Original Article

Utilization of maternal health care services in urban and rural areas of Maharashtra in India: a study based on district level household survey

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ABSTRACT

Introduction: Although maternal health in India has generally improved over the past two decades, the current Maternal Mortality Rate (MMR) implies that India's MMR is approximately 2.4 times higher than the set target in MDG-5. The study fills the gap by looking at women from the rural and urban areas with varying demographic and other socioeconomic attributes to find out their effect on Maternal and Child Health (MCH) service utilization in Maharashtra. Using data from the District Level Household Survey 2007-08, study attempt to investigate the rural-urban differences in maternal health care service utilization in Maharashtra, India.

Methods: This study use data from District Level Household Survey –conducted in 2007-08. The analysis carried out among ever-married women aged 15-49 years were interview from each districts of Maharashtra. Bivariate method used to fulfill the above objective.

Results: The result presented in the study shows that there is a huge gap in the utilization of maternal health services in the urban and rural areas of Maharashtra. Women's education through the media is more effective in the urban areas than in the rural areas, and wealth remains an issue particularly in the rural areas.

Conclusion: A sustained and focused Information Education and Communication campaign to improve the awareness amongst the community on MCH will help in improving the quality, accessibility, and utilization of maternal health care services provided by the government agencies in both rural and urban areas of Maharashtra, India.

Introduction

Maternal health care refers to the health care of women during pregnancy, childbirth, and the postpartum period. In developing countries like India, the leading causes of death and disability among women aged 15–49 is maternal mortality. Studies show that significant causes of maternal deaths are due to hemorrhage, sepsis, hypertensive disorder of pregnancy, unsafe induced abortion, and obstructed labor. Such a condition can improve by proper prenatal care and institutional delivery. It is global challenge to improve the utilization of maternal health care services system in low and middle income countries. Recognizing the importance of the problem, the United Nations focused on improving maternal health in the Millennium Development Goals to reduce Maternal Mortality Ratio (MMR) by three quarter during the period 1990–2015. This situation explained the importance of these indicators in global efforts towards human development (1). Less access and utilization of maternal and other health services contribute to a high maternal mortality rate, along with other socioeconomic factors (2). There are a large number of researches in India on the utilization of maternal healthcare services in rural and urban settings in the age group 15–19 years. A study done on the rural-urban differential in healthcare utilization founds that women in rural areas have lower levels of healthcare utilization than their urban area. (3). Despite several programs and policies and substantial improvement in maternal health indicators in India, the proportion of maternal mortality is unacceptably high (4). Alone India contributed about 15 percent of global maternal deaths worldwide in 2015, with approximately 45,000 maternal deaths (5, 6). India's maternal mortality ratio was 174, which was seven times higher than that of Russia, six times that of China, and about four times that of Brazil in 2015 (7, 8, 9). In 1972-76, India has achieved an appreciable decline in the MMR from 892

maternal deaths per 100,000 live births to 212 during 2007–09 (10).

Despite this remarkable decline, the current level of MMR in India is still unacceptably high. Maharashtra state is the second most populated state after Uttar Pradesh and the third largest state in India. There is regional variation within Maharashtra in terms of public distribution of health services, but there is wide variation across the districts and regions in the utilization of maternal health care (11). According to the National Family Health Survey (NFHS-1992-93), Maharashtra is the most urbanized state in India but struggle with many maternal related problems. Only eighty percent of births in Maharashtra received some form of antenatal care and that fifty percent of the women delivered at home compared with 43.5% at health institutions, so the home is still the preferential majority place for childbirth in Maharashtra. Some studies show that still, women in Maharashtra do not receive antenatal care (12, 13). There is a vast distinction between states and between rural and urban areas of India. This could be related to several factors, an important one being non-utilization or under-utilization of maternal healthcare services, especially amongst the rural poor and urban population due to inaccessibility, illiteracy, cultural factors that have a significant relationship as a determinant of maternal health in India (14, 15). Some studies show that women in rural areas have lower levels of healthcare utilization than their urban counterparts (16, 17, 18). For effective implementation of the programs, it is essential to understand the patterns, differentials, and factors affecting the utilization of maternal health care services. If these factors are correctly recognized, then the program efforts can be concentrated to increase the maternal health care utilization rates in both rural and urban areas of India. There is a serious dearth of empirical research in India on the utilization of maternal healthcare services in rural and urban settings of India. Therefore, the study aims to examine the differentials and the factors influencing maternal health care services in the urban and rural area of Maharashtra, India.

