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DEMOGRAPHIC PROJECTIONS BY RELIGION AND EDUCATION IN INDIA¹

INTRODUCTION

In the past years demographic methods have been applied to global and national estimates and projections of religion, both globally and for individual nations across the world (PEW 2011, Kaufmann et al. 2012, Goujon et al. 2007, Stonawski et al. 2014, 2015). By factoring in religion-specific fertility differentials and changes in age structure, one can more accurately forecast changes in the country's religious composition than is possible through a simple extrapolation. However, members of religious groups tend to differ in numerous other socio-economic characteristics and observed fertility differentials may be influenced for example more by variation in education than a result of belonging to a particular religious group. Education has been consistently found to influence fertility (Bongaarts 2003, Jejeebhoy 1995, Fuchs and Goujon 2014) as well as both child and adult mortality (Kravdal 2004, Albouy and Lequien

¹ We would like to thank Markus Springer for creating the maps and Matthew Cantele for the editing. We acknowledge support by a Starting Grant of the European Research Council, Grant Agreement 241003-COHORT.

2009, Subramanian et al. 2006). The relation between education and fertility is negative, and stronger than for other measures of socio-economic development, including income or occupational status (Skirbekk 2008). In this paper we argue that incorporating education as an additional dimension of the multi-state projection model can further improve projections of country's future religious composition.

We illustrate the relevance of education for projecting changes of religious landscape in the case of India. This religiously diverse country may become the most populous nation on earth in the coming 15 years (UN 2013), but its longer term demographic development remains highly uncertain. On the one hand, it has experienced rapid economic growth, high levels of urbanization, increases in literacy and strong fertility decline. On the other hand, in spite of rapid societal change a large share of India's population remains rural and conservative regarding cultural norms and customs, with levels of formal schooling increasing relatively slowly compared to other middle income countries (Dyson et al. 2005, Nachane 2011). Religion is central in the identity and daily lives of many Indians – only 0.1% of the Indian population in the 2001 census did not state a religion. This is highly relevant in the context of India as religion is an important determinant of demographic behaviour for many (Joseph 2013, Kumar 2012).

India is also a country of great social inequality and regional disparities. Gaps in education and differences in family size are significant across the subcontinent's plentiful religious groups. Hindus are by far the most numerous and amount to 80% of India's population in 2001. However, Muslims and some other smaller religious have higher fertility than Hindus. One can expect that India's religious composition will be changing due to the distinctly different demographic behaviour of various religions. Will India become a more religiously diverse country by mid-21st century? In this paper we focus on this question. We look at the possible future religious compositions of India's population depending on demographic and educational change. We investigate several alternative scenarios of future change in India's religious composition derived from the significant educational differentials we find in the country.

In the next section we elaborate on the relevance of including an educational dimension for modelling religious change and explain the multistate model we apply to model demographic, educational and religious change simultaneously. Before moving to the projection results, we look at religious and educational disparities across Indian states. We conclude with presenting projections of the religious composition in India by education until 2050.

RELIGIOSITY, EDUCATION AND FERTILITY

For as long as it has been measured, education has been found to generally be negatively associated with fertility (in contrast to other indicators such as income) (Akmam 2002, Abou-Gamrah 1982, Abbasi-Shavazi et al. 2009, Skirbekk 2008).

Today, education is one of the most important drivers of differential fertility – longer education tends to imply later marriage, later onset of childbearing, and a smaller family size – with stronger effects in poorer countries. Further, religious differentials in developing countries have been explained to a large extent by variation in education levels (Heaton 2011).

Contraceptive use differs by religious groups, and it has for a long period (Bhat and Zavier 2005). Among married women, Hindus saw their current use of contraception remain lower, for example contraceptive use rose from 14% to 49% in the years 1970–1999, while for Muslims it increased from 9% to 37% over the same period. Differences in education and other socioeconomic traits can explain much of the differences observed in contraception and fertility between religious groups (Joseph 2013, Rocca et al. 2013). Yet, religion can have independent effects on fertility (Rocca et al. 2013).

Education can also explain differences in demographic behaviour by religious groups. Indian education levels differ significantly between religious groups (Jeffery and Jeffery 1997). In Dhanbad district, Jharkhand, data collected through a household survey suggest that the number of children is greater among Muslims than Hindus, but at a higher educational status the difference narrows considerably. Thus, education seems to have a fertility-converging effect, reducing the fertility differences between Hindus and Muslims (Siddiqui and Jamal 2012).

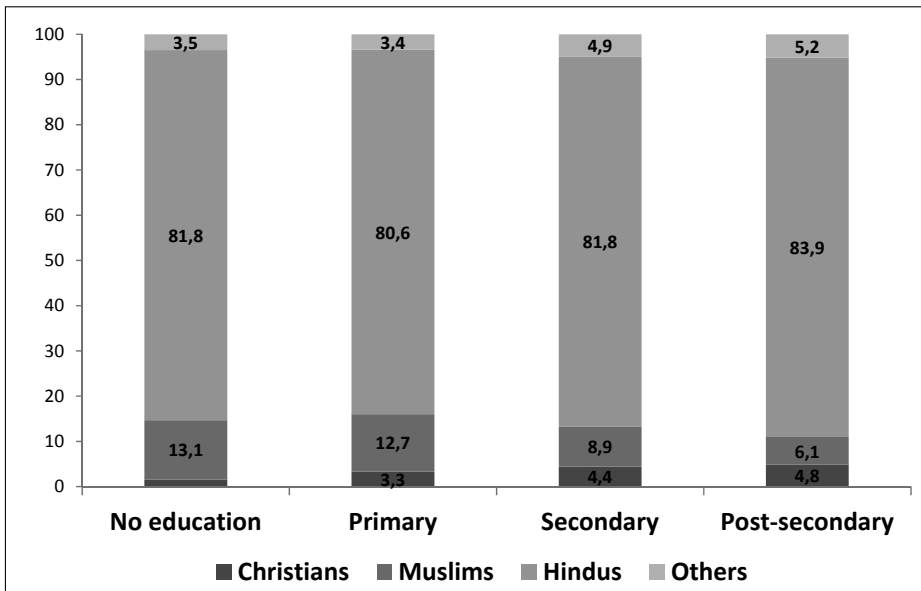
Education has also been found to affect religiosity. In Turkey, compulsory school reforms implemented in 1998 – individuals born after a specific date had to go to school for 8 years while those born earlier could drop out after 5 – led to lowered religiosity in terms of wearing a headscarf, attending Qur’anic courses and regular praying (Gulesci and Meyersson 2012). The marginal effect of an extra year of schooling in Canada has been found to relate to a 4 percent drop in religiosity (Hungerman 2011). Education and religion are both important individual and societal characteristics. Further, they may also be important for determining fertility levels and group-specific as well as overall population growth. India is home to numerous religious traditions. Hinduism and Buddhism, two of the largest world religions were born in India as well as many other religions that find their roots there (including Jainism and Sikhism). India has the largest community of Hindus and the third largest community of Muslims globally (PEW 2012). In 2001², there were 81.7% of Hindus, 11.6% of Muslims, 2.9% of Christians, and 3.9% of others among the Indian population at age 25 and older³.

² Population composition by religion and/or education from the 2011 census was not available by 2015.

³ We choose to focus on individuals aged 25 and above. This is done for the following reasons: a) most religious (and other types of attitudinal or value-orientation related change) takes place at younger ages, typically around the teens or early twenties (Skirbekk et al. 2010, Ryder 1980, Goujon et al. 2007); b) by avoiding focusing on children and early adults we also avoid controversies surrounding whether children should automatically be assigned the religion of their parents or one should wait until early adulthood. c) as we are focused on education, we would like to present data for an age where most

In spite of increases in literacy and education, the Indian population is still lagging behind China and the “tiger economies” of South-East Asia. Mean years of schooling (MYS) among population at age 25 and above equalled 7.9 years in 2001. Christians are the best-educated religious group with 12.2% of people with post-secondary education and 35.2% with secondary education (Table 1). Thus, their share of the total post-secondary educated population is disproportionately larger than their representation within the general population. The proportion of Christians among post-secondary educated was 4.8% in 2001 but if the shares had corresponded to the proportional distribution of the religious groups, the Christian share would have been 3.9%. Among people with no education a mere 1.6% were Christians (Figure 1). The lowest educated group is Muslims; only 3.8% had post-secondary education and 17.3% attained secondary level. Muslims (11.6% of the total population) were overrepresented among those with no formal education (13.1%) and among those with primary education (12.7%). Among Hindus 7.4% were post-secondary educated and 22.6% secondary educated. School enrolment rates suggest that religion-specific differences are likely to persist in the future. In 2005 the General Enrolment Rate (GER) in higher Indian education was 16.7% for Christians, 11.9% for Hindus and a mere 6.8% for Muslims (University Grants Commission 2008). Gender gaps in education are strongly pronounced as well, in particular among Muslims and Hindus.

