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Gender Disparity in Literacy in North Indian States

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Abstract

This paper analyses trend and variation in gender disparity in the north Indian states of Uttar Pradesh, Rajasthan, Haryana, Punjab, Chandigarh, Himachal Pradesh, Jammu and Kashmir, and Uttarakhand based on the data available from the 1991, 2001, 2011 population censuses and the Periodic Labour Force Survey (PLFS) 2023-2024. Data available from different population censuses indicate a marked decrease in gender disparity in literacy in north India during the period 1991-2011, but PLFS, 2023-24 data reveal that gender disparity in literacy remains quite pervasive in some of the states in this part of the country. The share of females in the population having at least secondary level education is less than that of males in all states and Union Territories, but in some states, females have a higher share than males in the population having up to primary level education. Uttar Pradesh, Uttarakhand, and Rajasthan record the highest gender disparity in literacy rate, where Chandigarh is the lowest and maintains gender parity, but most states still reflect persistent gender gaps.

Introduction

Gender disparity in literacy is an important dimension of gender inequality. It is contingent upon a range of social, cultural, and economic factors. Literacy is globally used to reflect the level of education of the population, and universal literacy is one of the development goals. UNESCO defines literacy rate as the proportion of the population of a given age group that can read and write. Literacy rate is typically measured according to the ability to comprehend a short, simple statement on everyday life, usually encompassing numeracy. According to UNESCO, a high literacy rate indicates the existence of an effective primary education system and/or literacy programmes that have enabled a large proportion of the population to acquire the ability to use the written word and make simple arithmetic calculations in daily life. UNESCO, however, emphasises that literacy should be distinguished from functional literacy, which is more comprehensive than literacy, which is assessed on a continuum in which multiple proficiency levels are determined. Literacy should also be distinguished from educational attainment, which refers to the formal level of schooling completed, although both are crucial indicators of social development and quality of life, influencing economic progress, health, and social participation. Literacy, however, is universally recognised as the fundamental measure of social development.

In India, literacy rate is measured following the definition of a literate person adopted at the population census. Since the 1991 population census, a person aged at least 6 years of age is classified as literate if she or he can read and write with understanding. Following this definition of a literate person, the literacy rate is defined as the proportion of the population aged at least 6 years who can read and write with understanding. The same definition has also been adopted under the Periodic Labour Force Survey (PLFS), that is conducted by the Government of India for the calculation of the literacy rate so that literacy rate obtained from the PLFS can be compared with the literacy rate obtained from the population census.

Gender disparity in literacy, or the difference between female and male literacy rates, is well-known and is a universally used indicator to highlight discrimination against females in the society and the economy. Eliminating gender disparity in literacy through accelerated improvement in female literacy is important, as female literacy is a force multiplier for social development. Illiteracy retards the development of both the individual and the society. However, despite all efforts being made at the level of the government, gender disparity in literacy continues to persist in the Indian society, which has implications for the social and economic development of the country. The Constitution of India gives equal civil rights to both men and women in all aspects of life. However, males still dominate their counterparts in the society, although this dominance is not the same throughout the country (Pathak and Gupta, 2013). In the northern region of the country, the male dominance over females in all aspects of the society and the economy has been found to be particularly strong.

In this paper, we analyse trend and variation in gender disparity in literacy across the states of north India. The available evidence suggests that general disparity in literacy in the northern states of India remains pervasive, and performance in reducing gender disparity in literacy remains poor. In the past, the lack of proper and adequate infrastructural facilities for girls, the lack of vision in designing school curriculum appropriate to the needs of girl children and introducing a uniform pattern of formal structure of education without considering the needs of specific areas or groups were other factors influencing the participation (Ghosh 2007). This article aims to examine the spatio-temporal variation in gender disparity in the literacy rate during the period 1991-2024. The states and Union Territories of India that have been covered in the present study include Jammu and Kashmir, Himachal Pradesh, Haryana, Punjab, Delhi, Chandigarh, Uttarakhand, Uttar Pradesh, and Rajasthan.

