

## **A Longitudinal growth study of weight among Lodha and Non-Lodha infants and young children of Lodhasuli, West Bengal, India**

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### **Abstract**

This is the first community based longitudinal study among the Lodha tribals and non-Lodha children of Lodhasuli, West Bengal, India. The objective of the present longitudinal growth study was to compare the growth in weight of Lodha (tribal) children with the non-Lodha children of two different nearby villages of Midnapore. The weight of 44 boys and 55 girls, from poor-class families in tribal and rural part of the Lodhasuli, Midnapore, were taken at one month interval over periods of up to 24 months. Independent sample t-test were used to compare the weight between sex and caste. Significant differences ( $p < 0.001$ ) in weight among both boys and girls were observed. Significant deviations ( $p < 0.001$ ) in weight were also observed from the NCHS data.

### **Introduction**

Children are most vulnerable to the effects of malnutrition in infancy and early childhood. Infants and young child's physical growth refers to the increases in weight and other body changes that occur as a child matures. This stage is the most crucial and critical phase of growth. The first year of an infant's life is a time of astonishing change. During this time, a baby will grow rapidly. On average, babies grow tripling their birth weights by their first birthday. No child grows at a perfectly steady rate throughout this period of childhood. However, the prevalence of underweight among children in India is amongst the highest in the world, and nearly doubles that of Sub-Saharan Africa. Most growth retardation occurs by the age of two, and is largely irreversible. Underweight prevalence is higher in rural areas (50 percent) than in urban areas (38 percent); higher among girls (48.9 percent) than among boys (45.5 percent); higher among scheduled castes (53.2 percent) and scheduled tribes (56.2

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percent) than among other castes (44.1 percent); and, although underweight is pervasive throughout the wealth distribution, the prevalence of underweight reaches as high as 60 percent in the lowest wealth quintile. Moreover, in a country where undernutrition is so widespread, the consequences of undernutrition go well beyond the individual, affecting total labor force productivity and economic growth. India's prevalence of underweight (47%) compares to Bangladesh (48%) and Nepal (48%), but is much higher than all other countries within South Asia and far higher than the averages for other regions of the world (World Bank 2009). There exists paucity of longitudinal growth studies among the infants and young children in India. This study is the first longitudinal community based study to enable us the Lodha tribal children and non- Lodha children of same area.

The objective of the present study was to compare the weight of Lodha (tribal) children with the Non- Lodha children of Lodhasuli, Paschim Midnapore.

### Materials and Methods

The Lodhas are a traditionally hunting-gathering community, clinging to archaic mode of production and belonging to Primitive Tribal Group (P.T.G) even after the fifth plan, due to their pre-agricultural habits and low literacy. They are mainly nomadic food gatherer in the jungle tracts of Midnapore (Debnath 2003). Lodha constitutes 84,966 (1.9 %) of the total Scheduled Tribal population of West Bengal (Census of India 2001). The total Scheduled Tribal population of Paschim Medinipur is 7, 72,177 (14.87 %) of which Lodha constitutes 60,136 (7.79 %) of the total Scheduled Tribal population of the District (Paschim Medinipur District Profile 2001).

This longitudinal community based study was conducted in the villages of Lodhasuli, Paschim Medinipur district, about 129 km from Kolkata city, the provincial capital of West Bengal. This study was taken at every month over periods of up to 24 months from 2008 and 2010. A total of 99 (Lodha boys=17, Lodha girls= 33, non-Lodha boys= 27 & non-Lodha girls= 22) young children aged 0-24 months were measured. Parents were informed about the objectives of the study and their consent was obtained. The study protocol was approved by the institutional ethical committee. Information on age, gender and weight was collected on a pre-tested questionnaire by house to house visit following interview and examination.

Anthropometric measurement (weight), were made by a trained investigator (NS) according to standard procedures (Tanner 1969). Weight were measured by a in the nude to the nearest 10g on infant beam balance. The balance was calibrated before the start of each day's measurements. Children were compared with the reference population (Hamill et al. 1979). Analyses were done using SPSS 16 software. Student's t-test were undertaken to test for sex and caste difference.

