

**The Impact of the
Public Distribution System in India
– A State-level Analysis**

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Introduction

- UPDS to TPDS in 1997 due to criticisms of leakages, urban bias and high administrative costs
- Current refrain to replace PDS with cash transfers
- Evidence of revival of PDS in some states after 2007 (Himanshu and Sen 2011; Khera 2011)
- Studies of changing impact of PDS on poverty reduction (Himanshu and Sen 2013; Drèze and Khera 2013)

- Fewer studies of the impact on nutrition and anthropometry
- Poverty – Hunger divergence in India
(Deaton and Drèze 2009; Basu and Das 2014)
- Objectives:
 - a. To trace the recent functioning of the PDS across states
 - b. State-level impact of PDS on anthropometry of children aged 7-19 years
 - c. Potential for catch-up growth?
Role of PDS in aiding catch-up growth?
- Data : NSS Consumption Surveys 2004-05, 2009-10 and 2011-12;
IHDS data of 2004-05 and 2011-12

Monthly Purchase of Cereals Per Capita (kg) from PDS

STATES	2004-05	2009-10	2011-12
ANDHRA PRADESH	2.26	3	3.02
ASSAM	0.45	1.34	2.68
BIHAR	0.1	0.66	2.22
CHHATTISGARH	1.46	4.65	3.91
GUJARAT	0.58	0.8	0.59
HARYANA	0.27	1.03	0.98
HIMACHAL PRADESH	3.08	4.53	5.15
JHARKHAND	0.25	1.33	1.8
KARNATAKA	2.3	2.33	2.42
KERALA	1.75	2.21	2.9
MADHYA PRADESH	1.12	1.85	1.91
MAHARASHTRA	1.04	1.59	1.65
ODISHA	0.82	3.14	3.66
PUNJAB	0.03	0.94	0.93
RAJASTHAN	0.73	0.79	1.19
TAMIL NADU	3.53	4.54	4.33
UTTAR PRADESH	0.29	1.2	1.36
WEST BENGAL	0.36	0.93	1.4

Utilisation of Cereals from PDS (%)

STATES	RURAL			URBAN		
	2004-05	2009-10	2011-12	2004-05	2009-10	2011-12
ANDHRA PRADESH	62.47	82.69	86.46	31.57	42.32	41.13
ASSAM	9.2	31.18	53.39	2.54	13.75	29.09
BIHAR	1.97	14.85	46.58	1.78	8.09	20.24
CHHATTISGARH	24.44	66.03	61.87	14.16	37.16	36.63
GUJARAT	32.65	37.45	30.79	7.92	10.97	6.68
HARYANA	4.09	19.85	17.58	5.26	8.4	9.16
HIMACHAL PRADESH	52.04	83.91	90.57	15.11	43.56	40.08
JHARKHAND	5.95	24.74	33.92	3.38	8.09	7.25
KARNATAKA	59.76	76.48	75.84	21.83	25.47	34.5
KERALA	39.31	60.17	82.23	28.59	48.53	63.75
MADHYA PRADESH	23.82	46.38	41.08	11.58	24.21	23.9
MAHARASHTRA	30.51	49.26	47.09	7.93	10.63	12.47
ODISHA	21.6	56.53	65.23	6.74	26.64	28.57
PUNJAB	0.3	21.87	24.52	0.68	10.89	8.71
RAJASTHAN	12.76	17.72	28.39	2.03	14.89	16.55
TAMIL NADU	80.04	92.49	92.15	49.75	71.73	70.04
UTTAR PRADESH	6.45	23.38	26.77	3.04	18.02	16.46
WEST BENGAL	15.1	37.44	51.51	6.58	14.92	22.35

Proportion of Stunted Children

STATES	2005-06 (NFHS-3) <5 years	2011-12 (IHDS II) 6-12 years
ANDHRA PRADESH	38.4	26.67
BIHAR	55.6	33.70
CHHATTISGARH	52.9	25.48
GUJARAT	51.7	36.47
HIMACHAL PRADESH	38.6	23.35
JHARKHAND	49.8	24.29
KARNATAKA	43.7	42.06
KERALA	24.5	18.58
MADHYA PRADESH	50	25.12
MAHARASHTRA	46.3	29.46
ODISHA	45	30.40
RAJASTHAN	43.7	24.35
TAMIL NADU	30.7	30.84
UTTAR PRADESH	56.8	35.65
WEST BENGAL	44.6	36.18

