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The Associations between Member of Parliament Characteristics and Child Malnutrition and Mortality in India

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Abstract

Child health outcomes vary between Parliamentary Constituencies (PCs) in India. There are a total of 543 PCs in India, each of which is a geographical unit represented by a Member of Parliament (MP). MP characteristics, such as age, gender, education, the number of terms they have served, and whether they belong to a Scheduled Caste or Scheduled Tribe, might be associated with indicators of child malnutrition and child mortality. The purpose of this paper was to examine the associations between MP characteristics and measures of child malnutrition and mortality. We did not find any meaningful associations between MP characteristics and child anthropometry, anemia, and mortality. Future research should consider the size of a constituency served by an MP along with MP party affiliations as these factors might help explain between-PC variations in child health outcomes. Our findings also underscore the need to better support female MPs and MPs from marginalized caste and tribal groups.

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Introduction

A number of recent studies have examined geographic variations in child malnutrition and mortality throughout India. For example, some studies have shown how child stunting is clustered in districts in northern and central states in India.¹ Additionally, rates of child malnutrition are below the national average in Tamil Nadu, but above the national average in states such as Bihar, Uttar Pradesh, Odisha, and Madhya Pradesh.^{2,3} Child mortality rates were also higher in Bihar, Uttar Pradesh, Madhya Pradesh, and Jharkhand than the national average in 2017.⁴ Certain studies have also quantified variations in child malnutrition within districts and between villages,⁵ allowing for more regionally precise intervention targeting.

An emerging body of literature has started examining the variations in child health between Parliamentary Constituencies (PCs), another decentralized geographical unit within India. There are 543 PCs across India. Each is a geographical unit represented by a Member of Parliament (MP) in India's lower house of parliament, the Lok Sabha. While some studies focus on examining the variation in child malnutrition across villages,^{6,7} districts,¹ and states,^{2,8,9} PCs could be an important source of variation

due to the fact that they represent constituents in government via an elected MP.¹⁰ PCs are also entitled to resources directly from the national government.¹⁰ For example, every MP is entitled to INR five crores (USD 689,000) in discretionary funds per year to implement development projects that benefit their constituents through the national government's Member of Parliament Local Area Development Scheme (MPLADs).¹¹

Additionally, theories of descriptive representation suggest that elected officials with certain demographic characteristics will prioritize the needs of those most similar to them.¹²⁻¹⁴ Thus, the demographic characteristics of the MPs themselves might explain variations in outcomes between PCs. For example, electing female leaders is associated with improved access to health services, water, sanitation, and nutrition outcomes.¹⁵⁻¹⁷ Electing female leaders at the district and village levels is also associated with an increased reporting of crime against women,¹⁸ while female legislators at the national level are more active than their male counterparts in speaking up on critical issues pertaining to women and children.¹⁹ Similarly, households that share caste identity with a local elected official in South India were more likely

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to receive household amenities provided by the government than households belonging to different castes.²⁰ Others found that increasing the share of seats reserved for Scheduled Tribes in state assemblies was associated with a significant decrease in poverty²¹ while having a Scheduled Caste or Schedule Tribe lead local government bodies in West Bengal was associated with increased benefits received by the entire village.²² Other theories suggest that policy outcomes are tied to the experience and education of an elected official.²³ Former scientists are more likely to enact reforms the longer they stay in office,²⁴ while the performance of elected officials in parts of India is tied to their education.²⁵ A more complete list of papers that examine the associations between characteristics of elected officials and outcomes is presented in supplementary table 1.

What remains unknown, however, is the extent to which these demographic characteristics of MPs are associated with child malnutrition and mortality throughout India, both of which remain major public health issues. India is home to 30% of the world's stunted children (<-2 SD height-for-age Z score) and has the highest prevalence of stunting in South Asia.^{26,27} In 2017, the prevalence of child wasting (<-2 SD weight-for-height Z score) and child underweight (<-2 SD weight-for-age Z score) was 15.7% and 32.7%, respectively.³ Furthermore, the prevalence of anemia (<11.0 grams/deciliter) was 59.7% in 2017.³ Additionally, as of 2019, India's child mortality rate was 42.4 per 1,000 live births.⁴ Therefore, understanding the associations between MP characteristics and child health could help elucidate why multiple indicators for child malnutrition are clustered in certain PCs,¹⁰ and why the variance in child malnutrition attributable to PCs is very similar to that attributable to districts.⁵

Given this background, the purpose of this paper is to descriptively examine whether certain politicians are more likely to help promote better child health outcomes in India. More specifically, we examine whether MPs' gender, caste, age, education, and number of terms served are associated with measures of child malnutrition and mortality. We combined data from the fourth round of the National Family Health Survey (NFHS-4) with PC boundary shapefiles and MP characteristic data. This allowed us to estimate a four-level multilevel model in which children were nested in households, PCs, and states while adjusting for MP characteristics. To our knowledge, MP demographic data have not been combined with NFHS-4 data in this way before. Thus, this is the first descriptive analysis to examine

the associations between MP demographics/experience and child health at the national level throughout India.

