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Stunting and Social Identity: Revisiting the India - Africa Comparison

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Abstract

The “Indian Enigma” refers to the higher rates of childhood stunting in relatively richer India compared to Sub Saharan Africa (SSA). However, existing explanations have ignored the role of social identity in both regions. While the average rates of stunting of under-five children in India and SSA are 35.7% and 33.6%, respectively, there are sharp disparities by social identities with varying socio-economic circumstances. In India, 27% of dominant upper caste Hindu children are stunted compared to 40% of children from the most marginalized groups, the Scheduled Castes (SCs) and Scheduled Tribes (STs). In SSA, Christians and Muslims have similar and lower stunting rates compared to all other religious groups. Furthermore, stunting rates are not higher among the groups in SSA that are politically excluded than among those who are not. Finally, accounting for factors identified as explaining the India-SSA height gradient - birth-order, mother height, open defecation, and sibling size - taken together can explain one-third of the differences among the caste groups in India. Our findings suggest that incorporating considerations of social identity is essential to understanding the problem of stunting in India and SSA.

Keywords: caste, India, sub-Saharan Africa, religion, stunting

JEL: I1, Z13

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1 Introduction

Chronic child malnutrition, which is one of the causes of stunting, is a global health concern with one in four children worldwide classified as stunted (UNICEF, 2018). India is home to around 120 million children aged under-5, and nearly a third of all stunted children globally, and has a higher prevalence rate (35.7%) than that of sub-Saharan Africa (33.6%). This is so despite children in Sub-Saharan Africa (SSA) facing a worse disease environment and having access to fewer calories (Deaton, 2007); two key factors determining child height. This has led to a literature on the so-called “Indian Enigma” trying to understand “why Indian children are short” in comparison to children in SSA (Deaton, 2007; Panagariya, 2013; Jayachandran and Pande, 2017; Spears, 2018; Von Grafenstein et al., 2023).

The continent-country comparison, however, overlooks disparities within the country and the continent, respectively. This paper first provides the most recent estimates of the India-SSA stunting gaps.¹ Next, it explore how stunting rates vary by socioeconomic status. For India, we look at two major social cleavages: caste and religion. In case of SSA, we examine differences by asset levels, extent of political exclusion of their ethnic group and religious denomination. Our results highlight the importance of uncovering the underlying heterogeneity for policy and provide new insights into the patterns of stunting in India and sub-Saharan Africa.

2 Data and methods

Our analysis is based on data from the Demographic and Health Surveys (DHS). We use data from the latest round for India for 2019-21, and for 19 countries in SSA for which data is available for the years 2015 and onwards.² The Indian data contain information on anthropometric outcomes on 195,024 children under five years. We examine the following broad social identity groups: (i) Scheduled Castes; (ii) Scheduled Tribes (STs); (iii) Other Backward Classes (OBCs); (iv) non-SC-ST-OBC-Hindus (v) non-SC-ST-OBC-Muslims; and (vi) the non-SC-ST-OBC-Rest. The six-way classification accounts for the two main cleavages in Indian society: caste/tribal status and religion.

The SC and ST comprise around 24 and 10% of the under-five population, respectively, and are among the most socioeconomically disadvantaged groups in India. They receive preferential affirmative action, for which purpose they are listed in a government schedule (hence called the Scheduled Castes and Scheduled Tribes). While the nomenclature of SC

¹The last publication, we are aware of, uses Indian Data from 2015-16, whereas we employ data from 2019-21.

²The list of countries from SSA, sample size and the year of survey are shown in Table A1 in the online appendix.

and ST are the official administrative categories, *Dalit* meaning “oppressed” and *Adivasi*, meaning “indigenous people,” is often used to describe SC and ST communities.

