

Reproductive and Maternal Health Interventions in Districts of Uttar Pradesh

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ABSTRACT

Maternal mortality ratios (MMR) vary significantly across states. Achieving the Sustainable Development Goal (SDG) of universal health coverage requires greater equity in sub-state access to health interventions. The present study analyses progress in maternal and reproductive health (RMH) interventions at the district level in Uttar Pradesh (UP) using data from National Family Health Survey (NFHS) rounds 4 and 5. The individual RMH indicators and the composite index of RMH interventions for 75 districts in UP revealed progress although coverage remained low in many districts and large differences persisted across districts. The mean coverage among women in the adoption of modern family planning practices (MOD-FP), as well as pregnant women having four or more Ante Natal Check-ups (ANC-4), and usage of iron folic acid (IFA) for 100 days or more, was found to be low. While a spatial clustering of socio-economic indicators was seen across the four regions of Uttar Pradesh: Western, Central, Bundelkhand and Eastern, RMH coverage showed no statistically significant spatial variation in these regions in 2019-21 in contrast with 2015-16 suggesting a trend of regional equality in RMH interventions in the state. Multivariate regression results showed that variations in RMH coverage across districts were predicted by socio-economic factors. The significant progress made by some districts, especially in the Eastern region suggested that government RMH policies and community health workers like Accredited Social Health Activists (ASHAs) could be a crucial and effective link between the government and pregnant women. Expanding fertility choices and ensuring safe motherhood for pregnant women requires a contextual understanding of the inter connections between social, economic and cultural factors.

Key words: Reproductive and maternal health, sub-state variations, socio-economic determinants, Uttar Pradesh

INTRODUCTION

Maternal mortality ratio (MMR) defined as the number of deaths per 100,000 live births declined significantly in India from 130 to 97 during 2014-16 to 2018-20 as per the data released by the Office of the Registrar General of India. Large differences in maternal health outcomes persist across states in India. As against the national average MMR of 97 deaths per 100,000 live births in 2018-20, the state of Uttar Pradesh (U. P.), had an MMR of 167, whereas Kerala's MMR was 19. However, greater equity in sub-national maternal health outcomes is necessary for the country to meet the Sustainable Development Goals (SDG) target of an MMR of 70 deaths per 100,000 live births to be achieved by 2030. The inequities in maternal health outcomes necessitate a closer look at sub-state access to reproductive and maternal health (RMH) interventions. While studies have typically measured inequalities at the national and

state level, the present paper contributes to the literature by exploring a lesser-researched issue of disparities in RMH services coverage at the sub-state level i.e. district level in Uttar Pradesh (U. P.) using data from National Family Health Survey (NFHS) rounds 4 and 5. It is well known that geographic access influences women's utilization of reproductive and maternal health (RMH) services (WHO, 2015). There are wide differences in U. P. across districts in socioeconomic indicators like income, household access to basic necessities, literacy, the share of urban population, percentage of population by caste and religion, family planning services and outreach, etc. These differences affect the coverage of RMH. The paper addressed four broad questions. Firstly, what progress have districts in U. P. made in the individual indicators of RMH interventions and in the composite index of RMH coverage between the two NFHS rounds i.e. between 2015-16 and 2019-21? Secondly, how have individual

districts performed in RMH services coverage, and what has been the extent of catching up in the 75 districts of U. P. and in comparison, with India's performance? Thirdly, given the vast differences in socioeconomic indicators across the four different regions in U. P. i.e. Western, Central, Bundelkhand, and Eastern regions, how significant are differences in RMH services coverage across regions? Finally, what key socio-economic and demographic determinants explain RMH interventions across districts in UP?

In 2015, the United Nations General Assembly set a target under SDGs to reduce global maternal mortality to less than 70 per 100,000 live births by 2030. Within-country inequalities persist across geographical regions in RMH indicators and are to the detriment of women in disadvantaged population sub-groups (Faye *et al.*, 2020). Large spatial heterogeneity is seen in MMR across districts in India (Goli *et al.*, 2022). Limited access to reproductive and maternal healthcare services contributes to poor outcomes in terms of maternal mortality and complications. The poorest, least educated and those residing in rural areas had lower health intervention coverage and worse health outcomes than the advantaged (WHO, 2015). Broad determinants of maternal mortality have been categorized as individual non-medical risk factors like poverty and caste inequities, social and economic context like women's social status and access to material necessities, and the functioning and efficacy of health systems like medical infrastructure and health services availability. The WHO's Commission on Social Determinants of Health provides a framework to identify structural factors and the interconnections between them that influence RMH interventions.

