Child Delivery Management Practices and its determinants: A distinct level analysis in Gujarat state

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Abstract: Improving maternal health and reducing maternal mortality have gained lot of importance for long time. Though various policies and lot of awareness and technology supported treatments are implemented throughout the world, but still there lot of issues related to safe motherhood. In this study an attempt is made to analyse child delivery management practices in Gujarat state by using DLHS-III.

Introduction: Improving maternal health and reducing maternal mortality have been main concerns of several international summits and conferences. It began with the International conference on safe motherhood held in 1987 and continued through International conference on Population and Development (ICPD) 1994 and again through ICPD+5 (five-year review of the 1994 ICPD) and the Millennium Development Goals. The Millennium Summit in 2000 calls for a 75 percent reduction by 2015 in the maternal mortality ratio from 1990 levels (UN, 2008). The National Population Policy of India (NPP 2000) also reiterates the government's commitment to the safe motherhood programmes within the wider context of reproductive health. Among the national socio-demographic goals for 2010 specified by the policy, several goals pertain to safe motherhood, namely that 80 percent of all deliveries should take place in institutions by 2010, 100 percent of deliveries should be attended by trained personnel, and the maternal mortality ratio should be reduced to a level below 100 per 100,000 live births. However as the deadline over, these hopes had not been met yet, the world was nowhere near achieving this objective, and it was not even certain that global maternal mortality levels had declined in the past decade to any significant degree (Shiffman, 2003).

The majority of maternal deaths occur due to unexpected complications, which would require the availability of emergency obstetric care. The presence of skilled birth attendant for all births is the only way to ensure all those with pregnancy complication to be referred to emergency obstetric care. Skilled birth attendants during labour, delivery and early post partum period could reduce an estimated 16 to 33 percent of deaths due to obstructed labour, hemorrhage, sepsis and eclampsia (UNFPA, 2004). A skilled birth attendant is a professionally trained health worker, usually a doctor, midwife or nurse, with the skill to manage a normal labour and delivery, recognize complications early on and perform any essential interventions, start treatment and supervise the referral of mother and baby to the next level of care if necessary (UNFPA, 2004).

In developing countries, many women are still assisted in delivery either by traditional births attendants, relatives or their deliver by themselves. According to a report of UNFPA in 2004, only slightly more than half of all deliveries are assisted by skilled personnel. The lowest levels skilled birth attendants at delivery in developing countries are in South Asia (29 percent) and sub-Saharan Africa (37 percent)(AbouZahr and Wardlaw, 2001). In view of the above, an attempt has been made to study the Child delivery management and its determinants in Gujarat.

Data Source and Methods: This paper utilizes the District Level Household Survey (DLHS)-III data among 7603 women who reported the information about their last delivery. By using SPSS (Statistical Package for Social Science), bivariate analysis techniques has been used to understand the variations in socio-economic and demographic parameters of child delivery management. A logistic regression model also used to assess the determinants such as socio-economic, demographic and maternal and child health care indicators on utilization of delivery care services.

Results: Appropriate delivery care is crucial for both maternal and perinatal health and increasing skilled attendance at birth is a central goal of the safe motherhood and child survival movements. Skilled attendance at delivery is an important indicator in monitoring progress towards Millennium Development Goal 5 to reduce the maternal mortality ratio by three quarters between 1990 and 2015 (United Nations, Millennium Development Goals). In addition to professional attention, it is important that mothers deliver their babies in an appropriate setting, where life saving equipment and hygienic conditions can also help reduce the risk of complications that may cause death or illness to mother and child (Campbell OM, and Graham WJ, 2006).

Socio-economic and Demographic Profile of Study Population: Health situation of a society is mainly determined by Demographic and socioeconomic condition of the

society. Data on demographic and socioeconomic trends are important for making statistics comparable within countries even across countries. Disease incidence, prevalence and mortality rates require reliable population-based denominators.

