



*Evidence for Action*



# **PARTICIPATION AND SCHOOL READINESS AT AGE 5 EVIDENCE FROM 3 INDIAN STATES**

**Report on Year 1, Strand A of the India Early Childhood Education Impact  
study, covering the period September 2011-December 2012**

**December 2013**

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## I INTRODUCTION AND OVERVIEW

### 1.1. Objective of this study

Extensive international research unambiguously concludes that quality early childhood education (ECE) programs have profound and long-lasting impacts on children's cognitive and character skills, with long-term impacts on education, health, and economic indicators.<sup>1</sup> In India, little information is available on scale regarding the facilities available for young children, children's participation in these facilities, the quality of the programs to which participating children are exposed, or the impacts of such exposure on children's development. Although India now has a national policy governing early childhood care and education which aims to "*promote inclusive, equitable and contextualized opportunities for promoting optimal development and active learning capacity of all children below 6 years of age,*"<sup>2</sup> planning appropriate interventions requires a careful examination of where young children are today and what needs to be done to achieve this goal.

This study proposes to fill some of the major gaps in our existing knowledge about young children in India. Its overall objective is to examine the nature of young children's participation in pre-primary facilities, and to explore the relationship between participation in these programs and children's school readiness. In subsequent phases of the study, the relationship between children's school readiness and their learning achievement in the early grades of primary school will be explored. Conceived as a five-year longitudinal study of a cohort of four year olds across three major Indian states, the study design consists of three strands:

- *Strand A* employs primarily survey methods of data collection to generate district level estimates of preschool participation, school readiness, and (in future years) early grade learning among children who were 3.5 to 4.5 years old at the time of the baseline visit.
- *Strand B* comprises an in-depth study of a subset of the full sample which aims to study variations across preschool settings in terms of a range of parameters and identify key factors that are associated with improved school readiness and early grade learning achievement.
- *Strand C* consists of a series of detailed case studies of selected early childhood education centres and programs.

The study is a collaborative effort between the Centre for Early Childhood Education and Development (CECED) at Ambedkar University and ASER Centre. Fieldwork and data analysis for Strand A is being conducted by ASER Centre, New Delhi, with support from UNICEF for Andhra Pradesh and Rajasthan and Sarva Shiksha Abhiyan (SSA) for Assam.

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<sup>1</sup> Cuhna, F., Heckman, J., et al (2005) *Interpreting evidence on Life Cycle Skill Formation* argues for investing in early childhood education as a means of ensuring (life) skills formation. Also see Heckman, J. et al (2010) *The rate of return to the High Scope Perry Preschool Program* which evaluates an early childhood intervention program in U.S.A targeted towards disadvantaged African-American children and finds evidence of long-term effect. Other studies have also shown positive impact of ECCE on children's social behavior such as reducing delinquency and criminality.

<sup>2</sup> Draft National Early Childhood Care and Education Policy, available at [http://wcd.nic.in/schemes/ECCE/National%20ECCE%20Policy%20draft%20\(1\).pdf](http://wcd.nic.in/schemes/ECCE/National%20ECCE%20Policy%20draft%20(1).pdf)

## 1.2. This report

This report presents the findings from Strand A of the first fifteen months of fieldwork for the study (September 2011-December 2012), during which four rounds of data collection were conducted. We attempt to answer two key questions: first, what trends are visible in the ECE participation of young children in the age group 3.5-4.5? And second, what are children's levels of school readiness, and how do these vary depending upon the nature of their participation in ECE programs? In both cases information on children's individual and household characteristics will be examined in order to see whether these have any relationship with the overall trends being discussed.

The analyses presented in this report are primarily descriptive and are intended to provide a picture of broad observed trends in these data. In the next phase of data analysis, more sophisticated statistical techniques will be employed in order to identify more precisely the nature of the relationships between children's individual and household characteristics on the one hand, and their ECE participation and school readiness on the other.

## 1.3. Methodology

### a. Sampling



This study is being conducted in three major states of India: Andhra Pradesh, Assam and Rajasthan (map). States were purposively selected to maximize variations in geographic location as well as demographic, socioeconomic and educational characteristics.

Within each state, two districts were purposively selected for inclusion in the study: Medak and Warangal in Andhra Pradesh, Dibrugarh and Kamrup in Assam, and Ajmer and Alwar in Rajasthan.<sup>3</sup>

*Selection of villages:* Within each district, a total of 60 villages with a population of between 2,000 and 4,000 persons were selected for the study. Given that the primary objective of this study is to examine the relationship between ECE participation and learning outcomes, sampling was deliberately restricted to larger villages in order to increase the likelihood of finding different providers of ECE facilities (and therefore variation in program content and processes) within a single village.

Villages were selected utilizing the following procedures:

- First, ten villages were purposively selected for inclusion under Strand B.<sup>4</sup> These were concentrated in between two and four blocks of each district.

<sup>3</sup> Of the two districts sampled in each state, one district had at least one better-known ECE program. This was added as a sampling criterion in order to ensure adequate variance in ECE content, quality and methods between districts.

<sup>4</sup> Criteria used for village selection are described in the report for Strand B of this study.

- Next, an additional fifty villages were selected for inclusion under Strand A. In order to ensure a representative sample at the district level, Strand B blocks were dropped while selecting the additional Strand A villages. For example, in Kamrup district of Assam, the ten villages purposively selected for Strand B were located in four blocks. Therefore, while sampling for Strand A, these four blocks were dropped and the fifty additional villages were selected from the remaining thirteen blocks.
- Systematic random sampling was utilized in order to ensure that at least one village was included from each block in the district.

*Selection of children:* Within each sampled Strand A village, the objective was to randomly select a total of fifty children in the age group of 3.5 to 4.5 years at the time of the baseline visit.<sup>5</sup> Children were selected using the following procedure:

- ICDS survey records maintained by Anganwadis in each village, which are expected to maintain up to date records of all children living in the catchment area of the Anganwadi, were used as the sampling frame for selection of children.<sup>6</sup>
- Field investigators first listed the Anganwadis operating in a given village and divided the target number of 50 children across these Anganwadis. For example, in a village with four Anganwadis, the field team was asked to randomly select 12 to 13 children of the required age from the ICDS survey records of each of the four Anganwadis.
- If the target number of children in this age group was not available in the records of an Anganwadi, additional children were selected in equal numbers from the records of other Anganwadis in the village, to the extent possible.
- In practice, despite the selection of larger villages for inclusion in this study, the target number of children (50 per village, or 2,500 children per district for Strand A) was not achieved. The final sample ranges from 1,390 children in Warangal (Andhra Pradesh) to 2,375 in Alwar (Rajasthan). In all, a total of 11,828 children were sampled under Strand A, as opposed to the envisaged total of 15,000 (See Appendix 1, Table 1).

#### *b. Tools and data collection*

**Table 1: Survey tools by field visit**

<b>Survey instrument</b>	<b>Visit 1</b> Sep - Dec 2011	<b>Visit 2</b> Feb – Mar 2012	<b>Visit 3</b> Jul - Aug 2012	<b>Visit 4</b> Oct - Dec 2012
Village information	✓			
Household survey	✓			
School readiness assessment	✓			✓
Child tracking	✓	✓	✓	✓
ECE rapid facility survey	✓	✓	✓	✓

<sup>5</sup> Field investigators were asked to select children whose recorded date of birth fell within a specified range of dates. Because the first round of fieldwork took about three months to complete, in practice, children who were sampled later in the process could have been up to 3 months older.

<sup>6</sup> In practice, states varied in terms of completeness of these records.

During the first year of the study (2011-12), sampled children were visited a total of four times, approximately once every three months (Table 1). The instruments used to collect data are described briefly below.

- *Village information questionnaire* (Visit 1). Provides basic information such as village population and number of households. It also records whether the village has access to basic amenities such as *pucca* roads, electricity, post office, banking services, etc. While the former information was obtained from the *sarpanch* (village head), the latter was recorded on the basis of the investigator's observation.
- *Household questionnaire* (Visit 1). Includes detailed information about the household, such as household members, demographic details, levels of education, primary sources of income, information pertaining to socioeconomic status, sampled child's participation in ECE programs. Overall, household information was collected for about 87% of sampled children,<sup>7</sup> with the highest proportion in Andhra Pradesh (95%) and the lowest in Assam (81%).
- *School Readiness Inventory* (Visit 1, 4). A School Readiness assessment<sup>8</sup> was administered to sampled children in Visits 1 and 4, which allows for an assessment of changes in children's school readiness during the course of one year and an analysis of the extent to which these changes are related to children's personal or household characteristics or to their participation in ECE programs. A total of 9,121 children were tested during the baseline visit and 9,936 during the endline visit a year later. Overall, 8,124 children were administered both baseline and endline school readiness assessments (69%), with some variation across states (Table 2).
- *Child tracking* (Visit 1, 2, 3, 4). The participation status of each sampled child was tracked during each round of fieldwork.
- *Rapid Facility Survey* (Visit 1, 2, 3, 4). Key aspects of infrastructure, staffing, enrolment, and availability of materials for children were observed in each ECE facility visited. If the centre was open and had children present during the survey visit, field teams also recorded basic information on the nature of the activities taking place and the attendance of sampled children during the visit. During Visits 1 and 2, all ECE facilities in the sampled village were visited, irrespective of whether sampled children were participating in them or not. During Visits 3 and 4, only those facilities where sampled children were participating were visited, whether within or outside the sampled village. Given that over the course of the four visits some centres ceased to exist, others opened, and sampled children moved from one facility to another, a total of about 55% of all centres were visited at least 3 times over the four visits.

A sample description for Strand A is summarized in Table 2 below; additional information on each domain (child, household, ECE centre and village) is provided in the appendices to this report.

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<sup>7</sup>In a number of instances, there is more than one child from a single household. Such households have not been double counted.

<sup>8</sup> The School Readiness Inventory was developed by the World Bank. For details, see [http://www.unicef.org/ceecis/Tool\\_7.pdf](http://www.unicef.org/ceecis/Tool_7.pdf). The tool is described in more detail in Section III of this report.

**Table 2: Sample Description - Strand A**

State	District	Visit 1						Children who were given both baseline and endline SRI test	
		No. of villages	No. of children	Children tested at baseline as % of sample	No. of HH surveyed	HHs as % of sampled children	No. of ECE centres visited	N	%
AP	Medak	51	1,477	76.5	1,835	95.0	210	1,265	65.5
	Warangal	51	1,031	74.2	1,310	94.2	266	931	67.0
	<b>Total</b>	<b>102</b>	<b>2,508</b>	<b>75.5</b>	<b>3,145</b>	<b>94.7</b>	<b>476</b>	<b>2,196</b>	<b>66.1</b>
AS	Dibrugarh	51	1,163	76.1	1,274	83.3	191	998	65.3
	Kamrup	50	1,662	72.0	1,829	79.2	349	1,450	62.8
	<b>Total</b>	<b>101</b>	<b>2,825</b>	<b>73.6</b>	<b>3,103</b>	<b>80.9</b>	<b>540</b>	<b>2,448</b>	<b>63.8</b>
RJ	Alwar	52	1,896	79.8	2,107	88.7	318	1,762	74.2
	Ajmer	51	1,892	82.4	1,976	86.1	259	1,718	74.9
	<b>Total</b>	<b>103</b>	<b>3,788</b>	<b>81.1</b>	<b>4,083</b>	<b>87.4</b>	<b>577</b>	<b>3,480</b>	<b>74.5</b>
<b>Total</b>		<b>306</b>	<b>9,121</b>	<b>77.1</b>	<b>10,331</b>	<b>87.3</b>	<b>1,593</b>	<b>8,124</b>	<b>68.7</b>



## II TRENDS IN PARTICIPATION

### 2.1. Overview

Analysis of data collected during the first four rounds of fieldwork for this study suggests that the concept of ‘participation’ among four year olds has a number of dimensions and can be unpacked in several different ways. This chapter describes these dimensions of participation and presents some major trends emerging from the data.

A first set of complexities stems from the difficulties in defining and measuring ‘participation’. Accordingly, we begin with a discussion on the kinds of measurement that were attempted as part of this study and the way in which participation is defined for purposes of this report. We then examine some key dimensions of participation among four year olds:

- In what kinds of institutions do four year olds participate?
- To what extent is this participation formal (the child is enrolled in an institution, parents know her status) and to what extent is it informal (the child was observed in an ECE centre or school, even though not acknowledged as participating by institutional records and/or by parents)?
- To what extent is this participation stable (children remained in the same institutions over the year), and to what extent does it fluctuate (children moved between several institutions, or between participating and not participating)?
- Based on the above, is it possible to generate an estimate of “dosage” or children’s exposure to ECE over the course of the year?

In all cases, we present trends by state and, where relevant, by district.

### 2.2. What is “participation”? A note on data

The difficulties of estimating participation among primary school children are by now well established. It is known, for example, that enrolment in school does not mean that children attend regularly; that attendance on a given day does not automatically imply presence throughout the hours that the school is open; that estimates of participation can vary considerably depending on how the term is defined; and that data collected from households often conflicts with data collected from schools.

