



Ananya Khanduri

Maternal Mortality Ratio in India: An Exploration

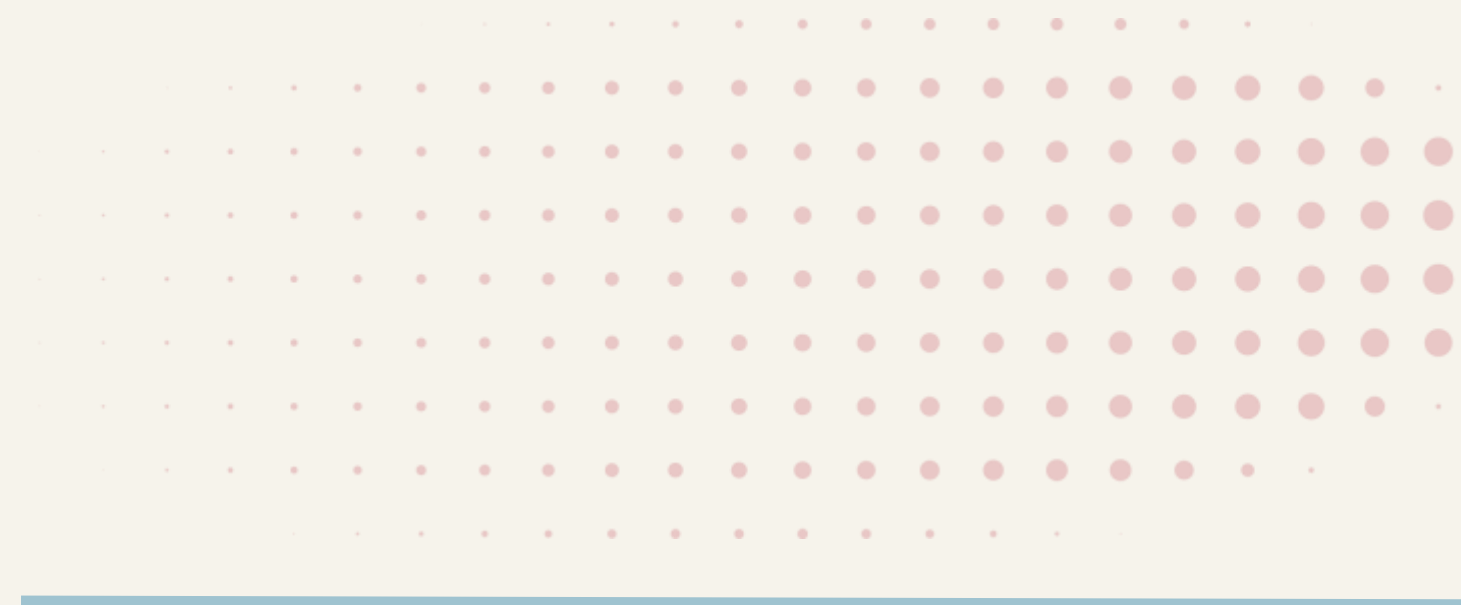
This presentation explores the complex relationship of Maternal Mortality Ratio with indicators like Poverty Rate and Life Expectancy of women in India. We will examine socioeconomic factors. We also focus on healthcare access and government initiatives.



By -
Ananya Khanduri




OVERVIEW

- Objective
 - Introduction
 - Maternal Mortality Ratio
 - Poverty Rate
 - Life Expectancy
 - About the Data
 - Visualisations and Comparison
 - Causes and Solutions
 - Bibliography
- 
-
-

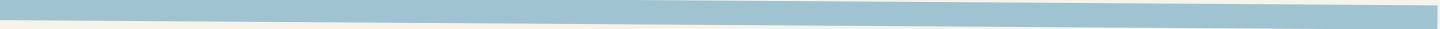


ABSTRACT

This study aims to:

1. Analyze the relationship between maternal mortality with respect to life expectancy and Poverty Rate among various states in India.
 2. Identify states with high maternal mortality and lower life expectancy.
 3. Explore other contributing factors that affect MMR.
 4. Provide policy recommendations for improving maternal health and life expectancy.
- 

Ananya Khanduri





Defining Maternal Mortality Ratio (MMR): Measurement and Significance

Ananya Khanduri

1

Definition of MMR

MMR is the number of maternal deaths per 100,000 live births. Deaths occur due to pregnancy or its management.

2

Calculation

The MMR is calculated by dividing maternal deaths by total live births. The result is then multiplied by 100,000.

3

Significance of MMR

MMR reflects quality of maternal healthcare. It indicates a nation's overall health infrastructure.

Understanding Life Expectancy: Definition, and Global Comparisons

Definition

Life expectancy is the average number of years a person is expected to live.

Ananya Khanduri

This is based on statistical probabilities.

Global Data

Global life expectancy varies.

Developed nations often have higher rates due to better healthcare and living conditions.

Significance

Life expectancy serves as an indicator. It reflects a population's overall health and well-being.

Poverty:

Definition

Poverty is when a person or family doesn't have enough money to meet their basic needs. This can include food, clothing, shelter, healthcare, and education.

Over the last several decades, India has become one of the fastest growing economies in the world. But even with this impressive progress, poverty in India continues to be an enormous problem. A small percentage of people in India have benefitted from this growth, while the vast majority still struggle to meet their basic daily needs.

Ananya Khanduri



Poverty Rate

Poverty rate is the ratio of the population whose income falls below the poverty line.

The poverty line is taken as half the median household income of the total population. The population affected is broken down by broad age groups: child poverty (0-17 years old), working-age poverty (18-65 years old) and elderly poverty (66 year-olds or more).

Note:

- The September 2023 Global Poverty Update by the World Bank revealed that at the \$3.65 poverty line, India accounts for 40% of the global poverty rate of 24.1%. (The World Bank)
- Between 2012 and 2021, 40% of the wealth created in India has been captured by just the wealthiest 1% of the population. ([BBC](#))

About the Data

This dataset collection aims to analyze the relationship between maternal health, poverty, and life expectancy in different states of India.

The data has been collected from the official website of the Reserve Bank of India.

Maternal Mortality Ratio (MMR) indicates the number of maternal deaths per 100,000 live births, reflecting healthcare access and maternal health.

Poverty Data shows the percentage and number of people below the poverty line, which influences healthcare access and maternal outcomes.

Life Expectancy provides an overall measure of health and well-being in different regions.