Figure 1. Religious composition of population 25 and older by education in India in 2001, in %



Source: own calculations based on Indian census 2001.

have completed their education – we therefore choose the age of 25 as many still are in their education in their early twenties.

Table 1. Religious and educational* composition in India in 2001

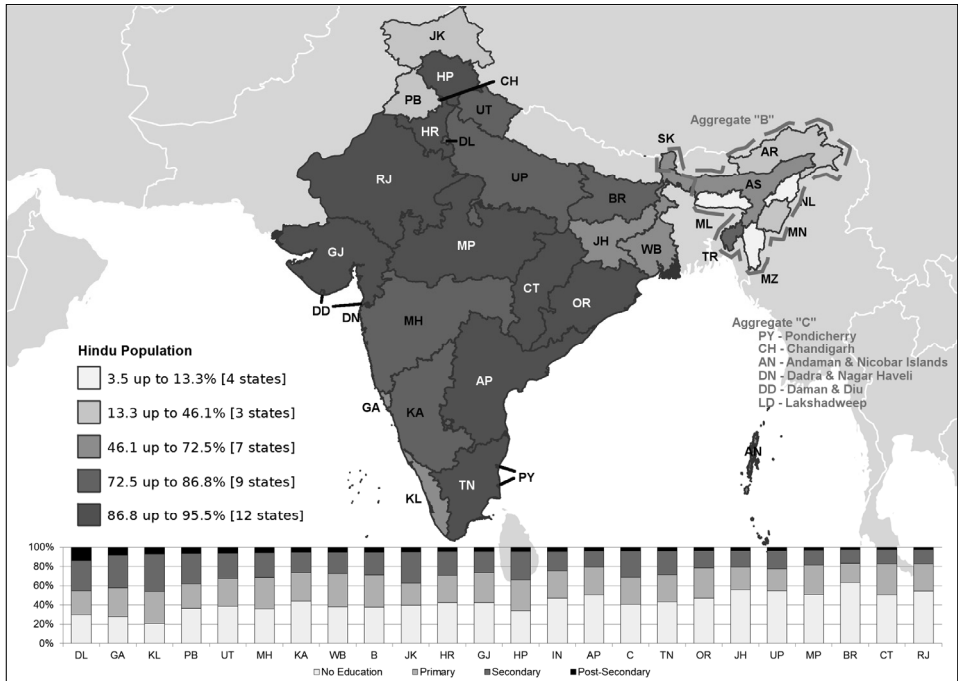
Gender	Age	Christians				Muslims				Hindus				Others				Total population [in thou]				
		E1	E2	E3	E4	Total	E1	E2	E3	E4	Total	E1	E2	E3	E4	Total						
Males	25+	20.6	27.1	38.6	13.7	2.8	42.0	28.5	23.8	5.6	11.6	33.4	25.9	30.4	10.3	81.8	31.7	20.6	35.8	11.9	3.9	248,723
	25-44	17.6	22.3	43.8	16.2	2.7	37.9	28.1	27.5	6.6	12.0	27.9	24.1	35.8	12.2	81.6	24.7	19.7	41.9	13.7	3.7	151,853
	45-64	23.3	31.6	34.1	11.0	2.9	46.6	29.5	19.3	4.5	11.0	38.7	28.4	24.4	8.4	82.1	36.5	21.9	30.5	11.0	3.9	75,194
	65+	30.6	42.0	20.7	6.6	2.9	58.6	28.7	10.8	2.0	10.3	53.4	29.2	13.6	3.8	82.0	56.6	22.2	17.0	4.2	4.8	21,677
Females	25+	32.1	25.5	31.8	10.7	3.0	67.1	20.8	10.3	1.8	11.5	63.1	18.4	14.3	4.2	81.6	54.1	18.4	20.4	7.0	3.9	233,439
	25-44	26.9	20.9	38.4	13.8	2.9	60.6	23.1	13.8	2.5	12.1	55.6	20.0	18.7	5.7	81.2	44.1	19.5	27.1	9.3	3.8	138,776
	45-64	36.3	30.2	26.5	7.1	3.1	74.7	18.9	5.5	0.9	10.9	70.4	17.7	9.4	2.5	82.1	61.7	19.1	14.1	5.0	4.0	71,758
	65+	48.0	36.5	11.7	3.8	3.1	88.3	10.0	1.5	0.2	10.0	85.2	11.3	3.0	0.6	82.3	83.9	11.4	3.9	0.8	4.6	22,904
Total	25+	26.4	26.3	35.2	12.2	2.9	54.1	24.8	17.3	3.8	11.6	47.8	22.3	22.6	7.4	81.7	42.6	19.6	28.3	9.5	3.9	482,162
	25-44	22.2	21.6	41.1	15.0	2.8	48.8	25.7	20.9	4.6	12.1	41.1	22.1	27.6	9.1	81.4	34.0	19.6	34.8	11.6	3.8	290,629
	45-64	29.8	30.9	30.3	9.0	3.0	60.2	24.4	12.6	2.8	11.0	54.2	23.2	17.1	5.5	82.1	48.9	20.5	22.5	8.1	3.9	146,952
	65+	39.9	39.1	15.9	5.1	3.0	73.6	19.2	6.1	1.1	10.2	69.8	20.0	8.1	2.1	82.1	70.4	16.8	10.4	2.5	4.7	44,581

* Educational categories: E1 – no education, E2 – Primary, E3 – Secondary, E4 – Post-secondary.
Source: own calculations based on Indian census 2001.

In a country the size of India one can expect significant regional variation in socio-cultural characteristics. This turns out to be true for both religion and education. Educational differences arise due to different state policies. We can expect higher educational attainments in the southern compared to the less developed northern states (Suryanarayana et al. 2011).

Hindus are a clear majority in most large Indian states while north-eastern, northern states and Kerala are religiously diverse (Figure 2). In five states we find more than 90% of Hindus (Himachal Pradesh [HP: 95.4%], Chhattisgarh [CT: 94.7%], Orissa [OR: 94.4%], Dadra and Nagar Haveli [DN: 93.5%] and Madhya Pradesh [MP: 91.1%]). The states and union territories with the lowest shares are Nagaland (NL: 7.7%), Lakshadweep (LD: 3.7%) and Mizoram (MZ: 3.6%). As expected, we find the highest share of uneducated Hindus in Bihar (BR: 63.5%) and a very low share of adult population with at least lower secondary education in other northern states (Uttar Pradesh, Rajasthan, Madhya Pradesh). Unsurprisingly, the states with the best-educated Hindu population (with less than 25% uneducated among 25 year and more olds and more than 7% with post-secondary education) are Delhi (DL:

Figure 2. Proportion and educational composition of Hindu population (aged 25 and more) by region in India in 2001*



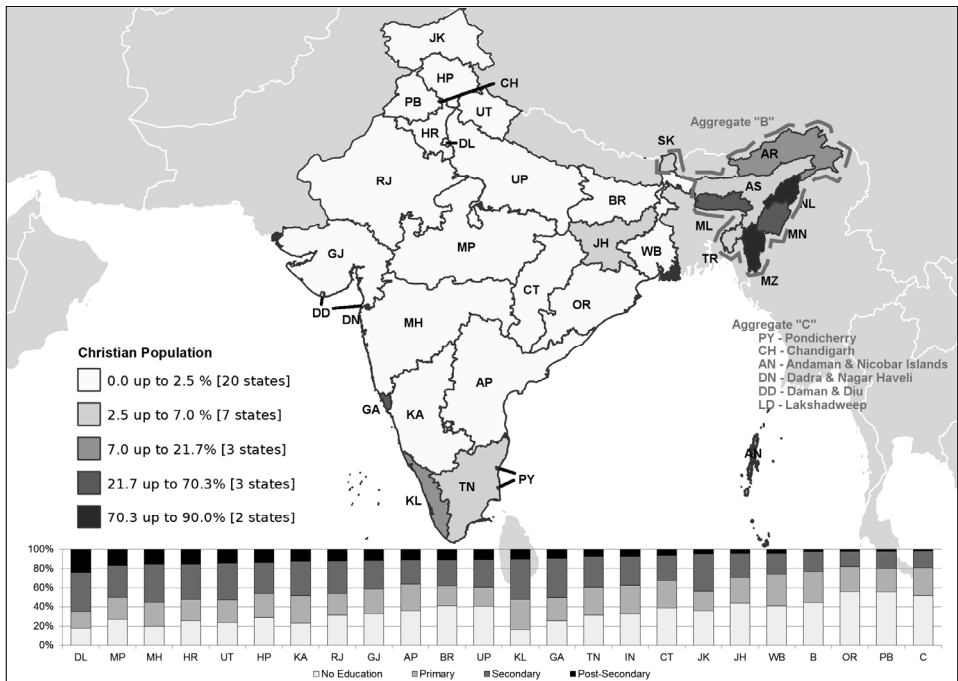
* State abbreviations are described in Appendix 2.

