Nourishing the Future: Investing in Early Childhood Development in Poor Rural Areas
养育未来：投资农村儿童早期发展

Linxiu Zhang

UN Environment International Ecosystem Management Partnership
Center for Chinese Agricultural Policy, CAS

Presented in the session on “Science Literacy: Women in Science and Technology” at the “World Conference in Science Literacy”

17-18, 2018, Beijing

“Preamber”

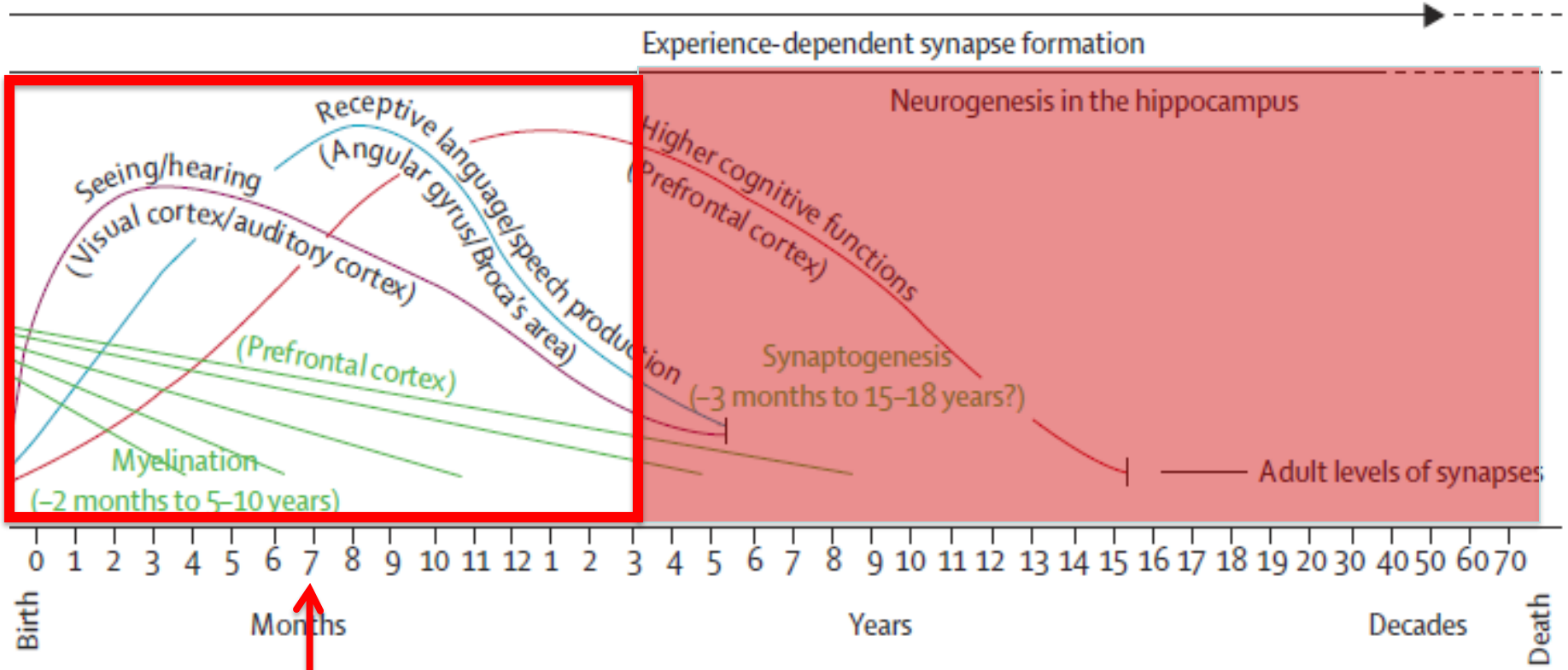
- This presentation is based on our team’s earlier study, but still relevant
- The story must be told over and over again
- Closely linked to this conference: science literacy

Rest of presentation

- **Significance of Early Childhood Development (ECD)**
- Addressing ECD issues in poor rural China
- Policy Implications

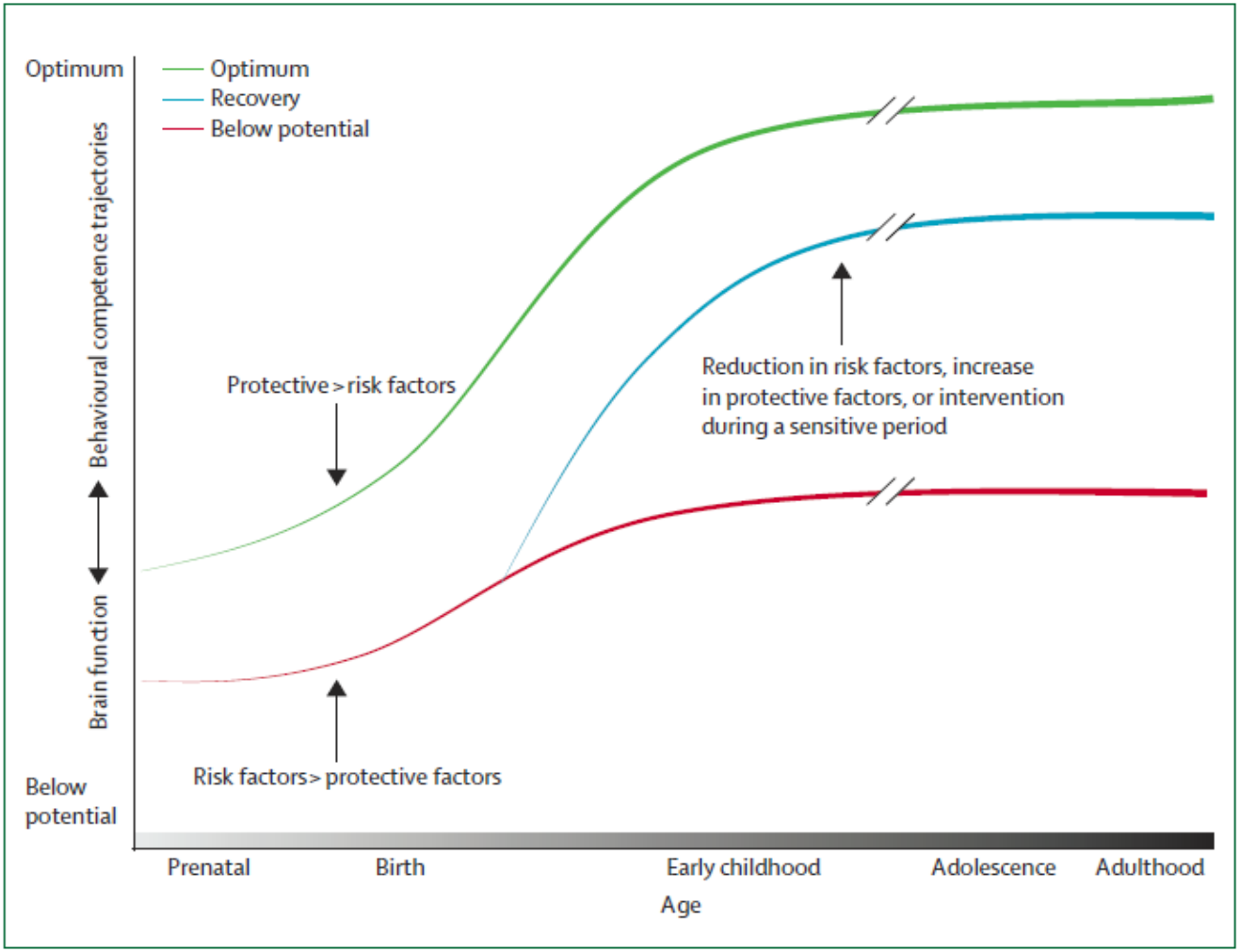
Research increasingly indicates the importance of nutritional and nurturing intervention within the first 1000 days of life

Science supports this notion



Most brain development happens before age 3, making this a crucial window for child development.

Brain development in the first 1,000 days of life can affect lifelong potential



It is estimated that about 250 million children under 5 years are not fulfilling their development potential because of insufficient nutrition or quality nurturing during the critical development window.

