

A RESTROSPECTIVE STUDY OF THE NUTRITIONAL STATUS OF PRIMARY SCHOOL CHILDREN IN HARARE

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ABSTRACT

Malnourished children may grow up to become adults with reduced physical and cognitive capacity. Knowledge of trends of children's nutritional status over time is important to raise awareness, guide resource allocation as well as develop nutrition-related interventions for communities. A retrospective study was conducted in Harare using data collected and compiled by the Harare City Council Nutrition Unit. Trends of nutritional status of primary school children in high density areas of Harare were examined in relation to stunting and wasting. All anthropometric data generated from 2003 to 2011 by the Harare Nutrition Unit were analysed. Age was calculated by subtracting the date of birth from the date of interview. The Z-scores for height-for-age (HAZ), and weight-for-height (WHZ) were calculated using the National Centre for Health Statistics (NCHS) standards. Children with HAZ and WHZ less than -2 SD from the median reference population were considered stunted and wasted, respectively. The least squares method was used to determine the strength of outcome change measures over time. A decrease in stunting was observed from a prevalence of 10.2% to 7.4% over the period 2003 to 2011 in males ($R^2 = 0.13$), and from 7.8% to 4.4% in females ($R^2 = 0.29$) over the same period. Wasting in both males and females was on a slower decrease starting only from the year 2007 to 2009 ($R^2 = 0.11$) for males and ($R^2 = 0.05$) for females. There has been an increase in wasting in recent years from 2009 to 2011 in males (2.7-4.6%) and females (3.1-3.6%). More males among primary school children are both wasted and stunted than females. The results demonstrate a decreasing prevalence in stunting in primary school children but there is an increase in prevalence of wasting in primary school children. Interventions to curb the rise in wasting in primary school children in Harare's high density areas are warranted such as resuscitation of school nutrition gardens, school feeding program and health education.

Key words: stunting, wasting, malnutrition, children, Zimbabwe

INTRODUCTION

Nutrition is a fundamental pillar of human life, health and development across the entire life-cycle. Proper and well balanced nutrition throughout the life-cycle is very important in maintaining a healthy status. Nutrition status of an individual can be assessed at all stages of the life-cycle from intrauterine growth to birth, through infancy, childhood, adolescence, and into adulthood and old age. The nutritional status of primary school children is often neglected and yet they are at a stage in the life-cycle that requires attention. Nutritional status for this age group can be assessed using wasting, stunting, underweight or overweight.

Stunting is defined as low height for age (< -2 SD from median height for age of reference population) [1]. Stunting may be a result of prolonged inadequate dietary intake, repeated infections or both. High stunting rates have been observed in children living in resource limited environments. In Zimbabwe, the national stunting prevalence among children under the age of 5 years has remained more or less stagnant at 32% for the past three decades [2]. There is evidence that stunted children may grow up to be adults who perform poorly education wise and will be less economically and physically productive [3, 4]. Wasting, defined as low weight for height (< -2 SD from median weight for height of reference population) is also another indicator used to measure nutritional status of individuals [1]. According to the Zimbabwe Demographic and Health Survey of 2010-2011 [2], wasting among children less than 5 years was reported at 3%. Zimbabwe Health Care Services has met with some success as well as challenges. Soon after independence in 1980, Primary Health Care was adopted to improve maternal, neonatal and child health care. A decade later, approximately 85% of the population had access to basic health services. However, the success was short-lived. The hyperinflationary environment, which existed during 2003-2008 reversed most of the gains of the improved health care system including school health [5, 6]. There have not been any studies on the effect of the adverse change in the socioeconomic and political climate on the trends in children's nutritional status during and after this period.

The aims of the study were to determine the trends and magnitude in prevalence rates of stunting and wasting from 2003 to 2011 in Harare's high density areas. To our knowledge these trends have not been adequately investigated and analysed in high density urban areas which are poor resourced settings in Zimbabwe. Knowledge of the trends is important to raise awareness and guide resource allocation. Besides, trends are important in following up and picking cases of overweight or obesity that is emerging in most developing countries as well as in developing nutrition-related interventions for the mentioned communities. Primary school children in urban Harare and other developing countries are often not the target of many food aid programs implemented either by government, United Nations agencies or Non-Governmental Organisations and yet they make up a significant proportion of any given population in developing countries. Most studies and surveys in Zimbabwe focus on children under the age of 5 years ignoring the primary school aged children. The present analysis therefore, describes levels and trends of stunting and wasting in Harare's low socioeconomic urban primary schools.