Source: own calculations based on Indian Census 2001, cartography prepared by Markus Springer.

29.6% / 13.7%), Goa (GA: 28.1% / 8.4%) and Kerala (KL: 20.5% / 7.0%). Further more, Kerala has the lowest share of non-educated Hindus in India. The states with less than 3% of population with post-secondary education are Sikkim (SK: 3.0%), Bihar (BR: 2.8%), Chhattisgarh (2.7%) and Rajasthan (RJ: 2.6%).

By contrast, India's Christians are on average much better educated and a higher share of them than of any other religious group had post-secondary education. Christians in India were mainly located in the Northeastern states (here labelled as "Aggregate B") and in the South, with the highest shares in Nagaland (NL: 90.0%), Mizoram (MZ: 87.0%), Meghalaya (ML: 70.3%) and Manipur (MN: 43.2%) (Figure 3). 24 out of 35 states and union territories had less than 5% Christian population. In 13 spatial units located in Central, Western and Northern India the share was even less than 1%. Although marginal in numbers, more than 15% Christians residing in Delhi, Maharashtra and Madhya Pradesh, Haryana and Haryana attained post-secondary education (DL: 24.1%, MP: 16.8%, HR: 15.6%) and more than 50% had at least secondary education. The case of Madhya Pradesh shows that minority religious groups can be surprisingly successful in terms of human capital

Figure 3. Proportion and educational composition of Christian population (aged 25 and more) by region* in India in 2001



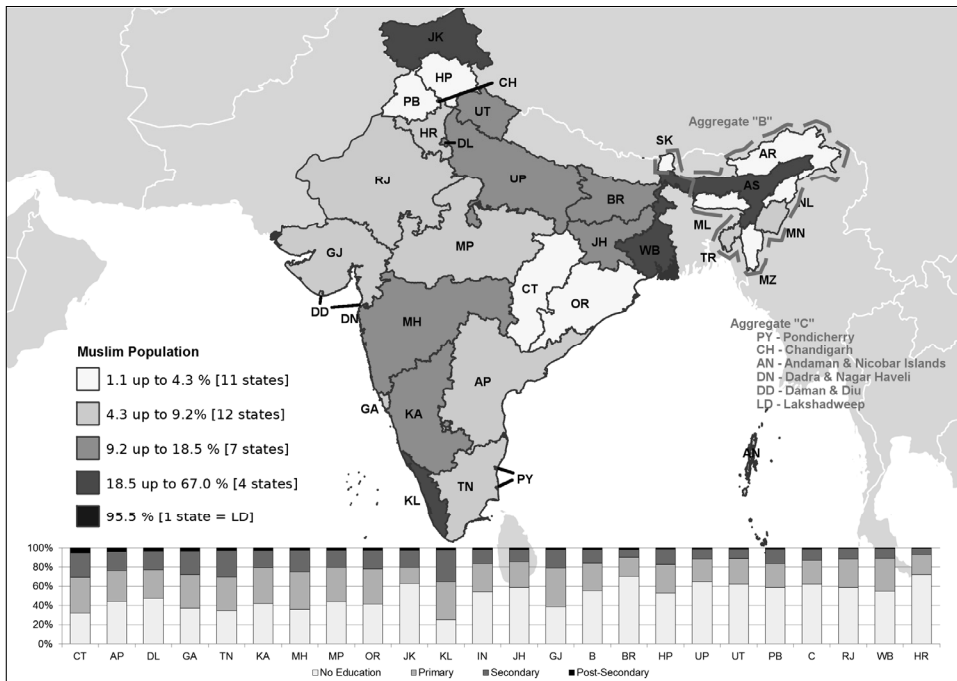
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accumulation even in contexts where members of majority religions perform poorly. However, in Northeastern states where Christians form a higher share of population than elsewhere (the B cluster in the map), they are less educated than their counterparts in other Indian states but also less educated than Hindus resident in the same states.

Muslims, India's largest religious minority group, are located nearly across the whole country. Their proportion is especially high in the Northern and Southwestern states, with the highest shares in Lakshadweep (LD: 95.5%), Jammu and Kashmir (JK: 67.0%), Assam (AS: 30.9%), West Bengal (WB: 25.2%) and Uttar Pradesh (UP: 24.7%) (Figure 4). In general, Muslims have relatively low education and in 5 states the share of uneducated exceeds 60% of the population aged 25 and more (Bihar, Uttar Pradesh, Haryana, Jammu and Kashmir, Uttaranchal). In Kerala, where educational attainment is higher than in most other states, nearly 40% of Muslims had at least secondary education – a similar share to Kerala's Hindus. In spite of generally worse educational characteristics, Muslims are better educated than Hindus in 5 states: Arunachal Pradesh, Tamil Nadu, Madhya Pradesh, Orissa and Gujarat. In

Figure 4. Proportion and educational composition of Muslim population (aged 25 and more) by region* in India in 2001



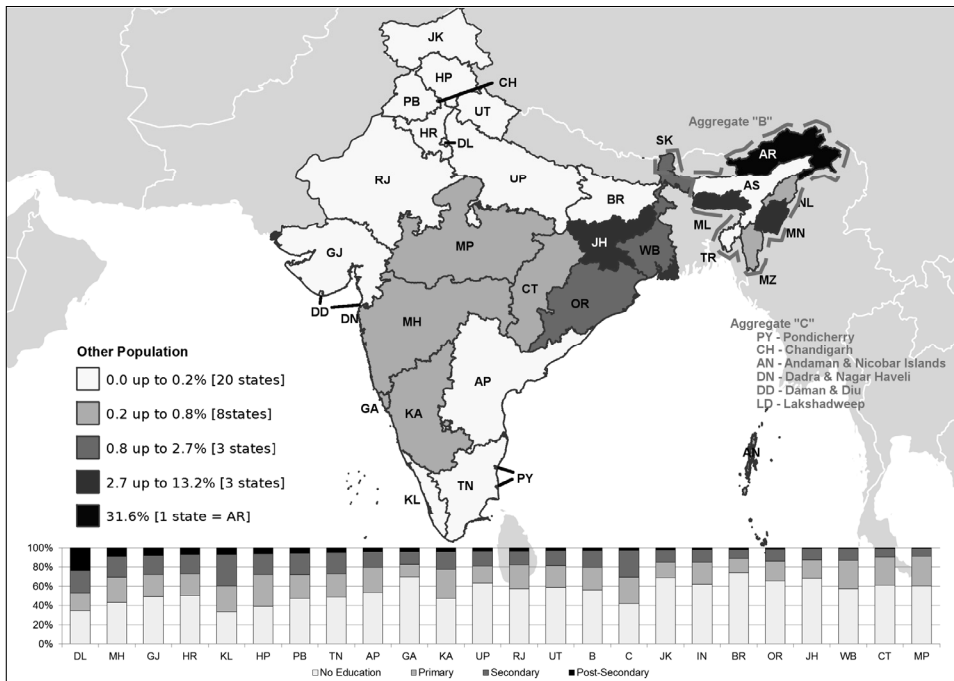
* State abbreviations are described in Appendix 2.

Source: own calculations based on Indian Census 2001, cartography prepared by Markus Springer.

all these states fewer Muslims than Hindus have no formal education and the share of those with primary education is higher. Except for Gujarat, the share of those with secondary education is about equal to Hindus and the share of post-secondary educated is generally lower. In Gujarat the educational advantage of Muslims in primary education is not translated into advantage at secondary level.

The share of confessors of other religions is the highest in the Northeastern states Arunachal Pradesh (AR: 31.6%), Jharkhand (JH: 13.1%), Meghalaya (ML: 11.8%) and Manipur (MN: 10.9%) (Figure 5). The share of other religious groups is high in states with a large Buddhist population while in the north-east and east indigenous groups with local folk religions comprise a large part of the residual group. The spatially small Daman and Diu (DD: 24.0%), Delhi (DL: 23.7%), Chandigarh (CH: 15.6%) and Pondicherry (PY: 15.5%) have the highest share of post-secondary educated population in the category of other religions. The states with lowest share of the highest educational category tend to be located in Central India, like Madhya Pradesh (MP: 0.7%), Chhattisgarh (CT: 0.8%), West Bengal (WB: 0.9%) and Jharkhand (JH: 1.0%).