Materials & Methods

Data Sources

We combined four different datasets to conduct this analysis. First, we used NFHS-4 from India, which was conducted between 2015 and 2016. Overall, NFHS-4 contains data from 601,509 households, from 28,522 villages in all 640 districts, 29 states, and seven Union Territories of India. Furthermore, NFHS-4 surveyed 699,686 women between the ages of 15–49 along with 259,627 children under the age of five. Households included in the survey were selected from a two-stage cluster sampling framework. For the purposes of this survey, a cluster was defined as a group of adjacent households, and was the primary sampling unit (PSU). The first stage of sampling involved selecting villages as PSUs for both rural and urban areas and PSUs with more than 300 households were divided into smaller groups of 100 to 150 households. As such, a cluster was a PSU, or a segment of a PSU, from which a set of households could be selected as a part of the second stage of sampling. No more than 22 households were selected from any given PSU in the second stage.

This dataset was then merged with the second and third sources, which were survey cluster coordinates collected using a global positioning system (GPS) and the boundary shapefiles for each parliamentary constituency (PC). We were then able to identify which PC each child in the NFHS dataset belonged to using PC GPS coordinates and cluster GPS coordinates. Additional details on how these two data sources were constructed are provided in previously published papers.¹⁰

Finally, we added Member of Parliament (MP) characteristics. These data are publicly available from PRS Legislative Research, an organization that tracks the functioning of the Indian government. These data include information pertaining to MP age, gender, education, and whether the PC they represent is reserved as either general caste, Scheduled Caste, or Scheduled Tribe. These data also contain information pertaining to MP experience, such as MP education and the number of terms served. We used MP characteristics from the 15th Lok Sabha, which was between 2009 and 2014, as these would immediately predate the fourth round of the NFHS.

Variables and Sample Sizes

The outcomes included in our analysis were the child height-for-age Z score (HAZ), weight-for-age Z score (WAZ), weight-for-height Z score (WHZ), stunting (<-2 SD HAZ), wasting (<-2 SD WHZ), and underweight (<-2 SD WAZ). We also included standardized hemoglobin measures (HB), anemia (<11.0 g/dL), childhood mortality (death between first and fifth birthdays), and postneonatal mortality (death between first 28 days and the first birthday). The NFHS dataset had complete HAZ, WHZ, and WAZ data for 225,002 children, complete HB data for 209,495 children, complete childhood mortality data for 245,690 children, and complete postneonatal mortality data for 247,958 children.

Our unadjusted models included only child sex and age (in months). We then built on these models by adding MP characteristics. These were MP gender (male/female), whether the PC they represent is reserved for a Scheduled Caste (SC) or Scheduled Tribe (ST) MP, MP age in years (categorized 31 to 39, 40 to 49, 50 to 59, 60 to 69, and 70 or above), MP education (categorized high school, college, and post-graduate), and the number of terms they have served (first/second/third or more). In India, MP seats are reserved for SC or ST representatives based on the proportion of SC/ST population of the entire state's population. Finally, our fully adjusted models included household and maternal characteristics. We included household location (urban/rural), household wealth (poorest wealth quintile or above), household religion (Hindu/Muslim/Christian/Other), and household caste (Scheduled Caste/Scheduled Tribe/Other Backwards Caste/Other). For mothers, we included education (no education/primary/secondary/higher), age of marriage (above or below 18), height (categorized less than 145 cm, 145–154 cm, 155–159 cm, and greater than 160 cm), body mass index (categorized less than 18.5 kg/m², 18.5–24 kg/m², 25–29 kg/m², and greater than 30 kg/m²), and age at first birth (categorized 13 to 17, 18 to 28, 29 to 38, and greater than 39). Table 1 below summarizes each covariate, its sample size by category, and the reference group.

After performing listwise deletion of all-missing observations for the above covariates, our fully adjusted sample sizes were 212,061 children with HAZ, WAZ, and WHZ outcome data, 197,320 children with HB outcome data, and 231,354 children with childhood mortality data, and 233,465 children with postneonatal mortality data.

Statistical Analysis

Our overall goal was to estimate the associations between MP characteristics and indicators of child malnutrition and mortality. As such, we estimated

four-level models in which children at level one were nested in clusters at level two, PCs at level three, and states at level four. Multilevel modeling is an empirical methodology that allows researchers to elucidate both the compositional and contextual factors associated with health. Therefore, by using this method, we were able to control for the contextual effects at the child, cluster, PC, and state levels while directly estimating the associations between MP characteristics and the given outcome.

