

Rural Urban Differences in Maternal Health Care Services: An Empirical Study in India

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ABSTRACT

The present study was conducted to understand the situation of maternal health care services in different states of India on the basis of NFHS-4 data. The study also tries to focus on Rural Urban differentials in maternal health care services in India. All the states of India and Delhi NCT were included in this study and all the Union Territories except Delhi were excluded. The present study considered only those ever married women, age range 15-49 years who conceived a baby within last five years. For maternal health care services, the study considered antenatal care, TT Vaccination, postnatal and delivery care. Statistical analysis has been carried out, and the $p < 0.05$ and $p < 0.01$ are considered as statistically significant. Present study depicts that in most of the cases rural women are deprived of maternal health care services compared to urban women and the differences are statistically significant in most of the states. The study depicts that maternal health care services are better utilized by urban women compared to rural women. It was also found that maternal healthcare scenario is better in Southern region states of India. Many of the states showed very poor results in terms of maternal health care and need immediate attention.

Key Words: Rural-Urban differences, Antenatal visit, Vaccination, Institutional delivery, Post natal check-up, Family Planning

INTRODUCTION

Women's role in the growth and development of a community/country is undeniable. If both men and women don't share responsibility and work together a country can never reach its full potential. Only a healthy woman can reach her full potential and contribute to her family, community, and country. It is also a fact that healthy women can give birth to a healthy children (Coffey 2015). The children are the future of a country (Roy and Roy 2019). Maternal health care services play a very significant role to decrease the extent of maternal and child health problems and number of deaths. In India, mother and child health condition in many sections are not satisfactory and needs improvement (Lakshmi and Jyoti 2017). So improving mother and child health condition is very important and needs immediate attention. In maternal health care services, place of residence plays a very important role as most of the time rural women face many difficulties. Nagdeva (2009) found huge rural-urban differences in antenatal checkup, postnatal check-up, trained professional attendants at delivery and TT vaccination. The study also mentioned that urban women are better informed about contraceptive methods.

An interesting study conducted by Vellakkal et al., (2017), detected that inequality in institutional delivery declined between pre NRHM Period 1 (1995-1999) and pre NRHM Period 2 (2000-04), and the steeper decline continued in the post NRHM period. Much larger equity impact in the uptaking of institutional delivery and antenatal services was founded in late post NRHM period 2011-12 compared to the early post NRHM period 2007-08. Uptake of antenatal services was not improved in the early post-NRHM period 2007-2008, considering an increase in the uptake of decline in its inequity in the late post NRHM period 2011-2012. A report made by the Committee on Health Care for underserved women (2014), pointed out that rural women experienced poorer health outcomes and their access to health care facility are less than the urban women. Numbers of women's health providers, as well as general health providers, are limited in many rural areas. A study based on Demographic and Health Survey (DHS) data found that rural-urban disparity is present in terms of antenatal care, facility-based delivery and modern contraceptives in six sub-Saharan countries, namely Ethiopia, Madagascar, Uganda, Cameroon, Zambia, and Zimbabwe (Alam et al., 2015).

According to Chauhan and Kumar (2016), the maternal mortality ratio (MMR) has been reduced significantly in India. However, enormous rural-urban disparity is present in maternal health outcomes. The study found that rural women are deprived of economic, social and healthcare outcomes. Between 1990 and 2015, global maternal mortality fell by almost 44 percent, dropping from 532000 deaths to 303000 deaths per year. More than 830 women die daily in childbirth or as a result of pregnancy and delivery. The majority of these deaths are caused by postpartum hemorrhage, hypertensive disorders, infection, pre-existing health condition or complications from pregnancy and delivery (Alkema et al., 2015). And most of these conditions are preventable with proper maternal health care services.

Though improvement has been made to some extent, maternal and child health remains a challenge to the healthcare delivery system in developing countries and India. Despite several programs and effort by the Govt. of India, the quality of maternal and child health care services are not up to the mark in India. There is a significant rural-urban disparity present in India (Awasthi et al., 2015). There are many other studies conducted in a different regions to understand the maternal healthcare situation (Adhikari 2016; Ghosh et al., 2017; Nayak and Varambally 2017; Sahoo et al., 2017; Tiruneh et al., 2017; Umar 2017). All the above-mentioned studies imply that understanding the present condition of maternal health care services are very relevant in India.

Objectives of the study

The present study was conducted to understand the situation of maternal health care services in different states of India. The main objectives of this study are-

1. To understand the situation of maternal health care services (Antenatal visit, TT Vaccination, Institutional delivery and postnatal checkup) in different states of India
2. To explore the Rural-Urban differentials (if any) in maternal health care services in India.

MATERIALS AND METHODS

The area of the present study is India. All the states of India and Delhi NCT are included in this study and all the Union Territories except Delhi are excluded. In 1991 the constitution 69th amendment act considered Delhi as a special Union Territory known as National Capital Territory and it has both the feature of a state and/or union territory. The present study is based on the unit level data extracted from the National Family Health Survey (NFHS-4) conducted by International

Institute for Population Sciences (IIPS) during 2015-16. It is a cross-sectional as well as Ex post facto research. Rural-Urban comparison of maternal health care services is the main objective of this study, so this study is also comparative research. The present study considers only those women who conceived within last five years. All the study women were married and the age range was 15-49 years. The total sample size consists of 256671 of such women. For maternal health care services, the study considers antenatal, postnatal and delivery care (covering indicators like tetanus injections, Antenatal, and postnatal check-up and Institutional delivery). Statistical analysis has been carried out using the statistical software package SPSS (18.0) and $p < 0.05$ as well as $p < 0.01$ is considered as statistically significant. Pearson Chi-Square test is performed to observe the association between the rural and urban area with maternal health care services in different states of India. Descriptive statistics are presented using figures and tables. Percentile calculation for an antenatal visit, TT vaccination, Institutional checkups, Postnatal checkup, Contraceptives use and FP methods have been done.

