

# Examining Demographic Disparities: A Comparative Analysis of Age Structure Changes Across Indian States (1990-2020).

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## Abstract

*This paper attempts to give a comparative perspective on the age structural change and demographic transition in India and its States. Data required for the present study on the indicators namely Birth Rate and Death Rate, life expectancy at birth, and Total fertility rate, has been collected mainly from various publications of the census report and sample registration system (SRS) of the Registrar General of India for the 30 years starting from 1990 to the year 2020. Results of the present analysis indicate that India and its major states of different regions are well in progress in their demographic transition and are at various stages of their demographic transition based on the progress made in their fertility and mortality transitions as a result of different progress made in their health and socio-economic development. Consequently, it is seen that while some of the states are at a very advanced stage of the Demographic transition some other states are seen lagging behind them. States in the South of India namely Kerala, are always seen in the advanced stage of their mortality, fertility, and demographic transitions when compared to their counterparts in the northern, Western, and Eastern states namely the states of UP, Gujarat, and West Bengal.*

*The main aim of the study is to analyze and compare the demographic transition, age structural changes, and aging process in The different regional states of India.*

**Keywords:** Age structural changes, Dependency ratio, Life Expectancy

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## Introduction

Demographic and age structural transition is a process of shifting age structure from a young population to an old population. this is an inevitable consequence of demographic transition, however, during the process of age structural changes there is an interim period during which the working-age population grows at a more rapid pace than children and the elderly population. Fertility and mortality are constant during the early stage of a demographic transition resulting in a constant age structure. Age-sex structure Is one of the most important characteristics of composition. Age statistics form an important component of population analysis as most of the analysis is based on age-sex data structure and it is also required for age-specific analysis of data For planning. The dependency ratio which is the ratio of economically active to economically inactive persons is dependent completely on age composition.

Age structural transition is a process and consequence of shifting age From a young age population to an old age population and it is an integral part of our demographic transition whose trajectories are determined by the timing and speed of fertility and mortality declines.

Fertility and mortality are constant during the early stage of a demographic transition resulting in a constant age structure. However, when mortality declines and fertility is constant in the later stage of a demographic transition, a large share of the country's population is young leading to a high dependency Ratio. during the final stage of the demographic transition then both fertility and mortality reach the lowest level the share of the old age population

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increases Thus Dependency ratio increases during the final stage of the demographic transition due to an increase in the elderly population.

The demographic transition period can be classified into the end of 4 phases Both pre-transition and post-transition period.

### **Phase 1 - HIGH BIRTH RATE AND HIGH DEATH RATE:**

In the first stage of the Demographic transition period India had a high birth rate and high death rate in this stage the country is at a low level of economic development agriculture which is the main occupation of the people in the backward States per capita income is low, the standard of living of the people is low, balanced diet is not sufficiently available to the masses. The death rate is high because of a lack of medical facilities, epidemics, famines, and illiteracy. The birth rate is high because of social and economic reasons, people are always keen to have large families.

### **Phase 2 - HIGH BIRTH RATE AND LOW DEATH RATE:**

In the second stage of the demographic country has a high birth rate and low death rate or stage of population explosion, growth rate of the population is very high. In this stage, income begins to rise economic activities expand and on account of better health facilities and good diet death rate falls rapidly, there is modernization of agriculture and expansion of trade, transport, and industry. The birth rate in this stage of economic development remains high because of social backwardness and strong belief in favor of large families.

### **Phase 3 - DECLINING BIRTH RATE AND LOW DEATH RATE:**

In the Third stage of Demographic transition. The population growth is low along with the economic development of the country structure changes in the economy begin to take place. Industrialization began to spread large part of the population began to reside in urban areas. The literacy rate increases and people start preferring small families.

### **Phase 4 - LOW BIRTH RATE AND LOW DEATH RATE:**

In the 4th stage of demographic transition rapid economic development will take place standard of the people will become very high there is considerable change in the social outlook of the people under the impact of urbanization, industrialization, and high rate of literacy. Quality of life will be given priority and the population will become almost stationary.

