



Republic of Botswana

MINISTRY OF HEALTH

# NUTRITIONAL STATUS OF CHILDREN UNDER FIVE IN BOTSWANA

## 2009 - 2017



**STATISTICS BOTSWANA**

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**NUTRITIONAL STATUS  
OF CHILDREN UNDER  
FIVE IN BOTSWANA  
2009-2017**

## PREFACE

This statistical brief presents findings of the nutritional status of children under 5 years from three household surveys conducted between 2009 and 2017. The main objective of the brief is to provide nutritional information of children under 5 years for use in planning and monitoring. The production of anthropometric indices is an important requirement for tracking progress in the achievement of Sustainable Development Goal 2, target 2.2, which aspires to ending all forms of malnutrition.

The nutritional status report provides an update on the nutritional status of children under 5 years since 2007 as reported by the Botswana Family Health Survey (BFHS). Prior to 2007 BFHS, Botswana mainly relied on routine data collected from all the districts by Ministry of Health.

Data sources are surveys conducted between 2009 and 2017 namely, Botswana Core Welfare Indicator Survey 2009/10 (BCWIS 2009/10), the Botswana Multi Topic Household Survey 2015/16 (BMTHS 2015/16) and the Botswana Demographic Survey 2017 (BDS 2017).

This stats brief was led by Ministry of Health in collaboration with UNICEF Botswana and Statistics Botswana.



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# CONTENTS

|  |           |
|--|-----------|
| PREFACE.....   | i         |
| INTRODUCTION.....  | 1         |
| <b>1.0 ANTHROPOMETRIC MEASURES.....</b>  | <b>2</b>  |
| <b>Table 1:</b> Completeness of variables used.....  | <b>2</b>  |
| <b>2.0 METHODOLOGY.....</b>  | <b>3</b>  |
| <b>2.1 MEASUREMENT OF NUTRITIONAL STATUS.....</b>  | <b>3</b>  |
| <b>3.0 RESULTS.....</b>  | <b>4</b>  |
| <b>3.1 BACKGROUND CHARACTERISTICS.....</b>   | <b>4</b>  |
| <b>Table 3.1:</b> Background characteristics of children under five years: 2009-2017.....                                    | <b>4</b>  |
| <b>3.2 UNDERWEIGHT.....</b>  | <b>4</b>  |
| <b>Table 3.2.1a:</b> Underweight Prevalence for children under 5 years by background characteristics from 2009 to 2017.....  | <b>5</b>  |
| <b>Table 3.2.1b:</b> Percentage of underweight children under 5 years by district-2009-2017.....                             | <b>6</b>  |
| <b>3.3 STUNTING.....</b>   | <b>6</b>  |
| <b>Table 3.3.1a:</b> Stunting Prevalence for children under 5 years by background characteristics from 2009 to 2017.....     | <b>7</b>  |
| <b>Table 3.3.1b:</b> Percentage of children under 5 years who are stunted by district-2009-2017.....                         | <b>8</b>  |
| <b>3.4 WASTING.....</b>  | <b>8</b>  |
| <b>Table 3.4.1a:</b> Percentage of children under 5 years wasted across the three surveys by background characteristics..... | <b>9</b>  |
| <b>Table 3.4.1b:</b> Percentage of children under 5 years who are wasted across the three surveys by district.....           | <b>10</b> |
| <b>Figure 3.1:</b> Prevalence of stunting versus wasting across three surveys.....   | <b>10</b> |
| <b>3.5 OVERWEIGHT.....</b>   | <b>11</b> |
| <b>Table 3.5.1a:</b> Percentage of children under 5 years who are overweight by background characteristics.....              | <b>11</b> |
| <b>Table 3.5.1b:</b> Percentage of children under 5 years who are overweight across by district-2009-2017.....               | <b>12</b> |
| <b>4.0 TRENDS IN NUTRITIONAL OUTCOMES 2009-2017.....</b>   | <b>13</b> |
| <b>Figure 4.1</b> Trends in Nutritional status by survey (BCWIS 2009/10, BMTHS 2015/16 and BDS 2017).....                    | <b>12</b> |
| <b>5.0 LIMITATIONS.....</b>  | <b>14</b> |

# INTRODUCTION

Nutrition is the foundation of every child's health, growth and development particularly during the first 1000 days of life (from conception to two years) and continues to be important into the 5<sup>th</sup> year of life. In Botswana, child malnutrition has been and continues to be a major public health problem. Malnutrition refers to both undernutrition and over-nutrition. According to WHO (2021), under-nutrition includes stunting (low height for age), wasting (low weight for height), underweight (low weight for age) and micronutrient deficiencies. On the other hand, over-nutrition defines overweight, obesity and consequently lead to diet-related non-communicable diseases. The report therefore provides findings from the analysis of anthropometric data for under-five aiming to measure the extent and severity of chronic and acute malnutrition in children aged under five years.

Malnutrition exposes children to greater risk of infections, causes delayed motor and cognitive development, and have far-reaching consequences for human capital, economic productivity, and national development. Chronic malnutrition is also linked to increased risk of non-communicable diseases later in life. Multi-sectoral interventions have been established to address malnutrition in the country.

## 1.0 ANTHROPOMETRIC MEASURES

Weight in kilograms and height/length in centimetres were obtained from children under five years of age in the various surveys. All the surveys were assessed for completeness of variables required in the analysis as shown in **Table 1** below. Across the surveys, over 90 percent of records had the required variables for analysis rendering them of good quality for analysis. Records missing data consisted of those with measurements that were outside the expected normal range of weight and length/height. Analysis was therefore performed on only records with complete data on all the required variables.

