

# Fertility at the District Level in India

## Lessons from the 2011 Census

CHRISTOPHE Z GUILMOTO, S IRUDAYA RAJAN

This paper describes the methodology for estimating recent fertility levels at the district level in India based on the 2011 Census figures. Due to the absence of reliable vital statistics for Indian districts, fertility levels are assessed using a set of indirect methods. Using mortality estimates and the child population aged 0–6 years to estimate the number of births during the seven years preceding the census, figures for crude birth rates and fertility rates are derived for all Indian districts. The results are compared with those derived from the 2001 Census. Our analysis points, in particular, to the significant population overcount in Jammu and Kashmir during the 2011 Census and the continuous but extremely slow process of fertility decline in India.

The provisional results of India's 2011 population census have highlighted several of the main contours of its current demographic regime (GOI 2011a; Navaneetham and Dharmalingam 2011). It stressed in particular the recent reduction in the intercensal growth rate, which has come down from 21.5% in 1991–2001 to 17.6% in 2001–11. Regional and sub-regional variations remain important, with population growth during the last decade ranging from apparent stagnation in Nagaland to a record 50% growth in Dadra and Nagar Haveli.

Variations in demographic growth rates are even wider at the district level, and migration accounts for the highest rates observed in areas such as Gurgaon and Ghaziabad districts around Delhi, or in Hyderabad and Bengaluru. Yet, fertility variations remain the prime factor behind the disparities in regional population growth observed across districts and states, and are responsible for most of the regional growth differentials observed over the last 30 years.

Estimates of the average number of children per woman exist only at the state level. The main source is, in particular, the Sample Registration System (SRS), which provides annual (or three-year average) vital rates for all states and union territories. But, even if differences between states are considerable – ranging, for instance, from 1.7 children per woman in Kerala in 2009 to 3.8 in Bihar – previous research has also shown that variations across districts within a single state can also be important (Guilmoto and Irudaya Rajan 2001, 2002, 2005). The districts are themselves large administrative units, with 231 of them having more than two million inhabitants. District-level fertility may be expected to vary considerably within the most populated states such as Uttar Pradesh, Madhya Pradesh or Andhra Pradesh. It is, therefore, of primary importance to get an exhaustive picture of fertility levels across Indian districts to understand the pace of fertility transition across the country and its regions.

Demographic sources at the district level remain, unfortunately, limited. Sixty years after Independence, the quality of the civil registration system in India is still appalling. In fact, not only does a significant proportion of the population fail to register births, but many local authorities do not compile, tabulate or publish birth registration statistics on an annual basis. Even the Office of Registrar General of India has ceased to publish a regular series of vital statistics as it used to in the past.

As a result, existing demographic estimates are based only on sample surveys or a sample registration. The most famous population sources for estimating fertility in India – the SRS

Christophe Z Guilmoto (*Christophe.Guilmoto@ird.fr*) is with the Institut de Recherche pour le Développement/Centre Population et Développement, Paris. S Irudaya Rajan (*rajan@cds.ac.in*) is with the Centre for Development Studies, Thiruvananthapuram.

and the National Family Health Survey (NFHS) – do not go beneath the state level. In the recent past, there have been several district-level demographic surveys such as the District Level Household and Facility Survey (DLHS) (with the last round in 2007-08), and more recently, the Annual Health Survey (AHS) launched in 2010. But these sources do not cover India entirely nor do they provide adequate fertility measurements. The Census of India remains, therefore, the only source for both simultaneous and exhaustive figures on fertility differentials at the district level.

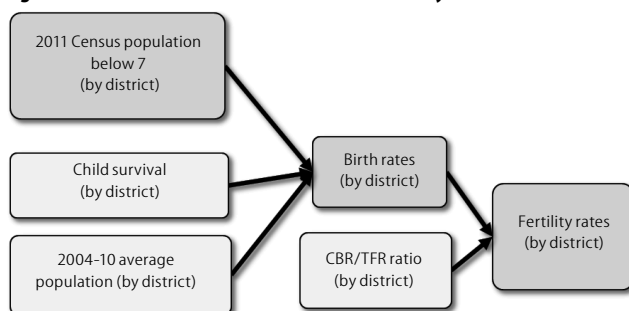
This paper begins with a presentation of our methodology. We hope that by describing our estimation technique in detail, we will encourage other scholars to review and improve on this procedure. In the second part, we discuss the quality of our results and stress the difficulties encountered in collecting data in some parts of India, where census figures may be overstated. As a conclusion, we review the distribution of fertility on the eve of the 2011 Census and its regional distribution.

### 1 From Census Children to Recent Births Per Woman

As mentioned in our introduction, the Census of India is the only source that provides an exhaustive picture of India's population in the absence of reliable birth registration data. Two types of information can be used for estimating fertility from the census. The first type relates to the information canvassed by the census on the births during the last 12 months preceding the census. In theory, this should provide a rather reliable estimate of birth rates during the previous year, provided that births are properly reported.

A more serious limitation of this source is that the so-called "fertility tables" are published rather late by the census, with direct estimates based on recent births not available before several years. The second type of census variable available for indirect estimation purposes is the child population distribution. Provisional figures have already been published at the district level in 2011. Here, we use the distribution of the population aged 0-6 years, following an estimation method inaugurated by the late P N Mari Bhat back in 1996 (Bhat 1996), using 1991 Census data.

**Figure 1: Overall Procedure of Census-Based Fertility Estimation**



The method is summarised in Figure 1. In a nutshell, the procedure consists in using the available child population data by district for estimating the corresponding number of births during the seven years preceding the census. This requires converting the child population into births after correction for infant and child mortality. The district-level

crude birth rates (CBR) are then derived by computing the ratio of births to the average district population during 2004-11. In order to convert birth rates into total fertility rates (TFR), a district-level ratio of birth to fertility rates is used. This ratio depends mainly on the local age distribution and the fertility schedule. Two crucial aspects of this procedure – mortality estimation and natality/fertility conversion – are reviewed in more detail in the next two sections.

### 1.1 Estimating Local Birth Rates

The pivotal hypothesis of this methodology refers to our capacity to back-project the child populations measured in 2011 and estimate the number of births during the previous seven years. The child population below the age of seven in 2011 is, in theory, composed of the surviving population born since 2004.<sup>1</sup> Yet, this hypothesis is concerned with three aspects – the potential impact of migration, age misstatement, and mortality. We can easily rule out the effect of migration, since there is little to support the hypothesis that international migration would significantly affect the distribution of children below the age of seven, either by excess departures or arrivals among the child population, compared to other age groups. But, we need to examine in greater detail the potential effects of the quality of age data and mortality on our estimation procedure.

#### 1.1.1 Age Reporting in India

Identifying the distribution of the population under age seven with the number of births during 2004-10 assumes that ages are properly reported in the census. This is a rather dubious assumption in the Indian context, where many people have no exact knowledge of their biological age or year of birth. Moreover, systematic attempts by census takers to properly assess age for all individuals would greatly extend the duration of the enumeration. The figures indicate that only few enumerators have taken the trouble to estimate the exact age of the respondents using traditional calendars. They often prefer to round off the age based on guesswork. Take for instance the case of the preferred rounding of ages to those ending with 0 or 5.

Using the 2001 Census tables published by single year of age, we can compute the ratio of the population of any single year to the average population returning the lower and higher adjacent ages. This ratio should be 100% in the absence of age attraction, but in 2001 it was above 200% for all ages ending 0 or 5 above 20 years, reaching, for instance, 750% for age 50 – meaning that there are 7.5 more people aged 50 than people aged 49 or 51 years.

In the case of children, the situation is, however, far less dramatic than among adults in terms of quality of age reporting. The population aged exactly five years in 2001 represents 105.6% of the average population aged four or six years. This demonstrates that the attraction of age five is almost negligible. In fact, 2001 data suggests that no major attraction or repulsion effect is visible before age seven. Since we do not yet have the population distribution by single age for 2011, we are forced to

presume a similar pattern for 2011, with relatively reasonable and good quality in age reporting before age seven.<sup>2</sup>

A different way of assessing the quality of the age data is using other age estimates. One such source relates to the figures computed by the Population Division of the United Nations in their latest 2010 revision of the World Population Prospects (United Nations 2011). From this series, we can, for instance, compute the proportion aged 0-6 years by interpolating the five-year age distribution estimated in 2000 and 2005 by the Population Division. We obtain a proportion of 16.4% in 2001, according to the Population Division estimates, as against a lower figure of 15.9%, according to the 2001 Census tabulations by single year of age. The relative difference between these estimates and the census figures was, therefore, less than 3% in 2001. In 2011, the same exercise leads to a greater difference of 9% between the provisional census figure and the Population Division estimate for India. Yet, the latter figure is likely to be biased since the Population Division estimate was prepared before the 2011 provisional results were published.<sup>3</sup>

We also observe that the age distribution of population below the age of seven during both the NFHS-3 (in 2005-06) and the DLHS (in 2002-04) was slightly higher at 15.7% and 15% respectively, than the average 2001 and 2011 proportion of 14.5%. These comparisons with United Nations' estimates and survey data suggest an underestimation of the child population by the census that could be of the order of up to 5%.

### 1.1.2 Mortality Correction

The child population recorded in 2011 by the census is composed of survivors of births that took place from 2004 to 2010. It is, therefore, necessary to form proper estimates of the intensity of infant and child mortality during that period to compute births by back projection. Assuming that the child population is correctly estimated by the census, the volume of births during 2004-10 is equal to the 2011 child population divided by the survival rate from age 0-6.

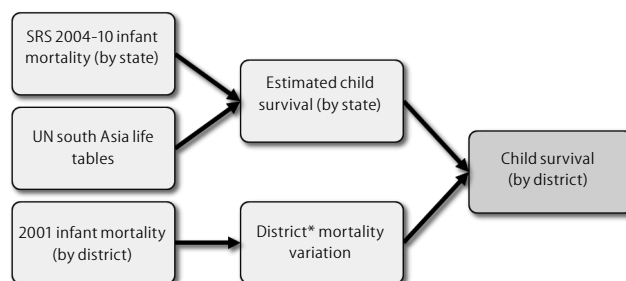
We need to first assess not only the mortality levels for India, but also for its states and districts, keeping in mind that child mortality risks may be, for instance, six times higher in Uttar Pradesh than in Kerala, and that inter-district differentials are bound to be as sizeable.<sup>4</sup> In view of the fact that no district-level mortality estimates exist for this period, we have two tasks before us: computing state-level survival rates during 2004-10 and estimating the extent of district differentials. Mortality analysis in India is hardly equipped with better data than fertility estimation in the absence of vital registration statistics. Note in comparison that the completeness of birth and death registration has been close to 100% in neighbouring Sri Lanka for the last 20 years, allowing, for instance, child mortality to be monitored at the district level (Chaudhuri, Gunasekera and Gunasekera 2006).

We start our analysis from estimates available at the state level. The SRS is probably a better source than the NFHS-3 for our purpose since it provides annual infant and child mortality figures for major states. We, therefore, use the average mortality below five years for the period 2004-10 for assessing mortality

levels for the larger states. For smaller units without annual mortality estimates, we use the 2005-07 average. We then convert mortality rates under five into person-years from birth to age seven. This can be done using model life tables that are most appropriate for the Indian mortality regime, i.e., the south Asia life tables derived by the United Nations (United Nations 1982). Mortality rates are thus converted into state-level survival rates from birth to age six, using which we can transform populations under seven into births during 2004-10.

Whenever necessary, ratios for new 2011 administrative units have been estimated by averaging original 2001 districts. It may be noted that most new 2011 districts stem from 2001 districts that have been bifurcated.<sup>5</sup> In such cases, the parameters from the original 2001 districts are simply imputed to the new 2011 districts. As noted further below, this strategy is far from perfect when 2001 districts have been precisely bifurcated because of the internal heterogeneity of their constituents (rural/urban, developed/backward), since mortality and other rates are very likely to vary within these heterogeneous districts. When new 2011 districts have been carved from two or more 2001 districts, we use a ratio obtained by averaging the values of the original districts.