Continuous Outcomes

The continuous outcomes included in our study were HAZ, WHZ, WAZ, and HB. For these outcomes, we estimated a four-level model that took the basic form of equation (1) $Y_{ijkl} = \beta_0 + \beta_1 X_{ijkl} + (e_{0ijkl} + u_{0jkl} + v_{0kl} + f_{0l})$ where Y_{ijkl} is one of the outcomes for child i nested in cluster j , PC k , and state l . In this model, X_{ijkl} is a vector of covariates, and the β coefficients for the MP characteristics were our parameters of interest. Furthermore, β_0 is the estimate for the reference child such that the continuous variables and random effects are equal to zero, and the categorical variables are equal to the reference categories. The random effects e_{0ijkl} , u_{0jkl} , v_{0kl} , and f_{0l} are the residual differentials for children, clusters, PCs, and states, respectively. Each residual differential is assumed to be normally distributed with a mean of 0 and a variance of $\sigma_{e_0}^2$, $\sigma_{u_0}^2$, $\sigma_{v_0}^2$, and $\sigma_{f_0}^2$, respectively. The variances signify the between-child ($\sigma_{e_0}^2$), between-cluster ($\sigma_{u_0}^2$), between-PC ($\sigma_{v_0}^2$), and between-state ($\sigma_{f_0}^2$) variations in child i experiencing the outcome.

Binary Outcomes

The categorical outcomes included in our study were stunting, wasting, underweight, anemia, childhood mortality, and postneonatal mortality. As with the continuous outcomes, we estimated a four-level model in which we estimated the probability (Pr) of a child i , in cluster j , PC k , and state l experiencing the outcome as shown in equation (2) $\text{logit}(\text{Pr}_{ijkl}) = \beta_0 + \beta_1 X_{ijkl} + (u_{0jkl} + v_{0kl} + f_{0l})$. The same assumptions and parameter definitions used for equation (1) were applied to equation (2). However, there is no $\sigma_{e_0}^2$ estimate in this model as the lowest-level (child) variance cannot be calculated in models with binary outcomes. As such, the remaining variance is a function of the binomial distribution.²⁸

Table 1. Summary of covariates and sample sizes.

	Variable	Category	N
Child Variables	Child sex	Boy (reference)	116,360
		Girl	108,642
MP/PC Variables	Child age (months)	31 to 39	25
		40 to 49	105
		50 to 59 (reference)	169
		60 to 69	158
		70 +	86
	MP Gender	Female	60
		Male (reference)	483
	MP Education	High school	100
		College (reference)	273
		Post graduate/doctorate	170
	PC Reservation	General (reference)	412
		SC	84
		ST	47
MP Term	First (reference)	290	
	Second	109	
	Third +	144	
Household Variables	Household Location	Rural Household	123,735
		Urban Household (reference)	40,915
	Household Wealth	Poorest Quintile (reference)	41,115
		2nd, 3rd, 4th, and 5th wealth quintiles	123,535
	Household Religion	Hindu (reference)	119,457
		Muslim	24,952
		Christian	13,327
		Other	6,914
	Household Caste	SC	30,717
		ST	32,816
		OBC (reference)	63,717
Other		30,687	
Missing		6,713	
Mother's Variables	Mother's Education	Mother Received no Ed	47,879
		Primary	23,345
		Secondary (reference)	76,465
	Maternal Marriage	Higher	16,961
		Mother Married <18	57,511
		Mother Married ≥ 18 (reference)	104,520
	Maternal Height	Missing	2,619
		< 145 cm	18,259
		145 cm to 154 cm (reference)	99,685
		155 cm to 159 cm	33,387
Maternal BMI	≥ 160 cm	13,319	
	<18.5	37,923	
	18.5 to 24 (reference)	101,600	
Age at first birth	25 to 29	19,624	
	30+	5,503	
	13 to 17	20,049	
	18 to 28 (reference)	136,998	
	29 to 38	7,079	
	39 +	183	
	Missing	435	

Results

Sample Characteristics

Out of the 225,002 children with complete anthropometric data, the mean HAZ, WHZ, and WAZ values were -1.48 (std. dev. 1.68), -1.52 (std. dev. 1.22), and -0.97 (std. dev. 1.39), respectively. In the full sample, approximately 38.3% of the children were stunted, 20.4% experienced wasting, and 34.5% were underweight. Of the 209,496 children with complete hemoglobin data, the average HB value was 10.6

(std. dev. 1.54), and approximately 57% of the children were anemic. Of the 248,925 children with childhood mortality data, 1,182 children died between their first and fifth birthdays. Finally, of the 251,193 children with complete postneonatal mortality data, 3,450 died between 28 days of birth and their first birthday.