Date : Dec 09, 2024

Table 12: State-wise Maternal Mortality Ratio												
Year		1999-01	2001-03	2004-06	2007-09	2010-12	2011-13	2014-16	2015-17	2016-18	2017-19	2018-20
Andhra Pradesh	Ananya Khanduri	220	195	154	134	110	92	74	74	65	58	45
Assam		398	490	480	390	328	300	237	229	215	205	195
Bihar		400	371	312	261	219	208	165	165	149	130	118
Chhattisgarh		-	-	-	-	-	-	-	141	159	160	137
Gujarat		202	172	160	148	122	112	91	87	75	70	57
Haryana		176	162	186	153	146	127	101	98	91	96	110
Jharkhand		-	-	-	-	-	-	-	76	71	61	56
Karnataka		266	228	213	178	144	133	108	97	92	83	69
Kerala		149	110	95	81	66	61	46	42	43	30	19
Madhya Pradesh		407	379	335	269	230	221	173	188	173	163	173
Maharashtra		169	149	130	104	87	68	61	55	46	38	33
Odisha		424	358	303	258	235	222	180	168	150	136	119
Punjab		177	178	192	172	155	141	122	122	129	114	105
Rajasthan		501	445	388	318	255	244	199	186	164	144	113

TABLE 14: STATE-WISE LIFE EXPECTANCY* (Contd.)												
(Years)												
State/Union Territory	2012-16			2013-17			2014-18			2015-19		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	59	60	61	62	63	64	65	66	67	68	69	70
Andhra Pradesh	68.0	71.4	69.6	68.3	71.2	69.7	68.7	71.4	70.0	68.9	71.8	70.3
Assam	64.4	66.8	65.5	65.4	67.3	66.2	66.1	67.9	66.9	66.8	68.3	67.5
Bihar	68.9	68.5	68.7	69.2	68.6	68.9	69.4	68.7	69.1	69.6	68.8	69.2
Chhattisgarh	63.6	68.5	65.2	63.8	66.6	65.2	63.7	66.6	65.2	63.7	66.9	65.3
Delhi	72.7	68.5	74.2	73.3	76.3	74.7	73.8	77.0	75.3	74.3	77.5	75.9
Gujarat	67.4	68.5	69.5	67.6	72.0	69.7	67.8	72.3	69.9	67.9	72.8	70.2
Haryana	67.2	68.5	69.4	67.6	72.3	69.7	67.7	72.3	69.8	67.7	72.6	69.9
Himachal Pradesh	69.4	68.5	72.3	69.8	75.6	72.6	69.6	76.8	72.9	69.9	77.1	73.1
Jammu & Kashmir	71.6	68.5	73.5	72.1	76.7	74.1	72.2	76.2	74.0	72.6	76.1	74.2
Jharkhand	67.8	68.5	67.9	68.8	68.4	68.6	69.9	68.5	69.1	70.2	68.8	69.4
Karnataka	67.6	68.5	69.1	67.7	70.8	69.2	67.9	70.9	69.4	67.9	71.3	69.5
Kerala	72.2	68.5	75.1	72.5	77.8	75.2	72.5	77.9	75.3	72.3	78.0	75.2
Madhya Pradesh	63.7	68.5	65.4	64.2	67.9	66.0	64.8	68.5	66.5	65.2	69.1	67.0
Maharashtra	70.8	68.5	72.2	71.2	73.0	72.5	71.3	73.8	72.5	71.6	74.0	72.7

TABLE 17: STATE-WISE POVERTY RATE (Concl'd.)						
(Person in Lakh)						
State/Union Territory	2004-05 (Based on MRP Consumption)#		2009-10 (Based on MRP Consumption)#		2011-12 (Based on MRP Consumption)#	
	No. of Persons	Percentage	No. of Persons	Percentage	No. of Persons	Percentage
Andhra Pradesh	238.8	29.9	176.6	21.1	78.8	9.2
Arunachal Pradesh	3.6	31.1	3.5	25.9	4.9	34.7
Assam	97.3	34.4	116.4	37.9	101.3	32.0
Bihar	485.6	54.4	543.5	53.5	358.2	33.7
Chhattisgarh	109.9	49.4	121.9	48.7	104.1	39.9
Goa	3.6	25.0	1.3	8.7	0.8	5.1
Gujarat	172.2	31.8	136.2	23.0	102.2	16.6
Haryana	55.1	24.1	50.0	20.1	28.8	11.2
Himachal Pradesh	14.6	22.9	6.4	9.5	5.6	8.1
Jammu & Kashmir	14.2	13.2	11.5	9.4	13.3	10.4
Jharkhand	130.7	45.3	126.2	39.1	124.3	37.0
Karnataka	185.7	33.4	142.3	23.6	129.8	20.9
Kerala	65.0	19.7	39.6	12.0	24.0	7.1