Scoping reviews of qualitative and quantitative studies in India on the social determinants of maternal health have identified economic status, social status (caste/tribe), religion, education, gender, place of residence, exposure to mass media and culture as important determinants (Hamal *et al.*, 2020). Inequalities in RMH are rooted in the interrelations between social, structural and contextual factors. Dey *et al.* (2018) highlight the importance of co-occurring forms of marginalization in dealing with inequities in effective healthcare utilization. Their study

showed that the interaction of wealth, literacy, religion, social group, and women's age at marriage created substantial disparities in utilization among women in rural households in 25 districts of U. P. The Demographic Health Surveys (NFHS, various rounds) are large sample surveys that collect data from households across India and are a rich data source for studies on RMH coverage and its determinants. Existing studies have used stand alone indicators like Full Ante Natal Care (ANC), demand for Family Planning (FP) satisfied, Post Natal Care (PNC), Institutional births (IB), presence of Skilled Birth Attendants (SBA), etc., or a Composite Coverage Index (CCI) or Coverage Gap Index (CGI) as outcome variables in multivariate analysis and inequality measurement using absolute and relative measures including range, range ratio, Gini coefficient, concentration index and slope index of inequality (Panda *et al.*, 2020; Wehrmeister *et al.*, 2020; Kiran *et al.*, 2022; Ferreira *et al.*, 2024). Women's autonomy and empowerment has been shown to be a significant predictor of maternal healthcare in India with maternal healthcare increasing with a greater level of autonomy (Mondal *et al.*, 2020; Das *et al.*, 2024). Socio-demographic factors influencing maternal healthcare utilization have been identified as caste, religion, educational attainment, age at marriage, wealth quintile, number of births, place of residence, etc., (Paul and Chouhan, 2020; Chauhan *et al.*, 2021). Yadav *et al.* (2020) showed an upward trend in the utilization of maternal healthcare services during 1998-99 to 2015-16. In their study, the binary logistic regression results from pooled data showed that factors associated with low utilization of maternal healthcare services were illiteracy, female age greater than 40 years, having five and more children, belonging to scheduled tribes, rural residence and not possessing a health card while partner's education, good economic status, women's autonomy and infrastructure at the village level were associated with better odds of availing these services. The role of primary health centres, and frontline community and health workers like Accredited Social Health Activists (ASHAs) significantly influenced women's reproductive and maternal health (Bhatia *et al.*, 2021; Singh *et al.*, 2023). A qualitative study conducted in two districts of rural U. P. showed that

community health workers positively influenced birth preparedness including institutional deliveries, through counselling and sharing of information relating to maternal health especially among socio-economically disadvantaged women (Blanchard *et al.*, 2021). Bhatia *et al.* (2021) examined trends and determinants of maternal mortality across states during 1997-2017 and concluded that gains in maternal mortality have been unevenly distributed. Their study showed that maternal mortality rates were higher than the national average in Empowered Action Group (EAG) states like Bihar, Odisha, Rajasthan and Assam.

MATERIALS AND METHODS

The present study accessed publicly available data from the National Family Health Survey (NFHS) Rounds 4 (2015-16) and 5 (2019-21) (International Institute for Population Sciences, and ICF; 2017, 2021). The NFHS is a large-sample multi-round survey conducted in a representative sample of households throughout India. The NFHS data enable comparisons across districts and over different survey reports. The eight health indicators from NFHS that were selected to study RMH coverage are given in Table 1.

A composite index of RMH coverage (RMH-Index) was constructed as the equal-weighted average of the eight indicators of Table 1 covering the reproductive, pregnancy, delivery and postnatal care continuum for RMH interventions in the 75 districts in U. P. and India. The trends in RMH coverage were

inferred and used for descriptive summary statistics to understand the distributions and to analyze variations across districts and regions in the state. Multivariate analysis was used to explain cross-sectional variations across districts and to understand the socio-economic and demographic correlates of RMH interventions. The ordinary least squares (OLS) regression model for cross-sectional regression using district-level data was specified as:

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki} + \varepsilon_i \quad \dots(1)$$

Where, y was the district score on the RMH index, x 's the district-level socio-economic and demographic explanatory variables in the study and ε was the classical disturbance term. The dependent variable for the regression analysis was the composite RMH index. The study included nine independent district-level variables, namely, per capita income (PCI), percentage of urban population (Urban pop), an index of household access to basic necessities (BN Index), the status of women index (Status Index), health infrastructure index (HI Index), total unmet need for FP (Unmet need) for currently married women aged 15-49 years and a measure of outreach in FP services given by whether health workers spoke to non-users about FP (FP outreach), percentage of Muslim population (Muslim pop), and percentage of Scheduled Class (SC) and Scheduled Tribe (ST) population (SC-ST pop).

The data on per capita net income at the district level (PCI) at 2011-12 prices for 2019-20 were obtained from Statistical Diary, Uttar

Table 1. Selected reproductive and maternal health (RMH) indicators used in the study

Category	Indicator
Reproductive health coverage (current use of family planning methods among currently married women aged 15-49 years)	1. Contraceptive coverage among currently married women aged 15-49 years—Any modern method of Family Planning (MOD-FP) (%)
Maternal health coverage (for the last birth in the five years before the survey)	2. Mothers who had an antenatal check-up (ANC) in the first trimester (%) (ANC-FT) 3. Mothers who had at least four ANC visits (%) (ANC-4) 4. Mothers whose last birth was last birth in the protected against neonatal tetanus (%) (TT) 5. Mothers who consumed iron folic acid for 100 days or more when they were pregnant (%) (IFA) 6. Births attended by skilled health personnel (%) (SBA) 7. Institutional births—public/private facility (%) (IB) 8. Mothers who received postnatal care (PNC) from a doctor/nurse/LHV/ANM/midwife/other health personnel within two days of delivery (%)

Source: Based on secondary data from NFHS.