Table 2 Percentage of women aged 15-49 years who had given birth recent year, according to selected background characteristics, in Gujarat, 2007-08

SED Characteristics	women	
	Number	Percentage
Age		
15-19	313	4.1
20-24	2640	34.7
25-29	2766	36.4
30-34	1341	17.6
35-39	409	5.4
40-44	111	1.5
45-49	23	0.3
Mean age	**26.36**	
Place of Residence		
Rural	5821	76.6
Urban	1782	23.4
Religion		
Hindu	6871	90.4
Muslim	621	8.2
Christian	77	1.0
Others	34	0.4
Caste		
ST	2193	28.8
SC	966	12.7
OBC	2874	37.8
Others	1570	20.6
Level of Schooling		
No schooling	3136	41.2
1-5 years	1201	15.8
6-10 years	2426	31.9
11-12 years	388	5.1
Above 12 years	452	5.9
Mean no. of schooling years	**8.6 years**	
Occupation		
Not working	4076	53.6
Agricultural sector	2446	32.2
Non-Agricultural sector	1081	14.2
Husband's Level of Schooling		
No schooling	1564	20.6
1-5 years	1247	16.4
6-10 years	3366	44.3
11-12 years	710	9.3
Above 12 years	716	9.4
Wealth index quintiles		

Poorest	717	9.4
Poorer	1358	17.9
Middle	1805	23.7
Richer	1940	25.5
Richest	1783	23.5
Total	**7603**	**100.0**

In this research paper totally 7603 women were considered for the analysis (15-49 years). Table 1 shows the socio-economic and demographic characteristics of women in India. The mean age of this study population was 26.36 years, it clearly shows that the study population was young. Of the total 7603 women interviewed, nearly two-fifth of the women was fall in the young age groups (15-24; 38.8 percent) and more than half of the respondents were fall in the 25-34 age group (54.0 percent). With regard to place of residence just little above three-fourth of them were residing in the rural area (76.6percent) and the remaining living in urban area. Overwhelming majority of the study population was Hindus (90.0percent) and the Muslims accounted just 8.2 percent in the locality. More than one-third of them were fall in the OBC category (37.8 percent), and a significant proportion were belongs to ST (28.8 percent). However, twelve percent of them were belongs to SC and another one-fifth of them were other category.

While looking to the educational level of the respondents, more than two-fifth of the women were illiterates (41.2 percent) and only six percent of them had more than 10 years of schooling. It is also observed from the table that little less than one-third of the respondents were completed 6-10 years of schooling (31.9percent). The average of years of schooling of the study population was 8.6 years. A similar pattern of educational attainment was observed among the respondents' husband level of education. More than half of the respondents in the study state were not working (53.6percent) and another significant proportion were working in the agricultural sector (32.2percent) and just 15 percent of them working in the non-agricultural sector. Households are categorized from the poorest to the richest groups corresponding to the lowest to the highest quintiles at the national level. Based on these classifications, more than one-quarter of the study population was fall under the lowest wealth quintile (9.4 percent in poorest and 17.9 percent in poorer WI) and around half of them fall in the highest wealth quintile (25.5percent in richest and 23.5percent in richer WI).

More than one-third of the respondents in Gujarat were married before they attained the legal marriageable age (38.5percent). Of the total 7063 women, only 15.6 percent of them married after the age of 20 years. This clearly indicates that probably more number of respondents was married before they attained the age of 18 years leading to the conclusion that child marriages were substantial. Further, the table shows

that the mean year of age at marriage for women was 18.11 years. With respect to age at first birth, more than one-fifth of the women delivered their first child before the age of 18 years (12.7percent) and another two-fifth of the respondents were given their first birth between 18-20 years. The mean age at first birth for the women was 20.52 years.