Trend Analysis and Comparison

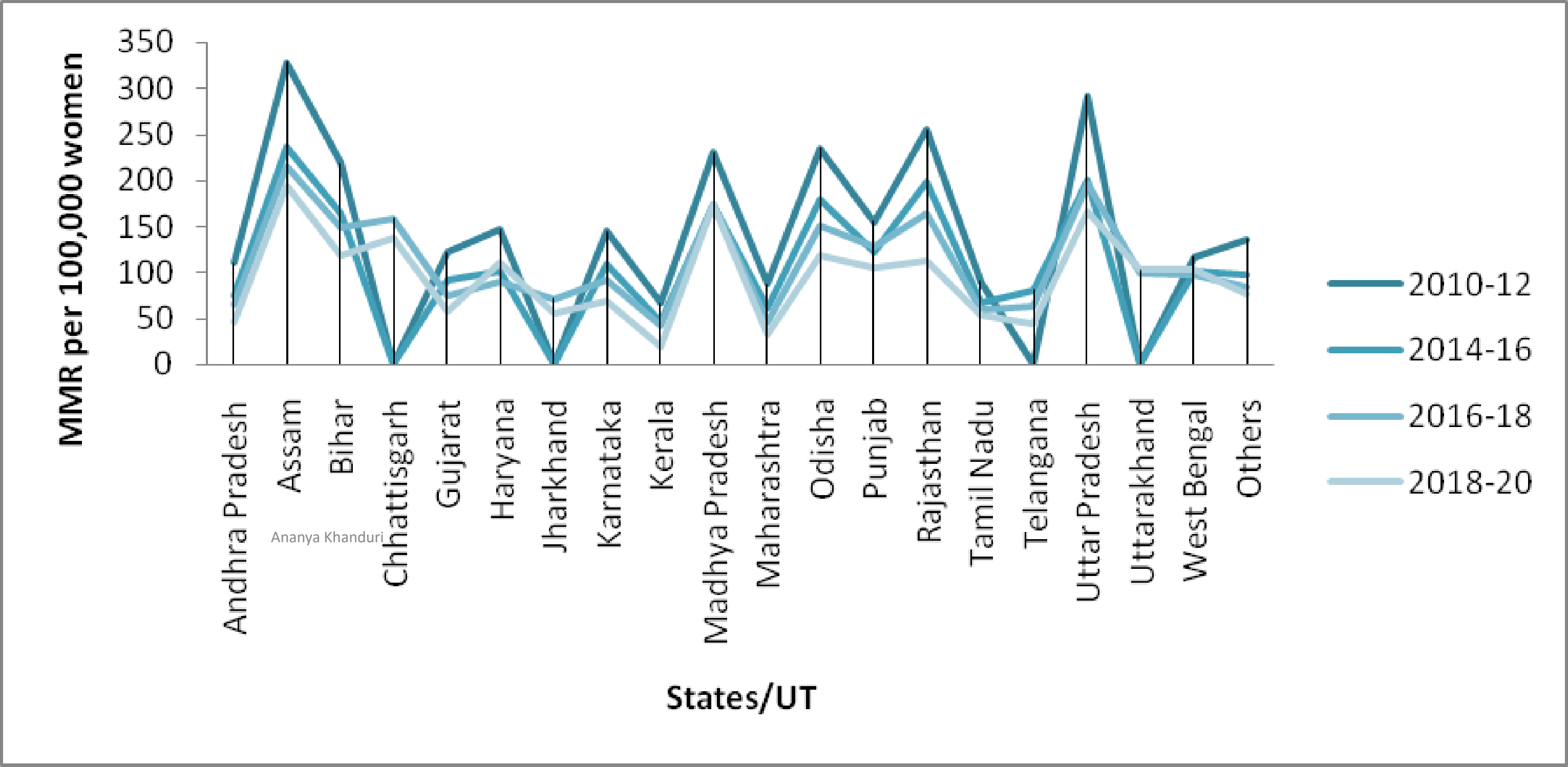
Trend Analysis:

Examines patterns in MMR, poverty levels, and life expectancy over time.
Identifies whether maternal mortality is decreasing or increasing and how it correlates with socio-economic factors.

Comparative Analysis:

Evaluates regional differences in MMR based on poverty rates and life expectancy.
Highlights states with higher/lower MMR and their socio-economic conditions.
Identifies potential policy impacts on improving maternal health outcomes.

