

Demographic Changes in India: Implications for Policy

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ABSTRACT

India's fertility decline in recent decades is resulting in a demographic dividend, a window of a few decades during which the worker-dependent ratio is favorable and rising. To take advantage of the demographic dividend, the country will need to invest heavily in the human capital of its children, who will be entering the workforce in large numbers over the next few decades. India's low labor productivity stems in large part from the poor nutrition, health, and schooling of its current workforce. At the same time, the country will need to foster an enabling economic environment to promote inclusive economic growth that generates productive employment for its youth and women. India's past growth has been largely jobless, resulting in massive underemployment and the growth of a large informal sector. The country will need to pursue a more inclusive growth strategy that focuses on development of a labor-intensive light manufacturing sector. As India ages, the rise of non-communicable diseases poses a major health challenge, especially as the country has not yet fully addressed its communicable/infectious disease problems and as government health spending has been woefully inadequate and stagnant. The rapid rise in the elderly population over the next two to three decades will necessitate a more comprehensive strategy of social insurance and social protection for the elderly. Finally, urban infrastructure improvements, inclusive green development, and tackling son preference are crucial for India's prosperous and inclusive future, including integrating women more fully into growth strategies.

Keywords: Demographic change, fertility decline, jobless growth, double burden of disease, NCDs

Cambios demográficos en la India: implicaciones para las políticas

RESUMEN

La disminución de la fertilidad en la India en las últimas décadas está dando lugar a un dividendo demográfico, una ventana de algunas décadas durante la cual la proporción de trabajadores dependientes es favorable y está aumentando. Para aprovechar el dividendo demográfico, el país necesitará invertir fuertemente en el capital humano de sus niños, quienes ingresarán en gran número a la fuerza laboral en las próximas décadas. La baja productividad laboral de la India se debe en gran parte a la mala nutrición, salud y escolarización de su fuerza laboral actual. Al mismo tiempo, el país necesitará fomentar un entorno económico propicio para promover un crecimiento económico inclusivo que genere empleo productivo para sus jóvenes y mujeres. El crecimiento pasado de la India ha sido en gran medida sin empleo, lo que ha resultado en un subempleo masivo y el crecimiento de un gran sector informal. El país deberá aplicar una estrategia de crecimiento más inclusiva que se centre en el desarrollo de un sector de manufactura ligera con uso intensivo de mano de obra. A medida que la India envejece, el aumento de las enfermedades no transmisibles plantea un importante desafío para la salud, especialmente porque el país aún no ha abordado plenamente sus problemas de enfermedades transmisibles/infecciosas y porque el gasto público en salud ha sido lamentablemente inadecuado y estancado. El rápido aumento de la población de edad avanzada en las próximas dos o tres décadas requerirá una estrategia más integral de seguro social y protección social para las personas mayores. Por último, las mejoras en la infraestructura urbana, el desarrollo verde inclusivo y la lucha contra la preferencia por los hijos varones son cruciales para el futuro próspero e inclusivo de la India, incluida una mayor integración de las mujeres en las estrategias de crecimiento.

Palabras clave: Cambio demográfico, disminución de la fertilidad, crecimiento del desempleo, doble carga de morbilidad, ENT

印度的人口变化：政策启示

摘要

印度近几十年来的生育率下降导致了人口红利，这是一个几十年的窗口期，在此期间，工作者与受赡养者比例是有利的且不断上升。为了利用人口红利，国家需要对儿童的人力资本进行大量投资，这些儿童将在未来几十年内大量进入劳动力市场。印度劳动生产率低下在很大程度上源于其当前劳动力的营养、健康和教育水平较差。与此同时，该国需要营造有利的经济环境来促进包容性经济增长，为青年和妇女创造生产性就业。印度过去的增长基本上没有创造就业机会，导致大规模就业不足和大量非正规部门的增加。该国需要奉行更具包容性的增长战略，重点发展劳动密集型轻工制造业。随着印度老龄化，非传染性疾病的兴起对健康构成了重大挑战，特别是该国尚未完全解决其传染病问题，而且政府的医疗支出严重不足且停滞不前。未来二三十年，老年人口的迅速增长将需要更加全面的老年人社会保险和社会保护战略。最后，城市基础设施的改善、包容性的绿色发展、以及解决重男轻女问题对于印度的繁荣和包容性未来至关重要，这包括让妇女更充分地融入增长战略。

关键词：人口变化，生育率下降，失业增长，疾病的双重负担，非传染性疾病

Introduction¹

India is on the verge of a major transformation. The country has experienced a rapid increase in economic growth, averaging 6 to 7 percent annually over the past three decades. Fertility rates have fallen below the replacement level, with several states having fertility rates well below replacement. Thanks to a significant reduction in infant mortality rates over the past two decades, the average life expectancy at birth is approaching 70 years.

Despite these positive developments, India faces significant challenges. Employment growth, especially outside of agriculture and the informal sector, has not kept pace with economic growth. Female employment has not grown—indeed, by some accounts, it has fallen—and female labor force participation remains extraordinarily low in comparison to that in other low- and middle-income countries. Much of the economy, even in the urban areas, remains informal in nature, with the share of organized-sector employment

in India among the lowest of all major emerging economies. Economic growth has widened the geographical divide in the country, with the southern and western states having benefited significantly more from growth opportunities than the northern and eastern states. These divisions carry over into the demographic domain, with the southern and western states being much farther along the demographic transition than the northern and eastern states.

Demographic changes

Fertility and mortality decline

One of the most profound demographic changes that has occurred in India over the last half century has been the sustained decline in fertility. The fertility rate has been declining since the mid-1960s—from about 5 children per woman of child-bearing age in 1971 to below 4 by 1991 and further to 2½ by 2011 (Figure 1). Latest data from both the SRS (2019) and the NFHS-5 (2019-21) suggest that the country has reached a milestone, with the fertility rate reaching just below the replacement level (2.0) for the first time in India's recorded history.

While the exact order of causality remains unclear, declines in infant and child mortality often coincide with, and likely influence, decreases in fertility rates. Over the past half century, the infant mortality rate in India has fallen precipitously—from over 140 deaths per 1,000 live births in the early 1970s to less than 30 in 2020. In just the last two decades, infant mortality has halved (Figure 2). Declines in infant and child

mortality, combined with improvements in factors affecting adult health, result in increases in average life expectancy at birth. Average life expectancy at birth in India has increased steadily—from a level of 37 years in 1950–55 to 55 years in 1985–90 and further to 69 years in 2015–20 (Figure 3).

However, the demographic transition under way has not been even across India. Even though the country has below-replacement fertility on average, five states (out of 30) have fertility that is above the replacement level (Figure 4). Two of the most populous states in the country—Uttar Pradesh and Bihar—have fertility rates well in excess of the replacement level (2.4 and 3.0, respectively). This means that, even though very few states have above-replacement fertility, a significant share of the country's population (30%) still lives in above-replacement fertility regimes.

Nevertheless, almost every state in the country has seen large declines in fertility rates over time. Indeed, over the 15-year period since 2005, many of the states that had the highest initial levels of fertility saw the largest fertility declines, and vice versa (Figure 5). As a result, there has been some convergence in fertility rates over time.

These trends are expected to continue. The National Commission on Population (2020) has projected that the high-fertility states of Bihar, Madhya Pradesh, Rajasthan, Jharkhand, and Uttar Pradesh will see the largest declines in fertility through 2036. The low-fertility states are not expected to see fertility rates decline below 1.5. Nationally, fertility is expected to reach 1.7 by 2036.

Demographic Changes in India: Implications for Policy

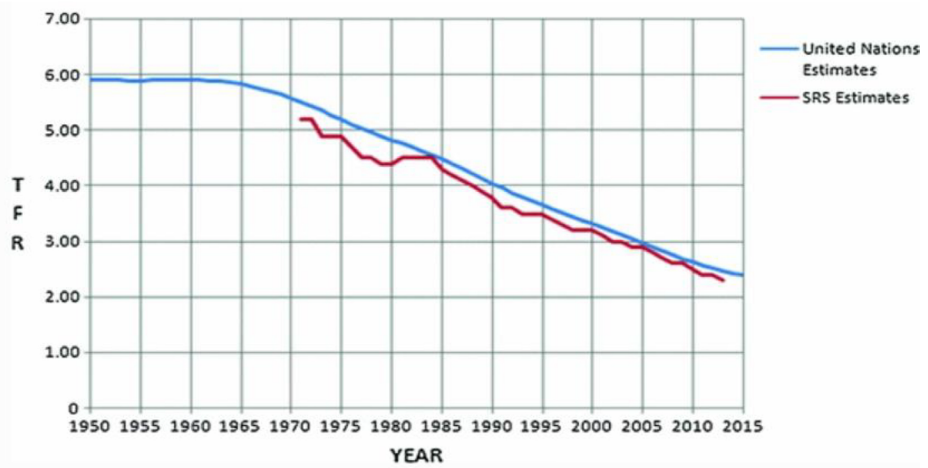


Figure 1: Total fertility rate, India, 1950–2015

Source: Chakrabarty and Deb (2018)

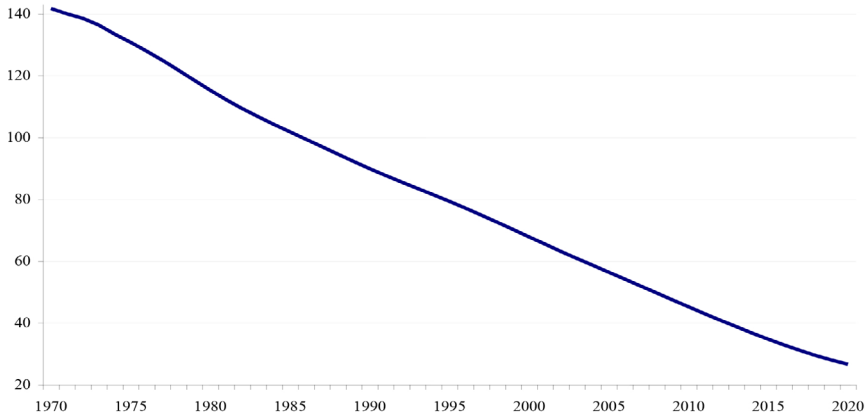


Figure 2: Infant mortality rate, India, 1970–2020

Source: UN Population Division, *World Population Prospects 2019* database

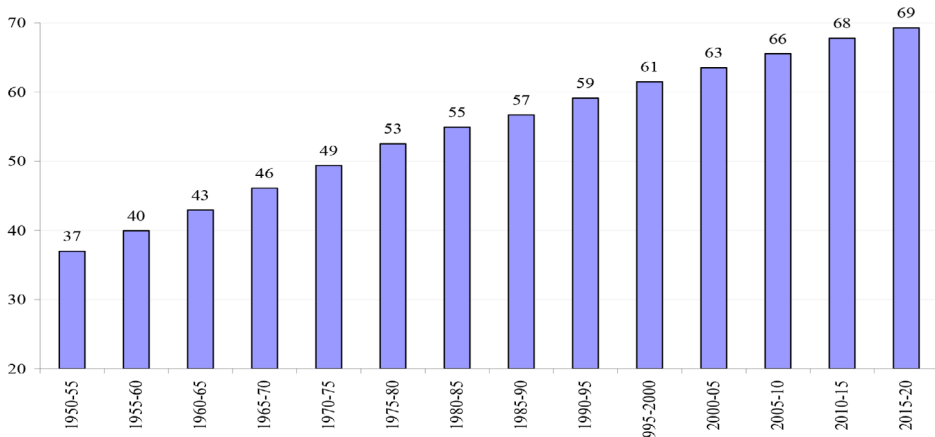


Figure 3: Average life expectancy at birth, India, 1950–2020

Source: UN Population Division, *World Population Prospects 2019* database

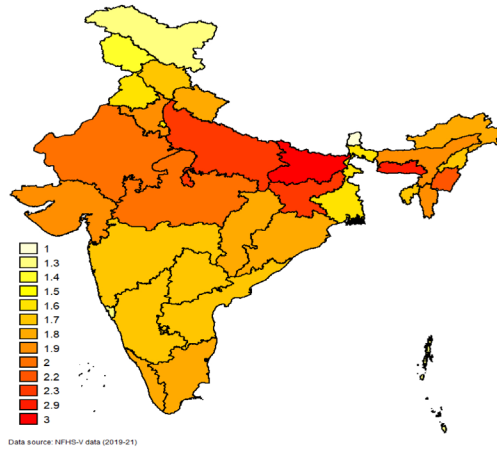


Figure 4: Interstate variations in the total fertility rate, 2019–21
 Source: NFHS-5 survey (2019–21)

