Re-evaluating prenatal sex-selection against females and son preference: practices, trends and policies in India

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Strand: 1) Policy issues 2) Fertility

Summary (250 words)

Prenatal sex-selection against females is a major policy concern in several developing Asian countries, including India and China. Over 100 million girls were estimated to be 'missing' in Asia, with important implications for society (e.g. marriage market squeeze), policy (e.g. girl child schemes) and the medical profession (e.g. regulation of reproductive technologies, PNDT Act 1994, India). Prenatal sex-selection is generally evidenced by a bias in the sex-ratio at birth (SRB) in a population, WHO, UNFPA, UNICEF, and UN Women's interagency statement has called for new indicators to monitor sex-selection practices. A new *sex-selection propensity* indicator developed by Dubuc and Sivia, is a more robust indicator for sex-selection practices than the SRB bias. Unlike the SRB bias, which is hyper-sensitive to fertility changes, the sex-selection propensity indicator can quantitatively assess change in sex-selection practice in a population. Son preference is the underlying cause of prenatal sex-selection against females. However, so far, no measure of the intensity of son preference exists.

The paper aims and objectives are twofold:

1) to measure and analyse *sex-selection propensities* across Indian states, by urban/rural populations and women's educational attainment in order to re-assess the social diffusion process of gender-selection.
2) To propose the first (macro) measure of son preference, building on Dubuc and Sivia's methodological progress.

The paper presents and compares the new measures of sex-selection propensity and son preference. In doing so it analyses the diffusion of sex-selection practice and changes in son preference. The paper discusses the relevance of the results for policy.

Topic & theoretical focus

Son preference has resulted in an estimated over 100 million 'missing' girls in Asia[1,2], mostly in India and China, due to excess girls' mortality and prenatal sex-selection. The diffusion of prenatal sex-selection (PSS) against girls is a major policy concern in these countries, with important implications for society[3], policy[4], girls' well-being and reproductive health[5,6], the perpetration of gender-based inequalities and hampering development[7]. PSS is generally evidenced in population level biased sex-ratio at birth (SRB=boys/100 girls) in favour of boys[8], with three necessary drivers: access to PSS enabling techniques (means), son-preference (motivation) and fertility reduction (urgency)[9]. A WHO, UNFPA, UNICEF and UN Women's interagency statement has called for the development of better son-preference and PSS indicators to inform policy[10].

The SRB bias is generally used as indicator for PSS levels, a proxy for son-preference strength and to evaluate policies. Dubuc and Sivia[11] showed that SRB is a crude and often misleading indicator for these purposes[11]. This is because SRB is sensitive to changes in fertility.[12] Where son preference prevails, parents are increasingly under pressure to sex-select in order to reconcile their family size and gender composition ideals ('fertility squeeze effect')[9]. In addition, PSS weighs more in distorting the SRB for smaller birth cohorts ('disproportionality effect')[11]. The novel quantitative indicators of PSS propensity (*Phi*; % of sex-selecting parents), free of disproportionality effect, proposed and detailed in Dubuc and Sivia[11], allowed to show that PSS peaked in India in 2005, despite a continued rise in SRB.

Data & methods

To do so, this work collated and used suitable available data from the Census and the Indian Demographic and Health Survey (DHS), which have previously been used to analyse sex-selection in India, for the 2000-2015 period to address the following questions:

- What were the trends of sex-selection propensity by Indian states since 2000? In which states prenatal sex-selection is most likely to increase/decrease in the coming years.
- SRB bias is stronger in urban areas. However, it is currently unclear whether sex-selection is more prevalent among urban populations. Does easier access to sex-selection enabling techniques outweigh 'modernisation' factors in urban areas in explaining sex section prevalence and SRB biases?
- To what extent does education explain variations in gender selection practices?
- Is son preference changing in India? What is its geographic distribution? How does it compare to the diffusion of gender selection practice?

Building on Dubuc and Sivia's work and methodological progress, this paper proposes a novel indicator of son-preference (SP[i]) and questions the diffusion of i) prenatal sex-selection practices and ii) change in son preference. Using DHS data, TFRs and sex-ratio at birth (SRB) are calculated for each survey period. These data are used to produce *the* indicator of sex-selection propensity (*Phi*) and evidence change in the practice of sex-selection in India and its geographical diffusion. Finally, this indicator is used in conjunction with the PSS propensity of a theoretical population of same fertility but universal son preference, as modelled in Dubuc and Sivia[11] to produce an indicator of son preference (SP[i])

Expected findings

The calculations of TFR, SRB are already completed for each available survey period, allowing the calculation of the propensity to sex-select in the population (*Phi*)

Some preliminary results:

