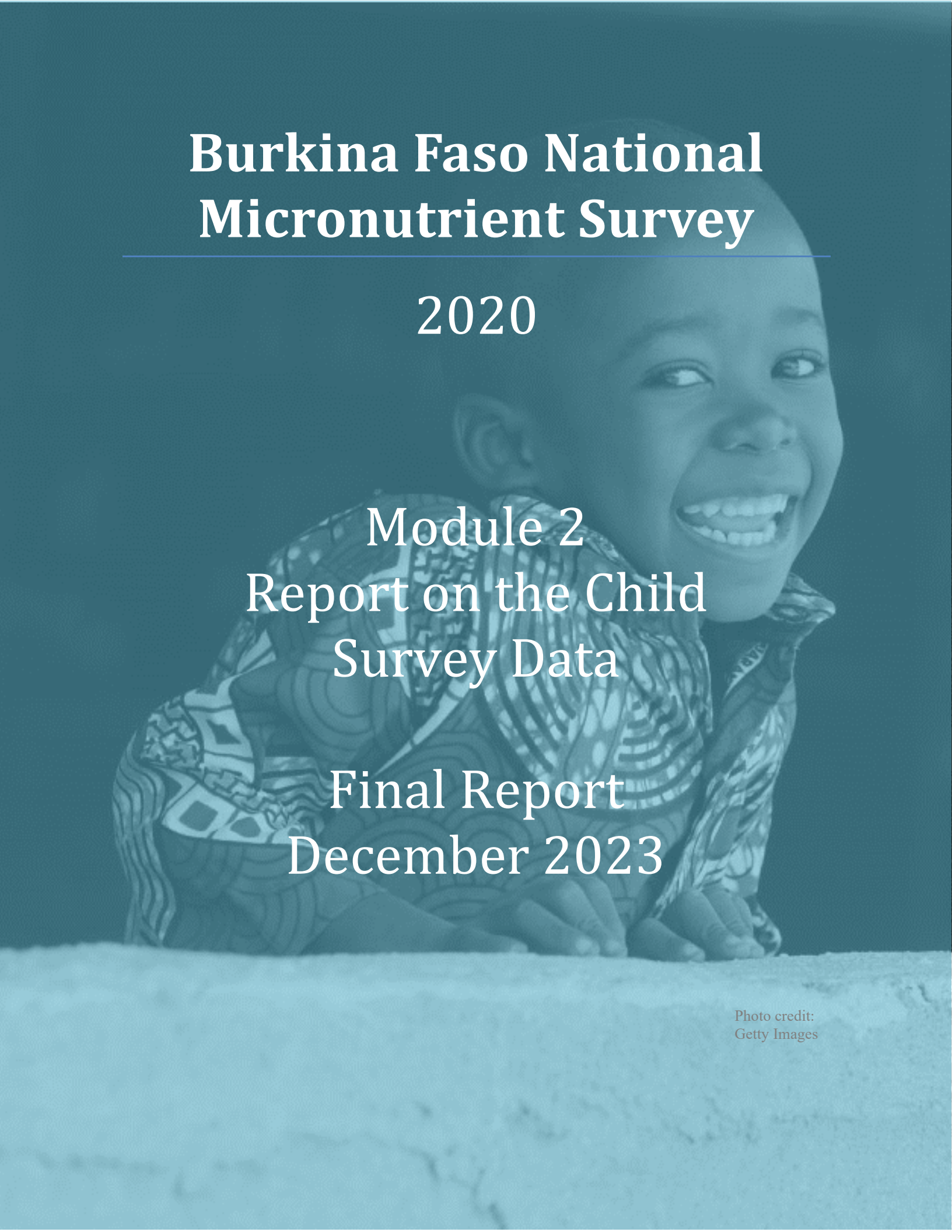
Burkina Faso National Micronutrient Survey

2020

Module 2
Report on the Child Survey Data

Final Report
December 2023



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Burkina Faso National Micronutrient Survey 2020

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Summary Tables of Findings

Burkina Faso National Micronutrient Survey, 2020

Response Rate for Questionnaire Among Children 6-59 Months									
Location	Sample Size to Invite[a]	Expected Sample Size[b]	Available[c]	Interview Completed[d]		Refused[d]		Respondent not at Home After Three Attempts[d]	
	N	N	N	N (%)		N (%)		N (%)	
Ouagadougou & Bobo Dioulasso	750	602	480	422	87.9	16	3.3	25	5.2
Other cities	750	602	419	337	80.4	37	8.8	24	5.7
Rural	750	603	542	488	90.0	18	3.3	19	3.5
Total	2,250	1,807	1,441	1,247	86.5	71	4.9	68	4.7

[a] Based on survey design and sample size calculation (30 clusters/stratum * 25 children/cluster = 750 children per stratum).
[b] Assuming a household participation rate of 85%, an average of 1.05 children aged 6-59 months per household and a child participation rate of 90%.
[c] Selected and available sample in the clusters, after exclusion of 7 out of 90 survey clusters due to security threats before and after data collection.
[d] Percentage based on available sample size.
Among all available children, the result of the child caregiver's interview could not be verified and no data was captured for 52 children (3.6%, n=14 in Ouagadougou & Bobo Dioulasso, n=21 in other cities, n=17 in rural areas) that were selected for the survey and 3 children interviews (0.2%) were discarded due to unreliable data.

Response Rate for Anthropometry, Venous Blood and Stool Specimen Collection Among Children 6-59 Months with Completed Interview[a]								
	Ouagadougou & Bobo Dioulasso		Other Cities		Rural		Total	
	N (%)		N (%)		N (%)		N (%)	
Length/height	411	(97.4)	335	(99.4)	480	(98.4)	1,226	(98.3)
Weight	410	(97.2)	335	(99.4)	477	(97.7)	1,222	(98.0)
Mid-upper arm circumference	408	(96.7)	336	(99.7)	477	(97.7)	1,221	(97.9)
Venous blood specimen	238	(56.4)	209	(62.0)	273	(55.9)	720	(57.7)
Stool specimen	222	(52.6)	228	(67.7)	259	(53.1)	709	(56.9)
Total	**422**	**(100.0)**	**337**	**(100.0)**	**488**	**(100.0)**	**1,247**	**(100.0)**

[a] Excludes the 194 children who did not have a complete interview (i.e., 1,441 children available – 1,247 children with completed interview).

Selected Characteristics of Children 6-59 Months (N=1,247)	Value
Location	
Ouagadougou & Bobo Dioulasso	29.9
Other cities	32.3
Rural	37.8
Age, months	
6-23	30.2
24-59	69.8
Sex	
Male	50.6
Female	49.4

Percentage of Internally Displaced Children (N=1,247)	Value
Location	
Ouagadougou & Bobo Dioulasso	1.7
Other cities	4.2
Rural	0.8
Total	**2.1**

Infant and Young Child Feeding Practices Among Children 6-23 Months	Value
Percentage of children ever breastfed (N=352)	87.7
Percentage of children with early initiation of breastfeeding (N=338)	60.4
Percentage of children currently breastfeeding (N=374)	77.4
Percentage of children 12-15 months with continued breastfeeding at 1 year (N=80)	86.4
Percentage of children 20-23 months with continued breastfeeding at 2 years (N=77)	50.8
Percentage of non-breastfed children who received the minimum milk feeding frequency (N=87)	12.3
Percentage of children who consumed the minimum dietary diversity (N=376)	12.6
Percentage of children who were bottle fed (N=375)	26.7

Consumption of Liquids Other Than Breastmilk Yesterday Among Children 6-23 Months (N=376)	Value
Percentage of children who consumed infant formula	1.6
Percentage of children who consumed milk other than breastmilk	8.8
Percentage of children who consumed plain water	49.3
Percentage of children who consumed sugar or glucose water	4.2
Percentage of children who consumed gripe water	2.3
Percentage of children who consumed sugar-salt water (ORS)	2.2
Percentage of children who consumed fruit juice	9.0
Percentage of children who consumed tea	5.1
Percentage of children who consumed honey	0.7
Percentage of children who consumed yogurt	4.9
Percentage of children who consumed other liquids	0.6

Consumption of Various Foods Yesterday Among Children 6-23 Months (N=376)	Value
Percentage of children who consumed food made from grains, roots and tubers	79.4
Percentage of children who consumed legumes and nuts	8.1
Percentage of children who consumed dairy products	8.2
Percentage of children who consumed flesh foods (meat, poultry and organ meats)	9.6
Percentage of children who consumed eggs	4.1
Percentage of children who consumed vitamin A rich fruits and vegetables	47.7
Percentage of children who consumed other fruits and vegetables	46.0
Percentage of children who consumed fortified infant flour	2.9

Consumption of Various Foods Yesterday Among Children 24-59 Months (N=871)	Value
Percentage of children who consumed food made from grains, roots and tubers	93.6
Percentage of children who consumed legumes and nuts	14.4
Percentage of children who consumed dairy products	11.1
Percentage of children who consumed flesh foods (meat, poultry and organ meats)	22.7
Percentage of children who consumed eggs	6.9
Percentage of children who consumed vitamin A rich fruits and vegetables	66.5
Percentage of children who consumed other fruits and vegetables	63.9
Percentage of children who consumed fortified infant flour	0.7

Consumption of Various Foods and Beverages Yesterday Among Children 6-59 Months (N=1,247)	Value
Percentage of children who consumed vitamin A rich foods	67.6
Percentage of children who consumed ready-to-use food supplements	1.3
Percentage of children who consumed ready-to-use therapeutic foods	1.6
Percentage of children who consumed other protein sources (snails, larvae, caterpillar, crickets, edible insects)	0.6
Percentage of children who consumed condiments and seasonings	61.0
Percentage of children who consumed tea (with or without sugar)	13.5
Percentage of children who consumed sugary foods	33.4
Percentage of children who consumed sweetened beverages	40.8
Percentage of children who consumed red palm oil	1.5
Percentage of children who consumed other vegetable oil (sunflower, cotton, maize/corn, peanut, palm)	26.3
Percentage of children who consumed fats (butter, shea butter, lard)	7.6

Consumption of Foods Made at Home with Purchased Salt, Wheat Flour, Vegetable Oil, and Bouillon Yesterday Among Children 6-59 Months (N=1,247[a])	Value
Percentage of children who consumed foods made at home with purchased salt (except rock salt)	87.9
Percentage of children who consumed foods made at home with purchased wheat flour	2.8
Percentage of children who consumed foods made at home with purchased vegetable oil	75.5
Percentage of children who consumed foods made at home with purchased bouillon	73.3

[a] Sample size might vary slightly (up to 12) due to missing data.

Intake of Micronutrient Supplements or Micronutrient Powder, and PICA Practices During the Last 7 Days Among Children 6-59 Months	Value
Percentage of children who took iron supplement (syrup or tablet) (N=1,235)	1.9
Percentage of children who consumed micronutrient powder mixed with food (N=1,237)	0.9
Percentage of children who took zinc supplement (N=1,242)	1.2
Percentage of children who consumed uncooked rice, uncooked pasta, or ice (N=1,232)	2.7
Percentage of children who consumed clay or soil (N=1,184)	8.5

Participation in Nutrition and Social Safety Net Interventions	Value
Percentage of children 6-59 months who participated in growth monitoring during the last month (N=1,139)	5.6
Percentage of children 6-23 months who participated in IYCF program during the last 12 months (N=373)	8.8
Percentage of children 6-59 months who received vitamin A capsule during last JVA+ campaign in November/December 2019 (N=1,199)	61.7
Percentage of children 12-59 months who received deworming tablet during last JVA+ campaign in November/December 2019 (N=1,062)	62.8
Percentage of children 6-59 months always sleeping under a mosquito net (N=1,247)	70.4
Percentage of children 6-23 months whose mother talked to a healthcare provider or community health worker (CHW) about how to feed child before child was born (N=366)	
Healthcare provider	39.6
CHW	4.0
Both	3.2
Percentage of children 6-23 months whose mothers talked to a healthcare provider or CHW about how to feed child after child was born (N=368)	
Healthcare provider	41.6
CHW	5.4
Both	2.9
Percentage of children 6-59 months who were treated for acute malnutrition in the last 12 months (N=1,238)	2.3
Percentage of children 6-59 months who received fortified blended flour in the last 12 months (N=1,239)	1.6
Percentage of children 6-59 months who received ready-to-use supplementary foods in the last 12 months (N=1,242)	2.7
Percentage of children 6-59 months who received ready-to-use therapeutic foods in the last 12 months (N=1,244)	3.4
Percentage of children 6-59 months living in household that participated in cash transfer program in the last 12 months (N=1,232)	1.9

Morbidity During the Last 2 Weeks Among Children 6-59 Months (N=1,247[a])	Value
Percentage of children with fever	26.6
Percentage of children with cough	27.1
Percentage of children with diarrhea	12.5

[a] Sample size might vary slightly (up to 12) due to missing data.

Infectious Diseases Among Children 6-59 Months	Value
Percentage of children with *Helicobacter pylori* infection assessed in stool specimen using a rapid test kit (N=650)	25.5
Percentage of children with any soil transmitted helminths (STH) assessed by Kato Katz (N=658)	3.6
Percentage of children with malaria infection assessed using a rapid test kit (N=800)	9.5

Anthropometric Status Among Children 6-59 Months	Value
Percentage of children with stunting (Length/Height-for-Age Z-score <-2z) (N=1,219)	20.7
Percentage of children with underweight (Weight-for-Age Z-score <-2z) (N=1,229)	15.8
Percentage of children with wasting (Weight-for-Length/Height Z-score <-2z) (N=1,210)	9.6
Percentage of children with overweight (Weight-for-Length/Height Z-score >+2z) (N=1,210)	2.2
Percentage of children with obesity (Weight-for-Length/Height Z-score >+3z) (N=1,210)	0.8

Anemia, Iron Deficiency and Iron Deficiency Anemia Status Among Children 6-59 Months	Value
Percentage of children with anemia (N=709)	
Any anemia (hemoglobin <11.0 g/dL)	41.0
Mild anemia (hemoglobin 10.0-10.9 g/dL)	25.0
Moderate anemia (hemoglobin 7.0-9.9 g/dL)	15.7
Severe anemia (hemoglobin <7.0 g/dL)	0.3
Percentage of children with iron deficiency (ferritin <12.0 µg/L, inflammation adjusted) (N=720)	39.4
Percentage of children with iron deficiency anemia (hemoglobin <11.0 g/dL and ferritin <12.0 µg/L, inflammation adjusted) (N=638)	21.9

Vitamin A Deficiency by Retinol and MRDR Among Children 6-59 Months	Value
Percentage of children with vitamin A deficiency by retinol (retinol <0.70 µmol/L, inflammation adjusted) (N=693)	50.2
Percentage of children with vitamin A deficiency by modified relative dose response (MRDR≥0.060, inflammation adjusted) (N=160)	36.9

Zinc Deficiency Among Children 6-59 Months (N=676)	Value
Percentage of children with zinc deficiency (zinc <65 µg/dL or 57 µg/dL, inflammation adjusted)	12.6

RBC and Serum Folate Deficiency Among Children 6-59 Months	Value
Percentage of children with RBC folate deficiency (red blood cell (RBC) folate <226.5 nmol/L) (N=753)	1.8
Percentage of children with serum folate deficiency (serum folate <6.8 nmol/L) (N=783)	1.8
Percentage of children with risk of serum folate deficiency (serum folate ≥6.8 and ≤13.4 nmol/L) (N=783)	20.4

Vitamin B_{12} Deficiency and Depletion Among Children 6-59 Months (N=781)	Value
Percentage of children with vitamin B_{12} deficiency (vitamin B_{12} <203.0 pg/mL)	12.0
Percentage of children with vitamin B_{12} depletion (vitamin B_{12} ≥203.0 and ≤300.0 pg/mL)	18.9

Inflammation Status Among Children 6-59 Months (N=720)	Value
Percentage of children with acute inflammation (C-reactive protein (CRP) ≥5 mg/L and α-1 acid glycoprotein (AGP) <1.0 g/L)	3.5
Percentage of children with chronic inflammation (AGP ≥1.0 g/L and CRP <5 mg/L)	21.9
Percentage of children with acute and chronic inflammation (CRP ≥5 mg/L and AGP ≥1.0 g/L)	13.0

Blood Disorder Status Among Children 6-59 Months (N=534)	Value
Percentage of children with glucose-6-phosphate dehydrogenate deficiency	6.1
Percentage of children with beta-thalassemia	1.4
Percentage of children with sickle cell trait (HbAS)	8.2
Percentage of children with hemoglobin C trait (HbAC or HbCA)	17.8

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List of Abbreviations

ABNORM	Agence Burkinabé de Normalisation de la Métrologie et de la Qualité
AGP	α1-acid glycoprotein
BFNMS	Burkina Faso National Micronutrient Survey
BIV	Biologically implausible value
BMGF	Bill & Melinda Gates Foundation
BRINDA	Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia
CDC	United States Centers for Disease Control and Prevention
CDCF	CDC Foundation
CHW	Community health worker
CI	Confidence interval
CMAM	Community-based Management of Acute Malnutrition
CNCN	Conseil National de Concertation en Nutrition
CRP	C-reactive protein
CSB	Corn soy blend
DBS	Dried blood spot
DN	Direction de la Nutrition (Nutrition Directorate)
ECLIA	Electrochemiluminescence immunoassay
ELISA	Enzyme linked immunosorbent assay
FAO	Food and Agriculture Organization
G6PD	Glucose-6-phosphate dehydrogenase deficiency
Hb	Hemoglobin
HH	Household
HIV	Human immunodeficiency virus
HPLC	High-performance liquid chromatography
ICP-OES	Inductively coupled plasma optical emission spectroscopy
IDA	Iron deficiency anemia
INSD	Institut National de la Statistique et de la Démographie
IRSS	Institut de Recherche en Science de la Santé
IYCF	Infant and young child feeding
IQR	Interquartile range
IZiNCG	International Zinc Nutrition Consultative Group
JVA+	Journées Vitamine A+ (Vitamin A Days)
LAZ/HAZ	Length/height-for-age z score
LNSP	Laboratoire National de Santé Publique
MDD	Minimum dietary diversity

MNP	Micronutrient powder
MUAC	Mid-upper arm circumference
MUACZ	MUAC-for-age z score
MRDR	Modified relative dose response
NMS	National Micronutrient Survey
ORS	Oral rehydration salts
PPS	Probability proportional to size
RBC	Red blood cell
RBP	Retinol binding protein
RTK	Rapid test kit
RUSF	Ready-to-use food supplement
RUTF	Ready-to-use therapeutic food
SE	Standard error
SMART	Standardized Monitoring and Assessment of Relief and Transitions
SRS	Simple random sample
sTfR	Soluble transferrin receptor
STH	Soil transmitted helminths
UNICEF	United Nations Children's Fund
VITAL-EQA	Vitamin A Laboratory – External Quality Assurance
WAZ	Weight-for-age z score
WFP	World Food Program
WHO	World Health Organization
WLZ/WHZ	Weight-for-length/height z score

Executive Summary

Introduction

The Burkina Faso National Micronutrient Survey (BFNMS) 2020 assessed the micronutrient status of select vulnerable populations (including children aged 6-59 months, adolescents aged 10-19 years, and women aged 15-49 years). The survey was nationally representative, excluding the Sahel region. The survey also assessed key nutrition program process indicators (e.g., coverage) for all large-scale nutrition-specific and nutrition-sensitive programs in the country that are currently implemented. This report module presents findings on infant and young child feeding (IYCF) practices, consumption of various foods and beverages, intake of micronutrient supplements or micronutrient powders, PICA practices, consumption of fortifiable foods, participation in nutrition and social safety net interventions, morbidity and infectious diseases, anthropometric status, anemia, micronutrient deficiencies, and inflammation status and blood disorders among children 6-59 months.

Summary Results

Survey, Anthropometry and Biological Specimens Response Rate

A total of 1,247 children 6-59 months participated in the survey, which had an 87% response rate. The sample size of the children surveyed was as follows; Ouagadougou and Bobo Dioulasso, 422; other cities, 337; and rural areas, 488. Almost all children had anthropometry data collected for length/height (98%), weight (98%) and mid-upper arm circumference (98%). Venous blood and stool specimens were collected for 58% and 57% of children, respectively.

Child Characteristics and Internally Displaced Children

More than two thirds (70%) were children aged 24-49 months whereas 30% were 6-23 months. Just over half (51%) were male and 49% were female. Two percent of respondents reported their children were ever forced to flee or abandon their house or usual place of residence due to armed conflict, violence, human rights violations or other disasters.

Infant and Young Child Feeding Practices Among Children 6-23 Months

Breastfeeding was common as reported for children ever breastfed (88%) and currently breastfeeding (77%). Sixty percent of the children initiated breastfeeding early, i.e., immediately or within one hour of birth. Continued breastfeeding at 1 year was common (86%) whereas continued breastfeeding at 2 years was less common (51%). Only 12% of non-breastfed children 6-23 months received the recommended minimum milk feeding frequency of at least 2 milk feedings the previous day. Only 13% of the children had consumed the minimum dietary diversity the previous day; indicating children's diets were

generally poor and lacking in important macro- and micronutrients for children's growth and development. Twenty seven percent of the children were bottle fed the day preceding the survey.

Almost half (49%) of children 6-23 months consumed plain water the day preceding the survey, whereas 9% consumed milk other than breastmilk and 9% consumed fruit juice. Five percent or less of children 6-23 months consumed other liquids the day preceding the survey (i.e., infant formula, sugar or glucose water, gripe water, sugar-salt water (oral rehydration salts (ORS)), tea, yoghurt, honey or other liquids).

Consumption of Various Foods and Beverages Yesterday Among Children 6-59 Months

Slightly more than two thirds of the children (68%) consumed vitamin A rich foods the previous day of the survey. These foods include meat, organ meat, fish, poultry, eggs, vitamin A-rich fruits and vegetables, and red palm oil. Consumption of special foods such as ready-to-use food supplements and therapeutic foods (RUSFs and RUTFs), and other protein sources was below 2% for each. Consumption of condiments and seasoning was relatively common (61%). Tea consumption was reported among 14% of the children 6-59 months. About a third of the children consumed sugary foods (34%) and sweetened beverages (41%).

Consumption of red palm oil was low (approximately 2%). Twenty six percent of the children consumed other vegetable oil and 8% of the children consumed other fats such as butter, shea butter or lard.

Consumption of Foods Made at Home with Purchased Salt, Wheat Flour, Vegetable Oil, or Bouillon Yesterday Among Children 6-59 Months

The majority of children (88%) consumed foods made at home with purchased salt (except rock salt) yesterday, whereas 3 out of 4 consumed foods made at home with purchased vegetable oil (76%) or purchased bouillon (73%). Only three percent of children had consumed foods made at home with purchased wheat flour yesterday.

Intake of Micronutrients and PICA Practices During the Last 7 Days Among Children 6-59 months

Intake of iron supplements (syrup or tablet), zinc supplements or micronutrient powders during the last 7 days was low (each at below 2%) among children 6-59 months. About 3% of respondents reported consumption of uncooked rice, uncooked pasta, or ice among the children during the last 7 days. Further, consumption of clay or soil was reported among 9% of children 6-59 months during the last 7 days. These non-food (PICA) items may absorb micronutrients or bind to the mucosal layer of the gut thereby preventing micronutrient absorption and metabolism.

Nutrition and Social Safety Net Interventions

Only 6% of children 6-59 months participated in growth monitoring during the previous 30 days. Participation in the IYCF program among children 6-23 months in the last 12 months was also low (9%). A majority (62%) of the children 6-59 months received a vitamin A capsule during the previous JVA+ campaign in November/December 2019. Similarly, 63% of the children 12-59 months received a deworming tablet during the last JVA+ campaign in November/December 2019. Seventy percent of children 6-59 months always slept under a mosquito net.

Of the mothers of children 6-23 months, 40% talked to healthcare providers about how to feed a child before the child was born, 4% talked to a community health worker (CHW), and 3% talked to both a healthcare provider and CHW. Similarly, 42% talked to healthcare providers about how to feed a child after the child was born, 5% talked to CHW, and 3% talked to both a healthcare provider and CHW. Two percent of children 6-59 months were treated for acute malnutrition in the last 12 months. A similar proportion of the children 6-59 months lived in households that participated in cash transfer programs in the last 12 months.

Morbidity and Infectious Diseases Among Children 6-59 months

At least one in every four children were reported having fever (26%) or cough (27%) during the previous two weeks. Diarrhea during the prior two weeks was reported among 13% of the children. One in every four children with reported diarrhea (26%) did not receive any diarrhea treatment. Assessment of stool specimens showed a prevalence of 26% for *Helicobacter pylori* infection and 4% for soil transmitted helminths (STHs) infection. The prevalence of malaria infection was 10%.

Anthropometric Status

The prevalence of stunting among children 6-59 months was 21%. The prevalence of underweight and wasting was 16% and 10%, respectively. Two percent of the children suffered from overweight and about 1% suffered from obesity.

Anemia Status

The prevalence of anemia assessed by low hemoglobin (Hb) concentration (<11.0 g/dL) among children 6-59 months was 41%; with mild anemia (Hb 10.0-10.9 g/dL) at 25%, moderate anemia (Hb 7.0-9.9 g/dL) at 16% and severe anemia (Hb <7.0 g/dL) at 0.3%.

Micronutrient Deficiencies

Iron deficiency measured by low serum ferritin (<12.0 μg/L) and corrected for inflammation was 39% among children 6-59 months. Iron deficiency anemia assessed by low hemoglobin (<11.0 g/dL) and low serum ferritin was 22%.

Vitamin A deficiency measured by low serum retinol (<0.70 μmol/L) and corrected for inflammation was 50% among children 6-59 months. The modified relative dose response (MRDR) test is a qualitative assessment of vitamin A liver stores and was conducted in a randomly selected subsample. A total of 37% of children were vitamin A deficient with a MRDR ratio ≥0.060 (retinol adjusted for inflammation).

Zinc deficiency measured by low serum zinc (<65 μg/dL or 57 μg/dL depending on time of day specimen was collected) and corrected for inflammation was 13% among children 6-59 months.

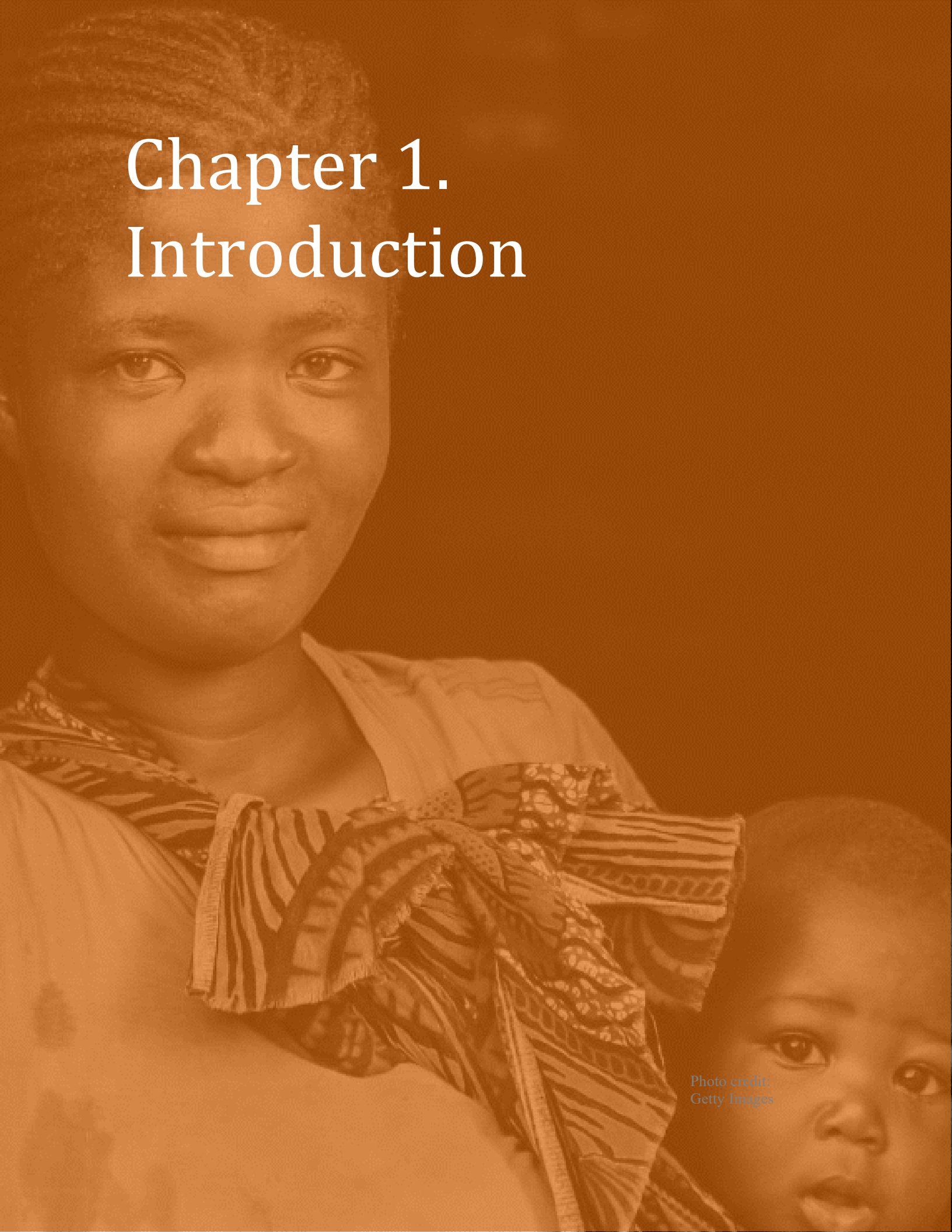
A total of 2% of children 6-59 months suffered from red blood cell (RBC) folate deficiency (RBC folate <226.5 nmol/L). A total of 2% of children 6-59 months suffered from serum folate deficiency (<6.8 nmol/L), and 20% were at risk of serum folate deficiency (≥6.8 and ≤13.4 nmol/L).

Vitamin B_{12} deficiency measured by low serum vitamin B_{12} (<203.0 pg/mL) was 12% and vitamin B_{12} depletion (≥203.0 and <300.0 pg/mL) was 19% in children 6-59 months.

Blood Disorders

A total of 6% of children 6-59 months suffered from glucose-6-phosphate dehydrogenate (G6PD) deficiency, and 1% suffered from beta-thalassemia. A total of 8% of children had sickle cell trait (HbAS), whereas 18% of children had hemoglobin C trait (HbAC or HbCA).

Chapter 1. Introduction



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Chapter 1: Introduction

This report module is the second module of the Burkina Faso National Micronutrient Survey 2020 report and describes the results from the analysis of the child questionnaire data, anthropometry and the following biomarkers: hemoglobin, malaria rapid test kit (RTK), *H. pylori* RTK, soil-transmitted helminths (STH), iron, vitamin A, zinc, folate, vitamin B_{12}, inflammation status, and blood disorder status. This is the final report that includes revisions and feedback from a workshop with the Technical Working Group. The full methodology of the survey has been described in the first report module (Burkina Faso Ministry of Health and CDC, 2023).

Infant and young child feeding (IYCF) practices affect a child's nutrition status and ultimately health and development. Nutritional status is the result of complex interactions between food consumption, health status and health care practices. The time between birth and two years of age is an especially important period for optimal growth, health, and development; unfortunately, this period is often marked by micronutrient deficiencies that interfere with optimal growth (Rivera *et al.*; 2003; UNICEF, 2019; Victora *et al.*, 2010).

1.1 Child Nutrition in Burkina Faso

Since 2009 the Directorate of Nutrition (*Direction de la Nutrition* – DN) has carried out an annual National Nutrition Survey using the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology, with support from UNICEF and other strategic partners. The National Nutrition Survey collects data on child anthropometry, IYCF practices, coverage of vitamin A supplementation and deworming, and recent morbidity, among other topics.

Table 1.1 outlines child anthropometry and IYCF indicators among children under five years from the 2020 National Nutrition Survey in Burkina Faso (Ministère de la Santé, 2020), collected after the 2020 Burkina Faso National Micronutrient Survey (BFNMS) during the COVID-19 pandemic. Although the country has made substantial improvements in childhood undernutrition since 2009, challenges remain. According to the recently updated WHO prevalence thresholds for undernutrition (de Onis *et al.*, 2018), 2 out of 13 regions had a high to very high wasting prevalence (≥10%) and 11 out of 13 regions had a high to very high stunting prevalence (≥20%) in 2020 (Ministère de la Santé, 2020).

Generally, since 2012, there has been a trend toward higher prevalence of key IYCF practices; however, the prevalence of being fed a minimally acceptable diet remained low in 2020 at 21.9% (Ministère de la Santé, 2020).

The 2020 BFNMS was more comprehensive than the National Nutrition Survey and included anemia and micronutrient biomarkers as well as potential risk factors for anemia and indicators of program performance. The 2020 BFNMS was also implemented in a different season before the COVID-19 pandemic.

Table 1.1 Nutrition and Feeding Practices Indicators for Children 0-59 Months

Indicator	Prevalence	
	%	[95% CI]
Stunting (<-2 height for age Z-score), 0-59 months	24.9	[24.0-25.9]
Wasting (<-2 weight for height Z-score and/or bilateral edema), 0-59 months	9.1	[8.6-9.8]
Underweight (<-2 weight for age Z-score), 0-59 months	17.6	[16.8-18.4]
Overweight or obesity (>+2 weight for height Z-score), 0-59 months	2.8	[2.4-3.2]
Started breastfeeding within one hour of birth, 0-23 months	63.4	[61.0-65.9]
Received colostrum, 0-23 months	95.4	[94.4-96.2]
Exclusively breastfed, 0-5 months	64.3	[60.8-67.7]
Continued breastfeeding at age 1 year, 12-15 months	96.4	[94.8-97.5]
Fed minimum meal frequency, 6-23 months	76.9	[75.1-78.7]
Fed 4+ food groups, 6-23 months	29.2	[27.7-30.9]
Fed minimally acceptable diet, 6-23 months	21.9	[20.4-23.4]

Source: Ministère de la Santé (2020). Enquête nutritionnelle nationale 2020 [National Nutrition Survey 2020]. Ouagadougou, Burkina Faso.

1.2 Micronutrient Status in Burkina Faso Among Children Aged 6-59 Months

Anemia and iron status

Anemia is a condition in which there are not enough healthy red blood cells (measured via hemoglobin) to deliver oxygen to the tissues of the body. Anemia is a major public health concern, affecting 40% of children 6-59 months worldwide (Stevens *et al*., 2022). Iron deficiency is a major contributing factor to anemia and is estimated to be responsible for a quarter to half of all anemia cases in children 6-59 months globally, and possibly less in populations with a higher burden of anemia and infections (Petry *et al.*, 2016). Other micronutrient deficiencies (folate, vitamins A and B12, riboflavin), infectious agents, genetic hemoglobinopathies, and other factors can also lead to anemia (Balarajan *et al.*, 2011; Namaste *et al.*, 2017).

Understanding both the prevalence and etiology of anemia is a priority issue in Burkina Faso. The 2014 National Iodine and Anemia Survey found an extremely high prevalence of anemia: 83.4% in children 6-59 months (Ministère de la Santé *et al.*, 2014).

There has been some recent monitoring of causes of anemia other than iron deficiency, such as malaria, in Burkina Faso. The 2014 and 2017-2018 Malaria Indicators Surveys found that in children 6-59 months of age the national prevalence of malaria in Burkina Faso was 46% between October and November 2014, and 17% between November 2017 and March 2018 (Institut National de la Statistique et de la Démographie [INSD] *et al.*, 2015; INSD *et al.*, 2018). In the latter survey, most of the data collection in children did not occur during the high transmission season. Malaria prevalence is higher in rural areas of the Southeast region and lowest in the Central region. These surveys did not capture data on other important causes of anemia such as hereditary thalassemias or parasites such as soil transmitted helminths or *H. pylori*. There are currently no nationally representative data on many of the other potential key causes of anemia in Burkina Faso.

Iron deficiency without anemia is also detrimental to child health. In addition to being a major cause of anemia, iron deficiency without anemia can negatively impact physical activity, work productivity, and cognitive function (Haas and Brownlie, 2001; Lozoff *et al.*, 2006; McClung and Murray-Kolb, 2013). The prevalence of iron deficiency without anemia can be as high as double that of the iron deficiency anemia rates in some developing countries (Camaschella, 2015). For example, in the Banfora region of Burkina Faso, iron deficiency without anemia affected 62.5% infants 6-17 months (adjusted for effects of malaria and inflammation) in addition to 31.1% of infants with iron deficiency anemia (Muriuki, 2020). Thus, given the high prevalence of iron deficiency and anemia in Burkina Faso, it is important to monitor indicators of iron status other than hemoglobin to capture the full scope of iron deficiency in the country. In addition, it is important to assess indicators of inflammation, which is known to impact iron status indicators. There are currently no national data on biomarkers of iron status or inflammation.

Other micronutrient deficiencies

There are no nationally representative data on vitamin A, folate, vitamin B_{12}, or zinc status in the country.

Inflammation

There are no current nationally representative data on markers of inflammation, though the prevalence is likely high given the rates of anemia and malaria. Inflammation is important in providing context to and correct interpretation of micronutrient assessments, as several biomarkers are directly affected by inflammation. Concentrations of several micronutrient indicators either decrease or increase in the presence of inflammation (Bresnahan *et al.*, 2014).

1.3 Nutrition Interventions in Burkina Faso With a Focus on Children Aged Under 5 Years

The Government of Burkina Faso has undertaken several measures to address and improve nutritional problems in the country, especially among women and children. In 2009, the "Conseil National de Concertation en Nutrition (CNCN)" was established - a multisectoral, multistakeholder platform for nutrition. The CNCN works with the Nutrition Directorate within the Ministry of Health to develop policies and programs that promote, protect and support optimal nutrition - such as the National Multi-Sectoral Nutrition Plan (2016-2020). This plan was created by considering several regional and international goals created from: the REACH Initiative, the Scaling Up Nutrition Movement Strategy 2016-2020, the African Union Strategy 2013-2025, and others. The Burkinabe government has since continued to revise policies and produced an updated Multisectoral Nutrition Policy for 2020-2029.

Burkina Faso has implemented several large-scale programs and interventions to improve the nutritional status of its population. The two higher-level interventions specified in their Nutrition Plan focus on Community-based Management of Acute Malnutrition (CMAM) and IYCF promotional interventions. CMAM is included in the minimum package of services in public and faith-based health facilities (Ministère de la Santé, 2016). In addition, the

government has specified a series of IYCF interventions to be rolled out gradually through 2025. As of 2016, 8 regions were receiving IYCF promotion activities such as creating an enabling environment for appropriate child feeding, creating a legal and regulatory framework for the commercialization of breast-milk substitutes, and the management of IYCF in the context of HIV and emergency response (Ministère de la Santé, 2016). Further, in 2016, the government began a program that provided free health care to children aged under 5 years and to pregnant or lactating women which was scaled up to all districts.

The National Multi-Sectoral Nutrition Plan also includes several strategies for addressing micronutrient malnutrition. In accordance with international guidelines, high dose vitamin A supplementation is distributed to children ages 6-59 months every 6 months. In 2020, coverage of vitamin A supplementation was 80.3% (Ministère de la Santé, 2020). Furthermore, deworming occurs twice yearly in children ages 12-59 months with coverage of 77.3% (Ministère de la Santé, 2020).

Fortification of certain staple foods is mandated in Burkina Faso. In 2003, Burkina Faso mandated that salt be iodized (Ministère de la Santé *et al*., 2003). Salt consumed in Burkina Faso is mainly imported from international sources. In 2013, Burkina Faso also committed to a universal salt iodization strategy that mandated that imported salt be iodized (Ministère de la Santé *et al.*, 2013). Since 2012, Burkina Faso has mandated the fortification of refined vegetable oils with vitamin A and wheat flour with iron and folic acid (Ministère de l'Industrie *et al.*, 2012). Despite this legislation, the fortification policies may not be having their intended impact on reducing micronutrient deficiencies.

The Burkina Faso National Multisectoral Nutrition policy includes the following interventions that have a direct and/or indirect impact on child nutritional status.

Nutrition-Specific

1. Integrated management of acute malnutrition
2. Infant and young child feeding (IYCF) promotional interventions
3. Micronutrient deficiency interventions
    a. Vitamin A supplementation and deworming campaigns
    b. Food fortification and universal salt iodization
    c. Iron and folic acid supplementation for pregnant women

Nutrition-Sensitive

1. Health sector, including malaria prevention, treatment, and control
2. Food security sector
3. Water, sanitation, and hygiene sector
4. Social protection sector
5. Education sector

1.4 Survey Rationale

While existing sociodemographic data suggest that vulnerable populations such as infants and young children in Burkina Faso are at high risk of vitamin and mineral deficiencies, no national data on iron, vitamin A, folate, vitamin B_{12}, and zinc status have been collected. A national micronutrient survey fills this evidence gap so that nutrition policymakers can review micronutrient status data, the effectiveness of existing programs, and if needed, revise or select new nutrition interventions specific to population needs.

Understanding the context-specific drivers of anemia is important to developing effective, evidence-based public health programming. Globally, iron deficiency is estimated to cause half of anemias; however, the proportion likely varies across contexts (Ezzati *et al.*, 2004). Beyond iron deficiency, numerous other factors contribute to anemia including problems producing hemoglobin (inflammation-induced iron sequestration, thalassemias), lack of sufficient DNA precursors (folate and vitamin B_{12} deficiencies), erythrocyte damage and hemolysis (parasitic infections, blood disorders like glucose-6-phosphate dehydrogenase deficiency (G6PD), immune-mediated destruction), and blood loss (Balarajan *et al.*, 2011; Namaste *et al.*, 2017). Although the physiology of anemia is relatively well understood globally, less is known about context-specific determinants of anemia in Burkina Faso.

To address the knowledge gap in context-specific drivers of anemia, the Burkina Faso National Micronutrient Survey collected data on micronutrient status and potential causes of anemia with the goal of identifying the predictors of anemia to guide programmatic decision-making; this will be published later as a secondary analysis.

1.5 Objectives of the Burkina Faso National Micronutrient Survey With a Focus on Children Aged Under 5 Years

The overall objectives of the survey were to carry out a nationally representative survey (however, not representative of the Sahel region due to insecurity) that assessed the micronutrient status of select vulnerable populations (including 6-59 months old children) and key program process indicators (e.g., coverage) for all large-scale nutrition-specific and nutrition-sensitive programs in the country that were currently implemented or planned. The survey objectives for children 6-59 months of age are presented below:

Anemia and iron

1. To determine the prevalence of anemia, iron deficiency, and iron deficiency anemia among children 6-59 months.
2. To determine the predictors of anemia among children 6-59 months.
3. To determine the prevalence of malaria among children 6-59 months.
4. To determine the prevalence of *H. pylori* and soil transmitted helminth infection among children 6-59 months.
5. To determine the prevalence of blood disorders among children 6-59 months.

6. To assess biomarkers of inflammation (α1-acid glycoprotein [AGP] and C-reactive protein [CRP]) to correct estimates of iron status for accurate interpretation of iron status.
7. To assess consumption of iron-rich foods (e.g., meat, beans) and potentially fortified foods (e.g., wheat flour).

Vitamin A

8. To determine the prevalence of vitamin A deficiency among children 6-59 months.
9. To assess biomarkers of inflammation (AGP, CRP) to accurately measure vitamin A status among children 6-59 months.
10. To determine vitamin A supplementation coverage among children 6-59 months of age.
11. To determine consumption of vitamin A-rich foods (e.g., orange-flesh sweet potato, red palm oil) and potentially fortified vegetable oil among children 6-59 months.

Zinc

12. To determine the prevalence of zinc deficiency among children 6-59 months.

Folate

13. To determine the prevalence of folate deficiency and risk of deficiency among children 6-59 months.

Vitamin B_{12}

14. To determine the prevalence of vitamin B_{12} deficiency and depletion among children 6-59 months.

Other nutrition and health indicators

15. To determine the prevalence of stunting, wasting and global acute malnutrition (by weight-for-length/height and mid-upper arm circumference [MUAC]), underweight, and overweight/obesity among children 6-59 months.
16. To measure IYCF indicators (e.g., early initiation of breastfeeding, bottle feeding, continued breastfeeding at age 1 year, minimum dietary diversity) among children 6-23 months.
17. To assess coverage of other nutrition-specific interventions (e.g., IYCF counseling during and after pregnancy, number of food groups consumed the previous day for children aged 24-59 months, child growth monitoring, micronutrient supplements, food aid) and nutrition-sensitive interventions (e.g., cash transfer programs).

1.6 Organization of this Report

This is the second module of the Burkina Faso National Micronutrient Survey report, and consists of:

1. Description of the background, objectives, and methods of the National Micronutrient Survey for children aged 6-59 months old.
2. Results from analyses of the child questionnaire data and field tests, including anthropometry and the following biomarkers: hemoglobin/anemia, malaria rapid test kit (RTK), *H. pylori* RTK, and soil-transmitted helminths.
3. Results from analyses of the child biomarker data, including iron deficiency, iron deficiency anemia, vitamin A deficiency, zinc deficiency, folate deficiency, vitamin B_{12} deficiency, inflammation status, and blood disorder status.

This is the final report that includes revisions and feedback from a workshop with the Technical Working Group.

Chapter 2. Methods

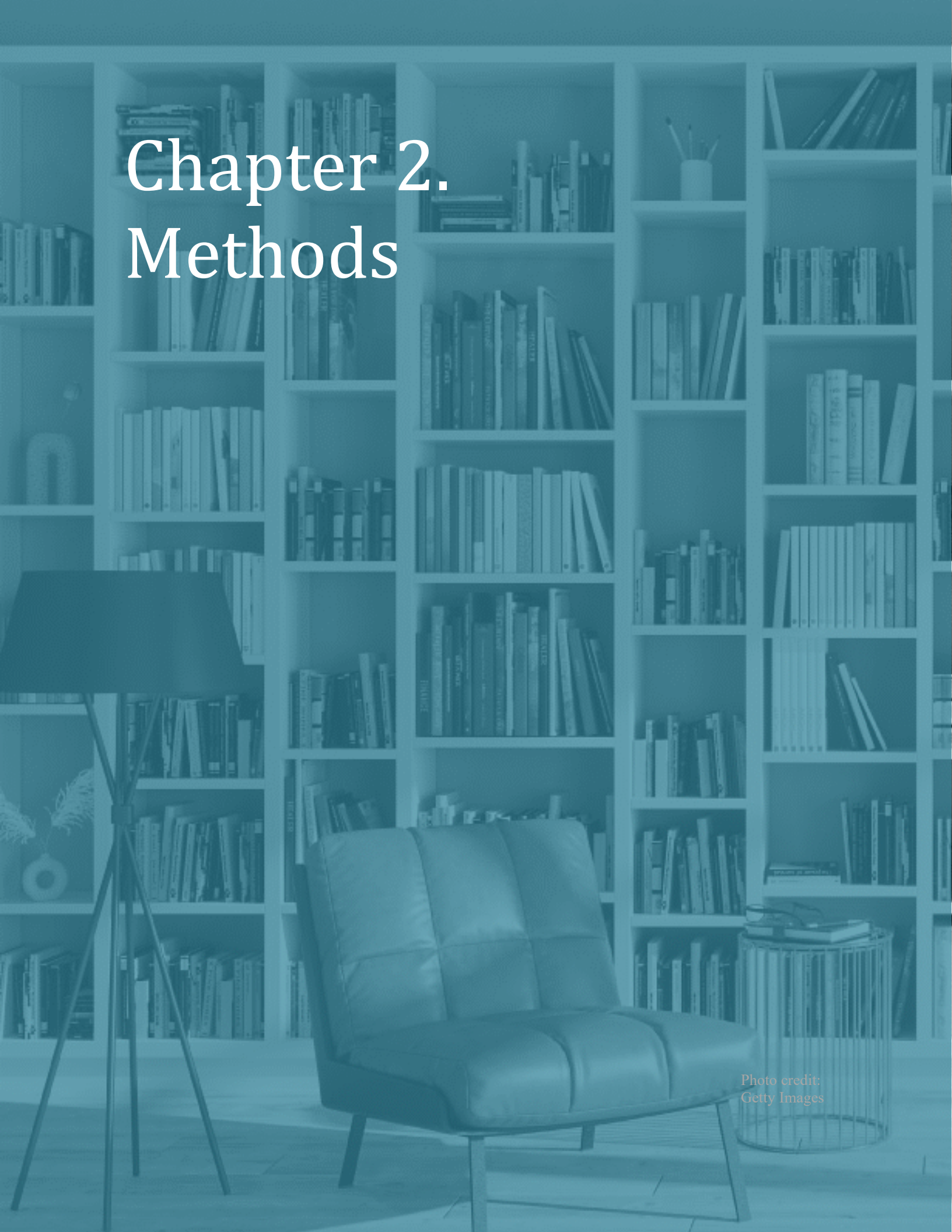


Photo credit: Getty Images

Chapter 2: Methods

2.1 Survey Design and Sampling

The Burkina Faso National Micronutrient Survey used a cross-sectional, stratified multi-stage cluster sampling design without replacement. The full survey methodology is described in the first module of this report (Burkina Faso Ministry of Health and CDC, 2023). Briefly, the country was divided into three strata: 1) Ouagadougou and Bobo Dioulasso, 2) Other cities, and 3) Rural areas. In the first stage, a total of 59 clusters (0.5% of clusters in original sampling frame) with security threats were removed from the sampling frame prior to randomly sampling 30 clusters within each of three stratum (Ouagadougou & Bobo Dioulasso; other cities; rural areas) using probability proportional to size (PPS) (n= 90 clusters total). PPS sampling was based on the 2006 national census that included further updates from the 2010 Demographic and Health Survey and the annual National Nutrition Surveys implemented in 2009-2018. An additional seven clusters out of the 90 (7.8%) clusters were removed due to security threats before and during data collection (i.e., 3 clusters in the Sahel region and 1 cluster each in the East, Cascades, Hauts-Bassins, and Center-North regions). In the second stage, a household census was conducted in each of the 83 selected clusters and 25 households were sampled using systematic random sampling with a random start and a fixed interval approach. In the third stage, a census was conducted in the 25 selected households in each cluster to list all eligible members of the priority populations (children 6-59 months, adolescent girls 10-19 years, adolescent boys 10-19 years, non-pregnant women aged 15-45 years, and pregnant women aged 15-49 years). A total of 25 children 6-59 months were sampled using simple random sampling from the list of all children in the 25 selected households. In clusters with fewer than the desired number of children, all children were approached for enrollment. There was no replacement for any reason.

Data are representative at the stratum-level and nationally except for the Sahel region. For the entirety of this report, prevalence estimates reported for the national level are nationally representative except for the Sahel region.

Table 2.1 shows the number of eligible children for the National Micronutrient Survey. We expected an average of 1.05 children 6-59 months per household. At an average of 1.05 children 6-59 months per household, a household participation rate of 85%, an individual participation rate of 90%, and 25 households per cluster visited, the estimated sample size of children 6-59 months was n=1,807. MRDR testing was planned in a 20% subsample of children 6-59 months (n=360).

Table 2.1 Projected Sample Size of Children 6-59 Months and Survey Components, Burkina Faso National Micronutrient Survey, 2020 [a,b,c]

Population Group	Survey Component	N to Invite	N Expected	Notes on Sample Selection
Children (6-59 months)	Child questionnaire Anthropometry Venous blood specimen Stool specimen	2,250	1,807	SRS of 25 children/cluster from sampled HH
	MRDR testing	450	360	SRS of 20% of sampled children/cluster

HH= Household; MRDR= Modified relative dose response test; SRS= Simple random sample
[a] This table represents overall sample sizes assuming 85% and 90% household and child participation rates, respectively.
[b] Assumption of 1.05 children 6-59 months/household.
[c] All children 6-59 months were sampled in clusters with fewer than 25 children 6-59 months.

2.2 Data and Specimen Collection and Data Management

Data and specimen collection, field measurements, quality assurance and cold chain, as well as survey planning, organization and training are fully described in the first module of this report (Burkina Faso Ministry of Health and CDC, 2023). Briefly, data were collected on electronic tablets, and the Child questionnaire (**Annex 1**) was programmed using COMMCARE (Dimagi Inc., Cambridge, Massachusetts, USA). A Technical Working Group consisting of staff from the Ministry of Health, Davycas, INSD, UNICEF, Helen Keller International, the Laboratoire National de Santé Publique (LNSP), the Institut de Recherche en Science de la Santé (IRSS), ABNORM, Action Contre la Faim, BMGF, Gret, FAO, WFP, WHO, and CDC/CDCF created the questionnaire that included sociodemographic characteristics and recommended indicators of IYCF practices, intake of micronutrient supplements or micronutrient powders, PICA practices, consumption of fortifiable foods, morbidity and infectious diseases, and national nutrition program and social safety net program coverage indicators. The final questionnaire was approved by the Technical Working Group. The child survey was completed by interviewing the mother or caregiver of the child. Length/height, weight, and mid-upper arm circumference (MUAC) measurements were assessed among all children 6-59 months. Children with MUAC <110 mm and/or bilateral edema who were currently not enrolled in treatment for severe acute malnutrition were referred to a health facility for evaluation, per MoH guidelines.

Blood and stool specimens were collected to assess micronutrient, infection, inflammation status, and blood disorders. Table 2.4 in the household module report describing the biological indicators and rationale for inclusion (Burkina Faso Ministry of Health and CDC, 2023) is available in **Annex 2**. Venous blood and stool specimens were collected following the survey protocol. Trained phlebotomists collected 10mL of venous blood from children 6-59 months using butterfly needles. Three vacutainers (Royal Blue top, Purple top, and Red top Vacutainers) were used for venous blood collection. For the subsample of children 6–59 months selected for MRDR, an additional 3 mL of venous blood was collected using a Red top vacutainer. Venous blood specimens were field tested for hemoglobin to identify anemia using a HemoCue® Hb-301 analyzer and malaria infection using an RTK for *Plasmodium falciparum* (CareStart *P. falciparum* (HRP2) test) using the Purple top vacutainer. Children with positive tests for severe anemia (Hb <7.0 g/dL) and/or malaria were provided a referral

slip to go to the nearest health facility for evaluation, per MoH guidelines. In each cluster, laboratory technicians were located at a central site with a temporary field laboratory to process blood and stool specimens. The Purple top vacutainer was used to prepare a whole blood lysate for the analysis of RBC folate prior to centrifugation of the Purple top vacutainer. The Blue top vacutainer was used for analysis of serum zinc, serum folate, and serum vitamin B_{12}. Serum from the Red top vacutainer was used for the In-house sandwich ELISA (ferritin, soluble transferrin receptor (sTfR), retinol binding protein (RBP), C-reactive protein (CRP), and α1-acid glycoprotein (AGP)) and serum retinol. Dried blood spot (DBS) samples were prepared by filling two 1 cm circles with ~50-100 µL whole blood from the Purple top vacutainers for analysis of blood disorders. An overview of quality assurance in biological specimen collection, transportation, analyses, and external and internal quality assurance is presented in **Annex 3**. Supplies for stool specimen collection were left for collection and picked up by the teams later that day or the following morning. Stool specimens were field tested for soil-transmitted helminths using the Kato Katz method (~1g of stool). and *H. pylori* infection using an RTK (Antigen SD Bioline test, ~1g of stool). Children with positive tests for soil-transmitted helminths or *H.pylori* were provided a referral slip to go to the nearest health facility for evaluation, per MoH guidelines.

The Directorate of Nutrition at the Ministry of Health and the CDC/CDCF led data management and analyses. Data cleaning included corrections for duplicate ID labels, internal data inconsistencies and outliers, and examining database completeness, missing values and observations in the "other" response categories. A-Consultants were contracted to provide technical assistance with cleaning and analysis of questionnaire and field test data (including anthropometry, hemoglobin/anemia, malaria, *H. pylori* and soil transmitted helminths) for this report module. Questionnaire and field test data analyses were conducted in SPSS. Micronutrient biomarker data analyses and all weighted median analyses were conducted in SAS. All data analyses accounted for the complex design of the stratified multi-stage cluster survey (e.g., SPSS with the complex sample module). Any analyses that combined data from more than one stratum was weighted, as the probability of being selected for the survey varied across strata but not within strata. Estimates for each location (i.e., Ouagadougou & Bobo Dioulasso, other cities, rural areas) as well as rural residence (i.e., rural areas) were therefore self-weighted. The children's weighting scheme approximated the auxiliary census data. Stratified analyses of malaria, anemia, micronutrient, and blood disorders by age groups were unweighted because the age group of children 6-23 months had a response rate <45% (i.e., unbalanced strata potentially causing biased estimates). Age group-specific estimates for these biomarkers should therefore be interpreted with caution. Furthermore, the complex survey sampling frame was not intact for MRDR testing due to non-response in 13 survey clusters (collapsed clusters). MRDR analyses were therefore conducted without accounting for a complex survey design. Thus, MRDR estimates were analyzed using national data but the estimates are not nationally representative. Among all children with completed interviews, 268 children (21%) were selected for MRDR testing, 755 children (61%) were not selected, and 224 children (18%) had missing data. It is assumed that some children among the 224 with missing data were selected. Some surveyed households had multiple selected children as children were independently sampled from all eligible children 6-59 months of age among 25 households in each cluster. All data analyses, including analysis of IYCF indicators, were therefore adjusted for intra-household clustering.

Analyses included calculating frequencies with 95% confidence intervals (i.e., logit confidence intervals for questionnaire and field test data, and Wald confidence intervals for micronutrient biomarker data). The Rao-Scott adjusted Pearson Chi-Square test for complex surveys was used to calculate p-values for differences between categories (i.e., accounting for the design effect). SPSS provides a Rao-Scott Chi-Square test using an F-based variant of the second-order adjustment, whereas SAS provides a first-order Rao-Scott Chi-Square test by default. P-values <0.05 were considered statistically significant and significant findings are highlighted in color in the results tables, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence. Proportions and 95% confidence intervals based on denominators with fewer than 25 observations were considered potentially unreliable and were suppressed. Estimates based on denominators of 25-49 observations are presented in tables in parentheses and should be interpreted with caution.

International IYCF indicators and anthropometry indicators were calculated using standard procedures (WHO, 2008; WHO and UNICEF, 2019). New indicators are presented in Annex of the report module if the required data were collected, such as some new 2021 IYCF indicators (WHO and UNICEF, 2021). Anthropometric indices for children aged 6-59 months, including length/height-for-age (LAZ or HAZ), weight-for-age (WAZ), weight-for-length/height (WLZ or WHZ), and MUAC-for-age (MUACZ) were determined in Z-scores/standard deviations against the 2006 WHO Child Growth Standards using the WHO SPSS macro which was adapted for complex survey analysis (WHO, 2006). There were 6 children among the 1,247 children with completed interviews who suffered from bilateral (nutritional) edema. Edema cases were removed from weight-for-age and weight-for-length/height Z-score analyses and were classified as having severe underweight and severe wasting, respectively. Sensitivity analysis showed no meaningful differences between prevalence estimates including or excluding edema cases. Anthropometry data quality checks included assessments of child age, decimal and whole number digit preference, missing values, biologically implausible values, and data distributions. Child age in days was calculated from date of birth and date of interview for 981 children with a date of birth obtained from official documentation or the mother/caregiver, whereas 266 children had an estimated age in completed months because a date of birth could not be obtained. Estimated ages in completed months were corrected for precision by applying a correction factor of +0.5 months/15 days as per WHO guidelines (WHO and UNICEF, 2019). Age heaping was observed at estimated ages 12, 24, 36 and 48 months, though recall bias gradually increased with age. In separate sensitivity analysis, estimated ages in completed months were adjusted for observed recall bias by randomly redistributing children with estimated age 12, 24, 36 and 48 months to ages 12 ± 1 months, 24 ± 2 months, 36 ± 3 months, and 48 ± 4 months, respectively (i.e., applying a fixed ± 8% interval). The redistribution allowed for a close approximation of the age distribution of children with a date of birth. Mean Z-scores and prevalence estimates of age-related anthropometry indicators were not meaningfully different between estimated age unadjusted and adjusted for recall bias and unadjusted estimated ages were used for analysis. Further, MUAC values that were recorded in cm (i.e., absolute value <50) were converted to mm without adjustment as there was no observed rounding of the decimal digit of MUAC in cm, and MUAC data in the overall sample was normally distributed.

Select micronutrient biomarkers that are influenced by the inflammatory process were adjusted for inflammation using the Biomarkers Reflecting Inflammation and Nutrition Determinants of Anemia (BRINDA) method to prevent either over- or underestimation of deficiency in children 6-59 months (i.e., serum ferritin, serum retinol, MRDR, serum zinc) (Namaste *et al.*, 2017; McDonald *et al.*, 2020). Micronutrient biomarker analysis could not be stratified by iron syrup/tablet, micronutrient powder, or zinc tablet intake because of very low prevalence of intake of these supplements (<25 unweighted cases each). Similarly, micronutrient biomarker analysis could not be stratified by any clinically relevant blood disorder status (i.e., having any of the following: hemoglobin variant Hb SS, Hb SC/CS, Hb CC, Hb SF/FS, G6PD, beta-thalassemia) because of low prevalence (< 50 unweighted cases). Micronutrient data quality checks included assessments of duplicate ID labels and data distributions. There were no adjustments to hemoglobin concentrations needed for altitude in the Burkina Faso National Micronutrient Survey, as all registered altitudes at households were below the 1,000-meter cutoff. Anemia data quality checks included assessments of missing values, biologically implausible values, end-digit preference, and data distributions.

Due to a faulty skip pattern in the COMMCARE program, data on meal frequency was not collected in all eligible children and the 2008 IYCF indicators minimum meal frequency, minimally acceptable diet and timely introduction of solid, semi-solid or soft foods could therefore not be calculated. No data were collected on maternal education or ethnicity among children selected for the survey, and data analysis was not stratified by these characteristics.

2.3 Response Rate for Interview, Anthropometry and Biological Specimens

A total of 2,250 children were planned to be invited to participate in the survey, based on 25 children selected from the 90 clusters selected in the first stage of sampling. Assuming a 85% household participation rate, an average of 1.05 children per household, and a 90% child participation rate, 1,807 children were expected to be surveyed. However, due to security threats, seven clusters were excluded from the survey before and during data collection, resulting in an expected sample of 1,666 children. Based on the census conducted to list all eligible children in the 25 households sampled from each of the 83 clusters, a total of 1,441 children were selected and available for the survey, of which a total of 1,247 children (87%) completed the interview (**Table 2.2**). A total of 71 (5%) respondents refused to participate and 68 children (5%) were not included in the survey because no respondent was home after three attempts. The remaining 4% of available children had missing or unreliable interview data.

Among the 194 non-responders to the survey (i.e., not present, refused, or other), there were relatively more non-responders in other cities (42%) compared to Ouagadougou and Bobo Dioulasso (30%) and rural areas (28%), which was largely due to more refusals in other cities. There were no meaningful differences in non-response rates across survey teams. Non-responders had a median age of 3 completed years whereas responders had a median age of 2 completed years (Wilcoxon ranksum test, p=0.042). There were 57% females among non-responders compared to 49% females among responders (Pearson χ^2 test, p=0.063).

Table 2.2 Response Rate for Questionnaire Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Population Group: Children	Sample Size to Invite[a] N	Expected Sample Size[b] N	Available[c] N	Interview Completed[d,e] N (%)		Refused[d,e] N (%)		Respondent not at Home After Three Attempts[d,e] N (%)	
Location									
Ouagadougou & Bobo Dioulasso	750	602	480	422	87.9	16	3.3	25	5.2
Other cities	750	602	419	337	80.4	37	8.8	24	5.7
Rural	750	603	542	488	90.0	18	3.3	19	3.5
Residence									
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	1,500	1,204	899	759	84.4	53	5.9	49	5.5
Rural	750	603	542	488	90.0	18	3.3	19	3.5
Total	**2,250**	**1,807**	**1,441**	**1,247**	**86.5**	**71**	**4.9**	**68**	**4.7**

[a] Based on survey design and sample size calculation (30 clusters/stratum * 25 children/cluster = 750 children per stratum).
[b] Assuming a household participation rate of 85%, an average of 1.05 children aged 6-59 months per household and an individual participation rate of 90%. For two strata, this number was rounded down and one was rounded up to produce the final expected sample size (N= 1,807).
[c] Selected and available sample in the clusters, after exclusion of 7 out of 90 survey clusters due to security threats before and after data collection.
[d] Percentage based on available sample size.
[e] Among all available children, the result of the child caregiver's interview could not be verified and no data was captured for 52 children (3.6%, n=14 in Ouagadougou & Bobo Dioulasso, n=21 in other cities, n=17 in rural areas) that were selected for the survey and 3 children interviews (0.2%) were discarded due to unreliable data.

The response rate for anthropometry measurements, venous blood specimen and stool specimen collection among the 1,247 children 6-59 months with completed interviews is shown in **Table 2.3**. Length or height, weight and mid-upper arm circumference (MUAC) measurements were completed for 1,226 (98%), 1,222 (98%) and 1,221 children (98%), respectively. Venous blood and stool collection were completed for 58% and 57% of the children, respectively, and venous blood collection was partially completed for an additional 10% of the children.

Non-response for venous blood collection was mostly due to refusals with 13% of children with no consent from their mothers/caregivers and 3% of children with consent refusing collection. Non-response for stool collection was mostly due to absence at follow-up (18%) as phlebotomists left stool specimen collection supplies at the household and returned later to pick up the specimen. An additional 10% of mothers/caregivers refused stool collection from their child. Only 1% and 2% of children had other reasons of non-response for venous blood (i.e., sickness, unsuccessful blood draw) and stool collection (i.e., child could not produce a specimen, sickness, unspecified), respectively. Furthermore, 15% and 14% of children had missing phlebotomy records and were missing laboratory results for venous blood biomarkers and stool biomarkers, respectively. The reasons for non-response among these children are therefore unknown.

Table 2.3 Response Rate for Anthropometry, Venous Blood and Stool Specimen Collection Among Children 6-59 Months with Completed Interviews, Burkina Faso National Micronutrient Survey, 2020

Population Group: Children	Location						Residence				Total N (%)	
	Ouagadougou & Bobo Dioulasso[a] n (%)		Other cities[a] n (%)		Rural[a] n (%)		Urban[a,b] n (%)		Rural[a] n (%)			
Completed Interviews	422	(100%)	337	(100%)	488	(100%)	759	(100%)	488	(100%)	1,247	(100%)
Anthropometry												
Length/height												
Complete	411	(97.4)	335	(99.4)	480	(98.4)	746	(98.3)	480	(98.4)	1,226	(98.3)
Partial	3	(0.7)	0	(0.0)	7	(1.4)	3	(0.4)	7	(1.4)	10	(0.8)
Not present	1	(0.2)	1	(0.3)	1	(0.2)	2	(0.3)	1	(0.2)	3	(0.2)
Refused	7	(1.7)	1	(0.3)	0	(0.0)	8	(1.1)	0	(0.0)	8	(0.6)
Other	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Weight												
Complete	410	(97.2)	335	(99.4)	477	(97.7)	745	(98.2)	477	(97.7)	1,222	(98.0)
Partial	4	(0.9)	1	(0.3)	10	(2.0)	5	(0.7)	10	(2.0)	15	(1.2)
Not present	1	(0.2)	1	(0.3)	1	(0.2)	2	(0.3)	1	(0.2)	3	(0.2)
Refused	7	(1.7)	0	(0.0)	0	(0.0)	7	(0.9)	0	(0.0)	7	(0.6)
Other	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
MUAC												
Complete	408	(96.7)	336	(99.7)	477	(97.7)	744	(98.0)	477	(97.7)	1,221	(97.9)
Partial	6	(1.4)	0	(0.0)	9	(1.8)	6	(0.8)	9	(1.8)	15	(1.2)
Not present	1	(0.2)	1	(0.3)	1	(0.2)	2	(0.3)	1	(0.2)	3	(0.2)
Refused	7	(1.7)	0	(0.0)	1	(0.2)	7	(0.9)	1	(0.2)	8	(0.6)
Other	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Venous blood specimen collection												
Complete[c]	238	(56.4)	209	(62.0)	273	(55.9)	447	(58.9)	273	(55.9)	720	(57.7)
Partial[d]	20	(4.7)	30	(8.9)	72	(14.8)	50	(6.6)	72	(14.8)	122	(9.8)
Not present[e]	0	(0.0)	6	(1.8)	7	(1.4)	6	(0.8)	7	(1.4)	13	(1.0)
Refused[e]	8	(1.9)	18	(5.3)	8	(1.6)	26	(3.4)	8	(1.6)	34	(2.7)
Other[e]	4	(1.0)	4	(1.2)	9	(1.8)	8	(1.1)	9	(1.8)	17	(1.4)
No consent	52	(12.3)	30	(8.9)	77	(15.8)	82	(10.8)	77	(15.8)	159	(12.8)
Missing data[f]	100	(23.7)	40	(11.9)	42	(8.6)	140	(18.4)	42	(8.6)	182	(14.6)
Stool specimen collection												
Complete[g]	222	(52.6)	228	(67.7)	259	(53.1)	450	(59.3)	259	(53.1)	709	(56.9)
Partial	0	(0.0)	3	(1.0)	1	(0.2)	3	(0.4)	1	(0.2)	4	(0.3)
Not present[h]	65	(15.4)	44	(13.1)	110	(22.5)	109	(14.4)	110	(22.5)	219	(17.5)
Refused[h]	35	(8.3)	22	(6.5)	64	(13.1)	57	(7.5)	64	(13.1)	121	(9.7)
Other[h]	11	(2.6)	2	(0.6)	9	(1.8)	13	(1.7)	9	(1.8)	22	(1.8)
Missing data[f]	89	(21.1)	38	(11.3)	45	(9.2)	127	(16.7)	45	(9.2)	172	(13.8)

MUAC = Mid-upper arm circumference

[a]Percentage based on completed interviews.

