AN ANALYSIS OF FERTILITY TRANSITION IN INDIA

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ABSTRACT

India is a country located in Asia's southern region. Its population is the largest in the entire world. The expense of living will increase exponentially as population growth intensifies resource demand. But the ageing population will increase in the future because total fertility is declining continuously. Thus, the inverse relationship between fertility rate and life expectancy As a result, the burden of NCDs diseases will increase. This paper discusses why the total fertility rate (TFR) is declining and the implications of increasing the ageing population in India. Highlighting the total fertility rate, burden of NCD diseases, challenges of an ageing population, and its implications in the future. Thus, the objectives of this paper are to examine trends in the total fertility rate and health issues associated with an ageing population in India, as well as analyse non-communicable disease deaths in India. The study analyses dependency ratio and total fertility rate trends in India from 1951 to 2022 using data from secondary data sources published by the Government of India and the United Nations Secretariat on world population prospects. The main sources of secondary data are such as Ministry of Health and Family Welfare, Government of India, W.H.O, United Nations World Population and Census Government of India etc.

Keywords: *Total Fertility Rate, NCDs, Ageing and Population etc.*

INTRODUCTION

India is a country located in Asia's southern region. Its population is the largest in the entire world. The expense of living will increase exponentially as population growth intensifies resource demand. But the ageing population will increase in the future because total fertility is declining continuously. The general consensus now is that fertility decline is occurring at a much faster rate than it was 10 to 15 years ago. This is largely due to the widespread belief that fertility may decline in the future at a faster rate than anticipated[i]. Economic interdependencies across age will drive rapid population aging in economies worldwide due to falling or low fertility rates. Nearly 48 percent of the world's population lives in countries with low fertility rates, leading to population decline. The Total Fertility Rate (TFR) is 1.5 births per woman in Europe and 1.4 births per woman in Japan. Southern European population is projected to reach 50 by 2040, raising concerns about population aging in 102 countries, prompting 54 countries to implement fertility-boosting policies.[ii] In the 1950s, contraceptive use was rare, but by 2020, fertility and contraceptive use in Asia and Latin America reached levels commonly observed in the developed world. This monograph provides a comprehensive analysis of fertility trends, focusing on changes in reproductive behaviour, preferences, and socioeconomic development. The global population is projected to reach around 8.5 billion by 2030, despite steady growth in numbers. The global population is increasing, but fertility has been declining over the past 70 years. The average number of children per woman in reproductive age has decreased by 50 percent, from 05 in 1951 to 2.4

in 2020, according to the World Population Prospects 2022.[iii]

Singapore's government has been grappling with a persistent decline in fertility since the 1980s. So, Singapore's government introduced a package of pronatalist incentives in 2001, including paid maternity leave, childcare subsidies, tax relief, and grants for flexible work arrangements, but the fertility rate deteriorated from 1.41 in 2001 to 1.16 in 2018[iv].

The declining fertility rate will also result in less demand for land, water, and other resources, which will help us, achieve our environmental goals. Some countries will have increased opportunities to profit from the demographic dividend. But in some countries, as the working-age population ages and retires, the result will be reduced labour force participation. Paul Samuelson's 1958 article outlines the overlapping-generations model, which divides an individual's life cycle into productive and unproductive periods. He argues that workers cannot save for retirement[v]. Samuelson suggests three solutions to the problem of retirees relying on workers: (1) a family system with transfers, (2) the creation of fiat money and (3) a social security system with pensions funded by workers' taxes. These solutions improve welfare for all generations and require a "social compact" to support them.

Economic growth is influenced by lower fertility rates, with improved infrastructure, healthcare, and education leading to increased income and reduced fertility. This decrease in fertility also benefits the ecosystem by reducing strain on resources like land and water. Social scientists sometimes perceive fertility trends as a herd animal, which casts suspicion on data showing declining fertility. A reputable demography magazine questioned whether fertility was falling in less developed nations in 1979. Demographers disagreed on whether even the earliest signs of fertility drops would emerge for 15 to 25 years, notwithstanding Nicholas Eberstadt's claim that they were happening in many developing nations. Early 2000s pioneers of declining fertility rates, Japan and South Korea are now experiencing a shortage of people of working age. Since the 1990s, the reliance ratio has increased, resulting in almost no GDP growth. To pay for rising social security costs, they must also overcome financial obstacles. To make up for the decline in the working population, an influx of immigrants from nations with faster population growth could create additional problems including class and social conflicts. Increasing fertility through various policy decisions: such as Germany's liberal labour laws, which permit longer parental leave and benefits, has increased birth-rates. Hungary recently nationalised IVF clinics, while Denmark offers state-funded in-vitro fertilisation (IVF) for women under the age of 40. There are provisions for regular payments and other financial advantages in Poland and Russia. Russia reinstituted the Soviet-era ‘Mother Heroine’ title, which bore and raised more than 10 children amounting to Rs. 13 lakhs.

