

Creche Attendance and Child Anthropometric Outcomes: Evidence from a Multi-State Early Childhood Programme

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This paper examines whether attendance in full-day community creches is associated with improved nutritional outcomes among young children in rural India. Drawing on Monitoring and Information System data from creches supported by the Azim Premji Foundation in Bihar, Jharkhand, Odisha and Chhattisgarh, we analyse longitudinal weight and height records for ~11,000 children aged six months to three years. We exploit variation in age at entry and duration of exposure to trace weight-for-age and weight-for-height trajectories for children enrolled in these creches. At admission, children are substantially lighter and thinner than both WHO growth standards and children of the same age in the National Family Health Survey, 2019-21 (NFHS-5) from the same districts of APF creches. Fixed-effects regressions show that longer exposure is systematically associated with higher final weight with stronger associations for children who enter at younger ages. We find evidence of catch-up growth as well, with the median child gaining more than 300 grams in weight for each month spent in the creche.

JEL Keywords: I14 (Health and Inequality), I15 (Health and Economic Development), I38 (Welfare and Poverty), O15 (Human Development), J13 (Fertility; Family Planning; Child Care).

Introduction

Despite steady economic growth and improvements in service delivery in India, progress on reducing under-nutrition has been slow and uneven. The National Family Health Survey (NFHS-5) shows that 32.10% of children under five are underweight, 35.50% are stunted, and 19.30% are wasted with only marginal improvements over NFHS-4.¹ These aggregate figures mask the particularly vulnerable window of the first 1,000 days (from conception to age of two years) during which deficiencies in nutrition and care can permanently impair physical growth, cognitive development, and long-term productivity.

A large body of global evidence emphasises that interventions during this early period have the highest returns. Adequate breastfeeding, appropriate Infant and Young Child Feeding (IYCF) practices, complete immunisation, deworming, and safe sanitation all play interlocking roles in enabling good nutrition. However, achieving these outcomes depends critically on care and supervision. Feeding requires time, knowledge, and responsiveness to children's hunger cues. NFHS-5 shows that only 11% of children aged 6–23 months receive a minimum adequate diet, reflecting both the lack of access to diverse foods and the absence of consistent caregiver support, particularly for working mothers in low-income households.²

Social protection and early childhood interventions in India have historically been fragmented across age groups. The Integrated Child Development Services (ICDS) provides important nutrition, growth monitoring, referral and preschool services through Anganwadi centres. Although supplementary nutrition and growth monitoring are provided to all children under six, the ICDS programme's primary focus has been on children aged three to six years who attend the centre every day for preschool activities. Children under three years of age mostly receive take-home rations (THR), distributed

¹ Ministry of Women and Child Development. (2022, March 16). *Malnutrition among children* [Press release]. Press Information Bureau, Government of India. <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1806601>

² International Institute for Population Sciences, & ICF. (2021). *National Family Health Survey (NFHS-5), 2019–21: India* (Volume I). IIPS. <https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf>

once a month or fortnightly, alongside regular growth monitoring. However, studies from different parts of the country report persistent problems in the effective implementation of THR for this age group. The rations are often shared within the household and consumed by non-intended beneficiaries, which can dilute the nutritional benefit for young children (IGC, 2019; Nair et al., 2021). This gap created space for a more targeted programme that directly feeds these children with supplementary nutrition. Further, India also does not have a national creche programme which addresses the childcare needs of families. Most childcare is provided by mothers or other female relatives restricting their ability to participate in economic activities outside the household. School dropout among older female siblings has also been reported. The earlier public creche schemes as well as the few provided following the statutory requirements under various labour laws have also been focussed on urban areas.

Recognising this gap, piloting Anganwadi-cum-crèche models which extend full-day childcare services—including feeding, health monitoring, and stimulation—to infants and toddlers below three years was proposed under the Restructured ICDS during the 11th Plan (2007-12). While this scheme did not take off much, the PALNA scheme under Mission Shakti was announced in 2022 (MWCD, 2025). It integrates standalone creches from the erstwhile National Creche Scheme as well as Anganwadi-cum-creches under one umbrella with norms for creche workers and helpers, nutrition, space and so on. The government aims to open 17000 creches under PALNA by 2025.