Pradesh (2022). The 2011 Census district-wise data on the urban, Muslim populations, SC and ST populations and total populations were used to obtain district-wise percentage of urban, Muslim and SC-ST population. The study included three indices relating to household access to basic amenities, the status of women and a measure of health infrastructure. The household access to necessities index, BN Index, was based on four indicators: the percentage of population living in households having access to electricity, improved drinking water source, improved sanitation and the percentage of households using clean fuel for cooking. The status of women index (Status Index) was constructed from data on four indicators relating to women's education, early marriage and their health-the percentage of women with ten or more years of schooling, the percentage of women aged 20-24 years married before age 18, and health of women given by the percentage of women whose body mass index (BMI) was below normal and percentage of women aged 15-49 years who were anaemic. The Basic Needs Index and Status of Women Index were constructed on a scale of 0 to 100 (excluding zero) and obtained as the geometric mean of standardized indicators included in each index after adjusting for the direction of indicators (WHO Centre for Health Development). Data for the construction of these two indices were obtained from NFHS-5, 2019-21. The Health Infrastructure Index (HI Index) was computed using data on six district-level indicators i.e. the number of Allopathic hospitals/dispensaries per lakh population, number of beds in Allopathic hospitals/dispensaries per lakh population, number of Ayurvedic/Homeopathic/Unani hospitals/dispensaries per lakh population, number of beds in Ayurvedic/Homeopathic/Unani hospitals/dispensaries per lakh population, number of Community Health Centres (CHCs)/Primary Health Centres (PHCs) per lakh population and number of family welfare clinics/centres per lakh population obtained from the official state publication (District Wise Development Indicators, 2021). The principal component analysis method was used to construct the Health Infrastructure Index. The factor scores from the first two rotated principal components were used to obtain weighted rotated factor scores using the proportion of variance

explained by the rotated component to the total variance of extracted components as weights. The weighted factor scores were then standardized to obtain the index score for each district on a scale of 0 to 100. The results from the KMO test and Bartlett's test of sphericity validated the use of principal component analysis for dimensionality reduction of the data set.

RESULTS AND DISCUSSION

The state of U. P. has a population of over 240 million people and accounts for about 17% of India's population. The state has a young population, a large proportion of women in the reproductive age group, with a high fertility rate. Low per capita income, low female literacy rates and large rural populations characterizing the state are all predictors of lower health coverage and worse health outcomes. Although the MMR in U. P. declined from 201 deaths per 100,000 live births in 2014-16 to 167 in 2018-20, within-state variations in access to RMH interventions are pronounced.

Trends in RMH Interventions

The progress in the coverage of individual RMH indicators and the overall performance given by the composite index (RMH-Index) among the districts of U. P. were evaluated. Table 2 gives summary statistics and Fig. 1 shows box plots that provide visual dispersion of individual indicators and the RMH index in the districts of U. P. for 2015-16 and 2019-21.

In U. P., the mean coverage across districts in the adoption of modern family planning practices (MOD-FP), four or more ANC's (ANC-4), and the usage of iron folic acid (IFA) by pregnant women were low. In 2019-21, the average usage of modern contraceptive practices was only 45%, while coverage in four or more ANC i.e. ANC-4 was 42% and only 22.5% of women consumed iron folic acid for 100 days or more. According to the WHO, the ability of women, to regulate and control fertility is an integral component of the reproductive healthcare package. Reproductive health interventions used by modern family planning methods also showed large inequalities in U. P. as given by the range and Gini coefficients. In 2019-21, the usage of modern contraception

Table 2. Summary statistics for individual reproductive and maternal health care interventions and the composite index in districts of Uttar Pradesh, 2015-16 and 2019-21

Variable	Year	Minimum	Maximum	Mean	Standard deviation	Gini coefficient
MOD-FP	2015-16	2.70	59.2	31.5	11.4	0.204
	2019-21	20.7	65.7	44.5	9.15	0.114
PNC	2015-16	17.0	74.8	54.2	13.0	0.132
	2019-21	41.5	88.5	72.2	9.61	0.074
ANC-FT	2015-16	13.5	76.2	46.2	14.4	0.176
	2019-21	40.2	82.7	63.4	10.5	0.094
ANC-4	2015-16	4.30	59.4	25.9	12.6	0.273
	2019-21	19.8	69.9	42.0	9.30	0.122
TT	2015-16	61.0	96.9	86.4	7.38	0.043
	2019-21	79.9	97.6	92.0	3.52	0.021
IFA	2015-16	2.00	26.1	12.3	5.98	0.273
	2019-21	10.6	47.8	22.5	6.77	0.165
IB	2015-16	30.8	89.6	69.0	11.1	0.087
	2019-21	63.3	96.3	84.0	7.39	0.049
SBA	2015-16	36.8	91.6	71.5	10.7	0.081
	2019-21	67.4	97.0	85.3	6.65	0.043
RMH-Index	2015-16	23.2	64.0	49.6	8.41	0.092
	2019-21	48.9	73.2	63.3	5.09	0.045