[b]Urban residence includes Ouagadougou & Bobo Dioulasso and other cities.

[c]A total of 15, 1 and 13 children with complete venous blood specimen collection were reported not to have hemoglobin measured for anemia testing, not to have sufficient specimen for a malaria infection test, and not to have a micronutrient test result, respectively.

[d]Includes 44 children with a missing phlebotomy record but who had either a hemoglobin value or malaria value (field forms) and/or at least one value for micronutrient specimen analyses.

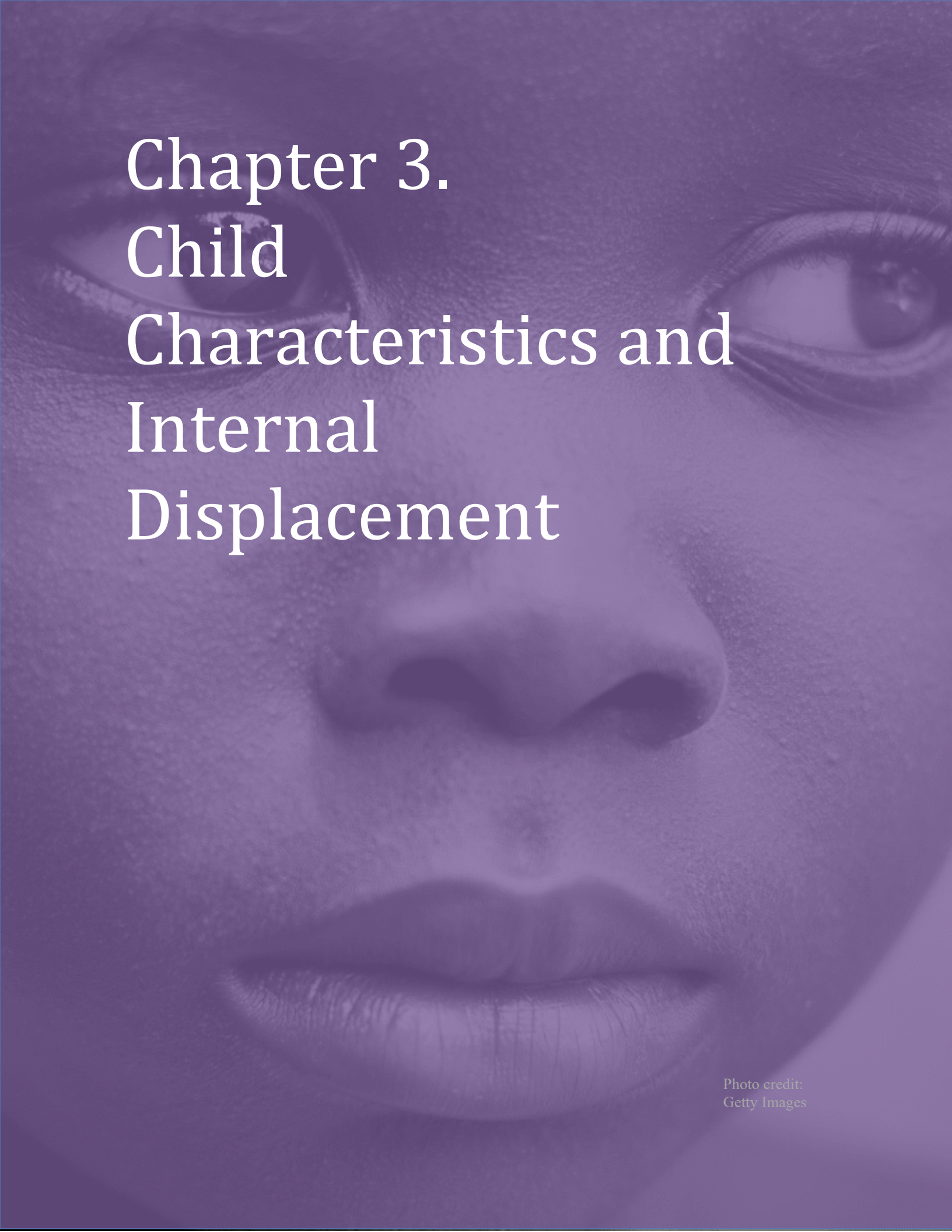
[e]A total of 63 and 4 children who were reported as not present, refused, or other, had a laboratory result for malaria infection (i.e., 15 children with positive/negative test results, 10 children with invalid test results, 38 children with insufficient specimen) or micronutrient testing, respectively. It is assumed that these children provided a venous blood specimen (e.g., possible data entry error, or potentially provided a specimen after the phlebotomist visit). The 15 children with a positive/negative malaria result and 4 children with micronutrient results were included in the corresponding analysis.

[f]Children with completed interviews who were missing all information relating to specimen collection, including a phlebotomy record, and valid values for hemoglobin, malaria, and micronutrient biomarkers (venous blood specimen collection) or valid values for *H. pylori* and soil-transmitted helminths (stool specimen collection).

[g]Includes 55 children with a missing phlebotomy record but who had a laboratory result for both *H. pylori* and soil-transmitted helminths. A total of 3 and 4 children with complete stool specimen collection did not have sufficient specimen for a *H. pylori* and Kato Katz test, respectively.

[h]A total of 69 children who were reported as not present, refused, or other, had a laboratory result for stool testing (i.e., *H. pylori* and soil-transmitted helminths: 40 and 40 children with positive/negative test results, 4 and 3 children with invalid test results, and 25 and 26 children with insufficient specimen, respectively). It is assumed that these children provided a stool specimen (e.g., possible data entry error, or potentially provided a specimen after the phlebotomist visit). The 40 children with positive/negative test results were included in the corresponding analysis.

Chapter 3. Child Characteristics and Internal Displacement



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Chapter 3: Child Characteristics and Internal Displacement

3.1 Individual Characteristics of Children 6-59 Months

A total of 1,247 children 6-59 months participated in the survey (**Table 3.1**). The percentage of children who participated varied by location, residence, age, wealth quintile and language of the interview. Among the children who participated in the survey, 38% were from rural areas compared to 32% from other cities and 30% from Ouagadougou & Bobo Dioulasso. A majority were from urban areas (62%) compared to 38% from rural areas. Seventy percent of the children were between 24-59 months of age compared to 30% of children between 6-23 months of age. By wealth quintile, survey participation ranged from 17% in the fourth and highest quintiles to 23% in the lowest wealth quintile. Almost half of the children came from households where the interview was conducted in Moore (Moré) (47%) compared to 21% in French and 20% in Dioula. Interviews for the rest of the participants were conducted in languages in smaller proportions, such as Fulfulde (3%), Gourmantche (5%) and other languages (4%).

Table 3.1 Selected Characteristics of Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	n	Children 6-59 Months		
		%	[95% CI]	p-value
Location				
Ouagadougou & Bobo Dioulasso	422	29.9	[28.3 , 31.6]	<0.001
Other cities	337	32.3	[30.8 , 33.7]	
Rural	488	37.8	[36.3 , 39.4]	
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	62.2	[60.6 , 63.7]	<0.001
Rural	488	37.8	[36.3 , 39.4]	
Age, months[a]				
6-8	60	4.8	[3.7 , 6.1]	<0.001
9-11	70	5.6	[4.4 , 7.0]	
12-17	128	10.3	[8.7 , 12.1]	
18-23	118	9.6	[8.0 , 11.4]	
24-35	297	23.9	[21.6 , 26.4]	
36-47	277	22.2	[19.9 , 24.6]	
48-59	297	23.8	[21.6 , 26.1]	
6-23	376	30.2	[27.8 , 32.7]	<0.001
24-59	871	69.8	[67.3 , 72.2]	
Sex				
Male	631	50.6	[47.8 , 53.4]	0.655
Female	616	49.4	[46.6 , 52.2]	
Wealth Quintile				
Lowest	288	22.8	[20.3 , 25.6]	<0.001
Second	261	21.1	[18.3 , 24.2]	
Middle	268	22.4	[19.6 , 25.5]	
Fourth	210	17.0	[14.6 , 19.6]	
Highest	220	16.7	[14.4 , 19.3]	
Language of Interview				
French	252	20.8	[18.2 , 23.5]	0.006
Moore	582	46.8	[43.3 , 50.3]	
Dioula	262	20.2	[17.4 , 23.3]	
Fulfulde	36	(3.0)	[2.0 , 4.5]	
Gourmantche	62	4.9	[3.6 , 6.6]	
Other[b]	53	4.4	[3.1 , 6.2]	
Total[c]	**1,247**	**100.0**	**-**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for weighting and complex sample design.
P-value obtained from Rao-Scott adjusted Pearson's chi-square statistic to account for weighting and complex samples design.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25 to 49 sample size in the denominator and the estimate should be interpreted with caution.
[a]65.7% of children had an official document with a date of birth (e.g., birth certificate, child health card, or vaccination card), whereas 0.9% had a date of birth obtained from a local event calendar. A total of 33.4% children either had a date of birth obtained through maternal recall, or an estimated age in completed months. Ages recorded in completed months are assumed to be obtained through recall or the local event calendar.
[b]Other languages included Bissa, Bwamou, Dafi, Dagara, Lobi, Lyelé, Nankana, and Nouni.
[c]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

3.2 Internally Displaced Children

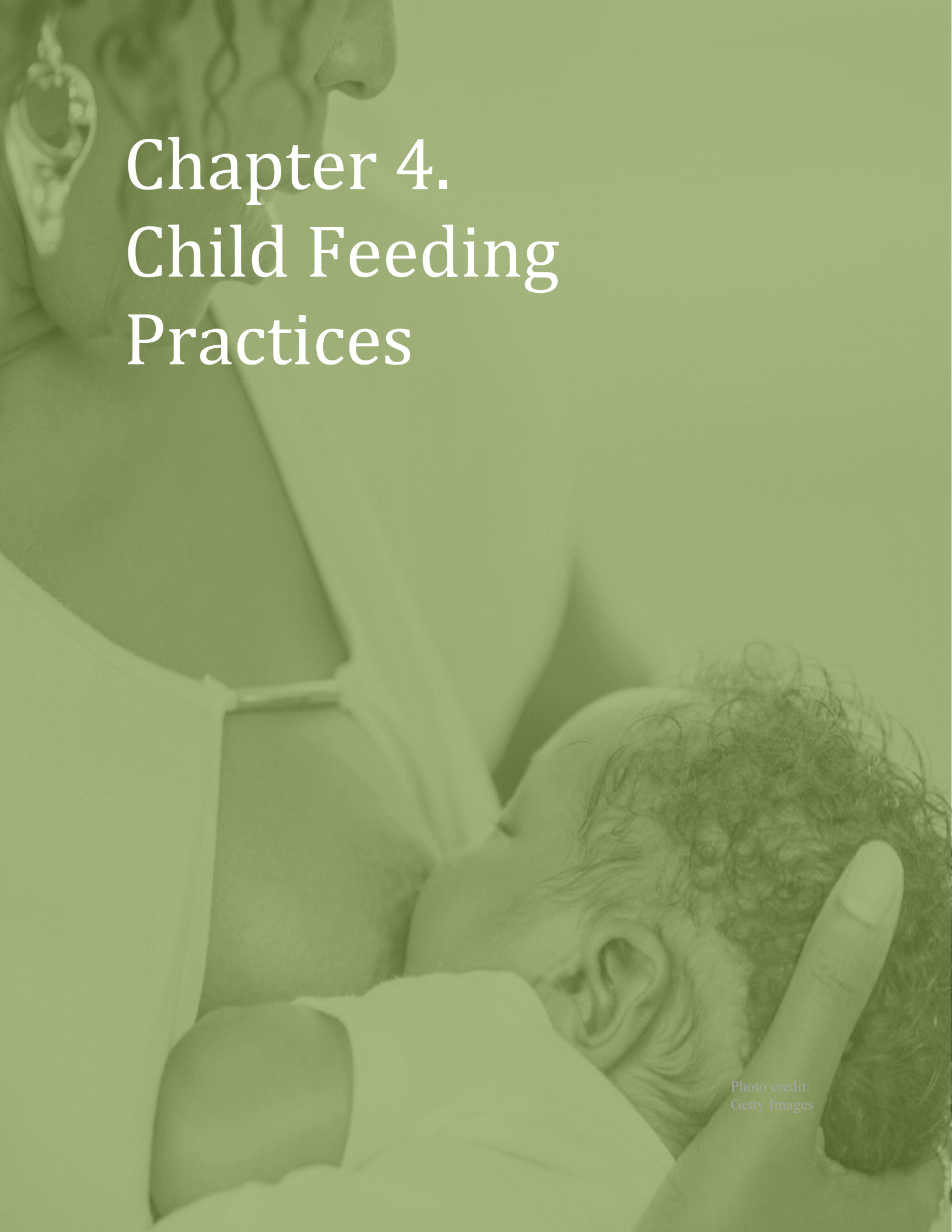
Nationally, 2% of children were ever forced to flee or abandon their house or usual place of residence due to fallout from armed conflict, situations of generalized violence, human rights violations, and/or human-made or natural disasters but did not leave Burkina Faso (**Table 3.2**). More children were internally displaced in other cities (4%) compared to Ouagadougou & Bobo Dioulasso (2%) and rural areas (about 1%). More children in urban areas were internally displaced compared to rural areas (3% versus 1%). Internal displacement also varied by wealth quintile with the second quintile having the highest percentage (6%) compared to 3% in the middle and less than 1% in the other quintiles.

Table 3.2 Child Ever Forced to Flee or Abandon House or Usual Place of Residence due to Armed Conflict, Violence, Human Rights Violations or Other Disasters but did not Leave Burkina Faso, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Forced to Leave Home		
		%	(95% CI)	p-value
Location°				
Ouagadougou & Bobo Dioulasso	422	1.7	[0.8 , 3.4]	0.004
Other cities	337	4.2	[2.3 , 7.4]	
Rural	488	0.8	[0.3 , 2.2]	
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	3.0	[1.8 , 4.7]	0.018
Rural°	488	0.8	[0.3 , 2.2]	
Age, months				
6-8	60	3.6	[0.9 , 13.5]	0.699
9-11	70	3.0	[0.7 , 11.4]	
12-17	128	0.9	[0.1 , 6.3]	
18-23	118	1.8	[0.4 , 7.0]	
24-35	297	2.9	[1.5 , 5.8]	
36-47	277	1.2	[0.4 , 3.6]	
48-59	297	2.4	[1.1 , 5.0]	
6-23	376	2.0	[1.0 , 4.2]	0.827
24-59	871	2.2	[1.4 , 3.5]	
Sex				
Male	631	2.2	[1.3 , 3.8]	0.809
Female	616	2.1	[1.2 , 3.6]	
Wealth Quintile				
Lowest	288	0.7	[0.2 , 2.7]	<0.001
Second	261	5.7	[3.1 , 10.3]	
Middle	268	2.6	[1.2 , 5.3]	
Fourth	210	0.4	[0.1 , 2.9]	
Highest	220	0.8	[0.2 , 3.4]	
Total[a]	**1,247**	**2.1**	**[1.4 , 3.3]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 4. Child Feeding Practices



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Chapter 4: Child Feeding Practices

This chapter presents findings on infant and young child feeding (IYCF) practices among children 6-23 months of age, as well as feeding practices among children 24-59 months of age. This chapter includes 2008 WHO IYCF indicators (WHO, 2008) and provides revised and new 2021 WHO & UNICEF IYCF indicators in the Annex when data were available to calculate them (WHO and UNICEF, 2021).

4.1 Ever Breastfed and Early Initiation of Breastfeeding Among Children 6-23 Months

Early initiation of breastfeeding is beneficial to the mother and the child. It allows newborns to have skin-to-skin contact which helps regulate body temperature (Moore *et al.*, 2016). Breastfeeding within an hour of birth also reduces the risk of mortality (NEOVITA Study Group, 2016).

Table 4.1 shows that breastfeeding is common. Nationally, 88% of children 6-23 months were breastfed at some point in life. Ever breastfeeding did not vary by location, residence, age, sex or wealth quintile. Among respondents that were the biological mother of the child, a total of 60% of children 6-23 months were breastfed within one hour of birth. Early initiation of breastfeeding within one hour of birth varied by location and residence. Early initiation of breastfeeding was higher in rural areas (68%) compared to 47% in Ouagadougou & Bobo Dioulasso and 64% in other cities. Fifty six percent of children 6-23 months in urban areas initiated breastfeeding early. Twenty four percent of children aged 6-23 months were breastfed after one hour but within a day, and prevalence did not vary by any background characteristic. Only 3% of children 6-23 months were breastfed after one day. Initiation of breastfeeding after one day varied by location and wealth quintile.

Table 4.1 Ever Breastfed and Early Initiation of Breastfeeding Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Ever Breastfed [a,b]			N	Initiation of Breastfeeding [a, b]								
						Early Initiation (Immediately or Within One Hour of Birth)			From One Hour but Within a day			After One Day or Longer		
		%	[95% CI]	p-value		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°														
Ouagadougou & Bobo Dioulasso	123	82.1	[73.6 , 88.3]		116	47.4	[38.2 , 56.7]		27.6	[20.0 , 36.8]		6.0	[2.6 , 13.2]	
Other cities	99	92.9	[85.8 , 96.6]	0.064	97	63.9	[54.2 , 72.6]	0.003	27.8	[20.0 , 37.3]	0.159	1.0	[0.1 , 7.0]	0.024
Rural	130	87.7	[80.8 , 92.4]		125	68.0	[59.2 , 75.7]		18.4	[12.5 , 26.2]		0.8	[0.1 , 5.5]	
Residence														
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	222	87.7	[82.6 , 91.5]	0.842	213	56.2	[49.5 , 62.7]	0.020	27.7	[22.0 , 34.2]	0.056	3.4	[1.6 , 7.1]	0.109
Rural°	130	87.7	[80.8 , 92.4]		125	68.0	[59.2 , 75.7]		18.4	[12.5 , 26.2]		0.8	[0.1 , 5.5]	
Age, months														
6-11	124	89.9	[83.2 , 94.1]	0.356	120	57.9	[48.8 , 66.5]	0.497	27.2	[19.9 , 36.0]	0.389	4.5	[1.8 , 10.8]	0.085
12-23	228	86.6	[81.4 , 90.4]		218	61.7	[55.0 , 68.0]		22.9	[17.7 , 29.0]		1.3	[0.4 , 4.2]	
Sex														
Male	163	85.8	[79.2 , 90.6]	0.301	156	60.8	[52.7 , 68.3]	0.898	23.2	[17.1 , 30.6]	0.633	1.3	[0.3 , 5.3]	0.228
Female	189	89.4	[84.4 , 92.9]		182	60.1	[52.7 , 66.9]		25.5	[19.6 , 32.4]		3.4	[1.5 , 7.7]	
Wealth Quintile														
Lowest	84	85.8	[76.4 , 91.8]		82	65.0	[53.9 , 74.6]		19.3	[12.1 , 29.3]		1.2	[0.2 , 8.1]	
Second	65	87.5	[76.4 , 93.7]		59	59.2	[46.1 , 71.0]		27.1	[17.2 , 39.9]		0.0	-	
Middle	78	88.6	[80.1 , 93.7]	0.476	78	61.7	[50.7 , 71.7]	0.689	26.9	[18.1 , 37.8]	0.780	0.0	-	0.033
Fourth	59	83.2	[70.3 , 91.2]		57	52.6	[39.3 , 65.6]		23.4	[14.2 , 36.2]		6.6	[2.1 , 19.3]	
Highest	66	93.8	[84.4 , 97.7]		62	61.1	[48.6 , 72.3]		26.3	[16.6 , 39.0]		6.0	[2.3 , 15.0]	
Total[c]	**352**	**87.7**	**[83.8 , 90.8]**		**338**	**60.4**	**[55.0 , 65.5]**		**24.4**	**[20.1 , 29.3]**		**2.5**	**[1.2 , 5.0]**	

Note: N unweighted. Sample size might vary slightly due to missing data. A total of 11 observations with inconsistent results were treated as missing values, and 3 observations had no data for initiation of breastfeeding.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Indicator is based on the 2008 World Health Organization indicators for assessing infant and young child feeding practices (WHO, 2008).
[b]Among children 6-23 months of age, and biological mother is respondent.
[c]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

4.2 Current Breastfeeding Among Children 6-23 Months

Table 4.2 reports 77% of children 6-23 months were currently breastfeeding at the time of the survey. The percentage of children currently breastfeeding was highest for other cities (84%) compared to rural areas (81%) and Ouagadougou & Bobo Dioulasso (67%). Most of the children aged 6-8 months (90%) and 9-11 months (91%) were currently breastfeeding compared to 80% of children aged 12-17 months and 61% children 18-23 months. The percentage of children currently breastfeeding did not vary by residence, sex or wealth quintile.

Table 4.2 Current Breastfeeding Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Currently Breastfeeding[a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	131	67.2	[58.4 , 74.9]	0.006
Other cities	104	83.7	[75.2 , 89.6]	
Rural	139	80.6	[73.0 , 86.4]	
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	235	75.7	[69.8 , 80.8]	0.185
Rural°	139	80.6	[73.0 , 86.4]	
Age, months				
6-8	60	89.8	[78.8 , 95.4]	<0.001
9-11	70	90.8	[81.9 , 95.6]	
12-17	126	80.3	[72.6 , 86.3]	
18-23	118	60.5	[51.3 , 69.0]	
Sex				
Male	175	76.6	[69.5 , 82.4]	0.711
Female	199	78.2	[72.1 , 83.3]	
Wealth Quintile				
Lowest	89	78.6	[68.6 , 86.1]	0.826
Second	69	77.9	[66.2 , 86.4]	
Middle	83	81.0	[71.4 , 87.9]	
Fourth	61	74.2	[61.0 , 84.0]	
Highest	72	73.9	[62.5 , 82.8]	
Total[b]	**374**	**77.4**	**[72.9 , 81.4]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Among all children 6-23 months of age.
[b]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

4.3 Continued Breastfeeding at 1 Year Among Children 12-15 Months and Continued Breastfeeding at 2 Years Among Children 20-23 Months

Most children 12-15 months (86%) continued breastfeeding at 1 year of age, whereas 51% of children 20-23 months continued breastfeeding at 2 years of age (**Table 4.3**).

The new 2021 World Health Organization and the United Nations Children's Fund indicator for continued breastfeeding among children 12-23 months of age is presented in **Annex 4.1**.

Table 4.3 Continued Breastfeeding at 1 Year Among Children 12-15 Months and Continued Breastfeeding at 2 Years Among Children 20-23 Months, Burkina Faso National Micronutrient Survey, 2020[a]

Characteristics	N	Continued Breastfeeding at 1 Year[b]			N	Continued Breastfeeding at 2 Years[c]		
		%	[95% CI]	p-value		%	[95% CI]	p-value
Location°								
Ouagadougou & Bobo Dioulasso	29	(69.0)	[50.6 , 82.8]		26	(34.6)	[18.8 , 54.7]	
Other cities	22	*	*	0.007	25	(64.0)	[43.5 , 80.4]	0.117
Rural	29	(89.7)	[71.8 , 96.7]		26	(50.0)	[31.3 , 68.7]	
Residence								
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	51	84.7	[74.3 , 91.4]	0.384	51	51.2	[37.7 , 64.6]	0.936
Rural°	29	(89.7)	[71.8 , 96.7]		26	(50.0)	[31.1 , 68.7]	
Age, months								
12-15	80	86.4	[78.1 , 91.9]		na	na	na	
20-23	na	na	na		77	50.8	[39.6 , 61.9]	
Sex								
Male	41	(88.8)	[75.5 , 95.4]	0.507	36	(42.6)	[27.2 , 59.6]	0.191
Female	39	(83.8)	[70.0 , 92.0]		41	(58.0)	[42.5 , 72.1]	
Wealth Quintile								
Lowest	21	*	*		14	*	*	
Second	16	*	*		17	*	*	
Middle	18	*	*	*	18	*	*	*
Fourth	12	*	*		14	*	*	
Highest	13	*	*		14	*	*	
Total[d]	**80**	**86.4**	**[78.1 , 91.9]**		**77**	**50.8**	**[39.6 , 61.9]**	

na= Not applicable
Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution. An asterisk indicates that the denominator sample size is <25 unweighted cases and has been suppressed.
[a]The new 2021 World Health Organization and the United Nations Children's Fund indicator for continued breastfeeding among children 12-23 months of age is presented in Annex 4.1.
[b]Among children 12-15 months of age. Indicator is based on the 2008 World Health Organization indicators for assessing infant and young child feeding practices (WHO, 2008).
[c]Among children 20-23 months of age. Indicator is based on the 2008 World Health Organization indicators for assessing infant and young child feeding practices (WHO, 2008).
[d]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

4.4 Bottle Feeding Among Children 6-23 Months

Nationally, 27% of children 6-23 months were reported to have drunk from a bottle with a nipple the day preceding the survey (**Table 4.4**). The percentage of bottle-fed children ranged from 17% in the lowest wealth quintile to 42% in the highest quintile. The percentage of bottle-fed children did not vary by other background characteristics.

Table 4.4 Selected Child Drank From a Bottle With a Nipple the Day Preceding the Survey Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Bottle Feeding[a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	133	27.1	[19.9 , 35.7]	0.355
Other cities	104	30.8	[22.5 , 40.5]	
Rural	138	22.5	[16.3 , 30.2]	
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	237	29.0	[23.3 , 35.4]	0.191
Rural°	138	22.5	[16.3 , 30.2]	
Age, months				
6-11	130	30.0	[22.5 , 38.6]	0.307
12-23	245	24.9	[19.7 , 31.0]	
Sex				
Male	174	29.3	[22.9 , 36.5]	0.303
Female	201	24.4	[18.7 , 31.2]	
Wealth Quintile				
Lowest	88	17.4	[10.8 , 26.8]	0.008
Second	70	30.1	[20.5 , 42.0]	
Middle	83	19.6	[11.9 , 30.6]	
Fourth	62	28.3	[18.1 , 41.4]	
Highest	72	42.2	[30.9 , 54.4]	
Total[b]	**375**	**26.7**	**[22.3 , 31.5]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the Don't know category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Indicator is based on the 2008 World Health Organization indicators for assessing infant and young child feeding practices (WHO, 2008).
[b]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

4.5 Minimum Milk Feeding Frequency Among Non-Breastfed Children 6-23 Months

Milk and other dairy products are rich sources of calcium and other nutrients. Minimum milk feeding frequency is an indicator defined as the proportion of non-breastfed children 6-23 months of age who received at least 2 milk feeds during the previous day (WHO, 2008). Twelve percent of non-breastfed children 6-23 months met the minimum milk feeding frequency (**Table 4.5**). The percentage of non-breastfed children 6-23 months who received at least 2 milk feeds was higher for urban areas (18%) compared to rural areas (0%). The minimum milk feeding didn't vary by any other background characteristic.

Table 4.5 Minimum Milk Feeding Frequency the Day Preceding the Survey Among Non-Breastfed Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Minimum Milk Feeding Frequency[a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	43	(20.9)	[11.0 , 36.1]	
Other cities	17	*	*	0.044
Rural	27	(0.0)	-	
Residence				
Urban [Ouagadougou. Bobo Dioulasso & Other cities]	60	17.7	[9.8 , 29.9]	0.022
Rural°	27	(0.0)	-	
Age. Months				
6-11	13	*	*	
12-17	26	(11.9)	[3.7 , 32.1]	0.316
18-23	48	(15.7)	[8.0 , 28.3]	
Sex				
Male	41	(11.6)	[4.8 , 25.4]	0.848
Female	46	(12.9)	[5.8 , 26.2]	
Wealth Quintile				
Lowest	19	*	*	
Second	16	*	*	
Middle	17	*	*	*
Fourth	16	*	*	
Highest	19	*	*	
Total[b]	**87**	**12.3**	**[6.9 , 20.9]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution. An asterisk indicates that the denominator sample size is <25 unweighted cases and has been suppressed.
[a]Among non-breastfed children 6-23 months of age. Indicator is based on the 2008 World Health Organization indicators for assessing infant and young child feeding practices (WHO, 2008). The indicator does not include the food group 'milk and milk products' which included milk, cheese, yoghurt of thicker consistency, or other foods made from milk.
[b]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

4.6 Consumption of Liquids Other than Breastmilk Among Children 6-23 Months

About half of the children 6-23 months consumed plain water the day preceding the survey (**Table 4.6**). Consumption of other liquids was lower and generally less than 10%, i.e., milk other than breastmilk (9%) and fruit juice (9%), or ≤5%, i.e., infant formula (2%), sugar or glucose water (4%), gripe water (2%), sugar-salt water (oral rehydration salts; 2%), tea (5%), yoghurt (5%) and honey (less than 1%).

Consumption of plain water was higher for breastfed (56%) compared to non-breastfed children 6-23 months (28%). Consumption of plain water varied by wealth quintile; whereby consumption in the lowest quintile was 38% and in the highest quintile 67%. Consumption of milk other than breastmilk varied by location, residence and wealth quintile. Consumption was highest in Ouagadougou and Bobo Dioulasso (16%) compared to other cities (8%) and rural areas (4%). Consumption of milk other than breastmilk was 12% in urban areas. Consumption was highest for the highest wealth quintile (25%) and lowest for the lowest quintile (2%). Consumption of fruit juice varied by location, residence and wealth quintile. Consumption of fruit juice was 16% in Ouagadougou and Bobo Dioulasso compared to 8% in other cities and 4% in rural areas. Consumption of fruit juice was 12% in urban areas. Consumption was highest for the fourth and highest quintile (17%) and lowest for the second quintile (1%).

Consumption of infant formula varied by location, residence and wealth quintile. Consumption of infant formula was 5% in Ouagadougou and Bobo Dioulasso compared to 0% in other cities and rural areas. Consumption of infant formula was 3% in urban areas. Consumption was higher in highest wealth quintile (7%) and fourth quintile (3%) compared to the lowest to middle quintiles (0%). Consumption of sugar or glucose water varied by location, residence and sex of the child. Consumption of sugar or glucose water was higher in other cities (11%) compared to Ouagadougou and Bobo Dioulasso (2%) and rural areas (0%). Consumption of sugar or glucose water was 7% in urban areas. More male children (8%) consumed sugar or glucose water compared to female children (1%). Consumption of yoghurt varied by location residence and wealth quintile. Consumption of yoghurt was higher in Ouagadougou and Bobo Dioulasso (10%) compared to other cities (5%) and rural areas (1%). Consumption of yoghurt was 7% in urban areas. Consumption was highest in the fourth wealth quintile (13%) and lowest in the lowest quintile (0%).

Table 4.6 Consumption of Liquids Other Than Breastmilk the Day Preceding the Survey Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Infant Formula			Milk Other Than Breastmilk			Plain Water		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	133	5.3	[2.5, 10.6]		15.8	[10.3, 23.5]		52.6	[43.5, 61.6]	
Other cities	104	0.0	-	0.002	7.7	[3.9, 14.7]	0.002	52.9	[43.3, 62.3]	0.224
Rural	139	0.0	-		3.6	[1.5, 8.4]		43.2	[34.8, 51.9]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	237	2.6	[1.2 , 5.2]	0.040	11.6	[8.1, 16.5]	0.005	52.8	[46.1, 59.3]	0.086
Rural°	139	0.0	-		3.6	[1.5, 8.4]		43.2	[34.8, 51.9]	
Age, months										
6-8	60	3.0	[0.7, 11.2]		3.0	[0.7, 11.2]		57.9	[44.7, 70.0]	
9-11	70	1.3	[0.2, 8.4]	0.832	9.9	[4.4, 20.7]	0.385	39.4	[28.1, 52.0]	0.146
12-17	128	1.4	[0.3, 5.4]		9.2	[5.3, 15.7]		46.7	[38.1, 55.5]	
18-23	118	1.5	[0.4, 5.8]		10.5	[6.2, 17.3]		53.7	[44.4, 62.7]	
Sex										
Male	175	1.0	[0.3, 3.9]	0.337	11.0	[7.1, 16.8]	0.148	49.7	[42.1, 57.2]	0.910
Female	201	2.2	[0.9, 5.1]		6.8	[4.0, 11.1]		49.1	[42.1, 56.1]	
Breastfeeding Status										
Breastfed	287	1.2	[0.5, 3.2]	0.528	7.7	[5.1, 11.4]	0.154	56.0	[50.0, 61.8]	<0.001
Non-breastfed	87	2.1	[0.5, 8.0]		12.7	[7.1, 21.7]		27.6	[19.1, 38.1]	
Wealth Quintile										
Lowest	89	0.0	-		2.2	[0.5, 8.4]		37.8	[27.9, 48.7]	
Second	70	0.0	-		4.1	[1.3, 12.0]		49.4	[37.6, 61.3]	
Middle	83	0.0	-	0.004	3.8	[1.2, 11.3]	<0.001	52.2	[41.3, 63.0]	0.012
Fourth	62	2.8	[0.7, 10.5]		12.7	[6.4, 23.6]		43.0	[30.8, 56.1]	
Highest	72	6.5	[2.7, 14.7]		24.8	[15.6, 36.9]		66.5	[54.1, 76.9]	
Total[a]	**376**	**1.6**	**[0.8, 3.4]**		**8.8**	**[6.3, 12.1]**		**49.3**	**[44.1, 54.6]**	

Table 4.6: Consumption of Liquids Other Than Breastmilk the Day Preceding the Survey Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020 *(Continued)*

Characteristics	N	Sugar or Glucose Water			Gripe Water			Sugar-Salt Water (ORS)		
		%	[95% CI]	p- value	%	[95% CI]	p-value	%	[95% CI]	p- value
Location°										
Ouagadougou & Bobo Dioulasso	133	2.3	[0.7 , 6.8]		3.0	[1.1 , 7.8]		3.0	[1.1 , 7.8]	
Other cities	104	10.6	[5.9 , 18.2]	<0.001	1.0	[0.1 , 6.6]	0.530	2.9	[0.9 , 8.6]	0.352
Rural	139	0.0	-		2.9	[1.1 , 7.4]		0.7	[0.1 , 5.0]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	237	6.5	[3.9 , 10.7]	0.004	2.0	[0.8 , 4.7]	0.637	2.9	[1.4 , 6.1]	0.149
Rural°	139	0.0	-		2.9	[1.1 , 7.4]		0.7	[0.1 , 5.0]	
Age, months										
6-8	60	0.0	-		3.1	[0.8 , 11.7]		3.0	[0.7 , 11.2]	
9-11	70	1.3	[0.2 , 8.6]	0.080	2.6	[0.6 , 9.7]	0.894	1.3	[0.2 , 8.6]	0.875
12-17	128	7.2	[3.7 , 13.7]		1.5	[0.4 , 5.9]		2.6	[0.8 , 7.9]	
18-23	118	4.7	[2.0 , 10.9]		2.6	[0.8 , 7.8]		1.7	[0.4 , 6.9]	
Sex										
Male	175	7.7	[4.4 , 12.9]	0.004	2.8	[1.1 , 6.5]	0.566	2.6	[1.0 , 6.7]	0.616
Female	201	1.2	[0.3 , 4.6]		1.9	[0.7 , 4.9]		1.8	[0.7 , 4.7]	
Breastfeeding Status										
Breastfed	287	4.0	[2.2 , 7.2]	0.726	3.0	[1.5 , 5.6]	0.102	2.5	[1.2 , 5.2]	0.403
Non-breastfed	87	4.9	[1.8 , 12.6]		0.0	-		1.0	[0.1 , 7.1]	
Wealth Quintile										
Lowest	89	0.0	-		0.0	-		0.0	-	
Second	70	3.4	[0.8 , 12.5]		2.7	[0.7 , 10.3]		1.4	[0.2 , 9.1]	
Middle	83	5.5	[2.1 , 13.9]	0.093	4.7	[1.8 , 11.8]	0.298	2.4	[0.6 , 9.4]	0.213
Fourth	62	9.5	[4.0 , 20.7]		1.4	[0.2 , 9.2]		1.9	[0.3 , 12.4]	
Highest	72	3.9	[1.3 , 11.4]		2.6	[0.6 , 9.9]		5.7	[2.1 , 14.4]	
Total[a]	**376**	**4.2**	**[2.5 , 6.9]**		**2.3**	**[1.2 , 4.4]**		**2.2**	**[1.1 , 4.3]**	

Table 4.6: Consumption of Liquids Other Than Breastmilk the Day Preceding the Survey Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020 *(Continued)*

Characteristics	N	Fruit Juice			Tea			Honey			Yoghurt		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°													
Ouagadougou & Bobo Dioulasso	133	15.8	[10.3 , 23.5]		3.8	[1.6 , 8.8]		2.3	[0.7 , 6.8]		9.8	[5.7 , 16.2]	
Other cities	104	7.7	[3.9 , 14.6]	0.005	5.8	[2.6 , 12.3]	0.698	0.0	-	0.072	4.8	[2.0 , 11.1]	0.003
Rural	139	4.3	[1.9 , 9.3]		5.8	[2.9 , 11.1]		0.0	-		0.7	[0.1 , 5.0]	
Residence													
Urban [Ouagadougou. Bobo Dioulasso & Other cities]	237	11.6	[8.1 , 16.4]	0.012	4.8	[2.7 , 8.5]	0.634	1.1	[0.4 , 3.4]	0.186	7.2	[4.6 , 11.3]	0.004
Rural°	139	4.3	[1.9 , 9.3]		5.8	[2.9 , 11.1]		0.0	-		0.7	[0.1 , 5.0]	
Age, months													
6-8	60	1.5	[0.2 , 9.9]		0.0	-		0.0	-		4.0	[1.0 , 14.6]	0.678
9-11	70	8.1	[3.3 , 18.6]	0.140	3.0	[0.7 , 11.5]	0.114	0.0	-	0.604	3.9	[1.3 , 11.6]	
12-17	128	10.3	[6.0 , 17.1]		5.8	[2.8 , 11.8]		1.4	[0.3 , 5.4]		3.9	[1.6 , 9.2]	
18-23	118	11.9	[7.3 , 18.9]		8.2	[4.4 , 14.7]		0.7	[0.1 , 5.1]		6.9	[3.7 , 12.8]	
Sex													
Male	175	11.1	[7.3 , 16.7]	0.191	5.3	[2.7 , 9.9]	0.917	0.5	[0.1 , 3.5]	0.647	6.1	[3.4 , 10.8]	0.300
Female	201	7.2	[4.3 , 11.9]		5.0	[2.7 , 9.2]		0.9	[0.2 , 3.5]		3.8	[1.9 , 7.5]	
Breastfeeding Status													
Breastfed	287	9.1	[6.3 , 13.1]	0.937	5.7	[3.5 , 9.2]	0.350	0.6	[0.2 , 2.4]	0.444	4.1	[2.3 , 7.2]	0.177
Non-breastfed	87	8.8	[4.4 , 16.8]		3.2	[1.0 , 9.7]		0.0	-		7.7	[3.7 , 15.4]	
Wealth Quintile													
Lowest	89	5.7	[2.4 , 13.2]		3.6	[1.1 , 10.6]		0.0	-		0.0	-	
Second	70	1.4	[0.2 , 9.1]		5.8	[2.2 , 14.3]		0.0	-		1.7	[0.2 , 11.1]	
Middle	83	6.3	[2.7 , 14.3]	0.002	6.1	[2.6 , 13.9]	0.883	0.0	-	0.204	4.2	[1.6 , 10.7]	0.003
Fourth	62	17.4	[9.5 , 29.7]		6.6	[2.5 , 16.6]		1.4	[0.2 , 9.4]		13.2	[6.6 , 24.6]	
Highest	72	16.9	[9.9 , 27.3]		3.9	[1.2 , 11.5]		2.6	[0.6 , 9.9]		7.8	[3.5 , 16.5]	
Total[a]	**376**	**9.0**	**[6.5 , 12.4]**		**5.1**	**[3.3 , 7.9]**		**0.7**	**[0.2 , 2.2]**		**4.9**	**[3.1 , 7.6]**	

ORS=Oral rehydration salts

Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the Don't know category were treated as missing values. One child was reported to drink bissap and is not included. All estimates account for complex sample design.

°All estimates account for weighting, except for stratification by location and rural residence.

P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.

[a]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

4.7 Types of Food Consumed by Children 6-23 Months and Minimum Dietary Diversity

Table 4.7 presents diverse food groups consumed by children 6-23 months during the previous day. Food made from grains, roots and tubers were commonly consumed (79%). Consumption of legumes and nuts was reported among 8% of the children. Consumption of fortified infant flour was not common (3%). Consumption of animal source foods was also less common, i.e., dairy products (8%), flesh foods (10%) and eggs (4%). Forty eight percent of the children consumed vitamin A rich fruits and vegetables and 46% consumed other fruits and vegetables.

Consumption of food made from grains, roots and tubers varied by age of child. The majority (91%) of children 18-23 months consumed food made from grains, roots and tubers compared to 84% among children 12-17 months, 71% among children 9-11 months and 56% among children 6-8 months. Consumption of legumes and nuts did not vary by any background characteristics. Consumption of fortified infant flour varied by location, residence and wealth quintiles. More children in Ouagadougou and Bobo Dioulasso (8%) consumed fortified infant flour compared to children in other cities (1%) and rural areas (1%). Four percent of children in urban areas consumed fortified infant flour. Consumption was higher among children in the highest wealth quintile (12%) compared to children in the lowest to fourth quintiles (0-1%).

Consumption of dairy products was higher in Ouagadougou and Bobo Dioulasso (14%) compared to other cities (10%) and rural areas (1%). Twelve percent of children in urban areas consumed dairy products. More male children (12%) consumed dairy products compared to female children (5%). More non-breastfed children (15%) consumed dairy products compared to breastfed children (5%). Consumption of dairy products was highest for the fourth wealth quintile (22%) and least for the lowest quintile (0%). Consumption of eggs varied by age of child and wealth quintiles. Consumption of eggs was highest (9%) for children 9-11 months and lowest for children 6-8 months (0%). Consumption of eggs also varied by wealth quintiles with the fourth and highest quintile reporting 9% and the lowest quintile reporting 1%. Consumption of dairy products varied by location, residence, sex of child, breastfeeding status and wealth quintile.

Consumption of vitamin A rich fruits and vegetables varied by age of child. Among children 18-23 months, 64% consumed vitamin A rich fruits and vegetables compared to 52%, 35% and 20% among children 12-17, 9-11 and 6-8 months, respectively. Consumption of other fruits and vegetables varied by location, residence, age and sex of the child. There were more children consuming other fruits and vegetables in Ouagadougou and Bobo Dioulasso (53%) compared to other cities (49%) and rural areas (37%). A total of 51% of children consumed other fruits and vegetables in urban areas. Among children 18-23 months, 58% consumed other fruits and vegetables compared to 54%, 38% and 14% among children 12-17, 9-11 and 6-8 months, respectively. More male children (52%) consumed other fruits and vegetables compared to female children (40%).

Annex 4.2 presents the new 2021 IYCF indicator for egg and/or flesh food consumption, and zero vegetable and fruit consumption among children 6-59 months.

Table 4.7 Consumption of Grains, Roots, Tubers, Legumes, Nuts, Fortified Infant Flour, Flesh Foods, Dairy Products, Eggs, Fruits and Vegetables the Day Preceding the Survey Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020[a]

Characteristics	N	Food Made From Grains, Roots and Tubers			Legumes and Nuts			Fortified Infant Flour[b]		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	133	76.7	[68.0 , 83.6]		9.0	[5.2 , 15.3]		7.5	[3.8 , 14.2]	
Other cities	104	76.9	[67.5 , 84.2]	0.255	10.6	[6.0 , 18.0]	0.248	1.0	[0.1 , 6.6]	0.002
Rural	139	84.2	[77.1 , 89.4]		5.0	[2.4 , 10.2]		0.7	[0.1 , 5.0]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	237	76.8	[70.6 , 82.0]	0.094	9.8	[6.6 , 14.4]	0.109	4.2	[2.2 , 7.7]	0.039
Rural°	139	84.2	[77.1 , 89.4]		5.0	[2.4 , 10.3]		0.7	[0.1 , 5.0]	
Age, months										
6-8	60	56.0	[42.9 , 68.4]		3.6	[0.9 , 13.6]		5.0	[1.6 , 14.6]	
9-11	70	70.5	[57.3 , 80.9]	<0.001	3.9	[1.3 , 11.6]	0.128	5.1	[1.6 , 15.5]	0.376
12-17	128	84.2	[76.7 , 89.6]		12.0	[7.3 , 19.1]		2.1	[0.7 , 6.5]	
18-23	118	91.2	[84.8 , 95.1]		8.6	[4.6 , 15.4]		1.5	[0.4 , 5.8]	
Sex										
Male	175	80.9	[74.3 , 86.2]	0.504	6.9	[3.9 , 11.9]	0.436	3.7	[1.6 , 8.3]	0.403
Female	201	78.2	[71.7 , 83.4]		9.2	[5.8 , 14.1]		2.2	[0.9 , 5.3]	
Breastfeeding Status										
Breastfed	287	79.0	[73.6 , 83.5]	0.486	7.3	[4.7 , 11.0]	0.252	2.9	[1.4 , 5.8]	0.898
Non-breastfed	87	82.6	[72.5 , 89.6]		11.1	[6.0 , 19.6]		3.1	[1.0 , 9.3]	
Wealth Quintile										
Lowest	89	86.6	[77.8 , 92.2]		9.6	[4.8 , 18.0]		1.4	[0.2 , 9.0]	
Second	70	79.1	[68.1 , 87.0]		6.1	[2.3 , 15.0]		1.4	[0.2 , 9.1]	
Middle	83	78.0	[67.3 , 85.9]	0.447	9.7	[4.9 , 18.2]	0.771	1.0	[0.1 , 7.0]	<0.001
Fourth	62	74.5	[61.1 , 84.5]		9.4	[4.2 , 19.7]		0.0	-	
Highest	72	76.9	[64.3 , 86.0]		5.2	[1.9 , 13.2]		11.7	[5.8 , 22.3]	
Total[d]	**376**	**79.4**	**[74.8 , 83.4]**		**8.1**	**[5.7 , 11.4]**		**2.9**	**[1.6 , 5.3]**	

Table 4.7 Consumption of Grains, Roots, Tubers, Legumes, Nuts, Fortified Infant Flour, Flesh Foods, Dairy Products, Eggs, Fruits and Vegetables the Day Preceding the Survey Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020[a] *(continued)*

Characteristics	N	Flesh Foods (Meat, Fish, Poultry, and Organ Meats)			Dairy Products			Eggs		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	133	12.8	[7.9 , 20.0]		14.3	[9.3 , 21.4]		4.5	[2.1 , 9.6]	
Other cities	104	6.7	[3.2 , 13.5]	0.299	9.6	[5.2 , 17.1]	0.001	5.8	[2.6 , 12.3]	0.338
Rural	139	9.4	[5.5 , 15.4]		1.4	[0.4 , 5.6]		2.2	[0.7 , 6.5]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	237	9.7	[6.5 , 14.2]	0.809	11.9	[8.3 , 16.7]	<0.001	5.2	[2.9 , 8.9]	0.166
Rural°	139	9.4	[5.5 , 15.4]		1.4	[0.4 , 5.6]		2.2	[0.7 , 6.5]	
Age, months										
6-8	60	2.0	[0.3 , 13.0]		3.5	[0.9 , 13.2]		0.0	-	
9-11	70	8.3	[3.7 , 17.6]	0.076	3.9	[1.3 , 11.5]	0.083	9.0	[4.1 , 18.5]	0.004
12-17	128	9.3	[5.5 , 15.4]		8.4	[4.5 , 14.9]		0.7	[0.1 , 4.8]	
18-23	118	14.3	[9.0 , 22.0]		12.7	[7.9 , 19.8]		6.9	[3.5 , 13.4]	
Sex										
Male	175	11.6	[7.7 , 17.2]	0.201	12.3	[8.1 , 18.2]	0.005	4.7	[2.3 , 9.1]	0.605
Female	201	7.8	[4.8 , 12.4]		4.6	[2.5 , 8.2]		3.6	[1.7 , 7.4]	
Breastfeeding Status										
Breastfed	287	7.8	[5.2 , 11.5]	0.097	6.2	[3.9 , 9.6]	0.009	4.3	[2.4 , 7.4]	0.797
Non-breastfed	87	13.7	[7.9 , 22.7]		15.2	[9.0 , 24.6]		3.6	[1.1 , 10.8]	
Wealth Quintile										
Lowest	89	9.0	[4.6 , 17.0]		0.0	-		1.1	[0.2 , 7.5]	
Second	70	11.3	[5.4 , 22.0]		1.4	[0.2 , 9.1]		1.4	[0.2 , 9.1]	
Middle	83	3.6	[1.2 , 10.8]	0.144	4.6	[1.7 , 11.7]	<0.001	2.2	[0.5 , 8.2]	0.019
Fourth	62	9.4	[4.2 , 19.7]		21.7	[13.0 , 34.0]		8.5	[3.5 , 19.1]	
Highest	72	16.1	[9.3 , 26.4]		17.8	[10.5 , 28.6]		9.2	[4.2 , 19.0]	
Total[d]	**376**	**9.6**	**[6.9 , 13.0]**		**8.2**	**[5.8 , 11.4]**		**4.1**	**[2.5 , 6.7]**	

Table 4.7 Consumption of Grains, Roots, Tubers, Legumes, Nuts, Fortified Infant Flour, Flesh Foods, Dairy Products, Eggs, Fruits and Vegetables the Day Preceding the Survey Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020[a] *(continued)*

Characteristics	N	Vitamin A Rich Fruits and Vegetables[c]			Other Fruits and Vegetables		
		%	[95% CI]	p-value	%	[95% CI]	p-value
Location°							
Ouagadougou & Bobo Dioulasso	133	42.1	[33.5 , 51.2]		53.4	[44.6 , 62.0]	
Other cities	104	46.2	[36.7 , 55.9]	0.161	49.0	[39.6 , 58.5]	0.019
Rural	139	54.0	[45.2 , 62.5]		36.7	[28.9 , 45.2]	
Residence							
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	237	44.2	[37.7 , 50.9]	0.071	51.2	[44.6 , 57.6]	0.007
Rural°	139	54.0	[45.2 , 62.5]		36.7	[29.0 , 45.2]	
Age, months							
6-8	60	20.1	[11.6 , 32.4]		14.3	[7.5 , 25.5]	
9-11	70	34.5	[24.0 , 46.7]	<0.001	37.5	[27.0 , 49.5]	<0.001
12-17	128	52.2	[43.3 , 60.9]		53.9	[45.1 , 62.4]	
18-23	118	64.3	[55.1 , 72.5]		58.3	[49.0 , 67.0]	
Sex							
Male	175	44.8	[37.5 , 52.4]	0.304	52.4	[44.8 , 59.9]	0.022
Female	201	50.2	[43.0 , 57.3]		40.4	[33.7 , 47.4]	
Breastfeeding Status							
Breastfed	287	45.4	[39.5 , 51.4]	0.112	45.5	[39.7 , 51.4]	0.723
Non-breastfed	87	55.4	[44.6 , 65.8]		47.6	[37.5 , 58.0]	
Wealth Quintile							
Lowest	89	48.5	[37.7 , 59.4]		32.9	[23.6 , 43.7]	
Second	70	61.4	[49.3 , 72.2]		47.4	[36.1 , 59.0]	
Middle	83	46.1	[35.1 , 57.4]	0.091	51.8	[40.8 , 62.7]	0.093
Fourth	62	44.4	[32.2 , 57.2]		49.5	[37.3 , 61.8]	
Highest	72	37.4	[26.7 , 49.4]		50.8	[39.0 , 62.6]	
Total[d]	**376**	**47.7**	**[42.4 , 53.0]**		**46.0**	**[40.9 , 51.1]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]The new 2021 World Health Organization and the United Nations Children's Fund indicators for egg and/or flesh food consumption and zero vegetable and fruit consumption are presented among children 6-59 months old in Annex 4.2.
[b]Misola, Vita casui, Vitaline, Bledina, Phosphatine, Cerelac, Corn Soy Blend +, and Corn Soy Blend ++.
[c]Included red palm oil as per the 2008 World Health Organization indicators for assessing infant and young child feeding practices (WHO, 2008).
[d]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Minimum dietary diversity (MDD) assesses whether children are fed with a variety of foods to meet their nutrient needs. Poor dietary diversity is associated with poor linear growth and increased risk of micronutrient deficiencies. MDD is defined as the proportion of children 6-23 months of age who consumed foods from 4 or more out of seven food groups (WHO, 2008). The seven food groups are: (i) grains, roots and tubers, (ii) legumes and nuts, (iii) dairy products (milk, yoghurt and cheese), (iv) flesh foods (meat, fish, poultry and liver/organ meat), (v) eggs, (vi) vitamin-A rich fruits and vegetables, and (vii) other fruits and vegetables.

Table 4.8 shows the number of food groups consumed among all children 6-23 months the day preceding the survey. Nationally, children 6-23 months consumed a median (IQR) of 1.6 (0.6, 2.5) food groups. Children in Ouagadougou and Bobo Dioulasso consumed a median (IQR) of 1.8 (0.6, 2.8) food groups, children in other cities consumed 1.7 (0.5, 2.6) food groups, and children in rural areas consumed 1.5 (0.7, 2.3) food groups. Children 6-11 months consumed a median (IQR) of 0.8 (0.0, 1.8) food groups, children 12-17 months consumed 1.9 (1.0, 2.7) food groups, and children 18-23 months consumed 2.1 (1.3, 2.8) food groups. Fourteen percent of children 6-23 months consumed none of the 7 groups (0 food groups). The majority of children (74%) consumed 1-3 food groups and this varied by residence with more children in rural areas consuming 1-3 food groups (80%) than children in urban areas (70%). Nationally, 12% of children 6-23 months consumed 4-6 food groups. The number of children who consumed 4-6 food groups varied by location, residence, age and wealth quintile. More children in Ouagadougou & Bobo Dioulasso (20%) consumed 4-6 food groups compared to 12% and 7% in other cities and rural areas, respectively. Fifteen percent of the children in urban areas consumed 4-6 food groups. Seventeen percent of children 18-23 months consumed 4-6 food groups compared to 15% and 4% among children 12-17 and 6-11 months, respectively. Consumption of 4-6 food groups was highest for the highest quintile (21%) and lowest for the lowest quintile (5%). Less than 0.5% consumed all the 7 food groups.

Table 4.9 shows the minimum dietary diversity among all children 6-23 months (2008 indicator). Nationally, 13% of children consumed a diet that met the MDD. More children in Ouagadougou & Bobo Dioulasso (20%) met the MDD compared to children in other cities (13%) and rural areas (7%). The percentage of children who met the MDD was 16% in urban areas. More older children (18-23 months) met the MDD (18%) compared to children 12-17 months (15%) and children 6-11 months (4%). The percentage of children 6-23 months who met the MDD was higher for the fourth and the highest wealth quintile (21%) and lowest for the lowest quintile (5%).

Table 4.8 Number of Food Groups Consumed the Day Preceding the Survey Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Number of Food Groups Consumed[a, b]							
		Median	IQR	1-3 Food Groups			4-6 Food Groups		
				%	[95% CI]	p-value	%	[95% CI]	p-value
Location°									
Ouagadougou & Bobo Dioulasso	133	1.8	[0.6 , 2.8]	70.7	[62.2 , 78.0]		19.5	[13.6 , 27.3]	
Other cities	104	1.7	[0.5 , 2.6]	70.2	[61.0 , 78.0]	0.135	11.5	[6.7 , 19.2]	0.005
Rural	139	1.5	[0.7 , 2.3]	79.9	[72.3 , 85.8]		6.5	[3.4 , 12.0]	
Residence									
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	237	1.7	[0.6 , 2.7]	70.4	[64.2 , 76.0]	0.047	15.4	[11.4 , 20.6]	0.007
Rural°	139	1.5	[0.7 , 2.3]	79.9	[72.3 , 85.8]		6.5	[3.4 , 12.0]	
Age, months									
6-11	130	0.8	[0.0 , 1.8]	71.0	[62.6 , 78.2]		4.4	[2.0 , 9.5]	
12-17	128	1.9	[1.0 , 2.7]	73.1	[64.5 , 80.2]	0.490	15.3	[10.0 , 22.7]	0.003
18-23	118	2.1	[1.3 , 2.8]	77.6	[69.1 , 84.3]		17.4	[11.6 , 25.4]	
Sex									
Male	175	1.7	[0.6 , 2.6]	70.3	[63.1 , 76.7]	0.163	14.3	[9.9 , 20.2]	0.256
Female	201	1.5	[0.6 , 2.4]	76.8	[70.3 , 82.2]		10.4	[6.9 , 15.6]	
Breastfeeding Status									
Breastfed	287	1.5	[0.5 , 2.5]	74.6	[69.3 , 79.3]	0.440	10.8	[7.7 , 14.9]	0.101
Non-breastfed	87	1.9	[1.1 , 2.7]	70.4	[59.7 , 79.2]		17.5	[10.7 , 27.2]	
Wealth Quintile									
Lowest	89	1.4	[0.6 , 2.2]	82.8	[73.3 , 89.4]		4.9	[1.8 , 12.4]	
Second	70	1.8	[0.7 , 2.6]	73.1	[61.5 , 82.2]		11.5	[5.9 , 21.3]	
Middle	83	1.6	[0.5 , 2.5]	74.5	[64.1 , 82.8]	0.189	8.0	[3.8 , 16.1]	0.009
Fourth	62	1.6	[0.7 , 2.8]	67.9	[54.8 , 78.6]		19.3	[11.1 , 31.4]	
Highest	72	2.0	[0.5 , 2.9]	67.4	[55.8 , 77.2]		21.3	[13.3 , 32.2]	
Total[c]	**376**	**1.6**	[0.6 , 2.5]	**73.8**	**[69.1 , 78.0]**		**12.2**	**[9.3 , 15.9]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a] The seven food groups are: (i) grains, roots and tubers, (ii) legumes and nuts, (iii) dairy products (milk, yoghurt and cheese), (iv) flesh foods (meat, fish, poultry and liver/organ meat), (v) eggs, (vi) vitamin-A rich fruits and vegetables, and (vii) other fruits and vegetables.
[b] A total of 14% of children 6-23 months consumed none of the 7 food groups, among whom 17% lived in Other cities, 14% lived in Rural areas, and 10% lived in Ouagadougou & Bobo-Dioulasso. Among these 50 children 6-23 months, breast milk, plain or gripe water, fruit juice, tea with sugar, sweetened beverages, other drinks, sugary foods, ready-to-use therapeutic foods, condiments and seasonings, or foods made at home with salt, wheat flour, vegetable oil, or bouillon were reported. Only 0.3% of children 6-23 months consumed the 7 food groups, among whom 1% lived in Other cities and 0% lived in Ouagadougou & Bobo Dioulasso and Rural areas.
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Table 4.9 Minimum Dietary Diversity Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Minimum Dietary Diversity[a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	133	19.5	[13.6 , 27.3]	0.006
Other cities	104	12.5	[7.4 , 20.3]	
Rural	139	6.5	[3.4 , 12.0]	
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	237	15.9	[11.8 , 21.2]	0.006
Rural°	139	6.5	[3.4 , 12.0]	
Age, months				
6-11	130	4.4	[2.0 , 9.5]	0.002
12-17	128	15.3	[10.0 , 22.7]	
18-23	118	18.4	[12.4 , 26.5]	
Sex				
Male	175	15.0	[10.4 , 21.0]	0.188
Female	201	10.4	[6.9 , 15.6]	
Breastfeeding status				
Breastfed	287	11.2	[8.1 , 15.4]	0.128
Non-breastfed	87	17.5	[10.7 , 27.2]	
Wealth Quintile				
Lowest	89	4.9	[1.8 , 12.4]	0.005
Second	70	11.5	[5.9 , 21.3]	
Middle	83	8.0	[3.8 , 16.1]	
Fourth	62	21.2	[12.6 , 33.6]	
Highest	72	21.3	[13.3 , 32.2]	
Total[b]	**376**	**12.6**	**[9.6 , 16.3]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Indicator is based on the 2008 World Health Organization indicators for assessing infant and young child feeding practices (WHO, 2008). Minimum dietary diversity: proportion of children who receive foods from 4 or more food groups during the previous day. The seven food groups were: (i) grains, roots and tubers; (ii) legumes and nuts; (iii) dairy products (yogurt, cheese); (iv) flesh foods (meat, fish, poultry and liver/organ meats); (v) eggs; (vi) vitamin A rich fruits and vegetables; and (vii) other fruits and vegetables.
[b]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

4.8 Types of Food Consumed by Children 24-59 Months

Nationally, 94% of children 24-59 months consumed foods made from grains, roots and tubers (**Table 4.10**). Consumption of legumes and nuts was much lower at 14% and consumption of fortified infant flour was below 1%. About 1 in every 5 children (23%) consumed flesh foods, and 11% and 7% consumed dairy products and eggs, respectively. Sixty-seven and 64% consumed vitamin A rich fruits and vegetables and other fruits and vegetables, respectively.

Consumption of grains, roots and tubers varied by location and residence. Consumption of grains, roots and tubers was highest for other cities (97%) compared to 96% in rural areas and 87% in Ouagadougou & Bobo Dioulasso. Consumption of grains, roots and tubers was at 92% in urban areas. Consumption of fortified infant flour varied by residence only. Only 1% of children in urban areas consumed fortified infant flour compared to 0% of children in rural areas. Consumption of legumes and nuts did not vary by any background characteristics.

Consumption of dairy products, flesh foods, and eggs varied by location, residence, and wealth quintile. Consumption of dairy products was highest in Ouagadougou & Bobo Dioulasso (20%) compared to 12% in other cities and 3% in rural areas. Consumption of flesh foods and eggs by location followed a similar pattern as dairy products with the highest consumption in Ouagadougou & Bobo Dioulasso (32% and 12%, respectively) and the lowest consumption in rural areas (16% and 2%, respectively). Consumption of dairy products and eggs in urban areas was around 5 times that of rural areas (16% versus 3% and 10% versus 2%, respectively). Similarly, more children in urban areas consumed flesh foods than in rural areas (27% versus 16%). Consumption of dairy products, flesh foods, and eggs increased by wealth quintile. Two percent of children in the lowest quintile consumed dairy products compared to 7% in the middle and 29% in the highest quintiles. Eight percent of children in the lowest quintile consumed flesh foods compared to 25% for the middle and 37% for the highest quintiles. Three percent of children in the lowest quintile consumed eggs compared to 4% for the middle and 19% for the highest quintiles.

Consumption of vitamin A rich fruits and vegetables varied by location only. Consumption of vitamin A rich fruits and vegetables was higher in other cities and rural areas (70%) compared to Ouagadougou & Bobo Dioulasso (59%). Consumption of other fruits and vegetables varied by location, residence, sex of the child, and wealth quintile. More children in Ouagadougou & Bobo Dioulasso (71%) and other cities (70%) consumed other fruits and vegetables compared to 54% in rural areas. Consumption of other fruits and vegetables was also higher in urban (70%) compared to rural areas (54%). Furthermore, consumption of other fruits and vegetables was higher among males (67%) compared to females (61%). Consumption of other fruits and vegetables was highest for the middle quintile (78%) and lowest for the lowest quintile (42%).

Annex 4.2 presents the new 2021 IYCF indicator for egg and/or flesh food consumption, and zero vegetable and fruit consumption among children 6-59 months.

Table 4.10 Consumption of Grains, Roots, Tubers, Legumes, Nuts, Fortified Infant Flour, Flesh Foods, Dairy Products, Eggs, Fruits and Vegetables the Day Preceding the Survey Among Children 24-59 Months, Burkina Faso National Micronutrient Survey[a], 2020

Characteristics	N	Food Made From Grains, Roots and Tubers			Legumes and Nuts			Fortified Infant Flour [b]		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	289	86.9	[81.0 , 91.1]		12.1	[8.5 , 16.9]		1.0	[0.3 , 3.2]	
Other cities	233	96.6	[93.3 , 98.3]	<0.001	15.9	[11.4 , 21.7]	0.491	1.3	[0.4 , 3.9]	0.129
Rural	349	96.3	[93.8 , 97.8]		14.9	[11.2 , 19.5]		0.0	-	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	522	91.9	[88.7 , 94.3]	0.005	14.1	[11.1 , 17.8]	0.676	1.2	[0.5 , 2.6]	0.047
Rural°	349	96.3	[93.8 , 97.8]		14.9	[11.2 , 19.5]		0.0	-	
Age, months										
24-35	297	92.3	[88.7 , 94.9]		15.4	[11.6 , 20.3]		1.4	[0.5 , 3.7]	
36-47	277	93.1	[89.3 , 95.6]	0.244	13.6	[9.8 , 18.4]	0.808	0.3	[0.0 , 2.2]	0.243
48-59	297	95.4	[92.3 , 97.2]		14.1	[10.6 , 18.7]		0.4	[0.1 , 2.8]	
Sex										
Male	456	93.1	[90.0 , 95.3]	0.541	14.7	[11.7 , 18.4]	0.763	0.9	[0.3 , 2.4]	0.489
Female	415	94.1	[91.4 , 96.1]		14.0	[10.8 , 18.0]		0.5	[0.1 , 2.0]	
Wealth Quintile										
Lowest	199	96.3	[92.6 , 98.2]		15.6	[10.8 , 22.0]		0.0	-	
Second	191	91.4	[84.2 , 95.4]		11.7	[7.7 , 17.2]		1.2	[0.3 , 4.8]	
Middle	185	95.3	[90.5 , 97.7]	0.294	18.8	[13.0 , 26.3]	0.142	0.0	-	0.153
Fourth	148	91.8	[86.0 , 95.3]		15.9	[10.5 , 23.4]		0.6	[0.1 , 4.1]	
Highest	148	92.4	[86.6 , 95.9]		8.8	[5.0 , 15.2]		2.1	[0.7 , 6.5]	
Total[c]	**871**	**93.6**	**[91.5 , 95.2]**		**14.4**	**[12.0 , 17.2]**		**0.7**	**[0.3 , 1.6]**	

Table 4.10 Consumption of Grains, Roots, Tubers, Legumes, Nuts, Fortified Infant Flour, Flesh Foods, Dairy Products, Eggs, Fruits and Vegetables the Day Preceding the Survey Among Children 24-59 Months, Burkina Faso National Micronutrient Survey, 2020[a] *(continued)*

Characteristics	N	Flesh Foods (Meat, Fish, Poultry, and Organ Meats)			Dairy Products			Eggs		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	289	31.8	[26.3 , 37.9]		20.1	[15.5 , 25.5]		11.8	[8.5 , 16.1]	
Other cities	233	22.7	[17.3 , 29.3]	<0.001	12.4	[8.7 , 17.5]	<0.001	8.6	[5.5 , 13.2]	<0.001
Rural	349	15.8	[11.8 , 20.7]		3.2	[1.7 , 5.6]		1.7	[0.8 , 3.8]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	522	27.1	[23.1 , 31.5]	<0.001	16.1	[13.1 , 19.7]	<0.001	10.1	[7.7 , 13.1]	<0.001
Rural°	349	15.8	[11.8 , 20.7]		3.2	[1.7 , 5.6]		1.7	[0.8 , 3.8]	
Age, months										
24-35	297	25.2	[20.4 , 30.7]		13.2	[9.8 , 17.5]		7.2	[4.8 , 10.7]	
36-47	277	22.1	[17.5 , 27.4]	0.401	10.6	[7.3 , 15.2]	0.353	8.2	[5.5 , 12.2]	0.358
48-59	297	20.8	[16.4 , 26.0]		9.5	[6.6 , 13.3]		5.3	[3.2 , 8.5]	
Sex										
Male	456	23.7	[19.9 , 28.1]	0.453	12.6	[9.8 , 16.0]	0.154	6.5	[4.5 , 9.1]	0.631
Female	415	21.6	[17.7 , 26.1]		9.5	[6.9 , 12.8]		7.3	[5.1 , 10.4]	
Wealth Quintile										
Lowest	199	8.1	[4.8 , 13.4]		1.5	[0.5 , 4.5]		2.6	[1.1 , 6.1]	
Second	191	19.4	[14.0 , 26.4]		5.7	[3.1 , 10.4]		3.2	[1.5 , 6.8]	
Middle	185	24.6	[17.6 , 33.1]	<0.001	7.4	[4.4 , 12.2]	<0.001	4.3	[1.9 , 9.3]	<0.001
Fourth	148	30.7	[23.3 , 39.2]		18.9	[13.4 , 26.1]		8.8	[5.1 , 14.7]	
Highest	148	36.6	[29.0 , 45.0]		28.6	[21.4 , 37.2]		19.4	[13.6 , 26.9]	
Total[c]	**871**	**22.7**	**[19.8 , 26.0]**		**11.1**	**[9.1 , 13.4]**		**6.9**	**[5.3 , 8.8]**	

Table 4.10 Consumption of Grains, Roots, Tubers, Legumes, Nuts, Fortified Infant Flour, Flesh Foods, Dairy Products, Eggs, Fruits and Vegetables the Day Preceding the Survey Among Children 24-59 Months, Burkina Faso National Micronutrient Survey, 2020[a] *(continued)*

Characteristics	N	Vitamin A Rich Fruits and Vegetables			Other Fruits and Vegetables		
		%	[95% CI]	p-value	%	[95% CI]	p-value
Location°							
Ouagadougou & Bobo Dioulasso	289	59.2	[53.1 , 64.9]		70.9	[64.7 , 76.5]	
Other cities	233	69.5	[62.8 , 75.5]	0.022	70.0	[63.4 , 75.8]	<0.001
Rural	349	69.6	[63.6 , 75.1]		53.6	[47.5 , 59.6]	
Residence							
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	522	64.6	[60.1 , 68.8]	0.119	70.4	[65.9 , 74.6]	<0.001
Rural°	349	69.6	[63.6 , 75.1]		53.6	[47.5 , 59.6]	
Age, months							
24-35	297	64.4	[58.5 , 69.9]		63.5	[57.6 , 68.9]	
36-47	277	67.3	[61.4 , 72.7]	0.612	59.5	[53.5 , 65.3]	0.083
48-59	297	68.0	[62.3 , 73.1]		68.4	[62.6 , 73.7]	
Sex							
Male	456	68.0	[63.5 , 72.2]	0.325	67.0	[62.3 , 71.3]	0.044
Female	415	64.9	[59.9 , 69.6]		60.5	[55.4 , 65.4]	
Wealth Quintile							
Lowest	199	62.8	[54.3 , 70.6]		42.0	[34.5 , 50.0]	
Second	191	68.0	[60.4 , 74.8]		56.7	[48.8 , 64.3]	
Middle	185	72.8	[65.3 , 79.2]	0.310	77.5	[70.4 , 83.3]	<0.001
Fourth	148	64.1	[56.1 , 71.5]		76.0	[67.9 , 82.7]	
Highest	148	63.6	[54.8 , 71.5]		72.8	[65.0 , 79.4]	
Total[c]	**871**	**66.5**	**[63.0 , 69.9]**		**63.9**	**[60.3 , 67.4]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]The new 2021 World Health Organization and the United Nations Children's Fund indicators for egg and/or flesh food consumption and zero vegetable and fruit consumption are presented among children 6-59 months old in Annex 4.2.
[b]Misola, Vita casui, Vitaline, Bledina, Phosphatine, Cerelac, Corn Soy Blend +, and Corn Soy Blend ++.
[c]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Table 4.11 presents the number of food groups consumed among all children 24-59 months of age the day preceding the survey. The median (IQR number of food groups consumed by children of this age was 2.4 (1.5, 3.1). Children in Ouagadougou and Bobo Dioulasso consumed a median (IQR) of 2.6 (1.6, 3.5) food groups, children in other cities consumed 2.5 (1.7, 3.3) food groups, and children in rural areas consumed 2.1 (1.3, 2.8) food groups. Nationally, 2% of children 24-59 months consumed none of the 7 food groups (0 food groups). None of the children 24-59 months of age consumed all 7 food groups.