Anthropometric Outcomes

Tables 2 and 3 below present our complete results for the continuous and binary anthropometric outcomes. In our fully adjusted models, we found that children represented by female MPs had lower WHZ and WAZ scores compared to children represented by male MPs. However, these differences were small (-0.07 , 95% CI -0.13 , -0.01 for WHZ and -0.05 , 95% CI -0.09 , 0 for WAZ). There were no differences in stunting, wasting, or underweight between children represented by male and female MPs. Children represented by ST MPs had lower WHZ and WAZ scores when compared to children represented by an MP in the general caste. Again, these differences were small (-0.09 , 95% CI -0.16 , -0.03 for WHZ and -0.09 , 95% CI -0.15 , -0.04 for WAZ). Similarly, children represented by an ST MP had a smaller likelihood of being wasted (OR 1.11, 95% CI 1.00, 1.24), and underweight (OR 1.13, 95% CI 1.03, 1.23).

Children represented by MPs in the 40 to 49 and 60 to 69 age groups had slightly lower HAZ scores (-0.05 , 95% CI -0.1 , 0, and -0.05 , 95% CI -0.1 , -0.01 , respectively) than children represented by MPs between the ages of 50 and 59. Children represented by MPs between the ages of 40 to 49 had a slightly higher WHZ score (0.05, 95% CI 0–0.10) than MPs in the reference age group of 50 to 59. Similarly, children represented by MPs in the 60 to 69 and 70 plus age groups had higher WHZ scores (0.05, 95% CI 0, 0.10, and 0.05, 95% CI 0, 0.11, respectively) than children represented by MPs in the reference age group. For stunting, children represented by MPs in the 40 to 49 age range had slightly higher odds of being stunted (OR 1.06, 95% CI 1, 1.13) than children represented by MPs in the 50 to 59 age range. For wasting, we found that children represented by MPs in the 40 to 49 and 60 to 69 age groups had lower odds of being wasted (OR 0.90, 95% CI 0.82, 0.98, and OR 0.93, 95% CI 0.86, 1.01, respectively) than children represented by MPs in the 50 to 59 age range. The full anthropometric results are presented in supplementary tables 2 and 3.

Hemoglobin and Anemia

Table 4 below presents our complete results for hemoglobin and anemia. Children represented by SC MPs had slightly higher hemoglobin measures (0.07, 95% CI 0,

Table 2. Results for continuous anthropometric outcomes, HAZ, WHZ, and WAZ.

	MP Characteristics			Fully Adjusted		
	HAZ	WHZ	WAZ	HAZ	WHZ	WAZ
MP Gender (reference = male)						
PC Reservation (reference = general)						
Female	0.01 (-0.06,0.07)	-0.06** (-0.12,0)	-0.03 (-0.09,0.02)	-0.01 (-0.06,0.04)	-0.07** (-0.13,-0.01)	-0.05** (-0.09,0)
SC	-0.05* (-0.11,0.01)	-0.01 (-0.07,0.04)	-0.04 (-0.09,0.01)	-0.02 (-0.07,0.03)	0 (-0.05,0.05)	-0.01 (-0.05,0.03)
ST	-0.21*** (-0.28,-0.13)	-0.17*** (-0.24,-0.1)	-0.24*** (-0.3,-0.17)	-0.04 (-0.1,0.02)	-0.09*** (-0.16,-0.03)	-0.09*** (-0.15,-0.04)
MP Age (reference = 50–59)						
31 to 39	-0.05 (-0.16,0.05)	-0.02 (-0.11,0.07)	-0.04 (-0.13,0.04)	-0.04 (-0.13,0.04)	-0.01 (-0.1,0.08)	-0.03 (-0.1,0.04)
40 to 49	-0.03 (-0.1,0.03)	0.05* (0.0,0.11)	0.02 (-0.03,0.07)	-0.05** (-0.1,0)	0.05* (0.0,0.1)	0.01 (-0.04,0.05)
60 to 69	-0.04 (-0.1,0.01)	0.06** (0.01,0.11)	0.01 (-0.04,0.06)	-0.05** (-0.1,0.01)	0.05* (0.0,0.1)	0 (-0.04,0.04)
70 +	-0.02 (-0.09,0.05)	0.06** (0.0,0.12)	0.02 (-0.03,0.08)	-0.04 (-0.09,0.01)	0.05* (0.0,0.1)	0.01 (-0.04,0.05)
MP Education (reference = college)						
High school	-0.04 (-0.09,0.02)	-0.01 (-0.06,0.04)	-0.03 (-0.08,0.02)	-0.03 (-0.08,0.01)	-0.01 (-0.06,0.04)	-0.02 (-0.06,0.02)
Post graduate/doctorate	0.01 (-0.04,0.06)	0 (-0.04,0.04)	0 (-0.04,0.04)	0.01 (-0.03,0.05)	0 (-0.04,0.04)	0 (-0.03,0.03)
MP Term (reference = first)						
Second	-0.01 (-0.06,0.05)	-0.02 (-0.07,0.03)	-0.02 (-0.06,0.03)	0 (-0.05,0.04)	-0.01 (-0.06,0.04)	-0.01 (-0.04,0.03)
Third +	0.02 (-0.04,0.07)	-0.02 (-0.07,0.02)	-0.01 (-0.05,0.04)	0.02 (-0.03,0.06)	-0.02 (-0.06,0.03)	0 (-0.03,0.04)

Table 4. Results for standardized hemoglobin measure and anemia.

