

## **Counting excess under-5 female mortality in Indian districts**

### *La discrimination contre les filles et la mortalité dans l'enfance en Inde*

[Christophe Z. Guilmoto, Nandita Saikia](#)

*Excess female mortality resulting from gender discrimination in the postnatal period was still common in India at the beginning of the century. Yet, little attention has been paid so far to its distinctive spatial patterns, that point to the presence of a large territory in north central India where high fertility, relative underdevelopment and staunch son preference combine to give rise to high levels of excess female mortality among girls below five. Christophe Z. Guilmoto and Nandita Saikia fill this gap.*

The literature on “missing women” in Asia tends to focus on the female deficit due to prenatal sex selection and underplays the role of postnatal sex selection. One reason is that there is a sort of fascination with the idea that modern technologies can be used to implement ancient patriarchal forms of bias against girls and women.

Another reason is more technical. It is easy to evidence skewed sex ratios at birth with basic birth data, whereas signs of postnatal discrimination are far more blurred, at least ever since deliberate selective infanticide has disappeared from China and India. This is primarily due to the absence in many countries of reliable civil registration data that would otherwise allow for easy computation of mortality rates by age and sex. In addition, the very concept of “excess female mortality” and the way to calculate it are still debated, since existing series demonstrate that, in “normal conditions” (i.e., without discrimination), the expected male-female mortality ratio varies greatly by age and overall mortality level.

As a result, estimates usually require the use of heavy statistical machinery and lead to a single estimate of excess female deaths for an entire country (Alkema et al. 2014; Bongaarts and Guilmoto 2015; Costa et al. 2017). However, a single number cannot adequately reflect the situation of a country as diverse as India, where history and geography have shaped very different regional gender systems.

## **Estimating excess under-five female mortality**

This consideration led us to focus on the existing demographic datasets describing India's 640-odd districts. Among these, an often neglected source is the decadal census, and in particular the detailed, district-level fertility tables of its 2011 edition, which detail the number of newborns by sex and mother's age (Fertility Series data F1, F5 and F9; Guilmoto et al 2018). We decided to test the strength of the classical Brass method, in which the proportion of surviving children by mother's age can be used for estimating past infant and child mortality, taking into account age at childbearing, which varies by district. Under-five mortality is an ideal measure, since earlier studies have shown that most of the excess female mortality is concentrated during the first years of life, a period during which girls have a distinct biological mortality advantage over boys.

The procedures involved quite a few stages:<sup>1</sup> here, let us focus on the results. We found that the average level of excess mortality in girls aged 0–4 in 2000–2005 was no less than 18.5 per 1000 live births, translating into an average of 239,000 excess deaths of young girls per year. Around 22% of the overall female under-5 mortality is therefore due to gender bias. Incidentally, India narrowly missed Millennium Development Goal 4 on child mortality (about 2 units per 1000 live births). This implies that without excess female mortality, India's Millennium Development Goal of reducing under five mortality (both sexes combined) from 125 per 1000 live births in 1990 to 42 by 2015 could have easily been achieved.

## **A map of gender discrimination**

The situation at district level is depicted in Figure 1. What emerges, in particular, is the strong spatial patterning of excess female mortality on the Ganga River Basin in North central India. There is a large cluster of almost 60 adjacent districts in Madhya Pradesh, Uttar Pradesh, and Rajasthan where excess female mortality exceeds 30 per 1000 live births. In contrast, gender discrimination is much lower, even if not totally absent, in many states in the South and East of the country.

Beyond their unique geography around the Hindi belt, the districts where postnatal discrimination towards girls takes the heaviest toll in India tend to be rural, agricultural districts, characterized by high population density, high fertility, low social development and high son preference. On the contrary, excess female mortality weakens with increasing female education and the substantial presence

of Muslim and tribal populations.

To understand the dynamics of gender bias, it is worth underlining that this map does not coincide at all with the more prosperous districts to the West of the country, from Punjab to Maharashtra, where prenatal sex selection is rife. Son preference and large families go hand in hand with excess female mortality. In contrast, the rapid fertility decline in Western India where the preference for male offspring remains pervasive has been accompanied by a skewed sex ratio at birth visible since the 1990s.



discrimination towards young girls. As the regional estimates of excess deaths of girls demonstrate, any intervention to reduce the discrimination against girls in food and health care allocation should therefore target in priority the regions of Bihar and Uttar Pradesh where poverty, low social development, and patriarchal institutions persist and investment in girls is limited.

The transition from postnatal to prenatal sex selection across districts is likely to extend soon to the large states of North India featuring on our map, where fertility is currently declining rapidly and economic progress is reaching even remote rural districts. This does not bode well for the future of the sex ratio at birth in India, and reinforces the need to address directly the issue of gender discrimination in addition to encouraging social and economic development that benefits Indian women.

## References

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## Foot notes

<sup>1</sup> We first obtained a series of under-five mortality rates by sex and district. We then used a set of existing life-tables drawn from countries with no gender bias to model the relationship between the sex ratio of under-five mortality and overall child mortality. Finally, we applied these standardized mortality sex ratios to our mortality estimates to derive excess under-5 female mortality for each district of India, and then converted this information into absolute numbers of excess female

deaths. For more details, see Guilmoto et al. (2018).