RESULTS

Table 1. Rural-Urban comparison of complete antenatal visits in different states of India

States and Zones	Complete antenatal visit						χ^2	OR	95% CI	
	Urban		Rural [®]		Total				Lower	Upper
	(%)	N	(%)	N	(%)	N				
Northern Zone	76.0	9769	65.4	26160	68.3	35929	369.350**	0.597	0.566	0.629
Jammu and Kashmir	89.6	966	84.6	5314	85.4	6280	16.427**	0.637	0.511	0.793
Himachal Pradesh	93.1	131	78.0	2161	78.8	2292	17.008**	0.261	0.132	0.518
Punjab	86.2	1531	87.1	2601	86.8	4132	0.626	1.078	0.896	1.297
Haryana	70.8	1813	60.3	3906	63.6	5719	58.148**	0.629	0.558	0.709
Delhi	81.3	1236	81.8	22	82.8	1258	0.004	1.034	0.347	3.085
Rajasthan	71.7	2844	53.8	9106	58.1	11950	283.534**	0.461	0.421	0.505
Uttarakhand	63.3	1248	45.3	3050	50.6	4298	114.243**	0.481	0.420	0.551
North East Zone	77.4	6377	59.8	22448	63.7	28825	669.759**	0.433	0.406	0.462
Sikkim	85.5	234	83.2	665	83.8	899	0.680	0.839	0.553	1.273
Arunachal Pradesh	52.3	729	35.1	3129	38.4	3858	73.462**	0.494	0.420	0.582
Nagaland	43.5	796	19.7	2340	25.7	3136	176.321**	0.318	0.268	0.378
Manipur	91.1	1409	74.1	3020	79.5	4429	170.427**	0.279	0.228	0.341
Mizoram	87.9	1650	68.0	2031	76.9	3681	204.058**	0.291	0.245	0.347

Tripura	86.0	286	74.6	883	77.4	1169	16.008**	0.478	0.331	0.690
Meghalaya	82.6	431	65.2	2688	67.6	3119	51.258**	0.395	0.304	0.513
Assam	79.9	82	68.5	7692	69.6	8534	46.780**	0.546	0.459	0.651
East Zone	69.1	6122	48.3	33121	51.6	39243	891.634**	0.418	0.395	0.444
Bihar	42.6	1780	26.0	15042	27.8	16822	218.531**	0.474	0.428	0.524
West Bengal	85.7	1078	82.3	3381	83.1	4459	6.743**	0.776	0.640	0.940
Jharkhand	69.2	1759	44.8	7188	49.6	8947	335.137**	0.362	0.324	0.405
Orissa	88.4	1505	81.0	7510	82.3	9015	46.211**	0.562	0.475	0.665
Central Zone	67.5	12806	47.9	40146	52.7	52952	1494.362**	0.443	0.425	0.462
Uttar Pradesh	61.7	6589	41.2	22152	45.9	28741	852.404**	0.436	0.413	0.462
Madhya Pradesh	68.3	4547	47.6	12859	53.0	17406	580.802**	0.421	0.392	0.452
Chhattisgarh	88.4	1670	77.7	5135	80.3	6805	92.322**	0.455	0.386	0.536
West Zone	82.9	4614	75.9	8703	78.3	13317	88.308**	0.647	0.591	0.709
Gujarat	81.1	2000	69.9	3827	73.7	5827	84.692**	0.542	0.475	0.618
Maharashtra	83.7	2443	80.3	4700	81.5	7143	12.541**	0.792	0.696	0.901
Goa	93.6	171	88.6	176	91.1	347	2.592	0.536	0.249	1.156
South Zone	85.4	6702	84.3	11538	84.7	18240	4.347*	0.914	0.840	0.995
Andhra Pradesh	89.1	633	87.8	1637	88.2	2270	0.692	0.884	0.661	1.182
Karnataka	81.1	1945	78.7	3931	79.5	5876	4.787*	0.585	0.749	0.984
Kerala	89.2	818	93.4	1310	91.8	2128	11.307**	1.695	1.243	2.311
Tamil Nadu	86.1	2687	85.6	3494	85.8	6181	0.330	0.959	0.830	1.108
Telangana	87.1	619	83.9	1166	85.0	1785	3.244	0.772	0.582	1.024
India	75.0	46390	57.8	142116	62.0	188506	29287.204**	0.456	0.446	0.467

Extracted from NFHS 4, 2015-2016; * $p < 0.05$, ** $p < 0.01$; complete antenatal visit = Yes®

The antenatal checkup is very important for maternal health and healthy children. Table 1 depicts the state-wise distribution of utilization of complete antenatal checkups and rural-urban differences. In most of the states, the difference is statistically significant except states like Punjab, Delhi, Sikkim, Goa, Andhra Pradesh, Tamil Nadu and Telangana. Here complete antenatal checkup means that at least 3 checkups are completed during pregnancy. More than 90 percent of Women from Kerala (91.8%) and Goa (91.1%) have completed antenatal check-up, whereas states like Nagaland (25.7%), Bihar (27.8%), Arunachal Pradesh (38.4%), Uttar Pradesh (45.9%) and Jharkhand (49.6%) shows a considerably alarming situation. Results point out the presence of disparities against rural women in the case of antenatal check-up and the rural-urban difference is statistically significant in most of the states of India. In the southern zone, the rural-urban disparity is less compared to other zones. The average number of women utilized antenatal checkups is

lower among urban women compared to rural women in case of Punjab, Delhi, and Kerala. The antenatal check-up situation in Nagaland is very alarming, 43.5 percent of urban women and only 19.7 percent of rural women have completed antenatal check-ups. States like Jharkhand, Uttar Pradesh, Madhya Pradesh, and Mizoram showed the highest rural and urban differences. Results also found that urban women are more likely to have complete antenatal visits compared to rural women (exceptions- Delhi, Punjab and Kerala). Women residing in rural areas of Himachal Pradesh, Uttar Pradesh, Madhya Pradesh, Jharkhand, Meghalaya, Mizoram, Manipur, and Nagaland are less likely to avail of antenatal care compared to urban women. Women of both rural and urban areas of Punjab, Delhi, Maharashtra, Andhra Pradesh, Tamil Nadu, Kerala, West Bengal and Sikkim show similar results in the antenatal check-up.