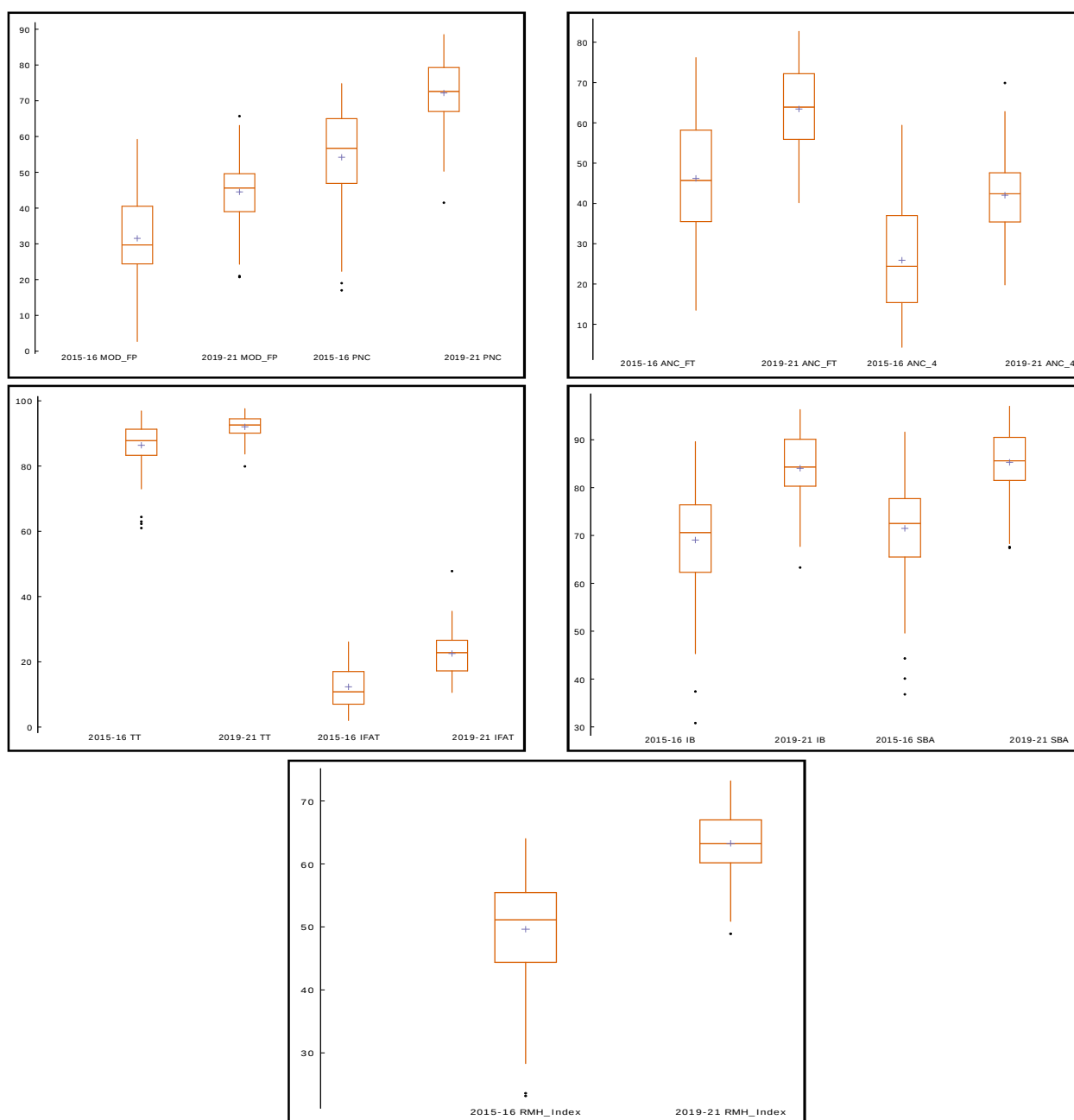
Where, MOD-FP: Modern family planning, PNC: Postnatal care, ANC-FT: ANC in the first trimester, ANC-4: Four or more ANC visits, TT: Tetanus, IFA: Iron folic acid usage, IA: Institutional births, SBA: Skilled health attendant at birth and RMH-Index: Composite index of reproductive and maternal health indicators.

was more than three times as high in women in the best-performing district as compared to the poorest-performing district in the state which had coverage of only around 20%. The percentage of pregnant women consuming iron folic acid for 100 or more days also showed low coverage and a large variation. Mean coverage was only 22.5% with the minimum being only 10.6%. However, a large percentage of pregnant women was protected against neonatal tetanus and this indicator showed the highest equality in coverage in 2019-21. ANC offers comprehensive interventions for pregnant women including immunization, nutrition education and counselling regarding care during pregnancy and delivery. First trimester ANC (ANC-FT) is crucial to identify risks in the early stage of pregnancy. While mean rates of ANC-FT improved from 46 to 63% between 2015-16 and 2019-21, in ANC-4 which required periodic visits and follow-up, gaps across districts remained high and progress was significantly slower with mean coverage increasing slowly from 26 to 42%. Safe motherhood requires attention by skilled health personnel (SBA) during labour and delivery and institutional deliveries (IB) lower the risk arising from complications. There was sharp rise in both SBA and IB with coverage of around 85% in 2019-21 and a reduction in the range and Gini coefficient. The average percentage

of mothers receiving PNC from skilled health personnel within two days of delivery increased to 72% in 2019-21 from 52% in 2015-16. Except in TT, where the mean figure for U. P. districts was comparable to India's figure of 92, in 2019-21, in all other indicators, the state of U. P. under performed in RMH interventions. In the case of IFA, U. P.'s average figure of 22.5 was about half the national average. In IB and SBA, although coverage has improved, the state figures were found to be lower than the national average for India in 2019-21. The average figures for U. P. in ANC-4 and MOD-FP were lower by 16 and 12% point differences, respectively, in comparison with all-India figures.