We should note that the official category of Scheduled Castes is defined for the marginalised caste groups in three religions: Hinduism, Sikhism and Buddhism. However, Islam and Christianity in South Asia also display caste-like cleavages and groups at the bottom of the hierarchy (Jodhka and Shah, 2010). They are possibly Dalit converts out of Hinduism, who not only self-identify as Dalit Muslims and Dalit Christians, but also have been demanding official SC status and access to affirmative action, which has been denied by the courts.³ Reflecting their self-perception, Dalit Muslims and Dalit Christians self-report themselves as SC in household surveys, even though legally they are not designated as such. Thus, the SC category in this paper combines the officially designated SCs, along with Dalit Christians and Dalit Muslims.

The OBCs, comprising roughly 46 percent of the population, is a group of intermediate to low-ranked castes and communities, which also receive affirmative action since 1992 in central government services, and since 2006 in central and private institutes of higher education (Deshpande, 2013). The non-SC-ST-OBC Hindus, i.e. high-ranking Hindu castes, are the socioeconomically dominant group in India comprising 14 percent of the under-5 population. The next group, the non-SC-ST-OBC Muslims, comprise around 5% of the under-5 population. As the Sachar Committee report on the social, economic and educational status of Muslims highlighted, all Muslims are recognized as a group facing multiple forms of disadvantage in the country (Sachar Committee, 2007). The final group is the non-SC-ST-OBC-Rest, that is, the high-ranking groups that are not Hindu or Muslim, and who comprise 1% of the total under-5 population.

For SSA, we have data on 202,557 children. We consider three cleavages to explore heterogeneity in stunting rates within the continent: (i) religious affiliation, namely, Christian, Muslims and Other religious denominations;⁴ (ii) households resident in ethnic homelands that are classified as facing political discrimination by the Ethnic Power Relations (EPR) data set (Wimmer et al., 2009); and (iii) asset levels as captured the DHS wealth index.⁵

For each child in the data, we calculate: (i) the average height-for-age Z score (HFA Z-score), which is the number of standard deviations of the actual height of a child from the median height of the children of his/her age as determined from the World Health Organization child growth standards (WHO Multicentre Growth Reference Study Group,

³<https://www.hindustantimes.com/india-news/centre-justifies-no-sc-tag-for-dalit-muslims-christians-in-supreme-court-101668021842718.html>

⁴Recent work by Alesina et al. (2023) highlights that Christian boys and girls have much higher upward and lower downward education mobility than Muslims and Animists. Also see Panin (2021) on the close link between religion and economics in SSA.

⁵See <https://dhsprogram.com/topics/wealth-index/Wealth-Index-Construction.cfm> for further details.

2006); and (ii) a dummy for stunting, that is, a dummy that takes value 1 when a child is more than 2 standard deviations below the world reference median and 0 otherwise. We then account for the age in months and gender of each child and calculate average stunting rates for India and SSA, as well as by the sub-groups described above, and provide the 95% confidence intervals which are calculated by allowing for standard errors of individuals in the same primary sampling unit to be correlated.

In a final step, we explore how much the explanations posited for the India-SSA gaps - birth order, mother height, open defecation and sibling size - can explain the gap in stunting rates between caste groups. We measure the height of mother's using their height-for-age-Z-score; and open defecation by a dummy for whether a mother reports her household having no toilet facility, as well as the share of households who do so at the primary sampling unit level. We compare children from the different social groups living in the same district using an ordinary least squares regressions, where standard errors are clustered at the level of the primary sampling level, and the controls include dummies for age-in-months, district, gender and urban residence.

3 Results

Our analysis identifies five key facts about stunting in India and SSA.

Fact 1: Figure 1 shows Indian children on an average are taller (HFA-Z-score -1.33 in India vs -1.40 in SSA) though they have higher rates of stunting (35.7% in India vs 33.6% in SSA). As the Kernel density plots shows this is because India has a longer tail on both the left and right, that is higher levels of stunting, but also children who are taller than SSA children. This indicates that the variance in child height in India is much greater.