Table 2. Rural-Urban comparison of complete Tetanus Vaccination in different states of India

State&Zones	Complete tetanus vaccination taken						χ^2	OR	95% CI	
	Urban (%)	N	Rural [®] (%)	N	Total				Lower	Upper
					(%)	N				
Northern Zone	86.7	9769	81.6	26160	83.0	35929	131.290**	0.680	0.636	0.727
Jammu and Kashmir	84.8	966	80.3	5314	81.0	6280	10.680**	0.731	0.606	0.883
Himachal Pradesh	72.5	131	68.1	2161	68.4	2292	1.107	0.810	0.546	1.201
Punjab	89.4	1531	89.1	2601	89.2	4132	00.074	0.972	0.793	1.192
Haryana	87.7	1813	84.5	3906	85.5	5719	10.017**	0.767	0.650	0.904
Delhi	83.2	1236	63.6	22	82.8	1258	5.800*	0.354	0.147	0.855
Rajasthan	87.3	2844	80.7	9106	82.3	11950	64.055**	0.610	0.540	0.689
Uttarakhand	87.3	1248	86.2	3050	86.5	4298	000.909	0.909	0.748	1.106
North East Zone	82.2	6377	73.0	22448	75.0	28825	225.467**	0.585	0.545	0.628
Sikkim	97.9	234	94.9	665	95.7	899	03.694	0.405	0.157	1.049
Arunachal Pradesh	66.9	729	50.3	3129	53.5	3858	65.529**	0.501	0.422	0.593
Nagaland	72.6	796	55.7	2340	60.0	3136	70.917**	0.474	0.397	0.565
Manipur	88.4	1409	82.3	3020	84.2	4429	27.342**	0.608	0.503	0.733
Mizoram	81.8	1650	67.6	2031	73.9	3681	96.164**	0.463	0.396	0.541
Tripura	97.9	286	88.3	883	90.7	1169	23.386**	0.162	0.070	0.374

Meghalaya	77.0	431	67.0	2688	68.4	3119	17.280**	0.605	0.477	0.768
Assam	87.8	842	83.7	7692	84.1	8534	9.564**	0.714	0.576	0.885
East Zone	90.4	6122	85.4	33121	86.2	39243	110.358**	0.618	0.565	0.677
Bihar	88.8	1780	82.1	15042	82.8	16822	50.971**	0.576	0.494	0.671
West Bengal	90.4	1078	90.3	3381	90.3	4459	0 .001	0.997	0.791	1.258
Jharkhand	90.2	1759	85.2	7188	86.2	8947	29.815**	0.624	0.527	0.740
Orissa	92.7	1505	90.1	7510	90.5	9015	10.140**	0.714	0.580	0.879
Central Zone	86.9	12806	82.0	40146	83.2	52952	172.251**	0.682	0.644	0.723
Uttar Pradesh	84.4	6589	81.0	22152	81.8	28741	38.658**	0.790	0.733	0.851
Madhya Pradesh	88.6	4547	80.9	12859	82.9	17406	141.494**	0.544	0.492	0.602
Chhattisgarh	92.6	1670	88.8	5135	89.7	6805	19.459**	0.636	0.519	0.779
West Zone	85.2	4614	80.1	8703	81.9	13317	53.732**	0.697	0.633	0.768
Gujarat	87.4	2000	77.9	3827	81.2	5827	77.619**	0.508	0.436	0.592
Maharashtra	83.1	2443	81.7	4700	82.2	7143	2.128	0.908	0.798	1.034
Goa	90.6	171	85.2	176	87.9	347	2.391	0.596	0.307	1.155
South Zone	78.1	6702	78.4	11538	78.3	18240	0.311	1.021	0.949	1.098
Andhra Pradesh	91.9	633	91.8	1637	91.8	2270	0.022	0.975	0.697	1.364
Karnataka	82.2	1945	79.8	3931	80.6	5876	4.720*	0.857	0.745	0.985
Kerala	94.3	818	94.6	1310	94.5	2128	0.102	1.064	0.728	0.985
Tamil Nadu	64.7	2687	62.7	3494	63.5	6181	2.631	0.917	0.728	1.555
Telangana	87.7	619	84.1	1166	85.4	1785	4.171*	0.742	0.826	1.018
India	85.3	46390	80.9	142116	82.0	188506	7333.07**	0.732	0.711	0.753

Data Extracted from NFHS 4, 2015-2016, *p<0.05, **p<0.01; TT vaccination = Yes®

Table 2 shows the state-wise percentage distribution of Tetanus vaccination (TT) during pregnancy in India. Here complete TT means women who have taken at least two Tetanus Vaccine. Because, at least two tetanus vaccination is necessary to protect a mother and her child from getting a tetanus infection. Tetanus is a life-threatening infection for which there is no cure, but it is easily preventable with the TT vaccine. The states that show more than 90 percent of women taking TT vaccine are Sikkim, Kerala, Andhra Pradesh, Tripura, Orissa, and West Bengal. The study also reflects that the utilization of TT vaccination is more among urban women compared to rural women. The present study also pointed out that rural women of Kerala show slightly better utilization of TT vaccination compared to urban women. West Bengal, Andhra Pradesh, Punjab, Uttarakhand, Maharashtra, Tamilnadu also show very little rural-urban differences in complete TT vaccination. States like Delhi, Nagaland, Arunachal Pradesh and Mizoram shows high urban-rural

differences where rural women are less likely had at least two TT vaccine. Urban women are much conscious about TT vaccination compared to rural women in most of the states of India, especially in Delhi and Arunachal Pradesh. States like Gujarat, Madhya Pradesh, Mizoram, Delhi, Nagaland, Arunachal Pradesh, Sikkim show greater rural and urban disparity compared to other states. Whereas in West Bengal, Maharashtra, Karnataka, Tamilnadu, Kerala, Andhra Pradesh both rural and urban women show similar practices in terms of TT Vaccine.