Although the composite index of maternal and reproductive health (RMH-Index) increased between 2015-16 and 2019-21, there were pronounced inter-district inequalities. The aggregate index varied considerably across districts from 49 to 73% in 2019-21. The mean RMH Index for U. P. was about 9 percentage points less than India's figure in 2019-21, but gaps between the aggregate national estimate of RMH for India and some of the lagging districts were large with a difference of 15 to 20 or more percentage points.

The box plots in Fig. 1 show smaller ranges, less scattered data and narrower distributions in 2019-21 as compared to 2015-16. Overall, the



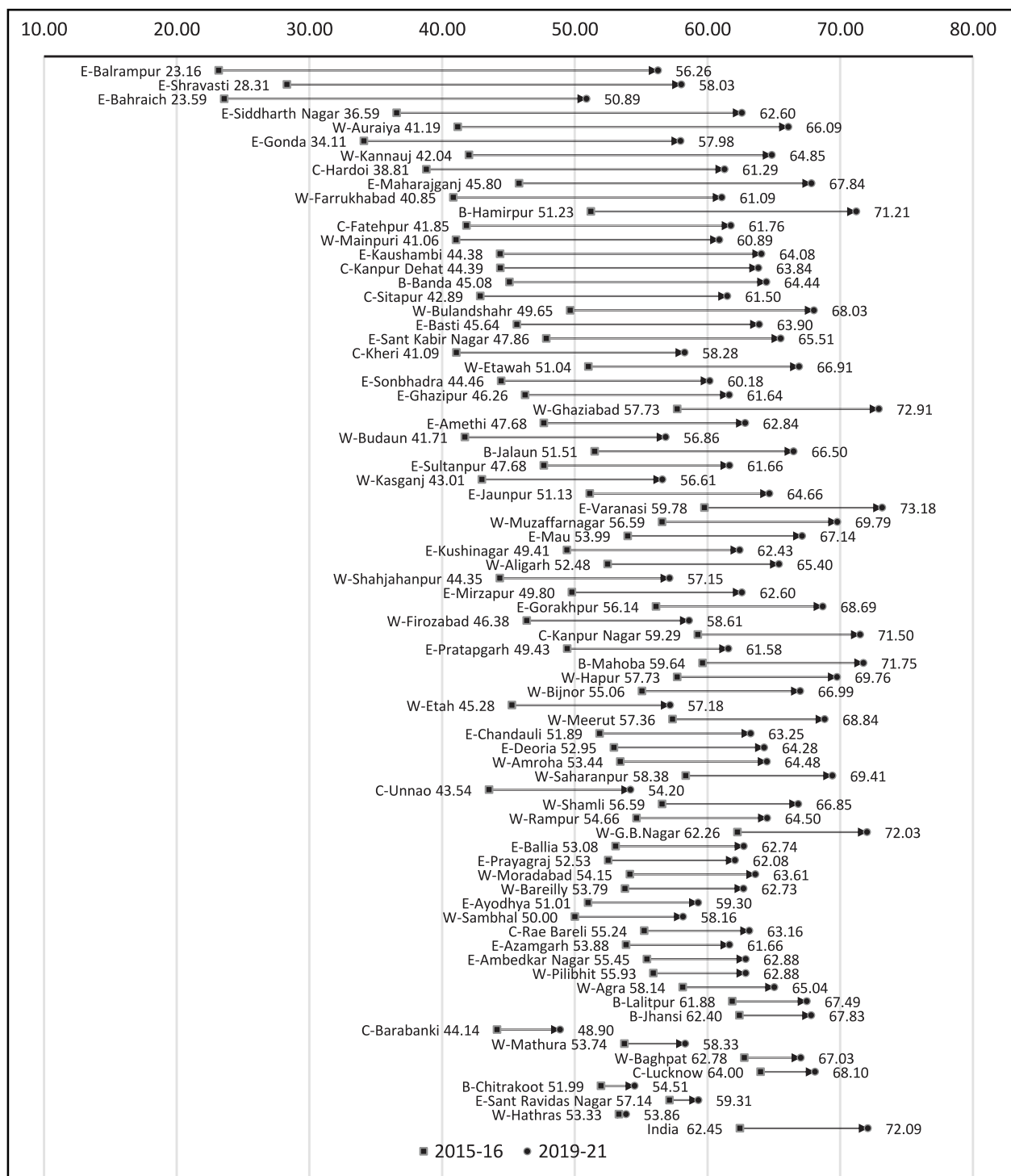
Where, MOD-FP: Modern family planning, PNC: Postnatal care, ANC-FT: ANC in the first trimester, ANC-4: Four or more ANC visits, TT: Tetanus, IFA: Iron folic acid usage, IA: Institutional births, SBA: Skilled health attendant at birth and RMH-Index: Composite index of reproductive and maternal health indicators.