During the last decade there has also been an expansion in creches being run by civil society organisations and state governments. Along with providing good quality childcare services, these creche interventions have also incorporated nutritional management as a core objective.³ Growth monitoring, targeted feeding and referrals have been some of the strategies used in these programmes. Prasad and Sinha (2015) describe the Action Against Malnutrition programme, a comprehensive community-based intervention in tribal blocks of Odisha, Jharkhand and Chhattisgarh that combines village creches for under-threes with participatory women's groups and efforts to strengthen ICDS and health services. Using longitudinal data on a cohort of 587 children aged 6–36 months attending creches, they report an increase in the share of non-wasted children from 72% to 80% and a reduction in SAM from 8% to 4% over 4–6 months, with 85% of severely wasted and 67%

³ Mobile Creches and Jan Swasthya Sahyog have made substantial contributions in this area; further information is available at their respective websites (mobilecreches.org and jssbilaspur.org).

of moderately wasted children improving by at least one WHO category. The authors stress, however, that these are preliminary data from the most intensively treated area, with no comparison group, limited external validity, and potential confounding from age, seasonality and secular trends, as well as measurement issues in anthropometry.

Gope et al (2019) evaluate the same programme in rural Jharkhand and Odisha using a quasi-experimental design for children aged 6–36 months. They find that the intervention with creches reduced wasting by 27%, underweight by 40%, and stunting by 27%, with particularly large effects among Adivasi and the poorest households, alongside improvements in infant and young child feeding, infection-control practices and service uptake. Yet their reliance on self-reported behaviours raises concerns about social desirability bias, and purposive placement of creches in poorer, more tribal areas means that residual selection bias and unmeasured seasonal or secular changes cannot be ruled out. Kadiyala et al (2021), in the UPAVAN cluster-randomised trial in rural Keonjhar (Odisha), show that nutrition-sensitive agriculture interventions delivered through women’s self-help groups with Participatory Learning and Action meetings can improve child and maternal dietary diversity, but do not translate into reductions in wasting or gains in maternal BMI over a 32-month period; they note that dietary outcomes are self-reported and that simple diversity scores only approximate micronutrient adequacy. More recently, Alim et al (2025) use qualitative work with parents, frontline workers and policymakers in Bangladesh to examine perceptions of community-based management of acute malnutrition, documenting broad support for NGO-led CMAM with specially formulated foods and nutrition counselling, but also persistent constraints related to staff shortages, weak government ownership and the absence of specially formulated foods from national guidelines.

Our paper contributes to this literature by studying the creche programme run by the Azim Premji Foundation, which provides supervised feeding and regular growth monitoring to children aged six months to three years, at scale. We analyse administrative and monitoring data on more than 11,000 children enrolled across multiple states in India, with repeated anthropometric measurements to track and manage their growth status. Unlike earlier studies based on small cohorts, short follow-up or self-reported practices, we focus on objective measures of weight and height collected routinely in programme settings, examine transitions across WHO malnutrition categories, and exploit the large scale and routine nature of the intervention to assess how creches function when embedded in regular service delivery rather than in tightly controlled pilots. Although the

programme is not randomly assigned, we take advantage of the staggered entry into creche by age, which generates natural variation in exposure to the programme across children. This allows us to study the association between time spent in creche and child health in a way that has not been possible in earlier work that lacked comparable variation in entry age and duration of participation. In doing so, we address several concerns raised in the earlier literature about limited sample size, short duration of observation, lack of programme-scale evidence and reliance on self-reported behaviours.

In this paper, we examine how such creche programmes could contribute to early child nutrition. While we do not have a control group, which limits identification and inference, we use staggered entry and varying duration of stay to explore how length of exposure to creche services correlates with child growth.

All these creches have a strong nutrition component and a common Monitoring and Information System (MIS) that records children's anthropometric outcomes. At the creche, children receive three meals a day, six days a week. Each child is subject to monthly observation of weight and quarterly measurement of height. Taking the analysis further, we find that, in almost all states, earlier entry and longer attendance are associated with better weight-for-age and weight-for-height trajectories, particularly among children entering before age two. These results highlight the potential of creches as a scalable intervention to address India's persistent nutrition challenges.

The paper is set out as follows. We begin by describing the data and the intervention in section 2, before turning to our methods and results in section 3. We then summarize and conclude in section 4.

