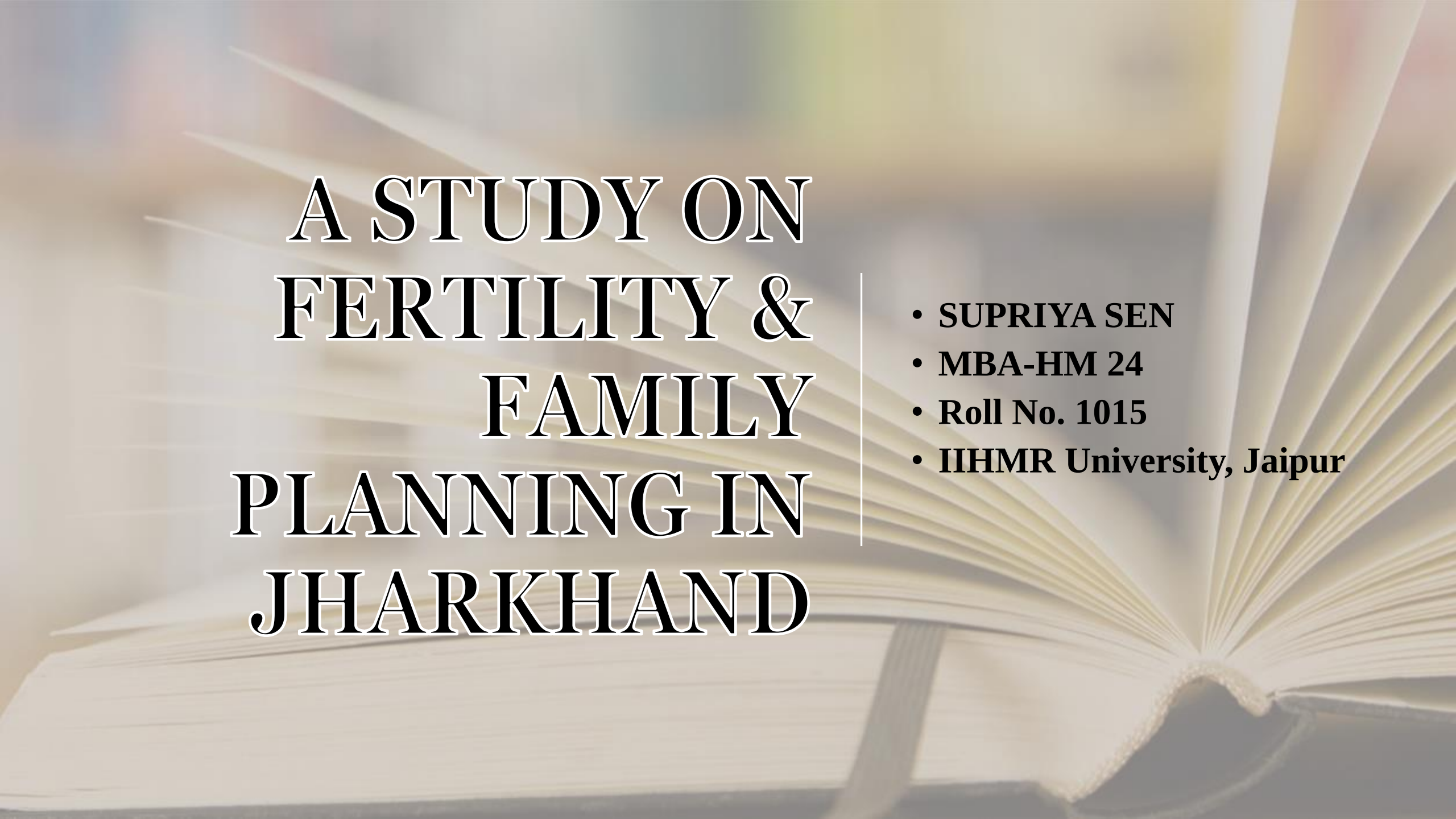




A STUDY ON FERTILITY & FAMILY PLANNING IN JHARKHAND

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INTRODUCTION

- In the past 50 years, India saw a drastic decline in fertility from 5.2 to 2.2 children per woman from 1971 to 2016
- National Population Policy was devised by the government of India in 2000 in order to meet the targeted TFR i.e. 2.1 children per woman and to bring stability in the population of India by 2045.
- This paper discusses Jharkhand's decline in fertility rate and the regional variations in order to explain current progress and identify areas in order to achieve sustainability or acceleration of fertilization.
- The decline in fertility rate in Jharkhand as compared to India in general with the emphasis on improvements in contraceptive coverage and demand met for family planning was compared.



NEED FOR THE STUDY

- The 2011 census shows that Jharkhand's population is approximately 33 million with a decadal growth rate of 22.4 percent, which was 40 years ago in Kerala and Tamilnadu.
 - The state of Jharkhand is predominantly rural with a population of 76,5 per cent of 30.5 million people living in cities, and a tribal population of over one-quarter (28 per cent).
 - Jharkhand being a poor state with high fertility rate, high MMR and Child mortality rate, high unmet needs, low literacy and low life expectancy are a major challenge for the government and policy makers.
 - Regrettably, there has been very little research in this field.
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RESEARCH QUESTION

- What are the different socioeconomic factors, affecting the fertility rate in currently married women of age group 15 – 49 in Jharkhand?
- What are the knowledge, attitude and practice of currently married women of age group 15 – 49 towards family planning in Jharkhand?

OBJECTIVES **OF THE** **STUDY**

To assess the status of fertility and family planning use in the state of Jharkhand

To assess the differentials in fertility and family planning use with respect to selected socioeconomic characteristics in the state of Jharkhand

To ascertain the time trends in fertility and family planning use in the state of Jharkhand.

METHODOLOGY



Analysis of Secondary data



- **NFHS(2,3 & 4) conducted in between 1998-2016 across India in a representative sample of households**
- **SRS data of Jharkhand and India between 2004 -2016.**

STUDY POPULATION

Currently married women in the age group (15-49 years) from Jharkhand and India

SAMPLING DESIGN

- ❖ Multi-stage sampling design in NFHS
- ❖ Uni. stage stratified simple random sample without replacement in SRS

VARIABLES

⑩ Dependent Variable – Total Fertility Rate (TFR)

⑩ Independent Variables –

1. Schooling (No Schooling)
2. Caste/tribe (Scheduled Caste)
3. Religion (Muslim)
4. Residence (Urban)
5. Wealth Index (Poorest and poor)

