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# The Indian Public Distribution System as provider of food security: Evidence from child nutrition in Andhra Pradesh

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## Abstract

We study whether a sudden increase of the price of rice supplied by the Indian Public Distribution System in Andhra Pradesh, a large Indian state, had a negative impact on child nutrition. A few months after the price increase, a health survey started to record weight for a large sample of children. The data collection continued for several months, so that children measured later lived for a longer period of time in a less favorable price regime. Using different estimation techniques we find that longer exposure to high prices are not accompanied by worse nutritional status, as measured by weight-for-age.

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## 1. Introduction

Food subsidization has a very long tradition in India. For most of the last three decades, it has accounted for more than 2 percent of total government expenditure, and its cost peaked in 1993–1994 at 55 billion Rupees (roughly 1.8 billion 1993 US\$), almost 50 percent of total expenditure allocated to poverty alleviation programs, and approximately 0.8 percent of Gross Domestic Product (Radhakrishna et al., 1997). The bulk of these sums sustains the Public Distribution System (PDS hereafter),

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which mainly supplies rice, wheat, edible oils, sugar, and kerosene at subsidized prices, through a network of retail outlets known as *Fair Price Shops*.

The main proclaimed task of the PDS is to provide food security to poor households, but corruption, inefficiencies, and limited scope are widely believed to prevent the system from fulfilling its goal. The existing literature does include several insightful descriptive studies of the program that analyze its functioning and ability to reach the poor, and provide estimates of the implicit subsidy it offers.<sup>1</sup> However, notwithstanding the size of the program and its importance in policy debates in India, an evaluation of the efficacy of the PDS in improving the nutritional status of the beneficiaries is still missing. The main goal of this paper is to contribute to fill this gap, by studying the relation between PDS and children's nutritional status, as assessed through anthropometric measurements.

The evaluation is complicated by the fact that take-off rates and program placement are not randomly assigned. As a consequence, a database recording both purchases from the PDS and child nutritional status would not easily allow to identify any *causal* link between the two variables. If Fair Price Shops are concentrated in poorer areas, one might observe a *negative* relation between purchases from the PDS and nutritional status, even if the former has a positive impact on the latter.<sup>2</sup> Similarly, a negative bias might arise if—as it is the case—purchases from the PDS are concentrated among poorer households, which in India frequently face poor nutrition, as well as health and epidemiological hazards. The picture is further complicated by the presence of other factors—such as preferences—that may cause unobserved systematic differences between eligible households that purchase from the system and those that do not.

The literature on program evaluation sometimes eludes the selection problem making use of natural experiments, whereby policy changes translate into arguably exogenous variations in the level of the examined treatment.<sup>3</sup> This is the path we follow here, and the natural experiment is provided by a sudden drop in the level of the subsidy offered by the system that took place in the state of Andhra Pradesh.

At the beginning of 1992—with effect starting January 27th—the State Government of Andhra Pradesh almost doubled the price of subsidized rice, which had been kept for years at levels much below the market price (Krishna Rao, 1993). In April of the same year, the National Family Health Survey (NFHS hereafter) began collecting data on fertility, family planning and health from a sample of ever married women in fertile age, recording also weight and age of all children up to age four. Since the collection of data continued for several months, children measured later in the survey lived for a longer period of time in a less favorable PDS regime.

We will show that most children in the sample show poor anthropometric performances, and that there is ample evidence that weight typically reacts quickly to changes

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<sup>1</sup> See, among others, Dev and Suryanarayana (1991), Howes and Jha (1992), Ahluwalia (1993), Parikh (1994), Indrakant (1997), Radhakrishna et al. (1997), Mooij (1999), Dutta and Ramaswami (2001) and the collected essays in Krishnaji and Krishnan (2000).

<sup>2</sup> For more extensive discussions of the bias that can arise from endogenous program placement see, for example, Rosenzweig and Wolpin (1986) and Pitt et al. (1993).

<sup>3</sup> See Meyer (1995). Besley and Case (2000) warn that the exogeneity of the policy changes should be closely scrutinized.

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