**Table 1: Completeness of variables used**

| Variable                                      | Number of records (%) |               |               |
|---|-----------------------|---------------|---------------|
|   | BCWIS 2009/10         | BMTHS 2015/16 | BDS 2017      |
| Age (in months)                               | 3,335 (ref.)          | 3,177 (ref.)  | 3,427 (ref.)  |
| Sex   | 3,335 (100%)          | 3,177 (100%)  | 3,427 (100%)  |
| Length/height (in centimeters)                | 3,193 (95.7%)         | 2,951 (92.8%) | 3,277 (95.6%) |
| Weight (in kilograms)                         | 3,204 (96.1%)         | 2,952 (92.8%) | 3,326 (97.1%) |
| Measure (recumbent length or standing height) | 3,335 (100%)          | 3,177 (100%)  | 3,427 (100%)  |
| sw (weight)                                   | 3,335 (100%)          | 3,177 (100%)  | 3,427 (100%)  |

## 2.0 METHODOLOGY

Secondary data from the following surveys notably; Botswana Core Welfare Indicator Survey 2009/10 (BCWIS), the Botswana Multi Topic Household Survey 2015/16 (BMTHS) and the Botswana Demographic Survey 2017, (BDS) were used to produce anthropometric indices; stunting (height for age), wasting (weight for height), underweight and overweight (weight for age).

In the Botswana Demographic Survey, date of birth was recorded as day, month and year, therefore, to determine age in months the date of birth and mid-point date of survey collection were used. The Botswana Core Welfare Indicators Survey 2009/10 had age recorded in months and Botswana Multi Topic Household Survey, derived age in months from date of birth and household visit date.

The data was analyzed using STATA version 13.1 developed by StataCorp and utilized the WHO package for nutrition data called **igrowup** accessed through -<https://www.who.int/childgrowth/software/en/>. The target datasets were prepared for analysis and z-scores were generated as a requirement to compute the indices (underweight, wasting, stunting and overweight). The z-scores are assessed in terms of how many deviations from the median of the reference population they are to represent the nutritional status for children in a population.

## 2.1 MEASUREMENT OF NUTRITIONAL STATUS

Anthropometric data (height/length and weight) were collected from the sampled population and these data were assessed to determine the nutritional status of children under 5 years of age. Malnutrition for children under 5 years was described using four (4) of the main measures of nutritional status. Each index provides different information about the growth and body composition for assessing nutritional status.

- **Underweight (Weight-for-age)** measures both acute and chronic malnutrition. Children whose weight-for-age is more than two standard deviations below the median of the reference population were considered moderately underweight, while those whose weight-for-age were more than three standard deviations below the median are classified as severely underweight. Children whose weight-for-age was more than 2 standard deviations above the median of the reference population were classified as overweight.
- **Stunting (Height/length-for-age)** was used to measure linear growth. For children whose height/length-for-age was more than two standard deviations below the median of the reference population were considered short for their age and were classified as moderately stunted. If the height/length-for-age was more than three standard deviations below the median, the classification was severely stunted. Stunting reflects chronic malnutrition due to long periods of inadequate nutrition and recurrent or chronic illness. It also often occurs concurrently with underweight.
- **Wasting (Weight-for height/length)** For children whose weight-for-height/length falls more than two standard deviations below the median of the reference population, they were classified as moderately wasted. For those falling more than three standard deviations below the median, they were considered severely wasted. Wasting reflects recent or rapid weight loss due to severe macronutrients deficiencies.
- **Overweight (high weight for height/length)**-This the opposite of wasting which measure over-nutrition. For children whose weight for height score is more than two standard deviations above the median of the reference population are considered.

There are several instances where the prevalence of malnutrition is estimated as zero (0.00%) or the prevalence of severe malnutrition was higher than that of moderate malnutrition. As estimates were further disaggregated by age, district and orphanhood, numbers sampled in these strata became very small. This resulted in a phenomenon of either not having a single child in the sample with malnutrition or the sample containing more children with severe malnutrition than moderate malnutrition. This points to the sample size not being big enough or the survey not powered enough to accurately estimate malnutrition within the strata.

## 3.0 RESULTS

### 3.1 BACKGROUND CHARACTERISTICS

Children 12 months and older accounted for most children included in the samples across the three (3) surveys at around 18% - 20% as shown in **Table 3.1**. The sex ratio ranged from 0.95 to 1.03. Slightly more females than males were sampled in the BCWIS, and the trend reversed in the BMTHS and the BDS. Most children under 5 years were found in rural areas, but the trend across the three (3) surveys shows the percentage decreasing down to 40.7% in the 2017 BDS from 50.4% in the 2009/10 BCWIS. Most children under 5 who were orphaned, had lost their father with very few having lost both parents.

The proportion of children who resided in rural areas was higher compared to children who reside in urban areas. Among orphaned children (no mother, no father or no mother and father), the results showed that the highest proportion of children with no father was recorded in 2009/10 at 2.67%, followed by 2.61% in 2017.

**Table 3.1: Background characteristics of children under five years: 2009-2017**

| Background characteristics | Surveys        |            |                |            |                |            |
|----------------------------|----------------|------------|----------------|------------|----------------|------------|
|                            | BCWIS 2009/10  |            | BMTHS 2015/16  |            | BDS 2017       |            |
|                            | Percentage (%) | Number (n) | Percentage (%) | Number (n) | Percentage (%) | Number (n) |
| <b>Survey</b>              |                |            |                |            |                |            |
| <b>Total</b>               | 100            | 3,335      | 100            | 3,177      | 100            | 3,427      |
| <b>Age group (months)</b>  |                |            |                |            |                |            |
| 0 – 5                      | 10.2           | 341        | 10.6           | 338        | 10.5           | 357        |
| 6 – 11                     | 10.4           | 348        | 9.4            | 300        | 10.2           | 349        |
| 12 – 23                    | 19.4           | 648        | 18.0           | 573        | 20.2           | 688        |
| 24 – 35                    | 20.7           | 689        | 21.9           | 697        | 20.4           | 694        |
| 36 – 47                    | 20.6           | 688        | 21.4           | 681        | 19.6           | 667        |
| 48 – 59                    | 18.6           | 621        | 18.5           | 588        | 19.2           | 653        |
| <b>Sex</b>                 |                |            |                |            |                |            |
| Male                       | 48.7           | 1,625      | 50.8           | 1,615      | 50.5           | 1,721      |
| Female                     | 51.3           | 1,710      | 49.2           | 1,562      | 49.5           | 1,687      |
| <b>Place of residence</b>  |                |            |                |            |                |            |
| Cities/Towns               | 15.5           | 516        | 16.1           | 512        | 19.4           | 660        |
| Urban Villages             | 34.1           | 1,137      | 40.2           | 1,278      | 39.9           | 1,361      |
| Rural                      | 50.4           | 1,682      | 43.7           | 1,387      | 40.7           | 1,387      |
| <b>Orphan hood</b>         |                |            |                |            |                |            |
| No mother                  | 1.20           | 40         | 0.60           | 19         | 0.41           | 14         |
| No father                  | 2.67           | 89         | 1.57           | 50         | 2.61           | 89         |
| Orphans                    | 0.15           | 5          | 0.03           | 1          | 0.03           | 1          |