The majority (71%) of children 24-59 months consumed 1-3 food groups. The proportion of children who consumed 1-3 food groups varied by location, residence, and wealth quintile. The proportion of children consuming 1-3 food groups was highest in rural areas (83%) compared to 68% for other cities and 58% for Ouagadougou & Bobo Dioulasso. A total of 63% of children in urban areas consumed 1-3 food groups. The proportion of children who consumed 1-3 food groups was highest for the lowest quintile (89%) and lowest for the highest wealth quintile (54%).

Nationally, 27% of children 24-59 months consumed 4-6 food groups. The proportion of children who consumed 4-6 food groups varied by location, residence, and wealth quintile. Consumption of 4-6 food groups was highest for Ouagadougou & Bobo Dioulasso (38%) compared to 31% for other cities and 16% for rural areas. A total of 34% of children consumed 4-6 food groups in urban areas. Forty four percent of the children consumed 4-6 food groups in the highest wealth quintile compared to 30% in the middle and 10% in the lowest quintile.

Table 4.11 Number of Food Groups Consumed the Day Preceding the Survey Among Children 24-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Number of Food Groups Consumed[a, b]							
		Median	IQR	1-3 Food Groups			4-6 Food Groups		
				%	[95% CI]	p-value	%	[95% CI]	p-value
Location°									
Ouagadougou & Bobo Dioulasso	289	2.6	[1.6 , 3.5]	57.8	[51.6 , 63.7]		37.7	[31.9 , 43.9]	
Other cities	233	2.5	[1.7 , 3.3]	67.8	[61.2 , 73.8]	<0.001	31.3	[25.4 , 38.0]	<0.001
Rural	349	2.1	[1.3 , 2.8]	82.5	[77.5 , 86.6]		15.8	[11.8 , 20.8]	
Residence									
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	522	2.5	[1.6 , 3.4]	63.0	[58.5 , 67.3]	<0.001	34.4	[30.2 , 38.9]	<0.001
Rural°	349	2.1	[1.3 , 2.8]	82.5	[77.5 , 86.6]		15.8	[11.8 , 20.8]	
Age, months									
24-35	297	2.4	[1.4 , 3.3]	65.2	[59.5 , 70.4]		30.4	[25.3 , 36.1]	
36-47	277	2.3	[1.4 , 3.0]	73.2	[67.6 , 78.2]	0.041	25.1	[20.3 , 30.5]	0.289
48-59	297	2.4	[1.5 , 3.0]	73.5	[68.0 , 78.4]		25.9	[21.0 , 31.4]	
Sex									
Male	456	2.4	[1.5 , 3.2]	68.9	[64.4 , 73.1]	0.275	29.0	[24.9 , 33.5]	0.207
Female	415	2.3	[1.4 , 3.0]	72.4	[67.6 , 76.7]		25.2	[21.0 , 29.8]	
Wealth Quintile									
Lowest	199	1.8	[1.1 , 2.5]	89.0	[83.9 , 92.6]		9.5	[6.1 , 14.4]	
Second	191	2.2	[1.3 , 2.9]	76.6	[69.9 , 82.2]		19.5	[14.3 , 26.0]	
Middle	185	2.5	[1.9 , 3.2]	68.3	[59.7 , 75.8]	<0.001	30.4	[23.0 , 39.0]	<0.001
Fourth	148	2.7	[1.7 , 3.6]	56.9	[49.0 , 64.5]		40.5	[32.9 , 48.5]	
Highest	148	2.8	[2.0 , 3.7]	54.1	[45.4 , 62.5]		44.0	[35.7 , 52.7]	
Total[c]	**871**	**2.4**	**[1.5 , 3.1]**	**70.6**	**[67.3 , 73.7]**		**27.2**	**[24.1 , 30.5]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a] The seven food groups are: (i) grains, roots and tubers, (ii) legumes and nuts, (iii) dairy products (milk, yoghurt and cheese), (iv) flesh foods (meat, fish, poultry and liver/organ meat), (v) eggs, (vi) vitamin-A rich fruits and vegetables, and (vii) other fruits and vegetables.
[b] A total of 2% of children 24-59 months consumed none of the 7 food groups, among whom 5% lived in Ouagadougou & Bobo-Dioulasso, 2% lived in Rural areas, and 1% lived in Other cities. Among these 21 children 24-59 months, breast milk, plain water, sugar-salt water solution, fruit juice, tea, sweetened beverages, sugary foods, condiments and seasonings, oils or fats, or foods made at home with salt, wheat flour, vegetable oil, or bouillon were reported. None of the children 24-59 months consumed the 7 food groups.
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

4.9 Consumption of Foods Rich in Vitamin A Among Children 6-59 Months

Table 4.12 shows 68% of all children 6-59 months consumed foods rich in vitamin A the day preceding the survey, including meat, organ meat, fish, poultry, eggs, vitamin A-rich fruits and vegetables, and red palm oil.

Consumption of vitamin A rich foods varied by age of the children. It was more than double for children 24-35 months (72%), 36-47 months (76%) and 48-59 months (75%) compared to children 6-11 months (35%). Consumption of vitamin A rich foods was also higher for children 24-59 months (74%) compared to children 6-23 months of age (53%). Consumption of foods rich in vitamin A did not vary by any other background characteristics.

Table 4.12 Consumption of Foods Rich in Vitamin A the Day Preceding the Survey Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Foods Rich in Vitamin A[a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	422	65.2	[60.3 , 69.8]	
Other cities	337	67.1	[61.5 , 72.2]	0.381
Rural	488	69.9	[64.8 , 74.5]	
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	66.1	[62.5 , 69.7]	0.214
Rural°	488	69.9	[64.8 , 74.5]	
Age, months				
6-11	130	35.1	[27.3 , 43.7]	
12-17	128	56.5	[47.6 , 65.0]	
18-23	118	67.3	[58.2 , 75.3]	<0.001
24-35	297	71.5	[65.8 , 76.7]	
36-47	277	75.5	[69.9 , 80.4]	
48-59	297	75.1	[69.7 , 79.9]	
6-23	376	52.6	[47.4 , 57.7]	<0.001
24-59	871	74.0	[70.6 , 77.2]	
Sex				
Male	631	68.8	[64.9 , 72.4]	0.354
Female	616	66.3	[62.1 , 70.2]	
Breastfeeding Status [b]				
Breastfed	287	50.6	[44.7 , 56.4]	0.201
Non-breastfed	87	58.6	[47.7 , 68.6]	
Wealth Quintile				
Lowest	288	62.5	[55.8 , 68.8]	
Second	261	69.7	[63.2 , 75.5]	
Middle	268	70.5	[64.0 , 76.2]	0.394
Fourth	210	68.2	[61.2 , 74.4]	
Highest	220	67.2	[60.3 , 73.5]	
Total[c]	**1,247**	**67.6**	**[64.6 , 70.4]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a] Includes meat, organ meat, fish, poultry, eggs, vitamin A-rich fruits and vegetables, and red palm oil.
[b] Breastfeeding stratification is indicated for children 6-23 months only.
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

4.10 Consumption of Specific Foods and Beverages Among Children 6-59 Months

Table 4.13 presents findings on the consumption of specific foods and beverages among children 6-59 months. Nationally, 61% of children 6-59 months consumed condiments and seasonings such as fish powder, bouillon cubes, tomato paste, etc. Consumption of condiments and seasonings varied by location and age of the child. Consumption of condiments and seasonings was higher in other cities (66%) compared to rural areas (64%) and Ouagadougou & Bobo Dioulasso (52%). Almost half (49%) of children 6-23 months consumed condiments and seasonings compared to 66% of children 24-59 months.

Thirty three percent and 41% of children 6-59 months consumed sugary foods (i.e., candy, sugar, honey, chocolates, sweet biscuits/cookies, etc.) and sweetened beverages (i.e., sugar water, fruit juice, tea with sugar, bissap, zoomkom, ginger, soda drinks, carbonated drinks, whether they were homemade or purchased), respectively. Consumption of sugary foods and sweetened beverages varied by location, residence, age of the child, and wealth quintiles. Consumption of sugary foods was highest in Ouagadougou & Bobo Dioulasso (42%) compared to other cities (36%) and rural areas (25%). Thirty nine percent of children in urban areas consumed sugary foods. More children 24-59 months (35%) consumed sugary foods compared to 29% of children 6-23 months. Consumption of sugary foods was highest in the highest wealth quintile at 51% compared to 30% for the middle and 24% for the lowest wealth quintiles. Consumption of sweetened beverages showed similar patterns as sugary foods. Consumption of sweetened beverages was highest in Ouagadougou & Bobo Dioulasso (55%) compared to other cities (44%) and rural areas (27%). Forty nine percent of children in urban areas consumed sweetened beverages. More children 24-59 months (46%) consumed sweetened beverages compared to children 6-23 months (30%). Consumption of sweetened beverages was highest for the highest wealth quintile at 61% compared to 45% for the middle and 22% for the lowest wealth quintiles.

Fourteen percent of children 6-59 months consumed tea with or without sugar. Consumption of tea among children 24-59 months was twice as high (16%) compared to children 6-23 months (8%).

Consumption was low for ready to use food supplements such as PLUMPY'SUP (1%) and ready to use therapeutic foods such as PLUMPY'NUT and F75 or F100 milk (2%). Consumption of ready to use therapeutic foods was higher (3%) among children 6-23 months compared to 1% among children 24-59 months.

Consumption of other protein sources such as snails, larvae, caterpillars, crickets, edible insects, etc, was also low (1%). Consumption of other protein sources was higher among males compared to females (1% versus 0.1%).

Table 4.13 Consumption of Specific Foods and Beverages the Day Preceding the Survey Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Ready-to-Use Food Supplements[a]			Ready-to-Use Therapeutic Foods[b]			Other Protein Sources[c]			Condiments and Seasonings[d]		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°													
Ouagadougou & Bobo Dioulasso	422	1.9	[1.0 , 3.7]		0.9	[0.4 , 2.5]		0.9	[0.4 , 2.5]		52.4	[46.8 , 57.9]	
Other cities	337	1.5	[0.6 , 3.5]	0.215	1.8	[0.8 , 3.9]	0.494	0.9	[0.3 , 2.7]	0.301	66.2	[60.6 , 71.3]	0.001
Rural	488	0.6	[0.2 , 1.9]		1.8	[1.0 , 3.5]		0.2	[0.0 , 1.4]		63.5	[58.5 , 68.3]	
Residence													
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	1.7	[1.0 , 2.9]	0.094	1.4	[0.7 , 2.6]	0.459	0.9	[0.4 , 1.9]	0.122	59.5	[55.6 , 63.4]	0.122
Rural°	488	0.6	[0.2 , 1.9]		1.8	[1.0 , 3.5]		0.2	[0.0 , 1.4]		63.5	[58.5 , 68.3]	
Age, months													
6-8	60	0.0	-		5.2	[1.7 , 15.2]		0.0	-		11.3	[5.4 , 22.1]	
9-11	70	2.6	[0.6 , 9.7]		2.7	[0.7 , 10.1]		0.0	-		46.8	[35.5 , 58.4]	
12-17	128	2.4	[0.8 , 7.4]		1.7	[0.4 , 6.6]		0.0	-		56.6	[48.0 , 64.9]	
18-23	118	2.5	[0.8 , 7.5]	0.470	2.4	[0.8 , 7.1]	0.202	0.7	[0.1 , 5.1]	0.887	60.1	[51.0 , 68.5]	<0.001
24-35	297	0.6	[0.2 , 2.5]		1.7	[0.7 , 4.1]		1.0	[0.3 , 3.1]		62.6	[56.8 , 68.2]	
36-47	277	1.2	[0.4 , 3.6]		0.8	[0.2 , 3.1]		0.7	[0.2 , 2.7]		68.1	[62.3 , 73.4]	
48-59	297	1.0	[0.3 , 3.1]		0.7	[0.2 , 2.9]		0.8	[0.2 , 3.2]		68.5	[62.7 , 73.7]	
6-23	376	2.1	[1.0 , 4.2]	0.098	2.6	[1.4 , 4.9]	0.045	0.2	[0.0 , 1.7]	0.209	48.7	[43.7 , 53.8]	<0.001
24-59	871	0.9	[0.5 , 1.9]		1.1	[0.6 , 2.1]		0.8	[0.4 , 1.7]		66.4	[62.7 , 69.8]	
Sex													
Male	631	1.1	[0.5 , 2.4]	0.663	1.5	[0.8 , 2.9]	0.864	1.1	[0.5 , 2.4]	**0.021**	60.3	[56.1 , 64.4]	0.605
Female	616	1.4	[0.7 , 2.7]		1.6	[0.9 , 3.0]		0.1	[0.0 , 1.0]		61.8	[57.6 , 65.8]	
Breastfeeding Status[g]													
Breastfed	287	1.8	[0.7 , 4.2]	0.397	2.5	[1.2 , 5.2]	0.699	0.0	-	0.064	50.8	[45.0 , 56.6]	0.142
Non-breastfed	87	3.2	[1.0 , 9.6]		3.2	[1.0 , 9.6]		1.0	[0.1 , 7.1]		41.6	[31.6 , 52.5]	
Wealth Quintile													
Lowest	288	0.0	-		1.7	[0.7 , 4.0]		0.0	-		56.9	[49.9 , 63.7]	
Second	261	2.2	[1.0 , 4.9]		1.5	[0.6 , 3.9]		1.7	[0.6 , 4.5]		61.3	[54.6 , 67.5]	
Middle	268	2.2	[1.0 , 4.9]	0.065	1.2	[0.4 , 3.6]	0.971	0.3	[0.0 , 2.2]	0.053	68.2	[61.9 , 73.9]	0.133
Fourth	210	1.4	[0.4 , 4.3]		2.0	[0.7 , 5.2]		0.0	-		59.4	[51.8 , 66.5]	
Highest	220	0.4	[0.1 , 3.0]		1.6	[0.5 , 4.8]		1.3	[0.4 , 3.9]		58.4	[50.9 , 65.6]	
Total[h]	**1,247**	**1.3**	**[0.8 , 2.1]**		**1.6**	**[1.0 , 2.4]**		**0.6**	**[0.3 , 1.3]**		**61.0**	**[57.9 , 64.1]**	

Table 4.13 Consumption of Specific Foods and Beverages the Day Preceding the Survey Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020 *(continued)*

Characteristics	N	Tea (With or Without Sugar)			Sugary Foods[e]			Sweetened Beverages[f]		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	422	14.2	[10.8 , 18.5]		41.5	[36.1 , 47.1]		54.5	[48.7 , 60.2]	
Other cities	337	13.7	[10.0 , 18.3]	0.884	35.9	[30.8 , 41.3]	<0.001	44.2	[38.7 , 49.9]	<0.001
Rural	488	12.9	[9.6 , 17.1]		25.0	[21.0 , 29.5]		27.0	[22.7 , 31.8]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	13.9	[11.3 , 17.0]	0.658	38.6	[34.9 , 42.5]	<0.001	49.2	[45.2 , 53.2]	<0.001
Rural°	488	12.9	[9.6 , 17.1]		25.0	[21.0 , 29.5]		27.0	[22.7 , 31.8]	
Age, months										
6-8	60	2.0	[0.3 , 12.9]		6.7	[2.5 , 16.8]		6.5	[2.4 , 16.2]	
9-11	70	3.0	[0.7 , 11.4]		29.7	[19.6 , 42.3]		19.5	[11.5 , 31.2]	
12-17	128	10.8	[6.5 , 17.5]		30.3	[22.9 , 38.8]		41.4	[33.0 , 50.2]	
18-23	118	11.8	[7.0 , 19.0]	0.003	38.6	[30.1 , 47.9]	0.001	35.7	[27.4 , 44.9]	<0.001
24-35	297	14.4	[10.7 , 19.2]		37.0	[31.6 , 42.9]		45.2	[39.4 , 51.0]	
36-47	277	14.8	[10.8 , 19.8]		33.5	[28.1 , 39.4]		45.2	[39.3 , 51.4]	
48-59	297	18.2	[14.1 , 23.1]		35.3	[30.0 , 41.0]		46.0	[40.1 , 52.0]	
6-23	376	8.3	[5.8 , 11.7]	<0.001	29.1	[24.6 , 34.0]	0.029	30.0	[25.5 , 35.0]	<0.001
24-59	871	15.8	[13.2 , 18.8]		35.3	[32.1 , 38.8]		45.5	[41.9 , 49.1]	
Sex										
Male	631	13.6	[11.1 , 16.7]	0.932	34.0	[30.2 , 38.0]	0.703	42.7	[38.6 , 46.8]	0.186
Female	616	13.5	[10.6 , 16.9]		32.9	[29.1 , 37.0]		38.9	[34.8 , 43.1]	
Breastfeeding Status[g]										
Breastfed	287	8.5	[5.6 , 12.5]	0.846	26.9	[22.0 , 32.4]	0.097	28.0	[22.9 , 33.6]	0.088
Non-breastfed	87	7.8	[3.7 , 15.6]		36.3	[26.7 , 47.2]		37.7	[28.1 , 48.4]	
Wealth Quintile										
Lowest	288	8.6	[5.4 , 13.5]		23.8	[18.6 , 29.8]		21.7	[16.9 , 27.5]	
Second	261	16.1	[11.4 , 22.2]		26.9	[21.5 , 33.1]		33.7	[27.5 , 40.5]	
Middle	268	14.2	[9.9 , 20.0]	0.167	29.9	[24.2 , 36.4]	<0.001	45.3	[38.5 , 52.2]	<0.001
Fourth	210	13.3	[9.1 , 19.2]		41.6	[34.9 , 48.7]		49.3	[42.1 , 56.6]	
Highest	220	16.3	[11.5 , 22.6]		51.3	[44.1 , 58.5]		61.3	[54.1 , 67.9]	
Total[h]	**1,247**	**13.5**	**[11.5 , 15.9]**		**33.4**	**[30.7 , 36.4]**		**40.8**	**[37.8 , 43.9]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]PLUMPY'SUP.
[b]PLUMPY'NUT, F75 milk, and F100 milk.
[c]Such as snails, larvae, caterpillars, crickets, edible insects, etc.
[d]Fish powder, bouillon cubes, tomato paste, etc.
[e]Such as candy, sugar, honey, chocolates, sweet biscuits/cookies, etc.
[f]The 2020 Burkina Faso National Micronutrient Survey child questionnaire was not developed to capture the new 2021 indicator 'sugar sweetened beverages'. The indicator 'sweetened beverages' in this table reports consumption of the following beverages: sugar water, fruit juice, tea with sugar, and other sweetened beverages such as homemade or purchased bissap, zoomkom, ginger, soda drinks, carbonated drinks.
[g]Breastfeeding stratification is indicated for children 6-23 months only.
[h]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

4.11 Consumption of Oils and Fats Among Children 6-59 Months

Consumption of red palm oil, other vegetable oil, and fats among children 6-59 months is reported in **Table 4.14**. Nationally, 1.5% of children consumed red palm oil and this did not vary by any characteristic.

Twenty six percent of children 6-59 months consumed other vegetable oil such as sunflower, cotton, maize/corn, peanut, and/or palm oil. Consumption of other vegetable oil varied by age and sex of the child, and wealth quintile. Consumption among 24-59 months was higher (30%) compared to children 6-23 months (19%). Consumption of other vegetable oils was higher for males (30%) compared to females (23%). Consumption of other vegetable oils was almost double in the highest wealth quintile (30%) compared to the lowest quintile (16%).

Eight percent of children 6-59 months consumed fats such as butter, shea butter and/or lard. Consumption of fats varied by location, residence, and age of the child. Consumption of fats was higher in rural areas at 10% compared to 9% in Ouagadougou & Bobo Dioulasso and 4% in other cities. Six percent of children in urban areas consumed fats. More children 24-59 months consumed fats (9%) compared to children 6-23 month (4%).

Table 4.14 Consumption of Oils and Fats Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Red Palm Oil			Other Vegetable Oil[a]			Fats[b]		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	422	1.9	[0.9 , 3.8]		25.6	[21.1 , 30.7]		9.0	[6.4 , 12.5]	
Other cities	337	1.8	[0.7 , 4.4]	0.368	28.8	[23.7 , 34.5]	0.519	3.6	[1.9 , 6.7]	0.007
Rural	488	0.8	[0.3 , 2.2]		24.8	[20.6 , 29.6]		10.0	[7.4 , 13.5]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	1.8	[1.0 , 3.2]	0.144	27.2	[23.7 , 31.1]	0.456	6.2	[4.6 , 8.3]	0.049
Rural°	488	0.8	[0.3 , 2.2]		24.8	[20.6 , 29.6]		10.0	[7.4 , 13.5]	
Age, months										
6-8	60	0.0	-		3.0	[0.7 , 11.2]		1.5	[0.2 , 9.9]	
9-11	70	0.0	-		10.9	[4.7 , 23.3]		2.7	[0.7 , 10.1]	
12-17	128	0.7	[0.1 , 4.8]		24.9	[18.2 , 33.2]		3.1	[1.2 , 8.1]	
18-23	118	2.0	[0.5 , 7.6]	0.724	25.2	[18.1 , 34.1]	<0.001	5.6	[2.7 , 11.3]	0.020
24-35	297	1.4	[0.5 , 3.7]		32.8	[27.4 , 38.6]		9.7	[6.9 , 13.6]	
36-47	277	2.2	[1.0 , 4.8]		29.4	[24.1 , 35.3]		8.5	[5.8 , 12.5]	
48-59	297	1.6	[0.7 , 3.7]		26.3	[21.4 , 31.9]		9.9	[6.9 , 13.9]	
6-23	376	0.9	[0.3 , 2.7]	0.288	19.0	[15.2 , 23.5]	<0.001	3.6	[2.1 , 6.0]	<0.001
24-59	871	1.7	[1.0 , 3.0]		29.5	[26.1 , 33.1]		9.4	[7.5 , 11.7]	
Sex										
Male	631	1.7	[1.0 , 3.1]	0.466	29.8	[26.0 , 33.9]	0.005	8.9	[6.8 , 11.5]	0.088
Female	616	1.2	[0.5 , 2.8]		22.7	[19.4 , 26.5]		6.3	[4.6 , 8.7]	
Breastfeeding Status[c]										
Breastfed	287	0.7	[0.2 , 2.9]	0.572	19.4	[15.0 , 24.7]	0.767	3.4	[1.8 , 6.2]	0.682
Non-breastfed	87	1.4	[0.2 , 9.4]		17.9	[11.1 , 27.6]		4.3	[1.6 , 10.9]	
Wealth Quintile										
Lowest	288	0.0	-		15.6	[11.3 , 21.2]		6.7	[4.0 , 11.0]	
Second	261	1.1	[0.4 , 3.4]		24.5	[19.1 , 30.9]		7.3	[4.6 , 11.2]	
Middle	268	1.5	[0.4 , 5.2]	0.131	28.9	[22.8 , 35.7]	<0.001	7.9	[4.8 , 12.6]	0.180
Fourth	210	2.4	[1.0 , 5.7]		35.6	[28.7 , 43.2]		5.0	[2.8 , 8.9]	
Highest	220	2.8	[1.3 , 6.2]		30.4	[23.9 , 37.8]		11.8	[7.8 , 17.3]	
Total[d]	**1,247**	**1.5**	**[0.9 , 2.4]**		**26.3**	**[23.6 , 29.3]**		**7.6**	**[6.2 , 9.4]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Sunflower, cotton, maize, peanut, and/or palm oil.
[b]Butter, shea butter, and/or lard.
[c]Breastfeeding stratification indicated for children 6-23 months only.
[d]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 5. Consumption of Fortifiable Salt, Wheat Flour and Vegetable Oil, and Potentially Fortifiable Bouillon

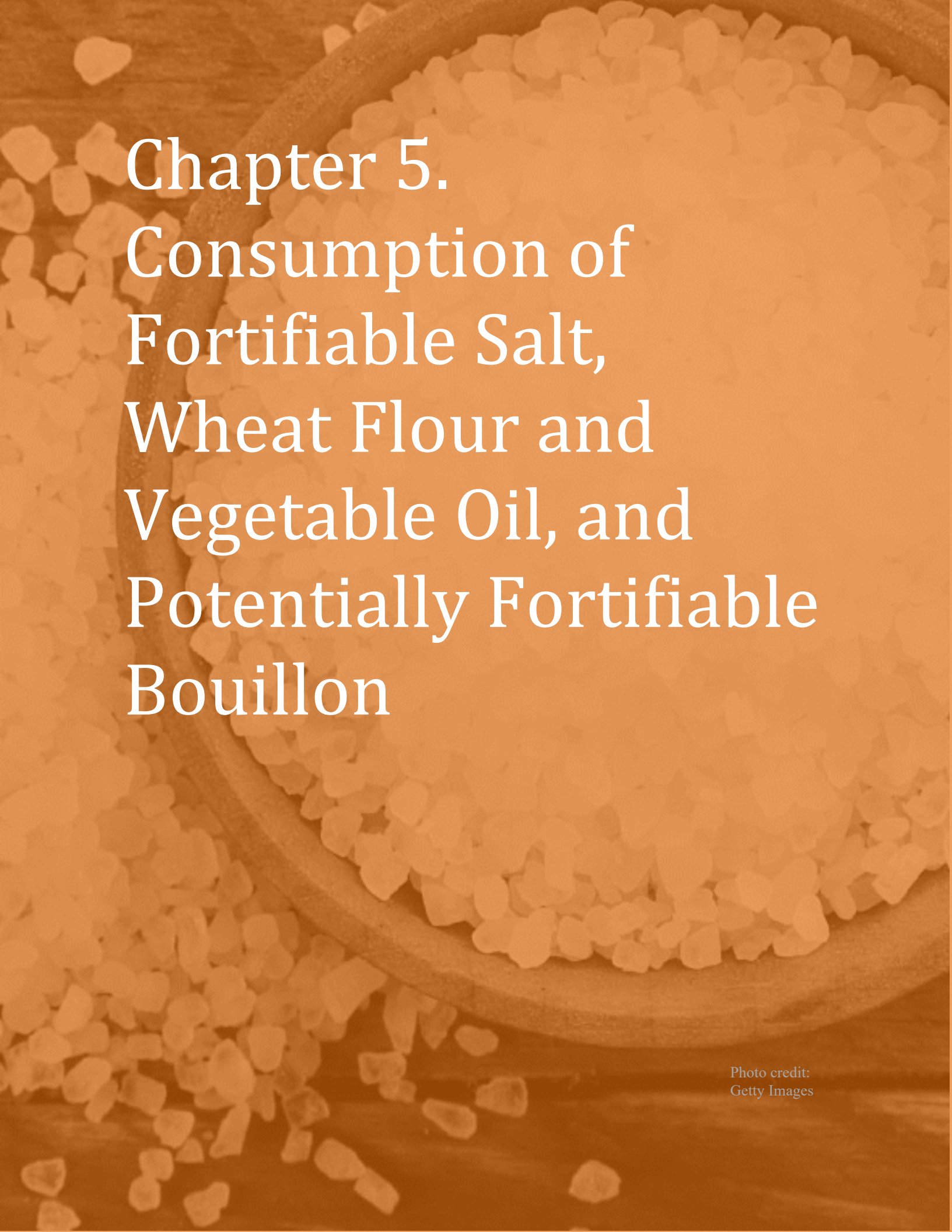


Photo credit: Getty Images

Chapter 5: Consumption of Fortifiable Salt, Wheat Flour and Vegetable Oil, and Potentially Fortifiable Bouillon

5.1 Consumption of Foods Made at Home with Purchased Salt (Except Rock Salt) Among Children 6-59 Months

Most children 6-59 months (88%) consumed foods made at home with purchased salt (except rock salt) the day preceding the survey (**Table 5.1**). The consumption of foods yesterday made with purchased salt varied by location, residence, age, sex, and wealth quintile. Almost all children (95%) consumed such foods in rural areas compared to 90% in other cities and 78% in Ouagadougou & Bobo Dioulasso. Eighty four percent of children in urban areas consumed foods made with purchased salt the day preceding the survey. Consumption of foods made with purchased salt was higher for children 24-59 month (94%) compared to children 6-23 months (73%). Consumption of foods made with purchased salt was higher for males (90%) compared to females (86%). It was highest for the lowest wealth quintile at 93% compared to 89% for the middle and 84% for the highest quintile.

Eleven percent of children 6-59 months did not consume foods made at home with purchased salt (except rock salt) during the last 7 days. There were more of those children in Ouagadougou & Bobo Dioulasso (21%) compared to 10% in other cities and 5% in rural areas. Fifteen percent of children 6-59 months in urban areas did not consume such foods. Twenty six percent of children 6-23 months did not consume foods made at home with purchased salt compared to 5% among children 24-59 months. The percentage of children who did not consume such foods was highest among children 6-8 months (74%) and least among children 48-59 months old (4%). The percentage of children who did not consume foods made at home with purchased salt increased from the lowest to the highest wealth quintile (6% to 16%).

Among children who consumed foods made at home with purchased salt (except rock salt) during the last 7 days, the median (IQR) number of days of consumption was 6.4 (6.2, 6.7) days (**Table 5.2**). Most of these children (89%) were reported to consume such foods every day. Ninety one percent of children 24-59 months consumed foods made at home with purchased salt every day compared to 82% among children 6-23 months. This was highest for children 24-35 months and 48-59 months (91%) and lowest for children 9-11 months (60%).

A small proportion of children consumed foods made at home with purchased salt (except rock salt) for 1-2 days (3%), 3-4 days (3%) and 5-6 days (5%) during the last 7 days. A higher percentage of children (6%) in other cities consumed these foods for 1-2 days compared to 2% in Ouagadougou & Bobo Dioulasso and 2% in rural areas. Six percent of children 6-23 months consumed foods made at home with purchased salt for 1-2 days compared to 2% for children 24-59 months. Consumption for 1-2 days per week decreased with increasing age of the children from 8% for 9-11 month olds to 2% for 48-59 month olds. Twice as many children 6-23 months consumed foods made at home with purchased salt for 3-4 days (6%) compared to 3% among children 24-59 months. Consumption for 3-4 days per week was

highest among children 9-11 months (11%) and lowest among children 18-23 and 24-35 months (2%). Consumption for 5-6 days per week was also highest among children 9-11 months (21%) and lowest among 18-23 months old (4%).

Table 5.1 Consumption of Foods Made at Home with Purchased Salt (Except Rock Salt) Yesterday and During the Last 7 Days Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Consumed Yesterday			N	Did Not Consume During Last 7 Days		
		%	[95% CI]	p-value		%	[95% CI]	p-value
Location°								
Ouagadougou & Bobo Dioulasso	420	77.6	[72.9 , 81.8]		420	21.2	[17.2 , 25.9]	
Other cities	336	89.6	[85.8 , 92.5]	<0.001	337	9.8	[7.0 , 13.5]	<0.001
Rural	488	94.7	[92.3 , 96.3]		488	4.9	[3.3 , 7.2]	
Residence								
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	756	83.8	[80.9 , 86.4]	<0.001	757	15.3	[12.7 , 18.2]	<0.001
Rural°	488	94.7	[92.3 , 96.3]		488	4.9	[3.3 , 7.2]	
Age, months								
6-8	59	26.7	[17.1 , 39.2]		60	73.8	[61.5 , 83.3]	
9-11	69	68.9	[56.6 , 79.1]		70	31.9	[21.7 , 44.2]	
12-17	127	84.2	[76.7 , 89.6]		127	14.2	[9.1 , 21.5]	
18-23	118	86.1	[78.7 , 91.3]	<0.001	118	11.3	[6.8 , 18.3]	<0.001
24-35	297	94.1	[90.8 , 96.3]		297	5.3	[3.2 , 8.5]	
36-47	277	93.9	[90.5 , 96.1]		276	5.5	[3.4 , 8.8]	
48-59	297	95.0	[91.8 , 97.0]		297	4.3	[2.5 , 7.3]	
6-23	373	73.0	[68.3 , 77.3]	<0.001	375	26.0	[21.8 , 30.7]	<0.001
24-59	871	94.3	[92.4 , 95.8]		870	5.0	[3.7 , 6.8]	
Sex								
Male	630	90.0	[87.2 , 92.2]	0.030	631	9.6	[7.5 , 12.3]	0.060
Female	614	85.8	[82.7 , 88.5]		614	13.1	[10.6 , 16.2]	
Wealth Quintile								
Lowest	288	93.2	[89.6 , 95.6]		288	5.7	[3.5 , 9.1]	
Second	260	88.8	[83.5 , 92.6]		260	11.0	[7.3 , 16.2]	
Middle	268	89.2	[84.7 , 92.5]	0.003	268	10.8	[7.5 , 15.3]	0.004
Fourth	209	82.3	[76.1 , 87.1]		209	15.3	[10.8 , 21.3]	
Highest	219	83.6	[77.8 , 88.2]		220	16.3	[11.8 , 22.1]	
Total[a]	**1,244**	**87.9**	**[85.9 , 89.7]**		**1,245**	**11.3**	**[9.6 , 13.3]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the Don't Know category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Table 5.2 Number of Days of Consumption of Foods Made at Home with Purchased Salt (Except Rock Salt) During the Last 7 Days Among Children 6-59 Months Consuming Such Foods, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Number of Days Consumed During Last 7 Days[a]												
		Median	IQR	1-2 Days			3-4 Days			5-6 Days			7 Days/Every Day		
				%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°															
Ouagadougou & Bobo Dioulasso	298	6.4	[6.2 , 6.7]	2.0	[0.8 , 4.9]	0.030	3.7	[2.1 , 6.5]	0.711	4.0	[2.2 , 7.2]	0.593	90.3	[85.6 , 93.6]	0.549
Other cities	274	6.4	[6.1 , 6.7]	5.5	[2.8 , 10.4]		2.6	[1.1 , 5.8]		5.1	[2.8 , 9.0]		86.9	[81.2 , 91.0]	
Rural	441	6.4	[6.2 , 6.7]	1.8	[0.9 , 3.6]		3.6	[2.2 , 5.9]		5.9	[3.8 , 9.0]		88.7	[84.9 , 91.6]	
Residence															
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	572	6.4	[6.2 , 6.7]	3.9	[2.3 , 6.8]	0.106	3.1	[1.9 , 5.0]	0.680	4.6	[3.0 , 7.0]	0.389	88.4	[84.8 , 91.2]	0.991
Rural°	441	6.4	[6.2 , 6.7]	1.8	[0.9 , 3.6]		3.6	[2.2 , 5.9]		5.9	[3.8 , 9.0]		88.7	[84.9 , 91.6]	
Age, months															
6-8	14	*	[3.3 , 5.8]	*	*		*	*		*	*		*	*	
9-11	43	(6.2)	[4.4 , 6.6]	(8.3)	[2.6 , 23.8]		(10.5)	[4.4 , 23.2]		(21.0)	[10.5 , 37.6]		(60.2)	[44.2 , 74.2]	
12-17	97	6.4	[6.1 , 6.7]	5.1	[2.1 , 11.8]		6.3	[2.9 , 13.5]		4.6	[1.7 , 11.7]		84.0	[75.0 , 90.1]	
18-23	95	6.4	[6.2 , 6.7]	4.2	[1.6 , 10.7]	0.044	2.2	[0.6 , 8.6]	0.048	3.9	[1.5 , 10.1]	0.001	89.6	[81.7 , 94.4]	<0.001
24-35	261	6.5	[6.2 , 6.7]	2.6	[1.2 , 5.7]		1.9	[0.8 , 4.6]		4.1	[2.2 , 7.6]		91.4	[86.8 , 94.4]	
36-47	244	6.4	[6.2 , 6.7]	2.0	[0.7 , 5.1]		2.8	[1.3 , 5.9]		5.3	[3.0 , 9.3]		89.9	[85.1 , 93.2]	
48-59	259	6.4	[6.2 , 6.7]	1.8	[0.7 , 4.8]		3.0	[1.5 , 5.9]		4.4	[2.4 , 7.8]		90.8	[86.5 , 93.8]	
6-23	249	6.4	[6.1 , 6.7]	5.8	[3.4 , 9.6]	0.005	5.5	[3.3 , 9.1]	0.020	6.9	[4.2 , 11.2]	0.157	81.8	[76.3 , 86.3]	<0.001
24-59	764	6.4	[6.2 , 6.7]	2.2	[1.2 , 4.0]		2.6	[1.7 , 4.0]		4.6	[3.2 , 6.5]		90.7	[88.1 , 92.8]	
Sex															
Male	529	6.4	[6.1 , 6.7]	3.3	[2.1 , 5.3]	0.624	3.0	[1.8 , 4.8]	0.574	5.5	[3.7 , 8.1]	0.630	88.2	[84.9 , 90.9]	0.785
Female	484	6.4	[6.2 , 6.7]	2.7	[1.4 , 5.5]		3.6	[2.2 , 5.9]		4.8	[3.2 , 7.2]		88.8	[85.2 , 91.6]	
Wealth Quintile															
Lowest	244	6.4	[6.2 , 6.7]	4.0	[1.4 , 11.0]		4.2	[2.1 , 8.3]		2.8	[1.4 , 5.8]		88.9	[82.4 , 93.2]	
Second	216	6.4	[6.1 , 6.7]	3.0	[1.3 , 6.5]		3.6	[1.8 , 7.1]		5.7	[3.2 , 10.0]		87.7	[82.2 , 91.7]	
Middle	222	6.4	[6.2 , 6.7]	2.1	[0.8 , 5.7]	0.867	0.9	[0.2 , 3.7]	0.128	6.6	[3.6 , 11.6]	0.535	90.4	[84.3 , 94.3]	0.702
Fourth	159	6.4	[6.1 , 6.7]	3.5	[1.5 , 8.2]		5.5	[2.8 , 10.4]		5.9	[2.8 , 11.8]		85.1	[78.1 , 90.2]	
Highest	172	6.4	[6.2 , 6.7]	2.6	[1.0 , 6.6]		2.7	[1.2 , 6.2]		5.1	[2.3 , 10.9]		89.6	[83.3 , 93.7]	
Total[b]	**1,013**	6.4	[6.2 , 6.7]	**3.0**	**[1.9 , 4.7]**		**3.3**	**[2.3 , 4.7]**		**5.2**	**[3.8 , 6.9]**		**88.5**	**[86.0 , 90.6]**	

Note: N unweighted. Sample size might vary slightly due to missing data. A total of 75 observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution. An asterisk indicates that the denominator sample size is <25 unweighted cases and has been suppressed.
[a]Among those who consumed foods made at home with purchased salt (except rock salt) during the last 7 days.
[b]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

5.2 Consumption of Foods Made at Home with Purchased Wheat Flour Among Children 6-59 Months

Consumption of foods made at home with purchased wheat flour among children 6-59 months was low the day preceding the survey (3%) (**Table 5.3**). Almost all (96%) of the children did not consume such foods during the last 7 days. Consumption during the day preceding the survey and during the last 7 days did not vary by location, residence, age, sex or wealth quintile.

Table 5.3 Consumption of Foods Made at Home with Purchased Wheat Flour Yesterday and During the Last 7 Days Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Consumed Yesterday			N	Did Not Consume During Last 7 Days		
		%	[95% CI]	p-value		%	[95% CI]	p-value
Location°								
Ouagadougou & Bobo Dioulasso	422	2.4	[1.3 , 4.3]		417	97.1	[94.9 , 98.4]	
Other cities	337	3.6	[1.7 , 7.2]	0.643	334	95.8	[92.1 , 97.8]	0.491
Rural	486	2.5	[1.2 , 5.0]		477	95.4	[92.6 , 97.2]	
Residence								
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	3.0	[1.8 , 4.9]	0.715	751	96.4	[94.4 , 97.7]	0.384
Rural°	486	2.5	[1.2 , 5.0]		477	95.4	[92.6 , 97.2]	
Age, months								
6-8	60	0.0	-		58	98.3	[89.0 , 99.8]	
9-11	70	1.7	[0.2 , 11.2]		69	98.3	[88.6 , 99.8]	
12-17	128	1.4	[0.4 , 5.6]		127	97.1	[92.4 , 98.9]	
18-23	118	5.9	[2.8 , 12.0]	0.196	118	92.3	[85.7 , 96.0]	0.237
24-35	296	2.4	[1.1 , 4.9]		288	96.6	[93.7 , 98.1]	
36-47	277	2.2	[1.0 , 4.8]		275	96.8	[93.9 , 98.3]	
48-59	296	3.9	[2.0 , 7.4]		293	95.0	[91.3 , 97.1]	
6-23	376	2.7	[1.4 , 4.9]	0.873	372	95.9	[93.4 , 97.6]	0.903
24-59	869	2.8	[1.8 , 4.5]		856	96.1	[94.3 , 97.3]	
Sex								
Male	630	3.1	[1.9 , 4.9]	0.524	619	96.0	[94.0 , 97.4]	0.965
Female	615	2.5	[1.4 , 4.5]		609	96.1	[93.9 , 97.5]	
Wealth Quintile								
Lowest	288	1.9	[0.6 , 5.3]		288	96.7	[93.2 , 98.4]	
Second	261	3.8	[1.8 , 7.9]		254	94.2	[89.9 , 96.7]	
Middle	266	3.2	[1.2 , 8.3]	0.748	264	96.0	[91.0 , 98.3]	0.664
Fourth	210	2.0	[0.7 , 5.2]		206	96.7	[92.6 , 98.5]	
Highest	220	3.1	[1.5 , 6.3]		216	96.8	[93.6 , 98.5]	
Total[a]	**1,245**	**2.8**	**[1.9 , 4.2]**		**1,228**	**96.0**	**[94.5 , 97.2]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the "Don't Know" category were treated as missing values. All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
[a] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

5.3 Consumption of Foods Made at Home with Purchased Vegetable Oil Among Children 6-59 Months

About three quarters (76%) of children 6-59 months consumed food made at home with purchased vegetable oil yesterday (**Table 5.4**). The percentage of children who consumed such foods yesterday was highest in Ouagadougou & Bobo Dioulasso (85%) compared to 80% in other cities and 64% in rural areas. Eighty two percent of children consumed foods with purchased vegetable oil in urban areas. More children 24-59 months (81%) consumed food made at home with purchased vegetable oil yesterday compared to 62% of children 6-23 months. Seventy nine percent of males consumed such foods yesterday compared to 72% females. The percentage also varied by wealth quintile with 86% of children in the highest quintile compared to 58% in the lowest quintile.

Fourteen percent of the children did not consume foods made at home with purchase vegetable oil in the last 7 days. The proportion varied by residence, age, sex and wealth quintile. Seventeen percent of the children in rural areas did not consume foods made with purchased vegetable oil compared to 12% in urban areas in the prior 7 days. A higher proportion (29%) of children 6-23 months did not consume such foods compared to 8% among children 24-59 months. More female children (16%) did not consume foods made at home with vegetable oil compared to male children (12%) during the last 7 days. This proportion was highest for the lowest quintile (20%) and lowest for the middle wealth quintile (9%).

Among children who consumed foods made at home with purchased vegetable oil during the last 7 days, the median (IQR) number of days of consumption was 6.1 (2.9, 6.5) days (**Table 5.5**). The median number of days of consumption (IQR) was 6.4 (6.1, 6.7) days in Ouagadougou and Bobo Dioulasso, 6.1 (3.0, 6.6) days in other cities, and 3.5 (2.1, 6.2) days in rural areas. Over half of children consuming such foods during the last 7 days (54%) consumed them every day during the last 7 days. Most (82%) were in Ouagadougou & Bobo Dioulasso compared to 58% in other cities and 30% in rural areas. Sixty nine percent of children in urban areas consumed such foods every day. Children 6-59 months who consumed foods made at home with purchased vegetable oil every day for seven days also varied by wealth quintile with 84% in the highest quintile compared to 56% in the middle and 28% in the lowest quintiles.

A total of 15%, 20% and 11% of children consumed foods made at home with purchased vegetable oil for 1-2 days, 3-4 days and 5-6 days during the last 7 days, respectively. The proportion consuming such foods for 1-2 days was higher for rural areas (24%) compared to other cities (16%) and Ouagadougou & Bobo Dioulasso (2%). Ten percent of children in urban areas consumed foods made with purchased vegetable oil for 1-2 days per week. A similar pattern was observed for those who consumed such foods for 3-4 days with the highest proportion in rural areas (34%) compared to other cities (16%) and Ouagadougou & Bobo Dioulasso (7%). Twelve percent of children in urban areas consumed foods made with purchased vegetable oil for 3-4 days per week. The proportion of children who consumed foods made at home with purchased vegetable oil for 1-2, 3-4 and 5-6 days varied

by wealth quintile. It was highest for the lowest quintile (30% and 37%, respectively) and lowest for highest quintile (3% and 5%, respectively) for children who consumed such foods for 1-2 and 3-4 days during the last 7 days. This proportion was highest for the second and middle quintiles (16%) and lowest for the lowest quintile (6%) for the proportion of children who consumed such foods for 5-6 days of the previous 7 days.

Table 5.4 Consumption of Foods Made at Home with Purchased Vegetable Oil Yesterday and During the Last 7 Days Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Consumed Yesterday			N	Did Not Consume During Last 7 Days		
		%	[95% CI]	p-value		%	[95% CI]	p-value
Location°								
Ouagadougou & Bobo Dioulasso	420	85.0	[81.1 , 88.2]	<0.001	419	13.4	[10.3 , 17.2]	0.096
Other cities	336	80.1	[75.1 , 84.2]		337	11.3	[8.2 , 15.3]	
Rural	488	64.1	[58.9 , 69.1]		487	16.8	[13.4 , 20.9]	
Residence								
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	756	82.4	[79.3 , 85.2]	<0.001	756	12.3	[10.0 , 15.0]	0.047
Rural°	488	64.1	[58.9 , 69.1]		487	16.8	[13.4 , 20.9]	
Age, months								
6-8	59	27.1	[17.3 , 39.7]	<0.001	60	70.1	[57.4 , 80.3]	<0.001
9-11	70	56.4	[44.0 , 68.0]		69	35.9	[25.0 , 48.4]	
12-17	126	73.4	[64.9 , 80.5]		127	15.3	[9.9 , 22.7]	
18-23	118	71.1	[61.8 , 78.9]		118	17.5	[11.3 , 26.1]	
24-35	297	84.3	[79.6 , 88.1]		295	6.4	[4.2 , 9.7]	
36-47	277	77.1	[71.5 , 81.9]		277	9.6	[6.5 , 13.9]	
48-59	297	81.9	[76.7 , 86.1]		297	7.4	[4.9 , 11.2]	
6-23	373	62.2	[57.0 , 67.1]	<0.001	374	28.5	[24.0 , 33.4]	<0.001
24-59	871	81.2	[78.2 , 83.9]		869	7.8	[6.1 , 9.9]	
Sex								
Male	630	78.9	[75.2 , 82.1]	0.005	629	11.8	[9.3 , 14.9]	0.033
Female	614	72.0	[68.2 , 75.6]		614	16.2	[13.4 , 19.5]	
Wealth Quintile								
Lowest	288	57.9	[50.9 , 64.7]	<0.001	288	19.7	[15.1 , 25.2]	0.019
Second	261	76.0	[70.0 , 81.2]		260	12.9	[9.1 , 17.9]	
Middle	266	81.0	[75.3 , 85.7]		268	9.4	[6.3 , 13.8]	
Fourth	209	80.8	[73.8 , 86.3]		207	15.6	[10.7 , 22.3]	
Highest	220	86.1	[81.1 , 90.0]		220	12.2	[8.6 , 17.1]	
Total[a]	**1,244**	**75.5**	**[72.8 , 78.1]**		**1,243**	**14.0**	**[12.0 , 16.2]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Table 5.5 Number of Days of Consumption of Foods Made at Home with Purchased Vegetable Oil During the Last 7 Days Among Children 6-59 Months Consuming Such Foods, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Number of Days Consumed During Last 7 Days[a]												
		Median	IQR	1-2 Days			3-4 Days			5-6 Days			7 Days/Every Day		
				%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°															
Ouagadougou & Bobo Dioulasso	305	6.4	[6.1 , 6.7]	1.6	[0.6 , 4.5]	<0.001	7.2	[4.8 , 10.7]	<0.001	9.5	[6.4 , 14.0]	0.452	81.6	[76.0 , 86.2]	<0.001
Other cities	264	6.1	[3.0 , 6.6]	16.3	[11.7 , 22.2]		15.5	[11.1 , 21.4]		10.6	[7.2 , 15.3]		57.6	[50.5 , 64.3]	
Rural	382	3.5	[2.1 , 6.2]	23.8	[19.1 , 29.3]		33.5	[28.0 , 39.5]		12.8	[9.4 , 17.2]		29.8	[24.6 , 35.7]	
Residence															
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	569	6.3	[4.5 , 6.6]	9.5	[7.0 , 12.9]	<0.001	11.7	[8.9 , 15.1]	<0.001	10.1	[7.6 , 13.2]	0.233	68.7	[64.1 , 72.9]	<0.001
Rural°	382	3.5	[2.1 , 6.2]	23.8	[19.1 , 29.3]		33.5	[28.0 , 39.5]		12.8	[9.4 , 17.2]		29.8	[24.6 , 35.7]	
Age, months															
6-8	16	*	*	*	*		*	*		*	*		*	*	
9-11	37	(4.4)	[2.4 , 6.3]	(15.7)	[6.5 , 33.3]		(30.6)	[18.0 , 47.0]		(15.7)	[7.2 , 30.9]		(37.9)	[22.7 , 56.0]	
12-17	91	6.1	[2.6 , 6.6]	18.5	[11.8 , 27.7]		20.2	[13.1 , 29.9]		4.7	[1.7 , 11.9]		56.7	[46.3 , 66.5]	
18-23	86	6.0	[2.7 , 6.5]	16.8	[10.2 , 26.4]	0.658	21.8	[14.3 , 31.7]	0.352	10.2	[5.4 , 18.6]	0.509	51.2	[40.7 , 61.6]	0.206
24-35	249	6.1	[3.2 , 6.6]	15.0	[10.9 , 20.4]		16.1	[11.7 , 21.8]		12.7	[8.9 , 17.8]		56.1	[49.5 , 62.6]	
36-47	227	6.0	[2.8 , 6.5]	16.0	[11.6 , 21.9]		20.6	[15.6 , 26.5]		11.1	[7.5 , 16.1]		52.3	[45.7 , 58.9]	
48-59	245	6.1	[3.1 , 6.6]	11.7	[7.9 , 16.8]		20.8	[15.9 , 26.8]		11.6	[8.0 , 16.5]		55.9	[49.3 , 62.3]	
6-23	230	5.9	[2.5 , 6.5]	17.7	[13.3 , 23.3]	0.183	23.3	[18.3 , 29.2]	0.154	9.1	[6.0 , 13.6]	0.255	49.8	[43.3 , 56.3]	0.173
24-59	721	6.1	[3.0 , 6.5]	14.2	[11.5 , 17.4]		19.1	[16.0 , 22.6]		11.8	[9.4 , 14.7]		54.9	[50.8 , 58.9]	
Sex															
Male	502	6.1	[2.9 , 6.5]	13.9	[10.9 , 17.5]	0.276	20.3	[16.7 , 24.4]	0.914	11.3	[8.6 , 14.8]	0.853	54.5	[49.7 , 59.2]	0.583
Female	449	6.1	[2.8 , 6.5]	16.4	[13.0 , 20.4]		20.0	[16.2 , 24.4]		11.0	[8.3 , 14.3]		52.7	[47.9 , 57.5]	
Wealth Quintile															
Lowest	204	2.8	[1.7 , 6.1]	29.8	[22.4 , 38.3]	<0.001	36.7	[28.7 , 45.5]	<0.001	5.8	[2.9 , 11.1]	0.006	27.8	[20.9 , 35.9]	<0.001
Second	200	4.5	[2.7 , 6.3]	18.7	[13.5 , 25.3]		26.6	[20.0 , 34.5]		16.4	[11.5 , 22.8]		38.3	[30.8 , 46.4]	
Middle	215	6.1	[3.3 , 6.6]	13.7	[9.0 , 20.3]		14.5	[9.8 , 20.9]		15.5	[10.7 , 21.8]		56.3	[48.1 , 64.2]	
Fourth	157	6.3	[4.6 , 6.6]	6.8	[3.4 , 13.2]		14.5	[9.4 , 21.6]		7.9	[4.4 , 13.8]		70.9	[62.1 , 78.3]	
Highest	175	6.4	[6.1 , 6.7]	2.5	[0.9 , 6.5]		5.2	[2.8 , 9.5]		8.4	[4.8 , 14.3]		83.9	[77.0 , 89.0]	
Total[b]	**951**	**6.1**	**[2.9 , 6.5]**	**15.1**	**[12.6 , 17.9]**		**20.1**	**[17.3 , 23.3]**		**11.2**	**[9.1 , 13.6]**		**53.7**	**[50.1 , 57.2]**	

Note: N unweighted. Sample size might vary slightly due to missing data. A total of 106 observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution. An asterisk indicates that the denominator sample size is <25 unweighted cases and has been suppressed.
[a]Among those who consumed foods made at home with purchased vegetable oil during the last 7 days.
[b]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

5.4 Consumption of Foods Made at Home with Purchased Bouillon Among Children 6-59 Months

Almost three out of four children 6-59 months consumed foods made at home with purchased bouillon the day preceding the survey (73%) (**Table 5.6**). The percentage of the children who consumed these foods the day preceding the survey varied by location, residence, age of the child and wealth quintile. Eighty two percent of children 6-59 months consumed foods made at home with purchased bouillon in rural areas compared to 75% in other cities and 61% in Ouagadougou & Bobo Dioulasso. Sixty eight percent of children in urban areas consumed foods made with purchased bouillon the day preceding the survey. Seventy eight percent of children 24-59 months consumed such foods compared to 63% of children 6-23 months. The percentage of the children who consumed such foods the day preceding the survey was highest for the lowest wealth quintile (82%) and lowest for the highest quintile (59%).

About 1 in every four children (26%) did not consume foods made at home with purchased bouillon during the last 7 days. This proportion of children varied by location, residence, age and wealth quintile. More children in Ouagadougou & Bobo Dioulasso (39%) did not consume such foods compared to 25% in other cities and 17% in rural areas. Thirty two percent of children in urban areas did not consume foods made with purchased bouillon during the last 7 days. A higher proportion of children 6-23 months (36%) did not consume such foods compared to 22% among children 24-59 months. The percentage of children who did not consume such foods was highest in the highest quintile (40%) and lowest in the lowest quintile (17%).

Among children consuming foods made at home with purchased bouillon during the last 7 days, the median (IQR) number of days of consumption was 6.4 (6.1, 6.7) (**Table 5.7**). Nationally, 82% of these children consumed such foods every day during the last 7 days. The percentage of children consuming these foods every day during the last 7 days did not vary by any background characteristic.

Nationally, the percentage of children 6-59 months who consumed such foods for 1-2, 3-4, and 5-6 days per week was low at 6% for each of these categories. The proportion who consumed such foods for 1-2 days varied by child's age. Among children 6-23 months, 9% consumed such foods for 1-2 days compared to 5% for children 24-59 months. The proportion of children who consumed such foods for 3-4 and 5-6 days did not vary by any background characteristics.

Table 5.6 Consumption of Foods Made at Home with Purchased Bouillon Yesterday and During the Last 7 Days Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Consumed Yesterday			N	Did Not Consume During Last 7 Days		
		%	[95% CI]	p-value		%	[95% CI]	p-value
Location°								
Ouagadougou & Bobo Dioulasso	417	60.7	[55.0 , 66.1]	<0.001	419	38.7	[33.3 , 44.4]	<0.001
Other cities	336	74.7	[69.4 , 79.4]		337	25.2	[20.5 , 30.6]	
Rural	487	82.1	[78.0 , 85.6]		483	16.6	[13.2 , 20.5]	
Residence								
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	753	68.0	[64.1 , 71.7]	<0.001	756	31.7	[28.0 , 35.6]	<0.001
Rural°	487	82.1	[78.0 , 85.6]		483	16.6	[13.2 , 20.5]	
Age, months								
6-8	60	24.9	[15.6 , 37.3]	<0.001	60	75.1	[62.7 , 84.4]	<0.001
9-11	70	54.2	[41.8 , 66.2]		70	45.8	[33.8 , 58.2]	
12-17	126	71.8	[63.3 , 79.0]		127	27.4	[20.4 , 35.9]	
18-23	118	78.1	[69.8 , 84.6]		118	21.1	[14.7 , 29.3]	
24-35	295	76.8	[71.5 , 81.4]		294	22.0	[17.5 , 27.3]	
36-47	277	78.0	[72.6 , 82.6]		277	21.3	[16.7 , 26.6]	
48-59	294	78.6	[73.0 , 83.2]		293	21.2	[16.6 , 26.6]	
6-23	374	63.1	[57.9 , 67.9]	<0.001	375	36.4	[31.6 , 41.5]	<0.001
24-59	866	77.8	[74.5 , 80.7]		864	21.5	[18.5 , 24.7]	
Sex								
Male	626	73.5	[69.5 , 77.2]	0.892	626	25.9	[22.2 , 29.9]	0.945
Female	614	73.2	[69.3 , 76.7]		613	26.1	[22.6 , 29.9]	
Wealth Quintile								
Lowest	288	82.0	[76.5 , 86.4]	<0.001	288	17.0	[12.7 , 22.3]	<0.001
Second	257	75.0	[68.0 , 80.9]		257	24.5	[18.7 , 31.5]	
Middle	268	79.0	[73.4 , 83.7]		266	19.7	[15.1 , 25.3]	
Fourth	208	66.3	[58.8 , 73.0]		209	34.1	[27.3 , 41.6]	
Highest	219	58.9	[50.9 , 66.4]		219	40.3	[32.8 , 48.3]	
Total[a]	**1,240**	**73.3**	**[70.5 , 76.0]**		**1,239**	**26.0**	**[23.3 , 28.8]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Table 5.7 Number of Days of Consumption of Foods Made at Home with Purchased Bouillon During the Last 7 Days Among Children 6-59 Months Consuming Such Foods, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Number of Days Consumed During Last 7 Days[a]												
		Median	IQR	1-2 Days			3-4 Days			5-6 Days			7 Days/Every Day		
				%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°															
Ouagadougou & Bobo Dioulasso	222	6.4	[6.1 , 6.7]	4.1	[1.7 , 9.4]	0.204	5.0	[2.8 , 8.6]	0.371	7.7	[4.7 , 12.4]	0.675	83.3	[76.6 , 88.4]	0.660
Other cities	234	6.4	[6.1 , 6.7]	8.5	[4.9 , 14.5]		5.6	[3.0 , 10.1]		6.4	[3.8 , 10.7]		79.5	[72.7 , 85.0]	
Rural	389	6.4	[6.1 , 6.7]	4.6	[2.5 , 8.3]		7.7	[5.4 , 10.9]		5.7	[3.5 , 9.0]		82.0	[77.0 , 86.1]	
Residence															
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	456	6.4	[6.1 , 6.7]	6.7	[4.2 , 10.5]	0.406	5.3	[3.4 , 8.1]	0.164	6.9	[4.8 , 9.9]	0.475	81.1	[76.3 , 85.0]	0.839
Rural°	389	6.4	[6.1 , 6.7]	4.6	[2.5 , 8.3]		7.7	[5.4 , 10.9]		5.7	[3.5 , 9.0]		82.0	[77.0 , 86.1]	
Age, months															
6-8	12	*	*	*	*		*	*		*	*		*	*	
9-11	33	(6.2)	[4.0 , 6.6]	(8.3)	[2.0 , 28.6]		(16.8)	[7.6 , 33.0]		(12.1)	[4.6 , 28.5]		(62.8)	[44.9 , 77.8]	
12-17	84	6.4	[6.1 , 6.7]	5.8	[2.4 , 13.3]		7.2	[3.2 , 15.1]		2.8	[0.7 , 10.6]		84.2	[74.5 , 90.6]	
18-23	83	6.4	[6.0 , 6.7]	13.5	[7.7 , 22.8]	0.022	3.4	[1.1 , 10.0]	0.096	4.8	[1.8 , 12.3]	0.595	78.2	[67.5 , 86.1]	0.058
24-35	210	6.4	[6.1 , 6.7]	7.3	[4.2 , 12.2]		5.1	[2.9 , 9.1]		7.5	[4.5 , 12.2]		80.1	[73.7 , 85.2]	
36-47	208	6.4	[6.1 , 6.7]	3.1	[1.4 , 6.7]		7.1	[4.2 , 11.6]		5.6	[3.1 , 10.0]		84.2	[78.3 , 88.7]	
48-59	215	6.4	[6.1 , 6.7]	3.4	[1.5 , 7.5]		5.5	[3.2 , 9.5]		7.0	[4.2 , 11.4]		84.1	[78.3 , 88.5]	
6-23	212	6.4	[6.0 , 6.7]	9.4	[6.0 , 14.3]	0.012	7.7	[4.9 , 12.1]	0.340	5.3	[3.0 , 9.4]	0.472	77.6	[71.3 , 82.8]	0.083
24-59	633	6.4	[6.1 , 6.7]	4.6	[2.8 , 7.3]		5.9	[4.2 , 8.2]		6.7	[4.9 , 9.2]		82.8	[79.1 , 85.9]	
Sex															
Male	430	6.4	[6.1 , 6.7]	6.0	[4.0 , 9.1]	0.759	5.7	[3.8 , 8.5]	0.422	6.8	[4.6 , 9.8]	0.649	81.6	[77.1 , 85.3]	0.958
Female	415	6.4	[6.1 , 6.7]	5.5	[3.3 , 9.0]		7.1	[4.9 , 10.2]		6.0	[3.9 , 9.0]		81.4	[76.8 , 85.3]	
Wealth Quintile															
Lowest	224	6.4	[6.1 , 6.7]	7.9	[3.8 , 15.8]		8.6	[5.3 , 13.5]		3.5	[1.8 , 6.9]		80.0	[72.2 , 86.1]	
Second	180	6.4	[6.1 , 6.7]	4.1	[1.8 , 9.0]		6.5	[3.7 , 11.1]		7.1	[4.0 , 12.3]		82.4	[75.5 , 87.7]	
Middle	192	6.4	[6.1 , 6.7]	5.0	[2.6 , 9.5]	0.750	4.5	[2.0 , 9.5]	0.535	9.5	[5.5 , 15.9]	0.207	81.0	[73.3 , 86.9]	0.971
Fourth	128	6.4	[6.1 , 6.7]	5.5	[2.2 , 13.2]		5.0	[2.4 , 10.3]		6.2	[3.1 , 11.9]		83.2	[74.8 , 89.2]	
Highest	121	6.4	[6.1 , 6.7]	6.1	[2.4 , 14.7]		6.9	[3.6 , 12.9]		5.4	[2.4 , 11.6]		81.6	[72.6 , 88.2]	
Total[b]	**845**	6.4	**[6.1 , 6.7]**	**5.8**	**[4.0 , 8.3]**		**6.4**	**[4.8 , 8.3]**		**6.4**	**[4.8 , 8.5]**		**81.5**	**[78.1 , 84.4]**	

Note: N unweighted. Sample size might vary slightly due to missing data. A total of 64 observations in the "Don't Know" category for number of days in the last 7 days were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution. An asterisk indicates that the denominator sample size is <25 unweighted cases and has been suppressed.
[a]Among those who consumed foods made at home with purchased bouillon during the last 7 days.
[b]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 6. Intake of Micronutrient Supplements and PICA Practices

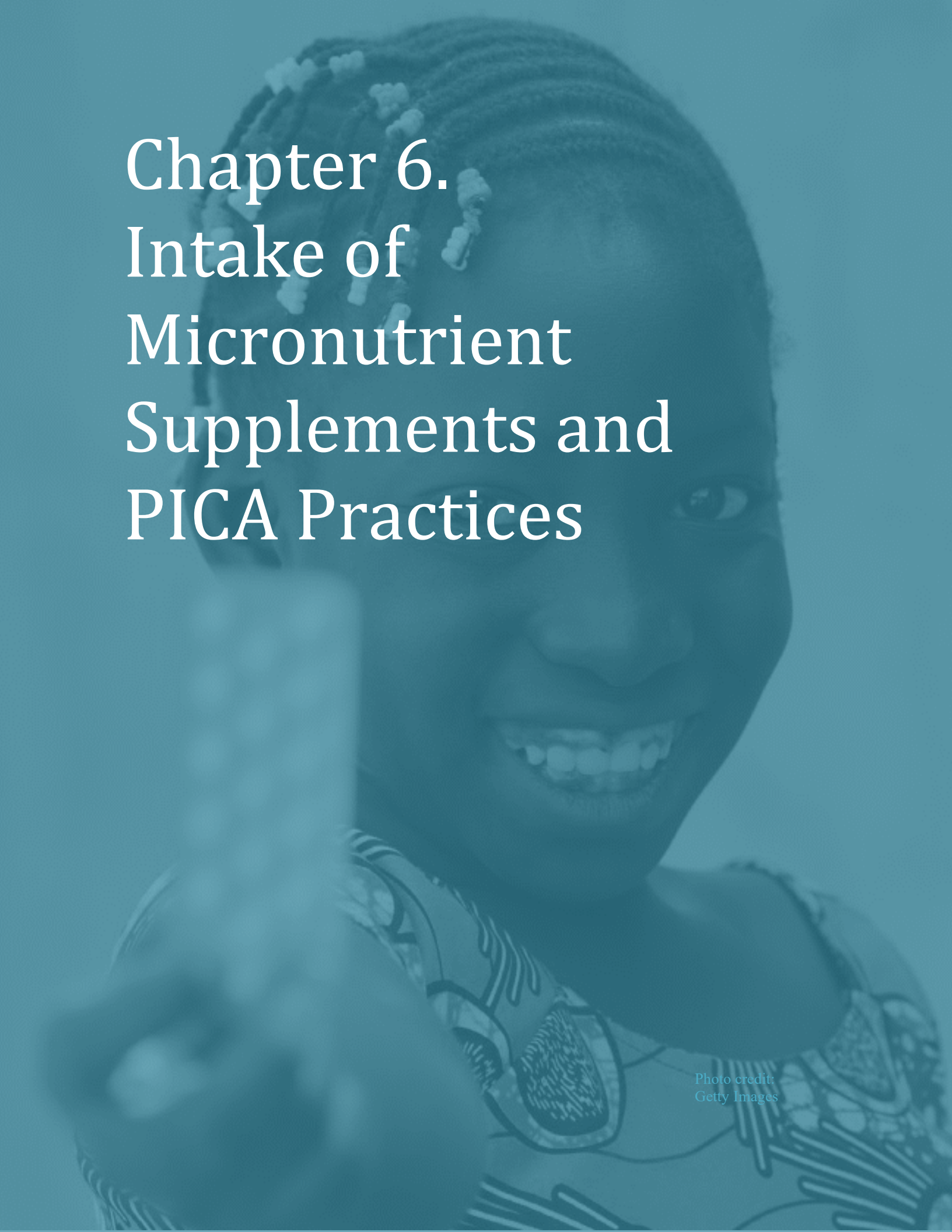


Photo credit: Getty Images

Chapter 6: Intake of Micronutrient Supplements and PICA Practices

6.1 Intake of Iron Syrup or Tablet, Micronutrient Powder, and Zinc Tablet Among Children 6-59 Months

Iron syrup or tablet consumption in the last 7 days among children 6-59 months was only 2% (**Table 6.1**). Consumption did not vary by location, residence, age, sex, and wealth quintiles.

