). Geographic disparities of at least 40 percentage points were seen in Kenya (urban: 14% and rural: 54%), Uganda (urban: 32% and rural: 76%), Niger (urban: 14% and rural: 55%), and Ethiopia (urban: 31% and rural: 76% (see Table 4.3). The urban-rural difference was the reverse in Liberia: 18% of children in urban areas and 12% of children in rural areas lived more than a 15-minute walk from the water source (a difference of 6 percentage points).

The role of the household head's sex and age

Whether children with a male or a female head of household were more likely to live more than a 15-minute walk from the primary water source varied across the countries (see Figure 4.9). In eight countries the percentage living far from water was at least one percentage point higher for children living with a male household head (see Table 4.3). In nine countries the percentage was at least one percentage point higher for children living with a female household head.

Major differences by sex of head of household appeared in Ghana (male household head: 32% versus female household head: 22%) and Senegal (18% versus 7%) (see Figure 4.9). Additionally, the difference between children living with a male or female household head was more than 70 percentage points in Kenya (male household head: 47% and female household head: 55%) and Zimbabwe (34% and 41%).

The age of the household head was especially important in Namibia. The percentage of children living more than a 15-minute walk from the primary water source was 16 percentage points higher for children living with a household head at least age 50 (39%) than for their counterparts who lived with a younger head of household (23%) (see Table 4.3 and Figure 4.10).

Variations during the last 13 years

Benin, Cameroon, Ethiopia, and Rwanda all experienced large increases in the percentage of children living more than a 15-minute walk from a primary water source (see Figures 4.11 and 4.12). This increase—10 percentage points—was most evident in Ethiopia, where the percentage increased from 61% in 2005 to 70% in 2011 (see Table 4.2).

Senegal demonstrated a major improvement in the percentage of children living more than a 15-minute walk from the primary water source, with a reduction of 28 percentage points from 2005 (44%) to 2010-11 (17%). Other countries that experienced important reductions—more than 15 percentage points—included Lesotho (2004: 55% and 2009: 39%), Mali (2001: 29% and 2006: 12%), and Nigeria (2003: 53% and 2008: 35%).

4.3 Lack of Access to Any Sanitation Facilities Whatsoever in or near Their Homes

The aim of Millennium Development Goal 7 is to reduce by half the proportion of people without basic sanitation facilities by 2015 (WHO, 2009). It has been calculated that, to meet this goal, countries in sub-Saharan Africa would need to spend an estimated 0.9 percent of their gross domestic product (GDP) annually in the sector—0.5 percent for new infrastructure, 0.2 percent for rehabilitation of existing assets, and 0.2 percent for operation and maintenance (Morella et al., 2008).

Lack of sanitation is a serious global health problem, affecting 2.5 billion people, particularly the poor and disadvantaged, who must defecate openly, a practice that places them at higher risk of disease transmission (UNICEF/WHO Joint Monitoring Program, 2012). About 10% of the total global disease burden is attributable to unsafe water, sanitation, and hygiene. Researchers have associated illnesses related to inadequate sanitation with about 3.6 million deaths each year (Pruss-Ustun et al., 2008).

There was large variation in the percentage of children without access to any sanitation facilities in sub-Saharan Africa (see Map 4.3). This percentage ranged from less than 3% in Burundi and Rwanda to 81% in Niger (see Table 4.4). Two of every three children in Burkina Faso, Chad, and Niger did not have access to any sanitation facilities in or near their homes. In Namibia and Liberia more than half of children under 18 years of age did not have access to any sanitation services.

Sex and geographic disparities

In general, there were no disparities related to children's sex in their access to sanitation facilities (see Figure 4.13). Lack of sanitation facilities was more common for boys than girls by about two percentage points in Burkina Faso (males: 68% and females: 65%), Ghana (males: 27% and females: 24%), and Liberia (males: 56% and females: 54%) (see Table 4.4).

In all of these sub-Saharan African countries, rural children were more likely than urban children to lack access to any sanitation facilities (see Figure 4.14). This geographic disparity was most marked—at least 60 percentage points—in Burkina Faso (urban: 15% and rural: 79%), Chad (17% and 85%), Namibia (17% and 82%), and Niger (19% and 93%) (see Table 4.4).

The role of the household head's sex and age

In four countries the percentage of children without access to any sanitation services was more than 11 percentage points higher for children living with a male household head than for children living with a female household head—Senegal (male household head: 21% and female household head: 10%), Burkina Faso (68% and 56%), Benin (69% and 57%), and Ghana (29% and 17%) (see Figure 4.15). In Namibia 76% percent of children living with a household head older than age 50 did not have access to any sanitation facilities, compared with 53% of those living with a younger head of household—a difference of 23 percentage points (see Figure 4.16 and Table 4.4).

Variations during the last 13 years

Ethiopia achieved the largest reduction (23 percentage points) in the percentage of children who do not have access to any sanitation facilities, from 66% in 2005 to 43% in 2011 (see Table 4.2). Other countries that experienced a reduction of more than 5 percentage points included Burkina Faso (2003: 73% and 2010: 68%), Lesotho (2004: 51% and 2009: 41%), Malawi (2004: 16% and 2010: 11%), and Mozambique (2003: 50% and 2011: 43%) (see Figures 4.17 and 4.18). Only Nigeria (2003: 25% and 2008: 31%) and Tanzania (2004-05: 17% and 2010: 19%) experienced increases in the percentage of children who did not have access to any sanitation facilities.

Table 4.1. Percentage of children who live in households that use surface water, by country, sex of child, and region of residence as well as sex and age of head of household

Country	Sex of child			Region of residence			Sex of household head			Age of household head		
	Male (a)	Female (b)	Comparison (b)-(a)	Urban (c)	Rural (d)	Comparison (d)-(c)	Male (e)	Female (f)	Comparison (f)-(e)	Less than age 50 (g)	Age 50 or more (h)	Comparison (h)-(g)
Benin	11.0	10.8	-0.2	5.5	13.8	8.3	11.7	6.5	-5.2	10.6	12.4	1.8
Burkina Faso	8.1	7.7	-0.4	0.8	9.5	8.7	7.9	7.6	-0.3	8.1	6.8	-1.3
Burundi	67.8	66.8	-1.0	14.7	71.8	57.1	67.3	67.3	0.0	67.2	68.0	0.8
Cameroon	26.3	25.6	-0.7	11.8	36.8	25.0	25.7	27.0	1.3	25.2	29.1	3.9
Chad	17.6	19.3	1.7	3.9	21.9	18.0	17.9	21.5	3.6	18.5	18.2	-0.3
Ethiopia	56.4	55.1	-1.3	8.1	63.9	55.8	57.5	48.3	-9.2	55.6	56.2	0.6
Ghana	13.6	12.5	-1.1	2.7	20.0	17.3	15.2	8.3	-6.9	13.2	12.7	-0.5
Guinea	27.6	27.0	-0.6	3.7	36.5	32.8	28.4	20.0	-8.4	27.0	28.2	1.2
Kenya	45.2	44.4	-0.8	6.2	51.4	45.2	44.0	46.4	2.4	44.3	47.7	3.4
Lesotho	14.4	13.4	-1.0	5.0	16.0	11.0	14.7	12.2	-2.5	13.6	14.5	0.9
Liberia	20.8	20.0	-0.8	1.0	31.4	30.4	22.9	14.9	-8.0	20.5	20.0	-0.5
Madagascar	49.7	48.7	-1.0	7.1	54.9	47.8	50.5	43.1	-7.4	49.1	50.3	1.2
Malawi	5.4	5.5	0.1	1.8	6.0	4.2	5.6	5.0	-0.6	5.5	5.4	-0.1
Mali	4.2	4.0	-0.2	0.9	5.4	4.5	4.1	4.4	0.3	3.9	5.0	1.1
Mozambique	15.9	16.1	0.2	3.2	21.3	18.1	17.4	13.1	-4.3	15.6	18.7	3.1
Namibia	9.5	9.0	-0.5	0.4	13.9	13.5	9.0	9.5	0.5	7.3	14.0	6.7
Niger	1.4	1.4	0.0	0.1	1.7	1.6	1.4	1.4	0.0	1.2	2.1	0.9
Nigeria	23.8	22.6	-1.2	7.1	30.3	23.2	22.8	26.1	3.3	22.5	26.8	4.3
Rwanda	62.9	63.7	0.8	30.7	67.6	36.9	62.5	65.2	2.7	63.1	65.3	2.2
Senegal	1.3	1.1	-0.2	0.1	1.9	1.8	1.4	0.3	-1.1	1.2	1.3	0.1
Tanzania	27.7	26.1	-1.6	8.8	31.5	22.7	27.3	25.4	-1.9	26.8	27.2	0.4
Uganda	13.1	13.0	-0.1	1.9	14.6	12.7	13.1	12.9	-0.2	12.8	14.3	1.5
Zambia	21.6	21.3	-0.3	1.1	31.3	30.2	22.5	17.8	-4.7	21.2	23.2	2.0
Zimbabwe	10.8	10.7	-0.1	0.9	14.0	13.1	11.2	10.2	-1.0	10.4	12.3	1.9

Table 4.2. Percentage of children who live in households that use surface water, who have more than a 15-minute walk to the water source, or who do not have access to any sanitation facilities whatsoever in or near their homes, by country, child's age, and year of data collection

Country	Child's age	Year of data collection		Households using surface water			More than 15 minute walk to water source			No access to any sanitation facilities whatsoever in or near home			
		1 Year	2 Year	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
		Value	Value	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
Benin	0-17	2001	2006	12.3	10.9	-1.5	30.4	34.2	3.8	69.2	67.2	-2.0	
Benin	0-4	2001	2006	13.6	11.8	-1.7	30.8	35.3	4.5	72.6	68.8	-3.7	
Benin	5-9	2001	2006	12.9	11.7	-1.2	30.3	35.4	5.1	71.2	70.3	-1.0	
Benin	10-14	2001	2006	11.4	9.8	-1.7	30.4	33.0	2.6	66.3	65.0	-1.3	
Benin	15-17	2001	2006	8.8	7.7	-1.1	29.7	29.9	0.2	58.8	57.2	-1.6	
Benin	0-17	2001	2006	13.4	11.9	-1.5	30.4	35.5	5.1	72.7	69.7	-3.0	
Burkina Faso	0-17	2003	2010	13.7	7.9	-5.8	47.3	43.7	-3.5	71.7	66.5	-5.1	
Burkina Faso	0-4	2003	2010	14.8	8.0	-6.8	47.2	43.7	-3.4	73.1	67.9	-5.2	
Burkina Faso	5-9	2003	2010	14.2	8.5	-5.8	48.0	43.8	-4.1	74.5	68.2	-6.3	
Burkina Faso	10-14	2003	2010	12.6	7.4	-5.2	46.6	44.5	-2.1	69.6	65.8	-3.7	
Burkina Faso	15-17	2003	2010	12.0	6.8	-5.2	47.3	41.4	-5.9	65.9	59.0	-6.9	
Burkina Faso	0-17	2003	2010	14.5	8.2	-6.3	47.5	43.8	-3.7	73.3	68.1	-5.2	
Cameroon	0-17	2004	2011	29.4	26.0	-3.4	38.6	40.0	1.4	7.5	7.9	0.4	
Cameroon	0-4	2004	2011	29.9	27.0	-2.9	38.9	40.9	2.0	8.7	8.4	-0.3	
Cameroon	5-9	2004	2011	29.9	26.5	-3.4	39.1	41.0	1.9	8.1	8.8	0.7	
Cameroon	10-14	2004	2011	29.8	25.4	-4.4	38.4	39.5	1.1	6.8	7.1	0.4	
Cameroon	15-17	2004	2011	26.3	23.0	-3.3	36.7	35.8	-0.9	4.8	5.8	1.0	
Cameroon	0-17	2004	2011	30.1	26.6	-3.5	38.7	40.7	2.0	8.6	8.6	0.0	
Ethiopia	0-17	2005	2011	27.8	55.7	27.9	60.0	69.5	9.5	64.0	39.6	-24.5	
Ethiopia	0-4	2005	2011	28.5	57.1	28.6	60.5	70.1	9.5	66.6	43.2	-23.4	
Ethiopia	5-9	2005	2011	28.1	57.3	29.2	60.6	70.9	10.4	64.9	40.3	-24.6	
Ethiopia	10-14	2005	2011	27.8	55.0	27.2	60.7	68.4	7.7	63.4	37.2	-26.1	
Ethiopia	15-17	2005	2011	25.6	50.1	24.6	55.5	66.5	10.9	56.9	33.9	-23.0	
Ethiopia	0-17	2005	2011	28.5	57.3	28.8	60.7	70.3	9.6	66.1	42.9	-23.2	

(Continued...)

Table 4.2. – Continued

Country	Child's age	Data collection		Households use surface water				Had more than a 15 minute walk to the water source				Do not have access to any sanitation facilities whatsoever in or near their homes			
		Year		Year 1		Year 2		Year 1		Year 2		Year 1		Year 2	
		1 Year	2 Year	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
Ghana	0-17	2003	2008	21.7	13.1	-8.6	37.5	29.0	-8.5	27.9	25.3	-2.6			
Ghana	0-4	2003	2008	23.6	14.2	-9.5	38.3	29.3	-9.0	30.6	26.8	-3.9			
Ghana	5-9	2003	2008	22.9	13.6	-9.3	37.5	29.9	-7.7	30.2	26.1	-4.1			
Ghana	10-14	2003	2008	20.5	12.6	-7.9	37.0	28.5	-8.5	25.7	23.9	-1.8			
Ghana	15-17	2003	2008	17.2	10.7	-6.5	36.4	27.3	-9.1	21.5	23.4	1.9			
Ghana	0-17	2003	2008	23.6	14.1	-9.5	38.5	29.9	-8.7	30.7	26.8	-3.8			
Kenya	0-17	2003	2008-09	52.4	44.8	-7.6	62.0	48.4	-13.6	20.9	17.1	-3.8			
Kenya	0-4	2003	2008-09	52.1	45.0	-7.1	59.2	47.1	-12.0	21.5	18.4	-3.0			
Kenya	5-9	2003	2008-09	51.9	45.0	-6.8	61.8	47.6	-14.2	22.2	17.6	-4.6			
Kenya	10-14	2003	2008-09	53.3	44.6	-8.7	64.3	50.4	-14.0	20.6	16.4	-4.2			
Kenya	15-17	2003	2008-09	52.2	44.1	-8.1	63.8	49.2	-14.7	17.1	13.9	-3.2			
Kenya	0-17	2003	2008-09	52.0	45.2	-6.8	59.6	47.0	-12.6	21.6	18.3	-3.3			
Lesotho	0-17	2004	2009	8.0	13.9	5.8	55.2	39.5	-15.7	46.7	39.8	-6.9			
Lesotho	0-4	2004	2009	8.9	14.3	5.4	55.6	39.3	-16.2	51.2	41.4	-9.7			
Lesotho	5-9	2004	2009	7.5	13.9	6.5	54.9	40.8	-14.1	49.0	42.6	-6.4			
Lesotho	10-14	2004	2009	8.1	13.9	5.7	54.5	39.2	-15.3	44.4	38.8	-5.6			
Lesotho	15-17	2004	2009	7.5	13.0	5.5	56.6	38.0	-18.6	40.9	34.9	-6.0			
Lesotho	0-17	2004	2009	8.4	14.1	5.7	55.2	39.2	-16.1	51.0	41.3	-9.7			
Madagascar	0-17	2003-04	2008-09	58.2	49.2	-9.0	26.5	19.0	-7.5	49.9	46.3	-3.5			
Madagascar	0-4	2003-04	2008-09	61.2	50.8	-10.5	27.7	19.8	-8.0	52.9	50.6	-2.3			
Madagascar	5-9	2003-04	2008-09	59.3	50.9	-8.4	26.9	19.2	-7.7	49.9	47.8	-2.1			
Madagascar	10-14	2003-04	2008-09	56.1	47.2	-8.9	24.7	18.3	-6.4	48.0	43.2	-4.8			
Madagascar	15-17	2003-04	2008-09	51.1	45.7	-5.4	25.7	18.1	-7.7	45.5	39.2	-6.2			
Madagascar	0-17	2003-04	2008-09	61.1	50.6	-10.5	27.4	19.7	-7.8	52.4	50.1	-2.3			
Malawi	0-17	2004	2010	11.9	5.4	-6.4	59.1	58.0	-1.0	14.7	10.3	-4.5			
Malawi	0-4	2004	2010	12.1	5.6	-6.5	58.9	58.1	-0.8	15.9	10.9	-5.0			
Malawi	5-9	2004	2010	12.0	5.4	-6.6	59.2	58.9	-0.3	15.5	10.3	-5.2			
Malawi	10-14	2004	2010	11.3	5.5	-5.8	58.8	57.7	-1.2	13.6	10.1	-3.5			

(Continued...)

Table 4.2. – Continued

Country	Child's age	Data collection		Households use surface water			Had more than a 15 minute walk to the water source			Do not have access to any sanitation facilities whatsoever in or near their homes		
		1 Year	2 Year	Year 1	Year 2	Year 2-Year1	Year 1	Year 2	Year 2-Year1	Year 1	Year 2	Year 2-Year1
Malawi	15-17	2004	2010	12.2	5.1	-7.1	59.8	56.3	-3.5	11.6	8.8	-2.8
Malawi	0-17	2004	2010	12.2	5.5	-6.7	59.1	58.3	-0.8	15.9	10.8	-5.1
Mali	0-17	2001	2006	4.9	4.1	-0.7	29.9	11.5	-18.5	20.8	19.5	-1.3
Mali	0-4	2001	2006	4.9	4.2	-0.7	28.8	11.2	-17.6	21.7	19.3	-2.4
Mali	5-9	2001	2006	4.5	4.3	-0.2	30.0	11.7	-18.3	22.0	20.4	-1.6
Mali	10-14	2001	2006	4.9	3.9	-1.0	31.6	11.3	-20.3	19.6	19.6	0.1
Mali	15-17	2001	2006	5.8	4.1	-1.7	29.2	11.9	-17.2	17.3	17.5	0.2
Mali	0-17	2001	2006	4.8	4.2	-0.6	29.1	11.5	-17.6	22.0	19.7	-2.4
Mozambique	0-17	2003	2011	15.4	16.0	0.6	60.4	54.7	-5.7	47.2	40.3	-6.9
Mozambique	0-4	2003	2011	17.1	16.5	-0.6	60.8	56.2	-4.6	49.6	43.2	-6.3
Mozambique	5-9	2003	2011	16.4	16.0	-0.4	61.4	55.8	-5.6	50.6	41.9	-8.7
Mozambique	10-14	2003	2011	14.1	16.1	2.0	60.6	53.6	-7.0	45.1	37.6	-7.5
Mozambique	15-17	2003	2011	10.7	14.2	3.5	55.8	49.9	-5.9	35.3	33.5	-1.8
Mozambique	0-17	2003	2011	17.1	16.2	-0.9	61.2	56.2	-5.0	50.0	43.0	-7.1
Namibia	0-17	2000	2006-07	7.5	9.2	1.7	37.3	27.3	-10.0	62.4	59.3	-3.2
Namibia	0-4	2000	2006-07	7.6	9.3	1.7	34.8	27.1	-7.7	63.1	61.5	-1.6
Namibia	5-9	2000	2006-07	7.7	9.0	1.2	38.6	27.2	-11.3	63.5	59.2	-4.3
Namibia	10-14	2000	2006-07	8.0	9.7	1.7	38.6	29.0	-9.6	62.3	59.1	-3.2
Namibia	15-17	2000	2006-07	6.0	8.7	2.7	37.4	24.6	-12.8	58.7	55.2	-3.5
Namibia	0-17	2000	2006-07	7.7	9.2	1.5	35.6	26.8	-8.9	63.9	61.4	-2.5
Namibia	0-17	2000	2006-07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nigeria	0-17	2003	2008	23.0	23.2	0.2	52.9	35.6	-17.3	24.5	31.2	6.6
Nigeria	0-4	2003	2008	21.6	22.6	1.0	52.5	35.0	-17.5	24.2	30.5	6.3
Nigeria	5-9	2003	2008	23.5	23.5	0.0	53.5	35.9	-17.6	25.6	31.8	6.2
Nigeria	10-14	2003	2008	24.1	23.6	-0.5	53.3	35.9	-17.5	24.2	31.3	7.1
Nigeria	15-17	2003	2008	23.4	23.5	0.1	51.5	35.8	-15.7	23.2	31.0	7.8
Nigeria	0-17	2003	2008	22.0	22.8	0.8	52.8	35.1	-17.7	24.7	30.9	6.2

(Continued...)

Table 4.2. – Continued

Country	Child's age	Data collection		Households use surface water				Had more than a 15 minute walk to the water source				Do not have access to any sanitation facilities whatsoever in or near their homes					
		1 Year		2 Year		Year 1		Year 2		Year 1		Year 2		Year 1		Year 2	
		Value	Year	Value	Year	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
Rwanda	0-17	2005	2010	52.2	63.3	11.1	65.6	69.5	3.9	3.3	1.2	-2.1	3.3	1.2	-2.1	3.3	1.2
Rwanda	0-4	2005	2010	51.6	62.4	10.7	65.8	67.5	1.8	3.5	1.3	-2.2	3.5	1.3	-2.2	3.5	1.3
Rwanda	5-9	2005	2010	52.0	64.5	12.5	65.4	70.6	5.1	3.5	1.3	-2.2	3.5	1.3	-2.2	3.5	1.3
Rwanda	10-14	2005	2010	53.1	64.0	11.0	65.5	70.5	5.0	3.1	1.0	-2.0	3.1	1.0	-2.0	3.1	1.0
Rwanda	15-17	2005	2010	52.7	61.4	8.7	65.8	69.5	3.7	2.5	0.8	-1.7	2.5	0.8	-1.7	2.5	0.8
Rwanda	0-17	2005	2010	51.7	63.0	11.4	65.7	68.4	2.7	3.5	1.3	-2.2	3.5	1.3	-2.2	3.5	1.3
Senegal	0-17	2005	2010-11	1.1	1.2	0.1	43.8	15.7	-28.1	23.9	18.7	-5.2	23.9	18.7	-5.2	23.9	18.7
Senegal	0-4	2005	2010-11	1.1	1.4	0.3	44.2	16.2	-27.9	25.8	19.7	-6.1	25.8	19.7	-6.1	25.8	19.7
Senegal	5-9	2005	2010-11	1.2	1.3	0.0	43.8	17.0	-26.9	25.5	20.1	-5.4	25.5	20.1	-5.4	25.5	20.1
Senegal	10-14	2005	2010-11	0.9	1.1	0.2	43.9	14.9	-29.0	22.7	18.0	-4.6	22.7	18.0	-4.6	22.7	18.0
Senegal	15-17	2005	2010-11	0.8	0.6	-0.1	42.1	12.7	-29.4	18.8	13.9	-4.9	18.8	13.9	-4.9	18.8	13.9
Senegal	0-17	2005	2010-11	1.2	1.3	0.1	44.2	16.7	-27.6	25.9	20.0	-5.9	25.9	20.0	-5.9	25.9	20.0
Tanzania	0-17	2004-05	2010	25.0	26.9	1.8	61.0	57.6	-3.3	15.0	17.3	2.3	15.0	17.3	2.3	15.0	17.3
Tanzania	0-4	2004-05	2010	25.7	27.4	1.7	61.3	58.6	-2.7	17.4	19.0	1.6	17.4	19.0	1.6	17.4	19.0
Tanzania	5-9	2004-05	2010	24.8	28.2	3.4	61.3	59.3	-2.0	14.6	17.5	2.9	14.6	17.5	2.9	14.6	17.5
Tanzania	10-14	2004-05	2010	24.2	26.5	2.3	61.0	56.5	-4.5	13.3	16.4	3.2	13.3	16.4	3.2	13.3	16.4
Tanzania	15-17	2004-05	2010	25.3	23.0	-2.3	59.1	53.5	-5.6	12.7	14.0	1.3	12.7	14.0	1.3	12.7	14.0
Tanzania	0-17	2004-05	2010	25.5	27.9	2.4	61.5	58.9	-2.6	16.9	18.6	1.8	16.9	18.6	1.8	16.9	18.6
Uganda	0-17	2006	2011	11.7	13.0	1.3	80.3	70.3	-10.0	12.0	10.0	-1.9	12.0	10.0	-1.9	12.0	10.0
Uganda	0-4	2006	2011	12.7	12.9	0.2	79.8	67.8	-12.0	13.0	11.0	-2.0	13.0	11.0	-2.0	13.0	11.0
Uganda	5-9	2006	2011	11.6	13.4	1.8	81.9	71.3	-10.6	12.8	10.5	-2.2	12.8	10.5	-2.2	12.8	10.5
Uganda	10-14	2006	2011	10.7	13.1	2.5	80.6	72.7	-7.9	10.8	9.6	-1.1	10.8	9.6	-1.1	10.8	9.6
Uganda	15-17	2006	2011	11.8	12.2	0.4	76.5	69.4	-7.1	9.8	7.1	-2.8	9.8	7.1	-2.8	9.8	7.1
Uganda	0-17	2006	2011	12.6	13.2	0.7	80.3	68.8	-11.4	13.0	11.0	-2.0	13.0	11.0	-2.0	13.0	11.0
Zambia	0-17	2001-02	2007	19.4	21.5	2.0	40.8	34.0	-6.8	27.3	24.4	-2.9	27.3	24.4	-2.9	27.3	24.4
Zambia	0-4	2001-02	2007	20.9	23.6	2.8	40.5	36.1	-4.4	30.3	27.2	-3.1	30.3	27.2	-3.1	30.3	27.2
Zambia	5-9	2001-02	2007	18.8	22.9	4.1	41.0	34.7	-6.3	26.6	25.6	-1.0	26.6	25.6	-1.0	26.6	25.6
Zambia	10-14	2001-02	2007	18.9	19.3	0.4	41.2	32.8	-8.4	26.0	22.9	-3.2	26.0	22.9	-3.2	26.0	22.9

(Continued...)

Table 4.2. – Continued

Country	Child's age	Data collection		Households use surface water				Had more than a 15 minute walk to the water source				Do not have access to any sanitation facilities whatsoever in or near their homes			
		Year		Year 1		Year 2		Year 1		Year 2		Year 1		Year 2	
		Value	1 Year	2 Year	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	
Zambia	15-17	2001-02	2007	18.2	16.2	-1.9	40.1	28.7	-11.4	23.9	16.6	-7.3			
Zambia	0-17	2001-02	2007	20.2	23.4	3.3	40.8	35.5	-5.3	29.4	27.0	-2.4			
Zimbabwe	0-17	2005-06	2010-11	3.1	10.7	7.6	42.9	34.9	-8.0	35.9	31.6	-4.3			
Zimbabwe	0-4	2005-06	2010-11	3.1	11.2	8.2	41.2	33.9	-7.3	37.2	32.3	-5.0			
Zimbabwe	5-9	2005-06	2010-11	3.1	11.0	8.0	43.4	35.7	-7.7	37.0	33.3	-3.7			
Zimbabwe	10-14	2005-06	2010-11	3.1	10.3	7.1	45.3	36.1	-9.2	36.4	32.0	-4.4			
Zimbabwe	15-17	2005-06	2010-11	3.1	9.9	6.8	40.1	33.2	-6.9	29.5	25.3	-4.2			
Zimbabwe	0-17	2005-06	2010-11	3.0	11.1	8.1	41.4	34.1	-7.4	37.2	32.5	-4.8			

Table 4.3. Percentage of children who live in households that are more than a 15-minute walk to the water source, by country, sex of child, and region of residence as well as sex and age of head of household

Country	Sex of child			Region of residence			Sex of household head			Age of household head		
	Male (a)	Female (b)	Comparison (b)-(a)	Urban (c)	Rural (d)	Comparison (d)-(c)	Male (e)	Female (f)	Comparison (f)-(e)	Less than age 50 (g)	Age 50 or more (h)	Comparison (h)-(g)
Benin	34.8	33.6	-1.2	22.0	40.9	18.9	34.7	31.5	-3.2	34.0	35.4	1.4
Burkina Faso	44.3	43.1	-1.2	27.9	47.4	19.5	44.2	38.2	-6.0	44.2	41.5	-2.7
Burundi	61.6	63.1	1.5	25.9	65.8	39.9	62.5	61.9	-0.6	62.1	65.2	3.1
Cameroon	40.2	39.7	-0.5	29.1	48.3	19.2	40.4	38.4	-2.0	39.3	42.5	3.2
Chad	56.0	58.3	2.3	43.3	59.0	15.7	56.9	58.7	1.8	57.4	55.0	-2.4
Ethiopia	69.8	69.1	-0.7	31.3	76.0	44.7	70.3	66.1	-4.2	69.2	71.0	1.8
Ghana	29.4	28.5	-0.9	15.2	38.2	23.0	31.9	22.4	-9.5	28.6	30.9	2.3
Guinea	35.5	35.4	-0.1	24.3	38.4	14.1	35.3	36.6	1.3	35.4	35.8	0.4
Kenya	48.7	48.1	-0.6	13.8	54.3	40.5	47.6	50.0	2.4	47.3	54.5	7.2
Lesotho	39.6	39.3	-0.3	16.7	45.2	28.5	39.3	39.7	0.4	38.3	42.9	4.6
Liberia	14.2	14.4	0.2	18.2	12.1	-6.1	14.8	13.2	-1.6	14.4	13.9	-0.5
Madagascar	18.7	19.3	0.6	10.5	20.2	9.7	18.7	20.3	1.6	18.7	21.5	2.8
Malawi	58.2	57.8	-0.4	35.5	61.7	26.2	57.4	59.9	2.5	57.5	61.3	3.8
Mali	12.0	10.9	-1.1	9.7	12.2	2.5	11.4	12.4	1.0	11.1	13.2	2.1
Mozambique	54.8	54.6	-0.2	27.7	66.1	38.4	55.0	54.1	-0.9	54.8	54.2	-0.6
Namibia	27.6	27.0	-0.6	3.3	40.3	37.0	25.2	29.4	4.2	22.8	38.8	16.0
Niger	47.8	48.2	0.4	13.5	54.7	41.2	47.9	48.4	0.5	48.6	45.8	-2.8
Nigeria	35.8	35.3	-0.5	27.3	39.2	11.9	35.8	34.0	-1.8	35.0	38.2	3.2
Rwanda	69.6	69.3	-0.3	42.3	73.1	30.8	68.8	71.0	2.2	68.9	74.2	5.3
Senegal	15.9	15.5	-0.4	5.0	22.6	17.6	17.9	7.1	-10.8	15.6	15.9	0.3
Tanzania	58.2	57.1	-1.1	35.2	63.4	28.2	57.4	58.3	0.9	57.2	59.5	2.3
Uganda	70.4	70.3	-0.1	31.5	75.6	44.1	71.4	67.6	-3.8	70.1	71.7	1.6
Zambia	34.5	33.5	-1.0	14.2	43.8	29.6	34.1	33.6	-0.5	33.5	37.9	4.4
Zimbabwe	35.4	34.5	-0.9	8.3	44.1	35.8	34.0	36.1	2.1	33.6	41.0	7.4
All children												

Table 4.4. Percentage of children who live in households that do not have access to any sanitation facilities whatsoever in or near their homes, by country, sex of child, and region of residence as well as sex and age of head of household

Country	Sex of child			Region of residence			Sex of household head			Age of household head		
	Male	Female	Comparison	Urban	Rural	Comparison	Male	Female	Comparison	Less than	Age 50	All
	(a)	(b)	(b)-(a)	(c)	(d)	(d)-(c)	(e)	(f)	(f)-(e)	(g)	(h)	(h)-(g)
Benin	68.1	66.2	-1.9	39.5	82.4	42.9	69.2	57.0	-12.2	66.2	72.8	6.6
Burkina Faso	67.6	65.4	-2.2	14.7	78.5	63.8	67.4	55.7	-11.7	66.2	68.2	2.0
Burundi	2.8	2.7	-0.1	1.8	2.9	1.1	2.5	3.8	1.3	2.7	3.1	0.4
Cameroon	7.7	8.1	0.4	1.7	12.7	11.0	8.7	4.9	-3.8	7.6	8.9	1.3
Chad	72.3	72.3	0.0	17.4	85.4	68.0	72.1	73.5	1.4	72.3	72.5	0.2
Ethiopia	40.1	39.0	-1.1	18.1	43.3	25.2	39.4	40.2	0.8	39.7	38.7	-1.0
Ghana	26.6	24.0	-2.6	7.9	37.0	29.1	29.1	16.6	-12.5	24.1	31.2	7.1
Guinea	27.6	27.4	-0.2	2.6	37.3	34.7	26.9	31.7	4.8	28.7	23.9	-4.8
Kenya	17.9	16.2	-1.7	1.5	19.8	18.3	16.2	18.8	2.6	16.3	21.8	5.5
Lesotho	40.3	39.3	-1.0	5.8	48.4	42.6	40.7	38.1	-2.6	39.0	42.4	3.4
Liberia	56.4	53.8	-2.6	29.0	70.3	41.3	56.2	52.8	-3.4	54.9	56.8	1.9
Madagascar	46.3	46.4	0.1	12.1	51.0	38.9	45.6	49.7	4.1	45.7	51.9	6.2
Malawi	10.4	10.1	-0.3	2.8	11.5	8.7	8.6	14.9	6.3	10.1	11.5	1.4
Mali	20.0	19.0	-1.0	6.8	24.6	17.8	19.4	20.3	0.9	19.1	21.6	2.5
Mozambique	40.2	40.3	0.1	14.8	50.9	36.1	40.7	39.4	-1.3	40.7	36.8	-3.9
Namibia	59.7	58.8	-0.9	17.0	82.0	65.0	55.2	63.3	8.1	52.6	75.8	23.2
Niger	80.5	80.6	0.1	19.2	92.7	73.5	79.8	84.7	4.9	80.3	81.3	1.0
Nigeria	31.9	30.4	-1.5	11.8	39.9	28.1	30.7	34.4	3.7	30.5	34.4	3.9
Rwanda	1.3	1.1	-0.2	0.9	1.2	0.3	0.9	2.0	1.1	1.1	1.5	0.4
Senegal	18.7	18.7	0.0	1.8	29.5	27.7	21.0	10.0	-11.0	19.7	16.8	-2.9
Tanzania	17.7	16.9	-0.8	2.3	21.1	18.8	16.7	19.6	2.9	16.7	19.8	3.1
Uganda	9.7	10.4	0.7	2.0	11.1	9.1	9.2	12.1	2.9	9.8	11.5	1.7
Zambia	24.1	24.8	0.7	1.9	35.5	33.6	23.0	29.7	6.7	23.8	29.2	5.4
Zimbabwe	31.8	31.4	-0.4	1.6	41.8	40.2	31.8	31.3	-0.5	31.3	33.0	1.7

Figure 4.1. Percentage of children who live in households that use surface water, by country and the child's sex