METHODS

The study made use of data from Harare's areas of low socioeconomic status. Harare is the capital city of Zimbabwe and like any major city in a developing country is experiencing rapid urbanisation. The city of Harare is divided into suburbs or zones along socioeconomic lines. Data was made available from the following suburbs: Budiro, Dzivarasekwa, Glen Norah, Glen View, Hatcliffe, Highfield, Kambuzuma, Kuwadzana, Mabvuku, Mbare, Mufakose, Southerton, Lochinvar, Sunningdale, Tafara and Warren Park. Assessment of nutritional status of primary school children was conducted in primary schools in the low socioeconomic areas of Harare. These areas of low socioeconomic status in Harare are overwhelmed by water shortage, poor sanitation and hygiene problems mostly due to overcrowding (high density).

Data Collection

The information that was used to assess the trends and prevalence of stunting and wasting originated from The City Health Nutrition Unit. These statistics are compiled using data which will have been collected from January to March of each year (2003-2011) from the selected primary schools in Harare and sent to the Health Information Section of the City Health Department. Approval to use data was obtained from the Director of Health Services, Harare City Health Department.

Every year the City Health Nutrition Unit conducts nutrition assessments in the above specified areas for routine surveillance purposes. All measurements were performed by trained nutritionists assisted by nurses according to WHO guidelines. Data collection for nutrition status assessment is part of the yearly planned programs which are approved by the Director of Health Services of City of Harare.

Age was calculated by subtracting the date of birth from the date of interview. Dates of birth were obtained from the school registers. The Z-scores for height-for-age (HAZ), and weight-for-height (WHZ) were calculated manually using the National Centre for Health Statistics (NCHS) standards because it is the method in use by the City Health Department. Children with HAZ and WHZ less than -2 SD from the median reference population were considered stunted and wasted, respectively. The denominator for the prevalence calculations was the total number of children 8-9 years assessed per area. Data was entered into and analysed using Microsoft Office Excel software. The least squares method was used to determine the strength of change of outcome measures over time: the closer R^2 was to one, the greater the change.

RESULTS

The number of primary school children in total assessed was 20 000 from 2003 to 2007 and on average 14 000 from 2008 to 2011, giving a total sample of 34 000 over the 8 year surveillance

period. The anthropometric assessments were each carried out on one day in each year at each school in the selected areas during the months of January to March.

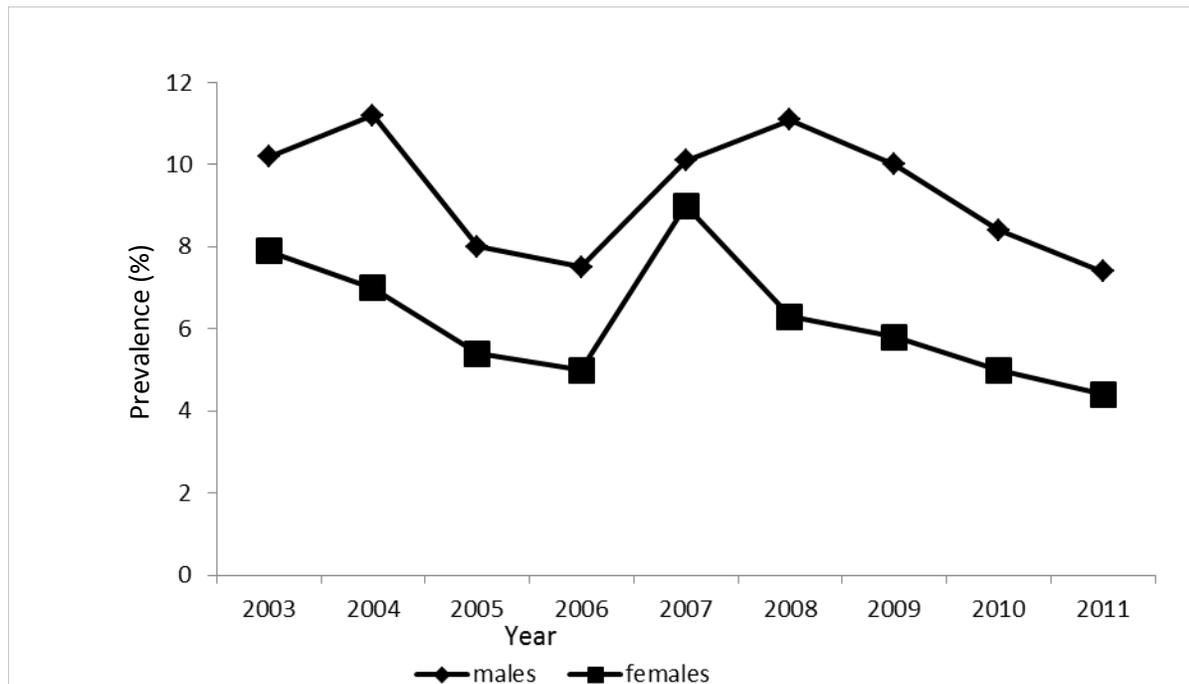


Figure 1: Trends in stunting in Western Harare primary school children from 2003-2011: City of Harare Health –Nutrition Unit

The overall prevalence of stunting decreased from 2003 to 2006. However, it then increased sharply during 2007 for girls and 2008 for boys. Stunting has been on a decrease since 2008 in both sexes (Figure 2). The prevalence of stunting is higher in males than in female pupils (Fig 2). The rate of decrease of stunting in males is less ($R^2 = 0.13$) than in females ($R^2 = 0.29$) as shown in Table 1.