DATA ANALYSIS

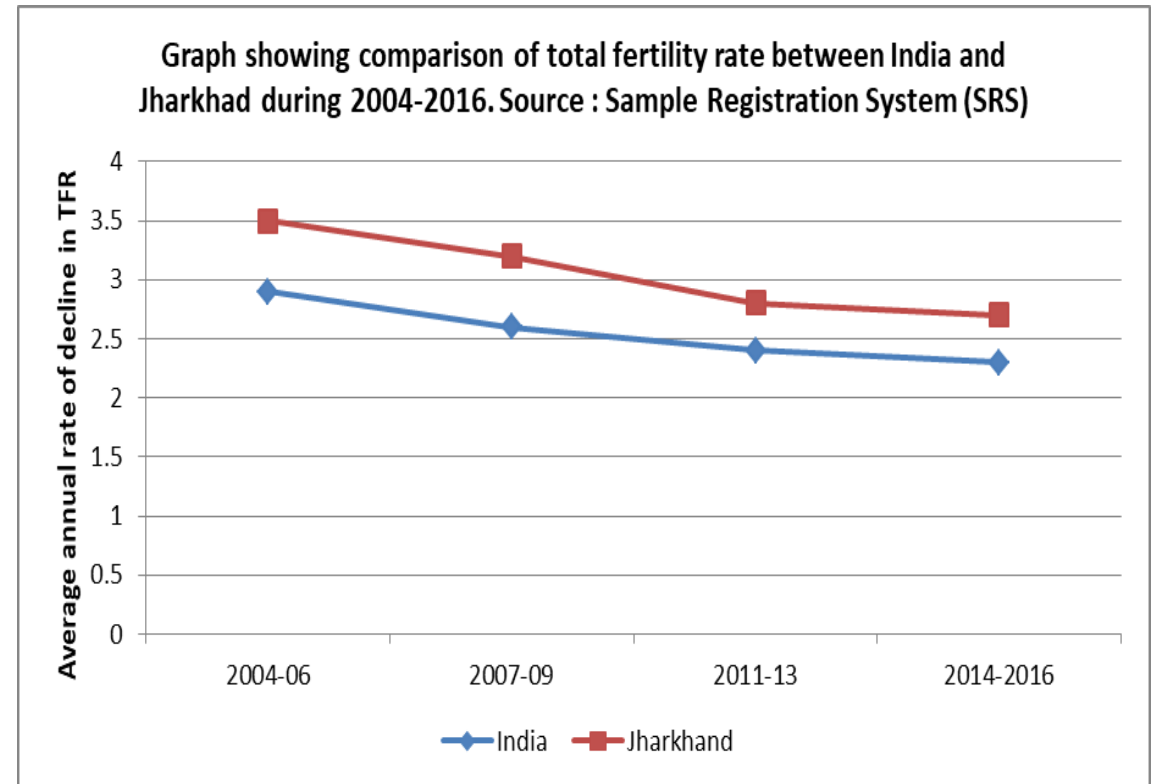
⑩ Data analysis was carried out using MS Excel.

⑩ Cross- Tabulation & Multiple Regression Analysis was performed to determine the relation between independent and dependent variables.

RESULTS

1. Rates and Patterns in TFR: Scenario of India and Jharkhand

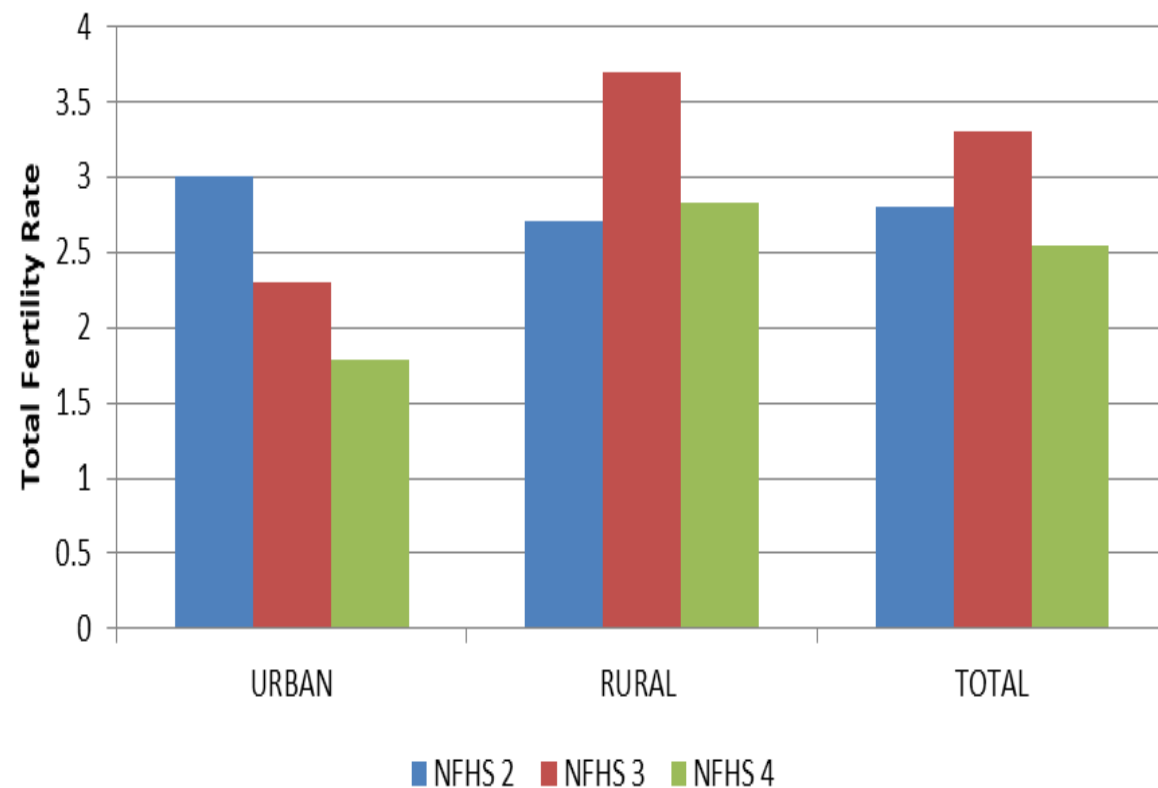
- ❖ The rate of decline in TFR in Jharkhand always exceeded pace of decline in India but it is much above the replacement level fertility
- ❖ The relative decline in fertility (22.8%) from 2004 to 2016 in Jharkhand is more than that of India (20.6%).
- ❖ The TFR of 2.55 in Jharkhand according to NFHS – 4 (2015–16) continued to be considerably higher than the country's TFR of 2.18 in 2015–16.



2. Rates and Patterns in TFR: According to Residency

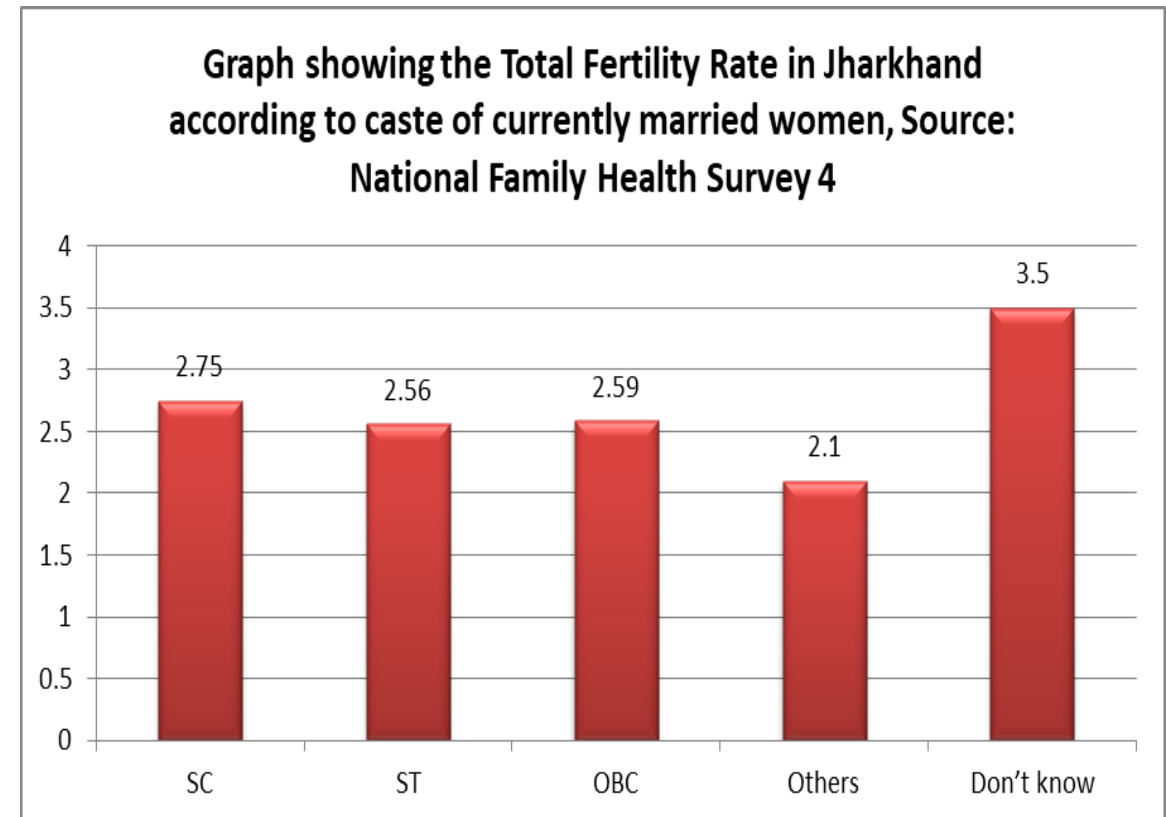
- ❖ The total fertility rate of women in rural area is 2.83 while in urban area it is 1.78 which is quite close to the replacement fertility level.
- ❖ The pace of urban fertility decline is much faster than the pace of rural fertility decline.
- ❖ The total fertility rate in urban area (1.78 children per woman) in NFHS 4 is extremely low than that of NFHS 2 (3 children per woman) and NFHS 3 (2.3 children per woman).

