Monitoring child growth: challenges and findings from the Nairobi Urban Health and Demographic Surveillance System (NUHDSS)

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Background

Inappropriate feeding practices, nutritional deficiencies and growth faltering of infant and children, coupled with recurrent episodes of infections are one of the main public health concerns in developing countries. Poor nutrition contributes to about 53% of deaths associated with infectious diseases among children aged under five in developing countries. Children bear a disproportionate burden of the urban health crisis as emerging evidence demonstrates that urban poor children exhibit poorer health and nutritional outcomes than children from better-off urban households or even those from rural areas. The goals of this study are 1) to document the challenges and lessons learnt in collecting longitudinal child anthropometric data; and 2) describe child growth patterns in poor urban communities.

Methods

This research uses data from a Maternal and Child Health project being implemented in the informal settlements of Nairobi, Kenya since January 2007. From the demographic surveillance system, all women who give births are enrolled in the project and administer a questionnaire which includes anthropometric measurements of their children. The children are then followed up every four months for a period of three years. Height-for-age, weight-for-age and weight-for-height z-scores are computed using the WHO/NCHS reference.

Preliminary Results

Preliminary data from the first three rounds show that about 28% of children had low birth weight. Among children with low birth weight, only 34% were able to catch-up after a period of eight to 12 months.

Sample description

Table 1. Sample size

	Survey 1 (02-05/07)	Survey 2 (07-09/07)	Survey 3 (11/07; 03-05/08)	Survey 4 (06-08/08+)	Survey 5 (09-12/08)
Cohort 1	632	489	**327**	233	
Cohort 2		460	346	**258**	
Cohort 3			932	694	**Number**
Cohort 4				972	
Total	632	949	1,605	2,157	