### Results

Table 1 shows the mean, standard deviation and t-test of the Lodha (tribal) and non-Lodha infants of Lodhasuli, West Bengal. It has been revealed that Non-Lodha boys and girls had greater means in all 24 months then Lodha boys and girls despite of their close residence. There existed significant ( $p<0.001$ ) caste difference at all ages and at age 1 months (significant difference,  $p<0.01$ ) in weight, except at age 4 months there was no significant difference observed among boys. Similarly significant difference ( $p<0.001$ ) at all ages and at age 6

months (significant difference,  $p < 0.01$ ) among girls were observed. Maximum weight gain among the Non-Lodha boys were observed at age 0 - 1 & 1 - 2 months (0.61 kg) and among Non-Lodha girls at age 2 -3 months (0.58 kg). Similarly, minimum weight gain were observed among the Non-Lodha boys were observed at age 18 -19 months (0.08 kg) and among girls at age 22 – 23 (0.05 kg). However, maximum weight gain among the Lodha boys were observed at age 1 - 2 months (0.53 kg) and among girls at age 3 - 4 months (0.58 kg). Similarly, minimum weight gain were observed among the Lodha boys at age 19 – 20 months (0.09 kg) and among girls at age 19 – 20 months (0.09 kg).

Figure 1 highlights the comparative sex and caste differences in mean weight among Lodha and Non-Lodha infants. It is clear that Non-Lodhas were significantly heavier than Lodhas at all ages. It is also evident from figure 1 that the Lodha boys were lighter than their female counterpart in all ages except for ages 1 to 3 months.

### **Discussion**

The present study is limited by its anthropometric measurements and its ethnic groups. While comparing this data with the reference population (NCHS 1979) it was revealed that the studied ethnic groups had very less mean weight (kg) than the reference data. More precisely, both Lodha boys and girls were much lighter than the standard reference values at all ages in this study. These results may therefore only be representative of two small communities and not representative of the state or country. To obtain a wider representation we suggest that more longitudinal studies involving more numbers of measurements viz., height, MUAC etc among infants and young children from different parts of India be undertaken. Such studies would allow us not only to understand the exact rate of change of growth but also to the make appropriate comparisons worldwide.

### **Conclusion**

The ethnic based method of analysis of longitudinal data presented above revealed a considerable differentiation of community growth patterns and the variability in weight velocity during the early growth period, in particular during infancy and early childhood.

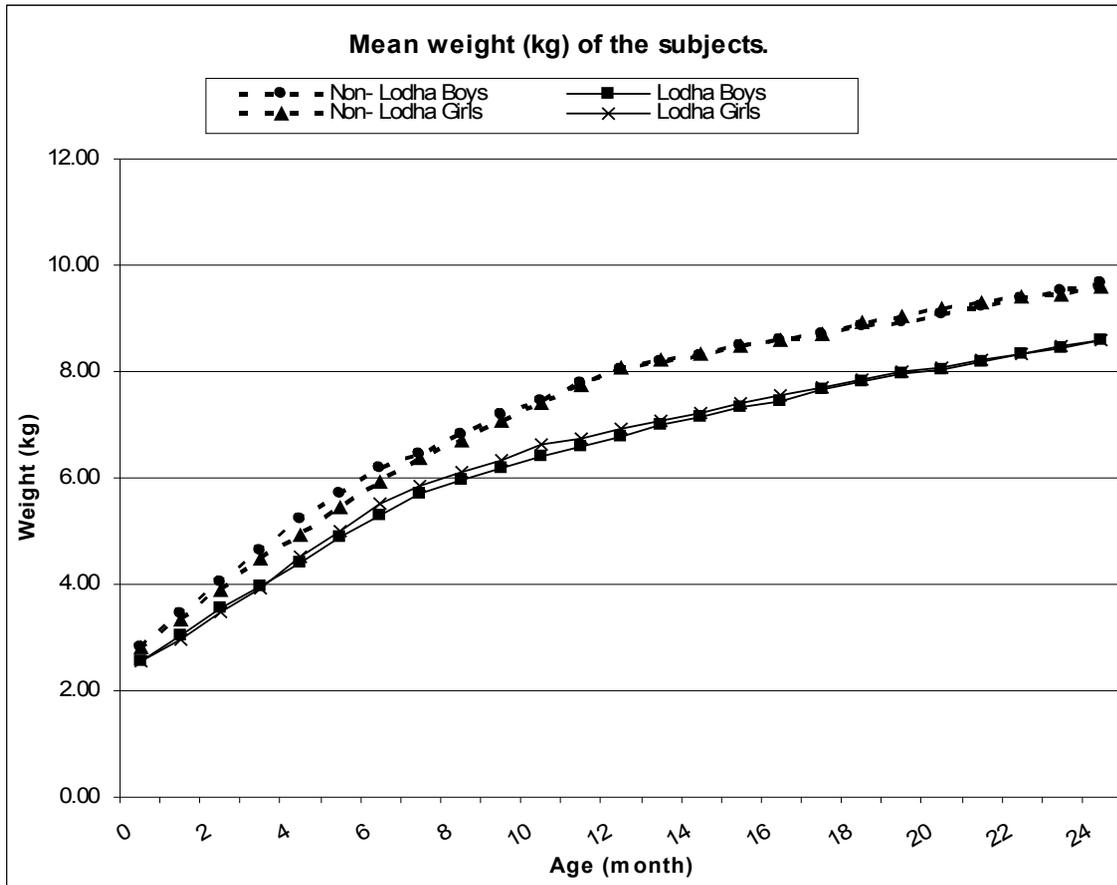
**Table 1: Mean (sd) of mean weight among Non-tribal and Lodha infants and young children.**