As part of this study, tools and procedures were developed to collect data on sampled children’s ECE participation from three sources: household respondents, institutional records, and direct observation of children in ECE centres and schools. Field investigators first collected extensive information on sampled children’s participation in ECE programs from family members. Specific questions were asked about the child’s participation in more than one institution (cases of double enrolment, as well as cases of being officially enrolled in one institution while actually attending another) and about both “official” participation (as an enrolled child) as well as “unofficial” participation (for example, children who attend Std 1 although not officially enrolled in school). Investigators also asked about how frequently children attended as well as how many hours they usually spent in the centre. Considerable effort was therefore expended on attempting to construct a complete picture of each child’s participation in early childhood education programs based on information provided by household members.

Subsequently, all ECE facilities and primary schools were visited in each of our sampled villages and the attempt was made to track individual children to specific institutions,<sup>9</sup> using the information provided by parents as a starting point. Field teams examined enrolment and attendance records and also looked to see whether sampled children were present at the time of the visit. In many cases it was found that the information provided by parents did not match with that obtained from the centres. For example, a child who family members said was neither enrolled nor attending was in fact observed in a centre or a primary school, or was found on the enrolment register of a different centre than the one mentioned by her parents. Family members were not always aware of the distinction between enrolment and attendance, nor were they always clear about the distinction between a child going to an ECE centre only for a brief period each day (for example at the time of the midday meal) and attending for the full period that the centre was open. In consequence, parents' characterizations of children as enrolled, attending, or non-participating were not necessarily consistent or accurate. Mismatches between information collected from households and from ECE centres and schools were encountered across all states and districts included in this study.<sup>10</sup>

A further, considerable, complication emerged from the inherently complex nature of young children's participation. As will be discussed more in Section 2.3 below, in the period preceding formal enrolment in primary school, children appear to move seamlessly between different activities, going to ECE centres on some occasions, accompanying a sibling to primary school on others, and staying home on still others. In other words, what a child was doing on any given day could be different not only from what her parents reported, but also from what she had been doing the previous day. An overview of this complexity and its implications for this study will be discussed in Section 2.6 below on the stability of young children's participation.

For purposes of this analysis, precedence has been given to field investigators' own observations at ECE centres and schools. That is, if a child was physically observed in a centre she was recorded as participating at that centre during the relevant round of fieldwork, regardless of what her family said or what the institution's records showed. If field teams were unable to visit the institution that parents specified (for example centres situated outside sampled villages were not visited during the first two rounds of fieldwork) then the information provided by parents was assumed to be accurate.

With these caveats in mind, we now turn to an examination of four year old children's participation, during the one year period under review.

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<sup>9</sup> Based on trends observed in Visits 1 and 2, in subsequent visits field teams broadened the scope of the fieldwork to include all institutions where sampled children were participating, whether within or outside the village.

<sup>10</sup> For example, during the fourth round of fieldwork close to 500 children were reported by their parents to be not attending anywhere; but more than a third of these were in fact observed in an institution – most often an Anganwadi. While the number of such cases is small relative to the total sample size, this illustrates the difficulty in obtaining reliable data on participation.

### 2.3. Who goes where? Provisioning and participation during the baseline visit

Data from the baseline visit for this study (September-December 2011) shows that all three states are well provisioned with respect to pre-primary facilities, possibly reflecting the fact that larger villages were intentionally selected. In line with Government of India policy for almost forty years, every sampled village had at least one Anganwadi and most had many more than one. Additionally, substantial proportions of villages had at least one private/other ECE facility, ranging from a quarter of all sampled villages in Assam to 90% in Rajasthan (Table 3). Most villages also had a primary school.

At the baseline visit, sampled four year old children's participation varied substantially depending on where they lived, but their participation was not only a function of the availability of facilities. Across the three states, almost all children were participating in either an ECE centre or a primary school in Andhra Pradesh (94%) and large proportions were participating in Assam (89%). But despite the fact that among these three states Rajasthan has by far the best provisioning in terms of preschool facilities, one third of sampled children were not participating anywhere.<sup>11</sup>

**Table 3: Preprimary and primary education: Provision and participation at baseline, by state**

State	Provision: % Sampled villages with			Participation: % Sampled children who were participating in					
	At least one Anganwadi	At least one private/other ECE	At least one primary school	Anganwadi in the village	Other ECE in the village	ECE outside the village	Primary School	None	Total
<b>AP</b>	100	34.4	88.5	52.6	11.5	22.0	7.9	6.1	100
<b>AS</b>	100	25.7	88.5	75.4	9.0	4.5	0.3	10.9	100
<b>RJ</b>	100	89.9	73.5	21.5	24.8	8.0	12.3	33.3	100

Although the decision to participate or not clearly does not depend only on the facilities available in the village, once participating, the nature of children's participation is broadly reflective of patterns in preschool provisioning in each state. Thus, for example,

- In Assam, where relatively few villages have private pre-primary facilities, the majority of children go to Anganwadis (76%).
- In Rajasthan, where 90% of sampled villages have at least one privately managed ECE facility, more children go to private/other preschools within the village (25%) than to Anganwadis (22%).
- In Andhra Pradesh, although a third of sampled villages had one or more privately managed ECE facility, more than one out of every five children goes to an institution outside the village (22%).

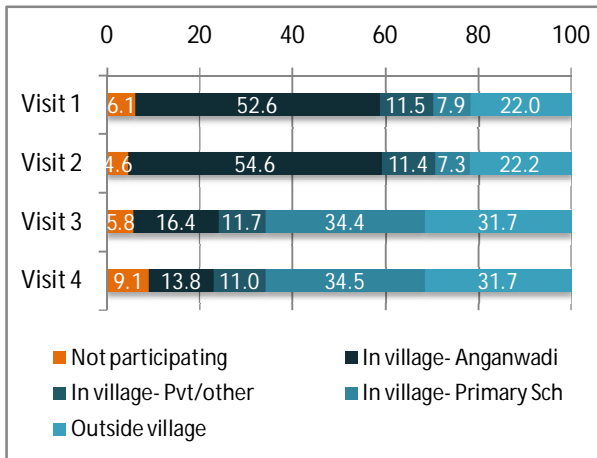
It is also important to point out that although most children were in ECE centres during the baseline visit, in Rajasthan and Andhra Pradesh fairly large proportions of these young children were also observed in primary school – 8% in Andhra Pradesh and 12% in Rajasthan. In Assam, on the other hand, almost no children were observed in primary school.

<sup>11</sup> Estimates of participation among four year olds from the Annual Status of Education Report (ASER) for 2011 are higher than those presented here for all three states, possibly reflecting the fact that different sampling and data collection methods are employed. However, the overall trend across the three states is identical, with Andhra Pradesh having the highest proportion of four year olds participating and Rajasthan by far the lowest.

## 2.4. Changes in participation from baseline to endline

The previous section showed that at age 4 the majority of children were already participating in some form of preschool or school (80%), but individual states showed very different patterns of participation. During the subsequent year, a great deal of movement was observed in what children were doing. However, there is no single path taken by young children across the country: states continue to look very different from each other in how children spend the year prior to entering primary school. The main features of observed trends in each state are summarized below.

**Chart 1: Participation across field visits, Andhra Pradesh**

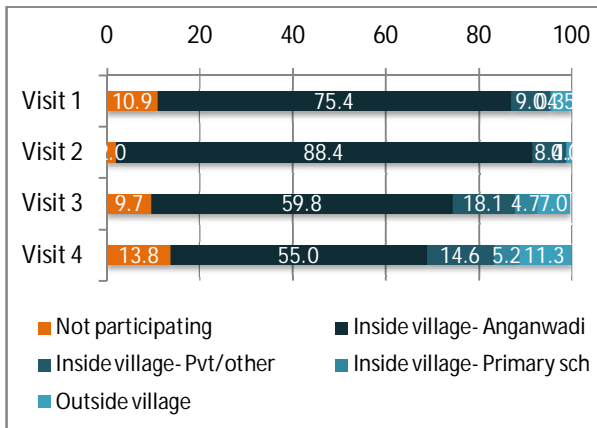


- The proportion of non-participating children is low from Visit 1 to Visit 3, but increases in Visit 4.

- By Visit 3, conducted in a new academic year, many children have moved from Anganwadis to primary schools in their village. In this visit about one in three children are in primary school.

- In Visits 1 and 2, one out of every 5 children goes outside the village to study. By Visit 3, almost one in every three children does so.

**Chart 2: Participation across field visits, Assam**

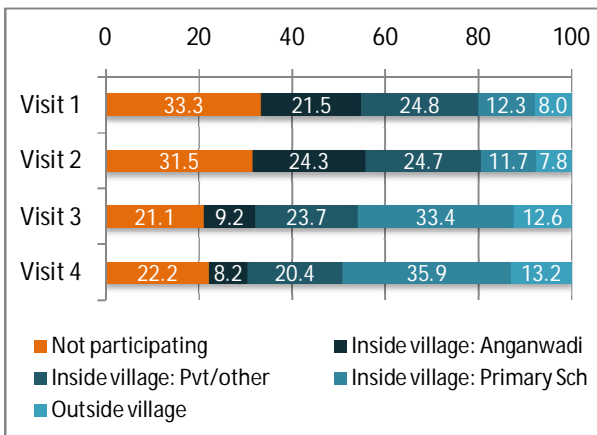


- The proportion of non-participating children fluctuates across visits. As in Andhra Pradesh, highest participation observed was in Visit 2 (Feb-March 2012).

- The majority of children were in Anganwadison all four visits, although this proportion declines between Visits 2 and 4. Even at Visit 4, few children are in school.

- Few children leave the village to study, though this proportion increases to 11.3% by Visit 4.

**Chart 3: Participation across field visits, RJ**



- High proportion of non-participating children throughout. But the proportion decreases over the year from one third to one fifth of all children.

- In all visits, more children are going to private/other preschools than to AWCs. This gap increases during the course of the year.

- Similar to AP, by Visit 3, a third of all children are observed in primary school. By Visit 4, more than 1 in 10 go outside their village to study.

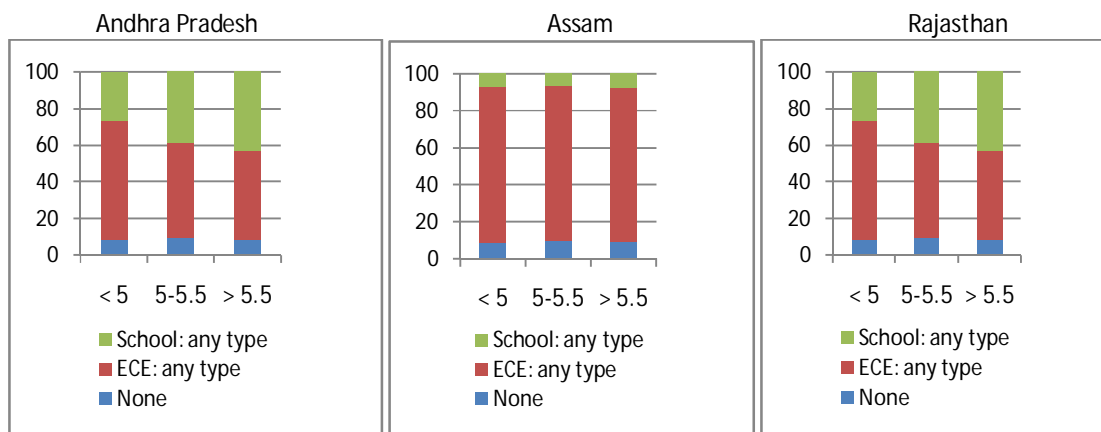
## 2.5. Participation at age 5: Endline visit

By the endline visit (October-December 2012), the proportion of non-participating children was observed to have increased in both Andhra Pradesh and Assam, but had fallen somewhat from its original high levels in Rajasthan. Among participating children the distribution of institutions attended had also changed, with larger proportions observed in primary school. In Andhra Pradesh and Rajasthan, where the academic year begins in April and children's official age of entry into school is at age 5, about a third of all children were observed in primary schools. In Assam, where the academic year begins in January and the official age of entry to Std 1 is at age 6, most children continued to participate in Anganwadis. Data by state and age shows that in both AP and Assam, a higher proportion of older children are in school and conversely higher proportions of younger children continue to be in ECE centres (Chart 4).

**Table 4: Participation of sampled children at endline**

State	N	% Sampled children:					
		Non participating	In ECE inside the village		In ECE outside the village	In primary School	Total
			Anganwadi	Other			
AP	3,321	9.1	13.8	11.0	31.7	34.5	100
AS	3,832	13.8	55.1	14.6	11.3	5.2	100
RJ	4,669	22.2	8.3	20.4	13.2	35.9	100

**Chart 4: Participation at endline, by age and state**



Finally, these data suggest that gender is a factor in household decision making about young children. This is particularly true in Rajasthan, where higher proportions of girls than boys are either non-participating or attending a government school or Anganwadi; whereas higher proportions of boys than girls are attending privately managed institutions. Although differences by gender are much smaller in Andhra Pradesh and Assam, the general trend of more boys than girls in private institutions and more girls in government ones is visible in these states as well.

