

Education and The Prison

India

Introduction

The Indian Subcontinent comprises of a combined total of thirty-six states and Union Territories. Each of which vary in *geographical size and population*. Furthermore, there is an obvious variation in the number of recorded crimes committed and thereby the number of convicts recorded by the prisons in each state or union territory.

Over the years, several articles have been published regarding the overcrowded jails¹, lack of amenities and increased number of custodial deaths. Nevertheless, this assignment aims to relate the education level of Indian citizens to the number of prisoners and recorded crime across the country.

About the Data Set

The Statistical Branch of National Crime Records Bureau publishes “Prison Statistics India” annually. These reports provide the public with statistical data regarding the prison facilities, the number of convicted people and further details about their religion, caste etc.

For this assignment, I downloaded the Prison data from years 2001 to 2013 ². Over the span of 13 years, one can deduce several insights about the trends, changes and possible development in the number of prisoners. It is for the social welfare, that data analysts visualize these sources and give people their perspective on the best ways to reduce the number of crimes in our country.

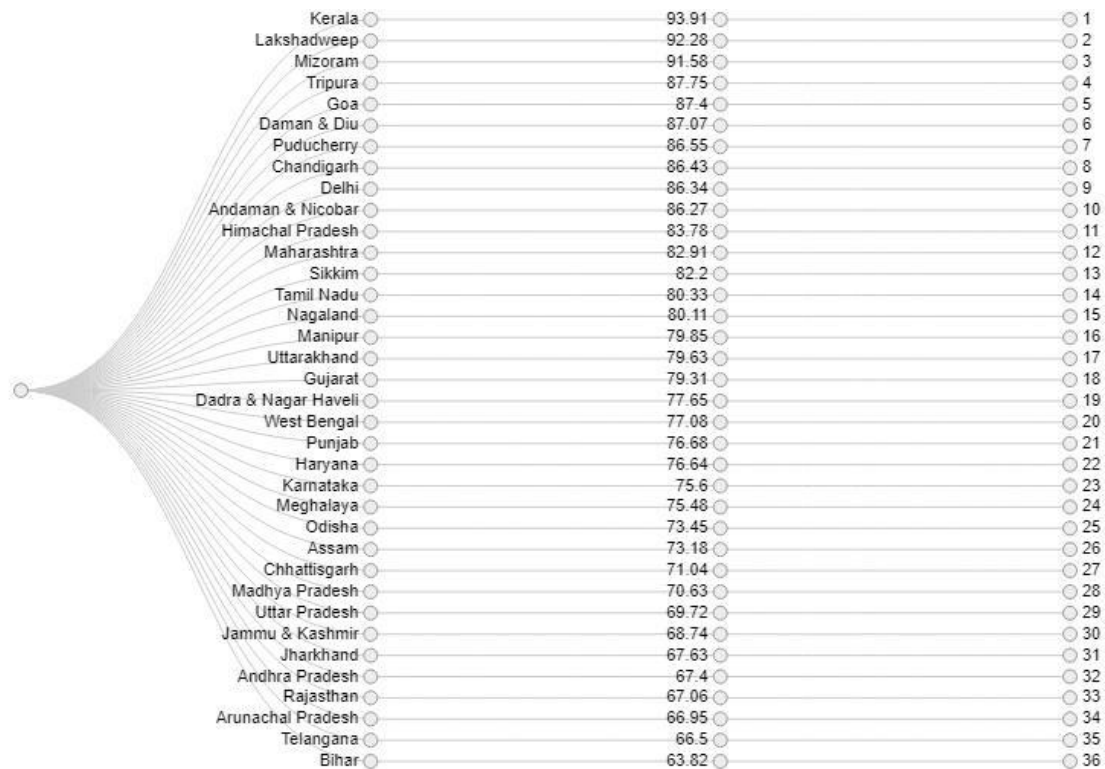
Literacy Rate in India

At the atomic level, literacy is defined as the ability of a person to read and write. Using the data set on Wikipedia³ we rank states according to literacy rates in year 2011, it is imperative to use a Cluster Dendrogram.

As stated at rawgraphs.io, a Cluster Dendrogram is used to represent the distribution of a hierarchal clustering.

“A **dendrogram** is a tree diagram frequently used to illustrate the arrangement of the **clusters** produced by hierarchical **clustering**”

-Wikipedia



While literacy rate in India is currently at an all time high at 74%, for purpose of this assignment we focus on states with lowest literacy rates.