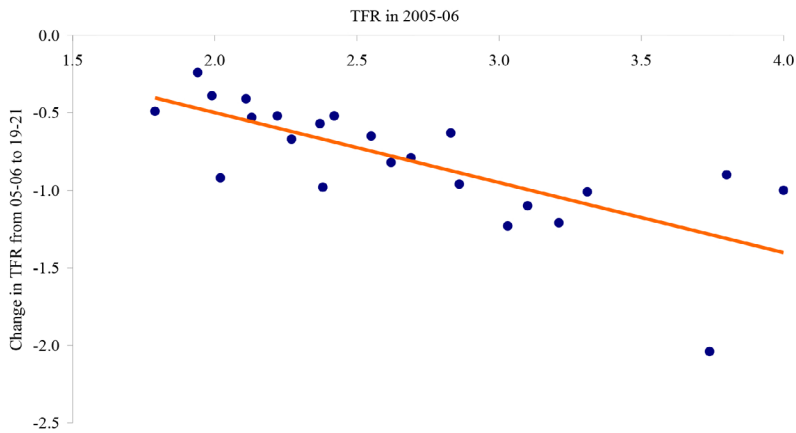


Figure 5: Decline in total fertility rate between 2005–06 and 2019–21 plotted against TFR in 2005–06, Indian states
 Source: Rounds 3 and 4 of NFHS Survey data



Figure 6: Median age of India's population, 1950–2020
 Source: UN Population Division, World Population Prospects 2019 database

Population Aging

The combination of falling fertility and increasing life expectancy results in large changes over time in the age structure of a population. The median age in India has been rising over the last half-century—from 19.3 years in 1970 to 22.7 years in 2000 to 28.4 years in 2020 (Figure 6). The National Commission on Population (2020) projected it to rise to 34.5 years by 2036. UN projections show the median age rising to 47 years by 2100 (Figure 7) (UN DESA 2019).

There are, of course, large spatial variations, with states such as Kerala that experienced fertility and mortality decline much earlier than other states aging more rapidly than states such as Bihar and Uttar Pradesh. The median age in Tamil Nadu, Maharashtra, and Kerala, for instance, will rise to 40 years in 2036, while the median age of the population in Bihar will increase to only 28 years (National Commission on Population 2020).

The aging of India's population over time is more readily observed in the changing shapes of the age pyramid over time. As fertility has declined and longevity has increased, the pyramid has—and will continue until 2036 to—become more top-heavy (Figure 8). However, there will be significant inter-state variations. Figure 9 shows Kerala's population pyramid in 2036 resembling India's in 2100, while Uttar Pradesh's population pyramid resembles India's in 2011. This points to the varied demographic landscape in India, spanning states like Kerala that

are much further along in the population aging transition to states like Uttar Pradesh that are much further behind.

UN population projections allow us to go well beyond 2036 to imagine what the age structure of India's population might look like later in the century (Figure 10). As the country's population ages, the size of the older age cohorts will increase over time relative to the younger cohorts. Because of increased female longevity at very old ages (80 years and older), the size of the female age cohorts beyond 80 years will be significantly larger than the corresponding male cohorts by 2100.

Imbalanced sex ratio

India is one of a handful of countries that have more males than females, particularly at birth and at younger ages, reflecting a strong parental preference for boys. The number of males to 100 females aged 0-6 years increased steadily across the various population censuses—from 103.9 in 1981, 105.8 in 1991, and 107.9 in 2001, to 109.4 in 2011. (The latest NFHS survey data from 2019–21 show a ratio of 108 males per 100 females.)

A few other countries, primarily in Asia, have imbalanced sex ratios at birth. These include China, Vietnam, and South Korea in East Asia; India and Nepal in South Asia; Georgia, Armenia, and Azerbaijan in the South Caucasus; and Albania, Montenegro, and Kosovo in the Western Balkans (Tafuro and Guilmoto 2020). Figure 11, which shows the evolution of the SRB over time in three countries—India, Azer-

baijan, and South Korea—suggests that, in comparison to the other two countries, the India’s SRB is only moderately skewed, and appears to have plateaued around 110-111 (the natural sex ratio at birth is around 105). South Korea is one of the few countries in the world where the SRB fell back to natural levels after a spike to 115 in the 1980s and 1990s. China also saw its SRB increase to an even higher number than South Korea (119) in 2005, but it appears to have fallen to 112 in 2017 (UNICEF 2018).

A skewed sex ratio at birth ultimately results in a surplus of males over females at older ages. Figure 8 suggests that by 2036, the male surplus will have moved up to the age group 45-50 years. Even Kerala is expected to have an excess of males among individuals aged 45 years and younger (Figure 9). But beyond that age and particularly beyond 60 years of age, Kerala is expected to have a large surplus of females,

reflecting the higher survival rates of women in old age.

While many countries have a slight biologically determined imbalance in the child sex ratio,² the imbalance is unusually large in India and very likely a consequence of three behavioral factors at work: First, parents elect to abort female fetuses based on prenatal ultrasound scans. Second, parents use contraception differently based on the sex makeup of their current offspring. For example, a parent may use contraception only after giving birth to a boy. Both these factors reflect *prenatal sex selection* behavior. Third, parents might practice outright female infanticide (which is rare) or choose to neglect their female infants in the allocation of food or health care (which is more common), and this would lead to an *excess of female neonatal and child mortality* and thereby a skewed sex ratio.³

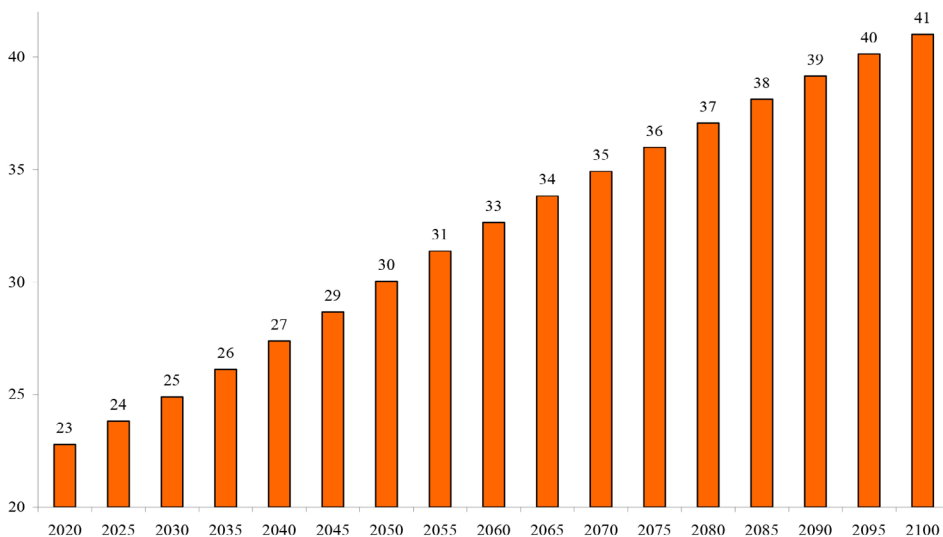


Figure 7: Median age of India’s population, 1950–2020

Source: UN Population Division, World Population Prospects 2019 database

Demographic Changes in India: Implications for Policy

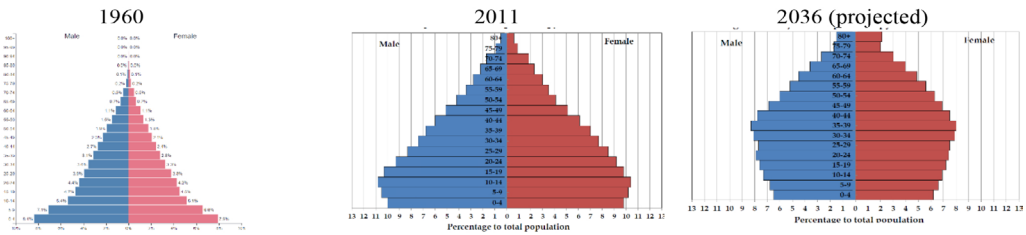


Figure 8: Population pyramid, India, 1960, 2011, and 2036 (projected)

Source: Data for 1960 from <https://www.populationpyramid.net/india/1960/>
 Data for 2011 and 2036 from the National Commission on Population (2020)

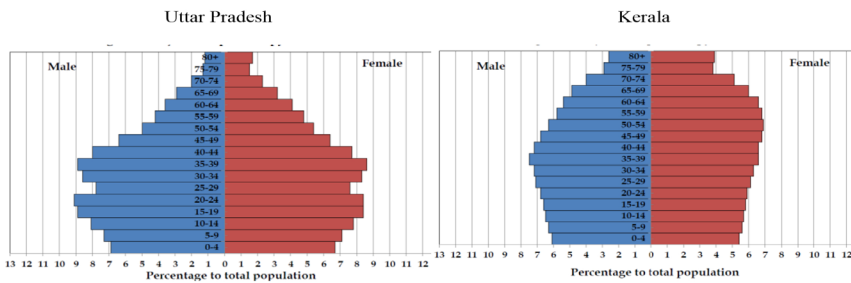


Figure 9: Projected population pyramid in Uttar Pradesh and Kerala, 2036

Source: National Commission on Population (2020)

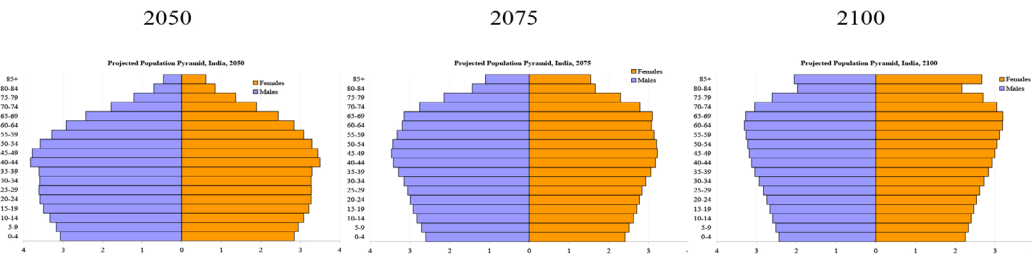


Figure 10: Projected population pyramid, India, 2050, 2075, and 2100

Source: UN Population Division, World Population Prospects 2019 database

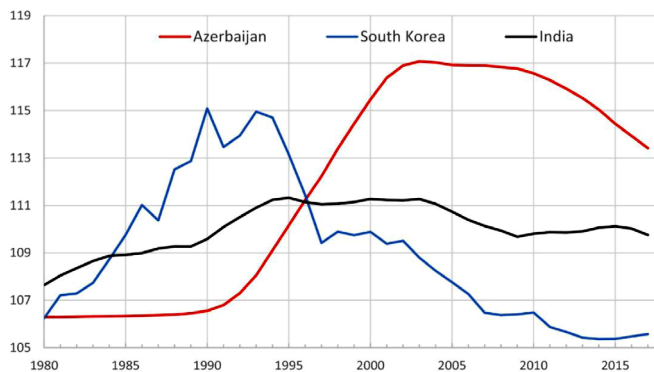


Figure 11: Sex ratio at birth in Azerbaijan, South Korea, and India, 1980–2015

Source: Tafuro and Guilмотo (2020)

Urbanization

Another significant demographic transformation occurring in India is urbanization. Internal migration historically has not been as pronounced in India as in other low- and middle-income countries. However, it has accelerated in recent decades, and has resulted in India's population becoming increasingly more urban. The proportion of the urban population doubled from about 17 percent in 1950 to 34 percent by 2018 (Figure 12) and is expected to be more than 50 percent by 2050.

While India's pace of urbanization may seem rapid, it pales in comparison to China's. The share of urban areas in China's population started at a lower level than India in 1950 (12%) but surpassed it in 1988 and had already reached 59 percent by 2018 (Figure 12). The number is projected to reach 80 percent by 2050.

Figure 13 (left panel) shows that the absolute number of people residing in the rural areas of India will peak around 2035 and start declining thereafter. By 2050, a majority of India's population will be residing in its urban areas. The right panel of the figure, which displays the distribution of India's urban population by size class of urban settlement and number of cities in 1990, 2018, and 2030 (projected),⁴ shows how concentrated the urban population will be by 2030. Just seven cities of 10 million or greater population will account for nearly 20 percent of the entire urban population of the country. A total of 71 cities will have populations in excess of a million, and these cities will account

for nearly one-half of the country's urban population.

