A report based on India's Multidimensional Poverty Index based on 2015-16 MPI survey results

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Subject: Visualization

Abstract:

The report aims to compare the Multidimensional Poverty levels across various states in India and analyse various social indicators to understand the level of deprivation and causes of poverty in each state.

Introduction

Over the last four decades,many techniques, procedures, theories and indices in Welfare Economics to understand,measure,analyze and compare the concepts of overall development and inequalities,poverty etc.The Multidimensional Poverty Index is basically a deprivation index, where we try to find people are deprived from some basic rights.MPI as a whole takes into account both the proportion of poor and intensity of poverty.HCR is the headcount ratio, which represents the proportion of poor in the society and "IPP" is the total deprivation in the region divided by the total number of poor in the region.After that I showed the percentage of people who are poor and deprived in Health,Education and Living Standards across various states.I tried to show that through indicators like Child Mortality Rate and Nutrition of Health Dimension,Years of Schooling and School Attendance of Education Dimension and finally cooking fuel,sanitation,drinking water,electricity, housing and assets of Living Standard dimension.Lastly how the percentage different dimensions like Health,Education and Living Standards contribute to the level of multidimensional poverty.It will be described in the pie-chart format.

About the Dataset:

I have collected the data from the Oxford Poverty and Human Development Index based on Sub-national Results MPI 2021 based on 2015-16 survey results.It contains files with data of all states levels in India,related to the MPI of the regions, Censored Headcount Region and Contributions of the regions to the poverty.

The Variables used in the Project:

MPI=Multidimensional Poverty Index

HCR=Headcount Ratio

IPP=Total Deprivation in the region divided by the total number of poor

CMR=Child Mortality Rate

NRT=Nutrition

YS=Years Of Schooling

ATR=Attendance Of Education

CF=Cooking fuel

SNT=Sanitation

DW=Drinking Water

ELC=Electricty

HS=Housing

AS=Assets

HTH=Health

EDU=Education

Living Standard= LVS

Analysis:

1. The MPI scores across all states of India.

2. The Headcount Ratio showing the percentage of population in Multidimensional Poverty across all states in India.

3. The Intensity of Deprivation among the Poor across all States in India.

4. The scenario of different dimensions like Health, Edcation and Living Standard of each state.

```
## Warning: package 'tidyverse' was built under R version 4.2.2
```

```
## ── Attaching packages ─────────────────────────────────────── tidyverse 1.3.2 ──
## ✓ ggplot2 3.3.6      ✓ purrr   0.3.5
## ✓ tibble  3.1.8      ✓ dplyr   1.0.10
## ✓ tidyr   1.2.1      ✓ stringr 1.4.1
## ✓ readr   2.1.3      ✓ forcats 0.5.2
```

```
## Warning: package 'ggplot2' was built under R version 4.2.2
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## Warning: package 'tidyr' was built under R version 4.2.2
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## Warning: package 'readr' was built under R version 4.2.2
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## Warning: package 'purrr' was built under R version 4.2.2
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## Warning: package 'forcats' was built under R version 4.2.2
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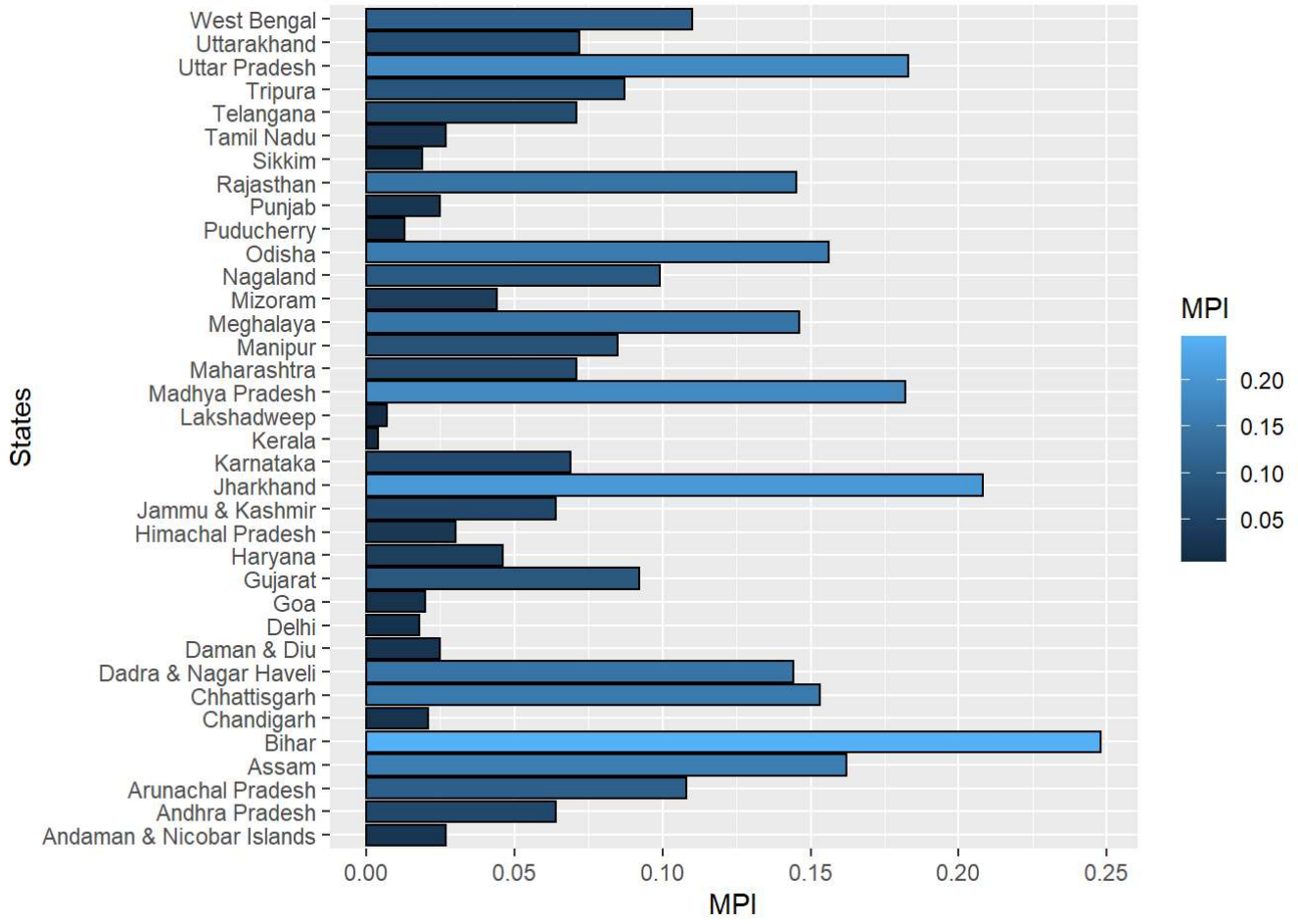
```