Graph showing the Total Fertility Rate in Jharkhand according to the type of Residence of currently married women (15-49). Source : National Family Health Survey



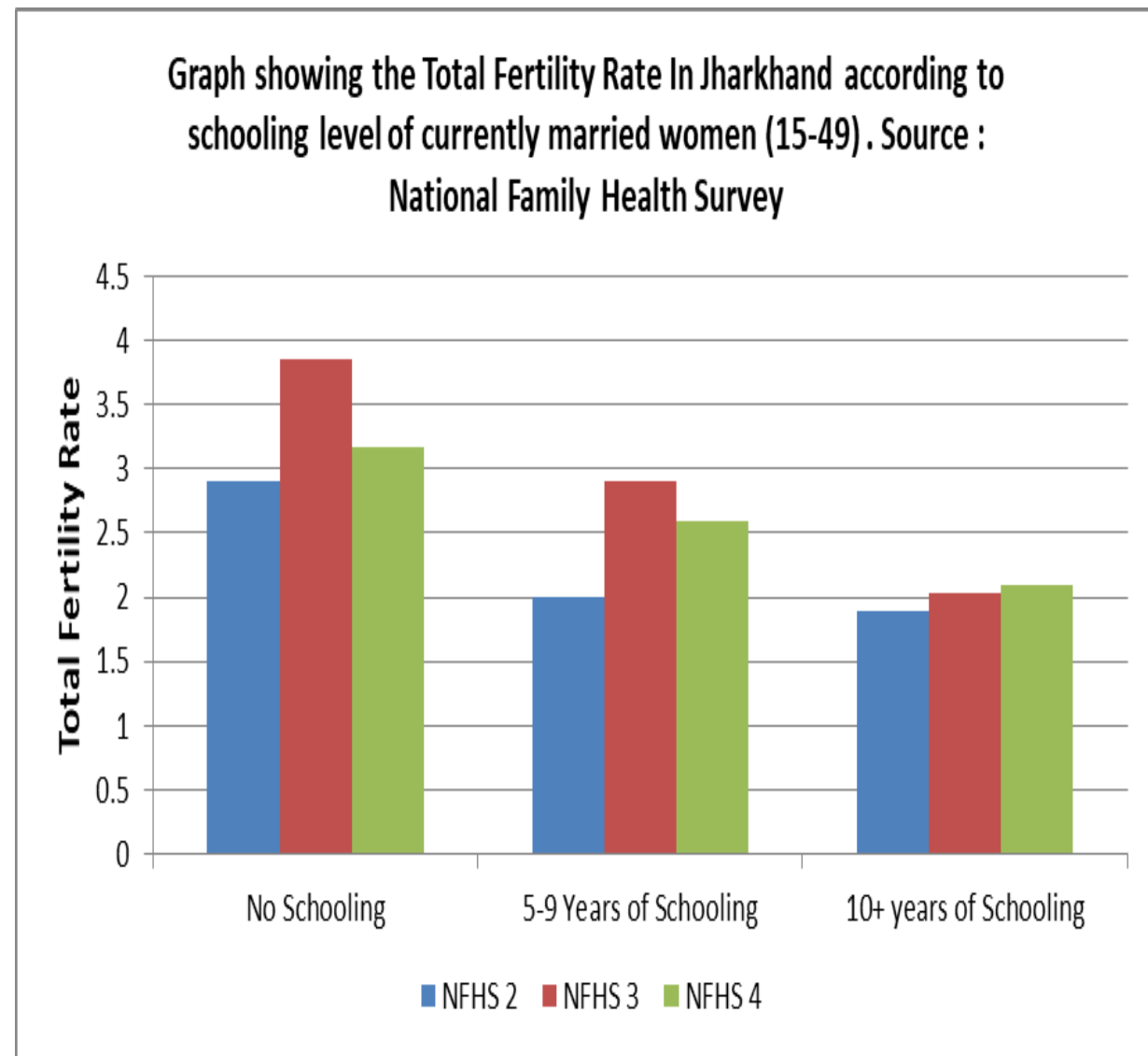
3. Rates and Patterns in TFR: According to Caste

Women belonging to the deprived category have higher Fertility rates (scheduled caste women with 2.75. scheduled tribe with 2.56 and women belonging to other backward class with 2.59) that those women who belong to the advantaged group according to NFHS – 4.