Implications of demographic changes

Demographic dividend

Much has been written about the economic implications of a country's demographic dividend, which is the window of opportunity for economic growth that opens up after 2-3 decades of declining fertility. This is because the population still has a large pool of working-age adults from its prior high-fertility period. This favorable situation, with many more income-earners than dependents, lasts for a few decades (typically 3-4) before the population begins aging and the dependency ratio starts increasing.

These changes are shown in Figure 14 for a hypothetical developing country. Initially, at low levels of economic development, a country faces a child dependency burden. As fertility declines, the share of children in the population declines, but the children born during the earlier period of high fertility start moving into working ages. This is the period of "demographic bonus" or "demographic dividend." However, over time, as the working-age adults age (and survive longer into old age), the share of the elderly starts increasing relative to the share of working-age adults. The country once again faces a demographic burden, but this time on account of the elderly, not children.

Bloom and Williamson (1998) have argued that an important reason for the slower economic growth of East

Demographic Changes in India: Implications for Policy

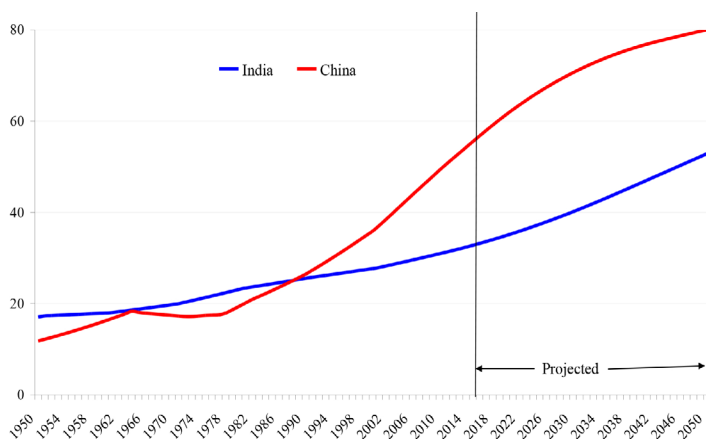


Figure 12: Percent of population that is urban, India and China, 1950–2050

Source: UN Population Division, 2018, *World Urbanization Prospects 2018* database

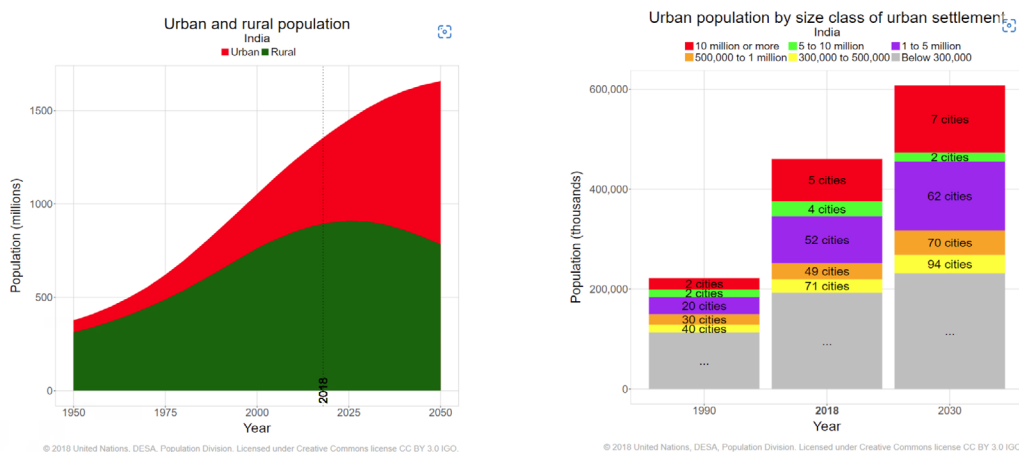


Figure 13: India's urban population and distribution, 1950–2020

Source: United Nations Population Division, *World Urbanization Prospects 2018* database (<https://population.un.org/wup/Country-Profiles/>)

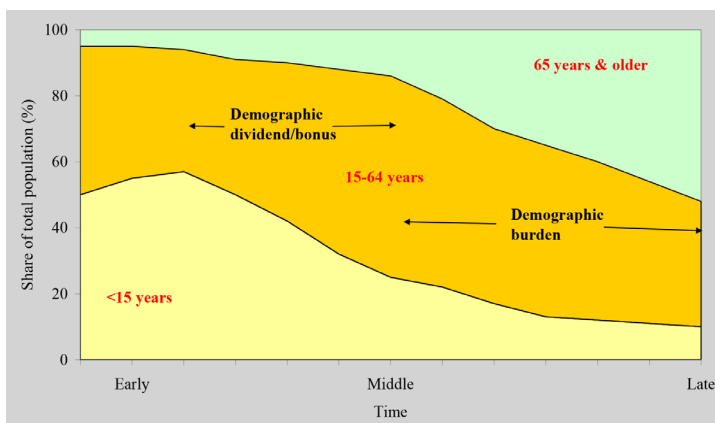


Figure 14: Demographic Dividend in a Hypothetical Population (% shares of young-dependent, working-age, and old-dependent age groups in the total population)

Asia (particularly the four East Asian tigers of South Korea, Singapore, Taiwan, and Hong Kong) prior to 1970 was the heavy *youth dependency burden* they were experiencing during this period. However, with fertility rates falling rapidly throughout the region during the 1950s and 1960s, the dependency burden turned into a demographic gift or dividend for the region starting around 1970, as the burgeoning population of surviving children entered working ages (Figure 15). This is said to have contributed in large part to the rapid economic growth experienced by these countries in the 1970s and 1980s. However, the demographic dividend has already started dissipating in many of these countries as the proportion of the non-working elderly population has been rising rapidly.

UN population projections can be used to extrapolate how the demographic dividend and demographic burden will play out in India over the remainder of this century. Figure 16 shows that the share of the working-age population has been increasing in India since 1970 but has accelerated since the mid-1990s. It will peak around 2035–45, and then begin declining—from about 66 percent in 2035–45 to 57 percent by the end of the century. This is not a very steep decline, and by the end of the century, India will still have roughly half of its population in the working-age group.

Figure 17 highlights the enormous potential—but also the challenge—of providing employment to India's working-age population. Cur-

rently, there are about 800 million Indians between the ages of 15 and 64, and this number will swell by 10 million every year for the next decade. But the boom will obviously not last forever. By mid-century, the workforce will reach its peak and then start shrinking, with 6 million people expected to transition from working age to retirement age every year by the end of the century. However, despite this initial surge and subsequent contraction, the overall size of the workforce by the end of the century is expected to be almost the same as it is now (750–800 million).

Figure 18, which plots the ratio of India's working-age to nonworking-age population over the period 1950–2100, shows the worker-dependent ratio peaking at 1.9 by 2045 and then declining quite sharply to a level of 1.3 by 2100. This suggests that the country likely has a window of opportunity over the next two decades to capitalize on its demographic dividend.

How does India's potential for a demographic dividend compare to that of some other countries in Asia? Figure 19 shows that, at 10.2, the ratio of the working-age (aged 15–64 years) to the *older* dependent (aged 65 years and older) population is lower in India than in neighboring countries, such as Pakistan (14) and Bangladesh (13), and in some Southeast Asia nations, such as Cambodia (13.2) and the Philippines (11.7), but is significantly greater than in Vietnam (8.8), China (5.9), and Sri Lanka (5.8). This suggests that India is a “mid-dividend” (as opposed to an early- or late-dividend) country.

Demographic Changes in India: Implications for Policy

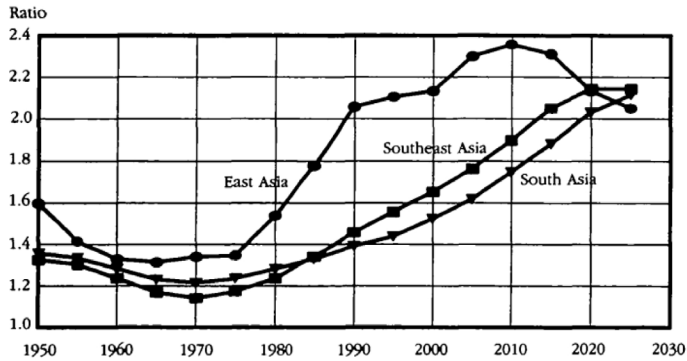


Figure 15: Ratio of Working-Age to Nonworking-Age Population in Asia, 1950–2030
Source: Bloom and Williamson (1978)

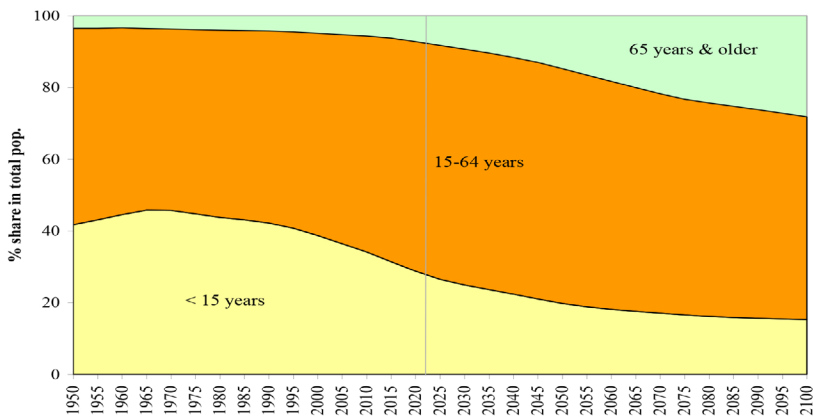


Figure 16. Demographic dividend in India, 2020–2100
(population shares of dependent and working age groups)

Source: United Nations Population Division, *World Population Prospects 2018* database

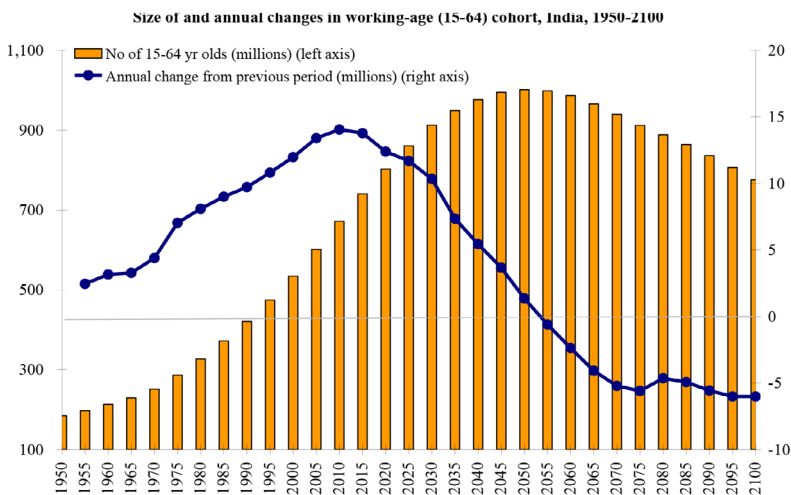


Figure 17: Size of working-age cohort and annual changes in this cohort size, India, 1950–2100

Source: United Nations Population Division, *World Population Prospects 2018* database

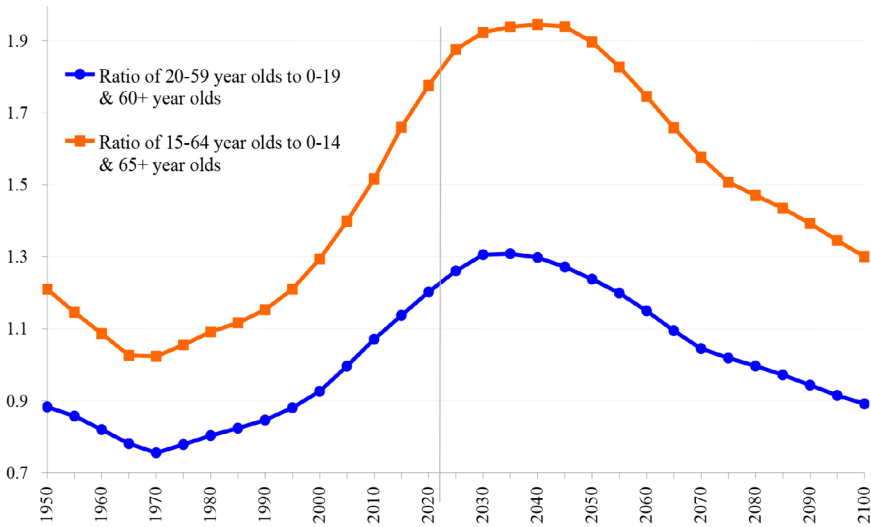


Figure 18: Projected ratio of working-age to dependent-age population, India, 1950–2100