## ── Conflicts ─────────────────────────────────────── tidyverse_conflicts() ──
## ✖ dplyr::filter() masks stats::filter()
## ✖ dplyr::lag()    masks stats::lag()
```

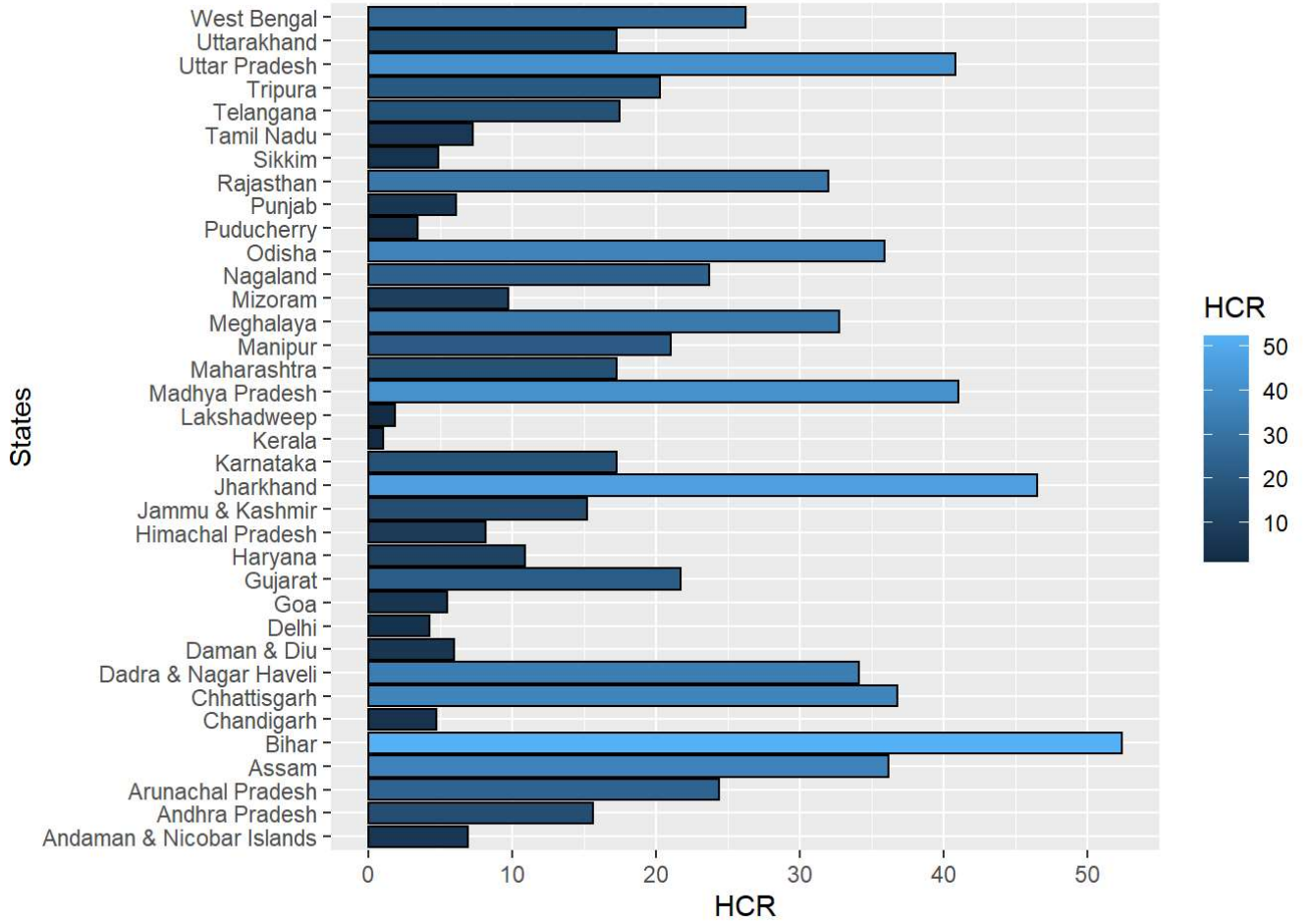
```
## Warning: package 'ggplot2' is in use and will not be installed
```

Multidimensional Poverty Index across all States

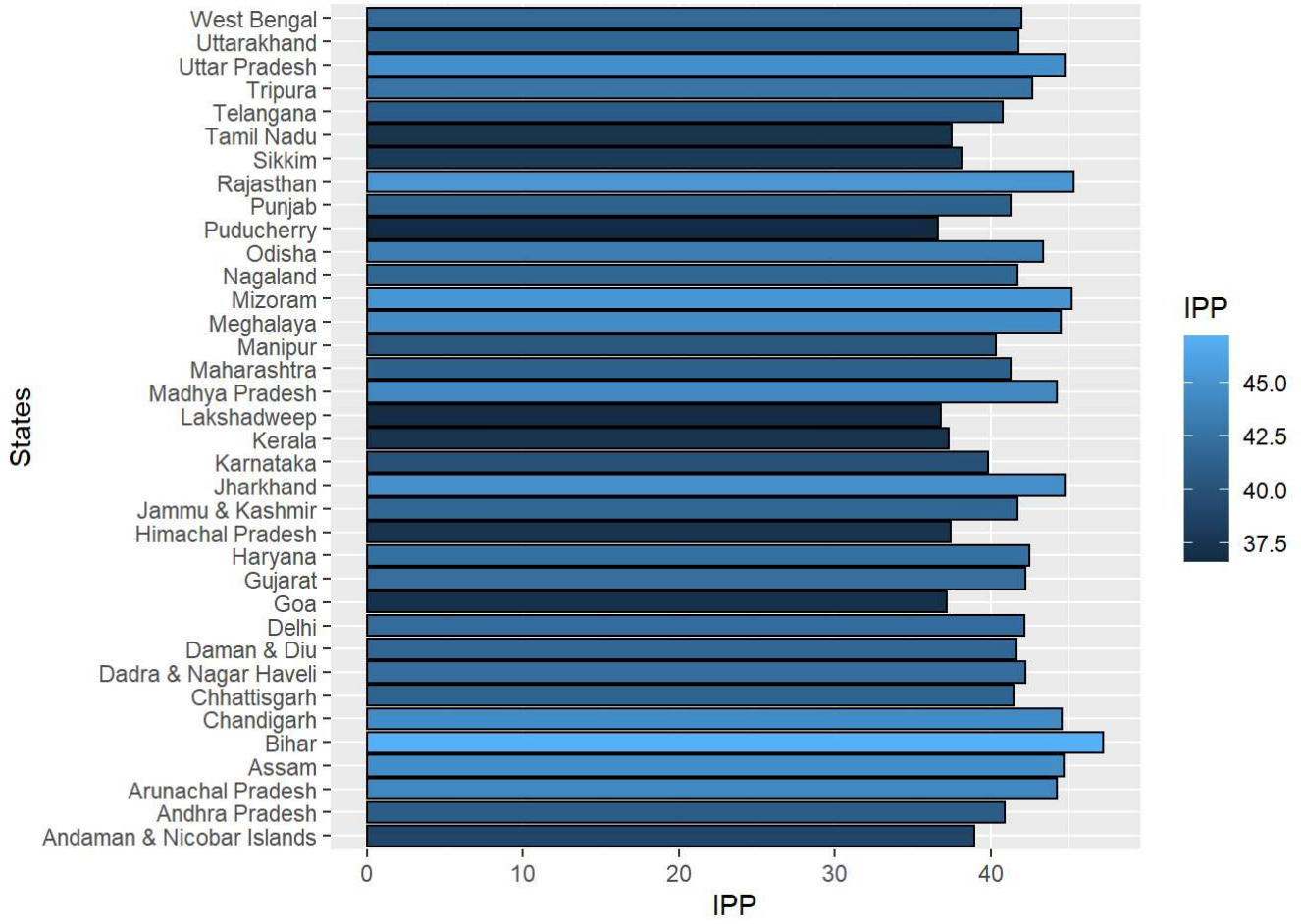
```
## NULL
```



Headcount Ratio:Percentage of Population in Multidimenisonal Poverty across all states



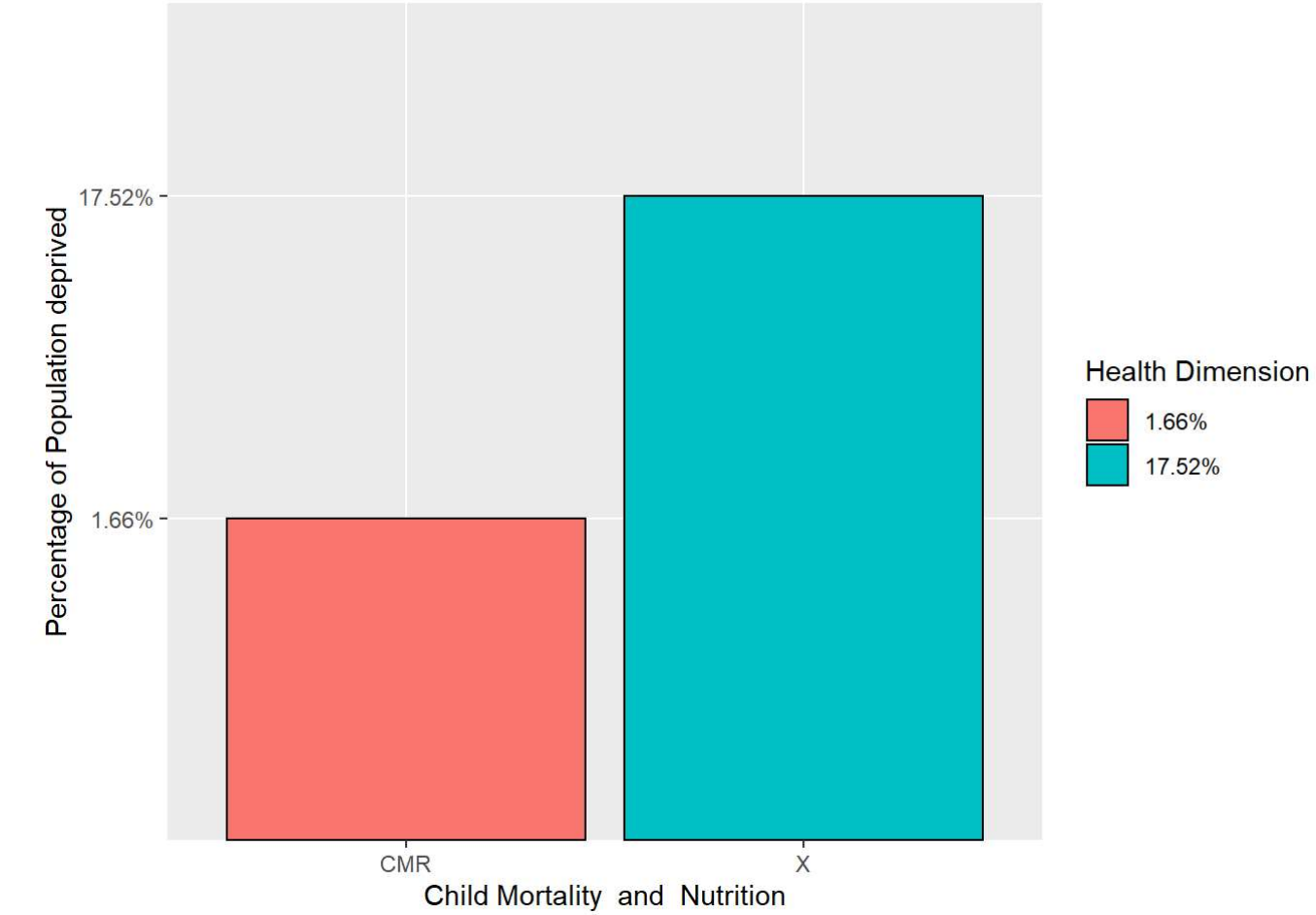
Intensity of deprivation of poverty among poor across all states


West Bengal
Uttarakhand
Uttar Pradesh
Tripura
Telangana
Tamil Nadu
Sikkim
Rajasthan
Punjab
Puducherry
Odisha
Nagaland
Mizoram
Meghalaya
Manipur
Maharashtra
Madhya Pradesh
Lakshadweep
Kerala
Karnataka
Jharkhand
Jammu & Kashmir
Himachal Pradesh
Haryana
Gujarat
Goa
Delhi
Daman & Diu
Dadra & Nagar Haveli
Chhattisgarh
Chandigarh
Bihar
Assam
Arunachal Pradesh
Andhra Pradesh
Andaman & Nicobar Islands
States
0
10
20
30
40
IPP
IPP
45.0
42.5
40.0
37.5

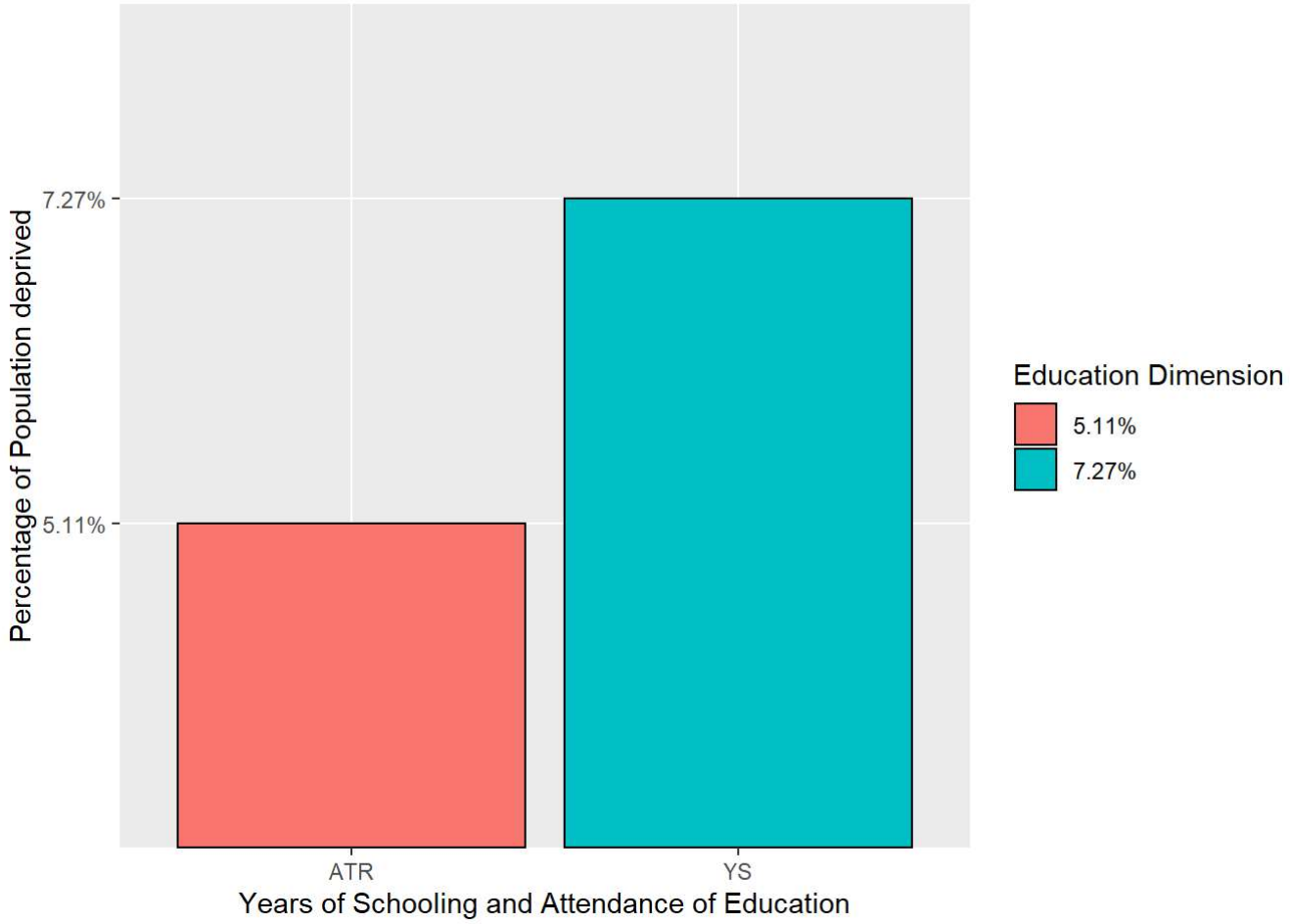
```
##                                1              2                3     4     5
## States Andaman & Nicobar Islands Andhra Pradesh Arunachal Pradesh Assam Bihar
## X                           4.81          10.41            12.74 27.38 40.94
## CMR                         0.46           1.17             1.44  2.54  4.26
## YS                          