Table 3. Rural Urban comparison of Institutional delivery in different States of India

State Zones	Institutional Delivery						χ^2	OR	95% CI	
	Urban (%)	N	Rural [®] (%)	N	Total				Lower	Upper
					(%)	N				
Northern Zone	87.6	12459	79.8	36033	81.8	48492	377.52**	0.560	0.528	0.594
Jammu & Kashmir	95.2	1190	81.0	7050	83.0	8240	146.58**	0.214	0.163	0.281
Himachal Pradesh	89.7	156	74.9	2772	75.7	2928	17.70**	0.341	0.202	0.576
Punjab	90.7	1871	92.0	3345	91.5	5216	2.69	1.182	0.968	1.444
Haryana	83.9	2347	78.8	5531	80.3	7878	26.84**	0.715	0.629	0.812
Delhi	86.9	1548	86.2	29	86.9	1577	0.01	0.943	0.325	2.738
Rajasthan	89.8	3728	82.6	13102	84.2	16830	114.57**	0.537	0.479	0.603
Uttarakhand	79.0	1619	63.8	4204	68.1	5823	123.49**	0.469	0.410	0.537
North East Zone	84.3	7762	55.7	29380	61.7	37142	2124.50*	0.234	0.219	0.250
Sikkim	95.6	249	94.6	756	94.8	1005	0.39	0.806	0.408	1.593
Arunachal Pradesh	81.1	887	44.0	4069	50.6	4956	400.33**	0.184	0.153	0.219
Nagaland	54.0	1061	25.2	3543	31.8	4604	312.79**	0.287	0.248	0.330
Manipur	83.5	1671	56.5	3965	64.5	5636	373.32**	0.257	0.223	0.297
Mizoram	95.5	2088	61.5	2812	75.9	4900	758.07**	0.076	0.061	0.095
Tripura	92.8	306	73.5	1024	78.0	1330	50.96**	0.215	0.137	0.339
Meghalaya	86.2	564	48.3	3843	53.2	4407	282.95**	0.150	0.117	0.192
Assam	91.5	936	68.2	9368	70.3	10304	219.94**	0.201	0.159	0.253
East Zone	82.8	7851	68.0	46192	70.2	54043	702.42**	0.441	0.415	0.469
Bihar	75.8	2580	65.3	22848	66.3	25428	114.55**	0.601	0.547	0.660
West Bengal	75.7	5323	72.8	4082	75.7	5323	76.69**	0.473	0.399	0.560
Jharkhand	81.9	2270	58.0	9931	62.4	12201	448.47**	0.306	0.273	0.343
Orissa	93.0	1760	83.4	9331	85.0	11091	104.80**	0.382	0.316	0.462

Central Zone	80.0	17202	69.8	58414	72.2	75616	685.06**	0.578	0.555	0.603
Uttar Pradesh	70.3	9154	67.6	32593	68.2	41747	24.42**	0.880	0.837	0.926
Madhya Pradesh	94.0	5925	75.1	18663	79.7	24588	983.54**	0.194	0.174	0.217
Chhattisgarh	82.9	2123	66.2	7158	70.0	9281	217.13**	0.405	0.358	0.458
West Zone	94.1	5846	85.3	11683	88.2	17529	295.93**	0.360	0.319	0.406
Gujarat	93.1	2506	83.4	5207	86.5	7713	136.12**	0.374	0.315	0.444
Maharashtra	94.9	3130	86.4	6270	89.2	9400	156.15**	0.343	0.288	0.408
Goa	96.2	210	98.5	206	97.4	416	2.24	2.680	0.701	10.246
South Zone	97.5	8475	94.5	15217	95.6	23692	113.29**	0.444	0.381	0.518
Andhra Pradesh	96.7	843	89.2	2284	91.2	3127	42.74**	0.285	0.191	0.424
Karnataka	95.1	2515	93.5	5253	94.1	7768	7.99**	0.737	0.596	0.911
Kerala	99.9	947	99.9	1513	99.9	2460	0.03	0.799	0.072	8.820
Tamil Nadu	99.1	3319	98.9	4599	99.0	7918	0.33	0.875	0.557	1.376
Telangana	96.5	851	87.6	1568	90.7	2419	51.38**	0.259	0.175	0.384
India	86.4	59595	72.0	196919	75.3	256514	21534.4*	0.404	0.394	0.414

Data Extracted from NFHS 4, 2015-2016, * $p < 0.05$, ** $p < 0.01$; Institutional delivery = Yes®

One of the most important aims of safe motherhood is to reduce the number of deaths and illnesses associated with pregnancy and childbirth. For safe motherhood, delivery under proper hygienic conditions and trained health care professionals are required. Here the place of delivery is broadly classified as Institutional and Home delivery. Institutional delivery was low in Nagaland (31.8%), Arunachal Pradesh (50.6%), Meghalaya (53.2%), Jharkhand (62.4%), Manipur (64.5%), Bihar (66.3%) whereas States like Kerala (99.9%), Tamilnadu (99%), Goa (97.4%), Sikkim (94.8%), Karnataka (94.1%), Punjab (91.5%), Andhra Pradesh (91.2%), Telangana (90.7%) show very high percentages of Institutional delivery (Table 3). Southern zone shows the highest percentage of Institutional delivery and North Eastern Zone shows the lowest percentage of Institutional delivery. Rural and urban differences in Institutional delivery are noticeable in all the zones as well as most of the states of India. The rural women of North Eastern regions show the lowest percentage of Institutional delivery whereas the rural-urban gap in institutional delivery is lowest in the Southern Zone. In the case of Institutional delivery states of Southern Zone shows very

impressive results. Meghalaya shows the poorest record in case of institutional delivery, only 48.3 percent of rural women had institutional delivery and 86.2 percent of urban women enjoy the institutional delivery. Similarly, rural women in Arunachal Pradesh are less likely to receive institutional facilities compared to urban women (81.1%). Mizoram, Nagaland, Manipur, Jharkhand, Assam show the huge rural-urban disparity, whereas Kerala shows a very stunning result with 99.9 percent of women getting facility of institutional delivery. There was no rural-urban disparity in Kerala. Rural women in the States like Goa and Punjab are little conscious about institutional delivery compared to urban women, though the differences are not huge like some other states mentioned above. The odd ratio shows that more urban women are likely to have Institutional delivery compared to rural women except Punjab and Goa.