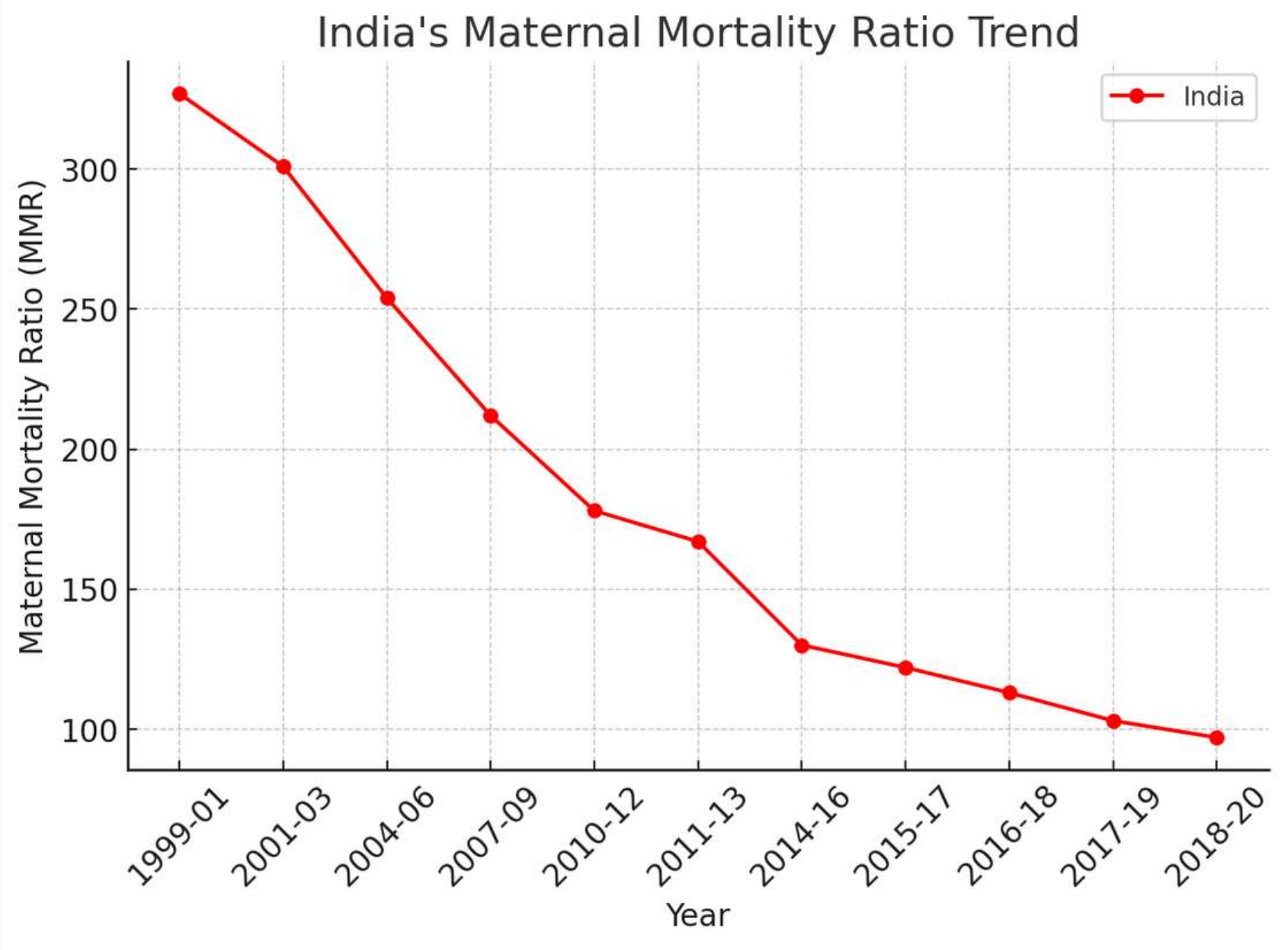
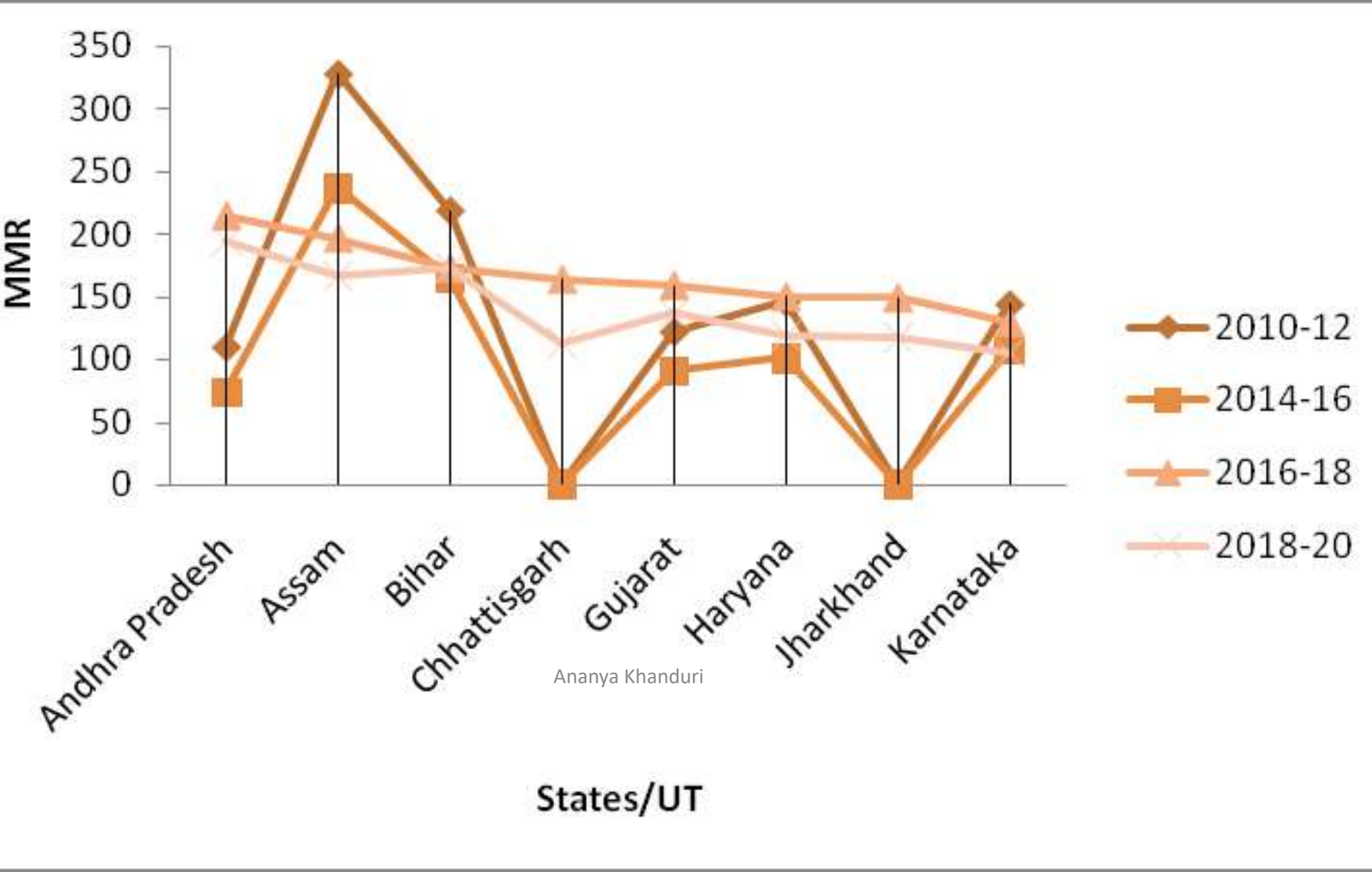
Historical Trends: MMR in India and its states over time