More over 600 million people in India are between the ages of 18 and 35, with 65% under the age of 35. However, decreased fertility rates have changed India's demographic age structure, resulting in a "bulge" in the working age group. This “demographic dividend” has improved the dependency ratio. As a result, the working population will accelerate expansion. Thus, in three decades, India's fertility rate will not be less than two, according to some economists and demographers’ projection. The "demographic dividend" has boosted India's dependency ratio, accelerated population expansion and predicted a fertility rate of at least two in three decades. In this context, the main objectives of the present paper are (i) to analyse the emerging trends of dependency ratio and total fertility rate in India. (ii) to determine the health challenges from an ageing population and status of death from non-communicable disease (NCDs) in India (iii) to suggest the policy implications for fertility rate and non-communicable diseases in India.

METHODOLOGY

The data for the present study has been retrieved from various secondary data sources published by

the Government of India (GoI). The present study covers broadly the periods between 1951 to 2022, to analyze the trends of total fertility rate in India. The main sources of secondary data are such as Ministry of Ministry of Health and Welfare Govt. of India, World Health Organisation (WHO), United Nations World Population and Census Government of India etc. Simple calculations, percentage and correlation are used for the estimations and analysis of the secondary data.

FERTILITY RATE

The replacement fertility rate is the average number of children a woman needs to have in order to maintain population stability, and it is estimated to be 2.1 children per woman. The Total Fertility Rate (TFR) is declining as a result of greater education, mobility, and late marriage, use of contraception, better health care facilities, financially independent women, and general affluence. In the current scenario, the majority of states have fertility rates below 2.1, and according to the NFHS 2021, only five states-Bihar (3), Meghalaya (2.9), Uttar Pradesh (2.4), Jharkhand (2.3), and Manipur (2.2) had fertility rates over the replacement rate. India's aging population is expected to rise from 4.4 percent in 2000 to 7.6 per cent in 2025, with older populations more affected to NCDs, increasing the health burden parallel with aging[vi].

The demographic process will create a growing labor force, resulting in growth and prosperity. This concept of a "demographic dividend" challenges the earlier conventional belief that a big and "excess" population is a burden rather than a gain from an economic standpoint[vii]. India is experiencing a demographic dividend opportunity, with infant mortality rate decreasing significantly in the first two decades of post-independence development. The fertility rate has declined, but infant mortality rates have sharply fallen, potentially increasing the population of young people due to greater child survival, possibly influenced by declining mortality in higher age groups. India remains one of the youngest countries globally, with a third of its population below 15 years old in 2000. The 15-24 age group grew significantly, with an average age of 29 in 2020, compared to 37 in China, the US, 45 in west Europe, and 48 in Japan[viii].

India began reaping demographic dividends in the mid-1970s, with dependency ratio projected to fall to 48 in 2025 and rise to 50 by 2050 due to a population bulge and declining death rates in older age groups. The UN's database predicts a decline in the youth population (15-24) by 2025, while official Indian projections suggest the decline may have begun earlier. India's youth population was 195.1 million in 2001, expected to increase by 5.4 million between 2001-06 and 2006-11[ix]. Thus, the dependency ratio, which measures the proportion of workers to non-workers, influences the surplus available for investment after current consumption. A higher ratio of workers to non-workers leads to a larger surplus, especially for high unemployment rates. But, the savings-growth causality suggests that increased longevity may not necessarily lead to increased savings in the working age population due to increased disease burden and healthcare expenses.[x] Table 1 shows that dependency ratio and child dependency ratio are declining and will continue to decline in the future. But the old-age dependency ratio will increase in the country.