Age (months)	Boys		Girls	
	Non-Lodha	Lodha	Non-Lodha	Lodha
0	2.83 (0.40)	2.57 (0.25)**	2.82 (0.32)	2.57(0.22) ***
1	3.44(0.43)	3.02(0.30)***	3.33(0.38)	2.97(0.21) ***
2	4.05(0.40)	3.55(0.37)***	3.88(0.35)	3.47(0.34) ***
3	4.64(0.50)	3.98(0.35)***	4.46(0.41)	3.94(0.22) ***
4	5.24(0.53)	5.07(2.58)	4.92(0.39)	4.52(0.31)***
5	5.71(0.62)	4.90(0.45)***	5.44(0.39)	4.99(0.37)***
6	6.17(0.76)	5.31(0.43) ***	5.91(0.60)	5.52(0.49)**
7	6.46(0.70)	5.71(0.51) ***	6.36(0.53)	5.85(0.50)***
8	6.81(0.67)	5.96(0.53) ***	6.71(0.49)	6.31(0.54)***
9	7.18(0.66)	6.20(0.57) ***	7.08(0.52)	6.35(0.58)***
10	7.46(0.66)	6.41(0.67) ***	7.41(0.52)	6.61(0.58)***
11	7.80(0.56)	6.59(0.71) ***	7.73(0.46)	6.74(0.60)***
12	8.03(0.51)	6.79(0.76) ***	8.06(0.45)	6.92(0.61)***
13	8.17(0.51)	7.00(0.69) ***	8.21(0.47)	7.09(0.58)***
14	8.31(0.51)	7.16(0.66) ***	8.33(0.39)	7.23(0.55)***
15	8.48(0.52)	7.34(0.68) ***	8.47(0.41)	7.39(0.52)***
16	8.60(0.46)	7.46(0.70) ***	8.60(0.43)	7.56(0.51)***
17	8.72(0.44)	7.68(0.71) ***	8.70(0.44)	7.69(0.53)***
18	8.86(0.48)	7.81(0.66) ***	8.93(0.47)	7.85(0.53)***
19	8.94(0.45)	7.95(0.65) ***	9.04(0.49)	7.99(0.59)***
20	9.06(0.55)	8.04(0.65) ***	9.17(0.50)	8.08(0.56)***
21	9.21(0.48)	8.18(0.59) ***	9.28(0.47)	8.21(0.55)***
22	9.35(0.48)	8.34(0.60) ***	9.40(0.47)	8.35(0.54)***
23	9.51(0.48)	8.44(0.64) ***	9.45(0.40)	8.48(0.55)***
24	9.65(0.51)	8.58(0.65) ***	9.60(0.41)	8.61(0.53)***

Standard deviations are presented in parentheses.

\*\* $p < 0.01$  Significant difference, \*\*\* $p < 0.001$  Significant difference.

Figure 1. Mean weight (kg) of the Lodha and non-Lodha infants.



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