Fig. 1. Distribution of individual reproductive and maternal health care interventions and the composite index in the districts of Uttar Pradesh, 2015-16 and 2019-21.

composite indicator showed less dispersion although some indicators had outliers. Improved performance with less dispersion in TT and PNC was also observed but sluggish performance in interventions of IFA and ANC-4 which requires repeated patient-provider contacts.

Fig. 2 shows the progress in reproductive and

maternal health care coverage as estimated by the composite index (RMH-Index) in the 75 districts of Uttar Pradesh. The districts are arranged in descending order of progress made between 2015-16 and 2019-21. The figure also gives the estimate of the RMH index for India to enable comparisons.



The alphabet on the left label refers to the region that the district belongs to: W–Western, C–Central, B–Bundelkhand and E–Eastern region.

Fig. 2. Progress in reproductive and maternal health care coverage as estimated by the composite index (RMH-Index) in the 75 districts of Uttar Pradesh and India between 2015-16 and 2019-21.

The figures showed a narrowing of within-state inequalities driven by significant improvements in lagging districts. Eastern districts of Balrampur, Shravasti and Bahraich

which had the lowest scores on the RMH Index in 2015-16 showed the fastest progress. In 2015-16, five Eastern districts: Balrampur, Shravasti, Bahraich, Gonda and Siddharth

Nagar ranked at the bottom in RMH scores. However, in 2019-21 the worst-performing five districts were from different regions: Barabanki and Unnao in the Central region, Chitrakoot in Bundelkhand, Hathras in the Western region, and Bahraich in the Eastern region. While Bahraich in the Eastern region made significant progress, Hathras district in the Western region showed the slowest progress in expanding RMH interventions in the state between 2015-16 and 2019-21. While most Eastern districts were primarily in the middle and lower ranks in RMH performance in 2019-21, the top 20 ranked districts on the composite index of RMH interventions comprised mostly Western districts, and four of the seven Bundelkhand districts, two of the ten Central districts but only four of the 28 Eastern districts in 2019-21: Varanasi, Gorakhpur, Maharajganj and Mau. Varanasi had the highest score on the RMH Index in 2019-21. Despite the progress made and although gaps have narrowed, low utilization of RMH interventions persisted in many districts in U. P. in 2019-21. The worst-performing district in 2019-21 was Barabanki in the Central region with an RMH-Index score of 48.90 compared with the national average score of 72.09. Only six of the 75 districts in U. P., namely, Varanasi (Eastern), Ghaziabad, G. B. Nagar, (Western) Mahoba, Hamirpur (Bundelkhand) and Kanpur Nagar (Central) had RMH intervention figures comparable with the national average for India in 2019-21.

The four administrative regions of the state:

Western, Central, Bundelkhand and Eastern differ considerably with the Western region being more advanced in socio-economic indicators like income, urbanisation, literacy and material access to necessities. The Western and Eastern regions have 30 and 28 districts, while Central and Bundelkhand have 10 and seven districts in the respective region. Given the vast differences across regions in socio-economic dimensions, a one-way ANOVA test was conducted to examine whether differences in mean RMH interventions between the four regions were statistically significant. While there was statistically significant difference between the regions in 2015-16 ($F(3,71)=2.89$, $p=0.0415$), there were no statistically significant differences between the four regions in 2019-21 ($F(3,71)=1.71$, $p=0.1727$). The distributions across regions in the composite RMH coverage index are given in Fig. 3 which gives the boxplots for the four regions for 2015-16 and 2019-21.

The Eastern region that was the most deprived in 2015-16 performed better in distribution although there were under-performers in all regions leading to greater spread within regions in 2019-21 (Fig. 3). Within regions, there were lagging districts. For example, Kheri, Barabanki and Unnao lagged in the Central region as compared to Lucknow or Kanpur Nagar, Chitrakoot lagged as compared to Hamirpur in the Bundelkhand region, Barabanki and Hathras, as compared to Ghaziabad or G. B. Nagar in the Western region and Balrampur, Shravasti and Bahraich as