## **REVIEW OF LITERATURE**

**JAMES AND SRINIVASAN (2019):-** The study by James and Srinivasan concentrated on the social security and economic independence of India's senior citizens. The main highlighted points are as follows:-

1. Economic Independence: A large percentage of India's older population lacks economic independence, according to the report. Many people depend on their kids or other family members for financial support, which might put them at risk, particularly if things shift within the family.
2. Social Security: The study highlighted the shortcomings in India's social security programs for the elderly. While certain government programs exist, they are sometimes inadequate and inaccessible to the elderly, especially those living in rural areas.
3. Gender discrepancies: While older women are more likely than older males to have social and economic anxieties, the study also discovered significant gender discrepancies. Longer life expectancies and decreased lifetime incomes and savings are main causes of this.
4. Recommendations for Policy: James and Srinivasan proposed a number of policy initiatives to mitigate the issue, such as strengthening pension plans, expanding access to healthcare, and establishing more resilient social support networks catered to the need of the elderly.

The aforementioned results highlight the necessity of all-encompassing policies aimed at providing the elderly population in India with enough security and dignity.

**Varughese and Jamuna's (2018):-** The study by Varughese and Jamuna concentrated on a number of women's health-related topics, especially when considering socio demographic variables and how they affect health outcomes. These are a few of their main research findings:

1. **Socio-Demographic Correlates:** The research demonstrated the substantial influence that age, education, marital status, and income have on women's health-related behaviours and results. Higher education levels, for example, have been linked to proactive health-seeking behaviour and improved health awareness.
2. **Infertility and Treatment-Seeking Behaviour:** They discovered that stigma around infertility frequently caused people to put off seeking treatment. Compared to women from lower socioeconomic strata, individuals from better socioeconomic origins were more likely to seek medical attention.
3. **Cultural and Social Influences:** Women's health behaviours were significantly shaped by cultural norms and beliefs. Whether and when women sought medical counsel was often affected by traditional ideas about health and reproduction.
4. **Healthcare Disparities in Access:** The survey also identified hurdles that rural women face more severely than their urban counterparts when it comes to healthcare services. This covered things like accessibility to medical services, travel time, and budgetary limitations.

In order to enhance women's health outcomes and promote prompt treatment-seeking behaviour of these findings highlight the significance of addressing sociodemographic gaps.

**Datta's 2018:-** The socioeconomic and health-related topics covered in Datta's study were numerous. Some of the key conclusions are as follows:

1. **Economic Disparities:** The analysis revealed notable differences in economic status amongst various population groupings. The article highlighted that obtaining healthcare and other necessary services was significantly impeded by income inequality.
2. **Health Outcomes:** According to Datta, socioeconomic status directly affects health outcomes. People in lower socioeconomic categories were more likely to have chronic illnesses and had less access to high-quality medical treatment.
3. **Education and Awareness:** The study placed a strong emphasis on how education might enhance health outcomes. Greater health awareness and proactive health-seeking behavior were linked to higher educational attainment.
4. **Gender Inequality:** The survey also noted that women frequently encountered greater health and financial obstacles than males did. It was suggested that this was caused by things like lower levels of education and fewer job prospects.
5. **Policies Suggestions:** To address these concerns, Datta proposed several policies, such as expanding educational opportunities, strengthening the healthcare system, and putting in place focused social welfare initiatives to assist disadvantaged groups.

To promote general health and well-being, these findings highlight the significance of tackling socioeconomic disparities.

**Desilva and Tenreyro (2017):-** Population control strategies and fertility convergence were the subject of study by De Silva and Tenreyro. The study looked at how these policies affected fertility rates around the world. The primary conclusions are as follows:

1. **Global Fertility Rate Decline:** Over the previous few decades, emerging countries have seen a tremendous drop in fertility rates, according to the report. In comparison to the slower drop seen in more developed nations, this collapse happened considerably more quickly.
2. The Authors maintained that a major contributing factor to this sharp reduction was the use of population control measures. Public awareness initiatives were used to encourage smaller family standards and to make contraceptive options more widely available.

3. Socioeconomic Factors: Although socioeconomic variables like GDP per capita, educational attainment, and urbanization were significant, they were unable to completely account for the patterns of declining fertility. According to the study, family planning program execution and intensity are critical.<sup>2</sup>

4. Fertility Rate Convergence: Several nations reached a fertility rate that was slightly higher than two children per woman, despite significant variations in economic factors.

### **Objectives of the Study**

- 1) To study the impact of the demographic transition on the population's age structure.
- 2) To study the comparative perspective of the mortality, Fertility, and demographic transitions taking place in India and its regional states.
- 3) To provide a comparative perspective of the aging transition taking place in India and its regional states.
- 4) To examine the present stage of demographic transition in terms of changes in birth rate, death rate, natural growth rate, and life expectancy at birth.

