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Policy-related determinants of child nutritional status in China: The effect of only-child status and access to healthcare

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ABSTRACT

This paper examines the determinants of child nutritional status in China, focusing specifically on those determinants related to health system reform and only-child status. Data are drawn from four waves of the China Health and Nutrition Survey (1991–2000). The empirical relationship between nutritional status, on the one hand, and income, access to quality healthcare and being an only-child, on the other hand, is investigated using ordinary least squares (OLS), random effects (RE), fixed effects (FE) and instrumental variables (IV) models. In the preferred model – a fixed effects model where income is instrumented – we find that being an only-child increases height-for-age *z*-scores by 0.12 of a standard deviation. By contrast, measures of access to quality healthcare are not found to be significantly associated with improved nutritional status.

Introduction

Over the course of the 1990s, there was a remarkable fall in the national prevalence of child undernutrition in China. According to the 1992 China National Nutrition Survey and the 2002 China National Nutrition and Health Survey, the prevalence of stunting among children under five fell by 42% between 1992 and 2002 (Wang, Zhai, He, & Hu, 2007). This was the largest percentage decline in undernutrition in any country during that decade (WHO, 2007).

In explaining undernutrition, it is usually observed that child nutritional status is the outcome of a complex interaction of immediate, underlying and basic determinants (Bryce, Coutinho, Darnton-Hill, Pelletier, & Pinstrup-Andersen, 2008; Mosley & Chen, 1984; Smith & Haddad, 2000; UNICEF, 1990). Empirically, income has been found to be among the most critical determinants of a household's decision to invest in its children's health (see, for example, the reviews by Behrman & Deolalikar, 1988; Strauss & Thomas, 1995), but other socioeconomic factors and policies also play a role.

This paper attempts to shed some light on the determinants of child nutritional status in China in the 1990s with a specific focus on the roles of income and two specific areas of policy. First is the one-child family policy to which a sharp increase in the number of only-children has been attributed. Second is a protracted period of health system reform which resulted in increased variation in the accessibility, cost and quality of healthcare, with potential implications for children's consumption of health services, their incidence of illness and, thus, nutritional status.

The paper commences with a description of the data, followed by a brief discussion of the one-child policy and the health reforms. There follows an explanation of the theoretical pathways, the analytical approach (model specification), and a description of the measurement of key variables. Then, the empirical relationships are explored using ordinary least squares (OLS), random effects (RE), fixed effects (FE) and instrumental variables (IV) models.

Data

Data are drawn from a large-scale panel survey, the China Health and Nutritional Survey (CHNS). A multistage, random cluster procedure was used to draw the sample (see Henderson et al., 1994, for example, for an elaboration of the sample design). Counties in each province were stratified by income (low, middle, and high) and a weighted sampling scheme was used to randomly select 4 counties in each province. In addition, the provincial capital and a lower income city were selected where feasible. Villages and townships within the counties, and urban and suburban neighborhoods within the cities, were selected randomly.

In CHNS 1991, only individuals belonging to the original 1989 sample were re-interviewed; in CHNS 1993, all the new households that had been formed from the 1991 sample households and still

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resided in sample areas were added; in CHNS 1997, all newly-formed households who resided in sample areas were once again added, plus additional households and communities to replace those no longer participating; and in CHNS 2000, newly-formed households, replacement households, and replacement communities were again added. Because there is always a concern that attrition will bias the results of a panel study, particularly if the parameters governing the missing data process are likely to be related to the parameters that need to be estimated, the survey design gives careful attention to the selection of replacement households. In the seven provinces included in this analysis, there were 3207 households in 1991, 2986 households in 1993, 3296 households in 1997 and 3237 households in 2000 across 176 primary sampling units (or communities); there were 13,229 individuals in 1991, 12,492 individuals in 1993, 14,268 individuals in 1997 and 13,657 individuals in 2000.

This paper utilizes four waves of the CHNS, from 1991 through 2000, and includes the seven provinces of Jiangsu, Shandong, Henan, Hubei, Hunan, Guangxi and Guizhou. The sample is restricted to children under the age of 12 in an attempt to avoid the measurement difficulties associated with variation in the timing and duration of the adolescent growth spurt.

Major policies of the 1990s: the one-child family policy and health sector reform

The one-child family policy

Introduced formally in January 1979, the one-child family policy refers not to one policy, but to a cornucopia of legislation and policy prescriptions designed to reduce fertility. Over time, benefits associated with compliance have included extra food rations, better housing, health subsidies, and allotments of farmland. Punitive measures have included fines, the loss of parents' jobs and the denial of workplace promotions or privileges.