		Hemoglobin		Anemia	
		MP Characteristics	Fully Adjusted	MP Characteristics	Fully Adjusted
MP Gender (reference = male)	Female	-0.03 (-0.12,0.06)	-0.04 (-0.13,0.05)	1.08 (0.97,1.2)	1.09 (0.98,1.21)
PC Reservation (reference = general)	SC	0.06 (-0.01,0.14)	0.07* (0,0.15)	0.95 (0.87,1.04)	0.94 (0.85,1.03)
	ST	-0.09* (-0.2,0.01)	0.01 (-0.1,0.11)	1.18*** (1.04,1.34)	1.03 (0.91,1.17)
MP Age (reference = 50–59)	31 to 39	-0.19*** (-0.33,-0.06)	-0.19*** (-0.33,-0.06)	1.25*** (1.06,1.48)	1.26*** (1.06,1.49)
	40 to 49	0.01 (-0.07,0.09)	0.01 (-0.07,0.09)	0.96 (0.87,1.06)	0.97 (0.88,1.07)
	60 to 69	0 (-0.07,0.08)	0 (-0.07,0.07)	0.98 (0.9,1.07)	0.98 (0.9,1.07)
	70 +	0.01 (-0.08,0.1)	0.01 (-0.08,0.09)	1 (0.9,1.11)	1.01 (0.91,1.12)
MP Education (reference = college)	High school	-0.08** (-0.16,0)	-0.08** (-0.16,-0.01)	1.08 (0.98,1.18)	1.08* (0.99,1.19)
	Post graduate/doctorate	0.01 (-0.05,0.08)	0.01 (-0.06,0.07)	0.96 (0.89,1.04)	0.97 (0.89,1.04)
MP Term (reference = first)	Second	0.05 (-0.03,0.12)	0.05 (-0.02,0.13)	0.97 (0.89,1.06)	0.96 (0.88,1.05)
	Third +	0.03 (-0.04,0.1)	0.03 (-0.04,0.1)	0.97 (0.89,1.05)	0.96 (0.88,1.04)

0.15) than children represented by general caste MPs. We found that children represented by MPs in the 31–39 age group had significantly lower hemoglobin measures (-0.19, 95% CI -0.33, -0.06) than children represented by MPs in the reference age group. Similarly, children represented by MPs in the 31–39 age group had significantly higher odds of being anemic (OR 1.26, 95% CI 1.06, 1.49) than children represented by MPs in the reference age group. Children represented by MPs with a high-school education also had significantly lower hemoglobin measures (-0.08, 95% CI -0.16, -0.01) than children represented by MPs who had a college education. We also found that children represented by an MP with a high-school education had significantly higher odds of being anemic (OR 1.08, 95% CI 0.99, 1.19) than children represented by MPs with a college education. The full hemoglobin and anemia results are presented in supplementary table 4.

Mortality

Table 5 below presents our complete results for childhood mortality and postneonatal mortality. In our MP adjusted model for childhood mortality, we found that children represented by an MP belonging to a Scheduled Caste had significantly higher odds (OR 1.49, 95% CI 1.15, 1.94) of dying between their first and fifth birthdays than children represented by

an MP from a general caste. We found a similar association for postneonatal mortality in the MP adjusted model (OR 1.23, 95% CI 1.03, 1.47). In our MP adjusted model, we also found that children represented by an MP who has served three or more terms has significantly lower odds of dying between 28 days and their first birthday (OR 0.89, 95% CI 0.77, 1.02) compared to children represented by an MP in their first term. There were no significant associations between MP characteristics and these measures of mortality in the fully adjusted models. None of the MP characteristics were significantly associated with either childhood mortality or postneonatal mortality in our fully adjusted models. The full mortality results are presented in supplementary table 5.

Discussion

Our study had two salient findings. First, we did not find any meaningful associations between descriptive characteristics of MPs and child anthropometry, anemia, or mortality outcomes in India. While MP gender and caste were significantly associated with certain anthropometric outcomes and hemoglobin, these associations were small. Second, we did not find any meaningful associations between MP experience characteristics—age, education,

Table 5. Results for childhood mortality and postneonatal mortality.