Table 3 Percentage of women aged 15-49 years who had given birth recent year, according to selected reproductive characteristics, in Gujarat, 2007-08

Demographic characteristics	women	
	Number	Percentage
Age at Marriage		
less than 18	2925	38.5
18-20	3493	45.9
21-25	1089	14.3
Above 25	96	1.3
Mean age at marriage	**18.11**	
Age at first birth		
Less than 18 years	967	12.7
18-20 years	3189	41.9
21-25 years	3017	39.7
Above 25 years	416	5.5
Mean age at 1st birth	**20.52**	
Total live birth		
No live birth	21	0.3
1-2 births	4444	58.4
3-4 births	2261	29.7
More than 5 live births	877	11.5
Mean number live births	**2.57 babies**	
Mean number of pregnancies	**2.73 pregnancies**	
Number of Still birth		
No still birth	7393	97.2
1 still birth	178	2.3
More than 1 still births	32	0.5
Spontaneous abortion		
No Spontaneous Abortions	6940	91.3
At least one Spontaneous Abortion	500	6.6
More than 1 spontaneous Abortions	163	2.1
Induced Abortion		
No Induced Abortions	7492	98.5
At least one Induced Abortion	89	1.2
More than 1 Induced Abortions	22	0.3

The table reveals that the percentage of women by their total number of live births. It is evident that around eleven percent of the Gujarat women had given more than five live births and another thirty percent of them were given 3-4 live births. The table further reveals that the mean number of live birth was 2.57 children for the women and the mean number of pregnancy was 2.73. This clearly indicates that the Gujarat women had higher fertility rate than the national average. The incidence of

spontaneous abortion (8.7 percent), induced abortion (1.7percent) and the incidence of still birth in this state was not at significant level (2.8 percent).

Child delivery Management:

Table 5 Percentage of women aged 15-49 years who had given birth recent year, according to child delivery management by Districts in Gujarat, 2007-08

Name of the District	Home	Institute	total	Name of the District	Home	Institute	total
The Dangs	89.2	10.8	623	Patan	38.6	61.4	298
Narmada	71.4	28.6	343	Sabar kantha	38.0	62.0	321
Surendranagar	54.2	45.8	297	Kheda	35.8	64.2	265
Bharuch	50.0	50.0	278	Porbandar	31.3	68.8	240
Amreli	50.4	49.6	272	Surat	30.2	69.8	245
Panch mahals	48.4	51.6	318	Rajkot	29.0	71.0	262
Valsad	47.2	52.8	286	Jamnagar	28.7	71.3	265
Vadodara	45.8	54.2	277	Gandhinagar	27.8	72.2	277
Bhavnagar	43.2	56.8	308	Anand	27.1	72.9	258
Kachchh	42.5	57.5	332	Navsari	22.7	77.3	207
Dohad	42.4	57.6	490	Ahmadabad	21.3	78.7	225
Junagarh	42.0	58.0	288	Mahesana	20.5	79.5	244
Banas kantha	39.8	60.2	384				

According to DLHIII data, little less than one-third of the respondents in the Gujarat state was not registered their pregnancy 930.8percent). It is also noticed that more than one-fourth of the pregnant women in Gujarat were not received any ANC services during their pregnancy period (28.6percent). With response to receiving of full ANC coverage, only one-fifth of the respondents were covered (19.8percent). Of the total 5428 women who received any ANC, 58percent of them received the delivery advice from the health professionals and forty-three percent received information on institutional delivery.

Table 4 Percentage of women aged 15-49 years who had given birth recent year, according to child delivery management, Gujarat, 2007-08

Pregnancy Details	women	
	Number	Percentage
Registered last pregnancy		
Yes	5259	69.2
No	2344	30.8
Mother received any ANC		
Yes	5428	71.4
No	2175	28.6

