International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Exploring the Determinants of Maternal Healthcare Utilization in India

Ms. Tashi Lamu

Assistant Professor
Department of Economics
Government College Bomdila.

Abstract

Women have played a significant role in almost every society of the world since time immemorial. But for many years, the status of women has been a source of debate and concern. Despite the progress made in recent years, women especially in the developing world still face numerous obstacles. Although men & women have different healthcare needs, they both have the right to lead healthy lives. However, for a large number of women and girls, gender discrimination routinely impedes their access to healthcare due to a variety of factors, such as limited economic opportunities, lack of education and mobility restrictions. As a result, the maternal death rate is unacceptably high. Every day in 2020, almost 800 women died from pregnancy and childbirth-related avoidable factors (WHO,2020). Almost 95% of all maternal deaths took place in low and lower-middle-income countries of the world where the lifetime risk of maternal death is comparatively high when compared with high-income and upper-middle-income countries. The probability of a 15-year-old woman dying from a maternal cause is her lifetime risk of maternal death. In low-income countries, it is 1 in 49 and 1 in 160 in lower-middle-income countries whereas, in high-income and upper-middle-income countries, it is 1 in 5300 and 1 in 1400 respectively (WHO,2020). Thus, women under the reproductive age group of 15-49 years have a higher lifetime risk of maternal death in low-income and lower-middle-income countries. Most maternal deaths occur in such countries because of the complications that develop during and after pregnancy and childbirth. Most of these complications are preventable if pregnant women have timely access to quality maternal healthcare facilities. However, several socio-demographic and economic obstacles prevent the majority of women in these areas from accessing and utilizing maternal health facilities.

Keywords- Maternal health, institutional delivery, antenatal care, post-natal care, accessibility.

INTRODUCTION

To increase equality and decrease poverty, maternal health is crucial to every nation's growth. Maternal health refers to the health journey of women throughout their pregnancy, childbirth and postpartum period. It encompasses the health care dimensions of family planning, preconception, prenatal and postnatal care in order to ensure a positive and satisfying experience as well as to reduce maternal morbidity and mortality. According to the World Health Organisation (WHO), around 287000 women lost their lives during and after pregnancy and childbirth in 2020. The majority of the nearly 95% of maternal deaths that happened in 2020 in low and lower-middle-income countries might have been prevented.

According to the UN Maternal Mortality Estimation Inter-Agency Group (MMEIG) 2020 study, "Trends in maternal mortality 2000 to 2020" globally, the maternal mortality rate has declined from 339 in 2020 to 223 in 2020 while India's maternal mortality rate has declined from 384 to 103 in 2020. This means that the average annual rate of reduction (ARR) in the global MMR was 2.07%, however, India's MMR decreased by 6.36%, which was 3 times higher than the global decline. This achievement puts India one step closer to

reaching the Sustainable Development Goal (SDG) of having an MMR below 70 per 100000 live births by 2030. Even though our country has made impressive progress in the area of maternal health, table 1.1 shows that it is still falling behind several industrialized and developing nations. As may be observed, nations with high Human Development have low maternal mortality ratios, such as Norway, Australia, Netherlands, Germany and Japan; these nations have single-digit maternal mortality ratios, while those with low Human Development have high maternal ratios.

Table-1.1: MMR[1](Maternal Mortality Ratio per 100000 live births) in major Developed & Developing Countries of the world

Countries	**2000**	**2010**	**2020**
Norway	7	6	1
Australia	9	6	3
Netherlands	14	8	4
United States	12	14	21
New Zealand	12	13	7
Canada	9	8	11
Germany	8	7	4
Japan	10	6	4
United Kingdom	12	10	10
U.A.E.	8	6	9
Sri Lanka	57	35	29
China	58	35	13
South Africa	85	154	127
Indonesia	265	165	173
Iraq	63	51	76
India	**384**	**215**	**103**
Bhutan	423	204	60
Pakistan	306	211	154
Bangladesh	399	242	123
Nepal	548	349	174

Note- MMR[1]: Estimates of maternal mortality rate have been computed to ensure comparability across countries, thus they are not necessarily the same as official statistics of the countries, which may use alternatives.