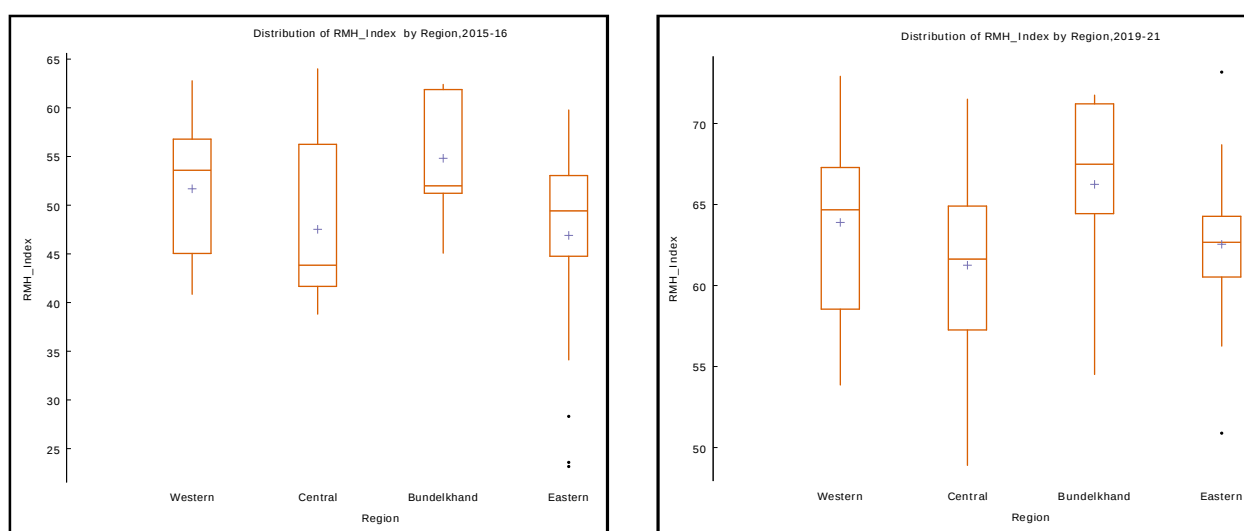


Fig. 3. Distribution of composite index of reproductive and maternal health (RMH-Index) in districts of Uttar Pradesh by region, 2015-16 and 2019-21.

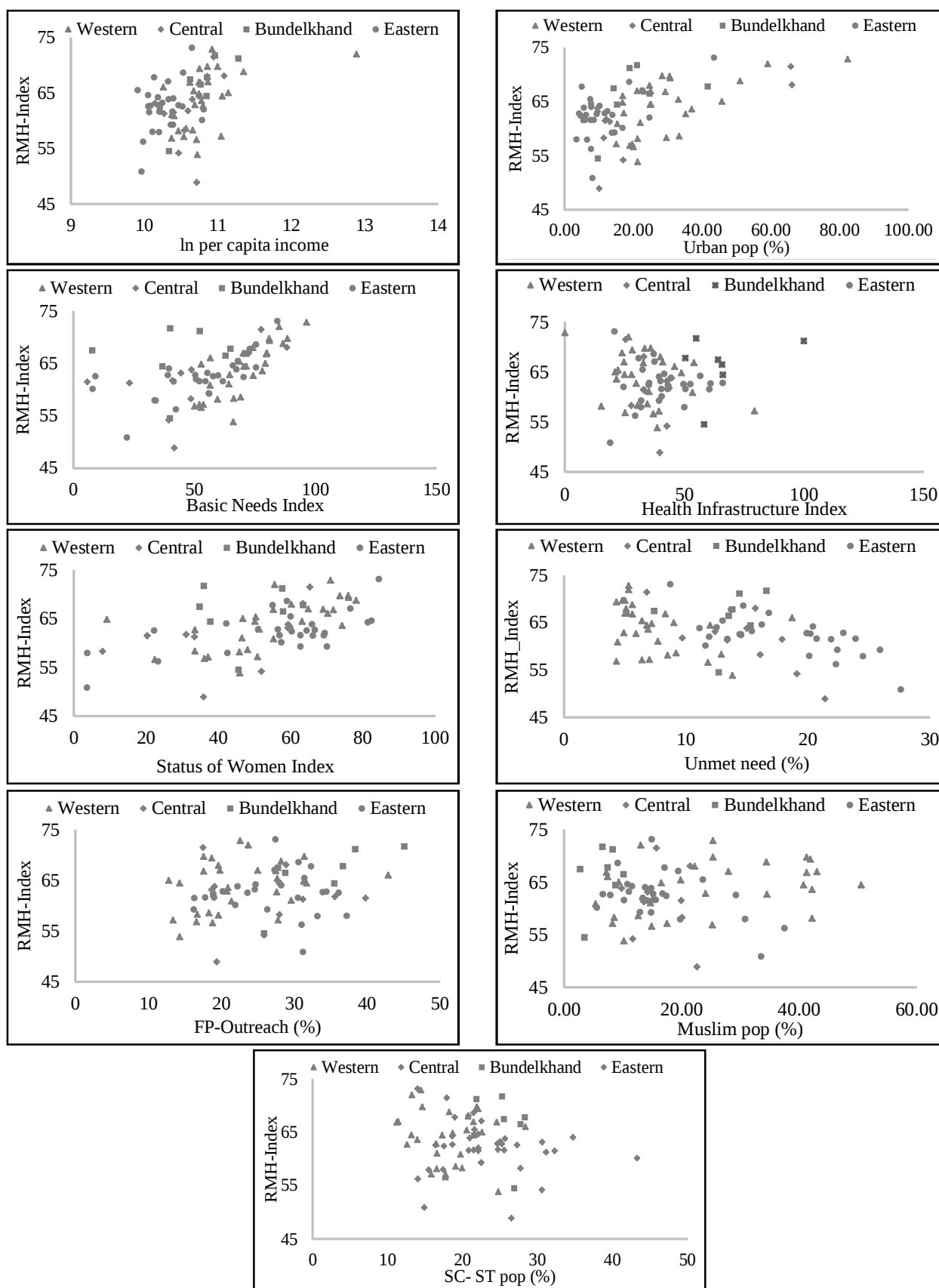


Fig. 4. Scatter diagram of RMH-Index and socio-economic variables by region.