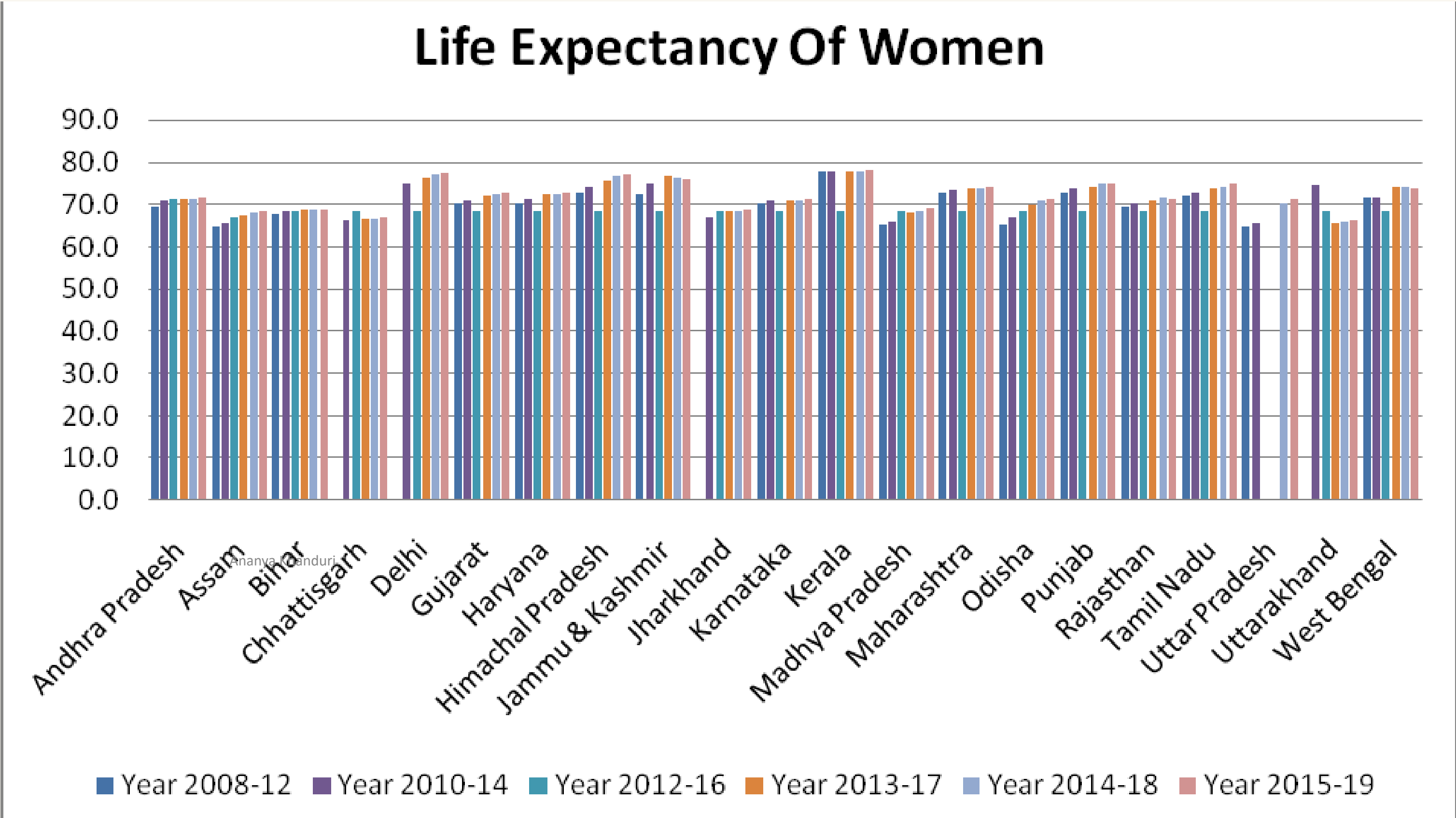
Ananya Khanduri

MMR trend for all states over the years. Each line represents a state's maternal mortality ratio, showing how it has changed over time.