**Table 5: Participation at endline, by gender and state**

Participation category	AP		AS		RJ	
	Boys	Girls	Boys	Girls	Boys	Girls
Not participating	9.0	9.1	13.9	13.9	19.6	23.0
ECE: Anganwadi	13.3	14.4	59.6	61.3	6.9	10.1
ECE: Private/Other	42.8	36.4	26.6	24.8	35.4	27.4
School: Government	31.5	36.4	*	*	23.0	27.0
School: Private/other	3.4	3.7	*	*	15.2	12.5
Total	100	100	100	100	100	100

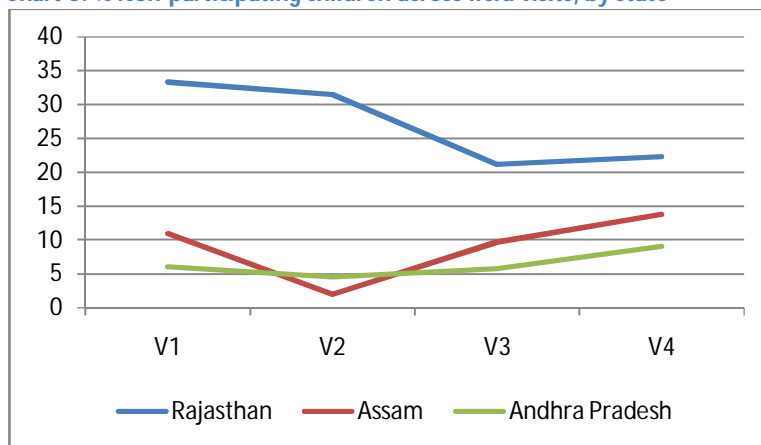
\*Due to insufficient cell sizes, figures for Assam do not include children in primary school at the time of Visit 4

## 2.6. Stability vs mobility in young children’s participation

It might be expected that young children follow a linear trajectory towards primary school that begins with non participation, continues to participation in some form of preschool, and ends with formal enrolment in primary school at age 5 or 6. In some cases one might expect to find children moving directly from non participation to primary school participation, without the intermediate step of preschool participation.

An analysis of data collected during this study suggests that although this may be true for the majority of children, in the period preceding their official entry to primary school, fairly large proportions of children move back and forth between non-participation, ECE facilities, and primary schools in a multitude of ways. One indication of this situation can be seen in the fluctuating proportions of non participating children across the different visits – although these differences are far more pronounced in Assam and Rajasthan than in Andhra Pradesh (Chart 5).

**Chart 5: % Non-participating children across field visits, by state**



However, the presentation of data separately for each visit can mask the fluid nature of individual children’s participation. In this section, therefore, we focus on two additional aspects of children’s mobility. First, we look at how often individual children’s participation status changed over the four visits. We then examine the directionality of these observed movements in order to see the extent to which they correspond to the expected trajectory described above.

Looking first at whether children’s participation status changed during the year, Table 6 below categorizes individual children by the number of times their participation was observed to change over four rounds of fieldwork, aggregated by state and also for the sample as a whole. ‘Change’, in this context, is defined as a difference in participation status between any two successive visits, such that an individual child’s status could change up to 3 times during the year (between Visits 1 and 2, between Visits 2 and 3, and between Visits 3 and 4). A change could imply a movement from non-participation to any kind of participation, or the reverse; from ECE centre to primary school, or the reverse; or from one ECE centre to another.<sup>12</sup> Movements from pre-primary to primary sections (or the reverse) within the same institution are also recorded as changes.

Interestingly, the data reveal broadly similar trends across the three states. Overall, we see that three quarters of sampled children either had the same participation status on all four visits (0 changes), or made one change over the course of the year – most often from ECE to primary school, but also from one ECE centre to another. However, one in five children in Rajasthan, one in four in Assam, and more than one in four in Andhra Pradesh recorded either two or (in a few cases) three changes over the course of these four visits.

**Table 6: Changes in participation among sample children**

No. of changes in participation status	Overall		Andhra Pradesh		Assam		Rajasthan	
	N	%	N	%	N	%	N	%
0	4108	34.7	827	24.9	1590	41.4	1691	36.2
1	4940	41.8	1579	47.6	1320	34.4	2041	43.7
2	2387	20.2	835	25.1	661	17.2	891	19.1
3	393	3.3	80	2.4	266	6.9	47	1.0
Total	11828	100	3321	100	3837	100	4670	100

What about the directionality of these changes? Among the children in our sample, we find that although the majority did indeed progress in the linear way envisaged at the beginning of this section, others exhibited a varied range of trajectories. We illustrate this situation by restricting the analysis to those children who were observed to be participating on all four visits and for whom at least one change in institution was recorded during the year (3,001 children, or a quarter of the full sample) (Table 7).

**Table 7: Movement between preschool and school**

Participation status of children in Visit 1	N	% Children in:								
		Visit 2			Visit 3			Visit 4		
		ECE	Primary School	Total	ECE	Primary School	Total	ECE	Primary School	Total
ECE	2,801	99.4	0.6	100	19.7	80.3	100	25.3	74.7	100
Primary School	200	27.4	72.6	100	56.7	43.3	100	67.7	32.3	100
Total	3,001	94.6	5.4	100	22.2	77.8	100	28.1	71.9	100

<sup>12</sup> For reasons to do with the way in which data was recorded, these data do not capture changes from one primary school to another and may thus slightly underestimate the actual number of changes.

During the baseline visit, 2,801 of these 3,001 children were observed in an ECE centre. Three months later, during Visit 2, almost all of them continued to participate in pre-primary (99.4%). During Visit 3, conducted during a new academic year in two of our three states, four out of five of these children had moved to primary school. But in Visit 4, we see that about 170 children had moved back 'down' from primary to pre-primary.

A similar downward movement is observed among the 200 children who were observed in primary schools on Visit 1. During Visit 2, more than a quarter of them had moved 'down' to a pre-primary centre and in each subsequent visit this proportion increased, such that by visit 4, less than a third of them were observed in primary school whereas the remaining two thirds were observed in a pre-primary facility.

A more careful analysis of this observed movement from primary school back to preschool suggests that two kinds of trends are at work here. First, there appears to be an *unofficial* movement that took place mostly among those children who were observed in primary schools during Visit 1. Given their age at the baseline visit, these children were almost certainly not enrolled in Std 1, but were probably accompanying an older sibling to school. In these cases, the observed 'downward' movement was usually to an Anganwadi, and it is not clear whether their presence in a Std 1 classroom on the day of the field visit was part of a regular pattern or an occasional event. The second trend is an *official* movement, observed mostly among children who moved from ECE centres to primary schools during the new academic year (Visit 3 or 4). The majority of these children appear to have enrolled in Std 1 in private primary schools and were subsequently sent down to a pre-primary class, presumably because they were unable to keep pace with the Std 1 curriculum.<sup>13</sup>

## 2.7. Estimating 'dosage'

The preceding sections of this chapter summarized different aspects of young children's participation in preschool or school, how these evolve over a year, and how they vary by state as well as by individual characteristics such as gender and age. Taken together, these variations in the extent and nature of children's participation have implications for estimating the amount of exposure or 'dosage' of preschool that a child has received during the course of a year, which in turn makes it difficult to estimate the impact of preschool on school readiness. Recall that as part of this study two assessments of children's school readiness were conducted, one at the beginning of the study and one approximately a year later. But if, during the course of the intervening year, children attended two or three different institutions, for varying amounts of time and with varying amounts of integration into the activities taking place, it becomes difficult to attribute observed changes in school readiness to any specific institution or activity.

As an attempt to resolve this situation we categorized children's participation across the four field visits into five broad categories.

- *No Participation*: Children who were not found to be participating in any preschool or primary school in any of the four visits.
- *Partial Participation*: Children who were found to be participating in either preschool or primary school or both on between one and three out of the four visits.

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<sup>13</sup> Similar examples of children being demoted from the age-appropriate grade on switching from government to private schools have been documented in other studies as well.



- *Full Participation*: Children who were found participating in all four visits. This group of children is further subdivided depending on the type of institution(s) attended:
  - *Full Participation – primary school*: Comprises children who were found to be participating in primary school on all four visits (includes children who moved from one primary school to another).
  - *Full Participation – ECE*: Comprises children who were found in Anganwadis or in private/other preschools on all four visits (includes children who moved from one pre-primary institution to another).
  - *Full Participation – mixed*: Includes children who were found participating on all four visits, but whose participation included any combination of ECE centre and primary school.

Table 8 provides the distribution of children across these participation categories, by state and district. These data show that in Andhra Pradesh 85% of children were found to be participating across all four visits (full participation). The corresponding proportion in Assam is 74% and in Rajasthan 71%. Other than in the two districts in Rajasthan, the proportion of children who did not participate at all during the year is extremely small.

**Table 8: Children's participation across four field visits**

State	District	N	No participation	Partial participation	Full participation			Total
					Pre primary only	Mixed primary and pre-primary	Primary School only	
AP	Medak	1931	1.1	15.9	32.3	45.7	4.9	100
	Warangal	1390	0.2	14.1	38.6	43.0	4.0	100
	<b>Total</b>	3321	0.8	15.2	35.0	44.6	4.6	100
AS	Dibrugarh	1529	0.9	29.6	62.8	6.7	0.0	100
	Kamrup	2308	0.1	24.1	69.4	6.4	0.0	100
	<b>Total</b>	3837	0.4	26.3	66.8	6.5	0.0	100
RJ	Alwar	2375	12.6	24.6	13.5	36.7	12.6	100
	Ajmer	2295	13.6	31.1	33.9	17.4	4.0	100
	<b>Total</b>	4670	13.1	27.8	23.6	27.2	8.4	100
<b>TOTAL</b>		11,828	5.5	23.8	40.8	25.4	4.6	100

## 2.8. Correlates of participation

Are there trends visible in the individual or household characteristics of children in our sample who were observed to participate fully, partially, or not at all? In Section 2.5 above we saw some evidence of gender differences in the type of institution children were attending during Visit 4, with boys more likely to be in privately managed institutions and girls more likely to be either non-participating or attending government institutions. However, no gender difference is visible in the total amount of exposure to pre-primary or primary schools over the course of the year. That is, boys and girls were equally likely to have no participation, partial participation, or full participation across the four visits – it is only the type of institution that varied.

Not surprisingly, participation does vary by age of the child. Across the four visits, younger children were more likely than older children to have not participated at all, and older children were more likely to have had full participation (Table 9). Additionally, within the “full participation” category, older children were more likely than younger ones to have been observed in primary school on all four visits; and younger children more likely than older ones to have been observed exclusively in pre-primary centres across the four visits.

**Table 9: Children’s participation, by age**

Age	N	No participation	Partial participation	Full Participation			Total
				Pre primary only	Mixed primary and pre-primary	Primary School only	
< 4	2,713	5.7	24.0	47.1	20.0	3.2	100
4 - 4.5	6,316	5.8	22.4	40.3	26.5	5.0	100
>4.5	2,577	4.5	21.9	38.0	30.3	5.4	100
<b>Total</b>	11,606	5.5	22.6	41.4	25.8	4.7	100

Finally, we look at household characteristics of sampled children to see whether these appear to relate to children’s participation. Aggregated across the three states, household economic status as measured by an asset index appeared to have little relationship with whether or not a child participated.<sup>14</sup> But both mother’s education and the availability of learning support at home appear to be related to children’s levels of participation in preschool or school (Table 10).<sup>15</sup> Sampled children were more likely to have full participation if they came from households where mothers had themselves been to school or in those where learning support was provided. Conversely, children were more likely not to have participated at all if their mothers had never been to school or if their households did not provide any type of learning support. These two variables are also strongly correlated among themselves, meaning that households where mothers had been to school were also those where learning support was available to children.

**Table 10: Household characteristics and children’s participation**

Household Characteristic	N	No participation	Partial Participation	Full Participation	Total
<b>Mother’s Education</b>					
None	4,445	2.7	21.8	75.5	100
Primary School (Std1-5)	1,533	0.7	17.3	82.0	100
Above Std. 5	3,484	0.4	17.6	82.0	100
<b>Household Asset Index<sup>16</sup></b>					
Low	2,704	1.5	21.7	76.8	100
Medium	4,332	1.3	18.4	80.2	100

<sup>14</sup> Although this varies across states.

<sup>15</sup> Information on father’s education was also collected, but did not appear to relate to children’s participation.

<sup>16</sup> ‘Household Asset Index’ includes 7 consumer durables – phone, fan, TV, cycle, scooter, refrigerator and car. A point of 1 was assigned to ownership of each. Thus, the consumer durable index ranges from 0 to 7. This was split into three categories – low, medium and high with each corresponding to index values of 0-1, 2-3, 4-7 respectively. This division was also based on the distribution: 27.8% households fall in the low index category, 44.1% in the medium and 28.1% in the high index category.

High	2,763	1.8	19.1	79.1	100
<b>Any Home Support<sup>17</sup></b>					
None	3,753	3.3	27.4	69.3	100
Some home support	6,079	0.4	14.4	85.2	100

## 2.9. Summary

This chapter has explored some of the major trends in how a cohort of four year olds participated in pre-primary or primary schools over the course of a year. The evidence from about 12,000 children in three states shows that very high proportions of young children participated regularly in some form of institutional program, whether ECE centre or primary school, with an average of 70% found to be attending some institution during all four visits. Of the children who participated regularly, more than half attended one or more ECE centres – Anganwadi, balwadi etc – throughout the year, while most of the others attended a combination of ECE centres and primary schools. Very few children – less than 6% of the sample overall – were non-participating throughout the year. These overall figures vary substantially by state.