Providing quality ECD service to 0-3 year old can have positive spillovers. It can not only enhance human capital of developing countries, but also help to break intergenerational poverty cycle

—— 《Lancet》

Series

Advancing Early Childhood Development: from Science to Scale 2

Nurturing care: promoting early childhood development

Pia R Britto, Stephen J Lye, Kerrie Proulx, Aisha K Yousafzai, Stephen G Matthews, Tyler Vaivada, Rafael Perez-Escamilla, Nirmala Rao, Patrick Ip, Lia C H Fernald, Harriet MacMillan, Mark Hanson, Theodore D Wachs, Haogen Yao, Hirokazu Yoshikawa, Adrian Cerezo, James F Leckman, Zulfiqar A Bhutta, and the Early Childhood Development Interventions Review Group, for the Lancet *Early Childhood Development Series Steering Committee**

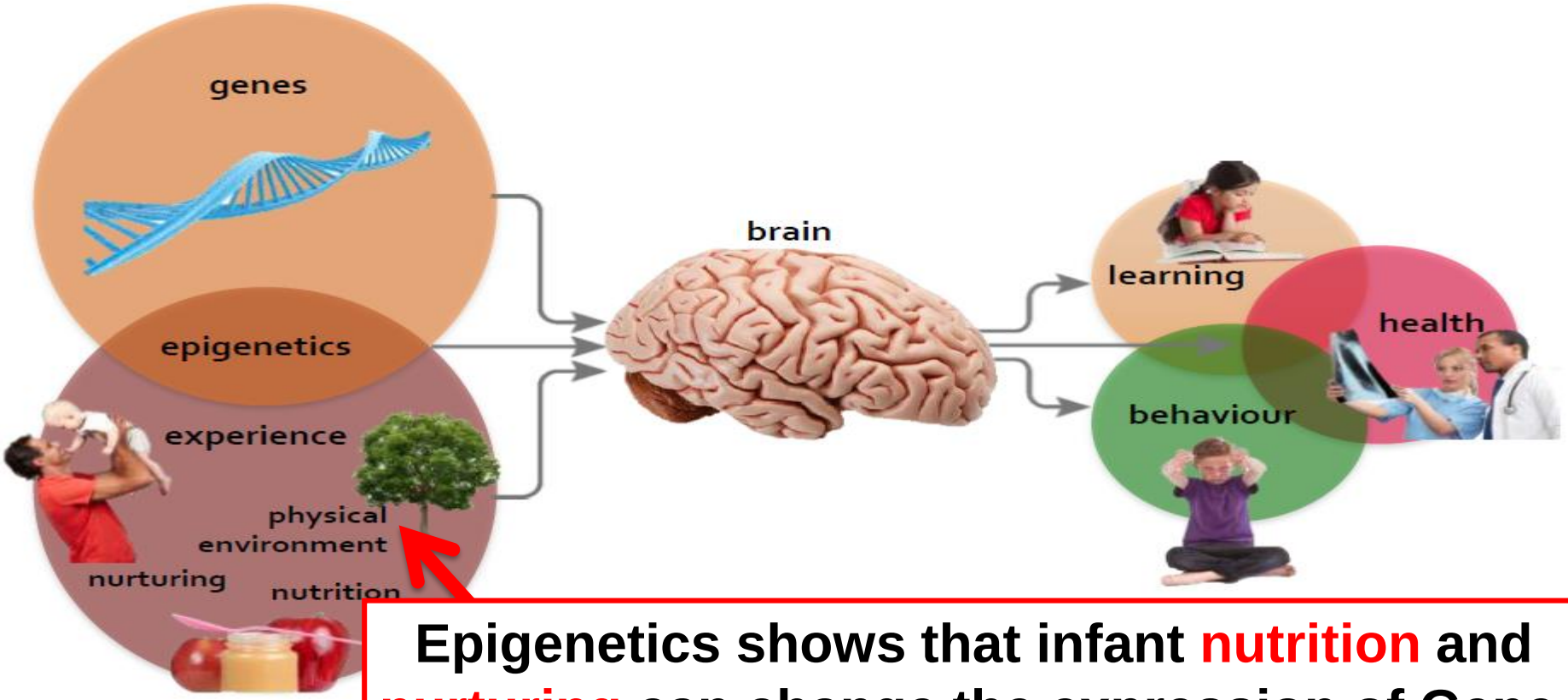
The UN Sustainable Development Goals provide a historic opportunity to implement interventions, at scale, to promote early childhood development. Although the evidence base for the importance of early childhood development has grown, the research is distributed across sectors, populations, and settings, with diversity noted in both scope and focus. We provide a comprehensive updated analysis of early childhood development interventions across the five sectors of health, nutrition, education, child protection, and social protection. Our review concludes that to make interventions successful, smart, and sustainable, they need to be implemented as multi-sectoral intervention packages

Lancet 2017; 389: 91–102
Published Online
October 4, 2016
http://dx.doi.org/10.1016/S0140-6736(16)31390-3

This is the second in a Series of three papers about early

Solutions:
Nutrition and/or Nurture (Parenting)

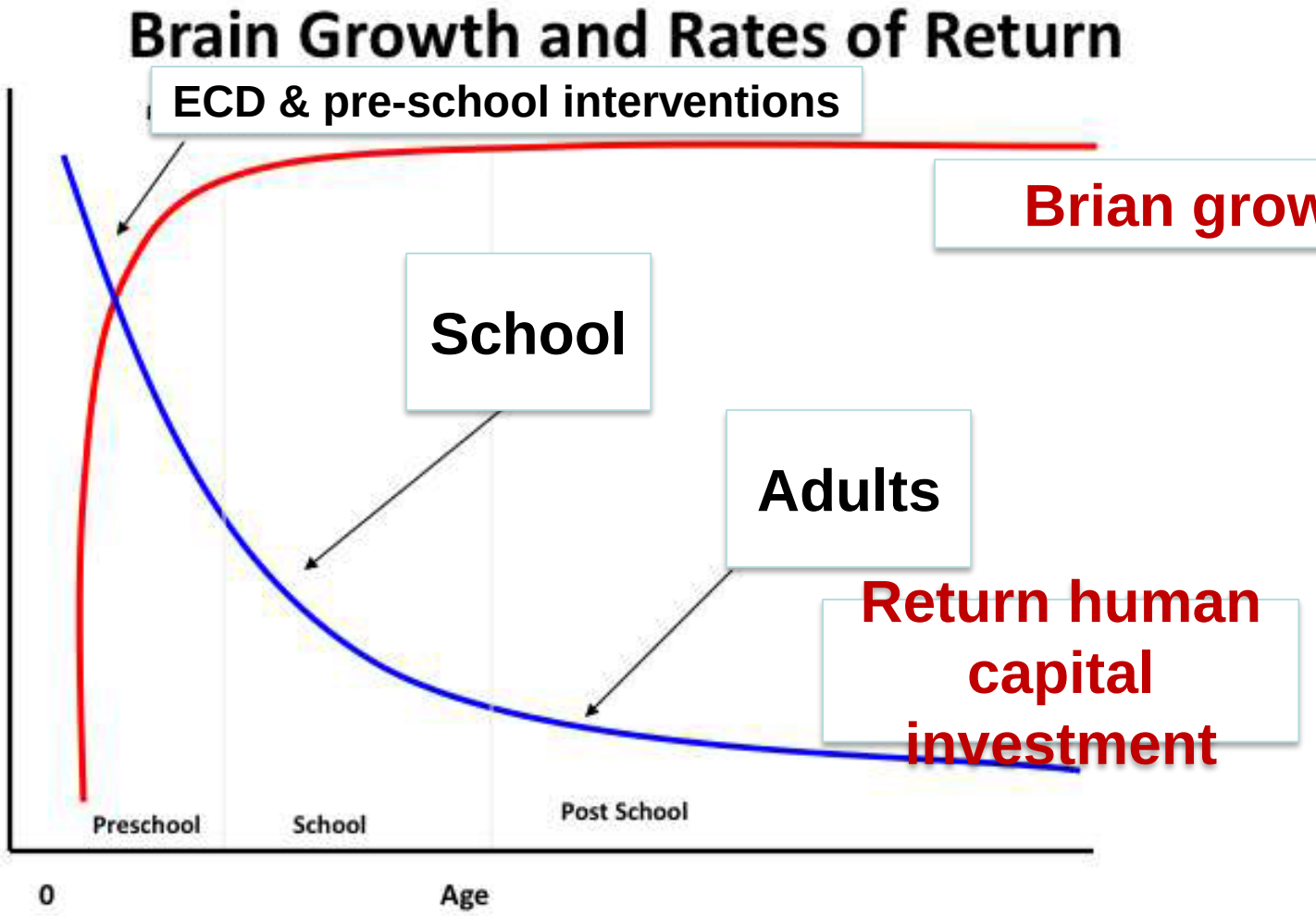
Both genes and environment are important for the infant development