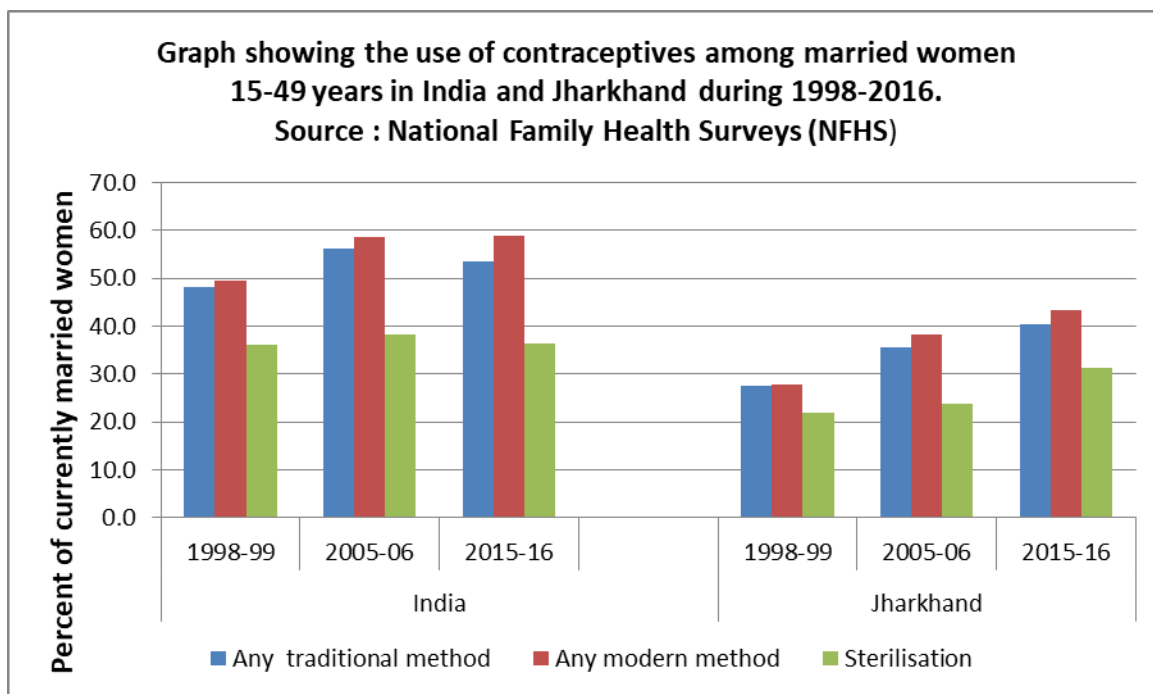


4. Rates and Patterns in TFR: According to Level of Education

- ❖ With respect to the education level, the fertility rate has showed a decline. In NFHS-2, fertility decreases from 2.9 (children per woman) without education to 1.9 (children per woman) with a total education of 10 or more years.
- ❖ women without any schooling (3.2) experience tends to have 1.3 children more than women who had an experience of 12 or more years of schooling (1.9).



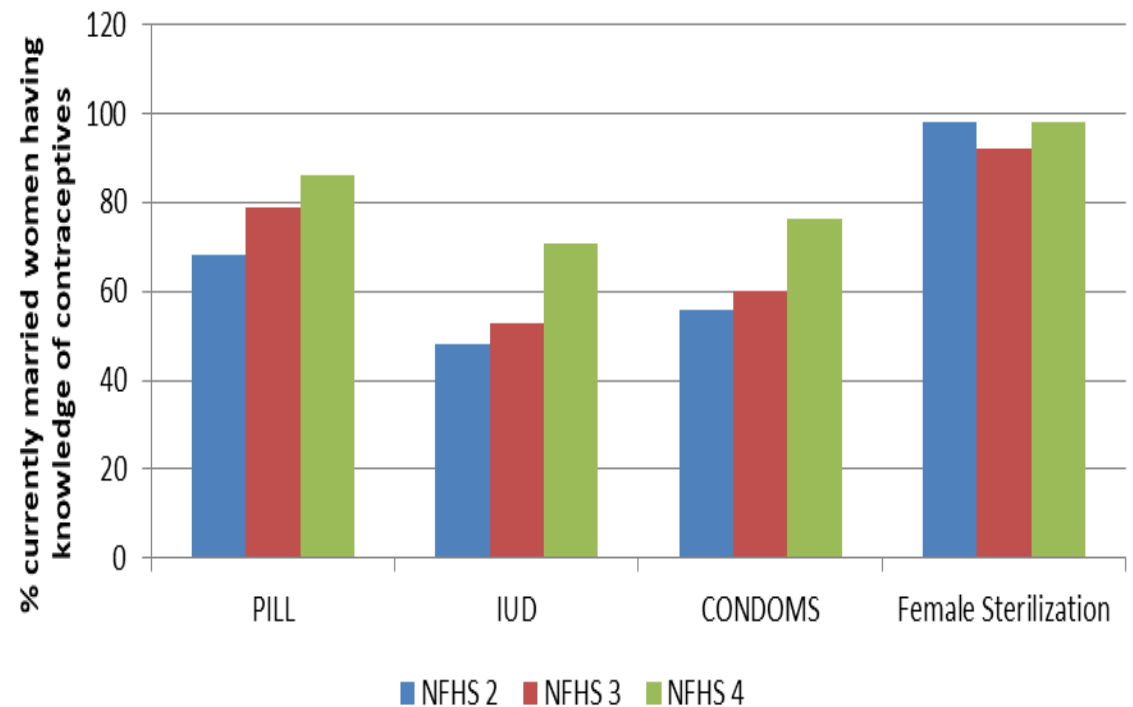
5. Knowledge and Use of Contraceptives



- ❖ Contraceptive Prevalence Rate is defined as the total number of contraceptive users per 100 eligible women at given time t.
- ❖ There seems to be a significant gap in the use of modern contraceptives among India (59%) and Jharkhand in 2015–16 (43.3%).
- ❖ About 36.3% and 31.3% of couples in India and Jharkhand respectively have one of the partners sterilized
- ❖ The use of conventional methods rises in Jharkhand from 27.6% to 40.4%.
- ❖ Pills (3 percent) and Condoms (2 percent) are the popular modern spacing methods used in Jharkhand.

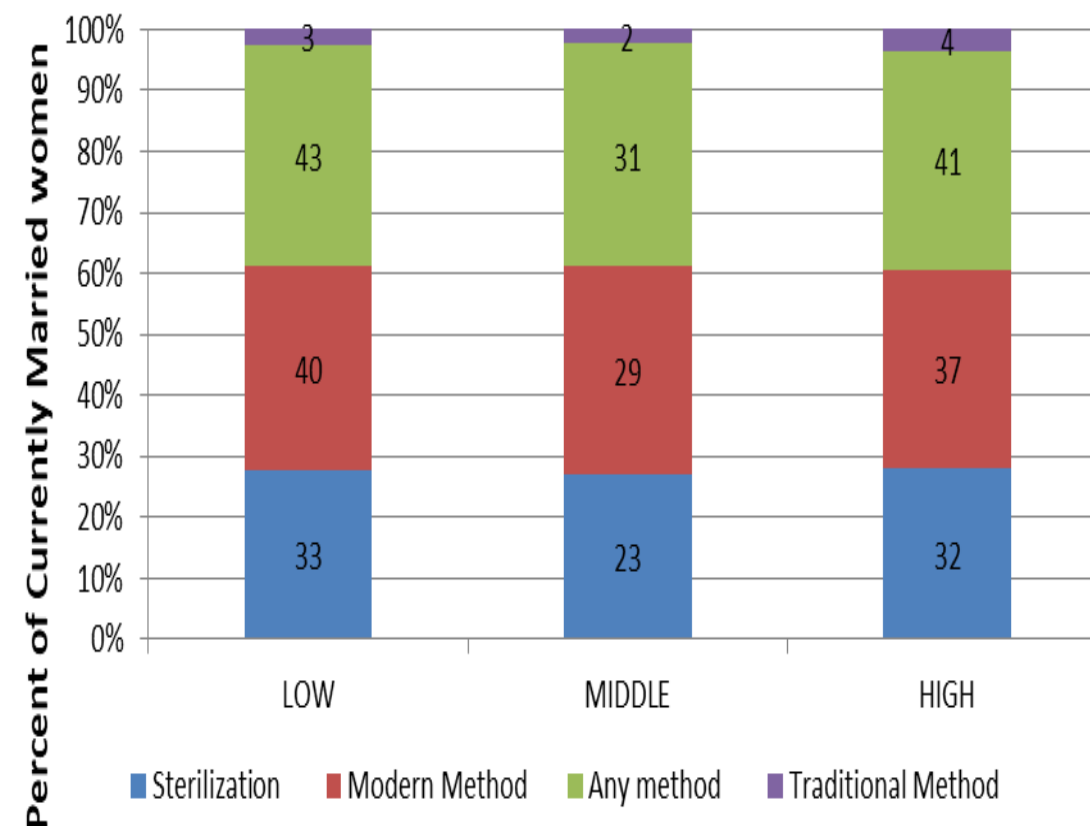
- The contraceptive prevalence rate (CPR) among currently married women age 15-49 is 40 percent, up from 36 percent in NFHS-3
- NFHS-4 data shows a sharp increase in contraceptive use with age from 7% for women between 15-19 and 52-53% for women between 30-49 years.
- The contraceptive prevalence continue to rise with the level of education, 16 % women having schooling of 12 or more years and about 37% of women who never went to school are to be sterilized which is just double.