Historical Trends: MMR in India Over Time

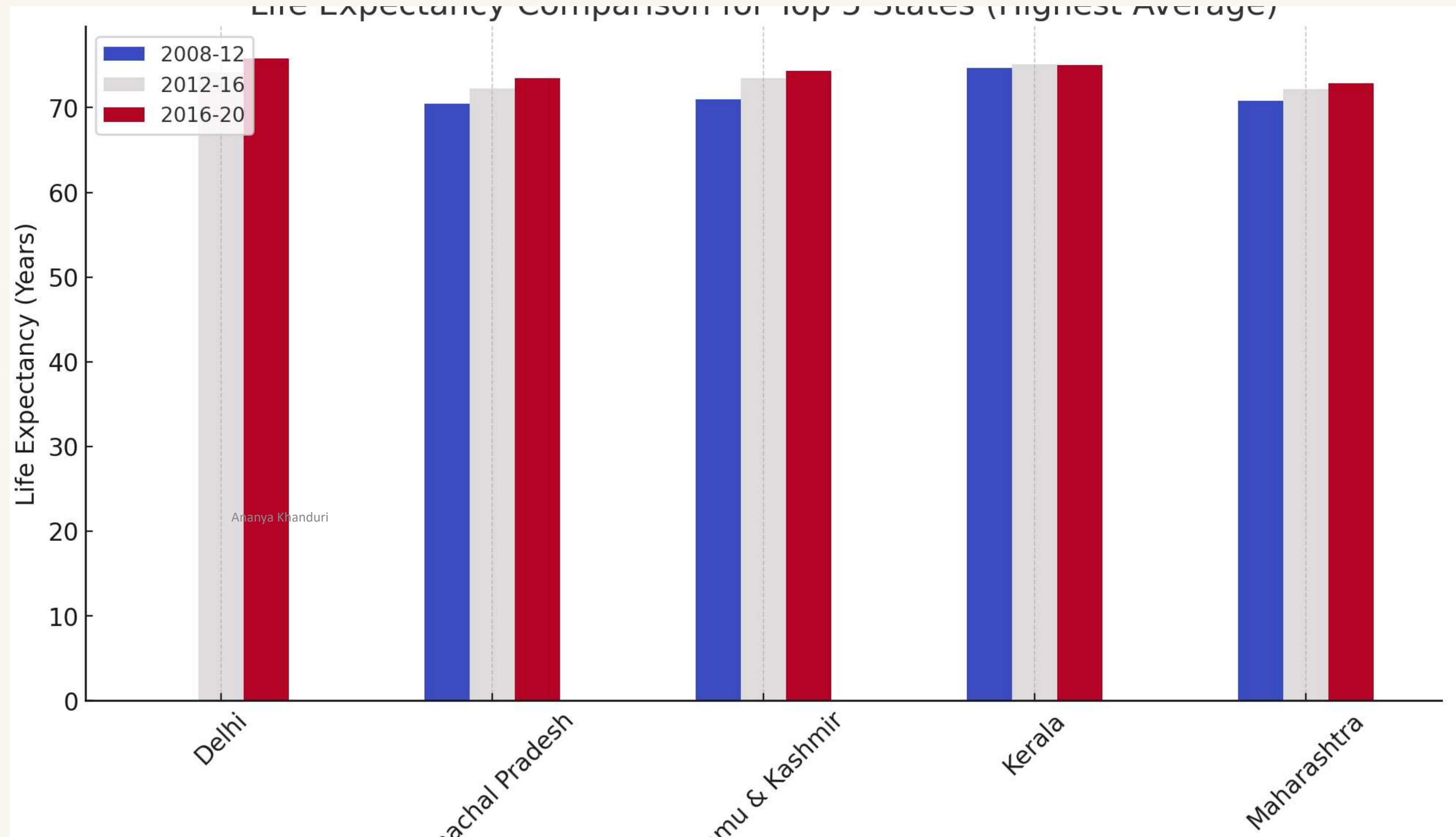


Comparison of Life Expectancy Across States

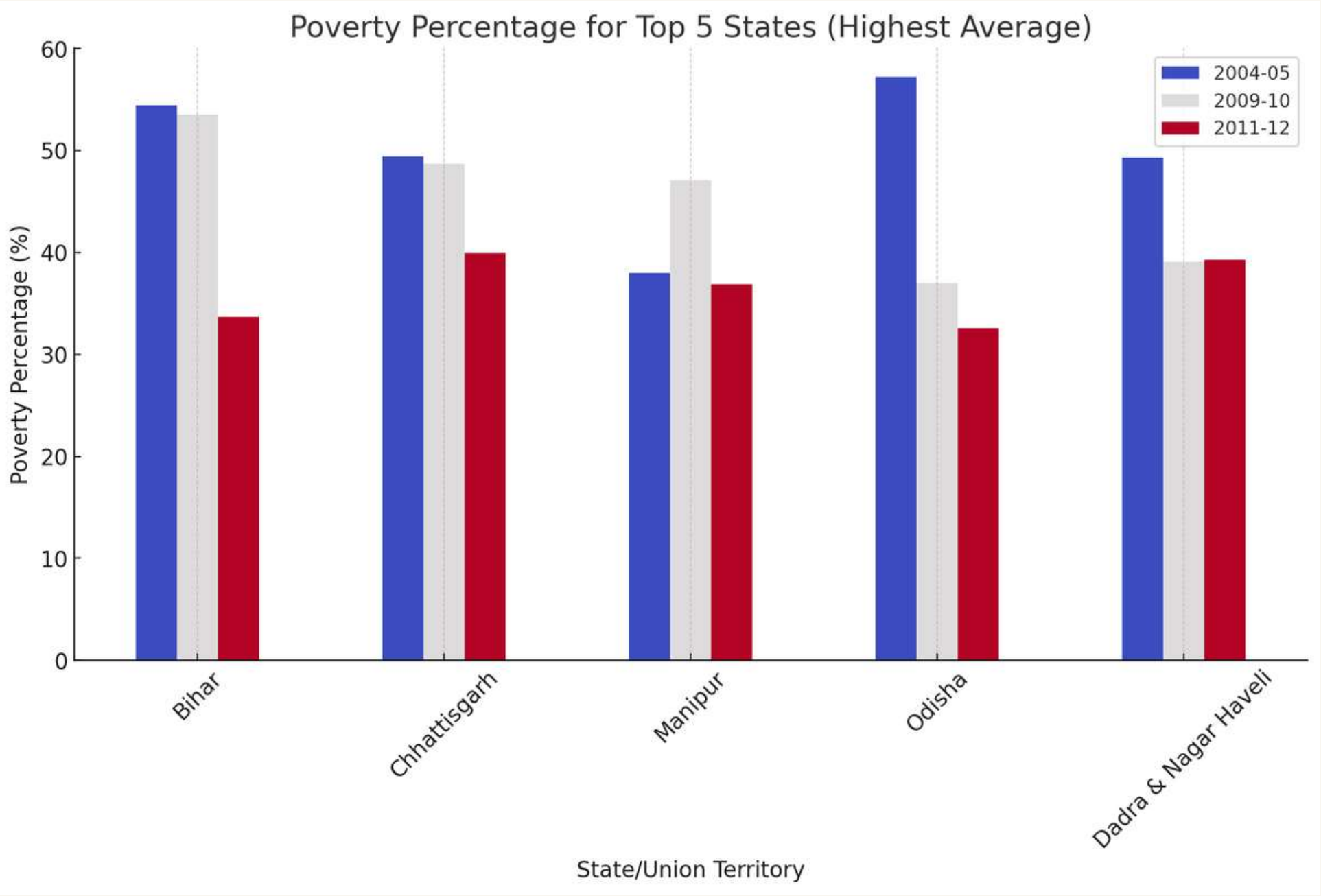
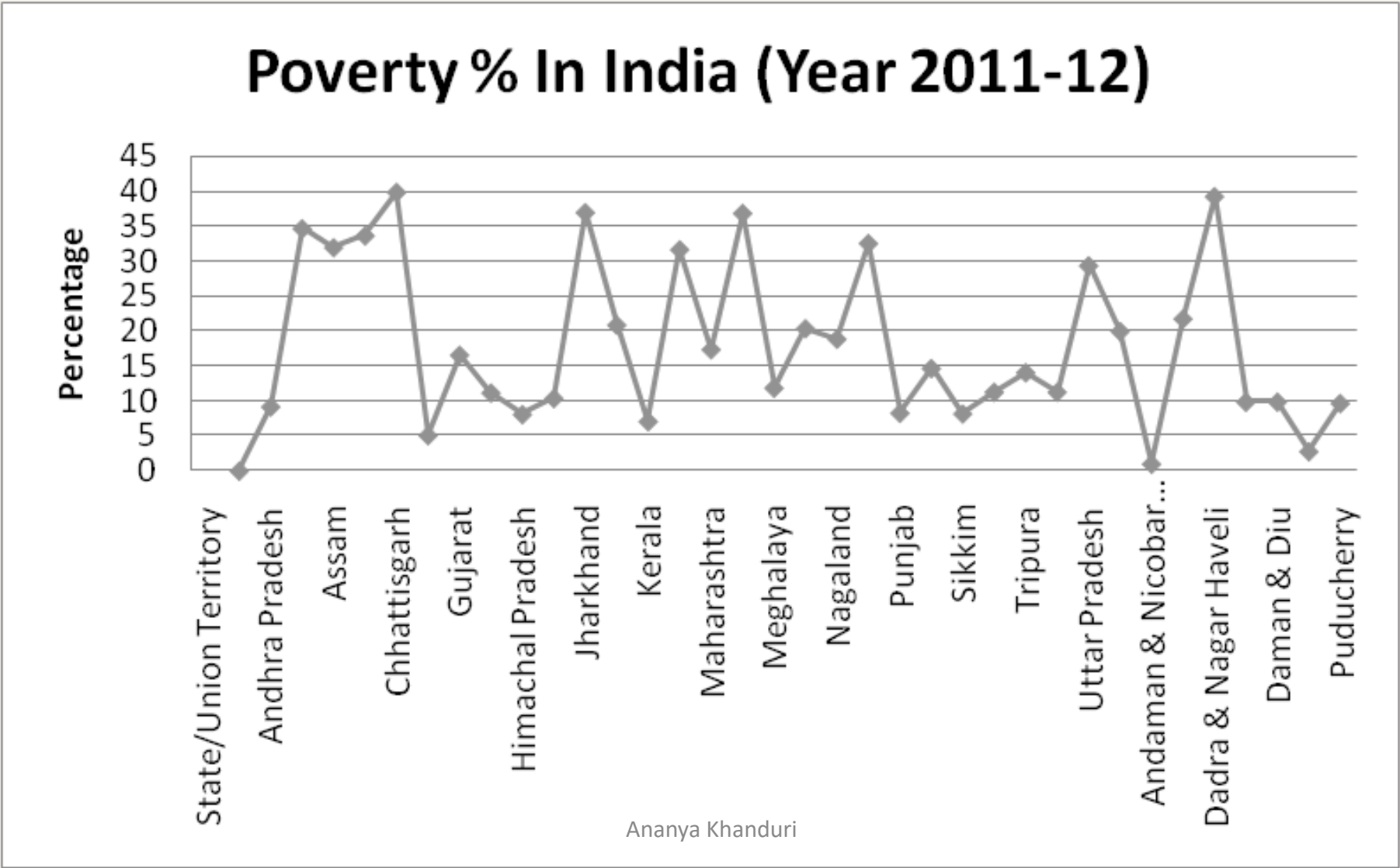


Life Expectancy trend for all states over the years. Each line represents a state's life expectancy of women, showing how it has changed over time.