**Figure 2: Estimation of District-Level Child Survival Estimation**



The estimation of district-level survival rates is more demanding, since we have no data at this level for this period. The DLHSs do not provide usable mortality estimates at the district level and the ongoing AHS has covered less than half of India's districts. We are therefore compelled to use the estimates of infant mortality derived from the 2001 Census by Irudaya Rajan et al (2008). The idea consists in using this source to calculate the relative intensity of infant mortality by comparing state- and district-level estimates, and then applying similar ratios to the 2004-10 rates. In other words, a ratio of relative mortality based on estimated infant mortality in 2001 is computed for each district (see Figure 2). These differentials are by no means negligible since district-level ratios vary from 43% to 178% of the respective 2001 state-level mortality estimates.<sup>6</sup>

This procedure yields finally a series of estimated 2004-10 births for all districts. Birth rates are then computed by estimating the average 2004-10 population in each district.

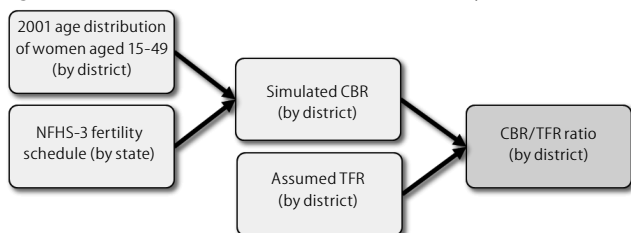
### 1.2 From Birth to Fertility

CBRs are important dimensions of population dynamics since they are the major determinants of variations in population growth across Indian districts. The other two components of the local demographic growth equation – viz, death and net

migration rates – are not available at this scale of analysis. Moreover, the volume of births is also affected by several structural features of regional populations. Populations with distorted sex ratios or with a large proportion of youth will be characterised, *ceteris paribus*, by a deficit of women of child-bearing age and consequently by lower birth rates. Demographic structures therefore play a significant role in areas characterised by heavy in- or outmigration, by skewed sex ratios or by young populations. The average number of children per woman (or TFR) is therefore a much better estimate of reproductive behaviour than CBRs.

The TFRs are computed from age-specific fertility rates, which census data does not provide yet. We will, therefore, use available age and fertility data to model the impact of population structures on the fertility-natality ratio in each state and district. The procedure (see Figure 3) is as follows: we first select from a fixed fertility schedule for each state and apply it to the specific age and sex structure of each district to compute a theoretical number of births and the corresponding birth rates. We use these two parameters (fixed fertility and resulting birth rates) to compute a fertility/birth rate ratio at the district level. This ratio will allow us to finally convert CBRs into TFRs.

**Figure 3: Estimation of the Ratio of Birth Rates to Fertility Rates**



The parameters used here stem from different sources. The age schedule of fertility comes from the age-specific fertility rates at the state level based on the SRS series for 2005-09. For smaller units, we can use only the 2005-07 period. These age-specific fertility rates are then applied to the age and sex distributions to estimate the number of births and the birth rates.<sup>7</sup> Here, we use the age and sex structure available at the district level from the 2001 Census after correction for district changes. Borrowing age and sex structures from the 2001 Census may be questionable in view of the potential changes in terms of population composition during the previous decade. This is especially true in districts that have experienced rapid population growth fuelled by migration, or for new 2011 administrative units that may have population compositions quite distinct from those in 2001. However, significant population reposition or redistribution corresponds probably to less than 20 districts and we can therefore assume that the fertility/birth rate ratios as computed here are the best available instruments to convert CBRs into TFR levels.

## 2 Consistency Checks

Before commenting on the results shown in the Appendix (on our website), we first need to check the consistency of these estimates and compare them to other available sources on

fertility in India. Here, we use both state- and district-level fertility estimates. But, this systematic verification has compelled us to conduct a more methodical review of data for one particular region, namely, the state of Jammu and Kashmir, where the quality of the 2011 Census figures is a source of serious concern.<sup>8</sup>

### 2.1 What Is the Matter with Jammu and Kashmir?

As shown further below, our census-based estimates fall in line with other fertility estimates available in India since 2005. Yet, we encountered several difficulties regarding district-level estimates from Jammu and Kashmir, and this has led us to re-examine the consistency of the 2011 Census results in this state.

#### 2.1.1 The Perplexing J&K Census Data

Provisional census data were published within a month following the 2011 Census. So far, the quality of these data has not been subjected to a thorough statistical review and no result from the post-enumeration survey has been published. We are, therefore, encouraged to take census results at face value. Yet, the provisional census results in Jammu and Kashmir were fairly intriguing for at least three reasons and this could have alerted demographers of the possibility of serious data issues:

- (1) The census-based population growth rate of 21.5% during 2001-11 was significantly higher in Jammu and Kashmir than the SRS-based rates of natural increase (birth rates minus death rates) of 14%.
- (2) The proportion of population below seven increased from 14.6% to 16% in Jammu and Kashmir, whereas it decreased significantly everywhere else in India during 2001-11.
- (3) The child sex ratio decreased considerably from 941 to 859 girls per 1,000 boys under seven, by far the largest decline observed among the states between 2001 and 2011.

The first anomaly was hardly acknowledged by any observer even if the difference between the census-based decadal population growth and the corresponding SRS estimate was more than 7%. Census figures tend to inspire more trust than vital rates derived from regional SRS samples. For instance, the observed population growth in 2001-11 was also unexpectedly high in Tamil Nadu compared to SRS-based estimates of the natural increase, but the gap between demographic growth and natural increase was simply ascribed to immigration to Tamil Nadu.<sup>9</sup> A similar logic would imply massive immigration in Jammu and Kashmir during 2001-11, but that seems quite implausible in a period otherwise characterised by prolonged political disturbances. A sudden rise in fertility would be another hypothesis, which will be explored below. But, if we trust SRS trends, an equally logical explanation for this elevated intercensal growth would be a 2001 Census underestimation or a 2011 Census overcount.

The second anomaly relates to the unexpected rise in the proportion of the child population in Jammu and Kashmir, which became the third largest among the states and union territories in 2011. This was noted by the Census of India (GOI 2011a), but no comment was offered. Such a rise in

the proportion of young population can only stem from a rebound of fertility rates in Jammu and Kashmir. Yet, no other fertility estimate confirms any downturn in fertility decline in the state (discussed below in more detail). Another possible explanation for this discrepancy could be an inflated child population during the 2011 Census, or on the contrary, a serious understatement of the population aged seven years or more in 2001.

The third anomaly is the sudden plunge in child sex ratios. Many in the state opined at once that prenatal sex selection had suddenly shot up in Jammu and Kashmir, and this hypothesis received a large echo in the regional, national and international press, encouraging activists to focus on the “new evil of gender discrimination”. Yet, this decrease in sex ratio is contradictory to that obtained from other sources. While rather low in the mid-2000s, the sex ratio at birth (SRB) did increase in Jammu and Kashmir from 838 in 2004-06 to 873 in 2008-10, according to the SRS estimates.

The neighbouring states of Punjab and Haryana had also recorded higher birth masculinity during the same period. Birth registration data from Jammu and Kashmir also pointed to an SRB of around 900 in 2007, significantly higher than the census-based sex ratio of the population between 0-6 years (859). The SRS estimates for the population aged less than five years are also higher, since they averaged 889 in 2004-10 without any discernible declining trend. However, there is no obvious technical explanation for this significant decline in child sex ratio except a sudden change in sex-selective under-enumeration.

### 2.1.2 Child Population and Fertility Estimates

The second abnormality noted earlier – the apparent rise in the proportion of the child population between 2001 and 2011 – has a direct bearing on our estimates for Jammu and Kashmir. Any rise in the child population translates mechanically into a parallel rise in CBR and TFR estimates at both the district and state levels. Our estimated TFR level of 3.7 children per woman derived from the census age distribution in Jammu and Kashmir is one of the highest in the country and represents a significant increase from the 3.0 estimate of 10 years earlier. The recent estimates of fertility in Jammu and Kashmir point, on the contrary, to a gradual decline in TFR levels in Jammu and Kashmir, reaching respectively 2.4 children per woman in the NFHS-3 survey and an average of 2.25 for the 6 annual SRS estimates from 2004 to 2009. As a matter of fact, the latest SRS estimate for Jammu and Kashmir puts fertility at two children per woman in 2010, signalling a continual decline in fertility rates in the state.

The gap between our census-based fertility estimate and other figures for the state amounts, therefore, to at least 1.4 children per woman (more than 60% in relative terms). Our district-level estimates for Jammu and Kashmir further show that the fertility level is supposed to have increased during 2001-11 in almost all districts. This again conflicts with what we know of regional trends, characterised by a regular decline in fertility levels in Jammu and Kashmir, according to the SRS

annual series. However, we also observe that the three districts in which fertility had in fact decreased at almost the same pace as elsewhere in India were Kathua, Jammu and Samba. These are three adjacent districts located in the extreme south of the Jammu region and notably characterised by the lowest proportion of Muslim population in the state (below 10% in all the districts).<sup>10</sup>

We should add here that the most spectacular decline in child sex ratios from 2001 to 2011 have been recorded also in districts of the Kashmir Valley such as Pulwama (-210 girls per 1,000 boys), Budgam (-172), Kupwara (-167), and Ganderbal (-151). On the contrary, the child sex ratio has remained almost stable between 2001 and 2011 in the three districts of Kathua, Jammu and Samba, which are distinguished by normal fertility trends.

At this point, we should depart from statistics and come back to the real world. Wild rumours started to circulate long before the final operations of the 2011 Census were held in Jammu and Kashmir. It was held that there was a plan to exaggerate the share of the Jammu region within the state by inflating census results in Jammu by, for instance, counting migrants and non-residents. At a time coinciding with the start of the house listing operations in May 2010, Syed Ali Shah Geelani spoke about “a planned conspiracy to change the Muslim majority of the state” through the census.<sup>11</sup> This obviously did not happen since the population growth was lowest in Jammu. But this rumour may also have, on the contrary, encouraged people in the rest of the state to react.

### 2.1.3 Child Population Overcount

We already mentioned several hypotheses accounting for these census anomalies. One of them would be a severe underestimation of the population in 2001, in part due to the census boycott supported by Kashmiri separatists.<sup>12</sup> But any such undercount does not explain the rise in child population, unless all fertility levels and trends from 2001 to 2010 given by the SRS are equally wrong. The other hypothesis of a real rise in fertility during the last decade is also contradicted by all available fertility measurements accessed from the SRS and from the NFHS. We are left with a third scenario, corresponding to an unusual population overestimation in 2011.<sup>13</sup> Let us now examine this hypothesis in greater detail.

According to the scenario emerging from our observations, the apparent surplus in demographic growth and fertility rates could have proceeded instead from a deliberate over-reporting of children in Jammu and Kashmir. The fear of a census conspiracy to inflate Jammu’s population could have induced people in the rest of the state, especially in the Kashmir Valley, to overstate their own household population by adding non-existent children. In this hypothesis, many people in the Kashmir region would have resorted to a systematic exaggeration of their household population in order to boost the overall share of this region within Jammu and Kashmir. Adding non-existent children to one’s family is probably the easiest procedure to inflate a population total during the census, since there are far less columns to fill up in the questionnaire. Most

variables for children such as mother tongue, occupation, education, or migration status can be quickly entered in the census schedule as 0, or duplicated from the mother's response. Incidentally, sex ratio levels suggest that in trying to inflate their child population, many households seem to have invented boys rather than girls – as if reporting non-existent boys was easier or more spontaneous.

Additional effort and data would be needed to confirm this wide over-reporting and to understand its demographic impact and exact motives. While the regional government has already challenged the veracity of the census figures,<sup>14</sup> its only concern relates to the child sex ratio rather than the entire child population in Kashmir. We have, moreover, no guarantee that this systematic overcount has not affected older age groups as well. Yet, the scale of this exaggeration brings with it an uncomfortable implication, namely, that the active cooperation or initiative of local enumerators in the process of census manipulation cannot be ruled out. The proportion of non-existent children entered in the census may be as much as 60% of the expected number of children, if we follow SRS fertility estimates. It is difficult to believe that census personnel could have failed entirely to detect these systematic misstatements, especially for preschool age children who are usually at home during the visit of the census enumerators.

Demographers will be able to confirm the true level of population overstatement during the 2011 Census only after the publication of data on the detailed age and sex structure. However, a few preliminary conclusions may be drawn from our finding. Since it is most likely that the published figures reflect a severe exaggeration of the real child population, fertility rates derived from the child population in Jammu and Kashmir are gross overestimates. There is little to be done with such inconsistent and unreliable figures. In addition, the dramatic decline in child sex ratio in Jammu and Kashmir is most probably an additional casualty of these manipulations. The efforts to track prenatal sex selection in Jammu and Kashmir may be simply misplaced and should be redirected to states where the situation is more likely to have significantly deteriorated – like Maharashtra or Rajasthan.