Figure 1: Ranking Literacy Rate across India

Prison Data Analysis

Out of the several statistical reports provided, I have done a detailed analysis of the education data set:

state_name	is_state	year	gender	education	convicts	under_trial	detenues	others
A & N Islands	0	2001	Female	Below Class X	0	0	0	0
A & N Islands	0	2001	Female	Class X and ab	2	1	0	0
A & N Islands	0	2001	Female	Graduate	0	0	0	0

Figure 2 Education data split into several categories

The dataset classifies prisoners into six different categories. In higher level of education:

- Illiterate
- Below Class X
- Class X and above and below Graduate
- Graduate
- Holding technical degree
- Post-graduate

Data Cleaning is imperative in this field. Using R studio, I calculate the total number of prisoners in each category as:

```
v1[[i]]=mydata$convicts[i]+mydata$under_trial[i]+mydata$detenues[i]
      +mydata$others[i]
```

Without loss of generality, we assume each year the number of prisoners is the same. After Creating a new test.csv, the data is visualized using Alluvial diagrams. These are apt to display the correlation between categorical dimensions-

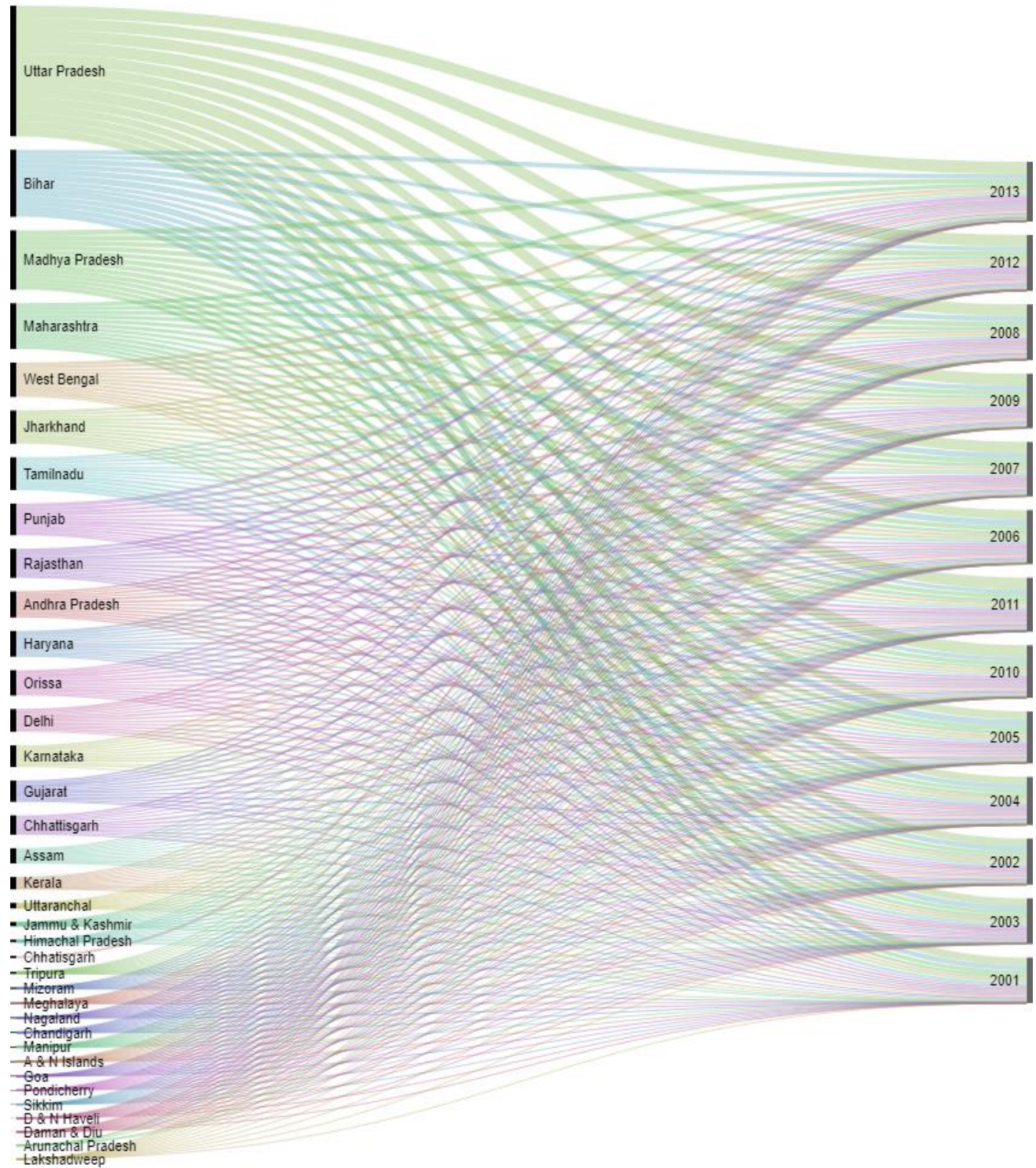


Figure 3 Categorical Dimensions of States over 13 years

Inferences

1. The total number of prisoners are roughly the same over this time span (2001-2013)
2. States with increasing population and size record more number of convicts.
3. The 2011 Census data divides Andhra Pradesh with Telangana.
4. As the literacy rate decreases, the number of convicts recorded increases.

The fourth inference gives us an understanding about our hypothesis-

States	Literacy Rate Ranking	Total Convicts ranking
Uttar Pradesh	29	1
Bihar	36	2
Madhya Pradesh	28	3