Consumption of micronutrient powder mixed with other foods during the last 7 days among children 6-59 months was rare (<1%). Consumption of micronutrient powder during the last 7 days was higher for children in the highest wealth quintile (4%) compared to all other wealth quintiles (<1%).

Consumption of zinc tablets during the last 7 days among children 6-59 months was rare as well (1%). Consumption of zinc tablets during the last 7 days varied by age. The highest proportion of children who consumed zinc during the last 7 days was among children 6-8 months (5%) and the lowest among children 9-11 months (0%).

Table 6.1 Iron Supplement (Such as Iron Tablet or Syrup), Micronutrient Powder (MNP) and Zinc Tablet Intake During the Last 7 Days Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Iron Supplement Consumed During Last 7 Days[a]			N	MNP Consumed During Last 7 Days[b]			N	Zinc Tablet Consumed During Last 7 Days[c]		
		%	[95% CI]	p-value		%	[95% CI]	p-value		%	[95% CI]	p-value
Location°												
Ouagadougou & Bobo Dioulasso	418	2.9	[1.6 , 5.2]		420	0.5	[0.1 , 1.9]		420	1.2	[0.5 , 2.8]	
Other cities	333	1.8	[0.8 , 3.9]	0.255	333	1.8	[0.7 , 4.5]	0.073	336	1.5	[0.6 , 3.5]	0.839
Rural	484	1.2	[0.5 , 3.1]		484	0.4	[0.1 , 1.6]		486	1.0	[0.4 , 2.5]	
Residence												
Urban [Ouagadougou. Bobo Dioulasso & Other cities]	751	2.3	[1.4 , 3.7]	0.204	753	1.2	[0.5 , 2.5]	0.225	756	1.3	[0.7 , 2.5]	0.644
Rural°	484	1.2	[0.5 , 3.1]		484	0.4	[0.1 , 1.6]		486	1.0	[0.4 , 2.5]	
Age, months												
6-8	59	3.6	[0.9 , 13.4]		60	0.0	-		60	4.6	[1.5 , 13.4]	
9-11	70	6.6	[2.4 , 17.0]		69	0.0	-		70	0.0	-	
12-17	127	1.4	[0.3 , 5.4]		126	1.5	[0.4 , 5.7]		127	2.4	[0.8 , 7.3]	
18-23	118	2.3	[0.7 , 6.9]	0.107	118	0.0	-	0.794	118	1.6	[0.4 , 6.3]	0.032
24-35	294	1.8	[0.7 , 4.2]		294	1.1	[0.4 , 3.5]		296	0.3	[0.0 , 2.3]	
36-47	274	1.5	[0.6 , 4.0]		274	1.3	[0.3 , 5.5]		277	2.0	[0.9 , 4.8]	
48-59	293	1.0	[0.3 , 3.2]		296	0.7	[0.2 , 2.8]		294	0.3	[0.0 , 2.1]	
6-23	374	3.0	[1.6 , 5.4]	0.065	373	0.5	[0.1 , 2.0]	0.347	375	2.1	[1.0 , 4.1]	0.085
24-59	861	1.4	[0.8 , 2.5]		864	1.0	[0.5 , 2.3]		867	0.9	[0.4 , 1.8]	
Sex												
Male	627	2.0	[1.1 , 3.6]	0.772	624	0.9	[0.3 , 2.6]	0.927	627	0.9	[0.4 , 2.1]	0.241
Female	608	1.8	[1.0 , 3.2]		613	0.9	[0.4 , 2.0]		615	1.6	[0.9 , 3.0]	
Wealth Quintile												
Lowest	286	1.8	[0.6 , 4.9]		284	0.3	[0.0 , 2.4]		287	1.0	[0.3 , 3.1]	
Second	258	1.9	[0.8 , 4.5]		261	0.4	[0.1 , 2.6]		260	1.6	[0.6 , 4.3]	
Middle	266	1.1	[0.3 , 3.3]	0.096	268	0.0	-	<0.001	268	1.5	[0.6 , 4.0]	0.917
Fourth	206	0.9	[0.2 , 3.3]		208	0.6	[0.1 , 4.0]		208	1.0	[0.2 , 4.0]	
Highest	219	4.3	[2.1 , 8.5]		216	3.8	[1.6 , 8.7]		219	0.9	[0.2 , 3.3]	
Total[d]	**1,235**	**1.9**	**[1.2 , 2.9]**		**1,237**	**0.9**	**[0.4 , 1.8]**		**1,242**	**1.2**	**[0.7 , 2.0]**	

MNP= Micronutrient powder
Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Iron syrup or tablets were observed for 1.19% and self-reported (not observed) for 0.72% of children.
[b]Micronutrient powder sachets were observed for 0.44% and self-reported (not observed) for 0.44% of children.
[c]Zinc tablets were observed for 0.49% and self-reported (not observed) for 0.73% of children.
[d]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

6.2 Consumption of Uncooked Rice, Uncooked Pasta or Ice Among Children 6-59 Months

The percentage of children who consumed uncooked rice, uncooked pasta and/or ice was low (3%) among children 6-59 months (**Table 6.2**). The percentage of children who consumed uncooked rice, uncooked pasta and/or ice varied by location, residence and wealth quintiles. More children (6%) in Ouagadougou & Bobo Dioulasso consumed uncooked rice, uncooked pasta and/or ice compared to other cities (2%) and rural areas (1%). Four percent of children in urban areas consumed any of these foods. More children in the highest wealth quintile (5%) consumed any of these foods compared to 3% in the middle and less than 1% in the lowest quintile.

Table 6.2 Consumption of Uncooked Rice, Uncooked Pasta, and/or Ice During the Last 7 Days Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Consumed Uncooked Rice, Uncooked Pasta, and/or Ice During Last 7 Days[a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	414	6.0	[3.8 , 9.4]	<0.001
Other cities	333	2.1	[1.0 , 4.4]	
Rural	485	0.6	[0.2 , 1.9]	
Residence				
Urban [Ouagadougou. Bobo Dioulasso & Other cities]	747	4.0	[2.7 , 5.8]	<0.001
Rural°	485	0.6	[0.2 , 1.9]	
Age. months				
6-8	60	0.0	-	0.504
9-11	70	0.0	-	
12-17	127	1.6	[0.4 , 6.4]	
18-23	116	2.8	[0.9 , 8.4]	
24-35	294	3.0	[1.5 , 5.8]	
36-47	273	4.0	[2.0 , 7.6]	
48-59	292	2.8	[1.4 , 5.7]	
6-23	373	1.4	[0.6 , 3.4]	0.086
24-59	859	3.3	[2.2 , 4.8]	
Sex				
Male	621	2.8	[1.6 , 4.6]	0.908
Female	611	2.7	[1.7 , 4.2]	
Wealth Quintile				
Lowest	285	0.4	[0.1 , 3.0]	0.006
Second	260	1.1	[0.3 , 3.3]	
Middle	265	3.2	[1.5 , 6.8]	
Fourth	206	4.6	[2.3 , 8.7]	
Highest	216	5.3	[2.8 , 9.9]	
Total[b]	**1,232**	**2.7**	**[1.9 , 3.9]**	

Note: N unweighted. Sample size might vary slightly due to missing data. A total of 15 observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Among children 6-59 months who consumed uncooked rice, uncooked pasta or ice during the last 7 days.
[b]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

6.3 Consumption of Clay or Soil Among Children 6-59 Months

Nine percent of children 6-59 months consumed clay and/or soil during the last 7 days (**Table 6.3**). Consumption varied by location, residence, age of the child and wealth quintiles. The percentage of children who consumed clay and/or soil during the last 7 days was higher for Ouagadougou & Bobo Dioulasso (12%), compared to 8% in other cities and 6% in rural areas. Ten percent of children in urban areas consumed clay and/or soil during the last 7 days. The percentage of children who consumed clay and/or soil was also higher for children 6-23 months (15%) compared to children 24-59 months (6%). More children in the middle wealth quintile (12%) consumed clay and/or soil compared to children in other wealth quintiles (4 to 10%).

Among seventy-three children who consumed clay or soil during the last 7 days, the median (IQR) number of times of consumption was 3.5 (1.9, 5.6) times (data not shown).

Table 6.3 Consumption of Clay and/or Soil During the Last 7 Days Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Consumed Clay and/or Soil During Last 7 Days[a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	386	12.4	[9.3 , 16.4]	0.005
Other cities	329	7.6	[5.2 , 11.0]	
Rural	469	6.2	[4.3 , 8.8]	
Residence				
Urban [Ouagadougou. Bobo Dioulasso & Other cities]	715	9.8	[7.8 , 12.3]	0.020
Rural°	469	6.2	[4.3 , 8.8]	
Age. months				
6-8	59	13.0	[6.6 , 23.9]	<0.001
9-11	66	11.1	[5.2 , 22.0]	
12-17	120	19.1	[12.9 , 27.4]	
18-23	112	14.3	[8.7 , 22.6]	
24-35	281	9.0	[6.1 , 13.1]	
36-47	260	5.5	[3.3 , 8.9]	
48-59	286	2.3	[1.1 , 4.8]	
6-23	357	15.1	[11.6 , 19.4]	<0.001
24-59	827	5.6	[4.2 , 7.4]	
Sex				
Male	598	8.4	[6.4 , 10.9]	0.921
Female	586	8.5	[6.5 , 11.1]	
Wealth Quintile				
Lowest	276	3.6	[1.9 , 6.6]	0.015
Second	256	8.2	[5.3 , 12.5]	
Middle	253	11.8	[8.3 , 16.5]	
Fourth	200	9.2	[5.9 , 14.1]	
Highest	199	10.3	[6.7 , 15.7]	
Total[b]	**1,184**	**8.5**	**[7.0 , 10.2]**	

Note: N unweighted. Sample size might vary slightly due to missing data. A total of 63 observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a] Among children 6-59 months who consumed clay and/or soil during the last 7 days.
[b] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 7. Nutrition and Social Safety Net Interventions

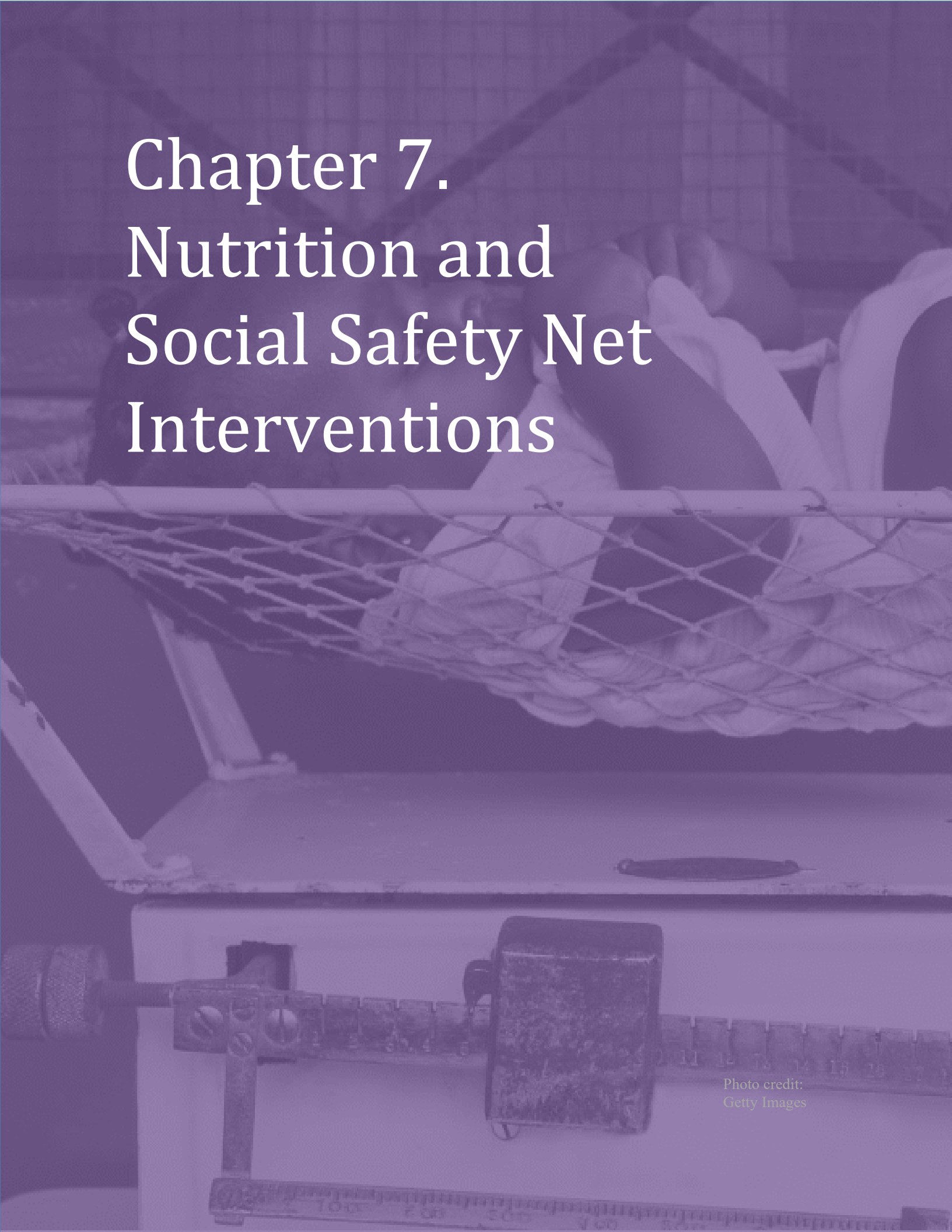


Photo credit: Getty Images

Chapter 7: Nutrition and Social Safety Net Interventions

This chapter describes the coverage of nutrition-specific and social safety net interventions among children 6-59 months, including:

- Growth monitoring and IYCF programs
- Mass distribution of vitamin A capsule (6-59 months) and deworming tablets (12-59 months)
- Distribution of mosquito nets for malaria prevention
- IYCF counselling by a healthcare provider and/or a community health worker (CHW) before and after the child was born
- Integrated management of acute malnutrition or receipt of fortified blended flour, ready-to-use therapeutic food (RUTF) or ready-to-use supplementary food (RUSF)
- Cash transfer program with accompanying behavior change communication on nutrition or health topics

7.1 Participation in Growth Monitoring Among Children 6-59 Months and Infant and Young Child Feeding (IYCF) Programs Among Children 6-23 Months

Among children 6-59 months, growth monitoring is monthly from 1 to 11 months of age, bimonthly from 12 to 23 months of age and once every 3 months in older children. However, growth monitoring is usually done for children 0-23 months old in practice. Nationally, 6% of children 6-59 months were reported to have attended the health center for growth monitoring in the last 30 days (**Table 7.1**). Participation in growth monitoring was higher for children 6-23 months (18%) compared to only 0.5% for children 24-59 months. It was highest among children 9-11 months (40%), followed by 30% among children 6-8 months (interpret with caution, <50 unweighted cases) and lowest among children 48-59 months old (0%). Participation in growth monitoring varied by wealth quintile with 4% participating in growth monitoring in the lowest quintile and 10% in the highest quintile. Participation did not vary by location, residence, and sex of the child.

About 9% of children 6-23 months participated in IYCF programs during the last 12 months. Fourteen percent of children 6-23 months participated in IYCF programs in rural areas compared to 9% in other cities and 3% in Ouagadougou & Bobo Dioulasso. Six percent of children 6-23 months in urban areas participated in IYCF programs in the last 12 months. Participation did not vary by age, sex or wealth quintile.

Table 7.1 Participation in Growth Monitoring Among Children 6-59 Months and Infant and Young Child Feeding (IYCF) Programs Among Children 6-23 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Participated in Growth Monitoring in the Last Month (Children 6-59 Months) [a,b]			N	Participated in IYCF Program During Last 12 Months (Children 6-23 Months)		
		%	[95% CI]	p-value		%	[95% CI]	p-value
Location°								
Ouagadougou & Bobo Dioulasso	393	7.4	[5.2 , 10.4]		131	3.1	[1.1 , 7.9]	
Other cities	305	4.3	[2.5 , 7.2]	0.178	103	8.7	[4.6 , 16.0]	0.009
Rural	441	5.2	[3.5 , 7.7]		139	13.7	[8.7 , 20.8]	
Residence								
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	698	5.8	[4.3 , 7.8]	0.569	234	6.0	[3.5 , 10.1]	0.009
Rural°	441	5.2	[3.5 , 7.7]		139	13.7	[8.7 , 20.8]	
Age, months								
6-8	49	(30.1)	[19.2 , 43.7]		59	3.2	[0.8 , 11.9]	
9-11	64	40.4	[28.6 , 53.4]		70	9.6	[4.6 , 18.9]	0.416
12-17	115	14.3	[9.0 , 21.9]		126	10.2	[5.9 , 17.2]	
18-23	110	2.4	[0.8 , 7.1]	<0.001	118	9.4	[5.3 , 16.3]	
24-35	278	1.2	[0.4 , 3.7]			na	na	
36-47	254	0.3	[0.0 , 2.4]			na	na	
48-59	269	0	-			na	na	
6-23	338	17.5	[13.8 , 22.0]	<0.001	373	8.8	[6.2 , 12.2]	-
24-59	801	0.5	[0.2 , 1.4]			na	na	
Sex								
Male	576	5.8	[4.2 , 8.1]	0.695	173	10.1	[6.3 , 15.6]	0.402
Female	563	5.3	[3.8 , 7.4]		200	7.6	[4.6 , 12.3]	
Wealth Quintile								
Lowest	262	4.2	[2.3 , 7.4]		89	11.0	[5.7 , 20.2]	
Second	232	3.7	[1.9 , 7.0]		70	9.8	[4.7 , 19.4]	
Middle	240	4.5	[2.5 , 8.0]	0.021	82	13.9	[7.9 , 23.5]	0.071
Fourth	201	6.3	[3.7 , 10.5]		62	5.2	[1.7 , 15.2]	
Highest	204	10.3	[6.8 , 15.2]		70	1.3	[0.2 , 9.0]	
Total[c]	**1,139**	**5.6**	**[4.4 , 7.1]**		**373**	**8.8**	**[6.2 , 12.2]**	

na= Not applicable
Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a]Growth monitoring is monthly from 1 to 11 months of age, bimonthly from 12 to 23 months of age, and once every 3 months in older children.
[b]Dates were observed on health cards for 97% of children and self-reported (not observed) for 3% of children.
[c]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

7.2 Coverage of Vitamin A Supplementation Among Children 6-59 Months and Deworming Tablets Among Children 12-59 Months

Among children 6-59 months, caregivers reported that almost two-thirds (62%) received a vitamin A capsule during the last mass distribution campaign (JVA+ campaign) in November/December 2019 (**Table 7.2**).

Vitamin A supplementation coverage during the last campaign varied by location, residence, age and wealth quintiles. More children (71%) received a vitamin A capsule in rural areas compared to other cities (66%) and Ouagadougou & Bobo Dioulasso (45%). Fifty six percent of children in urban areas received a vitamin A capsule. Vitamin A supplementation coverage increased by age with 39%, 63% and 65% of children 6-11, 12-23, and 24-59 months receiving a vitamin A capsule, respectively. Coverage of vitamin A supplementation was highest for the lowest wealth quintile (68%) and lowest for the highest quintile (49%).

Similarly, caregivers reported that almost two-thirds of children 12-59 months (63%) received deworming tablets during the last mass distribution campaign. Coverage of deworming tablets varied by location where 70%, 68% and 47% of children received the tablet in rural areas, other cities and Ouagadougou & Bobo Dioulasso, respectively. Fifty eight percent of children in urban areas received a deworming tablet during the last campaign, and coverage did not vary by age, sex, or wealth quintiles.

Table 7.2 Coverage of Vitamin A Supplementation Among Children 6-59 Months and Deworming Tablets Among Children 12-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Child Received Vitamin A Capsule During Last JVA+ Campaign in November/December 2019			N	Child Received Deworming Tablet During Last JVA+ Campaign in November/December 2019		
		%	[95% CI]	p-value		%	[95% CI]	p-value
Location°								
Ouagadougou & Bobo Dioulasso	396	44.9	[39.2 , 50.8]		343	46.9	[41.1 , 52.9]	
Other cities	333	65.5	[59.3 , 71.1]	<0.001	298	67.8	[61.5 , 73.5]	<0.001
Rural	470	71.3	[66.6 , 75.6]		421	70.3	[65.0 , 75.1]	
Residence								
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	729	55.9	[51.6 , 60.0]	<0.001	641	58.2	[53.8 , 62.4]	<0.001
Rural°	470	71.3	[66.6 , 75.6]		421	70.3	[65.0 , 75.1]	
Age, months								
6-8	59	24.7	[15.3 , 37.4]			na	na	
9-11	67	51.7	[39.1 , 64.1]			na	na	
12-17	124	60.6	[51.5 , 69]		122	58.1	[49.0 , 66.6]	
18-23	115	65.1	[55.8 , 73.4]	<0.001	114	60.7	[51.2 , 69.4]	
24-35	283	61.6	[55.6 , 67.4]		279	60.7	[54.5 , 66.6]	0.490
36-47	269	67.2	[61.1 , 72.8]		270	65.3	[59.1 , 71.1]	
48-59	282	65.6	[59.7 , 71.1]		277	65.5	[59.6 , 70.9]	
6-11	126	39.1	[30.7 , 48.2]			na	na	
12-23	239	62.8	[56.3 , 68.9]	<0.001	236	59.3	[52.8 , 65.6]	0.206
24-59	834	64.8	[61.1 , 68.3]		826	63.8	[60.1 , 67.4]	
Sex								
Male	603	61.0	[56.7 , 65.1]	0.603	537	62.4	[57.9 , 66.7]	0.778
Female	596	62.4	[58.1 , 66.5]		525	63.3	[58.7 , 67.6]	
Wealth Quintile								
Lowest	279	68.2	[62.0 , 73.9]		246	66.0	[58.6 , 72.6]	
Second	250	63.7	[56.6 , 70.2]		233	64.2	[57.0 , 70.8]	
Middle	258	62.1	[54.8 , 68.8]	0.010	231	61.1	[53.6 , 68.1]	0.700
Fourth	204	61.7	[53.7 , 69.1]		180	63.1	[54.7 , 70.8]	
Highest	208	49.4	[41.4 , 57.5]		172	58.4	[50.0 , 66.4]	
Total[a]	**1,199**	**61.7**	**[58.5 , 64.8]**		**1,062**	**62.8**	**[59.5 , 66.1]**	

JVA+= Journées Vitamine A+ (Vitamin A Days); na= Not applicable

Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the "Don't Know" category were treated as missing values. A total of 48 observations in the "Don't Know" category for vitamin A supplementation were treated as missing values. A total of 55 observations in the "Don't Know" category for deworming tablets were treated as missing values.

All estimates account for complex sample design.

°All estimates account for weighting, except for stratification by location and rural residence.

P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.

[a]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

7.3 Bed Net Use for Malaria Prevention Among Children 6-59 Months

Nationally, seventy percent of children 6-59 months were reported to always sleep under a mosquito net (**Table 7.3**). The percentage of children who always sleep under a mosquito net varied by location, residence, age and wealth quintiles. There were more children always sleeping under a mosquito net in other cities (79%) compared to Ouagadougou & Bobo Dioulasso (76%) and rural areas (59%). Seventy eight percent of children 6-59 months in urban areas were reported to always sleep under a mosquito net. Use of mosquito nets was highest for children 6-23 months (77%) compared to 68% among children 24-59 months. The use was highest for the highest wealth quintile (80%) and lowest for the lowest quintile (53%).

Slightly less than a quarter of all children 6-59 months (23%) sometimes slept under a mosquito net. About a third (34%) of children in rural areas sometimes slept under a mosquito net compared to 18% and 15% in Ouagadougou & Bobo Dioulasso and other cities, respectively. Slightly more than double (34%) the percentage of children in rural areas sometimes slept under a mosquito net compared to children in urban residence (16%). Twenty six percent of children 24-59 months sometimes slept under mosquito net compared to 18% among children 6-23 months. The number of children who sometimes slept under a mosquito net was highest (41%) for the lowest wealth quintile and lowest (12%) for the highest quintile.

Nationally, 7% of children were reported to never sleep under a mosquito net and this did not vary by any characteristics.

Table 7.3 Use of Mosquito Net Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Child Sleeps Under a Mosquito Net								
		Never			Sometimes			Always		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	422	6.4	[4.2 , 9.6]	0.751	17.5	[13.7 , 22.1]	<0.001	76.1	[71.1 , 80.4]	<0.001
Other cities	337	5.6	[3.3 , 9.4]		15.4	[11.8 , 19.9]		78.9	[73.8 , 83.3]	
Rural	488	7.2	[4.9 , 10.5]		34.2	[29.4 , 39.4]		58.6	[53.3 , 63.7]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	6.0	[4.3 , 8.3]	0.510	16.4	[13.7 , 19.6]	<0.001	77.6	[74.0 , 80.7]	<0.001
Rural°	488	7.2	[4.9 , 10.5]		34.2	[29.4 , 39.4]		58.6	[53.3 , 63.7]	
Age, months										
6-8	60	5.6	[1.8 , 16.1]		13.0	[6.6 , 24.0]		81.4	[69.3 , 89.5]	
9-11	70	5.2	[2.0 , 13.2]		15.7	[8.9 , 26.4]		79.0	[67.8 , 87.1]	
12-17	128	2.3	[0.7 , 7.0]		16.2	[10.7 , 23.9]		81.5	[73.6 , 87.4]	
18-23	118	9.6	[5.2 , 17.2]	0.272	22.7	[16.0 , 31.3]	0.002	67.7	[58.5 , 75.7]	<0.001
24-35	297	6.7	[4.2 , 10.3]		20.4	[16.0 , 25.6]		73.0	[67.4 , 77.9]	
36-47	277	5.4	[3.1 , 9.2]		31.2	[25.9 , 37.0]		63.4	[57.3 , 69.1]	
48-59	297	8.2	[5.5 , 11.9]		25.5	[20.6 , 31.1]		66.4	[60.5 , 71.8]	
6-23	376	5.7	[3.7 , 8.8]	0.471	17.7	[14.0 , 22.0]	0.003	76.6	[71.9 , 80.8]	0.002
24-59	871	6.8	[5.1 , 8.9]		25.5	[22.4 , 28.9]		67.7	[64.1 , 71.1]	
Sex										
Male	631	7.0	[5.1 , 9.6]	0.407	21.6	[18.4 , 25.3]	0.198	71.4	[67.4 , 75.0]	0.448
Female	616	5.9	[4.2 , 8.2]		24.7	[21.2 , 28.6]		69.4	[65.4 , 73.2]	
Wealth Quintile										
Lowest	288	5.9	[3.5 , 9.9]		40.6	[34.2 , 47.5]		53.4	[46.7 , 60.1]	
Second	261	6.8	[4.0 , 11.4]		27.4	[21.8 , 33.9]		65.8	[58.9 , 72.1]	
Middle	268	6.2	[3.5 , 10.7]	0.947	15.2	[10.9 , 20.9]	<0.001	78.6	[72.3 , 83.8]	<0.001
Fourth	210	5.8	[3.1 , 10.6]		15.7	[11.1 , 21.7]		78.6	[71.6 , 84.2]	
Highest	220	7.8	[4.4 , 13.4]		12.2	[8.2 , 17.7]		80.0	[73.3 , 85.4]	
Total[a]	**1,247**	**6.5**	**[5.0 , 8.3]**		**23.2**	**[20.6 , 26.0]**		**70.4**	**[67.4 , 73.2]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

7.4 Coverage of any Infant and Young Child Feeding (IYCF) Counseling Before Child Was Born Among Mothers/Caregivers of Children 6-23 Months

Of the mothers and caregivers of children 6-23 months, 40% received any IYCF counseling from a healthcare provider, 4% from a community health worker (CHW), and 3% from both before the child was born (**Table 7.4**).

More mothers or caregivers in rural areas (8%) talked to both the healthcare provider and CHW compared to 1% and 0% in other cities and Ouagadougou & Bobo Dioulasso, respectively. Similarly, more mothers or caregivers talked to both in rural compared to urban residence (8% versus 0.5%). More mothers or caregivers to children 9-11 and 12-17 months (6% in each category) talked to both compared to mothers or caregivers of children 6-8 months (2%) and 18-23 months (0%). Five percent of mothers or caregivers to male children talked to both compared to 2% of mothers/caregivers to female children. More mothers/caregivers from the second wealth quintile (9%) talked to both healthcare provider and CHW compared to 7% for the lowest quintile and 0% for all the other wealth quintiles.

Nationally, more than half of the mothers and caregivers (53%) reported not to receive any IYCF counseling from either a healthcare provider or CHW before the child was born. More mothers/caregivers did not talk to a healthcare provider or CHW in Ouagadougou & Bobo Dioulasso (64%) compared to 52% in other cities and 44% in rural areas. Fifty eight percent of mothers/caregivers of children in urban areas did not receive any IYCF counseling before the child was born.

The percentage of mothers/caregivers who talked to only a healthcare provider or only a CHW did not vary by any background characteristics.

Table 7.4 Before Child Was Born, Mother or Caregiver of Child 6-23 Months Ever Talked to Healthcare Provider or Community Health Worker (CHW) About how to Feed Child, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	No			Healthcare Provider			CHW			Both		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°													
Ouagadougou & Bobo Dioulasso	128	64.1	[54.6 , 72.5]		33.6	[25.3 , 43.0]		2.3	[0.8 , 7.1]		0.0	-	
Other cities	103	52.4	[42.7 , 62.0]	0.010	40.8	[31.6 , 50.7]	0.264	5.8	[2.6 , 12.4]	0.433	1.0	[0.1 , 6.6]	<0.001
Rural	135	44.4	[35.9 , 53.3]		43.7	[35.2 , 52.6]		3.7	[1.3 , 10.0]		8.1	[4.5 , 14.2]	
Residence													
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	231	58.0	[51.2 , 64.5]	0.011	37.3	[31.0 , 44.2]	0.214	4.2	[2.2 , 7.9]	0.934	0.5	[0.1 , 3.5]	<0.001
Rural°	135	44.4	[35.9 , 53.3]		43.7	[35.2 , 52.6]		3.7	[1.3 , 10.0]		8.2	[4.5 , 14.2]	
Age, months													
6-8	58	46.9	[34.1 , 60.2]		44.6	[31.9 , 58.1]		6.8	[2.5 , 17.0]		1.7	[0.2 , 11.0]	
9-11	67	61.7	[48.7 , 73.2]	0.374	30.7	[20.1 , 43.7]	0.367	1.5	[0.2 , 9.7]	0.304	6.2	[2.3 , 15.4]	0.041
12-17	124	50.3	[41.5 , 59.1]		38.8	[30.5 , 47.9]		5.4	[2.4 , 11.5]		5.5	[2.6 , 10.9]	
18-23	117	54.4	[45.1 , 63.5]		43.0	[34.1 , 52.4]		2.6	[0.8 , 7.8]		0.0	-	
Sex													
Male	170	54.1	[46.4 , 61.6]	0.748	36.5	[29.4 , 44.3]	0.265	4.2	[2.0 , 8.5]	0.887	5.2	[2.8 , 9.7]	0.040
Female	196	52.4	[45.2 , 59.5]		42.3	[35.3 , 49.5]		3.9	[1.8 , 7.9]		1.5	[0.5 , 4.5]	
Wealth Quintile													
Lowest	86	44.2	[33.6 , 55.3]		45.6	[34.9 , 56.7]		3.4	[0.8 , 13.5]		6.8	[3.1 , 14.5]	
Second	69	49.0	[36.9 , 61.3]		39.3	[28.0 , 51.9]		3.1	[0.8 , 11.7]		8.6	[3.9 , 18.0]	
Middle	80	63.2	[52.0 , 73.2]	0.070	30.3	[21.1 , 41.3]	0.124	6.5	[2.7 , 15.0]	0.794	0.0	-	0.003
Fourth	61	62.6	[49.2 , 74.4]		33.5	[22.3 , 47.0]		3.9	[1.0 , 14.2]		0.0	-	
Highest	70	47.7	[35.4 , 60.4]		49.6	[37.1 , 62.2]		2.7	[0.7 , 10.2]		0.0	-	
Total[a]	**366**	**53.2**	**[47.8 , 58.5]**		**39.6**	**[34.5 , 45.0]**		**4.0**	**[2.3 , 6.9]**		**3.2**	**[1.9 , 5.6]**	

CHW= Community health worker
Note: N unweighted. Sample size might vary slightly due to missing data. A total of 10 observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

7.5 Coverage of any Infant and Young Child Feeding (IYCF) Counseling After Child Was Born Among Mothers/Caregivers of Children 6-23 Months

Of the mothers and caregivers of children 6-23 months, 42% reported to receive any IYCF counseling from a healthcare provider, 5% from a CHW, and 3% from both after the child was born (**Table 7.5**).

Eight percent of the mothers from rural areas spoke to both a healthcare provider and a CHW about IYCF after the child was born compared to 0% in the urban areas (Ouagadougou & Bobo Dioulasso and other cities). More mothers (7%) in the lowest wealth quintile spoke to both a healthcare provider and a CHW compared to 6% in the second, 1% in middle and 0% in the fourth and highest quintiles.

Nationally, half of the mothers or caregivers of children (50%) reported not to receive any IYCF counseling from a healthcare provider or CHW after the child was born. More mothers/caregivers did not talk to either a healthcare provider or CHW in Ouagadougou & Bobo Dioulasso (60%) compared to 50% in other cities and 42% in rural areas. Fifty five percent of mothers/caregivers of children in urban areas reported not to receive any IYCF counseling after the child was born.

The percentage of mothers/caregivers who talked to only a healthcare provider or only a CHW did not vary by any background characteristics.

Table 7.5 After Child Was Born, Mother or Caregiver of Child 6-23 Months Ever Talked to a Healthcare Provider or Community Health Worker (CHW) About how to Feed Child, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	No			Healthcare Provider			CHW			Both		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°													
Ouagadougou & Bobo Dioulasso	128	60.2	[50.8 , 68.9]		37.5	[28.9 , 46.9]		2.3	[0.8 , 7.1]		0.0	-	
Other cities	103	49.5	[39.7 , 59.4]	0.022	43.7	[34.2 , 53.7]	0.583	6.8	[3.3 , 13.6]	0.223	0.0	-	<0.001
Rural	137	42.3	[34.0 , 51.1]		43.1	[34.8 , 51.8]		6.6	[3.2 , 12.9]		8.0	[4.5 , 13.9]	
Residence													
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	231	54.6	[47.8 , 61.3]	0.021	40.7	[34.2 , 47.6]	0.611	4.7	[2.5 , 8.5]	0.375	0.0	-	<0.001
Rural°	137	42.3	[34.0 , 51.2]		43.1	[34.8 , 51.8]		6.6	[3.2 , 12.9]		8.0	[4.5 , 13.9]	
Age, months													
6-8	59	50.2	[37.3 , 63.2]		39.4	[27.4 , 52.9]		8.7	[3.6 , 19.6]		1.7	[0.2 , 10.9]	
9-11	68	58.0	[45.0 , 69.9]	0.384	36.3	[24.9 , 49.5]	0.754	2.9	[0.7 , 10.8]	0.488	2.9	[0.7 , 10.8]	0.154
12-17	123	44.6	[36.0 , 53.6]		43.9	[35.2 , 53.0]		6.0	[2.9 , 12.1]		5.5	[2.7 , 11.0]	
18-23	118	51.5	[42.3 , 60.7]		43.2	[34.4 , 52.5]		4.4	[1.8 , 10.3]		0.8	[0.1 , 5.6]	
Sex													
Male	172	51.5	[43.8 , 59.0]	0.654	38.8	[31.6 , 46.6]	0.328	5.2	[2.7 , 9.8]	0.920	4.5	[2.3 , 8.7]	0.082
Female	196	49.1	[41.9 , 56.3]		44.0	[36.9 , 51.3]		5.5	[2.9 , 9.9]		1.5	[0.5 , 4.5]	
Wealth Quintile													
Lowest	88	44.3	[33.9 , 55.3]		43.5	[33.0 , 54.5]		5.6	[2.0 , 14.6]		6.7	[3.0 , 14.1]	
Second	69	44.2	[32.4 , 56.8]		42.7	[31.2 , 55.1]		7.5	[3.1 , 17.0]		5.5	[2.1 , 13.9]	
Middle	80	56.6	[45.0 , 67.5]	0.157	35.7	[25.8 , 47.1]	0.464	6.5	[2.7 , 15.0]	0.714	1.2	[0.2 , 7.7]	0.029
Fourth	61	61.7	[48.5 , 73.3]		36.4	[25.0 , 49.6]		1.9	[0.3 , 12.6]		0.0	-	
Highest	70	45.5	[33.4 , 58.3]		50.0	[37.4 , 62.6]		4.5	[1.4 , 13.3]		0.0	-	
Total[a]	**368**	**50.2**	**[44.9 , 55.6]**		**41.6**	**[36.4 , 47.0]**		**5.4**	**[3.4 , 8.4]**		**2.9**	**[1.6 , 5.1]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

7.6 Treatment of Acute Malnutrition and Receipt of Special Foods Among Children 6-59 Months

Nationally, 2% of children 6-59 months were reported to be treated for acute malnutrition (marasmus or kwashiorkor) in the last 12 months (**Table 7.6**). Treatment of acute malnutrition varied by location, residence, age of the child and wasting status (using weight-for-length/height) at the time of the survey. Fewer children in Ouagadougou & Bobo Dioulasso (0.2%) were treated for acute malnutrition in the last 12 months compared to children in other cities (3%) and rural areas (3%). Two percent of children in urban areas had received treatment for acute malnutrition. Treatment was higher in children 6-23 months (4%) compared to children 24-59 months (1%). Of the children with severe wasting 16% were treated in the last 12 months (interpret with caution, <50 unweighted cases), compared to 11% among those with moderate wasting and 1% among those who did not currently suffer from wasting.

Nationally, 2% of children 6-59 months received fortified blended flour (i.e., corn soy blend+ (CSB+) or CSB++) as part of a health program, 3% of children received RUSF as part of the management of moderate acute malnutrition or prevention of severe acute malnutrition (i.e., PLUMPY'SUP) and 3% received RUTF as part of treatment of severe acute malnutrition (i.e., PLUMPY'NUT, F50 milk, or F100 milk) in the last 12 months (**Table 7.7**). The percentage of children who received fortified blended flour, RUTF and RUSF in the last 12 months varied by age and current wasting status (using weight-for-length/height). More children 6-23 months (3%) received fortified blended flour compared to <1% of children 24-59 months. Similarly, 4% of children 6-23 months received RUSF compared to 2% of children 24-59 months. Six percent of children 6-23 months received RUTF compared to 2% of children 24-59 months. More children who currently had moderate wasting received fortified blended flour in the last 12 months (6%) compared to children who had severe wasting (4%) and those who did not currently suffer from wasting (1%). More children who currently had severe and moderate wasting children received RUSF in the last 12 months (11% each) compared to those who did not currently suffer from wasting (2%). Similarly, more children who currently had severe wasting received RUTF in the last 12 months (16%) compared to those with moderate wasting (9%) and those who did not currently suffer from wasting (3%). More children in the highest (7%) and the lowest wealth quintiles (6%) received RUTF in the last 12 months compared to children in other wealth quintiles (<3%).

Among the 27 children 6-59 months who were reported to receive treatment for malnutrition in the last 12 months, 6 children were reported not to receive either fortified blended foods, RUSF or RUTF.

Table 7.6 Treatment for Acute Malnutrition (Marasmus or Kwashiorkor) in the Last 12 Months Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Treated for Acute Malnutrition[a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	419	0.2	[0.0 , 1.7]	0.004
Other cities	336	3.0	[1.6 , 5.4]	
Rural	483	3.3	[2.0 , 5.5]	
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	755	1.7	[0.9 , 3.0]	0.033
Rural°	483	3.3	[2.0 , 5.5]	
Age, months				
6-8	59	3.6	[0.9 , 13.4]	0.022
9-11	70	2.8	[0.7 , 10.5]	
12-17	126	4.4	[1.8 , 10.1]	
18-23	118	5.9	[2.8 , 11.8]	
24-35	295	1.9	[0.8 , 4.6]	
36-47	277	1.8	[0.8 , 4.3]	
48-59	293	0.3	[0.1 , 2.3]	
6-23	373	4.4	[2.7 , 7.1]	0.001
24-59	865	1.4	[0.8 , 2.4]	
Wasting Status[b]				
Severe wasting	25	(16.2)	[6.2 , 36.1]	<0.001
Moderate wasting	91	10.8	[5.7 , 19.4]	
No wasting	1,086	1.3	[0.8 , 2.2]	
Sex				
Male	624	2.3	[1.3 , 3.9]	0.968
Female	614	2.3	[1.3 , 4.0]	
Wealth Quintile				
Lowest	286	3.4	[1.7 , 6.6]	0.069
Second	256	3.3	[1.6 , 6.4]	
Middle	268	2.9	[1.4 , 5.9]	
Fourth	209	0.0	-	
Highest	219	1.0	[0.3 , 4.0]	
Total[c]	**1,238**	**2.3**	**[1.6 , 3.4]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a]Includes marasmus or kwashiorkor.
[b]Among children 6-59 months of age with data for weight and length/height. Severe wasting is defined as having a weight-for-length/height z-score <-3 standard deviations and/or bilateral edema, and moderate wasting is defined as having a weight-for-length/height z-score <-2 and ≥-3 standard deviations from the 2006 WHO Child Growth Standards population median. No wasting is defined as having a weight-for-length/height z-score ≥-2 standard deviations from the 2006 WHO Child Growth Standards population median.
[c]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Table 7.7 Receipt of Fortified Blended Flour or Ready-To-Use Therapeutic Foods (RUTF) or Ready-To-Use Supplementary Food (RUSF) in the Last 12 Months Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Received CSB[a]			N	Received RUSF[b]			N	Received RUTF[c]		
		%	[95% CI]	p-value		%	[95% CI]	p-value		%	[95% CI]	p-value
Location°												
Ouagadougou & Bobo Dioulasso	420	1.0	[0.4 , 2.5]		419	2.6	[1.4 , 4.9]		421	2.4	[1.2 , 4.6]	
Other cities	334	2.4	[1.2 , 4.7]	0.273	335	3.3	[1.8 , 5.9]	0.679	335	4.8	[2.9 , 7.9]	0.221
Rural	485	1.4	[0.7 , 3.0]		488	2.3	[1.3 , 4.0]		488	3.1	[1.8 , 5.2]	
Residence												
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	754	1.7	[1.0 , 3.0]	0.836	754	3.0	[1.9 , 4.6]	0.482	756	3.6	[2.4 , 5.4]	0.741
Rural°	485	1.4	[0.7 , 3.0]		488	2.3	[1.3 , 4.0]		488	3.1	[1.8 , 5.2]	
Age, months												
6-8	60	1.5	[0.2 , 9.9]		60	0.0	-		60	0.0	-	
9-11	70	4.5	[1.5 , 13.2]		70	5.2	[1.6 , 15.7]		70	10.2	[4.6 , 21.2]	
12-17	127	4.3	[1.8 , 9.9]		127	6.5	[3.3 , 12.5]		128	5.6	[2.7 , 11.4]	
18-23	118	2.6	[0.8 , 7.9]	0.023	118	3.9	[1.6 , 9.1]	0.028	118	6.8	[3.4 , 13.1]	0.002
24-35	296	1.5	[0.6 , 4.0]		296	2.6	[1.2 , 5.3]		296	2.2	[1.0 , 4.8]	
36-47	274	0.4	[0.1 , 2.5]		276	2.7	[1.3 , 5.5]		276	3.5	[1.7 , 7.2]	
48-59	294	0.6	[0.2 , 2.4]		295	0.7	[0.2 , 2.8]		296	1.4	[0.5 , 3.6]	
6-23	375	3.4	[1.9 , 5.8]	0.002	375	4.4	[2.7 , 7.1]	0.019	376	5.9	[3.9 , 9.0]	0.002
24-59	864	0.8	[0.4 , 1.8]		867	2.0	[1.2 , 3.2]		868	2.3	[1.4 , 3.7]	
Wasting Status[d]												
Severe wasting	25	(3.8)	[0.5 , 22.7]		25	(11.1)	[3.6 , 29.6]		25	(16.2)	[6.2 , 36.1]	
Moderate wasting	90	6.1	[2.6 , 13.8]	0.001	91	10.7	[5.6 , 19.4]	<0.001	91	9.4	[4.7 , 18.0]	<0.001
No wasting	1,087	1.2	[0.7 , 2.0]		1,089	1.9	[1.2 , 3.0]		1,091	2.7	[1.9 , 4.0]	
Total[e]	**1,239**	**1.6**	**[1.0 , 2.5]**		**1,242**	**2.7**	**[1.9 , 3.8]**		**1,244**	**3.4**	**[2.5 , 4.7]**	

Table 7.7 Receipt of Fortified Blended Flour or Ready-To-Use Therapeutic Foods (RUTF) or Ready-To-Use Supplementary Food (RUSF) in the Last 12 Months Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020 (*continued*)

Characteristics	N	Received CSB[a]			N	Received RUSF[b]			N	Received RUTF[c]		
		%	[95% CI]	p-value		%	[95% CI]	p-value		%	[95% CI]	p-value
Sex												
Male	627	1.3	[0.7 , 2.7]	0.451	628	2.8	[1.7 , 4.5]	0.866	629	3.3	[2.0 , 5.2]	0.796
Female	612	1.9	[1.0 , 3.4]		614	2.6	[1.6 , 4.2]		615	3.6	[2.3 , 5.5]	
Wealth Quintile												
Lowest	287	2.4	[1.2 , 4.9]		288	3.2	[1.7 , 6.1]		288	5.6	[3.4 , 9.2]	
Second	260	0.5	[0.1 , 3.2]		261	2.5	[1.1 , 5.4]		261	0.4	[0.1 , 2.6]	
Middle	267	2.7	[1.3 , 5.6]	0.248	267	2.0	[0.8 , 4.6]	0.551	267	2.8	[1.3 , 5.8]	0.002
Fourth	209	1.1	[0.3 , 4.4]		209	1.8	[0.7 , 4.8]		210	2.0	[0.7 , 5.2]	
Highest	216	1.0	[0.3 , 4.1]		217	4.2	[2.0 , 8.4]		218	6.6	[3.6 , 12.0]	
Total[e]	**1,239**	**1.6**	**[1.0 , 2.5]**		**1,242**	**2.7**	**[1.9 , 3.8]**		**1,244**	**3.4**	**[2.5 , 4.7]**	

CSB= Corn soy blend; RUSF= Ready-to-use supplementary food, RUTF= Ready-to-use therapeutic food
Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a]Includes use of corn soy blend (CSB+ or CSB++) as part of a health program.
[b]Includes use of PLUMPY'SUP for the management of moderate acute malnutrition or prevention of severe acute malnutrition.
[c]Includes use of PLUMPY'NUT, F75 milk, or F100 milk as part of treatment for severe acute malnutrition.
[d]Among children 6-59 months of age with data for weight and length/height. Severe wasting is defined as having a weight-for-length/height z-score <-3 standard deviations and/or bilateral edema, and moderate wasting is defined as having a weight-for-length/height z-score <-2 and ≥-3 standard deviations from the 2006 WHO Child Growth Standards population median. No wasting is defined as having a weight-for-length/height z-score ≥-2 standard deviations from the 2006 WHO Child Growth Standards population median.
[e]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

7.7 Participation in a Cash Transfer Program

Among 6-59 months old children, 2% lived in households that participated in a cash transfer program in the last 12 months (**Table 7.8**). Participation in a cash transfer program varied by location, residence, sex of the child and wealth quintiles. There were more children living in households that participated in a cash transfer program in rural areas (4%) compared to 1% in other cities and 0.5% in Ouagadougou & Bobo Dioulasso. Less than 1% of children in urban areas lived in a household that participated in a cash transfer program. More female children lived in a household that participated in a cash transfer program (3%) compared to 1% of male children. More children in the lowest wealth quintile (5%) lived in a household that received cash transfers compared to the highest wealth quintile (1%).

Eighteen mothers/caregivers of children 6-59 months attended at least one accompanying behavior change communication session (i.e., village assembly and/or group counseling) in the last 12 months as part of the cash transfer program. These women reported to have heard about at least one of the following topics: breastfeeding, infant and young child nutrition, nutrition during pregnancy, vitamin A and iron supplementation, food groups and dietary diversity, hygiene, malaria, and other topics (e.g., household expenditures and school attendance) (data not shown, <25 unweighted cases).

Table 7.8 Participation in Social Safety Net Program Where Household Received Cash Transfer in the Last 12 Months Among Mothers/Caregivers of Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Children Living in Household that Participated in Cash Transfer Program in Last 12 Months		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	420	0.5	[0.1 , 1.9]	<0.001
Other cities	326	0.9	[0.3 , 2.8]	
Rural	486	3.9	[2.2 , 6.8]	
Residence				
Urban [Ouagadougou. Bobo Dioulasso & Other cities]	746	0.7	[0.3 , 1.7]	<0.001
Rural°	486	3.9	[2.2 , 6.8]	
Age, months				
6-8	60	1.5	[0.2 , 9.9]	0.345
9-11	69	0.0	-	
12-17	128	2.3	[0.7 , 6.8]	
18-23	115	1.7	[0.4 , 6.4]	
24-35	291	3.5	[1.8 , 6.7]	
36-47	273	1.8	[0.8 , 4.4]	
48-59	296	1.0	[0.3 , 3.0]	
6-23	372	1.5	[0.7 , 3.4]	0.514
24-59	860	2.1	[1.2 , 3.7]	
Sex				
Male	622	0.9	[0.4 , 2.3]	0.011
Female	610	3.0	[1.8 , 4.9]	
Wealth Quintile				
Lowest	287	4.8	[2.5 , 9.0]	0.007
Second	259	2.3	[0.8 , 6.3]	
Middle	261	0.9	[0.2 , 3.5]	
Fourth	207	0.0	-	
Highest	218	0.9	[0.2 , 3.4]	
Total[a]	**1,232**	**1.9**	**[1.2 , 3.1]**	

Note: N unweighted. Sample size might vary slightly due to missing data. A total of 11 observations in the "Don't Know" category and 4 observations with inconsistent data were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 8. Morbidity and Infectious Diseases

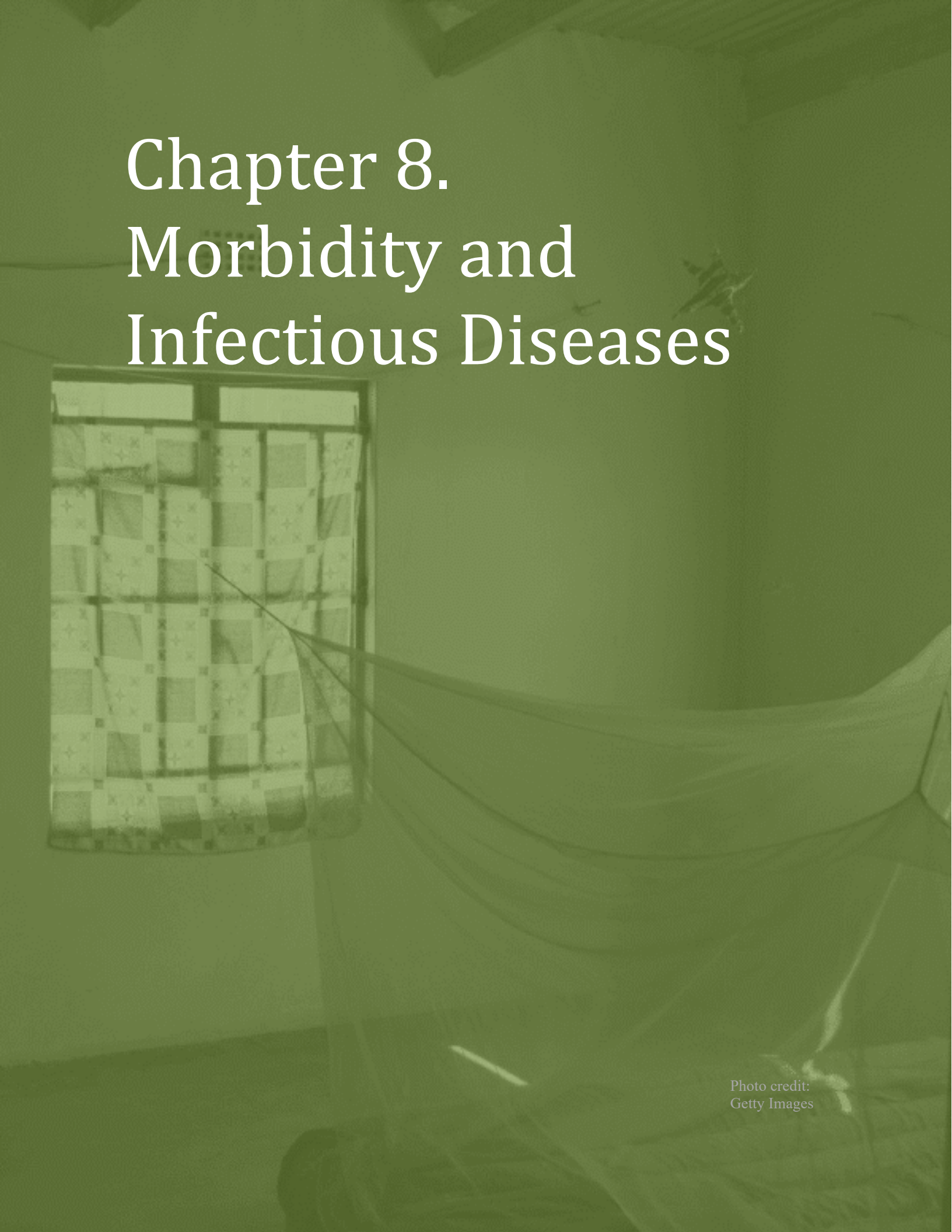


Photo credit: Getty Images

Chapter 8: Morbidity and Infectious Diseases

This chapter presents findings on recent morbidity (fever, cough, and diarrhea) and treatment for diarrhea in the 2 weeks prior to the interview among children 6-59 months as reported by the mother or caregiver. This chapter also presents findings of laboratory field tests for children, such as infections with malaria (blood specimen), soil transmitted helminths (stool specimen), and *Helicobacter pylori* (stool specimen).

8.1 Fever, Cough and Diarrhea Among Children 6-59 Months

Table 8.1 presents the prevalence of fever, cough, and diarrhea among children 6-59 months in the last two weeks as reported by their mothers or caregivers. A similar percentage (27%) of the children had fever and cough, while 13% had diarrhea.

The prevalence of fever varied by residence, age of the child and wealth quintiles. More children had fever in the last two weeks in rural areas (30%) compared to urban areas (25%). The prevalence of fever was higher for children 6-23 months (32%) compared to 24% for children 24-59 months. The prevalence of fever peaked for children 9-11 months (43%) and was lowest for children 48-59 months (22%). More children had fever in the lowest wealth quintile (36%) compared to 19% in the middle and 27% in the highest wealth quintile. The prevalence of cough varied by location and wealth quintiles. This was higher for Ouagadougou & Bobo Dioulasso (33%) compared to 24% in other cities and 25% in rural areas.

The prevalence of cough was similar for the lowest (32%), fourth (31%) and highest (31%) quintiles, and lower for the middle (26%) and second (17%) wealth quintiles. The prevalence of diarrhea only varied by age of the children. The prevalence among children 6-23 months (24%) was 3 times that of children 24-59 months (8%).

The prevalence of diarrhea peaked for children 9-11 and 12-17 months (25%) and was lowest for children 48-59 months (4%).

Table 8.1 Recent Morbidity During the Last Two Weeks Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Fever			N	Cough			N	Diarrhea		
		%	[95% CI]	p-value		%	[95% CI]	p-value		%	[95% CI]	p-value
Location°												
Ouagadougou & Bobo Dioulasso	419	26.0	[21.9 , 30.6]		420	33.1	[28.1 , 38.5]		420	12.4	[9.6 , 15.9]	
Other cities	337	23.1	[19.0 , 27.9]	0.089	337	23.7	[19.2 , 29.0]	0.018	337	11.9	[8.9 , 15.7]	0.832
Rural	488	30.1	[25.9 , 34.7]		486	25.3	[21.2 , 29.9]		483	13.3	[10.5 , 16.7]	
Residence												
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	756	24.5	[21.5 , 27.8]	0.047	757	28.2	[24.8 , 31.9]	0.217	757	12.1	[10.0 , 14.6]	0.574
Rural°	488	30.1	[25.9 , 34.7]		486	25.3	[21.2 , 29.9]		483	13.3	[10.4 , 16.7]	
Age, months												
6-8	60	27.4	[17.7 , 39.8]		60	19.3	[11.2 , 31.2]		60	21.2	[12.3 , 34.0]	
9-11	69	43.2	[31.7 , 55.5]		69	30.7	[20.5 , 43.3]		70	25.4	[16.2 , 37.6]	
12-17	128	30.3	[23.1 , 38.7]		128	28.2	[21.1 , 36.6]		128	25.2	[18.3 , 33.5]	
18-23	118	30.1	[22.6 , 38.8]	0.020	118	29.2	[21.6 , 38.1]	0.368	118	22.7	[16.0 , 31.1]	<0.001
24-35	297	24.1	[19.4 , 29.5]		295	26.3	[21.5 , 31.9]		291	9.6	[6.7 , 13.6]	
36-47	277	26.7	[21.7 , 32.3]		277	31.1	[25.7 , 37.0]		277	9.3	[6.4 , 13.3]	
48-59	295	22.2	[17.7 , 27.5]		296	23.7	[19.0 , 29.1]		296	4.2	[2.4 , 7.2]	
6-23	375	32.1	[27.7 , 37.0]	0.004	375	27.6	[23.2 , 32.4]	0.823	376	23.8	[19.7 , 28.5]	<0.001
24-59	869	24.3	[21.4 , 27.4]		868	26.9	[23.8 , 30.3]		864	7.7	[6.0 , 9.6]	
Sex												
Male	629	26.3	[23.0 , 30.0]	0.799	629	26.8	[23.3 , 30.6]	0.771	626	13.0	[10.5 , 15.9]	0.658
Female	615	27.0	[23.6 , 30.6]		614	27.5	[23.9 , 31.4]		614	12.1	[9.8 , 15.0]	
Wealth Quintile												
Lowest	288	36.3	[30.5 , 42.4]		288	31.9	[26.1 , 38.4]		287	12.6	[9.1 , 17.2]	
Second	258	25.6	[20.4 , 31.6]		257	16.7	[12.1 , 22.7]		256	12.4	[8.8 , 17.0]	
Middle	268	18.6	[14.1 , 24.0]	<0.001	268	26.2	[20.6 , 32.6]	0.002	268	12.3	[8.9 , 16.8]	0.979
Fourth	210	25.2	[20.0 , 31.3]		210	30.9	[24.9 , 37.5]		209	13.8	[9.8 , 19.1]	
Highest	220	27.1	[21.6 , 33.4]		220	31.0	[24.8 , 38.0]		220	11.8	[8.2 , 16.6]	
Total[a]	**1,244**	**26.6**	**[24.2 , 29.3]**		**1,243**	**27.1**	**[24.5 , 30.0]**		**1,240**	**12.5**	**[10.8 , 14.5]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Observations in the "Don't Know" category were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

One in every four children who had diarrhea in the last 2 weeks (26%) did not receive any diarrhea treatment (**Table 8.2**). Not receiving treatment did not vary by any background characteristic. Among children who were treated for diarrhea, various treatment options were administered including the use of oral rehydration salt (ORS) (16%), zinc supplements (10%), anti-biotics (20%), anti-diarrheal (26%), home remedies (13%) and other treatments such as painkillers (6%) (**Table 8.3**). The use of ORS among children with diarrhea was higher (23%) in those aged 6-23 months compared to those aged 24-59 months (8%). Use of other treatment options for diarrhea was higher (9%) among children 6-23 months compared to 1% among children 24-59 months. Treatment options did not vary by any other background characteristics.

Table 8.2 Treatment for Diarrhea Among Children 6-59 Months Having Diarrhea During the Last Two Weeks, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Did Not Receive Treatment for Diarrhea[a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	52	30.8	[19.1 , 45.5]	
Other cities	40	(20.0)	[10.2 , 35.5]	0.524
Rural	64	26.6	[17.0 , 39.0]	
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	92	26.1	[17.8 , 36.5]	0.949
Rural°	64	26.6	[17.0 , 39.0]	
Age, months				
6-8	13	*	*	
9-11	18	*	*	
12-17	32	(12.0)	[4.6 , 28.1]	
18-23	27	(30.2)	[15.7 , 50.2]	0.473
24-35	28	(37.0)	[21.0 , 56.4]	
36-47	26	(25.1)	[12.3 , 44.5]	
48-59	12	*	*	
6-23	90	23.0	[15.1 , 33.3]	0.359
24-59	66	29.6	[19.8 , 41.8]	
Sex				
Male	81	20.4	[13.0 , 30.7]	0.108
Female	75	31.6	[22.0 , 43.2]	
Wealth Quintile				
Lowest	37	(21.6)	[10.9 , 38.4]	
Second	31	(36.2)	[21.1 , 54.6]	
Middle	33	(30.6)	[17.1 , 48.6]	0.461
Fourth	29	(19.3)	[8.8 , 37.4]	
Highest	26	(19.3)	[8.0 , 39.6]	
Total[b]	**156**	**25.8**	**[19.3 , 33.5]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution. An asterisk indicates that the denominator sample size is <25 unweighted cases and has been suppressed.
[a]Among children 6-59 months who were reported to have diarrhea during the last two weeks.
[b]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Table 8.3 Treatment Given for Diarrhea Among Children 6-59 Months Reported to Have Diarrhea During the Last Two Weeks, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Oral Rehydration Salts Solution (ORS) [a]			Zinc Supplements [a]			Antibiotics [a]		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	52	15.4	[7.8 , 28.1]		9.6	[4.0 , 21.3]		21.2	[12.1 , 34.3]	
Other cities	40	(20.0)	[10.2 , 35.4]	0.717	(12.5)	[5.2 , 26.9]	0.736	(20.0)	[10.2 , 35.4]	0.951
Rural	64	14.1	[7.5 , 24.9]		7.8	[3.2 , 17.6]		18.8	[10.5 , 31.3]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	92	17.7	[11.0 , 27.3]	0.577	11.1	[6.0 , 19.7]	0.528	20.6	[13.4 , 30.3]	0.780
Rural°	64	14.1	[7.5 , 24.9]		7.8	[3.2 , 17.6]		18.8	[10.5 , 31.3]	
Age, months										
6-8	13	*	*		*	*		*	*	
9-11	18	*	*		*	*		*	*	
12-17	32	(28.4)	[15.3 , 46.5]		(8.5)	[2.7 , 23.6]		(19.9)	[9.2 , 38.0]	
18-23	27	(15.7)	[5.9 , 35.5]	0.065	(14.8)	[5.5 , 34.1]	0.946	(17.3)	[7.3 , 35.8]	0.915
24-35	28	(0.0)	-		(10.8)	[3.4 , 29.3]		(14.0)	[5.2 , 32.5]	
36-47	26	(20.3)	[8.6 , 40.8]		(4.7)	[0.6 , 26.9]		(26.6)	[13.0 , 46.7]	
48-59	12	*	*		*	*		*	*	
6-23	90	22.5	[14.8 , 32.6]	0.019	11.0	[5.9 , 19.4]	0.583	19.2	[12.2 , 28.9]	0.805
24-59	66	7.9	[3.3 , 17.9]		8.2	[3.4 , 18.5]		20.8	[12.5 , 32.4]	
Sex										
Male	81	15.2	[8.7 , 25.1]	0.704	13.7	[7.7 , 23.4]	0.092	15.9	[9.0 , 26.5]	0.215
Female	75	17.5	[10.3 , 28.1]		5.5	[2.1 , 14.0]		24.2	[15.7 , 35.2]	
Wealth Quintile										
Lowest	37	(13.5)	[5.8 , 28.6]		(2.7)	[0.4 , 17.4]		(24.3)	[12.2 , 42.6]	
Second	31	(11.9)	[4.5 , 28.0]		(9.8)	[3.1 , 26.9]		(10.5)	[3.4 , 28.2]	
Middle	33	(22.8)	[11.2 , 40.9]	0.467	(9.1)	[2.9 , 25.1]	0.417	(18.6)	[8.4 , 36.3]	0.637
Fourth	29	(10.2)	[3.2 , 28.0]		(17.4)	[7.2 , 36.2]		(24.5)	[11.9 , 43.8]	
Highest	26	(24.1)	[11.0 , 45.0]		(12.1)	[3.8 , 32.2]		(21.6)	[10.2 , 40.2]	
Total[c]	**156**	**16.3**	**[11.2 , 23.1]**		**9.8**	**[5.9 , 15.8]**		**19.8**	**[14.1 , 27.2]**	

Table 8.3 Treatment Given for Diarrhea Among Children 6-59 Months Reported to Have Diarrhea During the Last Two Weeks, Burkina Faso National Micronutrient Survey, 2020 (*continued*)

Characteristics	N	Anti-diarrheals [a]			Home Remedies [a]			Other [a, b]		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	52	26.9	[16.4 , 40.9]		19.2	[10.7 , 32.1]		7.7	[2.9 , 19.0]	
Other cities	40	(25.0)	[13.9 , 40.7]	0.969	(5.0)	[1.2 , 18.2]	0.136	(7.5)	[2.4 , 21.0]	0.501
Rural	64	25.0	[15.1 , 38.4]		15.6	[8.6 , 26.7]		3.1	[0.8 , 11.8]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	92	25.9	[17.8 , 36.2]	0.886	12.0	[6.9 , 19.9]	0.647	7.6	[3.6 , 15.4]	0.242
Rural°	64	25.0	[15.1 , 38.4]		15.6	[8.6 , 26.7]		3.1	[0.8 , 11.8]	
Age, months										
6-8	13	*	*		*	*		*	*	
9-11	18	*	*		*	*		*	*	
12-17	32	(34.0)	[19.6 , 52.0]		(20.3)	[9.9 , 37.1]		(12.9)	[4.9 , 30.0]	
18-23	27	(23.1)	[10.7 , 43.1]	0.880	(6.6)	[1.6 , 22.9]	0.637	(8.0)	[2.0 , 27.5]	0.414
24-35	28	(27.6)	[14.3 , 46.7]		(9.7)	[3.1 , 26.5]		(0.0)	-	
36-47	26	(22.5)	[10.3 , 42.5]		(9.3)	[2.4 , 30.3]		(3.5)	[0.5 , 21.3]	
48-59	12	*	*		*	*		*	*	
6-23	90	27.0	[18.6 , 37.4]	0.623	15.6	[9.6 , 24.2]	0.364	9.1	[4.6 , 17.4]	0.033
24-59	66	23.6	[14.9 , 35.4]		10.5	[5.0 , 20.9]		1.3	[0.2 , 9.1]	
Sex										
Male	81	26.7	[18.0 , 37.6]	0.737	14.1	[8.1 , 23.3]	0.810	6.2	[2.6 , 14.3]	0.831
Female	75	24.4	[15.7 , 35.7]		12.8	[7.0 , 22.2]		5.4	[2.0 , 13.8]	
Wealth Quintile										
Lowest	37	(32.4)	[18.0 , 51.2]		(16.2)	[7.5 , 31.7]		(2.7)	[0.4 , 17.4]	
Second	31	(19.6)	[8.9 , 37.8]		(12.1)	[4.6 , 28.4]		(3.0)	[0.4 , 19.1]	
Middle	33	(13.0)	[4.9 , 30.4]	0.264	(5.2)	[1.3 , 18.6]	0.257	(12.1)	[4.5 , 28.9]	0.422
Fourth	29	(33.6)	[18.7 , 52.7]		(23.4)	[11.3 , 42.3]		(7.2)	[1.7 , 25.3]	
Highest	26	(31.4)	[16.1 , 52.1]		(10.8)	[3.6 , 28.2]		(3.6)	[0.5 , 22.3]	
Total[c]	**156**	**25.6**	**[19.0 , 33.5]**		**13.4**	**[9.0 , 19.6]**		**5.8**	**[3.0 , 11.0]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution. An asterisk indicates that the denominator sample size is <25 unweighted cases and has been suppressed.
[a]Multiple response question.
[b]Among the 29 observations of other treatments, only two specified "painkillers".
[c]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

8.2 *Helicobacter Pylori* Infection Among Children 6-59 Months

The prevalence of *Helicobacter pylori* infection among children 6-59 months was 26% (**Table 8.4**). *H. pylori* infection was higher among children in Ouagadougou & Bobo Dioulasso (31%) compared to 27% in other cities and 20% in rural areas. The prevalence was 29% in urban areas. It was higher for children 24-59 months (28%) compared to children 6-23 months (18%).

