

Longitudinal Monitoring Survey on the Growth and Nutritional Status of Children in Zambia: Assessment of the Impact of Drought on the Health and Nutritional Status of Children

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Introduction

The nutritional status and growth and health status of children are useful indicators to assess the ability of a population to adapt to the environment and the extent of this adaptation. These indicators enable measurement and evaluation of the overall nutritional and health status of young children. Additionally, they enable identification of subgroups of the child population that are at increased risk of faltered growth, disease, impaired mental development, and death.

There are several factors that influence the nutritional status of children, including the poverty status of mothers and poor diet and environmental conditions of the households. These factors can impair growth in children and result in decreased body weight or height. Moreover, in addition to the cross-sectional survey, a long-term survey monitoring child growth enables assessment of the impact of poverty and environmental destruction, as well as the resilience of the population and that of the community residing in it.

This report presents a brief summary of the growth and nutritional status in Zambian children; the data provided is based on the report of Living Conditions Monitoring Survey (LCMS) 2004, with special focus on southern and eastern provinces of Zambia. Subsequently, I propose a methodology for conducting a longitudinal survey that monitors child growth and nutritional status in rural villages in the eastern and southern provinces of Zambia.

1. Overview of the child growth and nutritional status in Zambia based on the data from Living Conditions Monitoring Survey (LCMS) 1991–2004

Currently, two types of datasets on the nutritional status of Zambian children are available. They are derived from the national surveys: Zambia Demographic and Health Survey (ZDHS) and Living Condition Monitoring Survey (LCMS). The latest report of the individual survey published by ZDHS (ZDHS 2001–2002, Central Statistical Office 2003) was in 2003 and that by LCMS (LCMS 2004, Central Statistical Office 2005) was in 2005. In this article, more recent data (LCMS 2004) has been adopted to review the growth and nutritional status of Zambian children.

The LCMS-2004 survey included anthropometric measurements of children under the age of five for assessment of the nutritional status of children. Table 1 shows the variations in the malnutrition indices of children (aged 3–59 months) in urban and rural areas

and in individual provinces. While similar variations were observed in underweight and growth stunting among provinces; there were no variations in wasting. Overall, 50% of the children aged between 3 and 59 months showed growth stunting, 20% were underweight, and 6% showed growth wasting.

Table 1. Incidence of stunting, underweight and wasting of children aged 3-59 months by province, Zambia, 2004

	N	Stunting (%)	Under-weight (%)	Wasting (%)
All Zambia	1,229,519	50	20	6
Province				
Central	125,563	48	22	7
Copperbelt	159,141	44	16	4
Eastern	193,176	59	20	5
Luapula	121,740	64	26	4
Lusaka	132,731	40	18	8
Northern	172,851	55	25	6
North Western	77,470	49	19	10
Southern	162,858	40	16	6
Western	83,989	45	21	6

At the provincial level, there were significant variations in the nutritional status of children. With regard to “stunting,” there was 40% stunting in the southern province, which was identical to that observed in Lusaka and was the least among the 9 provinces. In contrast, the stunting rate in the eastern province was 59%, which was the second highest among all the provinces. A similar tendency was observed with regard to the “underweight” status: the southern province had the lowest rate, while that in the eastern province had an intermediate rate. In other words, at a provincial level, children in the southern provinces were relatively taller and heavier as compared to the average height and weight, whereas those living in the eastern provinces were shorter and lighter.

This tendency was observed to be consistent during the 6 surveys that were conducted between 1991 and 2004 (Fig. 1). Except for 1996, the rate of “stunting” has been higher than the average rate in the eastern province while it has been lower than average in the southern province. The rate of “stunting” increased from 1991 to 2004, whereas the rate of the

“underweight” status tended to decline and that of “wasting” remained stable in this period (Fig. 2).

