



SOC 476

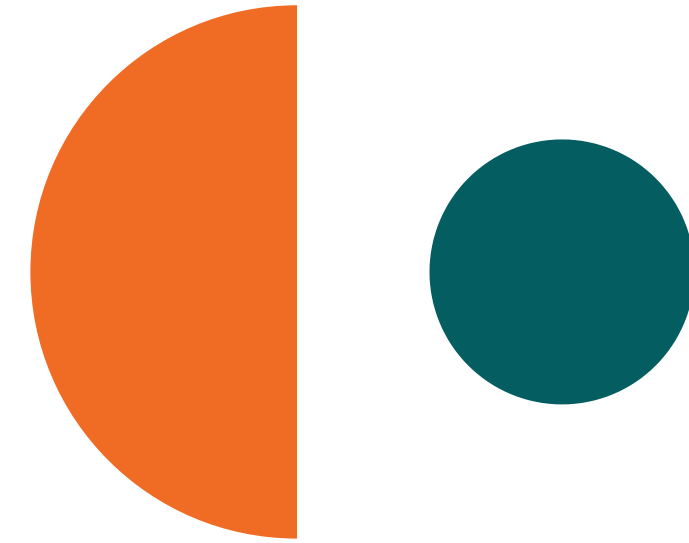
CONTEMPORARY APPLICATIONS OF SOCIAL DEMOGRAPHY

GROUP 13

Anisha Srivastava	220149
Diyansh Mittal	210358
Nishant Shanmukham	210674
Rashi Sharma	220872
Shreya Gupta	221027

CONTENTS

Topics included in the Presentation:



01 INTRODUCTION

02 LITERATURE REVIEW

03 DATA OVERVIEW

04 ANALYSIS

05 CONCLUSION



INTRODUCTION

India ranks **134th** in HDI & Education is the **only bridge** to question the **Status Quo** and **eradicate poverty**

Status Quo ?

1

1% own wealth accumulated by the remaining **90%**

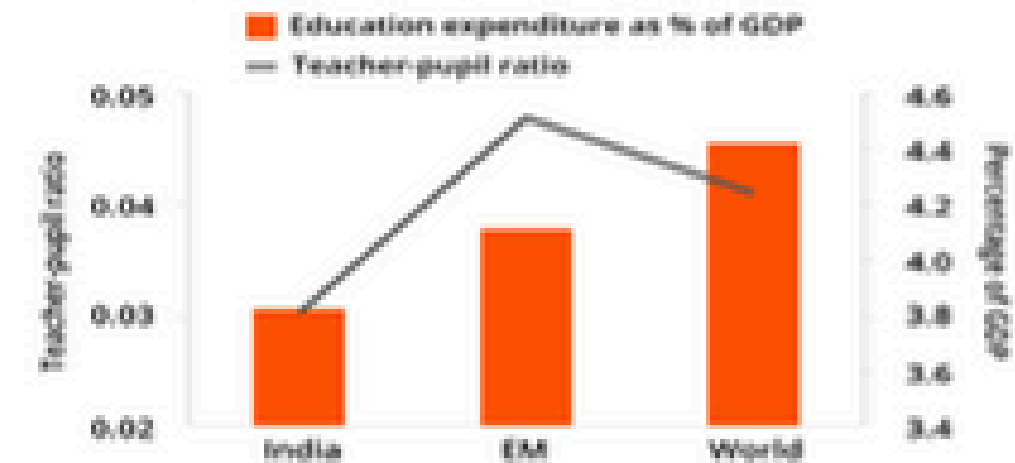
2

95% of population lacks access to basic necessity such as **food, healthcare & shelter**

3

India's **out of pocket** medical expenses are one of **the highest** in the world (>50%)

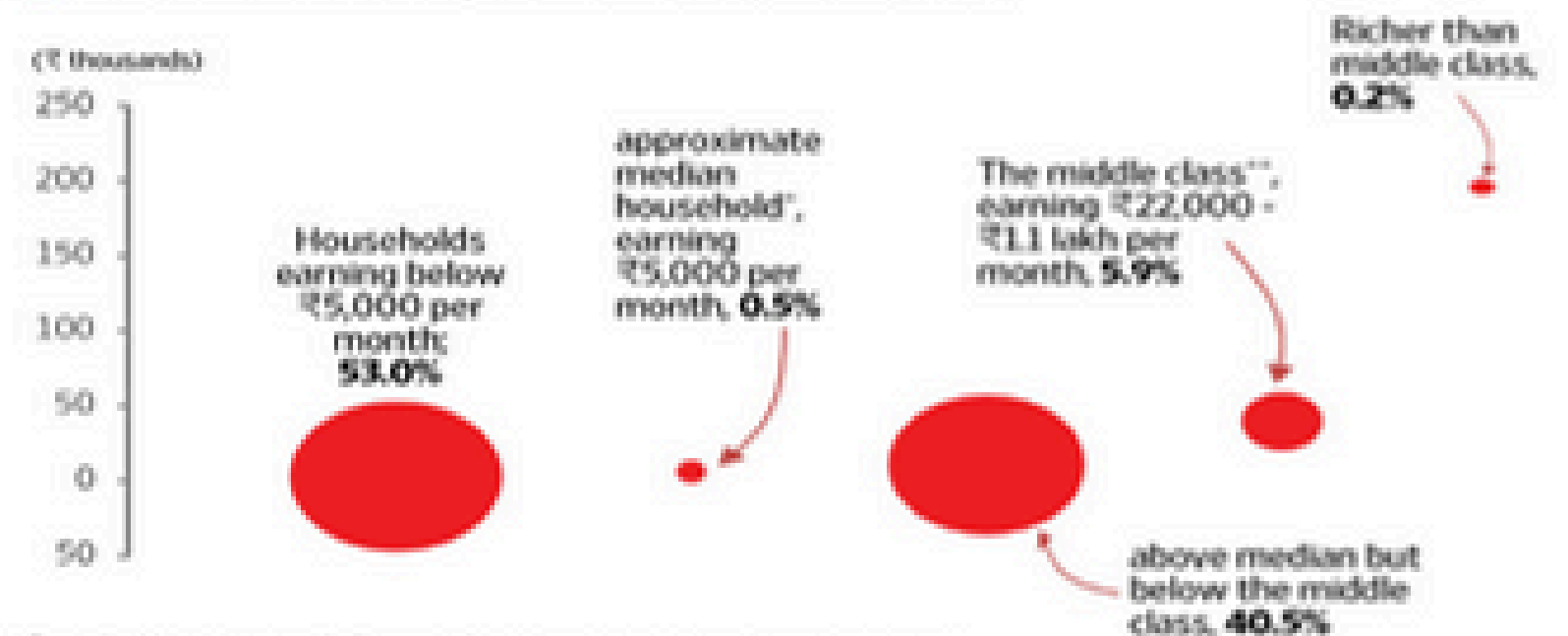
Government spending: Education



DATA SUGGESTS THAT ONLY 6% OF INDIANS BELONGED TO THE "MIDDLE CLASS" IN 2011-12, USING NCAER'S DEFINITION

Distribution of household income in 2011-12

● Monthly household income (average for each class) (for a typical family of four)