Kerala	1	18
Lakshadweep	2	36
Himachal Pradesh	11	21

“The number of prisoners in a state has an inverse relation with the literacy rate of the state. ”

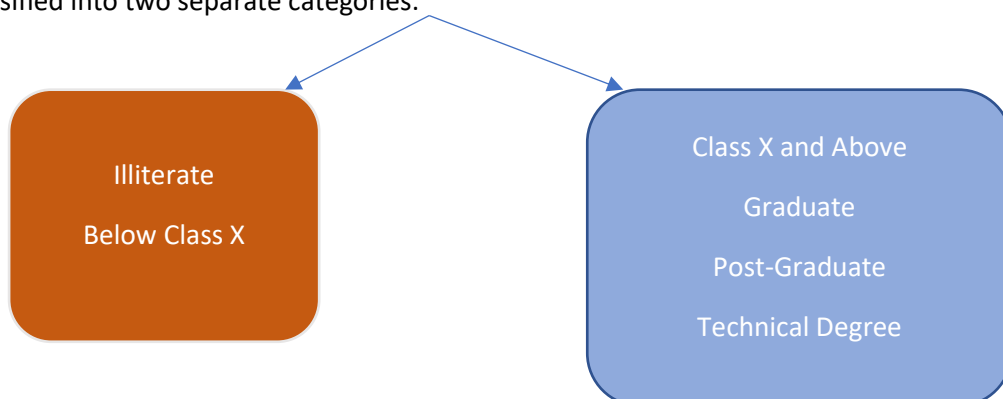
A Stronger Hypothesis

Until now, the reader may have the understanding of literacy rates and its relation with the number of prisoners. As defined before, literacy is the ability to read and write. Education cannot be confused with literacy. It encompasses the process of learning, acquiring knowledge, skills and many other paradigms. Across the Globe, Right to Education is recognized as a human right.

In the next hypothesis, we inquire for a stronger relation between education and the number of prisoners.

Data Analysis

The six categories in the Education data set of Prison Statistics (2001-2013) can be broadly classified into two separate categories:



The first category of prisoners has very low level of education. The Government recognizes education till class X a necessity for driving application, cards etc. As such, these prisoners can be classified together.

Programming R

We now have prison data for 13 years. At the same time, without loss of generality we assume each state has a total number of recorded convicts. Over the span of these 13 years, the total number of prisoners in the respective two categories were:

```
[1] "The number of Convicts who have below class X education:"
[1] 3598997
[1] "The number of Convicts who have above class X education:"
[1] 1083304
```

Figure 4 The two separate categories

Data Visualization

Thus, even though the first category has two classifications, it is 3.22 times the second category. To further conclude our hypothesis, I visualized data on Tableau:

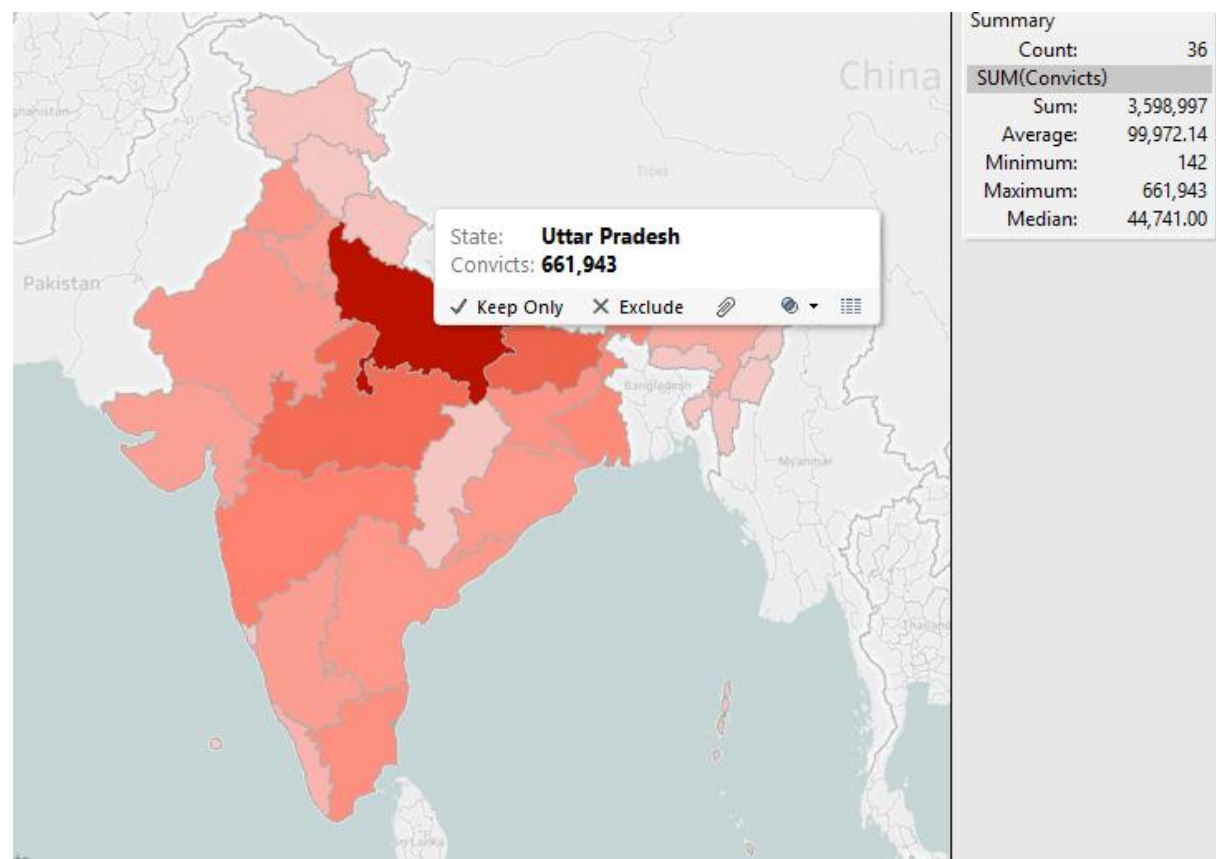


Figure 5 Uttar Pradesh: Highest number of uneducated prisoners

The Hypothesis

"Rise in education level decreases the number of prisoners thereby reducing the recorded crimes"

As explained above, the number of uneducated prisoners is 3.22 times the number of educated prisoners. The states and union territories that have high number of uneducated prisoners lead the ranking for **total number of recorded crime**. One can see this by comparing figures 3 and 6.

The rest of the Prison data set highlights the education level, facilities, religion etc. Religion, caste may play a major role in determining the total number of recorded crimes in a country. Since India is a diverse country, education proves to be the unifying factor for reducing the number of prisoners. A reduce in recorded crime increases social welfare of the society.

Uttar Pradesh	661943
Bihar	370535
Madhya Pradesh	327454
Maharashtra	232965
West Bengal	201446
Tamilnadu	181457
Jharkhand	169454
Punjab	154299
Rajasthan	144681
Orissa	144098
Andhra Pradesh	142072
Karnataka	125452
Haryana	124727
Gujarat	119425
Delhi	114806
Chhattisgarh	107091
Assam	84728
Kerala	63491
Uttaranchal	25991
Jammu & Kashmir	20565
Chhattisgarh	12783
Tripura	12416
Himachal Pradesh	11527
Mizoram	8924
Meghalaya	6928
Manipur	5259
A & N Islands	4771
Nagaland	4740
Goa	4437
Chandigarh	3923
Pondicherry	2767
Sikkim	2285
D & N Haveli	696
Daman & Diu	464
Arunachal Pradesh	255
Lakshadweep	142

Figure 6 Ranking states wrt no. of uneducated prisoners

Bibliography

1. <https://www.thenewsminute.com/article/indian-jails-are-massively-overcrowded-some-them-500-cent-66732>
2. <https://www.kaggle.com/rajanand/prison-in-india>
3. https://en.wikipedia.org/wiki/List_of_Indian_states_and_union_territories_by_literacy_rate
4. <https://en.wikipedia.org/wiki/Dendrogram>