Adapted from: Fields, D
Jessell, T. (2000); McCa

Epigenetics shows that infant nutrition and nurturing can change the expression of Gene, so we need pay more attention on nutrition and nurturing or parenting

Return to Human Capital Investment



Economists have also shown that intervening early in life is more cost-effective

Source: Heckman & Carneiro, 2003, Human Social Policy; RAND, Benefit and cost of early-childhood interventions, A documented Briefing, Lynn A. Karoly, M. Rebecca Kilburn, and Jill S. Cannon,1997

d Costs of Early-Childhood Interventions, A Documented
. Peter Rydell, Matthew Sanders, Peter W. Greenwood,

Rest of presentation

- Significance of Early Childhood Development (ECD)
- **Addressing ECD issues in poor rural China**
- Policy Implications

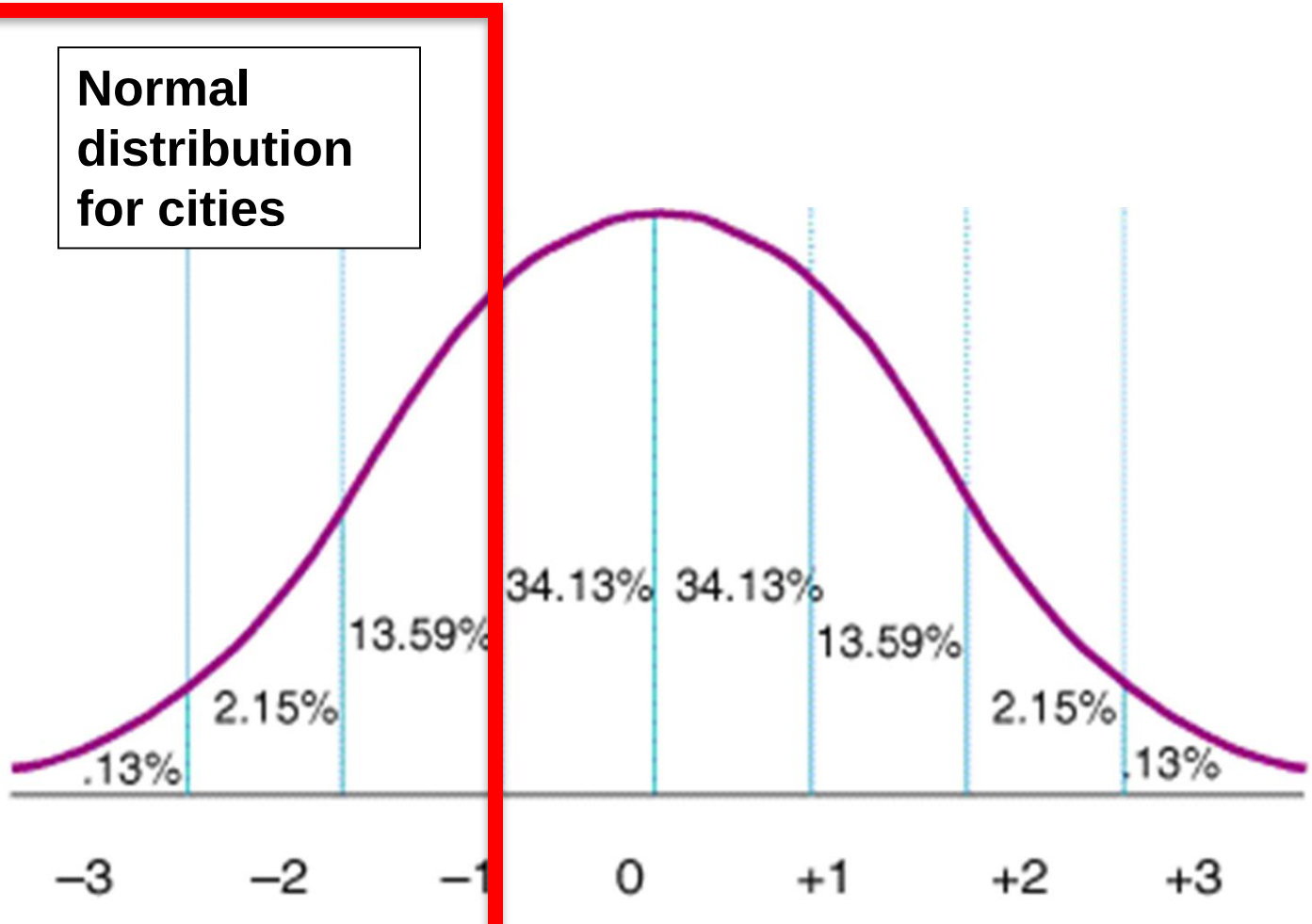
Empirical Studies on Child development in China
Share of child delayed (BSID MDI scores < -1 SD

- Urban China is about 15%:
  - Shanghai Jiaotong University 14%
  - Beijing Union Hospital (Xiehe) 12%
  - Hefei Provincial Hospital 16%
  - Guangzhou City Hospital 13%

  [*source; Gates Foundation 2015 Grand Challenges Conference, Beijing, October 2015*]

- Meaning?: ➔ International comparison

IQ distribution (international)



What is the quality of China's youngest babies?

•Testing ≈2000 babies and their Mom's/Grandma's in Southern Shaanxi

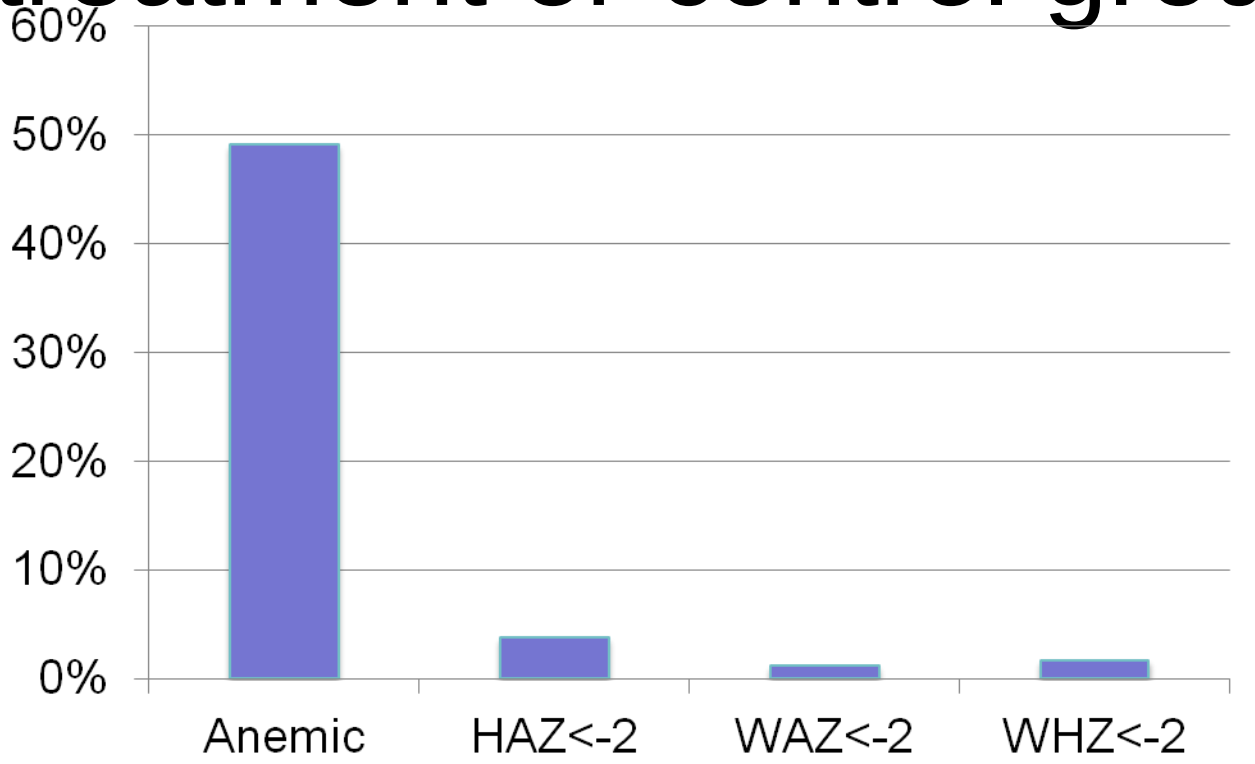
*These areas are 2 to 3 hour drive from Xi'an – one of China's fastest growing cities