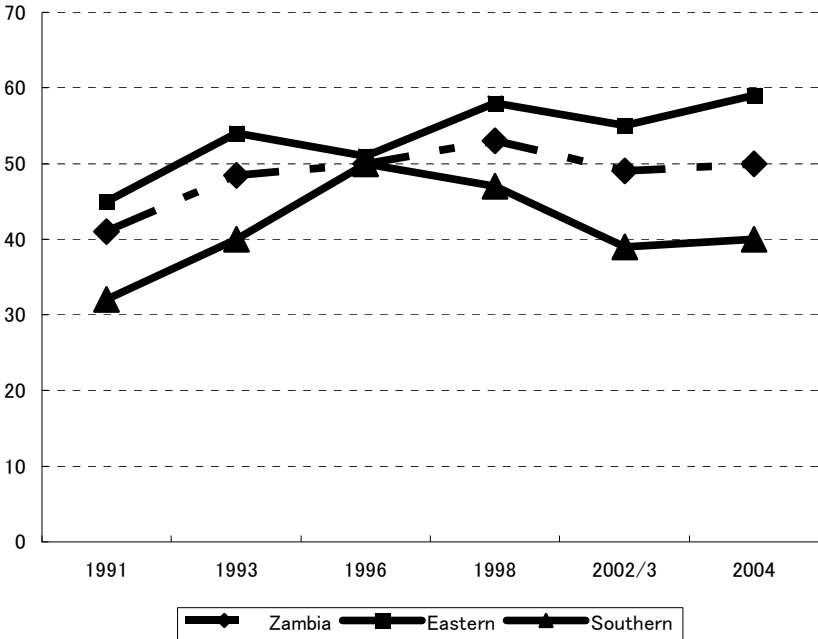


Fig.1 National and provincial trends in distribution of child malnutrition (Stunting)

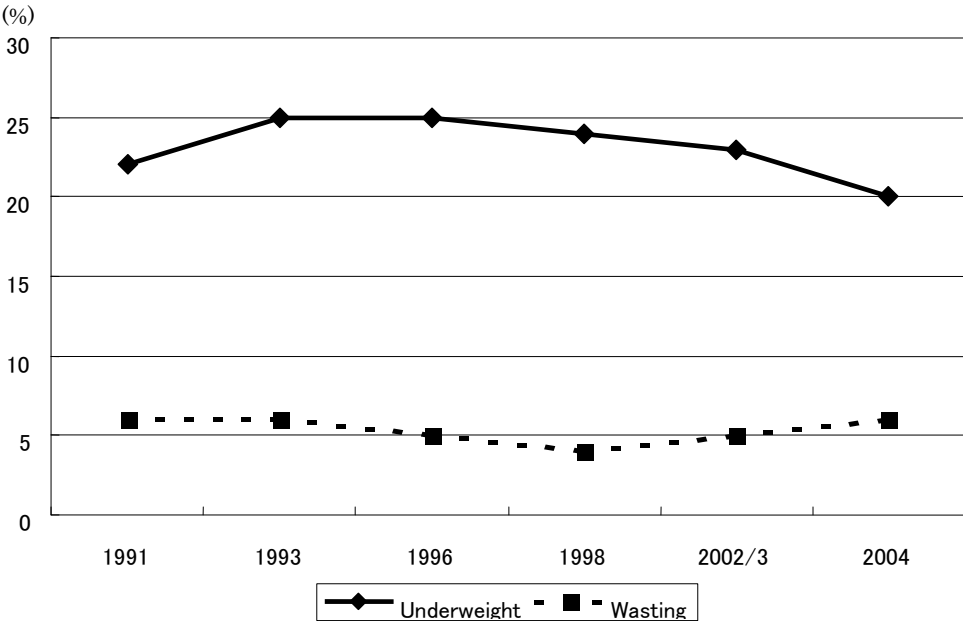


Fig. 2 National trends in distribution of child malnutrition (Underweight and Wasting)

In summary, 50% of the children aged between 3 and 59 months showed growth stunting (extremely short for their age), 20% were underweight (low weight for their age) and 6% showed growth wasting (low weight for their height). The stunting levels in the eastern

province are greater than the national average, while it was low in the southern province. Overall, the nutritional status of Zambian children were considered poor because only 2.3% of the children fell below -2 SD for each of the three indices including “stunting,” “wasting,” and “underweight” in the reference population (WHO 1983, 1995). From 1991 to 2004, the data from six cross-sectional surveys did not show any evidence of the impact of drought. A village-level intensive longitudinal monitoring survey is required to assess the impact of drought on the growth and nutritional status of children.