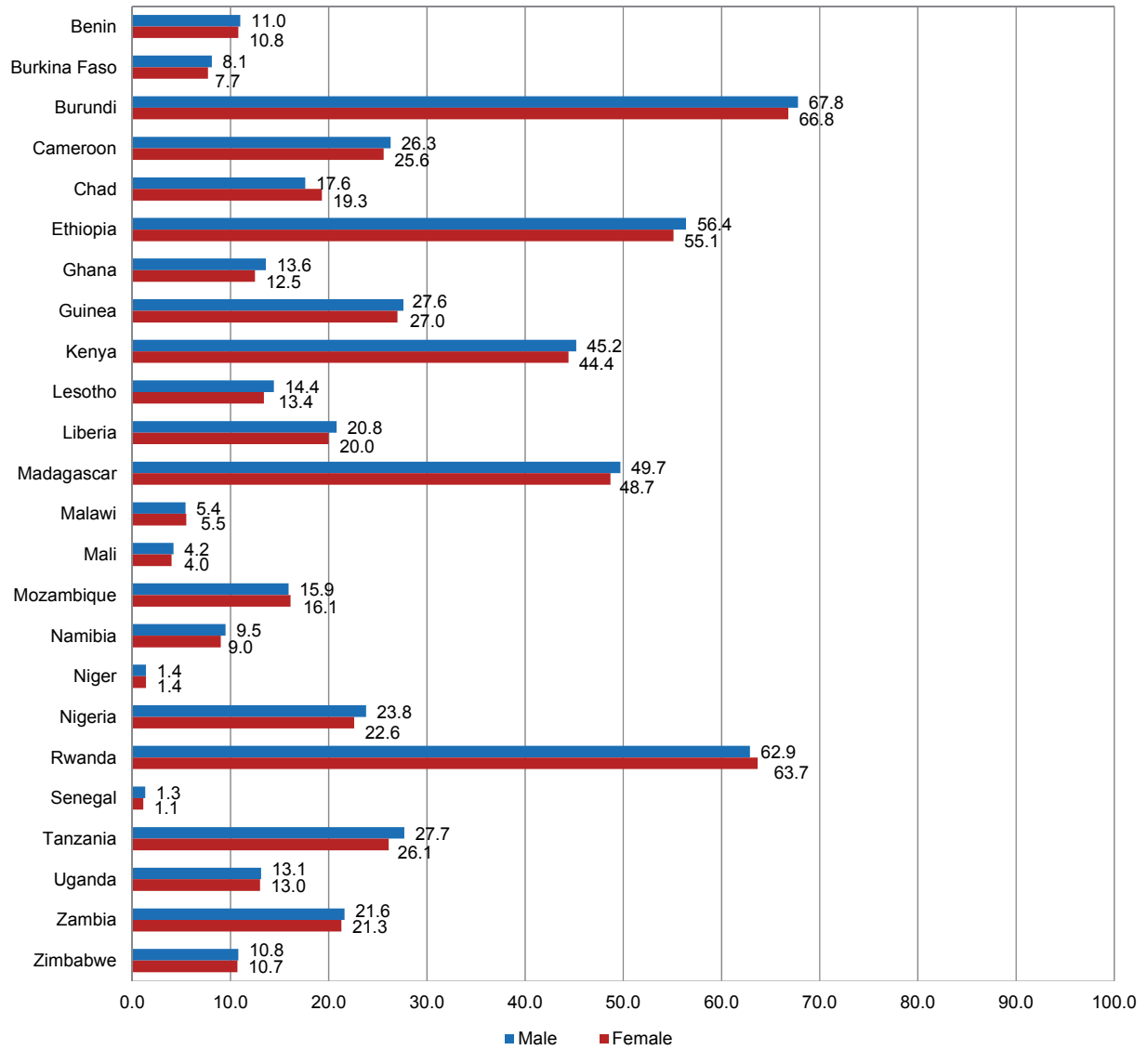


Figure 4.2. Percentage of children who live in households that use surface water, by country and region of residence

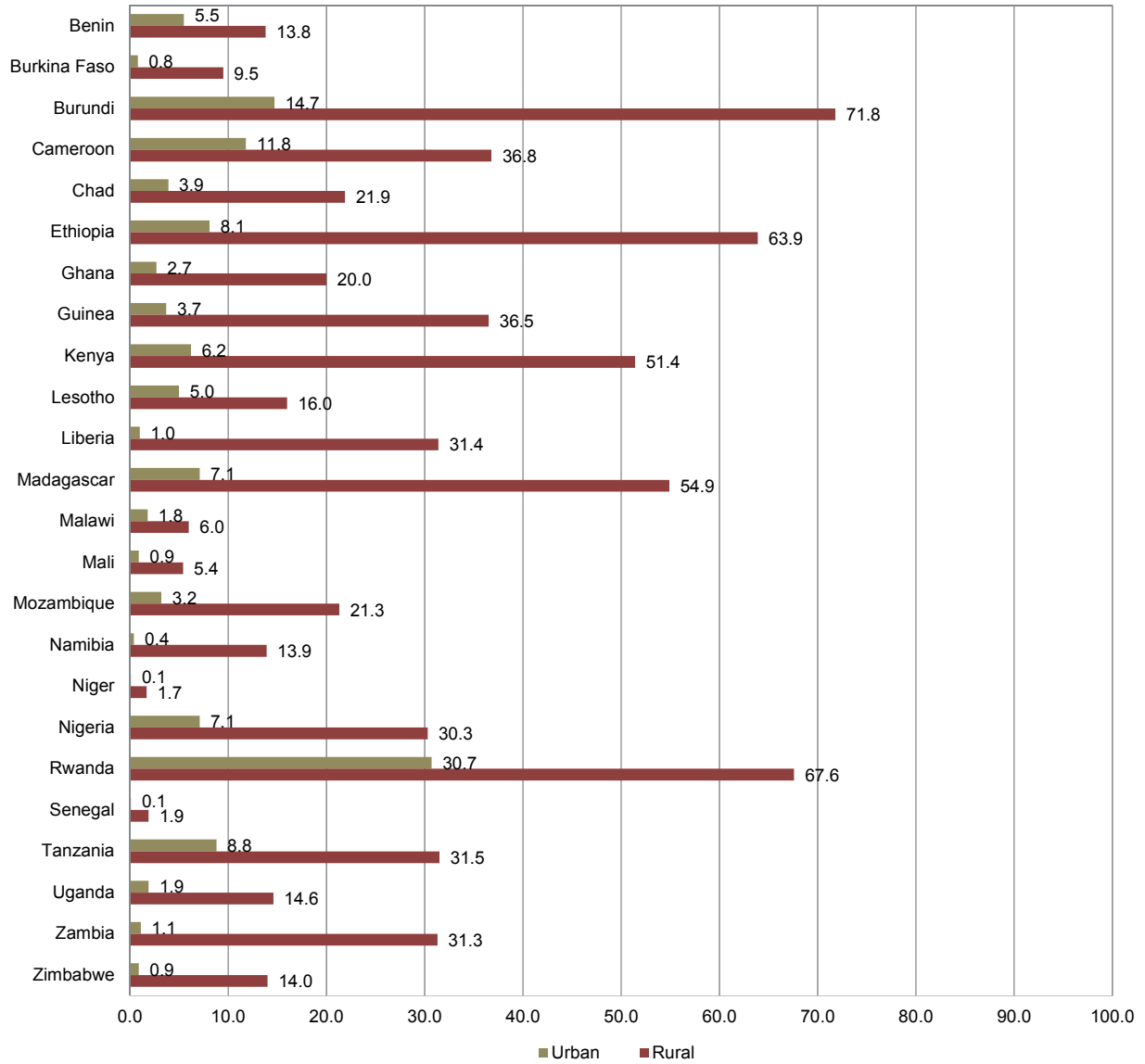


Figure 4.3. Percentage of children who live in households that use surface water, by country and the sex of the household head

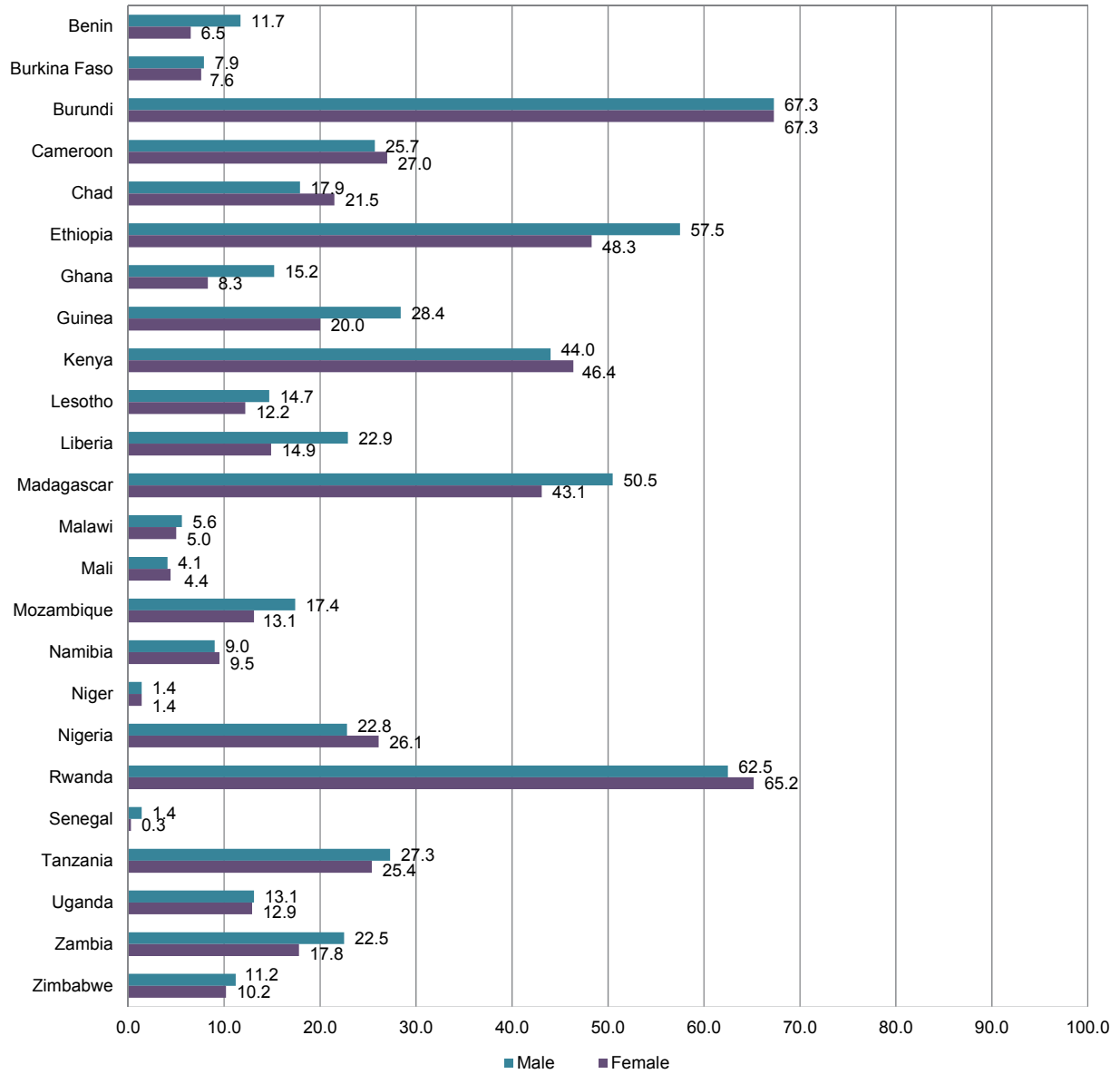


Figure 4.4. Percentage of children who live in households that use surface water, by country and the age of the household head

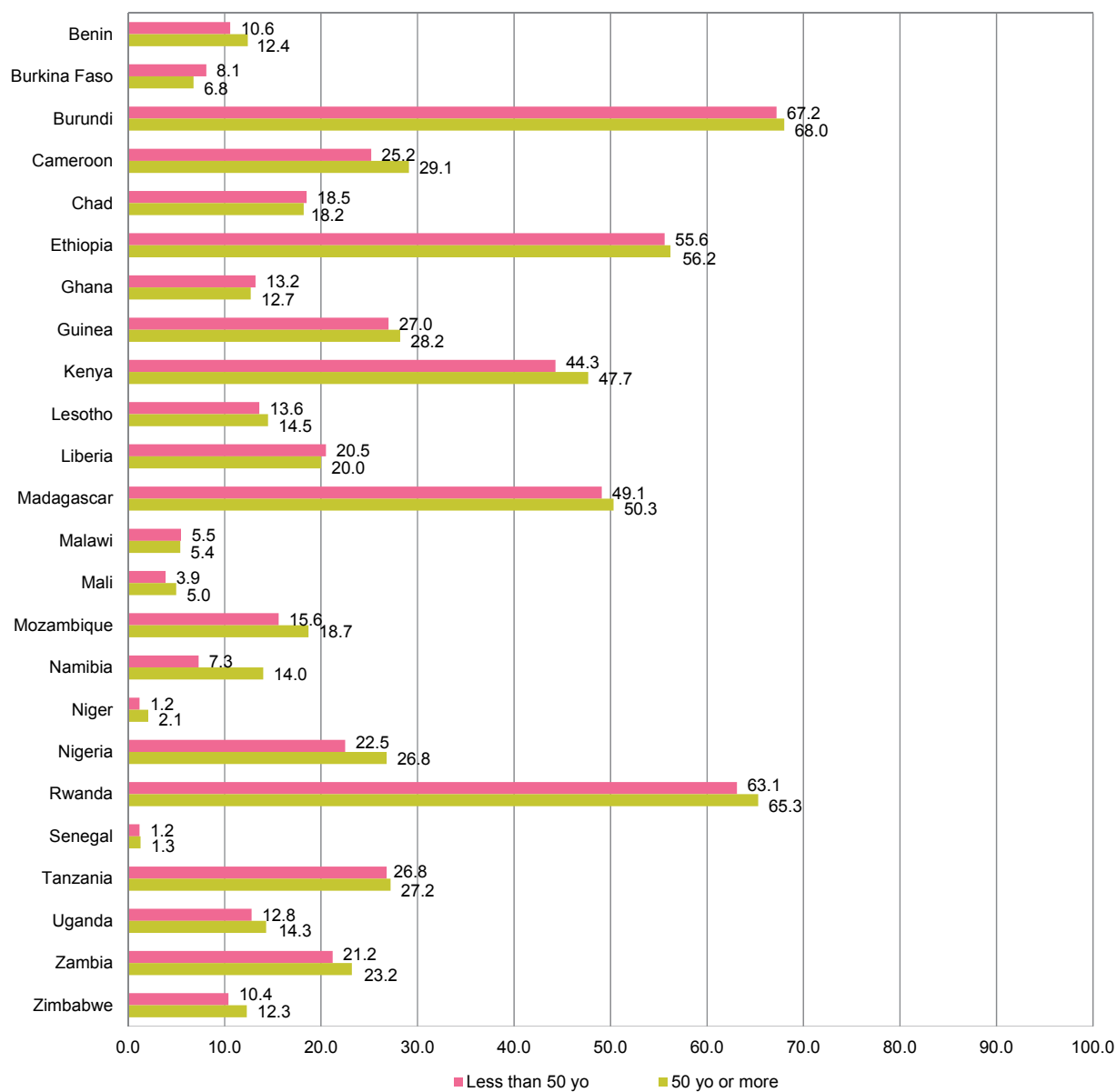


Figure 4.5. Changes in the percentage of children who live in households that use surface water

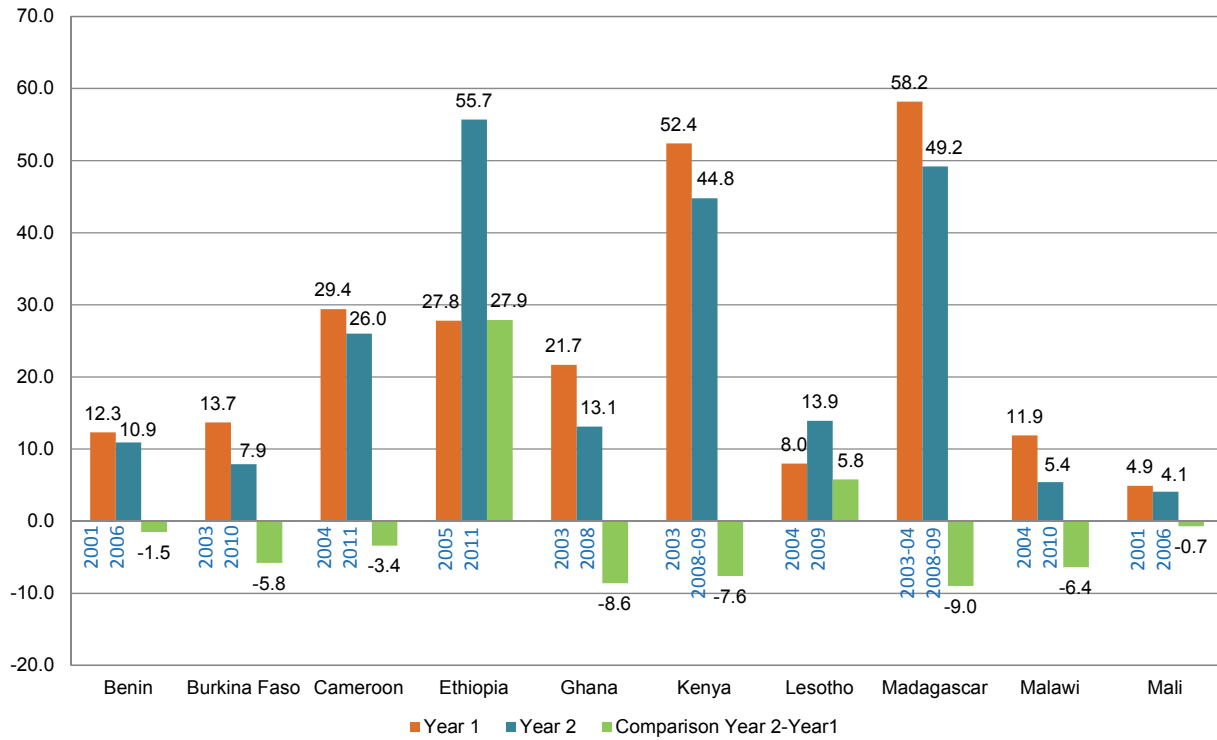


Figure 4.6. Changes in the percentage of children who live in households that use surface water

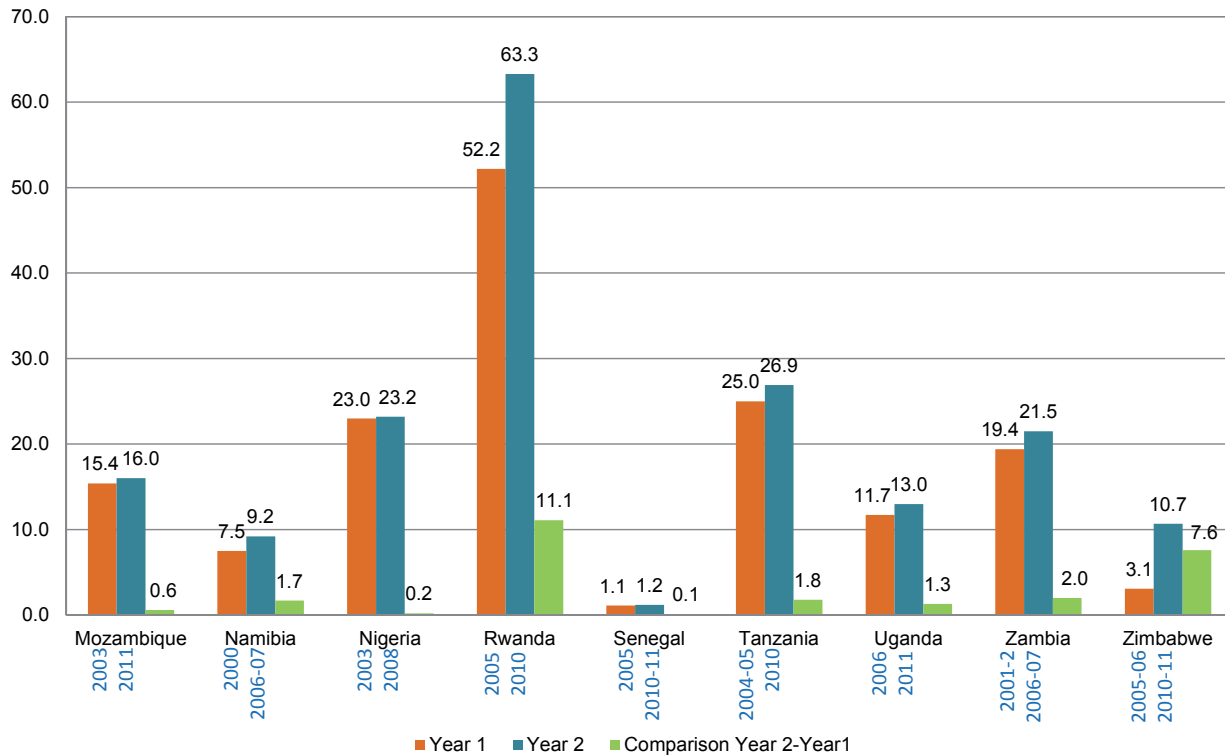


Figure 4.7. Percentage of children who live in households that are more than a 15-minute walk to the water source, by country and the child's sex

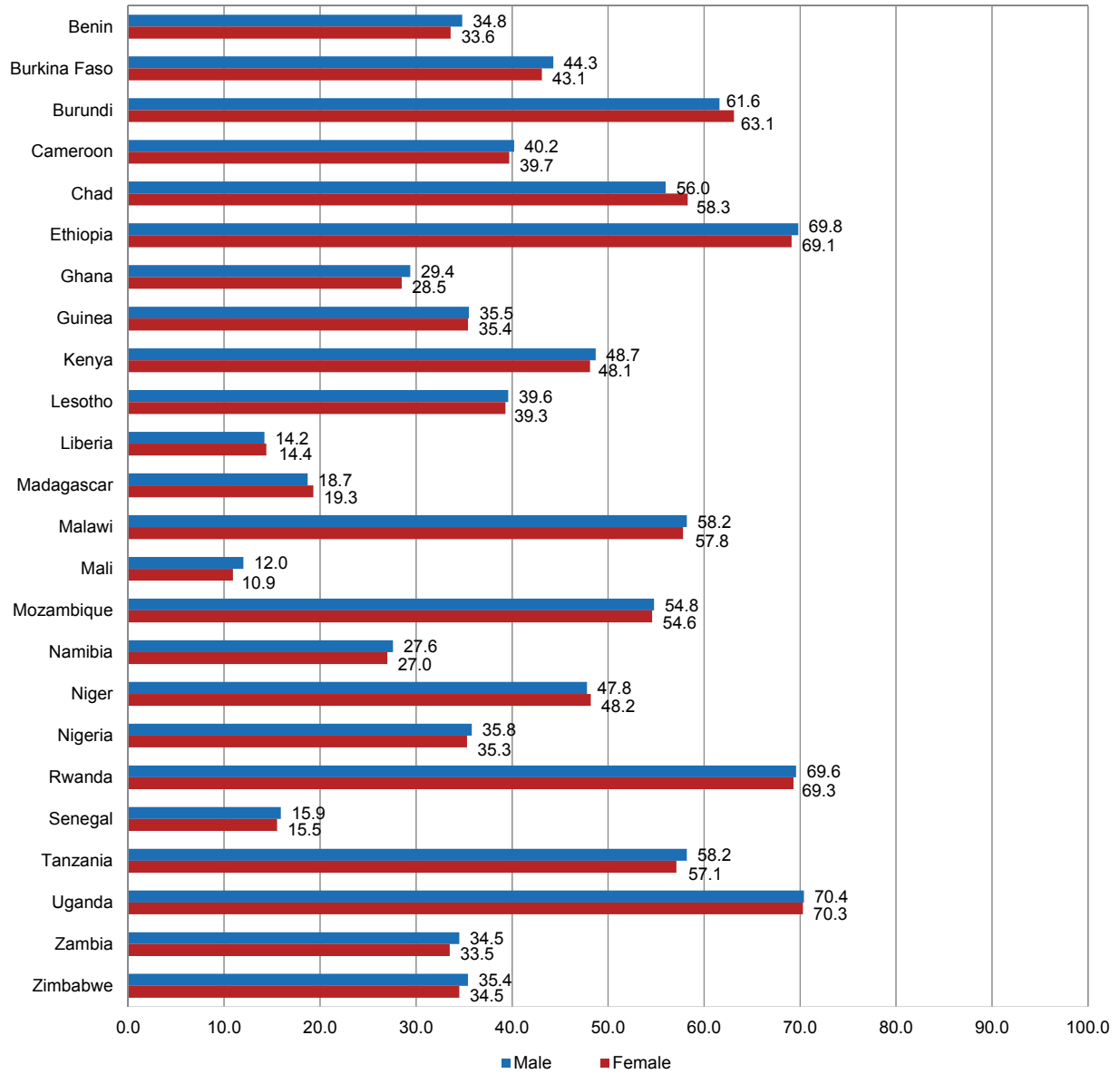


Figure 4.8. Percentage of children who live in households that are more than a 15-minute walk to the water source, by country and region of residence

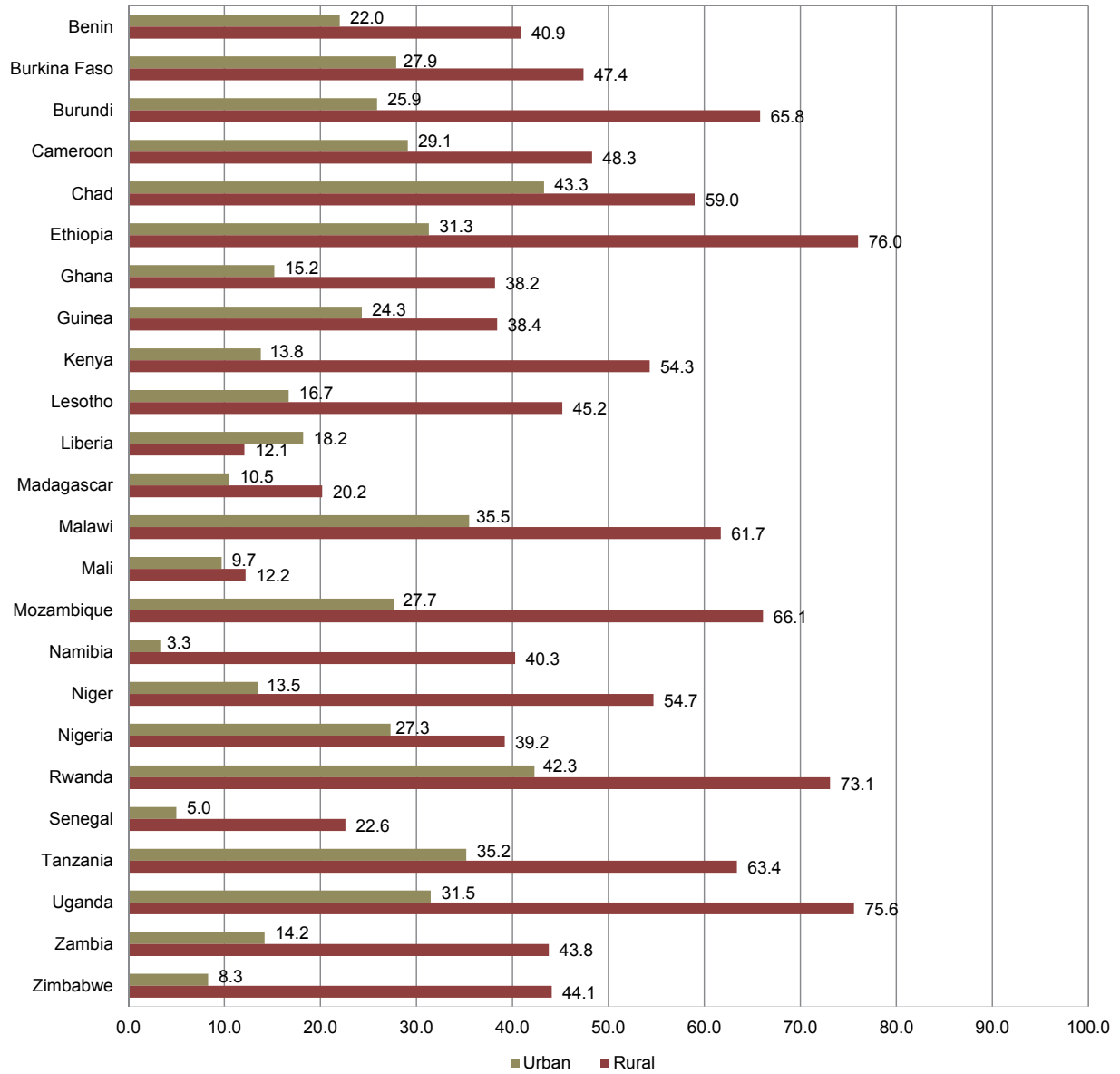


Figure 4.9. Percentage of children who live in households that are more than a 15-minute walk to the water source, by country and the sex of the household head

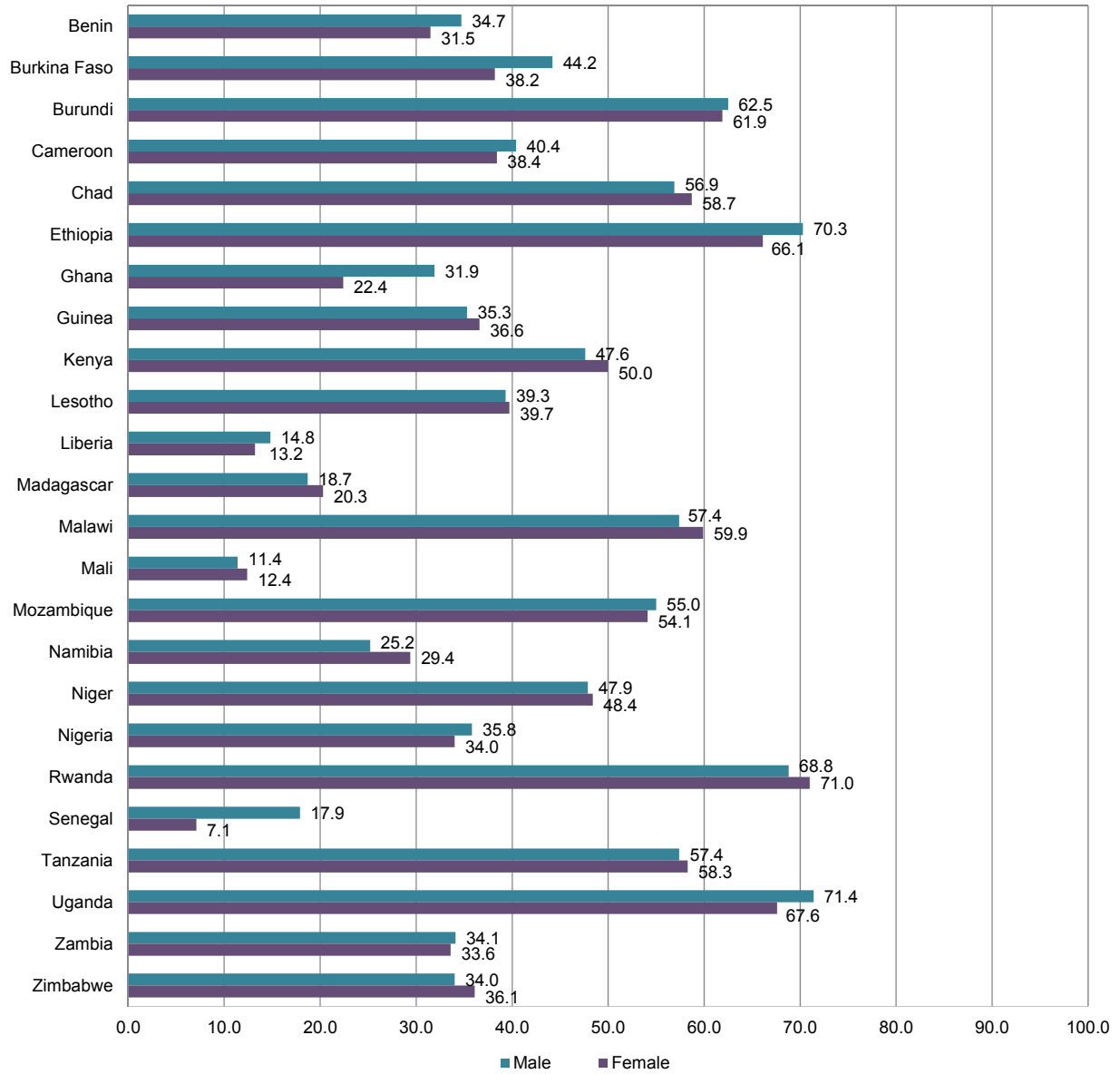


Figure 4.10. Percentage of children who live in households that are more than a 15-minute walk to the water source, by country and the age of the household head

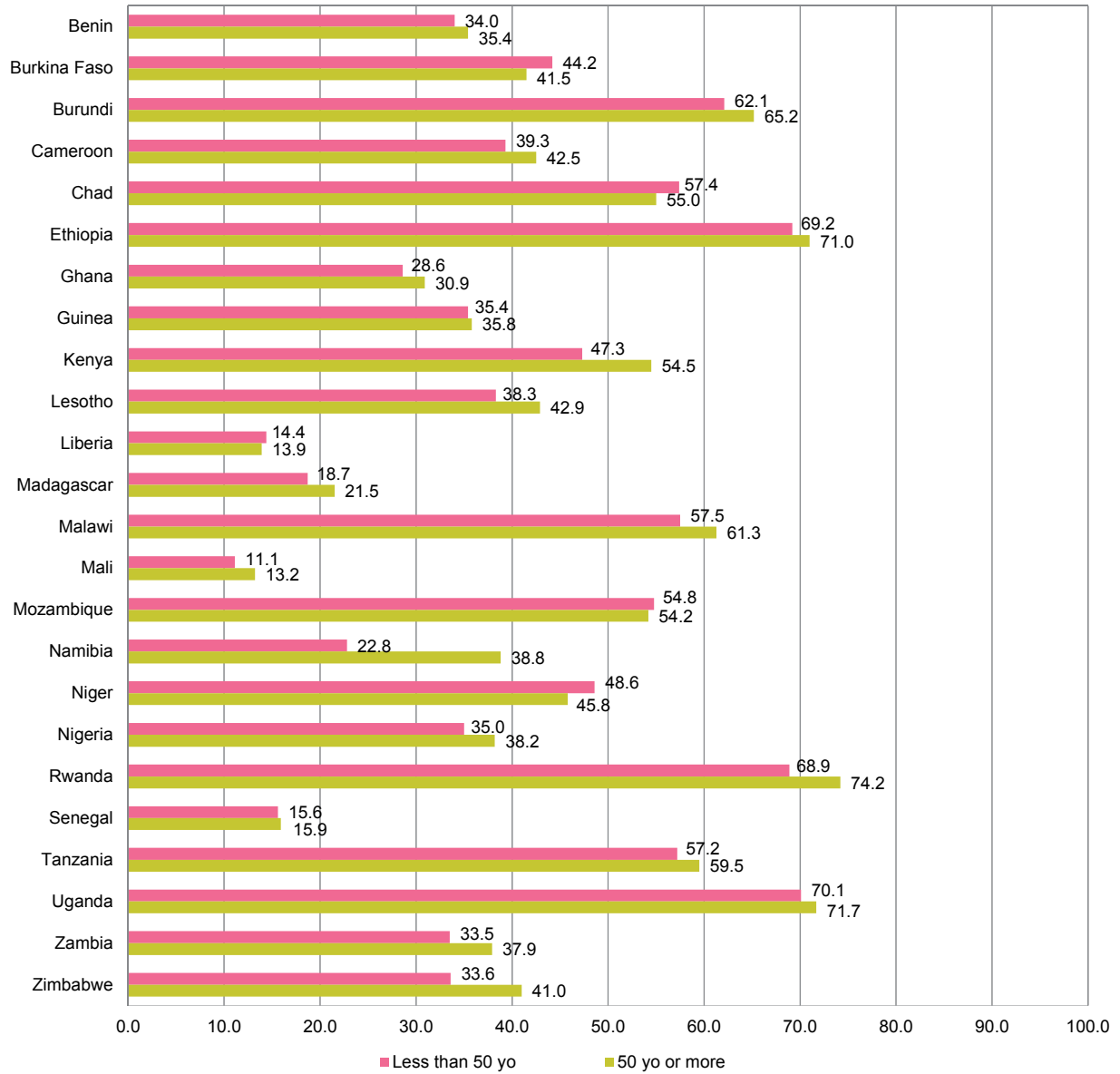


Figure 4.11. Changes in the percentage of children who had more than a 15-minute walk to the water source