Table 8.4 Prevalence of *Helicobacter Pylori* Assessed in Stool Specimen Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	*H. pylori* in Stool Specimen [a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	203	31.0	[25.1 , 37.6]	0.036
Other cities	199	26.6	[20.5 , 33.8]	
Rural	248	20.2	[15.5 , 25.8]	
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	402	28.5	[24.1 , 33.4]	0.017
Rural°	248	20.2	[15.5 , 25.8]	
Age, months				
6-8	21	*	*	0.011
9-11	39	(18.4)	[9.1 , 33.6]	
12-17	61	14.9	[7.9 , 26.4]	
18-23	64	24.4	[15.4 , 36.4]	
24-35	150	21.3	[15.5 , 28.6]	
36-47	153	33.7	[26.8 , 41.5]	
48-59	162	29.8	[23.3 , 37.3]	
6-23	185	18.3	[13.3 , 24.6]	0.008
24-59	465	28.3	[24.3 , 32.7]	
Sex				
Male	319	24.6	[20.0 , 29.8]	0.594
Female	331	26.4	[21.8 , 31.5]	
Wealth Quintile				
Lowest	134	25.0	[17.7 , 34.2]	0.051
Second	134	15.6	[10.2 , 23.0]	
Middle	160	29.9	[23.0 , 37.9]	
Fourth	118	26.5	[19.3 , 35.1]	
Highest	104	31.0	[22.6 , 40.8]	
Total[b]	**650**	**25.5**	**[22.1 , 29.1]**	

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data. A total of 16 observations with invalid test results and 28 observations with insufficient sample to perform a test were treated as missing values (i.e., excluded from N).
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution. An asterisk indicates that the denominator sample size is <25 unweighted cases and has been suppressed.
[a]Rapid test kit (Antigen SD Bioline test) providing a positive or negative result for *H. pylori* antigens.
[b]Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

8.3 Soil Transmitted Helminth Infection Among Children 6-59 Months

The national deworming campaign occurred in November and December 2019, approximately 2-3 months prior to survey data collection. Prevalence of any soil transmitted helminth (STH) infection assessed by the Kato Katz method on stool specimens among children 6-59 months was low (4%) (**Table 8.5**). Prevalence varied by age of the child but not with any other background characteristics. The prevalence of STH for children 6-23 months (6%) was twice that of children 24-59 months (3%).

The prevalence of light intensity STH infection was 2% for *Ascaris lumbricoides*, 1% for *Trichuris trichura* and less than 1% for hookworms among a total number of 658 children (**Table 8.6**). The prevalence of hookworm infections was 1% among children 6-23 months compared to 0% among children 24-59 months. There were no children with moderate or heavy intensity STHs.

Table 8.5 Prevalence of Any Soil Transmitted Helminths (STH) Assessed by Kato Katz Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Any STH [a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	212	2.8	[1.3 , 6.1]	
Other cities	199	4.5	[2.4 , 8.4]	0.618
Rural	247	3.2	[1.6 , 6.3]	
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	411	3.8	[2.3 , 6.2]	0.780
Rural°	247	3.2	[1.6 , 6.3]	
Age, months				
6-8	21	*	*	
9-11	41	(9.1)	[3.4 , 22.1]	
12-17	62	7.0	[2.7 , 17.0]	
18-23	65	4.9	[1.6 , 14.3]	0.215
24-35	153	2.0	[0.6 , 6.1]	
36-47	155	3.8	[1.7 , 8.2]	
48-59	161	2.2	[0.7 , 6.6]	
6-23	189	5.9	[3.3 , 10.4]	0.046
24-59	469	2.7	[1.5 , 4.6]	
Sex				
Male	324	3.2	[1.7 , 5.8]	0.602
Female	334	4.0	[2.3 , 6.7]	
Wealth Quintile				
Lowest	133	3.1	[1.2 , 7.8]	
Second	134	5.2	[2.5 , 10.7]	
Middle	160	4.2	[1.9 , 9.0]	0.538
Fourth	125	1.4	[0.4 , 5.4]	
Highest	106	3.7	[1.4 , 9.7]	
Dewormed in Last JVA+ Campaign (children 12-59 months, Nov-Dec 2019)				
Yes	355	2.8	[1.4 , 5.2]	0.235
No	218	4.7	[2.5 , 8.5]	
Total[b]	**658**	**3.6**	**[2.4 , 5.3]**	

JVA+= Journées Vitamine A+ (Vitamin A Days); STH= Soil transmitted helminths
Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data. A total of 6 observations with invalid test results and 30 observations with insufficient sample to perform a test were treated as missing values (i.e., excluded from N). A total of 55 observations in the "Don't Know" category for deworming during the last JVA+ campaign were treated as missing values.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution. An asterisk indicates that the denominator sample size is <25 unweighted cases and has been suppressed.
[a] Any worm infestation: either *Ascaris lumbricoides*, *Trichuris trichura*, or Hookworms.
[b] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Table 8.6 Prevalence of Light Intensity Soil Transmitted Helminths (STH) Assessed by Kato Katz Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020 [a]

Characteristics	N	*Ascaris lumbricoides*			*Trichuris trichura*			Hookworms		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	212	1.4	[0.5 , 4.3]		0.9	[0.2 , 3.7]		0.5	[0.1 , 3.3]	
Other cities	199	2.5	[1.1 , 5.8]	0.573	1.5	[0.5 , 4.6]	0.460	0.5	[0.1 , 3.5]	0.546
Rural	247	2.8	[1.4 , 5.8]		0.4	[0.1 , 2.8]		0.0	-	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	411	2.0	[1.0 , 4.0]	0.457	1.3	[0.5 , 3.0]	0.275	0.5	[0.1 , 2.0]	0.273
Rural°	247	2.8	[1.4 , 5.8]		0.4	[0.1 , 2.8]		0.0	-	
Age, months										
6-8	21	*	*		*	*		*	*	
9-11	41	(6.9)	[2.2, 19.5]		(0.0)	-		(2.2)	[0.3 , 14.3]	
12-17	62	3.1	[0.8, 11.4]		3.8	[1.0 , 14.1]		0.0	-	
18-23	65	1.3	[0.2 , 8.9]	0.574	1.8	[0.3 , 11.7]	0.116	1.8	[0.3 , 11.7]	0.095
24-35	153	2.0	[0.6 , 6.1]		0.0	-		0.0	-	
36-47	155	2.0	[0.6 , 6.1]		1.8	[0.6 , 5.3]		0.0	-	
48-59	161	2.2	[0.7 , 6.6]		0.0	-		0.0	-	
6-23	189	2.9	[1.3 , 6.4]	0.508	1.9	[0.6 , 5.6]	0.121	1.1	[0.3 , 4.3]	0.027
24-59	469	2.1	[1.1 , 3.9]		0.6	[0.2 , 1.8]		0.0	-	
Sex										
Male	324	2.3	[1.1 , 4.7]	0.933	0.9	[0.3 , 2.9]	0.951	0.0	-	0.165
Female	334	2.4	[1.2 , 4.7]		1.0	[0.3 , 3.0]		0.6	[0.2 , 2.5]	
Wealth Quintile										
Lowest	133	3.1	[1.2 , 7.8]		0.0	-		0.0	-	
Second	134	4.4	[2.0 , 9.4]		0.0	-		0.9	[0.1 , 6.0]	
Middle	160	1.4	[0.4 , 5.5]	0.181	2.8	[1.0 , 7.1]	0.112	0.0	-	0.615
Fourth	125	0.0	-		0.7	[0.1 , 4.8]		0.7	[0.1 , 4.8]	
Highest	106	2.9	[0.9 , 8.7]		0.9	[0.1 , 5.9]		0.0	-	
Dewormed in Last JVA+ Campaign (children 12-59 months)										
Yes	355	1.5	[0.6 , 3.6]	0.166	0.9	[0.3 , 2.8]	0.621	0.3	[0.0 , 2.3]	0.442
No	218	3.3	[1.6 , 6.8]		1.4	[0.4 , 4.2]		0.0	-	
Total[b]	**658**	**2.3**	**[1.4 , 3.8]**		**1.0**	**[0.4 , 2.1]**		**0.3**	**[0.1 , 1.3]**	

JVA+= Journées Vitamine A+ (Vitamin A Days); STH= Soil transmitted helminths

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data. A total of 6 observations with invalid test results and 30 observations with insufficient sample to perform a test were treated as missing values (i.e., excluded from N).

All estimates account for complex sample design.

°All estimates account for weighting, except for stratification by location and rural residence.

P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.

Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution. An asterisk indicates that the denominator sample size is <25 unweighted cases and has been suppressed.

[a] Classes of intensity are based on epg (eggs per gram) of stool according to WHO guidelines: light intensity - *Ascaris lumbricoides*: 1-4999 epg; *Trichuris trichura*: 1-999 epg; Hookworms: 1-1999 epg (WHO, 2002).

[b] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

8.4 Malaria Infection Among Children 6-59 Months

The BFNMS was implemented in February and March 2020, which corresponds to the low malaria transmission season in the Centre and North regions. Malaria transmission is perennial in the South and Southwest regions but peaks during the rainy season (approx. May/June through September/October). Malaria infection was detected in blood of 10% of the children 6-59 months (**Table 8.7**). The prevalence of malaria varied by location, residence, wealth quintiles, and child anemia status. More children had malaria in rural areas (14%) compared to other cities (12%) and Ouagadougou & Bobo Dioulasso (1%). The prevalence of malaria in rural areas (14%) was twice that of urban areas (7%). The prevalence was higher for the lowest (14%) and second (15%) wealth quintiles and lowest for the highest quintile (2%). Children with anemia had a higher prevalence of malaria (16%) compared to those without anemia (6%).

Table 8.7 Malaria Prevalence Assessed Using a Rapid Test Kit (RTK) in Whole Blood Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Malaria Infection [a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	248	1.2	[0.4 , 3.7]	<0.001
Other cities	233	11.6	[7.9 , 16.6]	
Rural	319	13.5	[10.1 , 17.7]	
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	481	7.0	[4.9 , 10.0]	0.001
Rural°	319	13.5	[10.1 , 17.7]	
Age°, months				
6-11	44	(2.3)	[0.3 , 14.5]	0.431
12-17	58	6.9	[2.6 , 17.0]	
18-23	67	7.5	[3.1 , 16.7]	
24-35	192	9.9	[6.3 , 15.3]	
36-47	214	8.4	[5.4 , 12.8]	
48-59	225	11.6	[7.9 , 16.6]	
6-23	169	5.9	[3.2 , 10.7]	0.104
24-59	631	10.0	[7.8 , 12.6]	
Sex				
Male	410	10.0	[7.3 , 13.6]	0.594
Female	390	8.9	[6.4 , 12.2]	
Wealth Quintile				
Lowest	189	14.1	[9.7 , 19.9]	<0.001
Second	158	14.6	[9.4 , 22.0]	
Middle	191	10.1	[6.7 , 15.1]	
Fourth	136	3.4	[1.3 , 8.8]	
Highest	126	1.5	[0.4 , 5.6]	
Anemia[b]				
Yes	290	16.1	[12.2 , 20.9]	<0.001
No	420	6.0	[4.1 , 8.8]	
Total[c]	**800**	**9.5**	**[7.6 , 11.8]**	

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data. A total of 13 observations with invalid test results and 57 observations with insufficient sample to perform a test were treated as missing values (i.e., excluded from N).
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence, and child age, which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Rapid test kit (CareStart *P. falciparum* (HRP2) test) providing a positive or negative result for *Plasmodium falciparum*.
[b] Any anemia (<11.0 g/dL).
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 9. Anthropometry Status

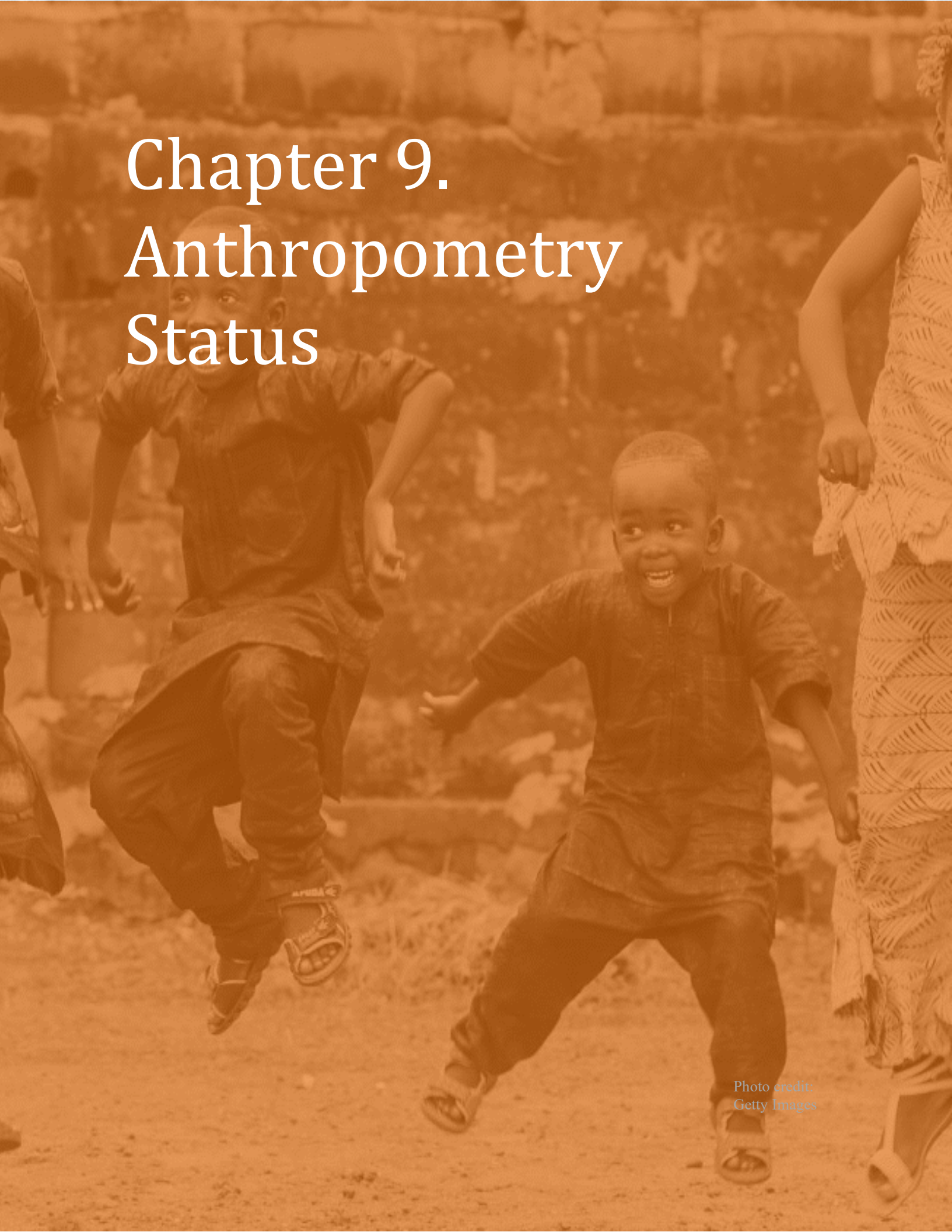


Photo credit: Getty Images

Chapter 9: Anthropometry Status

The survey collected data on the nutritional status of children 6-59 months by measuring recumbent length of those under age 2 years or height of those 2-years and older, weight, and mid-upper arm circumference. Indicators for nutritional status - length/height-for-age z-score (LAZ/HAZ), weight-for-age z-score (WAZ), weight-for-length/height z-score (WLZ/WHZ), and mid-upper arm circumference-for-age z-score (MUACZ) - were calculated using 2006 World Health Organization (WHO) child growth standards (WHO, 2006).

Annex 5.1 and **Annex 5.2** present mid-upper arm circumference (MUAC, absolute values in mm) and MUAC-for-age Z-scores (MUACZ) among children 6-59 months. **Annex 5.3** and **Annex 5.4** present the prevalence of global, moderate and severe acute malnutrition among children 6-59 months using weight-for-length/height Z-score (WLZ/WHZ) and MUAC, respectively. **Annex 6** presents data quality tables for anthropometry measurements (missing values, biologically implausible values, digit preference, and distribution characteristics).

9.1 Stunting Among Children 6-59 Months

Table 9.1 shows prevalence of stunting (LAZ/HAZ <-2z) and severe stunting (LAZ/HAZ <-3z) among 1219 children aged 6-59 months. Nationally, the prevalence of stunting was 21% and severe stunting was 7%.

Stunting varied by location, residence, age of the child and wealth quintiles. The prevalence of stunting was highest in rural areas (25%) compared to 19% in other cities and 17% in Ouagadougou & Bobo Dioulasso. Stunting was higher in rural (25%) compared to urban areas (18%). Stunting varied by age, with a peak for children 18-23 months (31%) and lowest for children 9-11 months (11%); **Figure 9.1**. Every 1 out of 4 children (25%) had stunting in the lowest wealth quintile compared to 22% in the middle and 14% in the highest wealth quintile.

The prevalence of severe stunting varied by location and residence. Nine percent of children in rural areas had severe stunting compared to 7% in other cities and 4% in Ouagadougou & Bobo Dioulasso. Nine percent of the children had severe stunting in rural areas compared to 6% in urban areas.

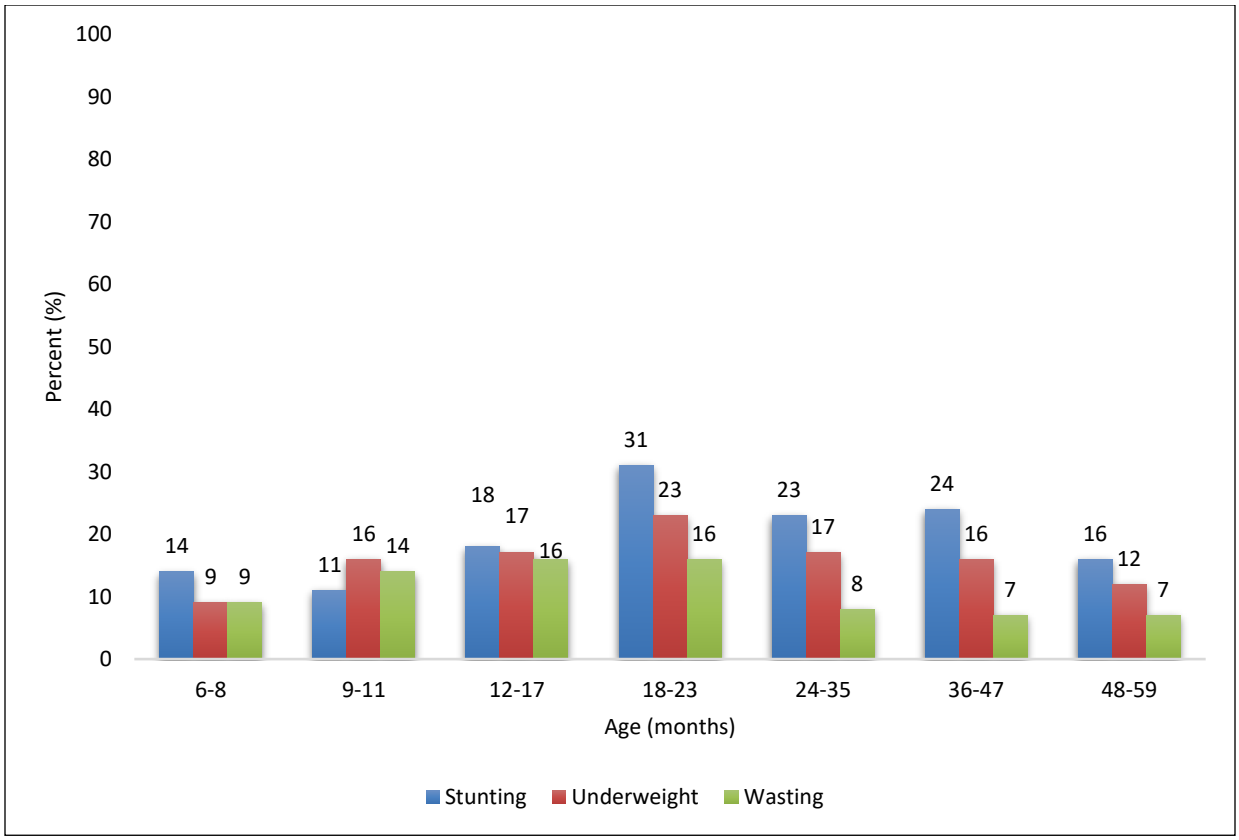


Figure 9.1 Prevalence of Stunting, Underweight and Wasting Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Note: Weighted estimates.

Table 9.1 Mean Length/Height-for-Age Z-score (LAZ/HAZ) and the Prevalence of Stunting Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	LAZ/HAZ			Prevalence					
					<-2 z-score (Stunting)			<-3 z-score (Severe Stunting)		
		Mean z-score	SE z-score	[95% CI] z-score	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	405	-0.54	0.08	[-0.70 , -0.39]	16.5	[13.3 , 20.3]		3.7	[2.3 , 6.0]	
Other cities	330	-0.99	0.08	[-1.15 , -0.84]	18.8	[15.1 , 23.2]	0.003	7.3	[4.9 , 10.7]	0.012
Rural	484	-1.12	0.08	[-1.28 , -0.97]	25.4	[21.6 , 29.7]		8.7	[6.4 , 11.6]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	735	-0.78	0.06	[-0.89 , -0.67]	17.7	[15.2 , 20.6]	0.001	5.6	[4.1 , 7.6]	0.023
Rural°	484	-1.13	0.08	[-1.28 , -0.97]	25.4	[21.6 , 29.7]		8.7	[6.4 , 11.6]	
Age, months										
6-8	57	-0.37	0.23	[-0.82 , 0.09]	14.0	[7.1 , 25.9]		7.4	[2.8 , 18.2]	
9-11	69	-0.52	0.19	[-0.90 , -0.14]	11.1	[5.7 , 20.8]		2.8	[0.7 , 10.6]	
12-17	124	-0.64	0.16	[-0.96 , -0.32]	18.0	[12.2 , 25.8]		3.8	[1.6 , 8.9]	
18-23	113	-1.21	0.14	[-1.49 , -0.93]	31.1	[23.0 , 40.5]	0.002	11.1	[6.6 , 18.2]	0.101
24-35	293	-1.16	0.09	[-1.34 , -0.99]	23.3	[18.9 , 28.4]		8.9	[6.1 , 12.8]	
36-47	272	-1.04	0.09	[-1.22 , -0.86]	23.8	[19.2 , 29.3]		7.0	[4.5 , 10.7]	
48-59	291	-0.73	0.09	[-0.90 , -0.56]	15.6	[11.8 , 20.4]		4.7	[2.7 , 8.2]	
6-23	363	-0.75	0.09	[-0.93 , -0.57]	20.2	[16.3 , 24.8]	0.799	6.5	[4.4 , 9.5]	0.798
24-59	856	-0.98	0.05	[-1.08 , -0.87]	20.9	[18.3 , 23.7]		6.9	[5.3 , 8.9]	
Sex										
Male	618	-0.94	0.07	[-1.07 , -0.81]	22.0	[18.8 , 25.5]	0.256	7.5	[5.7 , 10.0]	0.284
Female	601	-0.88	0.06	[-1.00 , -0.76]	19.3	[16.4 , 22.7]		6.0	[4.3 , 8.2]	
Wealth Quintile										
Lowest	284	-1.18	0.10	[-1.38 , -0.99]	24.8	[20.1 , 30.2]		7.7	[5.1 , 11.3]	
Second	255	-0.98	0.10	[-1.19 , -0.78]	23.4	[18.5 , 29.1]		8.2	[5.5 , 12.2]	
Middle	264	-0.95	0.10	[-1.14 , -0.75]	21.6	[17.0 , 27.0]	0.022	7.8	[4.8 , 12.3]	0.268
Fourth	206	-0.82	0.09	[-1.00 , -0.63]	17.2	[12.8 , 22.7]		3.6	[1.7 , 7.3]	
Highest	210	-0.48	0.12	[-0.71 , -0.24]	13.8	[9.8 , 19.2]		5.5	[3.1 , 9.7]	
Total [a]	**1,219**	**-0.91**	**0.05**	**[-1.00 , -0.82]**	**20.7**	**[18.5 , 23.0]**		**6.8**	**[5.4 , 8.4]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Missing values included 17 biologically implausible values (<-6 or >6 z-scores) and 11 children without measurements.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Note: z-scores are calculated using 2006 WHO growth standards.
[a] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

9.2 Underweight Among Children 6-59 Months

Table 9.2 shows the prevalence of underweight (WAZ <-2z) and severe underweight (WAZ <-3z) among 1229 children aged 6-59 months. Nationally, 16% and 4% of the children had underweight and severe underweight.

The prevalence of underweight varied by location, residence, and wealth quintiles. Underweight was highest in rural areas (21%) compared to 16% in other cities and 10% in Ouagadougou & Bobo Dioulasso. Rural areas had a higher prevalence compared to urban areas (21% versus 13%). The prevalence of underweight declined steadily from the lowest quintile (22%) to the fourth (11%) and highest quintile (12%).

Similarly, the prevalence of severe underweight varied by location, residence, and wealth quintiles. It was highest in rural areas (7%) compared to other cities (4%) and Ouagadougou & Bobo Dioulasso (2%). Rural areas had a higher prevalence of severe underweight compared to urban areas (7% versus 3%). Severe underweight declined steadily from the lowest quintile (7%) to the highest quintile (1%).

The majority of parents (83%) perceived their child weight as normal weight, 16% as underweight and 1% as overweight (**Table 9.3**). The percentage of those who viewed their child as normal weight varied by location and age. This was highest for Ouagadougou & Bobo Dioulasso (90%) compared to other areas (77%) and rural areas (82%). More parents of children 24- 59 months perceived their child weight as normal (85%) compared to parents of children 6-23 months (78%).

The percentage of those who viewed their child as underweight varied by child age. More parents of children 6-23 months perceived their child weight as underweight (22%) compared to parents of children 24-59 months (14%).

Parental perception of overweight varied by location. This was highest for other cities (1.5%), compared to Ouagadougou & Bobo Dioulasso (0.5%) and rural areas (0.2%).

Table 9.2 Mean Weight-for-Age Z-score (WAZ) and the Prevalence of Underweight Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	WAZ			N	Prevalence					
						<-2 z-score (Underweight)			<-3 z-score (Severe Underweight)		
		Mean z-score	SE z-score	[95% CI] z-score		%	[95% CI]	p-value	%	[95% CI]	p-value
Location°											
Ouagadougou & Bobo Dioulasso	408	-0.57	0.07	[-0.70 , -0.44]	409	10.0	[7.5 , 13.3]		1.7	[0.8 , 3.5]	
Other cities	334	-0.87	0.07	[-1.01 , -0.74]	335	15.5	[12.0 , 19.9]	<0.001	4.2	[2.4 , 7.2]	0.002
Rural	481	-1.05	0.06	[-1.16 , -0.93]	485	20.6	[17.0 , 24.8]		6.6	[4.7 , 9.1]	
Residence											
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	742	-0.73	0.05	[-0.82 , -0.64]	744	12.9	[10.6 , 15.6]	<0.001	3.0	[1.9 , 4.7]	0.002
Rural°	481	-1.05	0.06	[-1.16 , -0.93]	485	20.6	[17.0 , 24.8]		6.6	[4.7 , 9.1]	
Age, months											
6-8	58	-0.42	0.18	[-0.77 , -0.08]	58	9.4	[4.0 , 20.9]		5.8	[1.9 , 16.6]	
9-11	69	-1.08	0.14	[-1.35 , -0.81]	69	15.8	[9.0 , 26.3]		5.5	[2.1 , 13.9]	
12-17	123	-0.78	0.12	[-1.02 , -0.53]	123	17.2	[11.5 , 25.0]		3.9	[1.6 , 9.1]	
18-23	118	-1.03	0.12	[-1.26 , -0.79]	118	22.9	[16.0 , 31.6]	0.154	6.5	[3.3 , 12.5]	0.793
24-35	292	-0.89	0.07	[-1.03 , -0.75]	293	17.4	[13.3 , 22.3]		4.4	[2.5 , 7.4]	
36-47	272	-0.94	0.07	[-1.08 , -0.81]	275	15.7	[11.9 , 20.6]		4.5	[2.6 , 7.8]	
48-59	291	-0.71	0.07	[-0.85 , -0.58]	293	12.2	[8.8 , 16.7]		3.0	[1.5 , 6.0]	
6-23	368	-0.86	0.07	[-0.99 , -0.72]	368	17.6	[14.0 , 21.9]	0.278	5.4	[3.5 , 8.1]	0.276
24-59	855	-0.85	0.04	[-0.93 , -0.76]	861	15.1	[12.8 , 17.8]		4.0	[2.8 , 5.6]	
Sex											
Male	617	-0.85	0.05	[-0.95 , -0.74]	620	15.8	[13.0 , 18.9]	0.944	4.9	[3.4 , 7.1]	0.362
Female	606	-0.85	0.05	[-0.95 , -0.76]	609	15.9	[13.1 , 19.2]		3.8	[2.6 , 5.7]	
Wealth Quintile											
Lowest	284	-1.10	0.08	[-1.25 , -0.94]	286	21.8	[16.9 , 27.6]		6.8	[4.5 , 10.3]	
Second	257	-0.93	0.08	[-1.09 , -0.77]	258	18.8	[14.2 , 24.4]		5.6	[3.3 , 9.3]	
Middle	266	-0.83	0.08	[-0.99 , -0.67]	267	13.5	[9.8 , 18.3]	0.005	4.3	[2.2 , 8.0]	0.023
Fourth	202	-0.73	0.08	[-0.88 , -0.58]	204	11.4	[7.7 , 16.5]		3.0	[1.4 , 6.6]	
Highest	214	-0.55	0.09	[-0.73 , -0.36]	214	11.5	[7.8 , 16.7]		0.9	[0.2 , 3.4]	
Total[a]	**1,223**	**-0.85**	**0.04**	**[-0.92 , -0.78]**	**1,229**	**15.8**	**[13.8 , 18.1]**		**4.4**	**[3.3 , 5.7]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Missing values included 8 biologically implausible values (<-6 or >5 z-scores) and 10 children without measurements. Six children with bilateral edema were excluded from WAZ analyses and were classified as having severe underweight (<-3 z-scores).
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Note: z-scores are calculated using 2006 WHO growth standards.
[a] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Table 9.3 Parent's Perception of Their Child's Weight Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Parent Perception of Child Weight								
		Underweight			Healthy Weight			Overweight		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	422	9.2	[6.7 , 12.7]		90.3	[86.7 , 93.0]		0.5	[0.1 , 1.9]	
Other cities	337	21.4	[17.2 , 26.2]	0.067	77.2	[72.2 , 81.5]	<0.001	1.5	[0.6 , 3.5]	<0.001
Rural	488	17.8	[14.4 , 21.8]		82.0	[78.0 , 85.4]		0.2	[0.0 , 1.4]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	15.5	[13.0 , 18.5]	0.122	83.5	[80.4 , 86.1]	0.283	1.0	[0.5 , 2.1]	0.159
Rural°	488	17.8	[14.4 , 21.8]		82.0	[78.0 , 85.4]		0.2	[0.0 , 1.4]	
Age, months										
6-8	60	17.1	[9.4 , 29.1]		80.9	[68.6 , 89.2]		2.0	[0.3 , 12.9]	
9-11	70	30.1	[20.2 , 42.2]		69.9	[57.8 , 79.8]		0.0	-	
12-17	128	18.1	[12.2 , 26.1]		80.9	[72.9 , 87.0]		0.9	[0.1 , 6.3]	
18-23	118	22.4	[15.8 , 30.8]	0.011	77.6	[69.2 , 84.2]	0.019	0.0	-	0.732
24-35	297	15.6	[11.8 , 20.5]		83.4	[78.5 , 87.3]		1.0	[0.3 , 3.1]	
36-47	277	14.5	[10.8 , 19.3]		84.6	[79.7 , 88.5]		0.9	[0.2 , 3.4]	
48-59	297	12.4	[9.0 , 16.8]		87.3	[82.8 , 90.7]		0.3	[0.0 , 2.3]	
6-23	376	21.5	[17.6 , 26.0]	0.001	77.8	[73.3 , 81.8]	0.002	0.6	[0.2 , 2.5]	0.870
24-59	871	14.2	[11.9 , 16.8]		85.1	[82.4 , 87.4]		0.7	[0.3 , 1.6]	
Sex										
Male	631	16.0	[13.3 , 19.2]	0.716	83.5	[80.2 , 86.2]	0.596	0.5	[0.2 , 1.6]	0.464
Female	616	16.8	[13.9 , 20.1]		82.3	[79.0 , 85.3]		0.9	[0.4 , 2.1]	
Wealth Quintile										
Lowest	288	13.6	[9.9 , 18.5]		86.0	[81.1 , 89.8]		0.3	[0.0 , 2.4]	
Second	261	19.1	[14.3 , 24.9]		80.9	[75.1 , 85.7]		0.0	-	
Middle	268	19.7	[15.2 , 25.1]	0.249	78.6	[73.0 , 83.3]	0.177	1.7	[0.6 , 4.5]	0.087
Fourth	210	14.8	[10.2 , 20.9]		85.2	[79.1 , 89.8]		0.0	-	
Highest	220	14.1	[9.8 , 19.9]		84.5	[78.5 , 89.1]		1.4	[0.5 , 4.3]	
Total[a]	**1,247**	**16.4**	**[14.3 , 18.7]**		**82.9**	**[80.5 , 85.0]**		**0.7**	**[0.3 , 1.4]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
[a] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

9.3 Wasting, Overweight and Obesity Among Children 6-59 Months

Table 9.4 shows the prevalence of wasting (WLZ/WHZ <-2z), severe wasting (WLZ/WHZ <-3z), overweight (WLZ/WHZ >+2z) and obesity (WLZ/WHZ >+3z) among 1210 children aged 6-59 months. The prevalence of wasting and severe wasting was about 10% and 2%, respectively. Wasting varied by age of the child such that 15% of children 6-23 months had wasting compared to 7% among children 24-59 months. Wasting was 9% for children 6-8 months and peaked for children 12-17 and 18-23 months at 16% (**Figure 9.1**). Severe wasting did not vary by any of the background characteristics.

Nationally, 2% of the children had overweight whereas about 1% of the children had obesity. Overweight varied by residence where 3% of children in urban areas had overweight compared to 1% in rural areas. Obesity varied by age with the highest prevalence at 3% for children 18-23 months and lowest prevalence for children 6-8, 9-11, 12-17 and 36-47 months at 0%.

Table 9.4 Mean Weight-for-Length/Height Z-score (WLZ/WHZ) and the Prevalence of Wasting, Overweight and Obesity in Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	WLZ/WHZ			N	Prevalence											
						<-2 z-score (Wasting)			<-3 z-score (Severe Wasting)			>+2 z-score (Overweight)			>+3 z-score (Obesity)		
		Mean z-score	SE z-score	[95% CI] z-score		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°																	
Ouagadougou & Bobo Dioulasso	401	-0.43	0.06	[-0.55 , -0.31]	402	7.5	[5.2 , 10.7]	0.109	1.2	[0.5 , 2.9]	0.304	3.5	[2.0 , 5.9]	0.050	1.0	[0.3 , 3.1]	0.241
Other cities	329	-0.48	0.07	[-0.62 , -0.34]	330	9.1	[6.5 , 12.6]		2.1	[1.0 , 4.4]		2.4	[1.2 , 4.8]		1.2	[0.5 , 3.2]	
Rural	474	-0.63	0.06	[-0.74 , -0.52]	478	11.7	[9.0 , 15.2]		2.7	[1.6 , 4.6]		1.0	[0.4 , 2.5]		0.2	[0.0 , 1.5]	
Residence																	
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	730	-0.45	0.05	[-0.55 , -0.36]	732	8.3	[6.5 , 10.6]	0.052	1.7	[1.0 , 3.0]	0.194	2.9	[1.9 , 4.4]	0.024	1.1	[0.5 , 2.3]	0.084
Rural°	474	-0.63	0.06	[-0.74 , -0.52]	478	11.7	[9.0 , 15.2]		2.7	[1.6 , 4.6]		1.0	[0.4 , 2.5]		0.2	[0.0 , 1.5]	
Age, months																	
6-8	58	-0.22	0.19	[-0.58 , 0.15]	58	9.1	[3.8 , 20.1]		1.7	[0.2 , 11.0]		3.6	[0.9 , 13.6]		0.0	-	
9-11	69	-1.04	0.13	[-1.30 , -0.78]	69	14.4	[7.5 , 25.8]		7.3	[3.0 , 16.4]		0.0	-		0.0	-	
12-17	123	-0.65	0.12	[-0.90 , -0.41]	123	16.4	[10.8 , 24.1]		3.3	[1.2 , 8.6]		3.8	[1.6 , 9.0]		0.0	-	
18-23	116	-0.61	0.12	[-0.85 , -0.38]	116	16.1	[10.5 , 24.0]	0.005	0.8	[0.1 , 5.7]	0.072	3.4	[1.3 , 8.7]	0.089	2.6	[0.8 , 7.9]	0.031
24-35	289	-0.40	0.07	[-0.54 , -0.26]	290	8.2	[5.5 , 11.9]		2.1	[0.9 , 4.6]		3.5	[1.9 , 6.3]		1.8	[0.8 , 4.4]	
36-47	269	-0.49	0.06	[-0.61 , -0.37]	272	7.2	[4.5 , 11.1]		1.6	[0.6 , 4.1]		0.4	[0.1 , 2.5]		0.0	-	
48-59	280	-0.51	0.07	[-0.64 , -0.38]	282	6.7	[4.3 , 10.5]		1.4	[0.5 , 3.8]		1.8	[0.7 , 4.2]		0.3	[0.0 , 2.2]	
6-23	366	-0.64	0.07	[-0.78 , -0.51]	366	14.8	[11.5 , 18.9]	<0.001	3.0	[1.7 , 5.4]	0.149	2.9	[1.6 , 5.2]	0.249	0.8	[0.3 , 2.6]	0.854
24-59	838	-0.47	0.04	[-0.54 , -0.39]	844	7.4	[5.8 , 9.4]		1.7	[1.0 , 2.9]		1.9	[1.2 , 3.1]		0.7	[0.3 , 1.6]	
Sex																	
Male	608	-0.50	0.05	[-0.60 , -0.40]	611	10.3	[8.1 , 13.0]	0.447	1.8	[1.0 , 3.2]	0.472	2.8	[1.7 , 4.6]	0.155	1.2	[0.5 , 2.6]	0.117
Female	596	-0.54	0.05	[-0.63 , -0.45]	599	9.0	[6.9 , 11.6]		2.4	[1.4 , 4.0]		1.6	[0.9 , 2.9]		0.3	[0.1 , 1.4]	
Wealth Quintile																	
Lowest	281	-0.64	0.08	[-0.79 , -0.50]	283	11.8	[8.2 , 16.7]		3.1	[1.6 , 5.8]		1.1	[0.4 , 3.4]		0.4	[0.1 , 3.0]	
Second	254	-0.56	0.08	[-0.72 , -0.40]	255	11.8	[8.4 , 16.2]		1.5	[0.6 , 3.8]		2.4	[1.0 , 5.5]		1.5	[0.5 , 4.6]	
Middle	259	-0.52	0.08	[-0.68 , -0.36]	260	10.4	[7.2 , 14.8]	0.091	2.4	[1.1 , 5.3]	0.550	3.3	[1.7 , 6.2]	0.425	0.4	[0.1 , 3.1]	0.636
Fourth	201	-0.35	0.08	[-0.51 , -0.19]	203	6.2	[3.5 , 10.7]		2.0	[0.8 , 5.3]		1.4	[0.5 , 4.4]		0.6	[0.1 , 4.0]	
Highest	209	-0.47	0.08	[-0.62 , -0.31]	209	6.1	[3.4 , 10.7]		1.0	[0.3 , 4.2]		2.8	[1.3 , 6.2]		0.9	[0.2 , 3.5]	
Total[a]	**1,204**	**-0.52**	**0.04**	**[-0.59 , -0.45]**	**1,210**	**9.6**	**[8.0 , 11.5]**		**2.1**	**[1.4 , 3.1]**		**2.2**	**[1.5 , 3.2]**		**0.8**	**[0.4 , 1.5]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Missing values included 21 biologically implausible values (<-5 or >5 z-scores) and 16 children without measurements. Six children with bilateral edema were excluded from WLZ/WHZ analyses and were classified as having severe wasting (<-3 z-scores).
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Note: z-scores are calculated using 2006 WHO growth standards.
[a] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 10. Anemia Status, Iron Deficiency and Iron Deficiency Anemia

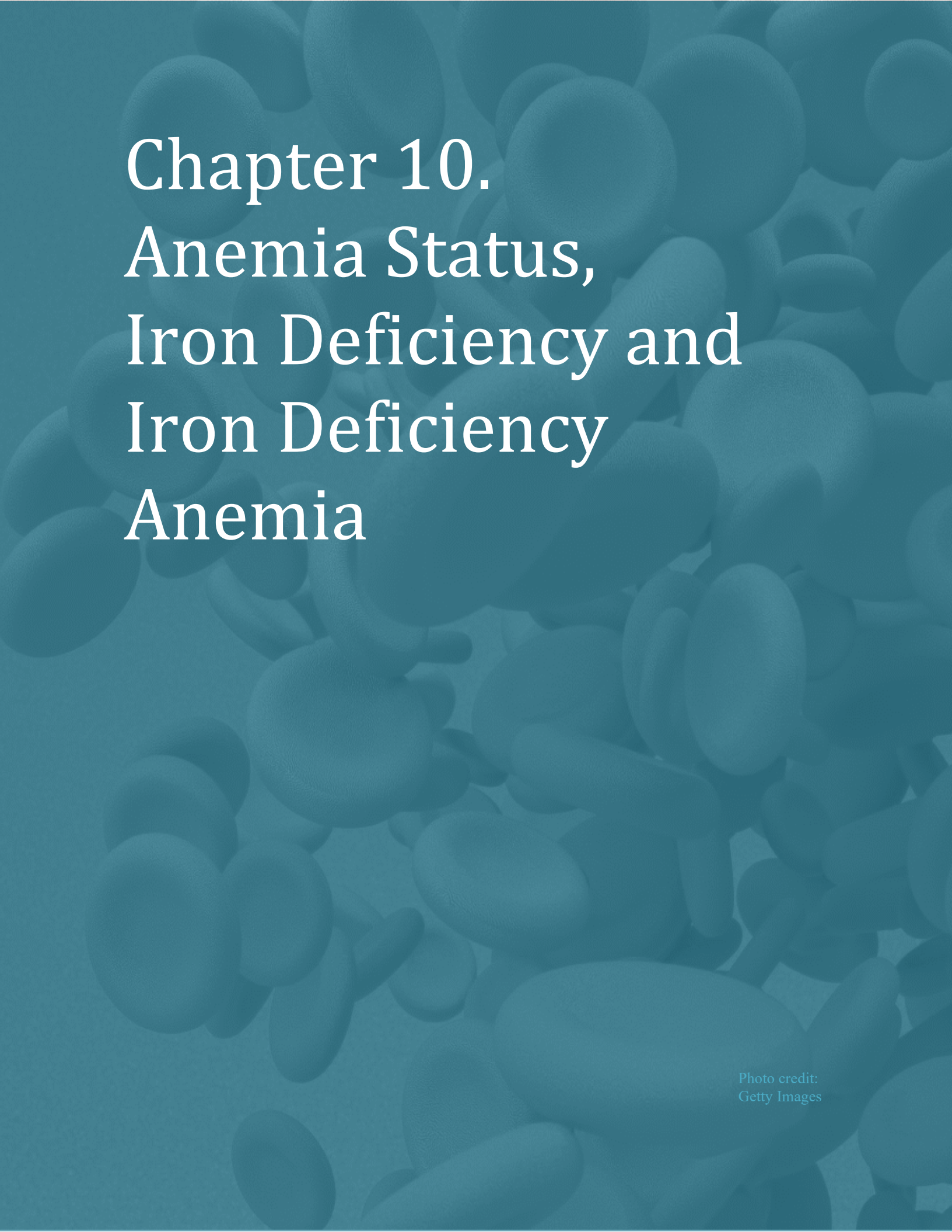


Photo credit: Getty Images

Chapter 10: Anemia Status, Iron Deficiency and Iron Deficiency Anemia

This chapter presents the status of anemia, iron deficiency and iron deficiency anemia among 709 children 6-59 months. Anemia is a condition in which there are not enough healthy red blood cells (measured via hemoglobin) to deliver oxygen to the tissues of the body. Anemia was determined by measuring hemoglobin in intravenous blood specimens using a HemoCue® Hb-301 analyzer. There were no hemoglobin adjustments for elevation in Burkina Faso as the elevation does not exceed 1000 meters above sea level.

Annex 8 presents additional tables and figures for hemoglobin concentrations (missing values, biologically implausible values, digit preference, and distribution characteristics).

10.1 Mean Hemoglobin and Anemia Among Children 6-59 Months

Nationally, the mean (SE) hemoglobin concentration was 11.2 (0.1) g/dL among children 6-59 months (**Table 10.1**). The national prevalence was 41% for any anemia, 25% for mild anemia, 16% for moderate anemia, and 0.3% for severe anemia.

Any anemia prevalence varied by location, residence, age of the children, wealth quintile and the result of the malaria rapid test. More children had anemia in rural areas (49%) compared to other cities (40%) and Ouagadougou & Bobo Dioulasso (32%). Thirty six percent of children in urban areas had anemia. Anemia was more prevalent among children 6-23 months compared to children 24-59 months (56% versus 37%, unweighted estimates to be interpreted with caution). The prevalence was highest (65%) among children 18-23 months and was 29% for children 48-59 months (unweighted estimates to be interpreted with caution). The prevalence decreased from 50% in the lowest wealth quintile to 42% in the middle and 34% in the highest quintile. More children had anemia among those who tested positive for malaria (65%) compared to those who tested negative (38%).

Mild anemia varied by location, residence and age. The prevalence of mild anemia was higher in rural areas (30%) compared to other cities (24%) and Ouagadougou & Bobo Dioulasso (19%). Twenty two percent of children in urban areas had mild anemia. Mild anemia also varied by age category with children 12-17 months having a prevalence of 32% and children 48-59 months a prevalence of 17% (unweighted estimates to be interpreted with caution).

Moderate anemia varied by age and malaria infection only. The prevalence of moderate anemia was higher among children 6-23 months compared to children 24-59 months (24% versus 14%, unweighted estimates to be interpreted with caution). It was highest for children 18-23 months (32%) and lowest for children 6-11 months (9%) (unweighted estimates to be interpreted with caution). More children had moderate anemia among those who tested positive for malaria (37%) compared to those who tested negative (13%).

Figure 10.1 shows the distribution of hemoglobin concentrations among children 6-59 months.

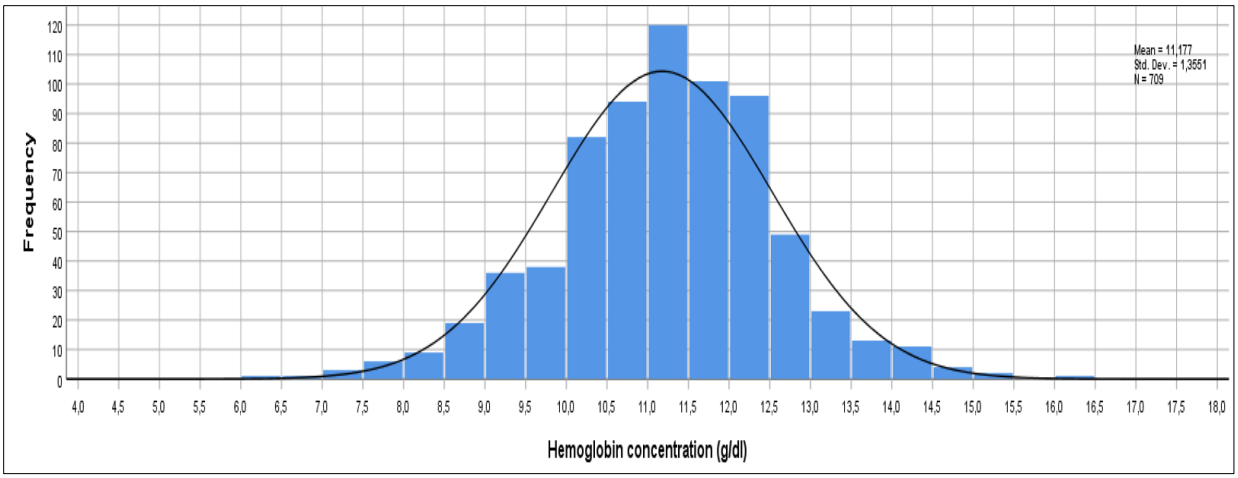


Figure 10.1 Distribution of Hemoglobin Concentrations (g/dL), Excluding Biologically Implausible Values (BIV), in Children 6-59 Months (N= 709), Burkina Faso National Micronutrient Survey, 2020

Note: Unweighted estimates. BIV is defined as hemoglobin concentration <4 g/dL or >18 g/dL (Sullivan *et al.*, 2008). There were no adjustments for altitude for the Burkina Faso National Micronutrient Survey.

Table 10.1 Anemia Prevalence Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Hemoglobin Concentration (g/dL)		Any Anemia (<11.0 g/dL)			Mild Anemia (10.0-10.9 g/dL)			Moderate Anemia (7.0-9.9 g/dL)		
		Mean	SE	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°												
Ouagadougou & Bobo Dioulasso	234	11.4	0.1	31.6	[25.9 , 38.0]		18.8	[14.4 , 24.2]		12.4	[8.5 , 17.8]	
Other cities	200	11.1	0.1	40.0	[33.5 , 46.9]	<0.001	24.5	[19.1 , 30.8]	0.011	15.0	[10.6 , 20.8]	0.145
Rural	275	11.0	0.1	49.1	[43.1 , 55.1]		30.2	[25.0 , 35.9]		18.9	[14.8 , 23.9]	
Residence												
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	434	11.3	0.1	36.1	[31.7 , 40.8]	<0.001	21.9	[18.2 , 26.0]	0.008	13.8	[10.7 , 17.6]	0.062
Rural°	275	11.0	0.1	49.1	[43.1 , 55.1]		30.2	[25.0 , 35.9]		18.9	[14.8 , 23.9]	
Age°, months												
6-11	32	(11.3)	(0.2)	(40.6)	[25.2 , 58.1]		31.3	[17.7 , 49.0]		9.4	[3.0 , 25.4]	
12-17	47	(10.8)	(0.2)	(55.3)	[41.0 , 68.8]		(31.9)	[20.2 , 46.4]		23.4	[13.4 , 37.6]	
18-23	57	10.6	0.2	64.9	[51.7 , 76.2]	<0.001	31.6	[20.9 , 44.7]	0.035	31.6	[20.8 , 44.7]	
24-35	162	11.0	0.1	46.3	[38.6 , 54.2]		29.0	[22.6 , 36.4]		17.3	[12.1 , 24.0]	0.004
36-47	198	11.2	0.1	38.9	[32.4 , 45.8]		25.3	[19.6 , 31.9]		13.1	[9.1 , 18.6]	
48-59	213	11.5	0.1	28.6	[22.9 , 35.1]		16.9	[12.4 , 22.5]		11.7	[7.9 , 17.0]	
6-23	136	10.8	0.1	55.9	[47.5 , 64.0]	<0.001	31.6	[24.3 , 39.9]	0.047	23.5	[17.2 , 31.4]	0.005
24-59	573	11.3	0.1	37.2	[33.3 , 41.2]		23.2	[19.9 , 26.9]		13.8	[11.1 , 16.9]	
Sex												
Male	365	11.1	0.1	41.8	[36.7 , 47.0]	0.664	24.9	[20.6 , 29.8]	0.987	16.2	[12.7 , 20.6]	0.679
Female	344	11.2	0.1	40.1	[35.0 , 45.5]		25.0	[20.7 , 29.8]		15.1	[11.7 , 19.3]	
Wealth Quintile												
Lowest	153	11.0	0.1	49.9	[42.2 , 57.7]		29.9	[23.1 , 37.7]		20.0	[14.5 , 27.0]	
Second	144	11.1	0.1	43.5	[35.6 , 51.9]		27.5	[21.2 , 34.9]		16.1	[10.6 , 23.6]	
Middle	174	11.2	0.1	42.0	[34.5 , 49.9]	0.018	23.6	[17.7 , 30.8]	0.290	17.9	[12.7 , 24.6]	0.174
Fourth	122	11.3	0.1	31.7	[24.0 , 40.5]		19.2	[13.0 , 27.4]		11.5	[6.8 , 18.8]	
Highest	116	11.3	0.1	33.9	[25.9 , 42.9]		23.5	[16.8 , 31.8]		10.4	[5.8 , 17.8]	
Any Iron Supplementation or MNP Intake During Last 7 Days												
Yes	20	*	*	*	*	*	*	*	*	*	*	*
No	689	11.2	0.1	41.2	[37.5 , 45.0]		25.2	[22.1 , 28.6]		15.9	[13.2 , 18.9]	
Any Blood Disorder[a]												
Yes	40	(10.9)	(0.2)	(42.6)	[28.2 , 58.3]	0.828	(20.2)	[10.4 , 35.8]	0.544	(22.3)	[12.0 , 37.8]	0.280
No	431	11.2	0.1	40.8	[36.2 , 45.4]		24.6	[20.8 , 28.8]		15.7	[12.4, 19.6]	
Total[b]	**709**	**11.2**	**0.1**	**41.0**	**[37.4 , 44.7]**		**25.0**	**[21.9 , 28.3]**		**15.7**	**[13.1 , 18.7]**	

Table 10.1 Anemia Prevalence Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020 (continued)

Characteristics	N	Hemoglobin Concentration (g/dL)		Any Anemia (<11.0 g/dL)			Mild Anemia (10.0-10.9 g/dL)			Moderate Anemia (7.0-9.9 g/dL)		
		Mean	SE	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Malaria												
Positive	69	10.5	0.2	65.0	[53.2 , 75.3]	<0.001	27.6	[18.1 , 39.7]	0.609	37.4	[26.4 , 49.9]	<0.001
Negative	639	11.3	0.1	38.3	[34.6 , 42.1]		24.7	[21.6 , 28.1]		13.3	[10.8 , 16.1]	
H. Pylori												
Positive	129	11.3	0.1	35.7	[27.5 , 44.7]	0.185	20.7	[14.4 , 28.9]	0.152	14.9	[9.8 , 22.2]	0.974
Negative	338	11.1	0.1	42.7	[37.5 , 48.1]		27.3	[22.8 , 32.3]		15.1	[11.5 , 19.5]	
Soil Transmitted Helminths												
Positive	11	*	*	*	*	*	*	*	*	*	*	*
Negative	457	11.2	0.1	40.8	[36.3 , 45.5]		25.4	[21.6 , 29.7]		15.1	[12.0 , 18.9]	
Dewormed in Last JVA+ Campaign (children 12-59 months, Nov-Dec 2019)												
Yes	413	11.1	0.1	43.3	[38.6 , 48.3]	0.230	26.6	[22.5 , 31.1]	0.232	16.5	[13.2 , 20.5]	0.812
No	242	11.2	0.1	38.4	[32.2 , 45.0]		22.3	[17.4 , 28.1]		15.8	[11.5 , 21.2]	
Household Cooks With Potash												
Yes	669	11.2	0.1	41.1	[37.4 , 44.9]	0.707	25.2	[22.1 , 28.7]	0.505	15.6	[13.0 , 18.6]	0.722
No	40	(11.1)	(0.2)	(37.9)	[23.4 , 54.9]		(20.0)	[9.5 , 37.3]		(17.9)	[8.2 , 34.6]	
Number of Days Household Cooked With Potash During Last 7 Days												
0-1	56	11.4	0.2	45.8	[32.9 , 59.3]	0.758	36.5	[25.1 , 49.6]	0.200	9.4	[4.1 , 20.0]	0.179
2-3	141	11.2	0.1	40.4	[32.4 , 48.9]		25.0	[18.3 , 33.2]		15.3	[10.5 , 21.8]	
4-5	100	11.2	0.1	37.3	[28.4 , 47.1]		26.8	[19.5 , 35.8]		10.4	[5.3 , 19.6]	
6-7	372	11.1	0.1	41.8	[36.8 , 46.8]		23.3	[19.3 , 27.8]		17.9	[14.2 , 22.3]	
Total[b]	**709**	**11.2**	**0.1**	**41.0**	**[37.4 , 44.7]**		**25.0**	**[21.9 , 28.3]**		**15.7**	**[13.1 , 18.7]**	

JVA+= Journées Vitamine A+ (Vitamin A Days) ; MNP= Micronutrient powder

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data. A total of 15 observations from children with complete venous blood collection but unmeasured hemoglobin, and 2 biologically implausible values (i.e., hemoglobin concentration <4 g/dL or >18 g/dL, Sullivan *et al.*, 2008) were treated as missing values (i.e., excluded from N). There were no adjustments to hemoglobin concentrations for altitude for the Burkina Faso National Micronutrient Survey as altitude <1000 m in all households (WHO, 2011a).

All estimates account for complex sample design.

*All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.

P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence, and child age, which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.

Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution. An asterisk indicates that the denominator sample size is <25 unweighted cases and has been suppressed.

[a] Any blood disorder defined as having either clinically relevant hemoglobin variants (Hb SS, Hb SC or Hb CS, Hb CC, Hb SF or Hb FS), beta-thalassemia, or glucose-6-phosphate dehydrogenase deficiency.

[b] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

10.2 Geometric Mean Ferritin, Iron Deficiency and Iron Deficiency Anemia Among Children 6-59 Months

Table 10.2 presents the geometric mean serum ferritin concentration and the prevalence of iron deficiency and iron deficiency anemia among children 6-59 months. Ferritin concentrations were adjusted for inflammation (Namaste *et al.*, 2017). Nationally, the geometric mean (SE) serum ferritin concentration among children was 15.9 (±0.59) µg/L. The prevalence of iron deficiency among children 6-59 months was 39%. The prevalence of iron deficiency varied by location, age, and malaria infection. Almost half of the children in Ouagadougou & Bobo Dioulasso had iron deficiency (48%) compared to 36% in rural areas and 36% in other cities. About half of the children 6-23 months had iron deficiency (49%) compared to 37% of the children 24-59 months (unweighted estimates to be interpreted with caution). Iron deficiency was highest among children 12-17 months (61%, interpret with caution, <50 unweighted cases) and lowest among children 48-59 months (25%) (unweighted estimates to be interpreted with caution). Iron deficiency was higher among children who did not have a malaria infection (41%) compared to children who had a malaria infection (20%).

The prevalence of iron deficiency anemia among children 6-59 months was 22%. The prevalence of iron deficiency anemia varied only by age and not by any other characteristic. More than a third of children 6-23 months had iron deficiency anemia (36%) compared to 19% among children 24-59 months (unweighted estimates to be interpreted with caution). Prevalence was highest among children 18-23 months (46%) and lowest among children 48-59 months (14%) (unweighted estimates to be interpreted with caution).

Annex 9.1 presents the serum ferritin concentration and the prevalence of iron deficiency and iron deficiency anemia among children 6-59 months unadjusted for inflammation.

Annex 9.2 and **Annex 9.3** present the serum soluble transferrin receptor (sTfR) concentration and prevalence of iron deficiency among children 6-59 months, respectively, adjusted and unadjusted for inflammation.

Table 10.2 Inflammation Adjusted Geometric Mean Serum Ferritin Concentration, Iron Deficiency, and Iron Deficiency Anemia Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

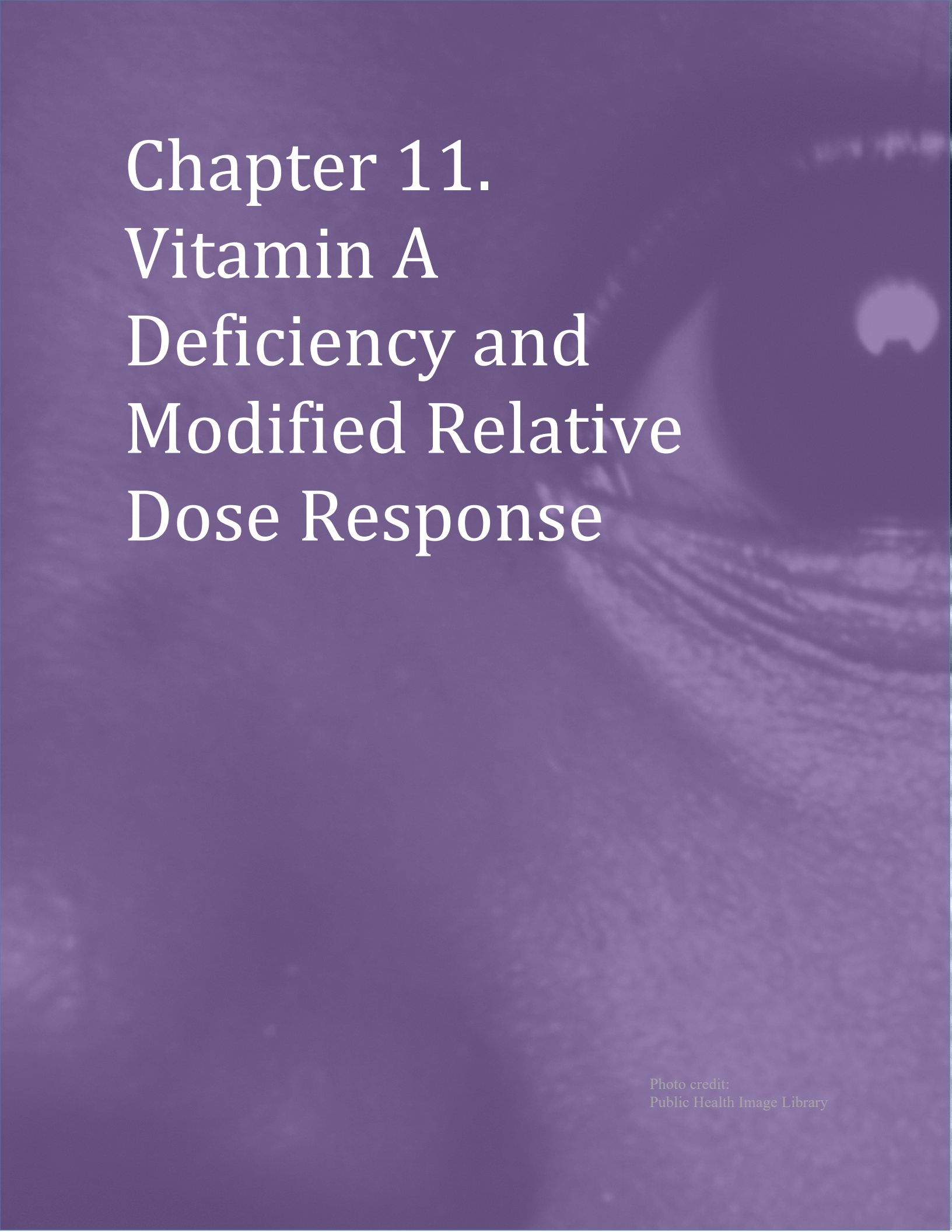
Characteristics	N	Ferritin [a, b] (µg/L)		Iron Deficiency [a, b, c] (Ferritin <12.0 µg/L)			N	Iron Deficiency Anemia (Hemoglobin <11.0 g/dL[d] and Ferritin <12.0 µg/L[a, b, c])		
		Geometric Mean	SE	%	[95% CI]	p-value		%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	232	12.9	0.78	47.8	[41.2 , 54.5]		217	24.0	[18.3 , 29.6]	
Other cities	197	17.6	1.18	35.5	[28.6 , 42.5]	0.014	173	19.1	[13.2 , 24.9]	0.501
Rural	291	17.1	1.03	36.4	[30.6 , 42.3]		248	22.6	[17.2 , 27.9]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	429	15.2	0.71	41.3	[36.4 , 46.1]	0.139	390	21.4	[17.3 , 25.5]	0.818
Rural°	291	17.1	1.03	36.4	[30.6 , 42.3]		248	22.6	[17.2 , 27.9]	
Age°, months										
6-11	35	(19.2)	(2.65)	(28.6)	[13.6 , 43.5]		28	(21.4)	[6.2 , 36.7]	
12-17	43	(9.5)	(1.30)	(60.5)	[45.8 , 75.1]		37	(32.4)	[17.3 , 47.6]	
18-23	58	10.2	1.21	55.2	[42.4 , 67.9]	<0.001	50	46.0	[32.2 , 59.8]	<0.001
24-35	171	12.6	0.84	49.7	[42.1 , 57.3]		144	29.2	[21.5 , 36.9]	
36-47	202	15.9	1.08	40.6	[33.7 , 47.5]		182	17.0	[11.5 , 22.5]	
48-59	211	22.4	1.36	24.6	[18.8 , 30.5]		197	13.7	[8.9 , 18.5]	
6-23	136	11.7	0.94	48.6	[40.1 , 57.1]	0.007	115	35.7	[27.0 , 44.3]	<0.001
24-59	584	16.8	0.68	37.2	[33.1 , 41.3]		523	19.1	[15.7 , 22.5]	
Sex										
Male	365	16.3	0.82	38.4	[33.3 , 43.5]	0.563	323	21.4	[17.0 , 25.9]	0.779
Female	355	15.5	0.79	40.5	[35.2 , 45.7]		315	22.3	[17.7 , 27.0]	
Wealth Quintile										
Lowest	156	17.1	1.32	35.8	[28.0 , 43.5]		133	20.8	[13.7 , 28.0]	
Second	153	16.0	1.27	38.8	[30.9 , 46.6]		131	22.7	[15.5 , 29.8]	
Middle	173	16.3	1.23	40.5	[32.7 , 48.4]	0.859	161	25.3	[18.5 , 32.2]	0.645
Fourth	124	14.8	1.36	40.2	[30.8 , 49.7]		109	17.5	[10.2 , 24.9]	
Highest	114	14.9	1.41	42.5	[33.0 , 52.0]		104	21.2	[13.7 , 28.7]	
Malaria										
Positive	64	26.3	3.10	20.4	[10.5 , 30.2]	0.001	61	18.3	[8.6 , 28.0]	0.479
Negative	617	15.1	0.59	41.3	[37.2 , 45.4]		576	22.3	[18.8 , 25.8]	
Dewormed in Last JVA+ Campaign (children 12-59 months, Nov-Dec 2019)										
No	242	15.4	0.99	39.2	[32.8 , 45.7]	0.815	215	19.7	[14.2 , 25.2]	0.380
Yes	428	16.1	0.77	40.2	[35.3 , 45.1]		381	22.9	[18.6 , 27.1]	
Total[e]	**720**	**15.9**	**0.59**	**39.4**	**[35.6 , 43.1]**		**638**	**21.9**	**[18.6 , 25.1]**	

Table 10.2 Inflammation Adjusted Geometric Mean Serum Ferritin Concentration, Iron Deficiency, and Iron Deficiency Anemia Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020 (*continued*)

Characteristics	N	Ferritin [a, b] (µg/L)		Iron Deficiency [a, b, c] (Ferritin <12.0 µg/L)			N	Iron Deficiency Anemia (Hemoglobin <11.0 g/dL[d] and Ferritin <12.0 µg/L[a, b, c])		
		Geometric Mean	SE	%	[95% CI]	p-value		%	[95% CI]	p-value
Household Cooks With Sodium Bicarbonate										
No	673	15.9	0.61	39.7	[35.8 , 43.6]	0.559	595	22.1	[18.7 , 25.5]	0.508
Yes	47	(16.8)	(2.01)	(35.4)	[21.7 , 49.0]		43	(18.0)	[6.9 , 29.1]	
Household Cooks With Potash										
No	48	(15.9)	(2.13)	(33.3)	[19.6 , 47.0]	0.384	39	(14.7)	[2.2 , 27.3]	0.322
Yes	672	15.9	0.61	39.8	[35.9 , 43.7]		599	22.3	[18.9 , 25.7]	
Number of Days Household Cooked With Potash During Last 7 Days										
0 – 1	47	(12.3)	(1.74)	(46.0)	[33.0 , 58.9]	<0.001	45	(27.2)	[15.7 , 38.7]	0.166
2 – 3	137	15.2	1.13	38.1	[29.7 , 46.5]		122	23.6	[16.0 , 31.2]	
4 – 5	114	12.3	0.99	56.2	[47.2 , 65.1]		97	28.6	[20.0 , 37.3]	
6 - 7	374	18.0	0.96	34.7	[29.5 , 40.0]		335	19.4	[15.0 , 23.8]	
Total[e]	**720**	**15.9**	**0.59**	**39.4**	**[35.6 , 43.1]**		**638**	**21.9**	**[18.6 , 25.1]**	

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by ELISA (Erhardt et al, 2004).
[b] Ferritin adjusted for inflammation using the Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia (BRINDA) method (Namaste *et al.*, 2017).
[c] WHO (2020).
[d] Hemoglobin concentrations are not adjusted for altitude in the Burkina Faso National Micronutrient Survey as altitude <1000 m in all households (WHO, 2011a).
[e] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 11. Vitamin A Deficiency and Modified Relative Dose Response



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Chapter 11: Vitamin A Deficiency and Modified Relative Dose Response

11.1 Geometric Mean Retinol and Vitamin A Deficiency Among Children 6-59 Months

Table 11.1 shows the mean serum retinol concentration and the prevalence of vitamin A deficiency among 693 children 6-59 months. Retinol concentrations were adjusted for inflammation (Namaste *et al.*, 2017). Nationally, the geometric mean (SE) serum retinol concentration was 0.70 (±0.012) µmol/L among children 6-59 months. Half of the children had vitamin A deficiency; defined as serum retinol <0.70 µmol/L. The prevalence of vitamin A deficiency varied by location, residence, sex and household use of potash in cooking. The prevalence was highest among children in rural areas (56%) compared to 52% in other cities and 40% in Ouagadougou & Bobo Dioulasso. The prevalence of vitamin A deficiency was 47% among children in urban areas. More than half of male children had vitamin A deficiency (54%) compared to 46% among female children. About half of the children from households that cook with potash had vitamin A deficiency (51%) compared to 33% of children from households that do not cook with potash (interpret with caution, <50 unweighted cases).