2. Longitudinal monitoring survey on growth and nutritional status

This survey aims to monitor the nutritional status of local villagers by measuring their physical dimensions (e.g., height, weight, and so on) on a regular basis and in a longitudinal manner in order to investigate the food shortage that occurs due to drought and its impact on health and human security of locals living in villages in the eastern and southern provinces of Zambia.

The study would involve all residents ranging from the infants to the elderly individuals from two or three rural areas in the eastern and southern provinces. All participants will be provided with detailed information regarding the procedures involved and the purpose of conducting the survey, and informed consent will be obtained from all the participants. The sample size in each province (comprising few villages) is expected to range from several hundreds to a thousand.

1. Baseline survey

Japanese experts simultaneously conduct anthropometric measurements in the field annually (Yamauchi 2007). Ideally, the measurements are performed on the same date or at least in the same month.

Measurements:

- 1) Infants (aged 0–2 years, unable to stand-up independently): body length (in the lying position), weight, and upper arm circumference (UAC).
- 2) Children (aged 2–18 years): height, weight, UAC, waist and hip circumferences, and skinfold thickness (in the triceps and subscapular regions).
- 3) Adults (aged >18 years): height, weight, UAC, waist and hip circumference, and skinfold thickness (in the triceps and subscapular regions).

2. Growth monitoring survey

Well-trained local health assistants conduct anthropometric examination according to the standard protocol (Weiner and Lourie 1981) on a weekly or biweekly basis.

Measurements:

- 1) Infants (aged 0–2 years, unable to stand-up independently): body length (in the lying position), weight, and upper arm circumference (UAC).
- 2) Children (aged 2–18 years): height, weight, and UAC.
- 3) Adults (aged >18 years): weight and UAC (The height of the adults is assumed to be stable).

3. Indicators and analyses

The three standard indices of physical growth that describe the nutritional status of children are defined as follows:

1. Height-for-age (chronic malnutrition)—Stunting
2. Weight-for-height (current malnutrition)—Wasting
3. Weight-for-age (chronic and current malnutrition)—Underweight

Stunting (Height-for-age) is a condition reflecting the cumulative effect of chronic malnutrition. Wasting (Weight-for-height) is defined as failure to gain weight in relation to the height. This can occur as a result of recent illness that causes a sudden loss of appetite and subsequent loss of muscle and fat in a child. In fact, this is a short-term effect. Underweight (Weight-for-age) is defined as low weight in relation to the age. It is a composite index for weight-for-height and height-for-age; thus, it does not distinguish between acute malnutrition (wasting) and chronic malnutrition (stunting). A child may be regarded as underweight for his/her age because he/she shows growth stunting, growth wasting, or both. Therefore, weight-for-age is a good overall indicator of the nutritional status of a population.

A number of indicators have been developed to express the various types of malnutrition that affect growth of children. However, those selected for this survey are the most commonly used indicators. According to the recommendations by the World Health Organization (WHO 1983, 1995), the nutritional status of children will be compared with an international reference population (Kuczmarski et al 2002) defined by the U.S. National Center for Health Statistics (NCHS) and accepted by the U.S Center for Disease Control (CDC).

4. Expected outcomes

- General nutritional status of children and adults as compared to the international reference population.
- Growth retardation during seasons of drought and periods of food shortage.
- Inter-household variations in the nutritional status and growth level of children during both normal and drought/food shortage periods.
- Identification of high-risk gender and age groups.
- Associations between the coping strategies/socio-economic status of the household and the

nutritional status and growth of the child.

-Development of a national standard growth curve in Zambia.

5. Potential issues

-Building growth and nutritional status monitoring system

-Hiring and training of local health assistants

-Procurement of equipments for anthropometric measurements: stadiometer, scale, and measuring tape (one each for a village)

-Batteries for digital scales (preferred to beam scales)

-The types of equipments used during ZDHS and/or LCMS?

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