Proportion of Underweight Children

STATES	2005-06 (NFHS-3) <5 years	2011-12 (IHDS II) 6-10 years
ANDHRA PRADESH	33	38.56
BIHAR	55.9	28.48
CHHATTISGARH	47.1	38.93
GUJARAT	44.6	44.55
HIMACHAL PRADESH	36.5	29.26
JHARKHAND	56.5	32.40
KARNATAKA	37.6	38.72
KERALA	22.9	18.11
MADHYA PRADESH	60	38.43
MAHARASHTRA	37	33.35
ODISHA	40.7	32.97
RAJASTHAN	39.9	27.35
TAMIL NADU	29.8	25.56
UTTAR PRADESH	42.4	36.34
WEST BENGAL	38.7	30.92

Anthropometric Indicators

Framework for Child Health:

$$H_{it} = H (F_{it}, C_i, Z_{it}, H_{it-1}, U_{it})$$

F_{it} = Food consumption of child i in time t

C_i = Time-invariant observable characteristics of HH of child i

Z_{it} = Time-variant observable characteristics of HH of child i

H_{it}, H_{it-1} = Health status of child i in each period

U_{it} = Unobserved characteristics of child i in time t

Impact of the PDS on nutrition estimated through:

$$H_{i2} = \beta_1 + \beta_2 \cdot (PDS_{i2} - PDS_{i1}) + \beta_3 \cdot H_{i1} + \beta_4 \cdot C_i + \varepsilon_i$$

H_{i2} = HfA / WfA z-score of 7-19 / 7-10 age group in 2011-12

H_{i1} = HfA / WfA z-score of the same child in 0-12 / 0-10 age group in 2004-05

$PDS_{i2} - PDS_{i1}$ = Change in purchase of rice or wheat from PDS by HH over this time period

- C_i = Control variables:
Age and Sex of child, Rural/Urban Sector,
HH Income, Social group, HH Size, Literacy status of Head,
HH Wealth index : asset ownership, building materials of
house, source of drinking water, sanitation facilities
- Propensity Score Matching used to study impact
- Probability of participation in PDS calculated for all households;
children in treatment households matched to children in control
households which are as similar as possible

Estimated Impact of the PDS in 2011-12, Functioning States

STATES	HEIGHT-FOR-AGE	WEIGHT-FOR-AGE
ANDHRA PRADESH	1.026 *** (2.02)	#
HIMACHAL PRADESH	0.063 (0.21)	0.296 (0.74)
KARNATAKA	0.349 * (1.77)	0.184 (0.63)
TAMIL NADU	1.918 ** (2.19)	#

Source: Calculations using 2011-12 IHDS data

*** $p < 0.01$

** $p < 0.05$

* $p < 0.1$

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Estimated Impact of the PDS in 2011-12, Reviving States

STATES	HEIGHT-FOR-AGE	WEIGHT-FOR-AGE
BIHAR	0.028 (0.20)	0.023 (0.13)
CHHATTISGARH	0.363 *** (2.83)	0.446 *** (2.10)
KERALA	0.218 (0.35)	0.539 * (1.16)
ODISHA	0.076 (0.48)	0.016 (0.07)

Source: Calculations using 2011-12 IHDS data

*** $p < 0.01$

** $p < 0.05$

* $p < 0.1$

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Estimated Impact of the PDS in 2011-12, Languishing States

STATES	HEIGHT-FOR-AGE	WEIGHT-FOR-AGE
GUJARAT	-0.243 (-1.12)	0.378 (1.23)
MADHYA PRADESH	-0.134 (-1.38)	-0.123 (-0.95)
MAHARASHTRA	0.112 (0.83)	0.019 (0.09)
RAJASTHAN	-0.044 (-0.36)	-0.126 (-0.85)
UTTAR PRADESH	-0.047 (-0.59)	-0.038 (-0.39)
WEST BENGAL	-0.174 (-1.40)	-0.093 (-0.66)

Source: Calculations using 2011-12 IHDS data

*** $p < 0.01$

** $p < 0.05$

* $p < 0.1$

ATT could not be calculated

Conclusion

- Significant positive impact of PDS on longer-term nutritional indicator in three of four functioning states
- Significant positive impact on short-term nutritional indicator in two of the earliest reviving states
- An indication that revival of the PDS may have begun to translate into nutritional gains for this age group in these states
- Also indicates greater role of PDS in aiding catch-up growth in the functioning and reviving states