Annex 9.4 presents the serum retinol concentration and the prevalence of vitamin A deficiency among children 6-59 months, unadjusted for inflammation. **Annex 9.5** and **Annex 9.6** present the retinol binding protein (RBP) concentration and prevalence of vitamin A deficiency among children 6-59 months, respectively, adjusted and unadjusted for inflammation.

Table 11.1 Inflammation Adjusted Geometric Mean Serum Retinol Concentration and Vitamin A Deficiency Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Retinol [a,b] (µmol/L)		Vitamin A Deficiency [a,b,c] (Retinol <0.70 µmol/L)		
		Geometric Mean	SE	%	[95% CI]	p-value
Location°						
Ouagadougou & Bobo Dioulasso	220	0.75	0.020	40.0	[33.3 , 46.7]	0.002
Other cities	201	0.69	0.023	51.7	[44.6 , 58.9]	
Rural	272	0.67	0.017	56.3	[50.1 , 62.4]	
Residence						
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	421	0.72	0.016	46.5	[41.5 , 51.5]	0.008
Rural°	272	0.67	0.017	56.3	[50.1 , 62.4]	
Age°, months						
6-11	25	(0.75)	(0.064)	(44.0)	[24.5 , 63.5]	0.689
12-17	37	(0.75)	(0.051)	(43.2)	[27.2 , 59.3]	
18-23	56	0.70	0.035	48.2	[35.1 , 61.4]	
24-35	160	0.69	0.022	53.1	[45.6 , 60.6]	
36-47	201	0.71	0.022	46.8	[39.8 , 53.8]	
48-59	214	0.69	0.018	52.3	[45.5 , 59.1]	
6-23	118	0.72	0.027	45.8	[36.8 , 54.7]	0.330
24-59	575	0.69	0.012	50.6	[46.4 , 54.8]	
Sex						
Male	359	0.68	0.016	54.0	[48.6 , 59.3]	0.043
Female	334	0.72	0.017	46.1	[40.5 , 51.6]	
Wealth Quintile						
Lowest	150	0.65	0.021	57.5	[49.6 , 65.3]	0.085
Second	144	0.68	0.025	52.9	[44.4 , 61.4]	
Middle	171	0.69	0.025	51.4	[43.4 , 59.5]	
Fourth	115	0.78	0.032	42.1	[32.5 , 51.8]	
Highest	113	0.74	0.027	43.0	[33.4 , 52.6]	
Malaria						
Positive	64	0.65	0.043	53.0	[40.8 , 65.2]	0.488
Negative	587	0.71	0.012	48.5	[44.3 , 52.7]	
Vitamin A Supplement Intake During Last JVA+ Campaign (Nov-Dec 2019)						
No	248	0.69	0.021	52.1	[45.6 , 58.7]	0.432
Yes	430	0.70	0.014	48.9	[44.1 , 53.7]	
Household Cooks With Sodium Bicarbonate						
No	648	0.69	0.012	50.6	[46.6 , 54.6]	0.379
Yes	45	(0.75)	(0.052)	(43.4)	[27.9 , 58.9]	
Household Cooks With Potash						
No	43	(0.75)	(0.043)	(33.2)	[18.3 , 48.0]	0.029
Yes	650	0.69	0.012	51.2	[47.2 , 55.2]	
Number of Days Household Cooked With Potash During Last 7 Days						
0 – 1	47	(0.72)	(0.057)	(43.8)	[28.7 , 58.8]	0.547
2 – 3	130	0.68	0.027	54.4	[45.6 , 63.2]	
4 – 5	109	0.73	0.032	47.6	[38.5 , 56.7]	
6 - 7	364	0.69	0.015	52.1	[46.7 , 57.6]	
Total[d]	**693**	**0.70**	**0.012**	**50.2**	**[46.3 , 54.0]**	

JVA+= Journées Vitamine A+ (Vitamin A Days)
Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by HPLC.
[b] Retinol adjusted for inflammation using the Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia (BRINDA) method (Namaste *et al.*, 2017).
[c] WHO (2011b).
[d] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

11.2 Geometric Mean MRDR and Vitamin A Deficiency Among Children 6-59 Months

A total of 160 children 6-59 months of age had available data among the sub-sample of 268 children confirmed to be selected for MRDR testing (**Table 11.2**). Thirteen clusters had no children with MRDR test results and MRDR and vitamin A deficiency estimates should therefore be interpreted with caution. Retinol concentrations were adjusted for inflammation (Namaste *et al.*, 2017) prior to calculating the ratio. The geometric mean MRDR (SE) ratio was 0.053 (±0.0022) and the prevalence of vitamin A deficiency, defined as MRDR ≥0.060, was 37%. The prevalence of vitamin A did not vary by any background characteristics.

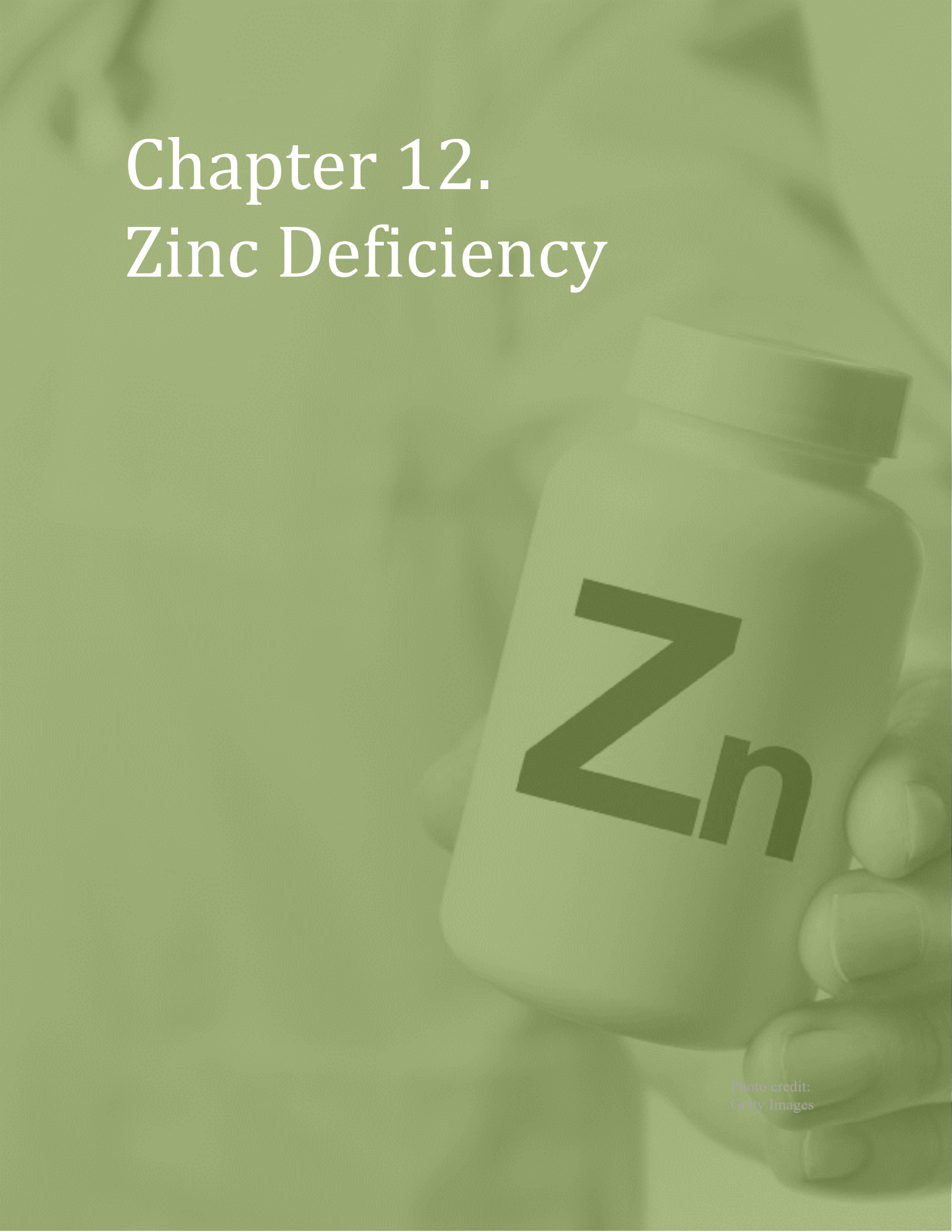
Annex 9.7 presents the MRDR ratio and the prevalence of vitamin A deficiency among children 6-59 months, unadjusted for inflammation.

Table 11.2 Inflammation Adjusted Geometric Mean Modified Relative Dose Response (MRDR) Ratio and Vitamin A Deficiency Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	MRDR [a,b]		Vitamin A Deficiency [a, b, c] (MRDR ≥0.060)		
		Geometric Mean	SE	%	[95% CI]	p-value
Location						
Ouagadougou & Bobo Dioulasso	50	0.054	0.0040	30.0	[17.2 , 42.8]	
Other cities	54	0.049	0.0040	38.9	[25.7 , 52.0]	0.465
Rural	56	0.057	0.0032	41.4	[28.0 , 54.1]	
Residence						
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	104	0.051	0.0028	34.6	[25.4 , 43.9]	0.419
Rural	56	0.057	0.0032	41.1	[28.0 , 54.1]	
Age, months						
6-23	21	(0.045)	(0.0041)	(23.8)	[5.4 , 42.2]	
24-35	40	(0.053)	(0.0039)	(37.5)	[22.3 , 52.7]	0.611
36-47	46	(0.056)	(0.0049)	(39.1)	[24.9 , 53.4]	
48-59	53	0.054	0.0038	39.6	[26.3 , 52.9]	
6-23	21	(0.045)	(0.0041)	(23.8)	[5.4 , 42.2]	0.183
24-59	139	0.054	0.0024	38.8	[30.7 , 47.0]	
Sex						
Male	92	0.051	0.0028	35.9	[26.0 , 45.8]	0.759
Female	68	0.055	0.0035	38.2	[26.6 , 49.4]	
Wealth Quintile						
Lowest	25	(0.054)	(0.0063)	(44.0)	[24.3 , 63.7]	
Second	33	(0.056)	(0.0042)	(39.4)	[22.5 , 56.2]	
Middle	41	(0.055)	(0.0046)	(41.5)	[26.2 , 56.7]	0.199
Fourth	29	(0.046)	(0.0039)	(17.2)	[3.3 , 31.1]	
Highest	32	(0.055)	(0.0053)	(40.6)	[23.4 , 57.8]	
Vitamin A Supplement Intake During Last JVA+ Campaign (Nov-Dec 2019)						
No	54	0.059	0.0044	44.4	[31.0 , 57.8]	0.146
Yes	104	0.050	0.0025	32.7	[23.6 , 41.8]	
Total	**160**	**0.053**	**0.0022**	**36.9**	**[29.3 , 44.4]**	

JVA+= Journées Vitamine A+ (Vitamin A Days); MRDR= Modified relative dose response
Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
Estimates do not account for weighting and complex sample design due to non-response for MRDR test in 13 survey clusters, and need to be interpreted with caution.
P-value obtained from Pearson's chi-square statistic.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by HPLC.
[b] Retinol adjusted for inflammation using the Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia (BRINDA) method (Namaste *et al.*, 2017).
[c] WHO (1996), Tanumihardjo (2011).

Chapter 12.
Zinc Deficiency



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Chapter 12: Zinc Deficiency

Table 12.1 shows the geometric mean serum zinc concentration and prevalence of zinc deficiency among 720 children 6-59 months. The geometric mean (SE) serum zinc concentration 0.75 (±0.007) µg/dL. Zinc concentrations were adjusted for inflammation (McDonald *et al*., 2020). Thirteen percent of the children had zinc deficiency. The prevalence of zinc deficiency varied by location, residence and wealth. More children in rural areas (17%) had zinc deficiency compared to children in Ouagadougou & Bobo Dioulasso (11%) and children in other cities (10%). Ten percent of children in urban areas had zinc deficiency. The prevalence of zinc deficiency decreased with increasing wealth. Zinc deficiency was highest in the lowest wealth quintile (19%) compared to 13% in the middle and 6% in the highest wealth quintile.

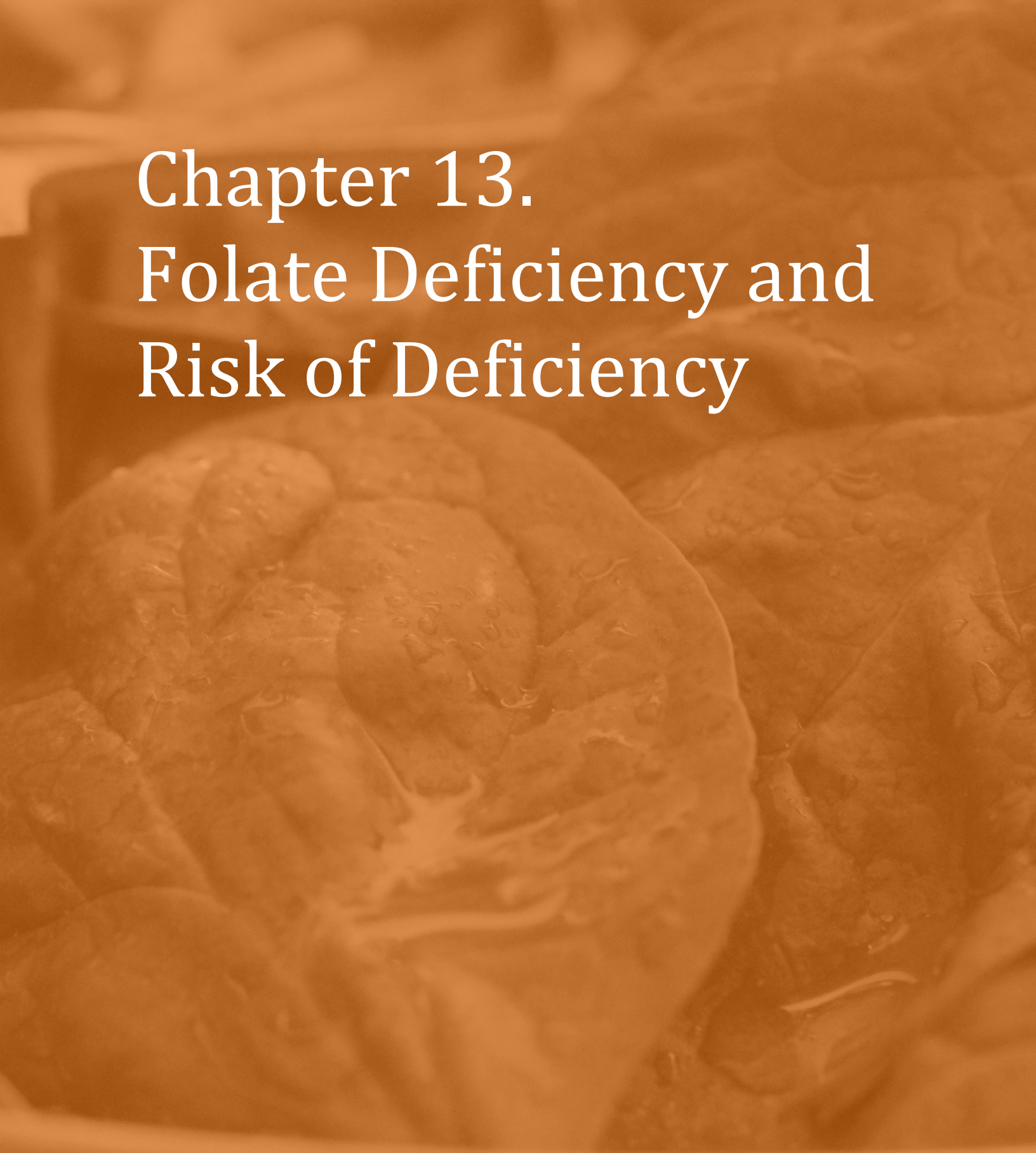
Annex 9.8 presents the serum zinc concentration and the prevalence of zinc deficiency among children 6-59 months, unadjusted for inflammation.

Table 12.1 Inflammation Adjusted Mean Serum Zinc Concentration and Zinc Deficiency Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Zinc [a, b] (µg/dL)		N	Zinc Deficiency [a, b, c] (Zinc <65 µg/dL or <57 µg/dL)		
		Geometric Mean	SE		%	[95% CI]	p-value
Location°							
Ouagadougou & Bobo Dioulasso	224	0.74	0.011	215	10.7	[6.7 , 14.7]	0.047
Other cities	207	0.77	0.012	198	9.6	[5.3 , 13.8]	
Rural	289	0.75	0.011	263	16.7	[11.9 , 21.6]	
Residence							
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	431	0.75	0.008	413	10.1	[7.1 , 13.0]	0.015
Rural°	289	0.75	0.011	263	16.7	[11.9 , 21.6]	
Age°, months							
6-11	33	(0.86)	(0.041)	31	(12.9)	[1.1 , 24.7]	0.528
12-17	43	(0.75)	(0.026)	38	(13.2)	[2.4 , 23.9]	
18-23	61	0.75	0.018	58	13.8	[5.0 , 22.6]	
24-35	169	0.76	0.013	159	9.4	[4.9 , 14.0]	
36-47	203	0.73	0.010	190	16.3	[10.9 , 21.7]	
48-59	211	0.74	0.012	200	11.5	[7.1 , 15.9]	
6-23	137	0.77	0.015	127	13.4	[7.5 , 19.2]	0.793
24-59	583	0.74	0.007	549	12.6	[9.8 , 15.3]	
Sex							
Male	371	0.75	0.009	351	13.5	[9.7 , 17.2]	0.468
Female	349	0.75	0.009	325	11.6	[8.2 , 15.0]	
Wealth Quintile							
Lowest	162	0.76	0.015	153	18.8	[12.3 , 25.3]	0.020
Second	150	0.73	0.013	131	14.0	[7.6 , 20.4]	
Middle	165	0.73	0.011	161	13.1	[7.8 , 18.4]	
Fourth	130	0.75	0.015	126	8.6	[3.8 , 13.4]	
Highest	113	0.79	0.019	105	5.5	[1.3 , 9.8]	
Household Cooks With Sodium Bicarbonate							
No	675	0.75	0.007	632	13.1	[10.4 , 15.8]	0.124
Yes	45	(0.74)	(0.022)	44	(4.8)	[0.0 , 11.4]	
Household Cooks With Potash							
No	44	(0.74)	(0.025)	40	(9.7)	[0.9 , 18.4]	0.549
Yes	676	0.75	0.007	636	12.7	[10.0 , 15.4]	
Number of Days Household Cooked With Potash During Last 7 Days							
0 – 1	48	(0.80)	(0.028)	47	(12.5)	[0.1 , 25.0]	0.999
2 – 3	149	0.73	0.013	138	12.7	[6.8 , 18.6]	
4 – 5	109	0.74	0.015	101	12.3	[5.8 , 18.7]	
6 – 7	370	0.75	0.010	350	12.9	[9.4 , 16.5]	
Total[d]	**720**	**0.75**	**0.007**	**676**	**12.6**	**[10.0 , 15.2]**	

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by ICP-OES.
[b] Zinc adjusted for inflammation using the Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia (BRINDA) method (McDonald *et al.*, 2020).
[c] Zinc deficiency defined as serum zinc less than 65 or 57 µg/dL depending on time of day: Morning (until noon), non-fasting: <65µg/dL; Afternoon, non-fasting: <57 µg/dL (IZiNCG, 2012).
[d] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 13. Folate Deficiency and Risk of Deficiency



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Chapter 13: Folate Deficiency and Risk of Deficiency

Red blood cell (RBC) folate reflects long term dietary folate intake of the last ~4 months and concentrations tend to be a more accurate reflection of tissue folate status (Mason, 2003). Serum folate reflects recent dietary folate intake (short term status, last few hours) (Pfeiffer *et al.*, 2010). Serum folate is more responsive to folic acid supplementation compared to food folates.

13.1 Geometric Mean RBC Folate and RBC Folate Deficiency Among Children 6-59 Months

RBC folate concentrations (RBC_Folate) among children were estimated using results from whole blood folate (WB_Folate), serum folate (S_Folate), and hemoglobin (g/dL) using the following equations (Zhang *et al.*, 2020). Whole blood folate was required for all equations. Equations 2 (estimated hematocrit = 36%) and 3 (estimated serum folate = population mean = 20.0 nmol/L) were used when hemoglobin or serum folate were missing, respectively.

1. RBC_Folate = [WB_Folate – (S_Folate * (1 – (Hb/34.4)))] / (Hb/34.4)
2. RBC_Folate = [WB_Folate – (S_Folate * (1 – 0.36))] / 0.36
3. RBC_Folate = [WB_Folate – (20.0 * (1 – (Hb/34.4)))]/ (Hb/34.4)

Nationally, the geometric mean (SE) RBC folate concentration among children 6-59 months was 627.2 (±11.99) nmol/L (**Table 13.1**). Nationally, 2% of children had RBC folate deficiency on the basis of megaloblastic anemia as a hematologic indicator (<226.5 nmol/L; WHO, 2015).

Annex 9.8 presents the RBC folate concentration and the prevalence of RBC folate deficiency on the basis of the appearance of hyper-segmented neutrophils as a hematologic indicator among children 6-59 months (<305 nmol/L; IOM, 1998).

Table 13.1 Geometric Mean RBC (Red Blood Cell) Folate Concentration and RBC Folate Deficiency (<226.5 nmol/L) Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	RBC Folate [a] (nmol/L)		RBC Folate Deficiency [a, b] (<226.5 nmol/L)		
		Geometric Mean	SE	%	[95% CI]	p-value
Location°						
Ouagadougou & Bobo Dioulasso	249	660.9	19.92	0.8	[0.0 - 1.9]	
Other cities	217	655.3	24.83	2.3	[0.3 - 4.3]	0.386
Rural	287	577.5	16.80	2.1	[0.4 - 3.7]	
Residence						
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	466	658.3	15.75	1.6	[0.4 - 2.8]	0.639
Rural°	287	577.5	16.80	2.1	[0.4 - 3.7]	
Age°, months						
6-11	34	(614.5)	(41.68)	(0.0)	-	
12-17	46	(566.2)	(40.65)	(0.0)	-	
18-23	61	583.4	43.76	1.6	[0.0 - 4.8]	‡
24-35	171	610.1	24.87	4.1	[1.1 - 7.1]	
36-47	216	634.0	19.99	0.9	[0.0 - 2.2]	
48-59	225	658.9	20.68	1.3	[0.0 - 2.8]	
6-23	141	585.0	25.27	0.7	[0.0 - 2.1]	0.304
24-59	612	636.1	12.85	2.0	[0.9 - 3.1]	
Sex						
Male	387	635.3	16.29	1.4	[0.2 - 2.6]	0.435
Female	366	616.8	16.33	2.2	[0.7 - 3.7]	
Wealth Quintile						
Lowest	160	582.2	20.75	1.4	[0.0 - 3.2]	
Second	154	575.1	29.15	5.4	[1.7 - 9.0]	
Middle	180	669.6	21.66	0.0	-	‡
Fourth	131	643.0	25.04	0.7	[0.0 - 2.0]	
Highest	128	673.4	33.45	1.7	[0.0 - 4.1]	
Household Cooks With Sodium Bicarbonate						
No	702	627.8	12.08	1.7	[0.8 - 2.7]	0.771
Yes	51	604.6	45.62	2.4	[0.0 - 6.9]	
Household Cooks With Potash						
No	44	(767.5)	(57.56)	(0.0)	-	‡
Yes	709	618.4	11.81	1.9	[0.9 - 2.9]	
Number of Days Household Cooked With Potash During Last 7 Days						
0 – 1	49	(587.4)	(32.77)	(0.0)	-	
2 – 3	146	637.6	22.27	1.3	[0.0 - 3.0]	‡
4 – 5	115	595.5	33.71	2.6	[0.0 - 5.6]	
6 – 7	399	622.1	16.09	2.1	[0.7 - 3.6]	
Total[c]	**753**	**627.2**	**11.99**	**1.8**	**[0.8 - 2.8]**	

RBC= Red blood cell
Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
‡P-value not estimable due to zero cells in contingency table.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by microbiological assay (O'Broin and Kelleher, 1992; Pfeiffer *et al*., 2011; Zhang *et al.*, 2020).
[b] Pfeiffer *et al.* (2016), WHO (2015).
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

13.2 Geometric Mean Serum Folate, Serum Folate Deficiency and the Risk of Serum Folate Deficiency Among Children 6-59 Months

Table 13.2 shows the geometric mean serum folate concentration, prevalence of serum folate deficiency and risk of serum folate deficiency among 783 children 6-59 months. Nationally, the geometric mean (SE) serum folate concentration was 20.0 (±0.39) nmol/L. Two percent of the children had serum folate deficiency and one in every 5 children was at risk of serum folate deficiency. The prevalence of serum folate deficiency varied by location and residence. Four percent of children in rural areas had serum folate deficiency compared to <1% in either other cities or Ouagadougou & Bobo Dioulasso. Less than 1% of children in urban areas had serum folate deficiency.

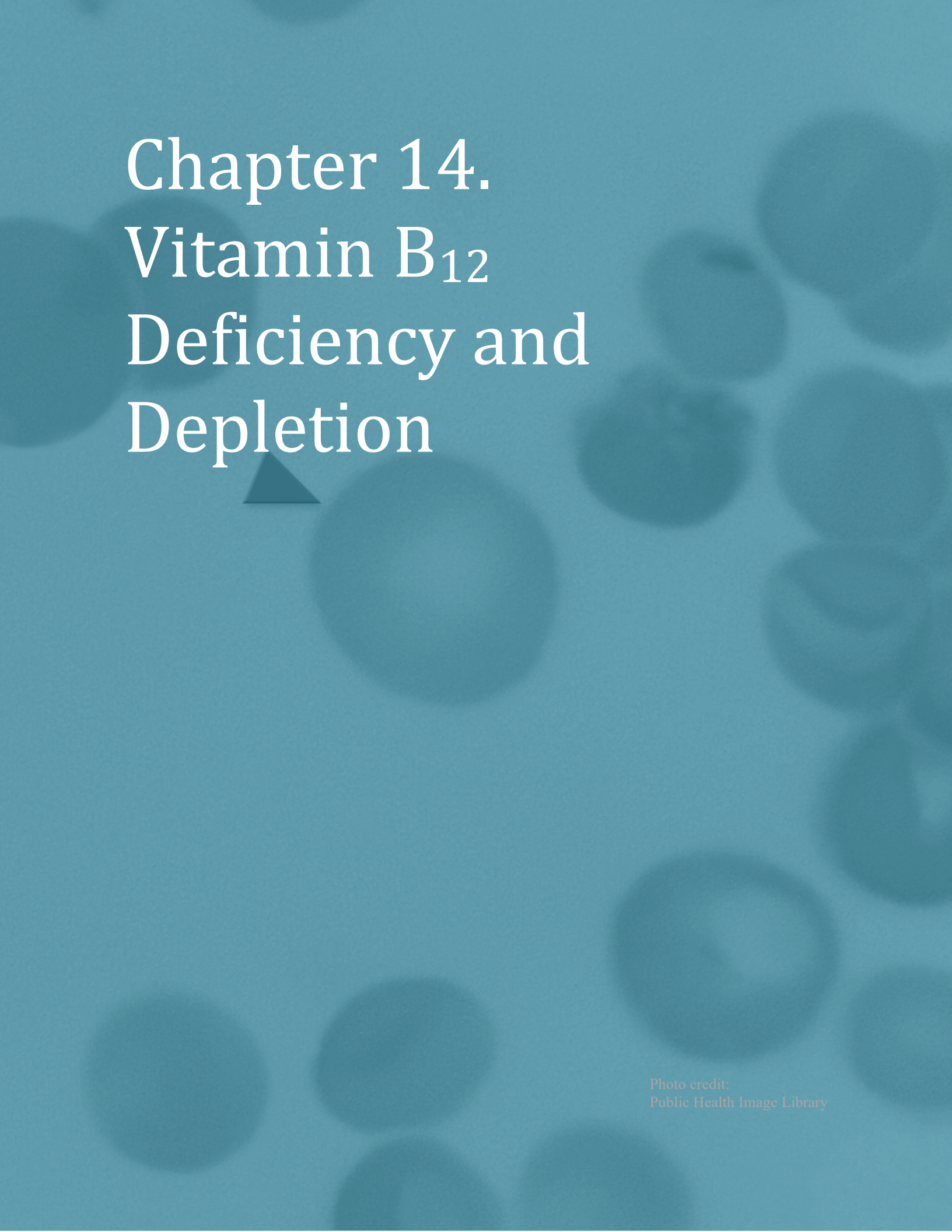
The risk of serum folate deficiency varied by location, residence, and age. Almost a third of the children in rural areas were at risk (29%) compared to 17% in other cities and 14% in Ouagadougou & Bobo Dioulasso. Fifteen percent of children in urban areas were at risk for serum folate deficiency. The risk of deficiency peaked for children 18-23 months (34%) and decreased to 16% for children 48-59 months (unweighted estimates to be interpreted with caution).

Table 13.2 Geometric Mean Serum Folate Concentration, Serum Folate Deficiency and Risk of Folate Deficiency Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Serum Folate [a] (nmol/L)		Serum Folate Deficiency [a, b] (<6.8 nmol/L)			Risk of Serum Folate Deficiency [a, b] (≥6.8 and ≤13.4 nmol/L)		
		Geometric Mean	SE	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°									
Ouagadougou & Bobo Dioulasso	252	21.6	0.69	0.8	[0.0 , 1.9]	0.004	13.5	[9.3 , 17.7]	<0.001
Other cities	224	21.7	0.77	0.4	[0.0 , 1.3]		16.5	[11.6 , 21.5]	
Rural	307	17.5	0.55	3.9	[1.8 , 6.1]		29.0	[23.8 , 34.2]	
Residence									
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	476	21.7	0.52	0.6	[0.0 , 1.3]	0.001	15.1	[11.8 , 18.5]	<0.001
Rural°	307	17.5	0.55	3.9	[1.8 , 6.1]		29.0	[23.8 , 34.2]	
Age°, months									
6-11	39	(22.9)	(1.77)	0.0	-	‡	(20.5)	[7.8 , 33.2]	0.019
12-17	50	19.2	1.45	2.0	[0.0 , 5.9]		20.0	[8.9 , 31.1]	
18-23	65	16.8	1.12	6.2	[0.3 , 12]		33.8	[22.3 , 45.4]	
24-35	184	18.6	0.76	2.7	[0.4 , 5.1]		25.0	[18.5 , 31.5]	
36-47	217	20.3	0.67	1.8	[0.0 , 3.6]		17.1	[12.1 , 22.0]	
48-59	228	21.4	0.68	0.4	[0.0 , 1.3]		16.2	[11.5 , 21.0]	
6-23	154	19.0	0.82	3.2	[0.4 , 6.1]	0.179	26.0	[19.0 , 32.9]	0.058
24-59	629	20.1	0.43	1.6	[0.6 , 2.6]		19.1	[16.0 , 22.2]	
Sex									
Male	402	20.1	0.56	1.9	[0.6 , 3.3]	0.841	20.0	[16.1 , 23.9]	0.815
Female	381	19.9	0.51	1.8	[0.5 , 3.0]		20.7	[16.5 , 24.9]	
Wealth Quintile									
Lowest	173	18.1	0.79	4.5	[1.5 , 7.5]	‡	25.1	[18.4 , 31.9]	0.229
Second	159	18.9	0.71	1.8	[0.0 , 3.8]		21.8	[15.3 , 28.2]	
Middle	184	20.7	0.86	1.0	[0.0 , 2.3]		21.1	[15.0 , 27.2]	
Fourth	136	20.6	0.93	1.5	[0.0 , 3.6]		15.4	[9.3 , 21.5]	
Highest	131	22.8	1.18	0.0	-		16.3	[9.5 , 23.1]	
Household Cooks With Sodium Bicarbonate									
No	731	20.0	0.41	2.0	[1.0 , 3.0]	‡	19.9	[16.9 , 22.9]	0.231
Yes	52	19.6	1.42	(0.0)	-		26.8	[14.9 , 38.7]	
Household Cooks With Potash									
No	48	(21.0)	(1.84)	(4.7)	[0.0 , 10.9]	0.130	(11.6)	[2.2 , 20.9]	0.133
Yes	735	19.9	0.40	1.7	[0.8 , 2.6]		20.9	[17.9 , 23.9]	
Number of Days Household Cooked With Potash During Last 7 Days									
0 – 1	52	19.1	1.64	3.8	[0.0 , 8.8]	0.408	17.4	[7.3 , 27.4]	0.003
2 – 3	159	17.5	0.73	2.4	[0.1 , 4.8]		31.6	[24.3 , 38.9]	
4 – 5	119	21.3	0.94	1.5	[0.0 , 3.7]		17.6	[10.8 , 24.4]	
6 – 7	405	20.7	0.57	1.2	[0.1 , 2.2]		18.2	[14.2 , 22.2]	
Total[c]	**783**	**20.0**	**0.39**	**1.8**	**[0.9 , 2.8]**		**20.4**	**[17.5 , 23.2]**	

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
‡P-value not estimable due to zero cells in contingency table.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by microbiological assay (O'Broin and Kelleher, 1992; Pfeiffer *et al.*, 2011).
[b] WHO (2015).
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 14. Vitamin B_{12} Deficiency and Depletion



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Chapter 14: Vitamin B_{12} Deficiency and Depletion

Table 14.1 presents the concentrations of serum vitamin B_{12}, prevalence of vitamin B_{12} deficiency and depletion among 781 children 6-59 months. Nationally, the geometric mean (SE) serum vitamin B_{12} concentration was 388.3 (±8.11) pg/mL. The prevalence of vitamin B_{12} deficiency was 12% and vitamin B_{12} depletion was 19%. The prevalence of vitamin B_{12} deficiency varied by location, residence and age. More children in rural areas had vitamin B_{12} deficiency (15%) compared to 14% in other cities and 6% in Ouagadougou & Bobo Dioulasso. Ten percent of children in urban areas had vitamin B_{12} deficiency. The prevalence of vitamin B_{12} deficiency was higher for children 6-23 months (23%) compared to children 24-59 months (9%) (unweighted estimates to be interpreted with caution). The prevalence peaked for children 12-17 months (32%) and declined to 6% for children 48-59 months (unweighted estimates to be interpreted with caution).

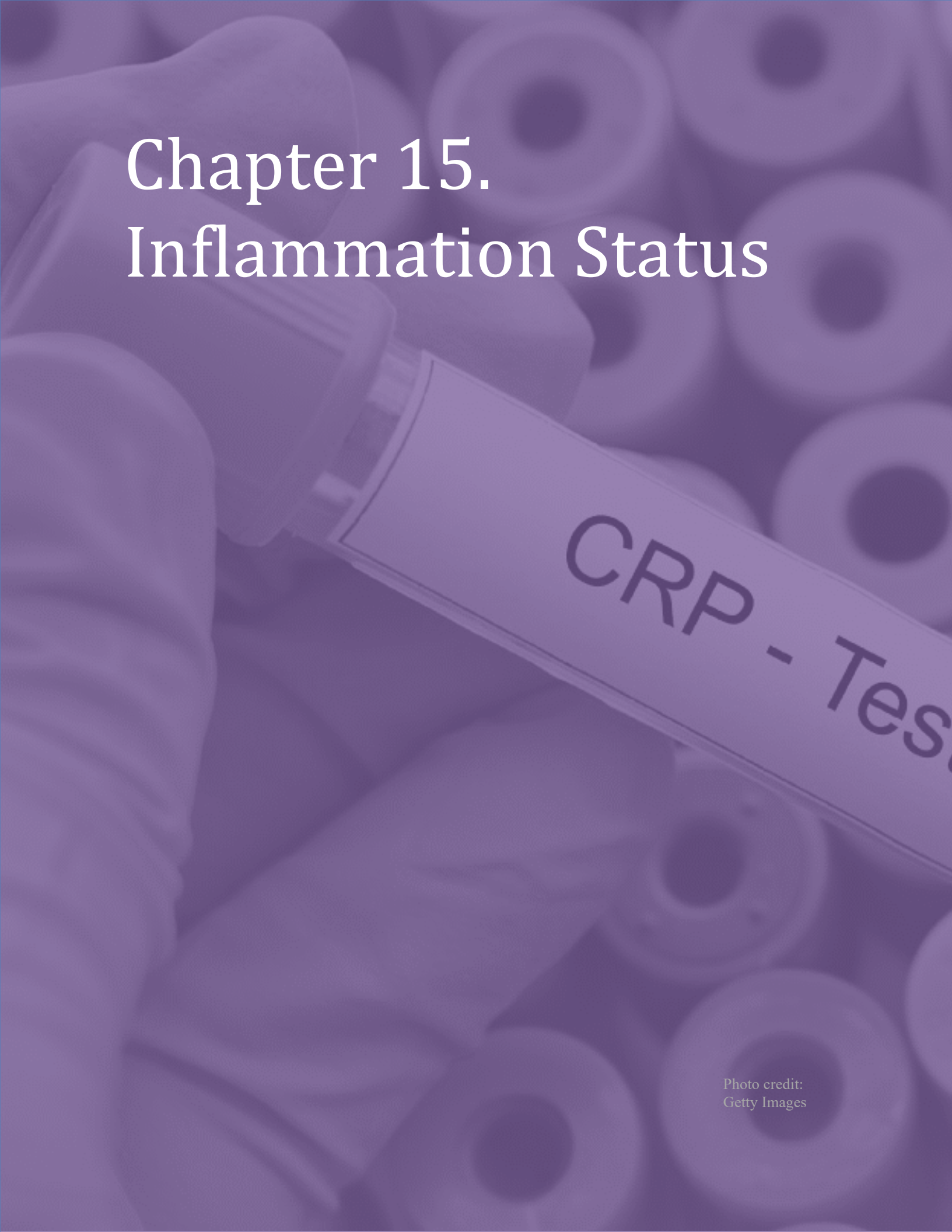
The prevalence of vitamin B_{12} depletion varied by location, residence and wealth. One in every 4 children 6-59 months in rural areas had vitamin B_{12} depletion compared to 19% in other cities and 11% in Ouagadougou & Bobo Dioulasso. Fifteen percent of children in urban areas had vitamin B_{12} depletion. The prevalence of vitamin B_{12} depletion decreased with increasing wealth. It was highest for the lowest quintile (25%) and lowest for the highest quintile (10%).

Table 14.1 Geometric Mean Serum Vitamin B_{12} Concentration, Vitamin B_{12} Deficiency, and Vitamin B_{12} Depletion Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Vitamin B_{12} [a] (pg/mL)		Vitamin B_{12} Deficiency [a, b] (<203.0 pg/mL)			Vitamin B_{12} Depletion [a, b] (≥203.0 and ≤300.0 pg/mL)		
		Geometric Mean	SE	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°									
Ouagadougou & Bobo Dioulasso	252	490.2	17.22	6.0	[2.9 , 9.0]		10.7	[6.8 , 14.7]	
Other cities	222	368.8	14.72	13.5	[8.6 , 18.4]	0.003	18.5	[13.4 , 23.6]	<0.001
Rural	307	341.1	10.10	15.3	[11.4 , 19.3]		25.4	[20.5 , 30.4]	
Residence									
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	474	420.0	11.73	10.1	[7.0 , 13.1]	0.017	14.9	[11.6 , 18.2]	<0.001
Rural°	307	341.1	10.10	15.3	[11.4 , 19.3]		25.4	[20.5 , 30.4]	
Sex									
Male	400	378.8	10.54	13.5	[10.0 , 17.0]	0.190	18.1	[14.3 , 21.9]	0.546
Female	381	398.6	11.72	10.5	[7.4 , 13.6]		19.7	[15.7 , 23.8]	
Age°, months									
6-11	39	(275.4)	(25.07)	(30.8)	[16.2 , 45.3]		(25.6)	[11.9 , 39.4]	
12-17	50	296.8	23.70	32.0	[19.0 , 45.0]		20.0	[8.9 , 31.1]	
18-23	65	358.5	21.11	12.3	[4.3 , 20.3]	<0.001	24.6	[14.1 , 35.1]	0.426
24-35	182	387.7	15.18	13.7	[8.4 , 19.1]		14.8	[9.6 , 20.1]	
36-47	217	412.7	14.53	8.3	[4.7 , 11.9]		19.8	[14.4 , 25.2]	
48-59	228	436.4	15.55	5.7	[2.7 , 8.7]		17.5	[12.6 , 22.5]	
6-23	154	315.4	13.74	23.4	[16.7 , 30.1]	<0.001	23.4	[16.7 , 30.1]	0.098
24-59	627	413.6	9.35	8.9	[6.5 , 11.3]		17.8	[14.7 , 20.8]	
Wealth Quintile									
Lowest	173	332.4	13.32	17.1	[11.2 , 23.0]		24.6	[18.1 , 31.0]	
Second	159	366.1	15.94	14.4	[9.1 , 19.8]		23.2	[16.4 , 30.0]	
Middle	183	360.1	14.38	10.6	[5.4 , 15.7]	0.100	21.6	[15.9 , 27.3]	0.002
Fourth	136	448.7	20.88	8.2	[3.5 , 12.9]		11.4	[5.3 , 17.5]	
Highest	130	495.8	29.57	8.6	[3.4 , 13.8]		9.6	[4.3 , 14.8]	
H. pylori									
Negative	364	400.1	11.94	10.7	[7.5 , 13.9]	0.781	19.6	[15.4 , 23.7]	0.705
Positive	139	382.8	19.92	11.6	[5.8 , 17.3]		18.1	[11.8 , 24.4]	
Household Cooks With Sodium Bicarbonate									
No	730	385.4	8.35	12.1	[9.6 , 14.6]	0.771	19.4	[16.4 , 22.3]	0.183
Yes	51	432.1	34.64	10.7	[2.0 , 19.5]		11.9	[3.0 , 20.7]	
Household Cooks With Potash									
No	48	(451.2)	(31.94)	(8.6)	[0.6 , 16.6]	0.456	(10.7)	[2.0 , 19.5]	0.137
Yes	733	384.7	8.37	12.3	[9.7 , 14.8]		19.4	[16.5 , 22.3]	
Number of Days Household Cooked With Potash During Last 7 Days									
0 – 1	52	430.4	41.23	19.9	[9.4 , 30.4]		10.0	[1.9 , 18.2]	
2 – 3	158	403.6	18.04	10.1	[5.3 , 14.9]	0.257	16.9	[10.8 , 23.0]	0.236
4 – 5	119	399.9	22.84	9.9	[4.4 , 15.4]		21.4	[13.9 , 28.8]	
6 – 7	404	368.3	10.72	12.8	[9.3 , 16.4]		20.9	[16.8 , 25.0]	
Total[c]	**781**	**388.3**	**8.11**	**12.0**	**[9.6 , 14.5]**		**18.9**	**[16.1 , 21.7]**	

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by ECLIA.
[b] Allen (2018).
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 15. Inflammation Status



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Chapter 15: Inflammation Status

Table 15.1 shows the prevalence of inflammation among 720 children 6-59 months. Nationally, the prevalence of elevated CRP only (acute inflammation) was 4%. The prevalence of elevated CRP only did not vary by any background characteristics.

The national prevalence of elevated AGP only (chronic inflammation) was 22% and prevalence varied by location, residence and age. It was highest in rural areas (26%) compared to 21% in other cities and 17% in Ouagadougou & Bobo Dioulasso. Nineteen percent of children in urban areas had elevated AGP only. Prevalence was highest among children 36-47 months (29%) and lowest among children 6-11 months (11%, interpret with caution, <50 unweighted cases) (unweighted estimates to be interpreted with caution).

The national prevalence of both elevated CRP and AGP was 13%. The prevalence of both elevated CRP and AGP varied by age and malaria infection. It was 24% for children 6-23 months compared to 10% for children 24-59 months (unweighted estimates to be interpreted with caution). The prevalence of elevated CRP and AGP peaked among children 18-23 months (29%) and was lowest among children 36-47 months (6%) (unweighted estimates to be interpreted with caution). The prevalence was higher for children who tested positive for malaria (22%) compared to 12% of children who tested negative.

Sixty two percent of the children 6-59 months had no inflammation. The prevalence of no inflammation varied by location, age and malaria infection. More children in Ouagadougou & Bobo Dioulasso had no inflammation (69%) compared to 60% in other cities and 58% in rural areas. The prevalence of no inflammation was highest among children 12-17 months (70%, interpret with caution, <50 unweighted cases) and lowest among children 18-23 months (41%) (unweighted estimates to be interpreted with caution). The prevalence was higher for children who tested negative for malaria (64%) compared to children who tested positive (41%).

Table 15.1 Inflammation Among Children 6-59 Months and by Stage of Inflammation, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	No Inflammation (CRP <5 mg/L and AGP< 1.0 g/L) [a,b]			Elevated CRP Only (CRP ≥5 mg/L and AGP< 1.0 g/L) [a,b]			Elevated CRP and AGP (CRP ≥5 mg/L and AGP ≥1.0 g/L) [a,b]			Elevated AGP Only (CRP <5 mg/L and AGP ≥1.0 g/L) [a,b]		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°													
Ouagadougou & Bobo Dioulasso	232	68.5	[62.2 , 74.8]		3.0	[0.8 , 5.2]		11.2	[7.1 , 15.3]		17.2	[12.1 , 22.4]	
Other cities	197	60.4	[53.7 , 67.1]	0.038	5.6	[2.4 , 8.7]	0.095	13.2	[8.2 , 18.2]	0.620	20.8	[15.3 , 26.3]	0.049
Rural	291	57.7	[52.0 , 63.4]		2.1	[0.4 , 3.7]		14.1	[10.2 , 18.0]		26.1	[21.2 , 31.1]	
Residence													
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	429	64.2	[59.5 , 68.9]	0.057	4.4	[2.4 , 6.4]	0.114	12.3	[9.0 , 15.5]	0.437	19.1	[15.3 , 23.0]	0.020
Rural°	291	57.7	[52.0 , 63.4]		2.1	[0.4 , 3.7]		14.1	[10.2 , 18.0]		26.1	[21.2 , 31.1]	
Age°, months													
6-11	35	(65.7)	[50.0 , 81.5]		(2.9)	[0.0 , 8.4]		(20.0)	[6.8 , 33.2]		(11.4)	[0.8 , 22.0]	
12-17	43	(69.8)	[56.0 , 83.6]		(0.0)	-		(18.6)	[6.9 , 30.3]		(11.6)	[2.0 , 21.2]	
18-23	58	41.4	[28.7 , 54.1]	0.018	5.2	[0.0 , 10.9]	‡	29.3	[17.6 , 41.1]	<0.001	24.1	[13.1 , 35.1]	0.041
24-35	171	60.2	[52.8 , 67.6]		5.3	[1.9 , 8.6]		14.0	[8.8 , 19.3]		20.5	[14.5 , 26.4]	
36-47	202	62.4	[55.7 , 69.1]		3.0	[0.6 , 5.3]		5.9	[2.7 , 9.2]		28.7	[22.5 , 34.9]	
48-59	211	66.4	[59.8 , 72.9]		2.4	[0.3 , 4.4]		11.8	[7.5 , 16.2]		19.4	[14.0 , 24.9]	
6-23	136	56.6	[48.2 , 65.0]	0.160	2.9	[0.1 , 5.8]	0.778	23.5	[16.4 , 30.7]	<0.001	16.9	[10.6 , 23.2]	0.125
24-59	584	63.2	[59.2 , 67.2]		3.4	[2.0 , 4.9]		10.4	[7.9 , 13.0]		22.9	[19.5 , 26.4]	
Sex													
Male	365	63.1	[58.0 , 68.2]	0.430	3.0	[1.2 , 4.8]	0.487	12.4	[9.0 , 15.8]	0.646	21.5	[17.1 , 25.8]	0.809
Female	355	60.2	[55.0 , 65.4]		4.0	[1.9 , 6.1]		13.6	[9.9 , 17.2]		22.3	[17.9 , 26.6]	
Wealth Quintile													
Lowest	156	58.1	[50.4 , 65.8]		2.7	[0.1 , 5.2]		14.4	[9.0 , 19.7]		24.9	[18.2 , 31.5]	
Second	153	57.2	[49.5 , 65.0]		3.4	[0.4 , 6.4]		14.0	[8.5 , 19.5]		25.3	[18.7 , 31.9]	
Middle	173	60.0	[52.4 , 67.6]	0.134	4.4	[1.2 , 7.5]	0.869	14.3	[9.0 , 19.6]	0.382	21.4	[15.1 , 27.7]	0.407
Fourth	124	70.6	[62.6 , 78.5]		4.2	[0.5 , 8.0]		7.3	[2.7 , 11.9]		17.9	[11.2 , 24.6]	
Highest	114	65.6	[56.2 , 75.0]		2.5	[0.0 , 5.2]		14.0	[6.8 , 21.1]		18.0	[10.5 , 25.5]	
Total[c]	**720**	**61.7**	**[58.1 , 65.3]**		**3.5**	**[2.1 , 4.8]**		**13.0**	**[10.5 , 15.5]**		**21.9**	**[18.8 , 24.9]**	

Table 15.1 Inflammation Among Children 6-59 Months and by Stage of Inflammation, Burkina Faso National Micronutrient Survey, 2020 (*continued*)

Characteristics	N	No Inflammation (CRP <5 mg/L and AGP< 1.0 g/L) [a,b]			Elevated CRP Only (CRP ≥5 mg/L and AGP< 1.0 g/L) [a,b]			Elevated CRP and AGP (CRP ≥5 mg/L and AGP ≥1.0 g/L) [a,b]			Elevated AGP Only (CRP <5 mg/L and AGP ≥1.0 g/L) [a,b]		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Malaria													
Negative	617	64.1	[60.2 , 67.9]	<0.001	3.1	[1.7 , 4.5]	0.143	11.9	[9.3 , 14.5]	0.022	20.8	[17.6 , 24.1]	0.089
Positive	64	40.8	[28.9 , 52.7]		6.8	[0.4 , 13.2]		22.3	[11.8 , 32.8]		30.1	[18.8 , 41.5]	
H. pylori													
Negative	349	61.5	[56.3 , 66.7]	0.062	3.3	[1.4 , 5.3]	0.663	12.7	[9.1 , 16.4]	0.571	22.5	[18.0 , 26.9]	0.098
Positive	129	71.1	[62.9 , 79.2]		2.5	[0.0 , 5.3]		10.8	[5.4 , 16.2]		15.7	[9.4 , 21.9]	
Dewormed in Last JVA+ Campaign (children 12-59 months, Nov-Dec 2019)													
No	242	62.2	[55.8 – 68.6]	0.852	3.0	[0.8 , 5.2]	0.636	13.6	[9.0 , 18.2]	0.452	21.2	[15.9 , 26.5]	0.535
Yes	428	61.4	[56.8 , 66.0]		3.7	[1.9 , 5.6]		11.6	[8.5 , 14.6]		23.3	[19.4 , 27.2]	
Total[c]	**720**	**61.7**	**[58.1 , 65.3]**		**3.5**	**[2.1 , 4.8]**		**13.0**	**[10.5 , 15.5]**		**21.9**	**[18.8 , 24.9]**	

CRP= C-reactive protein; AGP= alpha-1-acid glycoprotein

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.

All estimates account for complex sample design.

˚All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.

‡P-value not estimable due to zero cells in contingency table.

P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only.

Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.

Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.

[a] Assessed by ELISA (Erhardt *et al.*, 2004).

[b] Thurnham *et al.* (2011).

[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Chapter 16.
Blood Disorder Status

Photo credit:
Getty Images

Chapter 16: Blood Disorder Status

Data on inherited blood disorders among 534 children 6-59 months are presented in **Table 16.1**. The survey sample included 441 children from unique households (not directly related to any other child in sample) and 93 children from households with other selected children (may be directly related to other child in sample). Estimates therefore reflect the burden of disease and not the prevalence of hemoglobin variants in the population.

Nationally, 8% of children had sickle cell trait (HbAS), whereas 18% had hemoglobin C trait (HbAC: n=92, or HbCA: n=3, unweighted cases). Sickle cell trait doesn't usually lead to any clinical symptoms, but may cause increased risk for renal medullary carcinoma, complications of traumatic hyphema, and splenic infarction at high altitudes (Tsaras *et al.*, 2009). Hemoglobin C trait does not lead to any clinically relevant symptoms (Piel *et al.*, 2013). The prevalence of sickle cell trait varied by wealth quintile only. The prevalence of sickle cell trait was highest among children in the highest wealth quintile (17%) and lowest among children in the fourth wealth quintile (1%). The prevalence of hemoglobin C trait did not vary by any background characteristics.

Twelve out of 534 children 6-59 months had hemoglobin C disease (HbCC) which could lead to mild haemolytic anemia (unweighted cases) (Piel *et al.*, 2013). No child suffered from sickle cell disease (HbSS) which leads to severe disease (Ashley-Koch *et al.*, 2000). Only 2 children had hemoglobin SC disease (HbSC or HbCS) which is more severe than hemoglobin C disease though milder than sickle cell disease. Only 1 out of 534 children had HbSF which could be sickle cell disease or sickle beta-zero-thalassemia (severe disease). One child had persistent fetal hemoglobin (HbFA) which does not lead to any clinically relevant symptoms (Thein *et al.*, 2009).

Nationally, 1% of children 6-59 months had beta-thalassemia. Beta-thalassemia could be either beta-thalassemia minor (asymptomatic), transfusion-dependent beta-thalassemia (severe disease), or non-transfusion-dependent beta-thalassemia (variable symptoms) (Martin *et al.*, 2013). The prevalence of beta-thalassemia did not vary by any background characteristics.

Nationally, 6% of children were affected by glucose-6-phosphate dehydrogenate (G6PD) deficiency. The prevalence of G6PD deficiency varied by sex only, with prevalence among male children (9%) being 3 times that of female children (3%) (Cappellini *et al.*, 2008).

Table 16.1 Sickle Cell Trait, Hemoglobin C Trait, G6PD Deficiency and Beta-Thalassemia Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	HbAS [a,b,c] (Sickle Cell Trait)			HbAC/HbCA [a,b,c] (Hemoglobin C Trait)			G6PD Deficiency [b,d]			Beta-Thalassemia [a,b,e]		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°													
Ouagadougou & Bobo Dioulasso	197	5.6	[2.4 , 8.8]		18.8	[13.1 , 24.5]		5.1	[2.0 , 8.1]		2.5	[0.3 , 4.7]	
Other cities	117	10.3	[4.4 , 16.1]	0.284	17.9	[10.5 , 25.4]	0.881	7.7	[2.8 , 12.6]	0.638	0.0	-	‡
Rural	220	9.1	[5.0 , 13.2]		16.8	[11.7 , 21.9]		5.9	[2.8 , 9.1]		1.4	[0.0 , 2.9]	
Residence													
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	314	7.7	[4.5 , 10.8]	0.482	18.4	[13.8 , 23.0]	0.634	6.2	[3.5 , 9.0]	0.946	1.4	[0.2 , 2.6]	0.831
Rural°	220	9.1	[5.0 , 13.2]		16.8	[11.7 , 21.9]		5.9	[2.8 , 9.1]		1.4	[0.0 , 2.9]	
Age°, months													
6-11	25	(8.0)	[0.0 , 18.7]		(28.0)	[10.3 , 45.7]		(8.0)	[0.0 , 18.7]		(0.0)	-	
12-17	35	(2.9)	[0.0 , 8.4]		(14.3)	[2.7 , 25.9]		(8.6)	[0.0 , 17.9]		(5.7)	[0.0 , 13.4]	
18-23	39	(5.1)	[0.0 , 12.1]	0.767	(17.9)	[5.9 , 30.0]	0.634	(5.1)	[0.0 , 12.1]	0.164	(0.0)	-	‡
24-35	115	10.4	[4.8 , 16.1]		15.7	[9.0 , 22.3]		10.4	[4.8 , 16.0]		0.9	[0.0 , 2.6]	
36-47	167	8.4	[3.7 , 13.1]		16.2	[10.5 , 21.8]		5.4	[2.0 , 8.8]		1.8	[0.0 , 3.8]	
48-59	153	7.8	[3.6 , 12.1]		20.3	[13.9 , 26.6]		2.6	[0.1 , 5.2]		1.3	[0.0 , 3.1]	
6-23	99	5.1	[0.7 , 9.4]	0.233	19.2	[11.4 , 27.0]	0.686	7.1	[2.0 , 12.1]	0.618	2.0	[0.0 , 4.8]	0.636
24-59	435	8.7	[5.9 , 11.6]		17.5	[13.8 , 21.2]		5.7	[3.5 , 7.9]		1.4	[0.3 , 2.5]	
Sex													
Male	271	8.4	[4.8 , 12.1]	0.886	19.8	[15.0 , 24.6]	0.203	9.3	[5.8 , 12.8]	0.002	1.7	[0.2 , 3.2]	0.507
Female	263	8.1	[4.7 , 11.4]		15.7	[11.3 , 20.1]		2.8	[0.7 , 4.8]		1.1	[0.0 , 2.3]	
Wealth Quintile													
Lowest	139	9.2	[4.2 , 14.3]		21.6	[15.0 , 28.2]		6.4	[2.3 , 10.5]		0.0	-	
Second	98	4.4	[0.2 , 8.6]		13.6	[6.1 , 21.0]		3.9	[0.2 , 7.5]		3.0	[0.0 , 6.3]	
Middle	123	9.1	[3.6 , 14.5]	0.008	15.0	[8.9 , 21.2]	0.526	6.0	[1.6 , 10.4]	0.790	0.7	[0.0 , 2.1]	‡
Fourth	85	1.4	[0.0 , 4.2]		18.0	[7.8 , 28.3]		8.5	[2.4 , 14.6]		4.2	[0.2 , 8.3]	
Highest	89	16.8	[8.1 , 25.6]		20.3	[11.8 , 28.8]		6.1	[0.8 , 11.3]		0.0	-	
Total[f]	**534**	**8.2**	**[5.7 , 10.7]**		**17.8**	**[14.3 , 21.2]**		**6.1**	**[4.0 , 8.2]**		**1.4**	**[0.4 , 2.4]**	

G6PD= Glucose-6-phosphate dehydrogenate; HbAS (Sickle Cell Trait)= Hemoglobin S (Carrier for Sickle Cell); HbAC/HbCA (Hemoglobin C Trait)= Hemoglobin C (Carrier for Hemoglobin C)
Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
‡P-value not estimable due to zero cells in contingency table.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only.
Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by HPLC.
[b] Survey sample included 441 children from unique households (not directly related to any other child in sample) and 93 children from households with other selected children (may be directly related to other child in sample). Estimates therefore reflect the burden of disease and not the prevalence of hemoglobin variants in the population.
[c] Some are co-existed with beta-thalassemia.
[d] Assessed by a kit (Atlas Medical) providing a qualitative determination of G6PD activity in dried blood spots.
[e] Can include beta-thalassemia minor (asymptomatic), transfusion-dependent beta-thalassemia (severe disease), or non-transfusion-dependent beta-thalassemia (variable symptoms).
[f] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

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Annexes

Annex 1: Questionnaire for Children 6-59 Months

HOUSEHOLD LABEL
MXXXX

CHILD LABEL
EXXXX

BURKINA FASO
NATIONAL MICRONUTRIENT SURVEY - 2020
QUESTIONNAIRE FOR CHILD 6 TO 59 MONTHS (MOTHER / CAREGIVER)

IDENTIFICATION		
U001	REGION NAME AND CODE: _____	☐☐
U002	PROVINCE NAME AND CODE: _____	☐☐☐
U003	MUNICIPALITY NAME AND CODE: _____	☐☐
U004	CLUSTER CODE (01-90)	☐☐
U005a	HOUSEHOLD NUMBER ON CENSUS FORM	☐☐☐
U005b	HOUSEHOLD SAMPLE NUMBER (01-25)	☐☐
U006	CHILD'S FIRST AND LAST NAME+ CHILD'S LINE NUMBER FROM CENSUS SHEET: _____	☐☐
U007	RESPONDENT'S FIRST AND LAST NAME + RESPONDENT'S LINE NUMBER FROM CENSUS SHEET _____	☐☐
U008	RELATIONSHIP OF RESPONDENT TO THE CHILD: 1. Mother 2. Grandmother 3. Father 4. Other (specify) _____	☐

INTERVIEWER VISITS					
		1	2	3	FINAL VISIT
U009	DATE	_____	_____	_____	U012 DAY ☐☐
U010	INTERVIEWER CODE	☐☐	☐☐	☐☐	U013 MONTH ☐☐ U014 YEAR 2020
U011	RESULT* (SEE CODES BELOW)	☐☐	☐☐	☐☐	U015 inter. CODE ☐☐☐ U016 RESULT ☐☐
U017 NEXT VISIT DATE TIME		_____ _____	_____ _____		U018 Total No. of visits ☐

*Interview result codes
1. Completed
2. Absent
3. Postponed
4. Refused
5. Partial interview
96. Other (specify) _____

U019	LANGUAGE USED IN THE INTERVIEW ☐☐ 01. FRENCH 02. MOORE 03. DIOULA 04. FULFULDE 05. GOURMANTCHE 96. OTHER (SPECIFY) _____	U020. TIME INTERVIEW STARTED ☐☐ : ☐☐ h min
U021	FIELD SUPERVISOR CODE ☐☐☐	U022. FIRST DATA ENTRY PERSON'S CODE ☐☐☐ U023. SECOND DATA ENTRY PERSON'S CODE ☐☐☐

I. GENERAL CHARACTERISTICS OF THE CHILD			
Q.NO.	**QUESTIONS AND FILTERS**	**CATEGORIES AND CODE**	**SKIP TO**
U024	What is the child's sex?	MALE.....1 FEMALE.....2 OTHER (SPECIFY)_____.....96	
U025	What is the child's [NAME] date of birth? ASK TO SEE ANY DOCUMENTS THAT CAN VERIFY THE CHILD'S AGE	DAY..... ☐☐ DON'T KNOW DAY .....98 MONTH..... ☐☐ DON'T KNOW MONTH .....98 YEAR ..... ☐☐☐☐ DON'T KNOW YEAR 9998	
U026	Source used to verify age	BIRTH CERTIFICATE.....1 CHILD HEALTH CARD.....2 VACCINATION CARD .....3 MATERNAL RECALL.....4 CALENDAR OF EVENTS .....5 OTHER (SEPCIFY)_____.....96	
U027	Calculate age and enter age in months	COMPLETED MONTHS ..... ☐☐	
****IF THE AGE OF THE CHILD IS LESS THAN 6 MONTHS OR MORE THAN 59 MONTHS, STOP THE INTERVIEW AND CONTACT THE TEAM LEADER*****			
U028	Was the child forced to flee or to abandon his house or his usual place of residence, due, in particular, to fallout from armed conflict, situations of generalized violence, human rights violations, or man-made or natural disasters, or to escape all these dangers, but did not leave Burkina Faso?	YES.....1 NO .....2 DON'T KNOW.....98	

J. CHILD FEEDING			
Q.NO.	**QUESTIONS AND FILTERS**	**CATEGORIES AND CODE**	**SKIP TO**
J001	How long has it been since the child (NAME) last ate or drank anything other than water?	Number of hours: ☐☐ IF LESS THAN 1 HOUR, ENTER «00»	
CHECK AGE IN I024, CHILDREN older than 24 months (2 years), SKIP TO J013.			
J002	Did a health care worker or CHW ever talk to you about how to feed the child (NAME) **before** the child (NAME) was born?	YES, health care worker ..... 1 YES, CHW..... 2 YES, both, health care worker and CHW ..... 3 NO..... 4 DON'T KNOW 98	
J003	Did a health care worker or CHW ever talk to you about how to feed the child (NAME) **after** the child (NAME) was born?	YES, health care worker ..... 1 YES, CHW..... 2 YES, both, health care worker and CHW ..... 3 NO..... 4 DON'T KNOW 98	
J004	Has the child (NAME) ever been breastfed?	YES..... 1 NO..... 2 DON'T KNOW.....98	J011
J005	ENUMERATOR: Is the child the biological child of the respondent?	YES..... 1 NO..... 2	→ J007
J006	How long after the birth did you first put the child (NAME) to the breast? IF THE RESPONDENT REPORTS THAT SHE PUT THE INFANT TO THE BREAST IMMEDIATELY AFTER BIRTH, ENTER «0». IF NOT IMMEDIATELY BUT LESS THAN 1 HOUR, ENTER THE NUMBER OF MINUTES, FROM 1 to 59. IF 1-23 HOURS, WRITE NUMBER OF HOURS FROM 1 to 23. IN ALL OTHER CASES, ENTER THE NUMBER OF COMPLETED DAYS.	IMMEDIATELY ..... 0 MINUTES (if less than 1 hour) ☐☐ HOURS..... ☐☐ DAY(S)..... ☐☐	
J007	Is the child still breastfed	YES..... 1 NO..... 2	→ J009
J008	At what age in months did the child (NAME) stop breastfeeding? **(Enter the corresponding number)**	MONTHS..... ☐☐ CURRENTLY BREASTFED.....99	→ J011
J009	How many times was the child (NAME) breastfed during the day yesterday (from sunrise to sunset yesterday)? IF NOT BREASTFED ENTER « 00 »	Number of times ..... ☐☐ Don't know .....98 Refused to respond.....77	

J010	How many times was the child (NAME) breastfed last evening and during the night until morning (from sunset to sunrise this morning)? IF NOT BREASTFED ENTER « 00 »	Number of times ..... ☐☐ Don't know .....98 Refused to respond.....77	
J011	Did the child (NAME) drink anything from a bottle with a nipple (including breastmilk) yesterday day or night?	YES..... 1 NO..... 2 DON'T KNOW.....98	
J012	During the last 12 months, did the child (NAME) participate in an infant and young child feeding (IYCF) program?	YES..... 1 NO..... 2 DON'T KNOW.....98	
J013	Now, I would like to ask you about liquids other than breastmilk that the child (NAME) had yesterday during the day and at night. I am interested in whether your child had the item I mention even if the liquid was combined with other foods. (**Read each option one by one. Specify frequency for milk, infant formula, and yogurt**)	**Yes No** 1. Other milk than breastmilk (e.g., thin, powder, animal milk).....1 2 1.1 If yes, number of times..... ☐☐ 2. Plain water .....1 2 3. Sugar or glucose water.....1 2 4. Gripe water.....1 2 5. Sugar-salt-water solution (ORS) .....1 2 6. Fruit juice .....1 2 7. Infant formula (e.g., picot, Nativa, NAN, etc).....1 2 7.1. If yes, number of times..... ☐☐ 8. Tea .....1 2 9. Honey.....1 2 10. Yogurt .....1 2 10.1. If yes, number of times.... ☐☐ 96. Other (specify) _____ 1 2	
J014	Now, I would like to ask you about foods that the child (NAME) had yesterday during the day and at night. I am interested in whether your child had the item I mention even if it was combined with other foods. (**Read each food group option and examples one by one)**		
		Yes No	
1.	CEREALS (rice, bread, maize/corn, millet, tô, wheat, sorghum, porridge, or other foods made from grains)?	1 2	
2.	WHITE TUBERS AND ROOTS OR OTHER STARCHY FOOD (white potatoes, white yams, manioc, taro, fabirama, plantain, white sweet potato, or other foods made from roots)?	1 2	
3.	VITAMIN A-RICH VEGETABLES AND TUBERS (pumpkin, carrots, squash, orange-flesh sweet potato)? (SHOW AN EXEMPLE: PHOTOGRAPH)	1 2	
4.	LEGUMES AND NUTS (beans, peas, lentils, mung beans, nuts, seeds or foods made from these)?	1 2	
5.	MILK AND MILK PRODUCTS (milk, cheese, yogurt, or other foods made from milk)?	1 2	
5a	If yes, number of times?	TIMES ☐☐	
6.	MEAT (liver, kidneys, heart, or other organ meats, or processed meat)?	1 2	
7.	OTHER FLESH FOODS (beef, sheep/lamb, goat, chicken, guinea fowl, duck, fresh or dried fish or seafood)?	1 2	
8.	EGGS (chicken, guinea fowl, duck, quail, etc.) ?	1 2	

9.	VITAMIN A-RICH FRUITS – (fresh or dried ripe mango, ripe papaya, etc.)?	1 2	
10.	OTHER FRUITS (banana, other unripe fruits, unripe papaya, unripe mango, apple, oranges, guava, pineapple, watermelon, grapes, strawberries, plums, etc.)?	1 2	
11.	DARK GREEN LEAFY VEGETABLES (spinach, baobab leaves, cowpea leaves, okra leaves, kapok tree flowers, sorrel leaves, sweet potato leaves, eggplant leaves, or other local leaves)?	1 2	
12.	OTHER VEGETABLES (cauliflower, cabbage, eggplant, onion, tomato, etc.)?	1 2	
13.	Red palm oil?	1 2	
14.	Other vegetable oil (sunflower, cotton, maize/corn, peanut, palm)?	1 2	
15.	OTHER FATS (butter, shea butter, lard, etc.)?	1 2	
16.	Condiments and seasonings (fish powder, bouillon cubes, tomato paste, etc.)?	1 2	
17.	Tea (without sugar)?	1 2	
18.	Tea (with sugar)?	1 2	
19.	OTHER SUGAR-SWEETENED BEVERAGES (All drinks made with sugar at the house or purchased, notably bissap, zoom-kom, ginger, fizzy drinks, sodas, etc. (excludes diet soda))?	1 2	
20.	OTHER SUGARY FOODS (candy, sugar, honey, chocolate, cookies, etc.)?	1 2	
21.	Snails, larve, caterpillar, crickets, edible insects, etc.?	1 2	
22.	Fortified infant flour (Misola, Vita casui, Vitaline, Bledina, Phosphatine, Cerelac, CSB+, CSB++)?	1 2	
23.	Ready-to-use food supplements (PLUMPY‘SUP) ?	1 2	
24.	Ready-to-use therapeutic foods (PLUMPY‘NUT, F75 milk, F100 milk)?	1 2	
25.	Other foods not mentioned, Specify _____	1 2	

IF CHILD DID NOT EAT ANY SOLID, SEMI-SOLID, OR SOFT FOODS IN J014 THEN ASK J015, OTHERWISE GO TO J016.