Table 1: Trends in the Dependency Ratio (CR) in India during 1950 to 2050

Year	Dependency Ratio	Child Dependency Ratio	Old-Age Dependency Ratio
1950	73	67	6
1955	74	68	6
1960	76	70	6
1965	78	72	6
1970	79	72	7
1975	77	71	7
1980	74	67	7
1985	72	65	7
1990	69	62	7
1995	68	60	8
2000	64	56	8
2005	60	51	8
2025	48	36	12
2050	50	27	22

***Source**: population division of the department of economic and social affairs of the United Nations Secretariat, world population prospects, http://esa.un.org/unpp.*

India's economic performance is expected to surpass China due to its large working-age population and small number of dependents, but this is unlikely due to evolving employment, education, and health issues. Goldman Sachs predicts this demographic advantage will soon run out[xi]. India's emerging ageing scenario in the first half of the 21st century, predicting the elderly population for the next 50 years[xii].

STATUS OF POPULATION DIMENSIONAL INDICATORS IN INDIA

The status of population dimensional indicators in India during 1991 to 2022 are shown in Table 2. It is found that population density of India changed by 59.42 percent while birth rate declined by -82.84 percent between 1991 and 2022. On the other hand, the death rate in India declined by 92.62 percent while the fertility rate declined by 97.84 percent between 1991 and 2022.

Table 2: Status of Population dimensional indicators in India during 1991 to 2022

Year	Population	Population Density	Fertility Rate	Life Expectancy
1991	888,941,756	270.42	4.006	58.15
1992	907,574,049	276.09	3.920	58.63
1993	926,351,297	281.80	3.833	59.12
1994	945,261,958	287.55	3.763	59.59
1995	964,279,129	293.34	3.693	60.06
1996	983,281,218	299.12	3.623	60.53
1997	1,002,335,230	304.92	3.553	61.00
1998	1,021,434,576	310.73	3.483	61.47
1999	1,040,500,054	316.53	3.414	61.88
2000	1,059,633,675	322.35	3.346	62.28
2001	1,078,970,907	328.23	3.277	62.69
2002	1,098,313,039	334.11	3.209	63.09
2003	1,117,415,123	339.92	3.140	63.5
2004	1,136,264,583	345.66	3.071	63.91
2005	1,154,638,713	351.25	3.002	64.31
2006	1,172,373,788	356.64	2.934	64.72
2007	1,189,691,809	361.91	2.865	65.12
2008	1,206,734,806	367.09	2.796	65.53
2009	1,223,640,160	372.24	2.716	65.98
2010	1,240,613,620	377.4	2.636	66.43
2011	1,257,621,191	382.57	2.556	66.87
2012	1,274,487,215	387.71	2.476	67.32
2013	1,291,132,063	392.77	2.396	67.77
2014	1,307,246,509	397.67	2.365	68.07
2015	1,322,866,505	402.42	2.334	68.37
2016	1,338,636,340	407.22	2.302	68.67
2017	1,354,195,680	411.95	2.271	68.97
2018	1,369,003,306	416.46	2.240	69.27
2019	1,383,112,050	420.75	2.220	69.5
2020	1,396,387,127	424.79	2.200	69.73
2021	1,407,563,842	428.19	2.179	69.96
2022	1,417,173,173	431.11	2.159	70.19
% Change	***59.42***	***59.42***	***-97.84***	**-29.81**

Source: United Nations World Population Data,

This leads to a situation where all retirees are dependent upon workers to support them. Samuelson argues that the market cannot solve this problem and provides three examples of how to solve it as (1) a family system with transfers from working children to their retired parents (2) the creation of 'fiat money'2 as a store of value that can be saved by the workers, or (3) a social security system in which pensions are paid for by a tax on workers. A system of transfers from worker to retired through any of these institutions will lead to an improvement in welfare for all persons in current and future generations. Since each person has an incentive to renege on a tax-based system, it needs to be supported by a "social compact".

The most important factors influencing total fertility rates over time are raising life expectancy and a drop in agricultural labour force participation[xiii]. The analysis shows that the fertility rate is inversely related to life expectancy, with life expectancy increasing as the number of children per woman decreases. People in countries where there is a limit of two children per woman survive for at least 80 years whereas in nations where there is a limit of six children, people are more likely to die before the age of 60. Table 3 depicts the correlation between fertility rate and life expectancy in India during 1991 to 2022. It is found that there is inverse relationship between fertility rate and life expectancy in India during 1991 to 2022. It is witnessed the fertility rate declines and women's life expectancy increases in the country.