Size of bubbles denotes % of households belonging to a given income category

* corresponds to a monthly household income of ₹5,000 (for a typical family of four)

** corresponds to a monthly household income of ₹22,000 to ₹1.1 lakh (for a typical family of four), deduced from NCAER's 2001-02 criterion of annual household income of ₹2 lakh to ₹1.10 lakh (on 2001-02 prices) for an average household size of 5.29

Source: Devraj, Sanjiv, Ramesh Varma and NCAER, New Delhi, India Human Development Survey II (IHDS-II), 2011-12 and Mini calculations

INTRODUCTION – WHY ARE PEOPLE DROPPING THE GOLDEN TICKET?

India has one of the **highest** dropout rates in the **WORLD!**

Major Reasons?

1

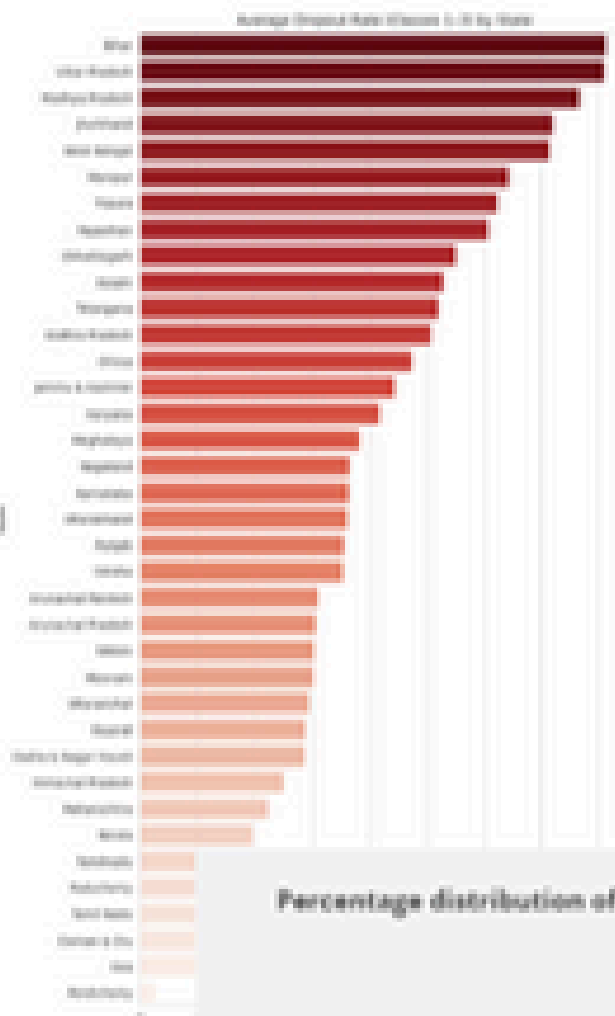
Poverty Constraints, Child Labor?

2

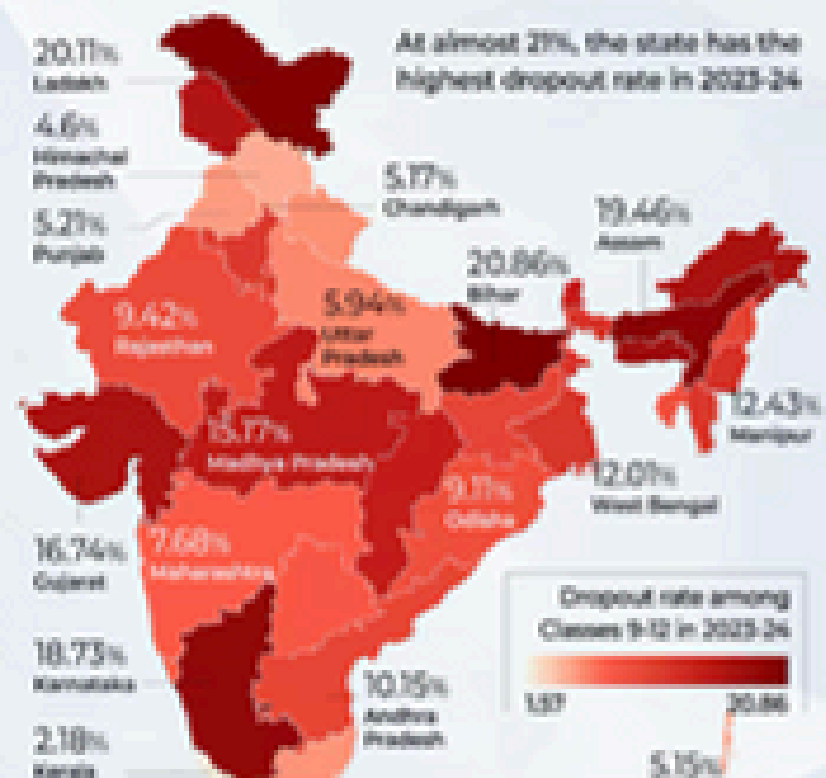
Societal stigma towards western Education ?