Source: UN Population Division, *World Population Prospects 2019* database

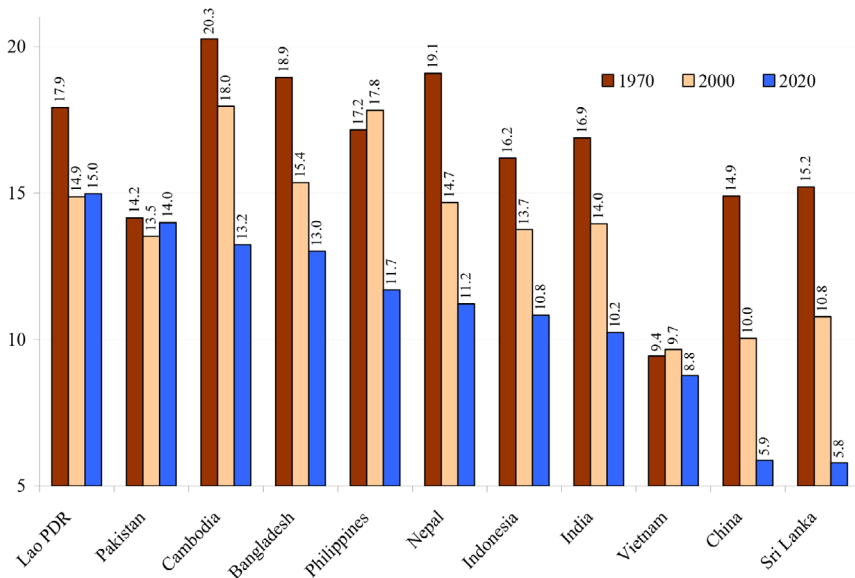


Figure 19: Ratio of working-age (15-64 years) to older dependent (aged 65 years and over) population, selected countries in Asia, 1970–2020

Source: UN Population Division, *World Population Prospects 2022* database

The Indian economy has grown much faster during the three decades after the mid-1990s than during the preceding three decades. As noted above, this has also been the period during which the worker-dependent ratio has

soared. Whether the demographic dividend is responsible for the more rapid growth is a matter of speculation, since there have been other confounding factors at play. For instance, the 1990s marked the beginning of major

economic reforms in the country. It is possible that economic reforms allowed India to capitalize on its initial demographic dividend, although this seems unlikely given that Indian economic growth has not been particularly labor intensive.

A final aspect of India's demographic dividend that will have important implications for policy is the uneven nature of the demographic transition. The large, poor states of Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh, where fertility rates continue to remain high, are projected to contribute more than one-half of the increase in the country's working-age population by 2036 (Kumar 2010). These are the states where the demographic windfall will be greatest, which in turn means that the responsibility for capitalizing on India's demographic dividend over the coming decades will largely fall on these states. Unfortunately, these states have been laggards so far in generating employment and growth for their residents.

Employment growth

The demographic dividend is merely an *opportunity* for growth; taking advantage of it hinges on two crucial factors: equipping the large number of entrants into the workforce with adequate human capital *and* fostering an enabling economic environment for their productive employment. Failure on either front risks squandering this opportunity, even igniting unrest as frustrations mount. The Arab Spring's turmoil in the early 2010s serves as a stark reminder of this potential pitfall.

Unfortunately, India has not met either of these two conditions. On most human development measures, it lags behind not just China and other East Asian countries but even South Asian neighbors like Bangladesh and Sri Lanka. While child malnutrition has dropped appreciably in the last two decades, it remains alarmingly high, with nearly a third of all children below 5 being underweight and stunted, threatening their future productivity.⁵ Similarly, despite recent gains in primary education, schooling quality, as measured by learning outcomes, is abysmal, with only a quarter of rural children aged 14-18 years being able to read grade 2 (age 7) level text fluently in their native language and to do simple arithmetic division (Pratham 2023).⁶ In 2021-22, according to some estimates, an astonishing 48.4 million children aged 6-17 years were possibly out of school, accounting for nearly 17 percent of this age group's total population (Mehta n.d.). These persistent problems with child health and education contribute to India's low labor productivity.

The other necessary condition for a country to benefit from its demographic windfall is an enabling macroeconomic and trade policy environment that creates high-quality jobs in high-productivity sectors of the economy. China, which experienced its demographic dividend much earlier than India, absorbed much of its burgeoning working-age population in a rapidly expanding export-oriented light manufacturing sector (Figure 20).

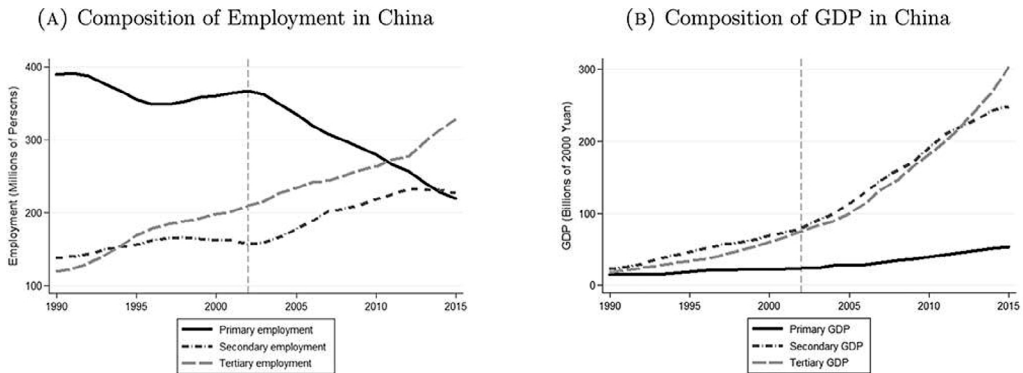


Figure 20: Primary, secondary, and tertiary sector employment and GDP in China, 1990–2015

Source: Majid (2015)

In the 1980s and 1990s, significant growth of employment took place in that country through the rapid expansion of township and village enterprises (TVEs) owned by cooperatives in smaller towns and villages. Between 1978 and 1999, for example, employment in TVEs increased from 28 million to 127 million—an annual growth of 7.4 percent. The fact that TVEs were significant absorbers of “surplus” labor in the rural areas can be gauged by the increase in their share in rural employment from 9 percent in 1978 to 26 percent in 1999 (Lu et al. 2002). Their role in generating productive employment in China was very significant, as they accounted for 18 percent of all employed persons in the country in 1999.

At the same time, Special Employment Zones (SEZs) were being set up experimentally in several major coastal cities as a means of establishing labor-intensive light manufacturing industries. In the 1990s, significant restructuring of state-owned enterprise also began taking place which encouraged the growth of the private sector

(Majid 2015). These reforms expanded urban manufacturing and set in motion rapid urbanization, a structural transformation of the Chinese economy, and a sustained rise in living standards. Especially after China’s ascension into WTO, total employment in the agricultural sector declined from 60 percent of total employment in 1990 to less than 28 percent in 2015, as non-agricultural employment and output increased dramatically to establish China as the factory of the world (Erten and Leight 2021).

The evidence from India has not been so encouraging. India has simply not developed the type of large-scale light manufacturing that can provide wage employment opportunities to the large pool of labor resources that it already has, let alone the millions of additional youths who will enter the labor force in the coming decades as part of its demographic windfall.

While the share of industry in total employment has increased in India, it has increased at a relatively slow pace—from about 15 percent in 1991 to 25 percent in 2019. While manufactur-

ing employment increased from about 32 million in 1983 to just over 60 million in 2011, most of the increase was in unorganized- or informal-sector manufacturing (Figure 21). Unorganized manufacturing accounts for about 80 percent of manufacturing employment (Goldar and Sadhukhan 2015).

Worryingly, recent data from the Center for Monitoring the Indian Economy (CMIE) show that manufacturing employment has declined sharply, almost halving in the five years since 2016–17. Admittedly, this includes the Covid year 2020–21, when many factories had shut down operations, but even between 2016–17 and 2019–20, manufacturing employment had fallen despite the government’s “Make in India” project that has sought to create an additional 100 million manufacturing jobs in the country by 2022 (Bhardwaj 2021).

How responsive has India’s overall employment growth been to its gross domestic product (GDP) growth? Evidence for this comes from a study by Moren and Wandal (2019), who estimate the employment elasticity of economic growth across a number of countries over the period 2000–17 using data from the ILO (Table 1). Of the seven countries in Asia, India had the lowest employment elasticity of economic growth, with a one percent increase in economic output being associated with only a 0.16 percent increase in employment. The corresponding elasticity was 0.31–0.37 for Vietnam, Bangladesh, and Indonesia and 0.43–0.46 for the Philippines and China.

Disaggregation by gender and youth shows again that the elasticity of female employment with respect to economic growth has been virtually zero in India during this period—in contrast to other countries where female employment has responded even more strongly to growth than male employment. While the employment elasticity of growth has generally been lower for youth than for adults in all seven countries, in India it has been negative. This suggests that the high levels of economic growth in India have not benefited women and youth in terms of employment opportunities.

India’s “jobless” growth is also evident in the country’s labor force participation rate, which has been stagnant for nearly the last three decades. Among youth (ages 15–29 years), labor force participation has actually been falling (Figure 22). Some of the fall may, of course, be related to rising enrollment rates at the secondary and tertiary school levels, but likely the low and declining labor force participation rates, especially among women, reflect paucity of employment opportunities. India has one of the lowest female labor force participation rates in the world, and they have fallen further in the last 15 years.⁷

Data from the government’s 2022 Periodic Labor Force Survey shows a surprising pattern of unemployment among youth. The unemployment rate is 42 percent among college graduates under 25 years of age, which is higher than among secondary school-leavers, reflecting the failure of the economy to generate enough high-skills jobs but

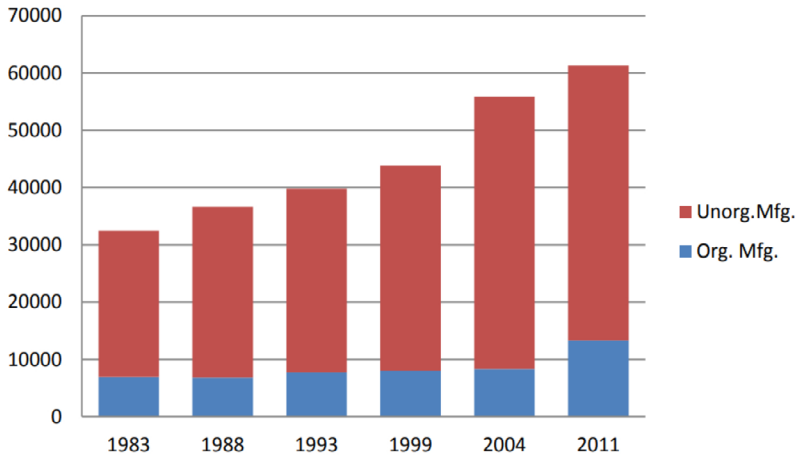


Figure 21: Employment in manufacturing, India, 1983–2015

Source: Goldar and Sadhukhan (2015)

Table 1: Estimated employment elasticity of economic growth, selected countries, 2000–17

Country	Total	Female	Male	Youth	Adult	Avg GDP growth
India	0.16	-0.04	0.23	-0.25	0.26	7.06%
Bangladesh	0.34	0.59	0.25	-0.11	0.46	5.95%
Pakistan	0.66	1.22	0.54	0.35	0.78	4.32%
Indonesia	0.37	0.45	0.32	0.04	0.43	5.28%
Philippines	0.46	0.49	0.45	0.21	0.52	5.30%
Vietnam	0.31	0.30	0.31	-0.17	0.43	6.41%
China	0.43	0.47	0.40	0.32	0.45	8.30%

Note: The above estimates show the percent increase in the relevant variable (e.g., female employment) with a 1% increase in GDP.