The literacy rate in India has improved significantly, from 18.3 per cent in 1951 to more than 74.0 per cent in 2011 (Census of India, 2011). According to the latest PLFS, the literacy rate in India has now crossed the 80 per cent mark. However, the survey reveals that literacy rate varies widely across the states and Union Territories of the country, with Mizoram topping the list with a literacy rate of more than 98 per cent, while Rajasthan has the lowest literacy rate in the country. Among the nine states and Union Territories of India covered in the present analysis, the total literacy rate is estimated to be the highest in Chandigarh, 93 per cent, but the lowest in Rajasthan, 71.4 per cent, according to the PLFS. The gender gap in the literacy rate also varies widely across these nine states and Union Territories.

Data Source and Methodology

The present study is the data from the 1991, 2001, and 2011 population censuses of India and the Periodic Labour Force Survey (PLFS) conducted during 2023-2024. The data available from these sources permits to calculation of literacy rate for males and females separately to analyse the gender disparity in literacy. We have first calculated the average annual change per year in male and female literacy rate during the period 1991-2023 for each of the nine states/Union Territories included in the present analysis. Let L_2 denote the literacy rate in the year t_2 and L_1 denote the literacy rate in the year t_1 ($T_2 > t_1$). Then the annual rate of change in the literacy rate between t_1 and t_2 is calculated as

$$\partial_{2,1} = \frac{(L_2 - L_1)}{L_1 \times (t_2 - t_1)} \times 100$$

The average annual rate of change during the period 1991-2023 is calculated as the weighted sum of the annual rate of change during the period 1991-2001, 2001-2011, and 2011, 2023 where weights are equal to the proportionate length of the three time-segments.

On the other hand, for measuring the gender disparity or inequality in the literacy rate, we have proceeded as follows: let L_m denotes the literacy rate for males and L_f denotes the literacy rates for females. The odds that a male is literate is then defined as

$$O_m = \frac{L_m}{100 - L_m}$$

Similarly, the odds that a female is literate is defined as

$$O_f = \frac{L_f}{100 - L_f}$$

The ratio of the odds that a male is literate and the odds that a female is literate, or the odds ratio, is then calculated as

$$\frac{O_m}{O_f} = \frac{\left(\frac{L_m}{100 - L_m}\right)}{\left(\frac{L_f}{100 - L_f}\right)} = \frac{L_M}{L_f} \times \frac{100 - L_f}{100 - L_m}$$

An index of the gender disparity in the literacy rate may now be calculated as

$$D_s = Log\left(\frac{O_m}{O_f}\right) = Log\left(\frac{L_M}{L_f}\right) + Log\left(\frac{100 - L_f}{100 - L_m}\right)$$

where *Log* is the logarithm to the base 10. This index is the Sopher's index of inequality or disparity (Sopher, 1974). When there is no disparity or when the odds of a male being literate is the same as the odds of a female being literate, the index is equal to zero and the higher the index the higher the gender disparity. The problem of this index, however, is that it fails to satisfy the principle of additive monotonicity which means that if a constant number is added to all observations in a non-negative series, ceteris paribus, the inequality index must decrease. To overcome this limitation, Kundu and Rao (1983) modified it as follows:

$$D = Log\left(\frac{L_m}{L_f}\right) + Log\left(\frac{(200-L_F)}{(200-L_m)}\right)$$

It may be noted that when $L_m > L_f$, $D > 0$, but when $L_m < L_f$, $D < 0$. However, there is no change in the magnitude of the index. Male literacy does not always need to be higher than female literacy, which means that the index D can take both positive and negative values. However, the magnitude of the index remains the same. In the present paper, we have used the index D to measure the gender disparity in literacy rate in the north Indian states and Union Territories of the country.

Finally, the choropleth maps have been constructed to visualise the spatial variation in gender disparity in the literacy rate. A choropleth map is a popular thematic mapping method that represents statistical data through various shading patterns or symbols on predetermined geographic areas, states, and Union Territories in the present case. Collectively, these tools provide an analytical framework to uncover and interpret literacy trends and gender disparity in literacy rates across states and Union Territories.

