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Determinants of Institutional Delivery Among Women in Madhesh Province, Nepal

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Abstract

Maternal health continues to be a very significant public health concern in Nepal, especially in Madhesh province, where the rate of institutional delivery facility is significantly lesser than the national average. Institutional delivery basically means a delivery that takes place inside healthcare facilities where healthcare professionals are available to reduce maternal mortality and assess neonatal health. This study is a close observation of socio-economic, and infrastructural factors that influence the real determinants of facility delivery services in Madhesh. The variables associated with having and not having facility delivery were broken down using the 2022 Nepal Demographic and Health Survey (NDHS) data through cross-sectional research design. The logit regression models for determinants of maternal education, household economic status, healthcare access, and socio-cultural beliefs regarding the type of delivery method have the highest coefficients. The prediction is the greater the maternal education, economic power, and frequency at which they receive so-called intuitional delivery, the more likely they will favor facility-based delivery. One thing is important to note that the less cited as opposite is the fact that certain preventive weights fall so fairly on some ethnic groups with high birth orders, based in the rural area, as well as those who research the custom of home birth as a must in terms of choosing the more alacritous institutional service. This study categorizes focused on intervention for change through community sensitization programs and accessible healthcare services. Cultural practices are strengthened by ensuring the availability of services, while strengthening healthcare access and partly multi-means will build institutional delivery rates in Madhesh along matching national and international objectives to maternal health.

Keywords: *Institutional delivery, maternal health, Madhesh province, socio-economic factors, accessibility, Nepal*

Introduction

Maternal health remains a daunting issue in Nepal as low institutional delivery rates compared to the national mean is the Madhesh Province. These institutional births take place in healthcare facilities and are therefore the best way to lower maternal and infant death rates (Ministry of Health and Population [MOHP], New ERA, & ICF, 2022). The government in Nepal has always come up with policies and programs to encourage use for women's reproductive services towards institutions and most of them have been implemented to show the desired impact. A few of them prove the chance of bringing about such a change: The Safe Motherhood Program, incentives for facility-based births, and several others. In Madhesh, the lowest rate of institutional childbirth is recorded despite such efforts also taken in place (Karkee et al., 2021).

There are natural causes ancestral to various social and infrastructural backgrounds that decide whether a woman will birth a child in a health care institution. The factors influencing institutional birth: maternally educated, wealth level of the household, geographic accessibility, cultural beliefs, and availability of skilled birth attendants (Paudel, Shrestha, & Siebeck, 2023). A slightly limited extent of study aspects has been done specifically for Madhesh Province, where unique socio-economic norms might be almost as good a reason as tradition in upholding the latent home birth inborn. Therefore, this study will contribute to narrowing this research gap by studying the determinants depicting the situation with respect to institutional delivery in Madhesh Province and to finding possible strategies for another group where these actions can contribute to increasing maternal healthcare service intake for their welfare.

Over the last 2 decades, Nepal has seen tremendous progress in reducing maternal mortality. The maternal mortality rate (MMR) has fallen from 539/100,000 live births during 1996 to 151/100,000 live births by 2022 (MOHP et al., 2022). Regardless of how appreciably much progress has been made, maternal mortality continues to be a major concern, particularly in rural and marginalized regions such as the entire Madhesh region. As per the Nepal Demographic and Health Survey 2022, 66.8 percent of births are delivered in health facilities in Madhesh Province compared to the national average of 79.3 percent (MOHP et al., 2022). Home delivery is the remaining, preferred option, with the possibility of most deliveries occurring without the assistance of a birth attendant and with a sharp increase in risk of maternal or neonatal complications.

High occurrence of home deliveries in Madhesh Province has shown to find varied root causes: financial barriers, remote access to health(s) facilities, transportation needs, and the

strong cultural and social norms that often dictate home births (Shah et al., 2023). Women are already facing the compounded challenge of reduced socio-economic status, limited formal education, and remote locality in accessing institutional delivery services (Mehata et al., 2020). Gender norms, cultural norms, and beliefs serve as major influences on decision-making toward childbirth; traditionally, it is considered respectful for women to deliver at home, and kin elders play a crucial role in deciding where deliveries should take place. Addressing these challenges, therefore, must involve an in-depth understanding of the factors that influence the choice of a delivery site in the Madhesh districts.