Delivery advice given		
Yes	3173	58.5
No	2255	41.5
Total	5428	100.0
During ANC received advice-need for institutional delivery		
Yes	2331	42.9
No	3097	57.1
Total	5428	100.0
Received full ANC		
No	6099	80.2
Yes	1504	19.8
Safe delivery		
No	2910	38.3
Yes	4693	61.7
DELIVERY DETAILS		
Place of delivery		
Home	3335	43.9
Institute	4268	56.1
Public sector	1533	35.9
Private sector	2735	64.1
Total	**7603**	**100.0**
Delivery Conducted by		
Health professionals	425	12.7
DAIs	2621	78.6
Friends and Others	289	8.7
Total	**3335**	**100.0**
Disposable delivery kit used - last delivery (Home)		
Yes	1086	32.6
No	1368	41.0
DK	881	26.4
Total	3335	100.0
Baby immediately wiped dry and then water (Home)		
Yes	2266	67.9
No	581	17.4
DK	488	14.6
New/sterilized blade used		
Yes	2088	62.6
No	505	15.1
DK	742	22.2
Reason for not going to health facility for delivery		
Not necessary	828	24.8
No time to go	674	20.2
Cost too much	556	16.7
Better care at home	508	15.2
Family did not allow	374	11.2
Too far/no transportation	206	6.2
Not customary	199	6.0
Poor quality service	188	5.6
Lack of knowledge	133	4.0

Other	203	6.1
Cost paid for delivery		
No cost paid	1259	16.6
Less than 200	1148	15.1
201-1000	1786	23.5
1001-3000	1678	22.1
Above 3000	1049	13.8
DK	683	9.0
Total		
Check up within 48 hours after delivery		
Yes	4266	56.1
No	3337	43.9

It reveals from the table that out of the 7063 women, who delivered the babies, 43.9 percent of the women had delivered their babies in the home and the remaining forty percent of them children were born at the hospitals. It is found that 4 out every 10 children were born in the home environment condition. Of the total 4268 institutional deliveries, 35.9 percent of the deliveries were undertaken at the public sectors and the remaining 64 percent were at the private hospitals.

Skilled attendance at delivery is an important indicator in monitoring progress towards Millennium Development Goal 5 to reduce the maternal mortality ratio by three quarters between 1990 and 2015 (United Nations, Millennium Development Goals). However in the Gujarat state, among the home deliveries, 289 deliveries were supervised/ monitored by the friends, relatives and other persons. It is interesting to note that more than three-fourth of the deliveries was undertaken with the help of DAIs (78.6percent) and just thirteen percent of the women delivered their babies with the help of health professionals. Of the total 3335 home deliveries, around one-third of the women reported that the delivery kit was used during their child delivery by the delivery attendant (32.9percent). However, more than three-fifth of the women stated that the new/ sterilized blade was used to cut the umbilical cord (62.6percent).

While asking the reasons for not utilizing the health facilities for the child delivery, around one-fourth of the respondents stated that it is not necessary (24.8percent) and another one-fifth of them reported that they did not find time to visit the institution – (not prepared). It is found that about 17 percent of the Gujarat women reported that cost involved in the child delivery related activities was too high. It is also observed that about another 15percent of the women believed that better care can get from the home itself. About eleven percent of them stated that their family did not allow them to go health facility for child delivery and another six percent replied that delivery at the institutions was not customary. With regard to the amount spent for their child delivery, more than one-third of the respondents in the study area spent more than 3000 rupees

for their child delivery and just sixteen percent of them did not spend any amount for their child delivery.

Determinants of place of delivery: One of the important thrusts of the National Rural Health Mission is to encourage delivery under proper hygienic condition and under the supervision of skilled health professionals. With this backdrop, the table below provides the details of the place of child delivery (Home/Institution) according to background characteristics of the respondents or the determinants of home/institutional delivery. The institutional birth among the study area is extremely low among aged (45-49) women (26.1percent) rural women (47.8percent), Christina women (26percent), illiterate women (39.5percent), women who engaged in agricultural (37.9percent), and respondents living in poorest (25.9percent), and poorer (33.2percent) standard of living condition. Since older and younger women have different experience and influence, their behavior on seeking health care are also vary. Commonly, younger women are more likely to utilize modern health care facilities than older women, as they are likely to have greater exposure and knowledge to modern health care, also more access to education.