Table 3: Correlation Matrix between Fertility Rate and Life Expectancy in India during 1991 to 2022

Variables	Total Fertility Rate (TFR)	Life Expectancy (LE)
Total Fertility Rate (TFR)	1.000	
Life Expectancy (LE)	-0.998	

Source: Estimated by Author

HEALTH CHALLENGES FROM AGING POPULATION

India's rapidly aging population, with 7.6 percent more over 65 by 2025, increases the risk of NCDs, thereby increasing the health burden associated with NCDs. NCDs are the largest health burden in India, accounting for 62 percent of total disease burden, primarily affecting middle aged and older populations, with future increases expected. The most prevalent NCDs in India include cardiovascular diseases (CVD), injuries, mental illness, cancer, respiratory diseases, and diabetes. Together, CVD and injuries account for 12 percent of the burden of illness (NCDs Policy Brief: India- 2011). According to W.H.O report (2022), 6,047,000 is the total number of NCD deaths in the whole population of India, representing 66 percent of deaths from NCDs and 22 percent of premature mortality from NCDs in India[xiv]. Smoking is a major risk factor for non-communicable diseases (NCDs), with high rates among youth, accounting for 1 in 5 men and 1 in 20 women deaths in India. India's burden of non-communicable diseases (NCDs) is expected to worsen due to rising diabetes cases and obesity, with CVD being the leading cause of mortality globally by 2030. India's Non-Communicable Diseases (NCDs) death rate has risen from 37.90 percent in 1990 to 61.8 percent in 2016, with diabetes, cancer, chronic respiratory diseases, and cardiovascular diseases being the main causes linked to poor diet, inactivity, tobacco use and harmful substances. Table 4 shows that the percentage share of deaths from NCDs has been increasing continuously in India from 1990 to 2022. Because increasing ageing populations and

unsystematic daily routines are responsible for NCDs deaths. On the other hand, there has been an increase of more than 34 percent in deaths from NCDs during 1990 to 2022.

Table 4: Percentage Share of Death from Non-Communicable Diseases in India

Year	Share of Death from NCDs
1990	37.90
2016	61.80
2020	63.00
2022	66.00
% Change	*34.00*

Source: www.statista.com

CONCLUSION AND POLICY IMPLICATIONS

India's older population is projected to rise significantly over the next four decades from 8.0 percent in 2010 to 19 per cent in 2050, posing social, economic, and healthcare policy challenges due to changing family relationships and limited old-age income support. The dependency ratio and child dependency ratio are declining and will continue to decline in the future, but the old-age dependency ratio will increase. India's population growth and age structure are driven by increasing life expectancy and declining fertility, with life expectancy rising from 37 in 1950 to 65 in 2011 due to public health improvements. It is found that there is inverse relationship between fertility rate and life expectancy during the study period. On the other hand, between 1991 and 2022, India's population and density changed by 59.42 percent, but birth rate, death rate, and fertility rate declined by -82.83 and 97.84 percentage points respectively. In contrast, the percentage share of deaths from non-communicable disease has been increasing continuously in India from 1990 to 2022. It is witnessed that there is an increase of more than 34 percent in deaths from NCDs during 1990 to 2022. NCDs largely affect the middle-aged and older population in India. These groups are growing fastest and will increase in the future. Overall from the analysis, it is observed that fertility rate, dependency ratio, and child dependency ratio are declining and will continue to decline in the future whereas old-age dependency ratio and deaths from NCDs will increase in the country. In the case of a declining total fertility rate and an increasing ageing population, mixed approaches to projection have been given by social scientists. Some social scientists and demographers said the declining total fertility rate in India, it will not a problem for the next three decades. But some social scientists and demographers said declining total fertility rate and an ageing population can be faced to challenges in India like Japan, Italy, Germany, France and china. According to the United Nations Population Division (UNPD), "India's ageing population is 6.1 percent. So we need to have an equal ratio of population replacement and fertility rate (World Population Prospects, 2019). The Government should focus to strengthen programmes, policies and make balanced strategies between fertility rate and replacement rate of population in the country.

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