The existing studies dealing with institutional delivery service in Nepal focused primarily on the national acute urban and hill regions leaving a void in the research from the point of identifying Madhesh Province. Whereas mother's education, wealth index, and health facility accessibility were studied at length (Paudel et al., 2023; Neupane et al., 2021), their ranking in the socio-economic context of Madhesh Province remains undefined. These groups often have to face systemic discrimination and barriers in accessing good healthcare (Parajuli et al., 2023). Further, informal information has linked patriarchal norms and cultural pro-inclinations for home deliveries in Madhesh with empirical evidence to be corroborated due to lack of research.

This study is meant to fill the existing research void of the determinants of institutional delivery, specifically in Madhesh. A variety of socio-demographic factors play a significant role in the utilization of institutional delivery service. A study of the Nepal Multiple Indicator Cluster Survey 2019 data has shown that mothers from the Madhesh Province delivered less likely in health institutions compared with mothers from Bagmati. Poverty, credit scarcity, and cultural practices entrenched in the region have greatly contributed to this anomaly. (Paudel et al., 2023)

Educated women will more often opt for institutional delivery. These findings show that 84.6 percent of the educated population used institutional delivery services in contrast to only about half of those who were poorly educated (Global Health, 2022). Educational attainment, so far as this is concerned, increases the consciousness of the benefits of skilled birth attendance in the context of institutional delivery among pregnant women and hence in terms of health risks involved in home delivery (Paudel et al., 2023).

The factor of ethnicity is equally important. Women from less-privileged ethnicities were less likely to deliver in health institutions. This is likely due to social discrimination and systemic barriers preventing their access to health services. (Paudel et al., 2023).

Thus, an economic position does greatly influence the choice of place for delivery. Women from affluent households have markedly different institutional delivery rates. The main

reason why women fear seeking institutional care is the high costs related to transportation, medical fees, and, eventually, the lack of income due to maternity leave. Many authors (Acharya et al., 2021).

The study clearly found that poor accessibility to health facilities was a major weakness to seeking institutional delivery services. Women in rural areas where health facilities are limited and transportation infrastructure is ordinary have encountered many barriers in accessing quality care at industrial facilities. Women in rural areas have been found by this study to be less likely to opt for institutional delivery as compared to their equals in urban settings (Paudel et al., 2023).

The with delivery being seen as a normal event that needs no intervention from a medical standpoint in the province. Family dynamics, especially the influences of the husbands and mothers-in-law, are driving decision-making on the site of childbirth. Qualitative study has shed light on a particular trend-though women are consulted on decisions all during pregnancy; the minute labor has started; the responsibility is shifted to the family. The fear of complications, past obstetric experiences, and perceived competency in health care providers are underlying these decisions (Shah et al., 2022).

The Nepalese government has been busy trying to create supportive systems to encourage institutional delivery. One such program is the Aama and Newborn Programme, which offers economic reasons for women who reach their births in health facilities. Despite the good intentions of these programs, challenges persist in attaining equitable access to maternal healthcare across regions and among different communities. It is imperative, therefore, that tailored interventions be aimed at addressing socio-cultural and economic barriers in Madhesh Province. These interventions may cut across such diverse strategies as community education missions aimed at raising awareness regarding the benefits that come with institutional delivery, the recovery of transportation infrastructure, and the up-gradation of existing health facilities to nurture community trust (Dhakal et al., 2023).

To assess the socio-economic and demographic determinants of institutional delivery among women which are in practice in Madhesh Province, the study seeks to outline the effect of availability of healthcare on women's decision-making on place of delivery, explore the existence of cultural beliefs influencing women's choices for delivery, and suggest some policy suggestions for the enhancement of institutional delivery rates in the area.

The study uses mixed-method research to assess comprehensively the determinants of institutional delivery in Madhesh Province. The quantitative method will include interviews with women of an age to bear children who have given birth recently concerning variables such as maternal education, household income, antenatal care visits, and delivery

experiences. For the qualitative approach, in-depth interviews and focus group discussions will be conducted with mothers, family members, health personnel, and community leaders to explore cultural norms, beliefs of women, and perceived barriers to their choice for institutional delivery.