### 3.2 UNDERWEIGHT

The prevalence of underweight children under five, decreased from 13.7 percent in 2009/10 to 8.6 percent in 2015/16 and further decreased to 7.5 percent in 2017. From 2009 prevalence of underweight among male children decreased from 15.7 percent (2009) to 9.6 percent (2015/16) and 8.0 percent (2017). Over the same period, prevalence of underweight among the girls decreased to 7.6 percent and 7.0 percent as compared to 11.9 percent recorded in 2009.

**Table 3.2.1a**, the results show that the prevalence of underweight varied by age group (months) with no consistent trend. Among children aged less than 6 months the prevalence of underweight declined significantly from 17.5 percent in 2009/10 to 6.0 percent (2015/16) and increased to 12.1 percent in 2017. For 2009/10, 17.0 percent of children aged 36-47 months were underweight and this decreased to 11.7 percent in 2017.



The highest percentage (11.4%) of underweight children was among those with no father recorded in 2015/16, followed by 8.4 percent in 2009/10 and continued to reduce to about 8.0 percent in 2017. (Table 3.2.1a). The zero-percentage estimated for orphans indicates that the sampled numbers of children who were orphans was too small to accurately estimate the prevalence of underweight in this group. The same applies for all the other indices.

**Table 3.2.1a: Underweight Prevalence for children under 5 years by background characteristics from 2009 to 2017**

| Survey                    | BCWIS 2009/10               | BMTHS 2015/16               | BDS 2017                    |
|---------------------------|-----------------------------|-----------------------------|-----------------------------|
|                           | Percentage below - 2 SD (%) | Percentage below - 2 SD (%) | Percentage below - 2 SD (%) |
| <b>Total</b>              | <b>13.75</b>                | <b>8.62</b>                 | <b>7.49</b>                 |
| <b>Age group (months)</b> |                             |                             |                             |
| 0 – 5                     | 17.5                        | 6.0                         | 12.1                        |
| 6 – 11                    | 10.8                        | 5.0                         | 8.5                         |
| 12 – 23                   | 14.9                        | 7.9                         | 8.0                         |
| 24 – 35                   | 13.1                        | 11.6                        | 8.4                         |
| 36 – 47                   | 17.0                        | 8.1                         | 11.7                        |
| 48 – 59                   | 13.9                        | 8.3                         | 9.6                         |
| <b>Sex</b>                |                             |                             |                             |
| Male                      | 15.7                        | 9.6                         | 8.0                         |
| Female                    | 11.9                        | 7.6                         | 7.0                         |
| <b>Place of residence</b> |                             |                             |                             |
| Cities/Towns              | 11.4                        | 6.0                         | 4.1                         |
| Urban Villages            | 12.4                        | 6.9                         | 5.9                         |
| Rural                     | 14.7                        | 11.3                        | 10.61                       |
| <b>Orphanhood</b>         |                             |                             |                             |
| No mother                 | 14.34                       | 15.53                       | 11.26                       |
| No father                 | 8.42                        | 11.42                       | 7.96                        |
| Orphans                   | 3.26                        | 0.00                        | 0.00                        |

There were wide variations by district in the prevalence of underweight from 2009 to 2017 as indicated in Table 3.2.1b. The highest proportion of children who were severely underweight was recorded in Kgalagadi North district at 9.6 percent in 2017. Jwaneng was relatively high at 6.7 percent, followed by Kgalagadi South and Ghanzi 5.4 percent each. Though there was a steady decline in prevalence of underweight during the year, districts along the western part of the country tended to register higher prevalence of underweight as compared to other districts. It should be noted however that the high prevalence of underweight recorded in Orapa in 2009/10 and 2015/16 could be attributed to small sample size.