Figure 5. Proportion and educational composition of confessors of other religions (aged 25 and more) in India by region* in 2001



* State abbreviations are described in Appendix 2.

Source: own calculations based on Indian Census 2001, cartography prepared by Markus Springer.

PROJECTIONS BY RELIGION AND EDUCATION

DATA AND METHODS

In this study, we carry out multi-state population projections by religion and education in India for the period 2000–2050. Multistate projection is a demographic methodology which can be used in projections of populations disaggregated by status – individual characteristics that can change over time – such as educational attainment, marital status, or religion and level of religiosity (for more details on this method see Philipov and Rodgers 1981, Hackett et al. 2014, Rogers 1975, 1995).

First, we estimate the base population for the year 2000 by age, sex, religion, and education using the 2001 Indian census. We distinguish four religious groups: *Christians, Muslims, Hindus* and *Others*, and four educational groups: *No education, Primary, Secondary* and *Post-secondary* (Table 2).

Table 2. Recoding of educational attainment categories

Category	Abbreviation	ISCED 1997 level
No education	E1	0
Primary	E2	1
Secondary	E3	2 and 3
Post-secondary	E4	4, 5 and 6

Differentials in childbearing levels and patterns by religion and education are then calculated using data from the 2005–2006 Demographic and Health Survey (DHS). Then we estimate international migration flows by age, sex, religion and education. We include mechanism of intergenerational transmission of religion between mothers and children that allows cohort effects to be included in the projection model. We also take into consideration trajectories of educational change during individual life span which are religion-specific. We do not include religious switching into the projection model because of empirical evidence suggest that changes of religious affiliation are very marginal in India.

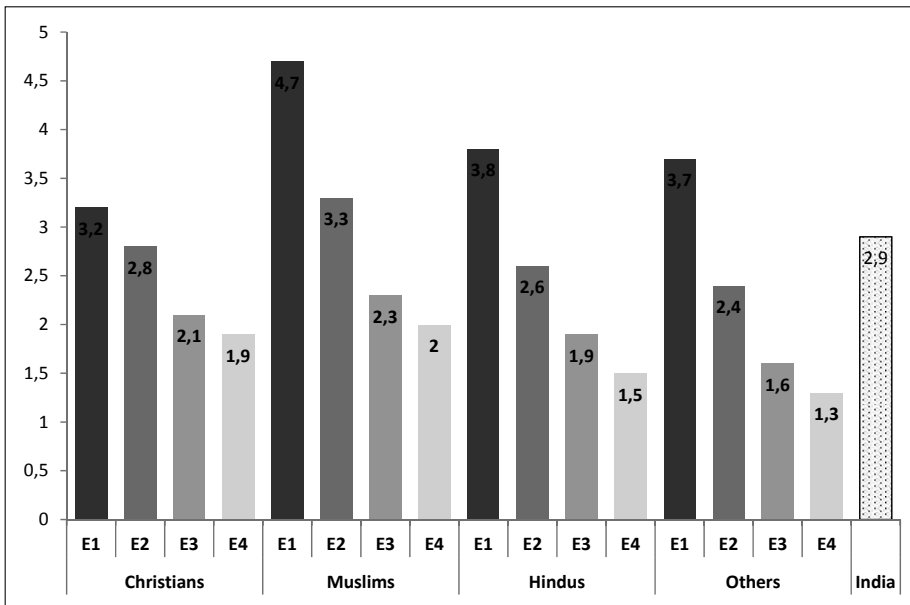
PROJECTION ASSUMPTIONS AND SCENARIOS

Our aim is to study possible consequences of change in education and fertility on the future religious composition of India. We present four scenarios that illustrate the effect of education improvement, changing fertility differentials and stall in education and/or fertility.

As we have argued in the previous sections, female education is a crucial determinant of fertility outcomes. However, the proportion of females with at least secondary education in India was only around 20%. According to the UN, the TFR for India was 2.5 in 2010, but fertility is much lower for better-educated females. According to DHS 2005–2006, the TFR of women with no formal education was nearly twice the rate (3.55) of those who had at least 12 years of schooling (completed upper secondary education and higher, TFR 1.80).

Fertility differentials by religion and education are pronounced. TFRs by religion and education for the baseline period for India are shown in Figure 6. Baseline fertility rates were estimated by applying the differentials by education and religion to TFR for the 2000 UN estimates. We find the expected education gradient for all religious groups – women with no formal education have the highest fertility while highly educated the lowest. Differentials are the most pronounced for Muslims, who have the highest overall fertility (3.4 children), and the least pronounced for Christians, who have a lower overall TFR (2.3 children). Fertility rates of women with a minimum of secondary education are well below the country average for both Muslims and Hindus. Other religions are a mixed group that includes religious groups with sub-replacement fertility (Buddhists and Sikhs) as well as high-fertility groups of Folk-religionists and Jains. Fertility differentials are greatest among the less educated.

Figure 6. Total fertility rate by religion and education* in India in 2000–2005

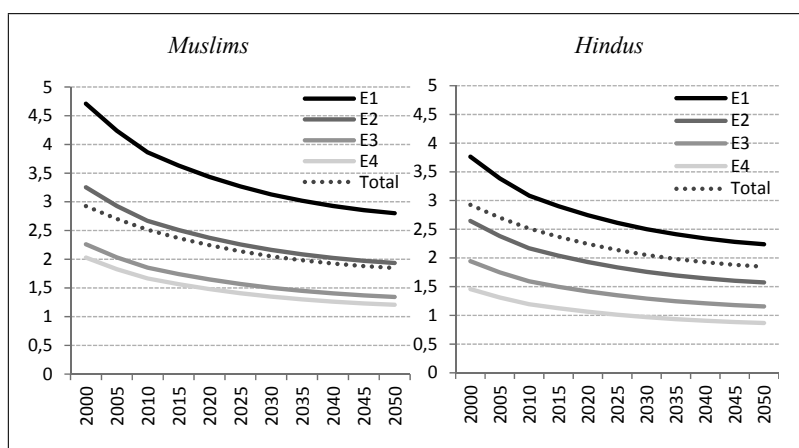


* E1 – no education, E2 – Primary education (some primary or completed primary), E3 – Secondary education (completed lower or higher secondary), E4 – Postsecondary (above upper secondary).

Source: own calculations based on DHS 2005-6 and UN 2011.

We consider three possible **trajectories of future fertility** defined with respect to both absolute and relative fertility differentials across the religious and educational groups. *Constant fertility* (F_c) represents the simplest scenario where TFR is “frozen” as of 2000. This means that both the relative differentials and education- and-religion-specific TFRs stay the same for the whole projection period. The *constant relative differentials* scenario (F_r) shows a case where overall TFR follows the UN medium scenario (UN 2011), but the relative differentials between the religious and educational groups remain (Figure 7). Finally the *fertility convergence* (F_g) is the case where all fertility differentials by religion and education converge by 2060 while overall TFR of India follows the UN medium scenario (UN 2013). The assumed convergence of fertility differentials results in a fertility rebound as the convergence concerns declining TFRs for low educated, and increasing fertility for highly educated. The effect is illustrated in Figure 8 for Hindus and Muslims.

Figure 7. Total Fertility Rates by education* among Muslims and Hindus according to the constant relative differentials scenario (F_r)

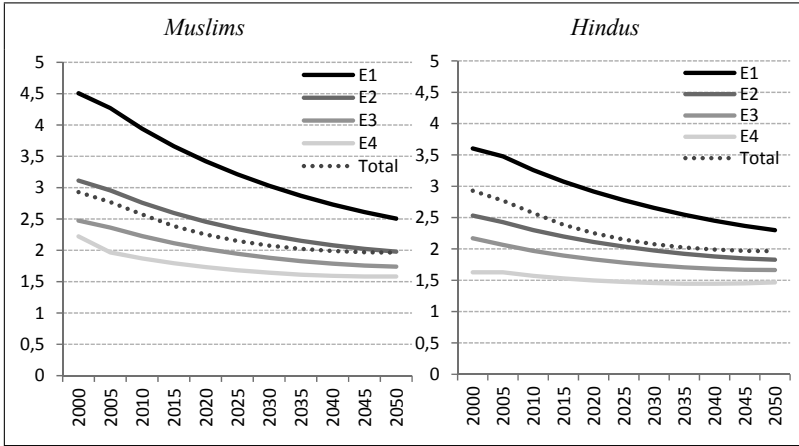


* E1 – no education, E2 – Primary education (some primary or completed primary), E3 – Secondary education (completed lower or higher secondary), E4 – Postsecondary (above upper secondary).