Source- WHO, UNICEF, UNFPA, World Bank Group & UNDESA/Population Division, 2020.

One of the key priorities of the World Health Organisation is to improve maternal health by decreasing maternal morbidity and mortality. The maternal mortality ratio is a crucial health indicator that measures the number of maternal deaths per 100000 live births in a given time period. It represents the risk of death a mother may experience during her pregnancy, childbirth or the 42 days following delivery. Improved maternal healthcare is indicated by a decreased maternal mortality ratio, which also shows how well maternal healthcare services are provided. With a population of over 1.21 billion, India was able to lower its maternal mortality ratio (MMR) from 130 per 100,000 live births in 2014–15 to 97 per 100,000 live births in 2018–20 which is evident from Table 2.2. It is clear from Table 2.2 that there exists variation in maternal mortality ratio among different states of India. During 2018-2020, Assam recorded the highest mortality ratio i.e., 97 per 100000

live births whereas Kerala recorded the lowest maternal mortality ratio of 19 per 100000 live births. The Empowered Action Group (EAG) and Assam has shown the declining trend of maternal mortality ratio from 188 per 100000 live births during 2014-15 to 137 per lakh live births during 2018-20. All states under EAG and Assam except Jharkhand and other states like Punjab and West Bengal recorded higher maternal mortality ratio than the national average depicting lower availability and accessibility of health care services in the region while some states like Kerala(19), Maharashtra(33), Telangana(43), Andhra Pradesh(45), Tamil Nadu(54) and Karnataka(69) have already achieved the Sustainable Development Goals of reducing maternal mortality ratio to 70 per 100000 live births by 2030 which also shows better maternal health as well as the availability and quality of health services for women in the states.

Table 1.2- Maternal Mortality Ratio (per 100000 live births) of India and bigger states

India & Bigger States	**2014-16**	**2015-17**	**2016-18**	**2018-20**
India	130	122	113	97
Assam	237	229	215	195
Bihar	165	165	149	118
Jharkhand		76	71	56
Madhya Pradesh	173	188	173	173
Chhattisgarh		141	159	137
Odisha	180	168	150	119
Rajasthan	199	186	164	113
Uttar Pradesh	201	216	197	167
Uttarakhand		89	99	103
EAG & Assam subtotal	188	175	161	137
Andhra Pradesh	74	74	65	45
Telangana	81	76	63	43
Karnataka	108	97	92	69
Kerela	46	42	43	19
Tamil Nadu	66	63	60	54
South subtotal	77	72	67	49
Gujarat	91	87	75	57
Haryana	101	98	91	110
Maharashtra	61	55	46	33
Punjab	122	122	129	105
West Bengal	101	94	98	103
Other states	96	96	85	77
Other subtotal	93	90	83	76
Source- SRS				

The majority of maternal deaths in India occur during labour, delivery, and the first few days after giving birth, with obstetric haemorrhage, infections, high blood pressure and anemia being the prominent reason. Most maternal deaths are preventable as well-established medical strategies are there to avoid or treat pregnancy and childbirth-related problems. All women should have access to quality prenatal, skilled delivery and postpartum care.

According to WHO 2020, approximately 99 percent of all births in the majority of high-income and upper-middle-income countries benefit from the presence of skilled health personnel like qualified midwives,

physicians or nurses. However, only 68 percent of people in low-income and 78 percent of people in lower-middle-income countries were able to reap benefits from such skilled health personnel. The presence of poor health infrastructure especially in rural areas accompanied by other socio-demographic and economic reasons prevents women in low-income and middle-low-income countries like India from seeking quality healthcare services during pregnancy and child birth leading to maternal morbidity and mortality. Thus, the identification and resolution of obstacles that restrict access to high-quality maternal healthcare services must be recognized and removed at the societal and health system levels in order to promote maternal health.