Findings and Discussions

Trend in male and female literacy rate. Table 1 presents the literacy rate for the total population and for males and females in the nine states/Union Territories for the period 1991-2023-2024. In 1991 literacy rate was the highest in Delhi but the lowest in Rajasthan. In 2023-2024, however, literacy was the highest in the Union Territory of Chandigarh, although it remained the lowest among the nine states/Union Territories in Rajasthan. Chandigarh is the only state/Union Territory among the nine states/Union Territories where the literacy rate was more than 90 per cent according to PLFS 2023-2024. On the other hand, Rajasthan and Uttar Pradesh are the only two states where the literacy rate was less than 75 per cent even in 2023-2024.

In all states and Union Territories, the female literacy rate has always been lower than the male literacy rate. In Chandigarh, Delhi, Haryana and Himachal Pradesh, male literacy was more than 90 per cent in 2023-2024, but there is no state/Union Territory where female literacy was more than 90 per cent. In 2023-204, the male literacy rate ranged from around 83 per cent in Uttar Pradesh and Rajasthan to more than 96 per cent in Chandigarh, whereas female literacy ranged from less than 60 per cent in Rajasthan to almost 90 per cent in Chandigarh. Rajasthan is the only state/Union Territory where the female literacy rate was less than 60 per cent in 2023-2024.

Estimates of literacy for rural and urban areas of the nine states/Union Territories are not available from PLFS, 2023-2024. However, data available from the 2011 population census indicates that female literacy has always been lower than the male literacy rate in all nine states/Union Territories. In the rural areas, the female literacy rate was the lowest in Rajasthan, whereas in the urban areas, it was the lowest in Uttar Pradesh. On the other hand, in both rural and urban areas, the female literacy rate was the highest in Himachal Pradesh. There is, however, no state where the female literacy rate was more than 75 per cent in the rural areas, whereas in three states – Himachal Pradesh, Chandigarh, and Delhi – the female literacy rate was more than 80 per cent at the 2011 population census.

Table 1: Literacy rates in 9 states/Union Territories of north India as estimated from the data available from the population census and Periodic Labour Force Survey.

State/Union Territory		Literacy rate						
		Total			Rural		Urban	
		Total	Male	Female	Male	Female	Male	Female
Chandigarh	1991	77.8	82.5	72.2	72.1	53.1	83.2	73.6
	2001	81.9	86.1	77.5	83.9	58.9	89.9	77.2
	2011	86.0	90.0	81.2	85.8	73.2	90.1	81.4
	2023	93.0	96.3	89.4	Na	Na	Na	Na
Delhi	1991	77.9	84.7	70.9	74.4	48.7	83.2	68.9
	2001	81.7	87.3	75.0	80.3	57.1	89.6	79.9
	2011	86.2	90.9	80.8	89.4	73.1	91.0	80.9
	2023	85.3	90.9	78.7	Na	Na	Na	Na
Haryana	1991	55.9	68.1	42.5	64.6	38.5	78.2	61.3
	2001	67.9	78.5	55.7	74.9	47.2	87.8	75.2
	2011	75.6	84.1	65.9	81.6	60.0	88.6	76.9
	2023	82.4	90.1	74.1	Na	Na	Na	Na
Himachal Pradesh	1991	63.9	75.4	52.1	72.9	47.7	86.9	74.2
	2001	76.5	85.4	67.4	83.3	58.0	91.7	80.1
	2011	82.8	89.5	75.9	89.1	74.6	93.4	88.4
	2023	87.3	93.9	81.1	Na	Na	Na	Na
Jammu & Kashmir	1991	Na	Na	Na	Na	Na	Na	Na
	2001	55.2	66.6	43.0	63.8	35.7	85.2	65.7
	2011	67.2	76.8	56.4	73.8	51.6	83.9	69.0
	2023	79.0	88.0	78.7	Na	Na	Na	Na
Punjab	1991	58.5	65.7	50.4	60.9	44.9	78.0	65.9
	2001	69.7	77.1	60.7	74.6	53.2	86.4	73.4
	2011	75.8	80.4	70.7	76.6	65.7	86.7	79.2
	2023	81.2	85.4	77.0	Na	Na	Na	Na
Rajasthan	1991	38.6	55.0	20.4	49.3	13.4	75.5	44.8
	2001	60.4	75.7	44.3	71.9	38.1	86.6	70.6
	2011	66.1	79.2	52.1	76.2	45.8	87.9	70.7
	2023	71.4	83.3	59.9	Na	Na	Na	Na
Uttar Pradesh	1991	41.6	55.7	25.3	52.4	19.2	73.9	48.6
	2001	56.3	70.2	41.6	66.9	34.2	82.9	60.7
	2011	67.7	77.3	57.2	76.3	53.7	80.4	69.2
	2023	73.9	83.2	64.7	Na	Na	Na	Na
Uttarakhand	1991	57.8	70.1	44.6	67.3	40.5	84.9	66.9
	2001	71.6	83.3	59.6	80.2	50.6	90.9	77.0
	2011	78.8	87.4	70.0	86.6	66.2	89.1	79.3
	2023	81.3	88.6	74.2	Na	Na	Na	Na