Table 4. Percentage distribution and rural urban differences of postnatal checkups in different States of India

States and Zones	Postnatal check up						χ^2	OR	95% CI	
	Urban		Rural [®]		Total				Lower	Upper
	%	N	%	N	%	N				
Northern Zone	77.2	9766	71.7	26133	73.2	35921	108.826**	0.749	0.709	0.791
Jammu and Kashmir	88.8	966	75.8	5311	77.8	6277	80.179**	0.394	0.320	0.486
Himachal Pradesh	90.1	131	79.1	2160	79.7	2291	9.179**	0.417	0.233	0.747
Punjab	90.3	1531	92.1	2601	91.4	4132	4.030*	1.253	1.005	1.563
Haryana	74.0	1813	73.0	3906	73.3	5719	0.602	0.951	0.838	1.079
Delhi	68.0	1233	81.8	22	68.3	1255	1.893	2.113	0.711	6.285
Rajasthan	74.5	2844	65.5	9105	67.7	11949	79.927**	0.650	0.591	0.715
Uttarakhand	70.5	1248	58.6	3050	62.1	4298	53.463**	0.592	0.514	0.682
North East Zone	72.2	6375	56.2	22433	59.7	28808	527.423**	0.494	0.465	0.525

Sikkim	82.9	234	81.1	665	81.5	899	.395	0.882	0.596	1.305
Arunachal Pradesh	46.5	729	35.3	3122	37.4	3851	31.492**	0.628	0.534	0.740
Nagaland	40.3	795	21.2	2338	26.0	3133	111.621**	0.400	0.336	0.475
Manipur	82.5	1409	61.1	3020	67.9	4429	201.414**	0.334	0.286	0.390
Mizoram	81.0	1650	62.3	2029	70.7	3679	152.359**	0.389	0.334	0.453
Tripura	77.6	286	62.4	883	66.1	1169	22.345**	0.478	0.351	0.652
Meghalaya	86.5	431	68.1	2686	70.7	3117	60.751**	0.332	0.249	0.444
Assam	78.0	841	64.7	7690	66.1	8531	59.409**	0.518	0.437	0.614
East Zone	69.9	6119	61.1	33103	62.4	39222	169.976**	0.677	0.683	0.718
Bihar	57.8	1780	51.9	15037	52.5	16817	22.122**	0.788	0.714	0.871
West Bengal	77.6	1077	71.2	3378	72.7	4455	17.016**	0.713	0.606	0.837
Jharkhand	63.7	1757	50.5	7187	53.1	8944	98.074**	0.583	0.523	0.649
Orissa	85.8	1505	85.1	7501	85.2	9006	.563	0.941	0.803	1.103
Central Zone	72.0	12804	60.9	40132	63.6	52936	517.135**	0.606	0.580	0.633
Uttar Pradesh	71.0	6589	60.7	22151	63.1	28740	230.814**	0.631	0.595	0.670
Madhya Pradesh	70.8	4546	56.7	12846	60.4	17392	277.584**	0.541	0.503	0.582
Chhattisgarh	79.0	1669	71.9	5135	73.6	6804	33.337**	0.678	0.593	0.774
West Zone	79.2	4613	76.4	8693	77.4	13306	13.118**	0.852	0.781	0.929
Gujarat	72.4	1999	70.5	3818	71.2	5817	2.255	0.912	0.809	1.029
Maharashtra	83.7	2443	80.7	4699	81.8	7142	9.895**	0.812	0.714	0.925
Goa	93.6	171	90.3	176	91.9	347	1.217	0.643	0.292	1.416
South Zone	83.9	6694	81.7	11518	82.5	18212	15.118**	0.852	0.787	0.928

Andhra Pradesh	88.0	633	85.4	1636	86.1	2269	2.586	0.789	0.605	1.051
Karnataka	68.7	1940	67.9	3920	68.2	5860	.362	0.965	0.858	1.085
Kerala	92.4	817	92.4	1310	92.4	2127	.001	1.005	0.722	1.397
Tamil Nadu	89.8	2685	89.5	3493	89.7	6178	.158	0.967	0.820	1.141
Telangana	90.6	619	86.9	1159	88.2	1778	5.432*	0.685	0.498	0.943
India	75.3	46371	64.8	142034	67.4	188405	13988.88*	0.605	0.591	0.620

Data Extracted from NFHS 4, 2015-2016, *p<0.05, **p<0.01 Postnatal checkups = Yes®

Table 4 depicts that Postnatal care is very important for the growth and development of the infant as well as the mother’s health. Postnatal care is considered when the mother receives care within two months of delivery from health professionals. It is observed that in many cases women who take institutional delivery tend to take postnatal checkups. States like Kerala (92.4%), Goa (91.9%), and Punjab (91.4%) are much aware of postnatal checkups. However, postnatal care has not received much attention in states like Nagaland (26.0%), Arunachal Pradesh (37.4%), Bihar (52.5%) and Jharkhand (53.1%). The present study also depicts that rural-urban difference is prominent except Haryana, Sikkim, Orissa, Gujarat, Goa, Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. Again Kerala shows a very impressive result. No significant difference has been found between rural and urban women in this state. Huge urban – rural disparities are observed in states like Manipur, Nagaland, Mizoram, Meghalaya, Tripura and Madhya Pradesh where urban women are much aware of postnatal checkups compared to rural women. It is observed from the table that urban women are more likely to have postnatal checkups compared to rural women except in Kerala, and Delhi (OR 0.065, 95% CI 0.591-0.620).

Table 5. Percentage of contraceptive methods used in different States of India

States & Zones	NFHS-4									χ^2	OR	95% CI	
	Method Use											Low er	Upper
	No(%)			Traditional (%)			Modern (%)						
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total				
Northern Zone	52.0	43.9	49.8	8.8	8.5	8.7	39.3	47.6	41.4	2.4**	0.722	0.693	0.753