A further implication concerns the impact on the decennial population growth rate. After correction for the fertility overstatement, an alternative 2011 population total would in fact be in the range of 11.75 million – as against the published provisional total of 12.55 million.<sup>15</sup> The decennial population growth rate would be reduced from the published figure of 23.7% to an estimated growth rate of 16.2% – a value significantly closer to the SRS-estimated natural rate of increase of 14% from 2001 to 2010.<sup>16</sup> Since the inflation in population numbers during the census has apparently been concentrated among the Muslim population, as seems to have been the case, we may also expect a jump in the proportion of the Muslims in the state according to the official census returns. This increase may artificially raise the proportion of Muslims from 67% in 2001 to about 70% of the state population in 2011, a bogus trend likely to launch another futile round of controversies about religious demographic differentials in Jammu and Kashmir and in India.<sup>17</sup>

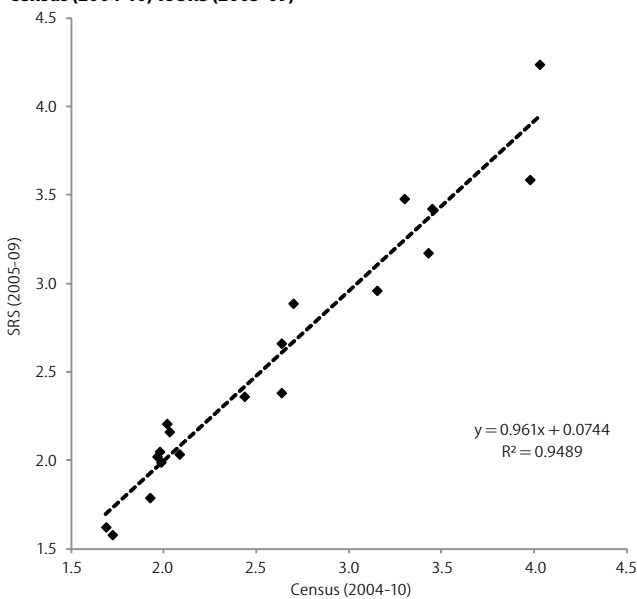
We finally add that the countrywide fertility estimate is only marginally affected by the removal of Jammu and Kashmir districts from our estimate, since the state accounts only for 1% of India's total population and its presumed TFR level, according to the SRS or NFHS figures, is very close to the national average.

In view of the aforementioned difficulties and the doubts over the quality of census data, we have decided to exclude Jammu and Kashmir from the purview of our estimation exercise. We do not want to circulate any potentially misleading fertility estimates related to Jammu and Kashmir in view of the data issues exposed here. Neither do we wish to feed point-less discussion about an alleged fertility rise in Jammu and Kashmir. Biased estimates of child sex ratio levels from the 2011 Census in Jammu and Kashmir have already polluted the debate on prenatal sex selection and we want to warn census data users against any unqualified use of the population figures for the state. We have, however, retained in our results the three districts in which fertility appears to be reasonably well estimated, namely, Jammu, Kathua and Samba.

## 2.2 Census-Based and Other Fertility Estimates

The previous discussion focused on issues related to the 2011 Census data for Jammu and Kashmir. We have also checked the reliability of our fertility estimates for the rest of India. The first validity check consists in comparing them with the annual

**Figure 4: Fertility Estimates for Larger States, Census (2004-10) vs SRS (2005-09)**



TFR estimates from the SRS. Figure 4 plots our census-based estimates against SRS estimates for large states, for which annual SRS estimates are based on larger samples. This comparison demonstrates the very high consistency level at the state level between our TFR estimates and the SRS measurements in these “large states”. The correlation coefficient ( $r^2$ ) is as high as 0.95 for these 19 states. There are significant variations for some states – such as Bihar – but the agreement between the two series is obviously very strong.

Including all the 34 regional units for which SRS provides TFR estimates, leads to a weaker, but still highly significant correlation ( $r^2=0.76$ ). For smaller states and union territories, the correspondence between both sources appears far less convincing, although it is difficult to identify the origin of the gap between the two series. The largest variation between both sets of TFR estimates corresponds to the north-eastern states from Meghalaya to Tripura, where census-based estimates are consistently higher than SRS values. The limited sample size for some smaller regional units tends to affect the quality of SRS figures, but the quality of our own census-based estimates may also be more fragile in smaller states.<sup>18</sup> We applied the same comparison procedure to earlier fertility estimates from the NFHS-3, which are available for 28 states. The correlation coefficient is again very significant ( $r^2=0.86$ ), but even higher when the analysis is restricted to the larger states.

Our 2011 TFR estimates can also be juxtaposed with the estimates derived from the 2001 Census at the district level, after the necessary correction for changes in the administrative geography. Here, we use our own district-level fertility estimates published 10 years ago (Guilmoto and Irudaya Rajan 2002). Since fertility decline is not uniform across the country, we use a logarithmic regression rather than a linear model.<sup>19</sup> The correlation analysis demonstrates a very strong relationship between the 2001 and 2011 estimates at the district level, with  $r^2=0.91$ . There are still 25 districts where fertility appears to have increased during the last 10 years, a rather unexpected result in a country that has recorded a sustained fertility decline in 2001-11. We cannot examine all such odd cases, but the two extreme examples described below may reflect the kind of issues encountered in our estimation procedure. In the district of Mewat (Haryana), formed in 2005, fertility has seemingly risen by more than one child per woman during the period 2001-11. However, the 2001 estimate relates to the district's original components in 2001 (viz, Gurgaon and Faridabad). There is nothing surprising in this case since the new district was precisely carved out of two highly urbanised districts of Haryana adjacent to Delhi to isolate the far less developed rural areas of Mewat, mainly populated by the underprivileged Muslim Meo community – among whom we can indeed expect fertility to be far higher than among the middle classes living in Gurgaon or Faridabad.<sup>20</sup>

Kurung Kumey (Arunachal Pradesh) is the only other district in the country where fertility appears to have increased by one child per woman during 2001-11 and is, again, a new district unit. It is composed of the least developed circles in the north-western part of the original Lower Subansiri district – from which it was carved out in 2001. In addition, the size of the district's population makes our procedure less reliable since Kurung Kumey has one of the lowest district populations (and density) found in India.<sup>21</sup> These two examples probably summarise some of the comparison issues we may face when assessing the recent change in fertility levels. This should encourage us to take due account of intercensal redistricting and of the overall population size of districts in many parts of

India when discussing the quality of census-based estimates and decennial trends.

A final test is conducted using the recently published district-level data from the AHS. The first AHS round was conducted in 284 districts of nine states in 2010-11, and it provides, for the first time, a set of detailed demographic indicators at the district level. From this source, we now have district-level CBRs, though TFR estimates are not available. After adjusting for district changes, we have once again regressed these CBR estimates against our census-based CBR estimates. Results are unfortunately rather disappointing since the correlation coefficient ( $r^2$ ) between the two series of CBR estimates is only 0.49 for the 281 comparable districts. A closer look at these two series indicates that discrepancies are modest at the state level. But, when CBRs are compared at the district level, the relative variations in the estimated CBR values between these two sources are often sizeable, ranging from -32% to +36%.

All this reflects serious discrepancies between census- and AHS-based estimates. Since we have previously observed a relatively high level of correspondence between our census-based estimates and others sources, the source of the observed discrepancy may therefore point to potential quality issues for the AHS figures at the district level. In this regard, a similar regression between census-based child sex ratios from both sources (2011 Census estimates and AHS) yields similarly mediocre results, with a coefficient correlation ( $r^2$ ) of 0.53. A proper assessment of the quality of the AHS statistics would, however, require a more in-depth analysis based on detailed results from the AHS.

### 3 Fertility Differentials and Trends

Fertility according to our estimates had reached 2.66 children during the seven years preceding the 2011 Census. This figure is very close to the corresponding SRS TFR average of 2.72 for 2005-09. It is also similar to the projected value of 2.65 for 2006-10 in 2002 by Bhat (2009). However, regional differentials are still extremely important. Fertility does vary today from 1 to 3 within India. India's fertility trend is the composite product of distinct regional fertility trajectories, ranging from early decliners like south Kerala and west Tamil Nadu to late-comers like north Bihar and west Rajasthan. We offer here a brief analysis of our results, stressing the regional diversity and the overall slow rate of fertility decline as seen from an Asian perspective.

#### 3.1 A Complex Map of Fertility Variations in India

On the one hand, fertility has gone below the replacement level of 2.1 children per woman in no less than 12 states and union territories in the country (see Table 1, p 66). In terms of districts, 174 out of 621 have fertility levels below 2.1 today, accounting for 28% of all Indian districts. The vast majority of them are located in the five southern states and union territories, and in the north-western states of Punjab and Himachal Pradesh. East India is represented by West Bengal, where almost half the districts fall into the below-replacement category, as well as Odisha and Tripura. West India consists

mostly of Maharashtra and Goa, with less than 10% of districts in Gujarat reporting a TFR level below 2.1.

But as state-level results indicate, a few regions such as Kerala, Tamil Nadu and Goa have even recorded fertility levels close to 1.5 children per woman. A closer look indicates that there are indeed a small number of districts (24) where fertility averages below 1.5 children per woman, according to the 2011 Census. The lowest fertility level in India is estimated in Kolkata (1.2), but several other districts of Kerala, Tamil Nadu and other states also report unusually low fertility levels. Several of them are big cities like Kolkata, New Delhi, Chennai, Kollam, Mumbai, Thiruvananthapuram, and Coimbatore. But, this list also includes typically rural districts such as Pathanamthitta, Idukki, Alappuzha and Kottayam in Kerala, Chickmagalur and Hassan in Karnataka, and Kanyakumari and Namakkal in Tamil Nadu.

**Table 1: State-Level Estimates of Crude Birth Rates and Total Fertility Rates (2001 and 2011)**

State	2001				State	2011			
	CBR	TFR	Change			CBR	TFR	Change	
Andaman and Nicobar	15.7	1.68	2.32	-0.6	Lakshadweep	16.6	2.06	2.69	-0.6
Andhra Pradesh	16.2	1.79	2.31	-0.5	Madhya Pradesh	24.3	3.17	3.86	-0.7
Arunachal Pradesh	23.7	3.29	3.92	-0.6	Maharashtra	17.9	2.16	2.56	-0.4
Assam	23.7	2.89	3.19	-0.3	Manipur	20.0	2.48	2.59	-0.1
Bihar	29.7	4.24	4.54	-0.3	Meghalaya	31.3	4.34	4.45	-0.1
Chandigarh	17.4	1.99	2.25	-0.3	Mizoram	24.1	2.90	3.36	-0.5
Chhattisgarh	23.2	2.96	3.60	-0.6	Nagaland	21.1	2.82	3.16	-0.3
Dadra and Nagar Haveli	25.1	3.07	3.61	-0.5	Odisha	19.7	2.36	2.82	-0.5
Daman and Diu	18.3	2.14	2.48	-0.3	Puducherry	16.4	1.66	1.82	-0.2
Delhi	18.7	2.21	2.62	-0.4	Punjab	16.7	2.05	2.42	-0.4
Goa	14.3	1.54	1.79	-0.2	Rajasthan	25.4	3.42	4.22	-0.8
Gujarat	20.1	2.38	2.57	-0.2	Sikkim	15.5	1.87	3.03	-1.2
Haryana	21.2	2.66	3.22	-0.6	Tamil Nadu	14.9	1.62	1.85	-0.2
Himachal Pradesh	17.6	1.99	2.39	-0.4	Tripura	18.9	2.21	2.48	-0.3
Jammu and Kashmir			2.98		Uttar Pradesh	24.8	3.59	4.36	-0.8
Jharkhand	25.8	3.48	4.07	-0.6	Uttarakhand	21.0	2.58	3.63	-1.0
Karnataka	17.8	2.04	2.40	-0.4	West Bengal	17.3	2.02	2.62	-0.6
Kerala	14.7	1.58	1.70	-0.1	India	21.2	2.66	3.16	-0.5

TFR= Total fertility rates (children per woman)

CBR= Crude birth rates (per 1,000 population)

2001 figures derived from Guilmo and Irudaya Rajan (2002).