Graph showing the Knowledge of contraceptive methods among currently married women in Jharkhand. Source : National Family Health Survey



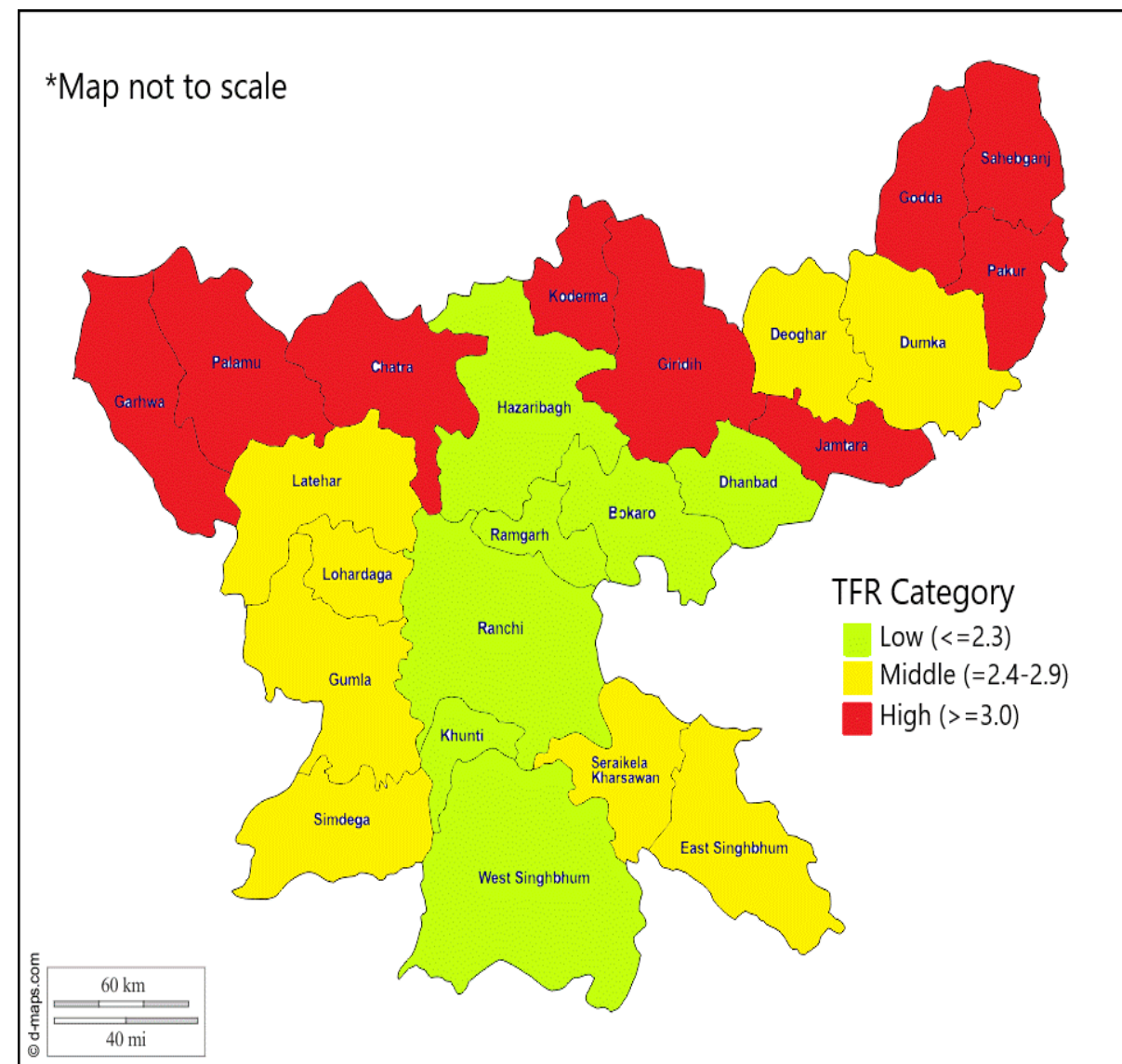
- Districts within Jharkhand are clustered into 3 tiers – Low, Medium and high based on the fertility rate. The Range is - low: TFR ≤ 2.3 , middle: TFR = 2.3–2.9 and high: TFR ≥ 3.0 .
- The importance of using sterilization is decreasing gradually and the use of modern methods such as condoms is increasing over time
- Traditional methods of contraception attributed for 2 per cent of users in districts with low and medium fertility and 4 per cent in districts with high fertility in 2015–2016.

Graph showing Percent distribution of main contraceptive methods among currently married women (15-49 years) in Jharkhand, by current TFR (2015-16). Source: National Family Health Survey 4

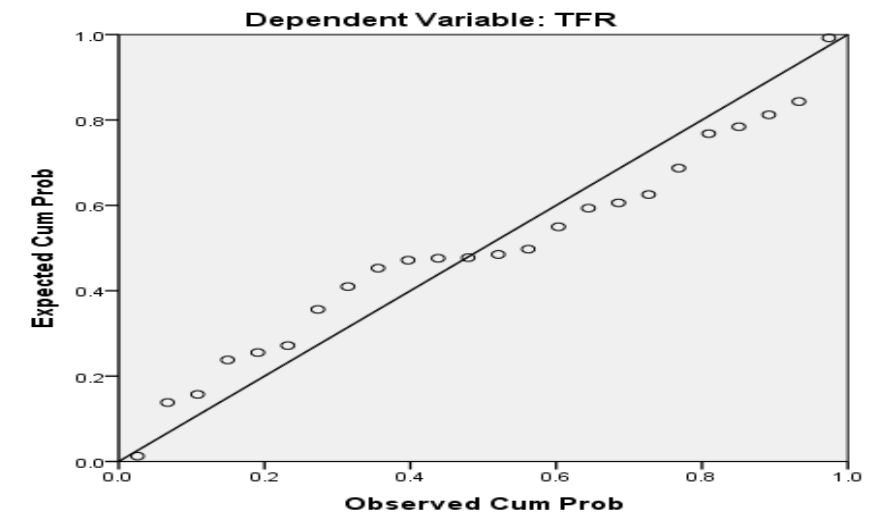
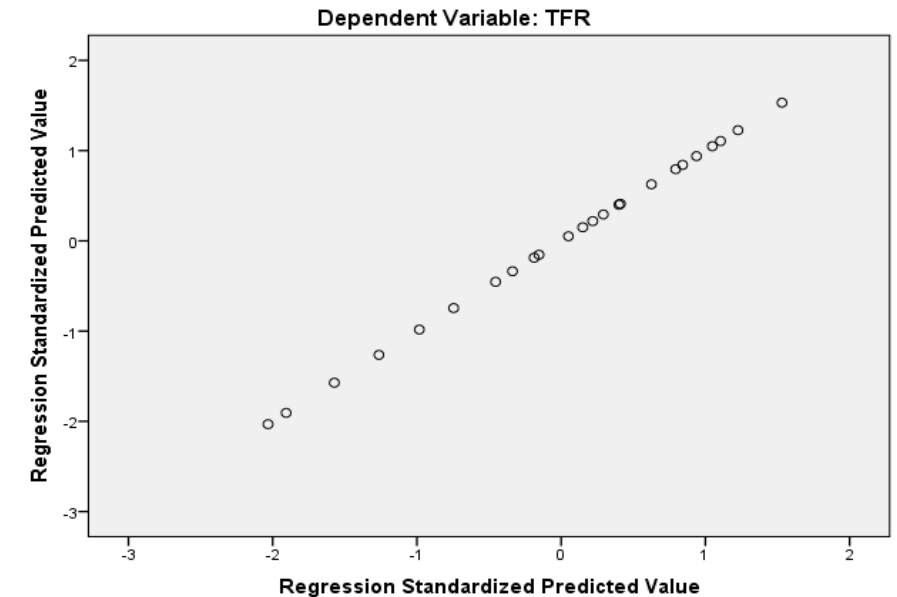