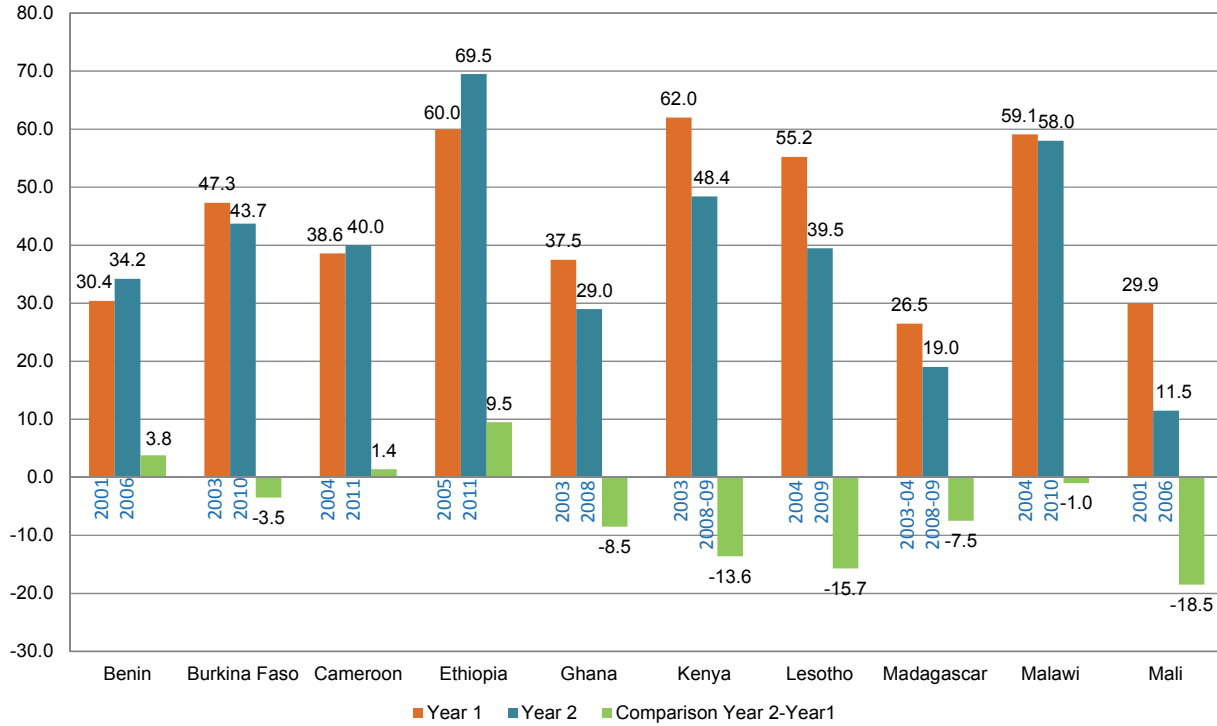


Figure 4.12. Changes in the percentage of children who had more than a 15-minute walk to the water source

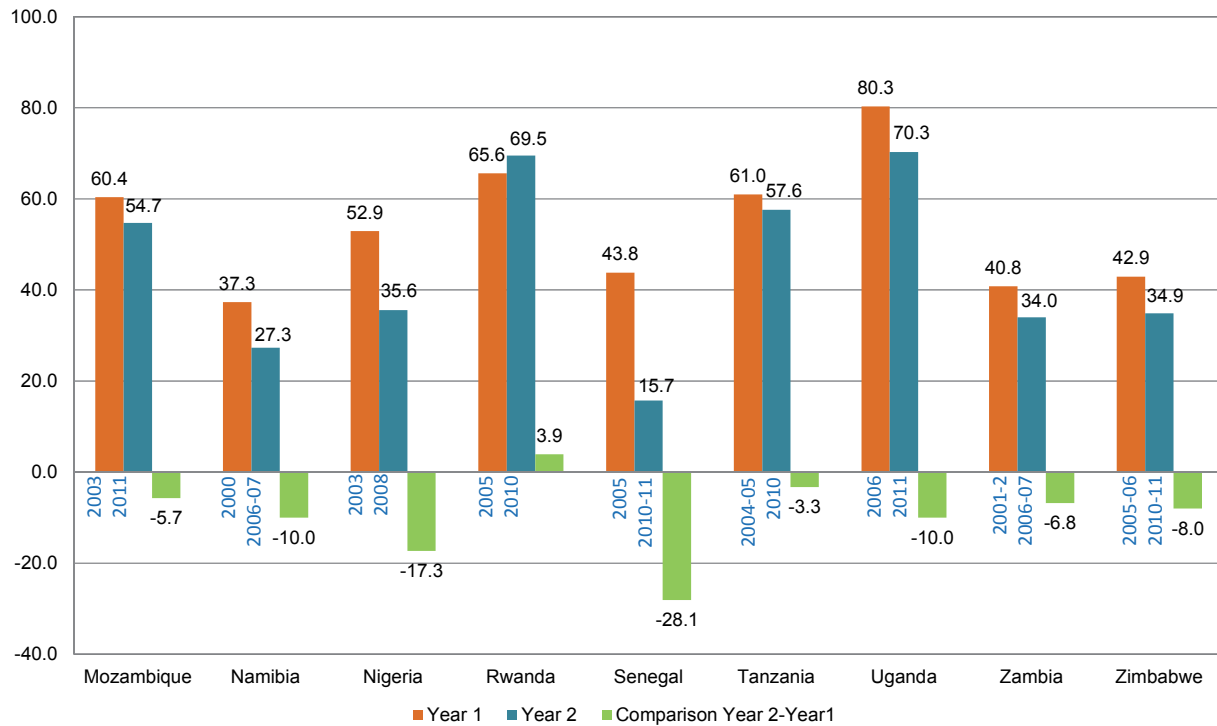


Figure 4.13. Percentage of children who live in households that do not have access to any sanitation facilities whatsoever in or near their homes, by country and the child's sex

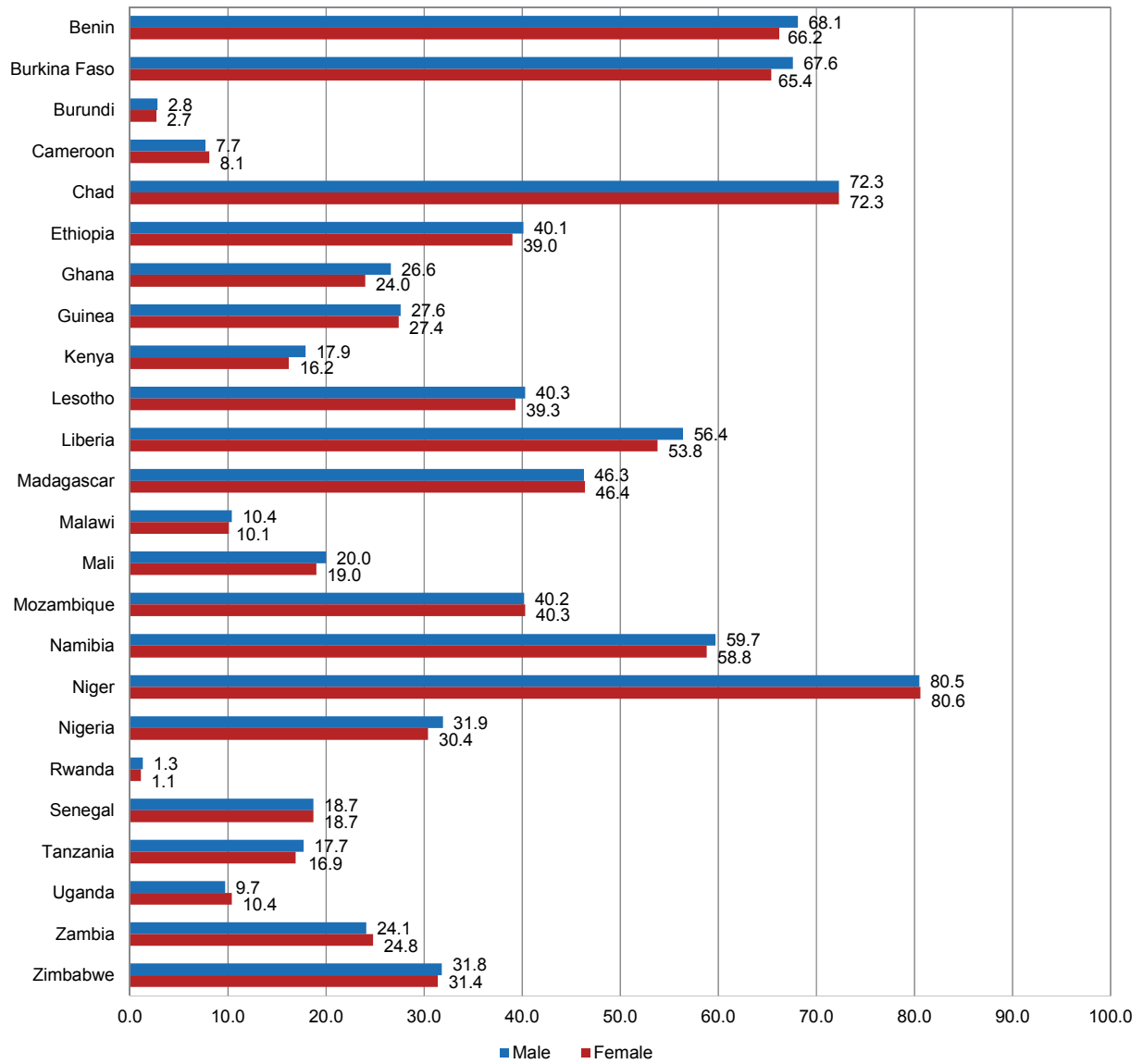


Figure 4.14. Percentage of children who live in households that do not have access to any sanitation facilities whatsoever in or near their homes, by country and region of residence

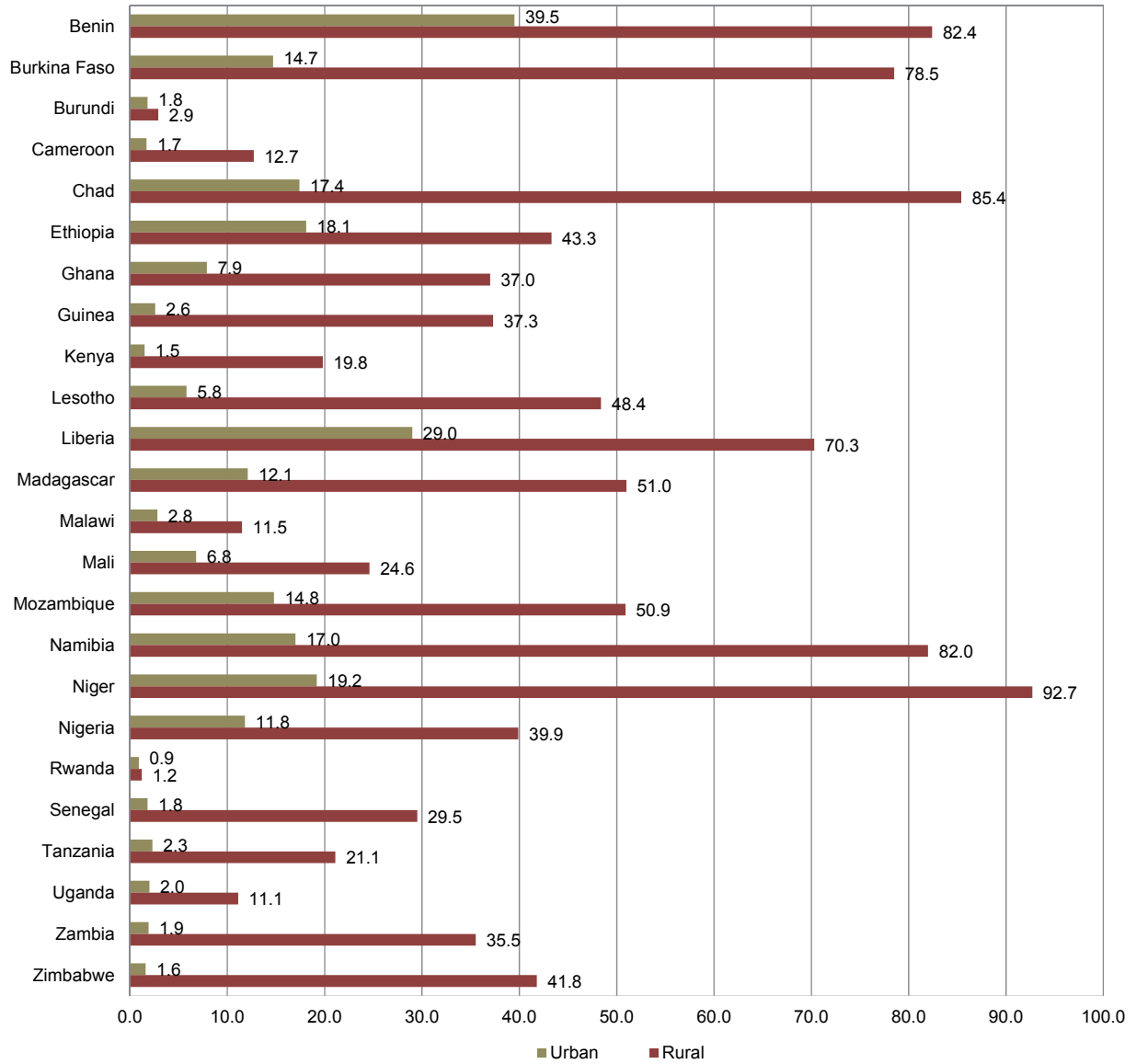


Figure 4.15. Percentage of children who live in households that do not have access to any sanitation facilities whatsoever in or near their homes, by country and the sex of the household head

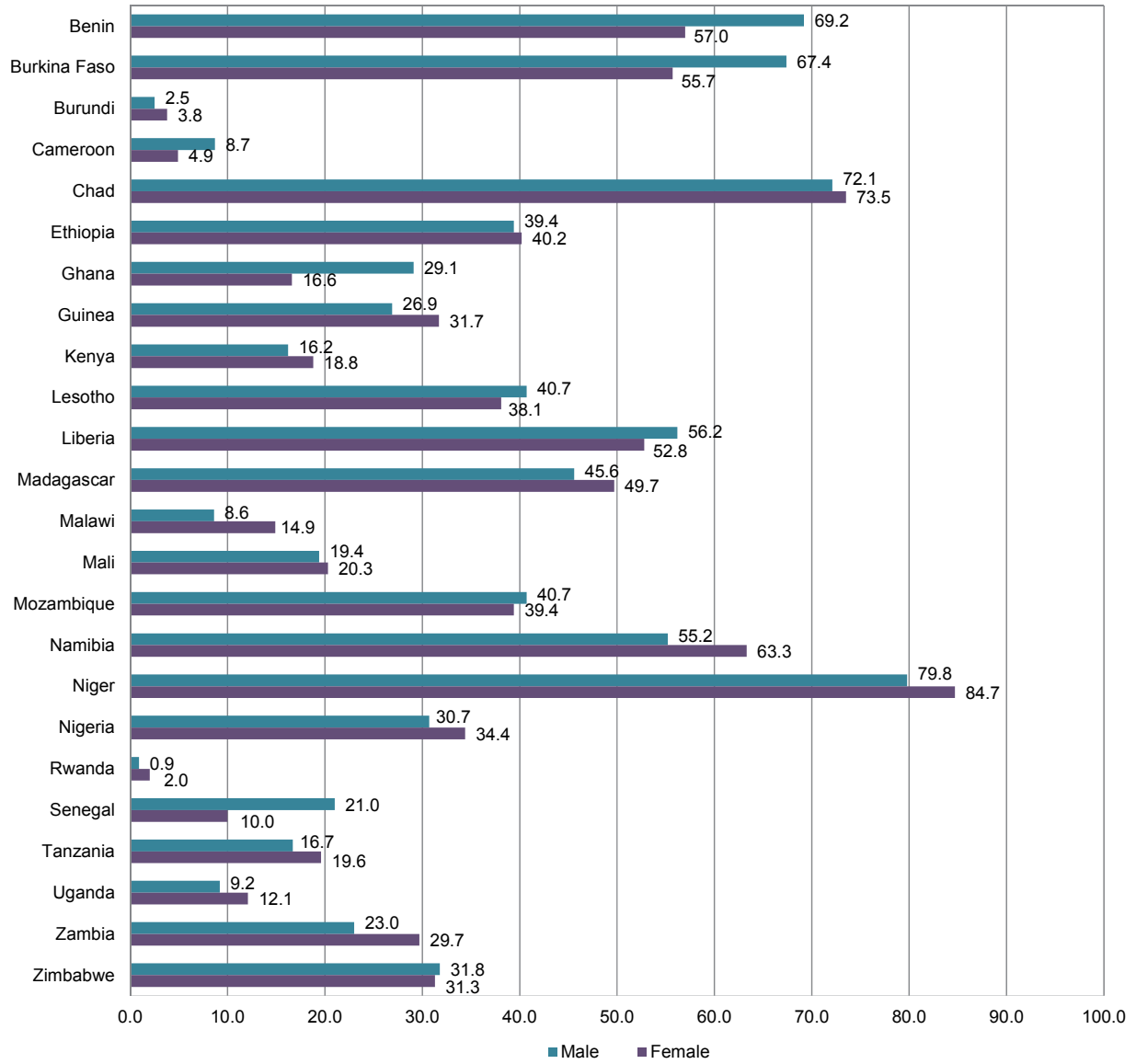


Figure 4.16. Percentage of children who live in households that do not have access to any sanitation facilities whatsoever in or near their homes, by country and the age of the household head

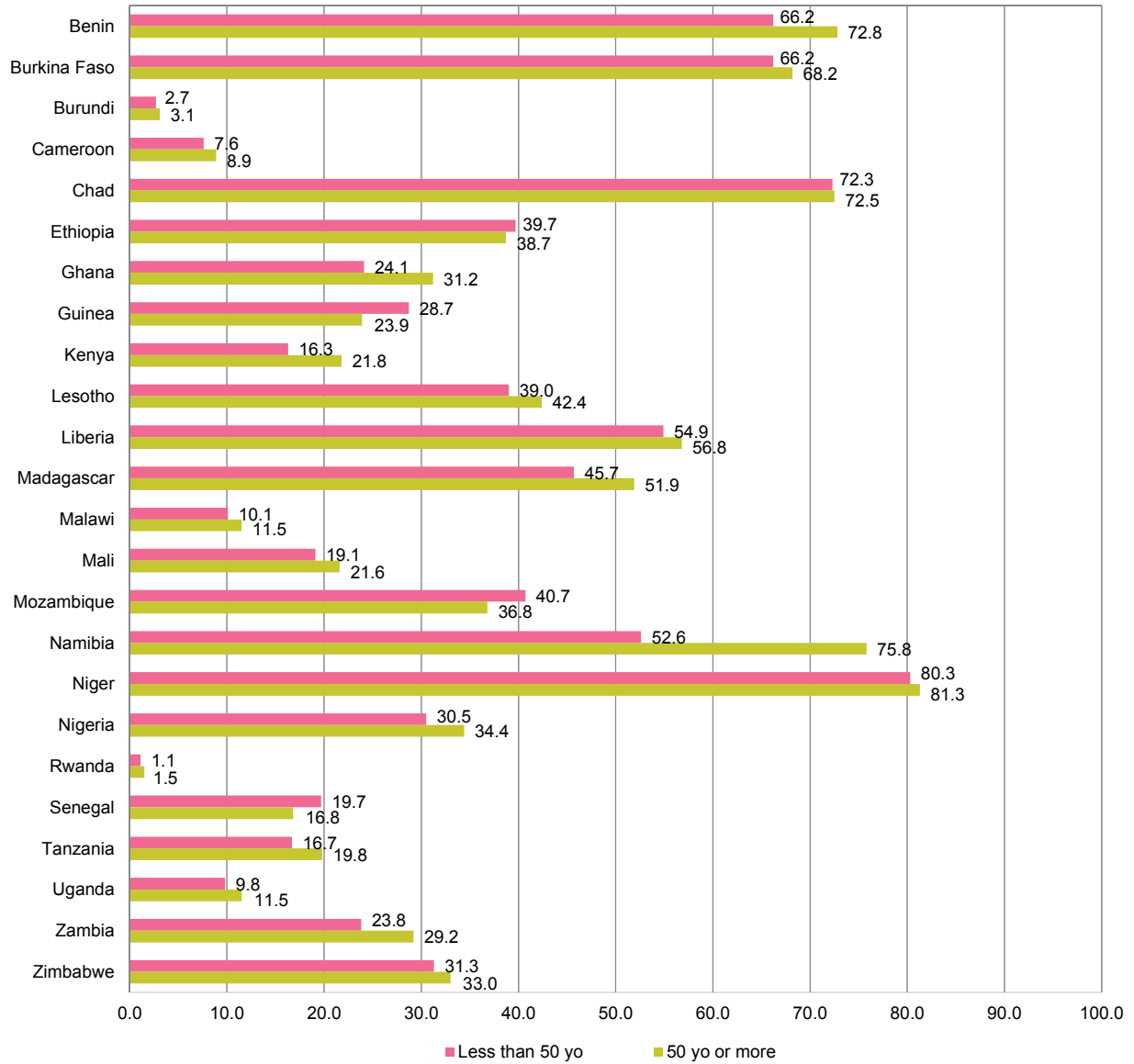


Figure 4.17. Changes in the percentage of children who did not have access to any sanitation facilities whatsoever in or near their homes

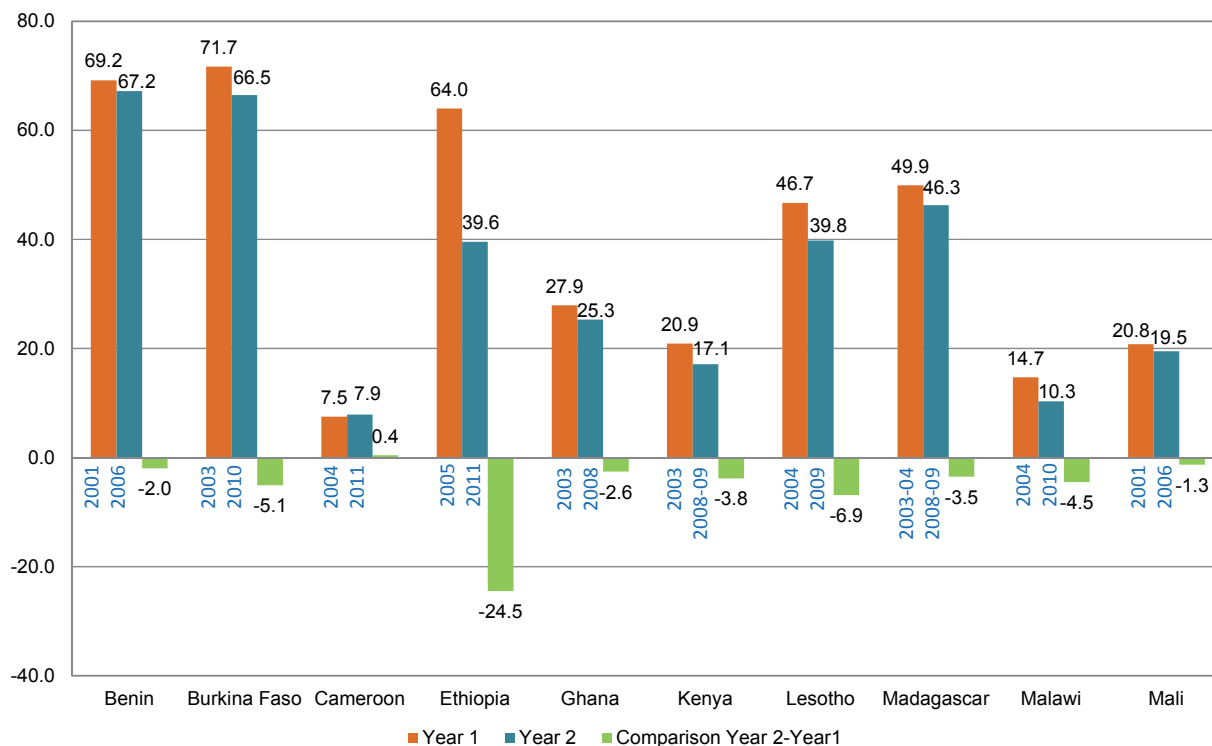
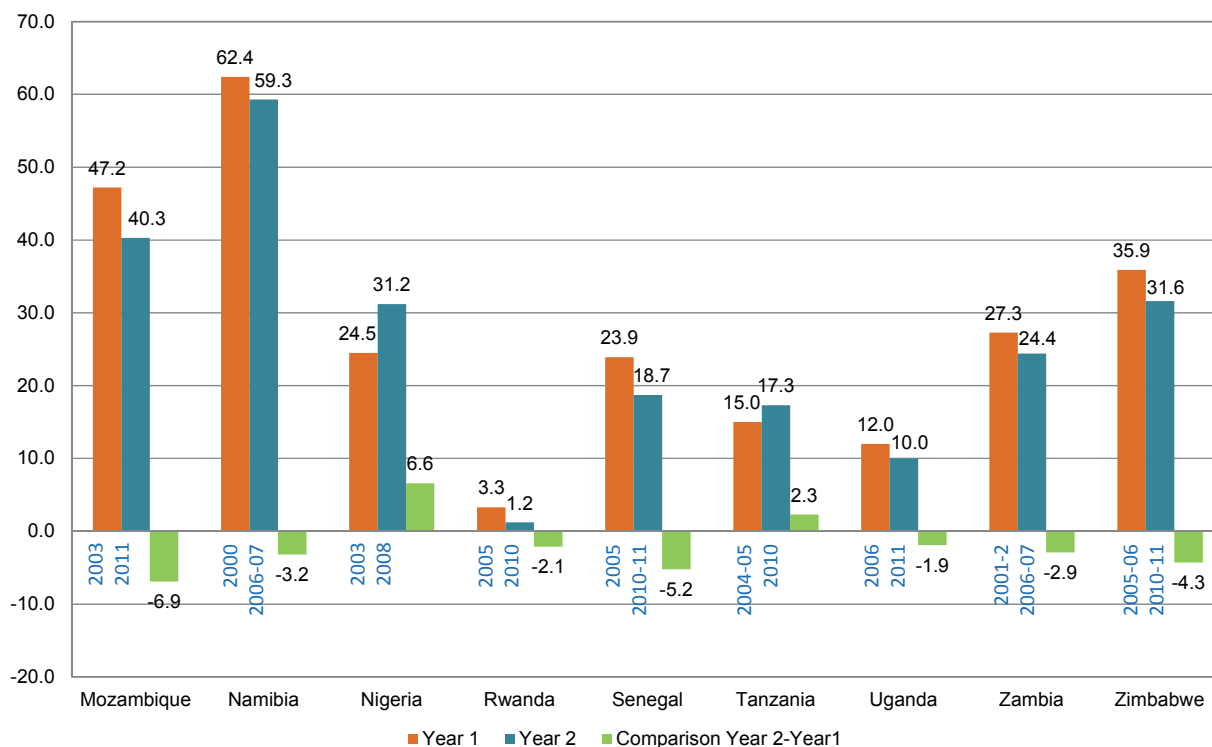
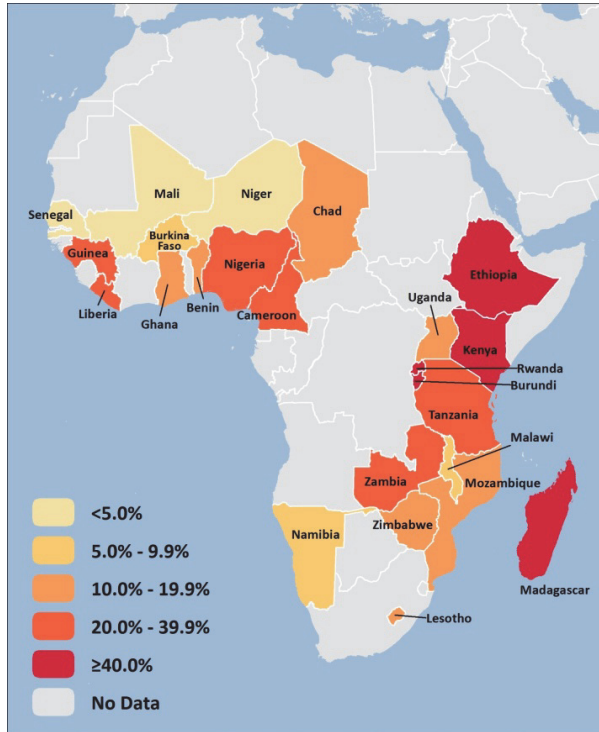


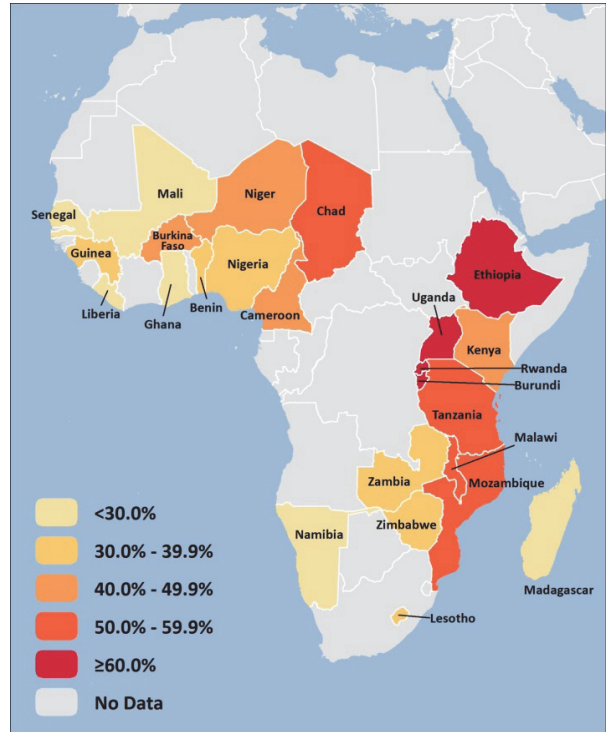
Figure 4.18. Changes in the percentage of children who did not have access to any sanitation facilities whatsoever in or near their homes



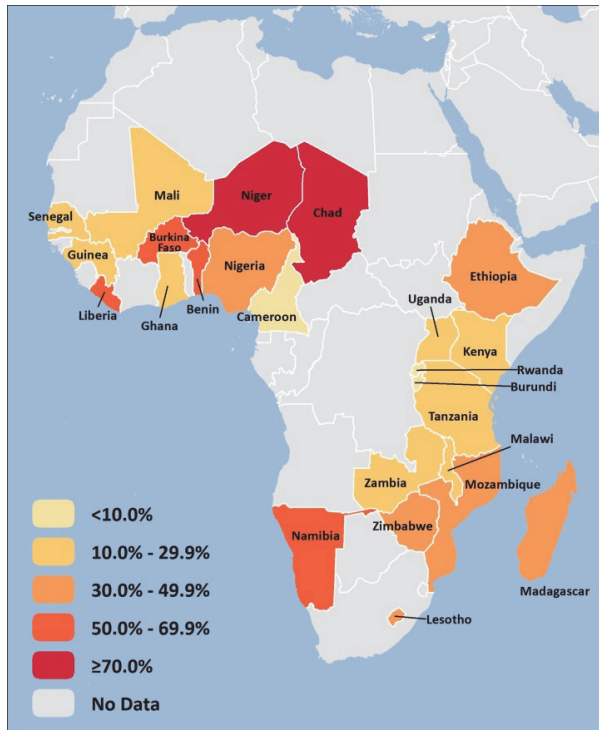
Map 4.1 Percentage of children who live in households that use surface water



Map 4.2 Percentage of children who live in households that are more than a 15-minute walk to the water source



Map 4.3 Percentage of children who live in households that do not have access to any sanitation facilities whatsoever in or near their homes



5 Shelter Deprivation

This chapter focuses on two household characteristics: dwellings with mud floors and homes that do not have electricity. The analyses included data on children up to 17 years of age.

5.1 Living in Houses with Mud Floors

The growing number and size of slums worldwide demonstrates that the slums are crucial elements of contemporary urbanization in developing countries (Morakinyo et al., 2012). Over 640 million children in the developing world live in overcrowded homes or dwellings with mud floors (UNICEF, 2005). Researchers have found an association in sub-Saharan Africa between living in houses with mud floors and health and nutritional problems. Dumba et al. (2008) found in the Luweero district of Uganda that, among children under age 5, living in a house with a mud floor was associated with the risk of having helminth infection. Ainsworth and Semali (2000), studying children under the age of 60 months in the Kagera region of Tanzania, found an association between a recent adult death in households with a dirt floor and substantially higher child morbidity. Ainsworth and Semali also found that better housing (e.g., having a concrete, tiled, or wooden floor instead of a dirt floor) was the only household-level socioeconomic variable with a strongly positive relationship to children's weight-for-height. Children in households with concrete, wood, or tile floors had weight-for-height z-scores 0.2 SD higher than children in households with dirt floors. Finally, a recent study by Mohammed and Tamiru (2013) in Arba Minch Zuria, southern Ethiopia, found that children under five years old living in houses with mud floors were more likely to have diarrhea than their counterparts living in houses with cement floors.

In sub-Saharan Africa the percentage of children under 18 years of age who lived in houses with mud floors was very inconsistent, from 16% in Madagascar to 95% in Chad (see Map 5.1). In Burundi and Ethiopia 9 of every 10 children lived in a house with mud floors (see Table 5.1). Three of every four children lived in houses with mud floors in Malawi, Mali, Niger, Tanzania, and Uganda. More than half of children in Burkina Faso, Guinea, Kenya, Liberia, Mozambique, Namibia, and Zambia, as well, lived in houses with mud floors.

Sex and geographic disparities

Generally, there were no child sex disparities related to living in a house with a mud floor (see Figure 5.1). However, in four countries—Cameroon, Kenya, Liberia, and Tanzania—the percentage of children living in houses with mud floors was about 2 percentage points higher for boys than girls (see Table 5.1).

In every country the percentage of children living in houses with mud floors was higher in rural areas than in urban areas (see Figure 5.2). This disparity reached more than 60 percentage points in Guinea, Kenya, Liberia, and Namibia, and in Zambia the difference was 70 percentage points. In Burkina Faso, Burundi, Cameroon, Malawi, Niger, Tanzania, and Uganda as well, the difference exceeded 50 percentage points (see Table 5.1).

The role of the household head's sex and age

In two-thirds of these sub-Saharan African countries, the percentage of children living in houses with mud floors was higher for children living with a male rather than a female head of household (see Figure 5.3). This difference was about 15 percentage points in four countries—Burkina Faso (male household head: 60% and female household head: 44%), Guinea (56% and 40%), Nigeria (43% and 28%), and Senegal (41% and 22%) (see Table 5.1). The inverse appeared in Namibia, where the percentage of children living in a house with mud floors was nearly 10 percentage points higher for

children living with a female household head than for children living in a male headed household (61% compared with 51%).

In three countries the percentage of children living in houses with mud floors was much higher for children living with a household head at least 50 years old than for children living with a younger household head—Namibia (difference of 28 percentage points), Lesotho (17 percentage points), and Zambia (11 percentage points) (see Figure 5.4 and Table 5.1).

Variations during the last 13 years

Ghana (3 percentage points), Nigeria (4 percentage points), and Zambia (3 percentage points) experienced an increase on the percentage of children living in houses with mud flooring (see Figures 5.5 and 5.6). In the other countries the percentage of children living in houses with mud floors decreased. As for changes by age group, in Zambia the percentage among children five to nine years old increased by 7 percentage points (2001-02: 59% and 2007: 66%). In contrast, among those ages 15-17, the percentage decreased by 7 percentage points (2001-02: 57% and 2007: 50%) (see Table 5.2). Overall, Mozambique experienced the greatest decrease, from 72% in 2003 to 56% in 2011, a reduction of 15 percentage points.

5.2 Living in Houses without Electricity

Today, 1.3 billion people in the world do not have access to electricity (United Nations Foundation, 2013). According to the International Energy Agency, more than four-fifths of these people live in rural areas, and more than 95% live in sub-Saharan Africa or developing areas in Asia (United Nations Foundation, 2013). The use of clean fuels such as gas and electricity for cooking—instead of biomass fuels, charcoal, and kerosene—is crucial to reduce important health risks affecting developing countries, such as respiratory diseases (acute respiratory infections, chronic obstructive pulmonary disease, tuberculosis, and asthma), low birth weight, cataracts, and blindness (Bruce et al., 2000; Kilabuko and Nakai, 2007). A study using DHS data from six francophone countries in Central and West sub-Saharan Africa suggested that the most important contributors to the rural-urban gap in infant mortality rates are environmental factors such as lack of electricity, an unsafe source of drinking water, and the poor quality of housing materials (van de Poel et al., 2009). The impact of these disadvantageous environmental conditions on infant mortality rates in rural areas reflects a lack of community-level infrastructure and the inability of some households to exploit the infrastructure when available.