This category comes close to the “lowest-low fertility”, a notion referring to cases of fertility dropping below 1.3 children per woman. This situation has been observed in some highly developed countries in east Asia (parts of China, South Korea, Japan, Taiwan, etc) and in Europe (Germany, Poland, Russia, Italy, Spain, etc). It may be noted that in these districts, the pace of fertility decline has slowed down to -0.3 children per woman during 2001-11 – as against -0.5 in India as a whole. It is difficult to predict future fertility trends in these areas, but lowest-low fertility is a distinct possibility in more than a dozen Indian districts by 2020.<sup>22</sup>

On the other hand, Bihar and Meghalaya are the only states where average fertility still stands at above four children per woman. In four isolated districts of the latter state, estimated fertility levels are even higher than five children per woman. These are states where fertility decline appears to have been rather modest during the previous decade. But, as usual, these state-level means tend to conceal the large amount of

intra-regional heterogeneity. The number of districts with fertility estimates above four is more numerous (72), and are scattered across many other regions in the country. Apart from Bihar and the north-eastern states, several of these high-fertility districts are located in west Rajasthan, Madhya Pradesh, Uttar Pradesh and Jharkhand. We recognise here the contours of the high-fertility area of north-central India, extending from the Indo-Gangetic plains to drier areas of the Deccan Plateau. Unsurprisingly, fertility decline has been slightly slower than average over the past 10 years in these 72 districts.

The largest number of states and districts lie between these two extremes, with fertility ranging from replacement level to four children per woman. These are also the areas where fertility decline has proceeded at a faster pace during the intercensal period (-0.6 children in 10 years). Unlike Bihar,

several “Empowered Action Group” states such as Rajasthan, Uttar Pradesh and Madhya Pradesh emerge with the fastest speed of fertility decline during the previous decade. But this intermediary category is a mixed combination of districts. On the one hand, it includes districts where women will very soon have, or already have in 2012, less than 2.1 children on an average in view of the speed of their recent fertility decline. Among these are several advanced districts in the otherwise lagging states such as Assam, Uttar Pradesh, Madhya Pradesh and Chhattisgarh. In particular, we notice distinct urban effects at work in areas such as Durg, Bhopal, Indore, Lucknow and Kanpur, where the fertility level was below 2.5 on the eve of the 2011 Census. On the other hand, we also find a large number of districts with higher than average fertility levels and where below-replacement levels are unlikely to be attained within the next 10 years in spite of the real progress achieved during the last decade.

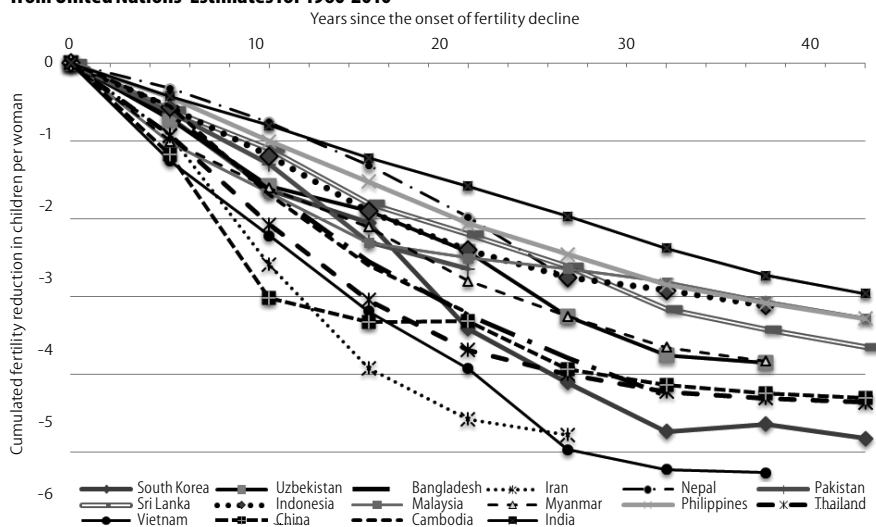
### 3.2 Is There a ‘Hindu Rate of Fertility Decline’?

A more general observation relates to the moderate momentum of fertility decline across Indian districts. According to our estimates, only 6% of all districts have recorded a reduction of more than one child per woman within the intercensal period. While it is auspicious to see that most of these 37 districts are in states with high fertility average levels such as Madhya Pradesh, Rajasthan, and especially Uttar Pradesh, it is surprising to find that there has been no acceleration in fertility decline in India. This does not square with the appreciable rate of social and economic change that has otherwise characterised India since the end of the 20th century.

Sustained urbanisation, rapid progress in education, economic development, and poverty reduction are distinct features of India’s last decade. Consider, for instance, the tripling of India’s gross domestic product (GDP) from 2000 to 2010, the



**Figure 5: Fertility Reduction since the Onset of Fertility Decline in Selected Asian Countries, Computed from United Nations' Estimates for 1960-2010**



decline in female illiteracy from 61% in 1991 to 46% in 2001, and 35% in 2011, the surprising increase in the proportion of households possessing mobile phones in 2011 (60%), or the regular reduction in the share of the population below the poverty line since the 1990s. These obvious achievements seem to have no parallel with the fertility trends. In fact, when seen from a historical perspective, fertility reduction seems to be more determined by its date of inception than by the rate of its decline, as noted earlier (Guilmoto and Irudaya Rajan 2001; Bhat 2009). States where fertility started to decrease earlier, as in south India, are still those in which fertility levels are the lowest. The geography of fertility has remained roughly the same, and little seems to have taken place by way of regional convergence.

To view Indian fertility trends from a larger perspective, we compare them with trends observed elsewhere in Asia. We use the fertility estimates brought out by the Population Division of the United Nations to compare the fertility levels since 1960 with selected countries in south, south-east and east Asia.<sup>23</sup> Trends are difficult to compare because of variations across countries in terms of (1) date of inception of fertility decline, and (2) fertility level at this date. For instance, the inception of fertility decline can be dated to 1960 in Sri Lanka and South Korea, 1965 in Malaysia, 1970 in India, China and Thailand, 1975 in Myanmar (Burma), Uzbekistan and Indonesia, 1980 in Bangladesh, 1985 in Iran and Nepal, and 1990 in Pakistan.<sup>24</sup> Similarly, pretransitional fertility levels ranged from 5.3 to 7.1 children per woman.<sup>25</sup> To standardise the series, we have therefore plotted the trends in terms of (1) years since the start of sustained fertility decline, and (2) overall fertility reduction since the start of the decline.

Figure 5 represents the reduction in TFR since the five-year period preceding fertility decline. It is seen, for instance, that fertility decreased by three children in China during the first 10 years following the onset of fertility decline, but this decline took 40 years to happen in India. Figure 5 confirms the rather slow profile of India's fertility trajectory over the last 40

years.<sup>26</sup> We first note that the Indian fertility curve is almost a perfect straight-line, corresponding to a TFR decline of 0.74 children per woman every 10 years since 1970. There is only a slight deceleration during the last decade, which corresponds to the low-fertility plateau in south India and elsewhere.

In most countries where fertility has declined for more than 30 years, such as China, South Korea and Vietnam, fertility has already stopped decreasing. Yet, the most obvious feature of fertility decline in India illustrated by this comparative analysis is that fertility has diminished faster everywhere else in Asia than in India. India's fertility trajectory stands clearly apart from trends

observed, for instance, in South Korea, Vietnam, Iran, Thailand, Bangladesh, and China. Over the first three decades following the inception of fertility transition, TFR levels in the latter countries are seen to have decreased by at least 1.5 children more than in India. The comparison with other countries also shows India's fertility decline to be significantly slower than its neighbours such as Burma, Nepal, Sri Lanka, and even Pakistan, where the outset of fertility decline came especially late.

The reduction in fertility in almost all countries, except India, has proceeded at a pace equal to or greater than one child per decade during the period examined here. In this respect, the only two countries closest to India in terms of slow fertility decline are Malaysia and the Philippines, and it is interesting to examine their situation. For one thing, Malaysia is hardly comparable with India, since it became a pro-natalist country during the 1980s (Jones and Leete 2002). Its government started then to de-emphasise the family planning programme introduced earlier. This explains why the pace of fertility decline among the ethnic Malay majority has decelerated.

As for the Philippines, where fertility started its decline after 1970 like India, it is one country where fertility decline has consistently fallen short of expectations (Costello and Casterline 2009). Many factors have been put forward to explain the rather slow reduction in family size in the Philippines: sluggish economic progress, opposition of the Catholic Church to modern contraception, weak family planning campaigns and lukewarm support to it by political leaders, prohibition of abortion, and insularity and spatial fragmentation. These are real obstacles to sustained fertility decline in this country, but as readers may easily notice, none of these conditions apply to India. On the contrary, India's governments have long supported family planning efforts. Economic growth in India has been sustained, no organised or political religious force has opposed modern contraception or family planning campaigns, and abortion has been legalised for more than 30 years now.

These are, of course, superficial comments on far more complex issues that have plagued India's demographic modernisation since the 1960s when the country first launched its birth planning campaigns. A complementary analysis of regional trends in India (not reproduced here) suggests that the pace of fertility decline has not been more rapid even in "success states" such as Kerala, Andhra Pradesh, Punjab or Odisha where replacement-level is already or almost attained. The examination of state-level trends always points to rates of fertility decline ranging from -0.5 to -0.8 children per decade, i.e., rates that are significantly slower than what has been observed in other Asian countries. At both the national and regional levels, trends have therefore been moderate and correspond to what could be dubbed a typical "Hindu rate of fertility decline".<sup>27</sup>

If India's fertility level still appears moderate compared to levels observed in other developing countries, it is more due to the early date of inception in the 1960s (its family policy programme was one of the first in the world) than to the pace of this decline ever since that period. As the international comparison demonstrates, many countries such as Bangladesh, Vietnam, Uzbekistan, Burma and Iran, which started their fertility decline at higher TFR levels and later than India, now have lower fertility rates. The fertility rates of Cambodia and Nepal are also likely to catch up with India's.

There are many structural checks accounting for the slow diffusion of the small-family norm in the country. When examined in parallel with the case of the Philippines, several factors can be easily ruled out. The growth in GDP, between 5-10% per year, observed in India since the mid-1990s belies, for instance, a strictly economic explanation for the slow reduction of fertility levels. The recent spurt in economic growth seems to have had no singular influence of fertility trajectories in states such as Gujarat or Maharashtra. Inversely, local studies can also document the presence of fast fertility decline without corresponding economic development, as Säävälä (2010) shows for Andhra Pradesh.

Similarly, governments in India have supported family planning more strongly than in the Philippines. Yet, the impact of the excesses committed during the Emergency may, in fact, be blamed for a brief stalling of fertility decline around 1980 and, perhaps, also for long-term political misgivings from politicians about the overt support for family planning. Finally, when compared with the archipelago of the Philippines, geography may not be a decisive factor in a country like India with a high population density and where, in spite of inadequate communication infrastructure, most inhabitants live not far from a town with many modern health facilities.

Family planning campaigns and economic development have, therefore, had only a limited influence on fertility reduction. This leaves us with explanations revolving more around the slow change in the demand for small families than around supply factors related to costs and availability of birth control methods. Furthermore, this slow fertility decline may not be readily associated with economic indicators such as poverty rates or average incomes, but is rather linked to

traditional lifestyles and values centred on family building and women's subordination.

Basu (2009) has rightly pointed out that "South Asian patterns of patriarchy and gender inequality and cultural prescriptions about the need for women to become wives and mothers" may account for a slower pace of fertility decline, and that sub-replacement fertility in India may not resemble the experience of industrialised countries. The process of "social modernisation" has probably less affected social structures in India than elsewhere. The rapid transformations affecting its urban middle classes are more representative of their political strength and media visibility than of their demographic and sociological weight.

In retrospect, the resilience of India's traditional institutions – a huge resource in times of social, political and economic upheavals – has indeed offered formidable resistance to the joint onslaught of government and market forces. Many government initiatives and other transformations fuelled by economic growth have, in fact, contributed to the promotion of the Malthusian norms, directly or indirectly. But fertility, like other crucial dimensions of social development such as female employment and literacy levels, has moved very slowly over the last 50 years in spite of the many economic and social incentives for smaller families. While in many countries, age-old family systems have given way to new social arrangements centred on nuclear households and supported by the development of new economic opportunities, the process has taken more time in India. The drive towards lower fertility has undoubtedly been slowed down by the strength of local social institutions protecting traditional family systems.