The data also show that although girls and boys were about as likely to participate in terms of the total quantum of participation, there are gender differences were observed in the type of institution they attended, with boys more likely than girls to attend private institutions, particularly in Rajasthan. In terms of household characteristics, children whose mothers had been to school or who had some form of home support available were more likely to have participated during all four visits than other children.

Also worth highlighting is the fact that almost the same proportion of children were observed in primary school throughout the year (4.6%) as were observed to be non-participating throughout the year (5.5%). The unofficial participation of large numbers of young children in Std 1 classrooms is not documented in primary school records and therefore not addressed either by education policies or by teachers in these schools.

In the sample overall, almost half of these children had mothers who had never been to school. Almost half came from households where no adult regularly read stories, told stories, or provided learning support to children. Data from this study shows that even among these less privileged households, large proportions of young children participate regularly in ECE centres. These institutions are therefore perfectly situated to help children bridge the gap between home and school and provide them with sound foundations with which to enter Std 1 – in other words, to build their school readiness. This is the subject we explore in the following chapter.

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<sup>17</sup>'Any Home Support' is composite of 3 questions asked from the household of the child: How often does anyone in the family "read stories to the child", "tells stories to the child" and "helps with learning tasks". Thus "Any Home Support" captures information from all three variables and is divided into two categories, namely, "none" and "some home support".

### III TRENDS IN SCHOOL READINESS

#### 3.1. 'School Readiness' – concept and measurement

School readiness refers to an assessment of whether a child has the skills, knowledge, and attitudes that are thought to be important in order to succeed in school as well as later in life. There are multiple and interconnected dimensions to school readiness, spanning the physical, cognitive, social, language, and emotional domains. According to the EFA Global Monitoring Report (2007), “the consensus from research is that school readiness encompasses development in five distinct but interconnected domains: physical well being and motor development; social and emotional development; approach to learning; language development; cognitive development and general knowledge”. Investing in young children’s school readiness across all these dimensions has been shown by many studies to have enormous benefits for children’s ability to succeed, not only in school but well beyond.

Not all of these dimensions of school readiness are easy to assess on scale. The assessment tool used for this study, the School Readiness Inventory (SRI), was developed by the World Bank and is intended to test children’s cognitive and language skills and concepts at age 5 and 6.<sup>18</sup> Within these broad categories, the tool tests children on a range of competencies which are broken down into ten specific tasks, summarized in Table 11. The maximum score assigned to each task varies from 1 (space concept) to 6 (reading readiness, sentence making), depending on the complexity of the task. The test as a whole has a total score of 40 points.

**Table 11: Description of competencies and tasks on the School Readiness Inventory**

Competency		Assessment activity	Score
Cognitive skills & concepts	Space Concept	Given two illustrations of children and houses, children were asked to point to the one in which the child was behind the house.	1
	Pre-number concept	Given pictures of four apple trees, children were asked to point to the one with the least and most apples.	2
	Number/object matching	Children were asked to match three numbers with pictures showing the same number of objects.	3
	Relative comparisons	Children were asked to point to a number (among 9, 3, 7, 8) that was less than the number 5.	2
	Sequential thinking	Children were shown illustrations of water filling up a bucket and were asked to determine the correct sequence for the pictures.	5
	Pattern making	Children were asked to repeat and complete a pictorial pattern.	5
	Classification	Children were asked to classify six creatures as either birds or animals.	6
Language skills & concepts	Following instructions	Children were asked to raise their hands, and then to pick up an object and bring it to someone.	4
	Reading readiness, identifies beginning sound	Children were asked to identify the beginning sound of words and to match the two words with the same beginning sound.	6

<sup>18</sup>Other dimensions of school readiness, such as social and emotional development, have been assessed for the smaller sample of children included under Strand B of this study using additional tools and techniques.

	Sentence making	Children were asked to describe two photographs in complete sentences.	6
<b>TOTAL</b>			40

### 3.2. The testing process

Children sampled for this study were tested twice. The baseline assessment was administered at the beginning of the study (September – December 2011), when the children were between 3.5 and 4.8 years of age;<sup>19</sup> and the end line was conducted one calendar year later (October – December 2012). Children were administered the SRI one-on-one by trained field investigators. Given that testing young children is challenging because they are often unused to interactions with strangers and nervous or uncomfortable at attempts to interact with them, investigators were asked to begin by spending 5-10 minutes making the child feel as comfortable as possible by engaging in a pre-defined activity (such as colouring or looking at a colourful story card). For the same reason, children were tested at home to the extent possible, to ensure the comfort of familiar surroundings and the presence of family members. In order to be able to standardize the testing process and ensure comparability of results, investigators were asked to spend a maximum of 30 minutes administering the tool with each child.<sup>20</sup>

Unusually for longitudinal studies, field teams were able to locate and assess more sampled children during the endline assessment (9,936) than in the baseline (9,121).<sup>21</sup> In the sections that follow we restrict the analyses to the 8,124 children for whom scores from both baseline and endline assessments are available, comprising approximately 70% of all sampled children (see sample description in Table 2, Chapter I).

### 3.3. Which tasks could children do at age 4?

Given that the School Readiness Inventory was developed for use with children in the age group 5-6, it was expected from the outset of this study that children would perform relatively poorly on most tasks during the baseline assessment at age 4. This turned out to be the case. Of the ten tasks given to children, there was only one that the majority of children in all three states were able to do during the baseline. This was the task on spatial concept, where children were shown two pictures – one of a child in front of a house, the other of a child behind a house; children were asked to point to the picture where the child is behind the house. Overall, more than 70% of sampled children were able to do this task, with some variation across states (from a low of 66% in Rajasthan to a high of 78% in Andhra Pradesh). By the endline a year later, 90% of children in every state could do this task.

<sup>19</sup> Sampled children were selected on the basis of their birthdays falling within a specified date range such that at the beginning of the fieldwork period, they would have been between 3.5 and 4.5 years old. However since fieldwork continued for approximately 3 months, children sampled later in the process could have been up to 3 months older.

<sup>20</sup> Even with all of these measures, in each assessment round, a small number of children did not respond to a single question – most likely a function of their level of discomfort rather than their inability to do the tasks on the SRI. This proportion expectedly is higher in the baseline (100 children) and decreases substantially by the end line when children are a year older (16 children).

<sup>21</sup> In large part this was due to two factors. First, by the endline visit, sampled children were being tracked to whichever institution they were participating in, whether inside or outside the village; as a result field teams were able to locate larger numbers of children. And second, by the endline visit large proportions of children were in primary school, again making them easier to locate.

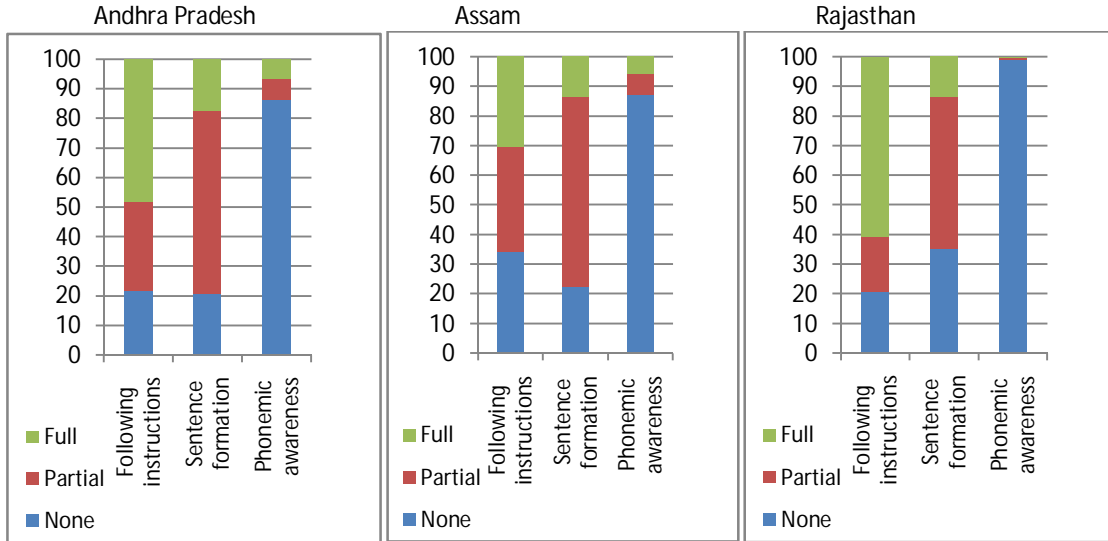
### 3.4. Progress over the year: Pre literacy tasks

There were two other tasks that a fair proportion of children were able to do either partially or fully even during the baseline assessment, both in the domain of language skills and concepts. The first was the ability to follow instructions. It is noteworthy that even in the baseline assessment, children in Rajasthan did by far the best when it came to following a relatively complex series of instructions (such as: “Go and pick up a paper from over there and give it to your mother. Then come and sit with me”) – and their ability to do so was better than that of children in other states even in the endline assessment (Chart 7). Given that fairly large proportions of children in Rajasthan were non-participating throughout the year of fieldwork, this seems to reinforce the common sense conclusion that children learn to follow instructions early on at home and in other social settings, rather than in ECE centres or schools.

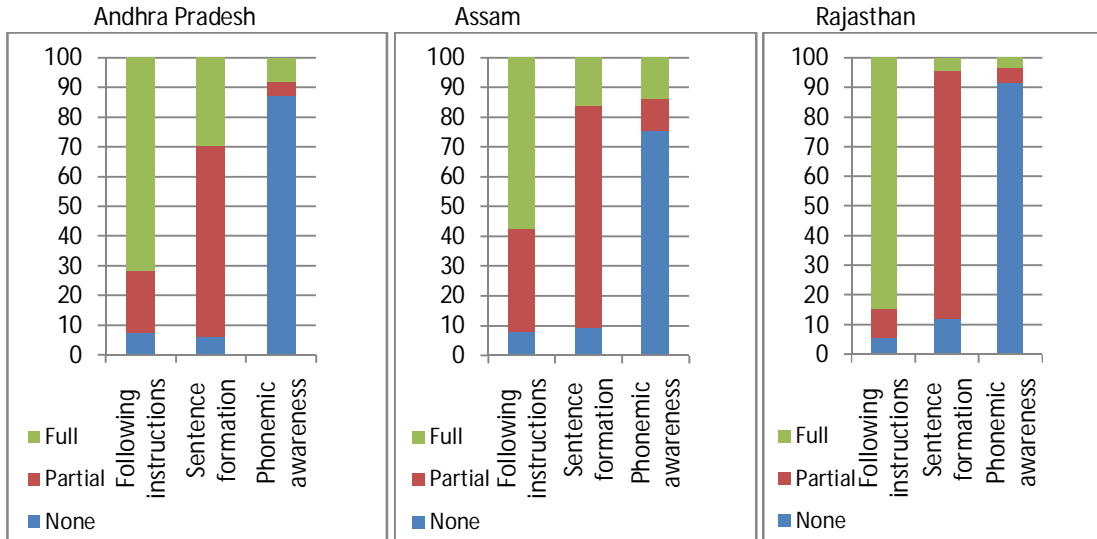
The other task that some children were able to do even in the baseline assessment was that of sentence formation. Here children were shown two pictures and asked to describe each in complete sentences. In all three states, most children were able to do this task partially even in the baseline, (where “partial” scores include cases where children were able to identify the picture and/or say something relevant about it, but could not describe it in complete sentences). This task is one where the influence of institutional participation appears to be substantial. In Andhra Pradesh, for example, a relatively high proportion of children were able to describe both pictures in full sentences even in the baseline (18%) and this proportion increases substantially to 30% by the endline. Recall that the proportion of participating children was high in AP, especially those going to private institutions. In Assam, on the other hand, where there was high participation throughout the year but mainly in Anganwadis, we observe that similar proportions of children were able to do this task in the baseline (14%) but there is a much smaller increase over the year. And finally, in Rajasthan, where high proportions of children were non-participating, we observe a decline in the proportion of children who could do this task correctly from baseline to endline.

The final task in the set that examined children’s language skills and concepts was that of phonemic awareness. Here children were asked to identify the object shown in a picture, identify the beginning sound of the word, and identify another picture in the set that represented an object that began with the same sound. This task proved to be impossible for almost all children in all states and virtually no progress was observed between baseline and endline. As the preceding paragraphs show, it is not that children are not acquiring pre-literacy skills and concepts, but rather that this task was far too complex to be able to capture changes in what they were able to do.