Jammu & Kashmir	51.2	41.1	49.7	13.3	11.3	13.0	35.5	30.3	37.3	41.5*	0.665	0.587	0.754
Himachal Pradesh	54.3	57.7	54.5	6.6	12.8	6.9	39.1	47.6	38.6	0.7	1.147	0.828	1.590
Punjab	29.2	26.1	28.1	11.6	14.1	12.5	59.2	29.5	59.4	5.6*	0.858	0.755	0.974
Haryana	49.4	42.9	47.5	5.2	6.7	5.7	45.3	59.8	46.9	28.7*	0.767	0.696	0.845
Delhi	65.5	52.7	53.0	0	5.5	5.4	34.5	50.4	41.6	1.9	0.587	0.271	1.271
Rajasthan	55.7	45.5	53.5	9.3	8.4	9.1	34.9	41.7	37.4	1.2**	0.664	0.617	0.715
Uttarakhand	61.4	54.2	59.4	3.4	5.3	3.9	35.3	40.5	36.7	24.8*	0.745	0.664	0.837
North East Zone	66.2	66.1	66.2	8.8	7.8	8.6	25.0	26.0	25.2	0.1**	0.998	0.946	1.052
Sikkim	58.7	71.9	62.0	0.7	0.8	0.7	40.6	27.3	37.3	13.8*	1.797	1.315	2.455
Arunachal Pradesh	76.7	75.0	76.4	4.2	3.7	4.1	19.2	21.3	19.6	1.1	0.912	0.771	1.079
Nagaland	82.8	73.7	80.7	4.9	5.8	5.1	12.3	20.4	14.2	43.1**	0.583	0.496	0.686
Manipur	78.4	71.7	76.4	10.2	14.1	11.3	11.5	14.2	12.3	28.9**	0.699	0.614	0.797
Mizoram	74.8	69.1	72.4	0.1	0.1	0.1	25.0	30.7	27.5	19.6**	0.752	0.663	0.853
Tripura	39.0	25.8	35.9	19.9	20.6	20.1	41.1	53.6	44.0	17.7**	0.545	0.410	0.725
Meghalaya	84.7	74.8	83.4	1.6	4.3	1.9	13.7	20.9	14.6	34.8**	0.537	0.435	0.662
Assam	43.6	39.1	43.2	16.7	19.7	16.9	39.8	41.2	39.9	6.9*	0.832	0.725	0.954
East Zone	69.8	57.2	67.9	5.2	8.3	5.6	25.1	34.5	26.4	4.8*	0.580	0.553	0.609
Bihar	83.2	76.8	82.5	0.7	2.6	0.9	16.1	20.7	16.6	66.1**	0.668	0.606	0.737
West Bengal	34.9	30.2	33.8	12.5	14.3	12.9	52.7	55.6	53.3	9.2*	0.809	0.705	0.927
Jharkhand	76.0	65.0	73.9	3.0	5.7	3.5	21.0	29.3	22.6	1.2*	0.587	0.532	0.647
Orissa	45.5	37.7	44.3	15.3	15.8	15.4	39.2	46.5	40.3	37.2**	0.722	0.651	0.802
Central Zone	64.4	51.4	61.4	9.0	11.5	9.6	26.6	37.2	29.0	9.5*	0.585	0.565	0.605

Uttar Pradesh	63.7	45.4	59.7	14.3	18.6	15.2	22.0	36.0	25.1	1.0*	0.472	0.450	0.495
Madhya Pradesh	65.2	60.6	64.1	1.7	2.5	1.9	33.1	36.8	34.0	41.3**	0.821	0.773	0.872
Chhattisgarh	64.8	51.3	61.7	4.0	5.5	4.3	31.2	43.2	33.9	1.3*	0.572	0.519	0.631
West Zone	59.1	57.8	58.6	2.4	4.4	3.0	38.6	37.8	38.6	2.8	0.947	0.889	1.010
Gujarat	70.6	65.7	69.0	2.6	6.0	3.7	26.8	28.3	27.3	19.7**	0.794	0.717	0.879
Maharashtra	48.6	50.7	49.3	2.2	3.3	2.5	49.2	46.0	48.2	3.9*	1.090	1.001	1.188
Goa	85.9	68.6	77.2	1.5	1.4	1.4	12.6	30.0	21.4	17.8**	0.357	0.219	0.583
South Zone	56.5	57.0	56.7	0.8	1.1	0.9	42.6	41.8	42.4	0.6	0.947	0.969	1.078
Andhra Pradesh	44.2	44.4	44.3	0	0.1	0.1	55.7	55.5	55.7	0.1	1.005	0.857	1.178
Karnataka	61.0	62.6	61.5	0.3	0.4	0.3	38.7	37.0	38.2	1.8	1.070	0.971	1.180
Kerala	56.0	61.2	58.0	4.4	3.9	4.2	39.6	34.9	37.8	6.4*	1.238	1.049	1.460
Tamil Nadu	58.4	55.2	57.1	1.0	1.2	1.1	40.6	43.6	41.8	8.1*	0.877	0.802	0.960
Telangana	54.3	55.7	54.8	0	0.7	0.2	45.7	43.6	45.0	0.5	1.060	0.897	1.254
India	62.7	53.9	60.7	7.0	7.8	7.2	30.3	38.3	32.1	1.5*	0.696	0.683	0.709

Source: Data Extracted from NFHS 4, 2015-2016, * $p < 0.05$, ** $p < 0.01$; contraceptive method = Yes®

Table 5 shows very poor results for family planning. More than 60 percent of women in India don't use any family planning measures, whereas only 32.1 percent of women use modern contraceptive methods and 7.2 percent use the traditional methods of family planning. Punjab (59.4%), West Bengal (53.3%) and Maharashtra (48.2%) show a high percentage of use of modern family planning methods. Manipur (12.3%), Nagaland (14.2%), Meghalaya (14.6%), Bihar (16.6%) along with many other states show a very low percentage of use of modern family planning methods. Tripura (20.1%), Assam (16.9%) and Orissa (15.4%) show high use of traditional FP methods. Mizoram (0.1%), Andhra Pradesh (0.1%) and Telangana (0.2%) show a very low percentage of the use of Traditional FP methods. The overall use of FP methods is the highest in Punjab (71.9%) and West Bengal (66.2%), whereas Meghalaya (16.6%) and Bihar (17.5%) are the lowest-performing states. Rural women are less likely to use a contraceptive

method (0.696 times) compared to urban women in India. Rural women in the States like Andhra Pradesh, Telengana, Karnataka, Maharashtra, HP, Kerala, and Sikkim are more conscious about contraceptive use compared to urban women. States like Delhi, Uttar Pradesh, Jharkhand, Chhattisgarh, Goa, Meghalaya, Tripura and Nagaland are below 25 percentile. States like Jammu and Kashmir, Haryana, Punjab, Rajasthan, Gujarat, Madhya Pradesh, Tamil Nadu, Orissa, West Bengal, Bihar, Assam, Mizoram and Manipur show moderate rural and urban differentials compared to rest of the states.