J015	Did the child (NAME) eat any solid, semi-solid, or soft foods yesterday during the day and at night? If the response is « YES »: What kind of solid, semi-solid, or soft foods did the child (NAME) eat? GO BACK TO J014 AND CHANGE RESPONSE TO YES FOR THESE FOODS	YES ..... 1 NO ..... 2 DON’T KNOW 98	} J017
J016	How many times did the child (NAME) eat solid, semi-solid, or soft foods other than liquids yesterday during the day and at night?	NUMBER OF TIMES ..... ☐☐ DON’T KNOW 98	

Now, I am going to ask you about certain foods that you have given to the child (NAME) that were prepared at home

J017	Did the child (NAME) consume foods prepared in the house with purchased wheat flour yesterday, during the day and night?	YES ..... 1 NO ..... 2 DON’T KNOW 98	
J018	During the last 7 days, how many days did the child (NAME) consume foods prepared in the house with purchased wheat flour?	Number of days ..... ☐ Did not consume ..... 00 DON’T KNOW 98	
J019	Did the child (NAME) consume foods prepared in the house with purchased vegetable oil yesterday, during the day and night?	YES ..... 1 NO ..... 2 DON’T KNOW 98	

J020	During the last 7 days, how many days did the child (NAME) consume foods prepared in the house with purchased vegetable oil?	Number of days..... ☐☐ Did not consume .....00 DON'T KNOW.....98	
J021	Did the child (NAME) consume foods prepared in the house with purchased salt (excluding rock salt) yesterday, during the day and night?	YES..... 1 NO..... 2 DON'T KNOW.....98	
J022	During the last 7 days, how many days did the child (NAME) consume foods prepared in the house with purchased salt (excluding rock salt)?	Number of days..... ☐☐ Did not consume .....00 DON'T KNOW.....98	
J023	Did the child (NAME) consume foods prepared in the house with purchased bouillon yesterday, during the day and night?	YES..... 1 NO..... 2 DON'T KNOW.....98	
J024	During the last 7 days, how many days did the child (NAME) consume foods prepared in the house with purchased bouillon?	Number of days..... ☐☐ Did not consume .....00 DON'T KNOW.....98	

K. CHILD HEALTH			
Q.NO.	**QUESTIONS AND FILTERS**	**CATEGORIES AND CODE**	**SKIP TO**
K001	Did the child (NAME) receive a dose of vitamin A during the last JVA+ campaign (November - December 2019)? (SHOW VITAMIN A CAPSULE)	YES ..... 1 NO ..... 2 DON'T KNOW 98	
K002	Did the child (NAME) receive a deworming drug during the last JVA+ campaign (November/December 2019)? (SHOW MEDICATION)	YES ..... 1 NO ..... 2 DON'T KNOW 98	
K003	Did the child (NAME) go to the health center for child growth monitoring last month (last 30 days)?	YES ..... 1 NO ..... 2 DON'T KNOW 98	
K004	REVIEW THE HEALTH CARD AND DOCUMENT THE DATES OF THE TWO MOST RECENT CHILD GROWTH MONITORING VISITS.	**CHILD GROWTH MONITORING** Most recent date: ☐☐/☐☐/☐☐☐☐ Second most recent date: ☐☐/☐☐/☐☐☐☐ Never gone ..... 92 Dates not filled ..... 93 No card 94	
K005	Does the child (NAME) sleep under a mosquito net?	NEVER ..... 1 SOMETIMES ..... 2 ALWAYS 3	
K006	Has the child (NAME) had a fever during the last 2 weeks?	YES ..... 1 NO ..... 2 DON'T KNOW 98	
K007	Has the child (NAME) had a cough during the last 2 weeks?	YES ..... 1 NO ..... 2 DON'T KNOW 98	
K008	Has the child (NAME) had diarrhea during the last 2 weeks?	YES ..... 1 NO ..... 2 DON'T KNOW 98	} K010
K009	What treatment was given to the child (NAME) for diarrhea? (consult health card if possible) **DO NOT READ RESPONSE OPTIONS, MARK ALL TREATMENTS GIVEN**	ORS ..... A ZINC SUPPLEMENTS ..... B ANTIBIOTICS ..... C ANTI-DIARRHEALS ..... D HOME REMEDIES ..... E OTHER (SPECIFY)_____ ..... X DID NOT GIVE TREATMENT ..... Y	
K010	During the last seven days, was the child (NAME) given iron syrup or tablets like this? SHOW AN EXAMPLE IF YES, ASK TO SEE THE BOTTLE AND ENTER THE CORRECT ANSWER	YES, OBSERVED ..... 1 YES, NOT OBSERVED ..... 2 NO ..... 3 DON'T KNOW 98	} K012
K011	During the last seven days, on how many days was the child (NAME) given iron syrup or tablets?	Number of days ..... ☐ DON'T KNOW 98	

K012	During the last seven days, was the child (NAME) given food mixed with micronutrient powder? SHOW THE MICRONUTRIENT POWDER SACHET (IF YES, ASK TO SEE THE SACHETS AND ENTER THE CORRECT ANSWER)	YES, OBSERVED.....1 YES, NOT OBSERVED.....2 NO.....3 DON'T KNOW.....98	} K014
K013	During the last seven days, on how many days was the child (NAME) given micronutrient powder sachets like this?	Number of days..... ☐ DON'T KNOW …… 98	
K014	During the last seven days, did the child (NAME) take a zinc tablet? SHOW AN EXAMPLE IF YES, ASK TO SEE THE PACKAGE	YES, OBSERVED.....1 YES, NOT OBSERVED.....2 NO.....3 DON'T KNOW.....98	} K018
K015	On how many days over the last 7 days, did the child (NAME) take a zinc tablet	Number of days..... ☐ DON'T KNOW…… 98	
K016	During the last 24 hours, did the child (NAME) take a zinc tablet? **Instruction**: tell the mother that 24 hours is since yesterday at this time today.	YES, OBSERVED.....1 YES, NOT OBSERVED.....2 NO.....3 DON'T KNOW.....98	} K018
K017	How many hours ago did the child (NAME) take the zinc tablet? IF CONSUMED LESS THAN ONE HOUR AGO, ENTER "00"	Number of hours ..... ☐☐ DON'T KNOW…… 98	
K018	During the last 12 months, has (NAME) been treated for acute malnutrition (marasmus or kwashiorkor)?	YES.....1 NO.....2 DON'T KNOW.....98	
K019	During the last 12 months, did the child (NAME) receive fortified blended food (CSB+, CSB++) as part of a health program? SHOW AN EXAMPLE	YES.....1 NO.....2 DON'T KNOW.....98	
K020	During the last 12 months, did the child (NAME) receive ready-to-use nutritional supplements (PLUMPY'SUP) as part of the management of moderate acute malnutrition or prevention of severe acute malnutrition ? SHOW AN EXAMPLE	YES.....1 NO.....2 DON'T KNOW.....98	
K021	During the last 12 months, did the child (NAME) receive ready-to-use therapeutic foods (PLUMPY'NUT, F75 milk, F100 milk) as part of treatment for severe acute malnutrition ? SHOW AN EXAMPLE	YES.....1 NO.....2 DON'T KNOW.....98	

K022	During the last week (7 days), did the child (NAME) eat clay and/or soil?	YES.....1 NO.....2 DON'T KNOW.....98	K023
K022b	If yes, during the past 7 days, how many times has the child (NAME) eaten clay and/or soil?	NUMBER OF TIMES ..... ☐☐ DON'T KNOW.....98	
K023	During the last week (7 days), did the child (NAME) eat uncooked rice, uncooked pasta or ice?	YES.....1 NO.....2 DON'T KNOW.....98	K024
K023b	If yes, during the past 7 days, how many times did the child (NAME) eat uncooked rice, uncooked pasta, or ice?	NUMBER OF TIMES ..... ☐☐ DON'T KNOW.....98	
K024	Do you think the child (NAME) is at a healthy weight, is underweight, or overweight?	HEALTHY WEIGHT.....1 UNDERWEIGHT.....2 OVERWEIGHT.....3	
K025	During the last 12 months, has your household participated in a social safety net project where you received cash transfers?	YES.....1 NO.....2 DON'T KNOW.....98	L001
K025b	If yes, were you the beneficiary of your household for this?	YES.....1 NO.....2 DON'T KNOW.....98	L001
K026	If yes, did you attend counseling sessions during village assemblies or group discussions?	YES.....1 NO.....2 DON'T KNOW.....98	L001
K027	If yes, on what topics did you receive information as part of this project? RECORD ALL MENTIONED RESPONSES	Breastfeeding ..... A Nutrition for children 0-23 months ..... B Nutrition during pregnancy ..... C Vitamin A and iron supplementation ..... D Food groups .....E Hygiene..... F Malaria ..... G Forgot.....H OTHER (SPECIFY) _____ X	

Interview end time : ☐☐ : ☐☐
Hour Minutes

Test / measurement	L001. Result of measurement	L002. Measurement	L003. Date of measurement	L004 Time of measurement	L005. Person who did measuring	L006. Equipment code
A. Height (cm) First measurement **Instructions:** For children 6-23 months, measure the child lying down For children 24-59 months, measure the child standing up	Length measured 1 Height measured 2 Not present .....3 Refused.....4 Other_____.....96 (Specify)	☐☐☐.☐ cm	☐☐/☐☐/☐☐☐☐ (day / month / years)	☐☐:☐☐ (hour : minute)	Code: ☐☐☐	Code of height board ☐☐
B. Height (cm) Second measurement	Length measured 1 Height measured 2 Not present .....3 Refused.....4 Other_____.....96 (Specify)	☐☐☐.☐ cm	☐☐/☐☐/☐☐☐☐ (day / month / years)	☐☐:☐☐ (hour : minute)	Code: ☐☐☐	Code of height board ☐☐
C. Difference between the first and second measurement (cm)		☐☐☐.☐ cm **If the difference between the first and second measurement exceeds 0.7 cm, take a third measurement**				
D. Height (cm) Third measurement **Instructions:** If the difference exceeds 0.7 cm	Length measured1 Height measured2 Not present .....3 Refused.....4 Other_____.....96 (Specify)	☐☐☐.☐ cm	☐☐/☐☐/☐☐☐☐ (day / month / years)	☐☐:☐☐ (hour : minute)	Code: ☐☐☐	Code of height board ☐☐

E. Weight (kg) First measurement	Weighed..... 1 Not present..... 2 Refused ..... 3 Other_____ 96 (Specify)	□□.□ kg	□□/□□/□□□□ (day / month / years)	□□:□□ (hour : minute)	Code: □□□	Code of scale □□
F. Weight (kg) Second measurement	Weighed..... 1 Not present..... 2 Refused ..... 3 Other_____ 96 (Specify)	□□.□ kg	□□/□□/□□□□ (day / month / years)	□□:□□ (hour : minute)	Code: □□□	Code of scale □□
G. Difference between the first and the second measurement (kg)		□□.□ kg **If the difference between the first and second measurement exceeds 0.1 kg, take a third measurement**				
H. Weight (kg) Third measurement **Instructions:** If the difference exceeds 0.1 kg	Weighed..... 1 Not present..... 2 Refused ..... 3 Other_____ 96 (Specify)	□□.□ kg	□□/□□/□□□□ (day / month / years)	□□:□□ (hour : minute)	Code: □□□	Code of scale □□

I. Mid-upper arm circumference (mm) First measurement	Measured..... 1 Not present..... 2 Refused ..... 3 Other_____ 96 (Specify)	☐☐☐ mm	☐☐/☐☐/☐☐☐☐ (day / month / years)	☐☐:☐☐ (hour : minute)	Code: ☐☐☐	Code of tape ☐☐
J. Mid-upper arm circumference (mm) Second measurement	Measured..... 1 Not present..... 2 Refused ..... 3 Other_____ 96 (Specify)	☐☐☐ mm	☐☐/☐☐/☐☐☐☐ (day / month / years)	☐☐:☐☐ (hour : minute)	Code: ☐☐☐	Code of tape ☐☐
K. Difference between the first and second measurement (mm)		☐☐☐ mm **If the difference between the first and second measurement exceeds 5 mm, take a third measurement**				
L. Mid-upper arm circumference (mm) Third measurement **Instructions:** If the difference exceeds 5 mm	Measured..... 1 Not present..... 2 Refused ..... 3 Other_____ 96 (Specify)	☐☐☐ mm	☐☐/☐☐/☐☐☐☐ (day / month / years)	☐☐:☐☐ (hour : minute)	Code: ☐☐☐	Code of tape ☐☐
M. Bilateral oedema	Evaluated ..... 1 Not present..... 2 Refused ..... 3 Other_____ 96 (Specify)	Bilateral oedema 1 None 2	☐☐/☐☐/☐☐☐☐ (day / month / years)	☐☐:☐☐ (hour : minute)	Code: ☐☐☐	
L008	Referral slip given if MUAC value <110 mm and/or bilateral oedema				YES, REFERRAL SLIP GIVEN FOR ACUTE MALNUTRITION ..... 1 NO..... 2 NOT APPLICABLE (NO ACUTE MALNUTRITION)..... 3	

CHILD LABEL EXXXX

BURKINA FASO
NATIONAL MICRONUTRIENT SURVEY - 2020
QUESTIONNAIRE FOR CHILD 6 TO 59 MONTHS (MOTHER / CAREGIVER)

L. BIOLOGICAL MEASUREMENTS SAMPLES TAKEN FOR ELIGIBLE CHILDREN 6-59 MONTHS			
L009	Name of phlebotomist: _____ Code: ☐☐☐		
TIME OF VENOUS BLOOD SAMPLE COLLECTION			
VENOUS Blood Sample			
Verification of process for taking sample			
L010	Consent obtained	YES 1	NO 2
L011	Sample taken	YES .....1 NOT PRESENT.....2 REFUSED .....3 OTHER (SPECIFY) 96	
L012	Sufficient Volume	YES 1	NO 2
L013	Time blood collection began (hour: minute)	☐☐ : ☐☐ hour minute	
L014	Time blood collection ended (hour: minute)	☐☐ : ☐☐ hour minute	
L015	Date sample taken (day/month/year)	☐☐ / ☐☐ / 2020	
HEMOGLOBIN CONCENTRATION			
L016	Hemoglobin concentration measured?	YES .....1 NO 2	
L017	Value for hemoglobin concentration	☐☐ . ☐ g / dL	
L018	Referral slip given if the hemoglobin value for the child is <7.0 g / dl	YES, REFERRAL SLIP GIVEN FOR ANEMIA ..... 1 NO ..... 2 NOT APPLICABLE (NO ANEMIA) 3	
L019	Number of HemoCue 301	☐☐	
MALARIA			
L020	Result of malaria RDT	POSITIVE .....1 NEGATIVE.....2 INVALID .....3 INSUFFICIENT SAMPLE TO PERFORM AN RDT .4	
L021	Referral slip given if the malaria RDT was positive	YES, REFERRAL SLIP GIVEN FOR MALARIA ... 1 NO ..... 2 NOT APPLICABLE (NEGATIVE MALARIA RDT).3	

HEMOGLOBIN CAPILLARY BLOOD SAMPLE			
Verification of process for taking sample			
Instructions: Hemoglobin will be additionally assessed using capillary blood in a preselected subsample of children 6-59 months.			
L022	Child selected for capillary hemoglobin subsample	YES.....1	NO.....2
L023	Consent obtained	YES.....1	NO.....2
L024	Single drop of capillary blood Sample taken	YES.....1 NOT PRESENT.....2 REFUSED .....3 OTHER (SPECIFY) 96	
L025	Sufficient volume	YES.....1	NO.....2
L026	Value for hemoglobin concentration	☐☐.☐ g / dL	
L027	Referral slip given if the hemoglobin value for the child is <7.0 g / dl	YES, REFERRAL SLIP GIVEN FOR ANEMIA .....1 NO .....2 NOT APPLICABLE (NO ANEMIA)..... ..3	
L028	Number of HemoCue 301	☐☐	
L029	Date sample taken (day/month/year)	☐☐/☐☐/ 2020	
L030	Pooled capillary blood Sample taken	YES.....1 NOT PRESENT.....2 REFUSED .....3 OTHER (SPECIFY) 96	
L031	Sufficient volume	YES.....1	NO.....2
L032	Value for hemoglobin concentration	☐☐.☐ g / dL	
L033	Referral slip given if the hemoglobin value for the child is <7.0 g / dl	YES, REFERRAL SLIP GIVEN FOR ANEMIA .....1 NO .....2 NOT APPLICABLE (NO ANEMIA)..... ..3	
L034	Number of HemoCue 301	☐☐	
L035	Date sample taken (day/month/year)	☐☐/☐☐/ 2020	

MRDR VENOUS Blood Sample			
Verification of process for taking sample			
Instructions: Vitamin A2 will be administered to a preselected subsample of children. You must return to the child's home 4 hours after Vitamin A2 administration to collect a venous blood sample.			
L036	Child selected for MRDR subsample	YES.....1	NO 2
L037	Consent obtained	YES.....1	NO 2
L038	Counseled mother/caregiver	YES.....1	NO 2
Realization of test for MRDR			
L039	Time vitamin A2 dose ingested (hour: minute)	☐☐ : ☐☐ hour minute	
L040	Sample taken	YES ..... 1 NOT PRESENT..... 2 REFUSED ..... 3 OTHER (SPECIFY) 96	
L041	Sufficient volume	YES ....1 NO 2	
L042	Time MRDR blood collection began (hour: minute)	☐☐ : ☐☐ hour minute	
L043	Date sample taken (day/month/year)	☐☐/☐☐/2020☐☐	

Stool Sample			
Verification of process for taking sample			
L044	Sample taken	YES ..... 1 NOT PRESENT..... 2 REFUSED ..... 3 OTHER (SPECIFY) 96	
L045	Sufficient quantity	YES.....1	NO 2
L046	Date sample taken (day/month/year)	☐☐/☐☐/2020☐☐	
L047	Sample collection time	☐☐ : ☐☐ (hour: minute)/	

CHILD
LABEL
EXXXX

BURKINA FASO
NATIONAL MICRONUTRIENT SURVEY - 2020
LABORATORY FOR CHILDREN 6 TO 59 MONTHS

W. MOBILE LABORATORY TESTS		
W001	Name of laboratory technician : _____	Code: ☐☐☐

Stool sample		
Verification of process for taking sample		
H. PYLORI		
W002	Result of H. Pylori test	POSITIVE.....1 NEGATIVE .....2 INVALID.....3 INSUFFICIENT SAMPLE TO PERFORM A TEST.....4
W003	Date sample treated (day/month/year)	☐☐/☐☐/ 2020 ☐☐
W004	Referral slip given if the H. Pylori test was positive	YES, REFERRAL SLIP GIVEN FOR POSITIVE H. PYLORI TEST .....1 NO.....2 NOT APPLICABLE (NEGATIVE H. PYLORI TEST).....3
GEOHELMINTHS		
W005	Result of Kato Katz test	POSITIVE.....1 NEGATIVE .....2 INVALID.....3 INSUFFICIENT SAMPLE TO PERFORM A TEST.....4
W006	Date sample treated (day/month/year)	☐☐/☐☐/ 2020 ☐☐
W007	Time sample treated	☐☐:☐☐ (hour : minute)/
W008a	Number of Ankylostome eggs per gram of stool	☐☐☐☐
W008b	Number of *Ascaris lumbricodes* eggs per gram of stool	☐☐☐☐
W008c	Number of *Trichuris trichiura* eggs per gram of stool	☐☐☐☐
W009	Referral slip given if the Kato Katz test was positive	YES, REFERRAL SLIP GIVEN FOR GEOHELMINTHS1 NO.....2 NOT APPLICABLE (NEGATIVE RESULT FOR SOIL-TRANSMITTED HELMINTHS).....3

Annex 2: Biological Indicators and Rationale for Assessment

Annex 2.1 Biological Indicators and Rationale for Assessment

Outcome	Indicator & Rationale	Recommended Cutoff Values and Definitions of a Public Health Problem, Where Applicable	Sample Volume for Analysis
Vitamin A Status	The WHO recommends using ≥2 biological indicators to assess vitamin A status, one of which is usually retinol (WHO, 1996). **Retinol binding protein (RBP)** [a] RBP can be analyzed at low cost using a sandwich-based enzyme linked immunosorbent assay (ELISA). There is no established RBP cutoff to define vitamin A deficiency, and a survey specific RBP vitamin A deficiency cutoff must be calculated based on retinol data. The RBP cutoff calculated for non-pregnant WRA is applied to adolescents as well. RBP is influenced by inflammation and infection among children but not WRA and the data are adjusted to correct for this effect for the correct interpretation of the data (BRINDA regression correction method). [c]	RBP is calibrated to serum retinol to calculate cutoffs equivalent to retinol <0.70 µmol/L (values among children 6-59 months are also adjusted for inflammation using CRP and AGP)	30 µL [b]
	Serum Retinol [d] Serum retinol is the WHO recommended vitamin A indicator. Retinol is also used to calculate population specific RBP cutoffs to define vitamin A deficiency. Retinol is influenced by inflammation and infection among children but not WRA and the data are adjusted to correct for this effect for the correct interpretation of the data (BRINDA regression correction method). [c]	**For all age groups:** Low serum retinol: <0.70 µmol/L **Definition of a public health problem:** Prevalence of vitamin A deficiency (developed for non-inflammation adjusted low serum retinol) Mild: 2-9% Moderate: 10-19% Severe: >20%	250 µL
	Modified relative dose response (MRDR) [e] As circulating serum retinol is under the homeostatic control of large liver stores of vitamin A, it is common that retinol levels do not change in response to vitamin A interventions. The modified relative dose response (MRDR) test is a valid measure of vitamin A liver stores. MRDR can be used to assess deficiency through sufficiency but is not used for defining toxic levels of vitamin A.	**For all age groups:** ≥0.060 are indicative of insufficient vitamin A liver reserves **Definition of a public health problem:** Prevalence of MRDR ≥ 0.060 Mild: <20% Moderate: ≥20 to <30% Severe: ≥30%	250 µL
Anemia	**Hemoglobin (Hb)** [f] Hemoglobin is responsible for carrying oxygen from the lungs to body tissues via the blood. Hemoglobin is used to assess anemia status.	**Children 6-59 months**: <11.0 g/dL NOTE: Per WHO guidelines, hemoglobin values were adjusted for smoking in WRA and adolescents, though smoking was rarely reported (WHO, 2011). There were no adjustments to altitude needed for the Burkina Faso National Micronutrient Survey on hemoglobin, as all registered altitudes at households were below the 1,000 meter cutoff.	10 µL

Outcome	Indicator & Rationale	Recommended Cutoff Values and Definitions of a Public Health Problem, Where Applicable	Sample Volume for Analysis
		Public health problem: Anemia prevalence: Normal: <4.9% Mild: 5.0 - 19.9% Moderate: 20.0 - 39.9% Severe: >40%	
Iron Status	**Serum Ferritin** [g] Ferritin is the WHO recommended indicator of iron deficiency in populations and is a measure of iron stores. It is strongly influenced by inflammation and infection and the ferritin data are corrected for this effect using CRP and AGP for correct interpretation (BRINDA regression correction method). [h]	**Children <5 years**: <12 ug/L	30 µL [b]
	Soluble transferrin receptor (sTfR) [i] sTfR is an indicator of iron insufficiency when iron stores are depleted (and assuming the absence of other causes of abnormal erythropoiesis). It is assumed to be less influenced by inflammation and infection than ferritin, however the sTfR data are also corrected for inflammation and infection using CRP and AGP for correct interpretation (BRINDA regression correction method). [j]	**For all age groups:** >8.3 mg/L (based on RAMCO scale, Ramco Laboratories, Stafford, TX, USA)	30 µL [b]
Iron Deficiency Anemia	Iron deficiency is a major cause of anemia. The WHO recommends using hemoglobin and ferritin, in combination, to classify iron deficiency anemia.	Individuals must meet the criteria indicated in the rows in this table for both iron deficiency based on ferritin and anemia based on hemoglobin	
Folate Status	**Serum Folate** [k] Serum folate provides information on short-term folate status and reflects recent folate intake within the past few hours.	**Assay cutoffs for risk of deficiency on the basis of megaloblastic anemia as a hematologic indicator** **For all age groups:** Elevated: >45.3 nmol/L Normal range: 13.5-45.3 nmol/L Possible deficiency: 6.8-13.4 nmol/L Deficiency: <6.8 nmol/L	15 µL
	RBC Folate [l] Red blood cell folate is reflective of longer-term folate status. Red blood cell (RBC) folate levels reflect folate stores over the last 3-4 months and are not affected by recent dietary intake.	**Assay cutoffs for risk of deficiency on the basis of megaloblastic anemia as a hematologic indicator** **For all age groups:** Deficiency: <226.5 nmol/L	15 µL

Outcome	Indicator & Rationale	Recommended Cutoff Values and Definitions of a Public Health Problem, Where Applicable	Sample Volume for Analysis
Vitamin B_{12} Status	**Serum B_{12}** [m] Vitamin B_{12} functions as a coenzyme for a critical methyl transfer reaction. A chronic dietary deficiency of either folate or vitamin B_{12} can cause macrocytic anemia.	**For all age groups:** Deficiency: <150 pmol/L (203 pg/mL) Depletion: 150 - 220 pmol/L (203 - 300 pg/mL)	150 µL
Zinc Status	**Serum Zinc** [n] Zinc is important for growth and immune function and has a variety of other physiological functions in the body. Circulating zinc is influenced by diurnal variation, recent food intake and recent supplement intake. Fasting samples were not possible in this survey so only non-fasting cutoffs are shown. Zinc is also an acute-phase reactant protein and is influenced by inflammation and infections.	**Children 6-59 months:** Morning, non-fasting: <65 µg/dL Afternoon, non-fasting: <57 µg/dL NOTE: Morning is defined as specimen collected before 12:00 hours and afternoon as after 12:00 hours. To convert to µmol/L divide by 6.54. [o] Zinc deficiency is of public health concern when the prevalence of low serum zinc concentration > 20%.	250 µL
Inflammation	**C-reactive protein (CRP) and α–1 acid glycoprotein (AGP)** [p] Ferritin, sTfR, RBP and serum retinol are acute-phase reactant proteins and are influenced by inflammation and infections. CRP and AGP are measured to allow adjustment for inflammation and infectious processes during analysis of iron and vitamin A indicators.	**For all age groups:** AGP >1.0 g/L CRP >5.0 mg/L	30 µL [b]
Malaria	**Malaria** Malaria can cause anemia and may influence other vitamin and mineral status indicators. It should be assessed to understand biological data. Malaria is assessed using CareStart *P. falciparum* (HRP2) rapid test kit.	**For all age groups:** Test provides a dichotomous result - positive or negative for malaria antibodies (falciparum).	5 µL
H. pylori	***H. pylori*** [q] *H. pylori* is a bacterial infection, which can reduce vitamin B_{12} absorption and cause ulcers. B_{12} deficiency and prolonged bleeding from ulcers can both lead to anemia. *H. pylori* is detected using *H. pylori* antigen detection in stool specimens.	**For all age groups:** This test provides a dichotomous result – positive or negative for *H. pylori* antigens.	1 g
Soil-transmitted Helminths	**Hookworm, *Ascaris*, and *Trichuris*** [r] Soil-transmitted helminths can cause anemia and should be assessed to understand the etiology of anemia and influence of helminths on other micronutrient status indicators.	**For all age groups:** Light-Intensity: *Ascaris lumbricoides*: 1-4999 epg *Trichuris trichiura*: 1-999 epg Hookworms: 1-1999 epg	1 g

Outcome	Indicator & Rationale	Recommended Cutoff Values and Definitions of a Public Health Problem, Where Applicable	Sample Volume for Analysis
	This test involves counting eggs observed in stool.	Moderate-Intensity: *Ascaris lumbricoides*: 5000-49999 epg *Trichuris trichiura*: 1000-9999 epg Hookworms: 2000-3999 epg Heavy-Intensity: *Ascaris lumbricoides*: ≥50000 epg *Trichuris trichiura*: ≥10000 epg Hookworms: ≥4000 epg	
Blood Disorders	**Hemoglobinopathies** [s] [t] Hemoglobinopathies are hereditary disorders in which there is abnormal production or structure of the hemoglobin molecule, which can cause anemia. These include: thalassemias, sickle cell and glucose-6-phosphate dehydrogenase deficiency (G6PD).	Genetic testing provides a dichotomous result – the presence or absence of specific blood disorders and traits: β-thalassemia, sickle cell, and G6PD.	100 µL

WRA= Women of reproductive age (defined as 15-49 years)

[a] Tanumihardjo SA, Russell RM, Stephensen CB, Gannon BM, Craft NE, Haskell MJ, Lietz G, Schulze K, Raiten D (2016). Biomarkers of Nutrition for Development (BOND) – Vitamin A review. J Nutr 146(9):1816S–48S.

[b] For an ELISA assay that provides results for ferritin, sTfR, RBP, CRP, and AGP.

[c] Larson LM, Namaste SM, Williams AM, Engle-Stone R, Addo OY, Suchdev PS, Wirth JP, Temple V, Serdula M, Nortrop-Clewes CA (2017). Adjusting retinol-binding protein concentrations for inflammation: Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia (BRINDA) project. Am J Clin Nutr 106(Suppl):390S-401S.

[d] WHO (2011). Serum retinol concentrations for determining the prevalence of vitamin A deficiency in populations. Vitamin and Mineral Nutrition Information System. Geneva.

[e] WHO (1996). Indicators for assessing vitamin A deficiency and their application in monitoring and evaluating intervention programmes. Geneva.
MRDR also provides value for serum retinol.

[f] WHO (2011). Hemoglobin concentrations for the diagnosis of anemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Geneva

[g] WHO (2020). WHO guideline on use of ferritin concentrations to assess iron status in individuals and populations. Geneva.

[h] Namaste SM, Rohner F, Huang J, Bhushan NL, Flores-Ayala R, Kupka R, Mei Z, Rawat R, Williams AM, Raiten DJ, Northrop-Clewes CA, Suchdev PS (2017a). Adjusting ferritin concentrations for inflammation: Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia (BRINDA) project. Am J Clin Nutr 106(Suppl):359S-71S.

[i] UNICEF, United Nations University, WHO (2001). Iron deficiency anemia, assessment, prevention, and control: a guide for programme managers. Geneva: World Health Organization.

[j] Rohner F, Namaste SM, Larson LM, Addo OY, Mei Z, Suchdev PS, Williams AA, Sakr Ashour FA, Rawat R, Raiten DJ, Northrop-Clewes CA (2017). Adjusting soluble transferrin receptor concentrations for inflammation: Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia (BRINDA) project. Am J Clin Nutr 106(Suppl):372S-82S.

[k] WHO (2015). Serum and red blood cell folate concentrations for assessing folate status in populations. Geneva.

[l] Pfeiffer CM, Sternberg MR, Hamner HC, Crider KS, Lacher DA, Rogers LM, Bailey RL, Yetley EA (2016). Applying inappropriate cutoffs leads to misinterpretation of folate status in the US population. Am J Clin Nutr 104:1607-15.

[m] de Benoist B (2008). Conclusions of a WHO Technical Consultation on folate and vitamin B12 deficiencies. Food Nutr Bull 9(2 Suppl):S238-44.

[n] de Benoist B, Darnton-Hill I, Davidsson L, Fonataine O, Hotz C (2007). Conclusions of the Joint WHO/UNICEF/IAEA/IZiNC interagency meeting on zinc status indicators. Food Nutr Bull 8(3):S480-S485

[o] IZiNCG (2012). Assessing population zinc status with serum zinc concentration. Technical Brief No. 2, 2nd ed..

[p] Namaste SM, Aaron GJ, Varadhan R, Peerson JM, Suchdev PS (2017b). Methodologic approach for the Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia (BRINDA) project. Am J Clin Nutr 106(Suppl 1):333S-347S.

[q] Rafeey M and Nikvash S (2007). Detection of *Helicobacter pylori* antigen in stool samples for diagnosis of infection in children. EMHJ13(5):1067-1072.

[r] WHO (2002). Prevention and control of schistosomiasis and soil-transmitted helminthiasis: report of a WHO expert committee. Geneva. Classes of intensity are based on epg (eggs per gram) of stool according to WHO guidelines.

Outcome	Indicator & Rationale	Recommended Cutoff Values and Definitions of a Public Health Problem, Where Applicable	Sample Volume for Analysis
[s] Engle-Stone R, Williams TN, Nankap M, Ndjebayi A, Gimou MM, Oyono Y, Tarini A, Brown KH, Green R (2017). Prevalence of Inherited Hemoglobin Disorders and Relationships with Anemia and Micronutrient Status among Children in Yaoundé and Douala, Cameroon. Nutrients 9(7). [t] Haemoglobin does not need to be adjusted for elevation or smoking for assessment of blood disorder indicators.			

Annex 3: Quality Assurance for Specimen Collection, Transportation and Analysis

1. Quality Assurance in Specimen Collection and Transportation

Laboratory technicians involved in the survey ensured that all containers for collecting and transporting stool and blood specimens were clean and free of any contaminants and interfering substances. All survey team members also received instructions, demonstrations and hands-on practical experiences on specimen collection and transportation during their training.

The laboratory technicians involved in blood collection adhered to sterile techniques and medical ethics. Before being punctured, the subject's skin was wiped with 70% alcohol. Venous blood was drawn using butterfly needles in vacutainers free of trace- and other metals. Blood was processed by the end of each day when possible. For distant clusters, whole blood lysate was kept refrigerated and processed following the day it was collected at the latest.

It was essential that proper cold chain logistics were followed throughout the survey to avoid adverse effects on specimen results. The cold chain followed biological specimens from initial collection to analysis. Each team had one portable freezer and one portable centrifuge. The portable freezer was used to keep the specimens and gel packs frozen. To avoid external zinc contamination, samples were aliquoted under low-cost hoods built out of storage boxes to protect from dust and other sources of contamination.

The collection and/or transport container had a secure lid and was leak resistant. Leak resistant containers reduce specimen loss and healthcare worker exposure to the specimen while also protecting the specimen from contaminants. The container material used did not leach interfering substances into the specimen. Used specimen containers were immediately disposed of according to the standard operating procedure normally applied by the health facilities and laboratories.

All specimens were labelled with unique identifiers that did not contain personal information at the stage of collection before transport, storage, shipment and analysis.

Biological specimens were analyzed as described in **Annex 3.1**. All personnel responsible for collecting, processing, storing, shipping, and analyzing biological specimens followed procedures outlined in a Laboratory Manual provided by CDC. All laboratories handling biological specimens collected from participants were required to successfully participate in an external quality assurance program. All laboratories conducting survey specimen analyses carried out quality control procedures. Laboratories responsible for analyzing survey specimens were required to successfully pass an external quality assurance program prior to survey implementation. Additionally, backup specimens for additional analyses are stored at the Laboratoire National de Santé Publique (LNSP) in Ouagadougou, Burkina Faso.

Annex 3.1 Laboratory Name and Methods Analysis of Biological Specimens, Burkina Faso National Micronutrient Survey, 2020

Indicator	Method	Lab Name
Retinol binding protein	In-house ELISA	VitMin Lab, Germany
Serum retinol	HPLC	Institut de Recherche en Science de la Santé, Burkina Faso
MRDR	HPLC	Institut de Recherche en Science de la Santé, Burkina Faso
Serum ferritin	In-house ELISA	VitMin Lab, Germany
Soluble transferrin receptor	In-house ELISA	VitMin Lab, Germany
Red blood cell folate	Microbiological assay	Peking University, China
Serum folate	Microbiological assay	Peking University, China
Serum B_{12}	ECLIA	Peking University, China
Serum zinc	ICP-OES	Children's Hospital Oakland Research Institute, USA
C-reactive protein	In-house ELISA	VitMin Lab, Germany
α–1 acid glycoprotein	In-house ELISA	VitMin Lab, Germany
Blood disorders (sickle cell disease, β-thalassemia, glucose-6-phosphate dehydrogenase)	HPLC	International Foundation Against Infectious Disease, Nigeria

ECLIA= Electrochemiluminescence immunoassay; ELISA= Enzyme-linked immunosorbent assay; HPLC= High-performance liquid chromatography; MRDR= Modified relative dose response; ICP-OES= Inductively coupled plasma optical emission spectrophotometry

2. External Quality Assurance

The CDC Nutritional Biomarkers Branch runs external laboratory quality assurance programs, the Vitamin A Laboratory and External Quality Assurance (VITAL-EQA) and the CDC method performance verification program. The VITAL-EQA program participation consists of two rounds per year (in the Spring and Fall). The VitMin Lab (in Willstaett, Germany) continues to successfully participate in CDC's external quality assurance program, VITAL-EQA, since 2006. The laboratory measures ferritin, soluble transferrin receptor (sTfR), retinol binding protein (RBP), C-reactive protein (CRP) and alpha-1-acid glycoprotein (AGP) concentrations in serum using an in-house enzyme-linked immunosorbent assay (ELISA) technique.

The Institut de Recherche en Sciences de la Santé (IRSS, in Ouagadougou, Burkina Faso) has successfully participated in CDC's external quality assurance program, VITAL-EQA, since 2019. The laboratory measures vitamin A concentrations (serum retinol) using a HPLC-UV/visible detection assay. In addition, IRSS participated in CDC's 2021 method performance verification program for serum retinol. The lab analyzed 40 samples and 8 Quality Control samples in duplicate to assess multi-day imprecision by HPLC. At the end of participation, IRSS received a comprehensive annual performance report showing the measurement imprecision and the percent difference compared to the CDC CLIA-approved reference method.

The Institute of Reproductive and Child Health, Health Science Center, Peking University (PU, China) measures serum and RBC folate using the reference microbiologic assay. PU also measures serum B_{12} using the electrochemiluminescence immunoassay (ECLIA) using a clinical analyzer instrument. It is an accredited laboratory participating in CDC's VITAL-EQA

program since 2013 and used in other international micronutrient surveys. In addition, PU successfully participated in CDC's 2021 method performance verification program for whole blood and serum folate. The lab analyzed 40 samples and 8 Quality Control samples in duplicate to assess multi-day imprecision by the microbiologic assay. At the end of participation, PU received a comprehensive annual performance report showing the measurement imprecision and the percent difference compared to CDC CLIA-approved microbiological method.

The Children's Hospital Oakland Research Institute (CHORI, USA) reported that performance of the ICP-OES for elemental analysis was nominal, with no significant variance of note. The zinc content of the Seronorm Quality Assurance/Quality Control standards (independent triplicates of each level standard, total 6) hit within the target range for each of the 21 run days. Other Quality Assurance/Quality Control checks such as intermittent blank samples to monitor instrument performance were also satisfactory on all run days.

3. Internal Quality Control

All laboratories that were involved in the analysis of the biological specimens routinely test quality control (QC) pools along with the survey samples analysis. The most reliable internationally acknowledged quality control sera are control material developed by CDC (for the In-house ELISA), and bench quality control materials developed by the respective laboratories. Specimen results were documented in a tabulated format using EXCEL files.

Annex 4: Additional Tables of Child Feeding Practices

Annex 4.1 Continued Breastfeeding Among Children 12-23 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Continued Breastfeeding at 12-23 Months [a]		
		%	[95% CI]	p-value
Location°				
Ouagadougou & Bobo Dioulasso	80	55.0	[43.9 , 65.6]	
Other cities	71	78.9	[67.7 , 86.9]	0.002
Rural	93	75.3	[65.3 , 83.1]	
Residence				
Urban [Ouagadougou. Bobo Dioulasso & Other cities]	151	68.0	[60.3 , 74.9]	0.143
Rural°	93	75.3	[65.3 , 83.1]	
Age, months				
12-15	80	86.4	[77.7 , 92.1]	
16-19	87	74.0	[63.5 , 82.3]	<0.001
20-23	77	50.8	[39.7 , 61.9]	
Sex				
Male	111	69.6	[60.1 , 77.6]	0.737
Female	133	71.6	[63.5 , 78.5]	
Wealth Quintile				
Lowest	57	73.9	[60.8 , 83.8]	
Second	54	75.2	[61.4 , 85.2]	
Middle	59	78.3	[66.5 , 86.8]	0.061
Fourth	38	(63.7)	[47.2 , 77.5]	
Highest	36	(51.7)	[35.6 , 67.6]	
Total[b]	**244**	**70.7**	**[64.7 , 76.0]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Indicator is based on the 2021 World Health Organization and the United Nations Children's Fund indicators for assessing infant and young child feeding practices (WHO and UNICEF. 2021).
[b] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 4.2 Consumption of Egg and/or Flesh Foods and Zero Vegetable or Fruit Consumption the Day Preceding the Survey Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Egg and/or Flesh Foods [a, b]			Zero Vegetable or Fruit [a]		
		%	[95% CI]	p-value	%	[95% CI]	p-value
Location°							
Ouagadougou & Bobo Dioulasso	422	30.1	[25.4 , 35.2]		23.7	[19.8 , 28.1]	
Other cities	337	22.0	[17.5 , 27.2]	<0.001	24.3	[19.9 , 29.4]	0.955
Rural	488	15.6	[12.2 , 19.7]		23.4	[19.3 , 28.0]	
Residence							
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	25.9	[22.6 , 29.5]	<0.001	24.0	[21.0 , 27.3]	0.821
Rural°	488	15.6	[12.2 , 19.7]		23.4	[19.3 , 28.0]	
Age, months							
6-8	60	2.0	[0.3 , 12.9]		76.8	[64.3 , 85.9]	
9-11	70	16.0	[9.2 , 26.6]		48.8	[37.3 , 60.3]	
12-17	128	10.0	[6.0 , 16.2]		32.1	[24.4 , 40.9]	
18-23	118	19.5	[13.2 , 27.8]	<0.001	21.7	[15.1 , 30.1]	<0.001
24-35	297	27.8	[22.9 , 33.4]		20.5	[16.2 , 25.7]	
36-47	277	26.4	[21.5 , 32.0]		17.5	[13.4 , 22.7]	
48-59	297	23.5	[18.8 , 29.0]		13.6	[10.0 , 18.1]	
6-23	376	12.9	[9.8 , 16.7]	<0.001	39.0	[34.0 , 44.2]	<0.001
24-59	871	25.9	[22.8 , 29.3]		17.2	[14.6 , 20.2]	
Sex							
Male	631	23.0	[19.8 , 26.6]	0.359	22.4	[19.3 , 26.0]	0.261
Female	616	20.9	[17.6 , 24.6]		25.1	[21.7 , 28.9]	
Breastfeeding Status [c]							
Breastfed	287	11.3	[8.2 , 15.5]	0.227	41.1	[35.3 , 47.1]	0.119
Non-breastfed	87	16.3	[9.9 , 25.6]		31.5	[22.5 , 42.2]	
Wealth Quintile							
Lowest	288	10.2	[7.0 , 14.6]		29.6	[24.0 , 35.9]	
Second	261	18.3	[13.2 , 24.9]		23.9	[18.7 , 30.0]	
Middle	268	20.2	[14.8 , 26.9]	<0.001	18.7	[14.2 , 24.4]	0.061
Fourth	210	29.4	[23.2 , 36.6]		21.0	[16.1 , 27.1]	
Highest	220	37.6	[31.2 , 44.4]		25.1	[19.7 , 31.5]	
Total[d]	**1,247**	**22.0**	**[19.5 , 24.7]**		**23.8**	**[21.3 , 26.4]**	

Note: N unweighted. Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
[a] Indicator is based on the 2021 World Health Organization and the United Nations Children's Fund indicators for assessing infant and young child feeding practices (WHO and UNICEF, 2021). The indicator was developed and validated only for children <24 months. Data are presented for children 6-59 months and are stratified by age, including the age group 6-23 months.
[b] Child consumed flesh foods (meat, fish, poultry, and organ meats) and/or eggs.
[c] Breastfeeding stratification is limited to children 6-23 months.
[d] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 5: Additional Tables of Anthropometry

Annex 5.1 Mean Mid-Upper Arm Circumference (MUAC) and Prevalence of Acute Malnutrition Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	MUAC [a] (mm)			MUAC < 115 mm [b] (Severe Acute Malnutrition)			115 mm ≤ MUAC < 125 mm [b] (Moderate Acute Malnutrition)			MUAC ≥ 125 mm [b] (Normal)		
		Mean	SE	[95% CI]	%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°													
Ouagadougou & Bobo Dioulasso	414	155	0.69	[154 , 156]	0.7	[0.2 , 2.2]		1.0	[0.3 , 3.2]		98.3	[96.1 , 99.3]	
Other cities	336	154	0.64	[153 , 155]	0.3	[0.0 , 2.1]	0.164	0.6	[0.2 , 2.3]	0.401	99.1	[97.3 , 99.7]	0.620
Rural	484	153	0.54	[152 , 154]	0.0	-		1.7	[0.8 , 3.3]		98.3	[96.7 , 99.2]	
Residence													
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	750	155	0.47	[154 , 155]	0.5	[0.2 , 1.3]	0.109	0.8	[0.3 , 1.9]	0.206	98.7	[97.5 , 99.3]	0.661
Rural°	484	153	0.54	[152 , 154]	0.0	-		1.7	[0.8 , 3.3]		98.3	[96.7 , 99.2]	
Age, months													
6-8	59	147	1.62	[144 , 150]	2.0	[0.3 , 13.1]		1.5	[0.2 , 10.0]		96.5	[86.7 , 99.1]	
9-11	69	147	1.33	[144 , 149]	0.0	-		1.7	[0.2 , 11.4]		98.3	[88.6 , 99.8]	
12-17	124	147	1.04	[145 , 149]	0.7	[0.1 , 4.9]		3.1	[1.2 , 8.0]		96.2	[91.1 , 98.4]	
18-23	117	148	0.96	[147 , 150]	0.0	-	0.245	1.6	[0.4 , 6.1]	0.341	98.4	[93.9 , 99.6]	0.170
24-35	295	154	0.64	[153 , 155]	0.3	[0.0 , 2.1]		0.7	[0.2 , 2.8]		99.0	[96.9 , 99.7]	
36-47	276	156	0.69	[155 , 158]	0.3	[0.0 , 2.3]		0.7	[0.2 , 2.7]		99.0	[97.0 , 99.7]	
48-59	294	159	0.70	[158 , 160]	0.0	-		0.7	[0.2 , 2.6]		99.3	[97.4 , 99.8]	
6-23	369	147	0.60	[146 , 149]	0.6	[0.1 , 2.3]	0.294	2.1	[1.0 , 4.5]	0.034	97.3	[94.9 , 98.6]	0.018
24-59	865	156	0.40	[156 , 157]	0.2	[0.1 , 0.8]		0.7	[0.3 , 1.5]		99.1	[98.2 , 99.6]	
Sex													
Male	622	155	0.52	[154 , 156]	0.1	[0.0 , 1.0]	0.260	1.4	[0.7 , 2.7]	0.277	98.5	[97.1 , 99.2]	0.679
Female	612	153	0.46	[152 , 154]	0.5	[0.2 , 1.5]		0.8	[0.3 , 1.9]		98.7	[97.4 , 99.4]	
Wealth Quintile													
Lowest	284	152	0.68	[150 , 153]	0.0	-		1.4	[0.5 , 3.6]		98.6	[96.4 , 99.5]	
Second	259	154	0.79	[153 , 156]	0.0	-		1.1	[0.4 , 3.4]		98.9	[96.6 , 99.6]	
Middle	268	155	0.76	[153 , 156]	0.0	-	0.074	1.1	[0.3 , 3.4]	0.522	98.9	[96.6 , 99.7]	0.845
Fourth	208	154	0.83	[152 , 155]	0.4	[0.1 , 3.0]		1.8	[0.6 , 5.7]		97.7	[94.0 , 99.2]	
Highest	215	155	0.96	[153 , 157]	1.5	[0.5 , 4.5]		0.0	-		98.5	[95.5 , 99.5]	
Total[c]	**1,234**	**154**	**0.36**	**[153 , 154]**	**0.3**	**[0.1 , 0.8]**		**1.1**	**[0.6 , 1.9]**		**98.6**	**[97.7 , 99.1]**	

MUAC= Mid-upper arm circumference
Note: N unweighted. Sample size might vary slightly due to missing data. Missing values included 2 biological implausible values for MUAC-for-age (<-5 or >5 z-scores) and 11 children without measurements. Six children with bilateral edema were included in the analyses.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
[a] Assessed using the QM2000 circumference measuring tape and following WHO procedures (de Onis *et al.*, 2004).
[b] WHO/UNICEF, 2009.
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 5.2 Mean Mid-Upper Arm Circumference-for-Age Z-score (MUACZ) Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	MUACZ			Prevalence					
					<-2 z-score			<-3 z-score		
		Mean z-score	SE z-score	[95% CI] z-score	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	414	-0.02	0.05	[-0.12 , 0.08]	2.7	[1.4 , 5.0]		1.2	[0.5 , 2.9]	
Other cities	336	-0.07	0.05	[-0.17 , 0.03]	2.7	[1.4 , 5.0]	0.974	0.3	[0.0 , 2.1]	0.325
Rural	484	-0.19	0.04	[-0.27 , -0.11]	2.9	[1.7 , 5.0]		0.6	[0.2 , 1.9]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	750	-0.05	0.04	[-0.12 , 0.02]	2.7	[1.7 , 4.2]	0.823	0.7	[0.3 , 1.6]	0.717
Rural°	484	-0.19	0.04	[-0.27 , -0.11]	2.9	[1.7 , 5.0]		0.6	[0.2 , 1.9]	
Age, months										
6-8	59	0.48	0.15	[0.19 , 0.77]	3.5	[0.9 , 13.3]		2.0	[0.3 , 13.1]	
9-11	69	0.23	0.11	[0.01 , 0.45]	1.7	[0.2 , 11.4]		0.0	-	
12-17	124	0.11	0.09	[-0.06 , 0.29]	3.8	[1.6 , 8.9]		0.7	[0.1 , 4.9]	
18-23	117	0.00	0.08	[-0.16 , 0.15]	2.4	[0.8 , 7.2]	0.863	0.0	-	0.770
24-35	295	-0.02	0.05	[-0.12 , 0.08]	1.7	[0.7 , 4.1]		0.6	[0.1 , 2.4]	
36-47	276	-0.25	0.06	[-0.35 , -0.14]	3.1	[1.6 , 5.9]		1.0	[0.3 , 3.0]	
48-59	294	-0.37	0.05	[-0.47 , -0.27]	3.2	[1.7 , 6.2]		0.7	[0.2 , 2.6]	
6-23	369	0.16	0.05	[0.05 , 0.26]	2.9	[1.6 , 5.4]	0.805	0.6	[0.1 , 2.3]	0.729
24-59	865	-0.21	0.03	[-0.27 , -0.15]	2.7	[1.8 , 4.0]		0.7	[0.4 , 1.6]	
Sex										
Male	622	-0.10	0.04	[-0.18 , -0.02]	3.2	[2.0 , 5.0]	0.329	0.7	[0.3 , 1.8]	0.794
Female	612	-0.10	0.04	[-0.17 , -0.03]	2.3	[1.4 , 3.9]		0.6	[0.2 , 1.7]	
Wealth Quintile										
Lowest	284	-0.24	0.06	[-0.35 , -0.13]	3.4	[1.8 , 6.6]		0.7	[0.2 , 2.7]	
Second	259	-0.09	0.06	[-0.20 , 0.03]	2.4	[1.0 , 5.2]		0.4	[0.1 , 2.6]	
Middle	268	-0.08	0.06	[-0.20 , 0.04]	1.9	[0.8 , 4.6]	0.852	0.3	[0.0 , 2.2]	0.570
Fourth	208	-0.11	0.06	[-0.24 , 0.01]	3.1	[1.4 , 6.9]		0.8	[0.2 , 3.3]	
Highest	215	0.05	0.07	[-0.09 , 0.19]	3.1	[1.4 , 6.6]		1.5	[0.5 , 4.5]	
Total[a]	**1,234**	**-0.10**	**0.03**	**[-0.16 , -0.05]**	**2.8**	**[1.9 , 3.9]**		**0.7**	**[0.4 , 1.3]**	

MUAC= Mid-upper arm circumference

Note: N unweighted. Sample size might vary slightly due to missing data. Missing values included 2 biological implausible values for MUAC-for-age (<-5 or >5 z-scores) and 11 children without measurements. Six children with bilateral edema were included in the analyses.

All estimates account for complex sample design.

°All estimates account for weighting, except for stratification by location and rural residence.

P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.

Note: z-scores are calculated using 2006 WHO growth standards.

[a] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 5.3 Prevalence of Global, Moderate and Severe Acute Malnutrition Using Weight-for-Length/Height Z-score (WLZ/WHZ) Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Prevalence of Acute Malnutrition Using WLZ/WHZ								
		<-2 z-score and/or Edema (Global)			-3 ≤ z-score < -2 (Moderate)			z-score <-3 and/or Edema (Severe)		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	402	7.5	[5.2 , 10.7]		6.2	[4.2 , 9.1]		1.2	[0.5 , 2.9]	
Other cities	330	9.1	[6.5 , 12.6]	0.109	7.0	[4.7 , 10.2]	0.281	2.1	[1.0 , 4.4]	0.304
Rural	478	11.7	[9.0 , 15.2]		9.0	[6.6 , 12.1]		2.7	[1.6 , 4.6]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	732	8.3	[6.5 , 10.6]	0.052	6.6	[5.0 , 8.7]	0.129	1.7	[1.0 , 3.0]	0.194
Rural°	478	11.7	[9.0 , 15.2]		9.0	[6.6 , 12.1]		2.7	[1.6 , 4.6]	
Age, months										
6-8	58	9.1	[3.8 , 20.1]		7.4	[2.8 , 18.2]		1.7	[0.2 , 11.0]	
9-11	69	14.4	[7.5 , 25.8]		7.1	[2.6 , 18.0]		7.3	[3.0 , 16.4]	
12-17	123	16.4	[10.8 , 24.1]		13.1	[8.2 , 20.3]		3.3	[1.2 , 8.6]	
18-23	116	16.1	[10.5 , 24.0]	0.005	15.3	[9.8 , 23.1]	0.005	0.8	[0.1 , 5.7]	0.072
24-35	290	8.2	[5.5 , 11.9]		6.1	[3.9 , 9.5]		2.1	[0.9 , 4.6]	
36-47	272	7.2	[4.5 , 11.1]		5.6	[3.3 , 9.2]		1.6	[0.6 , 4.1]	
48-59	282	6.7	[4.3 , 10.5]		5.3	[3.2 , 8.8]		1.4	[0.5 , 3.8]	
6-23	366	14.8	[11.5 , 18.9]	<0.001	11.8	[8.8 , 15.6]	<0.001	3.0	[1.7 , 5.4]	0.149
24-59	844	7.4	[5.8 , 9.4]		5.7	[4.3 , 7.5]		1.7	[1.0 , 2.9]	
Sex										
Male	611	10.3	[8.1 , 13.0]	0.447	8.5	[6.5 , 11.0]	0.219	1.8	[1.0 , 3.2]	0.472
Female	599	9.0	[6.9 , 11.6]		6.6	[4.8 , 8.9]		2.4	[1.4 , 4.0]	
Wealth Quintile										
Lowest	283	11.8	[8.2 , 16.7]		8.7	[5.7 , 13.0]		3.1	[1.6 , 5.8]	
Second	255	11.8	[8.4 , 16.2]		10.3	[7.2 , 14.6]		1.5	[0.6 , 3.8]	
Middle	260	10.4	[7.2 , 14.8]	0.091	8.0	[5.2 , 12.0]	0.088	2.4	[1.1 , 5.3]	0.550
Fourth	203	6.2	[3.5 , 10.7]		4.2	[2.2 , 7.8]		2.0	[0.8 , 5.3]	
Highest	209	6.1	[3.4 , 10.7]		5.1	[2.7 , 9.4]		1.0	[0.3 , 4.2]	
Total[a]	**1,210**	**9.6**	**[8.0 , 11.5]**		**7.5**	**[6.1 , 9.2]**		**2.1**	**[1.4 , 3.1]**	

Note: N unweighted. Sample size might vary slightly due to missing data. Missing values included 21 biologically implausible values (<-5 or >5 z-scores) and 16 children without measurements. Six children with bilateral edema were classified as having severe acute malnutrition (<-3 z-scores).
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Note: z-scores are calculated using 2006 WHO growth standards. Indicators presented using SMART methodology.
[a] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 5.4 Prevalence of Global, Moderate and Severe Acute Malnutrition Using Mid-Upper Arm Circumference (MUAC) Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Prevalence of Acute Malnutrition Using MUAC								
		<125 mm and/or Edema (Global)			115 mm ≤ MUAC <125 mm (Moderate)			<115 mm and/or Edema (Severe)		
		%	[95% CI]	p-value	%	[95% CI]	p-value	%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	414	1.7	[0.7 , 3.9]		1.0	[0.3 , 3.2]		0.7	[0.2 , 2.2]	
Other cities	336	0.9	[0.3 , 2.7]	0.620	0.6	[0.2 , 2.3]	0.401	0.3	[0.0 , 2.1]	0.164
Rural	484	1.7	[0.8 , 3.3]		1.7	[0.8 , 3.3]		0.0	-	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	750	1.3	[0.7 , 2.5]	0.661	0.8	[0.3 , 1.9]	0.206	0.5	[0.2 , 1.3]	0.109
Rural°	484	1.7	[0.8 , 3.3]		1.7	[0.8 , 3.3]		0.0	-	
Age, months										
6-8	59	3.5	[0.9 , 13.3]		1.5	[0.2 , 10.0]		2.0	[0.3 , 13.1]	
9-11	69	1.7	[0.2 , 11.4]		1.7	[0.2 , 11.4]		0.0	-	
12-17	124	3.8	[1.6 , 8.9]		3.1	[1.2 , 8.0]		0.7	[0.1 , 4.9]	
18-23	117	1.6	[0.4 , 6.1]	0.170	1.6	[0.4 , 6.1]	0.341	0.0	-	0.245
24-35	295	1.0	[0.3 , 3.1]		0.7	[0.2 , 2.8]		0.3	[0.0 , 2.1]	
36-47	276	1.0	[0.3 , 3.0]		0.7	[0.2 , 2.7]		0.3	[0.0 , 2.3]	
48-59	294	0.7	[0.2 , 2.6]		0.7	[0.2 , 2.6]		0.0	-	
6-23	369	2.7	[1.4 , 5.1]	0.018	2.1	[1.0 , 4.5]	0.034	0.6	[0.1 , 2.3]	0.294
24-59	865	0.9	[0.4 , 1.8]		0.7	[0.3 , 1.5]		0.2	[0.1 , 0.8]	
Sex										
Male	622	1.5	[0.8 , 2.9]	0.679	1.4	[0.7 , 2.7]	0.277	0.1	[0.0 , 1.0]	0.260
Female	612	1.3	[0.6 , 2.6]		0.8	[0.3 , 1.9]		0.5	[0.2 , 1.5]	
Wealth Quintile										
Lowest	284	1.4	[0.5 , 3.6]		1.4	[0.5 , 3.6]		0.0	-	
Second	259	1.1	[0.4 , 3.4]		1.1	[0.4 , 3.4]		0.0	-	
Middle	268	1.1	[0.3 , 3.4]	0.845	1.1	[0.3 , 3.4]	0.522	0.0	-	0.074
Fourth	208	2.3	[0.8 , 6.0]		1.8	[0.6 , 5.7]		0.4	[0.1 , 3.0]	
Highest	215	1.5	[0.5 , 4.5]		0.0	-		1.5	[0.5 , 4.5]	
Total[a]	**1,234**	**1.4**	**[0.9 , 2.3]**		**1.1**	**[0.6 , 1.9]**		**0.3**	**[0.1 , 0.8]**	

MUAC= Mid-upper arm circumference
Note: N unweighted. Sample size might vary slightly due to missing data. Missing values included 2 biologically implausible values for MUAC-for-age (<-5 or >5 z-scores) and 11 children without measurements. Six children with bilateral edema were classified as having severe acute malnutrition (<-3 z-scores).
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location and rural residence.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location and residence which account for complex survey design only.
Note: Indicators presented using SMART methodology.
[a] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 6: Anthropometry Data Quality

Annex 6.1 Percent of Missing Values of Length/Height, Weight, Mid-Upper Arm Circumference (MUAC), and age Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Missing Values[a]			
		Length/ Height %	Weight %	MUAC %	DOB[b] %
Location					
Ouagadougou & Bobo Dioulasso	422	1.9	1.9	1.9	23.5
Other cities	337	0.6	0.3	0.3	17.2
Rural	488	0.2	0.2	0.8	22.3
Residence					
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	1.3	1.2	1.2	20.7
Rural	488	0.2	0.2	0.8	22.3
Age, months					
6-8	60	1.7	1.7	1.7	8.3
9-11	70	1.4	1.4	1.4	10.0
12-17	128	2.3	2.3	3.1	14.1
18-23	118	0.8	0.0	0.8	6.8
24-35	297	0.7	0.7	0.7	16.2
36-47	277	0.4	0.4	0.4	27.1
48-59	297	0.7	0.7	1.0	35.4
6-23	376	1.6	1.3	1.9	10.1
24-59	871	0.6	0.6	0.7	26.2
Sex					
Male	631	1.1	1.1	1.4	22.0
Female	616	0.6	0.5	0.6	20.6
Wealth Quintile					
Lowest	288	0.7	0.7	1.4	21.5
Second	261	0.8	0.4	0.8	28.0
Middle	268	0.0	0.0	0.0	19.4
Fourth	210	1.0	1.0	1.0	23.8
Highest	220	2.3	2.3	2.3	13.2
Team					
Team 1	102	1.0	1.0	1.0	10.8
Team 2	76	0.0	0.0	0.0	9.2
Team 3	67	1.5	1.5	1.5	13.4
Team 4	84	0.0	0.0	0.0	17.9
Team 5	77	7.8	7.8	7.8	54.5
Team 6	73	0.0	0.0	0.0	23.3
Team 7	118	0.8	0.0	0.0	9.3
Team 8	68	1.5	1.5	1.5	23.5
Team 9	59	0.0	0.0	0.0	13.6
Team 10	115	0.9	0.9	0.9	14.8
Team 11	81	0.0	0.0	3.7	48.1
Team 12	90	0.0	0.0	0.0	42.2
Team 13	92	0.0	0.0	0.0	20.7
Team 14	85	0.0	0.0	0.0	11.8
Team 15	60	0.0	0.0	0.0	11.7
Total	**1,247**	**0.9**	**0.8**	**1.0**	**21.3**

DOB= Date of birth; MUAC= Mid-upper arm circumference
Note: Unweighted estimates.
[a]Percentage of missing values among all children with completed interviews.
[b]Percentage of children with an estimated age in completed months (no DOB recorded).

Annex 6.2 Percent of Biologically Implausible Values (BIV) of Length/Height-for-Age z-score (LAZ/HAZ), Weight-for-Length/Height z-score (WLZ/WHZ), Weight-for-Age z-score (WAZ), and Mid-Upper Arm Circumference-for-Age z-score (MUACZ) Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	Biologically Implausible Values (BIV)[a]							
	N	LAZ/ HAZ %	N	WLZ/ WHZ %	N	WAZ %	N	MUACZ %
Location								
Ouagadougou & Bobo Dioulasso	318	1.6	318	1.3	318	0.6	318	0.0
Other cities	277	1.1	277	1.1	278	0.0	278	0.0
Rural	378	0.3	378	1.3	378	0.5	377	0.5
Residence								
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	595	1.3	595	1.2	596	0.3	596	0.0
Rural	378	0.3	378	1.3	378	0.5	377	0.5
Age, months								
6-8	54	1.9	54	0.0	54	0.0	54	0.0
9-11	62	0.0	62	0.0	62	0.0	62	0.0
12-17	108	0.0	108	0.9	108	0.9	108	0.9
18-23	109	3.7	109	0.9	110	0.0	109	0.0
24-35	247	0.8	247	1.2	247	0.4	247	0.0
36-47	202	0.5	202	0.5	202	0.5	202	0.0
48-59	191	0.5	191	3.1	191	0.5	191	0.5
6-23	333	1.5	333	0.6	334	0.3	333	0.3
24-59	640	0.6	640	1.6	640	0.5	640	0.2
Sex								
Male	487	0.6	487	1.6	487	0.6	487	0.4
Female	486	1.2	486	0.8	487	0.2	486	0.0
Wealth Quintile								
Lowest	224	0.4	224	0.4	224	0.0	223	0.4
Second	187	0.5	187	1.6	188	1.1	188	0.5
Middle	216	0.9	216	1.9	216	0.5	216	0.0
Fourth	158	1.3	158	1.3	158	0.6	158	0.0
Highest	188	1.6	188	1.1	188	0.0	188	0.0
Team								
Team 1	90	0.0	90	1.1	90	1.1	90	0.0
Team 2	69	0.0	69	1.4	69	0.0	69	0.0
Team 3	57	1.8	57	0.0	57	0.0	57	0.0
Team 4	69	0.0	69	0.0	69	0.0	69	0.0
Team 5	32	0.0	32	9.4	32	6.3	32	0.0
Team 6	56	0.0	56	0.0	56	0.0	56	0.0
Team 7	106	0.0	106	0.0	107	0.0	107	0.0
Team 8	51	2.0	51	0.0	51	0.0	51	0.0
Team 9	51	0.0	51	0.0	51	0.0	51	0.0
Team 10	97	2.1	97	1.0	97	0.0	97	0.0
Team 11	42	4.8	42	0.0	42	0.0	41	4.9
Team 12	52	1.9	52	0.0	52	0.0	52	0.0
Team 13	73	0.0	73	1.4	73	0.0	73	0.0
Team 14	75	0.0	75	1.3	75	1.3	75	0.0
Team 15	53	3.8	53	7.5	53	0.0	53	0.0
Total	**973**	**0.9**	**973**	**1.2**	**974**	**0.4**	**973**	**0.2**

Note: Unweighted estimates.

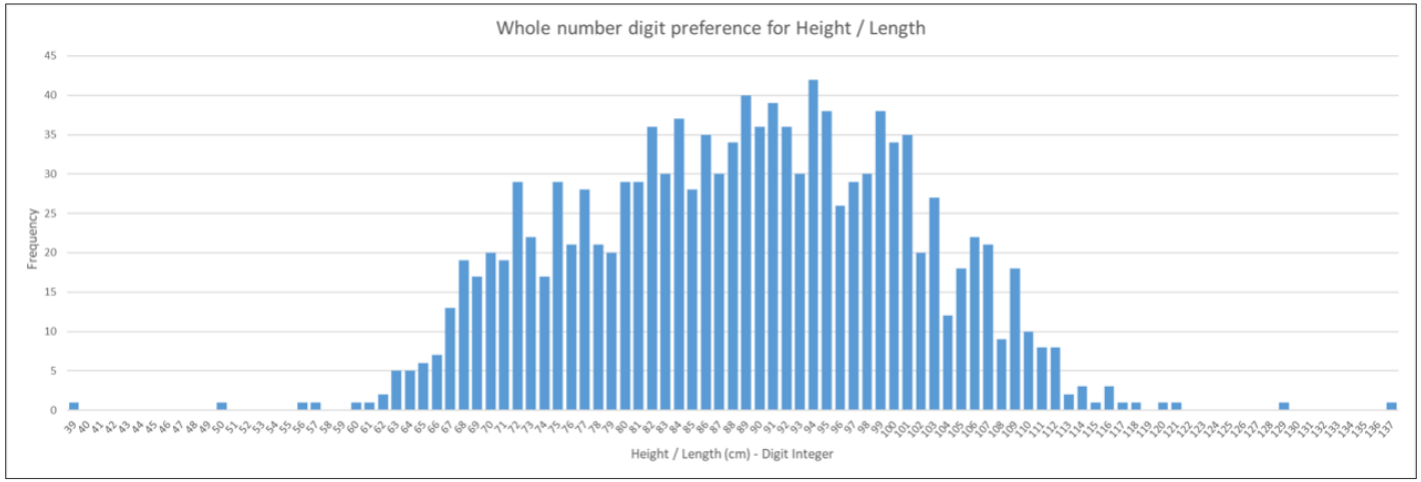
[a]Percentage of BIV (LAZ/HAZ <-6 or > +6) among children with completed interviews and total number of children with non-missing values for length/height and age (for LAZ/HAZ). Percentage of BIV (WLZ/WHZ <-6 or > +5) among children with completed interviews and total number of children with non-missing values for weight, length/height, and age (for WLZ/WHZ). Percentage of BIV (WAZ <-5 or > +5) among children with completed interviews and total number of children with non-missing values for weight and age (for WAZ). Percentage of BIV (MUACZ <-5 or > +5) among children with completed interviews and total number of children with non-missing values for mid-upper arm circumference and age (for MUACZ) (WHO, 2006).