Source: Moren and Wandal (2019)

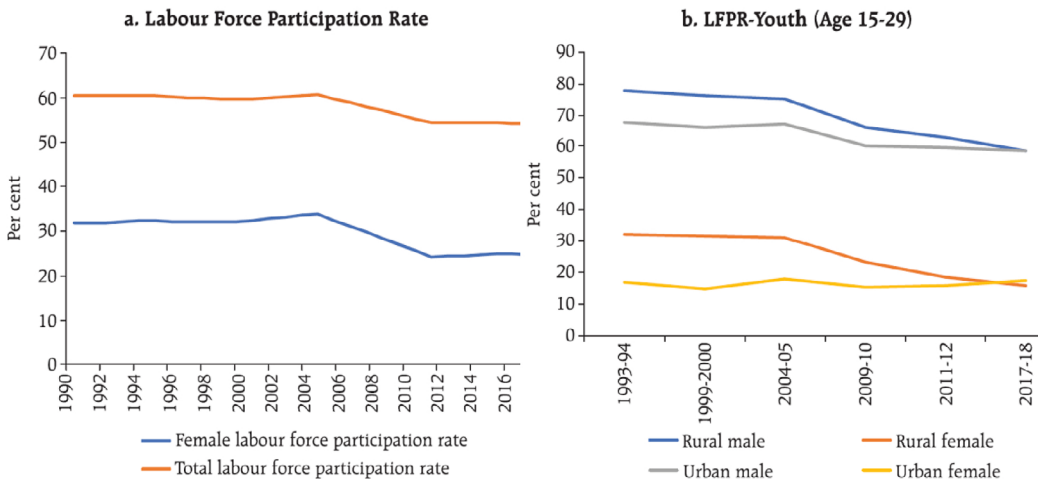


Figure 22: Labor force participation rate, by residence and gender, 1990–2018

Source: RBI (2019)

also the poor employability and low skill levels of college graduates. At the same time, it is estimated that the country produces more than one million college graduates each year.

The high unemployment rate among the college-educated was illustrated most recently in an incident where over 12 million youth applied for 35,000 clerical jobs with the Indian Railways (Kumar 2022). The disillusioned unsuccessful applicants went on a rampage across Bihar and Uttar Pradesh, setting fire to an empty train coach. Lack of gainful employment opportunities could pose a threat to the country's economic and political stability in the years ahead.

A symptom of the jobless growth is the persistence of a large unorganized sector in the Indian economy. Despite rapid economic growth over the last two decades, the unorganized sector remains unusually large in the country. In 2017–18, for instance, the unorganized sector employed 86.8 percent of India's work force, while 90.7 percent of all workers were informal workers—i.e., they had no written job contracts, paid leaves, and other benefits. Indeed, even within the organized sector, nearly 40 percent of all workers are informal employees or contract workers (Murthy 2019). While the unorganized sector serves as a cushion for workers who might otherwise have been unemployed, wages in the unorganized sector are minimal and informal-sector jobs are low-quality jobs without any protections—job security, benefits including sick leave, and pension.

Employment in the informal sector would not be as much of a problem if the country had a comprehensive publicly-financed social protection system. But it does not, despite recent efforts to extend social protection to workers in the unorganized or informal sector. Only a small fraction of workers in the unorganized sector are covered by comprehensive protection. Given the generally low wages in this sector, the lack of social protection means that these workers are highly vulnerable to poverty arising from unemployment spells, demand-side price shocks, financial crises, catastrophic illnesses and disabilities, and aging. Indeed, the idea of developing a broad social safety net that encompasses social security in old age, income support during periods of agricultural drought and macroeconomic recessions, sick leave, unemployment insurance for workers, and catastrophic health coverage is to make such social protections portable and not tied to a specific job or only to employment in government or the organized sector (Bowen et al. 2020).

Labor market rigidities, combined with outdated labor-market regulations, as well as education policies that subsidize tertiary education to the neglect of basic education, have contributed to weak employment generation in Indian manufacturing over the last seven decades.⁸ Like China, India could easily have taken a ride on the sails of globalization in the 2000s and become the factory of the world given its large labor force. But poor initial human capital investments in that labor force and a less conducive (*vis-à-*

vis China) policy framework prevented that from happening.

Uneven economic growth as a cause of jobless growth

Another possible cause of jobless growth in India may be related to the uneven nature of economic growth that has occurred in India, especially over the last four decades. As growth accelerated in the 1990s, so did inequality (Figure 23), reflecting the fact that much of the economic growth was driven by rising consumer spending, especially among the burgeoning upper-income urban class. The goods and services typically consumed by the upper-income urban quintiles are much less labor-intensive than the basic consumer goods and services consumed by the poor and the lower middle class, such as food products, apparel, footwear, furniture, jewelry, and toys.

One under-appreciated advantage of developing a large light manufacturing sector is that it often opens up wage employment opportunities outside agriculture for women. For instance, women accounted for 39 percent of Mexico's manufacturing workforce and 47 percent of China's in 2017 (Madgavkar et al., 2019). In Bangladesh, the garment industry has been a key driver of female employment growth; women workers account for 85 percent of the total workforce in that industry (Alam, Blanch, and Smith 2011). Given that the female share of total income in India has been well below that of many other low- and middle-income countries (Figure 24) over the last four decades, it will be critical for the country

to expand opportunities for non-agricultural employment to women in the coming years.

Admittedly, India has done a remarkable job over the last 3-4 decades in developing a competitive information technology (IT) and business-process outsourcing (BPO) industry. The industry has a total turnover of \$200 billion and is perhaps the largest private employer outside agriculture, employing some 5 million people, nearly 30 percent of whom are women (NASSCOM 2022). While these are impressive numbers, the future employment growth potential of this sector is limited since it almost exclusively employs skilled, college-educated individuals.

In recent decades, India has also emerged as a global hub for auto component manufacturing, such as the manufacture of shafts, bearings, and fasteners. Although total annual turnover is currently only \$27 billion in the sector, expectations are that the sector will reach \$200 billion in revenue by 2026 (IBEF 2023). The number of persons employed is, however, relatively small—at only 1.35 million.

Additionally, just in the last few years, manufacturing of mobile handsets has also taken off in India, aided by the gradual shifting of manufacturing out of China. Indeed, India has now become the second-largest mobile phone manufacturing nation after China, with 270 million handsets to be produced this year (*The Economic Times*, 15 August 2023). However, much of the mobile manufacturing revolves mostly around assembly of phones and em-

employs only about 0.25 million people (Suraksha 2023).

In comparison, the Chinese garment industry employs over 15 million persons; the building, tunnel, and subway construction industry employs 12

million persons; the building completion and interior design sector employs 12.5 million persons; and electrical machinery and equipment manufacturing employs 5.7 million workers (IBIS-World n.d.; CEIC Data n.d.).

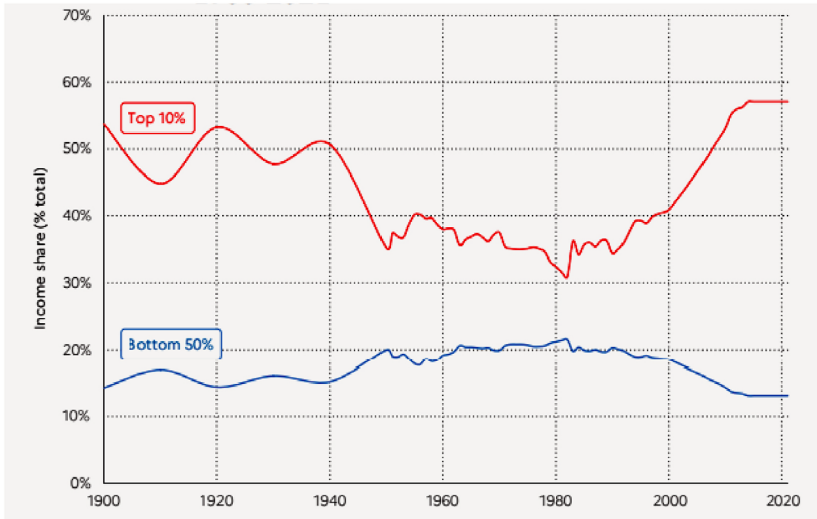


Figure 23: Income shares of the top 10% and bottom 50% in India, 1900–2021

Note: Income is gross (i.e., pre-tax) but includes pensions and unemployment insurance benefits.

Source: World Inequality Report 2022 (available at <https://wir2022.wid.world/>)

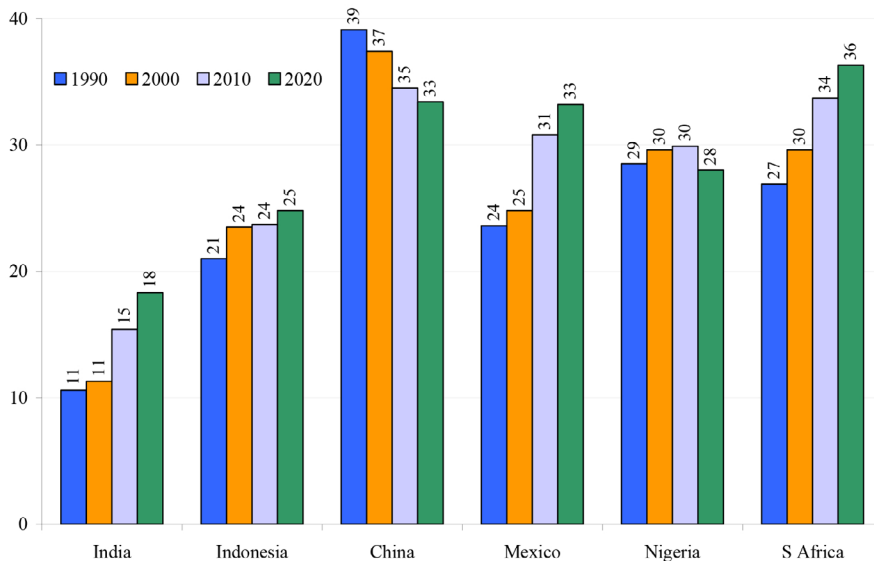


Figure 24: Percent share of total labor income accruing to women, selected countries, 1990–2020

Source: World Inequality Report 2022 (available at <https://wir2022.wid.world/>)

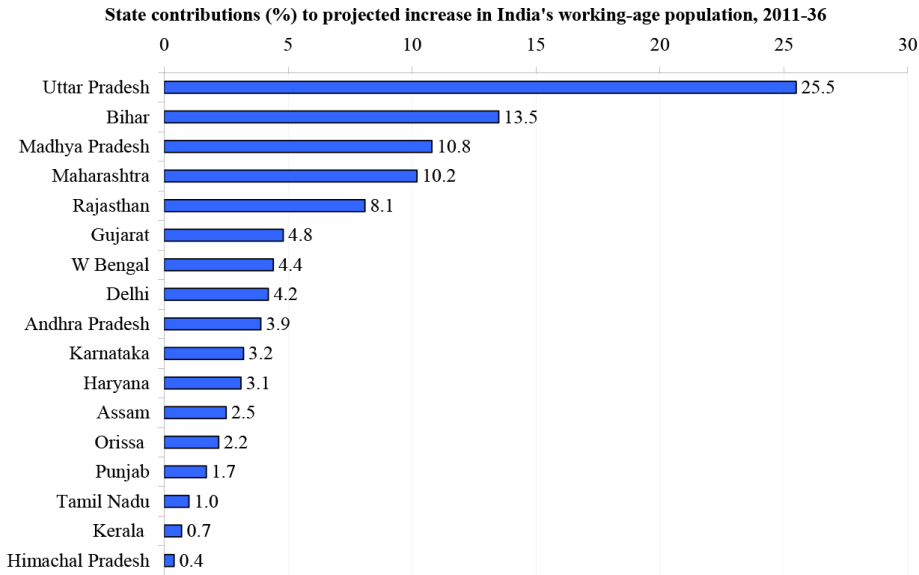


Figure 25: State contributions to projected increase in India's working-age population from 2011–36

Source: Kumar (2010)

Another aspect of uneven growth—one that will be equally important for policy moving forward—is the variability across states in generating employment and economic growth. States in the east and north, such as Bihar and Uttar Pradesh, have historically experienced far slower growth in employment and income than states in the west and south. However, these states are far behind in their fertility transitions and have experienced the largest increases in the working-age population in the last decade. This has contributed in large part to the jobless growth that India has experienced.

Further and even more worryingly, these states will continue to see very large increases in their working-age population in the coming decades. For instance, the four states of Bihar, Madhya Pradesh, Rajasthan, and Uttar

Pradesh alone are projected to account for nearly 60 percent of India's working-age population increase through 2036 (Figure 25) (Kumar 2010). Thus, the burden of utilizing India's demographic dividend will fall heavily on these states.

What India will need in the coming decades is massive numbers of jobs for unskilled and semi-skilled workers. Unless India reorients its development strategy to encourage more labor-intensive light manufacturing in the organized sector of the economy, it will be unable to provide high-quality jobs to the roughly 10-12 million individuals who will be joining its workforce annually in the coming decades. In that case, India's demographic dividend would not materialize, but could in fact turn into a demographic disaster.