3

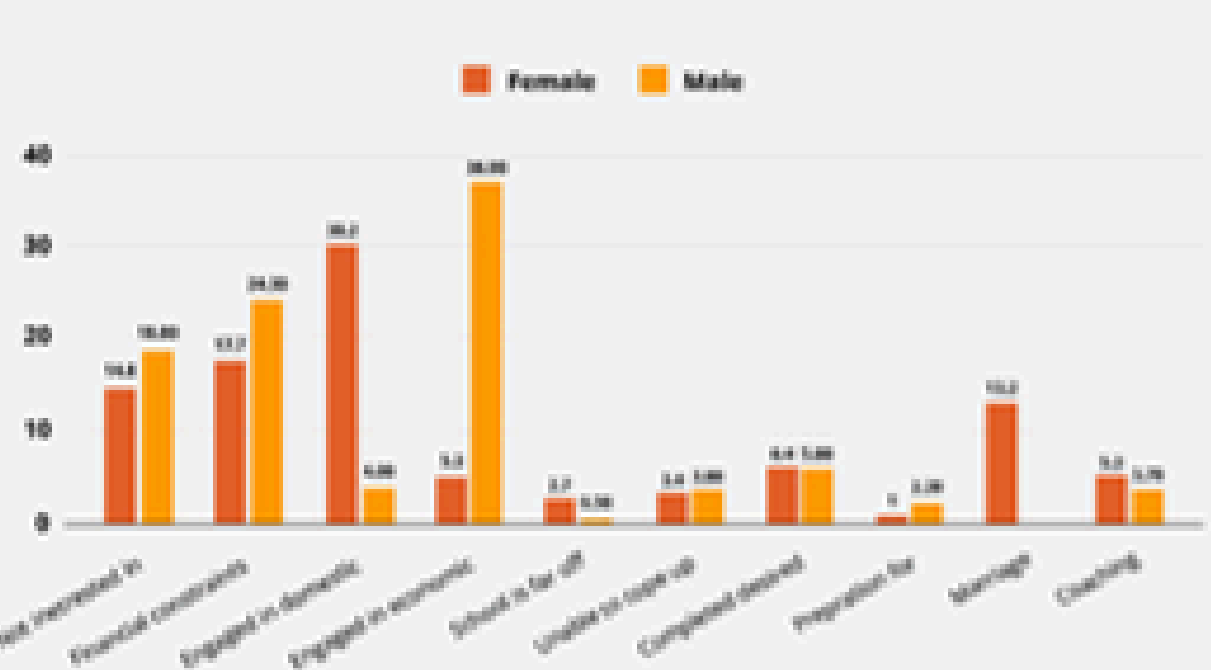
Infrastructural Deficiencies?



Bihar Leads in Secondary School Dropouts



Percentage distribution of ever enrolled persons by major reason for currently not attending





LITERATURE REVIEW

How Significant is India's Problem of Child Dropouts?

Regional Variation:

States like Bihar, Uttar Pradesh, and Jharkhand exhibit the highest dropout rates, while Tamil Nadu, Goa, and Puducherry have the lowest. This aligns with findings by Dinu (2009), who highlighted economic constraints and inadequate infrastructure as key contributors to dropout rates. [IJCRT- School Dropouts-Teacher's Perspective]

Why It Matters:

Dropouts reduce individual growth opportunities and deepen national socio-economic gaps. *[Matters India (2025)]*



Data-Driven Causes of Dropouts

- **Poverty & Household Need:** 41% of children from bottom 20% income households dropped out before Class 8 [National Sample Survey (NSS 75th Round)]
- **School Infrastructure:** Infra Score $\uparrow \rightarrow$ Dropout \downarrow ; Research by Sridevi (2024) found a strong negative correlation between infrastructure quality and dropout rates, with better facilities reducing dropouts significantly.
- **Teacher Attendance:** Studies suggest that dropout rates are lowest (18%) when teacher attendance exceeds 90% (Sridevi, 2024)
- **Mid-Day Meals & Clean Water:** Schools offering mid-day meals and clean water report dropout rates as low as ~21%, compared to ~39% in schools lacking these amenities (CRY, 2024)



Empirical Metrics Driving Our Dropout Analysis

Enrollment and Attendance: These metrics help identify gaps in student participation and potential dropout indicators. Studies have shown that factors like infrastructure and teacher quality significantly influence attendance and enrollment rates.

Teacher Coverage: This includes appointments and attendance of principals, regular government teachers, and para-teachers. The presence of qualified and regular teachers is crucial for maintaining student interest and reducing dropout rates.

Infrastructure Score: This assesses the availability of facilities like computers, electricity, libraries, and playgrounds. Research indicates that better infrastructure can improve learning outcomes and reduce dropout rates.

Food and Water Score: This evaluates the provision of mid-day meals and access to clean water. Access to basic amenities like these can enhance student attendance and retention.



OUR STUDY

Objective

Examine key factors contributing to school dropout rates in rural India.

Focus Areas:

- School infrastructure
- Teacher attendance and coverage
- Availability of mid-day meals and water

Data Source:

- Annual Status of Education Report (ASER)
- Years analyzed: 2010, 2014, and 2018

Purpose:

- Enhance understanding of dropout drivers
- Support future researchers and policymakers in crafting targeted interventions



DATA OVERVIEW

- **Data Source:** Annual Status of Education Report (ASER) by Pratham NGO
- **Geographic Coverage:** Rural regions across 26 states and 3 Union Territories
- **Years Covered:** 2010, 2014, and 2018
- **Sample Size:** Over 49,000 school-level data points
- **Data Includes:**
 - Student enrollment and attendance
 - Presence of teachers, principals, and para-teachers
 - School infrastructure (e.g., blackboards, classrooms, playgrounds)
 - Mid-day meal availability



DATA PRE-PROCESSING



Location Identifiers: 'state_name', 'state_code', 'district_code', 'district_name',

Enrollment & Attendance (Classes 1–5)

- 'childrenrollment_class_1', 'childrenrollment_class_2', 'childrenrollment_class_3'
- 'childrenrollment_class_4', 'childrenrollment_class_5'
- 'childattendance_class_1', 'childattendance_class_2', 'childattendance_class_3'
- 'childattendance_class_4', 'childattendance_class_5'

Teacher & Principal

- 'principal_appointment', 'principal_attendance'
- 'regulargovtteacher_appointment', 'regulargovtteacher_attendance'
- 'parateacher_appointment', 'parateacher_attendance'
- 'pe_class_teacher', 'pe_other_teacher'

Infrastructure

'computer_in_school', 'sch_electricity_conn', 'library_books__in_school_usable',
'playground_in_school', 'blackboard_class_2'

Food & Water

'midday_meal_in_school', 'kitchen_shed_in_school', 'tap_in_school_usable',
'meal_other_evidence_in_school'

DATA PRE-PROCESSING

Drop-Out Rate Calculation

- Dropout rates for Classes 1–3 and Classes 4–5 were calculated separately.
- The dropout rate was computed as the percentage of students who enrolled but did not attend.
- The following new columns were created:
 - "enrollment_1to3", "attendance_1to3", "dropout_rate_1to3",
 - "enrollment_4to5", "attendance_4to5", "dropout_rate_4to5"

$$\text{Drop-out Rate} = \frac{(\text{Total Enrollment}) - (\text{Total Attendance})}{(\text{Total Enrollment})}$$

DATA PRE-PROCESSING

Teacher Coverage & Attendance Ratio

This metric provides insight into teacher availability and their presence relative to student enrollment.