### **Research Methodology**

This study is like descriptive research which aims at ascertaining the current objective in detail by the collection of mainly secondary sources of data and information. The unique feature of the present study may be that it utilizes the estimates on Birth Rate and Death Rate, fertility, and mortality from the only source "The Sample Registration Of the Registrar General of India. For the present study, we have collected information for India and its Four major states of different regions for each of the years from 1990 to 2020 on the following indicators from various publications of the SRS of Registrar General of India. Birth Rate and Death Rate, Total fertility rate, Life Expectancy at birth.

The methodology followed in the present study is very simple as the first step of the information On the essential indicators the life expectancy at birth for each of the years from 1990 to 2020 for each regional state is derived from a report of IMR. Estimates Progress in the fertility, mortality, and demographic transition is traditionally studied by observing time trends in indicators such as crude birth rate, crude death rate, total fertility rate, and life expectancy at birth. Some other data from CSO, NSSO, NITI Aayog, and published data of the Government of India are also used in this study.

<b>Table showing Birth Rate and Death Rate in Southern State</b>		
<b>Kerala</b>		
<b>Year</b>	<b>Birth Rate</b>	<b>Death Rate</b>
<b>1990</b>	19.6	6
<b>1995</b>	18	6
<b>2000</b>	17.9	6.4
<b>2005</b>	15	6.4
<b>2010</b>	14.8	7
<b>2015</b>	14.8	6.6
<b>2020</b>	13.2	7

Table: 1 , Source: Author's Contribution

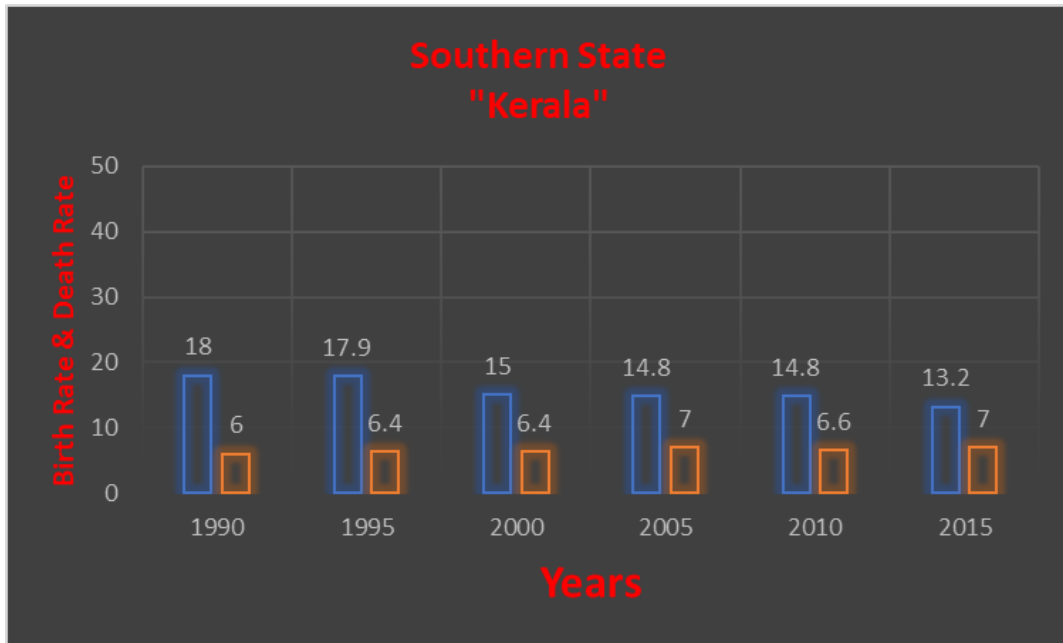


Figure: 1, Source: Author’s Contribution

Table showing Birth Rate and Death Rate in Eastern State		
West Bengal		
Year	Birth Rate	Death Rate
1990	28.2	8.4
1995	23.6	7.9
2000	20.7	7
2005	18.8	6.4
2010	16.8	6
2015	15.5	5.9
2020	14.6	5.5