Fact 2: The role of social identity is crucial in both the India and SSA contexts. Accounting for social identity presents a more nuanced picture. In case of India, the dominant non-SC-ST-OBC-Hindu children have lower levels of stunting (27%) than the SSA average. Moreover, the SC-ST are 13% points or almost 50% more likely to be stunted than the non-SC-ST-OBC-Hindu children. The non-SC-ST-OBC-Muslims and OBCs also display higher levels of stunting than the SSA-average. In the context of SSA, for stunting rates, there are no statistically significant differences between Muslims (34%) and Christians (35%), who comprise 60 and 32% of the total under-5 population, respectively. However, the individuals who do not identify as Christians or Muslims, and comprise 8% of the under-5 population in SSA, have stunting rates of 38% or are 3-4% points more likely to be stunted.

Fact 3: The politically discriminated groups in SSA are not shorter than the SSA-average and a whole 12% points or 40% less likely to be stunted than the SC-ST (left panel of Figure

3).⁶

Fact 4: Caste or tribal status is not merely a proxy for material assets. The SC-ST households in both the bottom 20 and top 20 percent of the asset distribution have higher rates of stunting than the non-SC-ST-OBCs (right hand panel of Figure 3). In fact, the rates of stunting for the bottom 20 and top 20 of the non-SC-ST-OBC and the SSA are very similar. This suggests that the burden that the SC-ST group face derives not only from their level of material well-being. This suggests a comparable phenomenon to what has been termed as *weathering* in the context of the United States at play in India, that is the burden faced by minority groups and marginalized communities in form of “early health deterioration as a result of cumulative exposure to experiences of social, economic and political adversity” (Geronimus, 1992).

Fact 5: Accounting together for birth order, open defecation, mother height and sibling size can explain at most one-third of the gaps in stunting rates between caste groups in India though all are economically meaningful correlates of stunting rates (Table 1). This suggests that the factors affecting gaps between social groups in India are distinct from the factors affecting gaps in stunting between India and SSA.

4 Conclusion

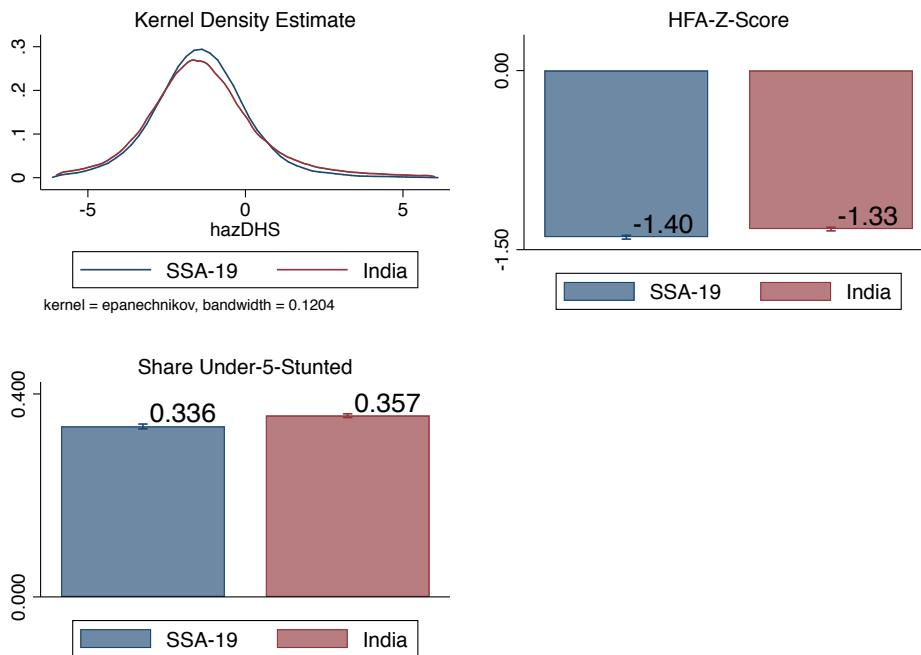
Our results provide several new insights into the patterns of stunting in India and SSA. It shows that understanding disparities within India and SSA are crucial in understanding stunting. The Indian enigma which compares average rates of stunting between India and SSA breaks down, i.e., is not so much of an enigma once we account for social identity differences in stunting within India and within SSA. The gaps between social groups in India are greater by a factor of six relative to the India-SSA stunting gap. We also show that the individuals who are not Christians and Muslims in SSA display similar levels of stunting to the SC-ST in India. Furthermore, the factors that the literature has identified as main explanations for the India-SSA stunting gaps can at best explain about one-third of the stunting gaps among social groups in India.