Section 2: The creche programme

The creche initiative examined in this study is part of a broader effort led by the Azim Premji Foundation in partnership with several civil society organisations. While the central mandate of the programme is to provide safe and nurturing spaces for young children with assured access to nutritious food, its benefits could extend well beyond nutrition. Full day childcare provision has the potential to support livelihood opportunities of mother - especially those in low - income rural households - by freeing time for paid work, accessing entitlements, and engaging more effectively with health and social protection

systems. For children, the structured environment of a creche offers opportunities for regular feeding, supervised hygiene, group play, and early stimulation. Together, these activities contribute to foundational motor, socio-emotional, and cognitive development, complementing the gains from improved nutrition.

At the time of writing (December 2025), 1,154 creches were operational across the four programme states. Our analysis uses data for 904 of these creches, corresponding to the centres for which the Azim Premji Foundation had complete MIS records. These creches serve 21,538 children, of whom 50.73 per cent are in Odisha, 27.42 per cent in Chhattisgarh, 20.35 per cent in Jharkhand, and 1.50 per cent in Bihar. Data on anthropometric outcomes for children during the period 1 June 2018 and 8 May 2025 have been used in this analysis⁴. Despite these constraints, the MIS provides sufficiently detailed longitudinal data to analyse weight-for-age (measured monthly), the core anthropometric outcome through which the programme's effects can be observed. For the analysis, we restrict the sample to 11,005 children after applying a series of data-consistency checks described in the appendix.⁵ These 11,005 children were weighed at least twice during their overall stay at the creche. These repeated measurements allow us to observe changes in weight during the period of creche attendance. These children were between six months and three years of age, which forms the target age group for the analysis.⁶ More details about this sample of children for analysis in this study is provided in Table 1. For each child, the MIS records basic demographic details (age, sex, date of entry, and location) along with anthropometric measurements - monthly weight and quarterly height- allowing for the construction of individual growth trajectories.

⁴ The MIS, while rich, has several limitations arising from missing and inconsistent records, impeding precise calculation of growth intervals. It appears in a non-trivial share of records: some children have multiple dates of birth, discrepant gender entries, or implausible sequences (e.g., measurement dates preceding birthdates). A small proportion of children fall outside the intended 6–36 months age range at admission, reflecting field-level enrolment practices. These are expected errors in MIS data and from the programme point of view it is observed that data quality improves over time as field teams get better trained and used to the system. Precise information on these inconsistencies is reported in Table A1 in the appendix section.

⁵ Please refer to the data consistency checks in Table A1 in the appendix section.

⁶ APF creche are intended to serve children between six months and three years of age. In practice, however, local community demand means that creche sometimes admit children who fall outside this age range at the request of parents.

Measurements are more frequent for children flagged as nutritionally or clinically at risk, who receive weekly weighing and enhanced nutrition (Special Nutrition Care).

At the point of enrolment, children’s height and weight are assessed using WHO-based classifications and categorised as Severely or Moderately Underweight (SUW, MUW) and as Severe or Moderate Acute Malnourished (SAM, MAM) or “Normal” based on anthropometric indicators. Monthly weights are recorded and any faltering in growth is also monitored, irrespective of the child’s underweight status. Heights are measured on a quarterly basis. Children falling into “red flag” categories—severely underweight, wasted, or exhibiting signs of illness or growth faltering—are referred to Village Health, Sanitation and Nutrition Day (VHSND) services, Primary Health Centres, or Nutrition Rehabilitation Centres for additional clinical support. In the crèche itself, children identified as nutritionally vulnerable receive supplementary feeding, including more frequent feeding and extra oil, calibrated to their appetite and growth needs.

Table 1: Analysis Sample Description

Number of observations	61,291	Entry age category	Share of children (%)	State	Share of children (%)
Number of Children	11,005	6 to 12 months	24.61	Bihar	1.16
Number of creches	792	12 to 18 months	21.85	Chhattisgarh	40.1
Median weight at first measurement (kg)	8.5	18 to 24 months	20.02	Jharkhand	24.86
Median weight at last measurement (kg)	9.7	24 to 30 months	20.5	Odisha	33.88
Median age at first measurement (years)	1.6	After 30 months	13.02		
Median age at last measurement (years)	2.06				
Median time in creche (months)	3.75				
Girls in sample (%)	50.38				

Because the programme is operational rather than experimental, the analysis does not incorporate a control group. Instead, it exploits the variation in children's age at entry and duration of exposure to creche services. This approach is motivated by three considerations: (i) earlier entry, particularly before age two, coincides with the biologically critical period of initiation of complementary feeding and rapid growth; (ii) longer attendance increases cumulative exposure to structured feeding, hygiene oversight, and psychosocial stimulation; and (iii) repeated anthropometric measurements allow for modelling of within-child changes over time. Accordingly, our analysis examines whether children entering earlier, and staying longer, exhibit stronger catch-up growth.