Table 6. Women's participation in decision making for FP in different States of India

States & Zones	NFHS-4				χ^2	OR	95% CI	
	Discuss FP alone or jointly with husband						Lower	Upper
	Rural (%)	Urban (%)	Total (%)	N				
Northern Zone	92.9	93.5	93.0	24239	2.838	0.909	0.813	1.016
Jammu and Kashmir	90.6	92.7	91.0	4121	3.034	0.762	0.560	1.036
Himachal Pradesh	94.0	93.8	94.0	1324	0.004	1.035	0.367	2.923
Punjab	93.7	93.7	93.7	3741	0.003	0.993	0.755	1.306
Haryana	90.6	90.8	90.7	4125	0.042	0.977	0.780	1.223
Delhi	90.0	91.3	91.2	742	0.019	0.862	0.108	6.915
Rajasthan	94.7	96.0	95.0	7823	5.521*	0.742	0.578	0.952
Uttarakhand	92.7	93.7	93.0	2363	0.700	0.861	0.607	1.222
North East Zone	87.2	92.4	88.3	12522	54.204**	0.560	0.478	0.654
Sikkim	92.9	97.1	93.7	381	1.721	0.386	0.089	1.683
Arunachal Pradesh	85.6	82.8	85.1	1172	1.098	1.234	0.832	1.829
Nagaland	92.9	97.1	94.2	886	6.111*	0.391	0.182	0.844
Manipur	91.7	92.6	92.0	1330	0.326	0.885	0.580	1.348
Mizoram	97.0	95.9	96.5	1333	1.175	1.381	0.769	2.479
Tripura	94.7	99.6	96.0	850	10.219**	0.079	0.011	0.582
Meghalaya	88.2	97.9	90.1	724	11.796**	0.163	0.051	0.527
Assam	83.5	85.1	83.6	5846	0.958	0.886	0.696	1.129
East Zone	88.9	91.3	89.3	17306	17.413**	0.757	0.664	0.863
Bihar	86.3	90.8	86.9	4433	9.091**	0.640	0.478	0.857
West Bengal	91.4	91.0	91.3	3521	0.111	1.047	0.800	1.370
Jharkhand	89.3	93.2	90.3	3186	10.449**	0.607	0.447	0.824
Orissa	89.3	90.5	89.5	6166	1.520	0.870	0.698	1.085
Central Zone	91.4	94.2	92.2	29107	64.345**	0.656	0.591	0.727
Uttar Pradesh	91.4	94.0	92.2	16788	32.928**	0.678	0.594	0.775
Madhya Pradesh	91.2	93.5	91.8	8775	12.822**	0.712	0.591	0.858
Chhattisgarh	92.1	96.6	93.4	3544	24.264**	0.409	0.283	0.590

West Zone	89.3	90.2	89.6	7191	1.531	0.903	0.768	1.062
Gujarat	85.9	86.9	86.2	2375	0.480	0.917	0.717	1.172
Maharashtra	91.0	92.3	91.4	4722	2.157	0.846	0.676	1.058
Goa	82.1	86.4	85.1	94	0.276	0.726	0.220	2.401
South Zone	89.5	90.7	89.9	10198	3.713*	0.874	0.763	1.002
Andhra Pradesh	92.8	94.6	93.3	1725	1.775	0.734	0.465	1.159
Karnataka	83.7	84.3	83.9	2985	.175	0.956	0.774	1.180
Kerala	96.2	93.5	95.2	1031	4.019	1.788	1.006	3.179
Tamil Nadu	90.2	92.5	91.2	3375	5.353*	0.749	0.586	0.957
Telangana	91.8	92.0	91.9	1082	0.010	0.977	0.617	1.548
India	90.4	92.7	91.0	100563	1.207**	0.744	0.707	0.783

Source: Data Extracted from NFHS 4, 2015-2016, *p<0.05, **p<0.01; FP decision jointly with husband = Yes®

Women's participation in decision making in Family Planning (FP) is very important. When women lack knowledge of FP, then they also lack choices and opportunities to decide when and how many times to get pregnant. Among the family planning method users, women participation in decision making for the use of family planning is high in most of the states. Assam and Karnataka show very low involvement of women in family planning decisions. According to the study, urban women are much conscious about FP compared to rural women except for Rajasthan, Nagaland, Tripura, Meghalaya, Bihar, Jharkhand, Uttar Pradesh, Madhya Pradesh, Chhattisgarh and Kerala. North East, East, Central and Southern zone show a significant difference between rural and urban area. The result depicts that a lower percentage of rural women utilizes Family Planning than urban women except in a few states like HP, WB, Arunachal Pradesh, Mizoram and Kerala, where rural women show better results.

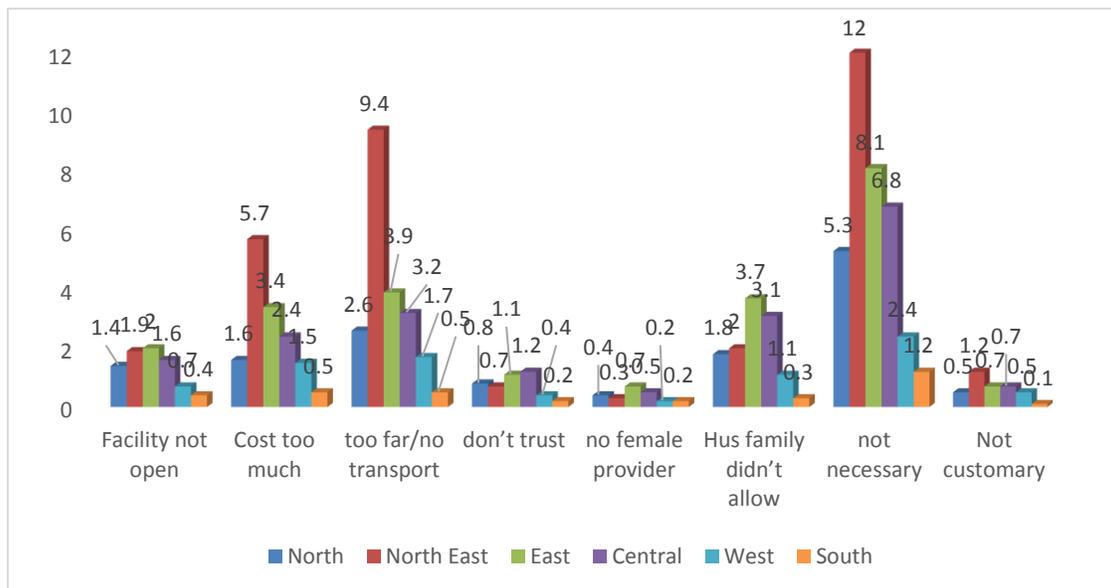
Figure 1. Zone wise distribution of causes for not visiting health facilit

Fig 1 shows the reported causes for not taking health care services. The results vary over different zones of India. It is very surprising that most of the women think maternal health care services are not necessary, which show a serious lack of awareness and proper education among women in India. Availability and high costs are stopping many women from taking maternal health care services. It is very alarming and shameful for a 21st century society that many women report, they don't take maternal health care services because their husband's family doesn't allow them to take such facilities. Women from the North-Eastern zone receive less maternal health care services. 12 percent of women from northeastern region think that motherhood care is not necessary, 9.4 percent of women opine that due to hilly area availability of transport system is not easy, 5.7 percent women agree that visiting health facility are expensive (Fig 1). Southern zone is showing much progress on maternal health care service compared to other zones.