**Table 3.2.1b: Percentage of underweight children under 5 years by district-2009-2017**

| District               | BCWIS 2009/10      |         |     | BMTHS 2015/16      |         |     | BDS 2017           |         |     |
|------------------------|--------------------|---------|-----|--------------------|---------|-----|--------------------|---------|-----|
|                        | Moderate           | Severe  | n   | Moderate           | Severe  | n   | Moderate           | Severe  | n   |
|                        | (<-2SD -<br>≥-3SD) | (<-3SD) |     | (<-2SD -<br>≥-3SD) | (<-3SD) |     | (<-2SD -<br>≥-3SD) | (<-3SD) |     |
| Gaborone               | 5.85               | 3.94    | 211 | 2.78               | 0.30    | 227 | 3.04               | 2.22    | 286 |
| Francistown            | 9.12               | 5.24    | 112 | 8.94               | 2.81    | 108 | 4.15               | 0.48    | 160 |
| Lobatse                | 3.98               | 2.25    | 47  | 2.64               | 4.10    | 43  | 5.32               | 0.00    | 37  |
| Selibe Phikwe          | 5.94               | 7.98    | 83  | 7.24               | 0.00    | 80  | 2.15               | 0.00    | 89  |
| Orapa                  | 10.55              | 6.14    | 22  | 15.77              | 0.00    | 13  | 0.00               | 0.00    | 34  |
| Jwaneng                | 5.32               | 3.05    | 30  | 0.00               | 0.00    | 24  | 0.00               | 6.74    | 31  |
| Sowa Town              | 0.00               | 6.67    | 11  | 0.00               | 0.00    | 17  | 0.00               | 0.00    | 23  |
| Ngwaketse              | 6.64               | 3.66    | 237 | 5.79               | 1.53    | 183 | 4.09               | 3.74    | 213 |
| Barolong               | 5.25               | 0.84    | 111 | 3.86               | 4.96    | 103 | 8.49               | 1.57    | 121 |
| Ngwaketse West         | 3.31               | 2.51    | 30  | 0.00               | 0.00    | 25  | 7.68               | 4.59    | 40  |
| South East             | 0.00               | 9.15    | 77  | 5.96               | 1.69    | 114 | 0.00               | 1.70    | 107 |
| Kweneng East           | 6.66               | 5.84    | 307 | 7.65               | 1.81    | 396 | 6.89               | 0.40    | 361 |
| Kweneng West           | 5.86               | 5.13    | 99  | 7.22               | 5.14    | 82  | 5.19               | 1.11    | 98  |
| Kgatleng               | 8.10               | 5.89    | 137 | 3.88               | 1.98    | 127 | 2.11               | 2.58    | 124 |
| Central Serowe/Palapye | 10.22              | 8.62    | 318 | 7.23               | 3.32    | 275 | 9.04               | 3.65    | 308 |
| Central Mahalapye      | 8.24               | 3.31    | 203 | 5.71               | 0.00    | 226 | 5.49               | 2.68    | 214 |
| Central Bobonong       | 5.20               | 5.43    | 142 | 5.47               | 2.65    | 107 | 6.70               | 1.77    | 185 |
| Central Boteti         | 7.22               | 5.22    | 152 | 7.48               | 1.95    | 93  | 11.88              | 4.12    | 119 |
| Central Tutume         | 13.19              | 3.85    | 318 | 9.10               | 2.74    | 293 | 7.39               | 1.16    | 249 |
| North East             | 11.13              | 8.02    | 127 | 8.24               | 2.28    | 112 | 2.91               | 1.23    | 124 |
| Ngamiland East         | 2.89               | 2.48    | 158 | 5.03               | 2.13    | 189 | 2.91               | 1.42    | 168 |
| Ngamiland West         | 9.75               | 5.10    | 162 | 4.26               | 1.54    | 123 | 7.31               | 0.00    | 119 |
| Chobe                  | 4.55               | 6.91    | 52  | 5.65               | 0.00    | 46  | 0.00               | 0.00    | 37  |
| Ghanzi                 | 12.56              | 15.46   | 89  | 10.92              | 11.15   | 65  | 3.92               | 5.37    | 61  |
| Kgalagadi South        | 11.79              | 3.37    | 62  | 8.55               | 3.79    | 69  | 8.05               | 5.36    | 69  |
| Kgalagadi North        | 26.67              | 8.46    | 38  | 9.27               | 0.00    | 37  | 5.14               | 9.55    | 31  |

### 3.3 STUNTING

**Table 3.3.1a** below shows that, 21.3 percent of children in 2017 were too short for their age (stunted), a decrease from 28.0 percent in 2009/10. Among children less than 6 months, 26.2 percent were stunted in 2017 and the highest prevalence of 33.9 percent was reported among children aged 12-23 months in 2017. For the same period children aged 48-59 months, only 15.8 percent were stunted.

Boys had a higher prevalence of stunting notably; 29.4 percent in 2009/10, 22.1 percent in 2015/16 and 23.4 percent in 2017 as compared to girls' whose prevalence at 26.6 percent in 2009/10, 17.5 percent in 2015/16 and 19.1 percent in 2017 are comparably lower. From 2009-2017, the prevalence of stunting was higher in the rural areas as compared to urban villages and cities/towns. Among children with no parents (one or both), the prevalence of stunting was higher for those with no father (25.3%) in 2017 compared to those with no mother (19.4%).

**Table 3.3.1a: Stunting Prevalence for children under 5 years by background characteristics from 2009 to 2017**

| Survey                    | BCWIS 2009/10              | BMTHS 2015/16              | BDS 2017                   |
|---------------------------|----------------------------|----------------------------|----------------------------|
|                           | Percentage below -2 SD (%) | Percentage below -2 SD (%) | Percentage below -2 SD (%) |
| <b>Total</b>              | <b>28.02</b>               | <b>19.82</b>               | <b>21.28</b>               |
| <b>Age group (months)</b> |                            |                            |                            |
| 0 – 5                     | 28.9                       | 10.9                       | 26.2                       |
| 6 – 11                    | 16.5                       | 16.3                       | 26.6                       |
| 12 – 23                   | 18.8                       | 21.2                       | 33.9                       |
| 24 – 35                   | 32.8                       | 27.7                       | 27.7                       |
| 36 – 47                   | 24.0                       | 19.7                       | 19.0                       |
| 48 – 59                   | 20.1                       | 12.3                       | 15.8                       |
| <b>Sex</b>                |                            |                            |                            |
| Male                      | 29.4                       | 22.1                       | 23.4                       |
| Female                    | 26.6                       | 17.5                       | 19.1                       |
| <b>Place of residence</b> |                            |                            |                            |
| Cities/Towns              | 22.4                       | 13.5                       | 16.8                       |
| Urban Villages            | 28.7                       | 18.3                       | 20.5                       |
| Rural                     | 29.1                       | 23.1                       | 24.06                      |
| <b>Orphanhood</b>         |                            |                            |                            |
| No mother                 | 22.79                      | 35.18                      | 19.39                      |
| No father                 | 27.46                      | 14.54                      | 25.34                      |
| Orphans                   | 3.26                       | 0.00                       | 0.00                       |

The proportion realized after combining children who were moderately and severely stunted, was highest in the Ghanzi District at 47.0 percent in 2009 followed by Lobatse District at 33.0 percent. In 2015/2016, the prevalence of stunted children was highest in the Kweneng West District (41.0%) when compared to other districts.

In 2017, the prevalence of severely stunted children was highest in Ngwaketse West District (23.7 percent) followed by Kgalagadi North (12.4%). Jwaneng District recorded zero severely stunted.