The United Nations (2013) has identified five areas in which promoting electricity in developing countries is crucial:

- **Education:** Electricity provides heating, cooling, and lighting so students can learn. Schools can stay open later and provide a space for students to study and for teachers to prepare.
- **Health care:** Health care workers and facilities need electricity to refrigerate vaccines, sterilize instruments, and power equipment and to provide light for procedures that cannot wait until daytime (e.g., when a pregnant woman goes into labor at night).
- **Business:** Businesses need electricity for lighting, to run machinery, and to power communications technologies.
- **Agriculture:** Electricity enables farmers to increase efficiency in the production, processing, and storage of crops.
- **Communities:** Electricity helps strengthen communities. For example, lighting makes communities safer at night, and electricity can pump and filter water to provide clean drinking water.

In sub-Saharan Africa the percentage of children living in houses without electricity was very high (see Map 5.2)—above 75% in the majority of countries. Nine of every 10 children lived in houses without electricity in Burkina Faso, Burundi, Chad, Liberia, Malawi, Niger, Rwanda, and Uganda. Only two countries, Ghana and Senegal, had rates below 50% (see Table 5.3).

Sex and geographic disparities

There was no sex disparities related to having electric power at home (see Figure 5.7). In every country, however, a higher percentage of rural children than urban children live in houses without electricity (see Figure 5.10). This discrepancy was greatest—about 75 percentage point—in Ethiopia and Zimbabwe. Liberia (a difference of 6 percentage points) had the smallest geographic disparity (see Table 5.3).

The role of the household head's sex and age

The sex of the household head mattered only in Senegal. The percentage of children living without electricity was 53% for children living with a male household head and 27% for their counterparts living with a female household head, a difference of 26 percentage points (see Figure 5.9 and Table 5.3).

In Namibia and Uganda the percentage of children without electricity was much higher for individuals living with a household head age 50 or older than for children living with a younger household head (see Figure 5.10). In Namibia this difference reached 29 percentage points (58% and 87%) (see Table 5.3). Zimbabwe exhibits the inverse pattern: 69% of children in households with heads younger than 50 years old lived in houses without electricity compared with 87% of children living with a younger household head—a difference of 19 percentage points.

Variations during the last 13 years

In most countries the percentage of children living in homes without electricity dropped between surveys—by about 10 percentage points in Ghana (2003: 59% and 2008: 48%), Lesotho (2004: 96% and 2009: 86%), Mozambique (2003: 90% and 2011: 79%), and Senegal (2005: 58% and 2010-11: 48%) (see Table 5.2). In contrast, the percentage of children living in houses without electricity increased in Madagascar (2 percentage points more) and Nigeria (4 percentage points more) (see Figures 5.11 and 5.12).

Table 5.1. Percentage of children who live in houses with mud floors, by country, sex of the child, and region of residence as well as sex and age of head of household

Country	Sex of child			Region of residence			Sex of household head			Age of household head			
	Male (a)	Female (b)	Comparison (b)-(a)	Urban (c)	Rural (d)	Comparison (d)-(c)	Male (e)	Female (f)	Comparison (f)-(e)	Less than age 50 (g)	Age 50 or more (h)	Comparison (h)-(g)	
Benin	45.0	44.2	-0.8	24.0	56.0	32.0	46.0	37.6	-8.4	43.7	49.7	6.0	44.6
Burkina Faso	59.3	57.8	-1.5	14.9	68.6	53.7	59.8	43.9	-15.9	58.3	59.9	1.6	58.6
Burundi	89.0	88.7	-0.3	38.3	93.6	55.3	89.2	87.7	-1.5	88.5	92.2	3.7	88.9
Cameroon	50.3	48.3	-2.0	18.9	72.9	54.0	50.2	46.0	-4.2	47.8	55.5	7.7	49.3
Chad	95.0	95.1	0.1	78.8	98.9	20.1	95.0	95.5	0.5	95.2	93.6	-1.6	95.0
Ethiopia	90.5	89.0	-1.5	54.6	95.8	41.2	90.6	86.5	-4.1	89.6	90.9	1.3	89.8
Ghana	19.0	17.2	-1.8	4.6	27.2	22.6	21.3	10.9	-10.4	17.4	21.4	4.0	18.1
Guinea	54.1	54.5	0.4	9.6	71.8	62.2	56.4	40.0	-16.4	55.1	51.8	-3.3	54.3
Kenya	68.5	66.5	-2.0	14.1	76.9	62.8	67.1	68.5	1.4	66.2	75.5	9.3	67.6
Lesotho	39.8	38.0	-1.8	3.9	47.7	43.8	38.4	39.8	1.4	34.8	51.3	16.5	38.9
Liberia	55.2	52.9	-2.3	15.8	76.3	60.5	56.0	49.6	-6.4	54.0	54.5	0.5	54.0
Madagascar	16.0	16.1	0.1	8.3	17.1	8.8	16.3	15.1	-1.2	16.4	13.3	-3.1	16.1
Malawi	77.8	78.2	0.4	32.4	85.6	53.2	76.7	81.8	5.1	77.8	79.6	1.8	78.0
Mali	76.5	75.1	-1.4	43.9	88.5	44.6	76.4	70.0	-6.4	75.1	78.8	3.7	75.8
Mozambique	56.8	55.8	-1.0	31.8	66.5	34.7	57.3	54.3	-3.0	56.5	55.0	-1.5	56.3
Namibia	56.2	55.9	-0.3	16.3	77.3	61.0	51.1	61.0	9.9	48.2	75.7	27.5	56.0
Niger	88.2	87.6	-0.6	40.8	97.3	56.5	87.5	90.6	3.1	87.4	90.0	2.6	88.0
Nigeria	41.3	40.2	-1.1	12.3	53.6	41.3	42.6	28.4	-14.2	40.4	42.6	2.2	40.8
Rwanda	82.3	82.9	0.6	43.8	87.8	44.0	81.7	84.7	3.0	82.3	85.4	3.1	82.6
Senegal	37.4	36.5	-0.9	14.4	51.4	37.0	40.8	22.2	-18.6	37.1	36.8	-0.3	37.0
Tanzania	73.2	71.3	-1.9	25.3	84.3	59.0	71.5	74.8	3.3	71.0	77.8	6.8	72.2
Uganda	75.9	74.9	-1.0	24.3	82.4	58.1	76.3	73.1	-3.2	74.9	79.0	4.1	75.4
Zambia	63.8	63.1	-0.7	16.5	86.5	70.0	62.8	65.9	3.1	62.2	72.7	10.5	63.5
Zimbabwe	33.4	33.8	0.4	2.3	44.3	42.0	36.6	30.1	-6.5	33.5	34.3	0.8	33.6

Table 5.2. Percentage of children who live in houses with mud floors or without electricity, by country, child's age, and year of data collection

Country	Child's age Value	Data collection		House with mud flooring			House without electricity			
		1 Year	2 Year	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	
		Comparison Year 2-Year1		Comparison Year 2-Year1		Comparison Year 2-Year1				
Burkina Faso	0-17	2003	2010	62.0	58.6	91.4	90.4	91.4	90.4	-1.0
Burkina Faso	0-4	2003	2010	64.3	59.4	93.2	91.6	93.2	91.6	-1.7
Burkina Faso	5-9	2003	2010	64.1	60.0	92.7	92.0	92.7	92.0	-0.7
Burkina Faso	10-14	2003	2010	59.6	57.8	90.1	89.5	90.1	89.5	-0.6
Burkina Faso	15-17	2003	2010	56.4	53.3	86.4	84.0	86.4	84.0	-2.4
Cameroon	0-17	2004	2011	53.6	49.3	57.0	52.0	57.0	52.0	-5.0
Cameroon	0-4	2004	2011	56.9	49.9	59.8	53.6	59.8	53.6	-6.1
Cameroon	5-9	2004	2011	56.5	51.8	60.6	55.3	60.6	55.3	-5.4
Cameroon	10-14	2004	2011	51.6	49.2	55.0	50.4	55.0	50.4	-4.6
Cameroon	15-17	2004	2011	43.5	41.8	46.5	42.8	46.5	42.8	-3.7
Ethiopia	0-17	2005	2011	93.1	89.8	90.5	84.3	90.5	84.3	-6.1
Ethiopia	0-4	2005	2011	94.7	91.1	92.7	86.4	92.7	86.4	-6.3
Ethiopia	5-9	2005	2011	93.8	91.0	92.1	86.3	92.1	86.3	-5.7
Ethiopia	10-14	2005	2011	92.8	88.1	89.7	82.8	89.7	82.8	-6.9
Ethiopia	15-17	2005	2011	88.0	87.2	82.5	77.8	82.5	77.8	-4.7
Ghana	0-17	2003	2008	15.2	18.1	59.2	47.6	59.2	47.6	-11.5
Ghana	0-4	2003	2008	16.6	19.0	64.0	49.9	64.0	49.9	-14.1
Ghana	5-9	2003	2008	16.0	19.4	61.4	50.1	61.4	50.1	-11.3
Ghana	10-14	2003	2008	14.3	16.9	56.7	45.2	56.7	45.2	-11.6
Ghana	15-17	2003	2008	11.8	15.9	48.0	42.2	48.0	42.2	-5.8
Kenya	0-17	2003	2008-09	71.1	67.6	90.3	85.9	90.3	85.9	-4.3
Kenya	0-4	2003	2008-09	72.0	68.1	89.5	85.6	89.5	85.6	-3.9

(Continued...)

Table 5.2. – Continued

Country	Child's age Value	Data collection		House with mud flooring			House without electricity		
		1 Year	2 Year	Year 1	Year 2	Year 2-Year1	Year 1	Year 2	Year 2-Year1
Kenya	5-9	2003	2008-09	72.1	66.9	-5.1	90.3	86.2	-4.0
Kenya	10-14	2003	2008-09	71.3	68.6	-2.6	91.5	86.3	-5.2
Kenya	15-17	2003	2008-09	66.8	65.3	-1.5	89.5	85.2	-4.3
Lesotho	0-17	2004	2009	43.1	38.9	-4.2	95.6	86.4	-9.2
Lesotho	0-4	2004	2009	47.0	40.4	-6.6	96.4	87.5	-9.0
Lesotho	5-9	2004	2009	45.1	40.9	-4.3	96.3	86.6	-9.8
Lesotho	10-14	2004	2009	41.0	38.7	-2.2	95.2	86.4	-8.8
Lesotho	15-17	2004	2009	38.1	33.9	-4.2	94.0	84.6	-9.5
Madagascar	0-17	2003-04	2008-09	18.2	16.1	-2.2	84.5	86.4	1.9
Madagascar	0-4	2003-04	2008-09	18.4	17.0	-1.4	87.2	88.5	1.3
Madagascar	5-9	2003-04	2008-09	18.7	16.5	-2.2	85.2	87.7	2.5
Madagascar	10-14	2003-04	2008-09	18.7	15.2	-3.5	82.9	85.0	2.1
Madagascar	15-17	2003-04	2008-09	15.2	14.5	-0.7	78.6	81.5	2.9
Malawi	0-17	2004	2010	79.6	78.0	-1.5	93.4	92.0	-1.4
Malawi	0-4	2004	2010	82.4	80.8	-1.6	94.6	92.9	-1.7
Malawi	5-9	2004	2010	80.4	78.9	-1.5	93.9	92.7	-1.2
Malawi	10-14	2004	2010	77.6	76.5	-1.0	92.4	91.5	-0.9
Malawi	15-17	2004	2010	73.3	71.8	-1.5	90.7	88.5	-2.2
Mali	0-17	2001	2006	79.9	75.8	-4.1	88.0	83.6	-4.4
Mali	0-4	2001	2006	81.6	76.3	-5.3	89.5	84.5	-5.1
Mali	5-9	2001	2006	82.4	77.4	-5.0	89.7	85.3	-4.4
Mali	10-14	2001	2006	78.0	75.3	-2.7	86.7	82.8	-3.9
Mali	15-17	2001	2006	70.7	71.0	0.4	81.0	78.3	-2.8

(Continued...)

Table 5.2. – Continued

Country	Child's age		Data collection		House with mud flooring			House without electricity		
	Value		1 Year	2 Year	Year 1	Year 2	Comparison Year 2-Year1	Year 1	Year 2	Comparison Year 2-Year1
Mozambique	0-17		2003	2011	71.7	56.3	-15.4	89.7	78.7	-11.0
Mozambique	0-4		2003	2011	74.4	58.5	-15.9	91.7	81.2	-10.5
Mozambique	5-9		2003	2011	74.5	57.5	-16.9	91.3	80.6	-10.7
Mozambique	10-14		2003	2011	70.1	54.8	-15.3	88.3	76.8	-11.6
Mozambique	15-17		2003	2011	59.3	49.9	-9.4	82.5	70.6	-11.8
Namibia	0-17		2000	2006-07	64.8	56.0	-8.8	73.3	66.3	-7.0
Namibia	0-4		2000	2006-07	63.0	54.9	-8.1	73.8	67.9	-6.0
Namibia	5-9		2000	2006-07	65.3	56.1	-9.3	73.3	65.9	-7.4
Namibia	10-14		2000	2006-07	67.1	58.4	-8.7	73.8	66.7	-7.1
Namibia	15-17		2000	2006-07	63.0	53.5	-9.5	70.6	63.0	-7.6
Nigeria	0-17		2003	2008	36.9	40.8	3.9	50.3	54.5	4.3
Nigeria	0-4		2003	2008	38.9	42.3	3.4	51.1	55.3	4.3
Nigeria	5-9		2003	2008	39.0	42.5	3.5	52.7	56.3	3.6
Nigeria	10-14		2003	2008	34.0	39.4	5.4	48.6	53.2	4.6
Nigeria	15-17		2003	2008	32.1	34.1	2.0	45.6	49.9	4.3
Rwanda	0-17		2005	2010	86.3	82.6	-3.7	95.4	91.2	-4.2
Rwanda	0-4		2005	2010	87.4	84.5	-2.9	95.7	92.0	-3.7
Rwanda	5-9		2005	2010	86.4	83.4	-3.1	95.4	91.8	-3.6
Rwanda	10-14		2005	2010	86.0	81.7	-4.3	95.6	90.7	-4.9
Rwanda	15-17		2005	2010	84.2	78.1	-6.1	94.1	88.9	-5.2
Senegal	0-17		2005	2010-11	37.4	37.0	-0.4	57.8	47.8	-9.9
Senegal	0-4		2005	2010-11	38.7	37.4	-1.3	60.0	49.1	-10.9

(Continued...)

Table 5.2. – Continued

Country	Child's age		Data collection		House with mud flooring			House without electricity			
	Value	1 Year	2 Year	Year 1	Year 2	Comparison		Year 1	Year 2	Comparison	
						Year 2-Year1	Year 2-Year1			Year 2-Year1	Year 2-Year1
Senegal	5-9	2005	2010-11	40.4	39.0	-1.4	61.0	50.5	-10.5		
Senegal	10-14	2005	2010-11	36.0	36.2	0.2	56.0	46.5	-9.5		
Senegal	15-17	2005	2010-11	31.0	32.4	1.4	49.1	40.1	-9.0		
Tanzania	0-17	2004-05	2010	77.1	72.2	-4.8	91.1	88.7	-2.4		
Tanzania	0-4	2004-05	2010	79.1	74.7	-4.5	92.4	90.1	-2.3		
Tanzania	5-9	2004-05	2010	78.0	74.0	-4.0	91.4	90.3	-1.1		
Tanzania	10-14	2004-05	2010	76.0	71.3	-4.8	90.6	88.2	-2.4		
Tanzania	15-17	2004-05	2010	71.2	63.5	-7.7	87.5	81.9	-5.6		
Uganda	0-17	2006	2011	80.3	75.4	-4.9	93.6	90.8	-2.8		
Uganda	0-4	2006	2011	83.0	75.6	-7.4	94.1	89.9	-4.2		
Uganda	5-9	2006	2011	81.6	76.5	-5.1	94.6	91.4	-3.2		
Uganda	10-14	2006	2011	78.7	75.8	-2.9	93.4	92.3	-1.1		
Uganda	15-17	2006	2011	72.9	70.9	-2.0	90.0	88.4	-1.6		
Zambia	0-17	2001-02	2007	60.9	63.5	2.6	80.3	81.0	0.8		
Zambia	0-4	2001-02	2007	65.9	68.9	3.1	84.4	85.2	0.8		
Zambia	5-9	2001-02	2007	59.0	66.0	7.0	78.7	82.4	3.6		
Zambia	10-14	2001-02	2007	58.7	59.5	0.8	78.4	78.4	0.0		
Zambia	15-17	2001-02	2007	56.7	50.1	-6.6	77.1	71.1	-6.0		
Zimbabwe	0-17	2005-06	2010-11	38.3	33.6	-4.7	71.8	71.8	0.0		
Zimbabwe	0-4	2005-06	2010-11	39.8	34.2	-5.7	70.8	70.5	-0.3		
Zimbabwe	5-9	2005-06	2010-11	39.6	35.4	-4.2	72.5	73.0	0.6		
Zimbabwe	10-14	2005-06	2010-11	38.8	33.9	-4.9	74.0	74.2	0.2		
Zimbabwe	15-17	2005-06	2010-11	31.0	27.6	-3.3	67.4	67.1	-0.4		

Table 5.3. Percentage of children who live in houses without electricity, by country, sex of child, and region of residence as well as sex and age of head of household

Country	Sex of child			Region of residence			Sex of household head			Age of household head		
	Male	Female	Comparison	Urban	Rural	Comparison	Male	Female	Comparison	Less than	Age 50	Comparison
	(a)	(b)	(b)-(a)	(c)	(d)	(d)-(c)	(e)	(f)	(f)-(e)	age 50	or more	(h)-(g)
Burkina Faso	91.3	89.4	-1.9	53.9	98.9	45.0	91.2	81.0	-10.2	90.4	90.4	0.0
Burundi	94.9	94.6	-0.3	51.5	98.8	47.3	94.7	94.9	0.2	94.5	97.1	2.6
Cameroon	52.2	51.8	-0.4	14.1	81.3	67.2	54.2	43.5	-10.7	49.8	60.8	11.0
Chad	95.9	96.0	0.1	80.2	99.7	19.5	95.8	97.1	1.3	96.0	96.1	0.1
Ethiopia	85.2	83.5	-1.7	19.8	95.5	75.7	86.1	77.1	-9.0	83.7	87.9	4.2
Ghana	48.8	46.4	-2.4	18.1	67.3	49.2	50.7	40.7	-10.0	46.1	55.0	8.9
Guinea	80.7	80.4	-0.3	39.1	96.8	57.7	80.8	78.6	-2.2	80.7	80.2	-0.5
Kenya	86.7	85.1	-1.6	40.1	93.9	53.8	84.6	88.6	4.0	84.6	94.1	9.5
Lesotho	86.7	86.1	-0.6	52.5	94.9	42.4	85.8	87.6	1.8	85.0	90.6	5.6
Liberia	97.1	96.5	-0.6	93.2	98.9	5.7	97.0	96.4	-0.6	96.5	98.9	2.4
Madagascar	86.8	86.1	-0.7	34.3	93.5	59.2	86.8	84.6	-2.2	86.5	86.3	-0.2
Malawi	91.8	92.1	0.3	65.2	96.4	31.2	90.9	95.0	4.1	91.5	95.0	3.5
Mali	84.8	82.4	-2.4	52.6	96.0	43.4	84.4	76.1	-8.3	82.9	86.6	3.7
Mozambique	79.2	78.2	-1.0	42.5	93.8	51.3	79.4	77.3	-2.1	78.4	81.1	2.7
Namibia	66.5	66.0	-0.5	21.8	90.2	68.4	61.8	70.7	8.9	57.9	87.3	29.4
Niger	90.6	90.4	-0.2	50.8	98.4	47.6	89.9	93.5	3.6	90.4	90.9	0.5
Nigeria	54.9	54.1	-0.8	16.3	71.7	55.4	55.4	48.2	-7.2	54.1	56.8	2.7
Rwanda	91.1	91.3	0.2	57.4	95.7	38.3	90.4	93.3	2.9	90.7	95.8	5.1
Senegal	48.4	47.3	-1.1	12.0	70.7	58.7	53.2	27.0	-26.2	48.1	47.3	-0.8
Tanzania	89.2	88.1	-1.1	56.2	97.0	40.8	88.0	91.3	3.3	88.0	92.1	4.1
Uganda	91.1	90.5	-0.6	51.8	96.1	44.3	90.7	91.0	0.3	90.2	95.1	4.9
Zambia	81.3	80.7	-0.6	48.7	96.9	48.2	80.1	84.5	4.4	79.9	89.1	9.2
Zimbabwe	72.7	71.0	-1.7	16.4	90.8	74.4	71.4	72.4	1.0	68.5	87.4	18.9

Figure 5.1. Percentage of children who live in a house with mud flooring, by country and the child's sex

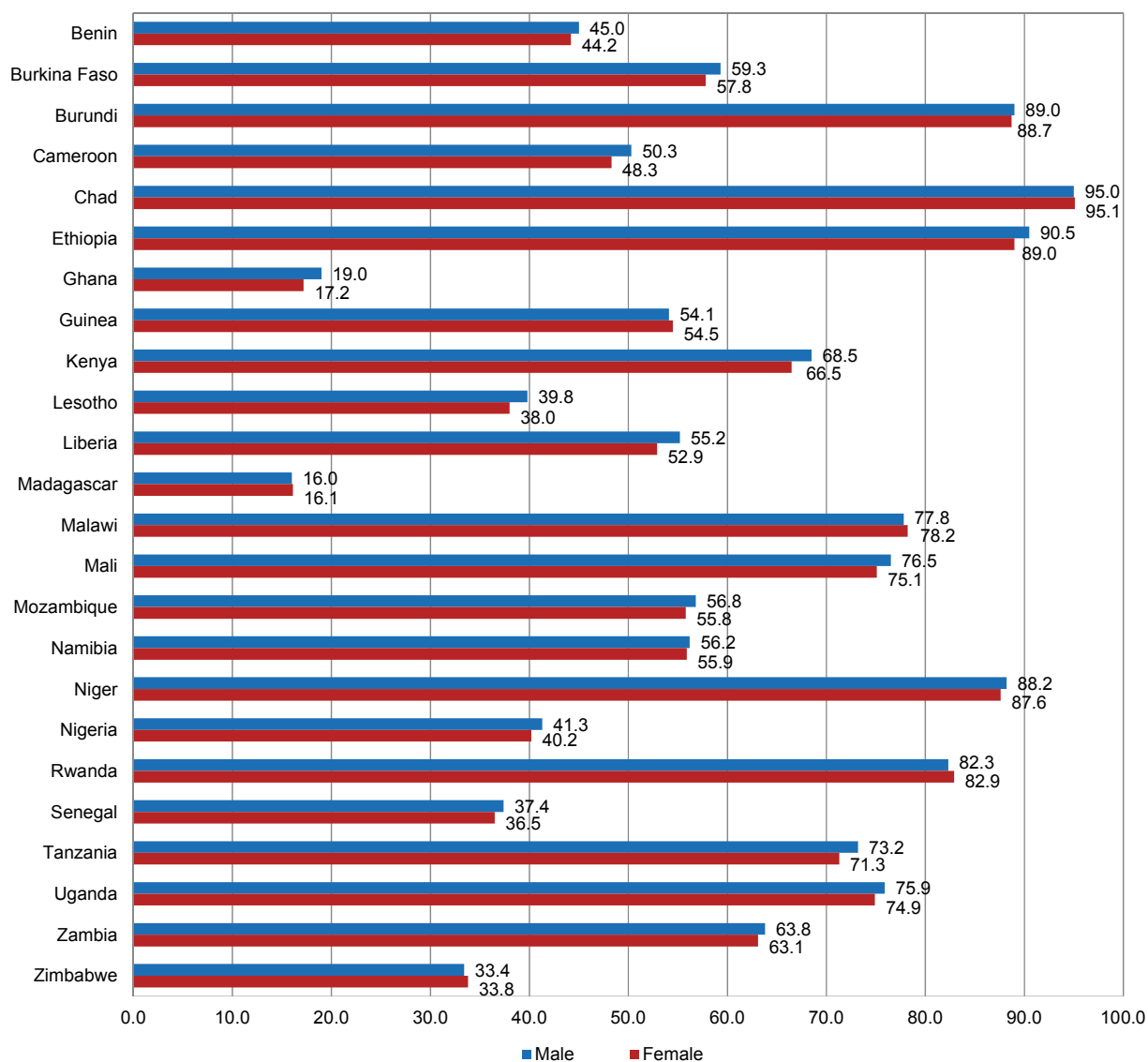


Figure 5.2. Percentage of children who live in a house with mud flooring, by country and region of residence

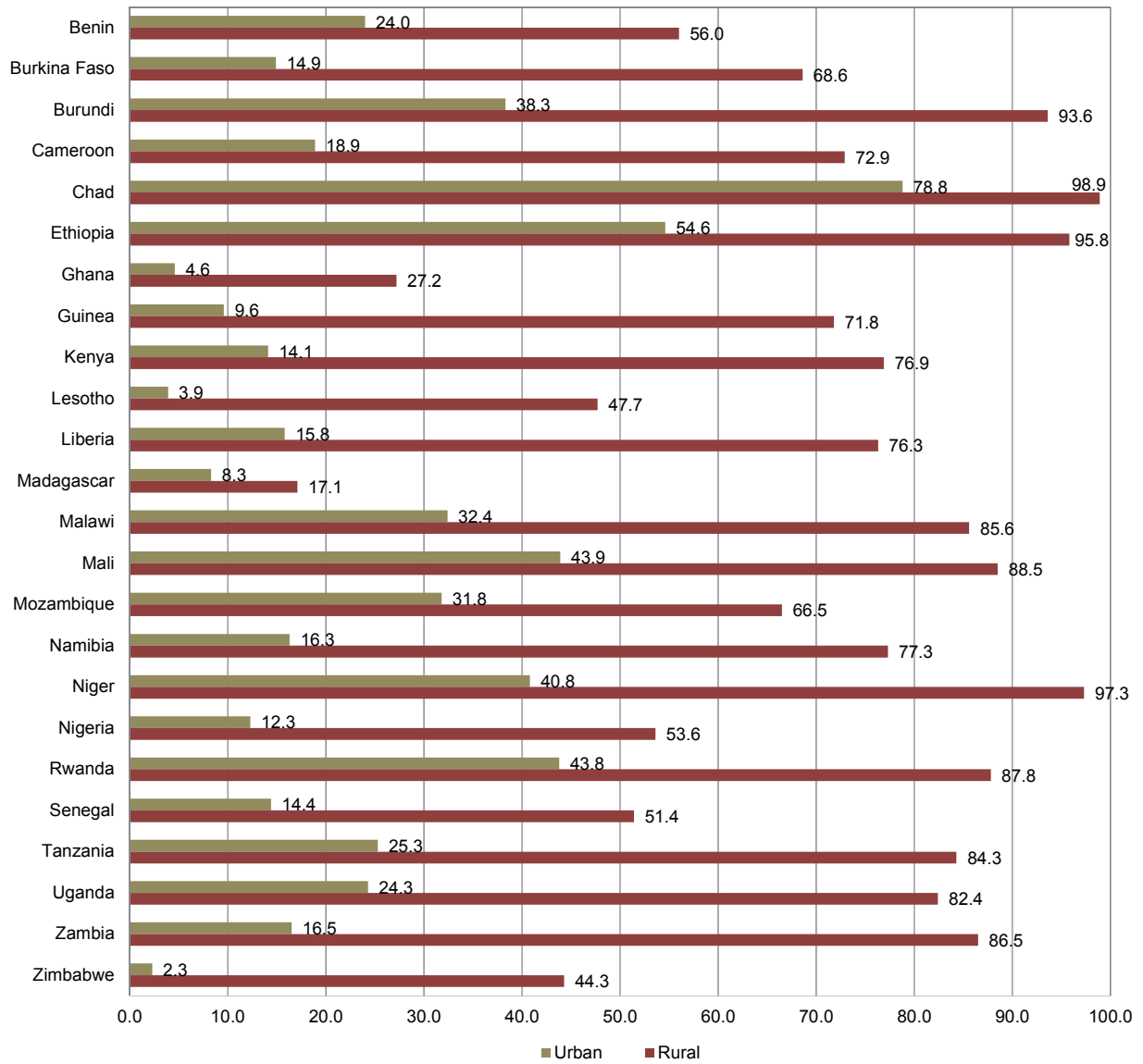


Figure 5.3. Percentage of children who live in a house with mud flooring, by country and the sex of the household head

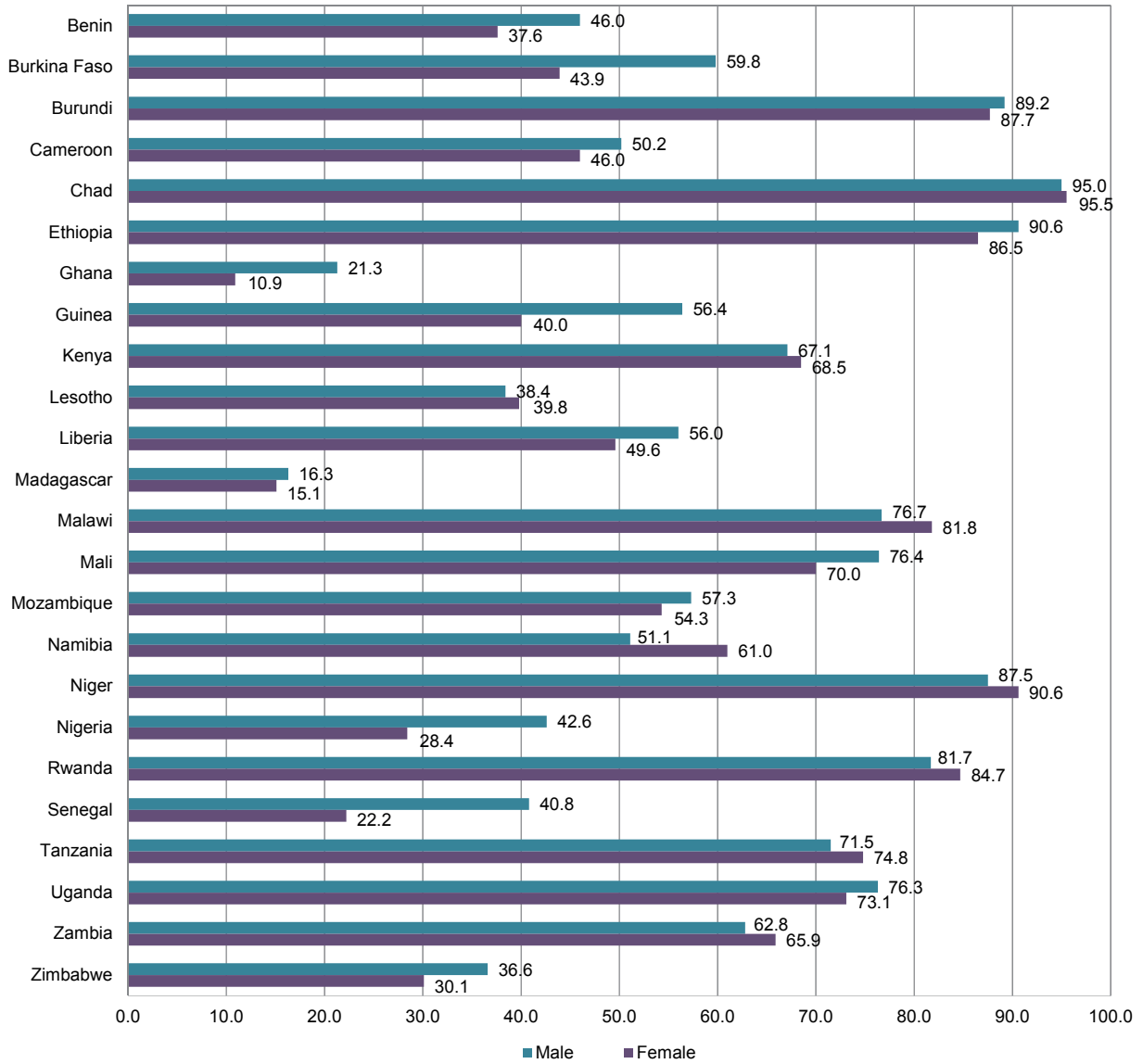


Figure 5.4. Percentage of children who live in a house with mud flooring, by country and the age of the household head

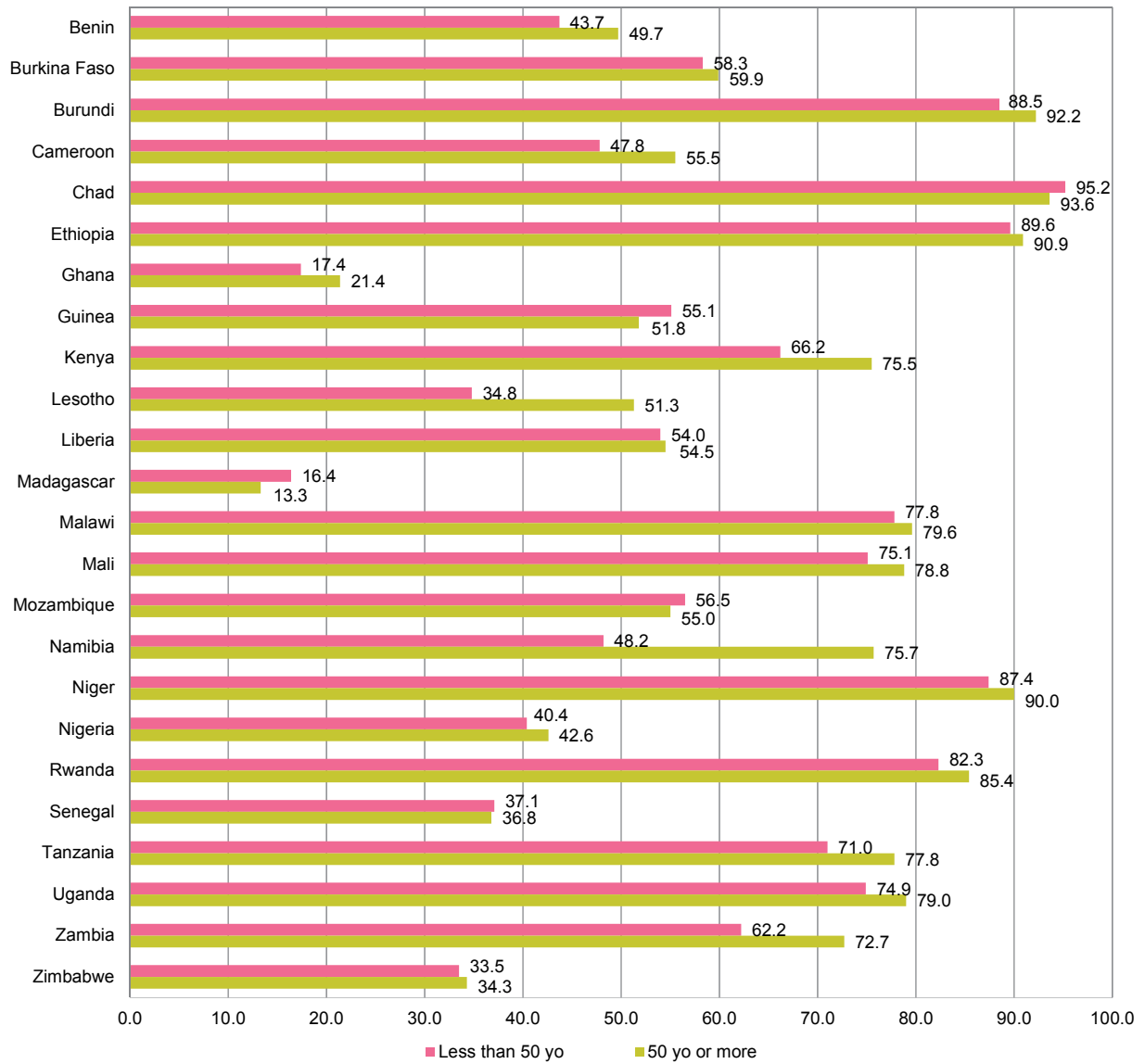


Figure 5.5. Changes in the percentage of children who live in a house with mud flooring