Fertility differentials within Jharkhand

- In NFHS – 4, the fertility level in districts varied from 1.65 in west Singhbhum, 1.91 in Ranchi districts; highly urbanized region, in central Jharkhand to 3.55 in Sahibganj districts from northern part.
- In the north region of Jharkhand and its neighbouring districts, most of the districts with high TFR were accumulated.
- The southern region of Jharkhand consists of districts with low TFR.



Independent Variables	Dependent Variable (TFR)	
Currently married women with:	Bivariate model:	Multivariate model:
	β -coefficient (S. Error; p-value)	β -coefficient (S. Error; p-value)
No Schooling	0.000 (0.001; 0.000)	0.002 (0.001; 0.049)
Residence (Urban)	0.000 (0.000; 0.088)	-0.001 (0.000; 0.018)
Religion (Muslim)	0.000 (0.000; 0.924)	0.000 (0.001; 0.731)
Caste (Schedule caste)	-0.001 (0.001; 0.414)	0.000 (0.001; 0.652)
Wealth Index (Poor & Poorest)	-0.001 (0.001; 0.342)	-0.001 (0.001; 0.388)
R square		0.362



“Model fit (R^2) for the regression is statistically significant at $p < 0.05$. Therefore, this model is significantly good fit”.

Table : Levels and Trends in demand for family planning in Jharkhand 1998–2016

YEAR	1998-99	2005-06	2015-16
Unmet need for family planning			
For Spacing	11.1	11.3	9
For Limiting	9.9	11.9	9.4
Total	21	23.1	18.4
Met need for family planning			
For Spacing	1.7	3.2	2.9
For Limiting	25.9	32.5	37.5
Total	27.6	35.7	40.4
Total demand for family planning			
For Spacing	12.8	14.5	11.9
For Limiting	35.8	44.4	46.8
Total	48.7	58.8	58.7

Rates & Patterns of Demand and Unmet need for family planning

- The overall demand of family planning (for limiting) showed an 11 percent increase from NFHS 2 (36%) to NFHS 4(47%).
- Considering the unmet need for spacing and limiting separately, it has been rising steadily over the period till 2006 and then a sudden decrease in a period of 10 years.
- . The percentage of unmet family planning needs in Jharkhand is well above national level (12.9%).

Rates & Patterns in Contraceptive use and method mix

- Contraceptive Prevalence Rate is defined as “percent of woman of reproductive age 15 – 49 years who are currently using a contraceptive method, mainly reported for married women”.
- The rate of contraceptive use in Jharkhand is considerably lower than the country as a whole (56%)
- Female sterilization and any modern method are the most popular modern method of contraception.
- The three modern methods such as pills, IUDs and condoms have shown a remarkable trend.

Table : Current use of contraceptive methods among currently married women 15-49 years by residence in Jharkhand. Source : National Family Health Survey									
Contraptive Method	NFHS 2			NFHS 3			NFHS 4		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Any Method	40.2	25	27.6	60	28.2	35.7	46.7	38.3	40.4
Any modern method	37.5	22.2	24.9	49.3	25.2	31.1	42.5	35.6	31.1
Pill	4	0.9	1.5	4.9	3.4	3.8	3.3	2.4	2.6
IUD	0.8	0.2	0.3	1.4	0.4	0.6	1.3	0.9	1
Condom	4.6	0.4	1.1	7.9	1.1	2.7	4.5	1.4	2.2
Female Sterilization	27.3	19.8	21.1	36	19.8	23.4	32.7	30.5	31.1
Male Sterilization	0.8	0.9	0.9	0.5	0.3	0.4	0.2	0.2	0.2
Any traditional method	2.4	0.9	1.1	10.1	2.9	4.7	4.1	2.5	2.9
Rhythm/Safe method	0.8	0.4	0.5	4.1	1.4	2.1	3	1.7	2
Withdrawal	1.6	0.5	0.7	5.1	0.9	2	1.1	0.8	0.9

Attitude Towards Family Planning

Women's attitude:

- Attitude is acquired and developed through various experiences.
- It was observed that the desired number of children tends to decrease when the level of education increases.
- Women who were aware of the contraceptive methods and side effects related to it were able to make better decision than the others.
- Moreover, Socio-economic factors played an important role in developing a positive attitude.

Men's attitudes: 56% of men believed that contraceptive is women's business and men should not be concerned about it. 51% of men were aware that use of condom can often prevent pregnancies.

DISCUSSION

- Jharkhand has played a major role in India's decline in fertility, particularly since 2005, when Jharkhand experienced a stronger decline in fertility than the whole nation.
- Knowledge of any form of family planning and of any modern practice in Jharkhand is universal.
- Jharkhand has significantly lower coverage of family planning with modern methods compared to India among currently married women, suggesting that significant improvements are required in access to family planning methods (NFHS-4).
- There is significant variability in fertility within districts of Jharkhand, ranging from 1.65 to 3.5 in 2015–16, including one-third of districts with fertility rates of 3.0 or above.
- Jharkhand, one of NRHM's (National Rural Health Mission) EAG states, has a bleak picture in terms of contraceptive use and offers scope to strengthen it further.



LIMITATIONS OF THE STUDY

- No analysis has been made of the role of sex preference in fertility differentials.
 - Other fertility determinants, such as age at marriage or the rate of abortion were not discussed in this study.
 - There were inadequate data concerning the provision of family planning services to help us understand why modern methods of family planning are so popular and why Jharkhand has such in adapted traditional methods
 - This analysis finally did not go beyond the districts level. Sub-district (blocks) research may help gain insight into the best possible approach to action.
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CONCLUSION

- There have been substantial decrease in fertility, but a lot needs to be done to meet fertility targets, minimize disparity between areas and make family planning for the couple universal.
- State policymakers must also gradually expand access to family planning programs and fulfil the unmet family planning requirement.
- The favourable implementation of women's empowerment programme, higher rate of participation of women in labour market and dispersed development programmes is considered conducive for the decline in fertility and unmet need for family planning in Jharkhand.

SUGGESTIONS

- Enhancing access to a broad range of high-quality contraceptive products and services.
- Emphasising on spacing methods and promoting spacing between children.
- Assuring greater participation of men in family planning.
- Expanding the health facilities and human capital to focus on the unmet need for family planning.
- Speeding up efforts to tackle socio-economic factors impacting fertility. It includes raising girl's age of marriage, encouraging more girls to go to schools and generating more job opportunities for women.