- **Total Appointed Teachers** is obtained from the sum of Regular government teachers, Para-teachers, and Principals
- Total Teachers Present is obtained from attendance from the same categories on the survey day

- $$\text{Teacher Coverage Ratio} = \frac{\text{Total Appointed Teachers}}{\text{Total Enrollment of the School}}$$

- If no students are enrolled, the Teacher Coverage Ratio is set to 0

- $$\text{Teacher Attendance Ratio} = \frac{\text{Total Teachers Present}}{\text{Total Appointed Teachers}}$$

- If no teachers are appointed, the Teacher Attendance Ratio is set to 0
- It helps assess both the availability and effectiveness of staffing in rural schools

DATA PRE-PROCESSING

Infrastructure Score

- The infrastructure score is the sum of all infrastructure indicators for each school
- Presence or Absence of a facility is represented by 1 or 0, respectively.
- The values ranged from **0-5**, Higher values signifying better facilities
- The following columns were summed up:

- 'computer_in_school',
- 'sch_electricity_conn',
- 'library_books___in_school_usable',
- 'playground_in_school',
- 'blackboard_class_2'

DATA PRE-PROCESSING

Food and Water Score

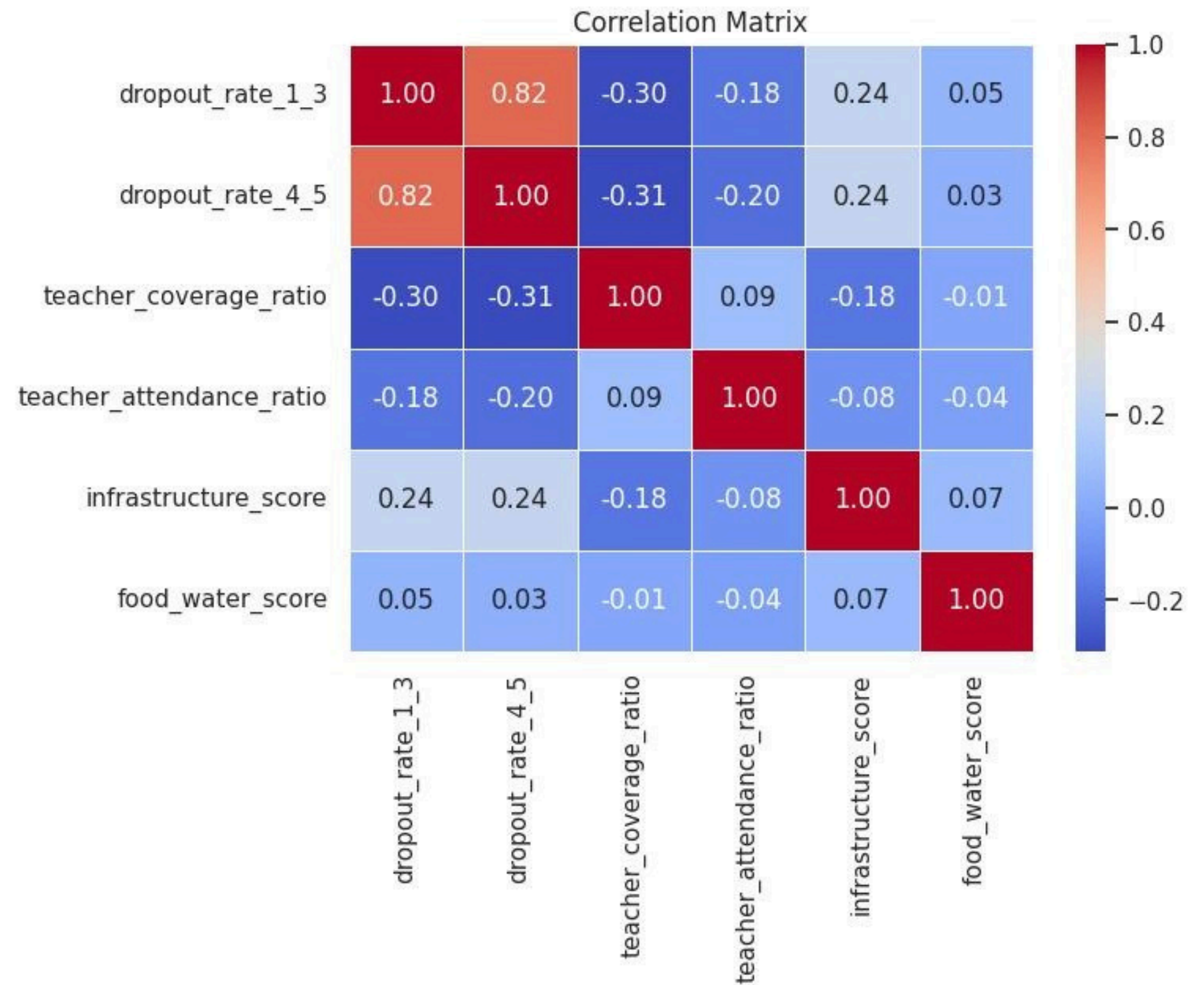
- The food and water score is the sum of all such availability indicators for each school,
- The presence or absence of a facility is represented by 1 or 0, respectively
- The score ranges from **0-4**, with higher values representing better meal and water provisions
- The following columns were summed up:
 - 'midday_meal_in_school',
 - 'kitchen_shed_in_school',
 - 'tap_in_school_usable',
 - 'meal_other_evidence_in_school'