MDI and PDI: Bayley Scales of Infant Development (BSID)

Like an IQ test for babies

Results from the Surveys (4 rounds)

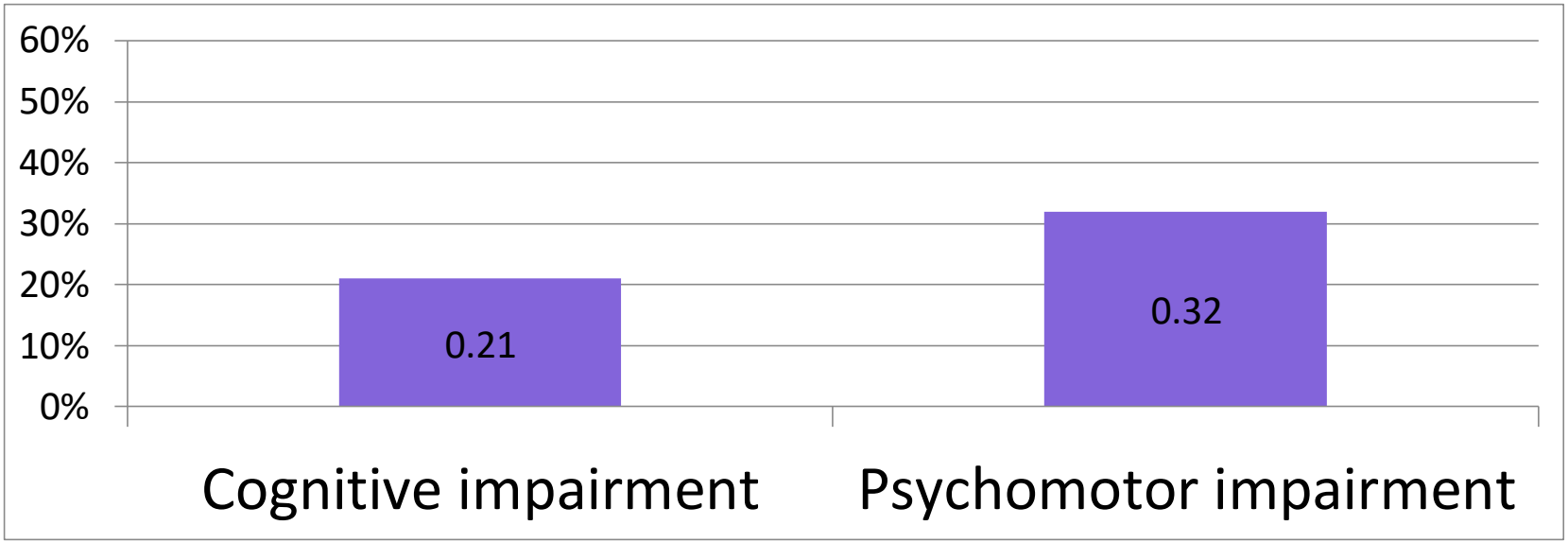
Baseline finding (before assignment to treatment or control groups)



Of the 1,800 infants aged 6-11 months, **49% were anemic**

→ But less than 5% were stunted, low weight or wasted, indicating that this is a *micro*nutrient problem—the babies are getting enough calories, but not enough micronutrients

Of the 1,800 infants aged 6-11 months tested….



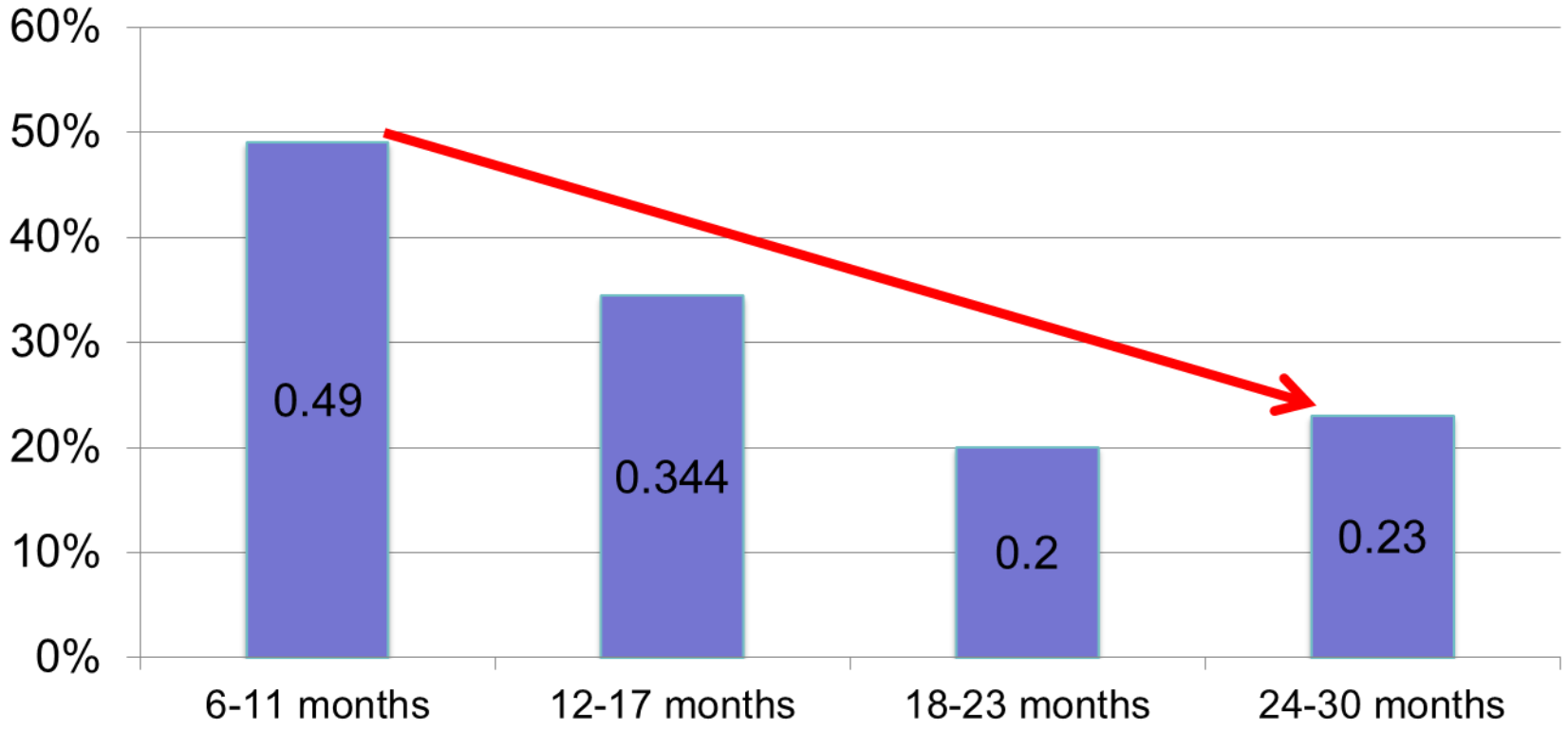
--21% were cognitively impairment (scored less than one sd of the mean of other babies at their age around the world);

--32% were impairment in their motor development;

What do the babies/toddlers from 6 to 30 months look like over time in the **absence** of the nutritional or parenting treatment?