Table: 2, Source: Author Contribution

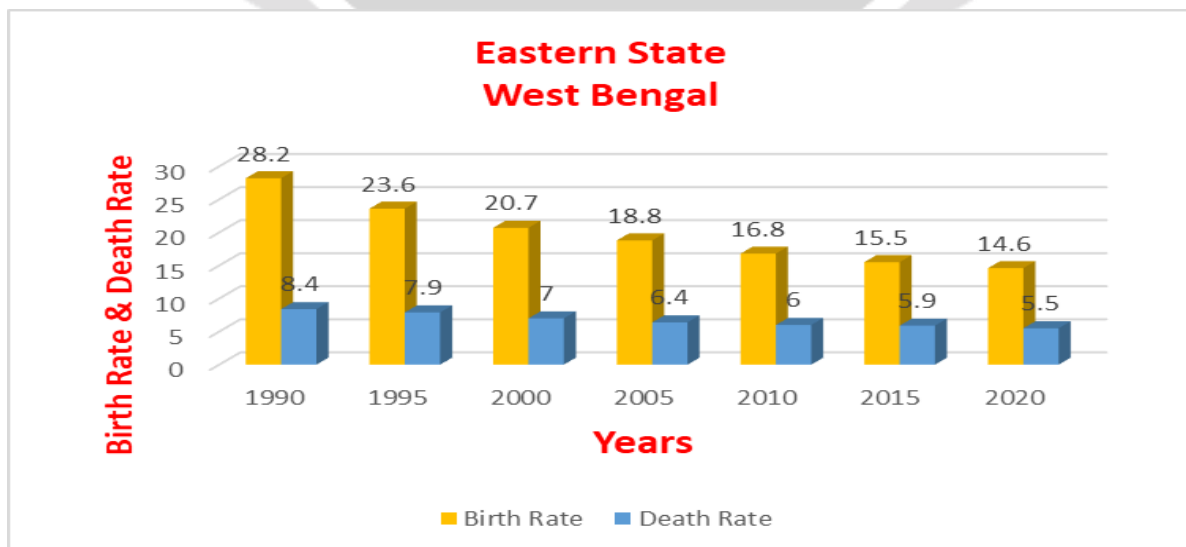


Figure: 2, Source: Author’s Contribution

<b>Table showing Birth Rate and Death Rate in Western State</b>		
<b>Gujarat</b>		
<b>Year</b>	<b>Birth Rate</b>	<b>Death Rate</b>
<b>1990</b>	29.6	8.9
<b>1995</b>	26.7	7.6
<b>2000</b>	25.2	7.5
<b>2005</b>	23.7	7.1
<b>2010</b>	21.8	6.7
<b>2015</b>	20.4	6.1
<b>2020</b>	19.3	5.6