Source: own elaboration.

To illustrate **the effect of education** we choose a combination of two simple scenarios. In the *rapid increase* scenario (E_r) education rises following the educational expansion observed in South Korea in the second half in 20th century – a country with the fastest educational expansion ever witnessed. This results in rapid education change by 2050. The rapid increase scenario is formulated in accordance to the fast track (FR) scenario of the recently published global human capital projections (KC et al. 2014). To show the other extreme we present the *constant education* scenario (E_c)

Figure 8. Total Fertility Rates by education* among Muslims and Hindus according to the convergence in fertility scenario (Fg)

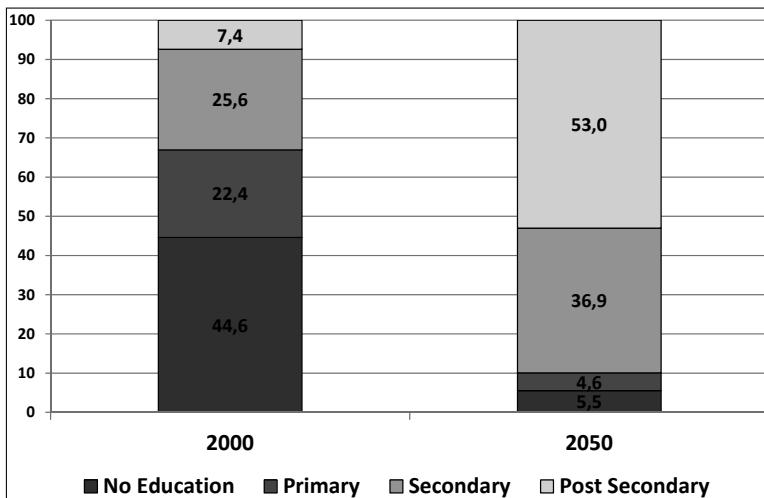


* E1 – no education, E2 – Primary education (some primary or completed primary), E3 – Secondary education (completed lower or higher secondary), E4 – Postsecondary (above upper secondary).

Source: own elaboration.

where educational enrolment does not increase beyond the levels recorded in 2001 (formulated in terms of constant enrolment rates (CER) scenario in KC et al. (2014)). Scenarios represent two extreme trajectories and the actual educational improvements in India will fall within this range. The change in educational composition in the *rapid increase* scenario is shown in Figure 9.

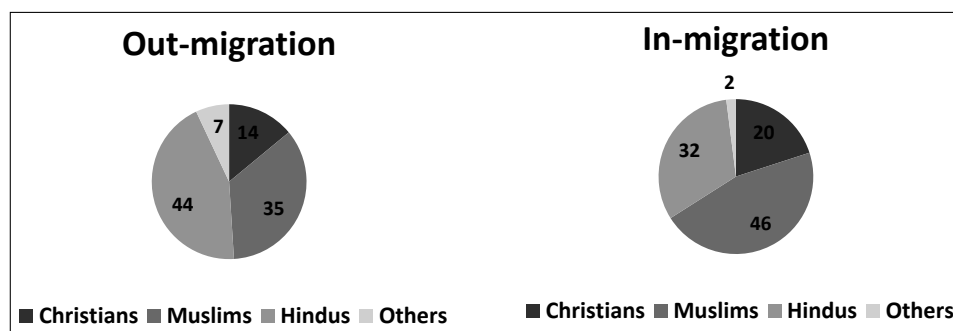
Figure 9. Educational composition of the population aged 25 years and above in India, 2000, 2050, in %



Source: own calculations.

Because we aim to illustrate the effects of educational and fertility change, we do not include multiple migration or mortality scenarios. In our projections the net-migration follows the assumptions of the UN medium scenario (UN 2013). We use religious composition of in-migration and out-migration developed in the Pew-ACC Religion and Demography Study (Figure 10) (Hackett et al. 2014, Stonawski et al. 2014). We assume random selection of migrants in terms of education. Outmigration rates by age, sex, religion and education are kept constant for the entire projection period. In-migration flows by age, sex, religion and education vary in order to meet the UN net migration levels.

Figure 10. Religious composition of migrant flows (in %)



Source: own calculations.

Mortality patterns are the same for all religious groups and follow the UN medium scenario. Religious switching in India is not taken into account. Hinduism is one of few religions person can enter only by birth and the share of religiously unaffiliated is negligible. This results in fairly stable religious transmission pattern and most of the change can be captured by demographic processes. It is possible that modernisation and increasing education will bring secularisation in the future (Norris and Inglehart 2004), however, research studies on religion in India have not found a significant disaffiliation process in India (e.g. Hackett et al. 2015). We also do not find any evidence for this in our data.

The presented four scenarios are combination of the three fertility and two education scenarios:

- *EcFc* is a constant scenario that represents stall in fertility and education. It can be understood as a benchmark scenario and provides a point of reference to illustrate the effects of education and fertility change.
- *EcFr* is a persisting inequality scenario. In this possible future inequalities in education and fertility persist. Enrolment rates are constant and there is no educational expansion but compared to the constant scenario fertility decline continues. Ferti-

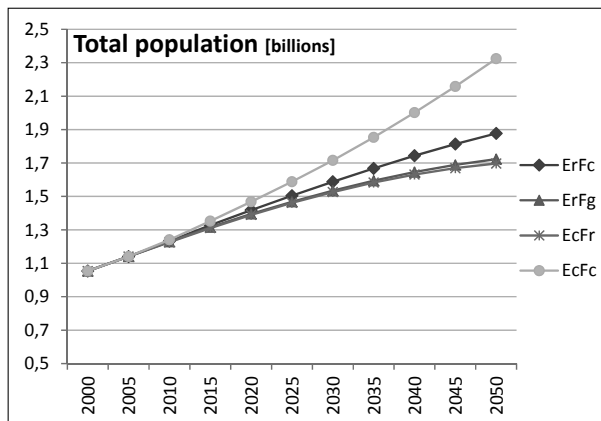
lity differentials across the religious and educational groups, however, remain as of 2000.

- **ErFc** is an educational expansion scenario. Fertility remains constant, i.e. educational improvements do not translate into change in childbearing. It is presented to demonstrate the effect of improving education.
- **ErFg** is a convergence scenario that represents the most optimistic possible trajectory of rapid educational expansion that translates into behavioural change. Fertility declines as education improves and fertility differentials between religious and educational groups shrink. This development would result in diminishing inequality.

CHANGING RELIGIOUS LANDSCAPE OF INDIA UNTIL 2050

India had 1.05 billion inhabitants in 2000. In the next 50 years, its population is expected to significantly increase to at least 1.7 billion, as shown in Figure 11. In case of stalled fertility and no improvements in educational enrolment, India's population would more than double to over 2.3 billion. This trajectory is highly unlikely and illustrates that fertility decline or development in education has a very strong impact on population size. The results show that increased education makes a great difference and the educational expansion scenario (*ErFc*) illustrates the pure effect of rapid educational expansion on population size. Just by increasing the number of highly educated women, the Indian population would grow to 1.9 instead of 2.3 billion even if education-specific TFRs remained the same as in 2000. The combination of educational expansion and fertility decline leads to even lower population size of 1.7 billion in 2050.