#### 4 Conclusions

The need for subregional monitoring of fertility trends has not changed since our previous analysis in 2002. Neither has the situation of civil registration in India improved during the interval. This is a disappointing observation in view of the need for birth certificates for school registration, and of the recent efforts made to establish a population register and to provide identity cards. To estimate fertility differentials, we have therefore been obliged to use census data and indirect techniques. The results of this exercise (see Appendix on our website) appear to be, on the whole, quite reliable as the very strong correspondence of state-level TFR levels with other sources of fertility estimates suggest. Its major outcome is an in-depth picture of fertility trends at the district level.

If sustained, the current rate of fertility decline in India should bring the national TFR average down to replacement-level before the end of the decade. This corresponds to the TFR projected by Bhat (2009), but it points to a faster rate of decline than foreseen by the Population Division of the United Nations. Our estimates also confirm the overall slow decline of fertility across India, where many districts witnessed, during the intercensal period, a decrease in TFR levels greater than one child per woman. This slow decline stands in opposition to historical trends observed elsewhere in Asia since the 1960s,

where TFRs have usually diminished at a significantly faster rhythm. Neighbouring countries with higher fertility rates, such as Pakistan, Nepal and even Afghanistan, have reported during the last 10 years a fertility decline faster than India's.<sup>28</sup> Fertility rates in Bangladesh, Sri Lanka, Bhutan and the Maldives are already below India's.

This Indian specificity may be partly a consequence of India's diversity, since the decline in one region may not coincide with the decline in other regions. Yet, even when fertility trajectories are examined at the state level, swift TFR decreases have remained uncommon. It may also be emphasised that while the impact of demographic change on economic growth is regularly stressed (James 2011; Bloom 2011), the experience of the last 20 years suggests that the reverse influence of economic development on fertility decline – a central tenet of the original theory of demographic transition – appears minimal in India.

Along the way, fertility estimation has also allowed us to spot a major unanticipated discrepancy in 2001 Census figures, namely, the most probable over-enumeration of the child population in Jammu and Kashmir. This is not a common feature of censuses, since quality issues usually relate to under-enumeration of specific groups (male migrants, minorities, homeless in cities, etc) or to well-known response biases, such as age misstatement. Population over-enumeration is a less common phenomenon and quite difficult to confirm in countries with no reliable civil registration system.

Many observers could wrongly infer from the rising proportions of the child population that fertility has indeed increased in Jammu and Kashmir over the last 10 years. But thanks to the SRS statistics, the various inconsistencies of the census results in this state could be detected. For want of disaggregated age and sex series, we have been unable to probe the adult population. But, it is perfectly possible that the population above age seven may also have been affected by over-reporting. This is unlikely to be as severe as it is for the child population, since the gap in Jammu and Kashmir between the corrected population growth rate in 2001-11

(16.2%) and the corresponding SRS-based rates of natural increase (14%) appears comparable to what could be observed in other states. Even if this persisting difference between corrected census rates and SRS figures could be entirely ascribed to exaggeration of the population above age seven, this would lead to an over-enumeration of about two lakhs in this population. This represents an over-enumeration rate of 2% for the population aged seven and above, a level far less catastrophic for demographic estimation than the possible exaggeration of the child population mentioned here.

Another lesson drawn from this exercise is that statisticians and demographers should remain vigilant and always question data before using them. A thorough review of the quality and consistency of the data they manipulate remains the best insurance against sociological inanities. Surveys and censuses are not machine-based operations beyond human agency. A survey remains a volatile confrontation between state-sponsored categories and etic concepts, between enumerators equipped with tools that are presumed all-terrain and context-free, and myriads of agents actively promoting their local social and political agenda through this encounter.

Many social issues are at stake during demographic data collection. The current caste census will, in fact, soon offer its own mishmash of exaggerations, misstatements and statistical ambiguities. Ever since the so-called Stamp's law of statistics was put forward,<sup>29</sup> the Indian census has become far more democratic and manipulation is often more a political statement now than the outcome of statistical incomprehension. In case of discrepancies, it is often found easier to dismiss statistical data than engage them, leading researchers to either credulously accept statistics or indiscriminately ignore them. But, in spite of a high level of "statistical noise", typical of Indian data, demographers can still detect trends or irregularities. Data from the 2011 Census and other large-scale surveys will no doubt provide some more illustrations of these anomalies, and this should encourage demographers to practise their skills before other social scientists and data users attempt to put the data to contribution.

#### NOTES

- 1 The concerned period extends from 1 April 2004 till 30 March 2011. We will simply refer to it as 2004-10 and use 2007 as the mid-year.
- 2 The pattern of age attraction among children was almost identical in 2001 compared to the 1991 results. This indicates that the progress in quality of age reporting during the 2001 Census was very slow.
- 3 The United Nations' figures are based on a total population estimate of 1.31 billion in 2010 – 100 million inhabitants more than the provisional results from the census taken a year later.
- 4 This differential refers to the state-level variation in under-five mortality estimated during the NFHS-3. The pronounced spatial clustering of infant and child mortality below the state level has been documented by Singh et al (2011).
- 5 See GoI (2011b) for details on administrative changes between 2001 and 2011.
- 6 For instance, in Madhya Pradesh, infant mortality was estimated to be 36% lower in Gwalior

- than in the state as a whole, but 25% higher in some districts of the nearby Bundelkhand region. Similarly, Mangalore registered a mortality level less than half that of Karnataka's value, as against districts such as Bellary or Koppal in the Deccan, where mortality rates are 40% above the state average.
- 7 The NFHS-3 offers another set of age-specific fertility rates, but we have opted for the SRS rates as they are more recent and cover more states and union territories. However, using different fertility schedules results only in very moderate variations.
  - 8 We have benefited notably from exchanges with Bashir Ahmad, Kamala Visweswaram and P M Kulkarni on this issue.
  - 9 See Navaneetham and Dharmalingam (2011). For Tamil Nadu, this corresponds to a net migration influx of about 3-4 million people during 2001-11 (Kulkarni 2011).
  - 10 Figures are taken from the 2001 Census. The overall Muslim population in the state was 67%.

- 11 A few days earlier, he had stressed that "Although the census is no alternative to self-determination, the local government employees must discharge their duties honestly to defeat the RSS-BJP designs to change the demography of Jammu and Kashmir". See Jameel (2010).
- 12 See Hamid (2011).
- 13 Bashir Ahmad Bhat (Population Research Centre, Srinagar) was the first scholar to raise the possibility of a census over-count in May 2011. See Bhat (2011).
- 14 See Ali (2011).
- 15 This alternative population figure is obtained by reducing the child population below seven years to an assumed fertility level of 2.3 children per woman.
- 16 The overall impact of this demographic over-count of India's population total remains modest since Jammu and Kashmir accounts for 1% of India's population.
- 17 Incidentally, a previous controversy had engulfed the Census of India in 2004 when

unadjusted religious figures exaggerated the Muslim population growth in India because they forgot to control for the absence of the census in Jammu and Kashmir in 1991. See Bhagat (2004).

- 18 In 2007, the SRS sample covered populations smaller than 40,000 people in states such as Arunachal Pradesh, Meghalaya and Mizoram. Comparatively, the sample ranged in bigger states, from one to six lakhs.
- 19 Low-fertility areas in south India have, for instance, recorded slower fertility decline during 2001-11 than other districts. The linear regression used here is based on the logarithm of fertility estimates rather than on original fertility estimates.
- 20 On Mewat's disadvantaged socio-economic situation, see IHD (2008). Conversely, Gurgaon district has now the highest internet penetration in the country according to 2011 figures.
- 21 The population below seven years recorded in Kurung Kumey was 15,540 children in 2011. On Kurung Kumey's socio-demographic characteristics, see IIPS (2010).
- 22 For a detailed discussion of TFR trends, see Haub (2011). See also the analysis of fertility trends in south Asia by Basu (2009).
- 23 We retained only countries of more than 10 million inhabitants and without early fertility decline.
- 24 The start of a sustained fertility decline is defined as the first five-year period in 1950-2010 during which fertility levels decreased by at least 5% during two successive five-year periods. We have removed Cambodia (for its erratic trends during the 1970s) and Afghanistan (for its very recent TFR decline) from the list.
- 25 In fact, there is no discernible relation between the pace of fertility decline and any other characteristic such as the subregion being in Asia, the date of inception of fertility decline, the fertility level at that period, the political regime, or the religious composition of the population.
- 26 James stresses that the *relative* rate of fertility decline in India has recently quickened (2011: 577). We use, on the contrary, a measure of *absolute* decline measured in births per woman rather than in percentages.
- 27 We borrow here from the expression "Hindu rate of growth" popularised by the late Raj Krishna.
- 28 More evidence on these fertility declines can be found in Demographic and Health Surveys conducted in Afghanistan in 2010, in Nepal in 2011, and in Pakistan in 2007.
- 29 The following quotation attributed to Harold Cox refers to India in the 1880s: "when you are a bit older, you will not quote Indian statistics with that assurance. The Government are very keen on amassing statistics – they collect them, add them, raise them to the nth power, take the cube root and prepare wonderful diagrams. But what you must never forget is that every one of these figures comes in the first place from the chowkidar, who just puts down what he damn pleases" (Stamp 1929: 258-59).

#### REFERENCES

- Ali, Muddasir (2011): "Govt 'Challenges' Census Figures: Orders Fresh Survey of Births during Past 5 Years", *Greater Kashmir*, 4 May, viewed on 11 May 2013, <http://www.greaterkashmir.com/news/2011/May/4/govt-challenges-census-figures-39.asp>
- Basu, Alaka Malwade (2009): "On the Prospects for Endless Fertility Decline in South Asia" in *Completing the Fertility Transition*, Population Bulletin of the United Nations (New York: United Nations), 554-61.

Bhagat, R B (2004): "Census 2001 and Religion Data: Fact and Fiction", *Economic & Political Weekly*, 39(39): 4292-94.

Bhat, Bashir Ahmad (2011): "Where Have They Gone? Searching Missing Girls in Jammu and Kashmir", *Greater Kashmir*, 12 May, viewed on 11 May 2013, <http://www.greaterkashmir.com/news/2011/may/12/where-have-they-gone-14.asp>

Bhat, P N Mari (1996): "Contours of Fertility Decline in India: A District Level Study Based on the 1991 Census" in K Srinivasan (ed.), *Population Policy and Reproductive Health* (New Delhi: Hindustan Publishing Corporation), 96-179.

– (2009): "India's Changing Dates with Replacement Fertility: A Review of Recent Fertility Trends and Future Prospects" in *Completing the Fertility Transition*, Population Bulletin of the United Nations (New York: United Nations), 376-91.

Bloom, David E (2011): "Population Dynamics in India and Implications for Economic Growth", PGDA Working Paper No 65, Harvard University.

Chaudhury, Rafiqul H, P Gunasekera and D Gunasekera (2006): "District-level Variations in Infant Mortality in Sri Lanka: A Challenge to Achieving the Millennium Development Goal on Child Survival", *Regional Health Forum*, 10(1): 96-103.

Costello, Marilou P and John B Casterline (2009): "Fertility Decline in the Philippines: Current Status, Future Prospects" in *Completing the Fertility Transition*, Population Bulletin of the United Nations (New York: United Nations) 529-38.

Dyson, Tim (2009): "On the Future of Human Fertility in India" in *Completing the Fertility Transition*, Population Bulletin of the United Nations (New York: United Nations) 392-408.

Gol (2011a): "Provisional Population Totals, Paper 1 of 2011, India Series-1", Office of the Registrar General and Census Commissioner, Government of India, New Delhi.

– (2011b): "Administrative Atlas of India", Office of the Registrar General and Census Commissioner, Government of India, New Delhi.

Guilmoto, C Z and S Irudaya Rajan (2001): "Spatial Patterns of Fertility Transition in Indian Districts", *Population and Development Review*, 27(4): 713-38.

– (2002): "District Level Estimates of Fertility from India's 2001 Census", *Economic & Political Weekly*, 37(7): 665-72.

– (ed.) (2005): *Fertility Transition in South India* (New Delhi: Sage Publications).