Top 5 states having highest life expectancy



Poverty Percentage Across states over time:



India's poverty rate falls below 5% in 2024, extreme poverty nearly eradicated: SBI Report.

Bihar is the poorest state in India, according to the Multidimensional Poverty Index (MPI).

Relation between MMR and Poverty Rate

Direct Relationship

1

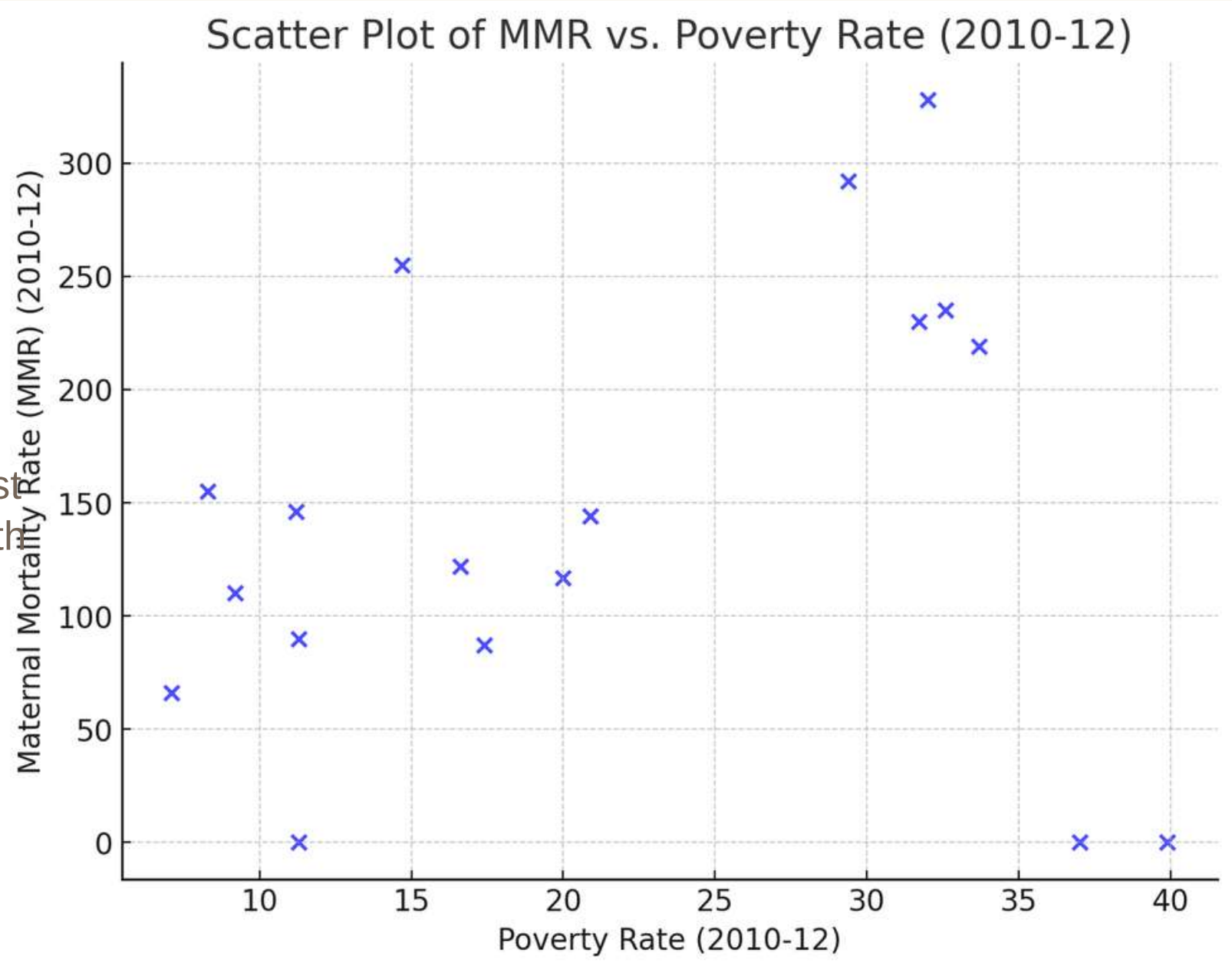
Positive Correlation Trend – There seems to be a general trend where states with higher poverty rates also tend to have higher MMR. This suggests that poverty may be a contributing factor to maternal mortality.

2

Outliers – Some states have very high MMR despite not having the highest poverty rates (e.g., Assam with an MMR of 328). Similarly, some states with relatively high poverty rates do not have extremely high MMR.

3

Clusters – A majority of states seem to fall within a mid-range for both poverty rate and MMR, but a few states have significantly higher or lower values.



Correlation Analysis: Is there a relationship between the MMR and Life Expectancy

1

Inverse Relationship

The trend appears to suggest a negative correlation, meaning that states where women have higher life expectancy tend to have lower maternal mortality rates.