2.75           9.56            14.19 15.04 25.39
## ATR                         0.23           1.64             5.97  5.89 11.93
## CF                          5.36          12.87             22.3 35.32 51.18
## SNT                         5.43          13.71            17.19 28.05 48.68
## DW                          1.84           5.75             6.85   9.5  1.69
## ELC                         2.04           0.62             7.63 15.72 29.01
## HS                          5.96            7.4            23.42 35.19 48.88
## AS                          3.03           6.31             13.7 14.72 18.79
##                 6             7                    8           9    10   11
## States Chandigarh Chhattisgarh Dadra & Nagar Haveli Daman & Diu Delhi  Goa
## X            4.09        28.42                30.27        4.38  3.35 4.59
## CMR          0.52         2.86                 1.65        0.51  1.05  0.4
## YS           2.84        12.45                 7.22        3.24  2.56 2.31
## ATR          1.46         4.72                 6.76        3.21  1.17 0.62
## CF           2.84        35.99                30.47         1.2  0.58 3.79
## SNT          4.05        34.06                32.81        4.12  3.03 4.16
## DW           0.71        10.97                11.21        1.17  1.39 0.47
## ELC          0.48         2.94                 2.12           0  0.07    0
## HS           2.25        34.17                32.52        1.07  1.35 3.35
## AS           1.19         11.1                12.79        3.06  1.63 1.23
##             12      13               14              15        16        17
## States Gujarat Haryana Himachal Pradesh Jammu & Kashmir Jharkhand Karnataka
## X       17.52%    8.75             6.57           11.36     36.61     12.65
## CMR      1.66%    1.45             0.82            1.28      3.08      1.06
## YS       7.27%    4.84             2.12            4.93     17.57      6.53
## ATR      5.11%    2.87             0.44            2.62       7.6       2.6
## CF      20.22%    9.17             7.61           13.63     45.74     15.52
## SNT     18.55%    6.64             6.16           13.24     44.14     15.07
## DW       5.56%     3.2             1.52            5.83     18.92      4.45
## ELC      2.99%    0.78             0.26            1.85     14.24      1.11
## HS      14.20%    7.39             6.33           11.77     40.85     13.28
## AS       9.04%    2.69                3            7.58     16.36      5.72
##            18          19             20          21      22        23      24
## States Kerala Lakshadweep Madhya Pradesh Maharashtra Manipur Meghalaya Mizoram
## X        0.79        1.84          