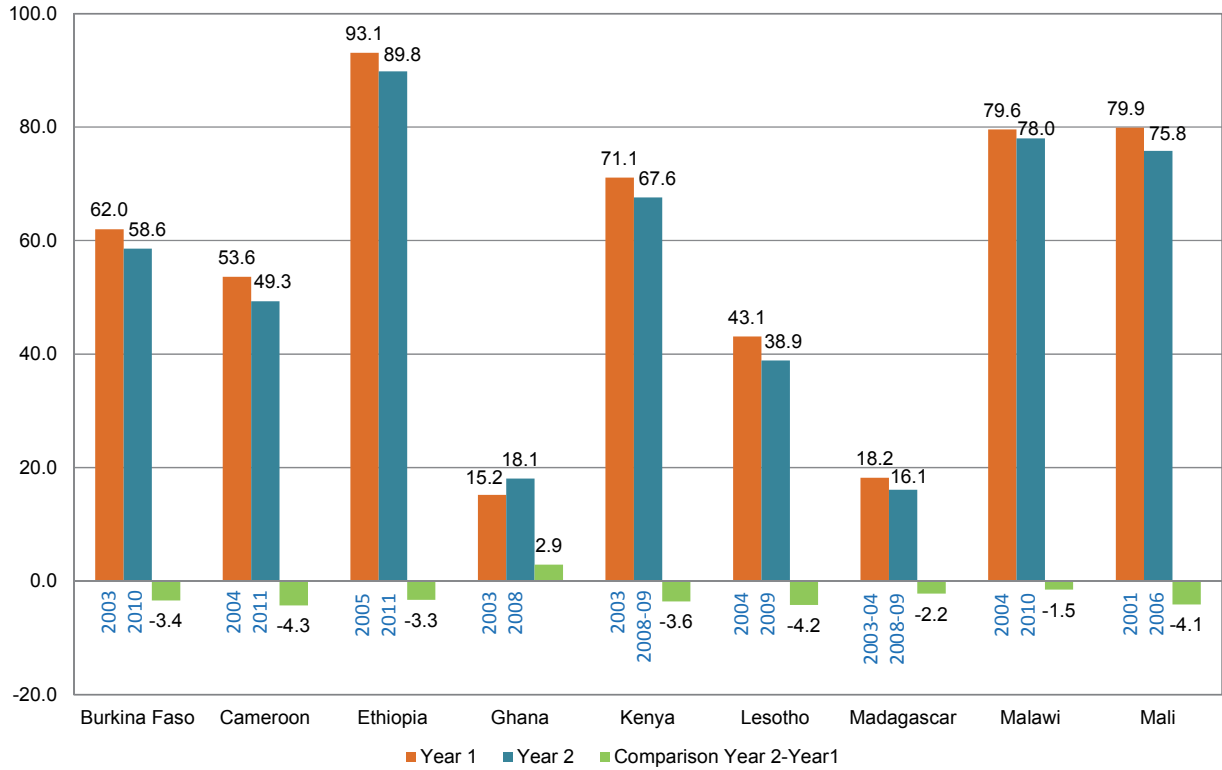


Figure 5.6. Changes in the percentage of children who live in a house with mud flooring

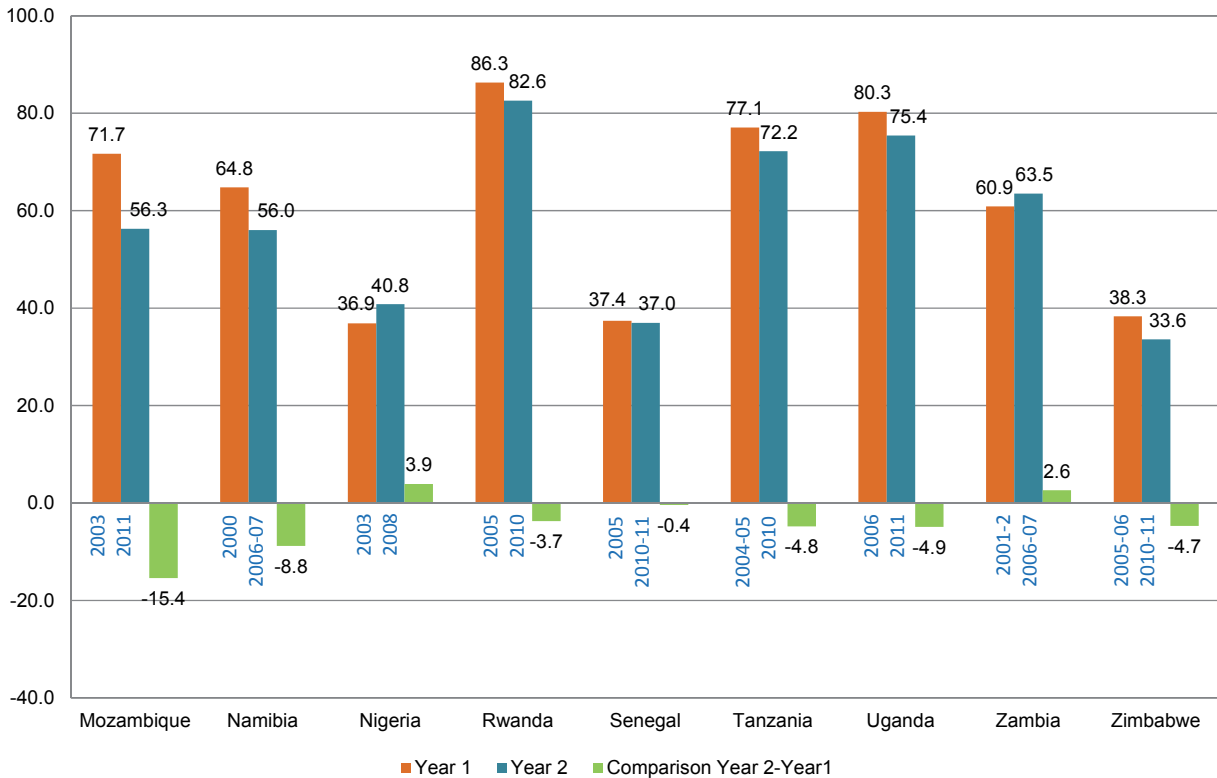


Figure 5.7. Percentage of children who live in a house without electricity, by country and the child's sex

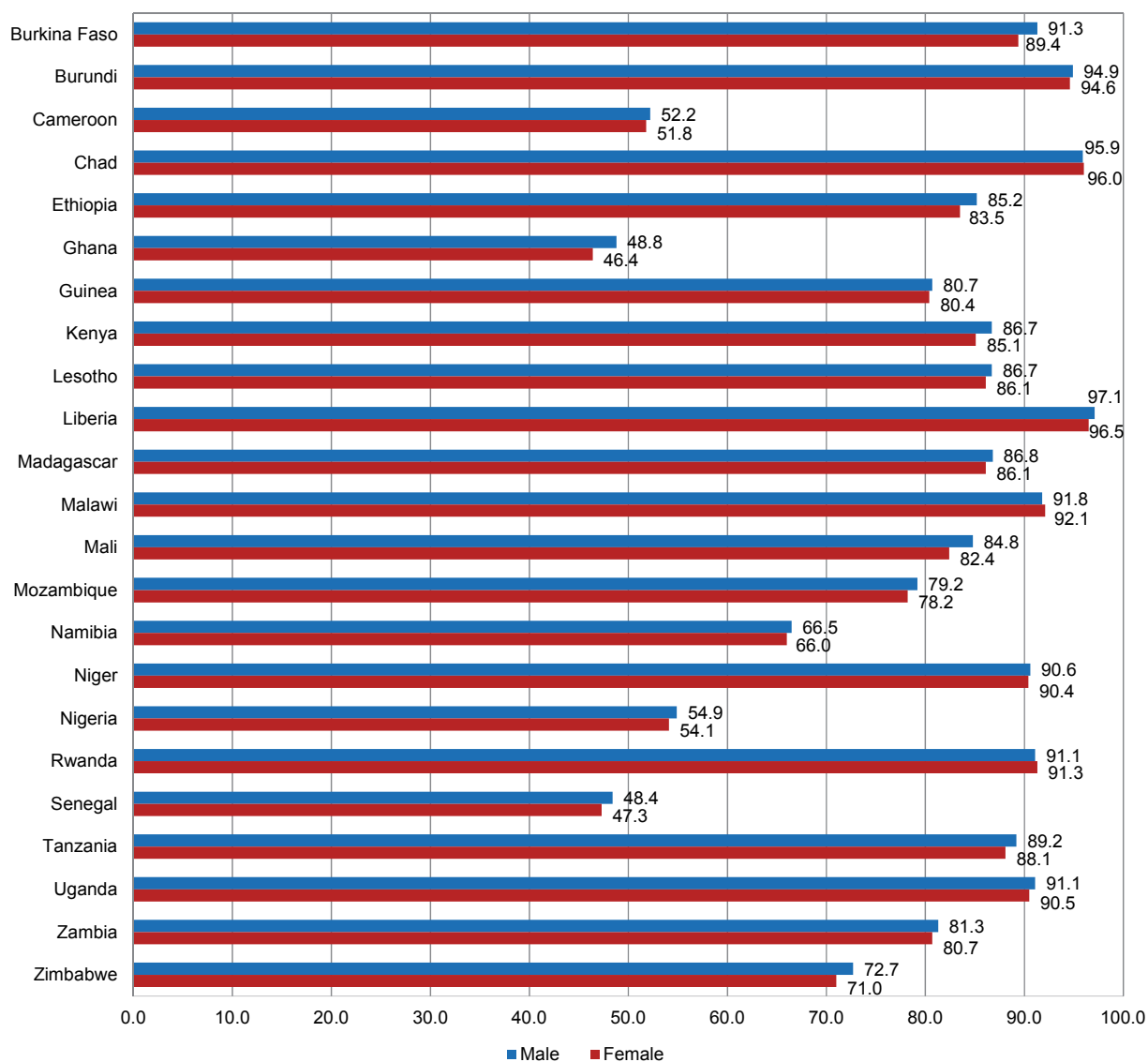


Figure 5.8. Percentage of children who live in a house without electricity, by country and region of residence

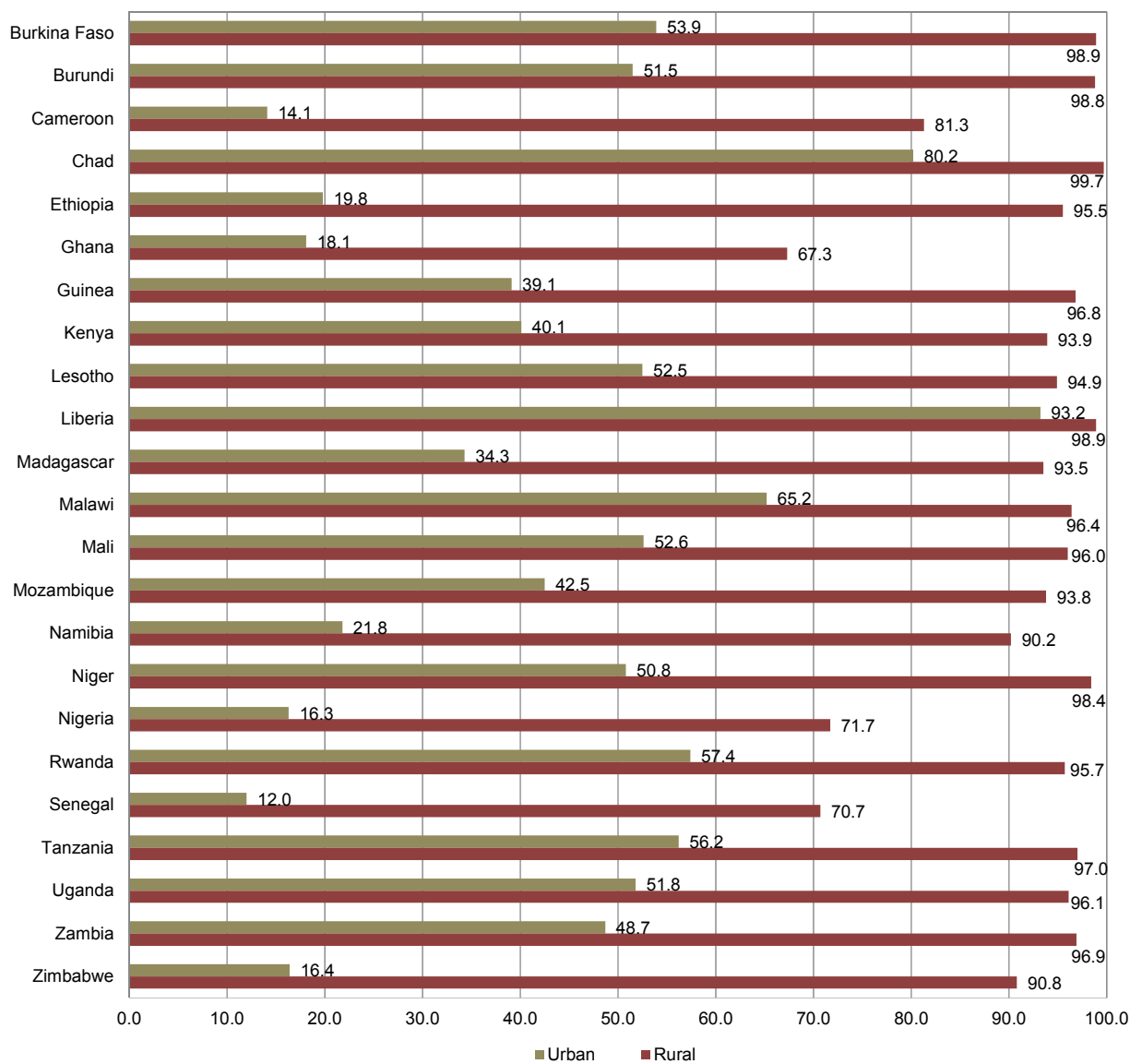


Figure 5.9. Percentage of children who live in a house without electricity, by country and the sex of the household head

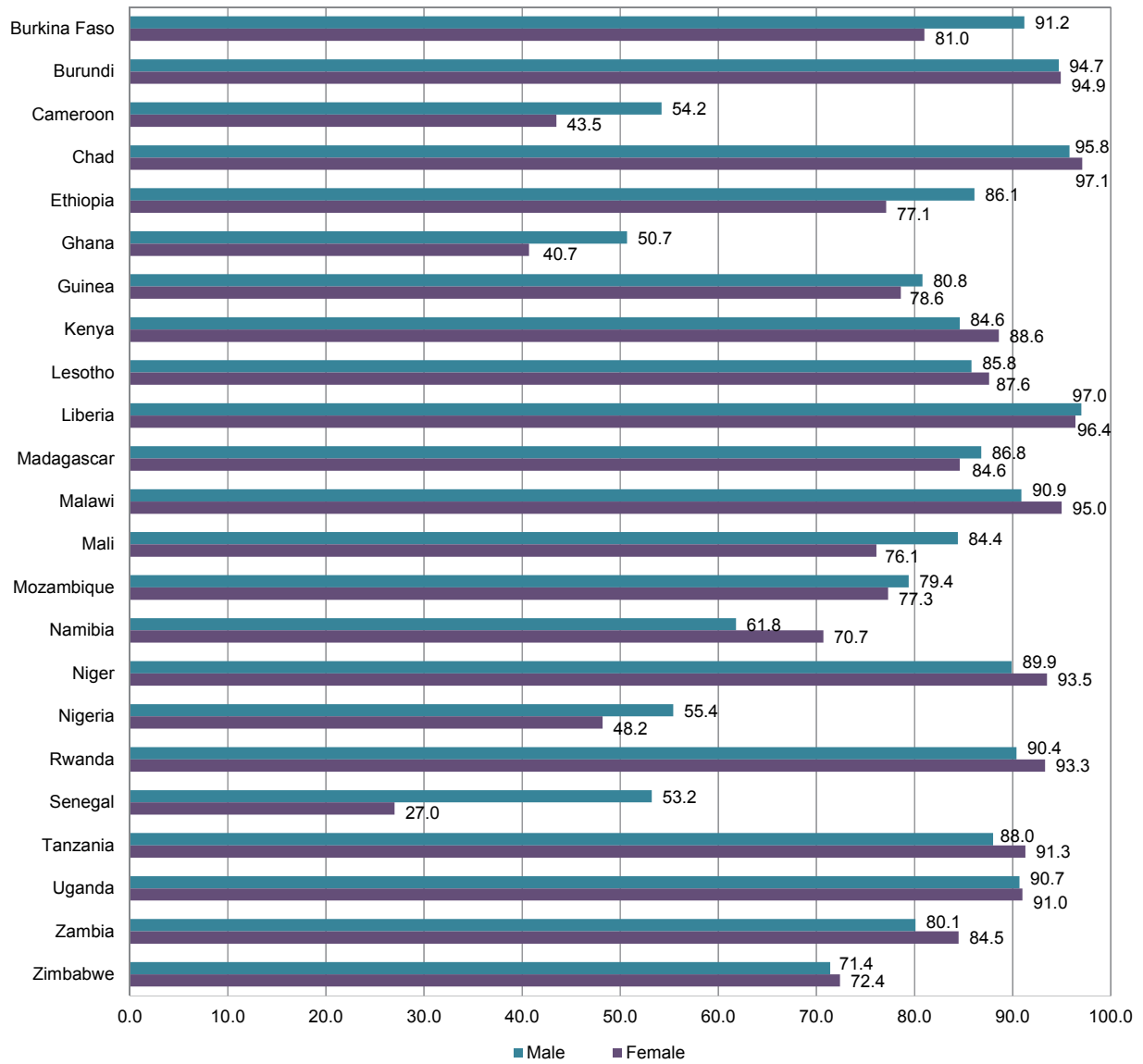


Figure 5.10. Percentage of children who live in a house without electricity, by country and the age of the household head

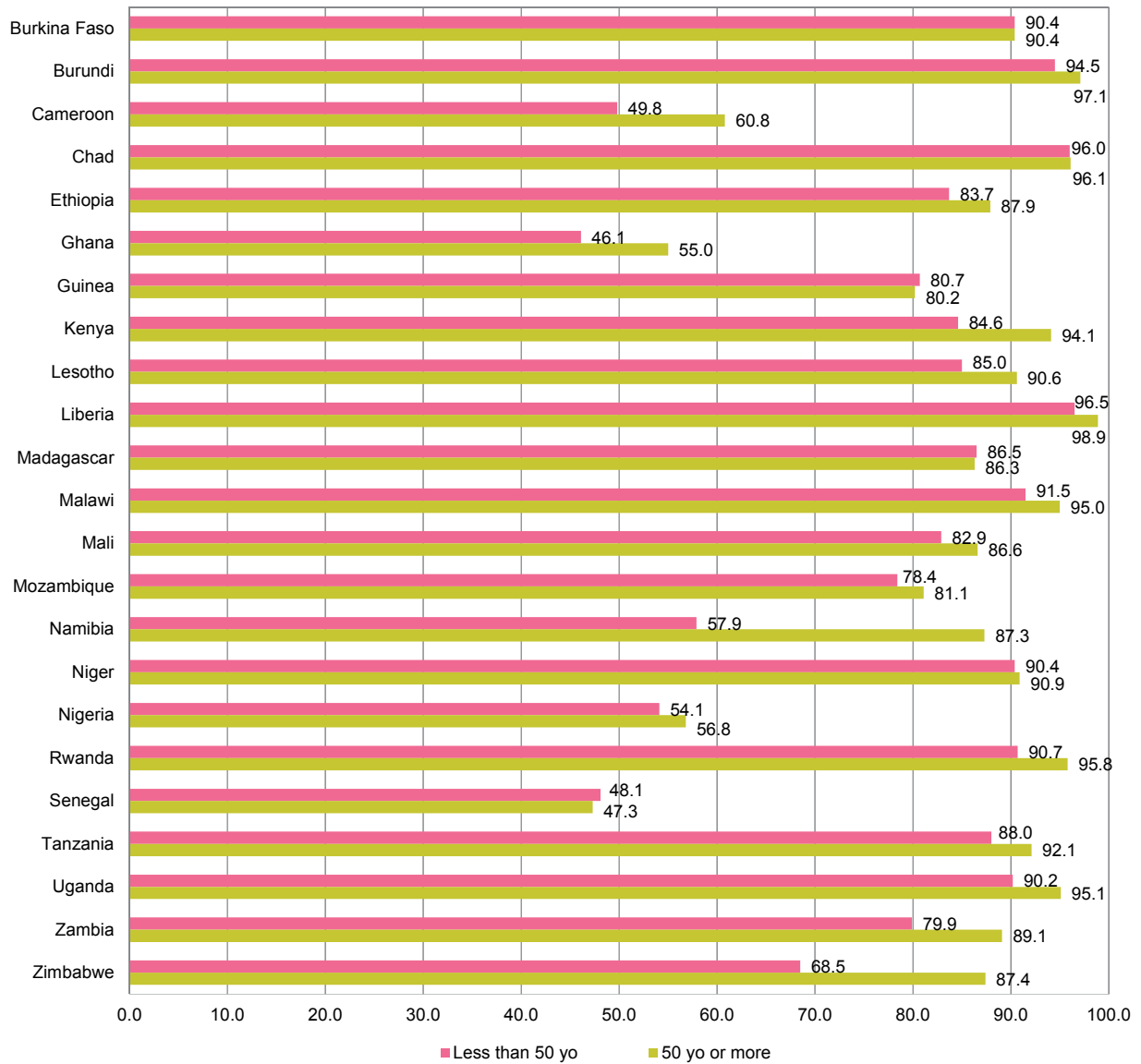


Figure 5.11. Changes in the percentage of children who live in a house without electricity

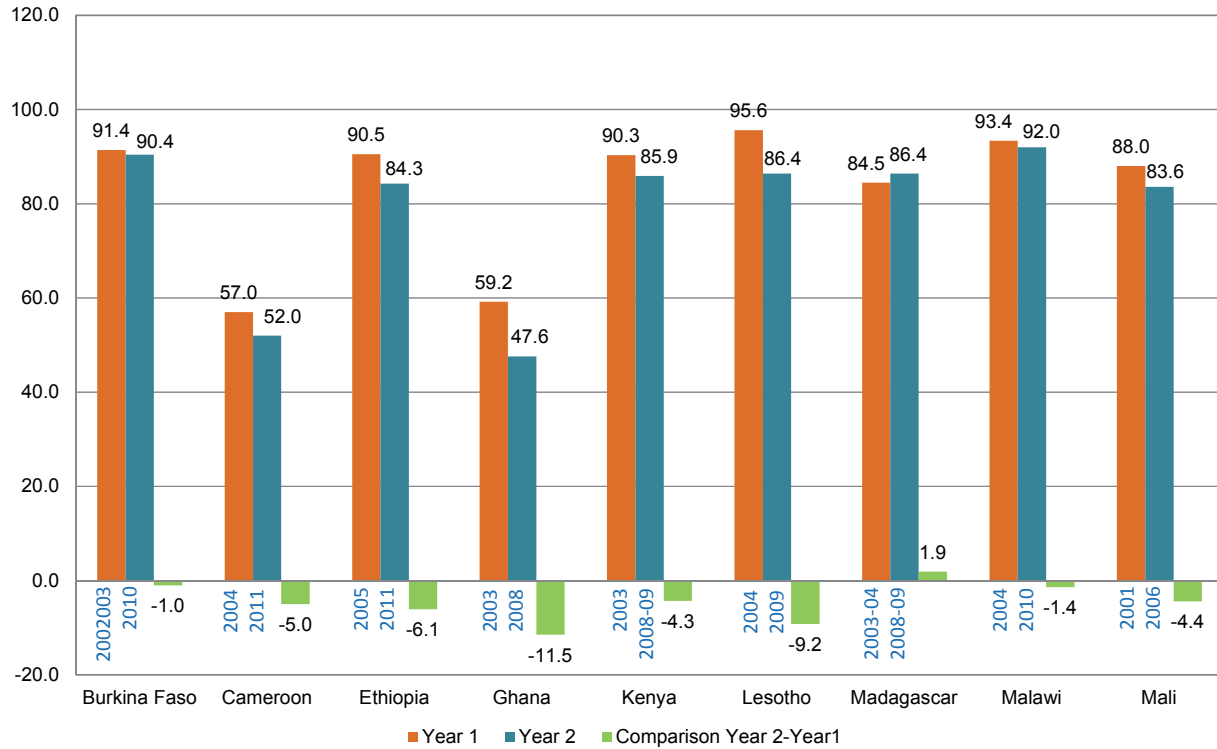
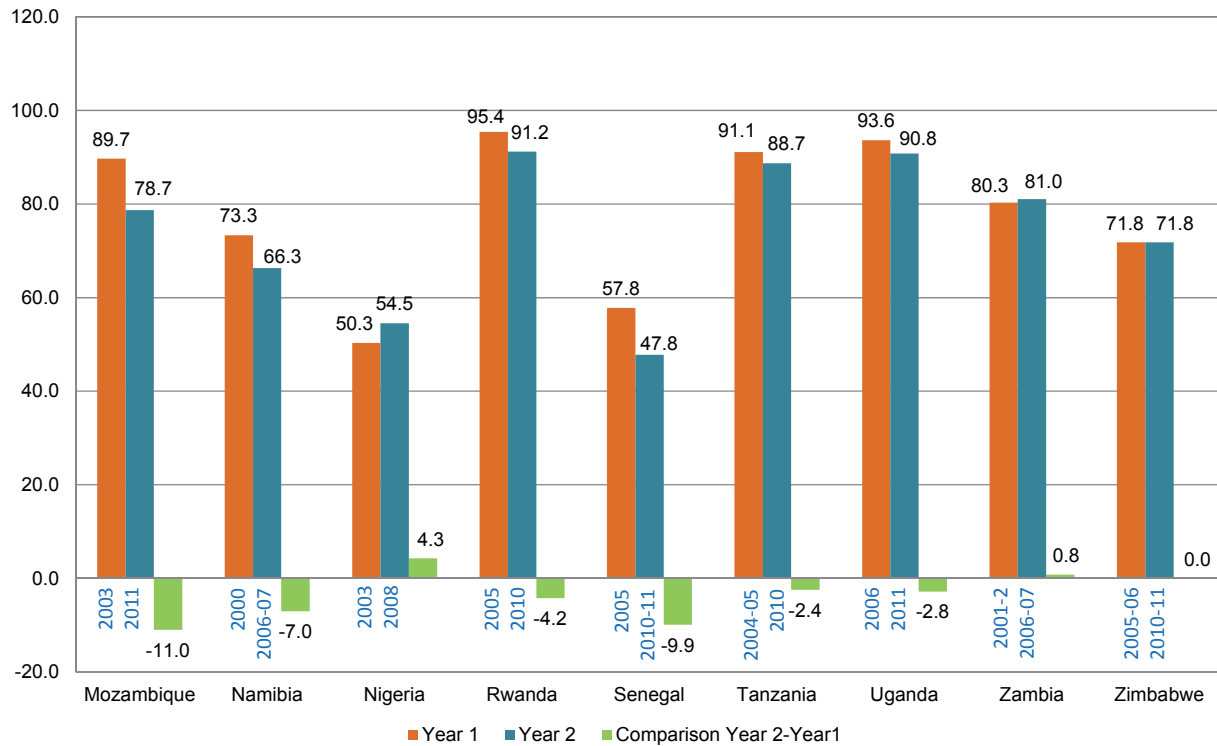
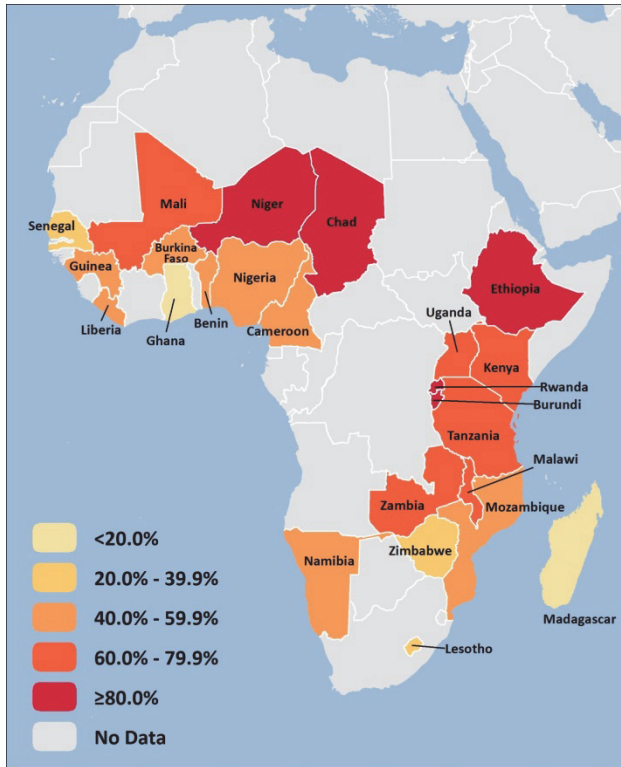


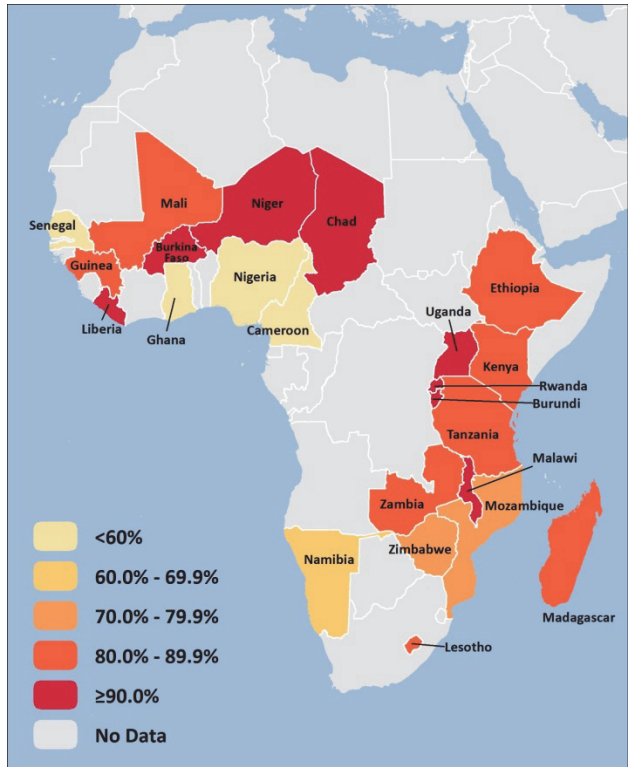
Figure 5.12. Changes in the percentage of children who live in a house without electricity



Map 5.1 Percentage of children who live in houses with mud floors



Map 5.2 Percentage of children who live in houses without electricity



6 Education Deprivation

In sub-Saharan Africa education is crucial to poverty reduction; improvement in gender equality, health, and nutrition; reductions in infant and child mortality; and decreases in the prevalence of HIV/AIDS (Bhargava, 2005; Bloom and Canning, 2004; Fotso et al., 2009). Studies have found that food insecurity adversely affects academic performance among children because it is associated with high absenteeism, sickness, low academic performance, and negative social behaviors (Frongillo et al., 2006). Exposure to violence has also been identified as a risk factor for low school enrolment and for dropout (Terefe, 1997). In contrast, school enrollment is associated with later sexual initiation and condom use (Nyamukapa, 2008; Katz, 2006; Magnani et al., 2002; Zambuko and Mturi, 2005). The association between safer sexual behavior and both school attendance and educational achievement is based on the rationale that children attending school are more motivated than their out-of-school peers to avoid the negative consequences of engaging in unprotected sex, such as unintended pregnancy and HIV infection. Educated children also may have more exposure to HIV prevention and sexual education resources and be more likely to understand the content of these materials (Jukes et al., 2008).

6.1 Children Who Have Received No Primary or Secondary Education

As Maps 6.1 and 6.2 indicate, the percentage of children with no education varies greatly among sub-Saharan African countries, ranging from 3% in Lesotho to 54% in Ethiopia and 64% in Burkina Faso. Table 6.1 shows the stratification of the percentages by the children's ages; these data reveal that this problem was more severe for younger children. For instance, 56% of Ethiopian children age 7-12 had no education compared with 33% of children ages 13-17, a difference of more than 20 percentage points. In Zimbabwe 8% of children age 7-12 but only 1% of children age 13-17 had no education. The percentage of children with no education was at least 10 percentage points higher for children age 7-12 than for their older counterparts in Ethiopia, Kenya, Mozambique, Namibia, Nigeria, Rwanda, and Tanzania (see Table 6.1).

Sex and geographic disparities

Overall, we found disparities by sex in the percentage of children age 0-17 without education (see Table 6.2). This percentage was higher for males in some countries and for females in other countries (see Figure 6.1). For instance, the greatest difference occurred in Niger, where 55% of males and 69% of females had not received a primary or secondary education, a difference of 14 percentage points. The percentage of children without education was about 10 percentage points higher for females than for males in Mali (males: 49% and females: 58%), Guinea (41% and 51%), and Benin (23% and 34%). The inverse situation occurred, but was less marked, in Kenya (males: 12% and females: 10%) and Lesotho (4% and 2%).

In every country except for Sao Tomé and Príncipe, the percentage of children age 0-17 without a primary or secondary education was higher in rural areas than in urban areas (see Figure 6.2). However, this difference was very diverse across the countries, from 2 percentage points in Lesotho to 52 percentage points in Burkina Faso. The difference was more than 30 percentage points in Senegal (urban: 17% and rural: 48%), Guinea (21% and 57%), Ethiopia (13% and 51%), and Niger (29% and 69%) as well as Burkina Faso (see Table 6.2).

The role of the household head's sex and age

In 18 countries the percentage of children without a primary or secondary education was at least one percentage point higher for children living with a male rather than a female head of household (see Figure 6.3). We did not find the inverse situation in any sub-Saharan African country. The largest discrepancies, around 20 percentage points, occurred in Burkina Faso (living with a male household head:

65% versus living with a female household head: 44%) and Nigeria (30% versus 12%) (see Table 6.2). In Benin, Cameroon, and Senegal, the percentage of children without a primary or secondary education was around 10 percentage points higher for children living with a male household head.

Overall, we found that the percentage of children without primary or secondary education was either not associated with the age of the head of household or was higher for children living with a household head 50 years or older rather than with a younger household head (see Figure 6.4 and Table 6.2). The percentage of children without a primary or secondary education was at least 5 percentage points higher for children living with an older head of household in Mali (52% versus 58%), Liberia (52% versus 58%), Benin (27% versus 34%), and Burkina Faso (62% versus 70%). In 10 countries there was no association between the age of the household head and differences in the percentage of children without primary or secondary education: Congo (Brazzaville), Lesotho, Mozambique, Namibia, Rwanda, Sao Tomé and Príncipe, Senegal, Uganda, Zambia, and Zimbabwe.

Variations during the last 13 years

In every country the percentage of children without a primary or secondary education decreased during the last 13 years. This decline was most evident—at least six percentage points—in Benin (2001: 36% and 2006: 29%), Mali (2001: 60% and 2006: 54%), Namibia (2000: 15% and 2006-07: 9%), and Zambia (2001-2: 23% and 2007: 14%) (see Figure 6.5 and Table 6.3).

6.2 Children Not Currently Enrolled in School

The percentage of children not enrolled in school also varied greatly among countries, ranging from 7% in Kenya to 52% in Burkina Faso (see Maps 6.3 and 6.4). Four of every 10 children in Senegal were not enrolled in school during the data collection period (see Table 6.1). Approximately one-third of children were not enrolled in school in Benin and Ethiopia. Overall, the percentage of children not enrolled in school was higher for children age 13-17 than for their younger counterparts. This difference rose to over 20 percentage points in Tanzania and Zimbabwe and was more than 30 percentage points in Madagascar. In 21 countries the percentage of children age 0-17 not enrolled in school at the time of the study was at least one percentage point higher for females than for males. In five countries this percentage was at least one percentage point higher for males than females, while in four countries, the percentages were similar between the sexes.