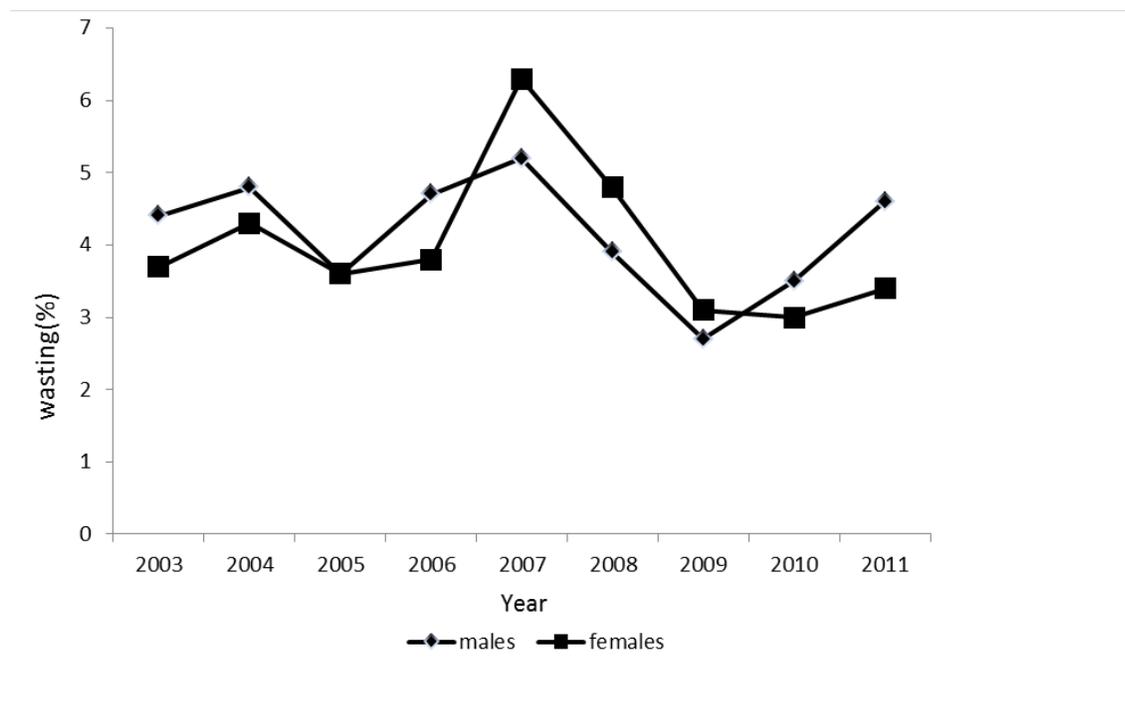


Figure 2: Trends in wasting in Western Harare primary school children from 2003-2011: City of Harare Health –Nutrition Unit

There was no significant change in wasting from 2003 to 2006. The prevalence increased from 2006 and was at its highest in 2007, which then decreased in 2009. The prevalence appears to have been on the increase for both males and females since 2009 (Fig 2). On average the prevalence is higher in males than females.

DISCUSSION

The aim of the present article is to describe levels and trends of childhood stunting and wasting among primary school children for the period 2003–2011 in parts of Harare’s low socioeconomic status areas. This was a retrospective study of school based data collected during routine surveillance and compiled centrally by the City Health, Nutrition Unit, in Harare from 2003 to 2011.

An increase in prevalence of stunting for girls was observed in 2007 whilst it was observed in 2008 for boys. Overall the analysis shows an impressive decrease in stunting in Harare’s low socioeconomic areas for both males and females from 2009-2011. According to Stevens *et al.* [7] the number of stunted children has decreased globally from 253 million in 1990 to 165 million in 2011, which is a similar trend that has been observed in Harare’s high density areas. Factors leading to this decrease need to be investigated as it shows a positive sign. According to results shown by the 2010-11 Zimbabwe Demographic and Health Survey, 32% of children under the

age of five years are stunted in Zimbabwe and this national prevalence has been stagnant for the past three decades [2]. Interventions that are leading to the decline in stunting rates in the studied parts of Harare may need to be implemented in most areas in Zimbabwe for the benefit of all individuals, particularly primary school children.