Access to Maternal healthcare services

Access to maternal healthcare services refers to the timely use of maternal healthcare services like antenatal care, skilled care delivery and postnatal care to achieve positive pregnancy experienced by pregnant women. In other words, access to maternal healthcare services is an opportunity to reach and obtain appropriate maternal healthcare services from skilled health personnel during pregnancy childbirth and postpartum phase by women. Thus, access to maternal healthcare services refers to the ability of the woman to utilize maternal healthcare services i.e., antenatal care, delivery care and post-natal care during pregnancy, childbirth and post-delivery, which ensures positive and healthy outcomes in the form of healthy mother and her healthy child. Several studies have identified the proper access and utilisation of maternal healthcare services i.e., antenatal care, safe delivery and post-partum services help in reducing maternal morbidity and mortality (Tsawe & Susuman, 2014; Pertin & Degi, 2020).

Factors affecting the access to maternal healthcare services

Accessibility to maternal healthcare services is crucial for saving the lives of pregnant women through the availability and utilization of quality maternal healthcare services. Therefore, access to these maternal healthcare services is dependent on how pregnant women are accessing that is, if pregnant women are unable to access and utilize life-saving maternal healthcare services then usage of these services will be restricted (Tsawe & Susuman, 2014). The ability to access maternal healthcare services especially, in developing countries, is affected by various socio-economic and other barriers which are discussed below in greater detail.

Geographical divide

Geographical divide led to inequality in accessing maternal healthcare services between hilly and plain areas because mostly hilly regions have difficult terrain as a result such areas remain underdeveloped and lack basic infrastructure like, hospitals, schools and colleges, transportation, etc. (Mishra at el., 2021). The access to and utilization of maternal healthcare services was alarmingly low in the rural hilly regions (Mustafa & Shekhar, 2021). One study found that utilization of maternal healthcare services is lagging in the Himalayan Mountain ranges when compared with the plain areas of India (Hiwale & Das, 2022). Another study says geographical remoteness is the main reason behind the poor utilization of antenatal care services and skilled delivery in the northeastern states of India (Sanasam, 2021). Thus, environmental factors in the form of different topographies create high inequality when accessing maternal healthcare services between hills and plains, as the accessibility of maternal healthcare services is high in plains when compared with the hilly regions.

Maternal education

One of the key reasons behind the high maternal motility ratio is low literacy levels among pregnant women. It is argued that maternal mortality and morbidity are seen to be lower in educated women because they are more aware of their health, the availability of maternal healthcare facilities, and the way to access such services compared to uneducated women. Women with secondary and higher education when compared to women with below primary and no education are more likely to start early antenatal care visits and prefer more to skilled delivery and postpartum care within 48 hours of delivery (Wang, 2021). Thus, a better education was associated with higher utilization of all three maternal healthcare services (Wang et al, 2021).

Studies have shown that uneducated women usually have less knowledge about the benefits of antenatal care, institutional delivery and post-partum care and they also face more difficulties in getting access to such services (Tran at el.,2012). Thus, there is a direct and proportional relationship between the maternal educational level and the access to maternal healthcare services i.e., the higher the maternal educational level, the higher will be the access to maternal healthcare services and vice-versa.

Maternal age

There is mixed evidence in the result of different studies regarding the association between maternal age and utilization of maternal healthcare services. In some studies, with the increase in maternal age, the utilization of maternal healthcare services also rises (Shanto et al,2023; Chakraborty, 2003). However, few studies suggested contrary to these studies, according to them, the women of young age access less maternal healthcare services (Singh, 2021). On the contrary, Sharma et al., 2020 suggest that there is no association between the age of mother with the utilization of maternal healthcare services.

Socio-economic status

Studies already conducted show that the continuation of socioeconomic inequalities is the main barrier to accessing maternal healthcare services (Anidhya, K., et al., 2021). Women belonging to families with BPL (Below Poverty Line) were less likely to utilize maternal healthcare services than women belonging to families with APL (Above Poverty Line) (Jat et al., 2011). Further, richer women are more likely than women from the poorest households to utilize essential maternal healthcare services, most likely because they face fewer barriers to accessing quality maternal healthcare services (Bintabara & Mwampagatwa, 2023).

Women working in the formal sector access more maternal healthcare services than those working in the informal sector. For example, daily wage earners don't prefer to visit hospitals for antenatal care check-ups because it leads to a loss of their income (Sharma, et al., 2022); women whose occupations are farmers, agricultural workers and labourers were less likely to utilize maternal healthcare services in comparison with housewives and professional women working in the formal sector (Jat et al., 2011). According to a study, women who belong to higher socioeconomic status tend to start early antenatal care and prefer skilled delivery in their life whereas women belonging to socioeconomic status usually don't start early antenatal care and prefer home delivery due to their financial constraints (Birmeta et al., 2013).

