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The Landscape of Early Childhood Development in Rural China

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Summary

In China, low levels of early childhood development (ECD) in rural areas may inhibit economic development as the nation attempts to transition from a middle-income manufacturing-based economy to a high-income innovation economy. This paper surveys the recent literature on ECD among children ages 0-3 years in rural China, including rates of developmental delays, causes of delays, and implications for the future of China's economy. Recent studies have found high rates of developmental delays among young children in rural China and point to poor nutrition and psychosocial stimulation as the primary causes. This review highlights the need for large-scale ECD interventions in rural China to raise human capital and support future economic growth.

Key words: early childhood development, cognition, nutrition, parenting, rural China

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Introduction

Early childhood development (ECD) is fundamental to success in later life. Research has shown that the majority of brain development occurs in the first three years of a child's life, making this a key period for the development of cognitive and noncognitive skills (Currie & Almond 2011; Grantham-McGregor, 2007). In turn, the skills developed in the first three years lay the foundation for later skills development (Cunha et al., 2006). For this reason, healthy ECD has been linked to a variety of positive long-term outcomes in health, education, employment, and adult earnings (Attanasio et al. 2015; Heckman et al. 2006; Heckman et al. 2010; Currie & Almond 2011; Knudsen et al., 2006).

Due to the importance of ECD for later outcomes, investments in early childhood also support overall human capital accumulation and economic growth (Cunha et al. 2006; Rolnick & Grunewald, 2003; Wang et al., 2018). Recent research has demonstrated that investments in cognitive and noncognitive development in early childhood yield the greatest economic returns compared to investments later in childhood or in adulthood (Heckman et al. 2006; Gertler et al., 2014). Low levels of investments, however, have been linked to persistent poverty and lower levels of human capital that limit a country's ability to transition to a skills-based economy (Heckman & Masterov, 2007).

Yet despite the well documented economic and social benefits of investments in ECD, poor cognitive development remains a significant problem among young children in developing countries. Recently, a Lancet review paper estimated that 250 million (43%) children under the age of five in low- to middle-income countries are at risk for developmental delays and reduced cognition (Black et al., 2013). As

ECD outcomes have been closely linked to educational and employment outcomes in later life, large shares of children at risk for developmental delays may limit a country's ability to raise human capital and grow and develop its economy.

As China attempts to transition from a middle-income, manufacturing-based economy to a high-income innovation economy, investing in the human capital of the nation's future labor force is critical to its overall goals. Research has shown that continued economic development for middle-income countries such as China hinges on promoting an educated population (Barro, 2001; Kharas and Kohli, 2011). However, China suffers from a wide rural-urban gap in educational outcomes (Wang et al., 2018). Low levels of ECD in rural areas may inhibit economic development if large shares of the population are unable to achieve high levels of education due to developmental delays in early childhood. Until recently, however, the literature on ECD in China, almost all of which is in Chinese, has focused mainly on urban areas (e.g., Zhou et al., 2013). There is now a need for better understanding of the ECD landscape in rural China, which is home to nearly three fourths of the nation's children and the majority of its industrial labor force.

This paper provides an overview of the recent literature on ECD across rural China. To meet this goal, we have three objectives. First, we describe the prevalence of developmental delays, including delays in cognitive, language, social-emotional and motor skills, among children ages 0-3 years in rural China. Second, we identify causes of the low levels of ECD and high rates of delays among China's rural infants and toddlers. Finally, we discuss the long-term social and economic implications of poor ECD in rural China. Ultimately, we aim to provide informed policy recommendations for improving ECD and raising human capital across rural China.

In pursuit of these objectives, we draw on large-scale studies of ECD among children age 0-3 years in rural China. The studies, which were conducted by our research teams across China between 2013 and 2018, are the first to document trends in ECD, as well as causes of developmental delays, among young children in China's rural areas. We also review studies, conducted by both our own survey teams and those of others, that examine cognition among school-age children in rural China and that evaluate interventions to improve rural ECD.

