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Beyond the billion:
India's demography at the beginning
of the century

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Beyond the billion. India's demography at the beginning of the century

*Christophe Z. Guilmoto**

Abstract

This paper offers a presentation of India's demographic situation since the 1950s, using the recent provisional data from the 2011 census. The main topics covered are: population distribution, population growth and its regional variations, fertility decline, mortality and health situation, gender vulnerability, internal migration and urbanization, international migrations, population and resources.

Keywords

India, demography, population.

Introduction

At the start of the twenty-first century, the second largest country of the planet is on the move: its demographic, social, political and economic structures are on their way to bringing about irreversible transformations that are bound to alter every dimension of Indian society for decades to come. In order to highlight the major phases that help to understand its population dynamics, this chapter will retrace the socio-demographic changes occurring in the second half of the century since Independence. The social and geographical diversity of India reminds us that any study of global trends in a country with more than a billion people can give only an imperfect picture of the specific and heterogeneous trajectories of all its regions and social diversity. Taking the first population census of independent India in 1951 as a point of reference, the 2011 census reveals a larger diachronic picture, a period of gradual changes, completely different from the dramatic jolts of the colonial period with its regular subsistence crises and epidemics until the bloody turmoil at the time of Partition. This essay will thus combine two scales, geographical and historical, to sketch a picture of the Indian population at the close of its demographic transition¹.

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¹ Data for 2011 refer to provisional data available in April 2011. For a different presentation of some major issues confronting India's population, see Dyson *et al.* (2003). Guha (2001) adopts a broader historical perspective.

The Indian population at the threshold of the century

According to the provisional census figures published in April, India's population stands at 1.210 billion in 2011, a value almost identical to the estimate by the United Nations. However, one of the most significant benchmarks in India's demographic history was reached recently. While certain non-governmental organisations tried to alert international opinion about India crossing the critical mark of a billion inhabitants in August 1999, the Indian authorities, in a less alarmist manner, decided to delay the registration of the fateful birth by a few months, announced later in May 2000 with the birth of little Astha in a hospital in Delhi. In fact, from a probabilistic viewpoint, this birth should have been that of a boy (who account for 52.1% of births) and should have occurred in a rural zone (73.8% of the population) without any medical infrastructure (66.4% of births). But this gap between the registered birth and the statistical norm points towards the discrepancy between the public image of the new India and the evolving demographic reality².

A more detailed numeric account of the demographic situation outlines the diversity of the regional panorama of a country composed of 35 States and Union Territories that are further subdivided into 640 districts. Tables 1 and 2 compare a range of data collected at the State level, whereby 10 States contain more than 50 million inhabitants whereas 5 States or Union Territories shelter less than a million inhabitants. In 2000, the bifurcation of the three most populated States (Uttar Pradesh, Bihar and Madhya Pradesh) altered the administrative picture even if the new units (Uttarakhand, Jharkhand and Chhattisgarh) represent sparsely populated regions. Uttar Pradesh remains, with its 200 million inhabitants, a considerable region of population larger than Brazil's, which is currently the world's fifth most populated country. Following far behind are Maharashtra, Bihar, West Bengal, and Andhra Pradesh whose populations range between 80 and 112 million inhabitants.

Map 1 of 2001 density in India, drawn at the district level, underlines the patchy distribution of population amounting to an average of 374 inhabitants per square km (see also Table 1 for 2011). It shows two densely populated zones. In the north, the high density corresponds to the sloped basins of the big rivers: it covers a large strip of land that cuts across the country from the west to the east and covers a part of the Indus basin in the west (Punjab) and the Gangetic plains in the centre, stretching from the foothills of the Himalayas up to Bengal and Bangladesh, where it merges with the waters of the Brahmaputra, whose valley in Assam is also densely populated. With a coverage of 400 million inhabitants, this region records densities that are close to 1000 inhabitants per square kilometre. In the rest of the country, the highest density of population is found mostly on the littoral, a long stretch of land that includes extremely humid zones, deltaic regions of strong agricultural productivity or well-developed metropolitan areas dating from the colonial era. However, there is a marked contrast from the rest of India, particularly with the landlocked and arid regions stretching from the western desert area of Rajasthan to the south of the Deccan plateau. In these parts of the country, urbanisation is often

² To which it may be added, that almost half of the girls born the same year as Astha would have already dropped out of school by 2010. Data used here are from the National Family and Health Survey (NFHS). See the description of Indian demographic sources at the end of this chapter.

Table 1: Demographic Indicators, States and Union Territories, 2011

Period	Total population	Decadal growth		Sex ratio		Density	Urbanization
	2011	1991 2001	2001 2011	All 2011	Children 2011	2011	2001
Units	million inhabitants	%	%	women per 1000 men		inhabitants per sq. km	%
States							
Andhra Pradesh	84.7	13.9	11.1	992	981	308	27.1
Arunachal Pradesh	1.4	26.2	25.9	920	878	17	20.4
Assam	31.2	18.8	16.9	954	929	397	12.7
Bihar	103.8	28.4	25.1	916	914	1 102	10.5
Chhattisgarh	25.5	18.1	22.6	991	992	189	20.1
Delhi	16.8	46.3	21.0	866	813	11 297	93.0
Goa	1.5	14.9	8.2	968	964	394	49.8
Gujarat	60.4	22.5	19.2	918	927	308	37.4
Haryana	25.4	28.1	19.9	877	869	573	29.0
Himachal Pradesh	6.9	17.5	12.8	974	980	123	9.8
Jammu & Kashmir	12.5	29.0	23.7	883	884	124	24.9
Jharkhand	33.0	23.2	22.3	947	935	414	22.3
Karnataka	61.1	17.2	15.7	968	968	319	34.0
Kerala	33.4	9.4	4.9	1 084	1 072	859	26.0
Madhya Pradesh	72.6	24.3	20.3	930	916	236	26.7
Maharashtra	112.4	22.6	16.0	925	924	365	42.4
Manipur	2.7	30.0	18.7	987	977	122	23.9
Meghalaya	3.0	29.9	27.8	986	971	132	19.6
Mizoram	1.1	29.3	22.8	975	930	52	49.5
Nagaland	2.0	64.4	-0.5	931	890	119	17.7
Orissa	41.9	15.9	14.0	978	976	269	15.0
Punjab	27.7	19.8	13.7	893	888	550	34.0
Rajasthan	68.6	28.3	21.4	926	923	201	23.4
Sikkim	0.6	33.0	12.4	889	861	86	11.1
Tamil Nadu	72.1	11.2	15.6	995	993	555	43.9
Tripura	3.7	15.7	14.8	961	945	350	17.0
Uttar Pradesh	199.6	25.8	20.1	908	894	828	20.8
Uttarakhand	10.1	19.2	19.2	963	973	189	25.6
West Bengal	91.3	17.8	13.9	947	929	1 029	28.0
Union territories							
Andaman & Nicobar Islands	0.4	26.9	6.7	878	831	46	32.7
Chandigarh	1.1	40.3	17.1	818	767	9 252	89.8
Dadra & Nagar Haveli	0.3	59.2	55.5	775	779	698	22.9
Daman & Diu	0.2	55.6	53.5	618	682	2 169	36.3
Lakshadweep	0.1	17.2	6.2	946	946	2 013	44.5
Puducherry	1.2	20.6	27.7	1 038	1 006	2 598	66.6
India	1210.2	21.3	17.6	940	934	382	27.8
Source	Census	Census	Census	Census	Census	Census	Census

Table 2: Social and Demographic indicators, States and Union Territories, 2002-11

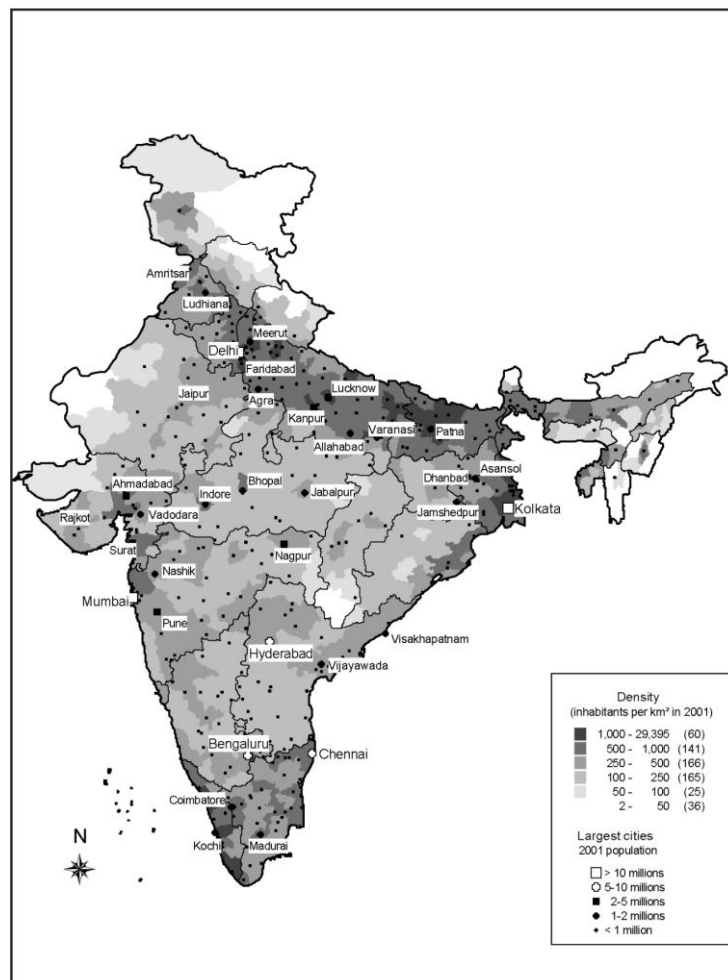
Period	Literacy rates		Birth rates	Death rates	Infant mort. rates	Fertility	Age at marriage		Populat. below the poverty l.
	M.	W.					M.	W.	
Units	2011	2011	2009	2009	2009	2002 2006	2002 2004	2002 2004	2004 2005
	%	%	‰	‰	‰ bths	cpw	years	years	%
<i>States</i>									
Andhra Pradesh	75.6	59.7	18.3	7.6	49	1.8	23.2	18.4	11.1
Arunachal Pradesh	73.7	59.6	21.1	6.1	32	3.0	23.4	19.5	13.4
Assam	78.8	67.3	23.6	8.4	61	2.4	27.2	20.7	15.0
Bihar	73.4	53.3	28.5	7.0	52	4.0	21.9	17.4	32.5
Chhattisgarh	81.5	60.6	25.7	8.1	54	2.6	22.7	19.0	32.0
Delhi	91.0	80.9	18.1	4.4	33	2.1	23.8	20.6	10.2
Goa	92.8	81.8	13.5	6.7	11	1.8	29.0	24.4	12.0
Gujarat	87.2	70.7	22.3	6.9	48	2.4	22.3	19.4	12.5
Haryana	85.4	66.8	22.7	6.6	51	2.7	22.7	19.0	9.9
Himachal Pradesh	90.8	76.6	17.2	7.2	45	1.9	26.0	21.7	6.7
Jammu & Kashmir	78.3	58.0	18.6	5.7	45	2.4	25.9	22.8	4.2
Jharkhand	78.5	56.2	25.6	7.0	44	3.3	22.8	18.3	34.8
Karnataka	82.9	68.1	19.5	7.2	41	2.1	25.1	19.1	17.4
Kerala	96.0	92.0	14.7	6.8	12	1.9	28.0	21.9	11.4
Madhya Pradesh	80.5	60.0	27.7	8.5	67	3.1	21.8	18.2	32.4
Maharashtra	89.8	75.5	17.6	6.7	31	2.1	24.6	19.1	25.2
Manipur	86.5	73.2	15.4	4.7	16	2.8	27.5	24.1	13.2
Meghalaya	77.2	73.8	24.4	8.1	59	3.8	22.8	20.8	14.1
Mizoram	93.7	89.4	17.6	4.5	36	2.9	25.1	21.6	9.5
Nagaland	83.3	76.7	17.2	3.6	26	3.7	27.1	22.5	14.5
Orissa	82.4	64.4	21.0	8.8	65	2.4	25.4	20.5	39.9
Punjab	81.5	71.3	17.0	7.0	38	2.0	23.8	20.9	5.2
Rajasthan	80.5	52.7	27.2	6.6	59	3.2	20.6	17.3	17.5
Sikkim	87.3	76.4	18.1	5.7	34	2.0	24.5	21.9	15.2
Tamil Nadu	86.8	73.9	16.3	7.6	28	1.8	26.4	20.7	17.8
Tripura	92.2	83.2	14.8	5.1	31	2.2	27.3	20.9	14.4
Uttar Pradesh	79.2	59.3	28.7	8.2	63	3.8	21.5	18.1	25.5
Uttarakhand	88.3	70.7	19.7	6.5	41	2.5	24.6	20.5	31.8
West Bengal	82.7	71.2	17.2	6.2	33	2.2	24.7	18.5	20.6
<i>Union territories</i>									
Andaman & Nicobar Islands	90.1	81.8	16.3	4.1	27	NA	25.9	21.4	17.6
Chandigarh	90.5	81.4	15.9	3.9	25	NA	24.6	22.8	3.8
Dadra & Nagar Haveli	86.5	65.9	27.0	4.8	37	NA	22.9	19.7	30.6
Daman & Diu	91.5	79.6	19.2	5.1	24	NA	26.7	23.0	8.0
Lakshadweep	96.1	88.3	15.0	5.8	25	NA	26.7	20.7	12.3
Puducherry	92.1	81.2	16.5	7.0	22	NA	27.6	22.4	18.2
India	82.1	65.5	22.5	7.3	50	2.7	24.5	19.5	21.8
Sources	Census	Census	SRS	SRS	SRS	NFHS-3	DLHS-2	DLHS-2	NSS