Social group and religion-

The access to and utilization of maternal healthcare services is also influenced by social groups and religion. According to one study, Muslim women were less likely to choose full antenatal care and skilled delivery care (Singh, P., et al,2021). Muslim women's cultural customs and religious beliefs may contribute to their low utilization of maternal healthcare services (Hazarika I,2011). Additionally, the low coverage of maternal healthcare services among mostly a scheduled caste/scheduled tribe woman may be related to their lower socio-economic level and lack of autonomy(Baru, R., et al, 2010) Thus, social determinants like lower social class and religion(Muslim) are reason for poor maternal health care utilization (Devasenapathy N, et. al,2015). However, religion appears to have little bearing on the struggles to the use of maternal healthcare services(Mujtaba M.A, et.al, 2016).

Education level and occupation of pregnant woman's spouse-

The education level and occupation of the pregnant woman's spouse or partner also determine the access to maternal healthcare services. For example, according to an Indonesian study, better education levels are more likely to encourage husbands to participate in ANC visits (Wulandari at el., 2022). Thus, if the spouse is more educated, he will support his wife in accessing quality maternal healthcare services, opposite will happen with the pregnant woman whose spouse's education level is below primary and no education. Further, the occupational status of the husband also determines the access to maternal healthcare services, e.g., husband of pregnant woman working in the formal sector earned stable incomes so, they support more to their pregnant

wife while accessing maternal healthcare services compared to those working in the informal sectors (Yadav, A.K., at el., 2021).
Thus, occupation and education level of spouse pregnant women also affect while accessing maternal health care services which should be clearly addressed for improving the overall maternal healthcare scenario.

Parity
Parity or gravida is a medical term that refers to birth order which also plays an important role in accessing maternal health care services. The higher the parity, the lower will be the access to maternal healthcare services and vice-versa. The woman who has fewer children are more likely to access maternal healthcare services than women who have a greater number of children. For example, women who have six or more children, their access to maternal health care services especially, ANC visits and skilled delivery decreases, as they rely more on their personal experiences (Bintabara et al., 2023). Thus, there is a significant relationship between parity and access to maternal healthcare services.

Level of service quality
Level of service quality refers to clinical effectiveness, safety and positive experience of patients (Godlee F, 2009). Some African studies reported that the reason behind the low access to maternal healthcare services is due to negative attitudes in the form of rude behaviors, poor communication as well as physical abuse done by the maternal healthcare providers toward the patients (Mannava et al., 2015). Due to shortage of maternal health provider, i.e., doctors, nurses and midwives, many pregnant women complaints that they were being sent home without receiving services. According to Gerein et. al. (2006), the reason behind shortages of maternal health workers is emigration, preferences for private health facilities over public health care and understaffing. The existing maternal health professionals may be going through over workload and dissatisfaction with their job and sometimes may take tasks for which they haven't gone through proper training becomes reason for showing their negative attitudes towards patients. In rural areas, the problem of low availability of maternal health arises due to less availability of trained health worker and their non-residence in villages. As a result, the vulnerable female population faces various maternal morbidity and mortality (Iyengar et. al.,2009). There are fewer hospitals equipped to provide emergency obstetric care around-the-clock is reduced due to a shortage of health providers leading to low access to maternal healthcare services (Gerein et al., 2006).

Exposure to mass media
Exposure to media is one of the important causes of inequality in accessing maternal healthcare services (Ali & Chauhan, 2020). A study in South India reported that women who were more exposed to mass media were more likely to receive antenatal care visits (Navaneetham & Dharmalingam, 2002). Media has a positive association with the existing maternal healthcare services. Information on health and current healthcare policies & programs can be found more easily through the media. Women who are more exposed to media may have a better understanding of maternal health complications and the benefits of using maternal healthcare services i.e., using early antenatal care, skilled delivery and postpartum care. Exposure to mass media may also be linked to other variables like higher education, higher wealth quintiles and living in urban areas which are positively correlated with an increased likelihood of excessive maternal health services (Singh et al., 2021).