It will be equally important to explore the availability and quality of maternal health services, such as the distribution of healthcare facilities, presence of skilled birth attendants, availability of medical supplies, and the state of infrastructure among the healthcare facilities in Madhesh Province (MOHP et al., 2022). By utilizing multiple sources of data, the proposed research will present a holistic understanding of factors affecting the choice of institutionally assisted delivery among Madhesh women.

Insights derived from this research will guide policy-making examples to increase institutional delivery rates. Such measures may involve community training programs based on the identification of the benefits of institutional delivery, an outreach effort to train and dispatch additional SBAs into rural regions, building up the road infrastructure to increase access to health facilities of socio-economic disadvantages to secondary health services access (Shah et al., 2022). Focus should be on Madhesh Province and give evidence-based recommendations to policymakers, healthcare providers, and nongovernmental organizations whose attempts are to enhance maternal and newborn health in the family. Ultimately, improving institutional delivery rates in Madhesh Province would go a long way in the achievement of the maternal health goal in Nepal.

Data and methods

This study has indicated that this study is cross-sectional with the assistance of secondary data from the NDHS 2022, a national-scale dataset that gives authentic information pertaining to maternal-health-seeking behavior and delivery utilization behavior in Nepal. The 2022 version of the NDHS was carried out by the Ministry of Health and Population (MOHP), New ERA, and ICF and conducted through structured household surveys employing multi-stage stratified sampling techniques (MOHP, New ERA, & ICF, 2022). Data, in this study, will be extracted for women aged 15–49 years who gave birth up to five years prior to the survey. These women will also be noted for their place of habitation in Madhesh Province. The variables mainly consist of socio-economic factors and demography (age, education, household income, ethnicity, and parity) and healthcare accessibility factors. Statistical analysis will be performed by using descriptive statistics and institutional delivery understanding logistic regression for exact odds ratios. This methodology definitely provides for evidence-based results with which policy interventions can be developed to attain better institutional delivery rates for Madhesh Province.

Results

Based on age, institutional delivery in Nepal is more likely with younger women. Mothers between 15 and 24 years have higher chances of service delivery with hospital births as compared to mothers of higher ages mostly because of the possibility of the former having had more providence at education and reception to maternal healthcare and because usually, older mothers would adjust to their traditional practices.

Education is a vital factor governing choice of hospital services. Women who had been educated to the extent of completing secondary level and above were found to access health facilities because they had been substantially exposed to maternal risk and health information.

Religious affiliation substantially marks healthcare-seeking behavior among Nepali women. Although most Hindu women in Nepal primarily living in Madhesh Province afford an alibi to deliver from house, which may be influenced by family members and the religion respectively, Muslim and minority women deal with additional issues, including social and cultural pressure for not seeking healthcare services and choosing institutional births.

Caste and ethnicity are two crucial determinants of service-based healthcare in Nepal, among which higher combined caste definitely can afford access to institutional delivery through numerous socio-economic rights. Meanwhile, Madhesi Dalit, Janajati, and marginalized communities accumulate unending stories of deprivation, discrimination and financial strain hindering them from safe-and-institutional birth.

Urban-rural differences make a huge difference in hospital delivery rates. An urban setting definitely eases women's approach for hospitals, maternity homes, and medical attendants, thus increasing the probability of institutional birth as life goes on. Economic status very significantly determines the potentiality of institutional delivery. Rich family women from areas with a high-quality standard of healthcare service will have an easy time meeting the cost of the delivery-related transport, medical payments, and availing of the private healthcare service-increasing institutional birth, where else poorer people, notably those occupying the lowest wealth quintile.

Table 1: Distribution institutional delivery visits the respondents

Variable	**Non Institutional**		**Institutional**		**Total**	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Age						
<20	24	9.9	47	9.7	71	9.7
20-24	115	46.3	232	47.8	347	47.3