Hamid, Peerzada Arshad (2011): "Counting Kashmiris", *Himal*, April, viewed on 11 May 2013, <http://www.himalmag.com/component/content/article/4355-counting-kashmiris.html>

Haub, Carl (2011): "Future Fertility Prospects for India", Expert Paper, Department of Economic and Social Affairs, Population Division, United Nations, New York.

IHD (2008): *A Baseline Survey of Minority Concentration Districts of India: Mewat (Haryana)* (New Delhi: Institute for Human Development).

IIPS (2010): *District Level Household and Facility Survey (DLHS-3), 2007-08: India: Arunachal Pradesh* (Mumbai: International Institute for Population Sciences).

Irudaya Rajan, S, P Mohanachandran Nair, K L Sheela, Lalitendu Jagatdeb and Nihar Ranjan Mishra (2008): *Infant and Child Mortality in India: District Level Estimates* (New Delhi: Population Foundation of India).

Jameel, Yusuf (2010): "J&K Sceptical about Census, Senses 'Conspiracy'", *The Asian Age*, 18 May, viewed on 11 May 2013, <http://archive.asianage.com/india/jk-sceptical-about-census-senses-%E2%80%99conspiracy%E2%80%99-628>

James, K S (2011): "India's Demographic Change: Opportunities and Challenges", *Science*, 333(6042): 576-80.

Jones, G and R Leete (2002): "Asia's Family Planning Programs as Low Fertility Is Attained", *Studies in Family Planning*, 33(1): 114-26.

Kulkarni, P M (2011): "Deciphering the 2011 Census Results", June, lecture delivered at the AIDS Prevention and Control, Voluntary Health Services, Chennai.

Navaneetham, K and A Dharmalingam (2011): "Demography and Development: Preliminary Interpretations of the 2011 Census", *Economic & Political Weekly*, 46(16): 13-17.

Säävälä, Minna (2010): "Below Replacement-level Fertility in Conditions of Slow Social and Economic Development: A Review of the Evidence from South India", *Finnish Yearbook of Population Research*, 45: 45-66.

Singh, A, P K Pathak, R K Chauhan and W Pan (2011): "Infant and Child Mortality in India in the Last Two Decades: A Geospatial Analysis", *PLoS ONE*, 6(11): e26856, doi: 10.1371/journal.pone.0026856.

Stamp, Josiah (1929): *Some Economic Factors in Modern Life* (London: P S King & Son Ltd).

United Nations (1982): "Model Life Tables for Developing Countries", Department of Economic and Social Affairs, Population Division (New York: United Nations).

– (2011): "World Population Prospects: The 2010 Revision", Department of Economic and Social Affairs, Population Division, United Nations, viewed on 11 May 2013, <http://esa.un.org/unpd/wpp/index.htm>

## Survey

September 8, 2012

### Revisiting Communalism and Fundamentalism in India

by

Surya Prakash Upadhyay, Rowena Robinson

This comprehensive review of the literature on communalism – and its virulent offshoot, fundamentalism – in India considers the various perspectives from which the issue has sought to be understood, from precolonial and colonial times to the post-Independence period. The writings indicate that communalism is an outcome of the competitive aspirations of domination and counter-domination that began in colonial times. Cynical distortions of the democratic process and the politicisation of religion in the early decades of Independence intensified it. In recent years, economic liberalisation, the growth of opportunities and a multiplying middle class have further aggravated it. More alarmingly, since the 1980s, Hindu communalism has morphed into fundamentalism, with the Sangh parivar and its cultural politics of Hindutva playing ominous roles.

For copies write to:

Circulation Manager,  
**Economic and Political Weekly**,  
 320-321, A to Z Industrial Estate,  
 Ganpatrao Kadam Marg, Lower Parel,  
 Mumbai 400 013.  
 email: [circulation@epw.in](mailto:circulation@epw.in)

**Appendix: Crude Birth Rates (CBR) and Total Fertility Rates (TFR), Indian Districts and States (2001 and 2011 Censuses)**

Name	CBR 2011	TFR 2011	TFR 2001	Name	CBR 2011	TFR 2011	TFR 2001	Name	CBR 2011	TFR 2011	TFR 2001
<b>India</b>	<b>21.2</b>	<b>2.7</b>	<b>3.2</b>	Kurukshetra	19.4	2.3	2.7	Baran	24.4	3.3	4.0
<b>Jammu and Kashmir</b>			<b>3.0</b>	Kaithal	20.4	2.6	3.1	Jhalawar	23.9	3.2	4.0
Kathua	20.9	2.8	3.1	Karnal	20.9	2.6	3.0	Udaipur	27.6	3.5	4.1
Jammu	16.4	2.1	2.7	Panipat	22.8	2.9	3.5	Pratapgarh	29.1	3.8	4.2
Samba	18.9	2.5	2.9	Sonipat	20.2	2.7	3.1	<b>Uttar Pradesh</b>	<b>24.8</b>	<b>3.6</b>	<b>4.4</b>
<b>Himachal Pradesh</b>	<b>17.6</b>	<b>2.0</b>	<b>2.4</b>	Jind	19.9	2.6	3.3	Saharanpur	24.0	3.5	4.0
Chamba	21.1	2.6	2.9	Fatehabad	20.6	2.5	3.2	Muzaffarnagar	24.9	3.7	4.4
Kangra	16.4	1.8	2.2	Sirsa	19.1	2.3	2.9	Bijnor	24.4	3.6	4.6
Lahaul and Spiti	13.9	1.7	2.0	Hisar	19.4	2.4	3.1	Moradabad	26.7	4.0	5.0
Kullu	18.4	2.1	2.6	Bhiwani	20.4	2.5	3.3	Rampur	26.9	4.1	5.1
Mandi	17.3	1.9	2.4	Rohtak	18.8	2.4	3.0	Jyotiba Phule Nagar	26.4	3.9	4.9
Hamirpur	16.2	1.8	2.2	Jhajjar	19.2	2.4	3.1	Meerut	22.8	3.3	3.9
Una	17.7	2.0	2.5	Mahendragarh	19.2	2.4	3.3	Baghpat	23.0	3.5	3.9
Bilaspur	17.1	1.9	2.3	Rewari	20.3	2.5	3.1	Ghaziabad	24.3	3.3	3.9
Solan	18.4	2.1	2.5	Gurgaon	24.5	3.2	4.5	Gautam Buddha Nagar	26.0	3.6	4.4
Sirmaur	20.7	2.6	3.1	Mewat	38.0	4.9	3.7	Bulandshahr	24.9	3.8	4.4
Shimla	15.9	1.8	2.2	Faridabad	22.1	2.8	3.7	Aligarh	25.5	3.9	4.5
Kinnaur	14.9	1.9		Palwal	27.2	3.5	3.7	Hathras	25.7	3.9	4.4
<b>Punjab</b>	<b>16.7</b>	<b>2.1</b>	<b>2.4</b>	<b>Delhi</b>	<b>18.7</b>	<b>2.2</b>	<b>2.6</b>	Mathura	25.8	3.9	4.6
Gurdaspur	16.1	2.0	2.4	North West	19.7	2.4	2.8	Agra	23.9	3.5	3.8
Kapurthala	15.5	1.9	2.2	North	17.7	2.1	2.1	Firozabad	24.8	3.7	4.8
Jalandhar	15.1	1.8	2.1	North East	21.4	2.6	3.2	Mainpuri	24.4	3.7	4.4
Hoshiarpur	15.8	1.9	2.3	East	17.4	2.0	2.5	Budaun	30.1	4.7	5.5
Shahid Bhagat Singh Nagar	14.9	1.9	2.2	New Delhi	11.6	1.4	1.9	Bareilly	25.2	3.7	4.9
Fatehgarh Sahib	15.8	1.9	2.3	Central	14.8	1.7	1.9	Pilibhit	24.5	3.6	4.9
Ludhiana	16.4	2.0	2.3	West	17.7	2.1	2.4	Shahjahanpur	27.8	4.1	4.8
Moga	16.1	2.0	2.4	South West	18.7	2.2	2.7	Kheri	26.9	3.9	4.7
Ferozepur	18.9	2.4	2.8	South	18.9	2.2	2.7	Sitapur	28.0	4.1	4.7
Muktsar	18.0	2.2	2.6	<b>Rajasthan</b>	<b>25.4</b>	<b>3.4</b>	<b>4.2</b>	Hardoi	27.8	4.2	4.8
Faridkot	16.9	2.1	2.4	Sri Ganganagar	20.0	2.5	3.4	Unnao	22.2	3.3	4.1
Bathinda	16.9	2.1	2.4	Hanumangarh	21.0	2.7	3.4	Lucknow	18.9	2.5	3.1
Mansa	16.8	2.1	2.7	Bikaner	27.2	3.6	4.4	Rae Bareli	22.7	3.2	4.3
Patiala	17.3	2.1	2.3	Churu	25.0	3.3	4.2	Farrukhabad	26.0	3.9	4.3
Amritsar	16.8	2.1	2.7	Jhunjhunu	20.9	2.8	3.8	Kannauj	25.2	3.8	4.4
Tarn Taran	18.4	2.3	2.7	Alwar	26.1	3.6	4.5	Etawah	23.0	3.4	4.0
Rupnagar	15.5	1.9	2.4	Bharatpur	27.9	4.1	4.9	Auraiya	23.2	3.5	4.1
Sahibzada Ajit Singh Nagar	18.2	2.2	2.4	Dholpur	29.9	4.5	5.7	Kanpur Dehat	22.2	3.4	4.2
Sangrur	16.8	2.1	2.5	Karauli	27.3	4.1	4.9	Kanpur Nagar	16.3	2.2	2.6
Barnala	16.9	2.1	2.5	Sawai Madhopur	24.6	3.5	4.4	Jalaun	21.6	3.1	3.7
<b>Chandigarh</b>	<b>17.4</b>	<b>2.0</b>	<b>2.2</b>	Dausa	26.3	3.7	4.6	Jhansi	20.4	2.7	3.4
<b>Uttarakhand</b>	<b>21.0</b>	<b>2.6</b>	<b>3.6</b>	Jaipur	22.8	2.9	3.8	Lalitpur	29.1	4.1	4.9
Uttarkashi	21.7	2.7	3.6	Sikar	22.5	3.0	3.9	Hamirpur	21.7	3.3	4.2
Chamoli	19.9	2.4	3.0	Nagaur	24.6	3.3	4.2	Mahoba	23.5	3.4	4.5
Rudraprayag	19.4	2.2	3.2	Jodhpur	26.9	3.7	4.4	Banda	26.9	4.0	4.6
Tehri Garhwal	20.2	2.4	3.2	Jaisalmer	32.8	4.8	5.8	Chitrakoot	29.5	4.4	5.2
Dehradun	19.1	2.2	2.6	Barmer	32.7	4.9	5.7	Fatehpur	23.6	3.6	4.5
Garhwal	17.7	2.0	2.8	Jalore	29.1	4.1	5.2	Pratapgarh	22.2	3.1	4.2
Pithoragarh	19.7	2.4	3.1	Sirohi	27.7	3.8	4.7	Kaushambi	28.1	4.3	4.8
Bageshwar	20.3	2.5	3.3	Pali	23.7	3.4	4.4	Allahabad	23.8	3.4	4.2
Almora	18.5	2.3	3.0	Ajmer	23.9	3.2	3.7	Barabanki	26.1	3.8	4.7
Champawat	22.5	2.7	3.8	Tonk	23.5	3.2	4.2	Faizabad	23.0	3.3	4.0
Nainital	20.9	2.5	3.3	Bundi	23.2	3.1	4.0	Ambedkar Nagar	22.2	3.1	4.2
Udham Singh Nagar	22.7	3.0	3.9	Bhilwara	24.7	3.3	4.0	Sultanpur	23.8	3.3	4.4
Haridwar	24.7	3.3	4.1	Rajsamand	25.2	3.3	3.9	Bahraich	31.8	4.6	5.2
<b>Haryana</b>	<b>21.2</b>	<b>2.7</b>	<b>3.2</b>	Dungarpur	29.5	3.9	4.5	Shravasti	31.6	4.5	4.8
Panchkula	18.8	2.2	2.8	Banswara	30.9	4.2	4.8	Balrampur	31.4	4.7	4.9
Ambala	17.0	2.0	2.4	Chittorgarh	22.6	2.8	3.8	Gonda	27.1	3.9	4.7
Yamunanagar	18.8	2.3	2.8	Kota	21.1	2.6	3.5	Siddharthnagar	31.2	4.6	5.1