References

Alesina, A., S. Hohmann, S. Michalopoulos, and E. Papaioannou (2023). Religion and educational mobility in Africa. Forthcoming. *Nature*.

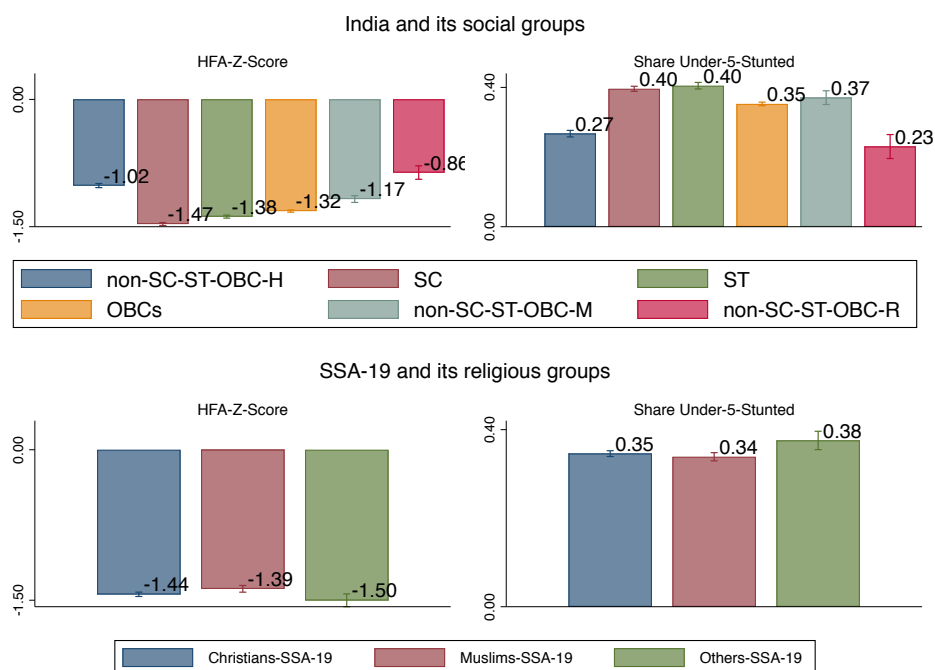
⁶The data on groups who are discriminated come from the Ethnic Power Relations Dataset (Wimmer et al., 2009) and can be accessed at <https://www.awimmer.com/data>.

- Deaton, A. (2007). Height, health, and development. *Proceedings of the National Academy of Sciences* 104(33), 13232–13237.
- Deshpande, A. (2013). *Affirmative action in India*. Oxford University Press.
- Geronimus, A. T. (1992). The weathering hypothesis and the health of African-American women and infants: evidence and speculations. *Ethnicity & disease*, 207–221.
- Jayachandran, S. and R. Pande (2017). Why are Indian children so short? The role of birth order and son preference. *American Economic Review* 107(9), 2600–2629.
- Jodhka, S. S. and G. Shah (2010). Comparative contexts of discrimination: Caste and untouchability in South Asia. *Economic and Political Weekly*, 99–106.
- Panagariya, A. (2013). Does India really suffer from worse child malnutrition than sub-Saharan Africa? *Economic and Political Weekly*, 98–111.
- Panin, A. (2021). Four reasons why analysis of economic policy and religion go hand-in-hand in sub-Saharan Africa.
- Sachar Committee (2007). *High Level Committee report on social, economic, and educational status of the Muslim community of India, November 2006*. Akalank Publications.
- Spears, D. (2018). Exposure to open defecation can account for the Indian enigma of child height. *Journal of Development Economics*, 1–17.
- UNICEF (2018). World Bank Group, Levels and trends in child malnutrition, 2016.
- Von Grafenstein, L., S. Klasen, and J. Hoddinott (2023). The Indian enigma revisited. *Economics & Human Biology*, 101237.
- WHO Multicentre Growth Reference Study Group (2006). WHO child growth standards based on length/height, weight and age. *Acta paediatrica* 95, 76–85.
- Wimmer, A., L.-E. Cederman, and B. Min (2009). Ethnic politics and armed conflict: A configurational analysis of a new global data set. *American Sociological Review* 74(2), 316–337.