25-29	69	27.9	137	28.2	206	28.1
30-49	39	15.9	70	14.4	109	14.9
Birth order						
First	40	16.3	181	37.2	221	30.2
Second	77	31.1	166	34.1	243	33.1
Third or higher	130	52.7	139	28.6	270	36.7
Level of education						
No Education	134	54.3	158	32.5	292	39.8
Basic Education	107	43.2	260	53.5	367	50.1
Higher Education	6	2.5	68	14.0	74	10.1
Religion						
Hindu	208	84.1	409	84.1	617	84.1
Other religion	39	15.9	77	15.9	117	15.9
Caste/Ethnicity						
Dalit	71	28.5	79	16.1	149	20.3
Muslim	40	16.3	75	15.4	115	15.7
Janjati	14	5.5	32	6.6	46	6.3
Other Terai	121	49.0	268	55.1	389	53.0
Brahmin/Chhetri	2	0.8	31	6.4	33	4.5
Place of Residence						
Urban	183	73.8	370	76.1	553	75.3
Rural	65	26.2	116	23.9	181	24.7
Wealth quintile						
Poorest	51	20.7	36	7.4	87	11.9
Poorer	89	35.9	120	24.7	209	28.5
Middle	66	26.5	137	28.1	202	27.5
Richer	35	14.2	119	24.5	154	21.0
Richest	7	2.7	75	15.3	81	11.1
Total	247	100.0	487	100.0	734	100.0

Source: Nepal Demographic and Health Survey, 2022

Table 1 shows that the distribution of institutions and non-institutional deliveries among women based on key socio-demographic factors in Madhesh Province, Nepal. The highest institutional delivery proportion occurred among educated women under the age of 20 years and those aged 20-24 years (47.8%). The lowest percentage of institutional delivery situations occurred among highly educated women less than 20 years old (9.7%) and 30-49 years (14.4%). This shows young women, especially those aged 20-24, are more likely to go to institutional delivery than older women.

Among deliveries women are more likely to happen in institutions (37.2%). After the first child, a decreasing trend in institutional delivery rate is observed. The highest percentage of non-institutional deliveries involved women with three or more children (52.7 percent). Experience and perceived safety of home delivery may influence a woman's subsequent choice towards home.

Education was associated very strongly with institutional delivery usage. Well-educated women had the highest propensity to deliver in institutions (14.0%), while non-educated women represented the highest percentage in non-institutions (54.3%). Most institutional deliveries took place among women with primary education (53.5%), thereby implying that illiteracy plays an active role in maternal healthcare choices.

The majority of survey respondents were Hindu (84.1%); however, institutional and non-institutional delivery ratios did not significantly differ based on one's religious denomination.

The institutional delivery rate of Other Terai caste group (55.1%) was significantly higher than the Brahmin/Chhetri (6.4%) and Janjati (6.6%). However, the Dalit group (16.1%) showed relatively lower institutional delivery rates than those recorded for non-institutional deliveries (28.5%). This could imply existing socio-economic and health systems barriers.

Urban females took advantage of higher institutional delivery rates (76.1%) as against rural females (23.9%). The data confirms the disparity between urban and rural areas concerning the issue of healthcare as rural women find it more difficult to undergo institutional deliveries.

The factor that strongly determines where the delivery should take place is economics. The richest women (15.3%) had the highest proportion of deliveries being institutional, and the poorest ones had the lowest (7.4%). The poorer and middle wealth quintiles had moderate to fair institutional delivery percentages of 24.7 percent and 28.1 percent, respectively, which reveals that financial constraints greatly come into play in using healthcare.

Factors association with demographic and socio-economic variables: The logistic regression analysis conducted with 329 observations, two strata, and 68 primary sampling units (PSUs) delineated significant determinants of institutional delivery within the state of Madhesh Province within Nepal. The model's F statistics (3.58, $p = 0.0002$) marks its overall significance, suggesting that socio-economic, demographic, and heath-access variables collectively are great predictors of institution-delivery utilization. In the subsequent survey weighted analysis, with a population size of 387.1 and 66 design degrees of freedom, significant predictors have give valuable direction and high strength so as to technology to enrich maternal health care in the region; odds ratios and confidence intervals,

intended from a different perspective, clear provisions for targeted efforts in healthcare service.

