The nutritional status of children living in institutionalized care with control charts and funnel plots for program monitoring.

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Context and Objectives

Upward of 9.42 million children live within institutionalized care worldwide.

This retrospective analysis aimed to describe the nutrition-related epidemiology of children living within institutionalized care and explore the use of control charts and funnel plots for program monitoring.

Methods

Records from 2,926 children, 0-18 years old in 6 countries were analyzed.

Data collected included information on age, sex, anthropometry, disability status and hemoglobin. Shewhart control charts and funnel plots were used to explore inter-site and over-time variations in nutritional status.

Results

Baseline screening found:

- Disabilities: 739 (25·3%)
- Low birth weight: 514 (57.5%)
- Prematurity: 294 (42·2%)
- Anemia: 717 (28.8%)
- Wasting: 212 (12·6%)
- Stunting: 1048 (37·3%)
- Underweight: 788 (34·1%)
- Overweight or obese:135 (12%)
- Small head circumference: 339 (31%)
- Children with disabilities had higher prevalence of malnutrition compared to counterparts without disabilities. All children had higher malnutrition when compared to global prevalence.
- There was inter-site variation.
- Funnel plots show sites with malnutrition prevalence outside expected limits for this specific population taking into consideration natural variation. Control charts highlight changes in site mean z-scores over time in relation to population control limits.

Conclusions

- Malnutrition is prevalent among children living in institutional-based care, including stunting, underweight, anemia and wasting.
- Underlying risk factors are more common than global prevalences: low birth weight, prematurity and disability.
- When exploring inter-site variations in malnutrition prevalence, disability should be accounted for by using disability-specific control charts.
- Control charts and funnel plotspresent useful data to site staff and managers as sites outside of control limits, taking natural variation into account.

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Competing Interests

None

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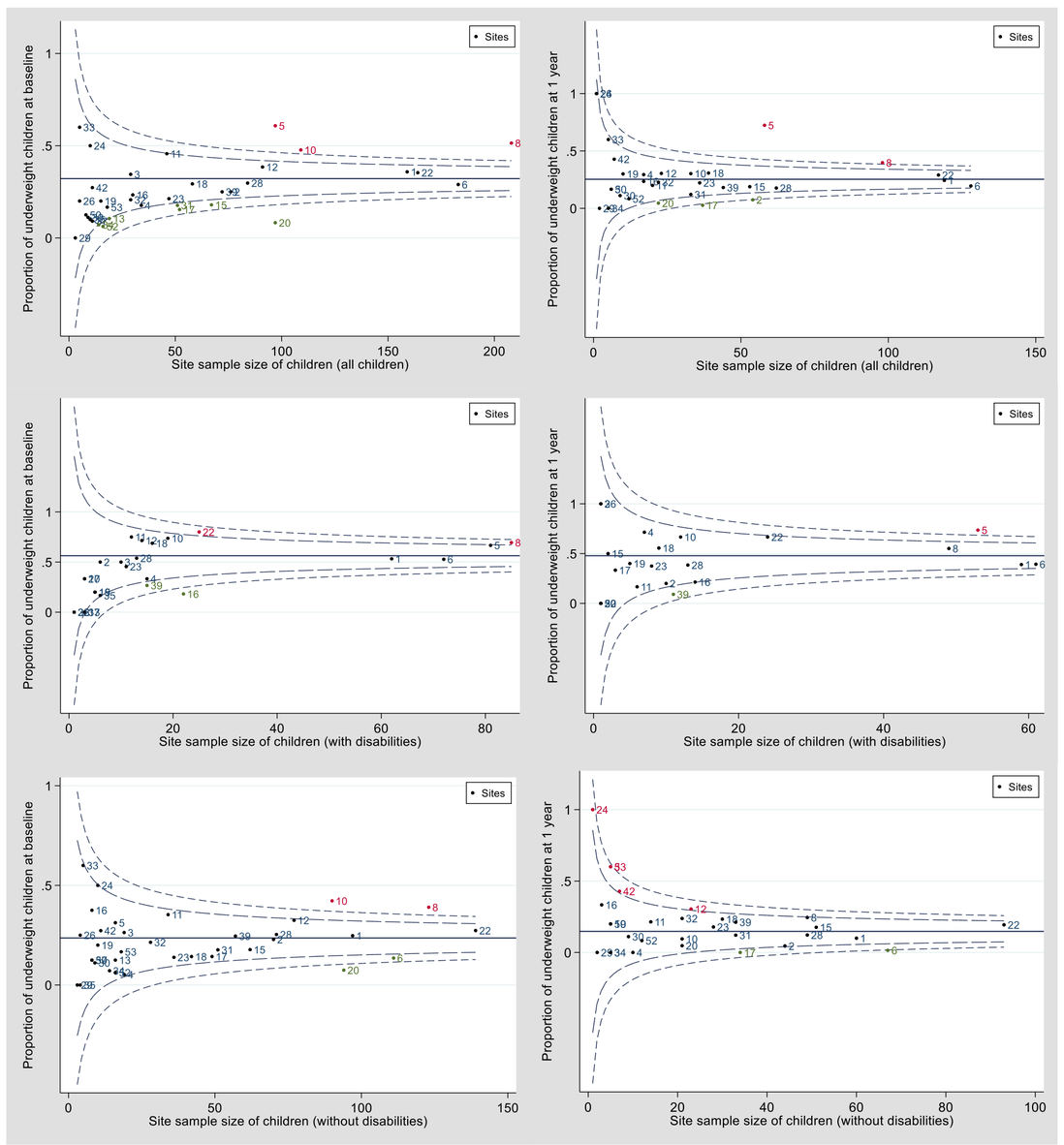