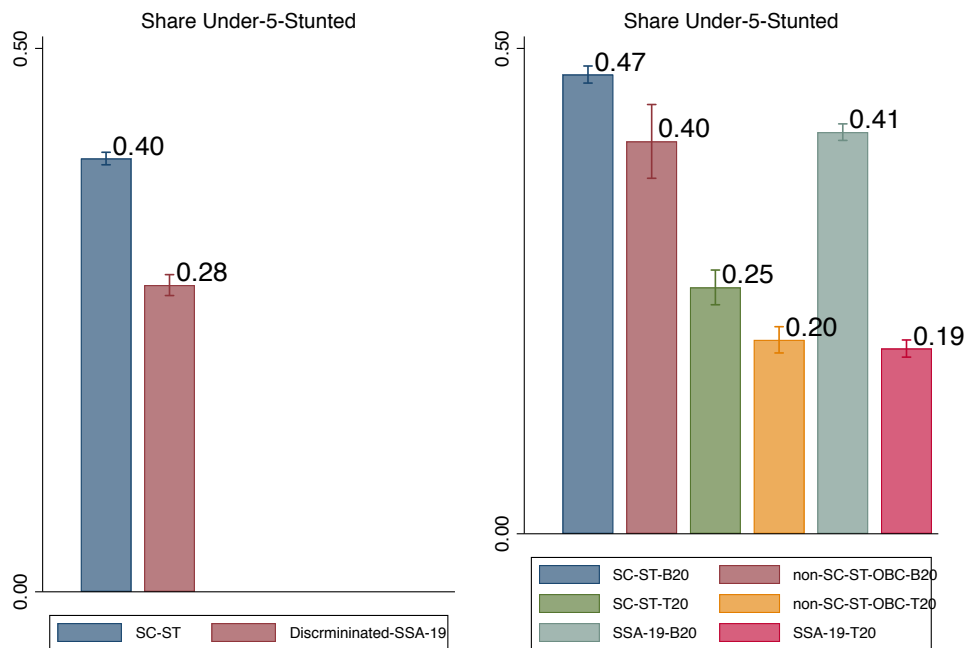
Notes: The data on the Height-for-age (HFA)-Z scores and stunting are from the Demographic and Health Surveys (DHS) conditional on the year of survey being later than 2014-2015. The mean for sub-Saharan Africa is based on the average of 19 countries as listed in Table S1. The data on the HFA Z-score for India and its four social groups is from the DHS, 2019-22.

Figure 1: Child heights and stunting: India and sub-Saharan Africa



Notes: The data on the Height-for-age (HFA)-Z scores and stunting are from the Demographic and Health Surveys (DHS) conditional on the year of survey being later than 2014-2015. The mean for sub-Saharan Africa is based on the average of 19 countries as listed in Table S1. The data on the HFA Z-score for India and its four social groups is from the DHS, 2019-22. non-SC-ST-OBC-H, non-SC-ST-OBC-M and non-SC-ST-OBC-R refer to the non-SC-ST-OBC Hindus, Muslims and the Rest, respectively.

Figure 2: Child heights and stunting by social groups in India and sub-Saharan Africa



Notes: The data on the Height-for-age (HFA)-Z scores and stunting are from DHS, conditional on it being later than 2015. The mean for sub-Saharan Africa is based on the average of 19 countries, as listed in Table S1. The data on the HFA Z-score for India and its four social groups is from the DHS, 2019-22.