Table 3, Source : Author Contribution

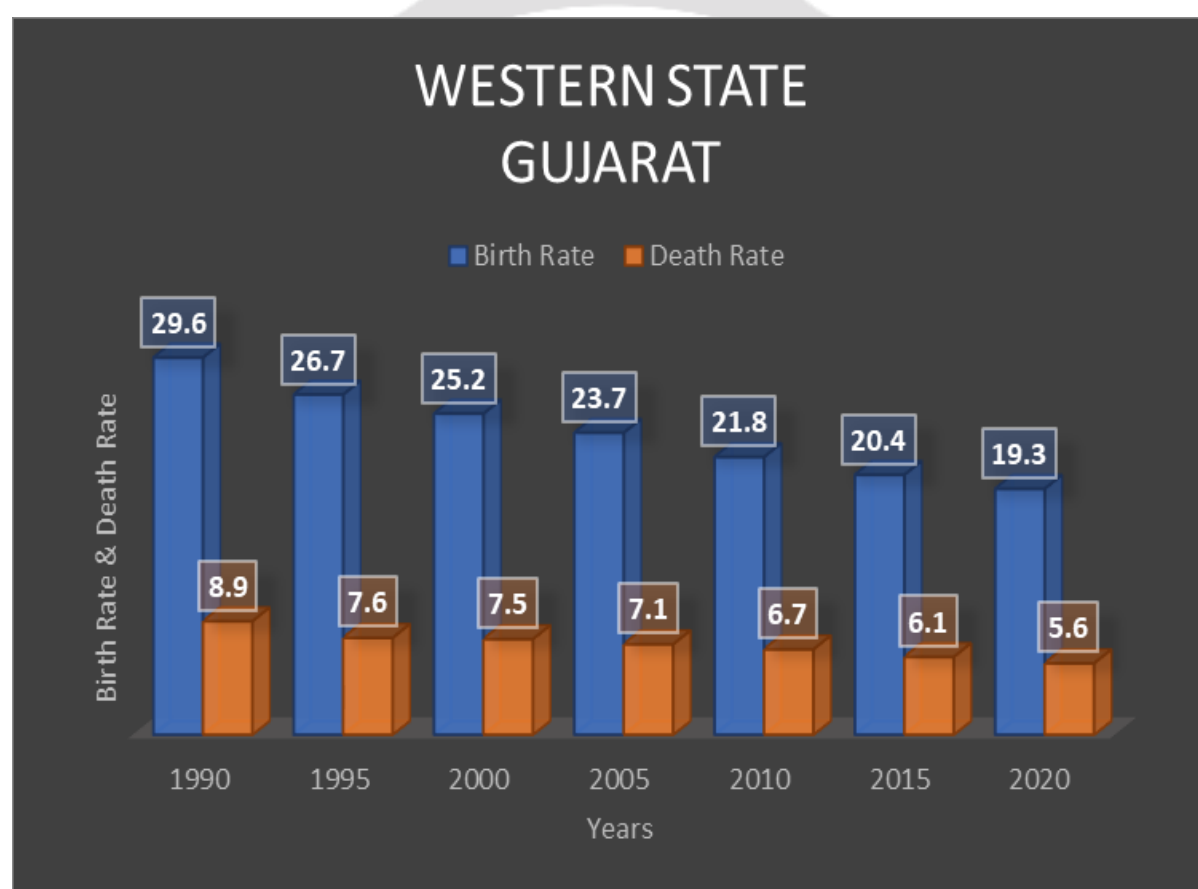


Figure: 3, Source: Author's Contribution

<b>Table showing Birth Rate and Death Rate in Northern State</b>		
<b>Uttar Pradesh</b>		
<b>Year</b>	<b>Birth Rate</b>	<b>Death Rate</b>
<b>1990</b>	35.6	12
<b>1995</b>	34.8	10.3
<b>2000</b>	32.8	10.3
<b>2005</b>	30.4	8.7
<b>2010</b>	28.3	8.1
<b>2015</b>	26.7	7.2

2020	25.1	6.5
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Table 4, Source : Author Contribution

