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Impact of legislature regarding ‘right to food’ and ‘wheat fortification’ on child malnutrition: Cross-country estimates

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Abstract

Food security objectives of UN Millennium Development Goals have been constrained by the lack of policy coordination in the spheres of food, nutrition and public health. This paper investigates the relative importance of coordination of nutrition legislation on malnutrition indicators. Using a regression analysis, the variation of incidence of stunting and under-five malnutrition for the year 2013 is explained using policy variables. Results reveal that low levels of implementation of ‘wheat fortification’ legislation and low level of constitutional support for food security result in statistically significant increments in malnutrition. Significant reductions in malnutrition are observable for highly coordinated implementation of both of these legislative articles. We control for anthropometric variables, income level and regional fixed effects in order to remove potential biases.

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Keywords: Wheat fortification; Constitutional right for food; Malnutrition; Public policy coordination

1. Introduction

Global food security and nutrition security have received substantial attention in the decade after setting the United Nations (UN) Millennium Development Goals. Yet, globally, 162 million children under five years of age were stunted and 68 million children under five years of age were reported either wasted or severely

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wasted in 2012. The incidence of stunting (which is still the primarily used malnutrition indicator) is observed largely in Asia and Africa, with 92 percent of all cases being reported in the two regions¹.

One of the key areas of focus in upgrading nutrition status across the world is policy formulation and coordination in areas of food security, nutrition and public health². The early policy attention was directed to accommodating the food security objectives as rights in the constitutional framework of countries³. Based on the level of enforceability, other initiatives have been undertaken globally in health and human rights as binding ratifications under the leadership of WHO/UN^{4, 5}. Notable health and dietary initiatives of this type include code on breastfeeding substitutes marketing and wheat fortification regulations. Maternal rights legislation under the International Labour Organization (ILO) addresses the human/worker rights to provisions during antenatal and postnatal period.

In this paper, we evaluate the level of policy coordination with specific attention to the ‘constitutional right to food’ legislation and ‘wheat fortification’ legislation. The impact of the above policy coordination on rates of malnutrition in children under five years, in general, and on rates of stunting in children under five years, in particular, is quantified. In order to identify the effect of policy coordination correctly, we control for rates of anemia in reproductive aged women. (Anemia in mothers is a physiological predictor of stunting in children). Development status of the country and region fixed effects are also controlled in order to obtain robust estimates.

2. Methodology

We decompose the variation in the malnutrition rates (measured as rate of malnutrition in children under five years and rate of stunting) using a regression estimation that enables evaluation of the impact of the coordination between ‘wheat fortification’ (WF) and ‘right to food’ (RTF) legislations. The two policy directives are selected based on the wide global coverage that these two policy initiatives and the level of public health impact that each legislation has on the population. However, other specific policy directives that are globally implemented are included as control variables in order to remove potential selection bias and omitted variable biases.

The ‘right to food’ (RTF) legislature is widely implemented globally to different degrees across countries. We categorize different levels of implementation into five ordered levels: low, medium-low, medium, medium-high, high. The ‘wheat fortification’ (WF) legislature is categorized in four ordered levels: no legislation, policy in progress, voluntary commitment, binding commitment.

Estimated model follows the specification in equation 1 below.

$$nutI = \beta_0 + \beta_1 anthroIs + \beta_j otherPs + \beta_1 WF + \beta_2 RTF + \beta_3 WF * RTF + \beta_k regionFE + \beta_l GDP + \varepsilon \quad (1)$$

Where,

| | |
|-------------------|---|
| <i>nutI</i> : | malnutrition indicator(stunting / under 5 malnutrition rate) |
| <i>anthroIs</i> : | incidence of anemia in women of reproductive age |
| <i>OtherPs</i> : | other nutrition policy initiatives (ILO legislation on maternity rights, breast feeding substitute code, diabetes and hypertension legislature) |
| <i>WF</i> : | level of wheat fortification legislature |
| <i>RTF</i> : | level of ‘right to food’ legislative implementation |
| <i>regionFE</i> : | fixed effects of geographical region (identifying, Asia, Africa, Europe, North America, Latin America, Oceania) |
| <i>GDP</i> : | level of national income (measured by Gross Domestic Product, 2012) |

The above specification is estimated using data from 194 countries and heteroskedasticity corrected standard errors are calculated in order to determine the statistical significance of each parameter.