Table 2: Factors association of demographic and socio –economic variable

Variable	Odds Ratio	Std. Err.	T	P>|t|	95% Conf. Interval	Sig
Age						
20-24	1.56253	0.5614279	1.24	0.218	0.7628607-3.200452	
25-29	3.20146	1.465325	2.54	0.013	1.284372-7.98004	**
30-49	5.100514	2.433628	3.41	0.001	1.968429-13.21625	***
Birth order						
Second	0.3697641	0.1127233	-3.26	0.002	0.201249-0.6793849	***
Third or higher	0.1444625	0.0438085	-6.38	0	0.0788771-0.2645814	***
Religion						
Other religion	2.869074	3.368785	0.9	0.373	0.2755371-29.8747	
Caste/Ethnicity						
Muslim	0.3576178	0.4217259	-0.87	0.386	0.0339972-3.761789	
Janjati	0.637963	0.3366044	-0.85	0.397	0.2226105-1.828291	
Other Terai	1.114267	0.2675199	0.45	0.654	0.6901213-1.79909	
Brahmin/Chhetri	3.486156	4.138854	1.05	0.297	0.326191-37.25818	
Educational attainment						
Basic Education	1.431895	0.3087253	1.67	0.101	0.9312412-2.201709	
Higher Education	2.007419	1.226251	1.14	0.258	0.5932723-6.792378	
Residence						
Rural	0.9221856	0.2228688	-0.34	0.739	0.5693483-1.493684	
Wealth quintile						
Poorer	1.744614	0.6538375	1.48	0.142	0.82587-3.685422	
Middle	2.322224	0.9022884	2.17	0.034	1.069505-5.042262	**
Richer	3.100555	1.606842	2.18	0.032	1.102348-8.720873	**
Richest	8.335945	5.145087	3.44	0.001	2.432548-28.56592	***
_cons	0.9815599	0.4663408	-0.04	0.969	0.3803502-2.533086	

The logistic regression results on the association between demographic and socio-economic factors and institutional delivery among women in Madhesh Province, Nepal, are presented in Table 2. The odds ratios (OR), standard errors, t-values, p-values, and confidence intervals of each variable provide the reader with an understanding of the significance of the variable in the institutional delivery.

Age clearly influenced the choice of institutional delivery. A statistically significant level was found at p level of less than 0.05 when compared to women below 20. Women in 25-29 years (OR = 3.20, p = 0.013) and 30-49 years (OR = 5.10, p = 0.001) were statistically significant in accepting delivery in health facilities.

Higher birth order exclusively implied a negative association with institutional delivery. Families experienced the burden of females who held a birth order of two (OR = 0.37, p = 0.002) and three or more fourth (OR = 0.14, p < 0.001) children.

Religion appeared not to be able to predict institutional delivery and "Other" religion (OR = 2.87, p = 0.373) did not come out as significant. The caste/ethnicity-related factors have taken a medium form with Muslim (OR = 0.36, p = 0.386), Janjati (OR = 0.64, p = 0.397), and Other Terais (OR = 1.11, p = 0.654) not on the same level. However, while the effect seems to be moderate, Brahmin/Chhetri women (OR = 3.49, p = 0.297) have some high levels of institutional delivery.

The women with a primary education (OR = 1.43, p = 0.101) and higher education (OR = 2.00, p = 0.258) were also likely to go to institutional delivery compared to the uneducated ones, but they are not statistically significant. This concludes that the effect of education is present but is probably mediated by other socioeconomic factors.

Residence in a rural location (OR = 0.92, p = 0.739) did not predict institutional delivery utilization significantly.

The weath quintile became a robust determinant of health care among pregnant women. Women of middle (OR = 2.32, p = 0.034), rich (OR = 3.10, p = 0.032), and richest wealth quintiles (OR = 8.34, p = 0.001) were significantly higher in parenthood.

Discussion

There is a high probability that increased maternal age will be conducive to choosing institutional delivery. No woman in the age bracket below 20 had favorable odds for an institutional birth. Women between the ages of 25-29 (3.20) did four times better with p=0.013, while those between 30-49 years (5.10) did eightfold better with p=0.001, as opposed to women in their teen years in the same category. The possible reason behind this trend is that with increasing maternal age, women become more aware and intend to assess the complications of childbirth by choosing to deliver at institutions, where safer outcomes can be achieved. Similar results in Nepal, such as higher age being positively associated with use of institutional delivery services due to an acute awareness of health issues experience of having had more deliveries, have been reported in a previous study (Paudel et al., 2023).

Higher birth order is significantly associated with lower propensity by the women themselves to deliver at health facilities. Compared to first-time mothers that would be on behalf of others, such as those bearing their second child (OR = 0.37, p = 0.002) and those with three or more births, would go against larger uptake of hospital delivery service (OR = 0.14, p < 0.001). Reasonably, incapacitated by financial forces that restrict their ability from securing these deliveries in optimum facilities; allow the tendency as being seen in other parts of Nepal where higher parity drives one's choice to ignore maternal healthcare services due to both earlier positive home delivery and economic limits (Neupane et al., 2021).