**Table 3.3.1b: Percentage of stunted children who are under 5 years of age by district-2009-2017**

| District               | BCWIS 2009/10   |         |     | BMTHS 2015/16   |         |     | BDS 2017        |         |     |
|------------------------|-----------------|---------|-----|-----------------|---------|-----|-----------------|---------|-----|
|                        | Moderate        | Severe  | n   | Moderate        | Severe  | n   | Moderate        | Severe  | n   |
|                        | (<-2SD - ≥-3SD) | (<-3SD) |     | (<-2SD - ≥-3SD) | (<-3SD) |     | (<-2SD - ≥-3SD) | (<-3SD) |     |
| Gaborone               | 7.71            | 16.4    | 211 | 7.02            | 3.98    | 227 | 10.46           | 9.67    | 286 |
| Francistown            | 8.90            | 8.67    | 112 | 10.42           | 5.37    | 108 | 12.85           | 6.13    | 160 |
| Lobatse                | 17.78           | 15.35   | 47  | 11.42           | 7.62    | 43  | 7.93            | 5.60    | 37  |
| Selibe Phikwe          | 7.47            | 14.78   | 83  | 12.21           | 5.34    | 80  | 6.08            | 3.81    | 89  |
| Orapa                  | 5.07            | 12.14   | 22  | 8.20            | 15.77   | 13  | 0.00            | 2.89    | 34  |
| Jwaneng                | 13.10           | 0.00    | 30  | 0.00            | 0.00    | 24  | 4.96            | 0.00    | 31  |
| Sowa Town              | 0.00            | 10.04   | 11  | 7.64            | 14.82   | 17  | 9.34            | 5.19    | 23  |
| Ngwaketse              | 13.19           | 13.00   | 237 | 14.52           | 3.69    | 183 | 10.14           | 5.91    | 213 |
| Barolong               | 14.59           | 4.29    | 111 | 14.56           | 10.25   | 103 | 12.12           | 6.35    | 121 |
| Ngwaketse West         | 7.59            | 11.63   | 30  | 10.15           | 2.90    | 25  | 7.95            | 23.69   | 40  |
| South East             | 18.04           | 12.65   | 77  | 11.88           | 3.87    | 114 | 9.64            | 8.59    | 107 |
| Kweneng East           | 13.87           | 11.77   | 307 | 9.58            | 9.58    | 396 | 12.68           | 5.47    | 361 |
| Kweneng West           | 12.63           | 12.21   | 99  | 27.56           | 13.63   | 82  | 18.31           | 6.59    | 98  |
| Kgatleng               | 13.15           | 17.94   | 137 | 8.23            | 4.90    | 127 | 11.47           | 4.68    | 124 |
| Central Serowe/Palapye | 17.71           | 14.34   | 318 | 18.04           | 5.13    | 275 | 19.80           | 10.35   | 308 |
| Central Mahalapye      | 18.85           | 9.43    | 203 | 13.05           | 4.91    | 226 | 18.77           | 8.28    | 214 |
| Central Bobonong       | 15.31           | 10.61   | 142 | 19.69           | 5.89    | 107 | 16.54           | 6.84    | 185 |
| Central Boteti         | 18.86           | 13.23   | 152 | 17.81           | 8.91    | 93  | 14.53           | 10.27   | 119 |
| Central Tutume         | 16.57           | 13.54   | 318 | 15.93           | 9.57    | 293 | 17.80           | 7.75    | 249 |
| North East             | 20.00           | 12.8    | 127 | 9.12            | 10.39   | 112 | 11.61           | 5.99    | 124 |
| Ngamiland East         | 14.13           | 11.4    | 158 | 10.97           | 5.79    | 189 | 11.48           | 8.84    | 168 |
| Ngamiland West         | 14.27           | 14.96   | 162 | 5.99            | 5.47    | 123 | 11.03           | 11.16   | 119 |
| Chobe                  | 15.99           | 10.27   | 52  | 15.43           | 3.04    | 46  | 14.78           | 2.77    | 37  |
| Ghanzi                 | 19.04           | 28.4    | 89  | 11.99           | 15.82   | 65  | 14.87           | 5.91    | 61  |
| Kgalagadi South        | 9.39            | 11.83   | 62  | 11.52           | 11.41   | 69  | 16.16           | 12.35   | 69  |
| Kgalagadi North        | 23.53           | 7.01    | 38  | 30.49           | 0.00    | 37  | 6.32            | 6.96    | 31  |

The prevalence of stunting for children under five years has generally showed an improvement between 2009 and 2017. The trend has been fluctuating from 28% in 2009/10 to 19.8% in 2015/16 which was the lowest over years before increasing to 21.3% in 2017.

### 3.4 WASTING

The results on **Table 3.2.1a** show that the prevalence of wasting varied by age group (month) from 2009 to 2017. Based on the three surveys, the prevalence of wasting decreased from 11.6 percent in 2009 to 5.1 percent in 2015/16 and further decreased to 4.0 percent in 2017. For 2009, the prevalence of wasting decreased among children of ages 0 to 35 months but peaked at 16.1 percent among children aged 36-47 months. For 2015/16, the prevalence decreased among children 6 to 47 months. **Table 3.3.1a** showed a similar declining pattern in 2017 with a rise of wasting prevalence among children aged 36-47 months.

The prevalence of wasting among boys and girls showed a decline over the period 2009-2017. The results showed a decrease in the prevalence of wasting in all places of residence with cities/Towns showing a decline from 13.8 percent in 2009 to 3.5 percent in 2017, urban villages from 10.8 percent in 2009 to 3.0 percent in 2017. In rural areas wasting prevalence decreased from 11.5 percent to 5.4 percent in 2017.

Among children with single parent orphan hood, the highest prevalence of wasting was recorded in 2009/10 ranging from 15.0 percent among those children with no mother to 15.5 percent for children with no father. It is worth noting that in the year 2017, the highest prevalence of wasting was among children without both parents, at 46.3 percent. This high estimate denotes a situation where, due to a small sample size, the observations are likely due to chance.