		Child Mortality		Postneonatal Mortality	
		MP Characteristics	Fully Adjusted	MP Characteristics	Fully Adjusted
MP Gender (reference = male)	Female	0.99 (0.76,1.3)	1.08 (0.87,1.35)	1.01 (0.85,1.19)	1.06 (0.9,1.24)
PC Reservation (reference = general)	SC	0.88 (0.68,1.14)	0.86 (0.69,1.08)	1.04 (0.89,1.22)	1.06 (0.91,1.23)
	ST	1.49*** (1.15,1.94)	1.04 (0.83,1.32)	1.23** (1.03,1.47)	1 (0.83,1.19)
MP Age (reference = 50–59)	31 to 39	1.01 (0.67,1.54)	1.09 (0.77,1.53)	0.91 (0.7,1.18)	0.92 (0.71,1.18)
	40 to 49	1.17 (0.91,1.5)	1.17 (0.95,1.44)	0.98 (0.84,1.16)	0.98 (0.84,1.14)
	60 to 69	1 (0.79,1.26)	1.05 (0.86,1.28)	1.01 (0.87,1.17)	1.01 (0.88,1.17)
	70 +	1 (0.76,1.32)	1.03 (0.82,1.29)	1.05 (0.88,1.24)	1.05 (0.89,1.24)
MP Education (reference = college)	High school	1.12 (0.89,1.42)	1.09 (0.9,1.33)	0.98 (0.84,1.13)	0.98 (0.85,1.13)
	Post graduate/doctorate	1.04 (0.85,1.28)	1.06 (0.9,1.25)	1.05 (0.92,1.19)	1.06 (0.93,1.19)
MP Term (reference = first)	Second	0.95 (0.75,1.2)	0.99 (0.81,1.21)	0.92 (0.8,1.07)	0.95 (0.82,1.1)
	Third +	1.05 (0.84,1.3)	1.06 (0.89,1.27)	0.89* (0.77,1.02)	0.91 (0.79,1.04)

and terms served—and child anthropometry, anemia, or mortality outcomes in India. Again, while some of these associations were significant, the effects were small, thus pointing to a null result.

There are four data limitations associated with our study. First, responses to questions about maternal characteristics were self-reported by the mothers. This could have been a potential source of measurement error. Nevertheless, data from the NFHS-4 is widely regarded as high quality and representative.²⁹ Second, we excluded missing observations for the outcomes and covariates. This could have potentially biased our results in the event that the missingness was not random. Third, for descriptive analysis using cross-sectional data, we do not account for possible confounding. Yet the largely null results show that using methods of causal inference may have biased the estimates further toward the null. Therefore, doing this descriptive analysis was important to attain a preliminary understanding of what, if any, associations exist between MP characteristics and child health in India. Fourth, the cross-sectional and descriptive natures of this study did not allow us to capture changes in MP characteristics over time, and how these changes could potentially impact nutritional outcomes.

Our findings are important for several reasons. First, we do not find a meaningful association between descriptive characteristics of MPs and various child health outcomes. This is in contrast to findings from previous studies. For example, one study found that a ten percentage point increase in women's representation in state legislative assemblies resulted in a 2.1% reduction in neonatal mortality.³⁰ Similarly, SC elected officials tend to invest more in the goods and services that their SC constituents want and need.³¹ Second, we did not find meaningful associations between MP experience and various child health outcomes. Again, this runs counter to findings from certain previous studies. Prior research has shown that more highly educated elected officials are less likely to use their political power opportunistically.²⁵ However, our null finding is consistent with another study that found that the impact of politicians' education on reforms is not robust.²⁴ This suggests that more research is required to understand a more precise method of estimation between the elected official experience and outcomes.

There are several possible explanations for our null findings. For example, MPs (the elected officials we considered) serve a much larger geographic area and number of people than elected officials considered in previous studies. Though in a vastly different context, evidence from the US shows that the average number of

constituents represented by members of the U.S. House of Representatives is on the rise, and how this has had a negative impact on representation quality.³² Thus, future research in India should examine the extent to which the divergence in our results from previous findings is due to differences in constituency size. Additionally, we did not consider the political party affiliation of each MP in our study. This was in large part due to the fact that not all states have the same political parties, making between-state political party comparisons difficult. However, power resources theory suggests that parties on the left of the political spectrum might be better at promoting the needs and interests of working-class voters, thereby improving social welfare.^{33,34} Therefore, future research should categorize the political ideologies of MP political parties and examine the extent to which these affiliations are associated with child anthropometry, anemia, and mortality in India.

Our results are novel given that we combined the most recent all-India data on child anthropometry and mortality, with data pertaining to elected officials that represent constituents at the national level. This is different from prior studies that have looked at the associations between elected officials at more local levels and child health using older child health data. Furthermore, despite our null findings, political reservations based on caste and gender remain an integral part of the electoral process in India. As shown in the previous literature, this can improve targeting of public services to historically marginalized groups while improving certain outcomes, such as the incidence of child labor.^{22,35} Reservations for women can also bolster women's entrepreneurship in India and can help lead to improved perceptions of women by men.^{36,37} As such, women and SC/ST elected officials should be provided with additional support to overcome any institutional barriers they face as they attempt to provide services to their constituents.³⁸

Conclusion

Child health outcomes vary across Parliamentary Constituencies in India. This might be due to the demographic characteristics of the elected officials that represent these areas. To our knowledge, however, the associations between these characteristics and child anthropometry, anemia, and mortality have not been descriptively analyzed in India. Contrary to findings from several other studies, we did not find any meaningful associations between MP characteristics and child health outcomes in India. This could be due to the constituency size served

by MPs relative to elected officials from smaller geographic units. Future research should examine constituency size and MP political party affiliation to see if these factors better explain the relationship variations in child health outcomes between Parliamentary Constituencies, the areas MPs serve in India.