Table 1 shows the number of children that were surveyed during the four rounds of data collection. The figures in bold indicate the number of children to be included in the analysis-after 3 visits of follow-up.
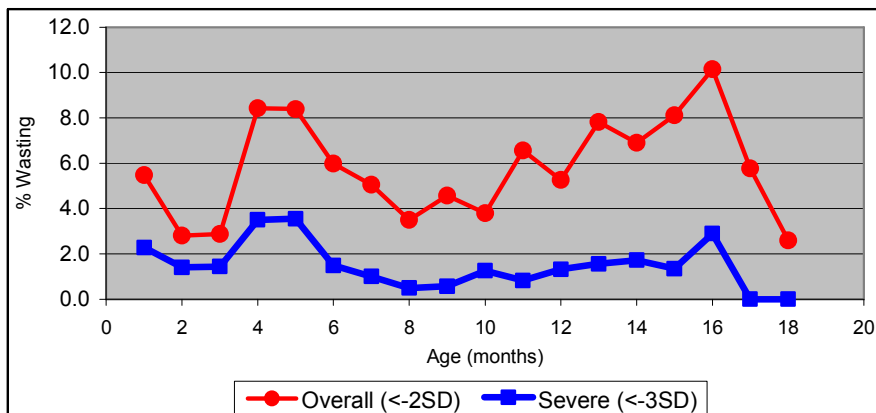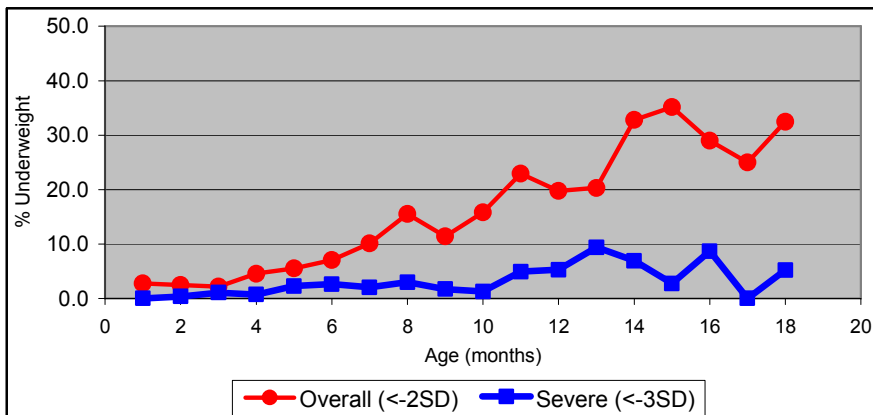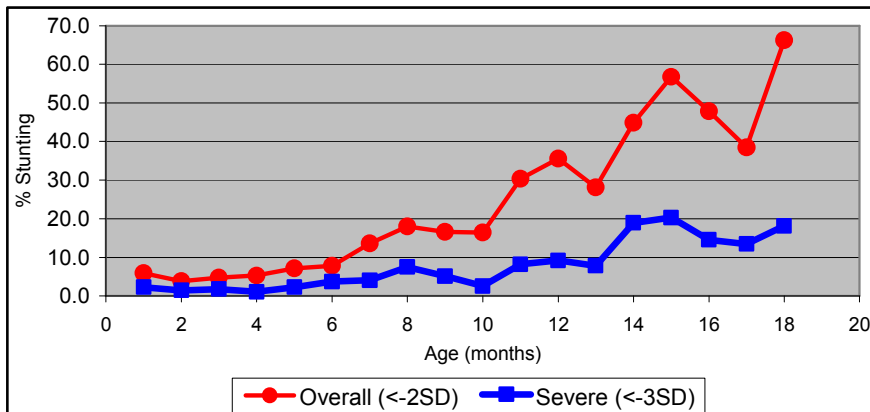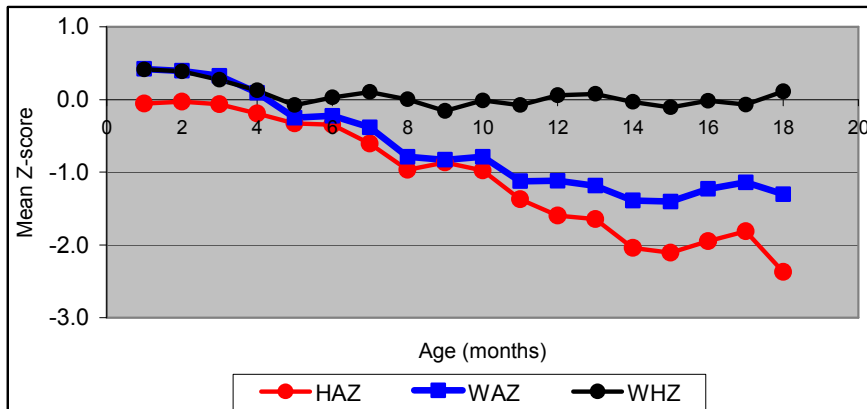
Table 2. Mean nutritional indices and prevalence of malnutrition

		Round 1 N=632	Round 2 N=327	Round 3 N=282
Height-for-age Index	Mean Z-score	+0.06	-0.85	-2.15
	% Stunting	3.8	14.6	52.7
Weight-for-age Index	Mean Z-score	-0.06	-0.64	-1.32
	% Underweight	4.9	11.6	29.5
Weight-for-height Index	Mean Z-score	-0.39	+0.04	-0.03
	% Wasting	11.2	3.4	6.2

Table 2 shows the prevalence of malnutrition among the children under study using the

preliminary figures (632, 327 and 282 at the various rounds of data collection)

Growth curve

The Graphs below show 1) the mean z-scores by age for the three malnutrition variables; 2) the percentage of stunting (overall and severe) by age; 3) the percentage of underweight (overall and severe) by age; and 4) the percentage of wasting (overall and severe) by age.

Mean Z-score

1.0

0.0

-1.0

-2.0

-3.0

Age (months)

— HAZ — WAZ — WHZ

70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0

% Stunting

Age (months)

— Overall (<-2SD) — Severe (<-3SD)

50.0
40.0
30.0
20.0
10.0
0.0

% Underweight

Age (months)

— Overall (<-2SD) — Severe (<-3SD)

12.0
10.0
8.0
6.0
4.0
2.0
0.0

% Wasting

Age (months)

— Overall (<-2SD) — Severe (<-3SD)

Conclusion

Designing and implementing a longitudinal program to monitor child growth in urban poor areas is feasible and can be used a tool to identify children at risk of death.