Sex and geographic disparities

The greatest differences, by child sex, in the percentage of children age 0-17 who were not enrolled in school occurred in Benin (males: 29% and females: 40%), Chad (51% and 66%), Cote d'Ivoire (40% and 51%), Guinea (42% and 53%), and Niger (59% and 73%)—all differences of at least 10 percentage points (see Figure 6.6 and Table 6.4).

We found no geographic disparities in Rwanda, Swaziland, and Uganda (see Figure 6.7). In the rest of the countries, however, the percentage of children who did not enroll in school was at least one percentage point higher in rural areas than in urban areas. This difference was at least 33 percentage points higher in Burkina Faso (urban: 25% and rural: 59%), Guinea (23% and 59%), and Niger (37% and 72%) (see Table 6.4). The percentage of children not enrolled in school was also at least 20 percentage points higher in rural areas than in urban areas in Chad, Ethiopia, Liberia, Mali, Nigeria, Senegal, and Sierra Leone.

The role of the household head's sex and age

The sex of the household head played an important role in the percentage of children not in school (see Figure 6.8). This percentage was at least five percentage points higher for children living with a male household head in five countries (Benin, Burkina Faso, Cameroon, Nigeria, and Senegal). The greatest discrepancy occurred in Nigeria, where the percentage of children not enrolled in school was 19 percentage points higher for children living with a male household head (32%) than for children living with a female household head (13%). A difference at least five percentage points higher for children living with a *female* household head occurred only in Chad (see Table 6.4). In Kenya, Mozambique, Sao Tomé and Príncipe, and Zimbabwe, the sex of the child made no difference to the percentages not enrolled in school.

In nine countries the percentage of children not enrolled in school was at least five percentage points higher for children living with a household head 50 years of age or older than for those living with a younger head of household: Benin (33% versus 40%), Burkina Faso (51% versus 57%), Cote d'Ivoire (44% versus 52%), Ghana (15% versus 22%), Liberia (44% versus 50%), Madagascar (26% versus 33%), Mali (56% versus 62%), Niger (64% versus 72%), and Tanzania (23% versus 29%) (see Figure 6.9). There were no significant associations between the age of the household head and differences in the percentage of children not enrolled in school in the Democratic Republic of Congo, Ethiopia, Lesotho, Namibia, Sao Tomé and Príncipe, and Senegal (differences of less than 1 percentage point) (see Table 6.4).

Variations during the last 13 years

In every country in sub-Saharan Africa, the percentage of children age 7-17 not enrolled in school decreased by at least one percentage point and in some countries substantially more. Ethiopia (2005: 51% and 2011: 35%) and Zambia (2001-02: 33% and 2007: 18%) experienced the largest decreases, at least 15 percentage points (see Table 6.3).

The decrease in the percentage of children not enrolled in school was much greater among younger children than among their older counterparts in Ethiopia (children age 7-12: 20 percentage points and children age 13-17: 10 percentage points), Ghana (children age 7-12: 16 percentage points and children age 13-17: 6 percentage points), and Mozambique (age 7-12 years old: 9 percentage points and age 13-17: 2 percentage points). The inverse situation occurred in two countries, Kenya (children age 7-12: 3 percentage points and children age 13-17: 11 percentage points) and Rwanda (children age 7-12: 4 percentage points and children 13-17: 19 percentage points) (see Figures 6.10 and 6.11).

6.3 School Dropouts

Overall, the percentage of children age 7-12 who had dropped out of school was very low, not reaching more than 4% in any of these countries except Burkina Faso (7%). As might be expected, the percentage of older children, age 13-17, who had dropped out of school was higher, ranging from less than 4% in Kenya to 35% in Burkina Faso (see Table 6.1). The highest percentages were seen in Burkina Faso, Madagascar, and Rwanda, where one of every three children age 13-17 had dropped out (see Maps 6.5 and 6.6).

Sex and geographic disparities

Overall, we did not find major disparities between the sexes in the percentages who had dropped out of school (see Figure 6.12). The greatest differences—about three percentage points—occurred in the Democratic Republic of Congo (males: 7% and females: 10%), Liberia (males: 2% and females: 5%), and Niger (males: 10% and females: 13%). The inverse situation occurred in Lesotho, where the percentage of

children who had dropped out of school was 3 percentage points higher for males (10%) than for females (7%) (see Table 6.5).

We found geographic disparities of at least six percentage points in the percentage of children who had dropped out of school in Burkina Faso (urban: 13% and rural: 21%) and Madagascar (urban: 9% and rural: 15%). We found smaller discrepancies, three to four percentage points, in Mali (urban: 5% and rural: 9%), Democratic Republic of Congo (urban: 7% and rural: 11%), and Zimbabwe (urban: 5% and rural: 9%) (see Figure 6.13 and Table 6.5).

The role of the household head's sex and age

Overall, there was no association between the sex of the household head and major differences in the percentage of children who dropped out of school (see Figure 6.14). In Burkina Faso children in a household whose head was age 50 or older were over five percentage points more likely to have dropped out than children in households headed by a younger person (24% versus 17%) (see Table 6.5).

Variations during the last 13 years

Reductions of at least six percentage points in the percentage of children age 7-17 years who dropped out school took place only in Benin (2001: 20% and 2006: 14%), Ghana (2003: 14% and 2008: 7%), Kenya (2003: 11% and 2008-09: 4%), and Zambia (2001-02: 20% and 2007: 9%) (see Table 6.3 and Figure 6.16).

Table 6.1. Percentage of children age 7-17 who have no education, who are not currently enrolled in school, and who have dropped out of school, by country and child's age

Country	No primary or secondary education			Not currently enrolled in school			Dropped out of school		
	Age 7-12	Age 13-17	Age 7-17	Age 7-12	Age 13-17	Age 7-17	Age 7-12	Age 13-17	Age 7-17
Benin	29.7	26.5	28.6	32.3	38.0	34.3	2.7	13.5	6.6
Burkina Faso	64.9	62.3	63.9	48.1	59.5	52.2	6.8	34.6	18.3
Cameroon	13.7	8.3	11.7	15.1	23.1	18.1	1.5	13.4	6.1
Ethiopia	55.7	32.8	47.1	37.8	31.1	35.2	1.8	7.1	4.3
Ghana	24.5	6.5	17.1	12.1	21.8	16.1	0.9	7.4	4.0
Kenya	16.5	2.8	11.1	5.5	8.8	6.8	0.1	3.9	1.7
Lesotho	3.4	2.3	2.9	5.9	20.6	12.7			
Madagascar	12.3	10.7	11.7	16.8	44.3	27.2	3.6	31.9	14.4
Malawi	7.6	3.4	6.0	8.8	19.2	12.8	1.3	10.3	4.8
Mali	54.7	51.6	53.5	55.8	59.2	57.1	2.3	14.2	7.0
Mozambique	30.1	14.1	24.2	23.7	32.4	26.9	2.2	14.8	7.5
Namibia	13.2	3.7	8.9	6.9	13.4	9.9	1.0	6.2	3.5
Nigeria	30.9	19.8	26.9	28.9	28.3	28.7	1.4	7.4	3.8
Rwanda	16.5	7.3	12.6	9.8	18.8	13.4	1.9	28.8	13.9
Senegal	36.4	33.8	35.4	38.0	45.7	41.0	2.2	15.4	7.5
Tanzania	29.4	14.0	23.2	16.1	36.3	24.3	1.4	12.3	6.3
Uganda	12.0	3.0	8.6	7.4	15.0	10.3	0.7	10.2	4.5
Zambia	21.2	3.2	14.1	19.2	16.0	17.9	1.4	9.0	4.8
Zimbabwe	8.4	0.7	5.2	4.4	24.0	12.3	0.9	15.8	7.4

Table 6.2. Percentage of children age 7-17 with no education, by country, sex of child, and region of residence as well as sex and age of head of household

Country	Sex of child			Region of residence			Sex of household head			Age of household head		
	Male (a)	Female (b)	Comparison (b)-(a)	Urban (c)	Rural (d)	Comparison (d)-(c)	Male (e)	Female (f)	Comparison (f)-(e)	Less than age 50 (g)	Age 50 or more (h)	Comparison (h)-(g)
Benin	23.3	34.4	11.1	18.7	34.3	15.6	30.3	21.4	-8.9	27.3	33.9	6.6
Burkina Faso	60.1	67.8	7.7	20.6	72.3	51.7	65.2	44.2	-21.0	61.8	69.8	8.0
Cameroon	9.5	13.9	4.4	4.0	18.0	14.0	13.5	5.4	-8.1	11.1	13.5	2.4
Congo (Brazzaville)	3.4	4.2	0.8	1.7	6.0	4.3	3.6	4.5	0.9	3.8	3.9	0.1
Congo Dem. Rep.	14.2	20.0	5.8	9.0	23.1	14.1	17.0	16.8	-0.2	16.8	18.1	1.3
Ethiopia	45.3	49.1	3.8	12.9	51.3	38.4	48.1	43.1	-5.0	46.7	48.8	2.1
Ghana	17.2	17.0	-0.2	10.5	21.7	11.2	19.3	12.5	-6.8	16.3	20.3	4.0
Guinea	40.8	50.5	9.7	20.5	56.9	36.4	46.4	41.0	-5.4	45.1	46.9	1.8
Kenya	12.1	10.1	-2.0	7.0	11.7	4.7	11.5	10.4	-1.1	10.8	12.4	1.6
Lesotho	4.2	1.6	-2.6	1.5	3.2	1.7	3.2	2.4	-0.8	2.7	3.5	0.8
Liberia	51.6	53.1	1.5	35.5	64.5	29.0	53.8	49.1	-4.7	51.5	57.8	6.3
Madagascar	12.3	11.1	-1.2	2.1	13.1	11.0	11.6	12.1	0.5	11.1	15.9	4.8
Malawi	6.6	5.4	-1.2	2.4	6.6	4.2	5.9	6.4	0.5	5.8	7.0	1.2
Mali	49.1	57.9	8.8	34.4	61.4	27.0	54.0	49.2	-4.8	52.3	57.5	5.2
Mozambique	20.8	27.8	7.0	11.9	30.8	18.9	24.6	22.7	-1.9	24.1	24.4	0.3
Namibia	9.6	8.2	-1.4	6.7	10.1	3.4	10.0	7.8	-2.2	9.0	8.6	-0.4
Niger	54.9	69.0	14.1	29.3	68.9	39.6	62.7	57.6	-5.1	60.0	67.1	7.1
Nigeria	24.0	29.8	5.8	11.2	34.0	22.8	29.5	11.7	-17.8	27.2	25.5	-1.7
Rwanda	13.0	12.2	-0.8	10.7	12.9	2.2	13.2	11.5	-1.7	12.7	12.3	-0.4
Sao Tomé and Príncipe	2.0	1.8	-0.2	2.5	1.4	-1.1	1.8	2.1	0.3	1.8	2.6	0.8
Senegal	36.1	34.8	-1.3	17.1	48.1	31.0	37.5	27.7	-9.8	35.6	35.1	-0.5
Sierra Leone	27.1	29.2	2.1	13.6	36.1	22.5	28.9	25.7	-3.2	27.4	30.0	2.6
Swaziland	4.7	3.5	-1.2	2.8	4.3	1.5	4.5	3.8	-0.7	3.3	5.8	2.5
Tanzania	23.8	22.7	-1.1	12.5	26.4	13.9	23.9	21.1	-2.8	22.9	24.7	1.8
Uganda	8.6	8.6	0.0	4.2	9.2	5.0	8.5	8.8	0.3	8.6	8.6	0.0
Zambia	14.1	14.1	0.0	6.4	18.5	12.1	14.2	14.0	-0.2	14.2	13.9	-0.3
Zimbabwe	5.6	4.7	-0.9	2.6	6.1	3.5	5.7	4.6	-1.1	5.1	5.5	0.4

Table 6.3. Trends in percentage of children age 7-17 who have no primary or secondary education, who are not attending school, or who have dropped out of school, by country and child's age

Country	Child's age	Data collection						No primary or secondary education						Not attending school						Dropped out of school					
		Year 1		Year 2		Year 1		Year 2		Year 1		Year 2		Year 1		Year 2		Year 1		Year 2		Year 1		Year 2	
		Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
Benin	7-17	2001	2001	2006	2006	36.4	28.6	-7.9	44.3	34.3	-10.0	10.3	6.6	-3.7											
Benin	7-12	2001	2001	2006	2006	36.2	29.7	-6.4	40.6	32.3	-8.3	5.5	2.7	-2.8											
Benin	13-17	2001	2001	2006	2006	37.0	26.5	-10.5	51.5	38.0	-13.4	19.5	13.5	-6.1											
Burkina Faso	7-17	2003	2010						71.0	52.2	-18.9														
Burkina Faso	7-12	2003	2010						67.6	48.1	-19.5														
Burkina Faso	13-17	2003	2010						76.3	59.5	-16.8														
Cameroon	7-17	2004	2011			13.1	11.7	-1.4	19.5	18.1	-1.5	6.4	6.1	-0.2											
Cameroon	7-12	2004	2011			15.4	13.7	-1.7	16.2	15.1	-1.1	1.7	1.5	-0.2											
Cameroon	13-17	2004	2011			9.6	8.3	-1.3	24.5	23.1	-1.5	12.9	13.4	0.5											
Ethiopia	7-17	2005	2011						51.3	35.2	-16.1														
Ethiopia	7-12	2005	2011						57.3	37.8	-19.6														
Ethiopia	13-17	2005	2011						41.2	31.1	-10.1														
Ghana	7-17	2003	2008			20.2	17.1	-3.1	27.6	16.1	-11.5	7.3	4.0	-3.3											
Ghana	7-12	2003	2008			26.2	24.5	-1.7	27.9	12.1	-15.9	1.7	0.9	-0.8											
Ghana	13-17	2003	2008			11.6	6.5	-5.0	27.2	21.8	-5.5	14.0	7.4	-6.6											
Kenya	7-17	2003	2008-09			15.2	11.1	-4.1	12.8	6.8	-6.0	5.3	1.7	-3.5											
Kenya	7-12	2003	2008-09			21.1	16.5	-4.6	8.0	5.5	-2.5	0.6	0.1	-0.5											
Kenya	13-17	2003	2008-09			7.3	2.8	-4.5	19.4	8.8	-10.5	10.7	3.9	-6.8											
Lesotho	7-17	2004	2009			5.6	2.9	-2.7	15.5	12.7	-2.8														
Lesotho	7-12	2004	2009			7.1	3.4	-3.6	9.3	5.9	-3.4														
Lesotho	13-17	2004	2009			3.9	2.3	-1.6	22.7	20.6	-2.2														
Madagascar	7-17	2003-04	2008-09			17.2	11.7	-5.5	30.6	27.2	-3.4	15.1	14.4	-0.7											
Madagascar	7-12	2003-04	2008-09			16.8	12.3	-4.6	20.1	16.8	-3.3	3.6	3.6	0.0											

(Continued...)

Table 6.3. – Continued

Country	Child's age	Data collection		No primary or secondary education						Not attending school			Dropped out of school		
		Year 1	Year 2	Year 1	Year 2	Comparison Year 2–Year 1	Year 1	Year 2	Comparison Year 2–Year 1	Year 1	Year 2	Comparison Year 2–Year 1			
		2003-04	2008-09	2003-04	2008-09	2008-09	2003-04	2008-09	2008-09	2003-04	2008-09	2008-09			
Madagascar	13-17	2003-04	2008-09	17.8	10.7	-7.1	48.3	44.3	-4.0	34.6	31.9	-2.7			
Malawi	7-17	2004	2010	8.8	6.0	-2.8	16.6	12.8	-3.8	6.3	4.8	-1.5			
Malawi	7-12	2004	2010	10.6	7.6	-2.9	13.3	8.8	-4.5	1.7	1.3	-0.4			
Malawi	13-17	2004	2010	5.7	3.4	-2.3	22.5	19.2	-3.3	14.0	10.3	-3.7			
Mali	7-17	2001	2006	59.8	53.5	-6.3	63.5	57.1	-6.4	7.2	7.0	-0.2			
Mali	7-12	2001	2006	59.0	54.7	-4.3	60.9	55.8	-5.1	2.9	2.3	-0.7			
Mali	13-17	2001	2006	61.3	51.6	-9.7	68.2	59.2	-9.0	15.5	14.2	-1.2			
Mozambique	7-17	2003	2011				32.3	26.9	-5.5						
Mozambique	7-12	2003	2011				33.2	23.7	-9.4						
Mozambique	13-17	2003	2011				31.0	32.4	1.5						
Namibia	7-17	2000	2006-07	14.9	8.9	-6.0	12.6	9.9	-2.7	4.0	3.5	-0.5			
Namibia	7-12	2000	2006-07	21.1	13.2	-7.9	10.5	6.9	-3.6	1.3	1.0	-0.3			
Namibia	13-17	2000	2006-07	5.9	3.7	-2.3	15.5	13.4	-2.1	7.2	6.2	-1.0			
Nigeria	7-17	2003	2008	27.8	26.9	-0.9	30.3	28.7	-1.6	4.1	3.8	-0.3			
Nigeria	7-12	2003	2008	31.3	30.9	-0.4	29.4	28.9	-0.4	0.8	1.4	0.6			
Nigeria	13-17	2003	2008	22.1	19.8	-2.3	31.9	28.3	-3.6	8.8	7.4	-1.3			
Rwanda	7-17	2005	2010				23.8	13.4	-10.4						
Rwanda	7-12	2005	2010				13.5	9.8	-3.8						
Rwanda	13-17	2005	2010				38.0	18.8	-19.3						
Senegal	7-17	2005	2010-11	39.7	35.4	-4.3	47.7	41.0	-6.7	11.6	7.5	-4.1			
Senegal	7-12	2005	2010-11	39.1	36.4	-2.6	41.4	38.0	-3.5	2.7	2.2	-0.5			
Senegal	13-17	2005	2010-11	40.6	33.8	-6.7	56.3	45.7	-10.6	24.2	15.4	-8.8			
Tanzania	7-17	2004-05	2010				26.0	24.3	-1.8						
Tanzania	7-12	2004-05	2010				23.3	16.1	-7.2						
Tanzania	13-17	2004-05	2010				30.0	36.3	6.3						

(Continued...)

Table 6.3. – Continued

Country	Child's age	Data collection		No primary or secondary education			Not attending school			Dropped out of school		
		Year 1	Year 2	Year 1	Year 2	Comparison Year 2–Year 1	Year 1	Year 2	Comparison Year 2–Year 1	Year 1	Year 2	Comparison Year 2–Year 1
Uganda	7-17	2006	2011				12.9	10.3	-2.7			
Uganda	7-12	2006	2011				9.0	7.4	-1.7			
Uganda	13-17	2006	2011				19.3	15.0	-4.3			
Zambia	7-17	2001-02	2007	22.9	14.1	-8.7	32.9	17.9	-15.0	11.2	4.8	-6.4
Zambia	7-12	2001-02	2007	31.6	21.2	-10.4	33.3	19.2	-14.1	3.5	1.4	-2.1
Zambia	13-17	2001-02	2007	8.9	3.2	-5.8	32.4	16.0	-16.3	20.3	9.0	-11.3
Zimbabwe	7-17	2005-06	2010-11				14.6	12.3	-2.2			
Zimbabwe	7-12	2005-06	2010-11				6.3	4.4	-1.8			
Zimbabwe	13-17	2005-06	2010-11				26.0	24.0	-2.0			

Table 6.4. Percentage of children age 7-17 not enrolled in school, by country, sex of child, and region of residence as well as sex and age of head of household

Country	Sex of child			Region of residence			Sex of household head			Age of household head			
	Male (a)	Female (b)	Comparison (b)-(a)	Urban (c)	Rural (d)	Comparison (d)-(c)	Male (e)	Female (f)	Comparison (f)-(e)	Less than age 50 (g)	Age 50 or more (h)	Comparison (h)-(g)	All children
Benin	28.7	40.4	11.7	24.9	39.8	14.9	35.7	28.5	-7.2	32.9	40.4	7.5	34.3
Burkina Faso	50.2	54.2	4.0	25.2	59.0	33.8	52.9	43.8	-9.1	50.6	57.1	6.5	52.2
Burundi	24.0	25.5	1.5	18.9	25.3	6.4	24.5	25.7	1.2	24.6	26.0	1.4	24.8
Cameroon	14.8	21.5	6.7	10.0	24.7	14.7	20.0	11.6	-8.4	17.0	21.8	4.8	18.1
Chad	50.8	66.1	15.3	36.1	64.2	28.1	57.6	63.6	6.0	57.7	62.6	4.9	58.5
Congo (Brazzaville)	11.0	12.6	1.6	9.9	13.7	3.8	11.3	13.2	1.9	11.2	14.8	3.6	11.8
Cote d'Ivoire	39.6	50.6	11.0	40.6	48.4	7.8	46.0	42.2	-3.8	43.6	52.3	8.7	45.2
Dem. Rep. of Congo	24.3	32.6	8.3	18.8	35.6	16.8	27.9	30.1	2.2	28.2	29.1	0.9	28.3
Ethiopia	35.9	34.6	-1.3	15.3	39.1	23.8	35.8	33.1	-2.7	35.2	35.5	0.3	35.2
Ghana	15.4	16.7	1.3	13.5	17.9	4.4	17.6	12.9	-4.7	14.6	22.3	7.7	16.1
Guinea	42.4	53.0	10.6	23.0	58.7	35.7	48.4	43.1	-5.3	47.1	49.1	2.0	47.6
Kenya	6.2	7.3	1.1	5.9	6.9	1.0	6.8	6.8	0.0	6.2	9.3	3.1	6.8
Lesotho	16.4	9.2	-7.2	7.0	14.2	7.2	13.4	11.6	-1.8	12.7	12.9	0.2	12.7
Liberia	42.4	47.4	5.0	29.6	56.0	26.4	46.2	42.0	-4.2	44.0	50.4	6.4	44.9
Madagascar	26.6	27.9	1.3	13.0	29.3	16.3	27.0	28.1	1.1	26.4	33.0	6.6	27.2
Malawi	12.5	13.0	0.5	9.6	13.3	3.7	12.2	14.1	1.9	12.1	15.8	3.7	12.8
Mali	52.6	61.6	9.0	37.9	65.1	27.2	57.6	53.0	-4.6	55.8	61.5	5.7	57.1
Mozambique	25.1	28.6	3.5	15.5	32.0	16.5	27.0	26.6	-0.4	26.3	30.2	3.9	26.9
Namibia	11.0	8.7	-2.3	8.1	10.8	2.7	11.4	8.3	-3.1	9.8	10.1	0.3	9.9
Niger	59.4	72.9	13.5	37.3	72.4	35.1	66.8	62.3	-4.5	64.1	71.6	7.5	66.1
Nigeria	25.7	31.8	6.1	12.8	36.0	23.2	31.5	12.7	-18.8	29.1	27.5	-1.6	28.7
Rwanda	13.9	12.9	-1.0	12.8	13.5	0.7	12.5	15.1	2.6	12.9	16.3	3.4	13.4
Sao Tomé and Príncipe	13.6	12.6	-1.0	12.5	13.7	1.2	12.9	13.4	0.5	13.0	13.7	0.7	13.1
Senegal	41.2	40.8	-0.4	24.4	52.4	28.0	42.7	34.8	-7.9	41.0	41.1	0.1	41.0
Sierra Leone	29.3	32.7	3.4	15.1	39.7	24.6	31.6	29.0	-2.6	30.2	33.1	2.9	31.0
Swaziland	11.9	11.9	0.0	11.4	12.0	0.6	13.5	10.7	-2.8	10.8	14.5	3.7	11.9

(Continued...)

Table 6.4. – Continued

Country	Sex of the child			Region of residence			Sex of the household head			Age of the household head			
	Male (a)	Female (b)	Comparison (b)-(a)	Urban (c)	Rural (d)	Comparison (d)-(c)	Male (e)	Female (f)	Comparison (f)-(e)	Less than age 50 (g)	Age 50 or more (h)	Comparison (h)-(g)	All children
Tanzania	23.7	24.8	1.1	16.2	26.5	10.3	23.6	26.3	2.7	23.1	28.7	5.6	24.3
Uganda	9.3	11.3	2.0	10.2	10.3	0.1	9.7	11.5	1.8	9.9	12.4	2.5	10.3
Zambia	16.1	19.7	3.6	11.1	21.8	10.7	17.6	19.2	1.6	17.7	19.2	1.5	17.9
Zimbabwe	12.2	12.5	0.3	11.0	12.8	1.8	12.3	12.4	0.1	11.7	14.8	3.1	12.3

Table 6.5. Percentage of children age 7-17 who have dropped out of school, by country, sex of child, and region of residence as well as sex and age of head of household

Country	Sex of child			Region of residence			Sex of household head			Age of household head			
	Male	Female	Comparison	Urban	Rural	Comparison	Male	Female	Comparison	Less than	Age 50	Comparison	All
	(a)	(b)	(b)-(a)	(c)	(d)	(d)-(c)	(e)	(f)	(f)-(e)	age 50	or more	(h)-(g)	children
Benin	5.9	7.5	1.6	6.4	6.7	0.3	6.3	7.5	1.2	6.3	8.0	1.7	6.6
Burkina Faso	19.3	17.0	-2.3	13.4	21.0	7.6	18.4	17.7	-0.7	16.9	23.5	6.6	18.3
Cameroon	4.9	7.5	2.6	5.3	7.0	1.7	6.4	5.2	-1.2	5.5	8.3	2.8	6.1
Congo (Brazzaville)	6.1	7.0	0.9	6.5	6.7	0.2	6.4	7.1	0.7	6.1	9.1	3.0	6.6
Congo Dem. Rep.	7.3	10.3	3.0	6.8	10.5	3.7	8.6	9.3	0.7	8.8	8.1	-0.7	8.7
Ethiopia	4.3	4.4	0.1	3.0	4.6	1.6	4.2	5.0	0.8	4.1	5.2	1.1	4.3
Ghana	3.4	4.5	1.1	3.6	4.2	0.6	3.5	4.8	1.3	3.8	4.7	0.9	4.0
Guinea	3.2	5.8	2.6	3.7	4.9	1.2	4.5	3.6	-0.9	4.4	4.2	-0.2	4.4
Kenya	1.4	2.1	0.7	3.4	1.5	-1.9	1.8	1.7	-0.1	1.6	2.2	0.6	1.7
Lesotho	9.6	6.6	-3.0	5.6	8.5	2.9	8.0	8.3	0.3	7.7	9.2	1.5	8.1
Liberia	1.6	4.5	2.9	2.9	3.2	0.3	2.9	3.2	0.3	2.9	3.9	1.0	3.0
Madagascar	13.2	15.6	2.4	8.9	15.3	6.4	14.3	14.7	0.4	14.0	17.1	3.1	14.4
Malawi	4.4	5.3	0.9	4.5	4.9	0.4	4.6	5.4	0.8	4.6	6.1	1.5	4.8
Mali	6.1	8.1	2.0	4.9	8.5	3.6	7.1	6.5	-0.6	6.6	8.6	2.0	7.0
Mozambique	6.8	8.3	1.5	5.9	8.6	2.7	7.3	8.2	0.9	7.4	8.3	0.9	7.5
Namibia	4.2	2.8	-1.4	2.8	3.9	1.1	3.8	3.2	-0.6	3.4	3.8	0.4	3.5
Niger	9.7	12.6	2.9	11.0	10.8	-0.2	11.0	10.3	-0.7	10.0	13.8	3.8	10.9
Nigeria	3.7	3.9	0.2	2.6	4.5	1.9	3.9	3.1	-0.8	3.8	3.8	0.0	3.8
Rwanda	13.3	14.5	1.2	13.2	14.0	0.8	13.1	15.2	2.1	13.6	15.9	2.3	13.9
Sao Tomé and Príncipe	10.3	9.3	-1.0	9.1	10.7	1.6	9.9	9.8	-0.1	9.9	9.7	-0.2	9.9
Senegal	7.1	7.9	0.8	7.8	7.2	-0.6	7.5	7.7	0.2	7.2	8.2	1.0	7.5
Sierra Leone	3.2	4.7	1.5	2.5	4.9	2.4	3.8	4.1	0.3	3.7	4.3	0.6	3.9
Swaziland	3.7	3.9	0.2	4.1	3.7	-0.4	4.6	3.1	-1.5	3.7	3.9	0.2	3.8
Tanzania	5.6	7.0	1.4	7.4	5.9	-1.5	6.1	6.7	0.6	6.4	5.5	-0.9	6.3
Uganda	4.1	5.0	0.9	5.9	4.4	-1.5	4.2	5.2	1.0	4.2	6.1	1.9	4.5
Zambia	3.3	6.2	2.9	4.0	5.3	1.3	4.6	5.2	0.6	4.6	5.6	1.0	4.8
Zimbabwe	7.2	7.6	0.4	4.5	8.5	4.0	7.6	7.2	-0.4	7.1	8.7	1.6	7.4

Figure 6.1. Percentage of children age 7-17 with no education, by country and sex of the child

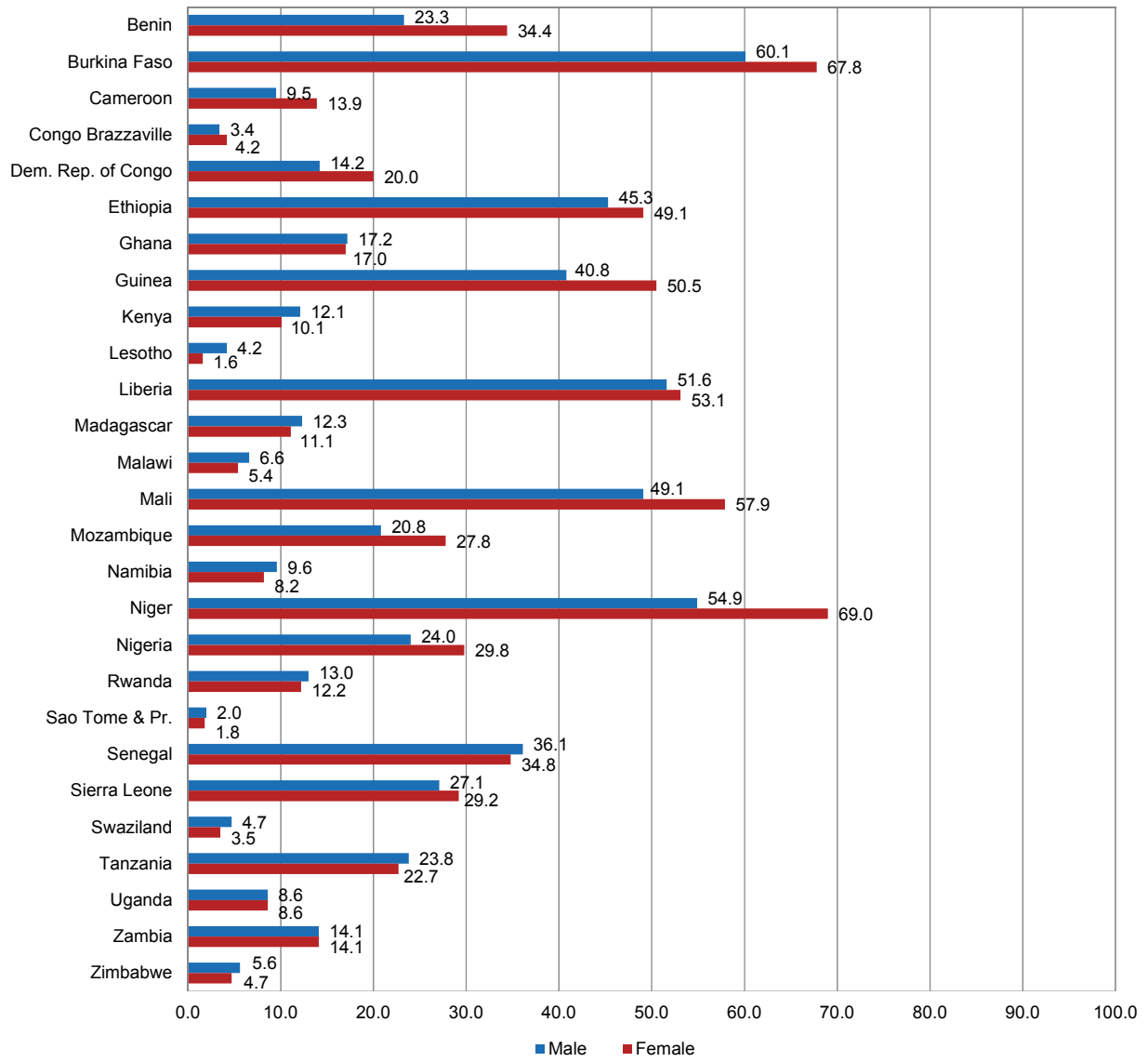


Figure 6.2. Percentage of children age 7-17 with no education, by country and region of residence

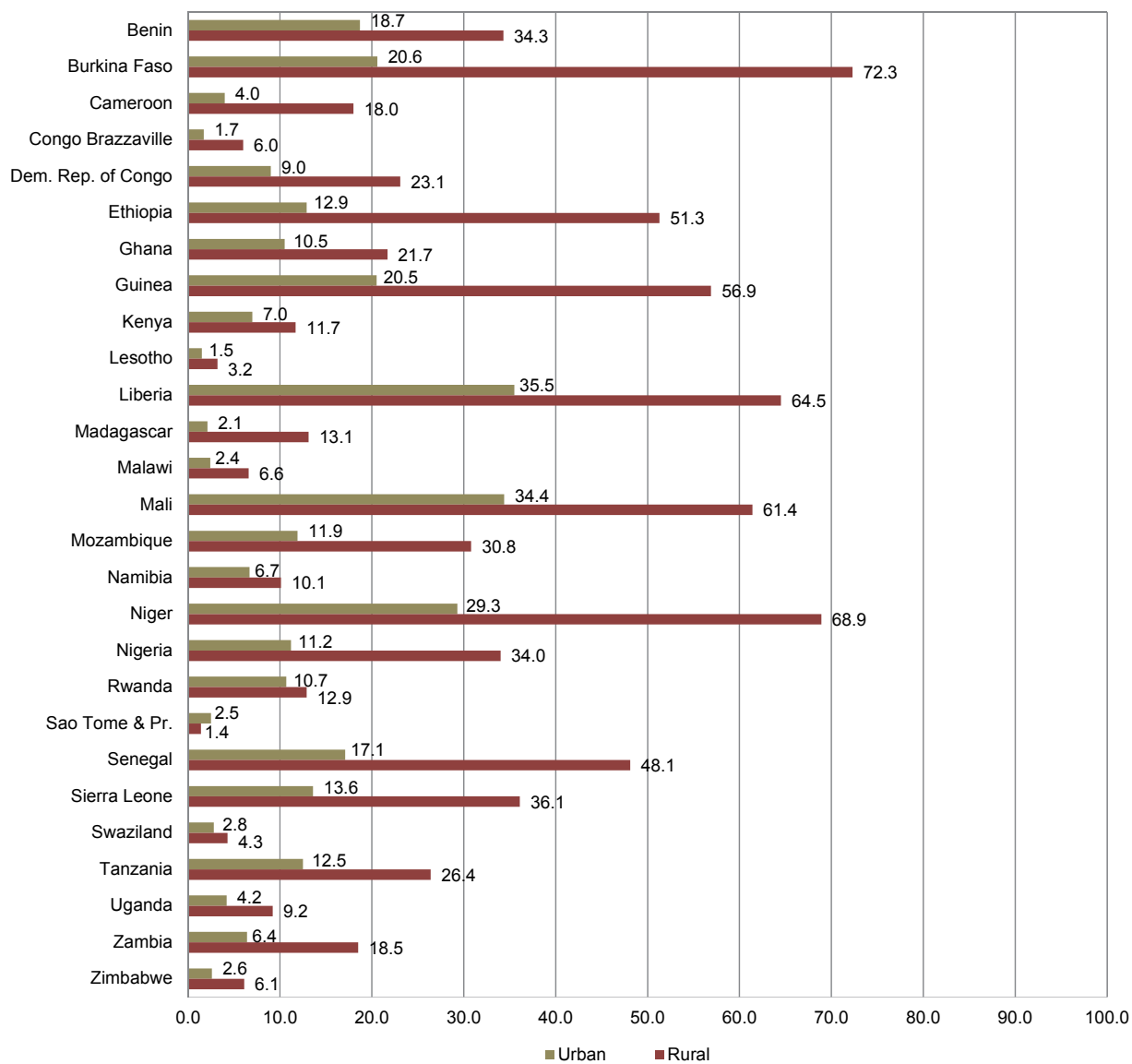


Figure 6.3. Percentage of children age 7-17 with no education, by country and sex of the household head