Figure 3: Stunting by discrimination and assets in India and sub-Saharan Africa

	(1)	(2)	(3)	(4)	(5)	(6)
	DV-Dummy for stunted					
SC	0.12*** (0.0059)	0.11*** (0.0059)	0.11*** (0.0059)	0.094*** (0.0059)	0.11*** (0.0059)	0.078*** (0.0058)
ST	[0.11 - 0.13] 0.12*** (0.0077)	[0.099 - 0.12] 0.11*** (0.0076)	[0.095 - 0.12] 0.098*** (0.0077)	[0.083 - 0.11] 0.099*** (0.0076)	[0.097 - 0.12] 0.11*** (0.0076)	[0.067 - 0.089] 0.075*** (0.0075)
OBCs	[0.10 - 0.13] 0.071*** (0.0057)	[0.094 - 0.12] 0.066*** (0.0057)	[0.083 - 0.11] 0.066*** (0.0057)	[0.084 - 0.11] 0.061*** (0.0057)	[0.091 - 0.12] 0.065*** (0.0056)	[0.060 - 0.090] 0.052*** (0.0056)
non-SC-ST	[0.060 - 0.082] 0.074*** (0.011)	[0.055 - 0.077] 0.062*** (0.011)	[0.055 - 0.077] 0.072*** (0.010)	[0.050 - 0.073] 0.072*** (0.010)	[0.054 - 0.076] 0.057*** (0.010)	[0.041 - 0.063] 0.056*** (0.0098)
non-OBC-M	[0.053 - 0.095] 0.029 (0.020)	[0.042 - 0.083] 0.029 (0.019)	[0.052 - 0.092] 0.027 (0.020)	[0.052 - 0.093] 0.043** (0.020)	[0.037 - 0.078] 0.028 (0.019)	[0.037 - 0.075] 0.040** (0.019)
non-SC-ST	[0.0088 - 0.068] 0.029 (0.020)	[-0.0093 - 0.067] 0.028*** (0.0033)	[-0.011 - 0.066] 0.027 (0.020)	[0.0050 - 0.081] 0.043** (0.020)	[-0.0098 - 0.066] 0.028 (0.019)	[0.0020 - 0.078] 0.0035 (0.0039)
birth order 2						
birth order 3						
birth order 4						
birth order 5						
HH with no toilet facility			0.066*** (0.0051)			0.051*** (0.0049)
Share of HHs in PSU with no toilet			0.037*** (0.0090)			0.029*** (0.0088)
Mother HFA-Z-Score				-0.081*** (0.0017)		-0.079*** (0.0017)
Sibling size					0.028*** (0.0013)	0.028*** (0.0030)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	195,024	195,024	195,023	193,819	195,024	193,818
R-squared	0.056	0.060	0.060	0.083	0.060	0.089

clustered standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Notes: The results are based on an OLS regression. The standard errors are clustered at the level of the PSU. non-SC-ST-OBC-H, non-SC-ST-OBC-M and non-SC-ST-OBC-R refer to the non-SC-ST-OBC Hindus, Muslims and the Rest, respectively. Other controls include dummies for: (i) district; (ii) age in months; (iii) gender; (iv) urban; and (v) birth order greater than 5.

Table 1: Birth order, mother HFA-Z-Score, open defecation, sibling size and stunting gaps between caste groups in India

Online Appendix - NOT FOR PUBLICATION

Country (1)	Observations (2)	Year (3)
Angola	6359	2015-16
Burundi	6048	2017
Cameroon	4497	2018-19
Gambia	3811	2019-20
Guinea	3466	2019
India	206025	2019-21
Liberia	2445	2019-20
Madagascar	5778	2021
Mali	8307	2018
Mauritania	9830	2019-21
Malawi	5149	2015-16
Nigeria	11364	2018
Rwanda	3809	2019-20
Sierra Leone	4136	2019
Chad	6802	2014-15
Tanzania	9001	2015-16
Uganda	4423	2016
South Africa	1113	2016
Zambia	8746	2018-19
Zimbabwe	4957	2015
Total	316,066	

Notes: The table shows the list of countries, the sample size and year of survey.

Table A1: List of countries from the DHS, sample size and year of survey