It is to the analyses of these that we now turn.

Section 3: Results

Figure 1 presents the trajectory of median child weight-for-age, stratified by the age at which children first enroll in the creche. It plots weight-for-age z scores on Y axis against Age over x-axis. Across all entry cohorts, children entering the creche weigh less than these normative benchmarks. For reference, healthy children between 2.5 and 3 years typically fall within a weight range of approximately 12.7 - 14.3 kg.⁷ This indicates that a substantial proportion arrive already exhibiting signs of undernutrition relative to global standards. Table 2 shows that nearly one-third of children enter the creche moderately underweight and around one in seven are severely underweight, while about one in ten are moderately acutely malnourished and a smaller share meet the criteria for severe acute malnutrition. Taken together, these figures suggest that a sizable proportion of children are already undernourished at enrolment, relative to WHO weight-for-age and wasting benchmarks.

⁷ Department of Women and Child Development, Government of Odisha. (2021). *Assessment of growth in children*. https://wcd.odisha.gov.in/sites/default/files/2021-06/Takeaway_8_English.pdf. To compare figure 1 with WHO standards, the actual absolute weight is calculated back from weight-for-age z scores using appropriate WHO formula. At 2.5 years of age, the WHO median weight is 13.1 kg for boys and 12.5 kg for girls; the corresponding -1 SD cut-offs are 11.7 kg and 11.1 kg. At 3 years of age, the median weights rise to 14.3 kg for boys and 13.9 kg for girls, with -1 SD values of 12.7 kg and 12.2 kg, respectively. These absolute weight calculations are based upon the LMS method endorsed by the World Health Organization for generating ideal weight-for-age scores by sex of the child. <https://www.who.int/publications/i/item/924154693X>

Children who enroll earliest—between 6 months and 1 year of age—reach a median weight of 11.45 kg by age 3, positioning them just above the threshold for underweight status. In contrast, children whose entry is most delayed (2.5–3 years) attain a median weight of 10.78 kg at age 3, which falls below the underweight cutoff. Notably, a comparable risk of underweight status at age 3 is observed among children entering at any point between 1 and 3 years.

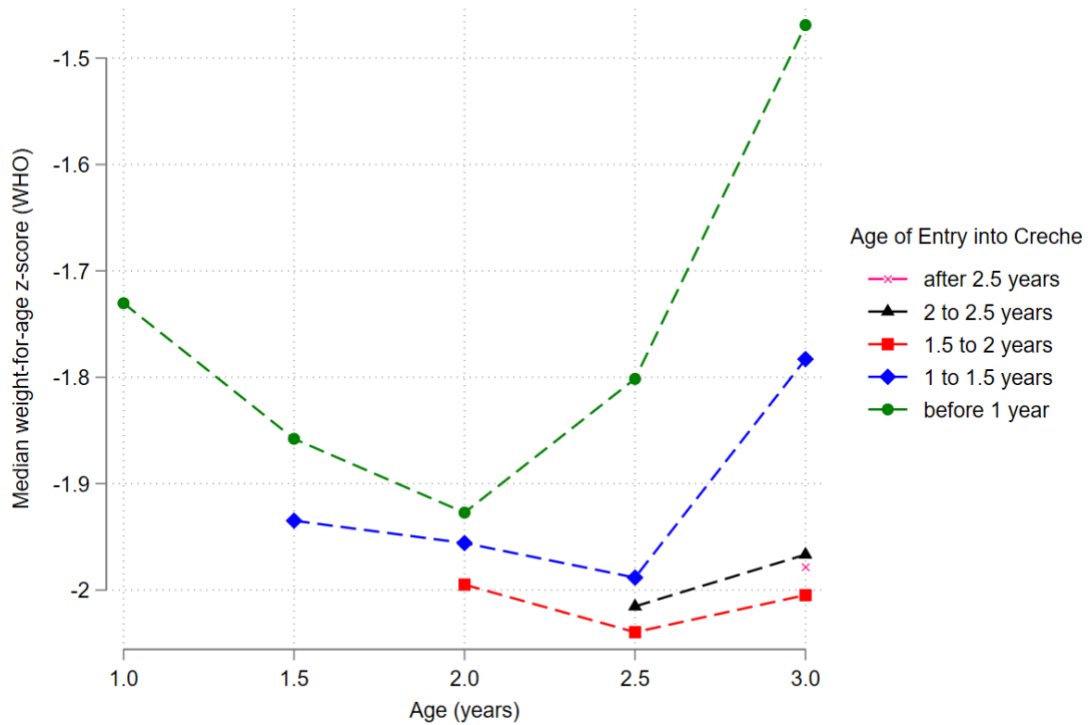
Taken together, these patterns indicate that earlier enrolment—specifically between 6 months and 1 year—may play a protective role in supporting catch-up growth and enabling children to reach a normal weight status by age 3.