M.: men; W.: women; *mort.*: mortality; *populat.*: population; *poverty l.*: poverty line; % bths: per 1000 births; *cpw*: child per women.

sparse, rural areas less prosperous and human density lower than 250 inhabitants per square kilometre. A few small patches of high density emerge in interior India, around the metropolitan districts of Bengaluru, Bhopal, Indore and Hyderabad. The human density is also very low in the Himalayan regions or in the forested areas of North East India.

This geo-demographic pattern not only underlines the preponderance of rural India in the population layout, but defines the close link between density and agricultural prosperity, itself primarily dependent on rainfall and irrigation. In fact, urbanisation still plays only a secondary role in the spatial distribution of the population. The remarkable agricultural development that has characterised Indian history since the sixties is partly responsible for the relatively strong capacity for local absorption of manpower, despite mounting demographic pressure during the twentieth century (Dorin and Landy, 2009).

Map 1: Population of India

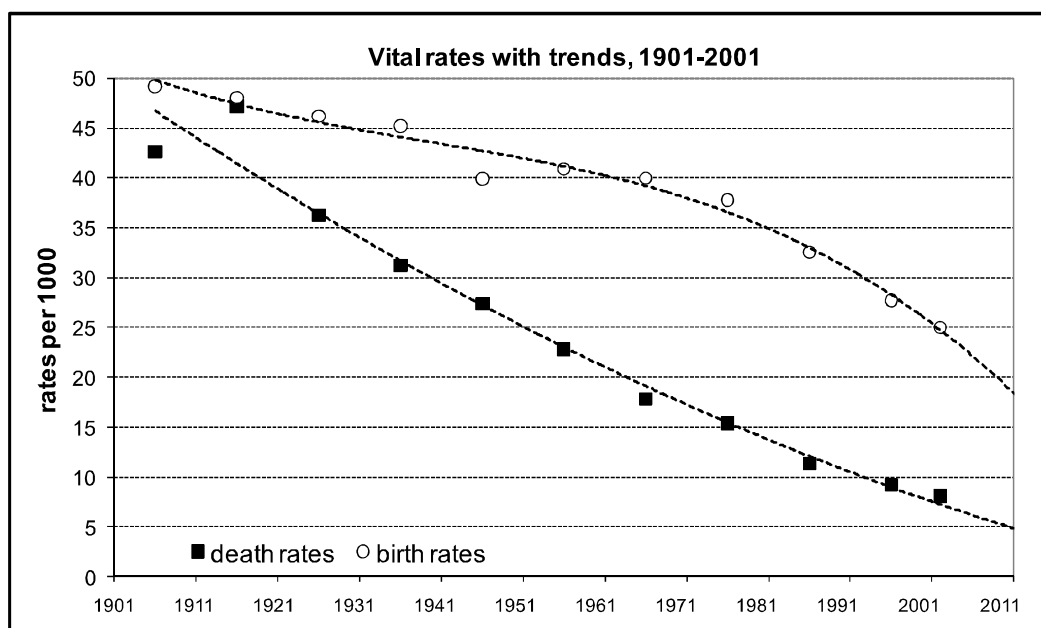


Key components of growth

The figure of 1.2 billion inhabitants in 2011 reflects, at the same time, the high demographic growth obtained in the past and the demographic turn in the nineties. During the last fifty years, the Indian population has multiplied by 2.8, whereas from 1901 to 1951, it grew only by 51%. In fact, the population growth rate at the national level has recorded a steady increase from the year 1920 onwards, following the regular fall in mortality in India due to the progressive reduction in the crisis for subsistence and killer epidemics. After the disturbances of the forties (the severe food crisis followed by the partition of the subcontinent), the decadal growth recovered, achieving 22% during 1951-1961 and touching 25 % in the two following decades (Table 3). It fell marginally during the new two decades, but the decline was more noticeable between 2001 and 2011, since it closed at 17.6%, a rate not observed since the fifties. However, the demographic momentum remains tremendous, and the net intercensal growth (182 million inhabitants) remains one of the largest ever recorded in the country.

A closer examination indicates that the intercensal growth, which was at a maximum between 1961 and 1981, has ever since been progressively curving downwards. The substantial slowing down observed during the last decade should accelerate in the years to come as the balance of births and deaths is set to reduce. Birth rates are regularly diminishing while death rates are almost levelling off, in spite of continuous gains in life expectancies, as a result of the changing age structures (Figure 1; see also Figure 3). The projections for the next decade, based on an annual growth of 1.5 percent, anticipate the repercussions of the predictable continuing fall of fertility rates. Compared to the situation in some of the largest developing countries of the world, such as Bangladesh, Pakistan or Nigeria, population growth in India remains temperate. Yet, India appears to be lagging behind, compared to several Asian countries such as China, where demographic transition started earlier and the annual growth rate has been less than 0.6% over the last ten years.

Figure 1: Vital rates with trends, 1901-2001



Sources: Census and SRS estimates

Table 3: India's Population, 1901-2011

	Population	Density	Sex ratio	Urbanisation	Literacy	Annual growth rate*	Life expectancy at birth*
	millions	inh./ km ²	w. % m.	%	%	%	years
1901	238.4	77	972	10.8	5.3	2.9	23.8
1911	252.1	82	964	10.3	5.9	5.6	22.9
1921	251.3	81	955	11.2	7.2	-0.3	20.1
1931	279.0	90	950	12.0	9.5	10.5	26.8
1941	318.7	103	945	13.9	16.1	13.4	31.8
1951	361.1	117	946	17.6	16.7	12.6	32.1
1961	439.2	142	941	18.0	24.0	19.8	41.3
1971	548.2	177	930	19.9	29.4	22.4	46.4
1981	683.8	216	934	23.3	36.2	22.5	51.3
1991	846.3	267	927	25.7	42.8	21.1	56.6
2001	1028.6	324	933	27.8	55.3	19.3	60.7
2011	1210.2	382	940	-	74.1	17.6	-

* Ten-year period preceding the census; inh.: inhabitants; w. % m.: women per 1000 men.

Source: Census

The figures for population growth in 2001-11 indicate significant differences in growth patterns between regions, with a decadal growth stretching from less than 5% in Kerala to more than 20% in Bihar, Rajasthan, Madhya Pradesh, and Uttar Pradesh (Table 1). In fact, the multi-dimensional Indian demography is composed of distinct layers corresponding to various stages of demographic transition. Hence, if Uttar Pradesh resembles, in a number of ways, certain sub-Saharan African nations, the demographic profile of Kerala is closer today to that of European countries. More than that of any other country in the world, Indian demography is marked by an extraordinary heterogeneity in the trajectories of its social or regional components.

In-depth analysis of the demographic growth offers a more complex vision of the demographic variations, a heterogeneous product of migratory movement and variations in fertility rates between regions³. A strong gradient, oriented from the southern region of modest growth towards the northern regions of strong growth, divides the country. In Kerala and other parts of South India, many districts recorded an increase of less than 10% in ten years. This low increase, due to a spectacular fall in the birth rate, is equally perceptible in parts of North West and coastal India. Moreover, population redistribution and rural-urban migration processes also disturb the regional demographic trends. Hence, in regions such as Garhwal (Uttarakhand) or along the Konkan Coast south of Mumbai, significant emigration has been taking place for numerous decades. This, combined with a moderate rate of natural increase, contributes towards markedly reduced population growth.

³ The inter-regional differences of mortality (Table 2) have now but a negligible impact on variations in regional population growth.