A multivariate regression using OLS was performed to identify predictors for variations in RMH coverage across the 75 districts in U. P. The pair-wise correlations between the nine explanatory variables used in the multivariate regression analysis are given in Table 3 and the results from the regression analysis are

The study's in-depth district-level assessment of RMH interventions in U. P. reiterated why a disaggregated study such as the present study can help policies in having a more nuanced and focused approach. It elucidated how certain districts could be identified as lagging within

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Table 4. Results from cross-sectional OLS regression using observations 1-75 (with dependent variable: RMH-Index)

	Coefficient	Std. error	t-ratio	p-value	Significance
Const	44.6268	4.31819	10.33	<0.0001	***
PCI	1.12210e-05	4.56354e-06	2.459	0.0166	**
Urban pop (%)	0.0895602	0.0351065	2.551	0.0131	**
BN index	0.0389432	0.0391932	0.9936	0.3241	
HI index	0.0479390	0.0274446	1.747	0.0854	*
Status index	0.112264	0.0258974	4.335	<0.0001	***
Unmet need (%)	-0.196490	0.0801880	-2.450	0.0170	**
FP outreach (%)	0.287895	0.0641986	4.484	<0.0001	***
Muslim pop (%)	0.0254726	0.0464511	0.5484	0.5853	
SC-ST pop (%)	0.0373368	0.0901468	0.4142	0.6801	
F (9, 65) =31.9849; p-value=0.0000					

*, ** and *** Indicate P=0.10, P=0.05 and P=0.01 levels, respectively.

a particular state, thereby needing a different approach to healthcare owing to pre-existing economic and social conditions that act as hurdles. The observed wide differences in progress made across districts underscored the need for a context-specific approach rather than a generalized 'one size fits all' approach. Although progress was made in the RMH indicators, the outcomes had neither been universal nor uniform. The study indicated that although there was a narrowing of inequalities in coverage in individual and aggregate indicators among districts and that while districts varied considerably in economic and socio-economic dimensions by region, RMH coverage did not show statistically significant variation by region. RMH coverage was rather correlated with factors like place of residence, economic status, status of women, health infrastructure and other such social factors that were key to explaining variation across districts.

Measures of maternal health like the MMR are quantitative assessments. They were imbued with notions of power and inequalities. Indicators like MMR said very little about the contexts in which women operated and the context in which healthcare was being implemented. India's record in female infanticide and female foeticide is poor. Abortions at an advanced stage of pregnancy adversely affect women's health with unauthorized sex determination and abortion clinics aiding these social malpractices. The study demonstrated that though RMH interventions go a long way in extending improvements as regards reproductive and maternal healthcare, they also need to simultaneously address some of

these other issues that affect women's maternal health more effectively. The launch of the National Health Mission in 2015 and various state and centrally sponsored government programmes promoting reproductive health, institutional delivery and safe motherhood like Janani Suraksha Yojana (JSY), Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) and Pradhan Mantri Matritva Vandana Yojana (PMMVY) had no doubt been pro-poor policies that have played crucial roles in extending maternal health care facilities for the socio-economically disadvantaged groups (Bhatia *et al.*, 2021). However, they must also emphasize women's 'lived experiences' as part of their strategy to ensure the best results. This is so because maternal and reproductive healthcare not only has a biological, political, or physiological dimension but it also has a socio-psychological one. Women's lived experiences are unique and specific and distinct from the governments, men and other involved actors. These lived experiences belong to the domain of the qualitative. Community health workers like Accredited Social Health Activists (ASHAs) and Auxiliary Nurse Midwives (ANMs) could be a crucial and effective link between the government and pregnant women through counselling, disseminating information and ensuring safe delivery care for disadvantaged women and by taking into account women's narrative on an issue which is both personal and private. Our policy suggestions, therefore, include the need for a combination of both quantitative and qualitative data assessment of women's maternal and reproductive health to meet the SDG target in the real sense of the term.

CONCLUSION

Sub-national disparities in RMH coverage reflect inequalities that represent hurdles in realizing the SDG target and represent one of the most actionable dimensions of inequality. The present paper argues that sub-state variations in maternal healthcare access were associated with population-related geographic differences in socio-economic factors like income, place of residence, the status of women, access to basic amenities, health infrastructure, caste, religion and availability of family planning and primary care providers. The study showed that despite progress made by lagging districts, there are wide and persistent district-level disparities in RMH interventions in the state of U. P. and also in comparison, with all-India national estimates. The significant progress seen in some of the backward districts, especially in the Eastern region, indicated that government reproductive and maternal healthcare policies and greater community access can help women in overcoming some of the disadvantages arising from location-specific challenges. The results from the study can serve to inform district-level strategies and monitor progress in smaller administrative units like districts or blocks for better maternal health outcomes.

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