ECD in Rural China

Recent studies of ECD in rural China, conducted by the coauthors of this paper and their colleagues, have revealed a troubling trend: large shares of rural children ages 0-3 years are not achieving their developmental potential. The first of these studies, conducted in 2014, assessed the cognitive development of 1,442 infants and toddlers aged 18-30 months in rural Shaanxi Province, using the First Edition of the Bayley Scales of Infant and Toddler Development (Bayley-I), a well-recognized tool for measuring the development of children ages 0-42 months (Bayley, 1993; 2006). The Bayley Scales is considered to be the "gold standard" for assessing infant and toddler development internationally (Yue et al., forthcoming; Rubio-Codina et al., 2016), and the Bayley-I has been used widely used throughout China since it was formally adapted to the Chinese language and environment in 1992 (Yi et al., 1993; Huang, Tao & Zhang, 1993).

The results, reported in Yue et al. (2017; 2019), found that 48% of children in the sample had cognitive scores below 85. This is equivalent to an adult IQ below 90, and at one standard deviation (SD) below the healthy mean of 100, a score of 85 marks the cutoff for developmental delays. In other words, nearly half of the children sampled were at risk for

delayed cognitive development. This is more than three times the rate of delay that one would expect to find in a "healthy population" (for example, in London, San Francisco, or Shanghai), where only about 15% of individuals would exhibit developmental delays.

A subsequent study, reported in Luo et al. (2017), measured the development of 448 infants and toddlers age 6-18 months in rural Hebei and Yunnan provinces. For this study, the research team used the third edition of the Bayley Scales (Bayley-III), which measures cognition as well as language, social-emotional and motor development. The Bayley-III… This version of the test was adapted into Chinese through a collaboration between Stanford REAP and Shanghai Jiaotong University in 2015.

In this second study, the research team found the same results as those reported in Yue et al. (2017; 2019): nearly half (48.7%) of sample infants were cognitively delayed. In addition, the study found that 40.6% of infants were delayed in language development, and 35.0% were delayed in social-emotional development (Luo et al. 2017). Taken together, these two studies indicate that the rates of developmental delays in rural China are much higher than that of a healthy population, and that delays are not only in cognition, but also in the development of essential noncognitive skills such as language and social-emotion. Notably, nearly all of the sample individuals in both the Yue et al. and Luo et al. studies were of Han ethnic origin.

Enumerators administer a Bayley-I test to a toddler in rural China. Recent studies have found that nearly half of infants and toddlers in rural China are at risk for cognitive delays. Source: REAP Field Survey, 2014.

Although these initial studies revealed high rates of developmental delays, they were not necessarily representative of all rural communities across China. Both studies were conducted in narrow geographic ranges within Shaanxi, Hebei, and Yunnan Provinces, as well as among one specific type of rural population (mountainous communities, which tend to more remote and less economically developed than other rural communities). Therefore, to understand the overall nature of ECD across China's diverse rural communities, members of the research team used the Bayley-III to assess the cognitive, language, social-emotional and motor development of 3,353 infants and toddlers aged 6-30 months in four major rural subpopulations of China, which altogether account for 69% of the nation's rural infants and toddlers (Wang et al., 2019). The four subpopulations include mountainous communities in western China, communities in China's central plains, rural resettlement communities (state-built residential areas to consolidate scattered populations that originally lived in mountainous villages), and

rural migrant enclaves in China's cities. After these new samples were added, the scope of the study areas spread across the provinces of Hebei, Henan, Guizhou, Yunnan, and Shaanxi and the cities of Beijing, Xi'an and Zhengzhou.

The results of this most recent study are reported in Wang et al. (2019). Among the four major rural subpopulations, the research team found the same rates of delay as were found in our previous studies (Table 1). About half (49%) of the infants and toddlers surveyed exhibited cognitive delays, while more than half were delayed in language and social-emotional development (52% and 53%, respectively), and nearly one third (30%) were delayed in motor development. Furthermore, 88% of infants (6-18 months) and 79% of toddlers (18-30 months) exhibited a delay in at least one of the four areas measured (Table 2). Compared to the rates of delay in a healthy population (15%), the rates of delay across rural China are over five times higher, indicating a severe problem in early childhood development among China's rural communities.