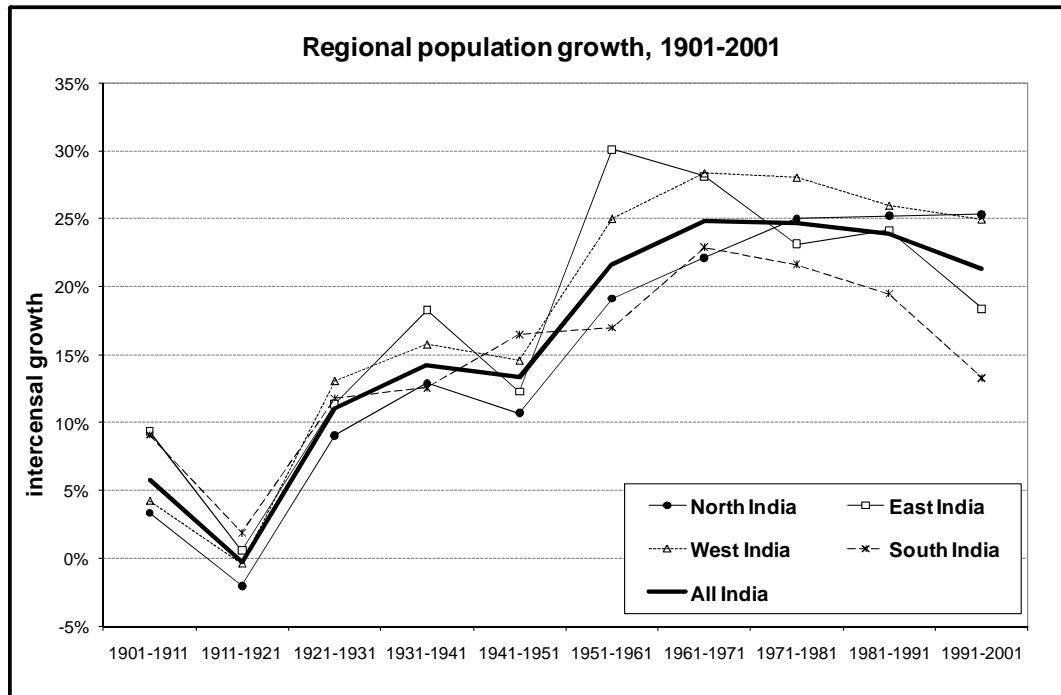
The highest growth is primarily found in the underprivileged rural zones in the north, from Rajasthan to Bihar, where fertility levels are still high. Most areas of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh⁴ are characterised by growth rates higher than the rest of the nation. In addition to these spatial patterns, some urban or peri-urban patches record a record growth because of massive in-migration: the Delhi region and Chandigarh in the northwest, Mumbai and Pune in Maharashtra, Hyderabad in Andhra Pradesh, Bengaluru in Karnataka and Indore and Bhopal in Madhya Pradesh.

This unequal regional distribution of growth has been observed since the eighties and tends to gradually alter the overall demographic balance between States, particularly between South India and the Hindi belt. South India's population, which corresponded to nearly 64 % of the Hindi-speaking region in 1981, accounts today for no more than 50 %. This gap is bound to widen as available population forecasts suggest that the population of the southern States may stabilise twenty years before that of the bigger northern States. The population of a State, such as Kerala, is indeed expected to grow by 24 % from 1996 to 2051, whereas Uttar Pradesh is expected to grow 142% growth in the same period. The National Population Policy of 2000 recommended that the 42nd Constitutional Amendment –freezing the number of seats to the lower and upper houses (Lok Sabha and Rajya Sabha) on the basis of the 1971 population till 2001– be extended up to 2026. Such an undemocratic measure aims to prevent the “progressive” States from losing their earlier political weight.

These differences are of an unprecedented magnitude. Figure 2 summarises the evolution of demographic growth in the four large regions of India. It indicates that the regional demographic profiles have long followed a rather parallel curve, marked in particular by a gradual population take-off since 1921, the turning point in Indian demographic history. But during the second half of the twentieth century, regional growth rates have started to gradually diverge. Population growth in North India was initially lower than the national average, because of recurrent subsistence or epidemic crises, and a higher level of mortality in these regions. Since Independence, the decennial growth has accelerated in North India and has levelled off at the decadal rate of 25 %, whilst birth rates are the highest in the country. Without any rapid demographic downturn, the growth momentum will become a prominent feature of North India in the next fifty years. The eastern States (Bengal, Orissa and the North East) have a more irregular profile, especially since West Bengal experienced some of the worst demographic crises in India during the forties when it was hit by the famine of 1943 and the communal riots during the creation of Pakistan. In contrast, surprisingly high growth rates were recorded between 1951 and 1971, in part due to migrations from neighbouring Bangladesh. The western States, on their part, have seen an exceptional population growth since 1951. Finally, the four southern States represent a case apart, with a demographic growth significantly lower than average during the last fifty years. This trend has been reinforced by rapid fertility reduction in the Dravidian states since 1970.

⁴ These States are often called “Bimaru”, an acronym coined by the famous demographer Ashish Bose by taking the first letters of these four States in question. It also signifies “sick” in Hindi.

Figure 2: Regional population growth, 1901-2001



Sources: Census

To conclude this section on the Indian population trends, let us underline that the major changes recorded in the Indian demographic regime have progressively reshaped the age pyramids by significantly reducing the proportion of young people in the total population⁵. The elderly population, however, represent a still modest share, with a little less than 8% of the total population above 60 years. This transitional phase of Indian demography, determined mainly by fertility decline, will be characterised over many decades by a small proportion of dependent population (i.e. young and old) as compared to the working-age population. This corresponds to a unique time period, particularly favourable to savings, economic growth and consolidation of human capital, which the economists have described in East Asia as a “window of opportunity”. To a large extent, the pioneer study of Coale and Hoover (1958) on India’s demographic future had anticipated such a development long before. These “demographic dividends” are due to the fastest growth rates of the adult population, as has been the case in South India for more than ten years. At present, all India seeks to benefit from this trend, and it will be doing so for the next two decades. Yet, the full impact of this demographic bonus will depend not only on job creation in the future, but also on the rise of female participation rates, which are still dramatically low in India. This historic turnaround of India’s demography, whose exact contribution in the dynamics of national economy is still too early to evaluate, precedes the future stabilisation of the demographic system bringing with it a significant aging of the population. From now on, the increase in the number of old people and the low fertility levels observed in regions, such as Kerala, inaugurate a new demographic regime, highlighting

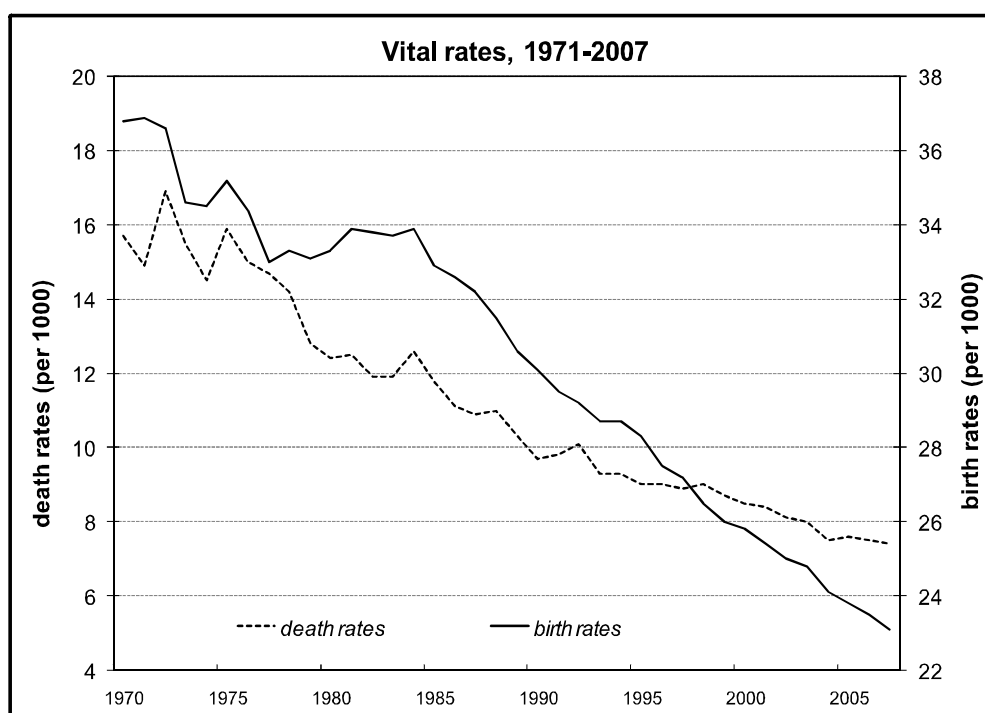
⁵ The population aged less than 5 represent only 10.7% of the total population in 2001 as against 12.2% in 1991. In absolute terms, the 0-4 age group amounts to 18 million people less than the previous 5-9 age group.

in particular the inadequacy of the old age support system and the limitations of the traditional family institutions that were supposed to take care of the elderly population. The deplorable conditions of many widows in rural India illustrate in a dramatic manner the contradictions that the increase of life expectancy can lead to⁶.

Figure 1 is based on estimated death and birth rates from different sources (Census and Sample Registration System) for the twentieth century. Following the well-known pattern of the demographic transition, birth and death rates have gradually separated from each other since 1900, and particularly after the dramatic decade 1911-21 –during which the Spanish flu pandemic caused the last major mortality surge all over the world. With continuous mortality decline since the twenties, the rate of natural increase has risen considerably.

A more detailed picture of recent changes emerges from 1970 onwards, based on the annual estimates of vital rates by the Sample Registration System (SRS). Figure 3 brings together birth and death rates on a comparable scale for the last three decades. These two curves show a parallel drop, but there are two distinct periods. During the first period, which began in 1975, there was a long stagnation of the birth rate, as a result of the birth control excesses of the emergency (see further below). The second period that started during the mid-eighties is on the contrary marked by a steady reduction of birth rates, which, being ultimately faster than mortality decline is causing an irreversible decrease in the rate of natural increase.

Figure 3: Vital rates, 1971-2007



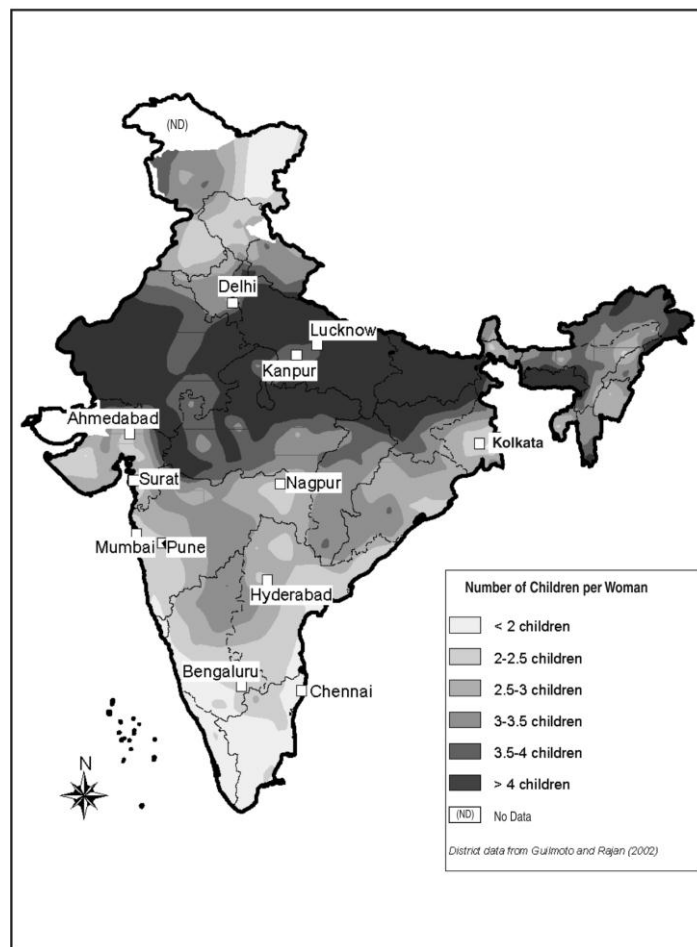
Sources: SRS

⁶ On social issues related to ageing, see for instance Rajan *et al.* (2008), Liebig and Rajan (2000) and UNFPA (2002).