**Table 3.4.1a: Percentage of wasting among children under 5 years across the three surveys by background characteristics**

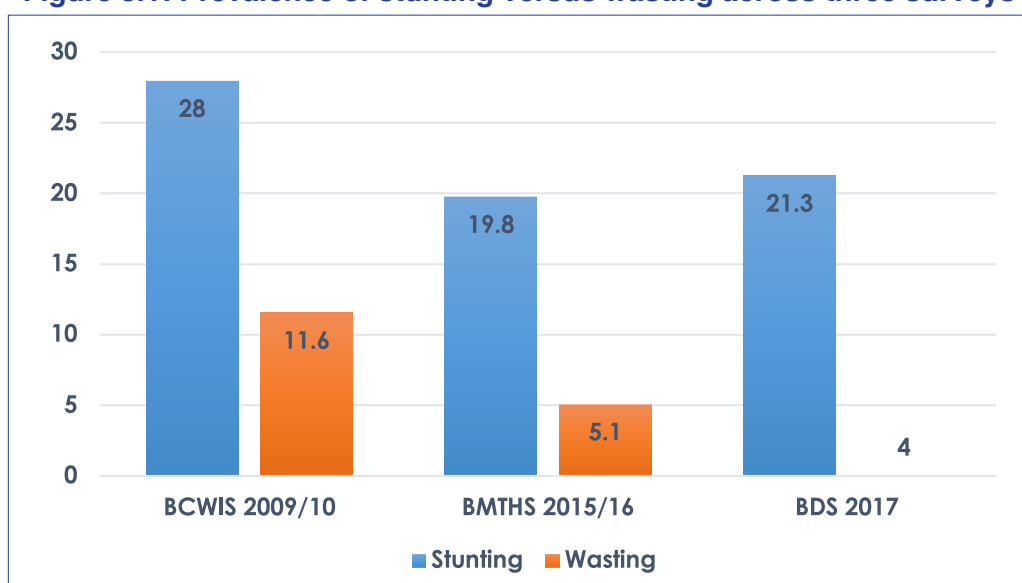
| Survey                    | BCWIS 2009/10              | BMTHS 2015/16              | BDS 2017                   |
|---------------------------|----------------------------|----------------------------|----------------------------|
|                           | Percentage below -2 SD (%) | Percentage below -2 SD (%) | Percentage below -2 SD (%) |
| <b>Total</b>              | 11.55                      | 5.14                       | 4.02                       |
| <b>Age group (months)</b> |                            |                            |                            |
| 0 – 5                     | 14.14                      | 13.95                      | 10.30                      |
| 6 – 11                    | 10.87                      | 8.09                       | 6.02                       |
| 12 – 23                   | 10.28                      | 7.83                       | 3.45                       |
| 24 – 35                   | 8.00                       | 3.84                       | 4.05                       |
| 36 – 47                   | 16.09                      | 3.42                       | 6.52                       |
| 48 – 59                   | 12.25                      | 5.00                       | 4.75                       |
| <b>Sex</b>                |                            |                            |                            |
| Male                      | 10.86                      | 5.88                       | 3.90                       |
| Female                    | 12.18                      | 4.39                       | 4.13                       |
| <b>Place of residence</b> |                            | 0.00                       | 0.00                       |
| Cities/Towns              | 13.77                      | 4.31                       | 3.51                       |
| Urban Villages            | 10.79                      | 4.01                       | 2.82                       |
| Rural                     | 11.46                      | 6.59                       | 5.43                       |
| <b>Orphanhood</b>         |                            |                            |                            |
| No mother                 | 14.55                      | 10.17                      | 3.75                       |
| No father                 | 15.49                      | 4.99                       | 5.22                       |
| Orphans                   | 0.00                       | 0.00                       | 46.26                      |

Over the three survey years in 2009, 2015/16 and 2017, the highest proportions of children who were severely wasted were recorded at Ghanzi district at 19.2 percent in 2009 followed by Orapa district and Sowa district at 15.1 percent and 11.0 percent respectively. However, in 2015/16 the prevalence of severely wasted children significantly decreased to 3.4 percent in Ghanzi district. Kgalagadi North district recorded the highest prevalence at 9.7 percent of severely wasted children under five years in 2017.

**Table 3.4.1b: Percentage of children under 5 years who are wasted across the three surveys by district**

| District               | BCWIS 2009/10   |         |     | BMTHS 2015/16   |         |     | BDS 2017        |         |     |
|------------------------|-----------------|---------|-----|-----------------|---------|-----|-----------------|---------|-----|
|                        | Moderate        | Severe  | n   | Moderate        | Severe  | n   | Moderate        | Severe  | n   |
|                        | (<-2SD - ≥-3SD) | (<-3SD) |     | (<-2SD - ≥-3SD) | (<-3SD) |     | (<-2SD - ≥-3SD) | (<-3SD) |     |
| Gaborone               | 8.44            | 3.49    | 211 | 0.45            | 0.45    | 227 | 2.60            | 1.58    | 286 |
| Francistown            | 2.02            | 9.73    | 112 | 7.74            | 2.48    | 108 | 1.72            | 0.58    | 160 |
| Lobatse                | 11.63           | 9.73    | 47  | 6.81            | 0.00    | 43  | 8.33            | 0.00    | 37  |
| Selibe Phikwe          | 8.42            | 9.53    | 83  | 4.87            | 1.17    | 80  | 2.87            | 0.00    | 89  |
| Orapa                  | 0.00            | 15.13   | 22  | 8.20            | 0.00    | 13  | 3.07            | 0.00    | 34  |
| Jwaneng                | 8.06            | 4.26    | 30  | 0.00            | 0.00    | 24  | 0.00            | 0.00    | 31  |
| Sowa Town              | 11.42           | 10.84   | 11  | 0.00            | 0.00    | 17  | 4.96            | 0.00    | 23  |
| Ngwaketse              | 6.45            | 2.37    | 237 | 1.38            | 1.49    | 183 | 4.25            | 0.86    | 213 |
| Barolong               | 15.17           | 4.55    | 111 | 7.31            | 1.00    | 103 | 1.94            | 1.53    | 121 |
| Ngwaketse West         | 6.93            | 0.00    | 30  | 3.08            | 0.00    | 25  | 0.00            | 0.00    | 40  |
| South East             | 11.71           | 9.82    | 77  | 3.2             | 0.00    | 114 | 0.65            | 0.73    | 107 |
| Kweneng East           | 8.35            | 4.88    | 307 | 5.26            | 0.00    | 396 | 0.98            | 1.04    | 361 |
| Kweneng West           | 5.36            | 4.97    | 99  | 2.29            | 1.31    | 82  | 0.00            | 0.00    | 98  |
| Kgatleng               | 4.12            | 5.23    | 137 | 2.90            | 0.78    | 127 | 4.07            | 0.95    | 124 |
| Central Serowe/Palapye | 5.83            | 7.13    | 318 | 3.75            | 1.66    | 275 | 4.43            | 1.06    | 308 |
| Central Mahalapye      | 4.20            | 3.08    | 203 | 3.89            | 0.96    | 226 | 3.91            | 2.06    | 214 |
| Central Bobonong       | 7.67            | 7.17    | 142 | 2.49            | 1.42    | 107 | 3.58            | 0.61    | 185 |
| Central Boteti         | 6.13            | 2.27    | 152 | 8.26            | 2.24    | 93  | 5.50            | 1.28    | 119 |
| Central Tutume         | 5.15            | 4.41    | 318 | 5.57            | 2.03    | 293 | 4.00            | 0.39    | 249 |
| North East             | 2.46            | 5.28    | 127 | 4.84            | 0.00    | 112 | 1.27            | 2.89    | 124 |
| Ngamiland East         | 1.51            | 0.00    | 158 | 4.67            | 0.71    | 189 | 1.93            | 0.00    | 168 |
| Ngamiland West         | 2.54            | 4.67    | 162 | 2.46            | 0.80    | 123 | 4.65            | 0.83    | 119 |
| Chobe                  | 4.81            | 2.24    | 52  | 6.49            | 0.00    | 46  | 3.31            | 0.00    | 37  |
| Ghanzi                 | 4.74            | 19.17   | 89  | 2.95            | 3.39    | 65  | 1.90            | 3.28    | 61  |
| Kgalagadi South        | 3.31            | 6.68    | 62  | 3.83            | 0.00    | 69  | 5.97            | 0.66    | 69  |
| Kgalagadi North        | 3.80            | 14.70   | 38  | 6.49            | 0.00    | 37  | 1.43            | 9.70    | 31  |

