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# A Comparative Study of Educational Levels by Age and Sex in Karnataka, India

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## Abstract

*This paper inspects the educational attainment of Karnataka's population, focusing on age and sex distribution in 2001 and 2011. By analyzing census data, this study identifies trends, disparities, and shifts in educational levels across different age cohorts and between males and females. The analysis reveals significant improvements in literacy rates and educational attainment over the decade, with marked differences across age groups. However, gender disparities persist, particularly in older age groups. The findings underscore the need for targeted educational policies to bridge these gaps and promote inclusive development.*

**Keywords:** Educational attainment; Age-sex distribution; Karnataka; Census data; Gender disparities; Comparative analysis

## 1 Introduction

### 1.1 Background

Education is a critical determinant of socio-economic development, influencing various aspects of life, including employment, health, and social mobility. Understanding the distribution of educational attainment by age and sex is essential for designing effective educational policies. In India, the state of Karnataka has made significant strides in improving literacy and educational outcomes. This study compares the educational levels of the population aged 7 and above in Karnataka based on census data from 2001 and 2011.

### 1.2 Review of Literature

Previous studies have highlighted the progress in educational attainment in

India, with a focus on regional disparities and gender differences<sup>(1,2)</sup>. Karnataka, in particular, has been noted for its educational reforms and increasing literacy rates<sup>(3)</sup>. However, there remains a need for a detailed analysis of how these improvements are distributed across different age groups and between males and females. This study aims to fill this gap by providing a comprehensive analysis of the educational levels in Karnataka.

### 1.3 Study Area

Karnataka is a state in the southwestern region of India, known for its diverse culture, rich history, and significant contributions to the nation's economy. The state has a population of over 60 million, with a literacy rate of 75.36% in 2011.

The educational landscape of Karnataka has been shaped by various state and central government initiatives aimed at improving access to education, particularly in rural and underserved areas<sup>(4,5)</sup>.

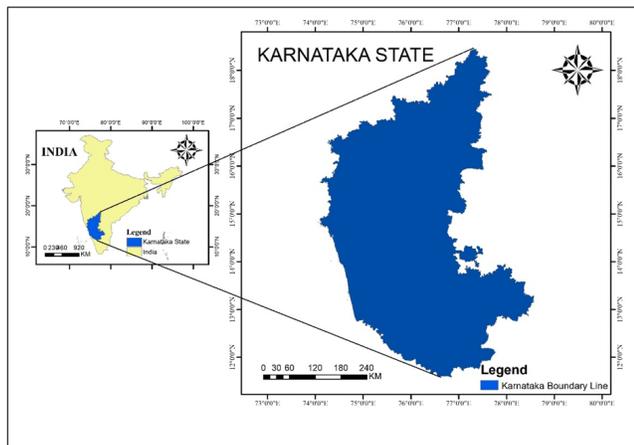


Fig. 1. Location map of Karnataka State, India

### 1.4 Objectives

- To compare the educational attainment of the population aged 7 and above in Karnataka between 2001 and 2011.
- To analyze the distribution of educational attainment by age and sex and identify trends and disparities in educational levels across different age cohorts and between males and females.

### 2 Methodology

The study is based on secondary data obtained from the Census of India for the years 2001 and 2011. The data is categorized by age, sex, and educational attainment levels. The analysis involves:

- **Data Cleaning and Organization:** Ensuring the consistency and accuracy of data for both years.
- **Descriptive Analysis:** Calculating percentages with bar graph to understand the distribution of educational levels by age and sex.
- **Comparative Analysis:** Comparing the 2001 and 2011 data to identify changes in educational attainment. And with the help of ArcGIS software prepared Karnataka Study area map.

### 3 Results and Discussion

The data from 2001 to 2011 reveals a notable increase in the total population across most age groups, with significant growth observed in the 15-19, 20-24, and 25-29 cohorts. This

upward trend indicates a growing and aging population, with the 20-24 age group experiencing the most substantial rise. The decrease in younger age groups, such as 0-4 and 5-9, may reflect a decline in birth rates or shifts in demographic patterns (Table 1).