**Chart 6: Children's performance in pre-literacy and language tasks, baseline, by state**



**Chart 7: Children's performance in pre-literacy and language tasks, endline, by state**



### 3.5. Progress over the year: Pre numeracy tasks

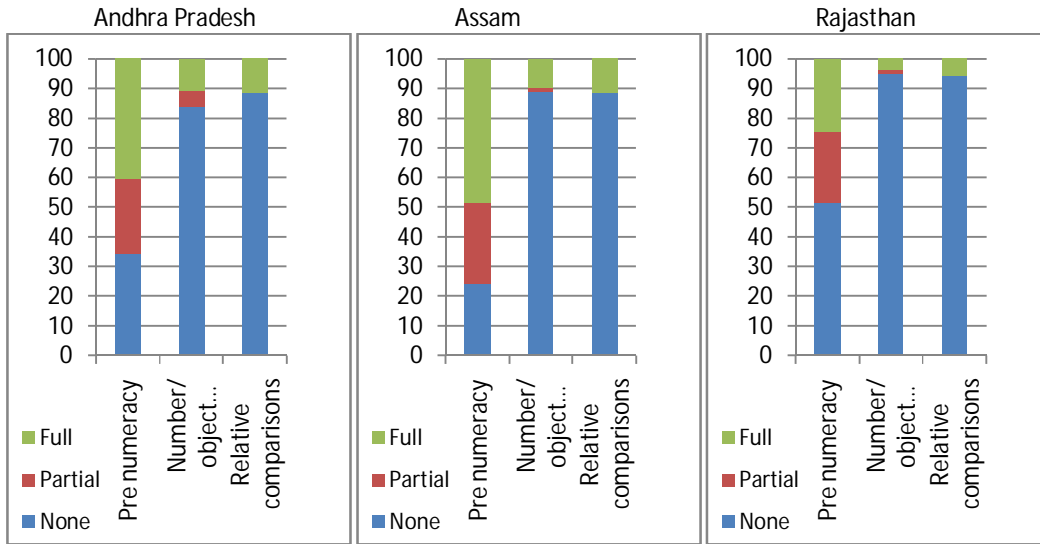
Within the set of tasks related to cognitive skills and concepts, three tasks are specifically intended to measure pre numeracy concepts and skills. The first relates to children's ability to distinguish between larger and smaller quantities – in this case, by looking at pictures of trees with fewer or greater numbers of apples. The second has to do with their ability to relate quantities to numeric digits by matching numbers to collections of objects representing the same number. And the third tests their ability to identify larger and smaller numbers from a given set of single digit numbers.

Some clear patterns are visible in the extent to which children were able to do these tasks during the baseline and how much improvement was observed during the year. During the baseline assessment, depending on the state, between a quarter and half of all children demonstrated full mastery of the first pre-numeracy task: 48% in Assam, 40% in Andhra Pradesh, and 24% in Rajasthan

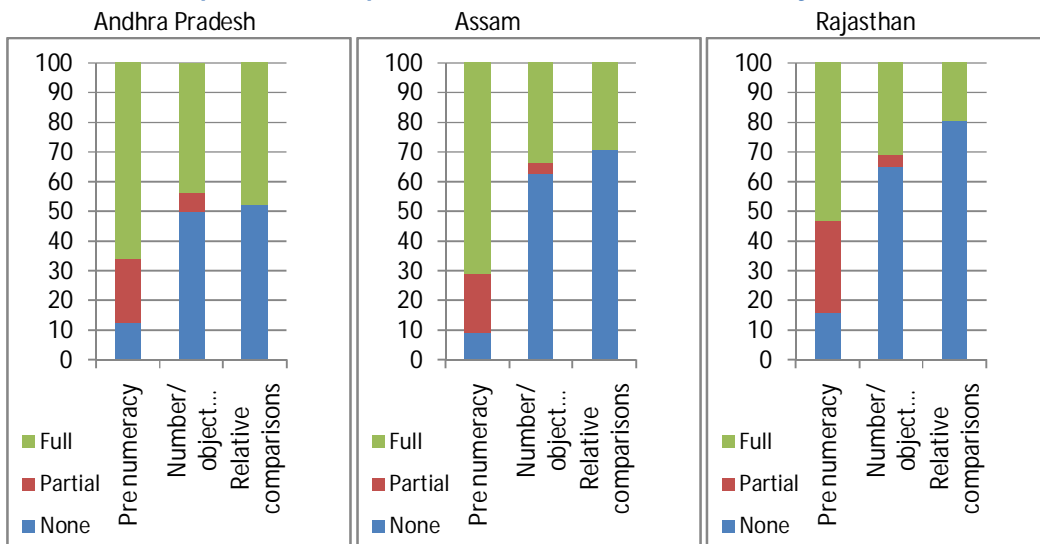
(Chart 8). A year later, these proportions had increased in each state by about 25 percentage points; the gap between states narrows slightly but does not disappear (Chart 9).

At the baseline, the remaining two pre numeracy tasks are all but impossible to do for virtually all children in all three states, with almost no difference in the proportion of children who could do each. A year later, the ability to do both tasks has improved substantially in all states; not surprisingly, more children have made progress on number/object matching than on relative comparisons.

**Chart 8: Children's performance in pre-number and number tasks, baseline, by state**



**Chart 9: Children's performance in pre-number and number tasks, endline, by state**



An examination of trends in each state suggests some important differences in how children progress towards the acquisition of pre numeracy concepts and skills. By way of illustration, we compare Assam to Andhra Pradesh. In Chapter II we saw that both states had very high proportions of children in the 'full participation' category: that is, they were observed to be participating on all



four visits. But whereas in Assam most children were in Anganwadis throughout the year, in Andhra Pradesh large proportions were in private institutions – ECE centres and/or schools.

Comparing children's progress in terms of the three pre numeracy tasks included in the School Readiness Inventory, we see that more children in Assam than in Andhra Pradesh were able to correctly complete the first task, both during the baseline and during the endline assessment. In other words, by the endline, 71% of children in Assam could correctly identify which picture of a tree had the least and most apples, as compared to 66% in Andhra Pradesh. We might expect, then, that higher proportions of children Assam should be able to successfully do the remaining two pre numeracy tasks as well. In fact what we find is that although figures for the two states were very similar at the beginning of the year, by the end of the year children in Andhra Pradesh were doing far better on both these tasks than those in Assam, with a 10 percentage point difference in performance on the first task (number/object matching) and a 19 percentage point difference on the second (relative comparisons).

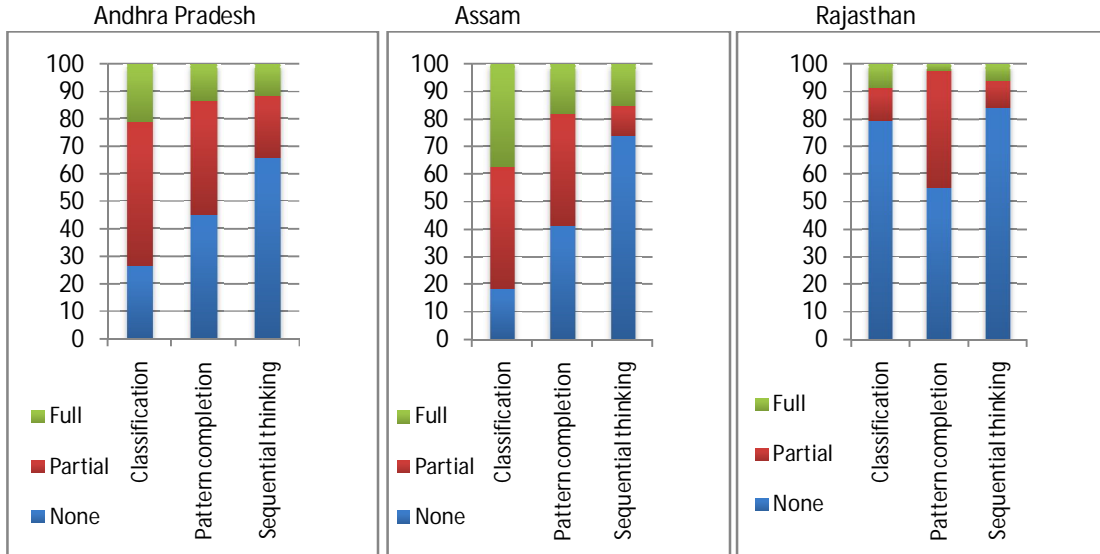
As in the case of speaking in complete sentences, these data support the argument that participation in different types of ECE centre or school are not equivalent in terms of helping children develop school readiness. Participation in more formal school or school-like settings alters the ways and the pace at which children learn. But these data also provide evidence that more formal, school-like settings are not necessarily appropriate or desirable, since they suggest the possibility that children may learn how to do certain types of tasks without a full or clear grasp of the underlying concepts.

### **3.6. Progress over the year: Other cognitive abilities**

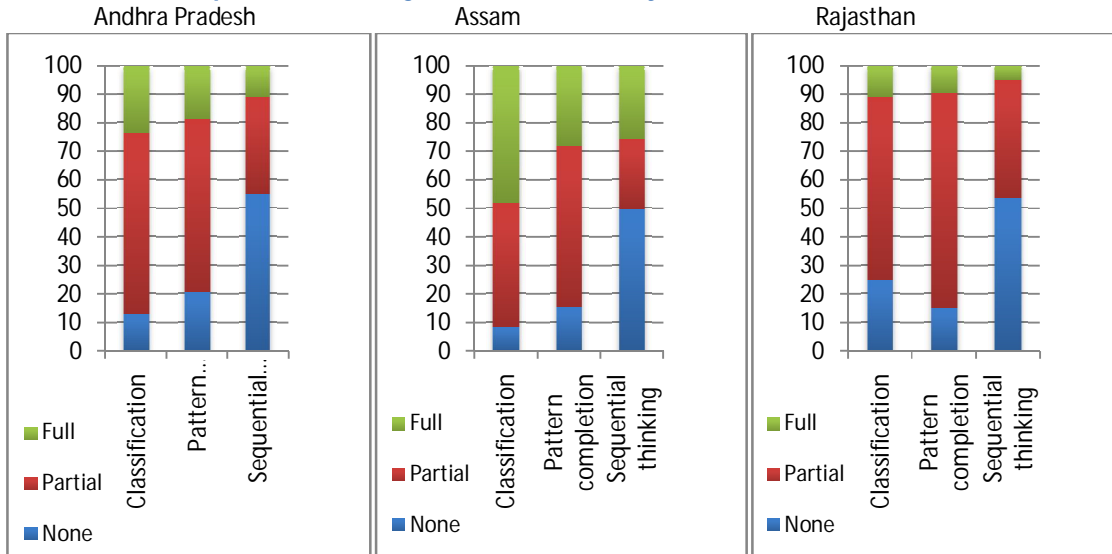
Three of the more difficult tasks in the domain of children's cognitive skills and concepts were the ability to classify objects (in this case, the ability to classify a set of pictures into birds and animals); the ability to first replicate and then complete a pattern comprising circles, triangles and squares; and the ability to identify the correct sequence in a series of pictures of a bucket filling from a tap. During the baseline assessment at age 4, although few children were able to do any these tasks correctly, substantial proportions were well on their way to doing so - particularly in Andhra Pradesh and Assam. In these two states the proportions of children able to do each task fully, partially, or not at all was very similar, as was the level of difficulty of each task relative to the others (Chart 10). In Rajasthan, on the other hand, most children were unable to do these tasks at all. Moreover, unlike in the other two states, children in Rajasthan appeared to find the classification task more difficult than either of the other two tasks.

By the endline a significant shift in children's abilities is observed in all three tasks and in all three states. Andhra Pradesh and Assam, once again, show similar broad trends, with similar proportions of children moving from being unable to complete each task to being able to partially complete it, and from being partially able to do a task to being able to do it perfectly. In Rajasthan, once again the pattern is different. Although starting from a significant disadvantage relative to the other states, children in Rajasthan show enormous progress over the course of the year such that at the time of the endline assessment, their ability to do these tasks looks quite similar to that of Andhra Pradesh (Chart 11).

**Chart 10: Children's performance in cognitive tasks, baseline, by state**



**Chart 11: Children's performance in cognitive tasks, endline, by state**



### 3.7. Summary of trends in school readiness

To summarize the preceding sections, we attempt to describe and categorize children's performance on the School Readiness Inventory in two different ways. First, we examine what they could do at the beginning of the study; and then we compare these data with where they were a year later.

A fairly clear hierarchy of skills and abilities is evident in the results from the baseline assessment. The tasks range from relatively easy (for example, most children could partially or fully follow instructions and demonstrated knowledge of spatial concepts) to very difficult (for example, few children could correctly compare numbers or identify the beginning sounds of simple words). Table 12 below classifies the ten SRI tasks into low difficulty, medium difficulty, or high difficulty based on this empirical evidence – that is, the proportion of children in the sample as a whole who were able to at least partially complete each task in the baseline assessment. Thus 'low difficulty' tasks are those that more than two thirds of all children could do either partially or fully; 'medium difficulty'

tasks are those that between one third and two thirds were able to do, partially or fully; and 'high difficulty' tasks are those that not even one third of all children could do even partially.

In the table, tasks are ranked from 1 (easiest) to 10 (hardest) according to this proportion across the full sample of children. It is immediately evident that children in individual states were not necessarily at the same level of ability at the baseline: more tasks fall into the low difficulty category for children in Assam, and in the medium and high difficulty categories for children in Rajasthan.