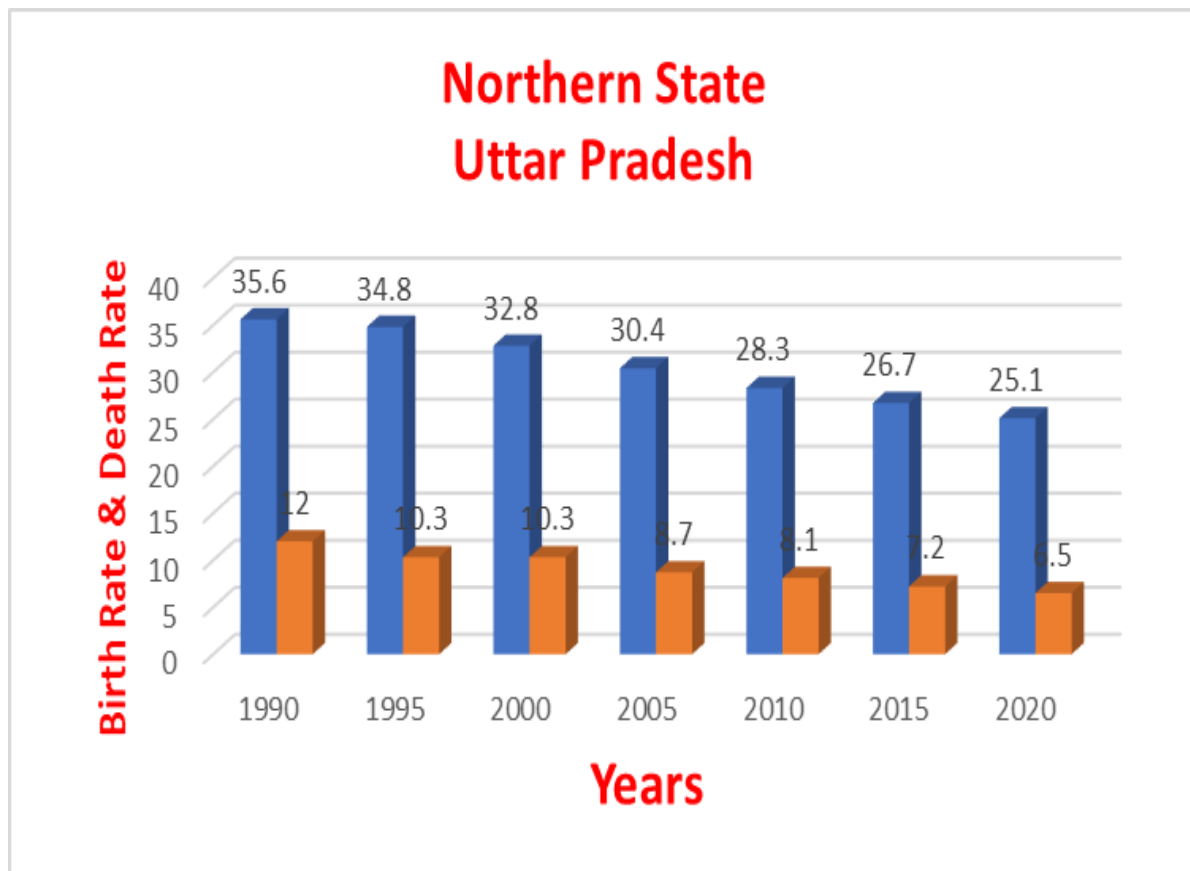


Figure: 4, Source: Author’s Contribution

**ANALYSIS AND INTERPRETATION OF THE BIRTH RATE AND DEATH RATE OF ALL THE FOUR REGIONAL STATES OF INDIA TOGETHER**

According to data Kerala has already reached the advanced stage of demographic transition because in 1990 it had a lower birth rate and death rate among all the four regional states of India. Population of the elderly people reached nearly 20% of the total population in Kerala. Kerala is aging faster than the rest of the states of the country in the demographic transition. The proportion of senior citizens is expected to increase by a larger proportion. On the other hand, Uttar Pradesh seems to be at the starting phase of demographic transition because of the high birth rate and high death rate in 1990. Where is West Bengal and Gujarat are at a better stage of demographic transition in comparison to Uttar Pradesh. In 2020 Kerala had the lowest birth rate and death rate followed by West Bengal then Gujarat and finally Uttar Pradesh. Uttar Pradesh is the most populous state of India and it accounts for 16.4% of the total population natural resources are abundantly available in Uttar Pradesh but there is inefficient utilization of resources and a lack of infrastructure development that leads to more backwardness of the state and people prefer large families in Uttar Pradesh which is the sign of backwardness.

Region	Southern State	Northern State	Eastern State	Western State
Year	Kerala	Uttar Pradesh	West Bengal	Gujarat
1990	1.9	5.2	3.4	3.4
1995	1.8	5	2.8	3.2
2000	1.9	4.7	2.4	2.9

<b>2005</b>	1.7	4.2	2.1	2.8
<b>2010</b>	1.8	3.5	1.8	2.5
<b>2015</b>	1.8	3.1	1.6	2.2
<b>2020</b>	1.5	2.7	1.4	2