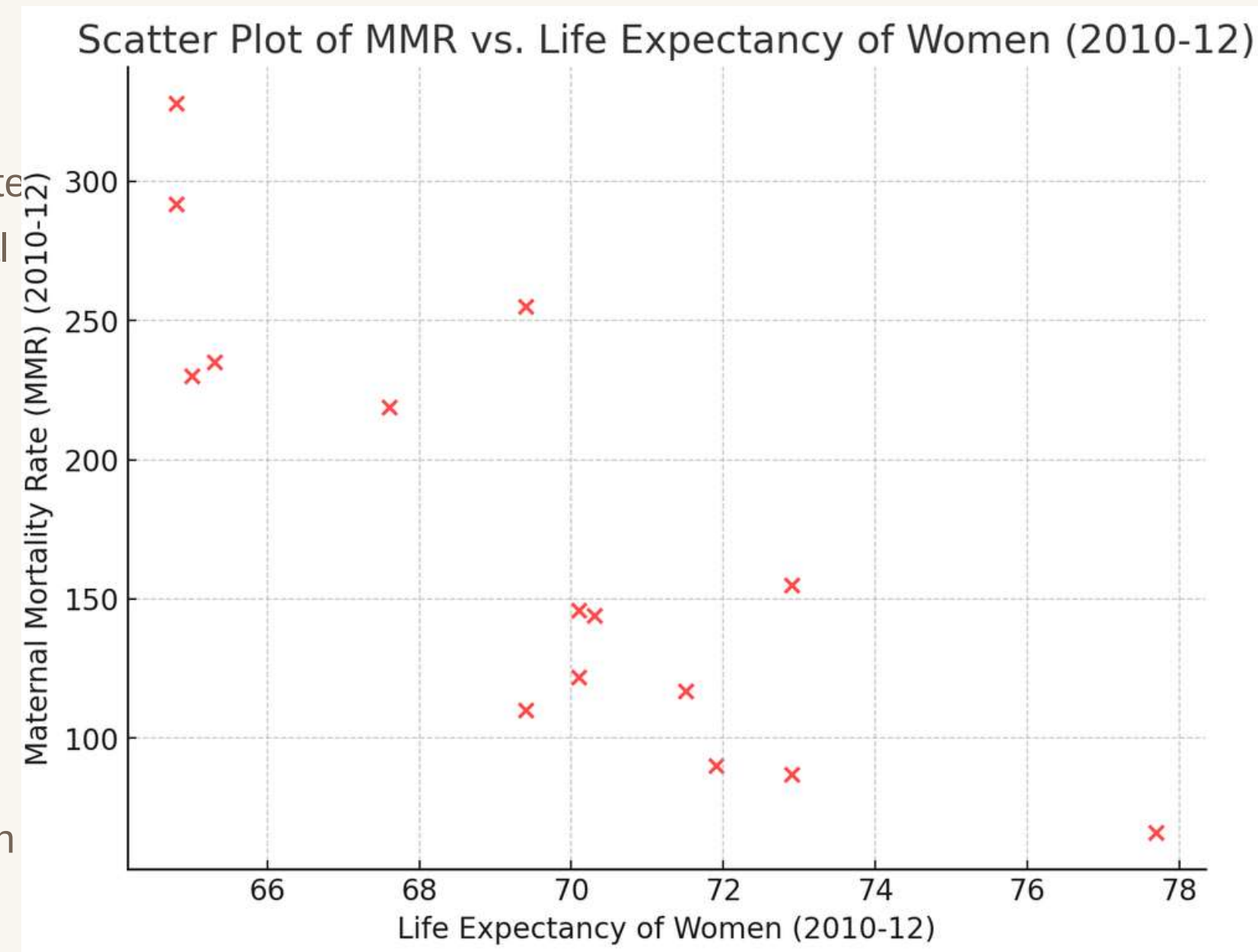
2

Complex Factors

This confirms that higher maternal mortality is linked to lower overall life expectancy, likely due to poor healthcare, nutrition, and living conditions in states with high MMR.

3

Statistical analysis helps quantify the strength and nature of the relationship between life expectancy and MMR. States with lower life expectancy (e.g., Assam) tend to have higher MMR, while states with higher life expectancy (e.g., Gujarat) tend to have lower MMR..





Factors Influencing MMR in India: Healthcare Access, Nutrition, and Education

1. Medical Causes (Direct Causes)

These account for 75-80% of maternal deaths.

Severe Bleeding (Postpartum Hemorrhage - PPH)

Leading cause of maternal deaths worldwide.

Infections (Sepsis) → Poor hygiene and untreated infections during/after childbirth.

Obstructed Labor & Uterine Rupture → Prolonged labor without medical intervention.

2. Socioeconomic & Systemic Causes (Indirect Causes)

- Poverty & Malnutrition → Poor women have less access to quality healthcare & nutrition, leading to higher risks.
- Limited Access to Healthcare → Poor transportation, lack of hospitals, and high costs prevent timely medical help.
- Low Female Education & Awareness → Lack of knowledge about maternal health & family planning leads to preventable complications.

3. Poor Health Infrastructure & Government Policies

- Weak Referral Systems → Delay in transferring critical patients to higher medical facilities.
- Shortage of Doctors & Midwives → Many states lack trained obstetricians & gynecologists.
- Inadequate Prenatal & Postnatal Care → Many women do not get regular check-ups.

How to reduce this ratio?



- **Better Healthcare Access:** More hospitals, trained birth attendants, and emergency care.
- **Improved Nutrition & Hygiene:** Reducing anemia, infections, and malnutrition in pregnant women.
- **Education & Awareness:** Teaching women about maternal health, contraception, and safe childbirth.
- **Stronger Policies & Funding:** More government investment in maternal healthcare programs.

Government Initiatives and Programs: Addressing Maternal Health Challenges

The Government of India has several policies to reduce maternal mortality, including financial support, free healthcare, and tracking high-risk pregnancies.

Financial support

Janani Suraksha Yojana (JSY): A conditional cash transfer scheme to promote institutional deliveries

Janani Shishu Suraksha Karyakram (JSSK): Free delivery, including C-sections, for pregnant women and sick infants in public health institutions

Free healthcare

Surakshit Matritva Aashwasan (SUMAN): Free, quality healthcare for women and newborns in public health facilities

Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA): Free antenatal checkups for pregnant women on the 9th of every month

Ananya Khanduri

Government programs promote institutional deliveries. They focus on improving maternal nutrition. These initiatives aim to reduce MMR and enhance life expectancy.

Future Directions: Policy Recommendations and the Path Forward

1	<div>Investment</div> <div>Increase investment in healthcare infrastructure and human resources. Prioritize maternal and child health services.</div>
2	<div>Education</div> <div>Promote girls' education. Empower women with knowledge and skills.</div>
3	<div>Equity</div> <div>Address socioeconomic disparities. Ensure access to quality healthcare for all.</div>

Continued efforts are needed to improve life expectancy and reduce MMR in India. This requires a multi-faceted approach.

Bibliography

1. <https://www.rbi.org.in/scripts/AnnualPublications.aspx?head=Handbook+of+Statistics+on+Indian+States> - RBI Website
2. The Methods and Materials of Demography Henry S. Shryock Jacob S. Siegel and Associates
3. <https://outreach-international.org/blog/poverty-in-india/> - Outreach International
4. <https://www.sciencedirect.com/science/article/pii/S0190740920321460> - ScienceDirect

The background features three vertical bars on the left: a wide pink bar, a medium blue bar, and a narrow beige bar. The right side of the image is a light beige background with two rectangular areas of a pink dot pattern. The top area is a grid of dots that tapers to the right. The bottom area is a solid grid of dots.

THANK YOU!

Ananya Khanduri