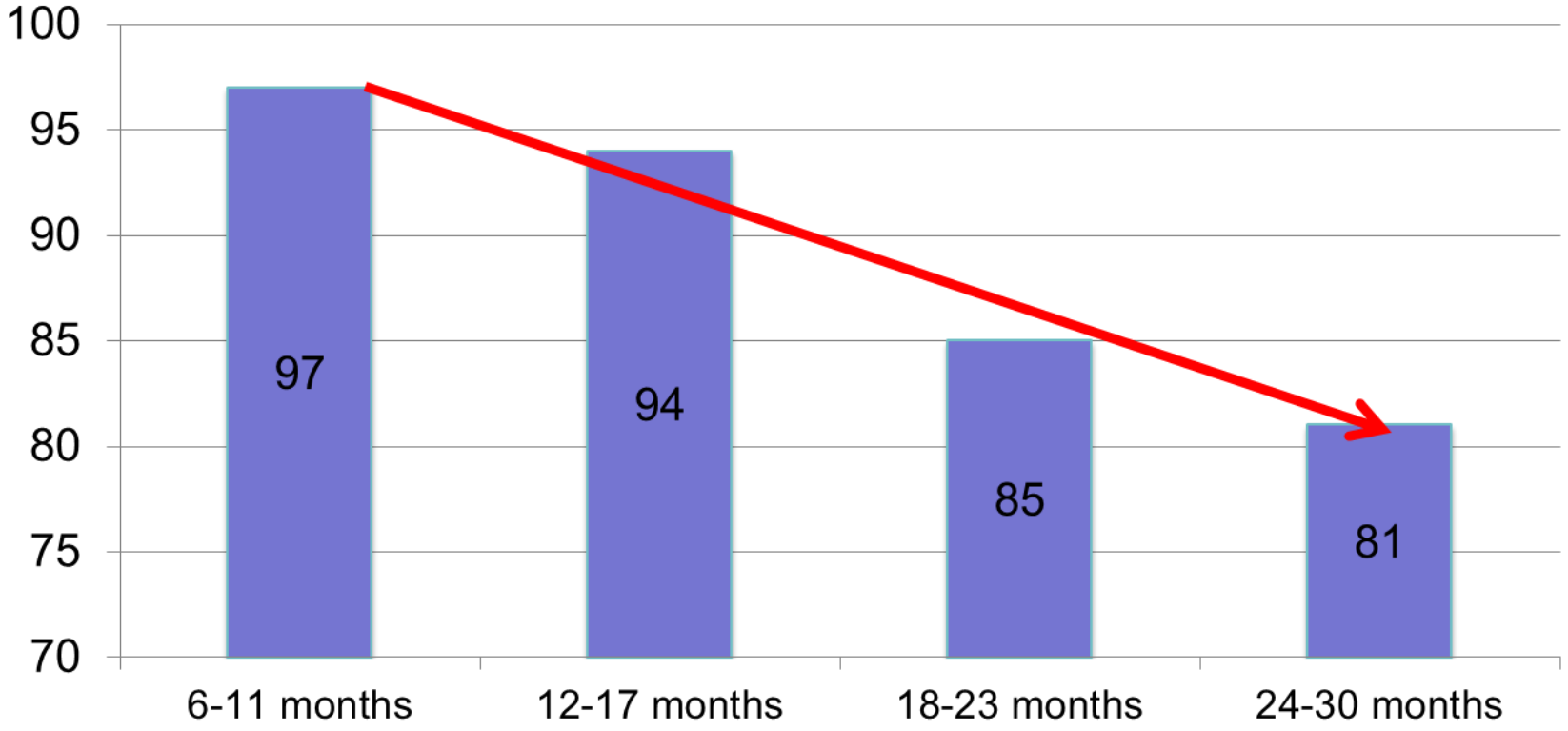
Evidence from control group (4-round panel dataset)…

Infants in control group see decline in anemia prevalence over the 4 rounds, but still high



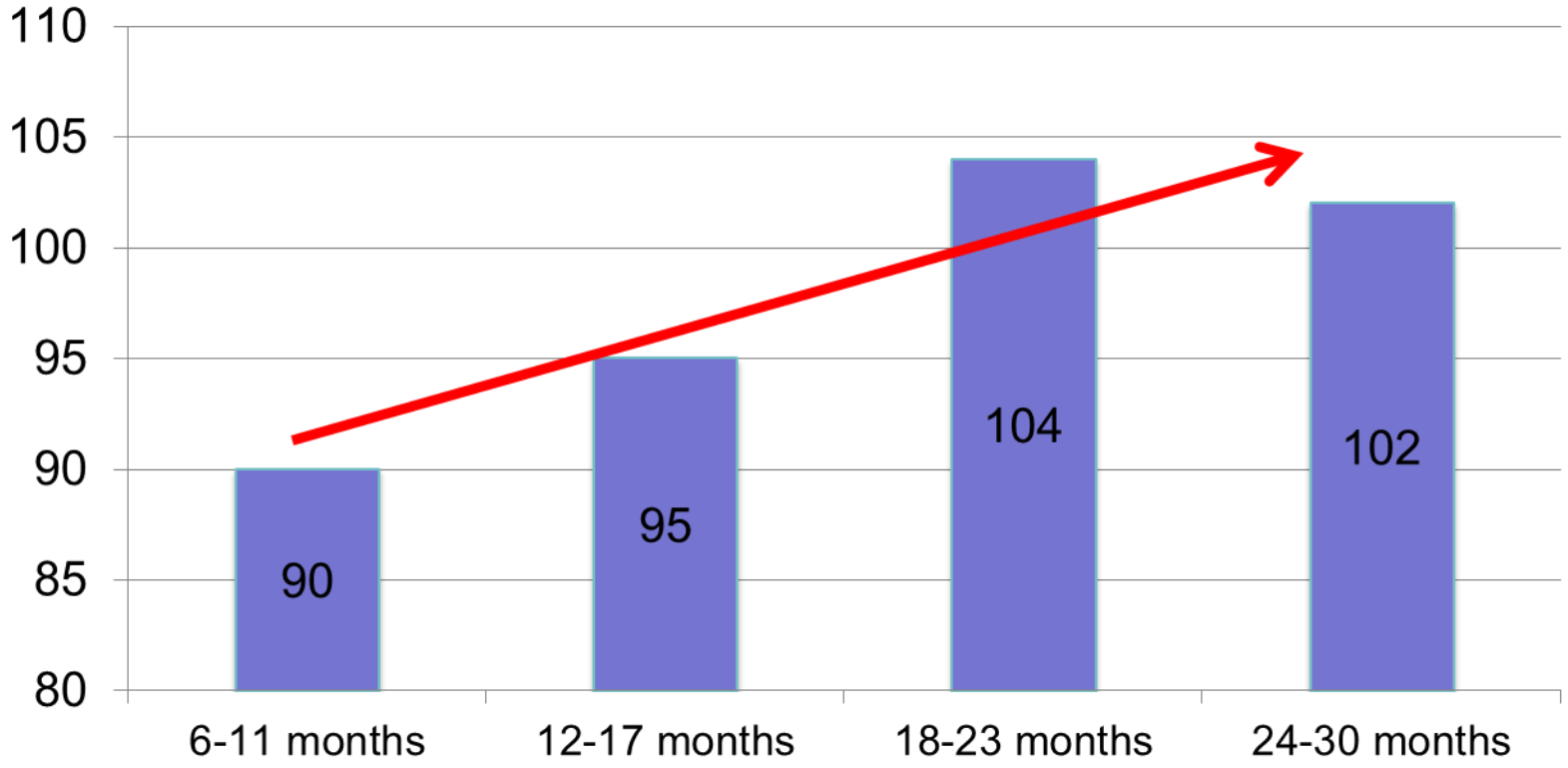
The anemia prevalence will decrease, but still about 20% of sample infants are anemic. Most of infant suffer anemia in the critical window for nutrition intervention (before 2 years). Still less than 5% of sample infants were stunted, low weight or wasted…

Infants in control group see their MDI deteriorate



The MDI score will decrease from 97 points to 81 points (about 16 points), infants were cognitively mild impairment (scored less than one Standard Deviation of the mean of other babies at their age around the world) increase from 21% to 56%…

However, infants in control group experience improvement in psychomotor development