1- What were the trends of sex-selection propensity by Indian states since 2000?
For the periods 2000-2005 and 2010-2015, overall sex-selection propensity is increasing. At regional level, sex-selection propensity is highest in Northern India. We observe a reduction

in sex-selection in the Northern States where sex-selection was most prevalent by far in the earlier period. At a more disaggregated level, there is also great differences between states, including within the Northern region. The results confirm that were the fertility transition is well advanced (ie fertility change is slowing) the propensity in sex selection has decreased. For instance, the states of Punjab and Delhi -with notoriously high SRB bias experience a reduction in sex selection prevalence. In contrast, states like Rajastan and Uttar Pradesh, where fertility is still well above replacement level, the propensity to sex-select is increasing and suggesting a momentum for more sex unbalance at birth in the near future and further masculinisation of the child population in the next decade.

2- Is sex-selection more prevalent among urban populations?
 The results (fig 1) show a higher propensity to sex-select in urban areas, but while the SRB bias is slightly increasing over time in urban India, we found that the propensity to sex-select is *reducing* in urban settings (illustrating the benefit of using Phi instead of SRB). In contrast, sex-selection propensity is increasing in rural India. As a result, we observe an overall increase in sex-selection propensity over time in India, driven by rural trends. Given the higher access to sex-selection methods in urban settings, results suggest instead a relative weakening of son preference in urban India overall (to be tested with the measure of son preference SP). In addition, understanding rural/urban differences is complicated by the regional patterns of son preference and fertility transition. The reduction in sex-selection prevalence in rural Punjab (with historical highest SRB) cannot be fully explained by a reduction in fertility, suggesting a regional effect and the weakening of son preference accelerating the pace of sex-selection transition in Punjab.
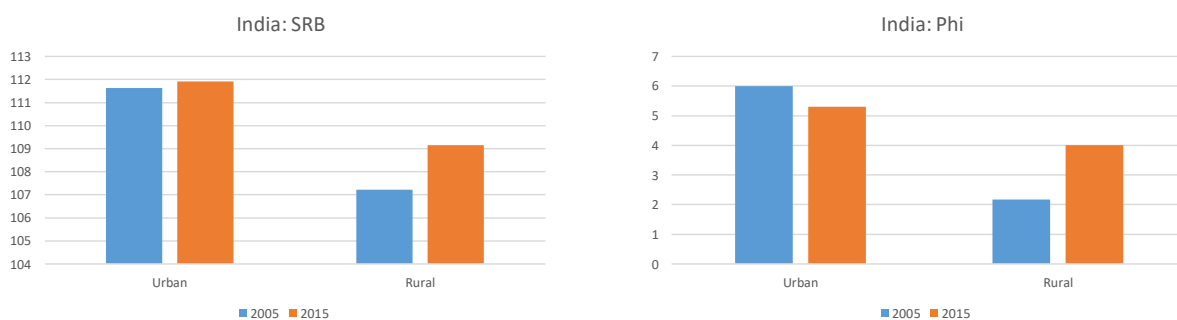

Fig 1: Sex-ratio at birth (SRB) and propensity to sex-select (Phi) in urban and rural India, 2005 and 2015. Phi is the proportion of couples practicing sex-selection

3–To what extent does education explain variations in gender selection practices?
Sex selection is little practiced among women with no education, which also typically have more children in average. Although SRB bias is little different by women's educational level between primary, secondary and higher educational attainment in 2010-15, we show a reversal in sex-selection practice for women with higher education whose propensity to sex-select has dropped below *Phi* levels for women with primary and secondary educational levels (fig 2).
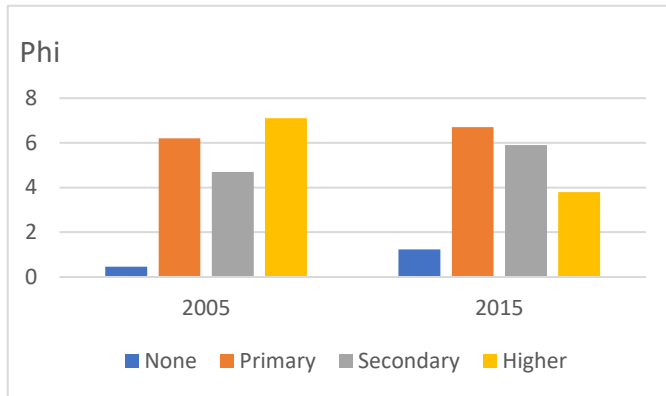
Fig 2: The propensity to sex-select (Phi) by women's educational attainment in India, 2005 and 2015

The results reveal a process of geographical and social diffusion of sex-selection, with urban and well-educated women (overall) leading the last phase of the sex-selection transition in India.

The development of the measure of son preference is in process

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