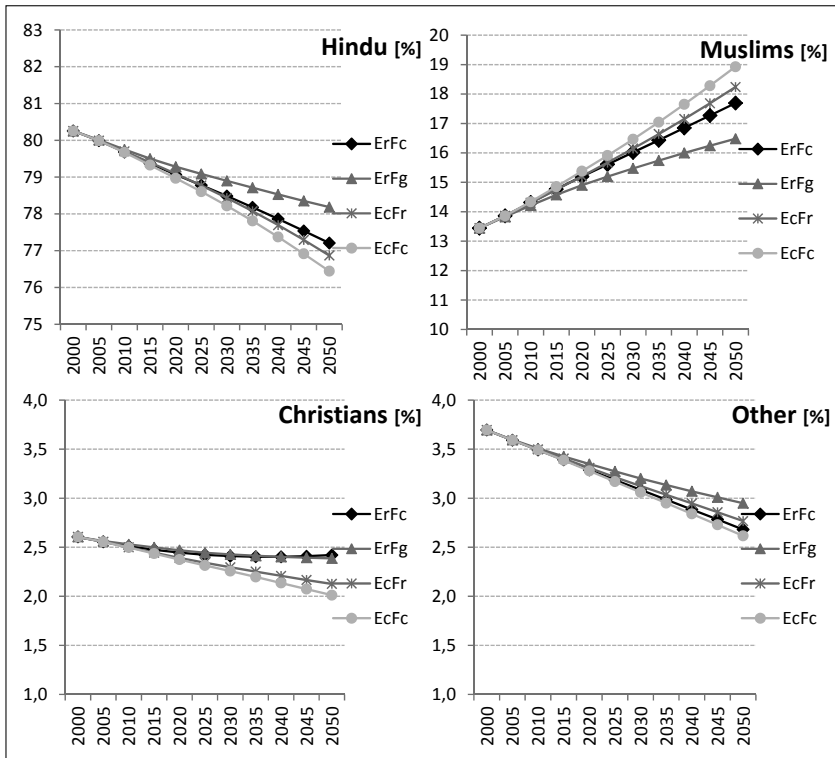
Figure 11. Overall population size of India according to 4 scenarios, 2000–2050



Source: own calculations.

The combination of educational expansion and converging fertility differentials (convergence scenario, *ErFg*) results in population size similar to the persisting inequality scenario (with stalled educational improvements, fertility declining according to the UN medium scenario but persisting fertility differentials, *EcFr*) due to lower overall TFR than in the convergence scenario (Figures 7 and 8). However, these two scenarios result in very different religious compositions of Indian population by 2050 (Figure 12).

Figure 12. Projected shares of religious groups in the overall population of India according to 4 scenarios, 2000–2050



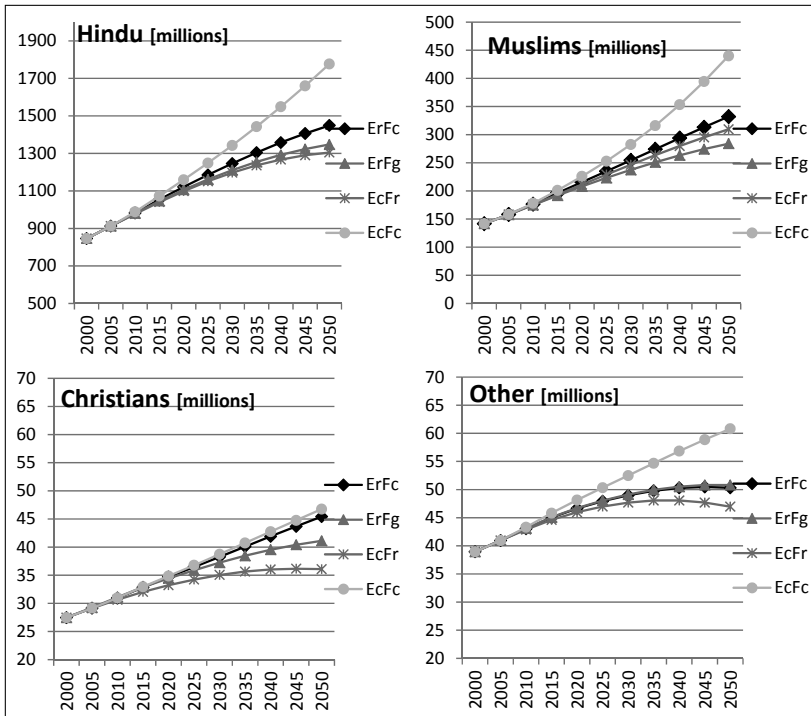
Source: own calculations.

Persisting inequality in fertility outcomes and education (*EcFr*) would turn India into a country less dominated by Hindus. Their share on total population would decline from 80.3 in 2001 to 76.9 in 2050. Due to a larger share of less educated and higher fertility than Hindus, the share of Muslims would rise from 13.3% in 2001 to 18.2% in 2050 and the total Muslim population would more than double to 310 million (Figure 13). The share of other religious groups would decline.

The total population size would be the same should the convergence scenario (*ErFg*) become the future trajectory of India's population, but Indians would most

likely live in a more equal and prosperous country. India's economy could take the opportunity of the demographic dividend if education increased rapidly and shrinking family size allowed Hindu and Muslim families alike to invest more into the human capital of their children. As a result of education reinforcing fertility decline, and under the condition of diminishing fertility differentials, the religious landscape of India would change the least under this scenario. The share of Muslims would increase to a lesser extent to 16.5%, and would still double to 284 million but the share of Hindus would decline the least by 2.1 percentage points to 78.2% by 2050. The share of Christians would stay about the same (2.6 in 2000 compared to 2.4 in 2050) and the share of other religions would shrink from 3.7% to 2.9%.

Figure 13. Projected size of religious groups in India according to 4 scenarios, 2000–2050



Source: own calculations.

The religious composition of India changes the most significantly under the constant scenario (*EcFc*), which results in rapid growth of the Muslim population. This scenario illustrates the long-term effect of stalled fertility and education enrolment. In this scenario we assume TFRs and fertility differentials remain as of 2000–2005. If only education was driving the change and fertility stalled (*ErFc*), the resulting religion-specific TFRs would be influenced only by compositional changes of the population of women in reproductive age. The educational characteristics of

Christian women would be changing at the slowest pace because they were better educated than women of other religions. Therefore, their TFR would remain at about 2.6 children per woman until the end of the projection period. All other religious groups would experience fertility decline. Holding fertility rates by education constant, a fast increase in education would depress the fertility of Hindus from 2.83 to about replacement level of 2.16 children per woman. Muslims would experience the most rapid educational improvements because of their worst education characteristics in 2001 and, consequently, rapid fertility transition. The TFR of Muslim women would plummet from 3.76 to 2.5 children per woman. A rapid educational increase in combination with convergence of fertility differentials by 2060 would result in the narrowest differentials in fertility between the groups (*ErFg*).

Overall TFR of India would decline to 2.22 children per women without any shift in fertility pattern if India were to replicate the educational expansion witnessed by South Korea (*ErFc*). Should fertility differentials persist and education would not improve (*EcFr*) overall Indian TFR would fall more rapidly to 1.85 children per woman in 2050 and all religious groups but Muslims would have sub-replacement fertility. Fertility decline would be less pronounced under the convergence scenario (*ErFg*) and the overall fertility would stabilize at about 1.96 towards 2050. Muslims would still be the most fertile religious group.

Changes in education and fertility would influence population age structure and population ageing of the religious groups. Muslims had the youngest population in India in 2001 with mean age of nearly 24 years, while Hindus are on average at 27 years and Christians and others at 28 (Table 3). The constant scenario (*EcFc*) and

Table 3. Projected population mean age by scenario, India 2000, 2025, 2050

Scenario	Year	Christians	Muslims	Hindu	Other	Total
ErFc	2000	28.3	23.8	26.7	27.9	26.4
	2025	32.7	28.0	31.6	34.1	31.2
	2050	35.8	32.9	36.4	40.4	35.9
ErFg	2000	28.3	23.8	26.7	27.9	26.4
	2025	33.2	29.1	32.1	34.1	31.8
	2050	38.3	35.7	37.9	40.2	37.7
EcFr	2000	28.3	23.8	26.7	27.9	26.4
	2025	34.0	28.6	32.3	34.4	31.8
	2050	40.6	34.4	38.6	41.7	38.0
EcFc	2000	28.3	23.8	26.7	27.9	26.4
	2025	32.2	26.7	30.4	32.7	29.9
	2050	34.8	28.5	32.4	35.8	31.8

Source: own calculations.

the persisting differentials scenario (*EcFr*) would lead to an increasing gap between the religious groups in term of population ageing. Muslims would be aging at the slowest pace and by 2050 their mean age would not exceed 36 years in any presented scenario. Educational expansion would speed up population ageing of all religious groups. The gap between Muslims and Hindus will be closing rapidly, especially under the convergence scenario (*ErFg*).

SUMMARY

In sum, both education and religion have independent effects on family formation and childbearing patterns, and thereby the population growth of India's religious groups. Hence, it is important to take into account both these different dimensions, particularly when focusing on a demographically important country such as India. This study has demonstrated that a more rapid educational increase and lower fertility is likely to a) lead to slower overall population growth as well as a somewhat older population, but also b) decrease variation in the growth rate of different religious groups. There is likely to be a gradual shift in the religious composition of the Indian population.