ANALYSIS

Correlations

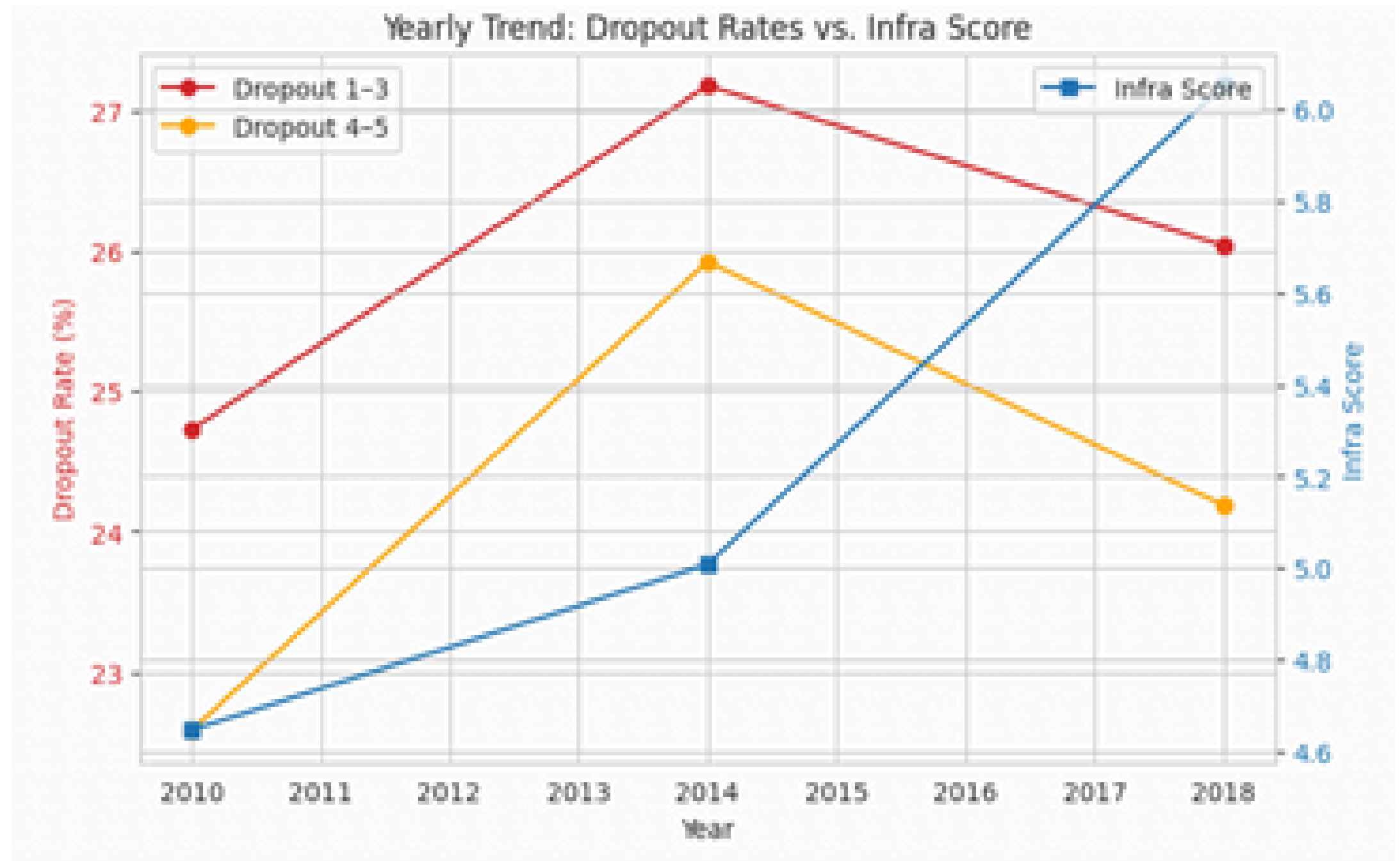
- Dropout rate is negatively correlated with teacher metrics.
- This is consistent with our regionwise observations.
- Very weak correlation with the food/water score due to lack of more relevant features
- Eg. presence of a tap, instead of drinkable water
- Unexpected correlation with the infrastructure score due to data limitations



ANALYSIS

Infrastructure

- 2010–2014: Small increase in the infrastructure score, but also an increase in the dropout rate
- 2014–2018: More significant increase in the infrastructure score, and a decrease in the dropout rate



ANALYSIS

Teacher Attendance

- For the first boxplot, the 75th percentile is at 52–53% implying that 25% of schools have dropout rates above 52–53% in this category.
- The median dropout rate for this case is about 33%.
- For the last boxplot, the 75th percentile is at 37–38%.
- The median dropout rate for this case is 22%.