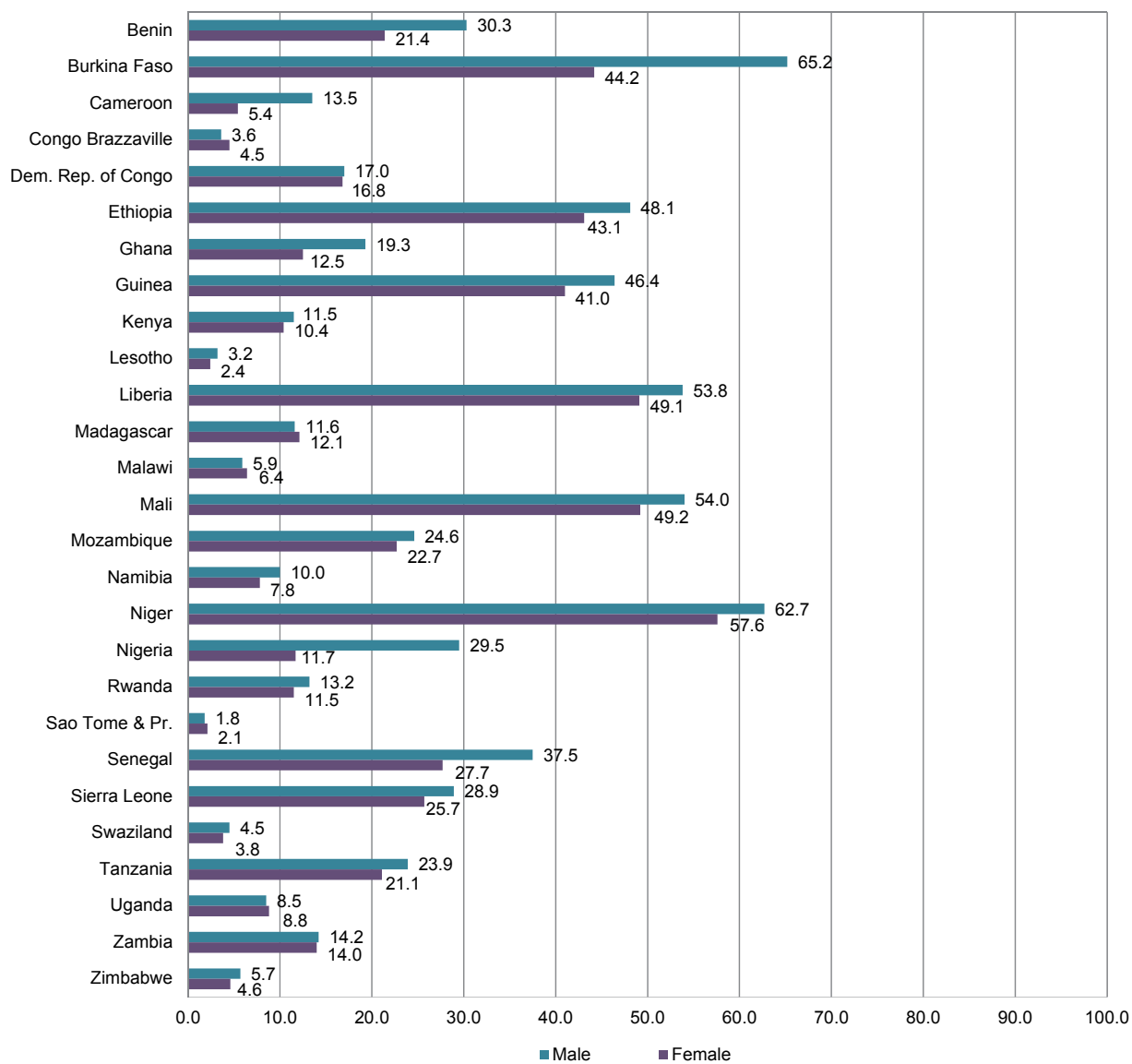


Figure 6.4. Percentage of children age 7-17 with no education, by country and age of the household head

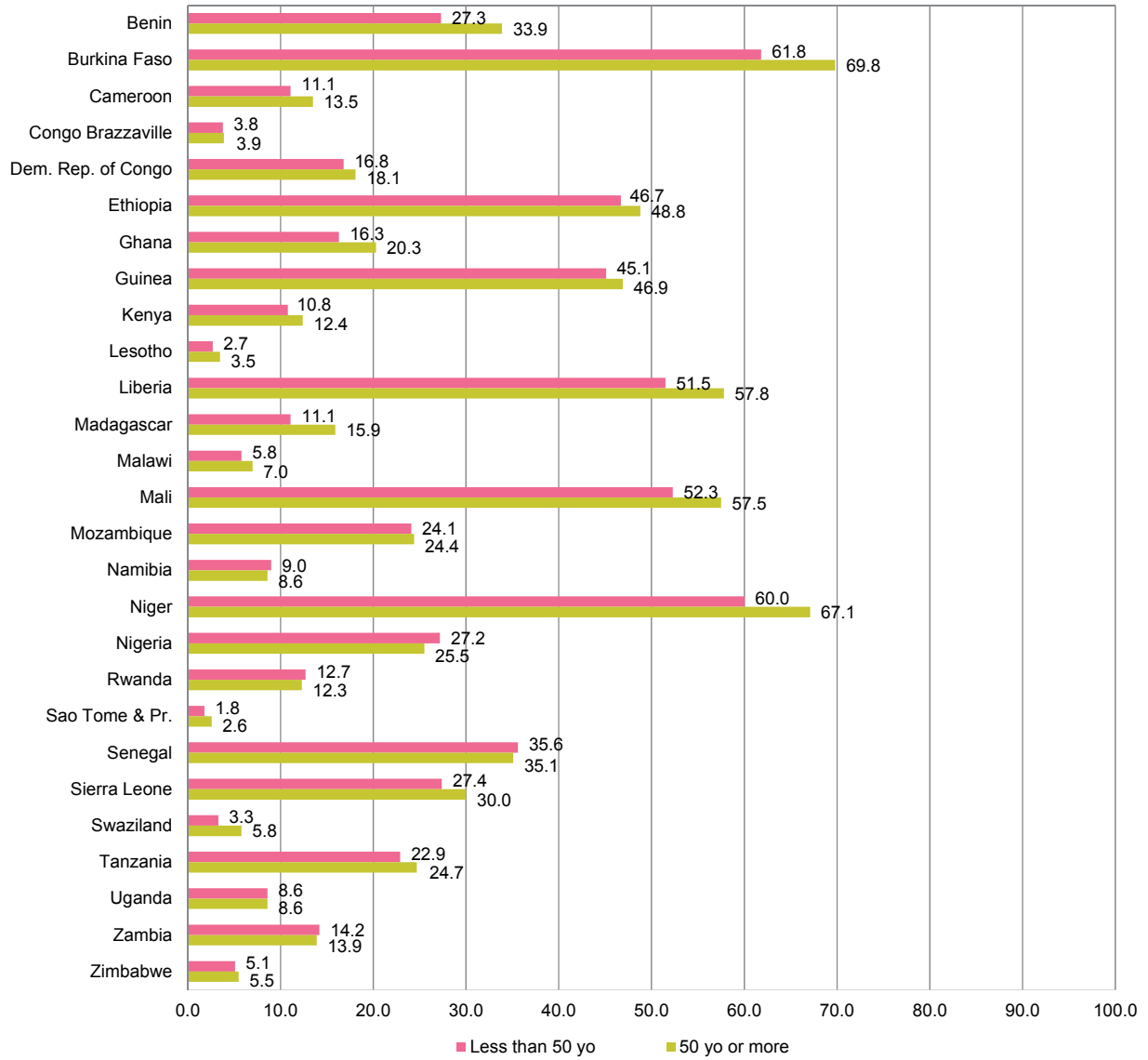


Figure 6.5. Changes in the percentage of children age 7-17 who have received no primary or secondary education

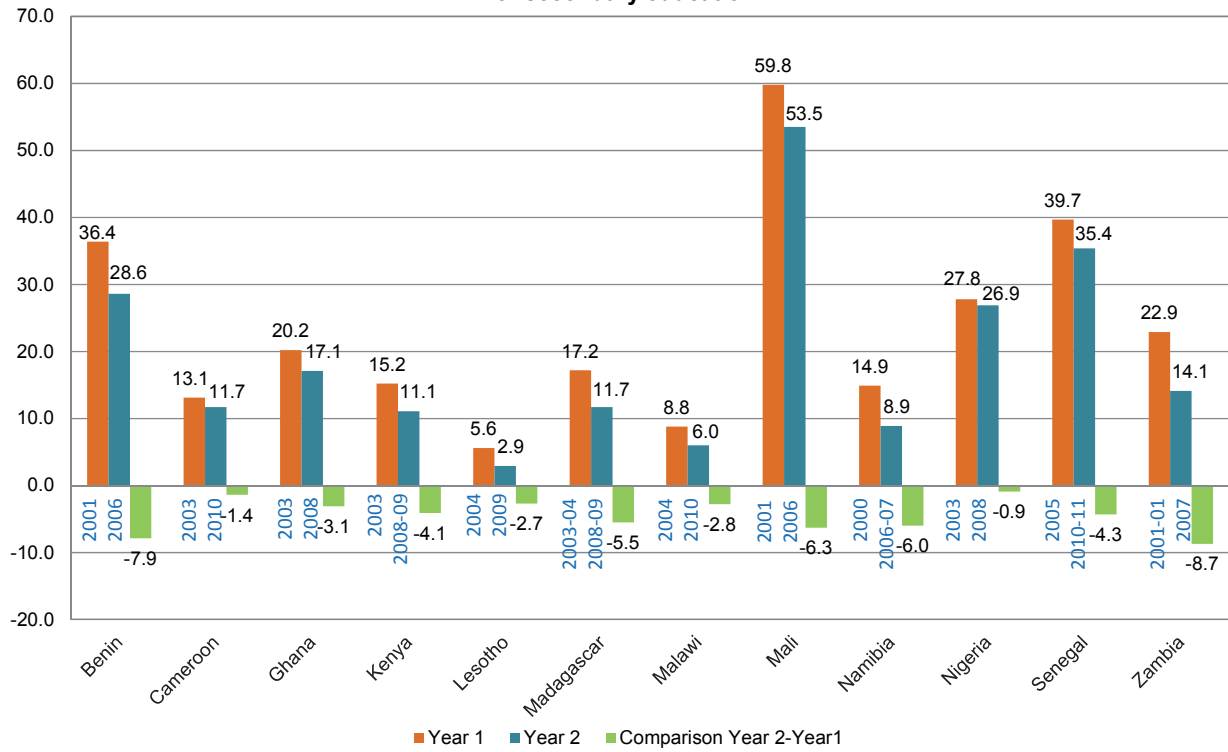


Figure 6.6. Percentage of children age 7-17 not enrolled in school, by country and sex of the child

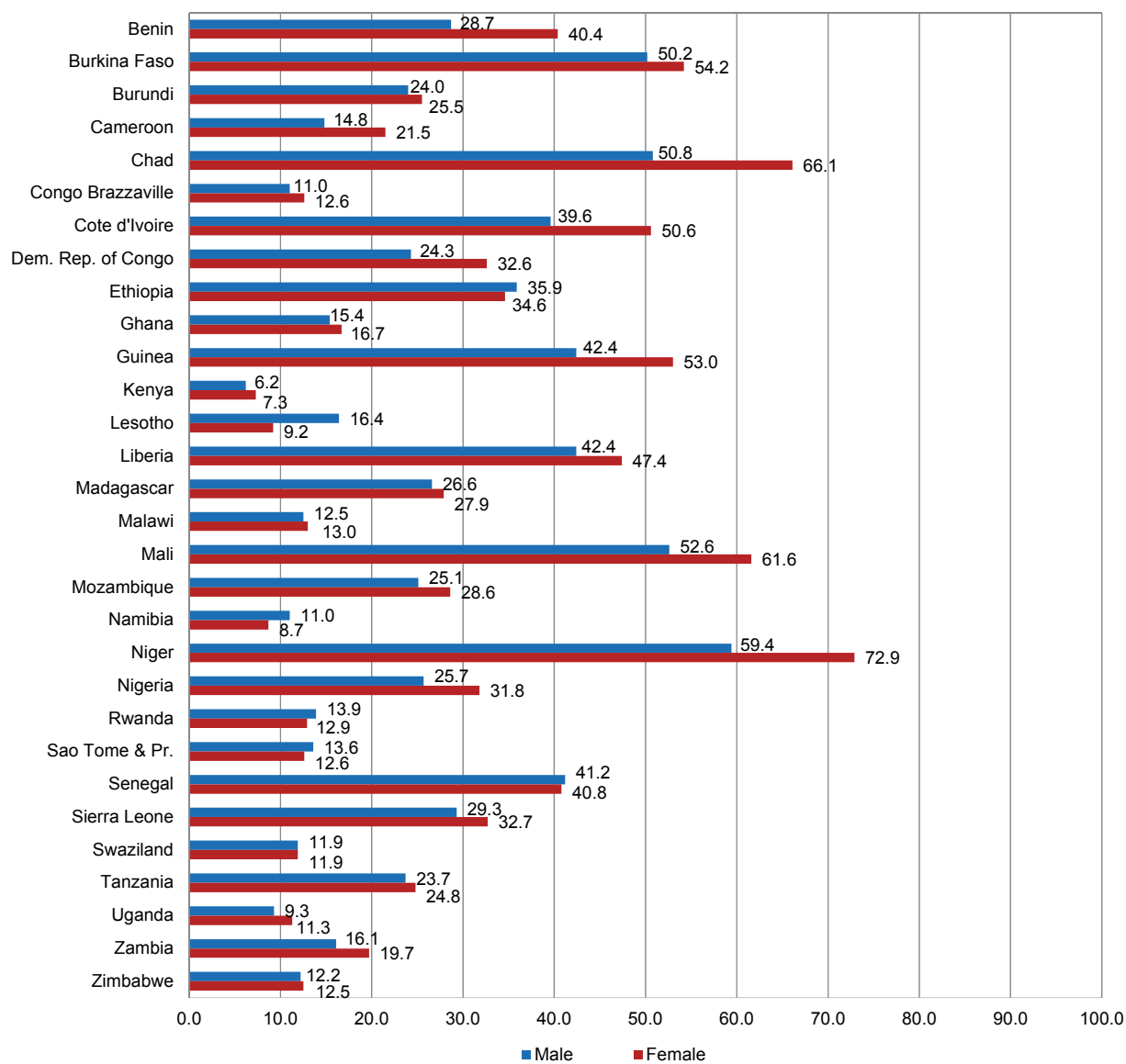


Figure 6.7. Percentage of children age 7-17 not enrolled in school, by country and region of residence

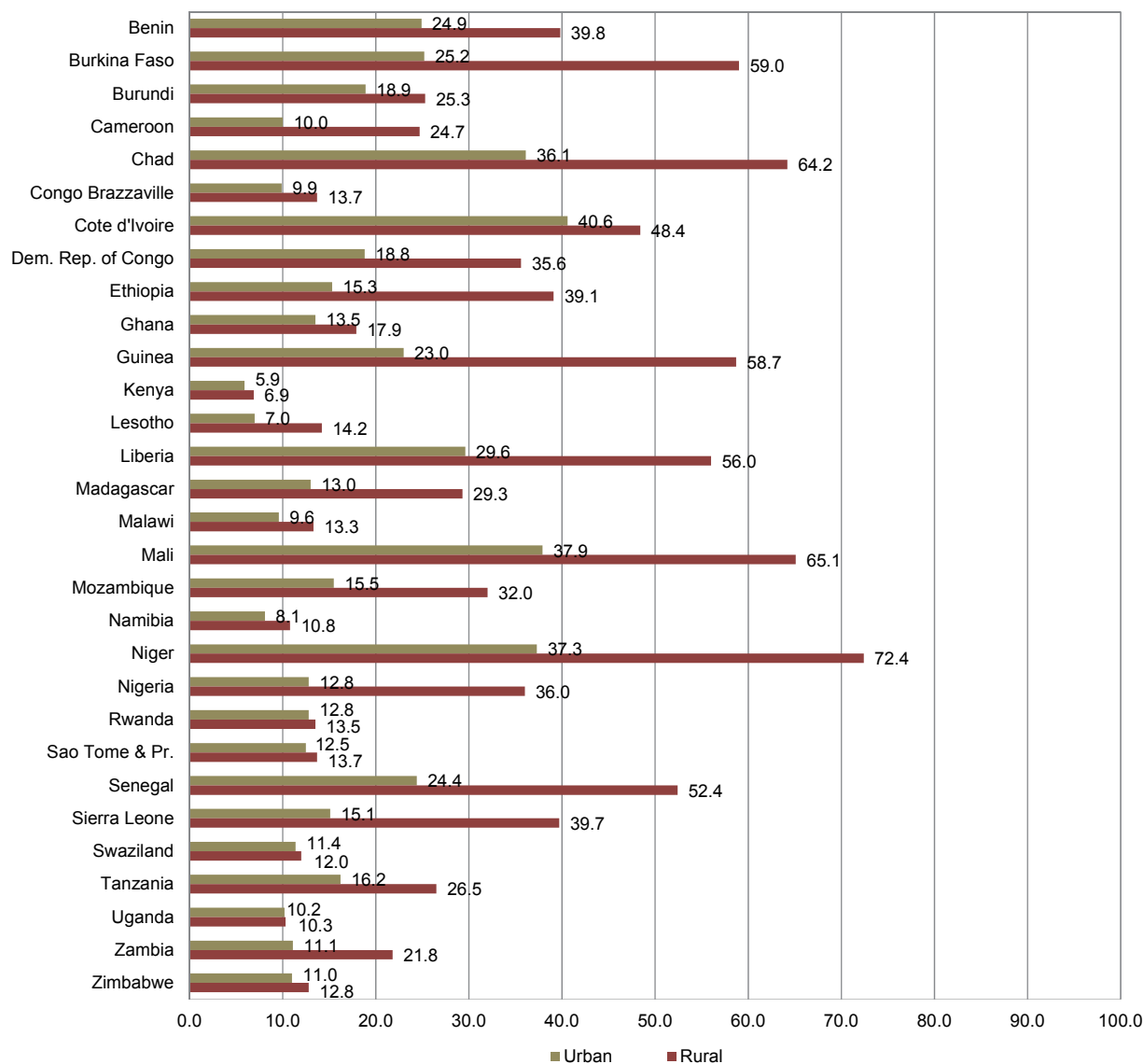


Figure 6.8. Percentage of children age 7-17 not enrolled in school, by country and sex of the household head

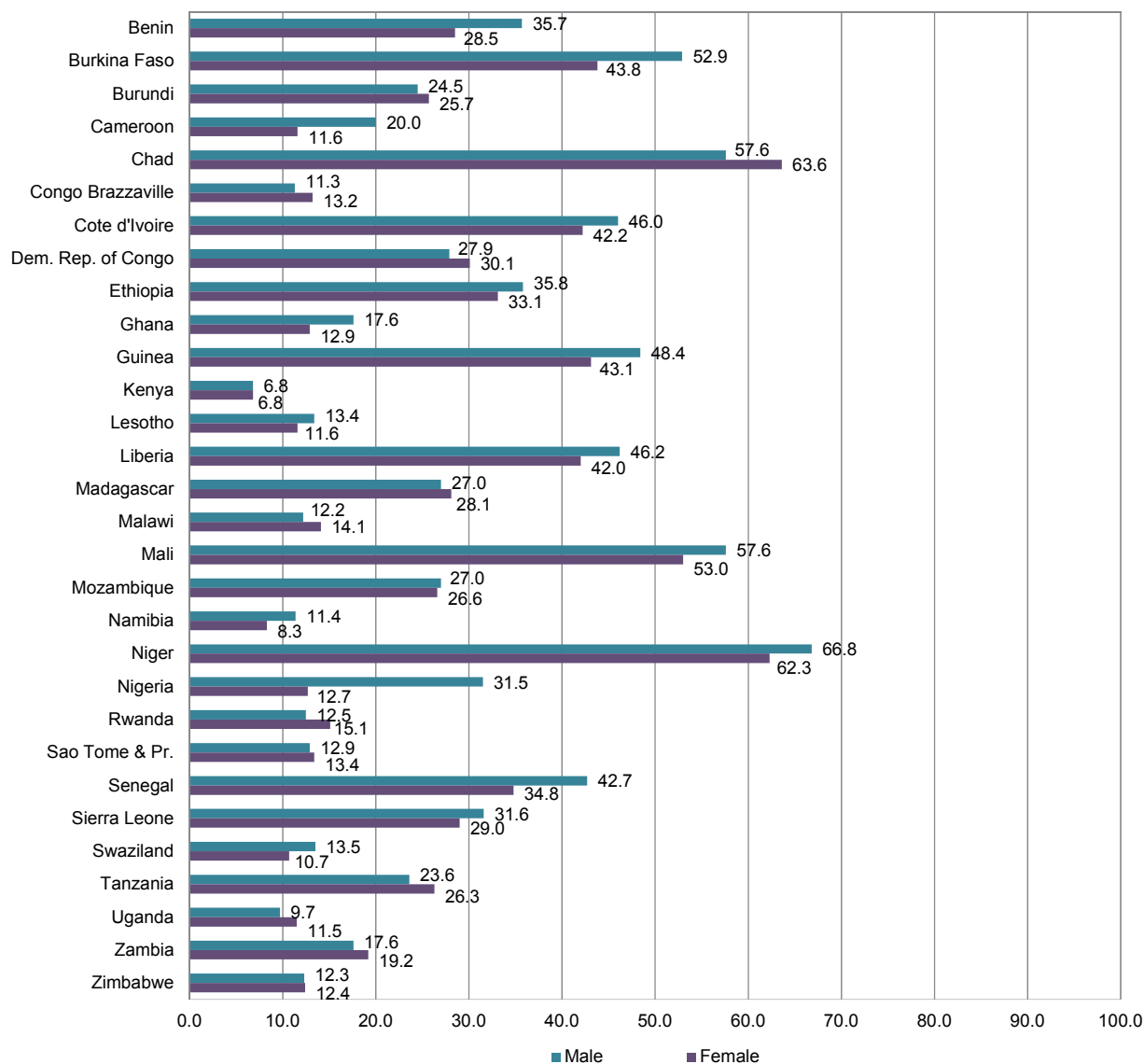


Figure 6.9. Percentage of children age 7-17 not enrolled in school, by country and age of the household head

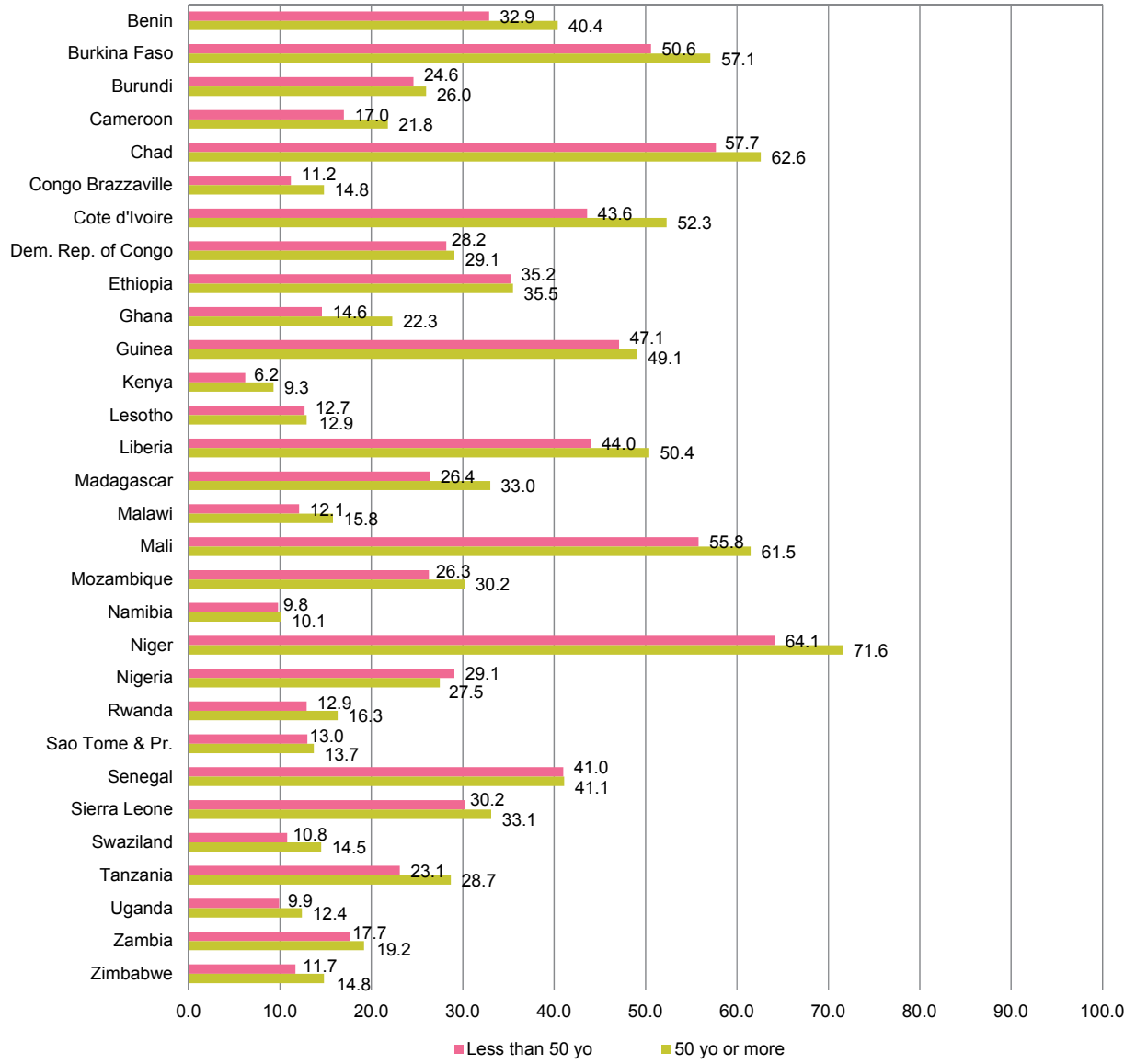


Figure 6.10. Changes in the percentage of children age 7-17 who are not currently enrolled in school

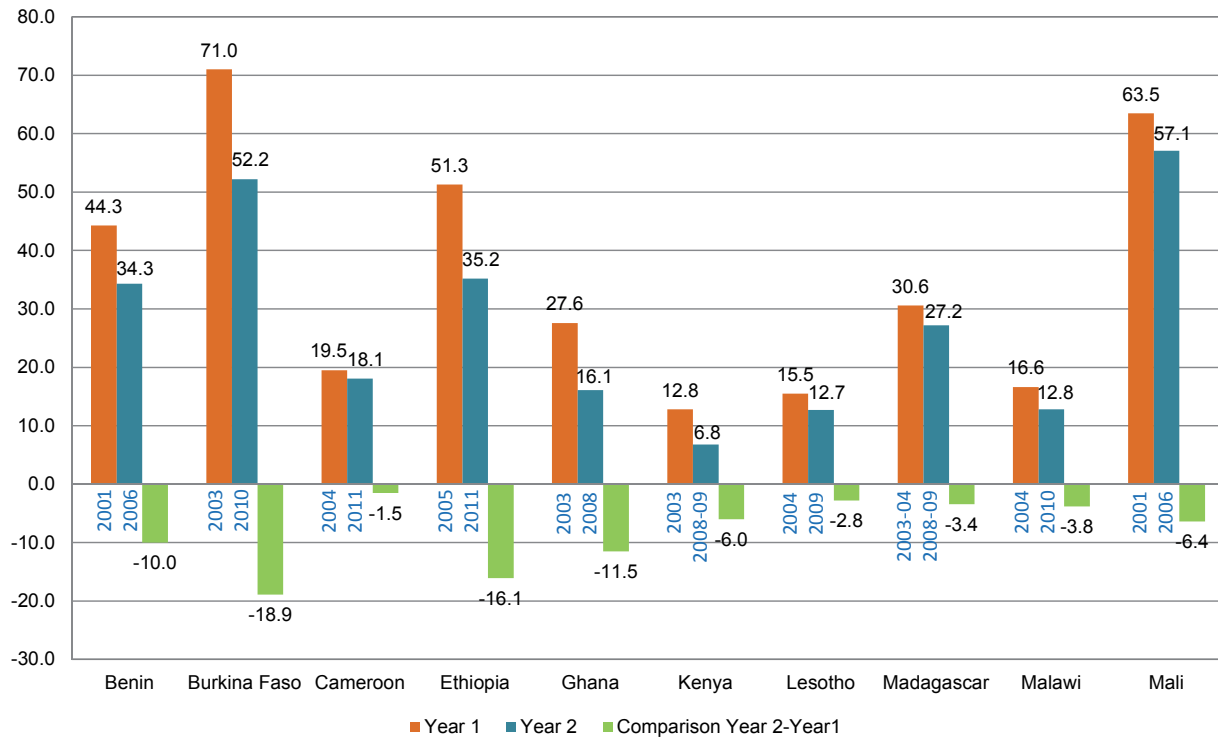


Figure 6.11. Changes in the percentage of children age 7-17 who are not currently enrolled in school

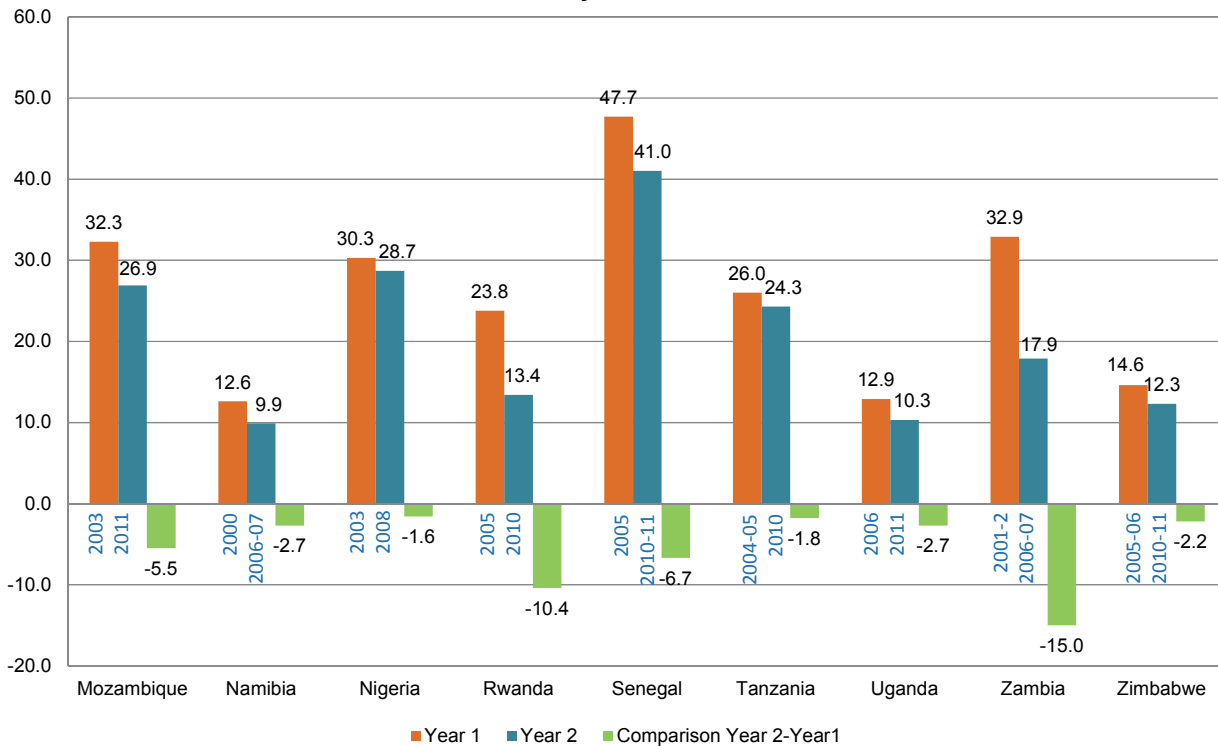


Figure 6.12. Percentage of children age 7-17 who dropped out of school, by country and the sex of the child

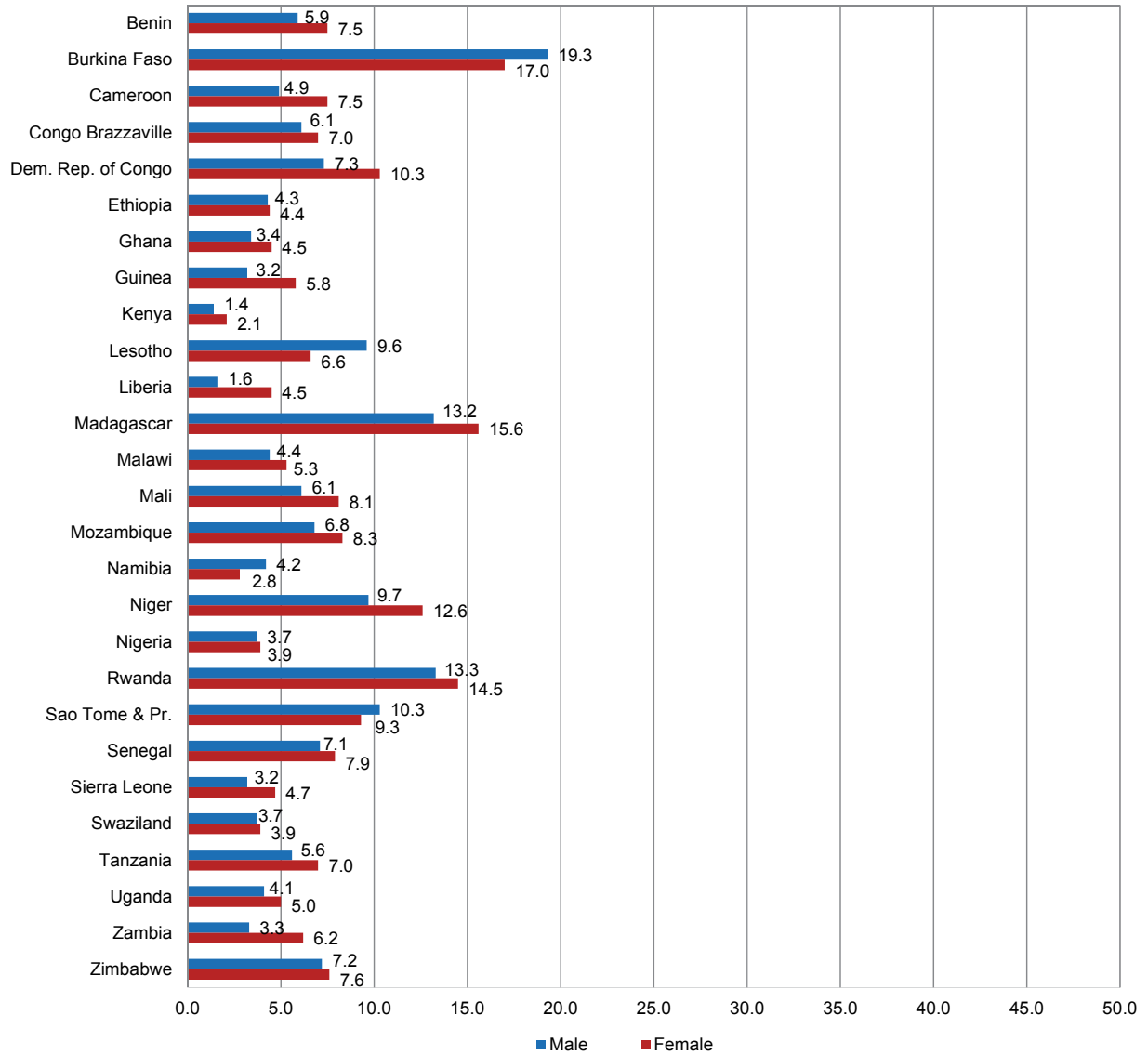


Figure 6.13. Percentage of children age 7-17 who dropped out of school, by country and region of residence