Table 1: Developmental delays among children age 0-3 years across rural China

	Full sample	Mountainous rural communities	Resettlement communities	Central rural communities	Migrant Communities
	(1)	(2)	(3)	(4)	(5)
Cognitive delay	49%	54%	51%	48%	42%
Language delay	52%	61%	54%	49%	39%
Social-emotional delay	53%	59%	67%	54%	39%
Motor delay	30%	35%	35%	30%	19%
Any type of delay	85%	90%	90%	84%	75%
Any two types of delay	57%	66%	63%	55%	45%
Any three types of delay	32%	39%	38%	33%	15%
Four types of delay	10%	14%	16%	9%	4%
Observations	**3353**	**2886**	**135**	**128**	**204**

Source: Wang et al. (2019). Reproduced with authors' permission.

Table 2: Developmental delays by age range

	Age (6~18 months)	Age (18~30 months)
Cognitive delay	46%	55%
Language delay	57%	45%
Social-emotional delay	56%	49%
Motor delay	40%	14%
Observations	**2203**	**1150**

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How do the rates of developmental delays in rural China compare to urban areas? In fact, studies in urban China have found rates of delay between 5% and 16% (Zhou et al., 2013; Xie et al., 2006; Xu et al., 2009; Shi et al., 2001), which is about what one would find in a healthy community elsewhere in the world. This means that in China, poor early childhood development and high rates of delays are primarily a rural problem. However, the rates of delay among our sample are similar to rates of developmental delays found in studies of other developing settings, such as Colombia, Mexico and South Africa, in which rates of cognitive delays were found to be 40%, 36% and 39%, respectively (Attanasio et al., 2015; Fernald et al., 2006; Rademeyer and Jacklin, 2013; Table 3). Moreover, although per capita GDP in Colombia, Mexico and South Africa are lower than rural China, the rate of developmental delays in rural China (49%) is higher than that in any of the other three countries. These results suggest that poor early cognitive development is a common problem among developing countries, and that among developing countries, rural China's ECD problem is particularly severe.

Table 3: Developmental delays across middle-income countries

Study location	GDP per capita (PPP)	Measure of development	Sample size	Age (months)	Prevalence of cognitive delays
Healthy population		BSID III			15%
Rural China	$16,600 (China overall)	BSID III	3343	6-30	49%
Colombia	$14,500	BSID III	1420	12-24	30-40%
Mexico	$19,500	BSID II	896	12.5-23.5	36%
South Africa	$13,400	BSID III	122	3-12	39%

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Causes of poor ECD

The previous section discussed ECD outcomes in rural China, noting high rates of developmental delays among rural infants and toddlers, comparable to or somewhat higher than in other developing countries. In this section, we draw on past studies conducted by the research team to identify the main causes of poor ECD outcomes in rural China. Our research has identified two main causes of poor ECD in rural China: poor nutrition and insufficient psychosocial stimulation. These factors are also mitigated by the effects of parental migration.

Poor Nutrition

Research has indicated that poor nutrition may be one cause for low ECD outcomes in rural China. Undernutrition, particularly micronutrient deficiencies such as anemia, have been linked to developmental delays in cognition, social-emotional skills, and physical growth (Grantham-McGregor and Ani, 2001; Chang et al., 2007). Unfortunately, early childhood anemia remains prevalent across rural China. Wang et al. (2019)'s study of developmental outcomes among infants and toddlers across China's four major rural subpopulations found that 42% of infants and toddlers were anemic, despite very low rates of stunting, being underweight, and wasting (Table 4). Another study, reported by Luo et al. (2015), found that 48.8% of rural infants and toddlers in China were anemic. Both exceed the 40% threshold set by the World Health Organization (WHO) for consideration as a "severe public health problem" (WHO, 2001). The rates of anemia among children in rural China are also higher than the rate of 18% found among children under age two in urban China (Hu et al., 2014); they are also much higher than those in developed countries such as the United States, where rates among similarly aged children have been found to be as low as 3% (Le, 2016). Hence, the data show that rural China still lags significantly behind developed countries in terms of nutrition, leading to consequences for ECD.