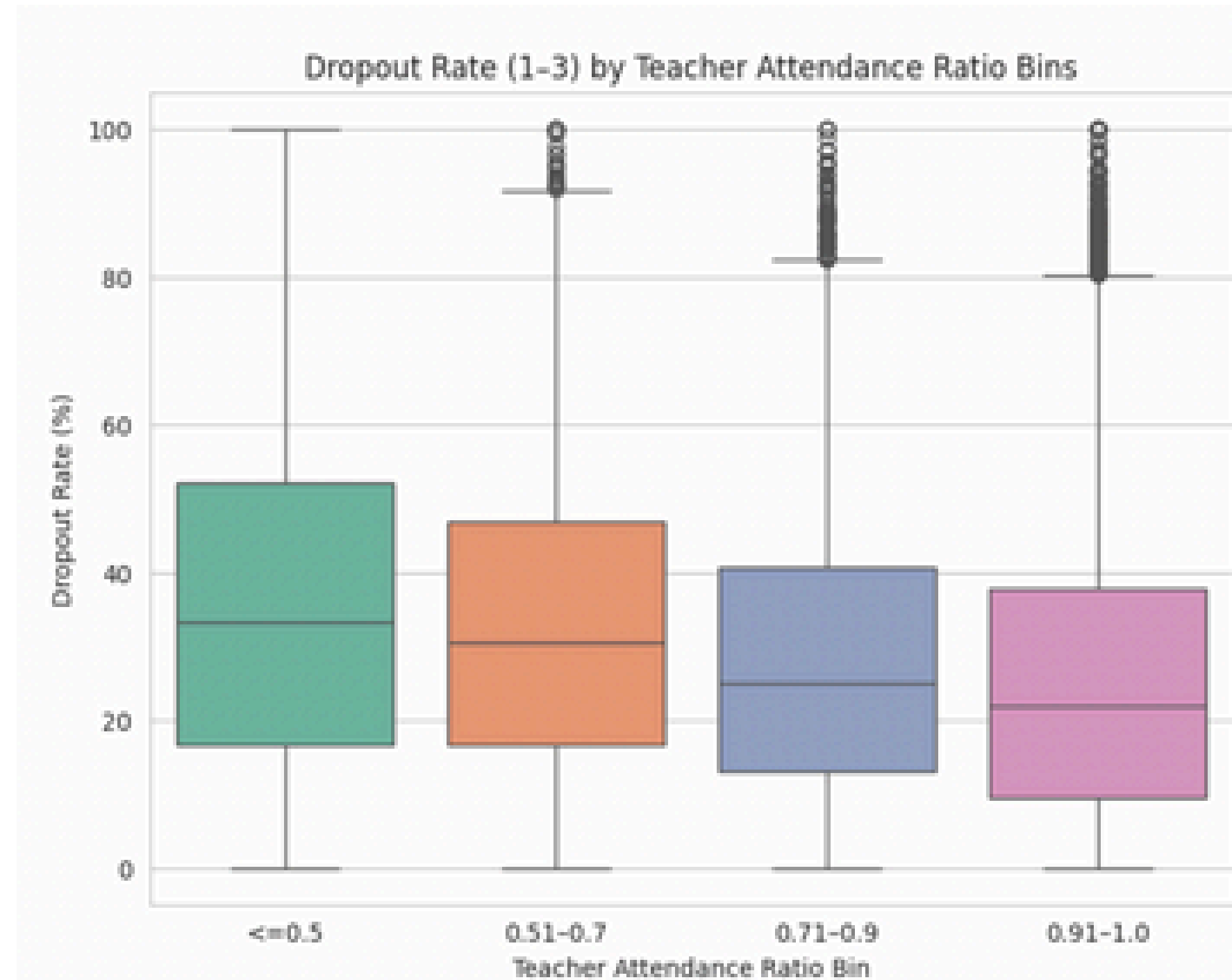
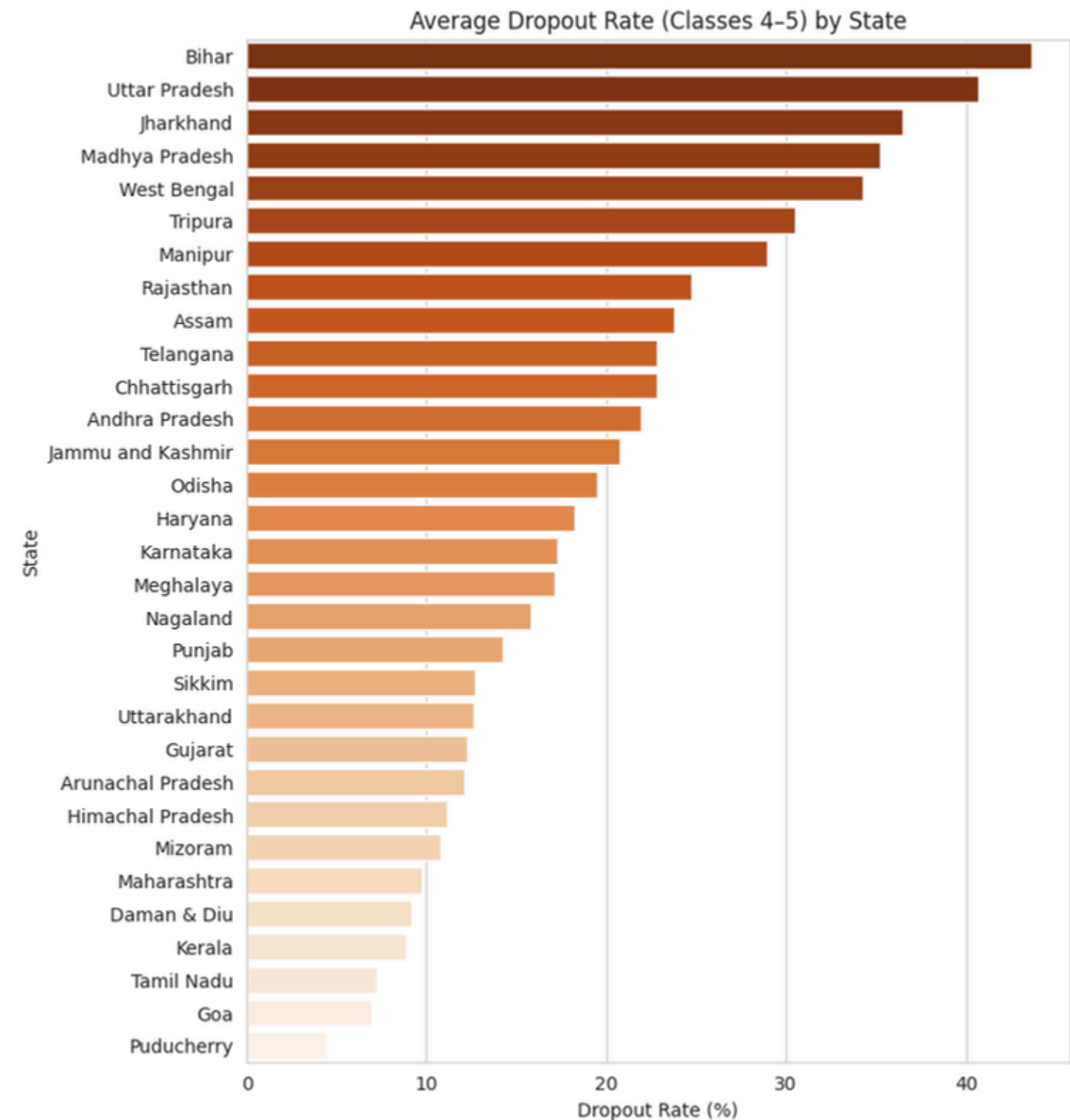
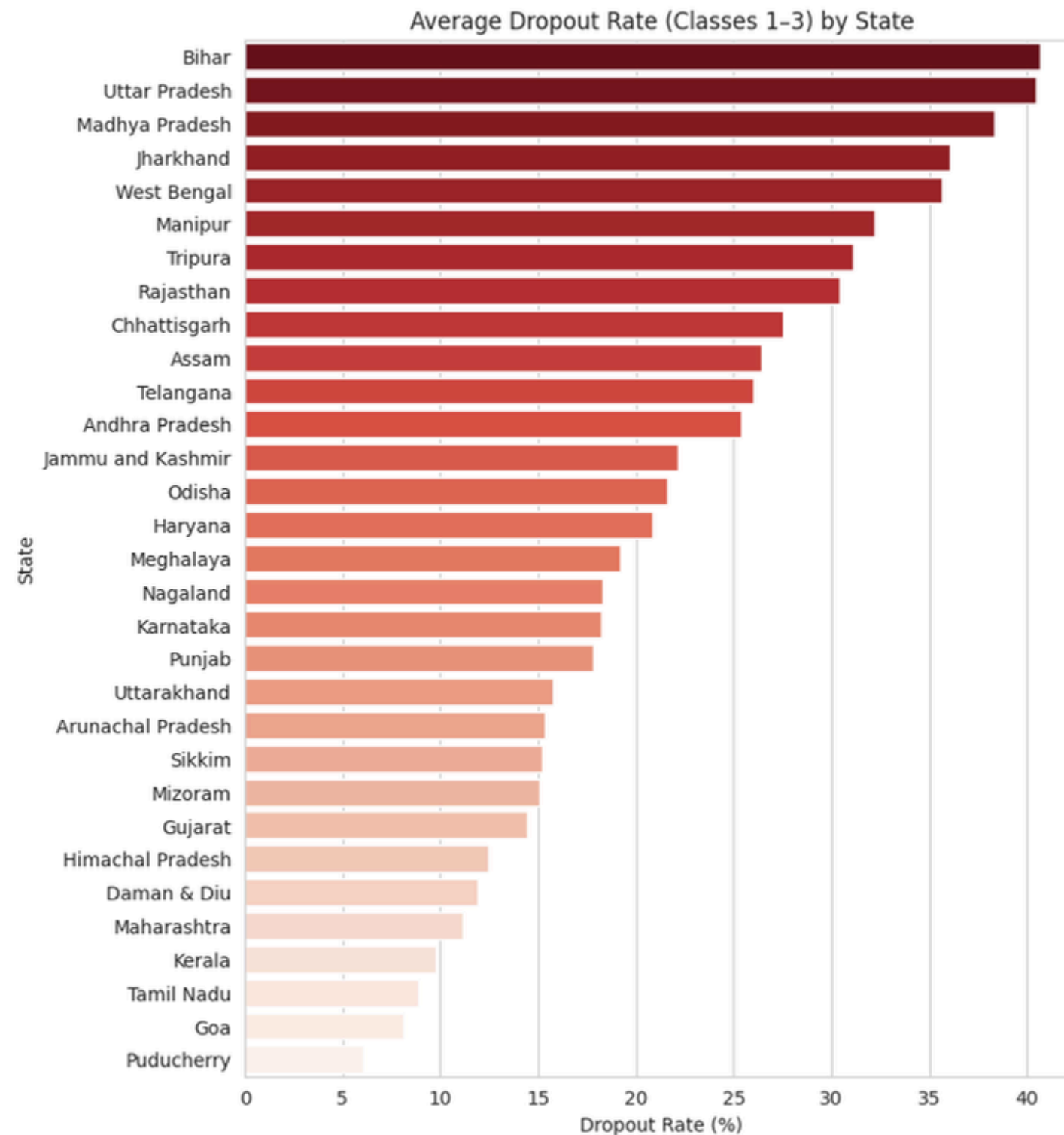