Remarks: Literacy rate is calculated as the proportion of the population aged 7 years and above who can read and write with understanding.

Source: Estimated by the authors from the data available from population censuses 1991, 2001 and 2011, and the periodic labour force survey 2023-2024.

Table 2: Gender disparity index (*D*) in states and Union Territories of north India during the period 1991-2024.

State/Union Territory	Year	Gender disparity index (Index *D*)		
		Total	Rural	Urban
Chandigarh	1991	0.095	0.193	0.087
	2001	0.077	0.239	0.113
	2011	0.078	0.114	0.077
	2023	0.060	Na	Na
Delhi	1991	0.126	0.265	0.132
	2001	0.111	0.225	0.086
	2011	0.090	0.147	0.090
	2023	0.109	Na	Na
Haryana	1991	0.281	0.302	0.162
	2001	0.223	0.288	0.114
	2011	0.169	0.206	0.105
	2023	0.144	Na	Na
Himachal Pradesh	1991	0.234	0.263	0.115
	2001	0.166	0.242	0.102
	2011	0.122	0.131	0.044
	2023	0.113	Na	Na
Jammu & Kashmir	1991	Na	Na	Na
	2001	0.261	0.335	0.182
	2011	0.201	0.226	0.137
	2023	0.083	Na	Na
Punjab	1991	0.161	0.179	0.114
	2001	0.158	0.215	0.118
	2011	0.090	0.103	0.067
	2023	0.076	Na	Na
Rajasthan	1991	0.523	0.659	0.322
	2001	0.330	0.378	0.146
	2011	0.270	0.316	0.157
	2023	0.223	Na	Na
Uttar Pradesh	1991	0.426	0.523	0.262
	2001	0.314	0.388	0.210
	2011	0.197	0.225	0.104
	2023	0.173	Na	Na
Uttarakhand	1991	0.275	0.300	0.167
	2001	0.225	0.296	0.125
	2011	0.159	0.189	0.087
	2023	0.130	Na	Na

Remarks: Na - Not available

There was no population census in Jammu and Kashmir in 1991.

Source: Authors' calculations based on data presented in Table 1.