Table 4: Health outcomes among children 0-3 years across rural China

	Full sample	Mountainous rural communities	Resettlement communities	Central rural communities	Migrant Communities
	(1)	(2)	(3)	(4)	(5)
Anemia	42%	38%	52%	46%	43%
Stunting	4%	7%	4%	2%	2%
Underweight	2%	3%	2%	1%	0%
Wasting	4%	4%	3%	4%	4%
Observations	**3272**	**2836**	**127**	**125**	**184**

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Insufficient Psychosocial Stimulation

Research has also pointed to insufficient psychosocial stimulation, caused by a lack of interactive parenting, as another major cause of poor ECD outcomes in rural China. International literature has demonstrated that psychosocial stimulation in early childhood is foundational to the development of cognitive, language, social-emotional and motor skills (Britto et al., 2017). Young children typically receive psychosocial stimulation through interactive parenting—activities in which caregivers and children engage together, such as reading, signing, telling stories and playing. This means that parenting practices are an essential input in healthy ECD.

Studies conducted by our research team have shown empirically that interactive parenting by a child's primary caregiver (typically the child's

mother or grandmother) is strongly and significantly linked to ECD outcomes, with children who receive more interactive parenting showing better developmental outcomes. Yue et al. (2017; 2019)'s study found that children whose caregivers read, sang and played with them were significantly less likely to be cognitively delayed. Additionally, in their study of China's four major rural subpopulations, Wang et al. (2019) found that playing with children had the largest and broadest impact on ECD: children whose caregivers played with them on a daily basis were significantly less likely to be delayed in cognition, language, and social-emotional development compared with children whose caregivers did not play with them. The findings of both studies point to the importance of interactive parenting and early education for healthy ECD outcomes.

Yet despite the significant and positive impacts of interactive parenting on ECD, the share of caregivers (parents and grandparents) in rural China who regularly engage in key interactive parenting practices is small. Yue et al., (2017; 2019)'s study found that only 39.2% of rural caregivers had played with their child in the previous day, while 37.5% reported singing and only 12.6% reported reading with their child. The share of caregivers who engaged in all three activities was even smaller, at 7.1%. Furthermore, Yue et al. (2019) found that, on average, toddlers played alone without parental supervision for more than 2.5 hours (155 minutes) per day, and toddlers spent more than an hour each day watching television, meaning that rural children spend large shares of time each day without human interaction. High rates of television viewing mean that caregivers often leave their toddlers alone with no form of human interaction.

Other studies conducted by our research team have found the same results. Luo et al., (2017) reported that although 59.4% of caregivers played with their child, only 36.2% sang to their child, and only 13.8% told stories to their child. The research reported in Wang et al., (2019) similarly found that 59% of caregivers played with their child, while only 36% sang, 18% told stories, and only 9% read to their child (Table 5). These rates stand in stark contrast with urban areas of China such as Sichuan, where nearly two thirds of caregivers read to their child at least every other day (Guo, 2016). They are also much lower than the rates of interactive parenting in other developing countries. A study of poor areas of Colombia found that 67% of caregivers tell stories to their child, and 73% of caregivers read books to their child (Attanasio et al., 2015), compared to 18% and 9%, respectively, among caregivers in rural China. Thus, rural China is not only lagging behind developed settings such as urban China and the United States, but also behind other developing countries with similar levels of income, including rural areas.