The PDI score will increase from 90 points to more than 100 points, infants were cognitively mild impairment (scored less than one Standard Deviation of the mean of other babies at their age around the world) also decrease from 33% to 17…

The parenting intervention

+

Toys and books

→

Delivered by Family Planning Cadres from each Sample towns

Loosely based on Jamaica curriculum (same as used in Colombia study ➔ Our team with help from Child Psychologists adapted the curriculum to poor rural China

Family planning cadres become “Parenting Trainers”

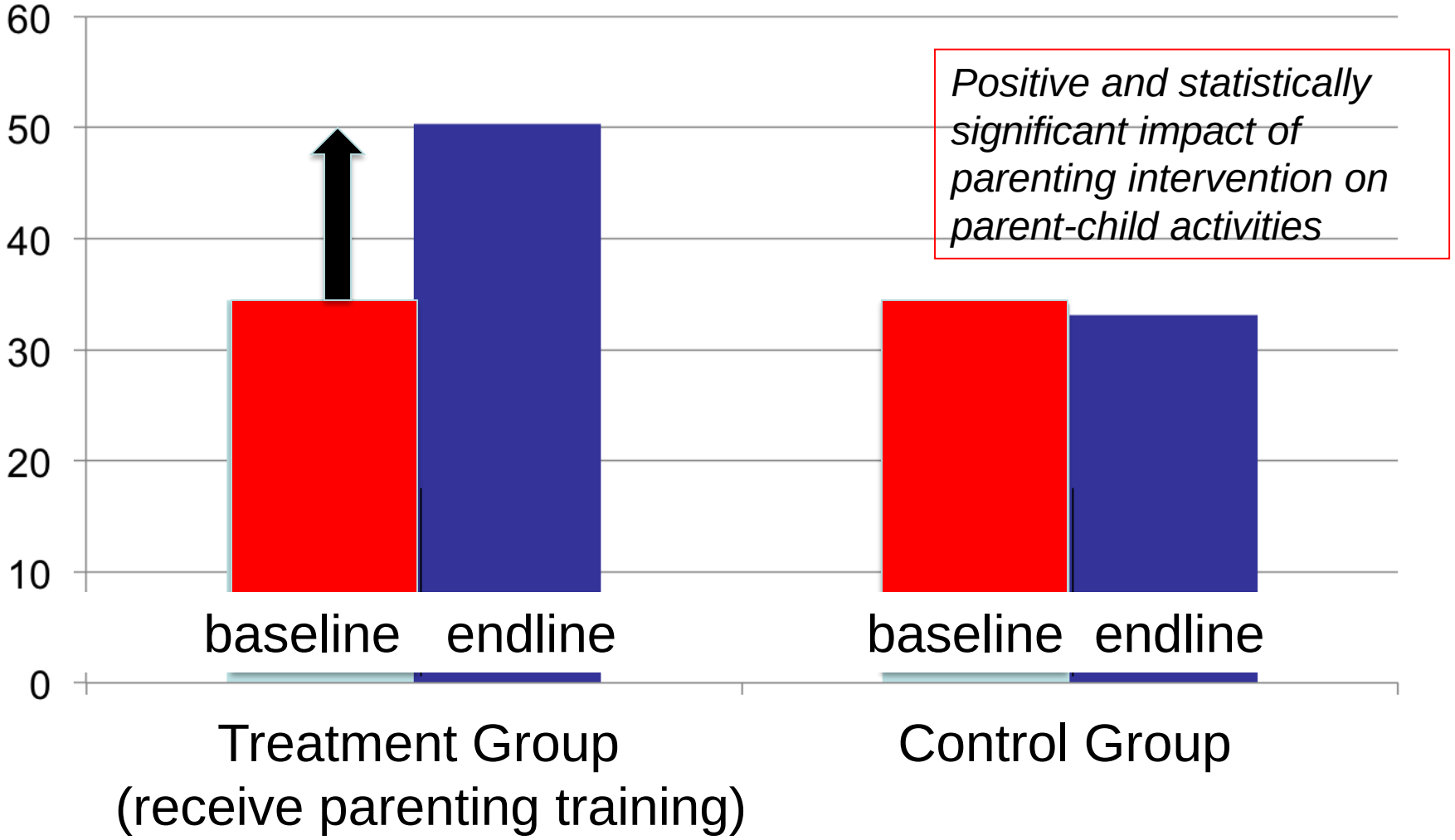
The parenting intervention