Methods

Design

The data is based on the third round of district-level household survey (DLHS-3), surveyed in 2007–2008, on India's eighteen high-performing states, Andhra Pradesh, Arunachal Pradesh, Goa, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Punjab, Sikkim, Tamil Nadu, Telangana, Tripura, West Bengal, and three high-performing union territories, the Andaman and Nicobar Islands, Chandigarh, and Pondicherry. The survey provides information on maternal and child health, family planning, and other reproductive health services. This study based on data collected from 37,716 households from Maharashtra during 2007-08. From these households, 34,920 ever-married women aged 15-49 years were an interview from each district of Maharashtra.

Sampling design and study size

DLHS-3 adopted a multi-stage stratified systematic sampling design adopted for DLHS-3 covering 50 primary sampling units (PSUs) from each district. Detailed information about sampling employed in this survey obtained from the national report of DLHS-3. The survey interviews 643,944 ever-married women aged 13–29 years from 720,320 sampled households (about 78% from rural and 22% from urban areas) spanning 601 districts of India. The overall response rate for ever-married women at the national level is 89%. Out of these 643,944 ever-married women,

a total of 201,058 have had a still or live birth during three years preceding the survey.

Independent variable

We have considered demographic and socio-economic variables such as mother's age at birth of the newborn (<20 years; 20-24 years, 25-29 years; 30 years and above), birth order and birth interval (first birth order; higher birth order and interval <24 months; higher birth order and interval ≥24 months). The education level of the woman (mother) and her husband defined using the number of years of schooling. The variable has five categories: no education, primary, secondary, secondary, and above. The wealth index is generally used as a proxy for the economic status of the. In this study, it is a composite index of household amenities and assets (five categories—poorest, poorer, middle, richer, and riches), caste (Scheduled Caste/Schedule Tribe; Other Backward Caste and Others), religion (Hindu; Muslim; Others), current working status of mother (not working; working), exposure to mass media (no exposure; exposure).

Dependent variable

Outcome variables are antenatal check-up during pregnancy, antenatal care, place of delivery, complications during delivery, post delivery complications.

Statistical analysis

Bivariate analysis used to examine the differences in the use of the antenatal check-up during pregnancy, antenatal care, place of delivery, between rural and urban population.

Ethical clearance

Our study based on the secondary data (DLHS). Data taken from International Institute for Population Sciences (IIPS) website [http://www.iipsindia.ac.in/]. Therefore, ethical clearance is not required for this study. We submitted a request to IIPS by briefly stating the objectives of this study and thereafter received permission to download the dataset.

Results

Table 1 shows the percentage distribution of women who received any antenatal care checkup during pregnancy according to background characteristics and place of antenatal care checkup by residence in Maharashtra. The result shows that respondents had a varied frequency of representation across urban and rural areas. In urban areas of Maharashtra, more than half of women (52%) went for antenatal checkups to the government hospital, and nearly forty-seven percent of women went to private hospitals. The differentials of the urban and rural residence revealed that more than half of women (58%) went for antenatal checkups to the government hospital, while only about 40% of women went to private hospitals in rural areas of Maharashtra. In response to the frequency of antenatal checkups, the study showed that rural older women (63%) are more likely to avail antenatal checkups from government hospitals as compared to younger women (30.6%). The percentage of women who had an antenatal checkup at home is low among all the age groups. This showed that urban residents more utilize a government healthcare service than in the rural area (Table 2). Eighty percent of women had availed 3 antenatal check-ups in the study sample. Among different caste groups, antenatal check-ups have not improved much. The likelihood of having 1 and 2 antenatal check-up decreases with increasing education and household wealth index.

Table 1. Percentage distribution of women who received any antenatal care check-ups (ANC) during pregnancy according to background characteristics and place of ante natal care check-up by residence in Maharashtra, 2007-08