(Continued)

**Appendix: Crude Birth Rates (CBR) and Total Fertility Rates (TFR), Indian Districts and States (2001 and 2011 Censuses) (Continued)**

Name	CBR 2011	TFR 2011	TFR 2001	Name	CBR 2011	TFR 2011	TFR 2001	Name	CBR 2011	TFR 2011	TFR 2001
Basti	24.9	3.6	4.7	<b>Sikkim</b>	<b>15.5</b>	<b>1.9</b>	<b>3.0</b>	<b>Meghalaya</b>	<b>31.3</b>	<b>4.3</b>	<b>4.5</b>
Sant Kabir Nagar	26.5	3.9	4.9	North District	15.6	2.2	3.4	West Garo Hills	28.5	3.9	4.1
Maharajganj	25.8	3.7	5.0	West District	17.0	2.1	3.5	East Garo Hills	30.3	4.1	4.4
Gorakhpur	21.6	3.0	4.3	South District	15.8	1.9	3.4	South Garo Hills	31.7	4.6	4.6
Kushinagar	25.6	3.6	4.7	East District	14.6	1.7	2.5	West Khasi Hills	37.7	5.8	5.5
Deoria	23.3	3.3	4.4	<b>Arunachal Pradesh</b>	<b>23.7</b>	<b>3.3</b>	<b>3.9</b>	Ri Bhoi	33.5	4.8	5.4
Azamgarh	24.3	3.4	4.5	Tawang	18.4	2.8	3.8	East Khasi Hills	27.3	3.5	3.6
Mau	24.0	3.4	4.6	West Kameng	20.6	2.9	3.4	Jaintia Hills	37.7	5.6	5.4
Ballia	21.8	3.1	3.8	East Kameng	30.7	4.4	4.4	<b>Assam</b>	<b>23.7</b>	<b>2.9</b>	<b>3.2</b>
Jaunpur	23.4	3.3	4.3	Papum Pare	22.5	2.7	3.5	Kokrajhar	23.4	2.9	3.3
Ghazipur	24.1	3.5	4.3	Upper Subansiri	23.7	3.5	4.1	Dhubri	31.8	4.1	4.3
Chandauli	25.6	3.6	4.5	West Siang	18.7	2.7	3.8	Goalpara	27.6	3.5	3.9
Varanasi	21.3	3.0	4.1	East Siang	18.7	2.5	3.7	Barpeta	27.8	3.6	3.8
Sant Ravidas Nagar (Bhadohi)	26.1	3.6	4.4	Upper Siang	19.8	3.1	4.0	Morigaon	28.3	3.6	3.9
Mirzapur	26.2	3.8	4.7	Changlang	27.0	3.6	4.4	Nagaon	26.4	3.3	3.6
Sonbhadra	27.9	3.9	4.8	Tirap	26.7	3.9	4.4	Sonitpur	22.5	2.7	3.0
Etah	26.5	4.1	4.9	Lower Subansiri	21.1	2.9	3.4	Lakhimpur	23.9	2.8	3.3
Kanshiram Nagar	28.8	4.4	4.9	Kurung Kumey	34.3	4.7	3.4	Dhemaji	24.1	2.9	3.5
<b>Bihar</b>	<b>29.7</b>	<b>4.2</b>	<b>4.5</b>	Dibang Valley	21.2	3.0	3.9	Tinsukia	21.0	2.5	2.9
Pashchim Champaran	32.2	4.6	5.0	Lower Dibang Valley	21.7	3.1	3.9	Dibrugarh	18.2	2.1	2.4
Purba Champaran	32.7	4.7	4.9	Lohit	25.2	3.5	4.2	Sivasagar	18.5	2.1	2.4
Sheohar	32.0	4.7	5.1	Anjaw	24.8	3.5	4.2	Jorhat	16.7	1.9	2.2
Sitamarhi	32.1	4.6	5.1	<b>Nagaland</b>	<b>21.1</b>	<b>2.8</b>	<b>3.2</b>	Golaghat	19.2	2.3	2.7
Madhubani	28.9	4.0	4.3	Mon	22.7	3.4	3.4	Karbi Anglong	31.4	3.9	3.7
Supaul	31.8	4.4	4.7	Mokokchung	14.2	1.7	2.0	Dima Hasao	23.8	2.9	3.1
Araria	34.2	4.9	4.9	Zunheboto	20.3	2.8	3.5	Cachar	23.6	2.9	3.1
Kishanganj	34.9	5.2	5.3	Wokha	17.5	2.3	3.2	Karimganj	28.2	3.7	3.6
Purnea	33.2	4.8	5.0	Dimapur	20.6	2.6	3.3	Hailakandi	27.9	3.7	3.8
Katihar	33.3	4.9	5.3	Phek	25.5	3.4	3.8	Bongaigaon	26.2	3.3	3.5
Madhepura	33.6	4.7	4.8	Tuensang	26.7	3.7	3.4	Chirang	23.4	2.8	3.2
Saharsa	33.0	4.6	4.6	Longleng	18.9	2.7	3.4	Kamrup	20.7	2.4	2.6
Darbhanga	29.2	4.2	4.5	Kiphire	25.1	3.5	3.4	Kamrup Metropolitan	15.6	1.8	2.6
Muzaffarpur	28.8	4.1	4.6	Kohima	21.0	2.7	3.0	Nalbari	18.9	2.2	2.7
Gopalganj	27.4	3.9	4.4	Peren	23.8	3.1	3.0	Baksa	19.8	2.4	3.0
Siwan	26.1	3.7	4.6	<b>Manipur</b>	<b>20.0</b>	<b>2.5</b>	<b>2.6</b>	Darrang	27.8	3.4	3.4
Saran	27.3	4.0	4.7	Senapati	20.2	2.6	2.2	Udalguri	21.2	2.6	3.2
Vaishali	28.0	4.1	4.6	Tamenglong	20.4	2.7	2.8	<b>West Bengal</b>	<b>17.3</b>	<b>2.0</b>	<b>2.6</b>
Samastipur	30.4	4.4	4.9	Churachandpur	19.6	2.5	2.5	Darjiling	15.2	1.6	2.1
Begusarai	29.9	4.3	4.8	Bishnupur	18.9	2.4	2.5	Jalpaiguri	18.1	2.1	2.8
Khagaria	34.9	5.1	5.1	Thoubal	24.2	3.1	3.3	Koch Bihar	18.6	2.3	3.0
Bhagalpur	28.9	4.3	4.5	Imphal West	17.2	2.0	2.2	Uttar Dinajpur	24.6	3.2	4.3
Banka	29.6	4.2	4.8	Imphal East	20.4	2.5	2.6	Dakshin Dinajpur	17.2	2.1	3.3
Munger	26.4	3.9	4.0	Ukhrul	20.0	2.8	3.1	Maldah	23.0	2.9	4.0
Lakhisarai	30.2	4.3	4.7	Chandel	17.8	2.1	2.8	Murshidabad	22.2	2.7	3.5
Sheikhpura	30.6	4.4	4.7	<b>Mizoram</b>	<b>24.1</b>	<b>2.9</b>	<b>3.4</b>	Birbhum	19.8	2.3	3.0
Nalanda	28.7	4.0	4.2	Mamit	28.6	3.7	3.3	Bardhaman	16.0	1.8	2.3
Patna	25.6	3.5	3.9	Kolasib	24.5	3.0	3.4	Nadia	15.2	1.7	2.4
Bhojpur	26.5	3.8	4.2	Aizawl	20.5	2.3	3.0	North Twenty Four Parganas	13.9	1.6	2.1
Buxar	27.4	4.0	4.4	Champhai	27.2	3.4	3.5	Hugli	14.0	1.6	2.0
Kaimur (Bhabua)	30.3	4.5	4.8	Serchhip	21.9	2.8	3.3	Bankura	17.4	2.1	2.6
Rohtas	27.1	3.8	4.5	Lunglei	23.6	2.9	3.5	Puruliya	21.0	2.7	3.1
Aurangabad	29.1	4.0	4.3	Lawngtlai	30.8	4.0	4.2	Haora	15.8	1.8	2.1
Gaya	29.0	4.0	4.4	Saiha	25.3	3.3	4.0	Kolkata	9.9	1.2	1.4
Nawada	27.3	3.8	4.3	<b>Tripura</b>	<b>18.9</b>	<b>2.2</b>	<b>2.5</b>	South Twenty Four Parganas	19.0	2.2	3.0
Jamui	29.6	4.1	4.5	West Tripura	16.5	1.9	2.3	Paschim Medinipur	17.4	2.0	2.6
Jehanabad	28.4	3.9	4.1	South Tripura	19.3	2.3	2.6	Purba Medinipur	17.3	2.0	2.6
Arwal	28.9	3.9	4.1	Dhalai	23.0	2.8	2.8	<b>Jharkhand</b>	<b>25.8</b>	<b>3.5</b>	<b>4.1</b>
				North Tripura	21.9	2.6	2.8	Garhwa	29.5	4.2	5.3

(Continued)

**Appendix: Crude Birth Rates (CBR) and Total Fertility Rates (TFR), Indian Districts and States (2001 and 2011 Censuses) (Continued)**