31.37       13.77   15.77     22.58    5.59
## CMR      0.03        0.88           3.22        1.02    1.41      2.47    0.92
## YS       0.31           0          14.91         4.9     4.9     17.53    5.75
## ATR      0.22        0.64           7.79        3.12    1.97       5.5    2.38
## CF       0.94        0.94          39.46       15.02   18.57     32.07    8.67
## SNT      0.35        0.13          38.12        14.8   13.92     19.72    6.01
## DW       0.35        0.57          18.91        6.33   16.44     15.18    2.95
## ELC      0.28           0           6.97        3.59    3.77      6.67    3.03
## HS       0.68        0.32          37.37       12.41   20.47     24.63    7.78
## AS       0.56        0.13          14.38        7.63    7.23     19.89    7.03
##             25     26         27     28        29     30         31        32
## States Nagaland Odisha Puducherry Punjab Rajasthan Sikkim Tamil Nadu Telangana
## X         15.09   26.8       2.63   4.27     23.68   3.13       5.08     11.67
## CMR        1.56    1.9       0.34   0.66      2.43   0.36       0.56      1.07
## YS        11.79  15.12       1.21   3.84     14.61   3.25       3.09     10.46
## ATR        3.72   4.57       0.09   1.58      7.58   0.36       0.52      1.29
## CF        22.85  35.39       2.66   4.76     30.32    3.9       5.96     13.91
```