Background characteristics	Rural			Urban			Total		
	Government	Private	Home	Government	Private	Home	Government	Private	Home
Age									
15-19	51.3	47.3	1.3	48.2	51.2	0.6	50.81	47.97	1.22
20-24	57.4	40.9	1.7	43.3	56.2	0.6	53.69	44.89	1.42
25-29	57.9	39.2	2.9	36.7	62.6	0.7	50.63	47.19	2.17
30-34	61.8	35.7	2.5	34.0	65.3	0.7	50.05	48.22	1.74
35-39	67.3	29.8	3.0	33.3	66.7	0.0	53.33	44.91	1.75
40+	63.9	30.6	5.6	52.9	47.1	0.0	60.38	35.85	3.77
Education									
0-5 Year	65.9	32.3	1.8	57.2	42.8	0.0	63.65	34.98	1.37
5-10Year	54.1	44.1	1.8	42.4	57.3	0.3	50.71	47.91	1.38
10 and above	36.6	62.0	1.3	21.0	78.3	0.7	29.20	69.79	1.02
Religion									
Hindu	56.6	41.3	2.2	37.4	61.9	0.7	51.96	46.22	1.83
Muslim	54.5	45.1	0.3	41.4	58.4	0.3	44.96	54.75	0.29
Buddhist	69.7	28.3	2.0	58.5	40.9	0.6	66.91	31.47	1.62
Caste/Tribe									
SC	68.7	29.8	1.5	55.2	44.4	0.4	64.41	34.45	1.14
ST	72.8	22.8	4.4	50.3	47.3	2.4	70.69	25.10	4.21
Others	45.9	53.0	1.1	33.9	65.8	0.4	41.26	57.94	0.80
Wealth Index									
Poor	72.8	23.5	3.6	68.9	31.1	0.0	72.68	23.83	3.49
Middle	59.2	39.0	1.8	62.0	37.0	1.0	59.59	38.75	1.66
Rich	41.7	57.3	1.0	35.4	64.1	0.6	38.57	60.62	0.81
Total	**57.5**	**40.4**	**2.2**	**39.4**	**60.0**	**0.6**	**52.1**	**46.3**	**1.7**

Table 2. Percent distribution of women according to background characteristics and number of antenatal check-up by residence in Maharashtra, 2007-08

Background Characteristics	Rural			Urban			Total		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Age									
15-19	7.0	17.0	76.0	3.6	13.0	83.4	6.47	16.0	77.5
20-24	5.1	15.3	79.5	2.5	10.7	86.8	4.48	14.1	81.4
25-29	5.0	13.0	82.0	2.5	7.1	90.4	4.15	10.9	84.9
30-34	5.1	18.3	76.6	0.7	6.3	93.1	3.16	13.1	83.7
35-39	3.8	14.4	81.9	3.5	3.5	92.9	3.66	9.9	86.4
40+	2.7	29.7	67.6	5.9	5.9	88.2	3.77	22.6	73.6
Education									
0-5 Year	7.0	17.3	75.7	4.2	12.9	83.0	6.34	16.1	77.5
5-10Year	4.1	13.4	82.5	2.0	9.3	88.7	3.52	12.1	84.3
10 &above Year	2.4	9.7	88.0	1.0	4.2	94.8	1.73	7.0	91.2
Religion									
Hindu	5.3	15.1	79.6	2.3	7.7	90.0	4.62	13.2	82.2
Muslim	5.0	17.0	78.0	2.6	12.2	85.2	3.22	13.5	83.2
Buddhist	4.4	15.4	80.2	2.9	4.7	92.4	4.02	12.6	83.3
Caste									
SC	5.3	15.5	79.2	3.9	7.8	88.4	4.85	13.0	82.2
ST	6.8	18.8	74.4	1.2	9.0	89.8	6.26	17.5	76.2
Others	4.9	14.9	80.2	2.5	9.5	88.0	4.01	12.8	83.2
Wealth									
Poor	8.0	19.4	72.6	7.7	15.4	76.9	8.02	19.0	73.0
Middle	4.6	16.1	79.3	4.0	16.6	79.5	4.49	16.1	79.4
Rich	3.2	10.6	86.2	1.9	7.3	90.8	2.59	9.0	88.4
Total	**5.3**	**15.1**	**79.7**	**1.9**	**7.3**	**90.8**	**4.40**	**13.12**	**82.48**

Table 3 gives a gloomy picture of the percentage of women according to background characteristics of women and place of delivery by residence in Maharashtra. More than half of birth (64%) births in Maharashtra take place in health facilities, and only thirty-six percent of births take place at home. Eighty-seven percent of deliveries in urban areas and 55 percent of deliveries in rural areas take place in health facilities. The percentage of births occurring in a health facility is higher (63 to 66%) for mothers under 34 years of age than for mothers age 35-49 (44 to 61%). The percentage of births occurring in a health facility in rural areas is higher for mothers under 29 years of age (53 to 59 percent) than for mothers age 30-49 (35 to 50 percent). In the case of urban areas, women with 10 and above years of education (80.5%) delivered in health facilities, women with less than 5 years of education (44.3%) are less likely to deliver in health

facilities in the rural area. A similar pattern was observed in the urban area of Maharashtra that women with 5 years of education (96.6%) are more likely to deliver in health facilities compared to women with less education (79.8%). More rural-urban differential was found in antenatal check-up patterns in the different age groups of the study population. It is high among the age group of 35-39 (34%) and low among the 15-19 (3%) age groups (Table 4). The rural-urban differential in antenatal check-ups at government hospitals increases by education. It is highest (16%) in the case of more than 10 years of schooling and the lowest (9%) in the case of 0-5 years of education. The rural-urban differential in antenatal check-ups at government hospitals by religion is highest among Hindus (19%) and lowest (11%) among Buddhists.