3. Results, discussion, conclusion and recommendations

The parameter estimates of the two models are included in Table 1. The first model explains the overall malnutrition rates of children under five years using the specification above. The second model explains the stunting rate in terms of policy and non-policy predictors.

Table 1. Nutrition Policy Coordination and Malnutrition Outcomes

| | (1) Malnutrition rate | (2) Stunting rate |
|---|--------------------------|----------------------|
| low RTF*lowWF | 31.320* (17.79) | 9.551 (12.50) |
| low RTF*moderateWF | -55.587*** (15.17) | n.a. |
| low RTF*highWF | -26.160* (14.79) | -0.912 (6.11) |
| moderateRTF*lowWF | 3.704 (14.56) | -6.249 (12.77) |
| moderateRTF*moderateWF | -110.164*** (9.88) | n.a. |
| moderateRTF*highWF | -34.363* (20.09) | -14.540** (6.68) |
| highRTF*highWF | -30.781** (14.51) | -10.795 (7.38) |
| veryhighRTF*highWF | -25.858 (18.41) | -9.519 (15.17) |
| Anaemia in reproductive aged women | 1.196*** (0.32) | -0.026 (0.15) |
| Breastfeeding substitute marketing code | -2.091 (1.38) | 0.266 (0.88) |
| Maternity provisions legislation | 0.021 (3.73) | -5.775*** (1.47) |
| Hypertension control legislation | -1.032 (2.26) | -1.479 (1.93) |
| Diabetes control legislation | -3.348 (2.65) | -0.257 (1.71) |
| Gross domestic product (2012) | -0.001 (0.00) | -0.001*** (0.00) |
| Region Fixed effects | included | included |
| Constant | 42.984*** (15.48) | 50.688*** (6.39) |
| Number of observations | 109 | 74 |
| Log likelihood | -458.297 | -253.971 |
| R squared | 0.830 | 0.709 |

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The first model depicts the more general case (i.e. that includes all the clinical levels of nutritional disorders in children under five years) while the second focuses on the more salient feature of malnutrition. We observe two main points from the first model. First, at poor implementation levels of each of the two legislative programs, the combined effort in fact worsens the health outcome as seen by increments in malnutrition incidence. Second, at high levels of implementation of both policies, the coordinated impact displays large magnitude reductions of malnutrition rate. In general, we observe that the model fit of the first model correspond to a R squared value of 0.83, indicating that the model explains 83 percent of the variation of malnutrition incidence.

The second model focuses on the more specific case of stunting. The sample size is 74 observations due to absence of stunting rate data for 2013 in some countries in the WHO public data sources. The model fit corresponds to a R squared value of approximately 0.71. The only policy coordination term that is highly statistically significant (at 5 percent level) is the interaction between moderate constitutional support and high wheat fortification legislative implementation. Even though it is not statistically significant, in the case of stunting also, we observe the expected sign of partial effects for poor and high level of coordination of two policies. Further, the level of maternity rights protection legislation is highly significant (at 1 percent level) in reducing the stunting rate.

Considering the estimates of both models, we conclude that food security and nutrition policies have the largest impact when coordinated. In fact, estimates for the two particular legislative articles of this study suggest that at poor levels of coordination, the impact could be negative (i.e. poor coordination may worsen malnutrition according to the model estimates). However, extensive analysis and policy experiments need to

be performed in order to generalize the findings to wider legislative coverage. A clear policy recommendation emerging from this analysis of recent cross-country data is that nutrition policy legislations cannot perform in isolation but need to be coordinated.

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