Place of residence-
Place of residence i.e., urban or rural is one of the key factors determining access to maternal healthcare services. The world's population has increased from 751 million in 1950 to 4.2 billion in 2018, a proportion that is expected to increase to 68% by 2050 (UN Department of Economic and Social Affairs). Despite having, a relatively low level of urbanization, 54% of the world's population lives in Asia, with Europe and Africa following at 30% each. In India, more than two-thirds of its population are living in rural areas but they are

unable to access quality healthcare services as about 75% of the healthcare infrastructure is located in urban and metro cities. The women in urban areas avail 4 or more antenatal care visits, prefer skilled delivery care and postnatal care because women in this areas have more physical and economic access to health facilities (Kangbai D.M,2020). Compared to urban residents, rural residents access and utilised less maternal healthcare services may be because of socio-demographic differences between both residents. Further, rural residents face structural barriers such as shortage of health personnel and limited exposure to social media which creates another barrier in access to health information, especially those women who had limited health literacy (Chen X, et. al,2020).

Distance to a healthcare facility

Generally speaking, distance to the nearest health facilities has been found to be a significant barrier to the access and utilization of maternal healthcare services, especially, in rural areas. The research has revealed that there is a very strong correlation between the distance to the nearest health facilities and the number of accessing maternal healthcare services i.e., farther the distance to the nearest hospital, the lesser will be the propensity to access maternal healthcare services by the women. Those pregnant women who are residing near or within walkable distance of the health facility incur zero transportation costs, so, they access more maternal healthcare services than those who are residing far away from the nearest health facility. The transportation cost rises with the distance or it is high on non-motorable roads and the pregnant women who are residing in such regions access very low maternal health care services. One Ethiopian research reported that mothers who traveled more than 5 kilometers from their home to the nearest health facilities were 1.69 times more likely to be delayed than their counterparts (Kassa, 2023). Thus, access to maternal healthcare services is substantially related to the average distance to the nearest health facilities.

Out-of-pocket maternal health expenditure

The out-of-pocket expenditure or unaffordability of maternal health care services is one of the significant reasons behind the low access to maternal health care in India (Akula et al., 2012). According to the findings of Sharma, et al., (2018), out-of-pocket maternal health expenditure incurred during ANC visits in a private health facility is nearly three times that in a public health facility. And the average delivery cost of private facilities was two to three times higher than that of public facility or home delivery. A few studies have highlighted that expenditure on delivery care is catastrophic for rural households, the less educated, slum dwellers and poor households (Bonu et al. 2009; Skordis-Worrall, et al. 2011). The poorest households are heavily burdened by spending on maternal care and often resort to borrowing to meet expenses (Skordis-Worrall et al. 2011).

According to Kerketta (2015) most of the mothers have out-of-pocket-maternal health-expenditure for availing antenatal and delivery care services in India, irrespective of public or private health facility. Though OOPMHE has been found to be more in private health facility, even in public health institutions, mother have to bear the expenses for availing ultrasound and receiving delivery care. OOPMHE by mother varies with her education, her residence (urban or rural) and socio-economic status. For example, urban mothers are more likely of OOPME on ANC and delivery care. As women educational level increases, the likelihood of OOPMHE on delivery care services also increases. Similarly, women belonging to higher socio-economic status spend more on availing maternal healthcare services compared to those belonging to lower socio-economic status as they are unable to bear the burden of expenses.

Thus, the various socio-demographic and economic factors like geographical divide, maternal education, maternal age, socioeconomic status, parity (birth order), social groups and religion, occupation and education level of husband, level of service quality, exposure to mass media, distance to a health facility and out-of-pocket maternal healthcare expenditure are significantly associated with the access to maternal health care services.

Conclusion

This article highlights the multifaceted socio-demographic and economic barriers that hinder pregnant women from accessing and utilizing maternal healthcare services. By analysing NFHS-5 data, the study reveals significant disparities in maternal healthcare utilization at both national and state levels. In addition to individual and household- level factors, systematic issues- particularly the lack of management capacity within the healthcare system- further exacerbate poor access and usage, especially in more backward regions of the country.