Figure 1: Funnel plots of proportion of underweight children (WAZ), 0-10 years at baseline (left side panels) and 1 year (right panels) for all children (top row), children with a disability (middle row) and those without disability (bottom row).

Site: 1 **Site: 6**

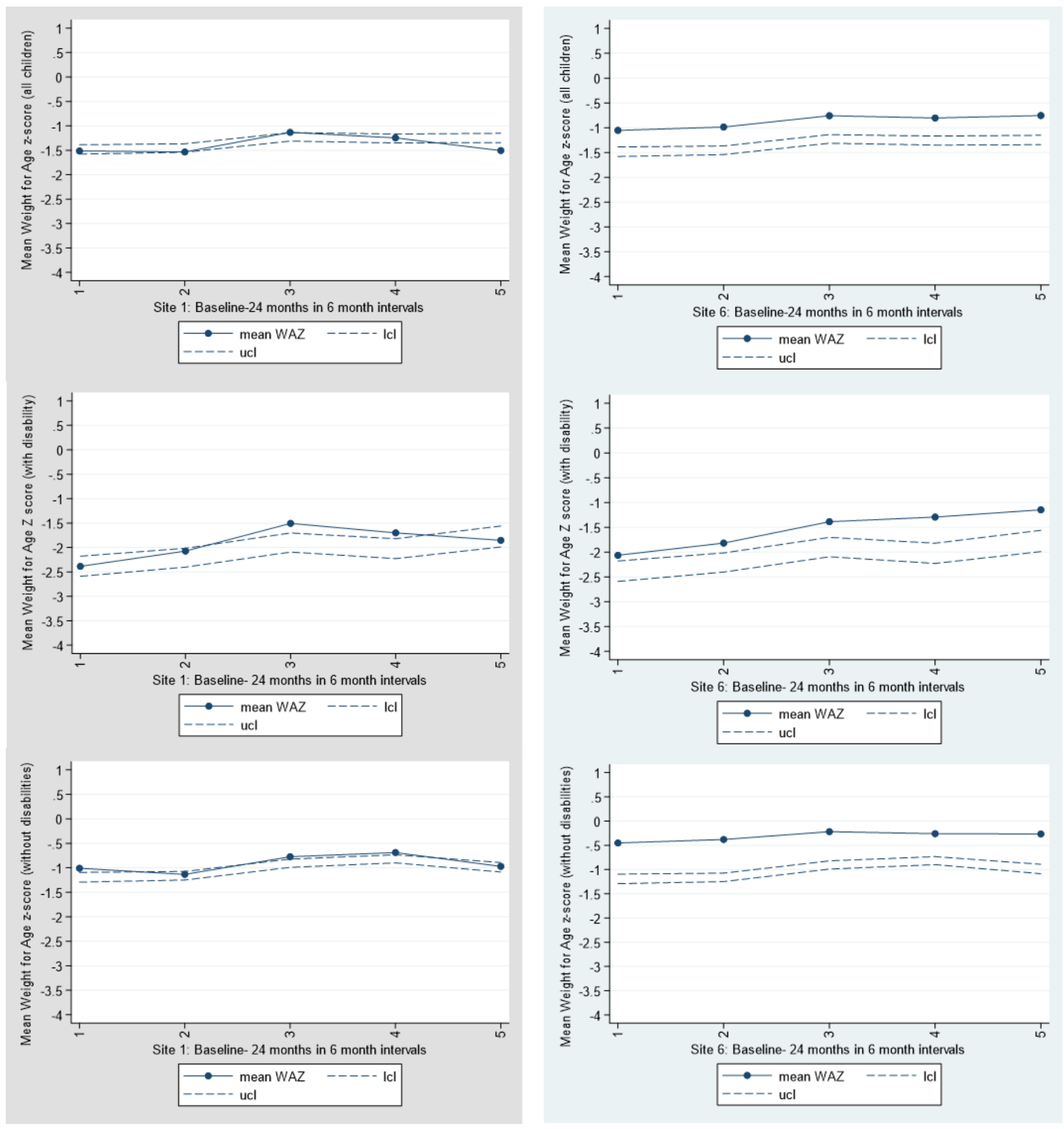

Figure 2: Individual site control charts showing mean WAZ for children 0-10 over time. Left panels (site 1) illustrate 'average' performance (site 1) and right panels (site 6) show 'above-average' performance. The top row shows all children; the middle row shows those with disability; and the bottom row shows those without disability.