Fig 05 – Dropout rate correlation with Teacher Attendance for classes (1-3)



ANALYSIS

Regionwise Trends



ANALYSIS

Regionwise Trends

- Bihar – 40.63%

High food/water and infrastructure scores but very low teacher attendance and coverage

- Uttar Pradesh – 40.10%

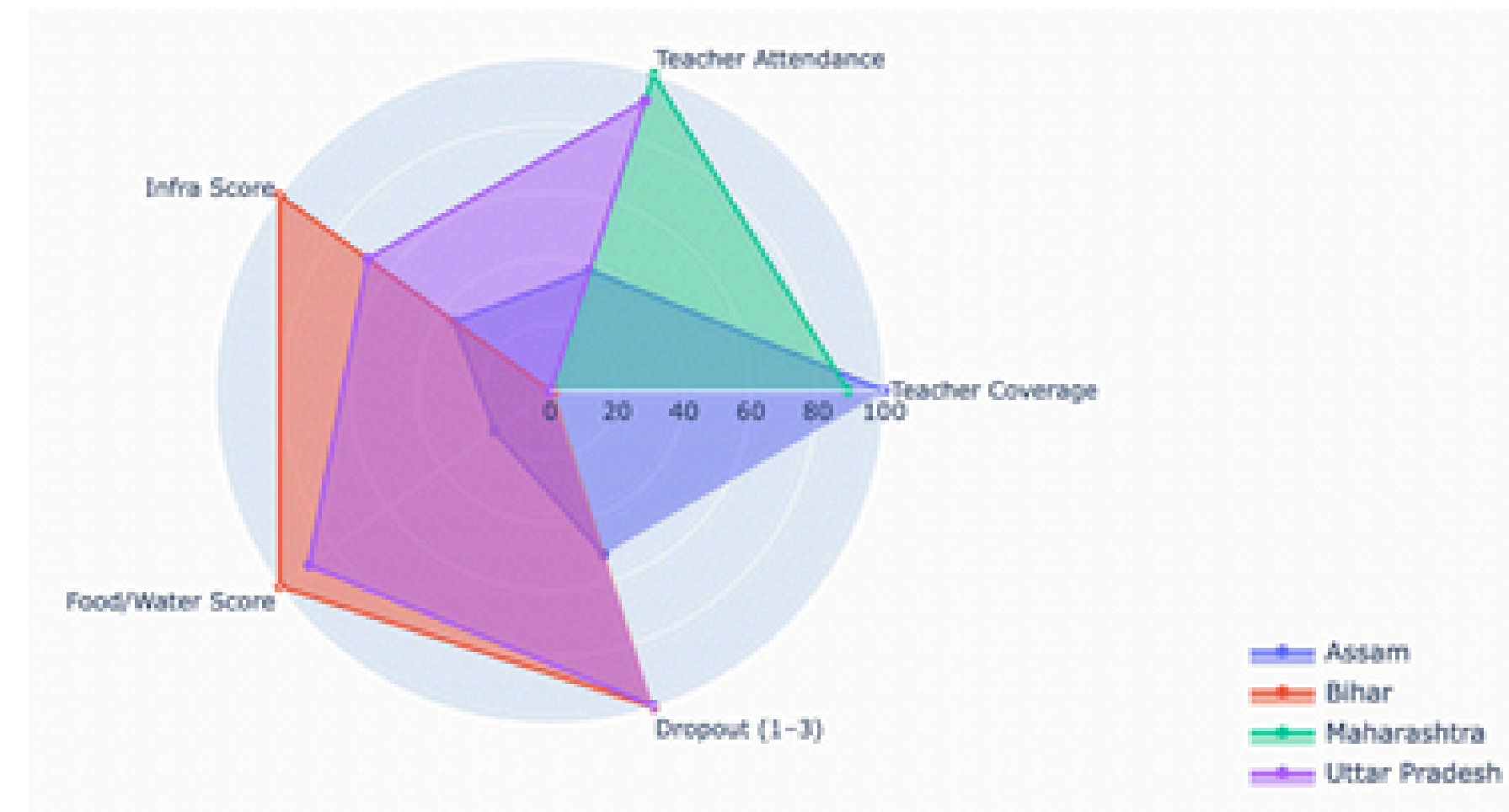
High food/water and infrastructure scores, high teacher attendance but very low teacher coverage