The findings underscore the urgent need to strengthen the provision of comprehensive maternal healthcare, including antenatal care, skilled delivery, emergency obstetric services, and postnatal care, within a responsive and well-coordinated health system. Without a focused strategy emphasizing skilled birth attendance, timely referrals, and accessible emergency care, India- especially its lagging states-will struggle to reduce maternal morbidity and mortality.

To address these challenges, targeted interventions must be implemented, including media and community-based campaigns to raise awareness among disadvantaged populations. Equally important is the rigorous monitoring and evaluation of existing maternal health programs to ensure their effectiveness and to drive continuous improvements in service delivery.

REFERENCES:

1. Akula, S. C., & Singh, P. (2021). Modeling relation between hospital efficiency and customer satisfaction of tertiary hospitals: A case of data envelopment analysis. *Pharmacognosy Journal*, *13*(6).
2. Ali, B., & Chauhan, S. (2020). Inequalities in the utilisation of maternal health care in rural India: Evidences from National Family Health Survey III & IV. *BMC public health*, *20*(1), 1-13.
3. Anindya, K., Marthias, T., Vellakkal, S., Carvalho, N., Atun, R., Morgan, A., ... & Lee, J. T. (2021). Socioeconomic inequalities in effective service coverage for reproductive, maternal, newborn, and child health: a comparative analysis of 39 low-income and middle-income countries. *EClinicalMedicine*, *40*.
4. Baru, R., Acharya, A., Acharya, S., Kumar, A. S., & Nagaraj, K. (2010). Inequities in access to health services in India: caste, class and region. *Economic and political Weekly*, 49-58.
5. Bintabara, D., & Mwampagatwa, I. (2023). Socioeconomic inequalities in maternal healthcare utilization: An analysis of the interaction between wealth status and education, a population-based surveys in Tanzania. *PLOS Global Public Health*, *3*(6), e0002006.
6. Birmeta, K., Dibaba, Y., & Woldeyohannes, D. (2013). Determinants of maternal health care utilization in Holeta town, central Ethiopia. *BMC health services research*, *13*(1), 1-10.
7. Chakraborty, N., Islam, M. A., Chowdhury, R. I., Bari, W., & Akhter, H. H. (2003). Determinants of the use of maternal health services in rural Bangladesh. *Health promotion international*, *18*(4), 327-337.
8. Chen, S., Lin, X., Wang, M., Gu, Z., Wang, M., Ji, Y., & Yang, M. (2025). Research on the status and influencing factors of maternal health literacy among postpartum women in urban villages. *Journal of Advanced Nursing*, *81*(1), 499-512.
9. Gerein, N., Green, A. and Pearson, S., 2006. The implications of shortages of health professionals for maternal health in sub-Saharan Africa. *Reproductive health matters*, *14*(27), pp.40-50.
10. Godlee, F. (2009). Effective, safe, and a good patient experience.
11. Hazarika, I. (2011). Factors that determine the use of skilled care during delivery in India: implications for achievement of MDG-5 targets. *Maternal and child health journal*, *15*(8), 1381-1388.
12. Hiwale, A. J., & Das, K. C. (2022). Geospatial differences among natural regions in the utilization of maternal health care services in India. *Clinical Epidemiology and Global Health*, *14*, 100979.
13. Iyengar, S. D., Iyengar, K., & Gupta, V. (2009). Maternal health: a case study of Rajasthan. *Journal of health, population, and nutrition*, *27*(2), 271.
14. Jat, T. R., Ng, N., & San Sebastian, M. (2011). Factors affecting the use of maternal health services in Madhya Pradesh state of India: a multilevel analysis. *International journal for equity in health*, *10*(1),