**Figure 3.1: Prevalence of stunting versus wasting across three surveys**



According to WHO cut-off points, wasting should be reduced to <5 percent and stunting should be <10 percent to be considered low. The prevalence of stunting in 2017 was at 21.3 percent which is considered high as it falls within <30 percent category. However, the BDS study shows a good improvement in stunting rates compared to a prevalence of 28 percent observed in 2009/10. Similarly, wasting showed an improvement as it declined to 4 percent in 2017.

### 3.5 OVERWEIGHT

In 2017, overweight prevalence of children under five years showed a decrease from 6.9 percent in 2009 as shown in **Table 3.5.1a**. The results further showed that the prevalence of overweight fluctuated by background characteristics such as age group, sex, place of residence and orphanhood.

Among children less than 6 months, 17.9 percent were overweight in 2009 and this decreased to 14.6 percent in 2017. The proportion of boys under five years who are overweight ranged from 7.0 percent in 2009 to 3.4 percent in 2017 while prevalence of girls who are overweight ranged from 6.8 percent 2009 to 3.6 percent in the 2017. Overweight seemed to be more prevalent in children who are 0-11 months compared to other age groups.

Among children with no parents (one or both), the prevalence was higher among those with no mother (10.12 %) in 2015/16 compared to those with no father.

**Table 3.5.1a: Percentage of children under 5 years who are overweight by background characteristics**

| Survey                    | BCWIS 2009/10             | BMTHS 2015/16             | BDS 2017                  |
|---------------------------|---------------------------|---------------------------|---------------------------|
|                           | Percentage above 2 SD (%) | Percentage above 2 SD (%) | Percentage above 2 SD (%) |
| <b>Total</b>              | <b>6.86</b>               | <b>3.46</b>               | <b>3.55</b>               |
| <b>Age group (months)</b> |                           |                           |                           |
| 0 – 5                     | 17.85                     | 7.92                      | 14.59                     |
| 6 – 11                    | 11.28                     | 9.52                      | 7.89                      |
| 12 – 23                   | 8.81                      | 3.91                      | 5.29                      |
| 24 – 35                   | 6.07                      | 3.18                      | 2.93                      |
| 36 – 47                   | 5.70                      | 2.23                      | 2.19                      |
| 48 – 59                   | 5.38                      | 1.94                      | 2.46                      |
| <b>Sex</b>                |                           |                           |                           |
| Male                      | 6.95                      | 3.62                      | 3.47                      |
| Female                    | 6.78                      | 3.30                      | 3.62                      |
| <b>Place of residence</b> |                           |                           |                           |
| Cities/Towns              | 10.48                     | 5.59                      | 5.64                      |
| Urban Villages            | 7.20                      | 3.69                      | 3.75                      |
| Rural                     | 5.48                      | 2.38                      | 2.33                      |
| <b>Orphanhood</b>         |                           |                           |                           |
| No mother                 | 2.96                      | 10.12                     | 0.00                      |
| No father                 | 4.12                      | 2.63                      | 2.42                      |
| Orphans                   | 0.00                      | 0.00                      | 0.00                      |

Prevalence of overweight by district indicated that from 2009-2017, the prevalence of overweight was higher in the cities and towns as compared to urban villages and rural villages. Urban areas such as Jwaneng, Orapa and Gaborone had overweight prevalence above 10% as shown in **Table 3.4.1b**.