```
## SNT        8.92  33.64       3.13   3.69     27.71   1.39       6.87      15.7
## DW          7.2  11.11       0.29   0.48     14.61   0.42       1.66      6.01
## ELC         2.41   9.45       0.11   0.26      7.12   0.14       0.51      0.92
## HS         22.94  31.16       2.83   4.17     21.41   3.36       4.76     10.98
## AS         17.23  14.13       0.76    0.8     14.54   2.87       1.83      7.51
##               33             34             35             36
## States Tripura Uttar Pradesh Uttarakhand West Bengal
## X         13.91         31.37       13.41       18.81
## CMR           1          4.37        1.84        1.18
## YS         9.31         16.02        7.16       13.07
## ATR        1.75         10.66        3.27        3.13
## CF        19.01         37.74       15.67       25.59
## SNT       14.23         35.71       12.39       22.09
## DW         8.61           2.5        3.36        4.84
## ELC        5.01          19.1        1.53        3.99
## HS        19.75         37.21        12.9       23.66
## AS        11.38          9.19        6.88        9.58
```

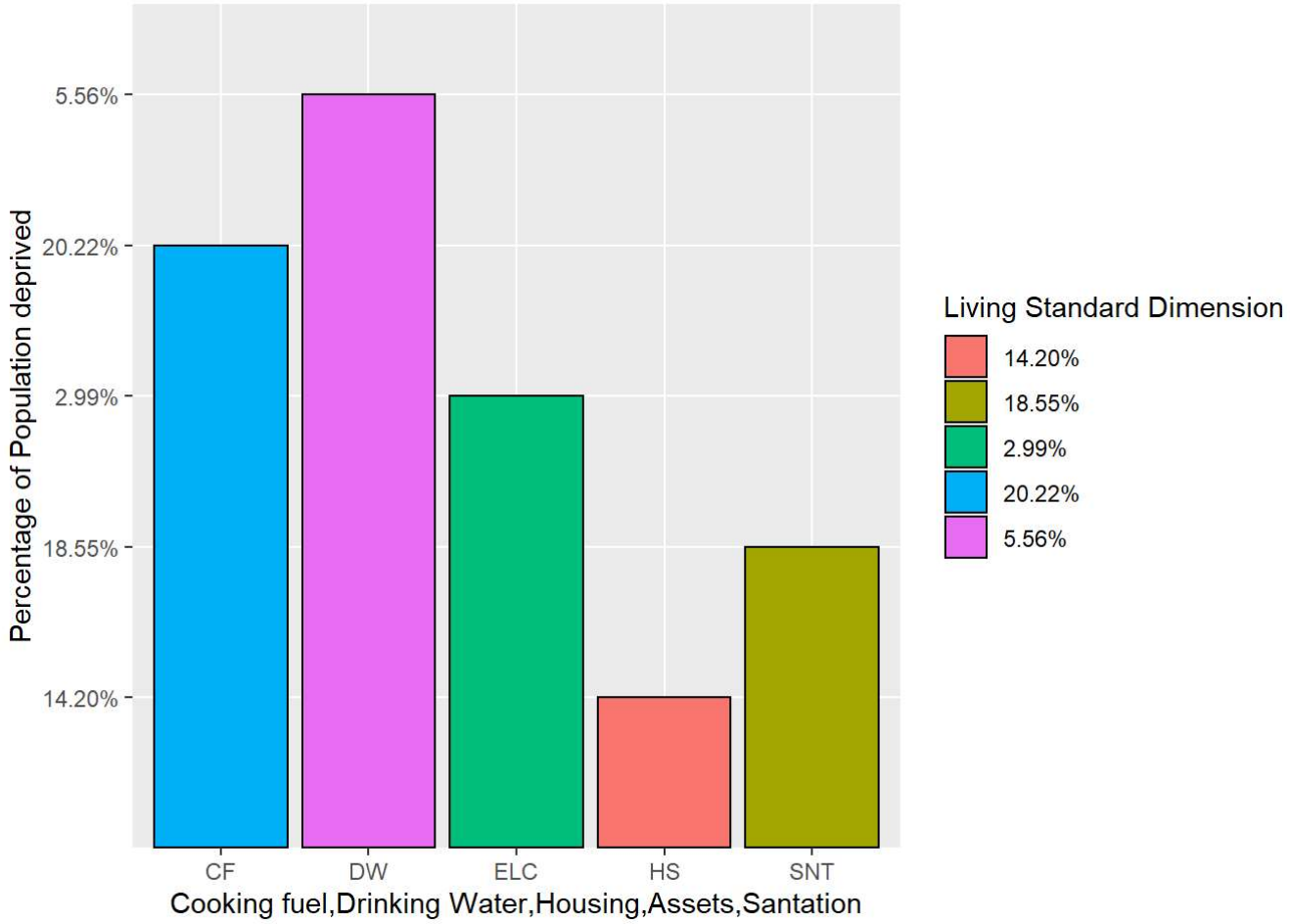
Percentage of people deprived in Health Dimension:Child Mortality and Nutrition



Percentage of people deprived in Education Dimension:Years Of Schooling and Attendance of Education



Percentage of people deprived in Living Standard Dimension:Cooking fuel,Drinking Water,Housing,Assets,Santation

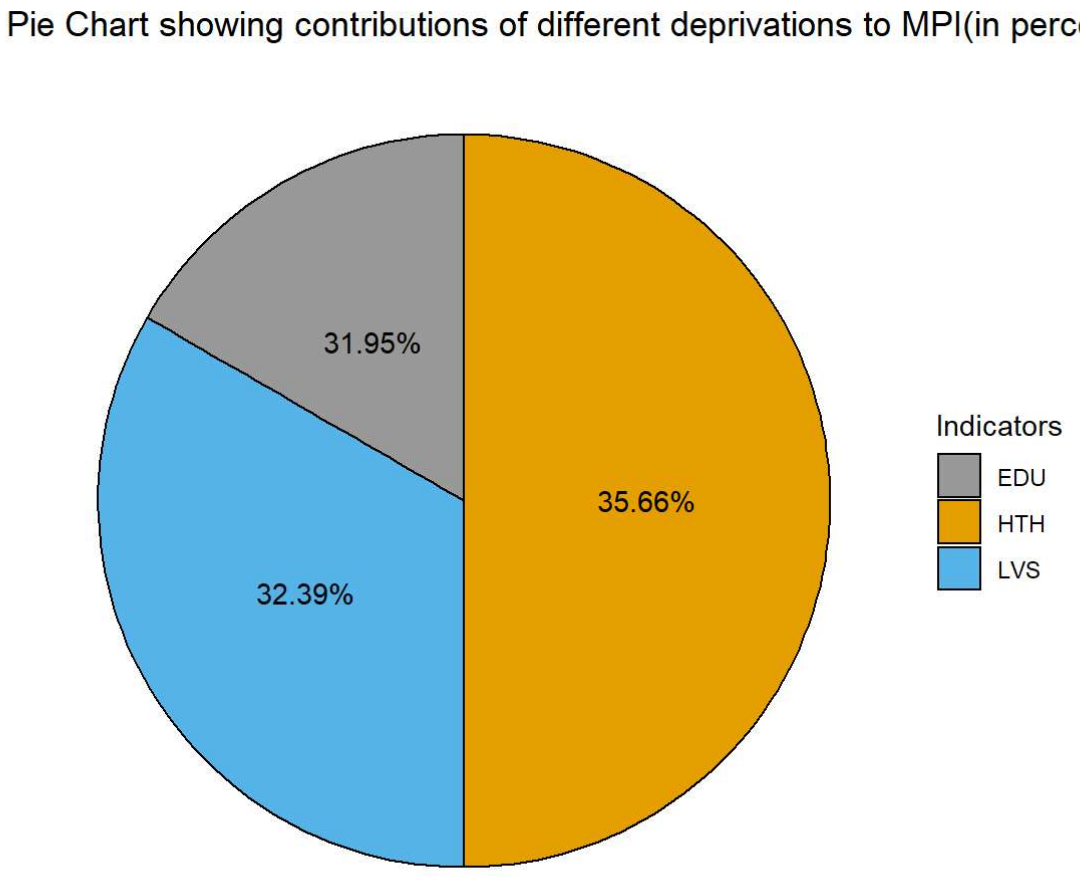


Piechart showing the Contributions of Education,Health and Living Standards deprivations to the Multidimensional Poverty