The findings revealed a slightly different trend with regards to wasting. There was not much change in wasting from 2003 to 2006. There was a sharp increase in wasting which was observed in 2007. In the same year, Zimbabwe was characterized by high incidences of water-borne diseases such as cholera, typhoid and other diarrheal diseases which have a negative impact on the health status of individuals. Other reasons for the increase during 2007 include the increased food insecurity that succeeded the economic meltdown experienced within this period [5]. The situation with regards to wasting prevalence improved only up to 2009. However, of late wasting is on the increase in both sexes. Thus, the nutrition situation with regard to this age group does not seem to be improving noticeably.

The indicators of wasting and stunting represent different nutrition insults to the child. Stunting reflects long term or chronic malnutrition whilst wasting reflects short term or acute malnutrition [8]. The overall increase in wasting in Harare's primary school children is a cause for concern. Firstly, it could be due to worsening socioeconomic conditions in Harare's high density suburbs given the increase in food prices, high unemployment rate and environmental factors such as drought that has been experienced in the past three farming seasons [9]. Secondly, anthropometric data is usually collected between January and March in the city of Harare primary schools. This happens to be the peak hunger season in Zimbabwe [9]. This could also be a factor contributing to the high wasting prevalence. Household food security is a strong determinant of child growth, therefore, these periods of food insecurity during the peak hunger season may lead to wasting among the school children [10]. Thirdly, Harare has been affected by typhoid and other diarrheal diseases due to water, sanitation and hygiene challenges [9]. This could also contribute to wasting in children through repeated gastro intestinal infections. Repeated gastric infections contribute to wasting through poor appetite and excessive loss of nutrients by way of diarrhoea and vomiting [11]. No school feeding programs have been in place since 2006 when there was a World Food Programme (WFP) school feeding programme in the areas with high rates of malnutrition in Zimbabwe [12]. However, these explanations are speculative and need further investigations. In the meantime in order to curb the rise in wasting we recommend the resuscitation of school feeding programs and school nutrition gardens as well as an improvement in the water and sanitation systems in these high density areas in Harare. School feeding programs have the advantage of increasing school attendance, and though the effect on the nutritional status of the school child is still unclear they are worth implementing and evaluating [13, 14].

In both indices of stunting and wasting it appears that males are more affected than females. Further investigation is required to ascertain the causes. Probable reasons could be due to the fact that females are more involved in household duties than males hence their exposure to food

throughout the day is increased. This finding that boys are more likely to be malnourished than girls is consistent with results from other studies conducted in Africa [15, 16]. A lot of attention from Non-Governmental Organisations and United Nations agencies in the recent past has been channelled towards the 'girl child' in Zimbabwe and other developing countries. More resources may also need to be channelled towards the 'boy child'.

The strength of the data stems from the fact that these trends were generated from large sample sizes every year since 2003. Even though the overall prevalences were below the global thresholds, the trends are vital in assisting with decision making and policy formulation. The timeliness and completeness of the records was not formally evaluated, however, the records were more than 90% complete, therefore the trends depicted were actual and reflective of the nutritional status of children in the studied parts of Harare during the time period 2003-2011.

One weakness is that the data on anthropometry especially wasting may not give a proper reflection of the situation as it was collected in one season, the hunger season in Zimbabwe over the period from 2003 to 2011. This is because some longitudinal studies have revealed seasonal variations in nutritional status with seasons [17].

The information from this analysis may be used to guide preventive interventions though it does not characterize the risk factors of the parameters collected and the data was anonymous.

CONCLUSION

The prevalence of stunting in Harare primary school children in areas of low socioeconomic status is on the decrease whilst the prevalence of wasting in the same areas is on the increase. The picture that emerges from this analysis is that of significant improvements with regards to chronic malnutrition. However, considerable challenges remain especially concerning wasting. More primary school males have a poorer nutritional status than primary school females. Programs to curb the rise in wasting and to eradicate stunting among primary school children in Harare's areas of low socioeconomic status are warranted.

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Table 1: Strength of change in prevalence of outcomes studied from 2003 to 2011: City of Harare Health –Nutrition Unit

	Prevalence %									
	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Wasting-males	4.4	4.8	3.6	4.7	5.2	3.9	2.7	3.5	4.6	R ² =0.11
Wasting females	3.7	4.3	3.6	3.8	6.3	4.8	3.1	3	3.4	R ² =0.05
Stunting males	10.2	11.2	8	7.5	10.1	11.1	10	8.4	7.4	R ² =0.13
Stunting females	7.9	7	5.4	5	9	6.3	5.8	5	4.4	R ² =0.29

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