Table 5, Source : Author Contribution

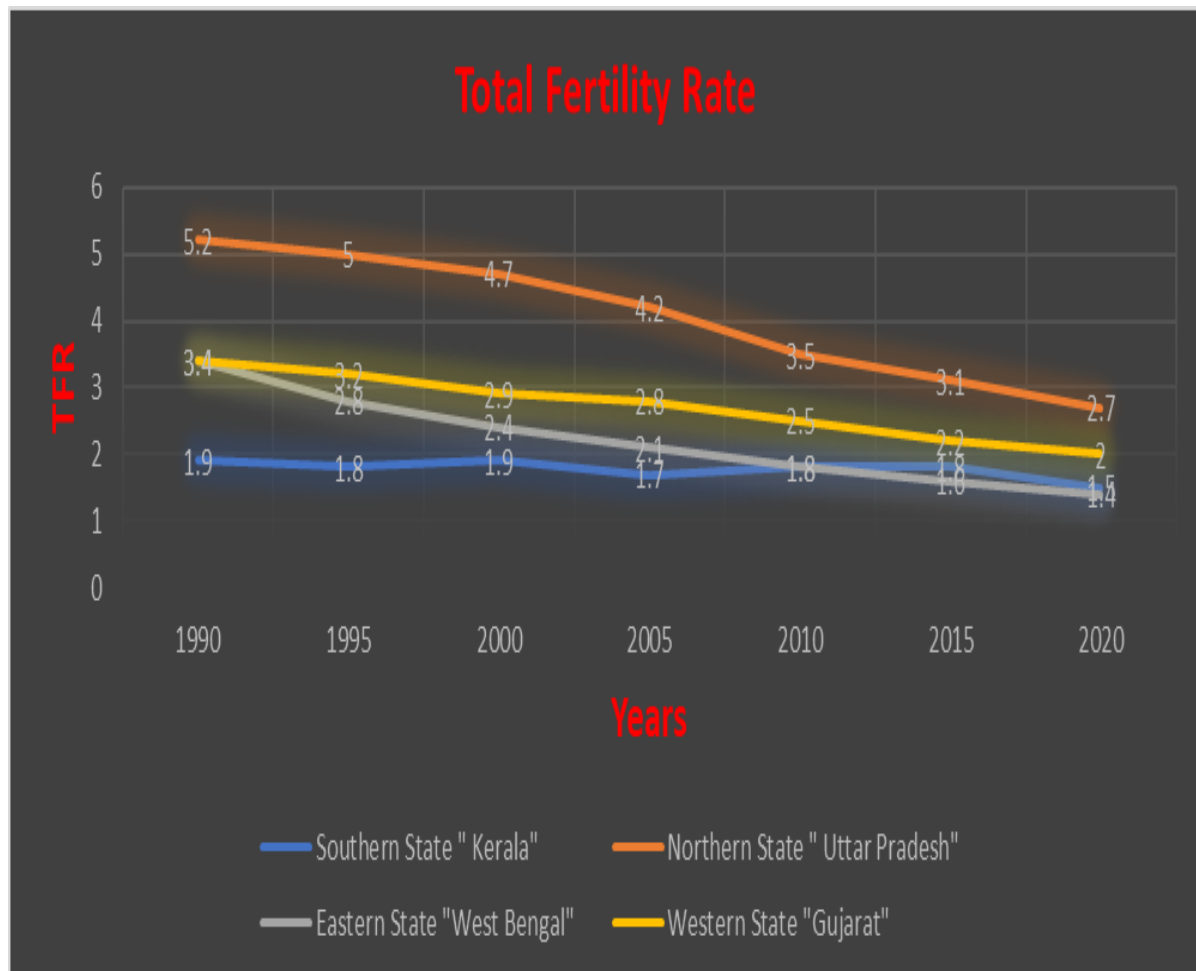


Figure: 5, Source: Author’s Contribution

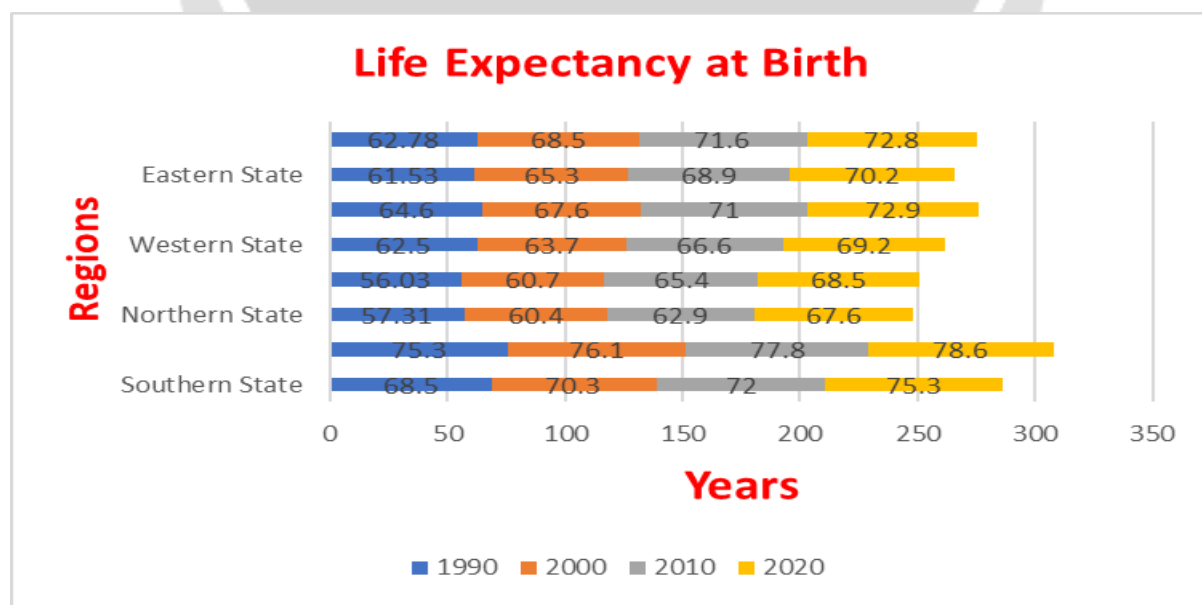
**ANALYSIS AND INTERPRETATION OF TOTAL FERTILITY RATE OF THE FOUR REGIONAL STATES OF INDIA TOGETHER**