- Once-per-week, in-home, one-on-one parenting training

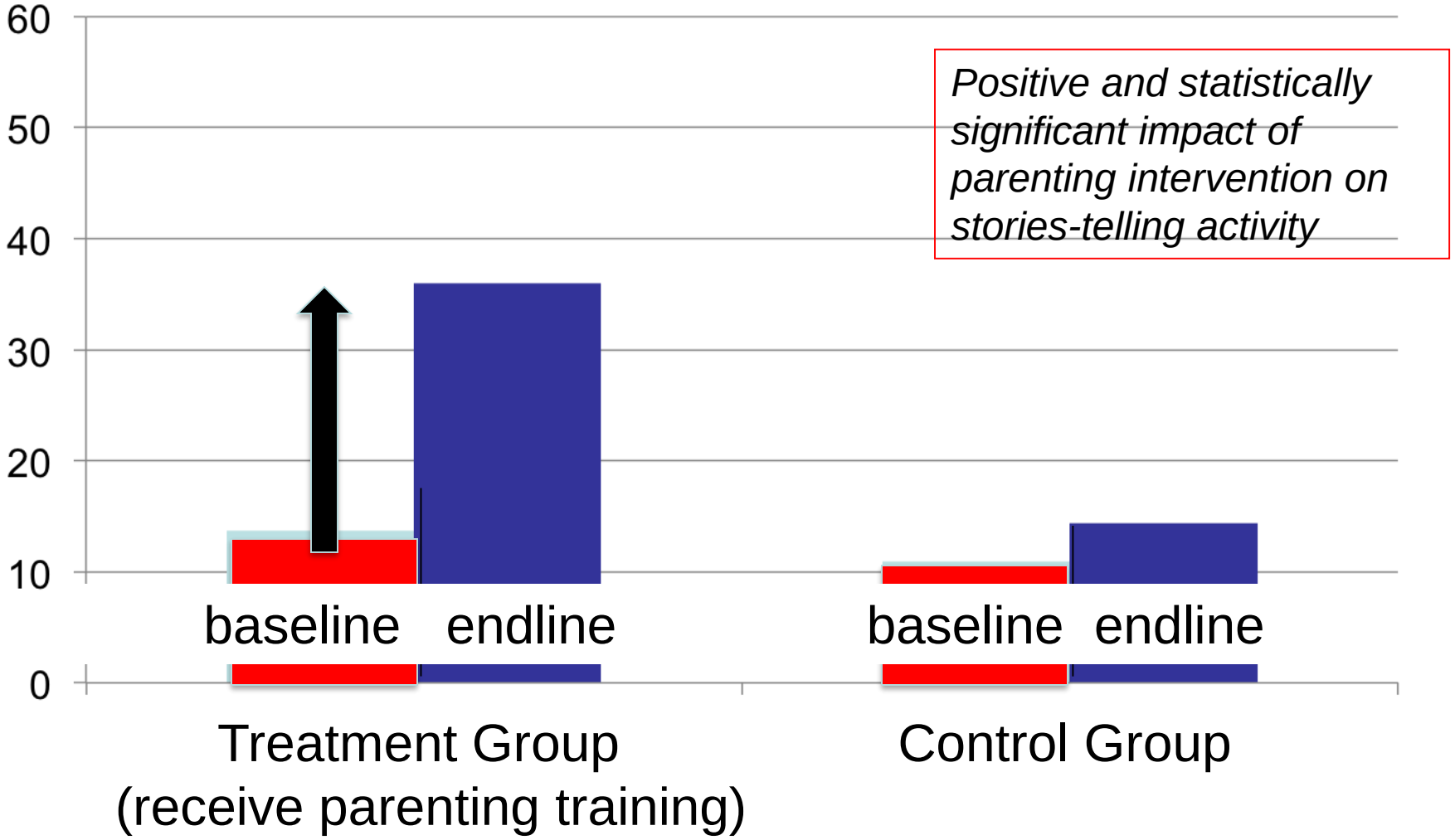
The impact of parenting intervention

Parenting practices
&
Child development or BSID MDI score

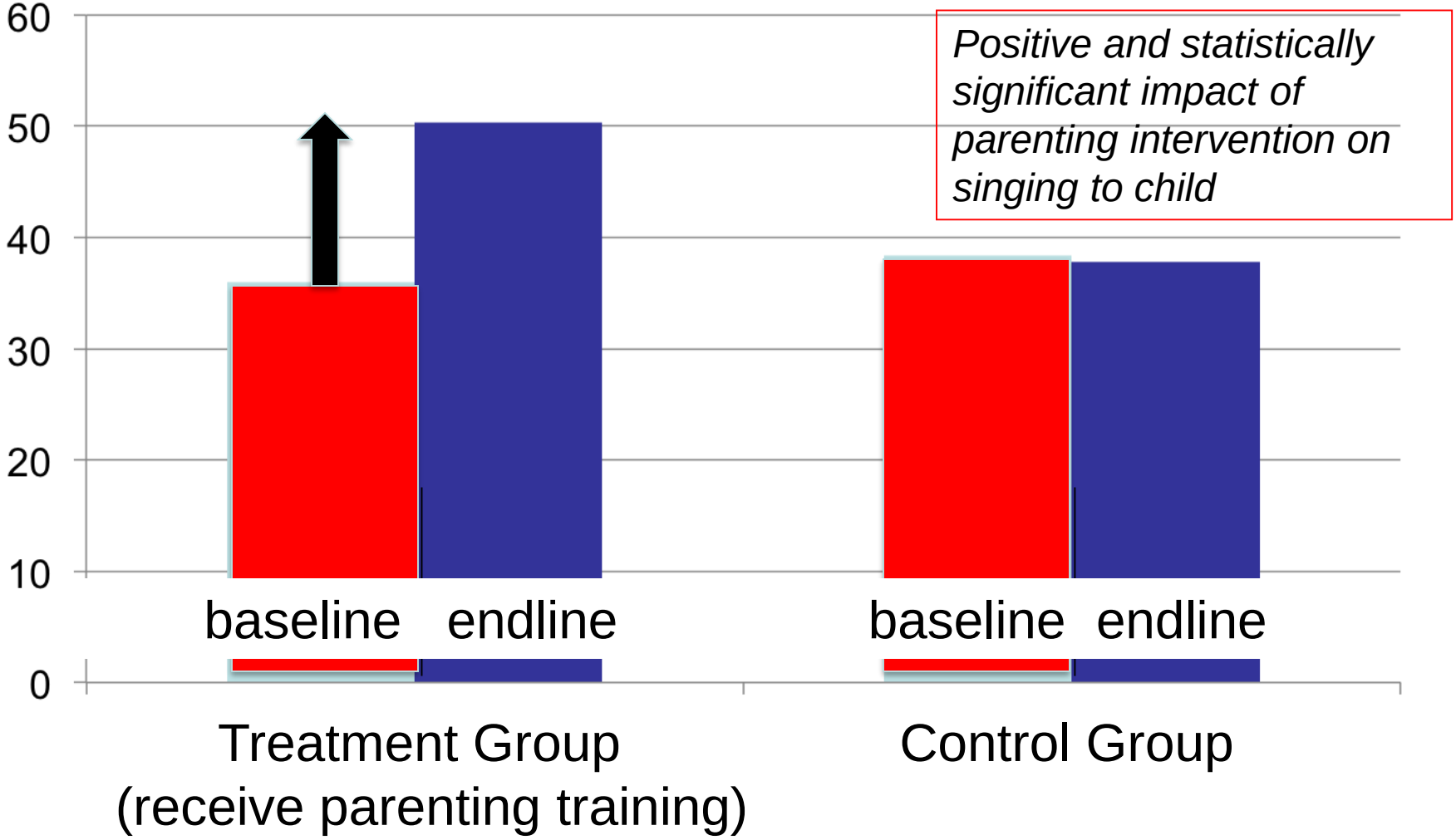
Share of caregivers that played with their children yesterday



Share of caregivers that told stories to their children yesterday



Share of caregivers that sang a song to their children yesterday



Intention to Treat

	Bayley Mental Development			
Dependent Variable:	MDI	MDI	MDI<80	MDI<80
	(1)	(2)	(3)	(4)
treatment	0.220*	0.220*	-0.152**	-0.151**
	(0.119)	(0.117)	(0.061)	(0.062)
additional controls		☑		☑