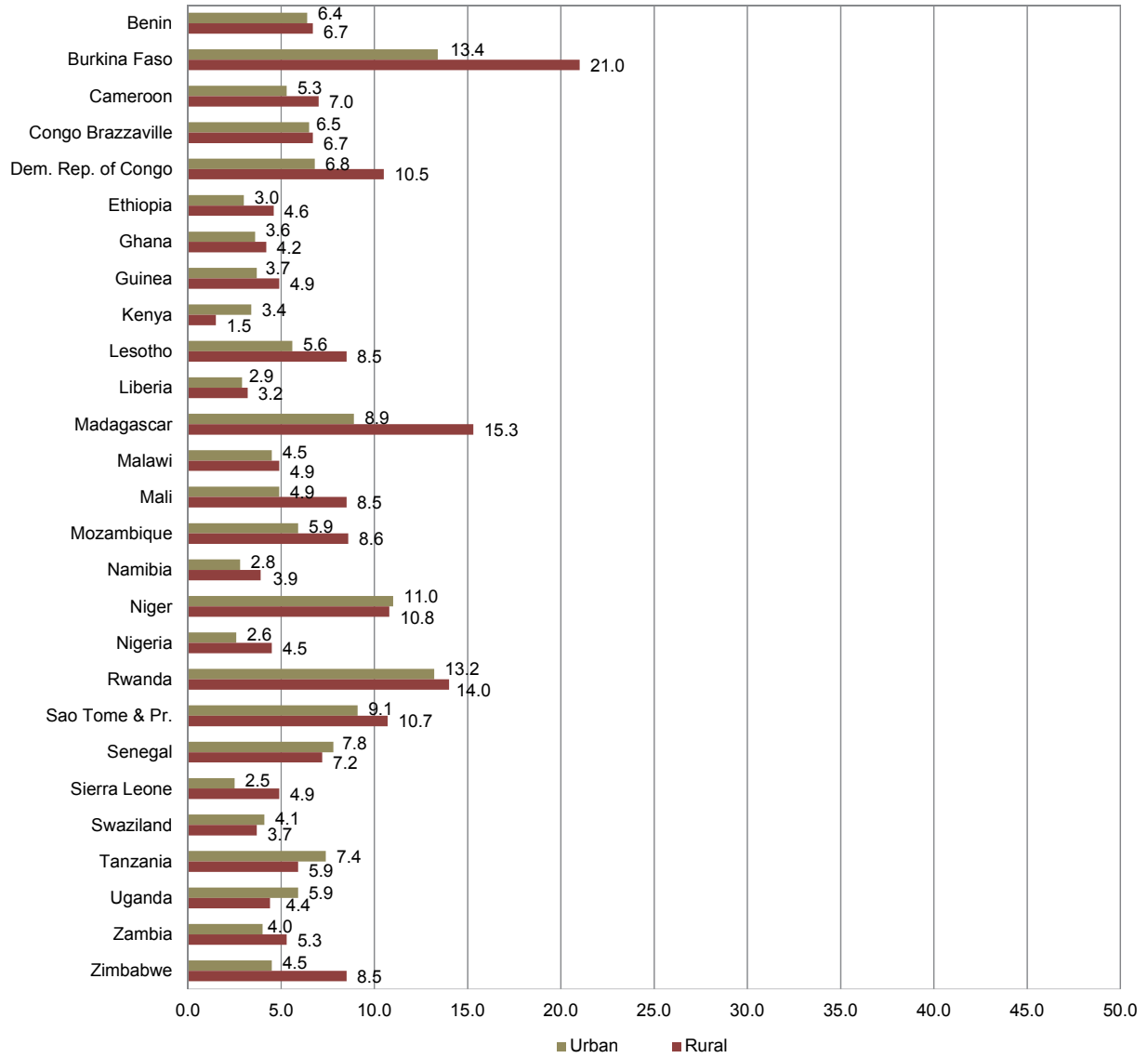


Figure 6.14. Percentage of children age 7-17 who dropped out of school, by country and sex of the household head

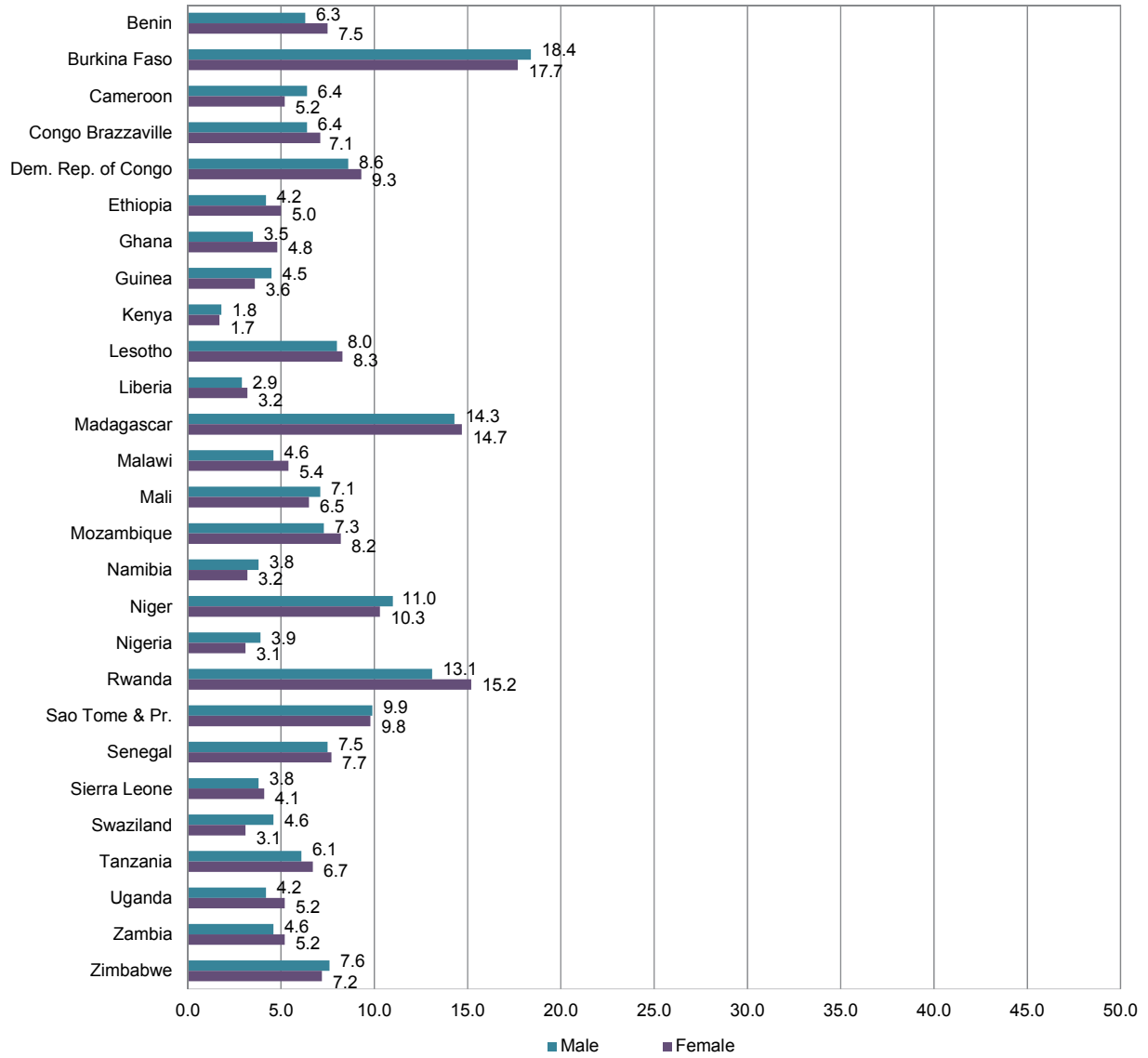


Figure 6.15. Percentage of children age 7-17 who dropped out of school, by country and age of the household head

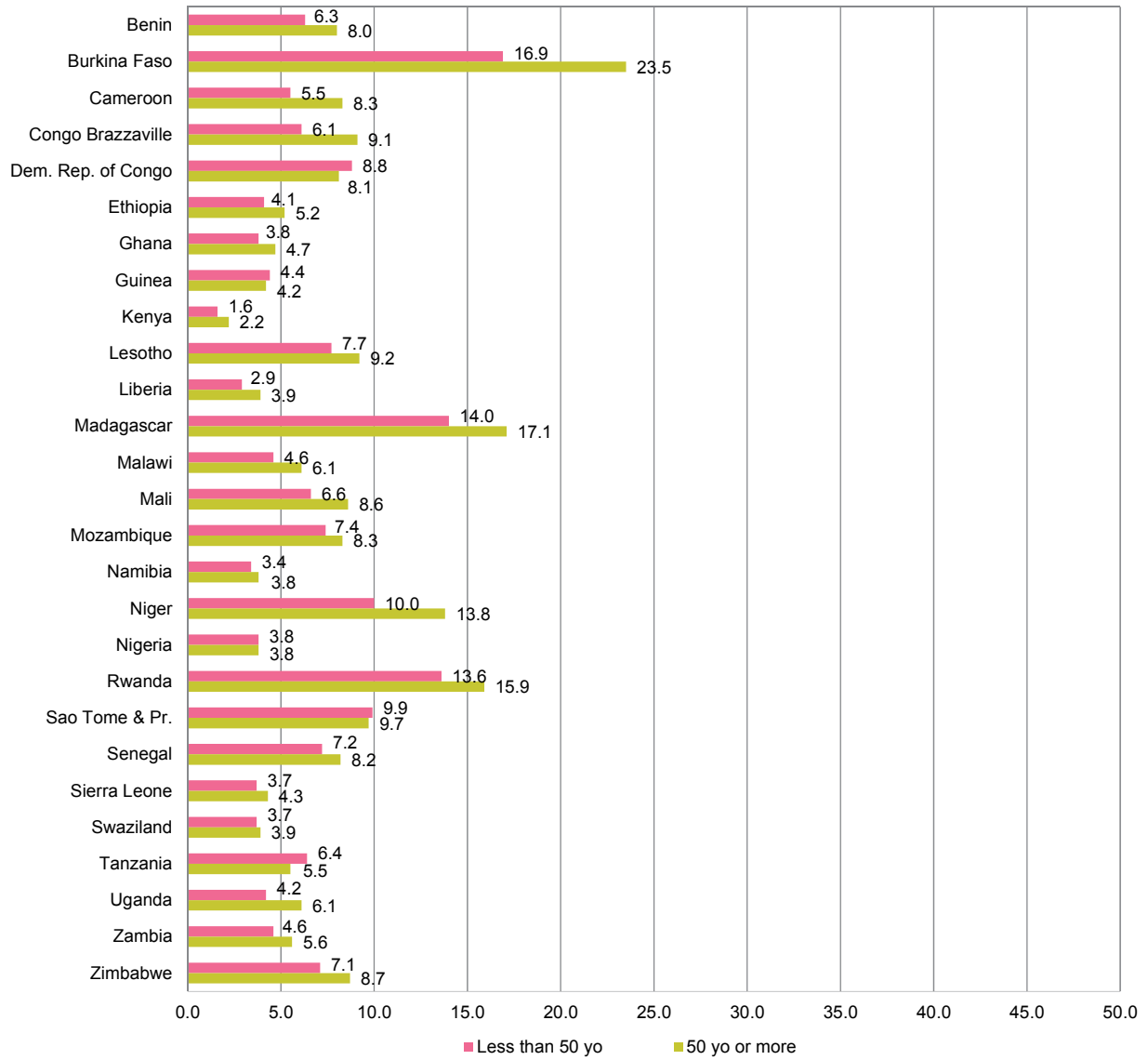
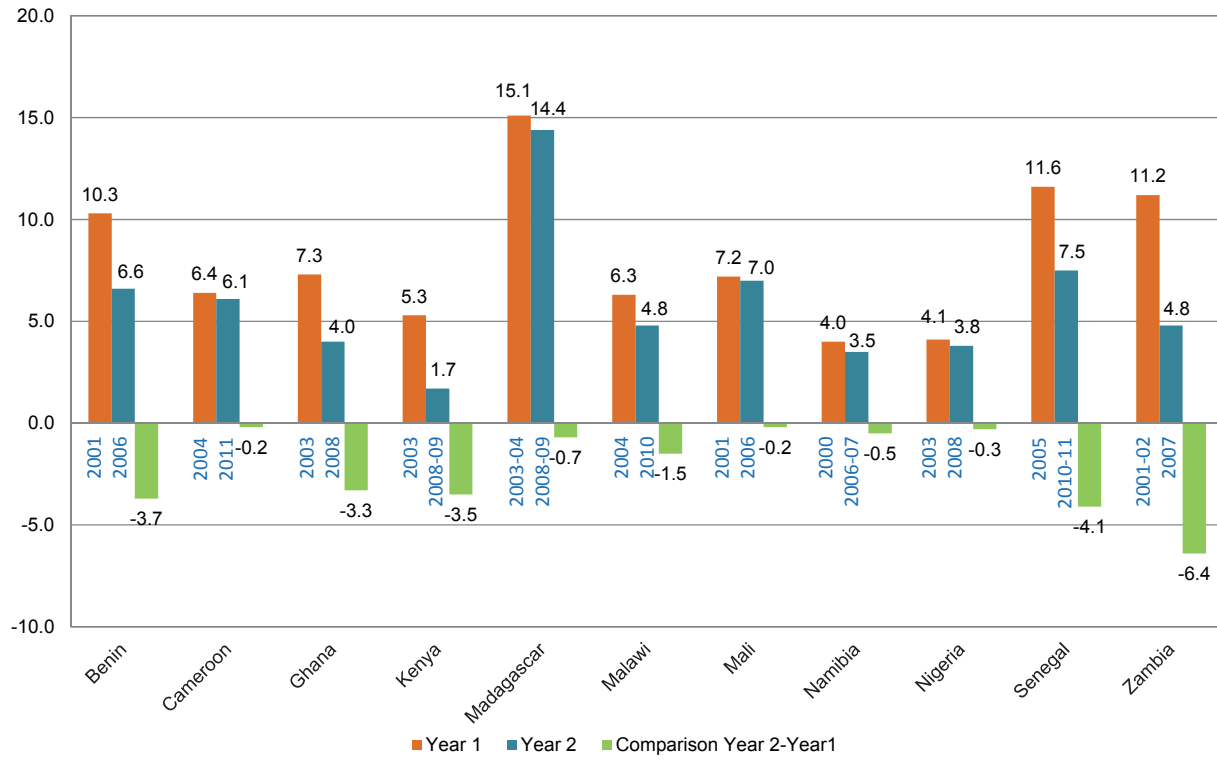
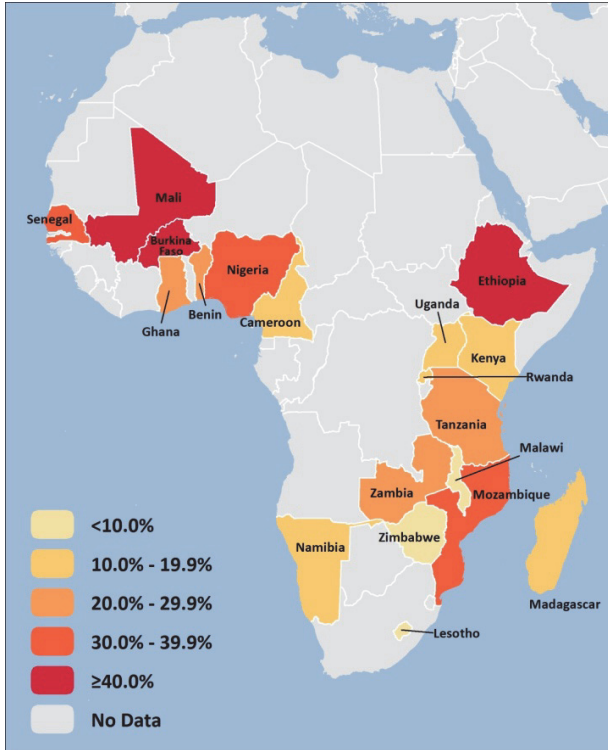


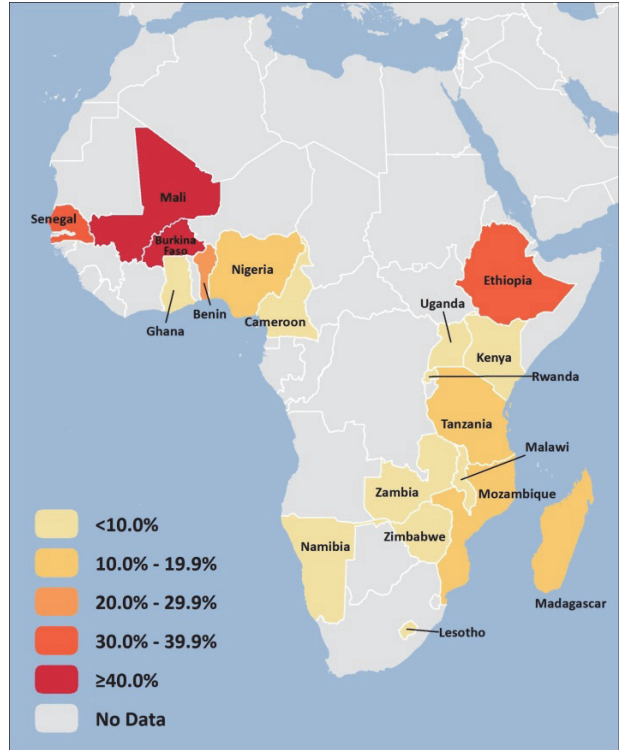
Figure 6.16. Changes in the percentage of children age 7-17 who dropped out of school



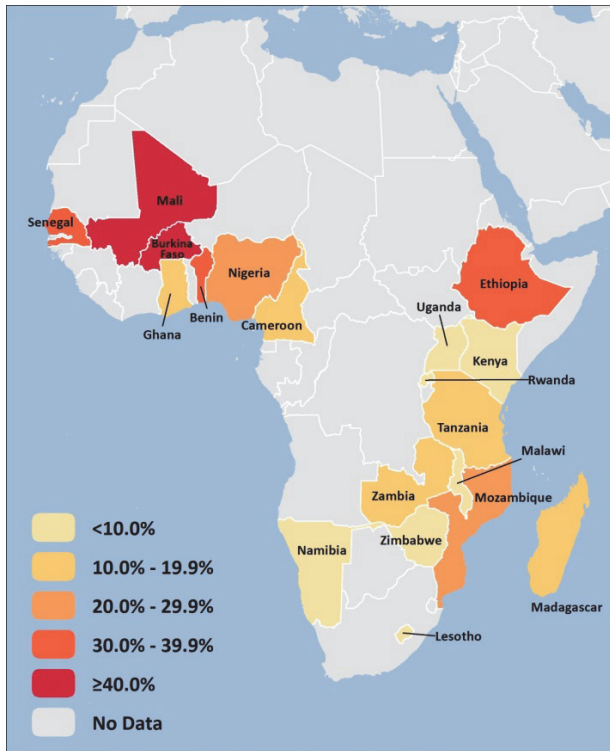
Map 6.1 Percentage of children age 7-12 with no education



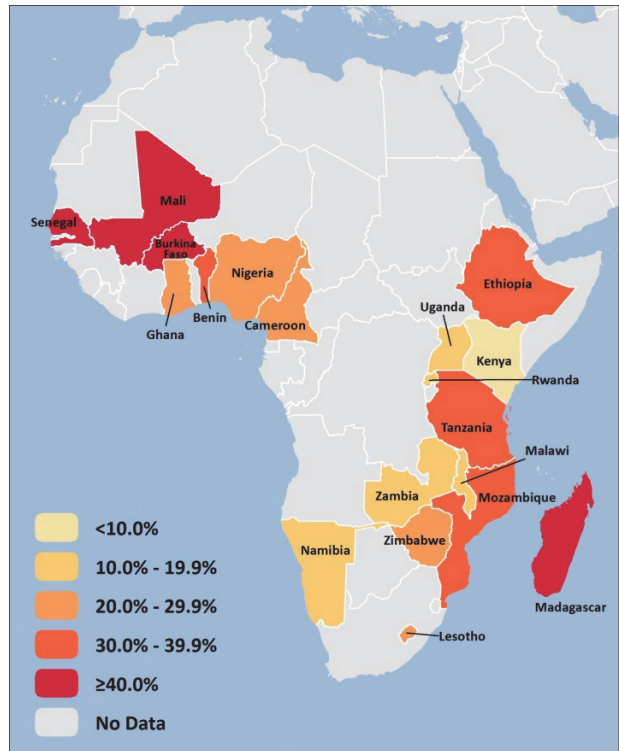
Map 6.2 Percentage of children age 13-17 with no education



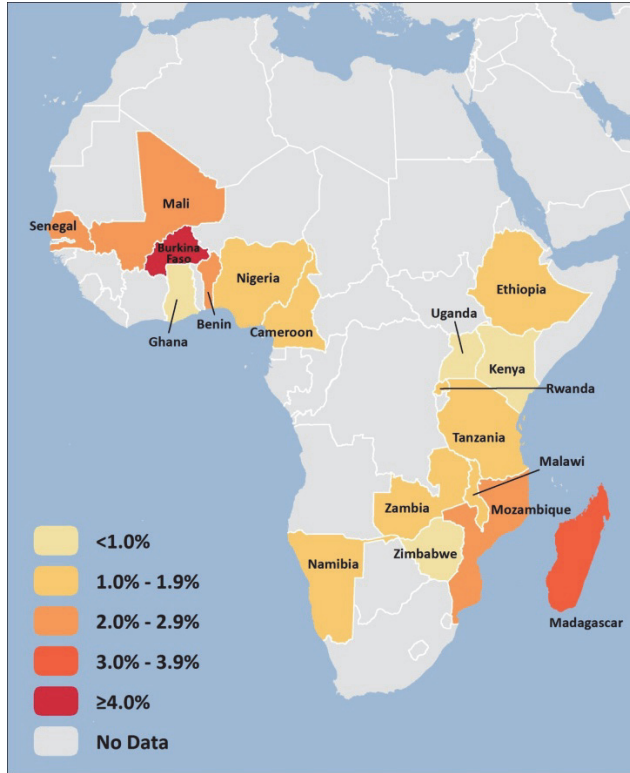
Map 6.3 Percentage of children age 7-12 not enrolled in school



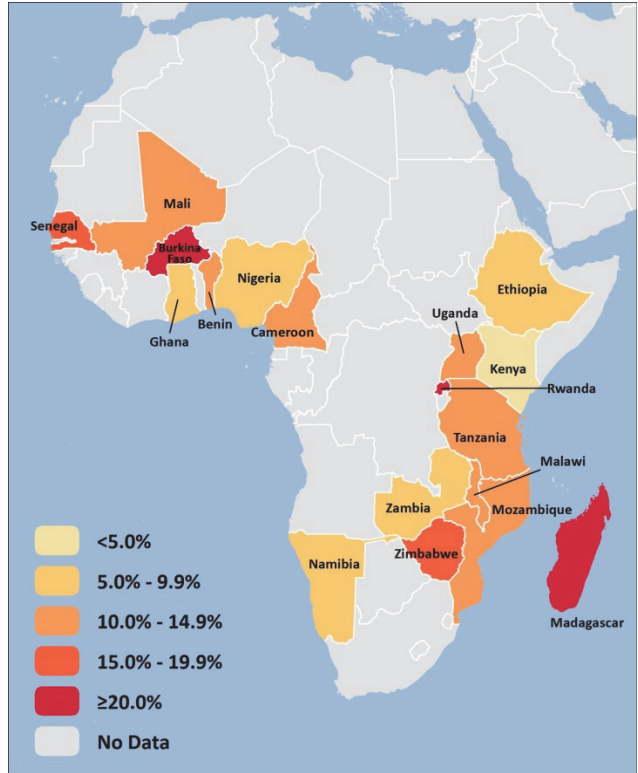
Map 6.4 Percentage of children age 13-17 not enrolled in school



Map 6.5 Percentage of children age 7-12 who have dropped out of school



Map 6.6 Percentage of children age 13-17 who have dropped out of school



7 Discussion

This document summarizes data from the Demographic and Health Surveys collected from 2000 to 2011 on deprivation in five areas: food, water and sanitation, health, shelter, and education. For each African country the prevalence of children's exposure to each type of vulnerability was described. We also determined the extent to which children's exposure to each type of vulnerability differed in each country by the child's sex and urban or rural residence as well as the sex and age of the household head.

7.1 Food Deprivation

Wasting. The data revealed no major sex disparities related to wasting in sub-Saharan Africa. There was a lower prevalence of wasting for children in urban areas than in rural areas, however. Such disparities were most pronounced in Cameroon, Ethiopia, Namibia, and Nigeria. Overall, the wasting prevalence did not vary by the sex and age of the household head in these sub-Saharan African countries. The most important progress in reducing the prevalence of wasting, gauged in terms of percentage points, took place in Burkina Faso (5 percentage point reduction) and Zimbabwe (4 percentage point reduction). The opposite situation occurred in Mali and Nigeria—increases of about three percentage points.

Stunting. In every country the prevalence of stunting among children less than age 5 was higher for males and children in rural areas than for females and children in urban areas. The sex of the household head played an important but inconsistent role in the prevalence of stunting. While the stunting prevalence was at least one percentage point higher for children living with a male household head in 8 countries, it was at least one percentage point higher for children living with a female household head in 11 countries. The age of the household head also made a difference—again, an inconsistent difference—to the prevalence of stunting. In seven countries the prevalence of stunting was at least one percentage point higher for children living with a household head age 50 or older. In 12 countries the inverse was true. Overall, sub-Saharan Africa experienced a decrease in the prevalence of stunting. The highest reductions, at least seven percentage points, occurred in Ethiopia and Zambia.

Underweight. In every country the prevalence of underweight was higher for males and children in rural areas than for females and children in urban areas. Lesotho experienced the largest disparity by sex—19% for male children and 14% for female children. Niger had the most pronounced geographic disparity—27% in urban areas and 47% in rural areas. In one-third of these sub-Saharan African countries, the prevalence of underweight was higher for children living with a female household head than for children living with a male household head. In half of the countries the underweight prevalence was higher for children living with a household head at least 50 years of age. Every country (with the exception of Kenya) experienced a decrease in the prevalence of underweight during the last 13 years.

7.2 Health Deprivation

Expanded program on immunization. Overall, the percentages of children who did not receive any of the eight EPI vaccines were similar among boys and girls in these countries. In every country except Burundi, the percentage of children who had not received any of the EPI vaccines was higher in rural areas than in urban areas. In 14 of the 23 countries included in this report, the percentage of children who had not received any of the EPI vaccines was lower for children living with a female household head than for children living with a male household head. As for age of head of household, in 17 countries the percentage of children who had not received any of the EPI vaccines was higher for individuals living with a household head who was at least 50 years of age than for children living with a younger head of household. With the exception of Zambia (31 percentage point increase) and Benin (4 percentage point increase), every country in the study demonstrated a reduction in the percentage of children who had not received any of the EPI vaccines.

Diarrhea. Overall, we did not find sex disparities related to rates of child diarrhea. In half of these countries, the diarrhea prevalence for children less than age 5 was lower in urban areas than in rural areas. In 13 of 23 countries, the prevalence of diarrhea was higher for children living with a female household head than for children living with a male household head. In Burundi, Kenya, and Uganda, the age of the household head played an important role in diarrhea prevalence among children less than age 5. In six countries—Cameroon, Ghana, Kenya, Namibia, Tanzania, and Zimbabwe—the prevalence of diarrhea among children less than age 5 increased between surveys in the last 13 years. This increase was more than four percentage points in Cameroon and Ghana.

Medical treatment of diarrhea. In 17 of 23 African countries, the percentage of children who did not receive medical advice for recent diarrhea was higher for girls than for boys. In two-thirds of the sub-Saharan African countries recent diarrhea was less likely to receive medical attention in rural areas than in urban areas. These disparities were greatest—at least 15 percentage points—in Ethiopia, Guinea, Madagascar, Mali, and Niger. In two-thirds of these sub-Saharan African countries, the percentage of children who did not receive medical advice for diarrhea was higher for children living with a male household head than for those living with a female household head. This difference was greatest—more than six percentage points—in Mozambique, Guinea, Cameroon, and Nigeria. In half of these countries, the percentage of children who did not receive medical advice was higher for children living with a household head younger than 50 years old than for children living with an older household head. The percentage of children who had diarrhea in the two weeks prior to the survey and did not receive medical advice decreased between surveys in every sub-Saharan African country except Benin (increase of 3.8 percentage points).

7.3 Water and Sanitation Deprivation

Use of surface water. Overall, we did not find sex disparities related to the use of surface water in sub-Saharan Africa. However, we did find geographic disparities. In these countries a higher percentage of children in rural areas used surface water than in urban areas. The percentage of children using surface water was at least five percentage points higher for children living with a male household head than for children living with a female household head in Benin, Ethiopia, Ghana, Guinea, Liberia, and Madagascar. Additionally, the percentage of children using surface water was at least three percentage points higher for children living with a household head at least 50 years old than for children living with a younger head of household head in Cameroon, Kenya, Namibia, and Nigeria. Ethiopia, with an increment of 29 percentage points, experienced the greatest increase in the percentage of children who used surface water. Other countries that experienced relatively significant increases included Rwanda (11 percentage points) and Zimbabwe (8 percentage points). In contrast, Madagascar experienced the greatest decrease on the continent (11 percentage points). An additional five countries (Burkina Faso, Ghana, Kenya, Madagascar, and Malawi) also experienced a decrease of more than five percentage points in the percentage of children using surface water.

15 minute walk to the water source. There were no sex disparities related to the percentages of children who had to walk 15 minutes or more to their water source. In every country except Liberia, this percentage was higher in rural areas than in urban areas. Whether the percentage of children living more than a 15 minute walk from the primary water source was higher for children living with a male or a female household head varied across these countries. The age of the household head was especially important in Namibia, where the percentage of children living more than a 15 minute walk from the primary water source was 16 percentage points higher for children living with a household head at least 50 years of age than for those who lived with a younger household head. Over the last 13 years large increases in the percentage of children living more than a 15 minute walk from a primary water source occurred in Benin, Cameroon, Ethiopia, and Rwanda. This increase was most evident in Ethiopia, at 10

percentage points. Senegal showed a major decrease in the percentage of children living more than a 15 minute walk from the primary water source (28 percentage point decrease).

Lack of access to any sanitation facilities whatsoever in or near their homes. Overall, there were no sex disparities related to children's access to sanitation facilities. In all of the sub-Saharan African countries, the percentage of children who did not have access to any sanitation facilities was higher in rural areas than in urban areas. In Benin, Burkina Faso, Ghana, and Senegal, the percentage of children without access to any sanitation services was more than 11 percentage points higher for children living with a male household head than for children living with a female household head. Ethiopia experienced the largest reduction (23 percentage points) in the percentage of children who do not have access to any sanitation facilities. Other countries that experienced reductions of more than five percentage points included Burkina Faso, Lesotho, Malawi, and Mozambique. Only Nigeria, with a 6 percentage point increase, and Tanzania, with a 2 percentage point increase, experienced increases in the percentage of children who did not have access to any sanitation facilities.

7.4 Shelter Deprivation

Living in houses with mud floors. Overall, there were no sex disparities related to living in a house with a mud floor. However, we found large rural-urban differences. In every country a higher percentage of children lived in houses with mud floors in rural areas than in urban areas. In two-thirds of these countries, the percentage living in houses with mud floors was higher for children living with a male rather than a female household head. This difference was about 15 percentage points in Burkina Faso, Guinea, Nigeria, and Senegal. The inverse situation occurred in Namibia, a 10 percentage point difference. The percentage living in houses with mud floors was much higher for children living with a household head at least 50 years old than for children living with a younger head of household in Namibia (28 percentage point higher), Lesotho (17 percentage points higher), and Zambia (11 percentage points higher). Three countries—Ghana (3 percentage points), Nigeria (4 percentage points), and Zambia (3 percentage points)—experienced an increase on the percentage of children living in houses with mud floors. In the rest of countries explored in this study, the percentage of children living in houses with mud floors decreased.

Living in houses without electricity. Overall, there were no sex disparities with regard to having electric power at home. In every country, however, the percentage of children living in houses without electricity was higher in rural areas than in urban areas. The sex of the household head mattered in Senegal, where the percentage living without electricity was 53% for children living with a male household head and 27% for children living with a female household head. In Namibia and Uganda the percentage without electricity was slightly higher (2 percentage points) among children living with a household head age 50 or older than for children living with a younger household head. In nearly all these countries, the percentage living in houses without electric power decreased. In Nigeria, however, the percentage of children living in houses without electricity increased by 4 percentage points. Madagascar experienced an increase of 2 percentage points.

7.5 Education Deprivation

Children who have received no primary or secondary education. Overall, there were inconsistent differences related to a child's sex in the percentage ages 0 to 17 years without education. In some countries the percentage was higher for males; in others, for females. For instance, the greatest difference occurred in Niger, where 55% of males and 69% of females had no education, a difference of 14 percentage points. The percentage of children without education was about 10 percentage points higher for females than males in Benin, Guinea, and Mali. The inverse situation, but less marked, occurred in Kenya and Lesotho, where a higher proportion of male children than female children had no

education by two percentage points. In every country except Sao Tomé and Príncipe, the percentage of children under 18 years old without education was higher in rural areas than in urban areas

In 18 countries the percentage without a primary or secondary education was at least one percentage point higher for children living with a male rather than a female head of household. We did not find the inverse situation in any sub-Saharan Africa country. In some countries the age of the household head was not associated with children's lack of education. In other countries the percentage without education was higher among children living with a household head 50 years or older. In every country the percentage of children without education has decreased during the last 13 years.

Children not currently enrolled in school. By sex, the greatest differences in the percentage of children up to age 17 years who were not enrolled in school occurred in Benin, Chad, Cote d'Ivoire, Guinea, and Niger, where the percentage was at least 10 points higher for females than for males. We found no rural-urban disparities in Rwanda, Swaziland, or Uganda. In the rest of the countries, however, the percentage of children who were not enrolled in school was at least one percentage point higher in rural areas than in urban areas. The sex of the household head played an important role in the percentage of children not enrolled in school. In five countries—Benin, Burkina Faso, Cameroon, Nigeria, and Senegal—this percentage was at least five percentage points higher for children in a male-headed household. By comparison, only in Chad was this percentage at least five percentage points higher for children living with a female head of household. In nine countries the percentage of children not enrolled in school was at least five percentage points higher for children living with a household head 50 years or older than those living with a household head less than age 50. In every country in sub-Saharan Africa the percentage of children age 7-17 not enrolled in school decreased by at least one percentage point during the last 13 years. Ethiopia and Zambia experienced the greatest decrease—at least 15.0 percentage points.

School dropouts. Overall, the percentage of children age 7-12 who had dropped out of school was very low, reaching no more than 3.6% in any country except Burkina Faso (7%), but at age 13-17 dropout rates rise, ranging from less than 4% in Kenya to nearly 35% in Burkina Faso. Dropout rates were similar for the two sexes. However, we found geographic disparities in the percentage of children who dropped out of school in two countries. In Burkina Faso and Madagascar dropout rates were at least six percentage points higher in rural areas than in urban areas. There was no association between the sex of the household head and the percentage of children who dropped out of school. In Burkina Faso the percentage of dropout rates was higher for children living in female-headed households than for children in male-headed households (24% versus 17%). Reductions of at least six percentage points in the proportion of children age 7-17 who dropped out school occurred in Benin, Ghana, Kenya, and Zambia.

In summary, this report provides information on the current status and trends on five types of deprivation: food, water and sanitation, health, shelter, and education. Several important findings will help in the design and evaluation of programs and help program planners and policymakers to achieve national objectives. First, in many sub-Saharan African countries, greater effort is needed to reduce sex and geographic disparities related to children's deprivation. In some cases programs also should address the role that the age and sex of the household head plays in the percentage of children experiencing these deprivations. Despite overall reductions in the exposure to some of these types of deprivation, some countries are still struggling to make and sustain improvements.

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