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Social safety nets and nutrient deprivation: An analysis of the National Rural Employment Guarantee Program and the Public Distribution System in India☆

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ABSTRACT

Using primary data collected during 2007–08 we examine nutritional status with respect to two macronutrients as well as various micronutrients of rural households in three Indian states: Andhra Pradesh, Maharashtra and Rajasthan and find serious deficiencies in regard to these nutrients in all three states. The impact of two policy interventions (NREG and PDS) on nutrient intake is considered and significant impacts are discovered. The impact effects of a change in these policy measures are also computed. Finally, to assess the impact on undernutrition, both the nutrient-income relation and how the proportions of undernourished vary are considered.

1. Introduction

Despite rapid economic growth in recent times the nutritional status of a vast majority of Indians has not recorded commensurate improvement. Thus, between 1980 and 2005 real GDP per capita grew at a rate of 3.9% per annum whereas this growth between 2000 and 2005 was an even more impressive 5.4%. Even though less spectacular, real per capita consumption growth during the 2000–2005 period was also strong at 3.9% per annum. Yet, as Deaton and Dreze (2009) indicate, more than 75% of the population has daily per capita calorie consumption below 2100 in urban areas and 2400 in rural areas. These magnitudes are cited as minimum requirements for Indians.[1]

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[1] FAO (2008) has used for India a lower calorie norm of 1770 calories per day.

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When it comes to nutritional deprivation most attention is paid to the major macronutrient—calorie consumption. However, there are reasons to be concerned about the deprivation of the other macronutrient (protein) and various micronutrients. Apart from the consequences of such deprivation for health and well-being, there is evidence (Jha, Gaiha, & Sharma, 2009) to support the contention that this deprivation is actually leading to a poverty nutrition trap where low nutrition leads to low productivity which leads to low wages and then to low nutrition, thus completing a vicious cycle.

In view of this, it arguably becomes important to understand the impact of various anti-poverty interventions on nutrition. This task can only be accomplished using household level data on consumption in a context where specific anti-poverty programs are operative. This paper is addressed to this topic. We empirically model the impact of two key policy interventions (the recent National Rural Employment Guarantee Program (NREG) and, the much older but recently revamped, Public Distribution System (PDS)) in the rural sector of three states in India: Rajasthan, Maharashtra and Andhra Pradesh (henceforth AP). The former represents a direct transfer of purchasing power whereas the latter involves an indirect transfer.[2]

Our contribution in this paper is four fold. First, using primary household level data, collected by a team led by the authors during 2007–08, we examine the nutritional status of rural households in three Indian states: AP, Maharashtra and Rajasthan with respect to the two macronutrients (calories and protein) as well as various micronutrients. Second, we estimate the impact of two key policy initiatives (NREG and PDS) on the nutritional status of rural Indians. Third, we report impact coefficients of a policy intervention, which in our view can serve as a useful guide for future policy on anti-poverty programs and nutrition. Finally, we assess the impact on the headcount index of undernutrition of a (hypothetical) transfer of income (proxied by real expenditure) through these interventions. To the best of our knowledge, this is the first study to compare the nutritional impact of these two policy initiatives in particular and of direct and indirect transfers in general.

The literature on the nutritional impact of anti-poverty programs is rather sparse. A somewhat dated but detailed analysis of the impact of the PDS on calorie intake and its cost-effectiveness is Radhakrishna, Subbarao, Indrakant, and Ravi (1997). Another notable contribution is Narayana, Srinivasan, and Parikh (1991) which assesses the cost-effectiveness of PDS and rural public works but stops short of analyzing their nutritional impact. Our study seeks to fill this rather large gap.

This paper is related to a large literature on workfare programs. Much of it is, however, focused on its targeting (Besley & Coate, 1992; Gaiha, 2000; Jha, Bhattacharya, Gaiha, & Shankar, 2009; Ravallion & Datt, 1995). This paper is also linked to a large literature on poverty nutrition traps. The effect of nutritional intake on labour productivity and wage rates has been an important area of research for health economists and nutritionists for some time. This found initial expression in the form of the efficiency wage hypothesis developed by Leibenstein (1957) and Mazumdar (1959), and was formalized and extended by Dasgupta and Ray (1986, 1987) and Dasgupta (1993), Mirrlees (1975), among others. Early surveys include Bliss and Stern (1978a, 1978b) and Bisnwanger and Rosenzweig (1984). Jha, Gaiha et al. (2009) offer an empirical validation with an all-India household survey. The link of this literature to the present paper lies in the possibility that policy interventions may have nutritional benefits which lead to productivity gains and thus result in more sustained reduction in deprivation and escape from poverty nutrition traps. This is particularly important as a recent report of a committee established by the Government of India, the Tendulkar Committee report on Poverty (2009), has sought to delink estimation of poverty from calorie norms. In fact, India's progress in poverty reduction leads to dramatically different conclusions depending on whether the focus is on consumption poverty or the more pervasive nutritional deprivation.[3]

The plan of this paper is as follows. In Section 2, we describe the data and methodology. Section 3 presents and discusses the results and Section 4 concludes.

2. Data and methodology

The present analysis draws upon primary household data drawn from three Indian states: Rajasthan, AP and Maharashtra. The data were collected by a team led by the authors during 2007–08. The sample survey was designed to be a representative one for the following reasons. First, a list of NREG districts was compiled for each state. From these districts,

[2] When it came into effect in November 2005 the National Rural Employment Guarantee Act (NREGA) was hailed as one of India's most creative social initiatives. The act guarantees 100 days of employment a year to at least one member of any rural household who is willing to perform unskilled labour for the minimum wage. By combining rural development with livelihood protection, this scheme is designed to develop infrastructure such as roads, irrigation and flood protection measures. Beginning with the poorest 200 districts, NREGA became a nationwide program in April, 2008. Thus, the direct transfer net of opportunity cost of time could be viewed as a conditional cash transfer. The Public Distribution System (PDS) refers to the distribution of some essential commodities (e.g. wheat, rice, kerosene) by the government at subsidized rates through ration and fair price shops. Thus the amounts purchased multiplied by the difference between the retail and PDS prices are equivalent to a real income transfer. Recently, attempts have been made to revamp the PDS by targeting it better on the poorest segments. Under the *Antodaya* in the Targeted Public Distribution System, for example, 10 million of the poorest BPL households are identified and 25 kg of foodgrains are given to each eligible family at a highly subsidized rate of Rs. 2 per kg for wheat and Rs. 3 per kg for rice. In effect, in both cases, income transfers translate into additional nutrient intake. However, estimates of calorie-income elasticities vary over a large range (from negligible in Behrman and Deolalikar (1987) to .30 to .50 in Subramanian and Deaton (1996)). Ravallion (1990) makes an important point that, even if calorie-income elasticity is low, the effect on undernutrition may be large if the density of people is high in the neighborhood of calorie requirement norm. More specifically, the marginal effect of a change in the nutritional intake of undernourished persons is determined by the product of the slope of nutrient intake-income relation and the slope of the cumulative distribution function of intake, evaluated at the nutrient norm. Thus, even if calorie-income elasticities are low, there are grounds for optimism about the prospects of eliminating nutritional deprivation by raising incomes of the poor. This is broadly the perspective that informs our analysis of the nutritional impact of the NREG and PDS.

[3] For a comment along these lines, see Gaiha and Kulkarni (2009).