Table 5: Interactive parenting inputs among caregivers across rural China

	Full sample	Mountainous rural communities	Resettlement communities	Central rural communities	Migrant Communities
	(1)	(2)	(3)	(4)	(5)
Told story to baby yesterday	18%	13%	15%	19%	29%
Read book to baby yesterday	9%	4%	5%	8%	21%
Sang song to baby yesterday	36%	27%	29%	36%	52%
Played with baby yesterday	59%	48%	54%	65%	68%
Observations	**3341**	**2878**	**133**	**127**	**203**

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In addition to low levels of interactive parenting, our research team also found that China's rural caregivers are not creating stimulating environments for their children. In 2017, two studies conducted by the research team examined the family environment in the four rural subpopulations assessed in Wang et al. (2019)'s study, using the Family Care Indicators (FCI) survey developed by the United Nations. The two studies, reported in working papers by Wang and Zheng (2019) and Wang and Yue (2019), found that families in

rural China had fewer toys, less variety of toys, and engaged in fewer play activities with children than families in developing countries with lower income levels, such as Bangladesh and Malawi (Hamadani et al. 2010; Gladstone et al. 2018). These findings indicate that caregivers in rural China are failing to stimulate their children either through interactions or through the home environment.

Taken together, the findings of these studies indicate that poor parenting—in terms of both nutrition and psychosocial stimulation—are certainly the root cause of poor ECD outcomes and high rates of delays among infants and toddlers in rural China. High rates of anemia are indicative of poor feeding practices in rural households, as the chief cause of anemia is deficiency of iron-rich foods, such as meat and leafy vegetables. Similarly, low levels of interactive parenting suggests that the majority of rural caregivers are not actively practicing parental investment.

Children and their caregivers pose for a photo. Research indicates that poor parenting is the main cause of low levels of ECD in rural China. Source: REAP Field Survey, 2014.

This is not to say that China's rural caregivers do not care about their children. In fact, qualitative data collected by our research team suggests that most families want to invest in their children (Yue et al., 2017; 2019; Wang & Yue, 2019). However, we believe that many rural caregivers lack awareness of how to successfully invest in healthy ECD—that is, how to provide micronutrient-rich diets to their children, and how to stimulate their children through interactive parenting. Through interviews, Yue et al. (2017) found that a large share of rural parents do not know what good parenting looks like or how to engage in interactive parenting practices. Additionally, a mixed-methods study of infant feeding practices in rural China, reported by Yue et al. (2016), found that caregivers do not know the differences in nutritional quality of different foods, believing that children will be healthy as long as they are fed and are full. This evidence points to a lack of parenting knowledge among caregivers in rural China as the main driver of poor nutrition and stimulation, and, ultimately, of poor developmental outcomes.

Parental migration

Another aspect of ECD in rural China that further complicates the picture is parental migration. In the past four decades, rural-to-urban migration in China has become the largest movement of people in the modern world, reaching 288 million in 2018 (Chan, 2013; China National Bureau of Statistics, 2019). Within this, women make up over a third of all working-age rural migrants (China National Bureau of Statistics, 2019). As a result, large shares of young children in rural areas are growing up in the care of surrogate caregivers, usually grandparents. In past studies conducted by the research team, about two thirds of young children are in the care of their mothers, while the other third are "left-behind children," usually cared for by paternal or maternal grandmothers as many mothers

have migrated to urban areas for work.

How does parental out-migration affect the ECD of left-behind children in rural China? International studies have found two competing effects of migration (Antman, 2013). On the one hand, parental migration may benefit ECD, as increased income allows families to invest more in the health and development of their children (Macours & Vakis, 2010). On the other hand, migration may also negatively impact ECD outcomes as a result of decreased parental care (Ngyuen, 2016).

In rural China, a study conducted by our research team found maternal migration in early childhood to negatively impact the cognitive development of infants and toddlers (Yue et al., 2016). This may be due to decreased care, as grandmothers tend to be worse caregivers than mothers in terms of both nutrition and stimulation. Grandmothers in rural China tend to feed infants less diverse diets and fewer iron-rich foods than mothers (Yue et al., 2018) and have less knowledge about child nutrition than mothers (Yue et al., 2018; Tan et al., 2010). Grandmothers are also less likely to engage in interactive parenting than mothers: Yue et al. (2019) found that among grandmothers, 12% told stories to children. 32% sang and 32% played with children, compared to 14%, 41% and 42%, respectively, among mothers.