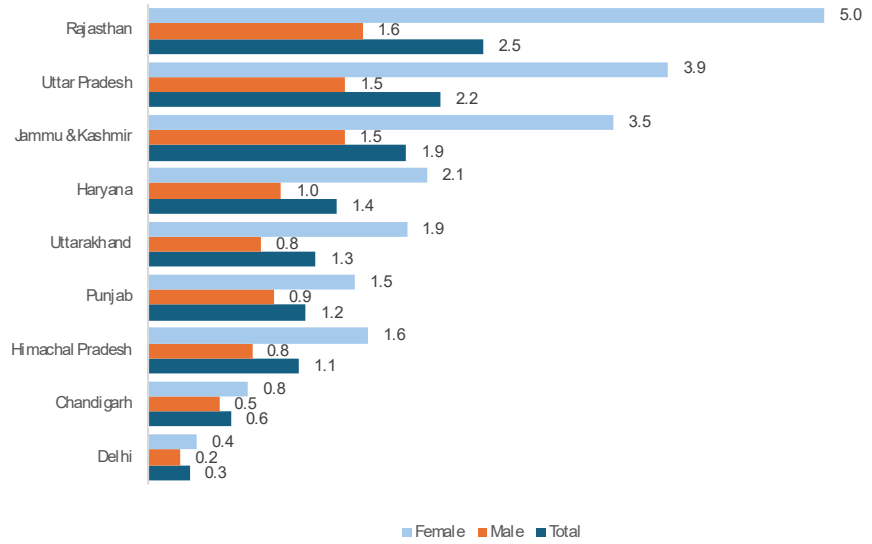

Figure 1: Average annual increase in literacy rate in different states/Union Territories of north India during 1991-2023-2024.
Source: Authors based on data given in Table 1.

Although the female literacy rate has always remained lower than the male literacy rate in all the 9 states/Union Territories, the average annual increase in the female literacy rate has always been faster in female literacy rate as compared to the male literacy rate during the period 1991-2024, as may be seen from Figure 1. In Rajasthan, female literacy rate increased at an average annual rate of around 5 per cent per year during this period, whereas the increase in Delhi has been just around 0.4 per cent per year. Rajasthan had the lowest female literacy rate among the nine states and Union Territories, whereas Delhi had the highest. The increase in female literacy has been associated with the level effects – the lower the female literacy in 1991, the higher the increase in it during the period 1991-2024.

Gender Disparity in Literacy. Table 1 shows an overall summary of the changing positions of North Indian states in gender disparity in literacy rates for three decades. If the gender disparity rate is divided into three stages, high, medium, and low, it can be seen that Rajasthan is consistent in high disparity from 1991 to 2024, and on the other hand, Chandigarh is acquiring the lowest disparity at the same time. Delhi, Himachal Pradesh, and Punjab are developing. Figures 2 through 5 highlight the variation in gender disparity in literacy across north Indian states and union territories. Chandigarh consistently maintained one of the lowest disparities, with an index of 0.09 in 1991, reducing slightly to 0.08 by 2011 and stagnant at the same percentage by 2023-24, demonstrating near gender parity in literacy. Similarly, Delhi shows progressive improvement, with the index *D* decreasing from 0.13 in 1991 to 0.09 in 2011, but recently, in 2024, disparity has increased in literacy rate to 0.11, reflecting its continued focus on equal educational opportunities, but some socio-economic factors are still lagging. Haryana reduced the gender disparity significantly during 1991-2024, marking substantial progress. Himachal Pradesh achieved remarkable

improvements, lowering its disparity from 0.23 in 1991 to just 0.12 in 2011 and 0.11 in 2024. In Jammu and Kashmir, the index *D* decreased from 0.26 in 2001 to 0.20 in 2011 and 0.08 in 2023-24, showing steady improvement despite political challenges. Punjab also demonstrated consistent progress, but gender disparity increased after 2011. In Rajasthan, the index *D* decreased from 0.52 in 1991 to 0.27 in 2011 and 0.22 in 2023-24, whereas Uttarakhand showed consistent improvement, with the index *D* decreasing from 0.28 in 1991 to 0.16 in 2011 and 0.13 in 2023-24. Uttar Pradesh also exhibited considerable progress as the index *D* decreased from 0.43 in 1991 to 0.20 in 2011, and to 0.17 in 2023-24. However, gender disparity in female literacy remains the highest in the state among all north Indian states and Union Territories.