DISCUSSION AND CONCLUSION

Mothers play a very special role in the family and health of families and communities are embedded in the health of mothers (Zo et al., 2015). It is very important to improve funding for health, especially for maternal healthcare, as maternal and newborn mortality results in a loss of US\$ 15 billion globally every year (Vora et al., 2015). Overall healthcare utilization and especially maternal health care have improved in India over the past few decades (Vidler et al., 2016). India has progressed immensely in the last 70 years, but the development has been uneven. Some sectors

developed tremendously, while other sectors are yet to show substantial development (Zodpey and Negaandhi 2018). Many rural areas have very low access to a health care facility. Access to health facilities are largely determined by the distance to health care facilities and these have significant relationship with the utilization of antenatal care (Acharya and Cleand 2000; Hotchkiss 2001). India contributes one quarter (26%) of all the maternal deaths globally, amounting to 136000 deaths annually (Yatnatti et al., 2015). Nearly 52 percent of delivery takes place without trained medical professionals. About three-fourths of women still give birth without the attendance of medical professionals in Uttar Pradesh and Bihar; countries first and third populated states respectively (Singh et al., 2009).

The present study depicts that 62% of women had a complete antenatal check-up. Lakshmi and Jyoti (2017) also report that antenatal care are not at all satisfactory. Among Indian states, Kerala shows the best result in antenatal check-up (91.8%). Most women utilize TT vaccination in India (82%) but there is a lot to improve as many others don't utilize TT vaccination even in this 21st century. Sikkim shows the best results regarding TT vaccination (95.7%). In the case of Institutional delivery, Kerala shows a very impressive result, where 99.9 percent of women have institutional delivery and 92.4 percent of women have postnatal check-up. Study of Kushwala et al., (2016) finds that antenatal services are not satisfactory and still women practice home delivery by untrained women. Neeta (2018) finds that only 66.4 percent of women visit for antenatal care, 18 percent of women enjoy postnatal care from the health care facility in rural areas of Ballari. Utilization of maternal health services is very low in rural areas. Singh et al., (2017), Singh and Grover (2016) in their studies show poor health services in the North Eastern Region, especially in Nagaland. Sikkim, a state in the North-eastern zone, show very good result.

State-wise, as well as rural-urban variation in maternal health care services, are very prominent in India. Many states have improved a lot, but there are many lagging behind showing very slow or no growth in the maternal health care services. In India, more than 70 percent of the population resides in the rural part. So it is very important to understand the trend of maternal health care services in both urban and rural areas and to find out the differences and find ways to lessen it. The present study finds that the women in rural areas have fewer antenatal visits than urban women and it is statistically significant except the states namely, Punjab, Delhi, Sikkim, Goa, Andhra Pradesh, Tamil Nadu, and Telangana. In India, one major cause of death in infancy is neonatal

tetanus infection. Women from Sikkim, Kerala, Andhra Pradesh, Tripura, Orissa, and WB utilize TT vaccination during pregnancy, but states like Arunachal Pradesh, Nagaland show less utilization of TT vaccination. The result reflects that rural-urban difference exists in the case of overall TT vaccination, but in states like HP, Punjab, Uttarakhand, Sikkim, West Bengal, Maharashtra, Goa, Andhra Pradesh, Kerala, Tamil Nadu and Telangana women's place of residence (rural-urban) has no significant association with the utilization of TT vaccination. In states like Punjab, Delhi, Sikkim, Goa, Kerala and Tamil Nadu, women's place of residence (rural-urban) has no significant association with Institutional delivery. Postnatal check-up also reflects rural-urban disparity, but in Haryana, Delhi, Sikkim, Orissa, Gujarat, Goa, Andhra Pradesh, Karnataka, Kerala and Tamil Nadu similar utilization of Postnatal check-up has been observed. An impressive study done by Machira and Palamulen (2017) depicts that women's postpartum care services are not utilized properly despite the efforts of the government to promote the use of maternal healthcare services in Malawi.

The highest percentage of women from the Southern zone (84.7%) go for antenatal care, followed by women from Western (78.3%) and Northern zone (68.3%). Women from the eastern zone show the lowest result of antenatal care. In the case of institutional delivery, women residing in the urban areas get better privileges than rural women and it shows significant results. Family planning is very important in a country like India, where the population size is already very high and still growing. India already has 1.3 billion people and will soon become the largest population of the world. In this current scenario, implementing right family planning is very important for the development of our country. Without the participation of women in the family planning decision, India cannot achieve its goal to control its population growth. Results show that most of the women in India don't use FP. Some use traditional FP methods and only 32.1 percent of women use Modern FP methods. Though the situation has changed a lot and the government is trying, but still, the result is not only alarming but also very undesirable. Immediate action is needed to improve the situation.

The study concludes that zonal difference exists with respect to the place of delivery. Hilly regions, lack of transport, lack of health facility, and lower economic conditions create major problem for maternal health care services. Reproductive health care includes various measures to protect a

mother from problems related to pregnancy and delivery complications. Without proper maternal health care services, safe and healthy motherhood is only a distant dream. Arokiasamy and Pradhan (2012) mention that health services are constrained not only by lack of availability of health care facilities but also by lack of information on availability and critical benefits of those services. Women should know the appropriate age to become pregnant. Women should be aware of the way a pregnant woman should have to care. Women should provide standard maternity care. All delivery cases should be assisted by a trained person in a health care facility. But the results show that there is a lot to improve. More studies should be conducted to understand all aspects of the maternal health care and the ways to improve the current scenario.

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