However, despite the fact that grandmothers tend to be poorer caregivers than mothers, the issue of poor parenting in rural China is not exclusively one of parental migration and surrogate caregivers. Although mothers do provide better nutrition and more diverse diets to their children compared to grandmothers, Yue et al. (2018) found that only a third of children cared for by mothers met the minimun requirements for dietarty diversity. Additionally, although mothers are more likely to engage in interactive parenting than grandmothers, less than half of mothers engage in each of the three targeted practices assessed in our past studies (Yue et al., 2019). These findings indicate that although surrogate caregivers do not provide the same quality of care as parents, parenting practices among all rural caregivers are in need of improvement.

Implications for China's future growth

The previous sections of this paper outlined the ECD outcomes of infants and toddlers in rural China, as well as the causes of high rates of developmental delays. In this section, we discuss the long-term implications of poor ECD outcomes. We first describe the impacts of poor ECD outcomes on academic achievement, after which we discuss the potential consequences of poor ECD for China's economic growth and development.

Poor ECD outcomes among China's rural infants and toddlers, caused by low parental investment in nutrition and psychosocial stimulation, may have significant consequences in the long-term. Research in psychology and neuroscience suggests that uncorrected delays occurring in the first 1,000 days of a child's life largely persist through adulthood (Biesalski, 2016), and additional research has shown that persistent cognitive delays from early childhood are linked to worse educational and employment outcomes in later life (Heckman et al., 2010; Heckman et al., 2006). This means that poor ECD among China's rural infants and toddlers can be expected to lead to worse academic performance, lower educational attainment, and worse employment outcomes in adulthood. Moreover, if the trend of poor ECD has existed for years, rural school-aged children may already be suffering the consequences of delayed development, which may lead to lower levels of human capital accumulation across rural China.

In fact, our research team has found that cognitive delays are not only common among

rural infants and toddlers; rural children in primary and junior high school also exhibit high rates of developmental delays. A recent study of primary school students in rural migrant communities in Beijing and Suzhou and rural areas of Henan and Anhui Provinces, reported in Zhao et al. (2019), found that one third (33%) of children were cognitively delayed (as measured by Raven's Standard Progressive Matrices). Another study of junior high school students in rural northwestern China, reported in He et al. (2019), found that between 37% and 40% of students were cognitively delayed (using Raven's Standard Progressive Matrices and the Weschler Intelligence Scale for Children). This suggests that rural China's ECD problem has persisted for some time, and that without intervention, early cognitive delays among the current generation of rural infants and toddlers will likely persist as children grow older.

Furthermore, these two studies found that lower IQ in children is linked to worse academic performance. Among primary school students, Zhao et al., (2019) found that students with an IQ below 85 (the cutoff for cognitive delays) scored 0.5 SD lower on standardized math tests than students with an IQ of 100 (the healthy mean IQ score). He et al. (2019) found an even greater achievement gap in junior high school: students with cognitive delays between 0.78 SD (using Raven's) and 0.95 SD (using WISC) below their peers in terms of academic performance. To put this into perspective, 0.5 SD represents one semester to one year of learning (Koedel & Betts, 2007; Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004). By conservative estimates, this means that cognitively delayed students lag behind their peers by about one semester in primary school and by nearly a year by the time they are in junior high school. As a result, about half of rural primary school students in China are not prepared for junior high school (Zhao et al, 2019).