Fertility Transition

The three successive National and Family Health Surveys (NFHS) have documented the circumstances accompanying the recent fertility decline in India⁷. The number of children per woman during this interval went down from 3.7 to 3.0 in the rural areas, whereas in the cities it fell from 2.7 to 2.1 within 13 years. Fertility levels differ considerably, ranging from less than 2 to almost 4 children per woman in different States (Table 1). Map 2 illustrates the extent of fertility variation at the district level by mapping district-level estimates. It reveals the strong spatial patterning of reproductive behaviours in India observed since the fifties (Guilmoto and Rajan, 2001).

Map 2. Fertility in India, 1995-2001



The mechanisms of fertility decline in the last thirty years have exacerbated the demographic heterogeneity of the country. It is true that the demographic transition is, in the first place, a mechanism of differentiation between social groups and between regions.

⁷ For a detailed analysis of the results of the NFHS-3 survey, see *Economic and Political Weekly* (November 29-December 05, 2008) and Rajan and James (2008).

All States in South India, as well as Goa, Himachal Pradesh and Punjab, were among the pioneers in fertility decline and have now rates below the replacement level of 2.1 children per woman. In an even larger part of the country, which includes the entire littoral, from Saurashtra in the west to West Bengal in the east, and penetrates the Deccan plateau, including particularly Telangana (Andhra Pradesh) and Vidarbha (Maharashtra), the average number of children per woman is today well under 3. Kerala, Punjab, Tamil Nadu and Goa began to gain attention in the nineties, when the data available made it possible to discern for the first time the dramatic fall in fertility levels in these areas. More recent statistics have subsequently allowed West Bengal, Himachal Pradesh, Karnataka and Andhra Pradesh to be added to the list of medium-fertility States. In Andhra Pradesh, fertility decline has been rather dramatic in view of its rather slow pace of economic or social development. In contrast, fertility rates remain rather high in central and northern India, with more than 3.5 children per woman on average. Local institutions in the Hindi heartland have somehow managed to better resist the Malthusian forces of social change. But these regions are also characterised by economic backwardness and low levels of social development (Table 2). Well-entrenched patriarchal institutions allow women only a marginal role in the family decisions, as indicated by the results of NFHS surveys on women's autonomy or by anthropological studies⁸.

From a geographical angle, fertility decline does not systematically coincide with urban structure as could be expected. Metropolises like Kolkata, Chennai, Bengaluru or Coimbatore did certainly register a dip in the fertility rate, but so also did a large number of less urbanised regions. Moreover, the northern cities, starting from Delhi, are lagging behind in their fertility transition compared with most of the rural areas of South India. The geographical patterns of fertility decline thus are only marginally affected by urbanisation. Fertility decline in rural South India was on the contrary precocious and seems to have spread towards central India by progressive spatial diffusion (Map 2). Today, the two remaining "islands" of high fertility in India are centred in west Rajasthan and in the Hindi belt, but they keep shrinking and are likely to disappear within the next decades.

The two main factors in fertility variations are marriage patterns and birth control⁹. For want of compulsory civil registration of unions, nuptiality is poorly estimated in India. Marriage patterns are, however, closely related with fertility rates, since births out of wedlock are marginal in number. In fact, in India, women's reproductive behaviour is rigorously monitored by society, and all its aspects are bound by strict social norms. It enforces numerous rules concerning the marriageable age of young women as well as divorce or widow remarriage, directly affecting married life. Social change has certainly led to the relaxation of many traditional norms, thus strengthening the role of (nuclear) families and of the government in fertility regulations. However, further on in the text we will see that this transformation has only partly benefited women, whose social status in the patriarchal system is still rather precarious.

⁸ In Uttar Pradesh, no more than 23.4% of women can go alone to the market, health facilities or places outside the village (NFHS-3 data). See also older field analyses conducted in North India by Jeffery and Jeffery (1997) and Patel (1994). A remarkable study of the social context of demographic change in rural Andhra Pradesh has been done by Säävälä (2001). On South India, see also Caldwell *et al.* (1988) and Guilmoto and Rajan (2005).

⁹ Other factors determining the average number of children per woman include fecundity, abortion and frequency of intercourse, but these "proximate determinants" have only moderately influenced fertility since independence.

Traditionally married at an early age, the girls in India now have a few more years to enjoy their adolescence. Marriage at puberty was in the past the norm in most of the regions (with the exception of South India). The average female age at marriage increased from 17.2 years in 1971 to 19.5 in 2002-04 (DLHS-2). The variations in this average age range from less than 18 years in Bihar or Rajasthan and to values close to 22 years in Kerala. Late marriage among women is today common in families with better socioeconomic status, in urban areas, and in Christian or Sikh minorities. But in many States, a majority of young women are already married before they reach the legal age of marriage (18 years). Men tend to marry five years later than women, but a first marriage after 35 years is also rare among them. But reproduction is no longer determined solely by nuptiality rates. Detailed age-specific fertility rates available from the NFHS indicate that only a minority of women have children before the age of 20. The fertility decline observed during the last thirty years has been felt across every age group, but it was more pronounced among women over 25 years of age –who often opt for sterilization after having the desired number of children. The decrease in fertility rates among younger married women is more recent and still restricted to urban India or to more developed regions.

Birth control

Since 1960, fertility levels have been more dependent on measures for birth control than on delayed marriages. The Indian family planning policy is in fact among the oldest in the world and the government introduced a voluntary programme to control the birth rate from the fifties onwards. The evolution of these population policies has been dramatic, and it is worth providing a brief history.

At the outset, it may be stressed that even before independence, the Indian National Congress had contemplated the role of birth control in national planning, and family planning was proposed in the first five-year plan of 1951. At the same time, the Gandhian tradition¹⁰, which advocated individual control of sexuality, resisted this revolutionary idea of birth control as a national planning instrument. No other prominent measure was proposed before the early sixties, a period in which the disturbing results of the 1961 census emphasised the issue of population growth (Table 3). Concrete measures were outlined in the third five-year plan (1961-66) proposing sterilization of couples who already had enough children, and modern contraceptives such as intra-uterine devices to lengthen inter-birth intervals. A Department of Family Planning was created in 1965 and it was initially to promote the use of contraceptives. Condoms for men were introduced in 1966 and abortion on medical and social grounds was legalised in 1972. By the end of the sixties, the programme actually took off at the national level, especially because of diversified contraceptive supply and its link to primary health centres, and because of the success of local initiatives, such as sterilization camps inaugurated in Ernakulam in Kerala in 1971. Various incentives for sterilization acceptors were also introduced, increasing the annual number of sterilizations from 300,000 in 1965 to 1.4 million in 1970 and reaching 2 million in 1975.

¹⁰ Gandhi clearly stated his opinion in 1925 by suggesting that men should “cease to indulge in their animal passions” by self control, whereas “artificial methods [of birth control] are like putting a premium upon vice” (Gandhi 2008). See also Hodges (2006).

The family planning campaigns expanded further during the emergency from 1975 to 1977. The government encouraged a strict policy for birth control, and numerous States implemented coercive measures ranging from penalties for parents with a large number of offspring to more brutal measures of forced sterilization among the underprivileged with the help of the local police. If the official number of sterilizations increased temporarily (more than 8 million in 1976-77), the credibility of the birth control programme declined considerably, causing such discontent against the State's action that the successive government would not dare to take any sizeable initiative in the matter. As the stagnation of birth rates after 1977 indicates (Figure 3), it would take nearly ten years for the family planning programme to get back on its feet, even though fertility transition during this time followed a sustained regular pace in several regions or social groups. At the same time, the initial feature of the Indian programme of including male vasectomies among a wide range of contraceptive methods rapidly gave way to a gradual emphasis on female sterilizations.

During the nineties, the government re-launched the family planning initiatives based on the ideas popularised during the International Conference on Population and Development held in Cairo in 1994, directly relating birth control to reproductive health and promoting the reproductive rights of women and couples (Santhya, 2003). The new approach represented a dramatic transformation in the culture of the family planning establishment: the old system of monitoring fixed targets was abandoned in 1996 and a new policy for population control was adopted in 2000, which incorporated various principles proposed at the Cairo conference. It intended to vigorously promote the norm of two children per family, with the main objective being to bring down the fertility rates to two children per family. A more recent and typical feature is the gradual introduction of regional population policies, implemented by states. Certain states do not hesitate to penalise rebels. Hence, in states like Rajasthan, Andhra Pradesh or Madhya Pradesh, people with more than two children are not allowed to contest local elections (Panchayat and Zilla Parishad polls).

It would certainly be unfair to study family planning in India at the level of national policies and administrative decisions alone. In contrast with several East Asian nations, the Indian demographic polity has long been characterised by limited government interference in local affairs. This is particularly true in domains, such as marriage or sexuality, which were earlier exclusively handled by traditional institutions, such as caste groups and families. The clash between the traditional social order implemented by local institutions and the new demographic rules introduced by government authorities has had profound repercussions. The government originally had no say in local social organisations, particularly in the rural sector, and their first campaigns oriented towards family planning were opposed or simply ignored by the traditional authorities. The failure of the coercive measures employed during the emergency indicated the very strong capacity for resistance by the population to outside intervention in private demographic arrangements. However, the government never lost the ambition to directly control demographic issues. A particular objective was to accelerate the diffusion of the Malthusian models, prevalent in the urban middle class, amongst the rest of the population, whose rapid demographic growth has long been perceived as a menace for social and political equilibrium.

Table 4: Socioeconomic and health indicators, 2003-06

<i>Housing</i>			<i>sources</i>			<i>Child health</i>			<i>sources</i>		
With electricity	67.9%	NFHS-3	All basic vaccinations	43.5%	NFHS-3						
With drinking water	87.9%	NFHS-3	Prevalence of diarrhoea during the last two weeks	9.0%	NFHS-3						
With toilet facilities	44.6%	NFHS-3	Underweight	42.5%	NFHS-3						
Pucca houses	45.9%	NFHS-3	Birth registration of children below 5	41.1%	NFHS-3						
<i>Household population</i>			<i>Primary Health Centres</i>								
With a TV	44.2%	NFHS-3	With adequate infrastructure (tap water, toilet, vehicle etc.)	31.8%	RCH-2						
With a bank/post office account	40.2%	NFHS-3	With adequate staff (medical officer, etc.)	48.2%	RCH-2						
With a mobile phone	16.8%	NFHS-3									
<i>General population</i>			<i>Maternal health</i>								
Have heard of aids	60.9%	NFHS-3	Four or more antenatal care visits	37.0%	NFHS-3						
Population living with HIV/AIDS (millions)	2.3	NACO	Delivered in a health facility	38.7%	NFHS-3						
HIV prevalence among adults aged 15-49	0.34%	NACO	Delivered by a skilled provider	47.2%	NFHS-3						
Households covered by health insurance/scheme	4.9%	NFHS-3	Maternal mortality (per 100,000 births)	301	SRS						
Diagnosed with depression	13.0%	WHS	Reported delivery complications	40.8%	DHLS-2						
<i>Women</i>											
Prevalence of anaemia among ever-married women	56.8%	NFHS-3	Median age at first marriage	18.3 years	NFHS-3						
Current users of modern contraception methods	48.5%	NFHS-3	Have experienced physical violence during the previous year	18.9%	NFHS-3						
Married before legal age	28.0%	DHLS-2									

Sources:

- NFHS 3: *National Family and Health Survey, 2005-06*
- DLHS-2: *Reproductive and Child Health, District Level Household Survey, 2002-04*
- RCH-2: *Facility Survey, Phase-II, 2003*
- NACO: *National Aids Control Organisation, 2006.*
- SRS: *Sample Registration System, Maternal Mortality in India, 1997-2003: Trends, Causes and Risk Factors, Registrar General, New Delhi, 2006.*
- WHS: *Health system performance assessment. World Health Survey, 2003: India.*

At the local level, family planning and health workers, with the help of primary health centres, continued to supply means of birth control to both women and men with growing success. But the decline in the birth rate has been probably more demand-driven than determined by changes in the supply side. Despite this demographic revolution, women still suffer from infertility caused by early and quick births, high reproductive morbidity, early sterilization (often before the age of 30) and a very high rate of maternal mortality (540 deaths for 100,000 births). The latter rate signifies that more than 80,000 women die each year in India due to problems during pregnancy and delivery. The mediocre reproductive health situation on the

ground is reflected by some of the figures shown in Table 4 and several more qualitative field studies are also available that describe the conditions of women and children in various rural or urban settings¹¹.