Table 3. Percentage distribution of women according to background characteristics and place of delivery by residence in Maharashtra, 2007-08

Background characteristics	Rural		Urban		Total	
	Institutional	Home	Institutional	Home	Institutional	Home
Age						
15-19	59.05	40.95	82.2	17.8	62.8	37.2
20-24	56.38	43.62	87.2	12.8	64.1	35.9
25-29	52.72	47.28	87.4	12.6	64.0	36.0
30-34	49.71	50.29	90.9	9.1	66.3	33.7
35-39	44.56	55.44	87.2	12.8	61.3	38.7
40+	34.69	65.31	68.4	31.6	44.1	55.9
Education						
0-5 Year	44.36	55.64	79.82	20.18	53.1	46.9
5-10Year	64.24	35.76	88.31	11.69	71.1	28.9
10 &above Year	80.56	19.44	96.67	3.33	88.2	11.8
Religion						
Hindu	53.46	46.54	88.65	11.35	61.4	38.6
Muslim	63.28	36.72	84.66	15.34	78.8	21.2
Buddhist	63.45	36.55	82.87	17.13	68.3	31.7
Caste						
SC	59.9	40.1	84.1	15.9	67.5	32.5
ST	30.5	69.5	81.0	19.0	34.7	65.3
Others	65.0	35.0	89.3	10.7	74.2	25.8
Wealth						
Poor	35.4	64.6	57.0	43.0	36.3	63.7
Middle	56.8	43.2	71.2	28.8	58.9	41.1
Rich	73.9	26.1	91.1	8.9	82.4	17.6
Total	**54.54**	**45.46**	**87.42**	**12.58**	**63.95**	**36.05**

Table 4. Rural urban differentials in any antenatal care check-ups (ANC) during pregnancy according to background characteristics and place of ante natal care check-up in Maharashtra, 2007-08

Background Characteristics	Government	Private	Home
Age			
15-19	3.1	-3.9	0.8
20-24	14.1	-15.2	1.2
25-29	21.1	-23.4	2.3
30-34	27.8	-29.6	1.8
35-39	33.9	-36.9	3.0
40+	10.9	-16.5	5.6
Education			
0-5 Year	8.6	-10.5	1.8
5-10Year	11.7	-13.3	1.5
10 &above Year	15.6	-16.3	0.7
Religion			
Hindu	19.1	-20.6	1.5
Muslim	13.2	-13.3	0.1
Buddhist	11.3	-12.6	1.4
Caste/Tribe			
SC	13.6	-14.6	1.1
ST	22.5	-24.5	2.0
Others	12.0	-12.8	0.7
Wealth			
Poor	4.0	-7.6	3.6
Middle	-2.9	2.1	0.8
Rich	6.3	-6.8	0.5

The rural-urban differential in antenatal check-ups at government hospitals by caste/tribe is highest (23%) among scheduled tribes and lowest (12%) among other castes. The rural-urban differential in first antenatal check-up by education decreases as education increases (Table 5). The rural-urban differential is lowest (1%) for more than 10 years of schooling, (2%) 5-10 years of education, and (3%) for 0-5 years of schooling. The rural-urban differential in third antenatal check-up by education is highest (7%) for 0-5 years of education and decreases to (6%) for 5-10 years of education and again increases to (7%) in case of more than 10 years of schooling. The rural-urban differential in third antenatal check-up at by wealth index is highest (5%) among women belonging to rich family

wealth index, and low (4%) among women belonging to poor family wealth index and lowest (0.2%) percent among women belonging to middle family wealth index. Table 6 depicts that rural-urban differentials in institutional delivery are more in urban areas as compared to rural areas. The rural-urban differential in institutional delivery by education decreases as education increases. It is high among women with 0-5 years of education (35%) as compared to 5-10 years of education (24%) and (16%) in the case of more than 10 years of schooling. Poor educational attainment was, therefore, more prevalent in rural areas. No difference found regarding institutional delivery between different religions religion and caste.