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Disclosure of Potential Conflicts of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Data Availability Statement

The data that support the findings of this study are openly available in India: Standard DHS, 2015–2016 Dataset at https://dhsprogram.com/data/dataset/India_Standard-DHS_2015.cfm?flag=0. The analysis was done in MLwiN version 3.05, and as such there is no code.

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References

- Menon P, Headey D, Avula R, Nguyen PH. Understanding the geographical burden of stunting in India: a regression-decomposition analysis of district-level data from 2015–16. *Matern Child Nutr.* 2018;14(4):e12620. doi:10.1111/mcn.12620.
- Cavatorta E, Shankar B. Explaining Cross-State F-MA. Disparities in child nutrition in rural India. *World Dev.* 2015;76:216–37. doi:10.1016/j.worlddev.2015.07.006.
- Swaminathan S, Hemalatha R, Pandey A, Kassebaum NJ, Laxmaiah A, Longvah T, Lodha R, Ramji S, Kumar GA, Afshin A, et al. The burden of child and maternal malnutrition and trends in its indicators in the states of India: the global burden of disease study 1990–2017. *Lancet Child Adolesc Health.* 2019;3(12):855–70. doi:10.1016/S2352-4642(19)30273-1.
- Dandona R, Kumar GA, Henry NJ, Joshua V, Ramji S, Gupta SS, Agrawal D, Kumar R, Lodha R, Mathai M, et al. Subnational mapping of under-5 and neonatal mortality trends in India: the global burden of disease study 2000–17. *The Lancet.* 2020;395(10237):1640–58. doi:10.1016/S0140-6736(20)30471-2.
- Rajpal S, Kim J, Joe W, Kim R, Subramanian SV. Small area variation in child undernutrition across 640 districts and 543 parliamentary constituencies in India. *Sci Rep.* 2021;11(1):4558. doi:10.1038/s41598-021-83992-6.
- Ackerson LK, Kawachi I, Barbeau EM, Subramanian SV. Geography of underweight and overweight among women in India: a multilevel analysis of 3204 neighborhoods in 26 states. *Econ Hum Biol.* 2008;6(2):264–80. doi:10.1016/j.ehb.2008.05.002.
- Mejía-Guevara I, Krishna A, Corsi DJ, Subramanian SV. Individual and ecological variation in child undernutrition in India: a multilevel analysis. *J South Asian Dev.* 2015;10(2):168–98. doi:10.1177/0973174115588841.
- Kim R, Rajpal S, Joe W, Corsi DJ, Sankar R, Kumar A, Subramanian SV. Assessing associational strength of 23 correlates of child anthropometric failure: an econometric analysis of the 2015–2016 national family health survey, India. *Soc Sci Med.* 2019;238:112374. doi:10.1016/j.socscimed.2019.112374.
- Li Z, Kim R, Subramanian SV. Economic-related inequalities in child health interventions: an analysis of 65 low- and middle-income countries. *Soc Sci Med.* 2021 March;277:113816. doi:10.1016/j.socscimed.2021.113816.
- Swaminathan A, Kim R, Xu Y, Blossom JC, Joe W, Venkataramanan R, Kumar A, Subramanian SV. Burden of child malnutrition in India: a view from parliamentary constituencies. *Econ Polit Wkly.* 2019;54(2). <https://www.epw.in/journal/2019/2/special-articles/burden-child-malnutrition-india.html>
- Guidelines on Members of Parliament Local Area Development Scheme (MPLADS)*. Government of India ministry of statistics and programme implementation; 2016 [accessed 2021 Dec 12]. https://mplads.gov.in/MPLADS/UploadedFiles/MPLADSGuidelines2016English_638.pdf
- Bradbury M, Kellough JE. Representative bureaucracy: assessing the evidence on active representation. *Am Rev Public Adm.* 2011;41(2):157–67. doi:10.1177/0275074010367823.
- Celis K, Introduction: CS, Descriptive T. Substantive representation of women: new directions. *Parliam Aff.* 2008;61(3):419–25. doi:10.1093/pa/gsn006.
- Wängnerud L. Women in parliaments: descriptive and substantive representation. *Annu Rev Polit Sci.* 2009;12(1):51–69. doi:10.1146/annurev.polisci.11.053106.123839.
- Chattopadhyay R, Duflo E. Women as policy makers: evidence from a randomized policy experiment in India. *Econometrica.* 2004;72(5):1409–43. doi:10.1111/j.1468-0262.2004.00539.x.
- Pathak Y, Women's Political MK. Reservation, early childhood development, and learning in India. *Econ Dev Cult Change.* 2017;65(4):741–66. doi:10.1086/692114.