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PART 2 – DATA ANALYTICS FOR LEAN SIX SIGMA

Lean Six Sigma & DMAIC

It is a stepwise method for running a Process improvement project.

- A process improvement is required to:
- Find biggest problems
- Diagnose current process
- Investigate effect of improvements

Define	Select project and establish objectives
Measure	Make the problem quantifiable and measurable
Analyze	Analyze the current situation and make a diagnosis
Improve	Develop and implement improvement actions
Control	Control the improved process performance and close the project.

NUMERICAL AND CATEGORICAL DATA

Numerical (quantitative) data:

Real-valued or whole numbers: 85.3 °C (temperature), 2.12 mm (dimension), 14 people (counts)

- *Discrete*: Variables that can only take integer values, such as counts (number of people, number of mistakes). Variables can also be discrete because of rounding.
- *Continuous*: Values not limited to integers, such as a distance or temperature.

Categorical (qualitative) data:

Subtraction and addition have no meaning

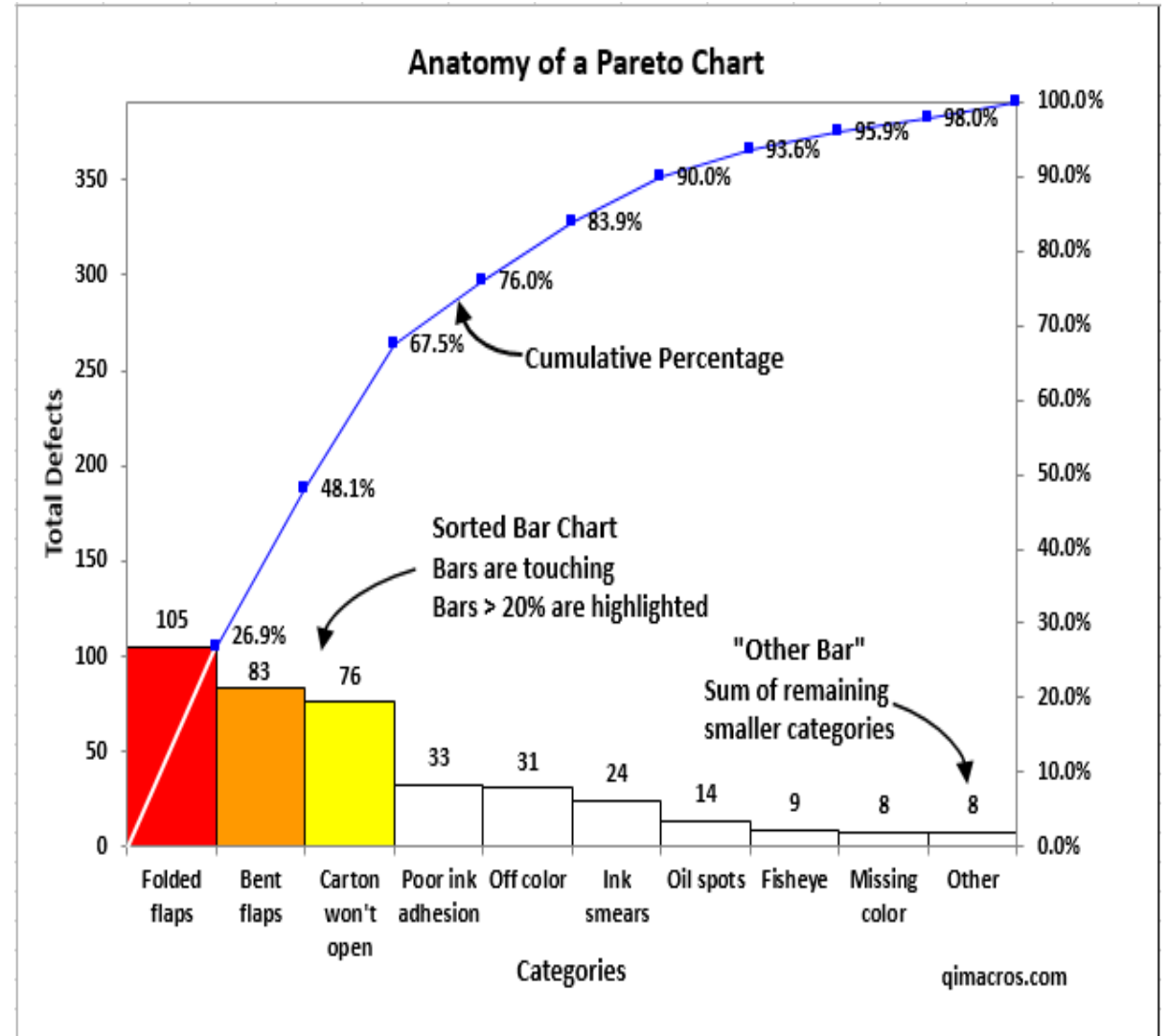
- *Ordinal data (order)*: there is a well-defined order among categories. Example: good, acceptable, critical, reject.
- *Nominal data (nomen = name)*: unordered categories; merely labels. Example: type XO, MM, SW, LS.
- *Binary data (bi = 2)*. Example: pass/fail, positive/negative, ok/nok.

Why make the distinctions between Numerical and Categorical data?

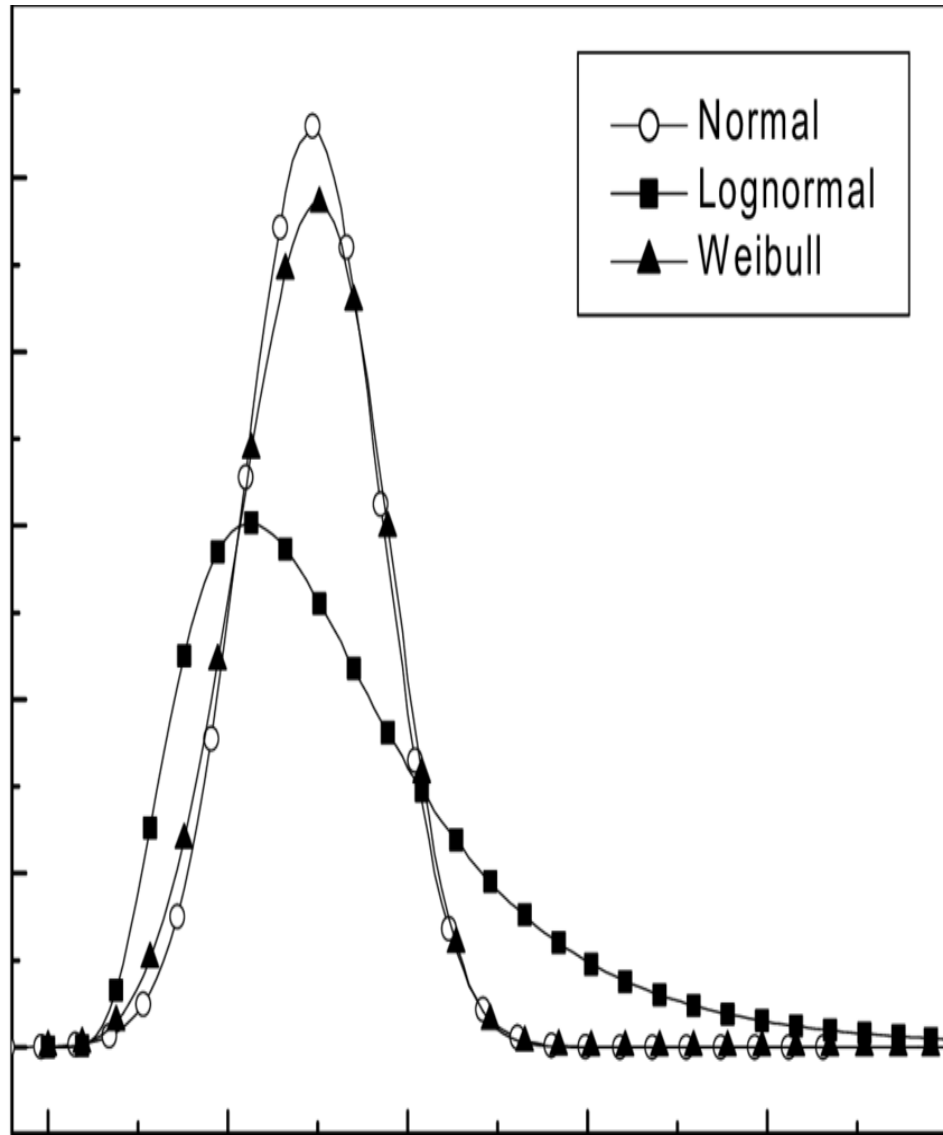
- **Information Density**. Numerical Data contains more information than categorical data. For Categorical data, more observations is required than numerical data.
- It determines which tool one should use.