Considering religion and education collectively has the potential to significantly improve our ability to understand social processes more accurately. Educational attainment is added to the religious projections because it can affect fertility and other demographic processes. We find large educational differences across religions in India that are translating into differences in childbearing and the population growth of these groups. Increasing educational attainment is among the most important drivers of fertility differentials in the contemporary world. Therefore, depending on future education gains we can expect a different pace of fertility decline across these religious groups that will in turn affect their relative growth and age structure – and consequently influence the country's population growth, its religious composition and educational differences by religion.

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DEMOGRAPHIC PROJECTIONS BY RELIGION AND EDUCATION IN INDIA

ABSTRACT

Studying religion jointly with education allows one to produce more precise projections of the size and structure of religious communities. India's religious groups are characterized by large differences in their education and fertility levels. Among those with secondary or more education, there tends to be low variation in fertility, while for those without any education, fertility is high and varies substantially. For India, if fertility differentials were constant and there was no increase in educational enrolment, the Indian population would grow from 846 million in 2000 to more than 2.3 billion in 2050, while the Hindu population would change from 80.2% to 76.4% and the proportion of Muslims would rise from 13.4% to 19%. If fertility converges and education levels increases, the population would increase to 1.7 billion by 2050, with 78.2% Hindus and 16.5% Muslims.

Keywords: India, religion, education, multistate population projections

APPENDIX 1

RELIGIOUS AND EDUCATIONAL COMPOSITION OF INDIA POPULATION BY AGE AND SEX ACCORDING TO 4 SCENARIOS

2000

Scenario	Gender	Age	Christians					Muslims					Hindus					Others					Total population [in thou]
			E1	E2	E3	E4	Total	E1	E2	E3	E4	Total	E1	E2	E3	E4	Total	E1	E2	E3	E4	Total	
Base-line	Males	25+	20.6	27.1	38.6	13.7	2.8	42.0	28.5	23.8	5.6	11.6	33.4	25.9	30.4	10.3	81.8	31.7	20.6	35.8	11.9	3.9	248,723
		25-44	17.6	22.3	43.8	16.2	2.7	37.9	28.1	27.5	6.6	12.0	27.9	24.1	35.8	12.2	81.6	24.7	19.7	41.9	13.7	3.7	151,853
		45-64	23.3	31.6	34.1	11.0	2.9	46.6	29.5	19.3	4.5	11.0	38.7	28.4	24.4	8.4	82.1	36.5	21.9	30.5	11.0	3.9	75,194
		65+	30.6	42.0	20.7	6.6	2.9	58.6	28.7	10.8	2.0	10.3	53.4	29.2	13.6	3.8	82.0	56.6	22.2	17.0	4.2	4.8	21,677
Year	Females	25+	32.1	25.5	31.8	10.7	3.0	67.1	20.8	10.3	1.8	11.5	63.1	18.4	14.3	4.2	81.6	54.1	18.4	20.4	7.0	3.9	233,439
		25-44	26.9	20.9	38.4	13.8	2.9	60.6	23.1	13.8	2.5	12.1	55.6	20.0	18.7	5.7	81.2	44.1	19.5	27.1	9.3	3.8	138,776
		45-64	36.3	30.2	26.5	7.1	3.1	74.7	18.9	5.5	0.9	10.9	70.4	17.7	9.4	2.5	82.1	61.7	19.1	14.1	5.0	4.0	71,758
		65+	48.0	36.5	11.7	3.8	3.1	88.3	10.0	1.5	0.2	10.0	85.2	11.3	3.0	0.6	82.3	83.9	11.4	3.9	0.8	4.6	22,904
2000	Total	25+	26.4	26.3	35.2	12.2	2.9	54.1	24.8	17.3	3.8	11.6	47.8	22.3	22.6	7.4	81.7	42.6	19.6	28.3	9.5	3.9	482,162
		25-44	22.2	21.6	41.1	15.0	2.8	48.8	25.7	20.9	4.6	12.1	41.1	22.1	27.6	9.1	81.4	34.0	19.6	34.8	11.6	3.8	290,629
		45-64	29.8	30.9	30.3	9.0	3.0	60.2	24.4	12.6	2.8	11.0	54.2	23.2	17.1	5.5	82.1	48.9	20.5	22.5	8.1	3.9	146,952
		65+	39.9	39.1	15.9	5.1	3.0	73.6	19.2	6.1	1.1	10.2	69.8	20.0	8.1	2.1	82.1	70.4	16.8	10.4	2.5	4.7	44,581

Demographic projections by religion and education in India

2050

Scenario	Gender	Age	Christians				Muslims				Hindus				Others				Total population [in thou]				
			E1	E2	E3	E4	Total	E1	E2	E3	E4	Total	E1	E2	E3	E4	Total						
ErFc	Males	25+	3.3	5.4	38.0	53.3	2.4	4.1	5.8	36.2	54.0	16.3	3.4	5.2	36.2	55.2	78.4	3.4	5.0	38.1	53.5	3.0	597,357
		25-44	0.6	1.4	29.6	68.4	2.3	0.3	1.0	29.3	69.4	18.0	0.2	0.9	28.6	70.3	77.1	0.2	0.8	28.6	70.4	2.6	272,535
		45-64	3.1	5.7	42.9	48.4	2.3	3.1	6.6	43.8	46.6	15.7	2.0	4.9	41.3	51.8	78.8	1.8	4.4	42.3	51.5	3.2	219,978
		65+	10.0	14.8	49.2	25.9	2.5	20.1	20.7	41.6	17.6	13.1	14.6	16.7	44.3	24.4	80.7	12.6	13.8	48.0	25.6	3.6	104,844
Year	Females	25+	4.9	3.9	37.9	53.4	2.4	8.8	4.5	36.0	50.7	16.4	8.9	4.2	34.8	52.0	78.2	7.7	4.3	36.8	51.2	3.0	586,801
		25-44	0.4	0.3	28.8	70.4	2.3	0.3	0.3	29.7	69.7	18.1	0.2	0.2	28.9	70.7	77.0	0.2	0.2	28.7	70.9	2.6	252,598
		45-64	2.9	2.4	42.2	52.5	2.3	5.8	3.9	46.3	44.0	16.0	4.3	2.8	42.3	50.6	78.6	3.3	2.4	42.6	51.7	3.1	211,533
		65+	15.1	12.0	46.9	26.0	2.8	38.9	17.7	32.1	11.3	13.3	34.1	14.4	33.9	17.6	80.2	25.2	12.9	40.1	21.8	3.7	122,670
2050	Total	25+	4.1	4.7	38.0	53.3	2.4	6.4	5.1	36.1	52.4	16.3	6.2	4.7	35.5	53.6	78.3	5.6	4.6	37.4	52.4	3.0	1,184,158
		25-44	0.5	0.9	29.2	69.3	2.3	0.3	0.6	29.5	69.5	18.1	0.2	0.5	28.7	70.5	77.0	0.2	0.5	28.7	70.6	2.6	525,134
		45-64	3.0	4.1	42.6	50.4	2.3	4.4	5.3	45.0	45.3	15.9	3.1	3.9	41.8	51.2	78.7	2.5	3.4	42.5	51.6	3.1	431,510
		65+	12.9	13.2	47.9	26.0	2.7	30.3	19.1	36.4	14.2	13.2	25.1	15.4	38.7	20.8	80.5	19.4	13.3	43.7	23.5	3.7	227,514