The direct effects of economic development or of family planning policies on fertility reduction seem to be limited, as demonstrated by econometric analyses (Drèze and Murthi, 2001). This is equally true for urbanisation, whose real impact on fertility tends to disappear when other variables are taken into consideration. In contrast, social factors such as female education and employment, exposure to media or religion clearly influence fertility levels. For instance, the Muslim fertility rate tends to be *ceteris paribus* systematically higher than that of Hindus (Bhat and Zavier, 2004)¹². Moreover, a large number of women tend to have more children, driven by their desire to have at least one son. Besides, as evident in the map, the statistical analysis confirms the irreducible character of geographical differences, even if the classical North-South dividing line has gradually eroded because of the spread of contraceptive prevalence and lower fertility. A remarkable observation is that the poor (Dalits or landless farmers) in South India today have a lower birth rate than the more prosperous sections in the northern States—as if reproductive behaviour was governed by the region of origin rather than socio-economic status. This strong geographical patterning of fertility suggests that the new pattern of fertility, itself an important component of social change, has expanded along homogenous socio-cultural lines. The diffusional processes at work are both vertical (top-down) down the social scale and horizontal from one locality to another. If, as estimated by the family planning statisticians, 250 million births have been avoided through birth control, this figure reflects the relative efficiency of a frequently criticised infrastructure. But the primary initiative relates to the progressive transformation of mentalities and attitudes of several pioneer social groups, whose new modes of behaviour have progressively spread towards the other social layers through capillary effects or towards adjacent regions as a contagious process.

The long course of the health revolution

The period between the two world wars marked a turning point in the demographic history of the Indian subcontinent, with the end of major crises and the beginning of a progressive decline in mortality. After the 1943 famine and Independence, the improvement in life expectancy at birth recorded an acceleration, due to effective management of famines and food shortage and the first vigorous efforts to promote public health (Table 3). During the period 1921-96, the rise in life expectancy was nearly 40 years, corresponding to an average yearly gain of 0.5 year. According to the latest figures of the World Health Organisation, the life expectancy at birth was close to 63 years in 2006.

The death rate in the country has been divided by three during the last fifty years. In several regions, mortality rates have decreased even faster during the last 30 years and the life

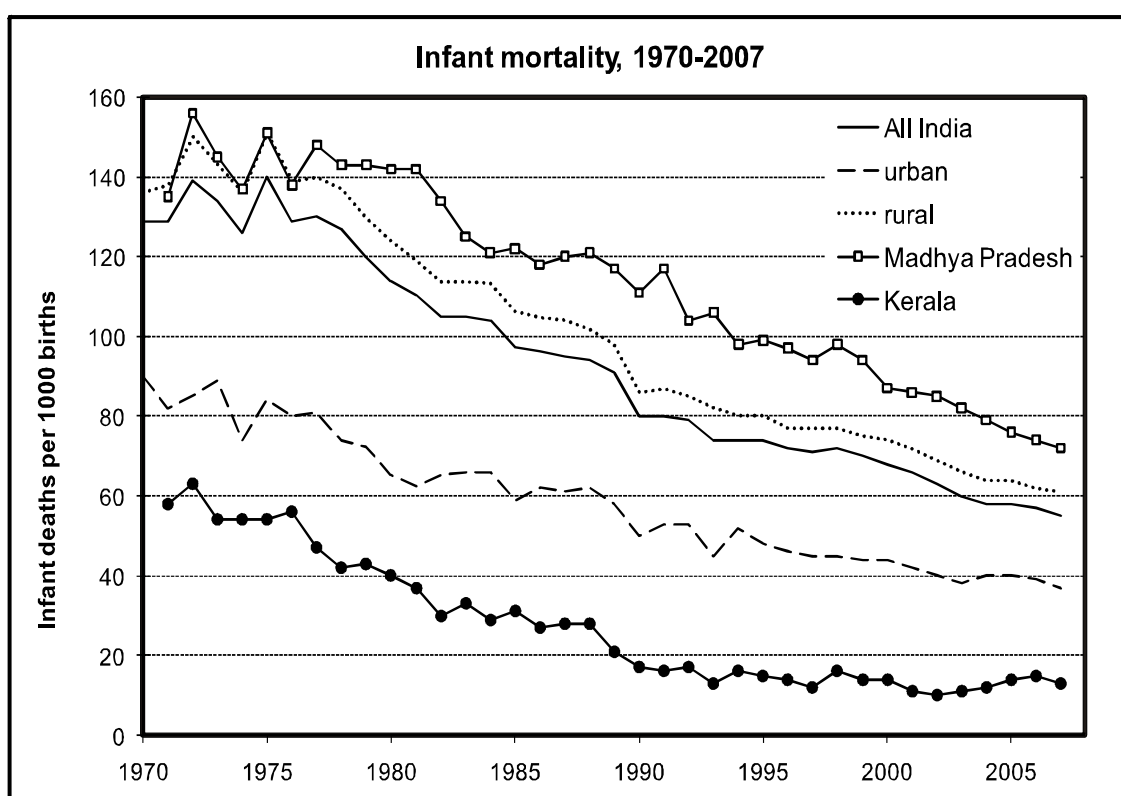
¹¹ On reproductive health and family planning in India, see Ramasubban and Jejeebhoy (2000), and Santhya (2003). Koenig *et al.* (2008) offers a recent collection of innovative studies on reproductive health in India.

¹² This difference in fertility levels accounts for the faster growth rates of the Muslim population. But the proportion of Muslims in India has increased only by a modest 0.7% during this latest intercensal period. For a more detailed discussion, see *Economic and Political Weekly* (29 January 2005).

expectancy at birth in Kerala crossed the barrier of 70 years in the early nineties. Improvements will now be slower in this State. The potential gains nonetheless remain considerable elsewhere as life expectancies are still below 60 years in other States, such as Assam or Madhya Pradesh (estimates for 2001-06). As we will see, future progresses should primarily target the underprivileged sections, from tribal groups to rural labourers, who have so far hardly benefited from the recent progress in health conditions¹³.

Figure 4 represents the evolution of infant mortality since 1970. The series reveals the considerable progress made in the fight against mortality over the period considered. Starting from 130 deaths per 1000 births, infant mortality has now come down under 55 presently. After a levelling off in the seventies, one notices a vigorous dip in the last twenty years, corresponding to a rapid and steady decrease between 1977 and 2007. The introduction of various health initiatives during the eighties, including universal vaccination and the control of diarrheic and acute respiratory diseases, is one of the keys for this success. Improvements in antenatal care and medical assistance during delivery also contributed to this trend (see also the data in Table 4).

Figure 4: Infant mortality, 1971-2007



Sources: SRS

¹³ Detailed analysis on health conditions in India can be found in World Bank (2001), and Misra *et al.* (2003). For a more critical analysis, see also Qadeer *et al.* (2001).

Infant mortality data are disaggregated by rural and urban areas and are also shown for Kerala and Madhya Pradesh in order to illustrate the extent of regional variations. For instance, mortality is significantly lower in the urban areas due to better living standards and access to health care. There is indeed a lag of about twenty years in the rural mortality rates compared with the urban areas, with infant mortality in the countryside being the same today as in the cities in the eighties. Kerala is once again much ahead of the rest of India while Madhya Pradesh registers one of the highest infant mortality rates. Yet, the latter State has made good progress in the last twenty years as infant mortality rates indicate. In addition, it should be underlined that the demographically backward States, such as Madhya Pradesh, Uttar Pradesh, Bihar and Orissa, were already trailing behind the rest of India in 1947, and the life expectancy at the birth was in these regions not higher than thirty years. As is true for the other dimensions of demographic change, the cumulative effect of old and recent trends – what economists refer to as path dependency—is of considerable importance for understanding demographic trajectories and their relative inertia over time. The redeployment of public resources towards less advanced regions and the poor has been unable to reduce the mortality gap.

Studies conducted by the World Bank or the National Council for Applied Economic Research (NCAER) show how the public infrastructure benefits, rather paradoxically, the richest strata and the advanced States rather than the underprivileged. Taking the national level of mortality below 5 years of 74 per 1000 as reference (index 100), we can assess the extent of social and economic differentials by using the latest NFHS-3 estimates. Child mortality is clearly much higher among the underprivileged sections, such as the tribal populations (index 134), the poorest economic quintile (135), Dalits (127), or illiterate mothers (127). In contrast, the index is lower among the most educated mothers (40), Christians or Sikhs (70), or the highest quintile (45). Geographical variations are no less important between cities and rural areas, or between Himachal Pradesh (56) and neighbouring Uttar Pradesh (130). The cumulative effect of regional and socioeconomic inequalities is considerable. For instance, children born of a tribal mother in Madhya Pradesh have a risk of death before reaching 5 years that is 15 times higher than children born of mothers with secondary education in Kerala. Such mortality levels correspond respectively to those of the Democratic Republic of Congo and Lithuania in 2005-10, a comparison that highlights the formidable disparities found in today's India.

The major epidemics, such as cholera or chicken pox, had practically disappeared before Independence. But other infectious and parasitic diseases still impact most age groups and they correspond today to the 17 % of deaths for which a detailed medical certificate is available. In this category, half of the deaths are due to tuberculosis, which is most virulent among men above 25 years. In contrast, children are primarily victims of intestinal infections and various types of septicaemia. The other major causes of death, 21 % of the total, are diseases affecting the circulatory system with myocardial infarctions and cerebrovascular diseases. This change in the causes of deaths follows the classic pattern of the epidemiological transition, with a regular shift from infectious diseases towards degenerative diseases. Another way to assess the intensity of morbidity and mortality consists of evaluating the number of years of life without any disability (disability-adjusted life years) and the so-called "burden of disease" as measured by the World Health Organisation. According to these figures, communicable diseases account for nearly half of the lost life years in good health in India, against an average of 7% in higher-income countries. Amongst these, the most dramatic diseases are infections and viral diseases,

followed by respiratory and prenatal infections. The toll attributed to non-communicable diseases, a third of the total diseases in 1998, is set to jump in the next twenty years and this will call for a progressive redefinition of the national health system in order to respond to new challenges related to cardiovascular, cancerous or neuropsychiatric pathologies¹⁴.