Table 5. Rural urban differentials in number of antenatal check-up according to background characteristics and number of antenatal check-up in Maharashtra, 2007-08

Background Characteristics	First	Second	Third
Age			
15-19	3.5	4.0	-7.4
20-24	2.6	4.6	-7.3
25-29	2.5	5.9	-8.4
30-34	4.4	12.0	-16.5
35-39	0.2	10.8	-11.0
40+	-3.2	23.8	-20.7
Education			
0-5 Year	2.9	4.4	-7.3
5-10Year	2.2	4.1	-6.3
10 &above Year	1.3	5.5	-6.8
Religion			
Hindu	3.0	7.4	-10.5
Muslim	2.4	4.8	-7.2
Buddhist	1.5	10.7	-12.2
Caste/Tribe			
SC	1.4	7.7	-9.1
ST	5.6	9.8	-15.4
Others	2.4	5.4	-7.8
Wealth Index			
Poor	0.3	4.0	-4.3
Middle	0.6	-0.4	-0.2
Rich	1.3	3.3	-4.6

Table 6. Rural urban differentials in place of delivery according to background characteristics in Maharashtra, 2007-08

Background Characteristics	Institutional	Home
Age		
15-19	-23.13	23.13
20-24	-30.85	30.85
25-29	-34.71	34.71
30-34	-41.16	41.16
35-39	-42.64	42.64
40+	-33.73	33.73
Education		
0-5 Year	-35.46	35.46
5-10Year	-24.07	24.07
10 &above Year	-16.12	16.12
Religion		
Hindu	-35.19	35.19
Muslim	-21.38	21.38
Buddhist	-19.42	19.42
Caste		
SC	-24.19	24.19
ST	-50.46	50.46
Others	-24.31	24.31
Wealth Index		
Poor	-21.60	21.60
Middle	-14.40	14.40
Rich	-17.11	17.11

Discussion

The results presented in the study shows that the utilization of maternal health service in Maharashtra clearly show that the use of maternal health service is higher among women of the urban area than a rural area. Present study findings are similar to the other studies (19, 20) national (21, 22) The high urban-rural gap in the use of the maternal healthcare services might be associated with different socio-economic and demographic characteristics in urban and rural areas in India (23,24, 25). The data revealed that the education of respondents and her husband had an impact on the utilization of maternal health services. The proportion of women who had received maternal health services increased as the education level of women increased, similar results found by other studies (26, 27, 28). Low use of health facilities in a rural area maybe because of various obstacles such as cost of transportation, cost of care and low awareness about health-promoting behavior, lack of health workers, poor infrastructural facilities, excess of workload, and a weak referral system (29, 30, 31). Previous literature reveals that the low use of health services is due to a lack of motivation among health providers and poor communication between healthcare providers and patients in the rural population (32). Studies show that poor rural households do not have enough resources to pay for healthcare expenses, whereas urban household is comparatively wealthier and better educated, which may facilitate the higher use of maternal health care (33). Mother's education and household wealth index both have a strong negative association with deliveries at home. The percentage of institutional deliveries is more in urban areas as

compared to rural areas. Place of delivery was associated with the education and wealth index, those who are better educated and belonging to a rich family wealth index are utilizing services from the private hospital (34). To achieve the national target, institutional delivery importance should give to the motivation of mothers for hospital delivery during ANC visits. In the current study, the home delivery prevalence was more in rural than in urban. The reason for home delivery can be due to inaccessibility and transport problems to the health system in a rural area while in the urban area because of the traditional belief that delivery was a natural process at home. A coverage evaluation survey by UNICEF (2009) found that Muslim women were less likely to go for institutional deliveries than women were from other religious groups (35). Further analysis shows that institutional deliveries were significantly higher among educated women and those from households belonging to higher wealth quintiles (36). Rural-urban differentials existed about the place of delivery. The percentage of institutional deliveries in urban areas was higher. The rural-urban differential in the use of maternal health care services is likely to be due to differences in the availability of maternal health care facilities, including the distance to the health care center and awareness. However, the study found that those women live in rural areas they less utilize health facility than those women live in urban areas.

Conclusion

Awareness among women regarding maternal health should promote because the maternal health problems are mainly due to poverty, ignorance, and lack of knowledge regarding proper maternal health care. It is, therefore, essential to first focus on services for the increasing awareness level of the mother. A sustained and focused Information Education and Communication campaign to improve the awareness amongst the community on MCH will help in improving the utilization of maternal health care services provided by the government agencies in both rural and urban areas of Maharashtra, India.

Ethical disclosure

Not applicable.

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Author contributions

All the authors have accepted responsibility for the entire content of this submitted manuscript and approved submission.

Conflict of interest

No conflict of interest has been declared by the authors.

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