Impacts of aging on population health

As noted earlier, the aging of India's population has already begun and is likely to accelerate in the coming decades, thanks to its demographic transformation. Increases in the median age of the population do not fully convey the extent to which India's elderly population is projected to grow over the remainder of the century. The population aged 65 years and older currently stands at about 90 million but is projected to grow sharply over the next three decades, more than doubling to a level of 225 million by mid-century (Figure 26). Thereafter, it will continue to increase, albeit at a more gradual pace, reaching 350 million by 2075 and 387 million by 2100. For the first time in India's recorded history, the number of elderly is projected to surpass the number of children under 5 years of age by 2030 and be more than five times the size of the under-5 population by the turn of the century.

The very large increase in the elderly population will have major implications for—and could potentially overwhelm—India's health infrastructure and spending on public health and old age security. The elderly not only have higher levels of morbidity than the young, but they also are much more likely to have long-term, chronic health problems that require ongoing, expensive treatment and management.

However, unlike developed countries that have confronted the challenge of population aging after they have already successfully addressed communi-

cable disease (CD) challenges, such as infectious childhood and parasitic diseases, India will simultaneously face the double burden of communicable and chronic or non-communicable diseases (NCDs). Indeed, this has already started occurring in the country, with NCDs such as diabetes and cardiovascular diseases responsible for a higher burden of disease as compared to CDs. In addition to aging, lifestyle factors, such as physical inactivity and unhealthy diet, associated with increasing levels of urbanization and affluence, have contributed to the growth of diseases such as diabetes and heart disease. Lifestyle factors often work synergistically with population aging to affect the incidence of NCDs.

The International Diabetes Federation Diabetes Atlas has estimated that the number of Indians with diabetes increased from about 33 million in 2000 to 74 million in 2021, resulting in an age-adjusted prevalence rate of 9.6 percent—only slightly lower than the prevalence rate in China (10.6%) (IDF 2021). Indeed, China and India together account for roughly 40 percent of all diabetics in the world. Even more alarmingly, it is estimated that more than one-half (53.1%) of the total population living with diabetes in India is undiagnosed and untreated, which means that they are at a high risk of developing severe co-morbidities, including stroke, heart and renal failure, blindness, and lower-limb amputation.

The India State-Level Disease Burden Initiative reveals a major shift in the disease burden in the quarter

century between 1990 and 2016 (ICMR 2017). The contribution of NCDs (in terms of disability-adjusted life-years or DALYs) had increased from 30.5 to 55.4 percent over the period, while the share of communicable diseases had fallen from 60.9 percent to 32.7 percent (Figure 26).⁹ The aging of the population, combined with changes in lifestyles, is a major contributor to this epidemiological transition.

The leading causes of health loss also changed significantly over the period 1990–2016 (ICMR 2017). Diarrheal diseases slipped from *the* leading cause of DALYs in 1990 to the third leading cause. Lower respiratory diseases moved down from second to fourth rank. Meanwhile, ischemic heart diseases and chronic obstructive pulmonary diseases (COPD) moved up from being the sixth and eighth leading causes of DALYs in 1990, respectively, to the leading and second-leading causes in 2016. Likewise, stroke, which was 12th in rank in the earlier period moved up to 5th rank. Thus, of the five leading causes of DALYs in 2016, three were NCDs.

This does not, however, mean that the absolute burden of communicable diseases, such as diarrhea and lower respiratory infections, is small—far from it. In 2018, there were nearly 2.8 million deaths in India from CDs, of which 1.6 million deaths were attributable to diarrheal, lower respiratory, and other common infectious diseases. In the same year, tuberculosis and HIV/AIDS were together responsible for more than 500,000 deaths.

Three factors affect changes in

the disease burden of a country: (a) aging of the population that results in higher prevalence rates of health conditions common to old people, (b) changes in exposure to environmental risk factors (e.g., air pollution) and lifestyle factors (e.g., dietary changes, physical inactivity) that are associated with chronic diseases like COPD or diabetes; and (c) general improvements in health systems that lower the risk of premature mortality or disability once a disease or injury has occurred.

The data from India are revealing. Despite the epidemiological transition that has occurred in the country, child and maternal malnutrition is still the dominant and leading risk factor of disease burden (Figure 28). Air pollution comes in second, followed by dietary inadequacy, high blood pressure, and high levels of fasting plasma glucose.

India is thus in the unique position of having to deal with the health challenges posed by its epidemiological transition—the onset of NCDs—while it has still not fully addressed the challenges of infectious and communicable childhood diseases. The double burden of disease can be daunting.¹⁰ Additionally, the process of rapid urbanization that is expected in the coming decades will make this challenge even greater, as urbanization separates millions of the elderly in the rural areas from their adult children who have migrated to cities. Finally, rising rates of obesity and physical inactivity, as well as high levels of air and water pollution, in the urban areas are likely to compound the health challenges facing India's older adults in the coming decades.

There is also a broader lesson for India from countries that have passed through an epidemiological transition earlier than India—the challenges posed by an aging population require significant outlays of public investment and resources to upgrade health infrastructure and reform health systems. Treatment and management of NCDs, such as cancer, heart disease and diabetes, is much more expensive than combating infectious diseases. Vertical programs that may have once worked well in controlling communicable diseases are not as effective in addressing NCDs.

Even though India is already in the middle of an epidemiological transition, government health spending in India remains woefully inadequate in comparison to many other low- and middle-income countries (Figure 29). Indeed, India's public health spending as a percentage of GDP has been stagnant at around 1 percent or less for decades. In 1999–2000, government health spending was about 1.12 percent of GDP (Berman and Ahuja 2008). In 2001, the global Commission on Macroeconomics and Health (WHO 2001) had recommended a level of government health spending in low-income countries that was well above what India spent then.

When the National Rural Health Mission (NRHM) was launched in 2005, the government had set a goal for itself of increasing public health spending to 2–3 percent of GDP by 2012 (GOI 2005a). Yet even by 2021–22, the number was still 1.2 percent (*The Economic Times*, 21 October 2021). Figure 30 shows that while health spending per

capita grew more rapidly than GDP per capita between 2000 and 2017 in most low- and middle-income countries, that was not the case in India.

China, which has experienced a rapid aging of its population in the last decade or two, increased its government spending on health from \$9 per capita in 2000 to \$300 in 2019—a 32-fold increase (Table 2). Even as a share of its GDP, public spending on health tripled from 1 percent to 3 percent over this period. In comparison, the corresponding increase for India was from \$4 in 2000 to \$21 in 2019—a five-fold increase in absolute terms but essentially flat when expressed as a share of GDP.

By increasing government spending on health, China was able to cut household out-of-pocket spending on health considerably—from 60 percent of total health spending in 2000 to 35 percent by 2019. High out-of-pocket spending on health is an inequitable way of financing health spending, especially in low- and middle-income countries. China was able to reduce out-of-pocket health spending by expanding universal health coverage through the provision of publicly-funded medical insurance. While India was able to also cut private out-of-pocket spending, the decrease was significantly smaller—from 72 percent to 55 percent. Households thus finance more than half of the total spending on health out of their own resources. This is onerous especially for the poor and the elderly who rely on their meager pensions and family support. The goal of universal health coverage is to keep out-of-pocket expenditures to a minimum.

While the Indian government has introduced many different publicly-funded basic health insurance schemes over the years, population coverage is still relatively low. Data from the NFHS-5 survey show that in 2019-21 about two-fifths of the *households* in the country—up from 29 percent in 2014-15—had at least one household member covered under some health insurance or health scheme (Figure 31). The proportion of *individuals* having health insurance coverage is therefore much lower. The survey found that only 30 percent of women aged 15-49 years and 33 percent of men aged 15 to 49 years were covered by health insurance or a health scheme. In contrast, some form of health insurance covered 95 percent of the Chinese population by 2015 (Zhou et al. 2020).

Roughly, half of those with insurance were covered by a state health insurance scheme and 16 percent were covered by the *Rashtriya Swasthya Bima Yojana* (RSBY). The Employee State Insurance Scheme (ESIS) or the Central Government Health Scheme (CGHS) covered only 3-6 percent of women and 4-7 percent of men. There were large inter-state variations in health insurance coverage, with Andhra Pradesh and Rajasthan having more than 80 percent coverage and Uttar Pradesh and Kashmir having roughly 15 percent coverage (Figure 31).

As the size of the elderly population in India grows, social assistance and income support for the elderly—especially the elderly poor—will become increasingly important. The 2011 Census showed that only 12 percent of

the workforce is covered under various pension systems (OECD 2021). This reflects the fact that a very large proportion of the Indian labor force works in the unorganized and informal sector. Over the years, the government has introduced a number of different social assistance schemes for the elderly who are not covered by government or organized-sector employment—for example, the National Old Age Pension Scheme, the National Family Benefit Scheme, the Annapurna Yojana (providing food security to senior citizens), and the Indira Gandhi National Widow Pension Scheme (covering widows aged 40-79 years) —but it is not clear what proportion of the elderly beyond retired government and organized-sector employees are actually covered by these schemes. Accurate information is lacking on the take-up rate of such social assistance schemes and the extent to which they are meaningful sources of economic support for the vast majority of the elderly in India. It is likely that extended families are the main source of social security and income support for the elderly.

Implications of changing sex ratios

India's sex ratio at birth is heavily masculine and getting more masculine over time, as fertility rates have declined. Since this worsening of the sex ratio has been occurring since the early 1980s, the surplus of males over females has now moved into youth ages. UN population projections of the surplus male population from 2020 to 2100 are shown in Figure 32. They show that the surplus is most pronounced in the age group

15-29 years, with more than 21 million more males than females in this group. Over time, the male surplus will begin shifting to older age groups. In 2060, for instance, there will be a total of 7 million more men than women in the age group 55-69 years. Because mortality rates for men are higher than those for women at older ages, the male surplus gets progressively smaller at older ages.

Imbalanced sex ratios can have several undesirable social implications, one of which is a “marriage squeeze.” Many men of marriageable age will be unable to marry since there will not be enough potential brides of marriageable age for them. In a society like India where there is a norm of universal marriage, this could pose a problem. It is also likely that having an entire cohort of young men who are forced by demographic circumstances to remain single increases the likelihood of crimes in general but specifically crimes against women and human trafficking. There is some evidence from China suggesting that an increase in the male-female ratio among 16–25-year-olds coincided

with a sharp increase in crime over the period 1988–2004 (Edlund et al. 2013). The shortage of potential brides—especially acute in the rural areas of China because of many young women having migrated to the cities in search of employment opportunities—has created a demand among rural men for brides from North Korea. Human traffickers often supply such brides to these men by transporting poor North Korean women illegally across the border into China (Davis 2006).

In India, as well, there has been an alarming increase in crimes against women in recent years. Using data from the annual reports of the National Crime Records Bureau, Dandona et al (2022) have estimated that the crime rate against girls and women has risen more than 70 percent over the last two decades in India—from 11.5 assaults per 100,000 women in 2001 to 19.8 assaults in 2018. Of course, it is unclear to what extent this is related to the rise in the sex ratio and the increase in the relative surplus of male youth in the country.

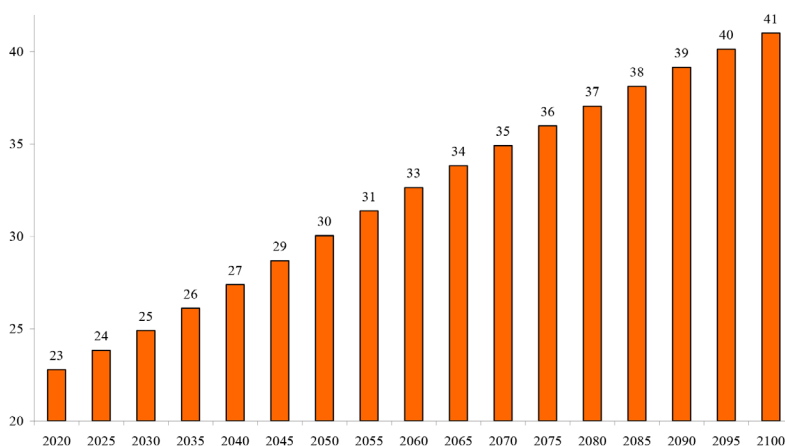


Figure 26: Projected median age of India’s population, 2020-2100
Source: UN Population Division, *World Population Prospects 2019* database.