The private healthcare system, originally ignored in the public health policies, has gained considerable importance during the last twenty years (Vaguet, 2009). It will play a key role in the adaptation to a range of emerging health challenges and new diseases. To some extent, it makes up for the failures of the largely free public system that is often criticised for its poor quality, by offering more diversified services and personal care. Driven partially by demand, the private sector has also contributed towards aggravating the inequality of health infrastructures and the inflation of costs of health care. The role of the public sector remains crucial in prevention or tracking of diseases, as well as in its objectives of reaching the poorest through its primary health care centres in rural regions. Among the emerging diseases, the HIV epidemic, which was detected since 1986 in India, went almost unnoticed for a long time because of the apathy of public authorities towards this epidemic menace. It is true that the prevalence rate, estimated to be 0.4 percent among adults in 2006, has remained rather low. Such a prevalence level is lower than that estimated for several Asian countries, such as Myanmar or Thailand. But according to the 2008 provisional estimates India has today about 2.3 million people living with HIV and AIDS –with a large majority of men among them¹⁵. The analysis of the social characteristics of the infected population show that the virus has already spread from the high-risk groups towards vector groups, such as clients of sex workers, employees of hotels or transport companies, or migrants, and towards the rest of the population (housewives and children). Unsurprisingly, the geographical spread of the HIV pandemic is contrasted. The regions most affected are found in the Northeast or in the Deccan. In 2003, Tamil Nadu and Maharashtra accounted for two-thirds of the cases officially registered. Using sentinel data based on pregnant women, the prevalence levels reach values above 3% in highly affected districts, such as Namakkal (Tamil Nadu), Belgaum (Karnataka), West Godavari (Andhra Pradesh) or Tuensang (Nagaland). One of the principal tools for fighting AIDS is through awareness campaigns, since a significant part of the population is still ignorant about the epidemic or about the forms of transmission; for instance, less than 23 % of women in Bihar knew that AIDS could be prevented with condoms in 2005-06 (see also Table 4).

The feminine vulnerability

The 2011 census showed a slight improvement in the overall sex ratio, moving from 927 to 940 women per 1000 men from 1991 to 2011.¹⁶ But this ratio remains extremely low compared to the rest of the world where women usually predominate in the population (Table 3). According to a

¹⁴ An under-studied facet of India's health transition corresponds to mental disorders. According to the World Health Survey conducted in India in 2003, the proportions diagnosed with depression or neurosis amounted to 15.1 % of the total population. See also Sébastia (2009).

¹⁵ The figures were provided by epidemiological and behavioural studies conducted by the National Aids Control Organisation. See also Ekstrand *et al.* (2003) and UNDP (2003).

¹⁶ Sex ratio is usually computed in India as the number of females per 1,000 males.

recent estimation, there are 43 million fewer women than expected in India (UNDP, 2010). The census results have further revealed a disturbing aggravation of the feminine deficit among children of less than 7 years: the child sex ratio fell gradually from 947 in 1991 to 914 in 2011. In spite of improvements since 2001 in the most affected states, the child sex ratio in children touch extremely low values in many regions as in Punjab (846) or in Haryana (830) as shown in Table 1 and Map 3. More worryingly, the 2011 census figures pointed to a gradual geographic diffusion of prenatal sex selection towards previously less affected States such as Maharashtra or Madhya Pradesh.

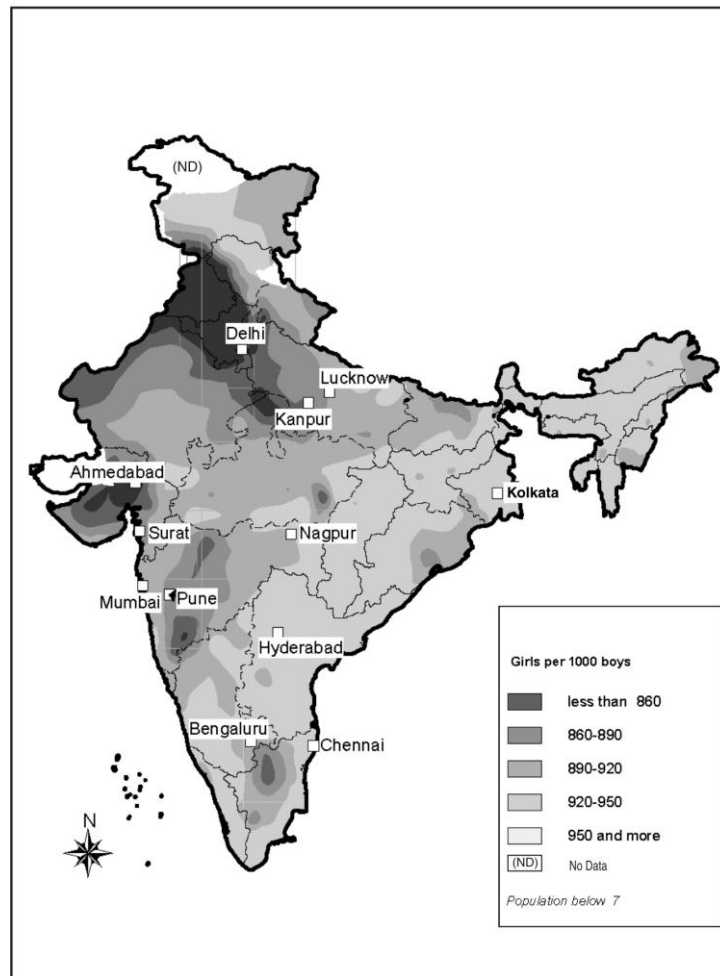
Sex ratio values depend on two well-identified factors: a sex ratio at birth that is much lower in India than the biological norm (approx. 950 female births for 1000 male births) and excess female mortality during childhood. These factors for their part are associated with specific discriminatory practices, such as sex-selective abortion, female infanticide and girl neglect.¹⁷ One should keep in mind that these practices form part of the life cycle of a woman marked by systematic discrimination, beginning from their conception and childhood, further prolonged by excess maternal mortality and among the elderly, not forgetting the notorious “dowry deaths”. There are numerous analyses, however, on the degradation of women’s status in India and recent studies have documented the multifarious aspects of gender-based violence (Table 4). A case point is widow mortality. Apart from the rare cases of *sati* that receive high media attention, the survival of widows has been shown to be closely related to the resources, such as land, which widows control and to the support received from their surviving sons (Chen, 2000). Nowhere do statistical indicators illustrate more clearly the extreme materialism of India’s demography, which dictates individuals’ chances of survival according to their economic assets.

Even to the naked eye, the geographic dimension of gender discrimination in 2001 is obvious as illustrated in Map 3 (see also the 2011 State-level data in Table 1). Some regions seem almost untouched, such as the large territory towards the south and the east, where the sex ratio—above 950 girls per 1000 boys—is relatively normal.

On the contrary, the lowest values are found in the northwest, over an area stretching from Punjab to Gwalior. An additional “hot spot” of discrimination against girls also emerges in Gujarat and Maharashtra. This regional distribution partially resembles the geography of female infanticide common among the higher castes, a feature of India’s old demographic regime that was combated by the colonial authorities in the nineteenth century. However, the thrust for masculinisation has recently invaded new territories and has come to gradually affect lower-status groups. The effects of spatial and social diffusion are once again visible.

¹⁷ Among the recent works on gender imbalances and sex selective abortions in India, see Bhat (2002), John *et al.* (2008) and Guilmoto (2008).

Map 3. Child sex ratio in India



Various arguments have tried to explain this degradation in the sex ratio at birth. Undoubtedly the patriarchal tenets of Indian society have a strong role to play in this. More contemporary features, such as the rapid social and geographical spread of dowry practices, also illustrate the modernisation of the gender discriminatory regime during the recent decades. The emergence of the private healthcare system, in which prenatal diagnosis and selective abortions are conducted, is also partly to blame and the rigorous legislation against sex selection has had so far limited effect. Another factor is fertility decline itself, which tends to exacerbate the need for gender manipulations amongst parents who want to have a son. In fact, the contemporary period corresponds partially to a mechanism of revival of old practices observed during the colonial period. But female infanticide has become an outdated procedure prevalent only in some marginal groups. Sex selection proceeds rather from a change in normative systems among the urban middle class devaluing feminine offspring because of dowry. Far from being an archaic legacy from the old patriarchal system, gender discrimination is today a typical aspect of the modernisation of the society, and the most educated or the most prosperous sections are its first vectors, including among the diaspora (Dubuc and Coleman, 2007).

Recent statistics tend to suggest that the sex ratio at birth in India may ultimately decrease and a slight downturn is indeed observable in the northwest (Guilmoto, 2009). But whatever the future trends, the recent process of demographic masculinisation will severely imbalance the marriage market in the future. The excess number of men –the first signs are already visible (Kaur, 2004)– will force a large number of them to delay their marriage and may prevent the poorest from marrying at all. With the increasing risk of female trafficking and gender violence, it is unlikely that women's status may benefit from their numerical shortage.

Migration and urbanisation

Mobility is the demographic feature most sensitive to economic hazards and fluctuations, and the data of the 2001 census shed some light on the new patterns of population redistribution after a decade of economic liberalisation. The overall number of migrants in India has increased by a third between 1991 and 2001. In fact, no less than 98 million people have reported a change of residence during 1991-2001, a figure most likely to be underestimated. Local migrants – migration within the district– still predominate, and among them women are in a majority as a result of the common rule of village exogamy. But the number of inter-State and international migrants has also rapidly increased: they correspond to almost a third of migrations of less than one year in 2001. The decennial increase in migration has been especially pronounced for inter-State migrants (+ 54%). On one hand, Delhi and Maharashtra recorded the entry of more than 2 million migrants, and on the other, Uttar Pradesh and Bihar lost the same number of out-migrants. The geographical patterns of regional mobility remains to some extent spatially segmented: the largest number of migrants tends to go from Uttar Pradesh and Bihar towards the northwest (Punjab, Haryana and Delhi), or from Uttar Pradesh and almost all other States towards Maharashtra. Long-distance flows are primarily caused by the exodus of (mostly male) workers towards big cities or towards more prosperous localities. The movement of female labour (maids, nurses and seafood workers) remains quite limited because of the numerous social impediments to women's mobility. However, the new migration patterns towards export-processing zones have involved a large number of women¹⁸.

Along with nomadic mobility, short-term migration and particularly seasonal movement are the most poorly understood forms of migration (Rao and Casimir, 2003; Farrington and Deshingkar, 2009). In the countryside, temporary mobility has retained considerable importance, facilitating particularly the seasonal redeployment of labour according to the agricultural calendar. Circular mobility allows the migrants to accumulate capital or to acquire training, thus escaping from the constraints and discriminations in the rural labour market. But migrant groups also fall easy prey to those looking to exploit their vulnerability, their debts and the strong segmentation of labour networks.

More erratic movements are associated with economic, climatic and political distress. Climatic hazards, such as drought and local floods, displace hundreds to thousands of persons every year. These movements can sometimes be permanent, as in the case of populations displaced

¹⁸ For a general view on migration, see Srivastava and Sasikumar (2003). On rural mobility, see also Farrington and Deshingkar (2009) and Breman (1996).

due to development projects. The dam on the Narmada (Sardar Sarovar Project) has drawn a great deal of attention to the large numbers of people threatened with eviction –possibly 200,000 persons although estimates vary (Cullet, 2007). As elsewhere in the world, dams are constructed in zones of low population density, occupied by socially and politically marginal groups, such as the tribal populations. The latter are shifted for the sake of developments that will benefit first of all, by their very nature (electricity production, irrigation and drinking water), the urban populations and the rich farmers living downstream. Millions of persons have been relocated since independence for these development projects. Exact figures are not available for a final estimation of the number of people affected, but the biggest development projects (Hirakud in Orissa; Povalam and Bansagar in Madhya Pradesh; Srisaigram in Andhra Pradesh) have led to the relocation of more than 100,000 people¹⁹.