Table 2: Undernutrition among Children at Entry into Creche

Anthropometric Category	Creche Children
Moderately Underweight (MUW)	31.59%
Severely Underweight (SUW)	15.14%
Moderately Acute Malnourished (MAM)	10.70%
Severely Acute Malnourished (SAM)	4.23%

Source: Authors' calculation from MIS dashboard of Creche run by APF

Figure 1: Average weight-for-age z-score by age at entry into creche, over time

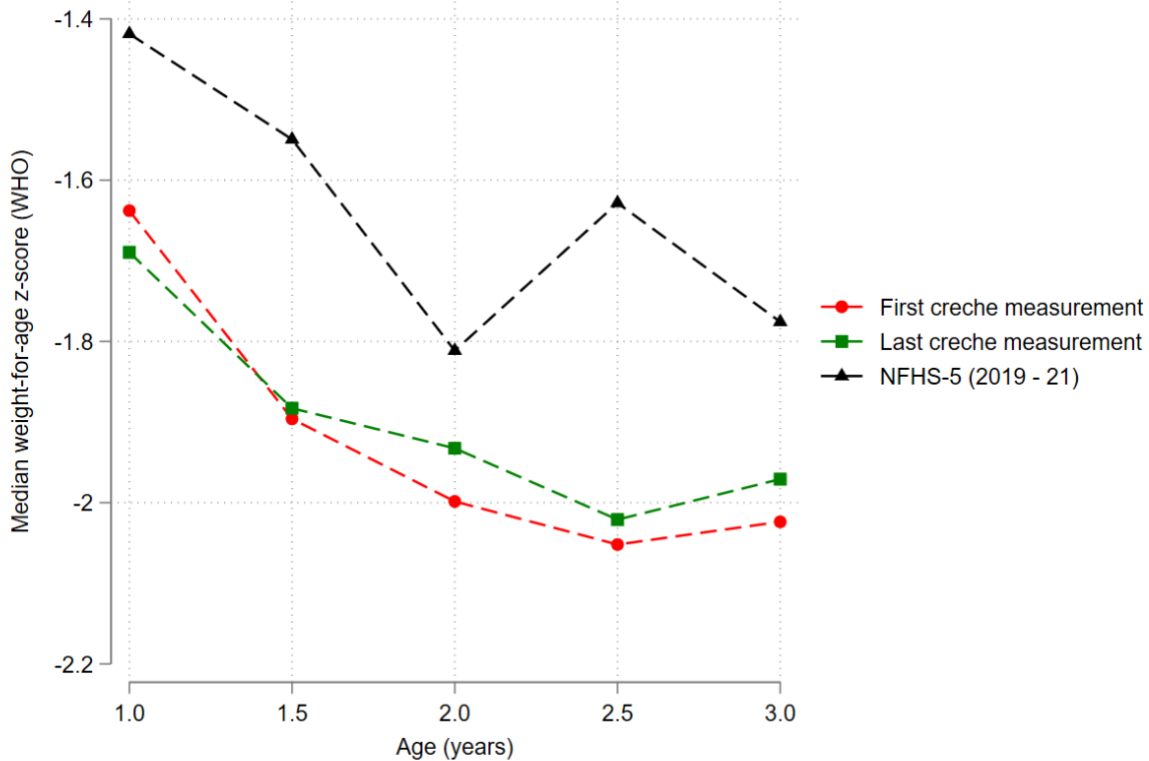


Source: Authors' illustration using MIS data from APF Creche

Figure 2 compares the nutritional status of children enrolled in APF crèches with that of rural children in the 2019–20 NFHS sample residing in the same districts. Across all age groups, children in the NFHS sample display higher weight-for-age z-scores than those enrolled in APF creches, indicating that the crèche population comprises a subgroup of children who begin with comparatively poorer nutritional status. In Figure 2, we have restricted the sample of NFHS-5 sample to the rural regions from same districts where APF is running the creches. This selection occurs against a backdrop in which Indian children in the NFHS already show substantial growth faltering relative to WHO standards over a prolonged period (Mamidi et al., 2011).