Table 5 Percentage of women aged 15-49 years who had given birth recent year, according to Place of child delivery with background characteristics, in Gujarat, 2007-08

Background Conditions	Place of delivery		
	Institute	Home	No. of women
Age group* 75.197**			
15-19	55.6	44.4	313
20-24	58.6	41.4	2640
25-29	58.1	41.9	2766
30-34	53.5	46.5	1341
35-39	44.5	55.5	409
40-44	30.6	69.4	111
45-49	26.1	73.9	23
Place of Residence* 704.990**			
Rural	47.8	52.2	5821
Urban	83.4	16.6	1782
Religion* 79.363**			
Hindu	55.2	44.8	6871
Muslim	69.7	30.3	621
Christian	26.0	74.0	77
Others	67.6	32.4	34
Caste* 691.186**			
ST	34.5	65.5	2193
SC	62.7	37.3	966
OBC	59.8	40.2	2874
Others	75.5	24.5	1570
Educational Level * 936.692**			
No schooling	39.5	60.5	3136

1-5 years	50.0	50.0	1201
6-10 years	68.8	31.2	2426
11-12 years	84.8	15.2	388
Above 12 years	95.1	4.9	452
Occupation* 525.246**			
Not working	67.0	33.0	4076
Agricultural sector	37.9	62.1	2446
Non-Agricultural sector	56.2	43.8	1081
Wealth index quintiles*1394.592**			
Poorest	25.9	74.1	717
Poorer	33.2	66.8	1358
Middle	46.8	53.2	1805
Richer	62.6	37.4	1940
Richest	88.2	11.8	1783
TOTAL	**4268**	**3335**	**7603**

***, **&, * refers to significant at 0.1%, 1% and 5% level (chi-square results – Place of delivery and background conditions). NS- Not significant

Older women, on the other hand, have accumulated knowledge on maternal health care and therefore likely to have more confidence about pregnancy and childbirth or they may be less comfortable with modern medicine and more reluctant to take advantage of available services; consequently, they may give less importance to obtain institutional care (Raghupathy, 1996).

In this study a similar observation is noticed that the proportion of an institutional delivery raises from 26.1 among the old age women (45-49 years) to 58.6 percent among young mothers (20-24 years). It indicate from the table that the percentage of births in homes were higher among older generation than the younger generation. The bi-variant analysis shows that child delivery management has a strong and statistically significant association with the age of women. When the place of child delivery is cross classified by the women's age, the interaction between these variables is significant, with values of the Chi-square of 75.197 (p =.000). Place of residence can also be an important determinant of the use of modern health care resources for childbirth. A higher proportion of births in urban areas occur in modern health care facilities compared to rural areas (83.4percent and 47.8percent respectively). Therefore, this study indicated that residence was the strongest predictor of use of institution for delivery care, with rural women, the urban women nearly two times more likely to use health facilities for child delivery. The table reveals that the use of health facilities for child birth was significantly associated with women's place of residence with a Chi-square of 704.990(p=. 000).

Caldwell (1979) and Schultz (1984) emphasis that education empowers women, and this leads to greater confidence and capability to make decision to use modern

health care services for themselves and for the children. This study also indicated a similar result that the percentage of child delivery at health facilities was quite high among the women who had more than 12 years of education (95.1percent) when compare to illiterates s (39.5percent). It is also observed that the association between women's education and utilization of health facility for child delivery was very strong and highly significant with a Chi-square of 936.692 (p = .000).

Sharma et.al (2007) discloses that employment can increase women's economic autonomy and reproductive health status because it raises awareness and provides new ideas, behavior and opportunities through interaction with other people outside the home and community. This study also shows a strong association between women's occupation and the use of health facility for child birth with a chi-square of 525.246 (p=.000). Women engaged in non-agricultural sector were greater use of health facility for child delivery (56.2percent) than women in the agricultural sectors (37.9percent). The results of this analysis show that institutional care seeking for child birth is influenced by wealth quintiles. It is observed from the table that there is a consistent increase in proportion of institutional deliveries from 25.9percent among poorest women to 46.8percent among women living at middle WI then to 88.2percent among richest women. The bivariate analysis shows that the women's standard of living condition (WI) was significantly associated with the management of child delivery ($\chi 2$ = 1394.592, p =.000).