It is not easy to generalize about the characteristics of the one-child policy, for at least two reasons: first, throughout its implementation, the one-child policy has been a very much decentralized policy, resulting in substantial geographic variation in the policy's rules and the stringency of its implementation – even across very small administrative areas. Second, as described in Scharping (2003), the severity of the policy has varied substantially over time. From an incentive-based structure at its introduction, the policy tightened increasingly until second births were effectively forbidden (except under special circumstances). In 1983, however, coercive enforcement was prohibited and the range of conditions under which couples could have two children started to expand. In 1988, about 12% of the Chinese population lived in areas with universal permission to have a second child and a further 50% lived in provinces extending a second-child permit to peasant households under certain conditions, and by 2001 about 60% of the Chinese peasant population and about 5% of the urban population was eligible for second-child permits (Scharping, 2003).

Health sector reform

Health system reform appears to have had important consequences for access to care. In the public sector, there was evidence of rising user fees and out-of-pocket expenditures throughout the 1990s (World Bank, 1997), possibly attributable to the introduction of hard budget ceilings (Hsiao, 1995; Liu & Mills, 2002), as well as declining insurance coverage and higher co-payments (Akin, Dow, & Lance, 2004; Henderson et al., 1995). In addition, government spending on preventive facilities (Liu, 2004) and at the lower levels of service provision (Liu & Mills, 2002) fell substantially. An eight-year study confirms a trend of rising user fees, but better physical access to lower levels of care, across both poor and rich communities (Akin, Dow, Lance, & Loh, 2005). It is argued that these changes in health system financing had deleterious consequences for child health and nutritional status by increasing the delay in seeking treatment (Liu & Mills, 2002), reducing the utilization of pre- and post-natal care (Anson, 2004), and contributing to the fall in immunization coverage (Liu & Mills, 2002). In addition, the emergence of unregulated private healthcare providers – another key feature of the reform – resulted in tremendous variation in the quality of care provided (Lim, Yang, Zhang, Feng, & Zhou, 2004).

Empirical evidence of policy change in the survey data

In the absence of exogenous measures of the implementation of the one-child policy we try to capture the effect on nutritional status of the one-child policy's *outcome*, of which the most plausible measure is the change in the percentage of only-children, i.e. the percentage of persons under the age of 12 who either have no siblings or whose siblings are 18 years or older. The CHNS data show that, in the seven provinces considered in this study, there was a sharp increase in the number of only-children. In 2000, 42.8% of children under the age of 12 were only-children compared to only 27.1% of children in 1991, equivalent to a 57.9% increase. Not all spatial and temporal differences in the percentage of only-children can necessarily be attributed to the one-child policy, though, which is why this paper does not claim to estimate the total effect of the one-child policy on nutritional status, but rather the effect of being an only-child.

The trends in healthcare access and quality described in the literature are also supported by the data. Financial access to healthcare facilities appears to have deteriorated between 1991 and 2000: the mean (real) price of a cold or influenza-related visit more than doubled from 3.8 yuan to 8.8 yuan. In addition, the full economic cost of accessing services increased: travel costs increased significantly from a mean of 0.05 real yuan in 1991 to 0.43 real yuan in 2000 – although rising costs may reflect increased use of motorized transport, rather than bicycles or walking. Travel time to the closest healthcare facility did not fall significantly. On the other hand, to the extent that mean waiting time and the availability of medicines can be used as indicators of the quality of treatment available, there appear to have been some improvements. The mean waiting time to see a healthcare worker halved over the decade from a mean of 18 minutes down to 9 minutes, and while there was little change between 1991 and 1997, by 2000 there had been a statistically significant increase in the availability of medicine at facilities (Table 1).

Table 1
Trends in accessibility and quality of health facilities in seven provinces, 1991–2000.

	1991	1993	1997	2000
For the closest health facility				
Mean travel time (min)	10	9.7	9.8	10.7
Mean real cost of travel (real yuan)	0.03	0.06	0.07	0.13
Mean waiting time (min)	17.6	15.2	11.7	8.7
Mean real cost of treating a cold	3.8	5.6	6.2	8.8
% Households reporting medicine usually available	91.1	93.3	92.8	93.6

Source. China Health and Nutrition Survey, 1991–2000.
Note. Information was collected on every facility that the household can use, and the means are calculated for the facility that is closest (in distance) to the household. Values are calculated for households with at least one child under 12. *F*-tests show that the differences between mean values for 1991 and 2000 are all statistically significant at the 1% level, except for the "percentage reporting medicine generally available" which is significant at the 10% level.