**Table 3.5.1b: Percentage of children under 5 years who are overweight across by district-2009-2017**

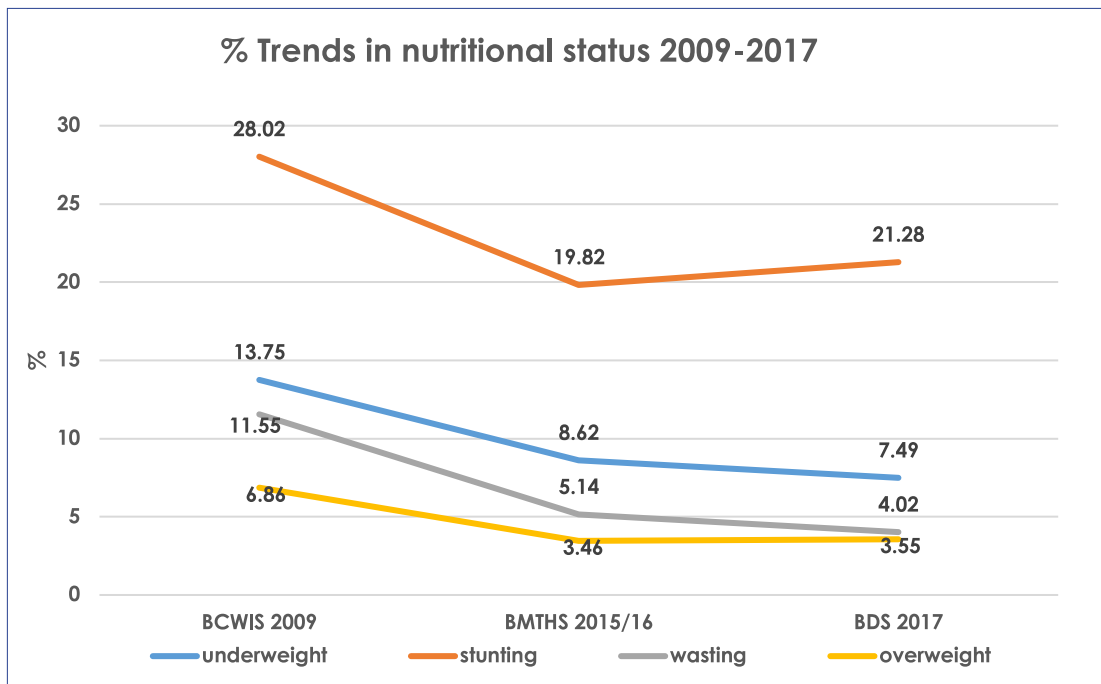
| District               | BCWIS 2009/10 |     | BMTHS 2015/16 |     | BDS 2017   |     |
|------------------------|---------------|-----|---------------|-----|------------|-----|
|                        | Overweight    | n   | Overweight    | n   | Overweight | n   |
|                        | (>+2SD)       |     | (>+2SD)       |     | (>+2SD)    |     |
| Gaborone               | 10.16         | 211 | 8.18          | 227 | 6.33       | 286 |
| Francistown            | 13.37         | 112 | 3.11          | 108 | 5.06       | 160 |
| Lobatse                | 7.70          | 47  | 0.00          | 43  | 5.61       | 37  |
| Selibe Phikwe          | 7.11          | 83  | 3.04          | 80  | 1.99       | 89  |
| Orapa                  | 10.42         | 22  | 16.68         | 13  | 7.83       | 34  |
| Jwaneng                | 13.90         | 30  | 4.79          | 24  | 10.16      | 31  |
| Sowa Town              | 0.00          | 11  | 6.67          | 17  | 9.57       | 23  |
| Ngwaketse              | 2.33          | 237 | 2.55          | 183 | 2.51       | 213 |
| Barolong               | 6.80          | 111 | 2.43          | 103 | 2.35       | 121 |
| Ngwaketse West         | 2.34          | 30  | 19.41         | 25  | 0.00       | 40  |
| South East             | 18.87         | 77  | 4.88          | 114 | 7.48       | 107 |
| Kweneng East           | 5.78          | 307 | 4.04          | 396 | 4.21       | 361 |
| Kweneng West           | 4.52          | 99  | 4.01          | 82  | 1.02       | 98  |
| Kgatleng               | 10.30         | 137 | 3.12          | 127 | 3.12       | 124 |
| Central Serowe/Palapye | 8.21          | 318 | 4.02          | 275 | 2.52       | 308 |
| Central Mahalapye      | 4.48          | 203 | 2.14          | 226 | 1.94       | 214 |
| Central Bobonong       | 2.52          | 142 | 2.05          | 107 | 2.55       | 185 |
| Central Boteti         | 11.69         | 152 | 1.04          | 93  | 3.53       | 119 |
| Central Tutume         | 2.25          | 318 | 3.29          | 293 | 2.84       | 249 |
| North East             | 2.82          | 127 | 2.58          | 112 | 2.39       | 124 |
| Ngamiland East         | 8.27          | 158 | 2.61          | 189 | 4.07       | 168 |
| Ngamiland West         | 11.85         | 162 | 1.39          | 123 | 0.65       | 119 |
| Chobe                  | 4.42          | 52  | 0.00          | 46  | 6.58       | 37  |
| Ghanzi                 | 6.16          | 89  | 0.00          | 65  | 2.78       | 61  |
| Kgalagadi South        | 5.55          | 62  | 1.79          | 69  | 1.84       | 69  |
| Kgalagadi North        | 0.00          | 38  | 0.00          | 37  | 3.54       | 31  |



## 4.0 TRENDS IN NUTRITIONAL OUTCOMES 2009-2017

Trends in nutritional status of children under five years was assessed across the three studies from 2009 to 2017 as shown in **Figure 4.1**. In general, the studies showed a decrease in malnutrition rates where by underweight prevalence dropped by almost half from 13.8% in 2009 to 7.5% in 2017. A significant decrease was also noted in stunting prevalence decreasing from 28% in 2009 to 21.3% while wasting dropped from 11.6% in 2009 to 4.0% in 2017. A similar trend was observed on overweight prevalence decreasing by half from 6.9% in 2009 to 3.6% in 2017.

**Figure 4.1: Trends in Nutritional status by survey (BCWIS 2009/10, BMTHS 2015/16 and BDS 2017)**



## 5.0 LIMITATIONS

Some limitations identified that might have affected the results include some missing data for some of the key variables needed to run the statistical analysis. Records that were missing key variables were not included in the analysis. While this did not constitute more than 10% of the total records it may have affected stratum that had few samples.



**NUTRITIONAL STATUS  
OF CHILDREN UNDER  
FIVE IN BOTSWANA  
2009-2017**



Republic of Botswana

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