Scenario	Gender	Age	Christians					Muslims					Hindus					Others					Total population [in thou]
			E1	E2	E3	E4	Total	E1	E2	E3	E4	Total	E1	E2	E3	E4	Total	E1	E2	E3	E4	Total	
ErFg	Males	25+	3.3	5.5	38.2	52.9	2.4	4.3	6.1	36.6	53.0	15.8	3.5	5.3	36.3	54.8	78.7	3.4	5.0	38.1	53.5	3.1	579,235
		25-44	0.7	1.4	29.6	68.3	2.4	0.3	1.1	29.4	69.3	17.1	0.2	0.9	28.6	70.3	77.7	0.2	0.8	28.6	70.4	2.8	254,410
		45-64	3.0	5.6	42.8	48.5	2.3	3.1	6.6	43.8	46.5	15.6	2.0	4.9	41.3	51.8	78.9	1.8	4.4	42.3	51.5	3.2	219,981
		65+	10.0	14.8	49.2	25.9	2.5	20.1	20.7	41.6	17.6	13.1	14.6	16.7	44.3	24.4	80.7	12.6	13.8	48.0	25.6	3.6	104,844
Year	Females	25+	5.0	4.0	38.0	53.0	2.4	9.3	4.8	36.4	49.6	15.9	9.2	4.3	35.0	51.6	78.6	7.7	4.3	36.8	51.3	3.1	569,856
		25-44	0.5	0.4	28.8	70.4	2.3	0.3	0.3	29.8	69.6	17.2	0.2	0.2	28.9	70.7	77.7	0.2	0.2	28.7	70.9	2.8	235,653
		45-64	2.8	2.4	42.2	52.6	2.3	5.8	3.9	46.3	44.0	16.0	4.3	2.8	42.3	50.6	78.6	3.3	2.4	42.6	51.7	3.1	211,533
		65+	15.1	12.0	46.9	26.0	2.8	38.9	17.7	32.1	11.3	13.3	34.1	14.4	33.9	17.6	80.2	25.2	12.9	40.1	21.8	3.7	122,670
2050	Total	25+	4.1	4.8	38.1	53.0	2.4	6.8	5.4	36.5	51.3	15.8	6.3	4.8	35.7	53.2	78.6	5.6	4.6	37.4	52.4	3.1	1,149,091
		25-44	0.6	0.9	29.2	69.3	2.4	0.3	0.7	29.6	69.5	17.1	0.2	0.6	28.7	70.5	77.7	0.2	0.5	28.7	70.6	2.8	490,063
		45-64	2.9	4.1	42.5	50.5	2.3	4.4	5.3	45.0	45.3	15.8	3.1	3.9	41.8	51.2	78.8	2.5	3.4	42.5	51.6	3.1	431,514
		65+	12.9	13.2	47.9	26.0	2.7	30.3	19.1	36.4	14.2	13.2	25.1	15.4	38.7	20.8	80.5	19.4	13.3	43.7	23.5	3.7	227,514

Demographic projections by religion and education in India

Scenario	Gender	Age	Christians				Muslims				Hindus				Others				Total population [in thou]				
			E1	E2	E3	E4	Total	E1	E2	E3	E4	Total	E1	E2	E3	E4	Total						
																		E1		E2	E3	E4	Total
EcFr	Males	25+	16.9	20.8	46.2	16.1	2.3	37.1	27.6	28.7	6.7	16.2	27.1	23.5	36.8	12.6	78.4	23.8	19.7	42.6	13.9	3.1	575,965
		25-44	16.7	20.7	45.9	16.7	2.2	36.6	27.7	28.9	6.9	18.1	26.5	23.3	37.5	12.7	77.0	23.1	19.4	43.4	14.0	2.7	251,140
		45-64	17.0	20.7	46.6	15.7	2.3	37.4	27.4	28.5	6.7	15.6	27.5	23.5	36.5	12.4	78.9	24.1	19.8	42.2	13.9	3.2	219,982
		65+	17.3	21.1	45.9	15.7	2.5	37.6	27.5	28.3	6.6	13.1	27.8	23.7	36.1	12.4	80.7	24.4	19.9	41.9	13.8	3.6	104,844
Year	Females	25+	25.8	19.6	40.1	14.5	2.3	59.3	23.4	14.7	2.6	16.3	54.5	20.2	19.4	6.0	78.3	42.6	19.7	28.2	9.4	3.1	566,814
		25-44	25.3	19.3	40.4	15.0	2.1	58.3	23.6	15.3	2.8	18.2	53.4	20.2	20.1	6.2	77.0	41.4	19.5	29.2	9.8	2.7	232,611
		45-64	26.0	19.6	40.1	14.3	2.3	59.9	23.3	14.3	2.5	16.0	55.0	20.1	19.0	5.8	78.6	43.0	19.9	27.9	9.3	3.1	211,533
		65+	26.4	19.9	39.6	14.1	2.8	60.3	23.2	14.0	2.5	13.3	55.5	20.1	18.7	5.7	80.2	43.6	19.9	27.4	9.1	3.7	122,670
2050	Total	25+	21.4	20.2	43.1	15.3	2.3	48.1	25.5	21.7	4.7	16.3	40.7	21.8	28.2	9.3	78.4	33.1	19.7	35.5	11.7	3.1	1,142,779
		25-44	20.8	20.0	43.3	15.9	2.2	47.1	25.7	22.3	4.9	18.1	39.4	21.8	29.1	9.6	77.0	31.9	19.5	36.6	12.0	2.7	483,751
		45-64	21.4	20.2	43.4	15.0	2.3	48.6	25.4	21.4	4.6	15.8	41.0	21.9	27.9	9.2	78.8	33.2	19.8	35.3	11.6	3.1	431,515
		65+	22.4	20.4	42.3	14.8	2.7	49.9	25.2	20.6	4.4	13.2	42.7	21.7	26.8	8.8	80.5	34.8	19.9	34.0	11.3	3.7	227,514

Scenario	Gender	Age	Christians				Muslims				Hindus				Others				Total population [in thou]				
			E1	E2	E3	E4	Total	E1	E2	E3	E4	Total	E1	E2	E3	E4	Total						
																		E1		E2	E3	E4	Total
EcFc	Males	25+	16.9	20.8	46.1	16.2	2.3	37.0	27.6	28.7	6.8	16.4	27.0	23.4	36.9	12.6	78.3	23.7	19.6	42.8	13.9	3.0	638,604
		25-44	16.6	20.7	45.8	16.8	2.1	36.5	27.7	28.9	6.9	18.0	26.4	23.3	37.6	12.8	77.1	23.0	19.4	43.6	14.1	2.7	313,779
		45-64	17.0	20.7	46.6	15.7	2.3	37.4	27.4	28.5	6.7	15.6	27.5	23.5	36.5	12.4	78.9	24.1	19.8	42.2	13.9	3.2	219,982
		65+	17.3	21.1	45.9	15.7	2.5	37.6	27.5	28.3	6.6	13.1	27.8	23.7	36.1	12.4	80.7	24.4	19.9	41.9	13.8	3.6	104,844
Year	Females	25+	25.8	19.5	40.1	14.6	2.3	59.1	23.5	14.8	2.6	16.5	54.3	20.2	19.5	6.0	78.2	42.4	19.7	28.4	9.5	3.0	625,219
		25-44	25.3	19.2	40.4	15.1	2.1	58.2	23.6	15.4	2.8	18.2	53.2	20.3	20.3	6.3	77.0	41.2	19.5	29.4	9.9	2.7	291,016
		45-64	26.0	19.6	40.1	14.3	2.3	59.9	23.3	14.3	2.5	16.0	55.0	20.1	19.0	5.8	78.6	43.0	19.9	27.9	9.3	3.1	211,533
		65+	26.4	19.9	39.6	14.1	2.8	60.3	23.2	14.0	2.5	13.3	55.5	20.1	18.7	5.7	80.2	43.6	19.9	27.4	9.1	3.7	122,670
2050	Total	25+	21.3	20.1	43.1	15.4	2.3	47.9	25.5	21.8	4.7	16.4	40.5	21.8	28.3	9.3	78.3	32.9	19.7	35.6	11.7	3.0	1,263,823
		25-44	20.7	20.0	43.3	16.0	2.1	47.0	25.7	22.4	4.9	18.1	39.3	21.8	29.3	9.7	77.1	31.8	19.4	36.7	12.1	2.7	604,795
		45-64	21.4	20.2	43.4	15.0	2.3	48.6	25.4	21.4	4.6	15.8	41.0	21.9	27.9	9.2	78.8	33.2	19.8	35.3	11.6	3.1	431,515
		65+	22.4	20.4	42.3	14.8	2.7	49.9	25.2	20.6	4.4	13.2	42.7	21.7	26.8	8.8	80.5	34.8	19.9	34.0	11.3	3.7	227,514

APPENDIX 2

STATE ABBREVIATIONS

Code State / Country Name	
IN	INDIA
AP	Andhra Pradesh
BR	Bihar
CT	Chhattisgarh
DL	Delhi
GA	Goa
GJ	Gujarat
HP	Himachal Pradesh
HR	Haryana
JH	Jharkhand
JK	Jammu & Kashmir
KA	Karnataka
KL	Kerala
MH	Maharashtra
MP	Madhya Pradesh
OR	Orissa
PB	Punjab
RJ	Rajasthan
TN	Tamil Nadu
UP	Uttar Pradesh
UT	Uttaranchal
WB	West Bengal
B	Aggregat - North East
AR	Arunchal Pradesh
AS	Assam
ML	Meghalaya
MN	Manipur
MZ	Mizoram
NL	Nagaland
SK	Sikkim
TR	Tripura
C	Aggregat - Small Regions
AN	Andaman & Nicobar Islands
CH	Chandigarh
DD	Daman & Diu
DN	Dadra & Nagar Haveli
LD	Lakshadweep
PY	Pondicherry