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Entering (or not) reproductive life in India: analysis of the occurrence and timing of the first child's arrival in relation to socio-economic factors

Indian total fertility rate has decreased from 5.91 to 2.33 between 1960 and 2016, approaching the replacement fertility (World Bank, 2018). The great diversity of this country, soon to be the most populous on the planet, suggests serious disparities both in socio-economic and political developments, and in terms of standards surrounding entry into reproductive life. The country is highly complex and its fertility has been of great interest to researchers since the so called "population bomb" that took place after the Second World War (Ehrlich 1968). The first major studies explaining the decline in Indian fertility focused on the wealthiest segments of the population, those most in contact with Western culture, who postponed the age at first marriage and the arrival of the first child, particularly through longer studies and later first work.

In the 2000's, Cosio-Zavala developed a theory that questioned the linearity of the link between socio-economic development and fertility decline. Studying Latin American countries in the 1980s and 1990s, she developed a framework she called the "Malthusianism of poverty". In her perspective, poverty could also be the cause of fertility decline. Indeed, she empirically observed that the poorest families, where women married young and had their first children early, could not afford to continue procreating due to the rising costs of education and health, and the shortage of work on the formal and informal labour markets. At some stage of their fertile life, their immediate future did not allow them to have another child, afraid of not being able to feed and raise her/him. In India too, this phenomenon was observed at the same time. Without the resources to wait for another child to "become useful" (Bertrand et al. 2014), families who found themselves in a state of high deprivation would stop their reproductive lives more or less abruptly, often using female sterilization.

Women from highly contrasted socioeconomic backgrounds therefore decreased their fertility over the decades. Within those contrasted dynamics that are the fertility decline of the wealthy educated and the Malthusianism of poverty, a neglected component is the absence of children. Childlessness has long been associated with deprivation, particularly in the Global South. In India when the reproductive norm was around 6 children, not having one was rarely a choice. Poverty damaged the bodies of women and men, preventing them from procreating. However, in recent years, we have seen the emergence of a new category of women who do not give birth until an 'advanced' age according to the current social norms. This category of women tends to come from more privileged family backgrounds, study longer and have better socio-economic status. As with fertility decline, childlessness is beginning to be ambiguously linked to socio-economic status.

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In our research, we are interested in the entry into reproductive life, which also includes people who do not have access to it. We seek to understand how the changes and continuities that took place in a complex society like India affected changes in the timing of entry into fertile life. Our hypothesis is that as Indian fertility declines, the wealthiest segments of the population increasingly allow themselves to choose not to have children or more easily accept the fact that they cannot give birth due to life's constraints. In our hypothesis, the less well-off segments of the population are still under pressure from higher reproductive norms and for them, childlessness is still largely due to a biological impossibility to procreate due to the impact of their socio-economic situation on their health; moreover their status prevents them to access to costly medical treatments.

Data and methodology

We use different waves of the Indian Demographic and Health Survey (DHS), particularly the 2015-2016 wave. Our sample consists of 699,686 women. To analyse the entry into the reproductive life, we start with survival analyses. After some exploration, we noted that women under 30 years of age were a segment of the population subject to high censorship, which biased our results. We therefore decided to consider only women aged 30 and over in our sample, reducing it to 333,943 women. The second step in our work was to create a survival tree containing the following explanatory variables: place of residence, level of education, religion, economic status, age at first intercourse, type of caste. The event we study is having a first child. This tree allows us to classify the studied population according to several criteria and to create sub-populations of interest. Once these sub-populations are created, we are able to determine their risk of knowing the event. Then, Kaplan-Meier survival curves are plotted for each of them, documenting the differences in terms of timing of entry into the fertile life. After these various descriptive results, we run Cox models using the above-mentioned factors to determine which variable increases or decreases the risk of experiencing the event: "having a first child". The survival tree also allows to identify interactions that may be relevant in the Cox model.

Preliminary results

Our first results highlight the importance of age at first intercourse (figures 1 & 2). Indeed, having the first sexual intercourse at 18 or older (node 2) is decisive for belonging to the subcategories of the population who are among the least at risk of experiencing the event than the population in general (lambda = 0.8039). These women are also more likely to have their first child later on average (median = 30 years).

Among the women who had their first sexual intercourse before 18, the second most important variable is cohort and there is an interaction effect between this variable and economic status. Indeed, a sub-population in particular stands out: women from the oldest generations and the poorest status

(node 5). They have been less likely to experience the event than the population in general (lambda = 0.7621). Particularly, their economically more advantaged counterparts or younger generations have all a lambda greater than 1, which indicates a greater chance of having a child for the first time. Moreover, like women who had their first sexual intercourse at 18 or older, this category of the population experiences the event on average later on (median = 30 years). Those preliminary results suggest that access to medical treatment against sterility improved across time for the benefits of the women from the youngest birth-cohorts, especially the wealthier ones.