Annex 6.3 Percent of Decimal Digit Preference in Length/Height Values Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Digit Preference for Length/Height Values									
		0, %	1, %	2, %	3, %	4, %	5, %	6, %	7, %	8, %	9, %
Location											
Ouagadougou & Bobo Dioulasso	413	10.4	12.1	16.5	10.4	8.7	9.4	10.2	7.3	8.5	6.5
Other cities	335	21.8	9.6	7.5	8.4	10.4	13.7	9.9	5.4	7.2	6.3
Rural	487	15.4	11.7	11.7	9.4	10.5	12.7	9.0	6.8	8.4	4.3
Residence											
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	748	15.5	11	12.4	9.5	9.5	11.4	10	6.4	7.9	6.4
Rural	487	15.4	11.7	11.7	9.4	10.5	12.7	9.0	6.8	8.4	4.3
Age, months											
6-8	59	18.6	10.2	11.9	6.8	11.9	10.2	10.2	0.0	11.9	8.5
9-11	69	23.2	8.7	11.6	5.8	8.7	7.2	8.7	7.2	13	5.8
12-17	125	15.2	16	7.2	13.6	12.8	12.8	7.2	4.8	6.4	4.0
18-23	117	13.7	15.4	10.3	9.4	10.3	15.4	7.7	8.5	6.8	2.6
24-35	295	13.2	10.8	13.2	8.5	9.8	12.5	11.9	7.1	6.4	6.4
36-47	275	16.0	9.1	11.3	11.6	9.8	12.4	9.5	7.3	7.6	5.5
48-59	295	15.6	10.8	14.9	8.1	8.5	10.5	9.5	6.4	9.5	6.1
6-23	370	16.8	13.5	9.7	9.7	11.1	12.2	8.1	5.7	8.6	4.6
24-59	865	14.9	10.3	13.2	9.4	9.4	11.8	10.3	6.9	7.9	6.0
Sex											
Male	623	15.1	12.0	12.2	9.8	10.0	10.9	11.1	6.7	7.1	5.1
Female	612	15.8	10.5	12.1	9.2	9.8	12.9	8.2	6.4	9.2	6.0
Team											
Team 1	101	7.9	16.8	10.9	9.9	9.9	13.9	13.9	3.0	8.9	5.0
Team 2	76	13.2	9.2	15.8	11.8	9.2	6.6	9.2	7.9	13.2	3.9
Team 3	66	4.5	10.6	13.6	7.6	13.6	10.6	10.6	12.1	13.6	3.0
Team 4	84	1.2	14.3	15.5	11.9	11.9	7.1	13.1	7.1	10.7	7.1
Team 5	71	18.3	12.7	15.5	11.3	4.2	7.0	14.1	1.4	5.6	9.9
Team 6	73	13.7	11.0	21.9	9.6	8.2	12.3	6.8	4.1	9.6	2.7
Team 7	117	6.0	11.1	12.8	15.4	18.8	11.1	11.1	6.0	4.3	3.4
Team 8	67	10.4	16.4	14.9	9.0	9.0	10.4	10.4	4.5	9.0	6.0
Team 9	59	8.5	11.9	3.4	6.8	20.3	6.8	13.6	13.6	8.5	6.8
Team 10	113	11.5	12.4	14.2	10.6	7.1	14.2	7.1	8.0	6.2	8.8
Team 11	81	18.5	8.6	16.0	6.2	9.9	11.1	8.6	12.3	6.2	2.5
Team 12	90	41.1	7.8	3.3	1.1	6.7	17.8	5.6	4.4	7.8	4.4
Team 13	92	28.3	9.8	7.6	7.6	4.3	20.7	7.6	2.2	5.4	6.5
Team 14	85	7.1	11.8	11.8	15.3	9.4	12.9	5.9	8.2	11.8	5.9
Team 15	60	50.0	1.7	3.3	3.3	5.0	10.0	8.3	6.7	3.3	8.3
Total	**1,235**	**15.5**	**11.3**	**12.1**	**9.5**	**9.9**	**11.9**	**9.6**	**6.6**	**8.1**	**5.6**

Note: Unweighted estimates. Digit preference is expected to be 10%.

Annex 6.4 Percent of Whole Number Digit Preference in Length/Height Values Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

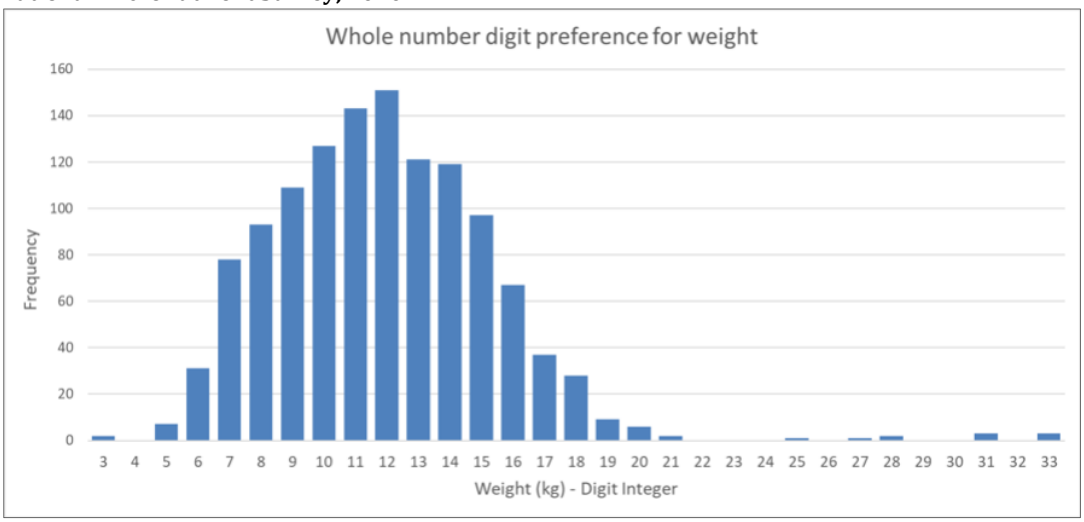


Annex 6.5 Percent of Second Decimal Digit Preference in Weight Values Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Digit Preference for Weight Values									
		0, %	1, %	2, %	3, %	4, %	5, %	6, %	7, %	8, %	9, %
Location											
Ouagadougou & Bobo Dioulasso	414	64.3	0.0	0.0	0.2	0.2	34.3	0.5	0.2	0.0	0.2
Other cities	336	77.7	0.0	0.0	0.0	0.0	21.4	0.6	0.0	0.3	0.0
Rural	487	67.8	0.2	0.4	0.0	0.0	31.4	0.0	0.2	0.0	0.0
Residence											
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	750	70.3	0.0	0.0	0.1	0.1	28.5	0.5	0.1	0.1	0.1
Rural	487	67.8	0.2	0.4	0.0	0.0	31.4	0.0	0.2	0.0	0.0
Age, months											
6-8	59	78.0	0.0	0.0	0.0	0.0	20.3	1.7	0.0	0.0	0.0
9-11	69	58.0	1.4	0.0	0.0	0.0	39.1	0.0	1.4	0.0	0.0
12-17	125	64.8	0.0	0.8	0.0	0.8	33.6	0.0	0.0	0.0	0.0
18-23	118	76.3	0.0	0.8	0.0	0.0	22.0	0.8	0.0	0.0	0.0
24-35	295	69.8	0.0	0.0	0.3	0.0	29.8	0.0	0.0	0.0	0.0
36-47	276	67.0	0.0	0.0	0.0	0.0	31.5	0.7	0.0	0.4	0.4
48-59	295	70.8	0.0	0.0	0.0	0.0	28.8	0.0	0.3	0.0	0.0
6-23	371	69.3	0.3	0.5	0.0	0.3	28.8	0.5	0.3	0.0	0.0
24-59	866	69.3	0.0	0.0	0.1	0.0	30.0	0.2	0.1	0.1	0.1
Sex											
Male	624	70.8	0.2	0.3	0.0	0.2	27.7	0.5	0.2	0.2	0.0
Female	613	67.7	0.0	0.0	0.2	0.0	31.6	0.2	0.2	0.0	0.2
Team											
Team 1	101	57.4	0.0	2.0	0.0	0.0	40.6	0.0	0.0	0.0	0.0
Team 2	76	98.7	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0
Team 3	66	56.1	0.0	0.0	0.0	0.0	43.9	0.0	0.0	0.0	0.0
Team 4	84	52.4	0.0	0.0	0.0	0.0	47.6	0.0	0.0	0.0	0.0
Team 5	71	63.4	0.0	0.0	1.4	0.0	29.6	2.8	1.4	0.0	1.4
Team 6	73	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Team 7	118	50.8	0.0	0.0	0.0	0.0	49.2	0.0	0.0	0.0	0.0
Team 8	67	62.7	0.0	0.0	0.0	0.0	37.3	0.0	0.0	0.0	0.0
Team 9	59	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Team 10	114	60.5	0.0	0.0	0.0	0.9	38.6	0.0	0.0	0.0	0.0
Team 11	81	75.3	0.0	0.0	0.0	0.0	24.7	0.0	0.0	0.0	0.0
Team 12	90	75.6	1.1	0.0	0.0	0.0	22.2	0.0	1.1	0.0	0.0
Team 13	92	50.0	0.0	0.0	0.0	0.0	48.9	1.1	0.0	0.0	0.0
Team 14	85	85.9	0.0	0.0	0.0	0.0	14.1	0.0	0.0	0.0	0.0
Team 15	60	78.3	0.0	0.0	0.0	0.0	18.3	1.7	0.0	1.7	0.0
Total	**1,237**	**69.3**	**0.1**	**0.2**	**0.1**	**0.1**	**29.7**	**0.3**	**0.2**	**0.1**	**0.1**

Note: Unweighted estimates. Digit preference at values 0 and 5 is expected to be 50%.

Annex 6.6 Percent of Whole Number Digit Preference in Weight Values Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

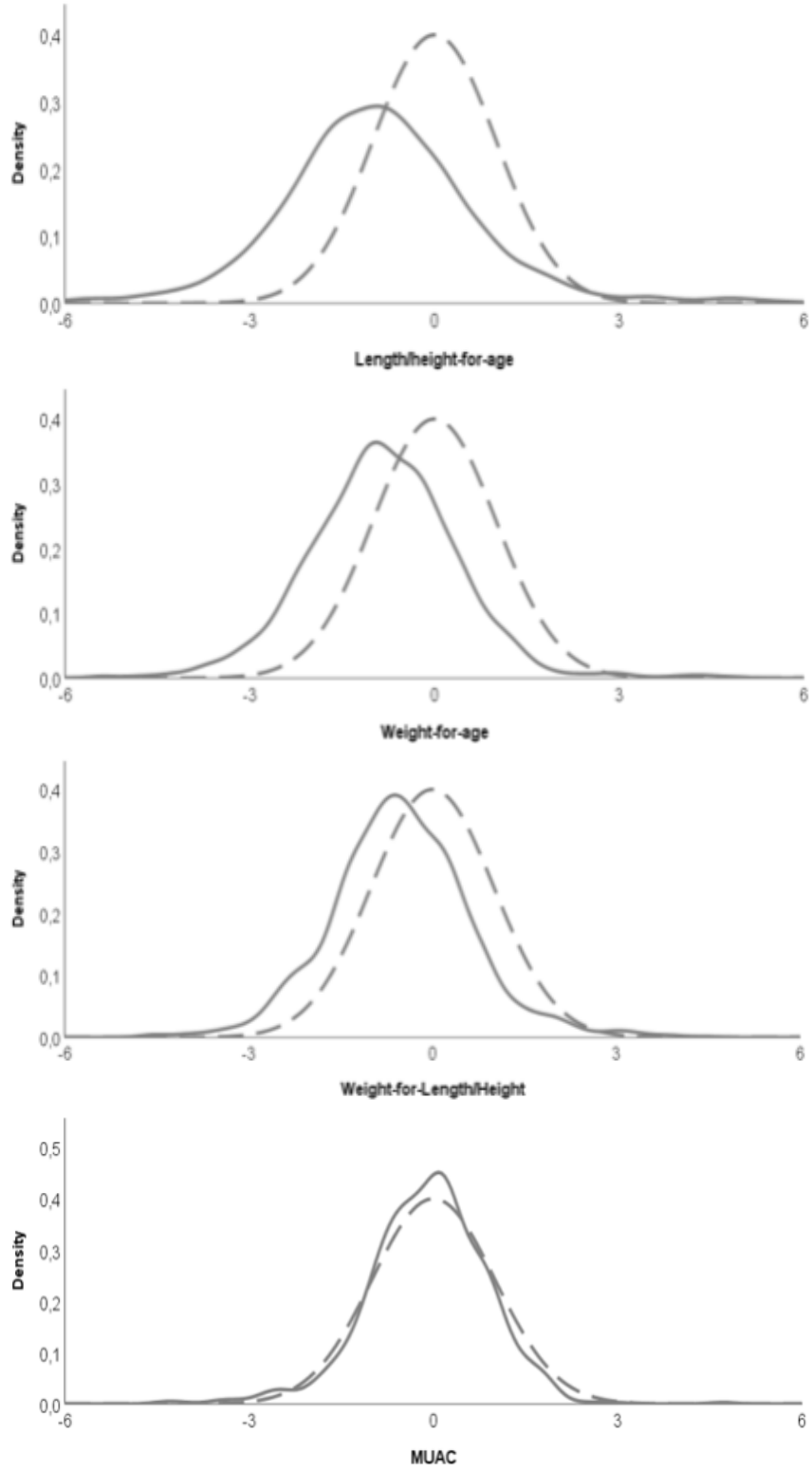


Annex 6.7 Standard Deviation (SD), Minimum (Min) and Maximum (Max) of Length/Height-for-Age z-score (LAZ/HAZ), Weight-for-Age z-score (WAZ), Weight-for-Length/Height z-score (WLZ/WHZ), and MUAC-for-Age z-score (MUACZ), Excluding Biologically Implausible Values, Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	LAZ/HAZ		N	WAZ		N	WLZ/WHZ		N	MUACZ	
		SD	Min,Max		SD	Min,Max		SD	Min,Max		SD	Min,Max
Location												
Ouagadougou & Bobo Dioulasso	405	1.58	-5.21 , 5.43	408	1.24	-4.83 , 4.51	401	1.12	-3.49 , 3.45	414	0.98	-4.71 , 2.95
Other cities	330	1.45	-5.92 , 4.49	334	1.21	-5.40 , 4.90	329	1.23	-4.64 , 4.47	336	0.92	-3.70 , 4.70
Rural	484	1.57	-5.88 , 6.00	481	1.16	-4.76 , 4.35	474	1.10	-4.53 , 3.87	484	0.86	-4.17 , 1.99
Residence												
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	735	1.54	-5.92 , 5.43	742	1.23	-5.40 , 4.90	730	1.17	-4.64 , 4.47	750	0.95	-4.71 , 4.70
Rural	484	1.57	-5.88 , 6.00	481	1.16	-4.76 , 4.35	474	1.10	-4.53 , 3.87	484	0.86	-4.17 , 1.99
Age, months												
6-8	57	1.69	-5.92 , 4.75	58	1.28	-3.64 , 2.31	58	1.36	-4.05 , 2.23	59	1.05	-3.70 , 1.81
9-11	69	1.60	-4.25 , 6.00	69	1.18	-4.38 , 1.91	69	1.07	-4.02 , 1.06	69	0.88	-2.52 , 2.21
12-17	124	1.81	-5.21 , 5.55	123	1.35	-3.90 , 4.30	123	1.37	-4.53 , 2.86	124	1.02	-4.71 , 2.00
18-23	113	1.54	-4.62 , 5.16	118	1.31	-4.33 , 4.04	116	1.28	-3.46 , 3.93	117	0.84	-2.85 , 2.38
24-35	293	1.50	-5.54 , 5.43	292	1.23	-5.39 , 4.51	289	1.19	-4.64 , 4.47	295	0.89	-4.39 , 2.95
36-47	272	1.54	-5.78 , 5.04	272	1.12	-5.40 , 1.60	269	1.00	-3.57 , 2.97	276	0.89	-4.01 , 1.72
48-59	291	1.42	-5.88 , 4.80	291	1.15	-3.80 , 4.90	280	1.00	-3.23 , 3.45	294	0.84	-4.17 , 4.70
6-23	363	1.70	-5.92 , 6.00	368	1.31	-4.38 , 4.30	366	1.31	-4.53 , 3.93	369	0.96	-4.71 , 2.38
24-59	856	1.50	-5.88 , 5.43	855	1.17	-5.40 , 4.90	838	1.07	-4.64 , 4.47	865	0.88	-4.39 , 4.70
Sex												
Male	618	1.59	-5.92 , 6.00	617	1.24	-4.38 , 4.90	608	1.19	-4.64 , 3.93	622	0.98	-4.39 , 4.70
Female	601	1.54	-5.88 , 5.16	606	1.19	-5.40 , 4.35	596	1.10	-4.47 , 4.47	612	0.86	-4.71 , 2.90
Wealth Quintile												
Lowest	284	1.45	-5.54 , 4.80	284	1.21	-4.76 , 4.35	281	1.16	-4.53 , 3.93	284	0.87	-3.36 , 1.99
Second	255	1.62	-5.68 , 5.55	257	1.20	-4.15 , 4.90	254	1.17	-3.49 , 3.87	259	0.85	-4.17 , 1.98
Middle	264	1.59	-5.92 , 6.00	266	1.23	-5.40 , 4.30	259	1.23	-4.64 , 3.54	268	0.93	-3.54 , 4.70
Fourth	206	1.41	-5.78 , 3.81	202	1.06	-4.01 , 3.05	201	1.07	-3.24 , 4.47	208	0.93	-4.01 , 2.38
Highest	210	1.65	-4.79 , 5.43	214	1.29	-4.83 , 4.51	209	1.07	-3.11 , 3.23	215	1.03	-4.71 , 2.95
Total	**1,219**	**1.56**	**-5.92 , 6.00**	**1,223**	**1.21**	**-5.40 , 4.90**	**1,204**	**1.15**	**-4.64 , 4.47**	**1,234**	**0.92**	**-4.71 , 4.70**

Note: Unweighted estimates.

Annex 6.8 Distribution of Length/Height-for-Age z-scores, Weight-for-Age z-scores, Weight-for-Length/Height z-scores, and Mid-Upper Arm Circumference-for-Age z-scores Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020



Note: Dashed lines are WHO references (WHO, 2006). Solid lines are smoothened kernel density plots. Length/height-for-age: N=1,219, skewness= 0.47, kurtosis= 1.89; Weight-for-age: N=1,223, skewness= 0.25, kurtosis= 1.79; Weight-for-length/height: N=1,204, skewness= 0.24, kurtosis= 1.31; Mid-upper arm circumference-for-age(MUAC): N=1,234, skewness= -0.42, kurtosis=2.31.

Annex 7: Design Effect for Biomarkers of Micronutrient Status

Annex 7.1 Design Effect for Biomarkers of Micronutrient Status

Biomarker	Design Effect (Without Adjustment for HH-Level Clustering)	Design Effect (With Adjustment for HH-Level Clustering)
Anemia (hemoglobin <11 g/dL)[a]	1.794	1.197
Iron Deficiency (inflammation-adjusted ferritin <12.0 µg/L)[b]	1.360	1.095
Iron Deficiency Anemia (hemoglobin <11 g/dL and inflammation-adjusted ferritin <12.0 µg/L)[a,b]	1.263	1.020
Vitamin A Deficiency (inflammation-adjusted retinol <0.70 µmol/L)[c]	1.983	1.077
Zinc Deficiency (inflammation-adjusted zinc <65 µg/dL before noon or <57 µg/dL noon to midnight)[d]	1.142	1.071
RBC Folate Deficiency (<226.5 nmol/L)[e]	1.690	1.048
Serum Folate Deficiency (<6.8 nmol/L)[f]	1.165	0.946
Vitamin B_{12} Deficiency (<203.0 pg/mL)[g]	1.093	1.108

HH= Household
Note: vitamin A deficiency based on the modified relative dose response was estimated without accounting for a complex sampling design due to non-response in 13 survey clusters (design effect approximates 1).
[a]WHO (2011a).
[b]WHO (2020).
[c]WHO (2011b).
[d]IZiNCG (2012).
[e]Pfeiffer *et al.* (2016), WHO (2015).
[f]WHO (2015).
[g]Allen (2018).

Annex 8: Additional Tables of Hemoglobin Data

Annex 8.1 Percent of Missing and Biologically Implausible Values (BIV) of Hemoglobin Concentration Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Missing[a] %	N	BIV[b] %
Location				
Ouagadougou & Bobo Dioulasso	422	44.5	234	0.0
Other cities	337	40.4	201	0.5
Rural	488	43.4	276	0.4
Residence				
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	759	42.7	435	0.2
Rural	488	43.4	276	0.4
Age, months				
6-11	130	74.6	33	3.0
12-23	246	57.3	105	1.0
24-59	871	34.2	573	0.0
Sex				
Male	631	42.2	365	0.0
Female	616	43.8	346	0.6
Wealth Quintile				
Lowest	288	46.9	153	0.0
Second	261	44.4	145	0.7
Middle	268	34.7	175	0.6
Fourth	210	41.9	122	0.0
Highest	220	47.3	116	0.0
Team				
Team 1	102	34.3	67	0.0
Team 2	76	39.5	46	2.2
Team 3	67	25.4	50	0.0
Team 4	84	36.9	53	0.0
Team 5	77	42.9	44	0.0
Team 6	73	65.8	25	0.0
Team 7	118	40.7	70	0.0
Team 8	68	11.8	60	0.0
Team 9	59	27.1	43	0.0
Team 10	115	45.2	63	0.0
Team 11	81	70.4	24	0.0
Team 12	90	58.9	37	0.0
Team 13	92	57.6	39	2.6
Team 14	85	42.4	49	0.0
Team 15	60	31.7	41	0.0
Total	**1,247**	**43.0**	**711**	**0.3**

Note: Unweighted estimates. BIV is defined as an adjusted hemoglobin concentration <4 g/dL or >18 g/dL (Sullivan *et al*., 2008). There were no adjustments for altitude for the Burkina Faso National Micronutrient Survey as altitude <1000 m in all households.
Sample size might vary slightly due to missing data in stratification variables.
[a] Percentage of missing values among all children with completed interviews.
[b] Percentage of BIV among children with completed interviews and non-missing hemoglobin concentrations.

Annex 8.2 Percent of Digit Preference in Hemoglobin Values Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Digit Preference for Hemoglobin Values									
		0, %	1, %	2, %	3, %	4, %	5, %	6, %	7, %	8, %	9, %
Location											
Ouagadougou & Bobo Dioulasso	234	11.9	9.4	11.9	9.8	12.3	8.1	8.9	6.8	10.2	10.6
Other cities	201	10.0	9.5	13.9	8.5	12.4	12.4	7.5	9.5	8.5	8.0
Rural	276	11.2	10.8	13.4	8.3	9.7	9.7	6.9	10.8	9.4	9.7
Residence											
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	435	11.0	9.4	12.8	9.2	12.4	10.1	8.3	8.0	9.4	9.4
Rural	276	11.2	10.8	13.4	8.3	9.7	9.7	6.9	10.8	9.4	9.7
Age, months											
6-11	33	6.1	6.1	15.2	18.2	0.0	9.1	6.1	15.2	12.1	12.1
12-23	105	9.5	7.6	17.1	5.7	9.5	5.7	6.7	17.1	10.5	10.5
24-59	573	11.5	10.6	12.2	8.9	12.2	10.8	8.0	7.3	9.1	9.2
Sex											
Male	365	12.1	9.6	11.2	9.3	12.1	12.3	7.7	8.2	7.7	9.9
Female	346	9.8	10.4	15.0	8.4	10.4	7.5	7.8	10.1	11.3	9.2
Team											
Team 1	67	3.0	11.9	16.4	13.4	6.0	3.0	9.0	13.4	13.4	10.4
Team 2	46	10.9	10.9	19.6	6.5	13.0	17.4	6.5	10.9	4.3	0.0
Team 3	50	8.0	8.0	18.0	12.0	8.0	10.0	8.0	4.0	12.0	12.0
Team 4	53	14.8	7.4	5.6	9.3	16.7	11.1	7.4	5.6	11.1	11.1
Team 5	44	9.1	13.6	11.4	4.5	20.5	9.1	11.4	6.8	9.1	4.5
Team 6	25	8.0	12.0	12.0	12.0	12.0	4.0	8.0	4.0	8.0	20.0
Team 7	70	17.1	11.4	5.7	14.3	12.9	7.1	7.1	8.6	7.1	8.6
Team 8	60	10.0	8.3	6.7	5.0	16.7	11.7	5.0	10.0	10.0	16.7
Team 9	43	7.0	9.3	11.6	9.3	2.3	14.0	16.3	11.6	14.0	4.7
Team 10	63	15.9	7.9	11.1	11.1	7.9	4.8	9.5	11.1	6.3	14.3
Team 11	24	4.2	4.2	16.7	4.2	8.3	4.2	4.2	25.0	12.5	16.7
Team 12	37	13.5	8.1	13.5	10.8	16.2	13.5	8.1	5.4	5.4	5.4
Team 13	39	7.7	2.6	25.6	2.6	5.1	10.3	12.8	5.1	15.4	12.8
Team 14	49	16.0	22.0	20.0	0.0	18.0	14.0	2.0	2.0	6.0	0.0
Team 15	41	14.6	7.3	9.8	12.2	4.9	17.1	0.0	17.1	7.3	9.8
Total	**711**	**11.0**	**10.0**	**13.1**	**8.9**	**11.3**	**10.0**	**7.7**	**9.1**	**9.4**	**9.6**

Note: Unweighted estimates. Digit preference is expected to be 10%. Hemoglobin concentrations include biologically implausible values (i.e., hemoglobin concentration <4 g/dL or >18 g/dL) (Sullivan *et al*., 2008).

Annex 8.3 Mean, Median, Standard Deviation (SD), Minimum (Min) and Maximum (Max) of Hemoglobin Concentrations, Including Biologically Implausible Values, Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Hemoglobin Concentration (g/dL)			
		Mean	Median	SD	Min-Max
Location					
Ouagadougou & Bobo Dioulasso	234	11.4	11.4	1.3	6.8 - 16.3
Other cities	201	11.1	11.2	1.5	2.8 - 14.6
Rural	276	11.1	11.0	1.6	7.2 - 23.0
Residence					
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	435	11.3	11.3	1.4	2.8 - 16.3
Rural	276	11.1	11.0	1.6	7.2 - 23.0
Age, months					
6-11	33	11.6	11.3	2.4	8.5 - 23.0
12-23	105	10.6	10.7	1.7	2.8 - 15.1
24-59	573	11.2	11.3	1.3	6.4 - 16.3
Sex					
Male	365	11.2	11.2	1.3	6.4 - 15.1
Female	346	11.2	11.2	1.6	2.8 - 23.0
Wealth Quintile					
Lowest	153	11.0	10.9	1.4	7.6 - 14.2
Second	145	11.1	11.1	1.7	7.2 - 23.0
Middle	175	11.1	11.2	1.6	2.8 - 16.3
Fourth	122	11.4	11.5	1.4	6.4 - 15.2
Highest	116	11.4	11.4	1.1	8.4 - 13.4
Total	**711**	**11.2**	**11.2**	**1.5**	**2.8 - 23.0**

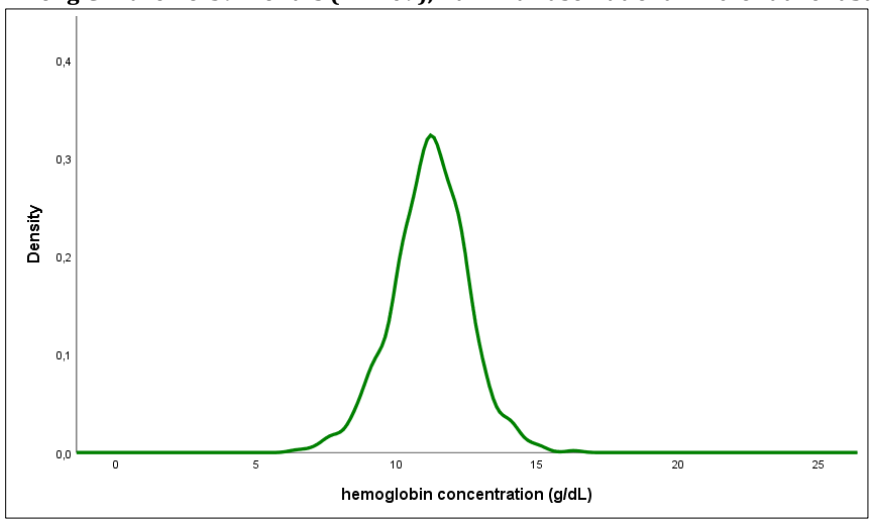
Note: Unweighted estimates. Hemoglobin concentrations include biologically implausible values (i.e., hemoglobin concentration <4 g/dL or >18 g/dL) (Sullivan *et al.,* 2008). There were no adjustments to altitude for the Burkina Faso National Micronutrient Survey as altitude <1000 m in all households.

Annex 8.4 Mean, Median, Standard Deviation (SD), Minimum (Min) and Maximum (Max) of Hemoglobin Concentrations, Excluding Biologically Implausible Values, Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Hemoglobin Concentration (g/dL)			
		Mean	Median	SD	Min-Max
Location					
Ouagadougou & Bobo Dioulasso	234	11.4	11.4	1.3	6.8 - 16.3
Other cities	200	11.1	11.2	1.3	6.4 - 14.6
Rural	275	11.0	11.0	1.4	7.2 - 15.1
Residence					
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	434	11.3	11.3	1.3	6.4 - 16.3
Rural	275	11.0	11.0	1.4	7.2 - 15.1
Age, months					
6-11	32	11.3	11.2	1.3	8.5 - 15.2
12-23	104	10.7	10.7	1.6	6.8 - 15.1
24-59	573	11.3	11.3	1.3	6.4 - 16.3
Sex					
Male	365	11.1	11.2	1.3	6.4 - 15.1
Female	344	11.2	11.2	1.4	7.3 - 16.3
Wealth Quintile					
Lowest	153	11.0	10.9	1.4	7.6 - 14.2
Second	144	11.1	11.1	1.4	7.2 - 15.1
Middle	174	11.2	11.2	1.5	6.8 - 16.3
Fourth	122	11.4	11.5	1.4	6.4 - 15.2
Highest	116	11.4	11.4	1.1	8.4 - 13.4
Total	**709**	**11.2**	**11.2**	**1.4**	**6.4 - 16.3**

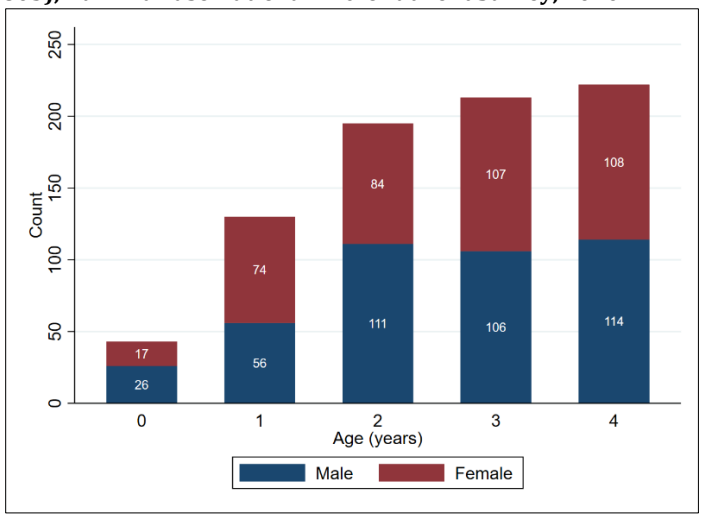
Note: Unweighted estimates. Hemoglobin concentrations exclude biologically implausible values (i.e., hemoglobin concentration <4 g/dL or >18 g/dL) (Sullivan *et al.*, 2008). There were no adjustments to altitude for the Burkina Faso National Micronutrient Survey as altitude <1000 m in all households.

Annex 8.5 Kernel Density Plot of Hemoglobin Concentrations, Excluding Biologically Implausible Values (BIV), Among Children 6-59 Months (N= 709), Burkina Faso National Micronutrient Survey, 2020



Note: Unweighted estimates. Skewness= -0.117, kurtosis= 0.619. Excluding 2 children with BIV, defined as hemoglobin concentration <4 g/dL or >18 g/dL (Sullivan *et al.*, 2008). There were no adjustments to altitude for the Burkina Faso National Micronutrient Survey as altitude <1000 m in all households.

Annex 8.6 Distribution of Collected Venous Blood Specimens by Age and Sex in Children Aged Under Five Years (N= 803), Burkina Faso National Micronutrient Survey, 2020



Annex 9: Additional Tables of Micronutrient Status

Annex 9.1 Geometric Mean Serum Ferritin Concentration, Iron Deficiency, and Iron Deficiency Anemia Among Children 6-59 Months, Not Adjusted for Inflammation, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Ferritin [a] (µg/L)		Iron Deficiency [a, b] (Ferritin <12.0 µg/L)			N	Iron Deficiency Anemia (Hemoglobin <11.0 g/dL[c] and Ferritin <12.0 µg/L[a, b])		
		Geometric Mean	SE	%	[95% CI]	p-value		%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	232	17.1	1.06	35.3	[29.1 , 41.6]		217	18.9	[13.6 , 24.2]	
Other cities	197	24.6	1.73	24.4	[18.3 , 30.4]	0.014	173	13.3	[8.4 , 18.2]	0.333
Rural	291	24.5	1.58	25.1	[20.0 , 30.2]		248	16.5	[11.8 , 21.2]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	429	20.8	1.01	29.5	[25.1 , 33.9]	0.135	390	16.0	[12.4 , 19.6]	0.968
Rural°	291	24.5	1.58	25.1	[20.0 , 30.2]		248	16.5	[11.8 , 21.2]	
Age°, months										
6-11	35	(27.4)	(4.16)	(14.3)	[2.6 , 25.9]		28	(14.3)	[1.3 , 27.3]	
12-17	43	(13.3)	(1.87)	(46.5)	[31.5 , 61.5]		37	(27.0)	[12.7 , 41.4]	
18-23	58	15.9	2.10	36.2	[23.9 , 48.6]	<0.001	50	34.0	[20.9 , 47.1]	0.001
24-35	171	17.5	1.22	37.4	[30.1 , 44.8]		144	22.9	[16.0 , 29.8]	
36-47	202	21.9	1.57	28.2	[21.8 , 34.6]		182	12.1	[7.3 , 16.9]	
48-59	211	30.4	1.96	17.1	[12.0 , 22.2]		197	9.6	[5.5 , 13.8]	
6-23	136	17.3	1.48	33.8	[25.9 , 41.7]	0.102	115	27.0	[18.9 , 35.0]	<0.001
24-59	584	23.1	0.98	26.9	[23.2 , 30.5]		523	14.1	[11.1 , 17.2]	
Sex										
Male	365	22.5	1.19	28.2	[23.6 , 32.7]	0.811	323	17.0	[13.0 , 21.1]	0.569
Female	355	21.8	1.18	27.4	[22.6 , 32.1]		315	15.4	[11.3 , 19.4]	
Wealth Quintile										
Lowest	156	24.4	2.02	24.3	[17.5 , 31.0]		133	16.3	[10.1 , 22.4]	
Second	153	22.8	2.00	30.9	[23.2 , 38.5]		131	19.6	[12.8 , 26.4]	
Middle	173	22.7	1.75	23.3	[16.9 , 29.7]	0.304	161	14.2	[8.5 , 19.8]	0.794
Fourth	124	19.6	1.82	31.3	[22.8 , 39.8]		109	15.6	[8.5 , 22.7]	
Highest	114	20.5	2.09	31.6	[22.8 , 40.5]		104	15.5	[8.9 , 22.2]	
Malaria										
Positive	64	40.5	5.03	7.8	[1.3 , 14.3]	<0.001	61	8.2	[1.4 -,15.0]	0.069
Negative	617	20.8	0.86	29.6	[25.9 , 33.3]		576	17.1	[14.0 , 20.2]	
Dewormed in Last JVA+ Campaign (children 12-59 months, Nov-Dec 2019)										
No	242	21.3	1.48	30.8	[24.8 , 36.8]	0.305	215	15.1	[10.3 , 20.0]	0.610
Yes	428	22.3	1.11	27.0	[22.7 , 31.3]		381	16.7	[13.0 , 20.5]	
Household Cooks With Sodium Bicarbonate										
No	673	22.0	0.90	28.1	[24.6 , 31.6]	0.414	595	16.4	[13.4 , 19.4]	0.651
Yes	47	(23.9)	(2.79)	(22.6)	[10.7 , 34.6]		43	(13.8)	[3.5 , 24.0]	
Household Cooks With Potash										
No	48	(21.8)	(3.04)	(26.6)	[13.8 , 39.4]	0.857	39	(14.7)	[2.2 , 27.3]	0.820
Yes	672	22.2	0.90	27.8	[24.4 , 31.3]		599	16.3	[13.3 , 19.2]	
Number of Days Household Cooks With Potash										
0 – 1	47	(18.6)	(2.87)	(31.9)	[19.5 , 44.3]		45	(22.9)	[11.3 , 34.4]	
2 – 3	137	20.8	1.67	28.7	[20.9 , 36.4]	0.015	122	18.9	[12.2 , 25.6]	0.047
4 – 5	114	16.4	1.37	38.6	[29.7 , 47.5]		97	22.1	[14.1 , 30.2]	
6 - 7	374	25.3	1.43	23.8	[19.4 , 28.3]		335	12.8	[9.2 , 16.5]	
Total[d]	**720**	**22.1**	**0.86**	**27.8**	**[24.4 , 31.1]**		**638**	**16.2**	**[13.3 , 19.0]**	

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by ELISA (Erhardt *et al.*, 2004).
[b] WHO (2022).
[c] Hemoglobin concentrations are not adjusted for altitude in the Burkina Faso National Micronutrient Survey as altitude <1000 m in all households (WHO, 2011a).
[d] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 9.2 Inflammation Adjusted Geometric Mean Serum Soluble Transferrin Receptor (sTfR) Concentration, Iron Deficiency, and Iron Deficiency Anemia Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	sTfR [a, b] (mg/L)		Iron Deficiency [a, b] (sTfR >8.3 mg/L)			N	Iron Deficiency Anemia (Hemoglobin <11.0 g/dL[c] and sTfR >8.3 µg/L[a, b])		
		Geometric Mean	SE	%	[95% CI]	p-value		%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	232	8.0	0.30	40.1	[33.5 , 46.7]		217	23.5	[17.8 , 29.2]	
Other cities	197	8.1	0.30	38.6	[31.7 , 45.5]	0.123	173	23.1	[16.8 , 29.5]	0.011
Rural	291	8.9	0.34	47.1	[41.5 , 52.7]		248	34.3	[28.4 , 40.1]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	429	8.0	0.21	39.3	[34.5 , 44.1]	0.040	390	23.3	[19.0 , 27.6]	0.002
Rural°	291	8.9	0.34	47.1	[41.5 , 52.7]		248	34.3	[28.4 , 40.1]	
Age°, months										
6-11	35	(9.3)	(0.87)	(45.7)	[29.2 , 62.2]		28	(25.0)	[8.9 , 41.1]	
12-17	43	(12.3)	(1.05)	(72.1)	[58.7 , 85.5]		37	(51.4)	[35.2 , 67.5]	
18-23	58	10.4	0.85	60.3	[47.7 , 73.0]	<0.001	50	56.0	[42.2 , 69.8]	<0.001
24-35	171	9.5	0.44	52.0	[44.5 , 59.6]		144	34.0	[26.1 , 42.0]	
36-47	202	7.8	0.27	37.6	[30.9 , 44.4]		182	23.1	[16.9 , 29.2]	
48-59	211	7.0	0.23	28.0	[21.9 , 34.0]		197	15.7	[10.6 , 20.8]	
6-23	136	10.7	0.54	60.3	[52.1 , 68.5]	<0.001	115	47.0	[37.9 , 56.0]	<0.001
24-59	584	7.9	0.19	38.4	[34.3 , 42.4]		523	23.3	[19.6 , 27.0]	
Sex										
Male	365	8.6	0.26	46.3	[41.1 , 51.5]	0.025	323	28.4	[23.4 , 33.4]	0.511
Female	355	8.1	0.24	38.2	[33.2 , 43.1]		315	26.4	[21.7 , 31.2]	
Wealth Quintile										
Lowest	156	8.3	0.38	43.0	[35.5 , 50.5]		133	32.0	[24.4 , 39.6]	
Second	153	9.3	0.49	50.1	[41.9 , 58.2]		131	37.2	[28.7 , 45.6]	
Middle	173	8.5	0.39	42.3	[34.6 , 49.9]	0.086	161	26.6	[19.5 , 33.7]	0.004
Fourth	124	8.2	0.39	40.5	[31.8 , 49.1]		109	19.4	[12.2 , 26.6]	
Highest	114	7.5	0.35	32.5	[23.6 , 41.4]		104	18.5	[11.0 , 26.0]	
Dewormed in Last JVA+ Campaign (children 12-59 months, Nov-Dec 2019)										
No	242	8.7	0.35	43.4	[36.9 , 49.8]	0.622	215	25.5	[19.5 , 31.5]	0.443
Yes	428	8.1	0.22	41.4	[36.7 , 46.1]		381	28.4	[23.9 , 33.0]	
Household Cooks With Sodium Bicarbonate										
No	673	8.4	0.19	42.6	[38.8 , 46.4]	0.630	595	27.7	[24.1 , 31.4]	0.484
Yes	47	(8.4)	(0.81)	(38.8)	[24.1 , 53.5]		43	(22.9)	[10.8 , 35.1]	
Household Cooks With Potash										
No	48	(8.7)	(0.88)	(40.5)	[26.9 , 54.0]	0.785	39	(23.5)	[9.2 , 37.8]	0.601
Yes	672	8.4	0.19	42.4	[38.6 , 46.3]		599	27.7	[24.1 , 31.2]	
Number of Days Household Cooks With Potash										
0 – 1	47	(8.3)	(0.65)	(38.6)	[26.3 , 50.9]		45	(29.4)	[17.6 , 41.2]	
2 – 3	137	8.5	0.43	40.9	[32.4 , 49.5]	0.390	122	28.5	[20.5 , 36.5]	0.984
4 – 5	114	8.9	0.47	49.5	[39.7 , 59.3]		97	27.0	[17.9 , 36.0]	
6 - 7	374	8.2	0.24	41.3	[36.3 , 46.3]		335	27.3	[22.5 , 32.1]	
Total[d]	**720**	**8.4**	**0.18**	**42.3**	**[38.7 , 46.0]**		**638**	**27.4**	**[24.0 , 30.9]**	

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by ELISA (Erhardt *et al.*, 2004).
[b] sTfR adjusted for inflammation using the Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia (BRINDA) method (Namaste *et al*., 2017).
[c] Hemoglobin concentrations are not adjusted for altitude in the Burkina Faso National Micronutrient Survey as altitude <1000 m in all households (WHO, 2011a).
[d] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 9.3 Geometric Mean Serum Soluble Transferrin Receptor (sTfR) Concentration, Iron Deficiency, and Iron Deficiency Anemia Among Children 6-59 Months, Not Adjusted for Inflammation, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	sTfR [a] (mg/L)		Iron Deficiency [a] (sTfR >8.3 mg/L)			N	Iron Deficiency Anemia (Hemoglobin <11.0 g/dL[b] and sTfR >8.3 µg/L[a])		
		Geometric Mean	SE	%	[95% CI]	p-value		%	[95% CI]	p-value
Location°										
Ouagadougou & Bobo Dioulasso	232	9.2	0.35	47.8	[41.0 , 54.7]		217	24.9	[19.1 , 30.7]	
Other cities	197	9.5	0.37	47.7	[40.6 , 54.8]	0.032	173	27.2	[20.5 , 33.9]	0.001
Rural	291	10.7	0.40	58.1	[52.3 , 63.9]		248	39.5	[33.5 , 45.6]	
Residence										
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	429	9.3	0.26	47.8	[42.8 , 52.8]	0.008	390	26.1	[21.6 , 30.5]	<0.001
Rural°	291	10.7	0.40	58.1	[52.3 , 63.9]		248	39.5	[33.5 , 45.6]	
Age°, months										
6-11	35	(10.9)	(1.02)	(65.7)	[50.0 , 81.5]		28	(28.6)	[11.8 , 45.3]	
12-17	43	(14.4)	(1.32)	(81.4)	[69.8 , 93.0]		37	(54.1)	[37.9 , 70.2]	
18-23	58	12.8	1.07	69.0	[57.0 , 80.9]	<0.001	50	60.0	[46.4 , 73.6]	<0.001
24-35	171	11.2	0.54	58.5	[51.1 , 65.9]		144	36.8	[28.8 , 44.8]	
36-47	202	9.2	0.32	47.5	[40.7 , 54.4]		182	28.0	[21.5 , 34.6]	
48-59	211	8.0	0.27	37.9	[31.3 , 44.6]		197	18.8	[13.3 , 24.2]	
6-23	136	12.7	0.66	72.1	[64.6 , 79.6]	<0.001	115	50.4	[41.4 , 59.5]	<0.001
24-59	584	9.3	0.22	47.3	[43.1 , 51.4]		523	27.0	[23.1 , 30.8]	
Sex										
Male	365	10.1	0.31	55.9	[50.7 , 61.2]	0.023	323	32.5	[27.3 , 37.7]	0.436
Female	355	9.5	0.29	47.5	[42.3 , 52.7]		315	29.7	[24.7 , 34.7]	
Wealth Quintile										
Lowest	156	9.9	0.45	53.6	[45.6 , 61.6]		133	37.1	[29.0 , 45.2]	
Second	153	11.0	0.59	58.3	[50.2 , 66.3]		131	39.5	[31.1 , 48.0]	
Middle	173	10.0	0.47	51.8	[44.0 , 59.6]	0.257	161	30.4	[23.0 , 37.7]	0.006
Fourth	124	9.3	0.46	47.1	[38.2 , 56.0]		109	20.5	[13.1 , 27.9]	
Highest	114	8.7	0.43	45.3	[35.3 , 55.4]		104	24.8	[16.5 , 33.2]	
Dewormed in Last JVA+ Campaign (children 12-59 months, Nov-Dec 2019)										
No	242	10.2	0.42	52.9	[46.3 , 59.5]	0.445	215	27.5	[21.4 , 33.7]	0.160
Yes	428	9.6	0.26	49.8	[45.0 , 54.6]		381	33.2	[28.4 , 37.9]	
Household Cooks With Sodium Bicarbonate										
No	673	9.8	0.23	52.7	[48.8 , 56.6]	0.080	595	31.7	[27.9 , 35.5]	0.218
Yes	47	(9.9)	(0.98)	(38.8)	[24.1 , 53.5]		43	(22.9)	[10.8 , 35.1]	
Household Cooks With Potash										
No	48	(10.0)	(0.98)	(49.3)	[34.0 , 64.5]	0.738	39	(23.5)	[9.2 , 37.8]	0.326
Yes	672	9.8	0.23	52.0	[48.0 , 55.9]		599	31.6	[27.9 , 35.3]	
Number of Days Household Cooks With Potash										
0 – 1	47	(10.3)	(0.79)	(55.0)	[41.8 , 68.2]		45	(36.1)	[23.5 , 48.7]	
2 – 3	137	9.8	0.51	50.4	[41.5 , 59.4]	0.511	122	31.7	[23.1 , 40.3]	0.902
4 – 5	114	10.3	0.56	58.0	[48.2 , 67.8]		97	32.4	[22.9 , 41.8]	
6 - 7	374	9.6	0.30	50.3	[45.1 , 55.5]		335	30.8	[25.8 , 35.7]	
Total[c]	**720**	**9.8**	**0.22**	**51.8**	**[48.0 , 55.6]**		**638**	**31.1**	**[27.5 , 34.7]**	

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by ELISA (Erhardt *et al.*, 2004).
[b] Hemoglobin concentrations are not adjusted for altitude in the Burkina Faso National Micronutrient Survey as altitude <1000 m in all households (WHO, 2011a).
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 9.4 Geometric Mean Serum Retinol Concentration and Vitamin A Deficiency Among Children 6-59 Months, Not Adjusted for Inflammation, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Retinol [a] (µmol/L)		Vitamin A Deficiency [a, b] (Retinol <0.70 µmol/L)		
		Geometric Mean	SE	%	[95% CI]	p-value
Location°						
Ouagadougou & Bobo Dioulasso	220	0.68	0.018	54.5	[29.1 , 61.7]	
Other cities	201	0.62	0.021	60.7	[53.6 , 67.8]	0.015
Rural	272	0.58	0.015	68.0	[62.3 , 73.8]	
Residence						
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	421	0.64	0.014	57.9	[52.9 , 63.0]	0.008
Rural°	272	0.58	0.015	68.0	[62.3 , 73.8]	
Age°, months						
6-11	25	(0.67)	(0.055)	(60.0)	[40.7 , 79.3]	
12-17	37	(0.67)	(0.046)	(48.6)	[32.5 , 64.8]	
18-23	56	0.60	0.031	66.1	[53.6 , 78.5]	0.574
24-35	160	0.61	0.020	60.0	[52.6 , 67.4]	
36-47	201	0.63	0.020	61.2	[54.3 , 68.1]	
48-59	214	0.61	0.016	64.5	[58.1 , 70.9]	
6-23	118	0.63	0.024	59.3	[50.4 , 68.3]	0.529
24-59	575	0.62	0.011	62.1	[58.0 , 66.2]	
Sex						
Male	359	0.61	0.015	65.6	[60.6 , 70.7]	0.029
Female	334	0.64	0.015	57.5	[52.0 , 63.0]	
Wealth Quintile						
Lowest	150	0.57	0.020	67.4	[59.8 , 74.9]	
Second	144	0.60	0.023	64.7	[56.6 , 72.8]	
Middle	171	0.61	0.022	62.5	[54.7 , 70.4]	0.215
Fourth	115	0.70	0.028	54.1	[44.1 , 64.0]	
Highest	113	0.67	0.024	57.0	[47.0 , 66.9]	
Vitamin A Supplement Intake During Last JVA+ Campaign (Nov-Dec 2019)						
No	248	0.61	0.018	62.8	[56.3 , 69.3]	0.679
Yes	430	0.63	0.013	61.1	[56.4 , 65.9]	
Malaria						
Positive	64	0.55	0.038	65.5	[54.0 , 77.0]	0.445
Negative	587	0.63	0.011	60.6	[56.5 , 64.8]	
Household Cooks With Sodium Bicarbonate						
No	648	0.62	0.011	62.1	[58.2 , 66.0]	0.480
Yes	45	(0.66)	(0.048)	(56.5)	[41.2 , 71.9]	
Household Cooks With Potash						
No	43	(0.66)	(0.039)	(61.0)	[45.7 , 76.2]	0.917
Yes	650	0.62	0.011	61.8	[57.8 , 65.7]	
Number of Days Household Cooks With Potash						
0 – 1	47	(0.62)	(0.051)	(58.2)	[43.5 , 72.9]	
2 – 3	130	0.61	0.025	61.1	[52.6 , 69.5]	0.956
4 – 5	109	0.65	0.029	62.3	[53.2 , 71.4]	
6 - 7	364	0.61	0.014	62.3	[56.9 , 67.8]	
Total[c]	**693**	**0.62**	**0.011**	**61.7**	**[57.9 , 65.6]**	

JVA+= Journées Vitamine A+ (Vitamin A Days)
Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by HPLC.
[b] WHO (2011b).
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 9.5 Inflammation Adjusted Geometric Mean Serum Retinol Binding Protein (RBP) Concentration, and Vitamin A Deficiency Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	RBP [a, b] (µmol/L)		Vitamin A Deficiency [a, b, c] (RBP <0.72 µmol/L)		
		Geometric Mean	SE	%	[95% CI]	p-value
Location°						
Ouagadougou & Bobo Dioulasso	232	0.82	0.016	32.8	[26.6 , 39.0]	
Other cities	197	0.78	0.020	41.1	[34.1 , 48.2]	<0.001
Rural	291	0.69	0.013	54.3	[48.4 , 60.2]	
Residence						
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	429	0.80	0.013	32.8	[26.6 , 39.0]	<0.001
Rural°	291	0.69	0.013	41.1	[34.1 , 48.2]	
Age°, months						
6-11	35	(0.77)	(0.032)	(37.1)	[21.1 , 53.2]	
12-17	43	(0.91)	(0.042)	(25.6)	[12.5 , 38.7]	
18-23	58	0.80	0.027	32.8	[20.7 , 44.9]	0.029
24-35	171	0.75	0.017	48.0	[40.4 , 55.5]	
36-47	202	0.74	0.018	43.6	[37.0 , 50.1]	
48-59	211	0.73	0.015	48.3	[41.6 , 55.1]	
6-23	136	0.82	0.020	31.6	[23.8 , 39.4]	0.001
24-59	584	0.74	0.010	46.6	[42.5 , 50.6]	
Sex						
Male	365	0.74	0.012	46.7	[41.5 , 51.9]	0.122
Female	355	0.78	0.014	41.0	[35.9 , 46.1]	
Wealth Quintile						
Lowest	156	0.71	0.017	51.8	[44.5 , 59.0]	
Second	153	0.73	0.019	50.2	[42.0 , 58.4]	
Middle	173	0.74	0.023	46.1	[37.9 , 54.4]	0.001
Fourth	124	0.82	0.024	32.0	[23.6 , 40.4]	
Highest	114	0.82	0.022	33.6	[24.9 , 42.3]	
Vitamin A Supplement Intake During Last JVA+ Campaign (Nov-Dec 2019)						
No	252	0.76	0.015	43.4	[37.1 , 49.7]	0.949
Yes	459	0.75	0.012	43.7	[39.1 , 48.2]	
Household Cooks With Sodium Bicarbonate						
No	673	0.75	673	44.1	[40.3 , 48.0]	0.587
Yes	47	(0.80)	(47)	(40.4)	[27.4 , 53.3]	
Household Cooks With Potash						
No	48	(0.85)	(0.038)	(31.8)	[17.8 , 45.7]	0.098
Yes	672	0.75	0.010	44.7	[40.9 , 48.5]	
Number of Days Household Cooks With Potash						
0 – 1	47	(0.75)	(0.035)	(42.3)	[28.5 , 56.2]	
2 – 3	137	0.75	0.022	46.8	[38.8 , 54.9]	0.930
4 – 5	114	0.75	0.021	45.2	[36.2 , 54.2]	
6 - 7	374	0.75	0.013	44.0	[38.7 , 49.3]	
Total[d]	**720**	**0.75**	**0.009**	**43.9**	**[40.2 , 47.6]**	

JVA+= Journées Vitamine A+ (Vitamin A Days)
Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by ELISA (Erhardt *et al.*, 2004).
[b] RBP adjusted for inflammation using the Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia (BRINDA) adjustment (Namaste *et al.*, 2017).
[c] A linear regression was used to calculate the RBP cutoff equivalent to retinol <0.70 µmol/L.
[d] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 9.6 Geometric Mean Serum Retinol Binding Protein (RBP) Concentration, and Vitamin A Deficiency Among Children 6-59 Months, Not Adjusted for Inflammation, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	RBP [a] (µmol/L)		Vitamin A Deficiency [a, b] (RBP <0.72 µmol/L)		
		Geometric Mean	SE	%	[95% CI]	p-value
Location°						
Ouagadougou & Bobo Dioulasso	232	0.74	0.015	43.5	[37.0 , 50.1]	<0.001
Other cities	197	0.69	0.018	55.8	[48.7 , 63.0]	
Rural	291	0.61	0.012	68.0	[62.5 , 73.6]	
Residence						
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	429	0.71	0.012	50.1	[45.2 , 55.0]	<0.001
Rural°	291	0.61	0.012	68.0	[62.5 , 73.6]	
Age°, months						
6-11	35	(0.68)	(0.029)	(57.1)	[40.7 , 73.6]	0.104
12-17	43	(0.81)	(0.039)	(34.9)	[20.6 , 49.2]	
18-23	58	0.68	0.025	56.9	[44.2 , 69.6]	
24-35	171	0.67	0.017	59.1	[51.6 , 66.5]	
36-47	202	0.66	0.017	58.4	[51.7 , 65.1]	
48-59	211	0.66	0.015	57.8	[51.2 , 64.5]	
6-23	136	0.72	0.018	50.0	[41.5 , 58.5]	0.080
24-59	584	0.66	0.010	58.4	[54.3 , 62.5]	
Sex						
Male	365	0.66	0.012	59.8	[54.6 , 64.9]	0.138
Female	355	0.69	0.013	54.3	[49.2 , 59.5]	
Wealth Quintile						
Lowest	156	0.62	0.016	67.4	[60.3 , 74.5]	<0.001
Second	153	0.64	0.017	63.1	[55.3 , 70.9]	
Middle	173	0.66	0.021	56.7	[48.5 , 64.8]	
Fourth	124	0.74	0.022	42.4	[33.1 , 51.7]	
Highest	114	0.73	0.019	51.6	[42.8 , 60.4]	
Vitamin A Supplement Intake During Last JVA+ Campaign (Nov-Dec 2019)						
No	252	0.68	0.014	58.1	[51.8 , 64.3]	0.637
Yes	459	0.67	0.011	56.2	[51.5 , 60.8]	
Household Cooks With Sodium Bicarbonate						
No	673	0.67	0.009	57.0	[53.2 , 60.8]	0.910
Yes	47	(0.70)	(0.036)	(57.9)	[43.2 , 72.7]	
Household Cooks With Potash						
No	48	(0.75)	(0.034)	(57.0)	[53.2 , 60.8]	0.091
Yes	672	0.67	0.009	57.9	[43.2 , 72.7]	
Number of Days Household Cooks With Potash						
0 – 1	47	(0.65)	(0.030)	(60.9)	[47.9 , 74.0]	0.964
2 – 3	137	0.67	0.021	58.7	[50.4 , 67.0]	
4 – 5	114	0.68	0.020	56.8	[48.0 , 65.7]	
6 - 7	374	0.66	0.012	57.6	[52.4 , 62.9]	
Total[c]	**720**	**0.67**	**0.009**	**57.1**	**[53.4 , 60.8]**	

JVA+= Journées Vitamine A+ (Vitamin A Days)
Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by ELISA (Erhardt *et al.*, 2004).
[b] A linear regression was used to calculate the RBP cutoff equivalent to retinol <0.70 µmol/L.
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 9.7 Geometric Mean Modified Relative Dose Response (MRDR) Value and Vitamin A Deficiency Among Children 6-59 Months, Not Adjusted for Inflammation, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	MRDR [a]		Vitamin A Deficiency [a, b] (MRDR ≥0.060)		
		Geometric Mean	SE	%	[95% CI]	p-value
Location						
Ouagadougou & Bobo Dioulasso	50	0.060	0.0047	42.0	[28.2 , 55.8]	
Other cities	54	0.057	0.0048	51.9	[38.4 , 65.3]	0.290
Rural	56	0.066	0.0036	57.1	[44.0 , 70.2]	
Residence						
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	104	0.058	0.0034	47.1	[37.4 , 56.8]	0.226
Rural	56	0.066	0.0036	57.1	[44.0 , 70.2]	
Age, months						
6-23	21	(0.052)	(0.0055)	(38.1)	[17.1 , 59.1]	
24-35	40	(0.062)	(0.0045)	(55.0)	[39.4 , 70.6]	0.587
36-47	46	(0.063)	(0.0057)	(54.3)	[39.8 , 68.9]	
48-59	53	0.062	0.0045	49.1	[35.5 , 62.7]	
6-23	21	(0.052)	0.0055	(38.1)	[17.1 , 59.1]	0.218
24-59	139	0.062	0.0029	52.5	[44.1 , 60.9]	
Sex						
Male	92	0.059	0.0033	51.1	[40.8 , 61.4]	0.892
Female	68	0.063	0.0041	50.0	[38.0 , 62.0]	
Wealth Quintile						
Lowest	25	(0.063)	(0.0074)	(60.0)	[40.6 , 79.4]	
Second	33	(0.065)	(0.0048)	(57.6)	[40.5 , 74.6]	
Middle	41	(0.064)	(0.0058)	(56.1)	[40.7 , 71.5]	0.037
Fourth	29	(0.051)	(0.0047)	(24.1)	[8.4 , 39.9]	
Highest	32	(0.061)	(0.0060)	(53.1)	[35.6 , 70.6]	
Vitamin A Supplement Intake During Last JVA+ Campaign (Nov-Dec 2019)						
No	54	0.069	0.0050	59.3	[46.0 , 72.5]	0.118
Yes	104	0.057	0.0029	46.2	[36.5 , 55.8]	
Total	**160**	**0.061**	**0.0026**	**50.6**	**[42.8 , 58.5]**	

MRDR= Modified relative dose response

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.

Estimates do not account for weighting and complex sample design due to non-response for MRDR test in 13 survey clusters, and need to be interpreted with caution.

P-value obtained from Pearson's chi-square statistic.

Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.

[a] Assessed by HPLC.

[b] WHO (1996), Tanumihardjo (2011).

Annex 9.8 Geometric Mean Serum Zinc Concentration and Zinc Deficiency Among Children 6-59 Months, Not Adjusted for Inflammation, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	Zinc [a] (µg/dL)		N	Zinc Deficiency [a, b] (Serum Zinc <65 µg/dL or 57 µg/dL)		
		Geometric Mean	SE		%	[95% CI]	p-value
Location°							
Ouagadougou & Bobo Dioulasso	224	0.73	0.011	215	12.1	[29.1 , 16.4]	
Other cities	207	0.76	0.012	198	10.6	[6.2 , 15.0]	0.013
Rural	289	0.74	0.011	263	19.8	[14.5 , 25.0]	
Residence							
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	431	0.75	0.008	413	11.3	[8.1 , 14.4]	0.004
Rural°	289	0.74	0.011	263	19.8	[14.5 , 25.0]	
Age°, months							
6-11	33	(0.85)	(0.041)	31	(12.9)	[1.1 , 24.7]	
12-17	43	(0.74)	(0.026)	38	(15.8)	[4.2 , 27.4]	
18-23	61	0.74	0.018	58	15.5	[6.3 , 24.7]	0.327
24-35	169	0.75	0.012	159	10.1	[5.4 , 14.7]	
36-47	203	0.72	0.010	190	18.9	[13.2 , 24.7]	
48-59	211	0.74	0.012	200	14.0	[9.2 , 18.8]	
6-23	137	0.77	0.015	127	15.0	[8.5 , 21.4]	0.911
24-59	583	0.74	0.007	549	14.6	[11.6 , 17.6]	
Sex							
Male	371	0.74	0.009	351	15.5	[11.5 , 19.5]	0.427
Female	349	0.74	0.009	325	13.3	[9.7 , 17.0]	
Wealth Quintile							
Lowest	162	0.76	0.015	153	20.1	[12.9 , 27.3]	
Second	150	0.72	0.013	131	20.0	[12.9 , 27.1]	
Middle	165	0.72	0.011	161	13.7	[8.3 , 19.0]	0.006
Fourth	130	0.75	0.015	126	9.3	[4.0 , 14.5]	
Highest	113	0.78	0.019	105	6.4	[1.9 , 10.9]	
Household Cooks With Sodium Bicarbonate							
No	675	0.74	0.007	632	14.8	[11.9 , 17.7]	0.297
Yes	45	(0.73)	(0.022)	44	(9.1)	[0.6 , 17.6]	
Household Cooks With Potash							
No	44	(0.74)	(0.025)	40	(12.0)	[2.4 , 21.5]	0.631
Yes	676	0.74	0.007	636	14.6	[11.7 , 17.5]	
Number of Days Household Cooks With Potash							
0 – 1	48	(0.79)	(0.028)	47	(14.7)	[0.0 , 30.5]	
2 – 3	149	0.73	0.013	138	12.7	[6.8 , 18.6]	0.888
4 – 5	109	0.74	0.015	101	13.1	[6.2 , 20.1]	
6 - 7	370	0.75	0.009	350	15.7	[11.9 , 19.5]	
Total[c]	**720**	**0.74**	**0.006**	**676**	**14.4**	**[11.7 , 17.2]**	

Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by ICP-OES.
[b] Zinc deficiency defined as serum zinc less than 65 or 57 µg/dL depending on time of day: Morning (until noon), non-fasting: <65µg/dL; Afternoon, non-fasting: <57 µg/dL (IZiNCG, 2012).
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.

Annex 9.9 Geometric Mean RBC (Red Blood Cell) Folate Concentration and RBC Folate Deficiency (<305 nmol/L) Among Children 6-59 Months, Burkina Faso National Micronutrient Survey, 2020

Characteristics	N	RBC Folate [a] (nmol/L)		RBC Folate Deficiency [a, b] (<305 nmol/L)		
		Geometric Mean	SE	%	[95% CI]	p-value
Location°						
Ouagadougou & Bobo Dioulasso	249	660.9	19.92	2.4	[0.5 - 4.3]	
Other cities	217	655.3	24.83	5.1	[2.1 - 8.0]	0.040
Rural	287	577.5	16.80	7.3	[4.0 - 10.7]	
Residence						
Urban [Ouagadougou, Bobo Dioulasso & Other cities]	466	658.3	15.75	3.8	[2.0 - 5.6]	0.051
Rural°	287	577.5	16.80	7.3	[4.0 - 10.7]	
Age°, months						
6-11	34	(614.5)	(41.68)	(5.9)	[0.0 - 13.8]	
12-17	46	(566.2)	(40.65)	(4.3)	[0.0 - 10.2]	
18-23	61	583.4	43.76	3.3	[0.0 - 7.8]	0.820
24-35	171	610.1	24.87	7.0	[3.2 - 10.9]	
36-47	216	634.0	19.99	4.6	[1.9 - 7.4]	
48-59	225	658.9	20.68	4.4	[1.8 - 7.1]	
6-23	141	585.0	25.27	4.3	[0.9 - 7.6]	0.615
24-59	612	636.1	12.85	5.2	[3.4 - 7.0]	
Sex						
Male	387	635.3	16.29	5.6	[3.1 - 8.1]	0.597
Female	366	616.8	16.33	4.6	[2.4 - 6.9]	
Wealth Quintile						
Lowest	160	582.2	20.75	4.4	[1.2 - 7.6]	
Second	154	575.1	29.15	11.1	[5.6 - 16.5]	
Middle	180	669.6	21.66	2.3	[0.0 - 5.0]	0.009
Fourth	131	643.0	25.04	3.4	[0.1 - 6.6]	
Highest	128	673.4	33.45	4.6	[1.0 - 8.1]	
Household Cooks With Sodium Bicarbonate						
No	702	627.8	12.08	4.8	[3.1 - 6.5]	0.220
Yes	51	604.6	45.62	9.0	[0.7 - 17.3]	
Household Cooks With Potash						
No	44	(767.5)	(57.56)	(2.3)	[0.0 - 6.8]	0.392
Yes	709	618.4	11.81	5.3	[3.5 - 7.0]	
Number of Days Household Cooked With Potash During Last 7 Days						
0 – 1	49	(587.4)	(32.77)	(4.1)	[0.0 - 9.7]	
2 – 3	146	637.6	22.27	4.0	[0.9 - 7.2]	0.366
4 – 5	115	595.5	33.71	8.7	[2.8 - 14.6]	
6 – 7	399	622.1	16.09	4.9	[2.7 - 7.1]	
Total[c]	**753**	**627.2**	**11.99**	**5.1**	**[3.4 - 6.8]**	

RBC= Red blood cell
Note: N unweighted (all children with valid test results and completed interviews). Sample size might vary slightly due to missing data.
All estimates account for complex sample design.
°All estimates account for weighting, except for stratification by location, rural residence, and child age. Estimates by child age were unweighted because the age group 6-23 months had a low response rate (<45%) and should therefore be interpreted with caution.
P-values obtained from Rao-Scott adjusted Pearson's Chi-square statistic to account for weighting and complex survey design, except for location, residence and child age, which account for complex survey design only. Statistically significant results (i.e., p <0.05) are highlighted in color, with the color gradient following the highest (darkest color) to lowest (lightest color) prevalence.
Figures in parentheses are based on 25-49 sample size in the denominator and the estimate should be interpreted with caution.
[a] Assessed by microbiological assay (O'Broin and Kelleher, 1992; Pfeiffer *et al*., 2011; Zhang *et al.*, 2020).
[b] Pfeiffer *et al.* (2016), IOM (1998).
[c] Survey results are nationally representative except for in the Sahel region, in which 59 clusters (0.5% of clusters in original sampling frame) were excluded from the sampling frame due to security threats prior to drawing the survey's 90 cluster sample.