* *Significant at the10 percent level*

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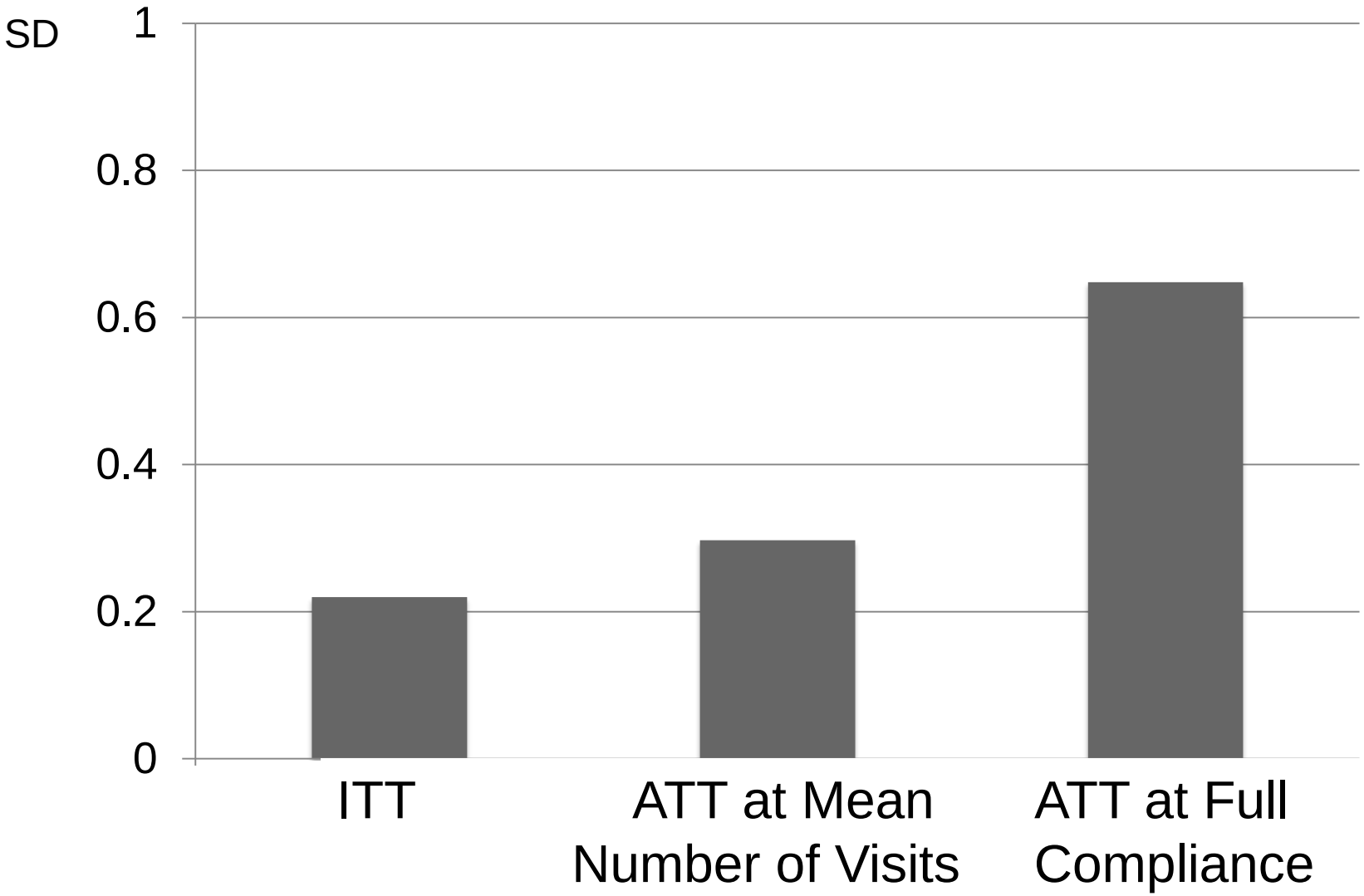
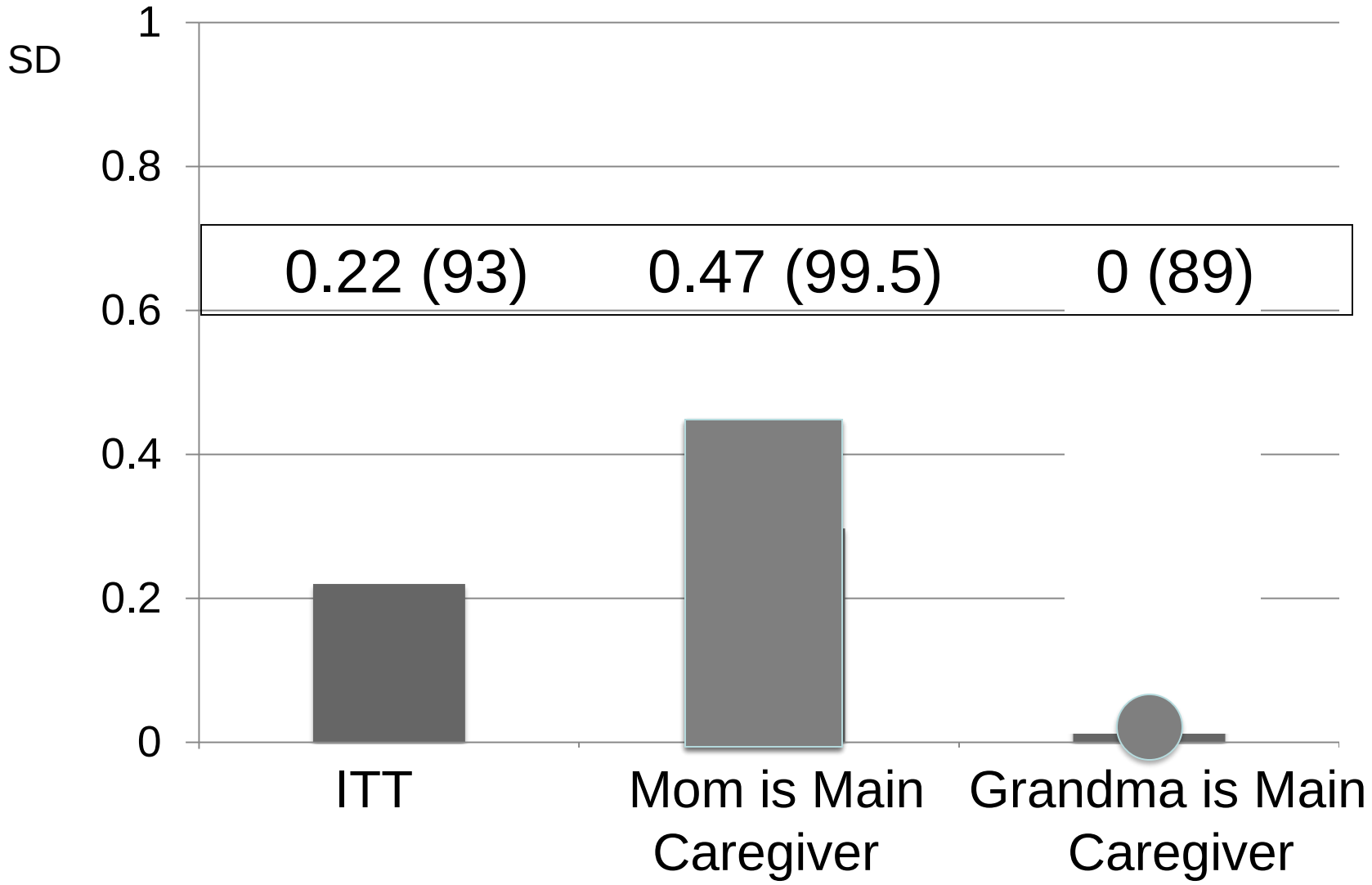
Effect sizes in other countries:

Columbia ➔ 0.29
Peru ➔ 0.23
Ecuador ➔ 0.16

Treatment on Treated (Comparing Impact Estimates on BSID MDI Score by Number of Home Visiting)



Heterogeneous Treatment Effects by Caregiver



A policy recommendation was submitted

政策研究简报

2016第2期（总第193期）

中国科学院农业政策研究中心　　2016年 2月24日

贫困农村儿童早期人力资本培育面临的挑战、探索及建议

- **Trying more models**
  - **Using villager as trainers**
  - **Community centers**

中 国 科 学 院

中国科学院政务信息采用通知

科技战略咨询研究院（筹）：

你单位 罗仁福、张林秀、史耀疆、周欢、黄季焜、刘承芳、易红梅 同志于 2016 年 4 月 7 日 向科学传播局报送的信息 中科院专家关于贫困农村儿童早期发展面临问题的调查研究与对策建议，被 《中国科学院专报信息》2016 年第 73 期 采用，并上报 中办 和 国办，已被 国办 刊物采用，并得到 国家领导人 批示。

感谢你单位的大力支持，希望继续关注和支持院政务信息工作，及时将本单位的科研成果、发展动态以及针对我院和国家的重要建议等重要信息报送科学传播局，为国家和院改革创新发展做出更大贡献。

联 系 人：李濛

联系电话：010－68597557

E—mail ：limeng@ cashq.ac.cn

中国科学院科学传播局政务信息处

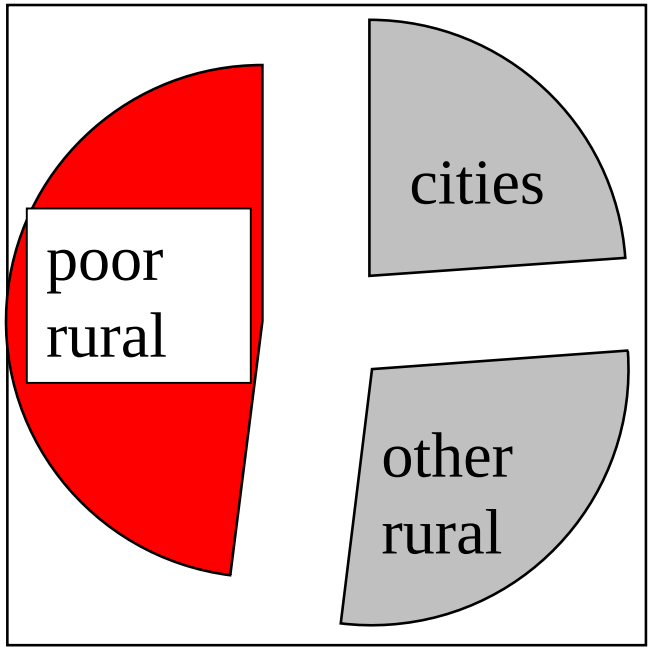
Parenting Center

Rest of presentation

- Significance of Early Childhood Development (ECD)
- Addressing ECD issues in poor rural China
- **Policy Implications**

Important assumption: We believe these are representative of three year olds in poor rural areas

- Poor rural areas are homes to nearly ½ of all of China's three year olds



Calculated from the 2010 Census

Another policy recommendation based on village trainer intervention

政策研究简报

2017第2期（总第203期）

中国科学院农业政策研究中心　　2017年 2月24日

村级工作人员入户指导可以显著促进贫困农村儿童早期人力资本培育

Our estimations: if we use 0.1% of GDP in 2016 on ECD to cover 0-3 year olds, the return can be 10 times.

- If **human development delays** are not properly addressed, it will be hard for China to maintain sustainable development
- **One of main interventions** ➔ Investment Heavily TODAY in human capital … for ALL in poor rural areas, especially at earliest stage – babies
- ⟹ Yield highest return to investment, break intergenerational poverty cycle, contribute to the improvement of science literacy!

Good News

- Government starts piloting ECD programmes in some rural areas
-
- We have full confidence in addressing ECD problems

- Contribution of success is beyond poverty alleviation in China

Thank You!