The overall urbanisation level appears rather modest in India, with only 27.8 % urban population of the total population in 2001²⁰. India had a somewhat high proportion of urban population (10.8 %) in 1901, but the development of the cities during the colonial period was particularly sluggish because of the low industrialisation of the country (Table 3). Except for the first jump following Partition, when most refugees converged on cities, the process of urbanisation increased in a significant manner only from the 1970s. Since then, the urban population has doubled with respect to the rural population. This is due to a large extent to migrations toward the cities, but the gradual absorption of the villages in the urban areas, particularly at the periphery of urban agglomerations, has been an additional factor. Map 1 indicates the million-plus cities as well as cities with more than 100,000 inhabitants in 2001.

Available census figures may not capture adequately the actual extent of the rural-urban redistribution. According to the migration statistics based on place of last residence, 21 million town dwellers declared that they had a rural residence ten years earlier. Actual rural-urban migration of villagers is probably greater. Thus if the urban population of 1951 had increased at the same pace as the total population, 107 million fewer urbanites would have been found in 2001 than effectively counted in the census. Since the natural increase of the urban population is lower– due to its lower birth rate–the difference between the expected population and the population recorded in towns is essentially due to the rural-urban migrants and their progeny, as well as to the gradual expansion of urban areas.

During the last few decades, the urban population as a percentage of the total population has gone from 23.3 % in 1981 to 25.7 % in 1991, rising to 27.8 % at the time of the last census, which registered more than 600 new localities classified as urban according to the criteria of the census (size, density and municipal status). Despite rapid economic development during the last decade, urban growth has remained moderate and economists have underlined the paradox of the jobless pattern of economic growth observed in India, with slow urbanisation being a consequence of this trend.

Industrialisation patterns, migratory networks and the impressive capacity of labour retention of the rural areas (Racine, 1997) together account for the relatively low rate of urbanisation since

¹⁹ According to the report of the World Commission on Dams, more than 4 million people in total have been displaced by dams in India.

²⁰ For an analysis on urbanisation in India, refer to Sivaramakrishnan *et al.* (2005) and Kundu (2003). The case of Delhi is studied by Dupont (2003). 2011 data on urbanization are not yet available.

Independence. This phenomenon is based on the profound transformations of the rural economy and the relative resilience of the local institutions that maintain unity in the village. The growth in agricultural production, due to rapid progress in irrigated areas and increasing use of fertilizers, combines with the development of the non-agricultural sector to boost the growth of jobs in the rural sector. In 2001, more than a quarter of rural jobs in India as a whole were in a sector other than agricultural. Figures are often higher in different regions like Punjab or Kerala that are characterised by a strong rural and urban integration, in a pattern akin to the Indonesian *desakota*, but also in the periurban areas of metropolitan cities. However, if the current development of industry and service sectors does not spread out more widely towards underprivileged rural zones, such as the arid Deccan, migratory movement towards the growth poles may accelerate in the future.

The urban thrust has for a long time been restricted to the bigger cities, to the detriment of the smaller cities where growth is slower. More than two thirds of town-dwellers today reside in cities of more than 100,000 inhabitants, as compared with 40% before Independence. Meanwhile, the number of million-plus cities has increased up to 35 in 2001. These cities (Map 1) account for nearly 38% of town dwellers and 10.5% of the national population, whereas the four millionaire cities of 1947 (Mumbai, Kolkata, Chennai and Delhi) sheltered then only 13% town dwellers and 2.2% of the Indian population.

The agglomerations of Mumbai, Delhi and Kolkata, each with more than 10 million inhabitants, are placed among the fifteen most populated cities of the world. Delhi takes the lead, gathering progressively all the sectors of activities, from international trade to small-scale artisanal or industrial production. The capital region has 16% migrants within its population, a proportion higher than in the fast-growing cities of Mumbai and Bengaluru. Several other metropolitan cities, such as Pune, Hyderabad or Bengaluru, have registered a strong growth rate. Among the other million-plus cities, some like Lucknow, Surat, Jaipur, Bhopal, Ludhiana or Visakhapatnam, have displayed spectacular development, with the population here having doubled in the last twenty years. The process of urbanisation is firstly horizontal through urban sprawl, with the new population spreading to a large extent to periurban or suburban zones, rather than vertical, with an increasing concentration in the city centres. The advantage of this suburban expansion is that it delays the congestion of the main cities, but tends to expand the metropolitan areas. Besides, affected cities still have large areas that are marked as rural where industries are set up in quest of land and cheap labour. Delhi, whose historical centre is stagnating demographically, is a good example of this, showing considerable growth at its borders and at the same time within the State of Delhi spilling over to the bordering States of Haryana and Uttar Pradesh. The mechanism is replicated in Mumbai and in Hyderabad, representing the maturity of Indian metropolisation by consolidation of regional satellites and growing peri-urbanisation. This results partly from saturation of the historical city centres, where population density exceeds 10,000 inhabitants per km² in all above-cited metropolises; the development of intra-urban transportation and increase in the number of commuters, the industrial decongestion of the city centres and the creation of secondary poles, the expansion of urban infrastructure, the sociological recomposition of downtowns and the eviction of slum-dwellers towards the periphery are distinctive signs of this evolution.

India and international migrations

India has received a significant number of refugees. The main wave followed Partition when nearly 8 million people headed towards India, coming mainly from west Punjab, Sind and east Bengal; these migrants settled in the areas close to the border, and especially in the cities. The Hindus, who still constitute a significant minority in Bangladesh, have continued to migrate towards India to date. Another significant refugee wave came from Tibet, and was first established in India in 1959, from Himachal Pradesh to Karnataka, followed by several hundreds of thousands of persons of Indian origin forcibly repatriated from Sri Lanka and Myanmar. During the last twenty years, the new arrivals were temporary refugees, coming from Sri Lanka (Tamils) and from Bangladesh (Chakmas from the Chittagong Hills), and also from Afghanistan, Myanmar (Christian Chins) and Bhutan (Lhotshampas of Nepalese origin). A large number of them have since left India, and the United Nations High Commissioner for Refugees counted only 170,000 refugees. The "internal refugees", estimated to number 600,000 in 2001, can also be taken into account. This category includes the population displaced within the country as a result of local conflicts, and accounts for the hundreds of thousands of Hindus (Pandits) from Kashmir relocated in Jammu or elsewhere, and more than 100,000 displaced in North East or in Gujarat²¹.

Relatively little is known about spontaneous immigration towards India. The statistical gaps in international migration statistics tend to feed the most fanciful or alarming rumours. The two major contingents of migrants are the Nepalese and Bangladeshis, and the political and media footage received by the two differs greatly. There are more than half a million Nepalese in India according to the Nepalese census of 2001, but certainly much more in reality. They settled long since in the regions bordering Nepal or Bhutan, as well as in the Darjeeling area and in the big cities. They are also found in large numbers in Garhwal and Indian Terai, where a number of them come as seasonal workers. These migrations increased at the beginning of the century because of the Maoist insurrection in rural Nepal. The arrival of Bangladeshi Muslims has had greater repercussion for both numerical and political reasons: in the absence of statistics, the Home Minister in 2003 evaluated them to be 15 million, surely an exaggerated figure. It is in the States of the North East, beginning from Assam, that migratory movement has had the most palpable population impact, evident from the rapid growth of population. As compared to all of India or West Bengal, Assam in fact witnessed a very rapid growth since 1951. Nowadays, Bangladeshi migrants move to the metropolitan cities, such as Delhi or Mumbai, taking the jobs at the lowest level of the social ladder (Ramachandran, 2005).

Emigration from India towards foreign countries is also multiform. It encompasses cross-border movements (mainly towards Nepal) and as well as long-distance moves of often unskilled labourers to the countries of the Persian Gulf and of entrepreneurs and professionals to developed countries. The statistics on the "Indian" population in foreign countries that we present in Table 5 have the advantage of having a single and simultaneous source, because of the estimations provided by the Indian consulates all over the world (Indian Council of World

²¹ See Chari *et al.* (2003) for a recent presentation of the situation of refugees in India. For the refugees, refer *Profile of Internal Displacements: India* (2004).

Affairs, 2001)²². There is an estimated total of 17 million persons in the Indian diaspora, which is second in size in the world after the Chinese diaspora. These figures, however, encompass the recent migrants, Indian nationals living abroad, and the population resulting from colonial emigration—such as ethnic Indians in Fiji or Mauritius.

Table 5: Population of Indian Origin for major destination countries, 2000

	Indian Nationals	Persons of Indian Origin	Stateless	TOTAL
<i>Asia and Oceania</i>				
<i>Australia</i>	30.0	160.0		190.0
<i>Fiji</i>	0.3	336.6		336.8
<i>Hong Kong</i>	22.0	28.5		50.5
<i>Indonesia</i>	5.0	50.0		55.0
<i>Malaysia</i>	15.0	1 600.0	50.0	1 665.0
<i>Myanmar (Burma)</i>	2.0	2 500.0	400.0	2 902.0
<i>New Zealand</i>	5.0	50.0		55.0
<i>Singapore</i>	90.0	217.0		307.0
<i>Thailand</i>	15.0	70.0		85.0
<i>Middle East</i>				
<i>Saudi Arabia</i>	1 500.0			1 500.0
<i>Bahrain</i>	130.0			130.0
<i>United Arab Emirates</i>	900.0	50.0		950.0
<i>Kuwait</i>	294.0	1.0		295.0
<i>Oman</i>	311.0	1.0		312.0
<i>Qatar</i>	130.0	1.0		131.0
<i>Yemen</i>	0.9	100.0		100.9
<i>Americas</i>				
<i>Canada</i>	150.0	700.0	1.0	851.0
<i>Guyana</i>	0.1	395.3		395.4
<i>Jamaica</i>	1.5	60.0		61.5
<i>Suriname</i>	0.2	150.3		150.5
<i>Trinidad & Tobago</i>	0.6	500.0		500.6
<i>USA</i>				1 678.8
<i>Europe</i>				
<i>France</i>	10.0	55.0		65.0
<i>Italy</i>	35.5	36.0		71.5
<i>Netherlands</i>	15.0	200.0	2.0	217.0
<i>United Kingdom</i>				1 200.0
<i>Africa and Indian Ocean</i>				
<i>Kenya</i>	15.0	85.0	2.5	102.5
<i>Mauritius</i>	11.1	704.6		715.8
<i>Reunion</i>	0.1	220.0		220.1
<i>South Africa</i>				1 000.0
<i>Tanzania</i>	5.0	85.0		90.0
WORLD				16 883.0

Source: Indian Council of World Affairs (2001)

Notes: figures in thousands; limited to countries with more than 50,000 persons of Indian origin ; Countries of recent immigration shown in italics.

²² These numbers should, however, be taken as rough estimates and are probably unreliable for some countries such as Myanmar, Sri Lanka, etc. There is no available data for the border countries, such as Nepal. The latter however counted 100,000 Indian nationals in the 2001 census and a much larger number of inhabitants of Indian origin in the Terai region.