Table 2 also shows that the gender disparity in literacy rates is substantially higher in rural areas compared to urban areas in all nine states and Union Territories. According to the data available from the 2011 population census, among the 9 states/Union Territories, gender disparity in literacy rate was the highest in Rajasthan in both rural and urban areas, whereas it was the lowest in the rural areas of Chandigarh and in the urban areas of Himachal Pradesh. In Chandigarh, Delhi, Haryana, Punjab, and Uttarakhand, the difference between rural and urban gender disparities in literacy rates increased in 2001 relative to the rural-urban difference in gender disparities in literacy in 1991. However, the rural-urban difference in gender disparity in literacy decreased in all states/Union Territories between 2001 and 2011. Overall, results reveal a clear trend of declining gender disparity in literacy across all states/Union Territories. In Himachal Pradesh, gender disparity in literacy in the urban areas is now marginal if the evidence from the 2011 population census is any indication. In the urban areas of Chandigarh, Delhi, Punjab, and Uttarakhand, gender disparity in literacy appears to have reached very low levels. In Rajasthan and Uttar Pradesh, however, gender disparity in literacy remains quite substantial even in the urban areas. In the rural areas of all the nine states/Union Territories, on the other hand, gender disparity in literacy remains quite substantial relative to the gender disparity in literacy in the urban areas.

Table 3: Change in gender disparity in literacy in states and Union Territories.

Disparity	1991	2001	2011	2023-24
High	Haryana Uttarakhand Uttar Pradesh Rajasthan Himachal Pradesh	Jammu & Kashmir Haryana Uttarakhand Uttar Pradesh Rajasthan	Rajasthan	Rajasthan
Medium	Punjab Delhi	Himachal Pradesh Punjab Delhi	Jammu & Kashmir Haryana Uttarakhand Uttar Pradesh Himachal Pradesh	Delhi Uttar Pradesh Himachal Pradesh Uttarakhand Haryana
Low	Chandigarh	Chandigarh	Punjab Delhi Chandigarh	Chandigarh Punjab Jammu & Kashmir

Source: Authors

Figure 2: Gender disparity (Index D) in literacy rate in north India, 1991.
Source: Authors, based on data from Table 2.

Figure 3: Gender disparity in literacy rate (Index D) in north India, 2001.
Source: Authors, based on data from table 2.