17. Kumar S, Prakash N. Effect of political decentralization and female leadership on institutional births and child mortality in rural Bihar, India. *Soc Sci Med.* 2017;185:171–78. doi:10.1016/j.socscimed.2017.04.013.
18. Iyer L, Mani A, Mishra P, Topalova P. The power of political voice: women's political representation and crime in India. *Am Econ J Appl Econ.* 2012;4(4):165–93. doi:10.1257/app.4.4.165.
19. Kalra S, Joshi DK. Gender and parliamentary representation in India: the case of violence against women and children. *Womens Stud Int Forum.* 2020;82:102402. doi:10.1016/j.wsif.2020.102402.
20. Besley T, Pande R, Rahman L, Rao V. The politics of public good provision: evidence from Indian local governments. *J Eur Econ Assoc.* 2004;2(2–3):416–26. doi:10.1162/154247604323068104.
21. Chin A, Prakash N. The redistributive effects of political reservation for minorities: evidence from India. *J Dev Econ.* 2011;96(2):265–77. doi:10.1016/j.jdeveco.2010.10.004.
22. Bardhan PK, Mookherjee D, Parra Torrado M. Impact of political reservations in West Bengal local governments on anti-poverty targeting. *J Glob Dev.* 2010;1:1. doi:10.2202/1948-1837.1025.
23. Roubini N, Sachs J. Political and economic determinants of budget deficits in the industrial democracies. National Bureau of Economic Research. 1988:w2682. doi:10.3386/w2682.
24. Dreher A, Lamla MJ, Lein SM, Somogyi F. The impact of political leaders' profession and education on reforms. *J Comp Econ.* 2009;37(1):169–93. doi:10.1016/j.jce.2008.08.005.
25. Besley T, Pande R, and Political RV. . 2005. University Economic Growth Center Discussion Paper No. 921. doi:10.22004/AG.ECON.28426.
26. 2018 Global Nutrition Report. 2021 Jan 31. <https://globalnutritionreport.org/reports/global-nutrition-report-2018/>
27. Kim R, Mejia-Guevara I, Corsi DJ, Aguayo VM, Subramanian SV. Relative importance of 13 correlates of child stunting in South Asia: insights from nationally representative data from Afghanistan, Bangladesh, India, Nepal, and Pakistan. *Soc Sci Med.* 2017;187:144–54. doi:10.1016/j.socscimed.2017.06.017.
28. Kim R, Mohanty SK, Subramanian SV. Multilevel geographies of poverty in India. *World Dev.* 2016;87:349–59. doi:10.1016/j.worlddev.2016.07.001.
29. Corsi DJ, Neuman M, Finlay JE, Subramanian SV. Demographic and health surveys: a profile. *Int J Epidemiol.* 2012;41(6):1602–13. doi:10.1093/ije/dys184.
30. Bhalotra S, Clots-Figueras I. Health and the political agency of women. *Am Econ J Econ Policy.* 2014;6(2):164–97. doi:10.1257/pol.6.2.164.
31. Chattopadhyay R, and Duflo E. The impact of reservation in the Panchayati Raj: evidence from a nationwide randomized experiment. *Econ Polit Wkly.* 2003;39(9).
32. Frederick B. Constituency population and representation in the U.S. house. *Am Polit Res.* 2008;36(3):358–81. doi:10.1177/1532673X07309740.
33. Franke RW, and Chasin BH. Kerala: radical reform as development in an Indian State. 2nd ed. San Francisco: Inst. for Food and Development Policy; 1994.
34. Chathukulam J, Tharamangalam J. The Kerala model in the time of COVID19: rethinking state, society and democracy. *World Dev.* 2021;137:105207. doi:10.1016/j.worlddev.2020.105207.
35. Kaletski E, Prakash N. Does political reservation for minorities affect child labor? Evidence from India. *World Dev.* 2016;87:50–69. doi:10.1016/j.worlddev.2016.06.003.
36. Beaman L, Duflo E, Pande R, Topalova P. Female leadership raises aspirations and educational attainment for girls: a policy experiment in India. *Science.* 2012;335(6068):582–86. doi:10.1126/science.1212382.
37. Ghani E, Kerr WR, O'Connell SD. Political reservations and women's entrepreneurship in India. *J Dev Econ.* 2014;108:138–53. doi:10.1016/j.jdeveco.2014.01.008.
38. Ban R, Rao V. Tokenism or agency? The impact of women's reservations on village democracies in South India. *Econ Dev Cult Change.* 2008;56(3):501–30. doi:10.1086/533551.