Two regions in the world have received the largest number of Indian migrants during the last few decades²³. On the one hand, we have the Anglo-Saxon countries, with 4 million Indian nationals, and on the other hand, the Gulf countries with about 3.4 million Indian migrants. These migratory streams are however rather distinct, based on the social profile of migrants as on the type of the migration itself. Migrants who move to the United States (West Coast and New York area) or other Anglophone countries represent the upper crust of migration. A large number of them are from the best educational institutions and leave for a foreign country, either as graduate students or to be recruited directly by international companies. In the United States, Indians are in the majority among the H1B visa holders that are reserved for professionals and furthermore constitute one of the most prosperous communities of North America. There is also a large student community of Indian origin present there. Indians usually settle for a long period, often acquiring the nationality of the host country. The strong development of outsourcing, which allows American and other companies from the developed countries to subcontract a major part of their service industry in India, will not necessarily slow down this brain drain. Rather, one observes a development of complex real migratory networks and several centres of high technology, such as Bengaluru, benefit from economic linkages with expatriate and returnee Indians.

The second wave dates back to the seventies, at the time of the economic boom in the oil-producing countries of the Middle East. Though a large number of Indian migrants nowadays are originally from Tamil Nadu, Andhra Pradesh or Maharashtra, Kerala is ahead of them all: it supplies more than one third of the migrants settled in the Gulf countries, a ratio ten times higher than that of its demographic weight in the country. A large part of the entire socio-economic fabric of Kerala today is based on emigration, and enjoys its significant economic dividends. Massive outmigration is also accompanied by several perverse effects on the economy and local society. Millions of Indian households are divided between international migrants (mostly men), who are absent for a long period, and other family left behind at home, who are mostly inactive. It may be noted that the income of the migrants in the Gulf are lower than those of migrants in the Anglo-Saxon countries, and that the draconian migratory regime, typical of Middle Eastern countries, also prevents permanent settling or relocation of the family of the migrants. As a result, the major part of the migrants' income is repatriated in India. The World Bank estimated the total amount of remittances to be \$49 billion in 2009, making India the first beneficiary in the world of migrant remittances even if it is only third by number of international migrants (behind Mexico and Russia). The government has only recently realised the importance of the Indian community abroad, and then, in 1999, bestowed upon eligible non-resident Indians the status of "Person of Indian origin" destined for the diaspora members deprived of Indian nationality. Since 2003, a Non-Resident Indian Day (*Pravasi Bharatiya Divas*) is celebrated annually with the active support of the Prime Minister, and new efforts are made to attract overseas Indians (double nationality, investment facilities and *Pravasi Bharatiya Samman* award).

²³ On international migration, see Zachariah *et al.* (2003), Hoda (2004) and Rajan (2010).

Population and resources

India shows an economic growth practically uninterrupted since Independence. The agricultural and industrial development has been quite significant. Despite neo-Malthusian sirens, the food production multiplied four times between 1950 and 2000 while cultivated land increased only by 26.5% during the same period. With the increase in productivity resulting partly from the Green Revolution, rice and wheat have ousted traditional cereals like millet or sorghum. Though several pockets of rural poverty still struggle with chronic food paucity, independent India has indeed proved its capacity to vigorously tackle most crisis situations, avoiding all risks of large-scale famine for the past fifty years (Drèze, 1995).

Suffering for a long time with an annual rhythm of regular but modest growth (the so-called Hindu rate of growth, oscillating around 3%), the country took an economic leap at the end of the eighties and after liberalisation in 1991. The period was characterised by a radical change in national economic policies and a progressive withdrawal of state interference, giving an impetus to the service sector and to exports. Since then, the average growth rate of the GDP has been around 7% per year, with the tertiary sector two and a half times as dynamic as agriculture. Apart from these general indicators, there has been a significant reduction in poverty. According to the standard estimations provided by the National Sample Survey (NSS), the percentage of the population living under the poverty line has gone from 51.3% in 1977-78 to 27.5% in 2004-05. Several socioeconomic indicators have been improving, from mortality to educational levels. The latest surveys have, for instance, confirmed the rapid increase in literacy levels in the country and the reduction in gender educational gaps (Table 2). The composite human development index (HDI), which places India henceforth in the category of “medium” level, confirms the country’s major economic and social progress in the last twenty years.

It is time now to turn towards the cost of this development and the disparities it has given rise to. Many of these are in fact direct outcomes of economic and social progress. Our analysis has underlined how the acceleration of the demographic change has created an imbalanced social structure. Gender, caste and religious disparities still persist, and may have in fact widened in some cases. Progress is slower in certain sections of the population, for example women or the tribal population, particularly because of their traditional subjugation or their spatial isolation. The Energy and Resource Institute (TERI) estimated in 1997 the costs incurred due to degradation of the environment at more than 10% of the gross national product, including particularly the decline in agricultural productivity due to soil erosion and health expenses of people affected by the air pollution. The picture, in terms of specific resources, is more complex because the environmental cost of the growth is extremely varied according to the region, and is accompanied at times with positive reactions aiming at the protection of resources. The historical depletion of India’s natural resources has at present slowed down, being restricted to certain regions of heavy exploitation. The forest cover has also recently ceased to diminish. Cultivation or plantation in the forested areas, and the conversion of mangroves into fish farming or rice production zones in the coastal areas have thus been discouraged since the nineties. Forest and biodiversity management has also led to new mobilisation of the populations concerned. Air pollution, which has increased in the metropolitan cities due to industrial growth and automobile traffic, is a more worrying feature. Even if partly addressed by new regulations, the rising morbidity due to domestic air pollution in India (linked notably

to fuel smoke, cooking devices and deficient ventilation) has been only recently acknowledged²⁴.

Hydro-reserves are a serious source of concern for India's future development. Indicators of per capita availability of renewable water place India, according to the Food and Agriculture Organisation (FAO), at the same level as Iran. Many regions like Gujarat or Tamil Nadu are in fact already in deficit, as numerous rural communities and urban localities are deprived of regular access to water. Thus only 20% of households had potable tap water in 2001 in India, less than 10% in rural areas—, even if the proportion with access to drinking water is now very high (Table 4). The tapping of underground resources, aided by diffusion of pumps installed for irrigation or consumption purposes, has caused a sharp fall in availability in many regions and also degradation of the quality of water reserves, which can only be reversed with great difficulty. The Green Revolution which turned India into the largest irrigated area of the world, ahead of China and the United States, and led to deep changes in the agricultural production systems is one of the main reasons of this condition. Furthermore, the current socioeconomic development dynamic and the ensuing rise in prosperity will cause the water needs to rise much faster than the population. The international projections place India among the nations likely to be subject to a water crisis from as early as 2025.

Conclusion

This chapter has examined the major components of demographic change in India. Along with the forces of social change and economic development, migration, fertility decline, demographic masculinisation or health transition have contributed to a growing differentiation of regional and social trajectories. At the same time, economic growth has brought a new impetus to the logic of demographic change in India even if it may be said that its overall impact on demographic outcomes is not yet fully understood. Long-run population dynamics—such as the fact that India should overtake China and become the most populated country of the world before 2030—are still marginally affected by the consequences of economic development

The impact of economic trends will nonetheless lend its tonality to the demographic revival. It will in particular determine the schedule of the last phase of the demographic transition across the country. The pace of improvement in living conditions and poverty reduction will, for instance, cause a sustained rise in demand for food and for health services, and will have major implications on mortality trends among the poor. In addition, the regulating efforts of the government will be central in the domains of social security, healthcare provision or prevention of communicable diseases. Similarly, economic growth and its regional polarisation are likely to generate migratory waves comparable to what has been observed in East China during the last twenty years. The economic take-off could put thousands of persons on the road and its impact on the urban development and on sanitary infrastructures would thus be considerable.

The structural effects of economic development on two other central dimensions of the Indian demographic system, the reproductive regime and the gender system, will be less

²⁴ The lack of adequate medical statistics means that behavioural risk factors are often better known in India than their actual health outcomes. See Raban *et al.* (2009).

straightforward. Their evolution in future will partially retain its endogenous character, based as much on the rapid evolution (or inertia) of the local institutions and value systems as on global socioeconomic transformations. The impact of these two components of India's population dynamics will be crucial in the future. The increasing number of males in the last twenty years will in particular have durable demographic repercussions unless the discrimination against girls reverses quickly; its social effects will impact several generations (birth cohorts) by upsetting the marriage market in Northwest India. All the same, the fertility transition will be undoubtedly the key dimension. It will condition for a long time the variations in population growth between regions and may widen the demographic gaps between the aging southern States and the rest of the country. The controversy accompanying the publication of census figures on religion in 2004 and the decision to hold a separate caste census before the end of 2011 demonstrate that demographic imbalances and differentials between the socio-cultural groups can acquire a considerable political dimension. In a context of accelerated social and developmental change, the population factor will therefore retain a central role in the struggle between gender and social groups to harvest the fruits of growth.

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Main internet sources of demographic information :

Demographic sources : <http://www.demographie.net/demographicdata>

Census and sample registration: <http://www.censusindia.gov.in/>

Department of Family Welfare (Family planning): <http://mohfw.nic.in/fsfwp.htm>

NFHS surveys: <http://www.nfhsindia.org/>

Unicef surveys: <http://www.childinfo.org/MICS2>

Ministry of Health & Family Welfare: <http://health.nic.in/>

Indian diaspora: <http://indiandiaspora.nic.in/>

Appendix: Sources on the population in India

The range of sources to study India's demography is quite heterogeneous. However, the wide availability of the statistics on the Internet now allows easier access and the basic components of demographic change today are far better documented than twenty years ago. But there remain serious gaps and issues concerning the quality of data in a number of domains and several topics, such as migrations or epidemiological change, are still poorly covered by available statistics.

The population census

The decadal Census of India remains the indispensable source for evaluation at different levels of the main socio-economic characteristics of the population, despite various limitations (quality and nature of the data, publication period). Some of the most used data from the census include:

- Population
- Population distribution per State, urban or rural zones, districts, *tehsil/taluk*, urban or rural localities
- Place of birth and last residence, age, sex, marital status, number of children
- Education level, employment status, occupation, language, religion, scheduled castes and tribes
- Standard of living, household assets and village infrastructure.

Civil registration

Civil registration of births and deaths, although introduced since the nineteenth century, remains chronically deficient in India. However, some states and municipalities do provide more reliable statistical series based on birth and death registration. To circumvent this difficulty, India has also introduced a sample system of registration of vital events (Sample Registration System) at the end of the sixties, which supplies reliable state-level estimates of vital rates on an annual basis.

Other sources

One of the first complementary sources corresponds today to three large-scale pan-Indian surveys on reproductive health (National Family and Health Survey). The Reproductive and Child Health (RCH and DHLS) surveys have provided additional data on infrastructures and health behaviour along with the MICS survey (Multiple Indicator Cluster Survey) on children in 2000. Epidemiological data remain rather scarce with the exception of HIV statistics provided by the National AIDS Control Organisation (NACO).

Surveys regularly conducted by the National Sample Survey Organisation (NSSO) provide most socioeconomic indicators. Surveys carried out by the National Council of Applied

Economic Research (NCAER) in 1994 and 2005 constitute an additional source on social development.