High rates of cognitive delays and poor academic outcomes in rural China present a challenge for the nation's future economic growth and development. Currently, many workers in China do not need high levels of education, as there are abundant low-skill jobs in manufacturing and construction. However, China is making plans to transition into an economy based on higher value-added, high-wage industries. International experience has shown that in order to be competitive in these higher value-added industries, individuals will need to have acquired skills taught at the level of high school or above (Bresnahan et al., 2002; Bresnahan, 1999). Yet with only 30% of the current labor force in China holding a high school education or higher, China is far from reaching adequate levels of high skilled workers (Khor et al., 2016). Although high school education has expanded considerably, rural students are still attending high school at far lower rates than their urban peers: whereas 99% of urban students matriculate into academic high school, only 77% of rural students do so (Wang et al., 2018). If cognitive delays inhibit the academic achievement of rural students, not only will many individuals have a difficult time finding employment; newly emerging industries may also falter from a short supply of skilled labor. This may lead to a "middle-income trap," an economic theory that describes a decrease in a nation's growth rate after reaching middle-income status, which inhibits further development and growth. In fact, countries with similar levels of ECD to rural China, such as Colombia, Mexico, South Africa and others, are already known to have been mired in the middle-income trap and have been unable to maintain even moderate growth rates (Li et al., 2017). To prevent this from happening in China, the nation will need to make significant investments in raising the human capital of its rural population, starting with ECD.

Conclusion

China has made vast strides in economic and social development in the past 40 years. However, there remain significant challenges, particularly for young children growing up in rural communities. In the long run, there is evidence that poor ECD in rural China is contributing to overall low levels of rural educational attainment and human capital accumulation, with troubling implications for China's future economic growth. Based on this evidence, there is a clear need for large-scale ECD interventions targeting rural children under three years of age.

International literature has found ECD interventions in nutrition and psychosocial stimulation to be effective in improving overall developmental outcomes and reducing the prevalence of delays (Aboud & Yousafzai, 2015). In particular, curriculum-based interventions, in which trained paraprofessionals teach caregivers how to provide adequate nutrition and stimulation to their children, have been shown to have significant positive impacts on cognition in the short-term (Grantham-McGregor & Walker, 2015; Walker et al., 2011; Hamadani et al., 2006; Nahar et al., 2012; Attanasio et al., 2014). Follow-up studies of ECD interventions have also found significant long term benefits to cognition and education (Grantham-McGregor & Walker, 2015; Walker et al., 2011).

A parenting trainer from the National Health and Family Planning Commission conducts a home visit to a rural family in Northwestern China as part of an ECD program to improve interactive parenting. A recent evaluation of this intervention found significant positive impacts on child development. Source: REAP Field Survey, 2014.

Members of our research team have tested the effects of ECD interventions in the context of rural China. In a recent study, colleagues within our research team examined the effects of a psychosocial stimulation home-visiting intervention, delivered through the National Health and Family Planning Commission (NHFPC), on the cognitive development of toddlers age 18-36 months. In association with the NHFPC and early childhood development experts, the researchers designed a week-by-week curriculum targeting toddlers age 18-36 months. In each weekly home visit, cadres from the NHFPC delivered age-appropriate information on child cognitive, language, socioemotional and motor skills and activities for caregivers to engage and interact with their children. The study, which is reported in Sylvia et al. (2018) found that the intervention significantly increased the cognitive abilities of children in the intervention group relative to children in the control group (who received no ECD intervention). Our research team is also in

the process of evaluating a center-based ECD intervention in rural western China, which offers curriculum-based one-on-one parenting training and group activities in a central location to which caregivers can bring their children. Preliminary results from this study similarly indicate positive impacts on child development. In other words, our recent studies find that interventions to increase interactive parenting can effectively improve ECD outcomes in rural China.

A caregiver and her child read together in a parenting center in rural northwestern China. Source: REAP Field Survey, 2017.

Recent government efforts indicate that China is also aware of the problem of poor ECD in rural areas. Since 2015, China's Ministry of Education, the NHFPC and other departments within China's government have called for effective ECD programs in health, nutrition and simulation, paying particular attention to poor rural areas (UNICEF, 2017). It is yet to be seen whether this initiative will effectively raise the ECD of China's rural infants and toddlers; however, it indicates a step in the right direction. Now, there is a need for policymakers to work with researchers and child development experts to scale and deliver evidence-based interventions that will help China's rural children achieve their full developmental potential.

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