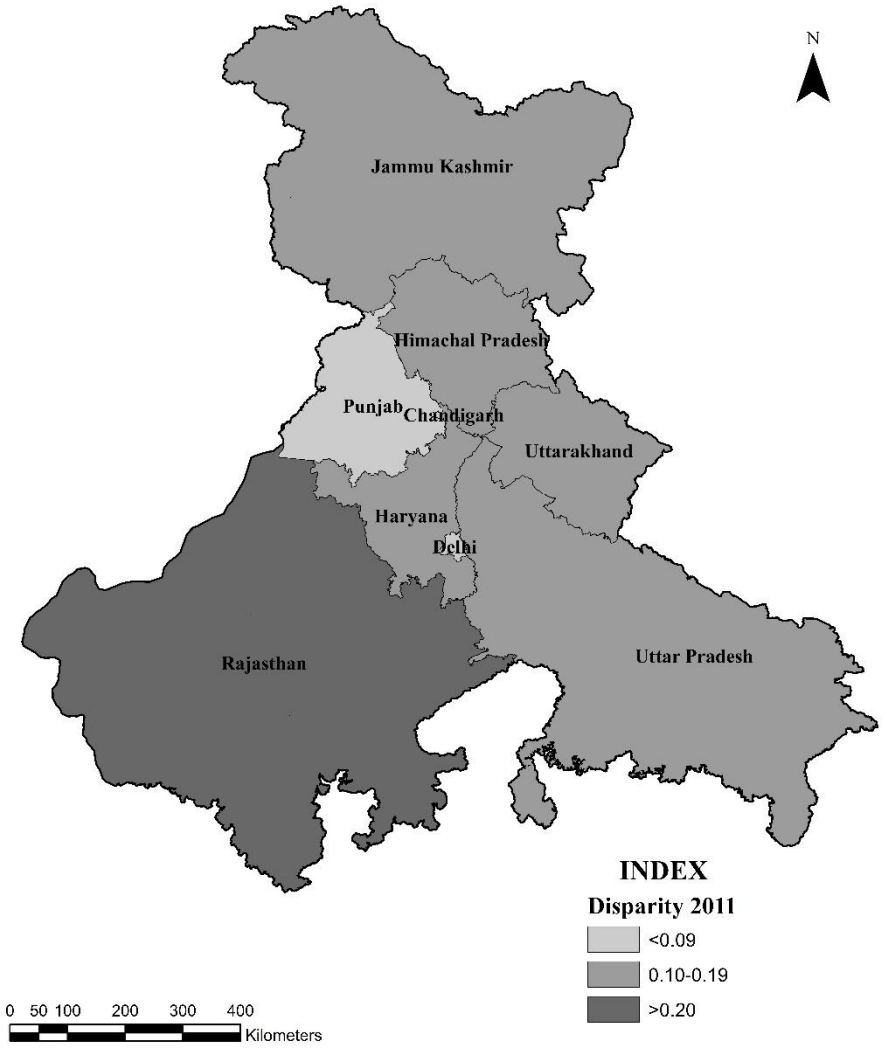

Figure 4: Gender disparity (Index D) in literacy rate in north India, 2011.
Source: Authors, based on data from Table 2.

Figure 5: Gender disparity (Index D) in literacy rate in north India, 2023-2024.
Source: Authors, based on data from Table 2.

Table 3 depicts how gender disparity in literacy has changed from high to low in different states and Union Territories. The gender disparity is classified as high if $D>0.20$; medium if $0.10 \leq D \leq 0.19$, and low if $D<0.09$. The most remarkable decrease in gender disparity in literacy has been observed in Haryana and Uttarakhand, where gender disparity in literacy was high in 1991 and 2001 but decreased to medium in 2023-2024. In Himachal Pradesh, gender disparity in literacy was medium in 2001 and decreased at a slow rate, remaining in the same position in 2023-2024. On the other hand, in Uttar Pradesh and Uttarakhand, gender disparity in literacy appears to have remained high between 1991 to 2001 but decreased in medium from 2011 to 2023-2024. Rajasthan also had high gender disparity in literacy during the 40 years between 1991 and 2011, but there has been a rapid decrease in gender disparity in literacy between 2011 and 2023-2024, but it is still in a high level of disparity in 2023-24. On the other hand, gender disparity in literacy was low in Delhi in 2011, but it appears to have increased between 2011 and 2023-2024.

Table 4: Proportion (per cent) of population aged 7 years and above having different levels of education in north Indian states/Union Territories.

State	Primary			Middle			Secondary and above		
	Person	Male	Female	Person	Male	Female	Person	Male	Female
Chandigarh	10.3	9.9	10.8	10.5	11.9	9.1	72.1	74.6	69.5
Delhi	12.4	12.7	12.1	17.9	18.3	17.3	55.5	59.9	49.3
Haryana	13.8	13.3	14.5	15.5	17.1	13.8	53.1	59.7	45.9
Himachal Pradesh	17.1	15.7	18.5	13.6	15.3	12.0	56.6	63.0	50.6
Jammu & Kashmir	9.6	9.6	12.1	24.9	27.2	17.3	44.4	51.2	49.3
Punjab	15.8	16.2	15.4	15.5	17.2	13.7	50.0	52.0	47.9
Rajasthan	15.8	17.1	14.4	18.5	21.9	15.2	37.2	44.2	30.4
Uttar Pradesh	12.5	12.9	12.1	20.7	23.7	17.8	40.7	46.6	34.7
Uttarakhand	12.5	11.3	13.7	17.8	19.2	16.4	50.9	58.1	44.1

Source: Government of India (2024)

Table 4 presents the level of education of the literate population as revealed through the PLFS 2023-2024. In Rajasthan, only around 37 per cent of the population aged 7 years and above had at least secondary level education, whereas this proportion was more than 72 per cent in Chandigarh. In Jammu and Kashmir and Uttar Pradesh also, less than 50 per cent of the population aged 7 years and above had at least secondary level education, whereas Chandigarh in the only state/Union Territory in north India where more than 70 per cent of the population aged 7 years and above had at least secondary level education. On the other hand, the proportion of the population having up to the primary level education only was the highest in Himachal Pradesh, but the lowest in Jammu and Kashmir, whereas Jammu and Kashmir and Uttar Pradesh are the only two states where at least one-fifth of the population aged 7 years and above had middle-level education according to the PLFS 2023-2024. In Chandigarh, Haryana, Himachal Pradesh, Jammu and Kashmir, and Uttarakhand, the of females aged 7 years and above and having up to primary level education is higher than that in males. The gender disparity index (index *D*) in primary level education, in these states and Union Territories, is, therefore, negative and reflects a higher proportion of females than males aged 7 years and above having up to primary level education (Figure 6). However, there is no state/Union Territory where the proportion of

females aged 7 years and above and having at least secondary level education is higher than the proportion of males aged 7 years and above and having at least secondary level education, so that the gender disparity index (index *D*) is positive in all states and Union Territories.