```
## 'data.frame':    1 obs. of  3 variables:
##  $ HTH: chr "24.71"
##  $ EDU: chr "21.85"
##  $ LVS: chr "53.44"
```

```
##       HTH   EDU   LVS
## 502 24.71 21.85 53.44
```

```
##  [1] "Andaman & Nicobar Islands" "Andhra Pradesh"
##  [3] "Arunachal Pradesh"         "Assam"
##  [5] "Bihar"                     "Chandigarh"
##  [7] "Chhattisgarh"              "Dadra & Nagar Haveli"
##  [9] "Daman & Diu"               "Delhi"
## [11] "Goa"                       "Gujarat"
## [13] "Haryana"                   "Himachal Pradesh"
## [15] "Jammu & Kashmir"           "Jharkhand"
## [17] "Karnataka"                 "Kerala"
## [19] "Lakshadweep"               "Madhya Pradesh"
## [21] "Maharashtra"               "Manipur"
## [23] "Meghalaya"                 "Mizoram"
## [25] "Nagaland"                  "Odisha"
## [27] "Puducherry"                "Punjab"
## [29] "Rajasthan"                 "Sikkim"
## [31] "Tamil Nadu"                "Telangana"
## [33] "Tripura"                   "Uttar Pradesh"
## [35] "Uttarakhand"               "West Bengal"
```



Summary of Analysis

I have used the Multidimensional Poverty Index to capture the level of deprivations faced by the population below the poverty line in a particular region.It is an important measure since it helps to assess the factors that region is deprived in.I have compared the MPI scores across different states to get a clear picture of the most deprived regions in India.After that, I showed the percentage of people deprived in each of the dimensions of Health,Education and Living standards.The results are crucial for ascertaining the part of the population that

needs more impetus to foster growth and development.Lastly, I showed the percentage of contributions of various indicators to the Multidimensional Poverty Index.This will help us to know which of the indicators are causing the deprivations in the regions so that they can be improved and reduce the level of poverty.

Conclusion

Poverty remains as a major problem in almost all the countries across the world.Due to existence of poverty,people get deprived of their basic needs and their sufferings are endless.So Poverty Eradication is an important aspect for development and growth of the nations across the world.The first step of poverty eradication is measuring the poverty levels across various states and countries. Health,Education and Living Standards are the main areas where poor people mostly get deprived of.The measurement can be done by checking the deprivation of which areas lead to higher poverty levels and the percentage of people who are deprived in.The results can be used to improve those relevant areas so that it can help to uplift people out of poverty and deprivation.