Despite this initial disadvantage, children attending APF creches exhibit consistent improvements in weight-for-age scores between entry and endline. Taken together, these patterns suggest both that APF crèches are serving children with greater nutritional deficits and that participation in the crèche is associated with meaningful gains in their weight status over time.

Figure 2: Average weight-for-age in APF creche and NFHS-5, over time



Source: Authors' illustration using data from MIS dashboard and National Family Health Survey, 2019-21.

We now turn to a more formal econometric estimation of the impact of duration of stay in the creche. Our estimates are, of course, correlational.

The association between the duration a child spends at a creche, and their subsequent weight is investigated using two closely related log-linear regression models, which are appropriate given the established non-linear nature of weight growth, particularly during early childhood. The general form of the models uses the natural logarithm of the child's weight at time t , with $\log(1 + W_{ict})$, as the dependent variable. We use two following equations to test the association between duration spent at creche and the weight of the child:

$$\log(1 + W_{ict}) = \beta_0 + \beta_1 \log(1 + M_{ict}) + \beta_2 \log(1 + A_{ict}) + \beta_3 \log(1 + W_{ic1}) + \beta_4 \text{Girl}_{ic} +$$

$$+ \sum_{k=1}^4 \gamma_k Cohort_{ik} + \lambda_{month(t)} + \mu_c + \epsilon_{ict} \text{ --- (1)}$$

$$\begin{aligned} \log(1 + W_{ict}) = & \beta_0 + \beta_1 \log(1 + M_{ict}) + \beta_2 \log(1 + A_{ict}) + \beta_3 \log(1 + W_{ic1}) + \\ & + \beta_4 Girl_{ic} + \sum_{k=1}^4 \gamma_k Cohort_{ik} + \sum_{k=1}^4 \delta_k [\log(1 + M_{ict}) \times Cohort_{ik}] + \\ & \lambda_{month(t)} + \mu_c + \epsilon_{ict} \text{ --- (2)} \end{aligned}$$

In these equations, W_{ict} is the weight of child i in Kg from creche c measured in visit t . M_{ict} is the month between visit t and first visit. We take this as a proxy for the time spent by a child at creche. β_1 is the main coefficient of interest in equation (1). A_{ict} is the age of the child in months. W_{ic1} is the weight of a child on their first visit in a creche. $Girl_{ic}$ take value 1 if the child is a girl and zero if the child is a boy. $Cohort_{ik}$ is a dummy for the entry-age cohort (with omitted base cohort consisting of children who entered creche between the age of 30 to 36 months. $Cohort_{ik}$ takes value 1 if the child enters creche between the 24 to 30 months, 2 if the child enters creche between 18 to 24 months, 3 if the child enters creche between 12 to 18 months, and 4 if the child enters creche before 12 months of age.

The growth in weight of a child over time is shown to be non-linear, especially in early childhood.⁸ The variable A_{ict} allow us to distinguish the association of time spent in the creche from the association of age with a child's weight growth. μ_c controls for all stationary features at the creche level (location, staffing, physical conditions, and so on) that may influence weight growth. The variable $\lambda_{month(t)}$ captures seasonality common across creches (for example, lean seasons and monsoon-related illness). This prevents seasonal patterns from being misattributed to time in creche. By interacting entry-cohort with months spent in the creche, we directly examine whether earlier entry into

⁸ World Health Organization. *Weight-for-age*. WHO. <https://www.who.int/tools/child-growth-standards/standards/weight-for-age>

creche is associated with greater subsequent weight gain among children. Clustering at the creche level allows for correlated growth patterns among children within the same facility, affecting the precision of the estimates without altering their magnitude.