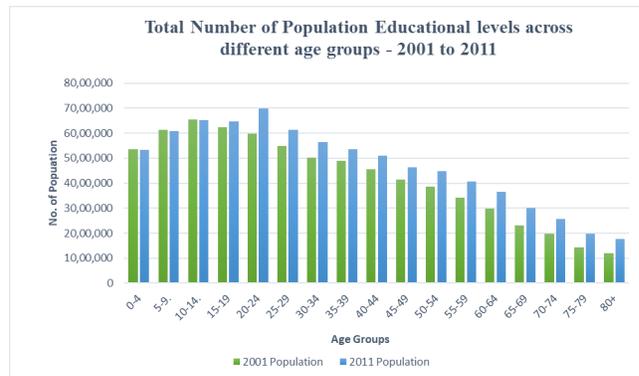


Fig. 2. Total Number of Population Educational levels across different age groups in Karnataka State - 2001 to 2011

In terms of educational attainment, there has been a general improvement across all age groups, as evidenced by the percentage changes. The most remarkable increases are seen in the 80+ age group, with a 47.94% rise in educational levels, followed by the 75-79 (38.06%) and 65-69 (29.87%) age groups. This suggests a significant enhancement in education, particularly among older individuals, likely due to better access to education and improved literacy rates.

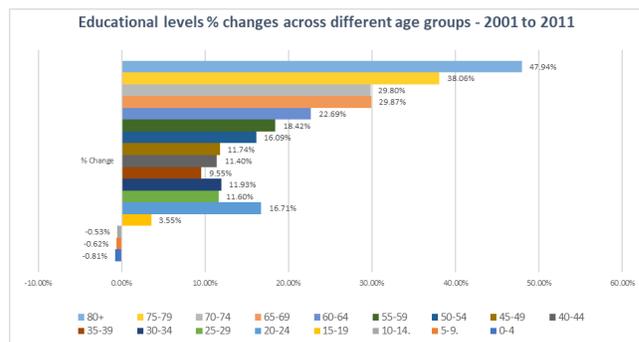


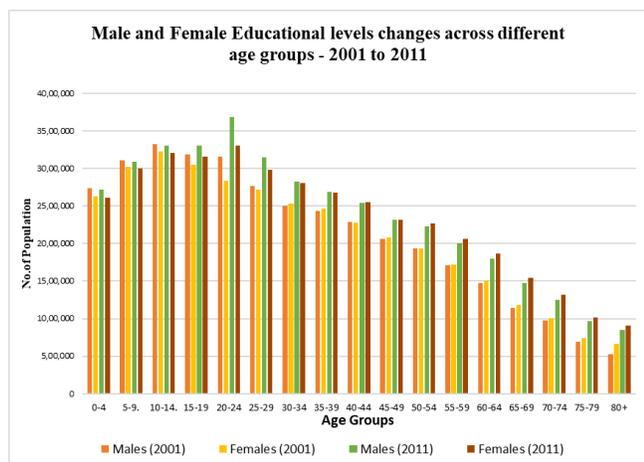
Fig. 3. Educational levels % changes across different age groups in Karnataka State - 2001 to 2011

When analyzing gender-specific changes, both males and females have shown gains in educational levels, with females generally experiencing higher percentage increases in many age groups, especially among the elderly. This trend indicates progress toward closing the gender gap in education. Overall, the data highlights substantial advancements in educational attainment and underscores the success of educational policies aimed at increasing access and equity across all age groups and genders.



**Table 1. Total Number of Male and Female Population across Different Age Groups (2001-2011)**

Sl. No	Age Group	2001 Popula- tion	2011 Popula- tion	% Change	Males (2001)	Females (2001)	Males (2011)	Females (2011)
1	0-4	53,65,123	53,21,654	-0.81%	27,32,654	26,32,469	27,12,054	26,09,600
2	5-9	61,25,478	60,87,320	-0.62%	31,05,567	30,19,911	30,89,654	29,97,666
3	10-14	65,48,225	65,13,884	-0.53%	33,21,456	32,26,769	33,05,687	32,08,197
4	15-19	62,34,987	64,56,320	3.55%	31,87,987	30,47,000	33,01,369	31,54,951
5	20-24	59,87,456	69,87,654	16.71%	31,54,321	28,33,135	36,87,345	33,00,309
6	25-29	54,87,125	61,23,123	11.60%	27,65,432	27,21,693	31,45,768	29,77,355
7	30-34	50,32,178	56,32,147	11.93%	25,01,223	25,30,955	28,24,754	28,07,393
8	35-39	48,97,654	53,65,321	9.55%	24,35,187	24,62,467	26,84,456	26,80,865
9	40-44	45,67,321	50,87,654	11.40%	22,87,654	22,79,667	25,39,876	25,47,778
10	45-49	41,45,678	46,32,189	11.74%	20,65,432	20,80,246	23,12,123	23,20,066
11	50-54	38,65,412	44,87,456	16.09%	19,32,354	19,33,058	22,24,567	22,62,889
12	55-59	34,32,789	40,65,123	18.42%	17,12,432	17,20,357	20,04,187	20,60,936
13	60-64	29,78,456	36,54,789	22.69%	14,76,345	15,02,111	17,92,764	18,62,025
14	65-69	23,21,654	30,14,587	29.87%	11,39,345	11,82,309	14,70,987	15,43,600
15	70-74	19,78,123	25,67,898	29.80%	9,71,345	10,06,778	12,51,309	13,16,589
16	75-79	14,32,789	19,78,456	38.06%	6,93,567	7,39,222	9,63,678	10,14,778
17	80+	11,87,432	17,56,345	47.94%	5,28,123	6,59,309	8,50,876	9,05,469



