

# Early linear growth retardation: results of a prospective rotavirus vaccine cohort of Zambian infants

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## Background

Linear growth retardation is the most dominant nutritional problem globally. We aimed to describe linear growth trajectory among infants under 2 years of age using the WHO growth velocity standards.

## Methods

This was a prospective cohort study of infants enrolled at 6 weeks of age and followed up for up to 24 months in Kamwala Urban Health Centre, Lusaka, Zambia. The study was conducted between April 2013 and March 2015. Infants were enrolled if they were 6–12 weeks of age and the mother was willing to participate voluntarily and provided informed consent. Anthropometric data were collected at scheduled clinic visits at 1 month, 2 months, 3 months, then quarterly until the infant was 24 months old. We defined linear growth velocity as the rate of change in height. We estimated linear growth velocity as the first derivative of the penalized cubic spline mixed effects model.

## Results

A total of 338 children were included in the analysis. Of these, 185 (54.7%) were female, 115 (34.1%) were born to HIV positive mothers and thus classified as HIV Exposed (HE). The mean age of children at enrollment was 1.6 months (SD = 0.15). On average, the growth velocity for 3-month length increments conditional on age were 0–3 months = 2.97 cm/3mo (95%CI = 2.69, 3.25); 3–6 months = 2.62 cm/3mo (95%CI = 2.38, 2.87); 6–9 months = 1.57 cm/3mo (95%CI = 1.43, 1.71); 9–12 months = 1.18 cm/3mo (95%CI = 1.08, 1.28); 12–15 months = 1.14 cm/3mo (95%CI = 1.02, 1.27); 15–18 months = 0.87 cm/3mo (95%CI = 0.79, 0.96); 18–21 months = 0.80 cm/3mo (95%CI = 0.72, 0.89); and 21–24 months = 0.86 cm/3mo (95%CI = 0.77, 0.96). For both boys and girls, the growth velocity in our cohort were consistently below the 3rd percentile of the WHO linear growth velocity standard. The estimated mean height and the age at which growth begins to falter were 68.6 cm (95%CI = 68.0, 69.2) and 13.6 months (95%CI = 13.2, 14.1) respectively.

## Conclusion

We found slower rate of growth among otherwise healthy Zambian infants. The data suggests that growth retardation is universal and profound in this cohort and may have already been occurring in utero.