**Table 12: % Children scoring full or partial marks on the baseline assessment, by state and task**

Task/ State	Low difficulty (More than 2/3 children could do the task, partially or fully)			Medium difficulty (1/3-2/3 children could do the task, partially or fully)			High difficulty (Less than 1/3 children could do the task, partially or fully)			
	1	2	3	4	5	6	7	8	9	10
	Following instructions	Sentence Formation	Spatial Concepts	Pre-Number	Classification	Pattern completion	Sequential Thinking	Number-Object Matching	Relative Comparisons	Phonemic awareness
<b>All children</b>	<b>74.8</b>	<b>72.7</b>	<b>71.8</b>	<b>61.4</b>	<b>53.5</b>	<b>52.0</b>	<b>23.9</b>	<b>9.8</b>	<b>9.2</b>	<b>8.1</b>
AP	78.2	79.5	74.5	65.8	73.4	54.8	34.1	16.4	11.4	13.8
AS	65.7	77.7	78.0	75.9	81.9	59.0	26.2	11.0	11.8	12.9
RJ	79.0	64.8	65.8	48.4	20.9	45.3	15.9	4.9	5.8	1.1

**Table 13: % Children scoring full or partial marks on the endline assessment, by state and task**

Task/ State	1	2	3	4	5	6	7	8	9	10
	Following instructions	Sentence Formation	Spatial Concepts	Pre-Number	Classification	Pattern completion	Sequential Thinking	Number-Object Matching	Relative Comparisons	Phonemic awareness
<b>All children</b>	<b>93.2</b>	<b>90.4</b>	<b>89.6</b>	<b>87.0</b>	<b>83.2</b>	<b>83.4</b>	<b>47.3</b>	<b>39.8</b>	<b>30.1</b>	<b>14.4</b>
AP	92.8	93.9	90.3	87.5	87.0	79.4	45.0	49.8	47.7	12.7
AS	92.1	90.7	89.7	90.9	91.5	84.5	50.4	37.5	29.1	24.4
RJ	94.1	87.8	89.1	84.1	75.0	85.0	46.5	35.1	19.6	8.7

Table 13 presents the same categories of information, this time using data from the endline assessment. It is immediately apparent that children made a great deal of progress on most of the tested skills and concepts during the intervening year. In every state, the entire set of medium difficulty tasks are now in the low difficulty category, and several of the high difficulty tasks have moved into the medium difficulty category. Additionally, the ranking of tasks from easiest to hardest remains unchanged from baseline to endline. What is more, the variations across states that were visible in the baseline data have all but disappeared by the endline.

The substantial uniformity across states in the results presented in Table 13 above is partially because the categories used are insufficiently fine-grained to capture variations. Children’s ability levels on some skills and concepts develop over time as a result of normal maturational processes, which may be driving some of the progress captured by these data. Finally, therefore, we examine children’s performance on the endline assessment, this time looking at the proportion of children who scored full marks on each item (Table 14). Although items are presented in the same order as in the earlier two tables, their ranking from 1 to 10 has been changed to reflect this new classification.

**Table 14. % Children scoring full marks on the endline assessment, by state and task**

Task/ State	2	8	1	3	6	7	9	4	5	10
	Following instructions	Sentence Formation	Spatial Concepts	Pre-Number	Classification	Pattern completion	Sequential Thinking number-	Object Matchin	Relative Comparisons	Phonemic awareness
<b>All children</b>	<b>73.0</b>	<b>14.8</b>	<b>89.6</b>	<b>62.0</b>	<b>25.6</b>	<b>17.6</b>	<b>13.1</b>	<b>35.2</b>	<b>30.1</b>	<b>7.8</b>
AP	71.5	29.8	90.3	66.0	23.5	18.6	11.2	43.4	47.7	7.9
AS	57.7	16.4	89.7	71.1	48.4	28.0	25.9	33.9	29.1	13.8
RJ	84.6	4.1	89.1	53.1	10.9	9.6	5.2	31.0	19.6	3.6

If we expect children age 5 to demonstrate substantial mastery of the skills and concepts tested using these 10 tasks, then this table demonstrates that pre primary and primary schools in these states have a great deal of work to do. Thus, for example, the two tasks that large proportions of children could do even in the baseline (spatial concepts and following instructions) are the only two where large proportions demonstrate full mastery in the endline. These are abilities largely acquired outside of formal institutional settings. But on Task 2 involving describing a picture in full sentences, although close to three quarters of all children were able to partially do so even in the baseline, extremely low proportions scored full marks on this item in the endline in any state, suggesting that the activity of speaking is not given much attention in either ECE centres or primary schools.

The School Readiness Inventory uses a few selected indicators to assess aspects of children’s cognitive and language skills and concepts. Although the tool does not capture children’s social, emotional, or physical development, it does provide some pointers as to what children are learning and what they are not during the year preceding enrolment in primary school. These data suggest, for example, that children do make progress on acquiring pre numeracy skills and concepts, with reasonably high proportions of children able to do the pre-number and number/object matching tasks – with some variation visible across states. On the other hand, pre-literacy skills and concepts are still under-developed or nascent in children, suggesting that a closer examination is required of how these concepts are taught in preschool and primary school settings. Given the level of difficulty of the language textbooks used even in Std 1, without better preparation children will continue to enter primary school without the tools they need in order to succeed.

### 3.8. Overall Trends: Aggregate baseline and end line scores

In conclusion, we present aggregate scores on the School Readiness Inventory by state and district.

During the baseline assessment, scores on the School Readiness Inventory were uniformly low across the states and districts covered in this study – an expected outcome, given that most sampled children were in the age group 3.5 to 4.5 years at the time of test administration. Across the sample, the mean total score was 11.1 out of 40, or 27.8%. The score distribution is positively skewed with a large proportion of children scoring 0 and high proportions scoring in the lower score ranges.<sup>22</sup> As Table 15 shows, whereas mean scores are fairly similar across districts in Andhra Pradesh and Assam, they are substantially lower in Rajasthan; moreover mean scores are strikingly different between districts in Rajasthan.

**Table 15: Aggregate Total Scores in Baseline and End line, by state and district**

State	District	N	Mean total scores		
			Baseline	Endline	Change
AP	Medak	1,265	12.7	18.9	6.1
	Warangal	931	13.3	17.1	3.8
	<b>Total</b>	<b>2,196</b>	<b>13.0</b>	<b>18.1</b>	<b>5.1</b>
Assam	Dibrugarh	998	11.5	16.0	4.5
	Kamrup	1,450	14.8	21.3	6.4
	<b>Total</b>	<b>2,448</b>	<b>13.5</b>	<b>19.1</b>	<b>5.6</b>
RJ	Alwar	1,762	6.1	15.6	9.6
	Ajmer	1,718	10.6	14.0	3.4
	<b>Total</b>	<b>3,480</b>	<b>8.3</b>	<b>14.8</b>	<b>6.5</b>
<b>TOTAL</b>		<b>8,124</b>	<b>11.1</b>	<b>17.0</b>	<b>5.9</b>

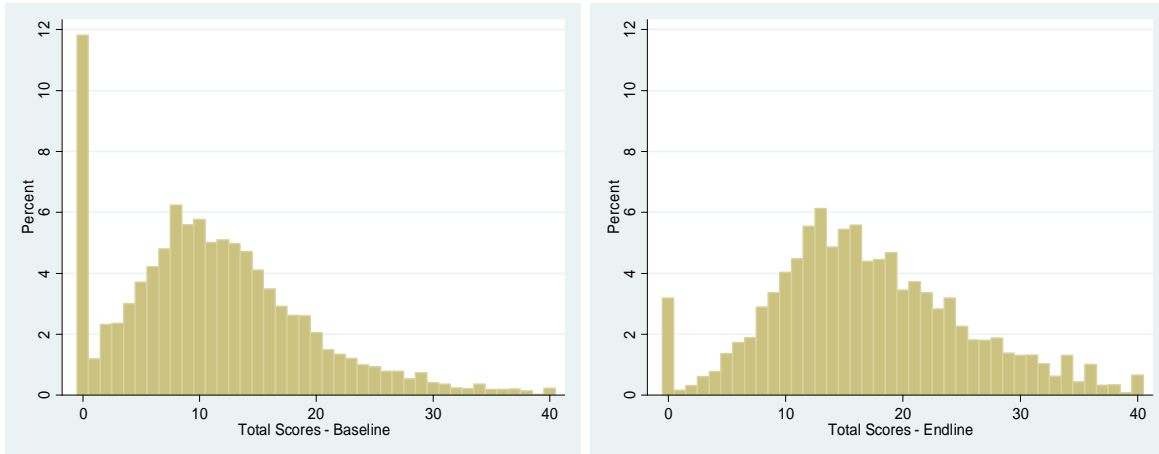
In the intervening year, children’s school readiness is seen to improve in all districts. Mean total scores improve by 6 points (15%) for the sample overall. The percentage point improvement is quite similar across the three states, but there is some variation across individual districts. Rajasthan, in particular, presents the interesting case of having one district showing the largest percentage point improvement across all six districts and the other showing the lowest.

By the end line the score distribution becomes more even, with fewer children scoring 0 and more children scoring in the higher ranges of the point scale. However, even in the end line there is greater clustering of scores below the mean of the score range (20.5). This suggests that while there is improvement in performance, for a majority of children school readiness as measured by the School Readiness Inventory remains low.

Among states, children in Kamrup district (Assam) do better than those in all other districts in both assessment rounds. The end-line mean score in Kamrup is close to the mean of the range (20.5). Districts in Rajasthan on the other hand, have the lowest end-line mean score among all states (14.8).

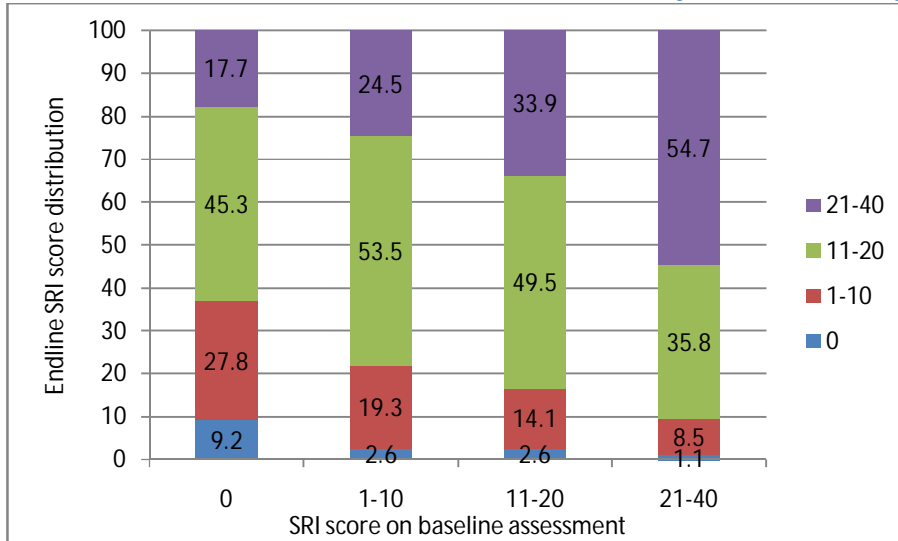
<sup>22</sup> The SRI scoring sheet distinguishes between children who did not respond and who responded incorrectly on each task. An aggregate score of 0 implies that children attempted at least some tasks but were unable to do any of them even partially.

**Chart 12: Distribution of Total Scores in baseline and endline, all children**



From the overall distribution of scores we see that despite improvements from the baseline, a substantial proportion of children continued to perform quite poorly even at the endline. In order to be able to look at groups of children in closer detail, we divide the SRI point scale into four categories or score ranges. First, we examine the case of the substantial proportion of children who scored 0 in the baseline. The remaining children are divided into three score ranges (1-10, 11-20 and above 21). Chart 13 graphs this ‘transition matrix’: it shows how children in each score category during the baseline assessment did on the same test a year later, in the endline assessment. Thus, for example, the first (leftmost) bar represents the children who scored 0 in the baseline, and shows that of these children, 9.2% continued to score 0 a year later; 27.8% scored between 1 and 10; 45.3% scored between 11 and 20; and 17.7% scored more than 20 in the endline.

**Chart 13: Transition Matrix: Performance of children in endline by baseline score category**



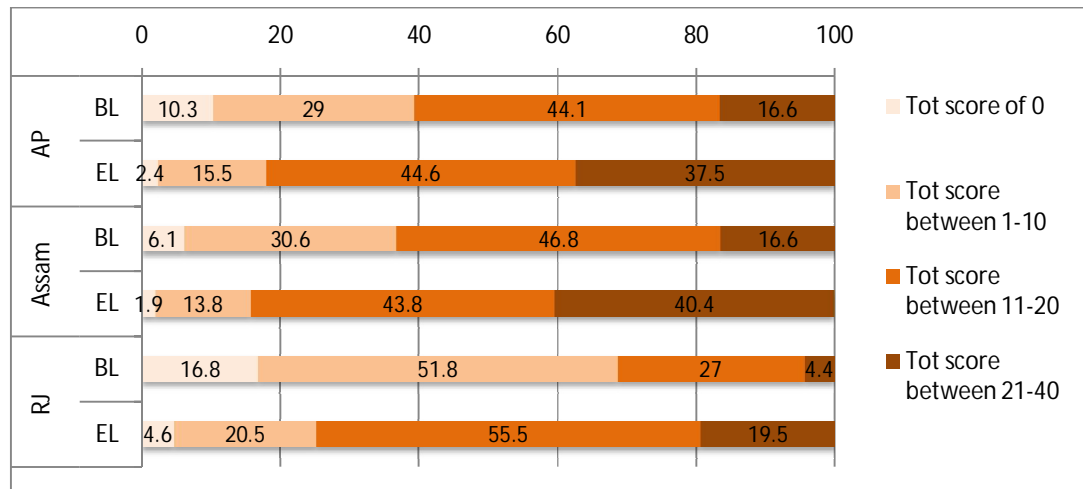
Two features of this progression are worth pointing out. First, children made considerable progress during the year between the two assessments. Overall, more than 30% of children score in the highest score range during the end line, as opposed to 11% in the baseline; and simultaneously the proportion of children scoring 0 reduces to less 3% of the sample. Second, although changes from

baseline to endline are positive in aggregate, a substantial amount of sliding back is also visible. For example, 45% of the children who scored above 20 in the baseline assessment registered a lower score in the endline.<sup>23</sup>

Although this overall pattern is mirrored in individual states, the quantum of change varies (Chart 14). In Assam for instance two-fifth of the sample achieve the highest score range in the end line, with Andhra Pradesh following close at 37%. In Rajasthan on the other hand, less than 20% children achieve the same score range. Assam also has the lowest proportion of students scoring 0, followed by Andhra Pradesh (2.5%) and Rajasthan (4.6%).