**Fig. 4. Male and Female Educational levels changes across different age groups in Karnataka State - 2001 to 2011**

### 3.1 Findings

The data reveals significant trends in population and educational attainment across various age groups from 2001 to 2011. Younger age groups, such as those aged 0-4 to 10-14, show a relatively stable or slightly declining population, indicating either a stabilization in birth rates or shifts in demographic patterns. In contrast, there is substantial growth in the youth and young adult demographics, particularly within the 20-24 age group, which saw an increase of 16.71%. This suggests an expansion in the number of individuals transitioning into higher education and the workforce. Middle-aged groups

(25-34) also exhibit notable growth, reflecting an expanding working-age population. The most striking trend is the significant increase in older age groups, especially those aged 65 and above, with the highest growth rates observed in the 75-79 and 80+ age brackets, driven by improved life expectancy and potentially lower birth rates.

In terms of educational attainment, there are substantial improvements across all age groups. The most pronounced increases are seen among young adults, with the 20-24 age group experiencing a 16.71% rise in educational levels. This indicates major advancements in education for this demographic. Similarly, middle-aged adults (25-34) have seen ongoing improvements in educational attainment. Notably, older age groups (35-64) and the elderly (65 and above) also show significant gains in educational levels, with the most considerable increases observed among the elderly, reflecting the long-term effects of improved educational access and historical educational reforms. Gender-based analysis shows that both males and females have experienced increased educational attainment, with some variations in percentage changes, indicating progress towards educational equality. Overall, the data highlights a trend of an aging population coupled with substantial improvements in educational attainment across all age groups.

### 3.2 Recommendations

To address the challenges and opportunities highlighted by the data, several key recommendations emerge. Firstly, it is essential to develop comprehensive policies to support the



growing elderly population, including enhanced healthcare services, improved pension schemes, and age-friendly infrastructure. These measures will help ensure that the increasing number of elderly individuals can maintain a high quality of life. Additionally, promoting social integration programs can help elderly individuals remain active and engaged within their communities. For the youth and young adults, continued investment in educational infrastructure and resources is crucial to sustaining the gains in educational attainment observed over the past decade. Supporting lifelong learning initiatives will also be important for adults and the elderly, enabling them to continually update their skills and knowledge. Addressing regional disparities is another vital aspect; targeted educational programs and resources should be directed towards underserved areas to ensure equitable development across regions. Finally, future research should focus on longitudinal studies to track ongoing trends and gender-specific analyses to address any persistent disparities in education and employment, ensuring that policies are effectively tailored to promote equality and opportunity for all.

## 4 Conclusion

The analysis of population and educational trends from 2001 to 2011 reveals significant insights into the changing demo-

graphic landscape and advancements in educational attainment. The data highlights a notable increase in the elderly population, which underscores the need for comprehensive policies and services to support this growing demographic. Concurrently, improvements in educational levels across all age groups indicate positive strides in educational access and quality. The substantial gains observed, particularly among young adults and the elderly, reflect the successful implementation of educational reforms and increased opportunities over the past decade. Moving forward, it is crucial to address the needs of an aging population, continue enhancing educational opportunities, and ensure that policies are inclusive and equitable across different regions and demographics. By doing so, we can foster a more balanced and prosperous society that supports individuals throughout their entire lifespan.

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