Figure 1 - Survival tree – classification
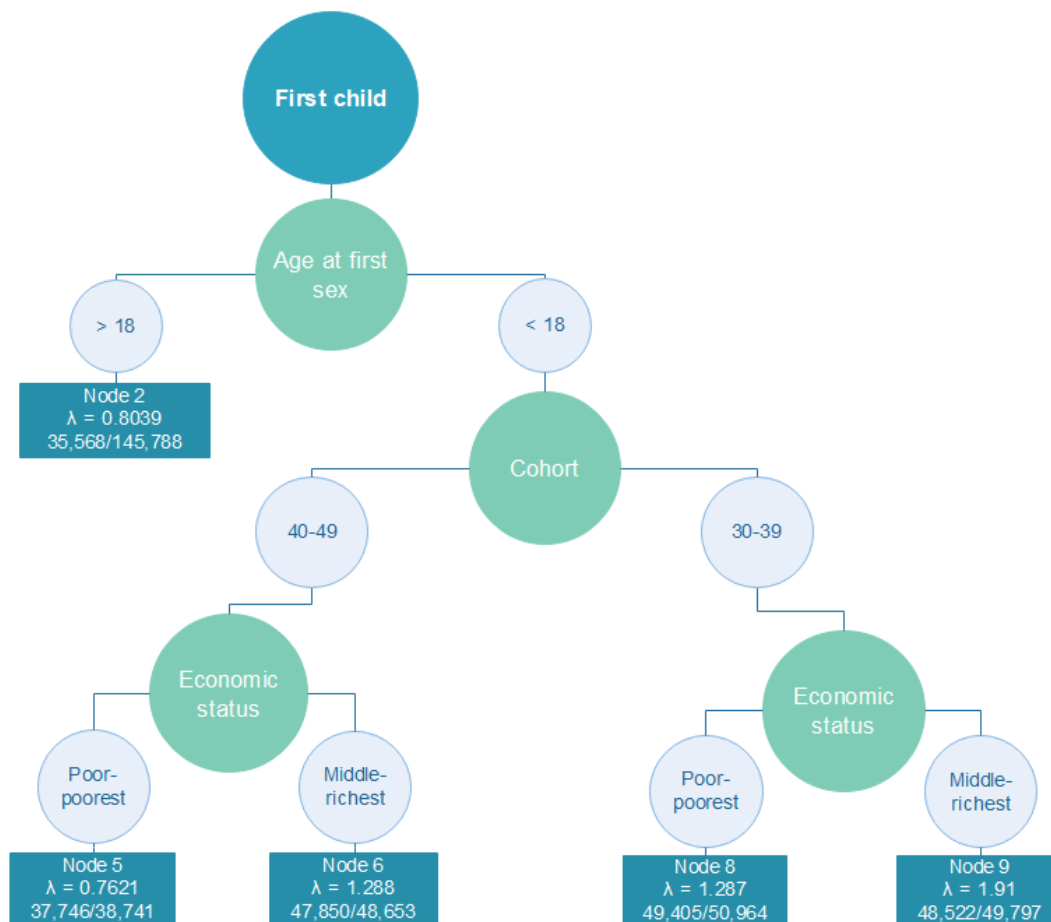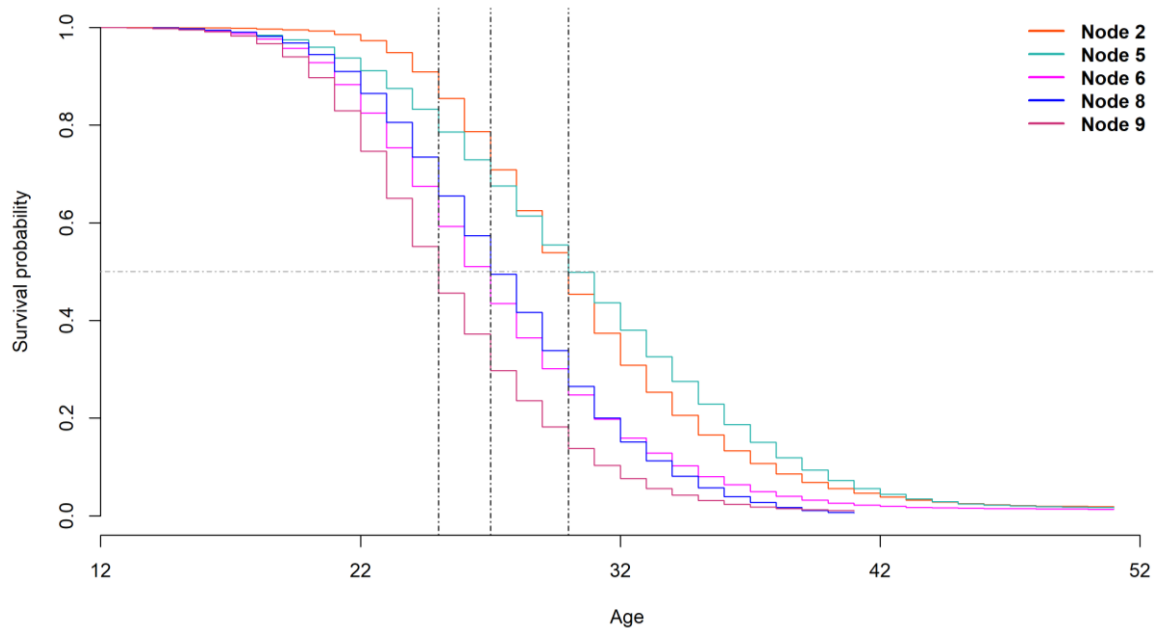*Source: Indian Demographic and Health Survey – 2015-16*

Figure 2 Kaplan-Meier survival curves (based on the survival tree)
Source: Indian Demographic and Health Survey − 2015-16

Node 9 Median: 25 years	Node 8 Median: 27 years	Node 6 Median: 27 years	Node 5 Median: 30 years	Node 2 Median 30 years
< 18	< 18	< 18	< 18	> 18
30 to 39 years	30 to 39 years	40 to 49 years	40 to 49 years	
Middle to richest	Poorest to poorer	Middle to richest	Poorest to poorer	

From now on, we will deepen the analysis and interpretations, running Cox models on the variables we presented and looking at the factors associated with early or late beginning of sexual life, since it is the most important predictor of the access to reproductive life according to the survival trees. In addition, we will search how to better capture the historical trend in access to reproductive health and its social coverage in India. Finally, we will take into account the disparities within India, especially the contrast between the North and the South of the country, which differ in terms of fertility level, Human Development Index, as well as caste and patriarchal cultures.

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