- Assam – 27.45%

Low-moderate food/water and infrastructure scores and low-moderate teacher attendance with high teacher coverage

- Maharashtra – 11.59%

Low food/water and infrastructure scores, but high teacher attendance and coverage



CONCLUSION

Core Issues Behind Dropouts as identified from the literature review

Financial hardship, poor infrastructure, and sociocultural barriers remain major drivers of school dropouts in rural India.

Study Findings from Our Analysis

- Dropout rates are significantly linked to teacher attendance and teacher coverage.
- Exceptional performance in infrastructure or food/water scores as per this data does not necessarily translate into lower dropout rates unless teacher attendance and teacher coverage metrics are high.
- **State-wise Contrast**
 - High dropout: Bihar, Uttar Pradesh, Jharkhand (lack of teachers & poor facilities)
 - Low dropout: Andhra Pradesh, Maharashtra, Haryana (better infrastructure & support)

CONCLUSION

Limitations

- **Non-Uniform Data Collection:** Data was manually collected by ASER volunteers across different states and years. This introduces variation in sample size and quality, making comparisons less robust and potentially biased.
- **Sparse Data for Higher Classes:** Classes 6–8 were excluded due to insufficient data. This narrows the scope and limits understanding of dropout patterns in middle and upper primary levels, where dropout peaks in many cases.
- **Limited Time Points:** The dataset only consisted of three years (2010, 2014, 2018), which may not adequately capture long-term trends or policy impacts. Gaps between years can also obscure short-term interventions or shifts.
- **Attendance Data Prone to Outliers:** Attendance was recorded on a single day per school, making it sensitive to anomalies (e.g., holidays, weather disruptions), thereby weakening the reliability of calculated dropout rates.

CONCLUSION

Policy Interventions

Programs like Sarva Shiksha Abhiyan, Samagra Shiksha Abhiyan, and PM POSHAN aim to improve school infrastructure, teacher accountability, and student nutrition.



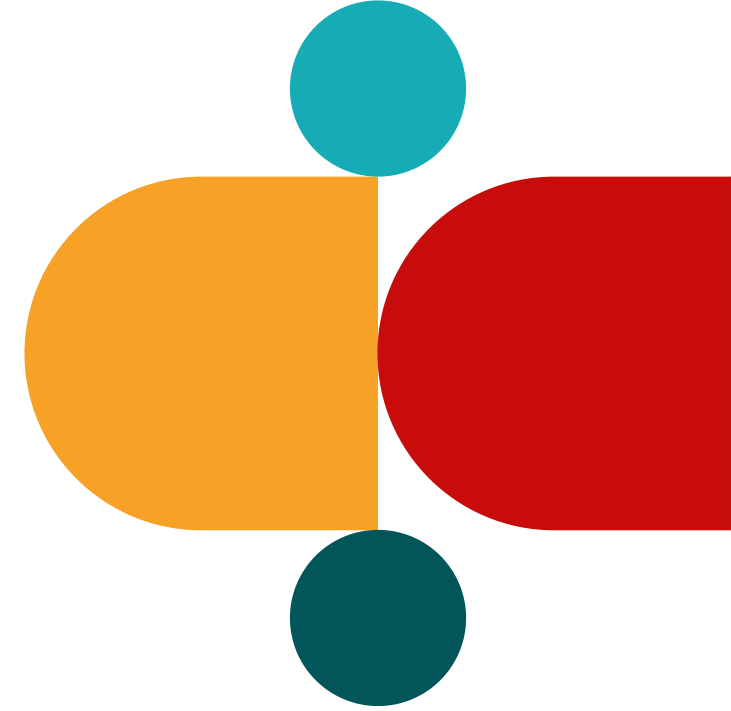
Img 1: Jharkhand meal serving in PM POSHAN Yojna



Img 2: Students receiving mid-day meal at a school in Wokha district of Nagaland state

REFERENCES

- *Dropout Rates in Schools in India*
- *School drop-out rate is a serious concern | Matters India*
- *TRENDS IN SCHOOL DROPOUT RATE IN INDIA Dr. KV Sridevi*
- *Determinant of school dropouts in India: A study through survival analysis approach*
- *<https://documents1.worldbank.org/curated/en/099308007102434482/pdf/IDU1bac1b6fa165e014df81930512eod1336463c.pdf>*
- *https://jhr.uwpress.org/content/early/2019/07/02/jhr.56.2.1216-8430R3_*
- *Sarva Shiksha Abhiyan*



**THANK
YOU**