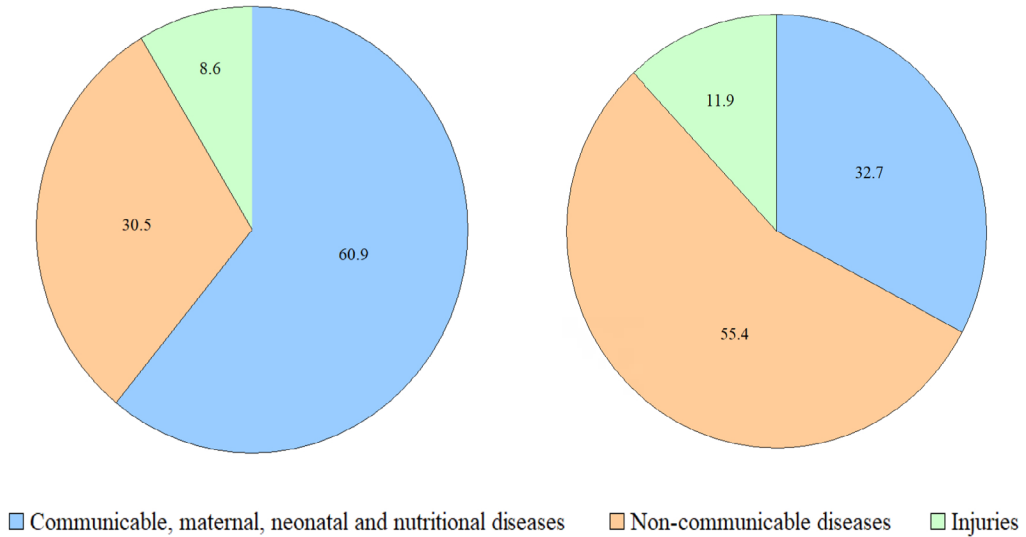


Figure 27: Contribution of major disease groups to total DALYs in India, 1990 and 2016
Source: ICMR (2017)

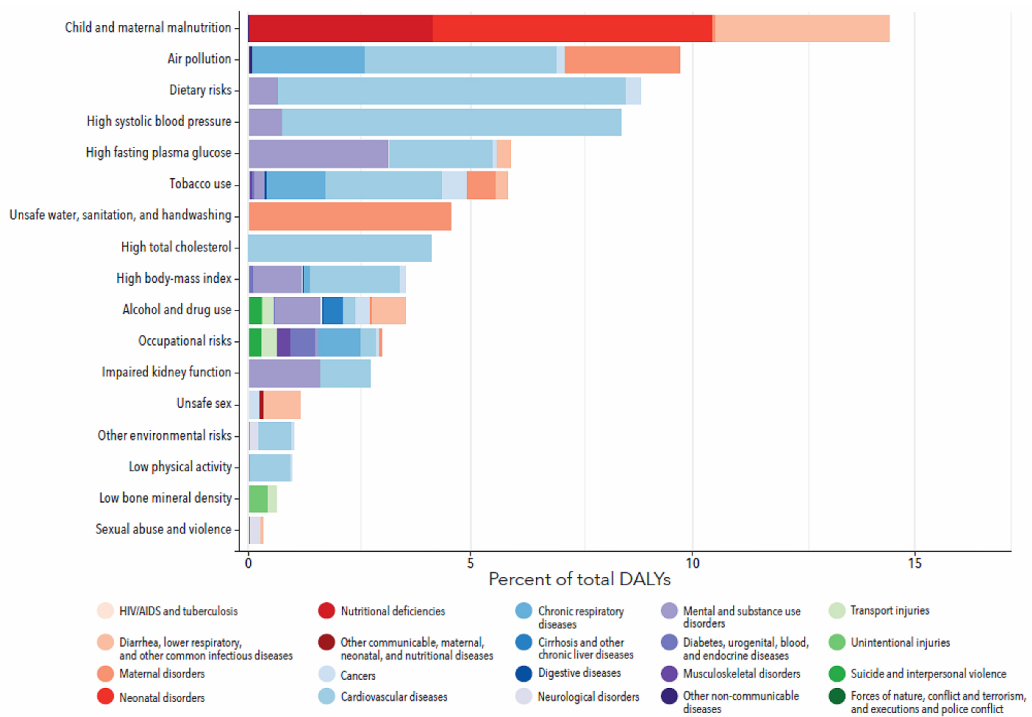


Figure 28: Percent DALYs attributable to various risk factors in India, 2016
Source: ICMR (2017)

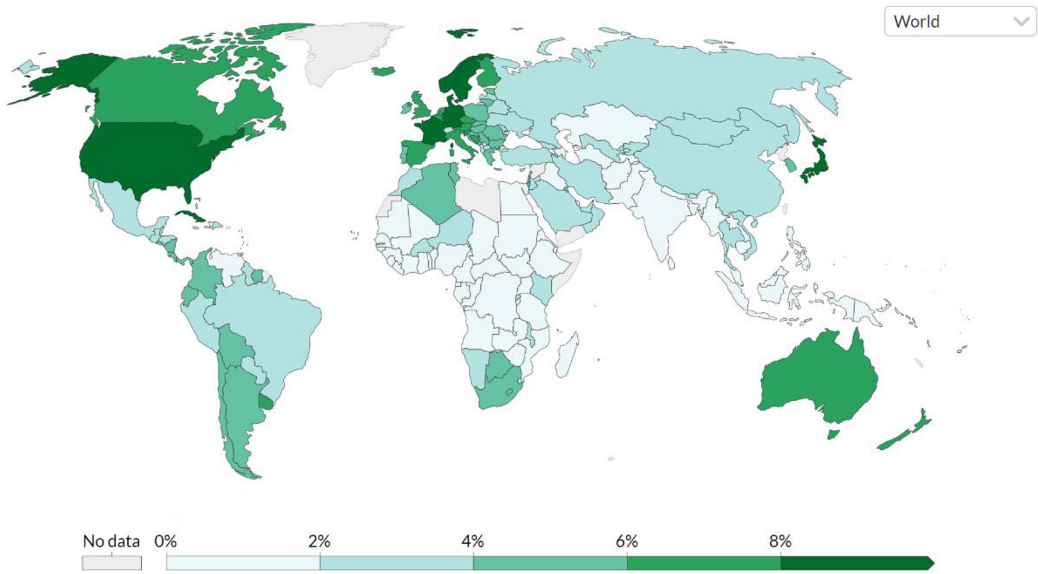


Figure 29: Government health spending as a share of GDP across the world, 2018

Source: WHO, <https://ourworldindata.org/financing-healthcare>

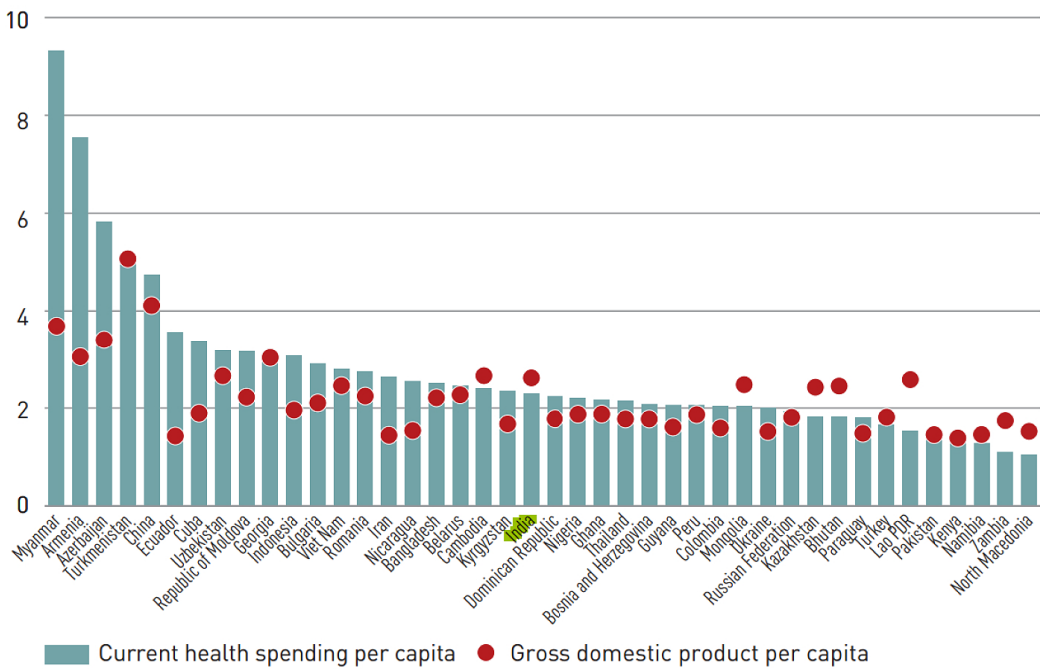


Figure 30: Cumulative growth of GDP and recurrent health spending across countries, 2000–17

Source: WHO, <https://ourworldindata.org/financing-healthcare>

Table 2: Health spending in China and India, 2000–19

Variable	China			
	2000	2006	2012	2019
Total health spending US\$ per capita	42	81	282	535
Govt health spending as % of total health spending	22	35	56	56
Out of pocket spending as % of total health spending	60	56	39	35
GDP US\$ per capita	934	2,058	6,169	10,002
Total health spending as % of GDP	4.5	3.9	4.6	5.3
Govt health spending as % of GDP	1.0	1.4	2.5	3.0
Variable	India			
	2000	2006	2012	2019
Health spending US\$ per capita	19	30	49	64
Govt health spending as % of total health spending	21	21	28	33
Out of pocket spending as % of total health spending	72	72	63	55
GDP US\$ per capita	459	813	1,470	2,115
Total health spending as % of GDP	4.1	3.7	3.3	3.0
Govt health spending as % of GDP	0.9	0.8	0.9	1.0

Source: WHO (2019)

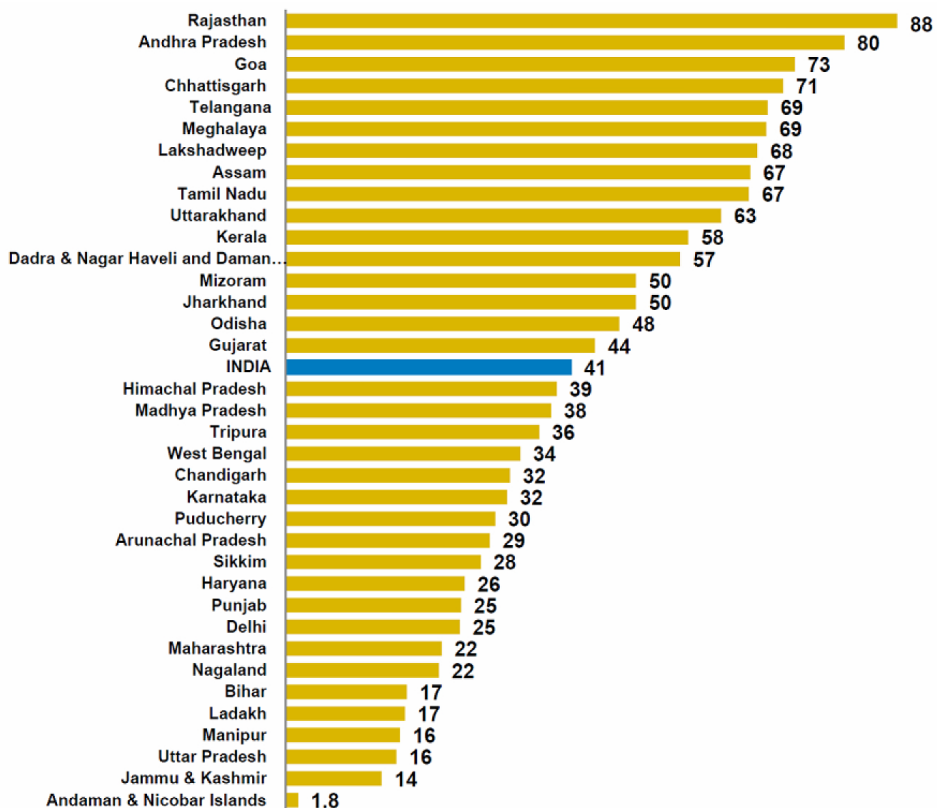


Figure 31: Percentage of households with at least one member covered by some health insurance program or scheme, 2019–21