Name	CBR 2011	TFR 2011	TFR 2001	Name	CBR 2011	TFR 2011	TFR 2001	Name	CBR 2011	TFR 2011	TFR 2001
Chatra	30.2	4.3	4.6	Raigarh	20.9	2.7	3.2	Shahdol	24.2	3.1	3.6
Kodarma	29.7	4.0	4.5	Korba	22.7	2.9	3.5	Anuppur	22.7	2.9	3.6
Girdih	30.5	4.2	4.7	Janjgir-Champa	21.9	3.1	3.5	Sidhi	28.3	3.9	4.7
Deoghar	29.2	4.1	4.5	Bilaspur	25.5	3.3	3.6	Singrauli	29.6	4.0	4.7
Godda	29.3	4.0	4.2	Kabirdham	30.1	3.9	3.8	Jhabua	35.4	5.0	5.4
Sahibganj	31.3	4.2	4.5	Rajnandgaon	22.3	2.8	3.3	Alirajpur	33.4	4.7	5.4
Pakur	32.3	4.3	4.4	Durg	20.5	2.5	2.9	East Nimar	26.2	3.5	3.9
Dhanbad	20.9	2.9	3.4	Raipur	24.1	3.0	3.4	Burhanpur	25.5	2.9	2.9
Bokaro	21.6	2.9	3.5	Mahasamund	20.7	2.7	3.1	<b>Gujarat</b>	<b>20.1</b>	<b>2.4</b>	<b>2.6</b>
Lohardaga	27.1	3.9	4.6	Dhantari	20.0	2.5	3.3	Kachchh	24.9	3.1	
Purbi Singhbhum	19.5	2.4	2.7	Uttar Bastar Kanker	20.9	2.6	3.2	Banaskantha	26.5	3.3	3.9
Palamu	27.5	3.9	4.9	Bastar	24.6	3.1	3.5	Patan	21.8	2.6	3.1
Latehar	31.1	4.4	4.9	Narayanpur	26.7	3.3	3.5	Mahesana	17.7	2.0	2.5
Hazaribagh	25.7	3.5	4.1	Dakshin Bastar Dantewada	23.1	2.8	3.6	Sabarkantha	22.6	2.7	2.9
Ramgarh	21.6	3.0	4.1	Bijapur	25.0	3.0	3.6	Gandhinagar	18.4	2.0	2.4
Dumka	25.8	3.4	3.6	<b>Madhya Pradesh</b>	<b>24.3</b>	<b>3.2</b>	<b>3.9</b>	Ahmedabad	17.9	2.0	2.3
Jamtara	26.1	3.4	3.6	Sheopur	28.1	3.8	4.6	Surendranagar	21.4	2.7	3.4
Ranchi	21.5	2.8	3.5	Morena	25.5	3.6	4.2	Rajkot	17.9	2.1	1.9
Khunti	25.3	3.3	3.5	Bhind	23.6	3.3	4.0	Jamnagar	18.4	2.2	2.4
Gumla	26.9	3.8	4.0	Gwalior	20.5	2.6	3.3	Porbandar	16.8	2.0	2.5
Simdega	24.5	3.5	4.0	Datia	23.1	3.1	4.0	Junagadh	17.2	2.1	2.6
Pashchimi Singhbhum	27.5	3.6	3.5	Shivpuri	28.0	3.8	5.1	Amreli	17.1	2.2	2.5
Saraikela-Kharsawan	23.7	3.1	3.5	Tikamgarh	26.2	3.4	4.5	Bhavnagar	20.4	2.6	3.0
<b>Odisha</b>	<b>19.7</b>	<b>2.4</b>	<b>2.8</b>	Chhatarpur	26.7	3.8	5.0	Anand	18.8	2.2	2.4
Bargarh	16.8	2.1	2.5	Panna	26.9	3.6	4.7	Kheda	19.5	2.3	2.6
Jharsuguda	16.9	2.1	2.6	Sagar	24.8	3.3	4.2	Panchmahal	23.9	3.1	3.5
Sambalpur	17.7	2.1	2.6	Damoh	25.1	3.3	4.0	Dohad	32.4	4.2	4.3
Debagarh	20.5	2.5	3.1	Satna	24.8	3.3	4.3	Vadodara	18.3	2.1	2.4
Sundargarh	19.3	2.3	2.7	Rewa	24.3	3.2	4.4	Narmada	20.7	2.6	2.8
Kendujhar	23.1	2.8	3.0	Umaria	26.2	3.4	4.0	Bharuch	17.5	2.1	2.5
Mayurbhanj	21.4	2.7	3.0	Neemuch	20.8	2.5	3.3	The Dangs	28.5	3.6	3.8
Baleswar	19.1	2.3	2.9	Mandsaur	21.1	2.6	3.5	Navsari	15.1	1.8	2.0
Bhadrak	18.9	2.3	2.9	Ratlam	24.3	3.1	3.7	Valsad	19.3	2.2	2.5
Kendrapara	17.0	2.0	2.6	Ujjain	22.0	2.8	3.5	Surat	19.8	2.2	2.5
Jagatsinghapur	14.3	1.7	2.3	Shajapur	23.0	3.0	4.1	Tapi	16.3	1.8	2.5
Cuttack	15.4	1.8	2.4	Dewas	23.5	3.0	3.8	<b>Daman and Diu</b>	<b>18.3</b>	<b>2.1</b>	<b>2.5</b>
Jajapur	18.1	2.2	2.6	Dhar	26.9	3.5	4.1	Diu	19.1	2.1	2.9
Dhenkanal	18.1	2.1	2.7	Indore	20.8	2.4	2.9	Daman	18.0	2.2	2.3
Anugul	18.5	2.2	2.9	West Nimar	26.3	3.5	4.3	<b>Dadra and Nagar Haveli</b>	<b>25.1</b>	<b>3.1</b>	<b>3.6</b>
Nayagarh	17.2	2.1	2.5	Barwani	32.8	4.4	5.1	<b>Maharashtra</b>	<b>17.9</b>	<b>2.2</b>	<b>2.6</b>
Khordha	16.2	1.9	2.4	Rajgarh	24.7	3.3	4.2	Nandurbar	22.9	2.9	3.3
Puri	15.8	1.8	2.4	Vidisha	27.0	3.7	4.5	Dhule	20.3	2.6	2.7
Ganjam	18.4	2.2	2.9	Bhopal	20.7	2.4	3.0	Jalgaon	19.0	2.4	2.7
Gajapati	24.1	2.9	3.3	Sehore	24.9	3.4	4.6	Buldana	19.7	2.6	3.0
Kandhamal	24.7	3.0	3.6	Raisen	25.5	3.5	4.5	Akola	17.5	2.2	2.7
Baudh	22.6	2.8	3.2	Betul	21.5	2.9	3.9	Washim	19.4	2.5	3.0
Subarnapur	19.2	2.5	2.8	Harda	24.0	3.3	4.2	Amravati	16.2	2.0	2.5
Balangir	21.2	2.7	2.8	Hoshangabad	21.4	2.9	3.7	Wardha	14.6	1.7	2.3
Nuapada	23.1	2.9	3.0	Katni	24.7	3.1	3.6	Nagpur	16.1	1.8	2.2
Kalahandi	23.0	2.8	3.2	Jabalpur	19.2	2.3	2.9	Bhandara	15.7	1.9	2.4
Rayagada	25.1	2.9	3.3	Narsimhapur	21.1	2.7	3.5	Gondiya	16.1	1.9	2.5
Nabarangapur	28.6	3.5	3.4	Dindori	25.5	3.2	3.2	Gadchiroli	17.0	2.0	2.9
Koraput	26.2	3.0	3.1	Mandla	22.7	2.9	3.4	Chandrapur	15.7	1.8	2.4
Malkangiri	30.0	3.5	3.3	Chhindwara	20.9	2.8	3.5	Yavatmal	18.0	2.2	2.9
<b>Chhattisgarh</b>	<b>23.2</b>	<b>3.0</b>	<b>3.6</b>	Seoni	21.1	2.7	3.4	Nanded	20.9	2.8	3.3
Korea	22.7	3.0	3.4	Balaghat	20.0	2.5	3.1	Hingoli	21.7	2.9	3.4
Surguja	25.6	3.4	3.9	Guna	28.0	3.8	4.6	Parbhani	21.8	3.0	3.3
Jashpur	22.7	3.1	3.3	Ashoknagar	27.6	3.7	4.6	Jalna	23.1	3.2	3.2

(Continued)

**Appendix: Crude Birth Rates (CBR) and Total Fertility Rates (TFR), Indian Districts and States (2001 and 2011 Censuses) (Continued)**

Name	CBR 2011	TFR 2011	TFR 2001	Name	CBR 2011	TFR 2011	TFR 2001	Name	CBR 2011	TFR 2011	TFR 2001
Aurangabad	22.7	2.8	3.1	Bidar	20.0	2.7	3.4	Kollam	13.2	1.4	1.6
Nashik	21.1	2.6	3.1	Raichur	22.5	2.9	3.3	Thiruvananthapuram	12.9	1.4	1.6
Thane	18.7	2.1	2.6	Koppal	22.8	2.9	3.4	<b>Tamil Nadu</b>	<b>14.9</b>	<b>1.6</b>	<b>1.8</b>
Mumbai Suburban	14.2	1.6	2.0	Gadag	18.8	2.3	2.6	Thiruvallur	16.4	1.7	1.9
Mumbai	12.0	1.4	1.6	Dharwad	18.0	2.1	2.5	Chennai	13.6	1.4	1.3
Raigarh	17.3	2.0	2.3	Uttara Kannada	15.5	1.7	2.2	Kancheepuram	16.5	1.7	1.9
Pune	18.2	2.0	2.3	Haveri	18.6	2.2	2.6	Vellore	16.1	1.8	1.9
Ahmadnagar	18.2	2.3	2.7	Bellary	22.6	2.7	3.1	Tiruvannamalai	16.2	1.9	2.1
Bid	21.0	3.0	3.2	Chitradurga	17.0	2.0	2.3	Viluppuram	17.2	2.0	2.1
Latur	19.7	2.6	3.1	Davanagere	16.6	1.9	2.4	Salem	14.6	1.6	1.9
Osmanabad	18.5	2.6	3.0	Shimoga	15.4	1.7	2.0	Namakkal	12.9	1.5	1.7
Solapur	18.6	2.4	2.7	Udupi	12.8	1.2	1.5	Erode	12.4	1.4	1.6
Satara	15.4	1.9	2.3	Chikmagalur	13.4	1.4	1.9	The Nilgiris	12.3	1.3	1.6
Ratnagiri	13.4	1.6	2.1	Tumkur	14.6	1.7	2.2	Dindigul	14.4	1.6	1.8
Sindhudurg	11.8	1.4	1.8	Bangalore	17.5	1.7	1.9	Karur	14.3	1.6	1.8
Kolhapur	15.5	1.8	2.3	Mandya	13.7	1.5	1.9	Tiruchirappalli	14.4	1.6	1.8
Sangli	15.8	1.9	2.3	Hassan	13.2	1.5	1.9	Perambalur	15.5	1.8	2.0
<b>Andhra Pradesh</b>	<b>16.2</b>	<b>1.8</b>	<b>2.3</b>	Dakshina Kannada	14.8	1.5	1.7	Ariyalur	15.6	1.8	2.1
Adilabad	17.1	2.0	2.7	Kodagu	14.1	1.5	2.0	Cuddalore	15.6	1.7	2.1
Nizamabad	16.5	1.8	2.5	Mysore	15.2	1.7	2.1	Nagapattinam	14.6	1.6	1.9
Karimnagar	13.1	1.5	2.2	Chamarajanagar	14.5	1.6	2.0	Thiruvarur	13.7	1.5	1.8
Medak	18.3	2.2	2.9	Gulbarga	22.1	3.0	3.5	Thanjavur	14.1	1.5	1.8
Hyderabad	16.0	1.6	1.9	Yadgir	25.9	3.5	3.5	Pudukkottai	16.0	1.7	2.0
Rangareddy	19.6	2.0	2.6	Kolar	16.5	1.9	2.5	Sivaganga	14.9	1.6	1.9
Mahbubnagar	20.4	2.4	3.1	Chikkaballapura	15.5	1.8	2.5	Madurai	15.0	1.6	1.8
Nalgonda	16.1	1.8	2.6	Bangalore Rural	16.3	1.9	2.2	Theni	14.1	1.6	1.8
Warangal	14.4	1.6	2.5	Ramanagara	14.3	1.6	2.2	Virudhunagar	14.6	1.6	1.9
Khammam	15.0	1.6	2.3	<b>Goa</b>	<b>14.3</b>	<b>1.5</b>	<b>1.8</b>	Ramanathapuram	14.7	1.6	2.1
Srikakulam	15.6	1.8	2.4	North Goa	13.7	1.5	1.7	Thoothukkudi	15.0	1.6	1.8
Vizianagaram	15.9	1.8	2.5	South Goa	15.0	1.6	1.8	Tirunelveli	15.1	1.7	1.9
Visakhapatnam	16.1	1.7	2.2	<b>Lakshadweep</b>	<b>16.6</b>	<b>2.1</b>	<b>2.7</b>	Kanyakumari	13.2	1.4	1.6
East Godavari	14.7	1.6	2.1	<b>Kerala</b>	<b>14.7</b>	<b>1.6</b>	<b>1.7</b>	Dharmapuri	17.0	1.9	2.6
West Godavari	14.2	1.6	2.0	Kasargod	17.1	1.8	1.9	Krishnagiri	17.3	2.0	2.6
Krishna	13.8	1.5	1.9	Kannur	15.4	1.6	1.7	Coimbatore	13.5	1.4	1.7
Guntur	14.7	1.6	1.9	Wayanad	16.3	1.7	2.0	Tiruppur	14.6	1.6	1.6
Prakasam	16.8	1.9	2.3	Kozhikode	15.6	1.6	1.7	Puducherry	16.4	1.7	1.8
Sri Potti Sriramulu Nellore	15.3	1.7	2.0	Malappuram	20.4	2.2	2.4	Yanam	19.7	2.0	2.5
YSR	17.1	1.9	2.3	Palakkad	15.3	1.6	1.8	<b>Puducherry</b>	<b>16.2</b>	<b>1.6</b>	<b>1.8</b>
Kurnool	19.0	2.2	3.0	Thrissur	13.7	1.5	1.6	Mahe	16.7	1.6	1.5
Anantapur	16.9	1.9	2.4	Ernakulam	13.0	1.5	1.5	Karaikal	16.7	1.7	1.9
Chittoor	16.0	1.8	2.2	Idukki	13.0	1.4	1.6	<b>Andaman and</b>			
<b>Karnataka</b>	<b>17.8</b>	<b>2.0</b>	<b>2.4</b>	Kottayam	12.4	1.4	1.6	<b>Nicobar Islands</b>	<b>15.7</b>	<b>1.7</b>	<b>2.3</b>
Belgaum	19.9	2.4	2.7	Alappuzha	12.7	1.4	1.5	Nicobars	16.2	1.8	2.2
Bagalkot	22.4	2.7	3.1	Pathanamthitta	11.0	1.3	1.5	North and Middle Andaman	16.3	1.7	2.3
Bijapur	22.6	3.0	3.0					South Andaman	15.4	1.6	2.3