Table 3: Months Spent at Creche, Time of Entry into Creche, and Weight Growth

Dependent variable: Natural log of weight measured at creche (in Kg)		
	Model 1: Same association across all entry age cohorts	Model 2: Different association by entry age cohorts
	(1)	(2)
Natural log of months spent in creche	0.039***	0.03***
	(0.002)	(0.002)
Natural log of Age of the child (in months)	0.12***	0.111***
	(0.008)	(0.009)
Natural log of Weight at first measurement (in Kg)	0.769***	0.769***
	(0.036)	(0.036)
Girl child	-0.008***	-0.008***
	(0.002)	(0.002)
Entry cohort (2 to 2.5 years) × Log months in creche		0.007***
		(0.002)
Entry cohort (1.5 to 2 years) × Log months in creche		0.011***
		(0.0024)
Entry cohort (1 to 1.5 years) × Log months in creche		0.0132***
		(0.002)
Entry cohort (before 1 year of age) × Log months in creche		0.012***
		(0.003)

Number of Observations	61,287	61,287
Number of Creche	792	792
Cluster level	Creche	Creche
Fixed Effect	Cohort, month-of-year, creche	Cohort, month-of-year, creche

Column 1 in table 3 assumes that the association between months in creche and weight is same for all children, regardless of the age at which they enter creche. The coefficient on the log of months in creche is 0.039. Holding age, initial weight, sex, creche and month-of-year constant, a 10% increase in months spent in the creche is associated with roughly a 3.9% higher weight.⁹ Referring to Table A2 in the appendix, a boy who enters the creche at around 18 months of age weighing 8.7 kg is predicted to gain about 375 grams per month in the creche, after accounting for age and other characteristics in regression model (1). A girl who enters at a similar age weighing 7.8 kg is predicted to gain about 346 grams per month under the same model. Relative to WHO child growth standards, boys and girls in our sample enter the creche at substantially lower than the median weight-for-age, yet over the next six months they gain around 2.25 kg and 2.08 kg respectively, compared with about 1.3 kg for a WHO reference child of the same age.¹⁰ These larger gains from a low starting point are consistent with partial catch-up growth among undernourished children enrolled in APF creches, rather than with normal growth among well-nourished children.¹¹

Column 2 in table 3 assumes that association between months in creche and weight vary across entry-age cohorts. The baseline coefficient on log months, 0.03, applies to

⁹ For log–log models, moving from M to 2M months changes $\log(\text{months})$ by $\ln(2)$. So predicted proportional change in weight due to doubling the months spent at creche = $0.039 \times \ln 2 = 2.7\%$. This approach can be used to estimate how doubling the months spent at creche is associated with child weight, both for the full sample and for each entry-age cohort.

¹⁰ Department of Women and Child Development, Government of Odisha. (2021). *Assessment of growth in children*. https://wcd.odisha.gov.in/sites/default/files/2021-06/Takeaway_8_English.pdf

¹¹ Department of Women and Child Development, Government of Odisha. (2021). *Assessment of growth in children*. https://wcd.odisha.gov.in/sites/default/files/2021-06/Takeaway_8_English.pdf. This growth chart is derived from WHO weight-for-age growth.

children who enter creche at 2.5 years or later. For children of this group, a 10% increase in months spent in the creche is associated with a 3% higher weight.

When we add interaction terms to the baseline coefficient, the association between months spent in the creche and weight becomes cohort specific. For children who enter creche between 2 and 2.5 years, the total elasticity is then about $0.007 + 0.03 = 0.037$. Among children who enter the creche between 2 and 2.5 years of age, a 10% increase in months spent in the creche is associated with a 3.7% higher final weight. The corresponding increase is 4.1% for children who enter between 1.5 and 2 years, 4.32% for those who enter between 1 and 1.5 years, and 4.92% for children who enter before their first birthday. Thus, the association between additional exposure to the creche and child weight is strongest for children who enter at younger ages. This continues to hold even after accounting for age, entry weight, sex, creche, and seasonality.

Conclusion

This paper examined the association between creche attendance and improvements in child anthropometric outcomes using administrative data from a large multi-state early childhood programme. Despite the absence of a control group and the descriptive nature of the analysis, several consistent patterns emerge that collectively underscore the potential value of creche - based interventions in addressing persistent undernutrition among young children in rural India.