The total fertility rate in the year 1990 Uttar Pradesh has the highest total fertility rate value in comparison to all other regional states of India and according to data in 1990 Kerala is again at the advanced stage of total fertility rate and it has lowest among all the four regional states of India. The state had already reached below replacement fertility level in the year 1990 while the rest of the states were experiencing high or mid-level fertility. In 2010 total fertility rates of Kerala and West Bengal are equal and in 2020 total fertility rate of West Bengal is the lowest. According to data, West Bengal is in a better position than Kerala in 2020. On the other hand, Uttar Pradesh had the highest total fertility rate in 1990 among all the regional States of India and that’s why Uttar Pradesh is the most populated state of India. Generally, a high level of fertility is linked to poverty, low maternal education, gender inequality low female labor participation rate. Hence maintaining a low total fertility rate is vital for the state's development. Gujarat's total fertility rate is better than Uttar Pradesh's and slowly and steadily improving and in 2020 it has total fertility rate value is equal to 2.



Table Showing Life Expectancy at Birth								
	Southern State		Northern State		Western State		Eastern State	
	Kerala		U.P.		Gujarat		West Bengal	
Year	Male	Female	Male	Female	Male	Female	Male	Female
1990	68.5	75.3	57.31	56.03	62.5	64.6	61.53	62.78
2000	70.3	76.1	60.4	60.7	63.7	67.6	65.3	68.5
2010	72	77.8	62.9	65.4	66.6	71	68.9	71.6
2020	75.3	78.6	67.6	68.5	69.2	72.9	70.2	72.8

Table 5, Source : Author Contribution



## **ANALYSIS AND INTERPRETATION OF LIFE EXPECTANCY OF THE FOUR REGIONAL STATES OF INDIA TOGETHER**

Life expectancy in the case of males and females both Kerala has performed extremely well in comparison to the rest of the different regional States of India. Female life expectancy in Kerala is greater than male and Life expectancy is the key metric for assessing population health. Broader than the narrow metric of infant and child mortality, Which focuses solely on mortality at a young age, life expectancy captures the mortality along with the entire life course. It tells us the average of deaths in a population. Kerala has the highest life expectancy in India which has increased to 75.3 years for males and 78.6 years for females in 2020 whereas in 1990 it was 68.5 years for males and 75.3 years for females.

On the other hand, Uttar Pradesh has the lowest life expectancy which is 67.6 years for males and 68.5 Years for females in 2020 which shows that still Uttar Pradesh needs More infrastructure development and more advanced high-tech hospitals and doctors to improve life expectancy at birth. Whereas Gujarat and West Bengal had better life expectancy than Uttar Pradesh in 2020, males had 69.2 years and females had 72.9 years. In 1990 Gujarat's life expectancy for males and females was better than West Bengal but in 2020 West Bengal had better life expectancy results than Gujarat.

## **CONCLUSION**

The core idea and conclusions of this research are mostly provided by the analysis of age structure changes and demographic transitions in several Indian regional states. India's social-economic and demographic development differs depending on comparison. Studying the nature and process of age structural shift in India's many regional states is the overall goal of this paper's additional investigation. The birth rate and death rate, life expectancy at birth, total fertility rate, and other SRS indicators were the sources of the data used for this analysis, which were also derived from the Handbook of Statistics. From 1990 to 2020, all of the data presented here was collected. The demographic transition has mostly been studied, analyzed, and compared for all four regional states of India.

The paper's key finding is that, compared to all other Indian regional states, Kerala is at a much-advanced stage of the demographic transition. It has early-stage low birth and death rates and is experiencing an increase in population aging. The two main variables contributing to the aging population are the low overall fertility rate and the high birth weight.

With a high birth and death rate, high overall fertility rate, and low life expectancy at birth, Uttar Pradesh is also analysed as the most backward state in India. This indicates that the state needs to make further improvements in the areas of social awareness, employment, and education. In contrast to West Bengal and Gujarat, which are experiencing a better demographic transition than Uttar Pradesh and are gradually improving in terms of fertility rate, life expectancy, and other indicators, Uttar Pradesh is a densely populated state in India that is also synonymous with backwardness. Most of the state's population is forced to migrate elsewhere for employment.

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