It may also be seen from Figure 6 that the gender disparity is the highest in the population having at least secondary level education in Delhi, Haryana, Himachal Pradesh, Rajasthan, Uttar Pradesh, and Uttarakhand. However, in Chandigarh, Jammu and Kashmir and Punjab, the gender disparity is higher in the population having middle-level education than in the population having at least secondary-level education.

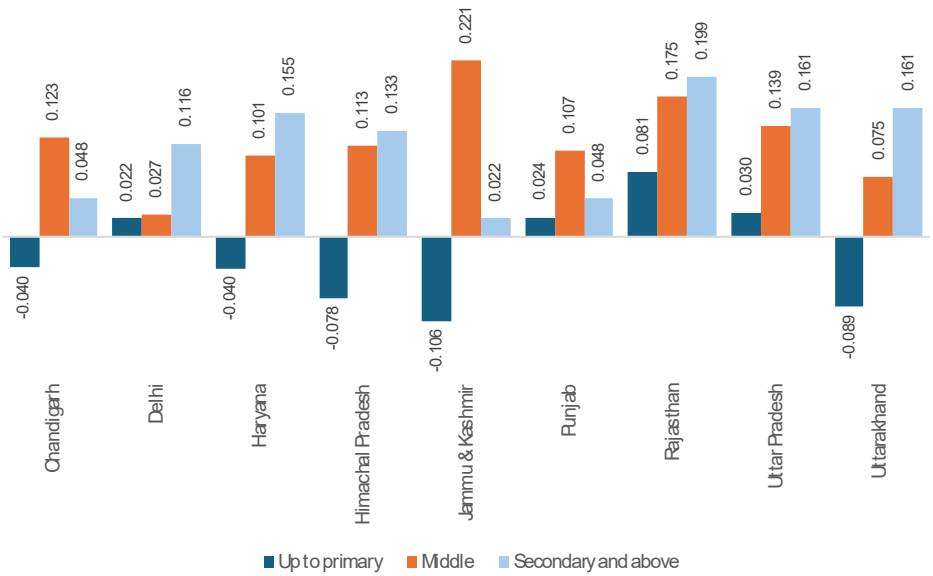

Figure 6: Gender disparity by the level of education in states/Union Territories of north India, 2023-2024.
Source: Authors based on data of Table 4.

Conclusion

In this paper, we have conducted an empirical investigation of the gender disparity in literacy across the states/Union Territories of North India. The level of literacy varies widely across these states and Union Territories, and the male-female difference in literacy may be a reason behind this variation. The analysis reveals that since 1991, the gender gap in literacy has been steadily decreasing in all states and Union Territories of North India. This study shows that Rajasthan, Uttar Pradesh, and Uttarakhand have emerged with the maximum gender disparity in literacy rate between males and females. Meanwhile, Punjab, Chandigarh, and Delhi have the lowest gender disparity in rural areas, and Chandigarh has the lowest disparity in urban areas, indicating that Chandigarh is on track to achieve gender parity, though female illiteracy is still there in 2023-24. The article concludes that there is

an inverse relationship between literacy and gender disparity; when female literacy increases, gender disparity decreases, which means that all state and Union Territories in this part of India are on the way to gaining gender parity, but no state in India has a better female literacy rate than males but female illiteracy always surpasses male illiteracy which clearly defines the lack of opportunity in women education in North India. It also reveals more gender disparity in rural areas than in urban areas. Consequently, there is an urgent need to focus on female literacy in all areas, particularly rural areas, to address the issue of gender disparity.

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