Source: National Family Health Survey 5, 2019–20

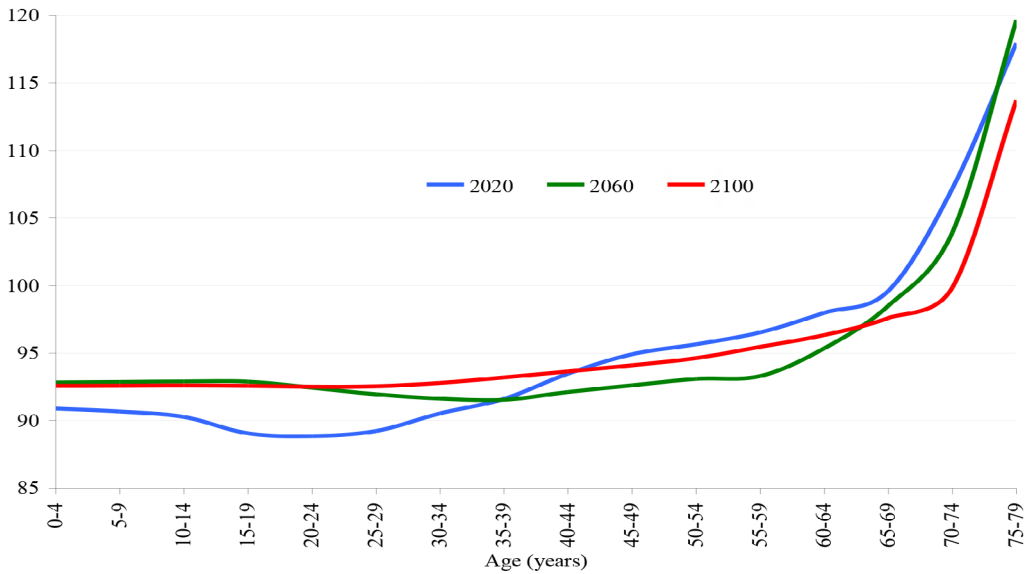


Figure 32: Projected sex ratio (females as % of males), by age, 2020–2100

Source: United Nations Population Division, *World Population Prospects 2019* database

Concluding Remarks

India is already in the midst of its demographic dividend, and there is only a short window of opportunity remaining—perhaps two decades at most—before the dividend starts dissipating. Human capital investments will need to be front and center of a strategy to capitalize on India’s demographic dividend. Significant further investments will need to be made in ensuring broad-based and inclusive human capital development—in education, nutrition, and health. As many as 200-250 million children currently aged 5-15 years will reach working age in another decade or so. To ensure these students are employable and productive in the economy, it is imperative for them to be well-nourished and healthy and to have basic reading and numeracy skills.

Building an improved human capital foundation for the next generation of workers needs a refocus in policy priorities toward (i) universalization of secondary schooling, especially among girls; (ii) greater focus on student learning outcomes instead of delivering an unrealistic and often outdated curriculum; (iii) more skills-based and vocational training for youth in post-secondary institutions; (iv) improved health systems and health infrastructure to address traditional infectious childhood diseases; and (v) improved focus on combating the scourge of child stunting and underweight. Despite progress in reducing child malnutrition, recent estimates show that a third of all children below five years of age are stunted and underweight. With its pernicious effects on student learning, cognitive development, later-life health,

and labor productivity as an adult, early-life undernutrition represents an enormous waste of India's human capital and future growth potential.

India's educational system will also need a major revamp if the country wishes to fully capitalize on its demographic dividend. The system is more focused on curriculum delivery than on learning. Even at the post-secondary level, there is little emphasis on building technical skills to prepare students for productive jobs. Recent studies suggest that barely a quarter of engineering graduates in the country, let alone high school or college graduates, are employable. All this will need to change if the current cohorts of school-age children and college graduates are going to be ready for productive jobs upon graduation.

Because of the large inter-state disparities in both social and economic indicators, a one-size-fits-all approach will not work in India. The northern and eastern states, such as Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, Uttaranchal, and Uttar Pradesh, have worse nutritional, health and educational outcomes than the southern and western states. These are also the states where public infrastructure and governance are weakest, and the net addition to the working-age population (demographic dividend) will be highest. This makes policy reforms in these states more imperative but also more challenging to implement.

At the same time, India's population will age rapidly over the coming

decades. By 2030, there will be more individuals aged 65 years and over than children below 5. Aging will bring its own sets of problem, the chief among which will be health. As countries have aged, the burden of disease has shifted from communicable diseases to NCDs, such as cancer, heart diseases, and diabetes. While that has started happening in India (with NCDs already accounting for more than one-half of the total disease burden in the country), the country also faces a large absolute burden of infectious diseases, such as diarrhea and lower respiratory infections. Health systems in the country are ill-prepared to meet this double burden of disease, especially as the treatment and management of NCDs that tend to be chronic in nature is significantly more expensive. Government health spending per capita is still very low in the country. Despite past commitments to raise the level of spending to 2-3 percent of GDP, government expenditure on health has remained around one percent of GDP for more than two decades—significantly lower than in many other Asian countries, such as China, Indonesia, and Sri Lanka.

As chronic conditions become endemic, the public financing of health interventions will need to shift. Currently, a large proportion of spending on health is in the form of out-of-pocket payments by patients. Because of overcrowding, inadequate access, and the poor quality of care in public secondary and tertiary health facilities, individuals are often forced to visit private facilities. Most drug costs, even in presumably-free public facilities, are borne

by patients. As a result, more than one-half of health expenses are paid out-of-pocket by patients, imposing a major economic burden on them. Other low- and middle-income countries have addressed this issue by expanding and universalizing health coverage through the provision of publicly-funded medical insurance. While India has taken steps in this direction, fewer than a third of working-age adults are covered by any form of health insurance.

The aging of the population will have another implication beyond the rise of NCDs and the double burden of disease. The large elderly population living for decades beyond their working years will need income support from other sources besides their children and families, especially as there will be fewer children to look after their parents. Despite the introduction of numerous social insurance and pension schemes for the elderly during the last decade, only 12 percent of Indians are covered by a formal pension scheme and the main support system for the elderly in India remains the extended family. The plight of the elderly, especially among poor families, is difficult, with widows suffering an especially low status in extended households. As such, programs that guarantee basic income support for the elderly will need to be an important part of any social protection system in India.

But simply investing in human capital will not be enough. India has been unable to fully utilize its demographic dividend to date not only because of its low-skills workforce but

also because of the nature of Indian economic growth. Growth of the economy has simply not translated into enough jobs for young people and for women. Indeed, the employment elasticity of growth has been virtually zero for women and negative for youth. Nor has the country invested enough in labor-intensive light manufacturing—the kind that turned China into the factory of the world and provided jobs to hundreds of millions of rural workers starting in the 1980s.

In part, the jobless growth that the Indian economy has experienced also reflects the rising inequality in the country. Much of the growth during the last two decades has been driven by consumer spending in the burgeoning urban middle class. Most of these consumer goods are not particularly labor intensive in nature.

Additionally, trade policies and labor market rigidities (with antiquated labor-market regulations) have contributed to weak employment generation in Indian manufacturing. Despite seven decades of economic development, Indian labor markets, even in the urban areas, remain largely informal in nature and much of the increase in manufacturing employment that has taken place in the past has been in the unorganized, small-scale sector.

In particular, the Indian economy's creation of high-quality jobs has most adversely impacted women. The female labor force participation rate remains unusually low in India, even relative to other countries in the region (e.g., Bangladesh), and there is evidence

that the labor force participation rate for women has declined over time. It is unlikely that this decline reflects supply-side factors (namely, women's desire to opt for leisure or home production with increased affluence). More likely, it reflects the state of India's job markets, which have offered little by way of decent, high-quality jobs, particularly for youth and women. Moving forward, Indian economic policy will have to focus squarely on creating high-quality job opportunities for women and youth, so that India can mobilize more than half of its working-age population that has been left behind.

This paper has not touched upon the environmental implications of the demographic dividend.

A sobering reality is that, despite the decline in fertility, India's population will continue to increase until the middle of this century. Indeed, another quarter-billion people will be added to India's population in the next 3-4 decades. Rapid economic and population growth in the past have already strained the environment to its physical limits, with Indian cities routinely ranking among the most polluted and most water scarce in the world. To keep up with increased food demand, agricultural cultivation has intensified, and the use of fertilizers, pesticides, and water has increased tremendously. Carbon emissions per capita have risen seven-fold in the last 50 years, with India ranking as the third largest carbon polluter in the world (after China and the United States). Air, water, and soil pollution have had serious impacts on human morbidity and mortality in the country.

It is estimated that India has the largest number of pollution-related deaths in the world (2.4 million in 2019). Climate change is only going to make all this even worse. Clearly, if India is to expand labor-intensive manufacturing and further intensify its agricultural sector to feed an additional 250 million people, it will have to pursue a more environmentally sustainable "green" development strategy.

The green development will have to be comprehensive and particularly address the situation in urban areas, where growth has been haphazard and the quality of life for many residents is poor. Many of these individuals have no or low-productivity jobs, substandard housing, and paltry access to public services. Several Indian cities are on the verge of running out of water, and air quality is among the poorest of any cities in the world. Major public investments will need to be undertaken in urban infrastructure and services, and cities will need to come up with creative "green" and inclusive development strategies that offer good jobs, affordable housing, clean air and water, and improved access to public services.

Finally, the other bane of Indian society—son preference among households—continues unabated, having become stronger over time, even in the face of expanding female education and rising affluence. In its extreme form, son preference leads to sex-selective contraceptive behavior or, even worse, abortions and neglect of infant girls. As a result of such practices, it is estimated that excess female under-five mortality

may be as high as 18.5 for every 1,000 live births. Nearly 45 million females are presumed missing in India, constituting a third of all missing females in the world (the other major violator in this regard being China).

Deep and pervasive societal gender discrimination of this type is corrosive and violates the basic human rights of half of India's population, but

it is also self-defeating since women can play an important role in powering future growth and development in India. Indeed, women may be India's best and least underutilized remaining resource. If India is to become a prosperous, inclusive society in the coming decades, it will need to incorporate women much more fully and proactively in its future growth and development strategies.

Endnotes

- 1 This paper draws upon a more comprehensive and detailed report prepared for the World Bank by the author: "Long-term Demographic Changes in India and Implications for Human Development Outcomes and Strategies" (August 2022).
- 2 In most populations, more male than female babies are born to compensate for the slightly higher (biological) risk of mortality among newborn boys relative to girls.
- 3 Note that while fetal sex discernment is banned in India by the Pre-Conception and Pre-Natal Diagnostic Techniques Act of 1994, such a ban is difficult to enforce since abortions are legal and the technology that permits fetal sex detection is available legally for routine medical purposes such as antenatal care.
- 4 The grey area is a residual category that includes all urban settlements with a population of fewer than 300,000 inhabitants.
- 5 Data from the Fifth National Family Health Survey conducted in 2019–21.
- 6 The "National Education Policy" of 2020 has envisioned a transformation in education by putting a greater focus on quality. But it is too recent to be evaluated. Government schools are crippled with problems such as widespread teacher absenteeism and inadequate classrooms, toilet facilities, and other infrastructure. Low-quality public education has driven parents – even from lower-income groups – to private schools. The problems in education mirror those in the health sector, where patients are driven to the private sector by a poorly performing public health care system.
- 7 More recent data from the Periodic Labor Force Survey conducted by the National Sample Survey show an uptick in both female and male labor-force participation rates. For instance, the rate for women aged 15 years and over increased from 23.3 percent in 2017–18 to 32.5 percent in 2020–21. It is not clear that whether this uptick marks a reversal in the long stagnancy of labor force participation rate or if it is attributable to the Covid pandemic in 2020 and 2021.
- 8 The Indian Parliament has recently passed new labor reforms, codifying 29 previous labor laws into four codes. The legislation focuses on protecting workers and cutting red tape, as well as extending factory shifts from nine to 12 hours and allowing women to work in night shifts, but the legislation is likely to only benefit the small minority of workers in the organized

sector. Additionally, it is not clear how the new legislation will introduce greater labor-market flexibility, which is often regarded as a disincentive to formal employment growth in Indian manufacturing.

- 9 Disability-adjusted life years (DALYs) is a commonly used measure of the health burden caused by different diseases that takes into account both premature mortality and disability. One DALY represents the loss of the equivalent of one year of full health.
- 10 The devastation wreaked by the Covid-19 pandemic in 2021, with unofficial estimates of 3-5 million deaths caused by the disease, is a telling example of the challenges India continues to face in controlling communicable disease. India was one of the worst-affected countries by Covid-19.

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