First, the descriptive growth trajectories presented in Figures 1 and 2 show clearly that children enrolled in creches begin life at a substantial anthropometric disadvantage relative to population averages captured in NFHS-5. In every entry cohort and across all states, children entering creches weigh less and are more likely to fall in underweight or wasting categories at the point of enrolment. This suggests that creches are effectively reaching children with the greatest nutritional deficits—precisely those for whom additional care, supervision, and structured feeding may have the highest marginal returns.

Second, both median growth patterns and formal regression estimates indicate that earlier entry into the programme is associated with stronger improvements in nutritional status. Children who enter between six and twelve months of age exhibit the most

pronounced gains in weight-for-age and weight-for-height z-scores, and by age three they approach or surpass thresholds defining underweight status. This reinforces the well-documented importance of interventions during the first 1,000 days, a period during which growth faltering is most likely and most difficult to reverse. Creches represent one of the few institutional mechanisms capable of providing daily feeding and supervision to infants and toddlers—services that are typically unavailable through the ICDS system.

Third, duration of exposure matters substantially. Across states (except for Bihar, where sample sizes limit inference), the regressions consistently show that each additional month of creche attendance is associated with average weight gains of roughly 346 – 375 grams for the median child in creche.¹² These weight gains amplify further as children enter creche at earlier ages. Importantly, initial weight remains a strong predictor of weight over time, implying that children who start in the lowest categories require both sustained programme exposure and more nutrient-dense interventions to close the gap.

Taken together, these findings indicate that creches can serve as an important complement to existing early childhood and nutrition programmes by providing structured feeding, consistent caregiving, and regular health monitoring to children most vulnerable to undernutrition. Beyond their immediate nutritional impact, crèches generate a wider set of developmental and social benefits. By offering reliable full-day childcare, they release significant amounts of time for mothers - particularly those in low-income households - enabling greater participation in paid work, improved job stability, and enhanced ability to engage with social protection and health systems. These changes in household time allocation can have independent effects on income, food security, and caregiving practices.

Moreover, improvements in early nutritional status have far-reaching implications for children’s long-term well-being. Better weight-for-age and weight-for-height trajectories in early childhood are strongly associated with enhanced cognitive development, reduced morbidity, and improved school readiness, all of which contribute to higher human capital accumulation over the life course. By supporting catch-up

¹² This range applies to both girls and boys. As reported in the results section, an average boy in the creche gains about 2 kg and an average girl about 1.9 kg over six months of stay. This corresponds to a monthly gain of roughly 333 grams for boys and 316 grams for girls.

growth among severely and moderately malnourished children, crèches may therefore help mitigate the intergenerational transmission of deprivation and strengthen children's future educational and economic prospects.

These broader considerations underscore the value of integrating crèche services more systematically into India's early childhood development architecture. Strengthening nutritional protocols, expanding coverage, and embedding creches within local health and ICDS delivery systems could amplify their impact and provide a unified platform for delivering care, nutrition, and developmental stimulation.

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Table A1: Coverage and Internal consistency check for Creche MIS data

Number of children (all ages)	21,538
Number of Missing Child IDs	34
Number of creches	905
Number of visit-level observations	103,367
Share of children who were measured for weight just once	31.22%
Share of visit records with a measurement not done	21.71%
Share of visit records with date of measurement missing	12.20%
Share of visit records where a measurement is done but the date is missing	0.13%
Share of visit records with weight recorded as zero	22.44%
Share of visit records with height recorded as zero	52.08%
Share of visit records where the date of measurement precedes the recorded date of birth	1.79%
Share of visit records belonging to children with multiple recorded dates of birth	1.88%
Share of children measured more than once on the same day	2.14%
Share of children who entered the creche before 6 months of age	9.82%
Share of children who entered the creche after 3 years of age	15.16%

Note: In Table A1, more than half of all visit records show height recorded as zero. This pattern reflects how height is measured and entered in the MIS. Heights are measured quarterly rather than monthly; for visits between two quarterly rounds, height is entered as zero to indicate that it was not measured at that visit. In the MIS, a value of zero for weight similarly indicates that the child's weight was not measured on that visit.

**Table A2: Calculation for weight gain for a child
who stayed in creche for 6 months**

	Boy	Girl
Age at entry into creche (years)	1.43	1.47
Weight at entry into creche (Kg)	8.7	7.8
Median predicted weight after 6 months (Kg) in creche as per column 1 in Table 3	10.95	9.88
Weight gain over 6 months (Kg)	2.25	2.08
Average monthly weight gain (Grams)	375	346