Another way to look at these figures is to look at where most children had moved to by the end line. For instance, in both Assam and Andhra Pradesh the largest movement between baseline and endline is in the highest score category, where the proportion of children increases by over 20 percentage points. In both states we also see similar reductions in the proportion of children scoring between 1-10 points – this category sees a reduction of almost 15 percentage points in both states. In Rajasthan on the other hand, proportion of children scoring 1-10 points reduces by a third and a similar proportion of children move into the next score category (11-20 points). What this amounts to is that in both Assam and Andhra Pradesh, by the end line, far more children move into the higher score categories whereas in Rajasthan we have a far greater reduction in the proportions of children scoring 0 or in the lowest score category.

**Chart 14: % Children in each score range in baseline and end line, by state**



<sup>23</sup> To some extent this 'sliding back' is an artifact of the way individual test items were scored.

## IV CONCLUSIONS

### 4.1. The relationship between participation and school readiness

In this final chapter we take a first cut at putting together the results presented in earlier chapters on children's participation and their levels of school readiness, in order to answer the question: does more participation relate to better school readiness? And does the type of institution attended appear to make a difference?

It should be noted at the outset that the descriptive tables presented below are not an indication of causality. In the next stage of analysis, more sophisticated data analysis techniques will be utilized to arrive at more precise estimations of the relationships between children's individual, household, and ECE centre (or school) characteristics and how these relate to their levels of participation and school readiness.

For the moment, we examine the observed relationship between the extent of children's participation, as captured by the 'dosage' variable, and improvements in their school readiness. Recall that our 'dosage' variable had 5 categories, reproduced here:

- *No Participation*: Children who were not found to be participating in any preschool or primary school in any of the four visits.
- *Partial Participation*: Children who were found to be participating in either preschool or primary school or both on between one and three out of the four visits.
- *Full Participation*: Children who were found participating in all four visits. This group of children is further subdivided depending on the type of institution(s) attended:
  - *Full Participation – primary school*: Comprises children who were found to be participating in primary school on all four visits (includes children who moved from one primary school to another).
  - *Full Participation – preschool*: Comprises children who were found in Anganwadis or in private/other preschools on all four visits (includes children who moved from one pre-primary institution to another).
  - *Full Participation – mixed*: Includes children who were found participating on all four visits, but whose participation included any combination of preschool and primary school.

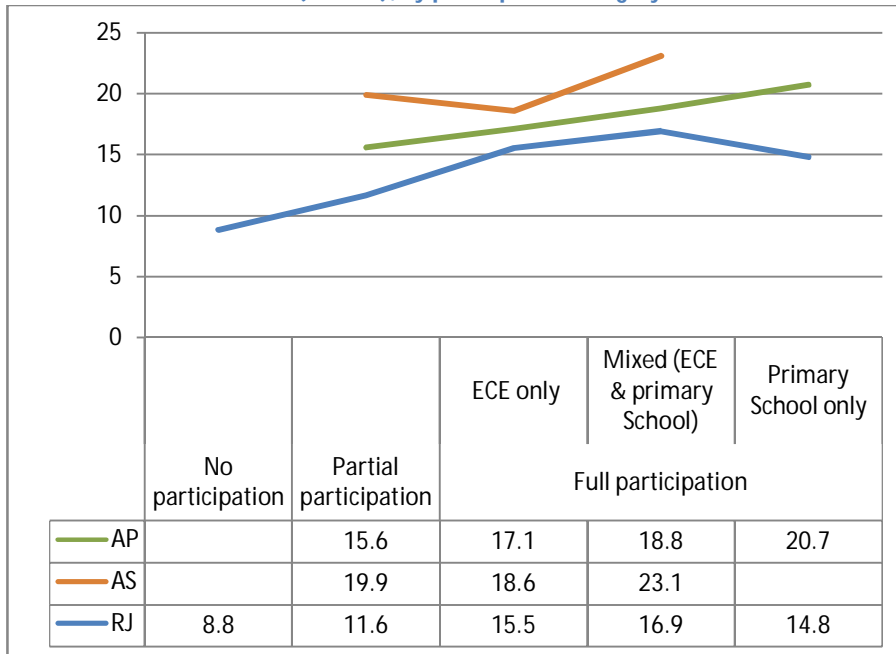
Chart 15 presents the mean aggregate endline score on the School Readiness Inventory for each dosage category, separately for each of the three states included in this study. This chart should be read with two caveats. First, the dosage variable is an imperfect measure of children's exposure to preschool or primary school, especially in the 'partial' and 'mixed' categories which include a variety of combinations of ECE and primary school. And second, sample sizes in some categories were extremely small; those figures have therefore been removed from the analysis, therefore the graph lines for Assam and Andhra Pradesh have fewer data points than the one for Rajasthan.

Despite these caveats, a broad overall trend is visible which suggests that increased participation is indeed related to higher scores on the School Readiness Inventory. It is also noteworthy that states exhibit a clear hierarchy with respect to school readiness: in each category of participation for which data are available, children in Assam do better than those in Andhra Pradesh, who in turn do better than those in Rajasthan. Although a detailed analysis will not be presented here, it is worth pointing out that while households in Assam did worse than other states in terms of indicators of affluence,



they scored by far the highest on indicators such as mother’s education, reading materials available in the home, and literacy support provided to children (see Appendices 4-8 for more details).

**Chart 15: Mean total scores (Endline), by participation category and state**

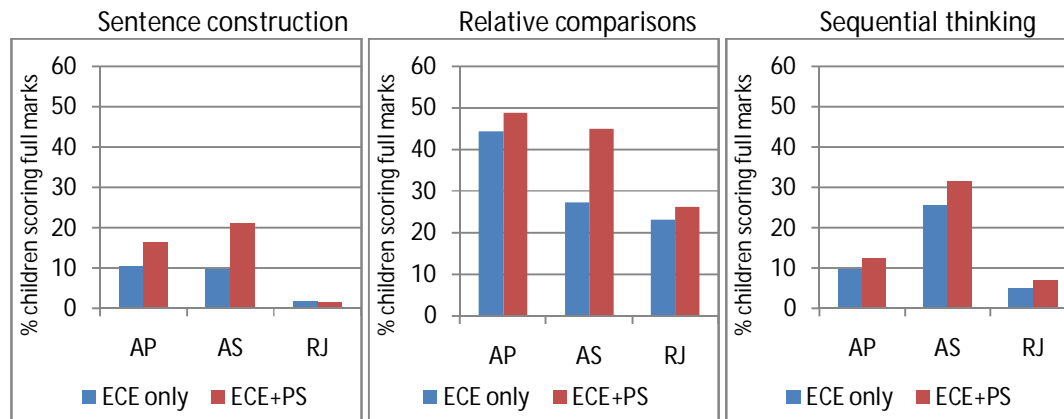


The analysis presented above suggests that the quantum of participation is related to children’s overall school readiness. Within the category of ‘full participation’, however, the evidence is less clear on whether more formal learning environments (in this case, primary schools) are better than less formal environments (in this case, ECE centres) at fostering the development of specific types of skills and concepts.

Rather than looking at aggregate scores, therefore, we look at children’s development of three specific abilities. From the set of pre literacy tasks, we focus on children’s ability to construct full sentences; from the set of pre numeracy tasks, we examine children’s ability to compare numbers; and from the remaining indicators of cognitive development we focus on sequential thinking. In each case we restrict the analysis to the two categories of ‘full participation’ for which we have sufficient numbers of children in all three states: the category of ‘ECE only’, which includes all children who were observed in an ECE centre on all four field visits; and the category of ‘Mixed participation’, which includes all children who were observed on all four visits in some combination of ECE centre and primary school. In other words, while children in both categories had the same quantum of participation, those in the ‘mixed’ category had some exposure to formal school settings while those in the ‘ECE only’ category did not.

Chart 16 below presents the observed trends with respect to these parameters. Without controlling for children’s age or home backgrounds, these data suggest that children with some exposure to primary school do substantially better on each of these three tasks than those with no such exposure. The only exception is in Rajasthan where children struggle with the task of speaking in full sentences, regardless of the nature of the institution they have participated in.

**Chart 16: % Children scoring full marks on select competencies, by participation category and state**



#### 4.2. Summary and concluding thoughts

This report has presented broad trends in the participation status and school readiness of a cohort of close to 12,000 children drawn from three major Indian states. Children were tracked for a year, from late 2011 to late 2012. During this period children were visited four times in order to track their participation status; extensive information was collected about their households; and each child was assessed twice, once at the beginning and again at the end of the period, in order to observe changes in their cognitive and language skills and concepts.

Although the analyses presented here are preliminary and descriptive, one clear conclusion is that at age 4 and 5 children participate regularly in institutional settings, whether ECE centres or schools. 70% of the sample was observed to be participating in all four rounds of fieldwork, although there is considerable variation across states both in the quantum of participation and in the types of institutions that children attend.

The varying 'pathways' followed by children in the year prior to primary school are only partly linked to the availability of ECE facilities in the villages where they live. Anganwadis were operating in every village sampled for this study, and many villages had private/other ECE centres as well. But during the fourth round of fieldwork, for example, in Assam most children were attending Anganwadis; in Andhra Pradesh substantial proportions of children were going to an institution outside their village; and in Rajasthan more than a third were in primary school. It is notable that fairly large numbers of young children were observed in primary schools even during the baseline visit at age 4, especially in Andhra Pradesh and Rajasthan, where their participation is typically unofficial and therefore largely invisible to teachers and policy makers alike. There is also evidence of gender differences in participation among young children, especially in Rajasthan, with boys more likely to attend private preschools or schools and girls more likely to attend government institutions.

With respect to the indicators of school readiness assessed as part of this study, there is no doubt that children grow enormously in skills and concepts between age 4 and age 5. Of the abilities measured using the School Readiness Inventory, changes are most visible in the domains of cognitive development and pre numeracy, least visible in the domain of language skills and concepts. Although further analysis is needed to establish causal relationships between types of participation and changes in school readiness, these data suggest that children's ability to do tasks in all three

domains was higher if they had some exposure to primary school, as compared to those children who had participated only in ECE centres.

Lastly, it is important to note that for a given quantum of participation (category of 'dosage'), children in Assam had higher mean school readiness scores than those in Andhra Pradesh, who in turn did better than those in Rajasthan. As the Appendices to this report show, these outcomes appear to be strongly related to specific household-level indicators. Children in Assam had by far the most educated mothers and the most supportive environment in terms of the availability of literacy materials and home support for learning, whereas children in Rajasthan had the least educated mothers and much less support available at home. Notably, indicators of affluence such as household assets and type of house do not seem related to children's school readiness. These data underline the importance of household environments in fostering children's cognitive and language development – not a surprising outcome given the young age of the children in this study.

To summarize, data from this study suggests that improvements in children's school readiness are related more to their home background and participation in primary schools than to their participation in ECE programs. The study has also shown that in the year preceding primary school, large proportions of children in all three states spend at least part of their time in ICDS Anganwadi centres. The implementation of a carefully designed ECE curriculum in Anganwadi centres could therefore go a long way towards helping to achieve the Government of India's recent policy goal for young children, which aims to *promote inclusive, equitable and contextualized opportunities for promoting optimal development and active learning capacity of all children below 6 years of age*.

A final point that requires urgent attention from primary school planners and curriculum designers has to do with planning educational curricula for children along a continuum that begins with preschool and continues into primary school and beyond. By the end of the period of fieldwork covered in this report, more than a third of all children in Andhra Pradesh and Rajasthan were in primary school.<sup>24</sup> It is likely that most of the remaining children will have followed them since then, and subsequent phases of this study will provide additional data on how children's levels of school readiness relate to their reading and math achievement in early grades. But even the limited evidence from this first phase of the study shows that children age 5 do not have the foundational knowledge and skills required to cope with the Std 1 curriculum. To provide only one example, during the endline assessment when most children were 5 years old, barely a third could correctly match numbers to pictures showing the same number of objects. A glance at the Std 1 math textbook of any state will show that children are expected to reach much further than this during their first year in school. If ECE centres are to help children bridge the gap between home and primary school, serious efforts will be required to build these foundational skills and concepts.

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<sup>24</sup> As mentioned earlier in this report, children in Assam officially enter Std 1 at age 6 rather than age 5, and the academic year begins in January, rather than April.