59.Jat, T. R., Ng, N., & San Sebastian, M. (2011). Factors affecting the use of maternal health services in Madhya Pradesh state of India: a multilevel analysis. *International journal for equity in health*, *10*(1), 59.
15. Kangbai, D. M., Bandoh, D. A., Manu, A., Kangbai, J. Y., Kenu, E., & Addo-Lartey, A. (2022). Socio-economic determinants of maternal health care utilization in Kailahun District, Sierra Leone, 2020. *BMC pregnancy and childbirth*, *22*(1), 276.
16. Kassa, B. G., Tiruneh, G. A., & Solomon, A. A. (2023). Delay in reaching health facilities and its associated factors among mothers giving birth in South Gondar zone hospitals, Northwest Ethiopia, 2020: A facility-based cross-sectional study. *Frontiers in Global Women's Health*, *4*, 916978.
17. Kerketta, S. (2015). Out of pocket expenditure on utilization of ante-natal and delivery care services in India: analysis based on NSSO 60th round. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, *4*(6), 1704-1710.
18. Mannava, P., Murray, J. C., Kim, R., & Sobel, H. L. (2019). Status of water, sanitation and hygiene services for childbirth and newborn care in seven countries in East Asia and the Pacific. *Journal of global health*, *9*(2), 020430.
19. Mishra, P. S., Veerapandian, K., & Choudhary, P. K. (2021). Impact of socio-economic inequity in access to maternal health benefits in India: Evidence from Janani Suraksha Yojana using NFHS data. *Plos one*, *16*(3), e0247935.
20. Al-Mujtaba, M., Cornelius, L. J., Galadanci, H., Erekaha, S., Okundaye, J. N., Adeyemi, O. A., & Sam-Agudu, N. A. (2016). Evaluating Religious Influences on the Utilization of Maternal Health Services among Muslim and Christian Women in North-Central Nigeria. *BioMed research international*, *2016*(1), 3645415.
21. Navaneetham, K., & Dharmalingam, A. (2002). Utilization of maternal health care services in Southern India. *Social science & medicine*, *55*(10), 1849-1869.
22. Pertin,M & Degi, K. (2020). Barriers to utilization of maternal and child health care services in Arunachal Pradesh, India: Empirical evidences from field survey. *International Journal of Creative Research Thoughts*, pp.1101-1109.
23. Sanasam, D. C. (2020). Maternal reproductive health: a comparison between India and empowered action group states. In *Urban health risk and resilience in Asian cities* (pp. 149-163). Singapore: Springer Singapore.
24. Shanto, H. H., Al-Zubayer, M. A., Ahammed, B., Sarder, M. A., Keramat, S. A., Hashmi, R., ... & Alam, K. (2023). Maternal Healthcare Services Utilisation and Its Associated Risk Factors: A Pooled Study of 37 Low-and Middle-Income Countries. *International Journal of Public Health*, *68*, 1606288.
25. Singh, P., Singh, K. K., & Singh, P. (2021). Maternal health care service utilization among young married women in India, 1992–2016: trends and determinants. *BMC Pregnancy and Childbirth*, *21*(1), 1-13.
26. Singh, N., Patel, R., & Chauhan, S. (2021). Geospatial analysis of utilization of maternal health care services in india. *GeoJournal*, 1-20.
27. Tran, T. K., Gottvall, K., Nguyen, H. D., Ascher, H., & Petzold, M. (2012). Factors associated with antenatal care adequacy in rural and urban contexts-results from two health and demographic surveillance sites in Vietnam. *BMC health services research*, *12*(1), 1-10.
28. Tsawe, M., & Susuman, A. S. (2022). Inequalities in maternal healthcare use in Sierra Leone: Evidence from the 2008–2019 Demographic and Health Surveys. *Plos one*, *17*(10), e0276102.
29. Wang, H., Frasco, E., Takesue, R., & Tang, K. (2021). Maternal education level and maternal healthcare utilization in the Democratic Republic of the Congo: an analysis of the multiple indicator cluster survey 2017/18. *BMC Health Services Research*, *21*(1), 1-13.
30. WHO (2017) Report on maternal, reproductive and child health.

31. Wulandari, R. D., Laksono, A. D., & Matahari, R. (2022). Does Husband's Education Level Matter to Antenatal Care Visits? A Study on Poor Households in Indonesia. *Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine*, *47*(2), 192.
32. Yadav, A. K., Sahni, B., Kumar, D., Bala, K., & Kalotra, A. (2021). Effect of women's and partners' education on maternal health-care services utilization in five empowered action group States of India: an analysis of 13,443 women of reproductive age. *International Journal of Applied and Basic Medical Research*, *11*(4), 231-237.