The study also states that education does not have any significant statistical relationship with institutional delivery. Women who have some education (OR = 1.43, p = 0.101) and women with higher educational attainment (OR = 2.00, p = 0.258) are more likely to opt for institutional birth as compared to those without formal education. The results show that pregnant women prepared to give birth at institutions are much better educated, but the contrast does not significantly impair unwise decision rules of maternal care. Functionally, education in influencing health-seeking behaviors is very complex and maybe the mediating factors like income, social-cultural beliefs, and access to healthcare facilities. A national perspective considering the data from Nepal, good maternal education is associated with high-nursery care of health services as educated women are more likely either to be well-informed of such services or maybe the implementation of the acquired education for their recognition (Paudel et al., 2023).

There was no significant relationship between religious affiliation and institutional birth since the category of women affiliated with the "Other religion" (OR = 2.87, p=0.373) did not significantly differ from the baseline. Apart from religious affiliations, caste or ethnicity does not have a marked influence on the choice of location for delivery. There is no significant difference in women's take-up of institutional delivery among Muslim (OR = 0.36, p = 0.386), Janjati (OR = 0.64, p = 0.397), and Other Terai (OR = 1.11, p = 0.654) groups; on the other hand, Brahmin/Chhetri women (OR = 3.49, p = 0.297) are more likely to use institutional delivery services, albeit not significantly. These results underscore the fact that socio-cultural presumptions regarding religion and ethnicity may not be salient themes in the institutional delivery utilization of this sample. Conversely, in many other studies, it has been observed that women from disadvantaged castes in Nepal are less likely to use institutional delivery services, largely as a result of systemic discrimination and socio-economic impediments (Thapa et al., 2022). The absence of a significant association herein could represent progress towards reducing disparities in healthcare access may reflect characteristics unique to the samples.

Generally assumed beliefs, in this study, rural area residence (OR = 0.92, p = 0.739) does not considerably affect the probability of an institutional delivery. This absence implies potential decline of the urban-rural divide in accessing maternal health services in the Madhesh region. The gradual access of medical outreach in rural areas could be facilitated through good healthcare-related infrastructures and transport mechanisms in rural areas. On a national scale, urban women's health services access was better than that for rural women, as pointed out in a recent study (Thapa et al., 2015). The association found here in this study, given the lacking urban-rural divide, is promising and indicative of effective regional healthcare schemes.

Economic status substantially predicts the practice of opting for institutional delivery. Women in the middle (OR = 2.32, p = 0.034), richer (OR = 3.10, p = 0.032), and richest quintiles (OR = 8.34, p = 0.001) registered a higher probability of location of delivery taking place in health institutions as compared to those among the poorest lot. Affordability through financial resources and mechanism of purchasing healthcare service including

transportation, fees dispensable to the hospital, and other related costs have produced these findings. The bridging this economic gap will play an essential role in imposing good maternal health. Promoted costs to make childbirth relatively less expensive have been proposed among several strategies for the disadvantaged families in the unfriendly rural areas.

Conclusion

Full understanding of the key social determinants, model of used healthcare, and regional variation is required to address this issue, which refers to an institution for institutional birth in Madhesh. The study shaped several determinants, but more pronounced predictors were an individual's age and age at first marriage. Economic status, but not education, shows a large role in predicting the choice of where to deliver with the threshold as a huge adjustment for multiparous women. Results revealed that caste did not influence model choice among women. Similarly, religion did not make a statistically significant difference in deciding service location to deliver a child in or out of an institution but significantly influences the choice of the institution because the same religion members deliver out of an institution). Differentiated or targeted involvements should be proposed specifically for disadvantaged and multiparous women delivered into the institutions. The policy recommendations include creating a supportive environment by means of financial assistance extended to poor households and education to mark women as potentially their possible alternate to possible risks of delivering at home and reason of institutional deliveries. Future acting study should develop the conduct of longitudinal studies to objectively evaluate the results after these involvements and allow assessing evidence-informed changes in maternal healthcare utilization.

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