## APPENDICES

Appendix 1: Sample description, Strand A, Visit 1-Visit 4 (Detailed)

State	District	No. of villages	No. of children	Visit 1					Visit 2	Visit 3	Visit 4			No. of children tested in baseline and endline	% Sample children tested in baseline and endline
				No. of children tested in baseline	% Sample children tested in baseline	No. of HHs surveyed	HHs as a % of sampled children	No. of ECE Centres surveyed	No. of ECE Centres surveyed	No. of ECE Centres surveyed	No. of children tested in the endline	% Sample children tested in endline	No. of ECE Centres surveyed		
Andhra Pradesh	Medak	51	1,931	1,477	76.5	1,835	95.0	210	169	216	1,616	83.7	175	1,265	65.5
	Warangal	51	1,390	1,031	74.2	1,310	94.2	266	210	280	1,246	89.6	216	931	67.0
	<b>Total</b>	<b>102</b>	<b>3,321</b>	<b>2,508</b>	<b>75.5</b>	<b>3,145</b>	<b>94.7</b>	<b>476</b>	<b>379</b>	<b>496</b>	<b>2,862</b>	<b>86.2</b>	<b>391</b>	<b>2,196</b>	<b>66.1</b>
Assam	Dibrugarh	51	1,529	1,163	76.1	1,274	83.3	191	155	146	1,255	82.1	167	998	65.3
	Kamrup	50	2,308	1,662	72.0	1,829	79.3	349	273	239	1,981	85.8	344	1,450	62.8
	<b>Total</b>	<b>101</b>	<b>3,837</b>	<b>2,825</b>	<b>73.6</b>	<b>3,103</b>	<b>80.9</b>	<b>540</b>	<b>428</b>	<b>385</b>	<b>3,236</b>	<b>84.3</b>	<b>511</b>	<b>2,448</b>	<b>63.8</b>
Rajasthan	Alwar	52	2,375	1,896	79.8	2,107	88.7	318	280	118	1,963	82.7	98	1,762	74.2
	Ajmer	51	2,295	1,892	82.4	1,976	86.1	259	223	200	1,875	81.7	190	1,718	74.9
	<b>Total</b>	<b>103</b>	<b>4,670</b>	<b>3,788</b>	<b>81.1</b>	<b>4,083</b>	<b>87.4</b>	<b>577</b>	<b>503</b>	<b>318</b>	<b>3,838</b>	<b>82.2</b>	<b>288</b>	<b>3,480</b>	<b>74.5</b>
<b>Total</b>		<b>306</b>	<b>11,828</b>	<b>9,121</b>	<b>77.1</b>	<b>10,331</b>	<b>87.3</b>	<b>1593</b>	<b>1310</b>	<b>1199</b>	<b>9,936</b>	<b>84.0</b>	<b>1190</b>	<b>8,124</b>	<b>68.7</b>

**Appendix 2: Amenities within sampled villages, by state and district**

State	District	% Villages with:									
		Electricity	PDS shop	Bank	Private health clinic	Health sub-centre	Pucca road	STD booth	Post office	Internet	Private school
Andhra Pradesh	Medak	100.0	96.7	24.6	91.8	67.2	96.7	93.4	88.5	3.3	29.5
	Warangal	100.0	100.0	13.1	95.1	49.2	100.0	96.7	93.4	6.6	50.8
Assam	Dibrugarh	87.9	82.8	13.8	25.9	41.4	44.8	22.4	15.5	17.2	46.6
	Kamrup	92.7	98.2	20.0	32.7	61.8	47.3	25.5	45.5	5.5	50.9
Rajasthan	Alwar	98.3	87.9	29.3	74.1	84.5	98.3	58.6	75.9	13.8	86.2
	Ajmer	100.0	95.1	49.2	67.2	86.9	100.0	63.9	86.9	18.0	86.9

**Appendix 3: Sampled children belonging to different social categories and religion, by state and district**

State	District	Caste					Religion			
		SC	ST	OBC	General	Total	Hindu	Muslim	Other	Total
Andhra Pradesh	Medak	26.5	7.8	60.3	5.4	100	87.3	5.6	7.0	100
	Warangal	23.7	20.3	53.0	3.0	100	97.0	1.8	1.2	100
	<b>Total</b>	<b>25.4</b>	<b>13.0</b>	<b>57.3</b>	<b>4.4</b>	<b>100</b>	<b>91.3</b>	<b>4.0</b>	<b>4.6</b>	<b>100</b>
Assam	Dibrugarh	9.5	6.4	73.6	10.5	100	94.4	4.6	1.0	100
	Kamrup	9.7	11.5	16.9	62.0	100	63.2	35.7	1.1	100
	<b>Total</b>	<b>9.6</b>	<b>9.5</b>	<b>39.5</b>	<b>41.5</b>	<b>100</b>	<b>76.0</b>	<b>22.9</b>	<b>1.0</b>	<b>100</b>
Rajasthan	Alwar	21.2	14.5	50.6	13.7	100	82.7	17.3	0.0	100
	Ajmer	13.3	5.2	66.8	14.7	100	77.4	22.4	0.2	100
	<b>Total</b>	<b>17.4</b>	<b>10.1</b>	<b>58.4</b>	<b>14.2</b>	<b>100</b>	<b>80.1</b>	<b>19.8</b>	<b>0.1</b>	<b>100</b>
<b>All States</b>		<b>17.5</b>	<b>10.8</b>	<b>52.3</b>	<b>19.3</b>	<b>100</b>	<b>82.3</b>	<b>15.9</b>	<b>1.8</b>	<b>100</b>

**Appendix 4: Parent's educational background**

State	District	Mother's Education				Father's Education			
		None	Primary School (Std1-5)	Above Std 5	Total	None	Primary School (Std1-5)	Above Std 5	Total
Andhra Pradesh	Medak	53.1	16.9	30.0	100	39.1	14.8	46.1	100
	Warangal	39.2	15.6	45.3	100	28.0	12.9	59.1	100
	<b>Total</b>	<b>47.4</b>	<b>16.4</b>	<b>36.2</b>	<b>100</b>	<b>34.6</b>	<b>14.1</b>	<b>51.4</b>	<b>100</b>
Assam	Dibrugarh	44.3	17.5	38.2	100	21.3	26.2	52.5	100
	Kamrup	21.6	19.6	58.8	100	19.3	16.0	64.6	100
	<b>Total</b>	<b>30.5</b>	<b>18.7</b>	<b>50.7</b>	<b>100</b>	<b>20.1</b>	<b>20.1</b>	<b>59.8</b>	<b>100</b>
Rajasthan	Alwar	48.8	14.9	36.2	100	13.0	10.1	76.8	100
	Ajmer	70.0	13.4	16.6	100	22.5	15.5	62.0	100
	<b>Total</b>	<b>59.0</b>	<b>14.2</b>	<b>26.8</b>	<b>100</b>	<b>17.6</b>	<b>12.7</b>	<b>69.6</b>	<b>100</b>
<b>All States</b>		<b>47.0</b>	<b>16.2</b>	<b>36.8</b>	<b>100</b>	<b>23.6</b>	<b>15.4</b>	<b>61.1</b>	<b>100</b>

**Appendix 5: Distribution of Consumer Durable items and Asset Index within sampled households, by state and district**

State	District	% Households who own:							Consumer Durable Index			
		Phone	Fan	TV	Cycle	Scooter	Fridge	Car	% Household in Asset Index Category:			
									Low	Medium	High	Total
Andhra Pradesh	Medak	68.9	94.5	69.5	40.0	10.9	2.2	0.9	11.0	62.1	26.9	100
	Warangal	70.9	96.6	62.5	38.3	12.6	2.0	0.8	13.0	56.7	30.2	100
	<b>Total</b>	<b>69.7</b>	<b>95.4</b>	<b>66.7</b>	<b>39.3</b>	<b>11.6</b>	<b>2.1</b>	<b>0.9</b>	<b>11.8</b>	<b>59.9</b>	<b>28.2</b>	<b>100</b>
Assam	Dibrugarh	39.0	30.0	60.9	71.1	11.8	5.3	2.5	48.4	30.8	20.8	100
	Kamrup	34.3	27.7	45.4	66.0	11.4	4.7	2.5	55.7	28.8	15.5	100
	<b>Total</b>	<b>36.2</b>	<b>28.7</b>	<b>51.8</b>	<b>68.1</b>	<b>11.6</b>	<b>4.9</b>	<b>2.5</b>	<b>52.7</b>	<b>29.6</b>	<b>17.7</b>	<b>100</b>
Rajasthan	Alwar	83.7	74.7	51.3	17.3	33.0	21.0	4.1	22.5	45.0	32.5	100
	Ajmer	84.6	79.3	60.6	22.0	43.2	11.0	5.4	18.5	41.5	40.1	100
	<b>Total</b>	<b>84.1</b>	<b>77.0</b>	<b>55.8</b>	<b>19.6</b>	<b>37.9</b>	<b>16.1</b>	<b>4.7</b>	<b>20.6</b>	<b>43.3</b>	<b>36.2</b>	<b>100</b>
<b>All States</b>		<b>65.3</b>	<b>67.9</b>	<b>57.9</b>	<b>40.2</b>	<b>22.0</b>	<b>8.5</b>	<b>2.9</b>	<b>27.6</b>	<b>44.2</b>	<b>28.2</b>	<b>100</b>



### Appendix 6: Household physical structure, by state and district (%)

State	District	House construction material			
		Pucca	Semi-pucca	Kutchha	Total
Andhra Pradesh	Medak	26.1	69.2	4.8	100
	Warangal	32.6	60.7	6.7	100
	<b>Total</b>	<b>28.8</b>	<b>65.7</b>	<b>5.6</b>	<b>100</b>
Assam	Dibrugarh	16.0	31.3	52.7	100
	Kamrup	16.0	19.4	64.5	100
	<b>Total</b>	<b>16.0</b>	<b>24.3</b>	<b>59.7</b>	<b>100</b>
Rajasthan	Alwar	84.9	8.9	6.2	100
	Ajmer	85.5	6.1	8.3	100
	<b>Total</b>	<b>85.2</b>	<b>7.6</b>	<b>7.2</b>	<b>100</b>
<b>All States</b>		<b>47.1</b>	<b>30.3</b>	<b>22.5</b>	<b>100</b>

### Appendix 7: Learning support within sampled households

State	District	Reads/Tells Stories			Helps with learning			No. of Reading Materials			
		Never	At least once	Total	Never	At least once	Total	None	1 or 2	3 or more	Total
Andhra Pradesh	Medak	59.3	40.7	100	48.1	51.9	100	30.3	55.3	14.3	100
	Warangal	68.6	31.4	100	44.1	55.9	100	36.5	59.2	4.3	100
	<b>Total</b>	<b>63.2</b>	<b>36.8</b>	<b>100</b>	<b>46.4</b>	<b>53.6</b>	<b>100</b>	<b>32.9</b>	<b>56.9</b>	<b>10.2</b>	<b>100</b>
Assam	Dibrugarh	44.5	55.5	100	23.4	76.6	100	11.3	60.0	28.6	100
	Kamrup	10.5	89.5	100	4.8	95.2	100	4.3	47.2	48.5	100
	<b>Total</b>	<b>24.5</b>	<b>75.5</b>	<b>100</b>	<b>12.4</b>	<b>87.6</b>	<b>100</b>	<b>7.2</b>	<b>52.5</b>	<b>40.4</b>	<b>100</b>
Rajasthan	Alwar	66.5	33.5	100	50.2	49.8	100	12.5	64.6	22.9	100
	Ajmer	80.0	20.0	100	72.8	27.2	100	20.9	55.8	23.2	100
	<b>Total</b>	<b>73.0</b>	<b>27.0</b>	<b>100</b>	<b>61.1</b>	<b>38.9</b>	<b>100</b>	<b>16.6</b>	<b>60.4</b>	<b>23.1</b>	<b>100</b>
<b>All States</b>		<b>55.5</b>	<b>44.5</b>	<b>100</b>	<b>42.1</b>	<b>57.9</b>	<b>100</b>	<b>18.7</b>	<b>57.0</b>	<b>24.3</b>	<b>100</b>

#### Appendix 8: Sample distribution of children, by gender

State	District	N	Boys	Girls	Total
AP	Medak	1,930	52.1	47.9	100
	Warangal	1,389	51.8	48.2	100
	<b>Total</b>	3,319	52.0	48.0	100
Assam	Dibrugarh	1,499	47.6	52.4	100
	Kamrup	2,275	49.4	50.6	100
	<b>Total</b>	3,774	48.7	51.3	100
RJ	Alwar	2,300	54.1	45.9	100
	Ajmer	2,291	52.2	47.8	100
	<b>Total</b>	4,591	53.1	46.9	100
<b>TOTAL</b>		11,684	51.4	48.6	100

#### Appendix 9: Sample distribution of children, by age at baseline

State	District	N	Below 4 years	Between 4-4.5 years	Above 4.5 years	Total
AP	Medak	1,931	21.8	52.9	25.4	100
	Warangal	1,388	23.6	50.7	25.7	100
	<b>Total</b>	3,319	22.5	52.0	25.5	100
Assam	Dibrugarh	1,423	23.8	55.0	21.2	100
	Kamrup	2,201	28.6	48.9	22.4	100
	<b>Total</b>	3,624	26.7	51.3	22.0	100
RJ	Alwar	2,370	20.5	60.4	19.1	100
	Ajmer	2,293	22.3	56.7	21.1	100
	<b>Total</b>	4,663	21.4	58.6	20.1	100
<b>TOTAL</b>		11,606	23.4	54.4	22.2	100