PARETO – ANALYSIS

- The 80/20 principle, also known as the Pareto Principle. A Pareto chart can help to single out the few vital issues, from the trivial many.



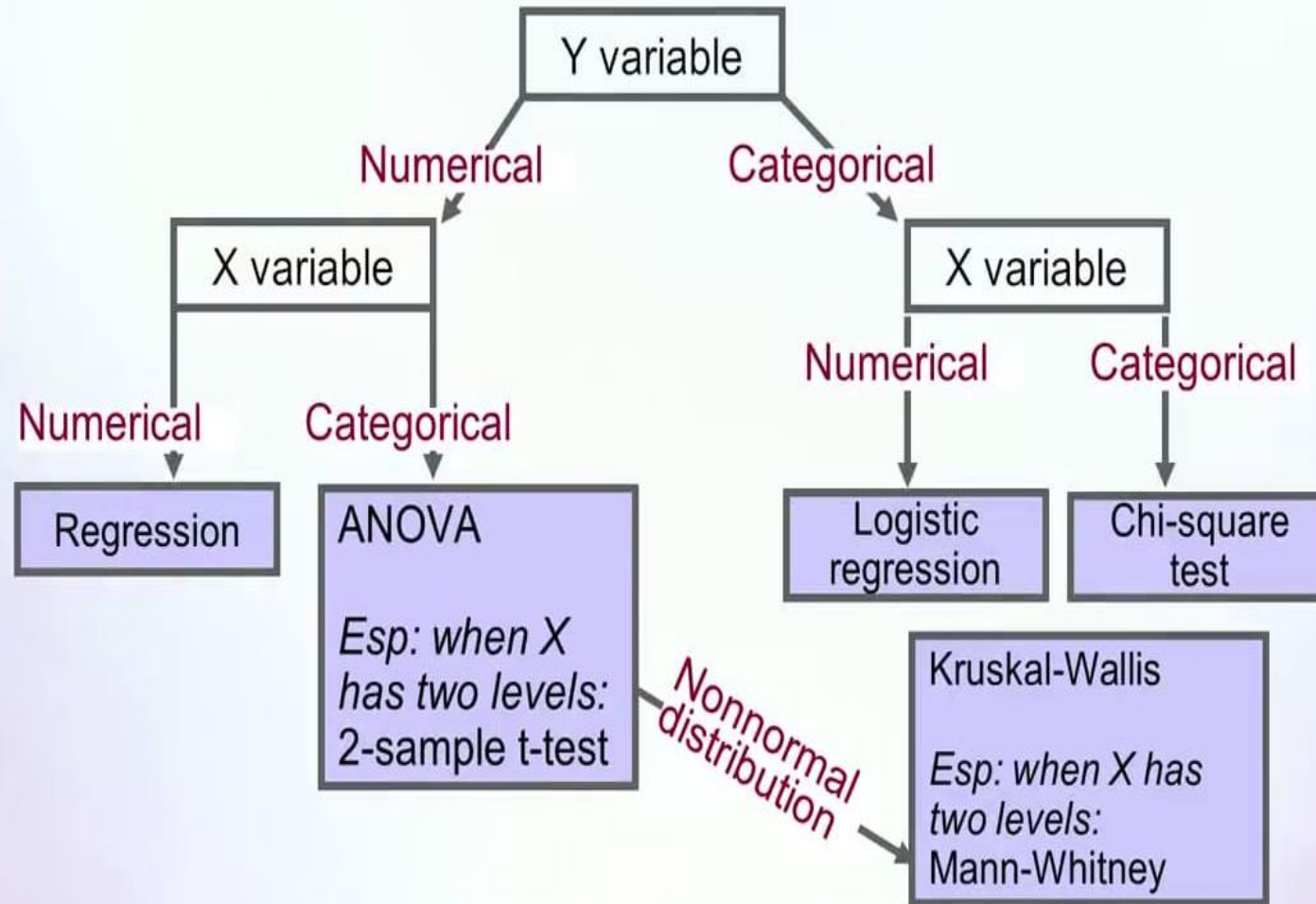
PROBABILITY DISTRIBUTION GRAPHS



3 Types

- Normal Distribution
- Weibull Distribution
- Log-Normal Distribution

DATA ANALYSIS



Testing: Numerical Y and Categorical X – ANOVA

1. **Organize Data** -
Organize the data such
that the Y and X variables
are in the columns



2. **ANOVA** - Are the groups
means identical for each of
the levels of the X variable?



3. **Residuals** - Is the random
scatter normal? Are there
outliers or irregularities?

- **KRUSKAL-WALLIS Test**

It is a non-parametric test. This means that there is no specific distribution assumed on the residuals. ANOVA is based on assumptions that residuals are normally distributed, and that the residuals contain no irregularities such as outliers. Kruskal-Wallis Test is less powerful than ANOVA if we let go of the assumptions.

- **Two- Sample t-test**

Also known as the student's t-test. It is a method used to compare means of two groups. The p-value can be used to calculate whether the differences of the two mean is coincidental, or truly significant. It is a very old test and forms the building block of many other tests that have been developed since.

- **TEST FOR EQUAL VARIANCES**

Increasing variability always degrades the performance of the production system. This is the law of variability. Compare variances across groups with the test for equal variances. It can also be used for the ANOVA analysis to determine if the 'assume equal variances' mode can be used (p-value will be more precise).

Testing Numerical X and Numerical Y

- **Correlation:** It is an index that expresses how strong a relationship between two numerical variables is.
- **Regression:** Regression analysis is about finding the best fitting linear line.

A line can be described mathematically by the formula $y = a + bx$.

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1. Fitted Line Plot

- Fit a line $Y = a + bX$ that describes the relationship

2. Regression

- Is the evidence for the relationship significant?
- Is the relationship strong?

3. Residuals

- Are the residuals normal?
- Are there outliers or irregularities?

4. Prediction interval (optional)

- Bounds for 95% of the data points

Testing Categorical Y

- **Chi-square analysis** – It is commonly used for testing relationships between categorical variables. The first step is to make a cross-tabulation. The second step is to look at the p-value and check if the results are significant.
- **Logistic Regression** – Logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more nominal, ordinal, interval or ratio-level independent variables.

First

- Enter data in event/trail format

Second

- Make fitted line plot

Third

- P- Value



Thank You