Another strong association was found between age at marriage and the place of child delivery. The proportion of intuitional deliveries was quite high among the women who had married above the age of 25 years (79.2percent) when compare to women who had early marriage (less than 18 years; 45.5percent). A smaller pattern was observed with regard to the age at the time of child delivery. The present study result shows that the percentage of hospital deliveries was high among women who given their child in the later ages than the women who given in the early period of life.

The association between practice of receiving of any ANC services and utilization of health facility for child delivery was very strong and highly significant with a Chi-square of 1292.371 (p = .000). Intuitional deliveries were more common among women who availed full ANC package (81.3percent) than the counterpart (49.9 percent). The incidence of still births high among the women who had given birth at the home than at the health facilities.

Table 6 Percentage of women aged 15-49 years who had given birth recent year, according to Place of child delivery with demographic characteristics, in Gujarat, 2007-08

Demographic characteristics	Place of delivery

	Institute	Home	No. of women
Age at Marriage ***380.481			
less than 18	45.5	54.5	2925
18-20	57.4	42.6	3493
21-25	78.6	21.4	1089
Above 25	79.2	20.8	96
Age at first birth * **			
less than 18	39.5	60.5	967
18-20	50.0	50.0	3189
21-25	65.0	35.0	3017
Above 25	77.4	22.6	416
Registered last pregnancy * 1006.255**			
Yes	68.2	31.8	5259
No	29.1	70.9	2344
Delivery advice given * 165.562**			
Yes	75.9	24.1	3173
No	59.5	40.5	2255
Total			
During ANC received advice-need for institutional delivery* 32.176**			
Yes	73.2	26.8	2331
No	66.0	34.0	3097
Total	3750	1678	5428
Mother received any ANC ***1292.371			
Yes	69.1	30.9	5428
No	23.8	76.2	2175
Received full ANC ***482.793			
Yes	81.3	18.7	1504
No	49.9	50.1	6099
Safe delivery ***6033.315			
Yes	90.9	9.1	4693
No	-	100.0	2910

***, **&, * refers to significant at 0.1%, 1% and 5% level (chi-square results – Place of delivery and Demographic characteristics). NS- Not significant

However the magnitude and significance of these associations could change when such a simple relationships are control by other factors. For example that the social and economic variables might be interrelated: education leads to lower parity. Therefore, in order to investigate the effects of a number of variables simultaneously, a multivariate analysis is attempted. The multiple regression analysis method adopted in the present study is multiple logistic regression, which would allow the identification of the effect of each of the selected independent variables on maternal health are utilization controlling for the effects of other independent variables. This analysis aims to investigate on how the differentials in the utilization of health facilities for child birth when its relationships with the independent variable adjusted for the simultaneous effects of the different characteristics of the women and their household related variables. Given

the interest in the dichotomous use of modern maternal health care utilization, namely whether a woman utilized health facility or not, a dichotomous logistic regression was employed to determine which factors best explain and predict the outcome of the use of health facility during child delivery.

In order to determine the association between each independent variable and the use of antenatal care, place of delivery and assistance during delivery, two statistics of the model are used. These are the logistic regression coefficient and the odds ratio. The Levels of significance (p-values) of each statistics are also presented. The logistic regression coefficients indicate the direction of the relationship: which factors increase the likelihood of maternal health care or which factors reduce it (Pallant, 2007). The odds ratios (OR) represents the change in odds of being in one of the categories of outcome when the value of a predictor increases by one unit (Tabachnick & Fidell, 2007). In addition, a positive logistic regression coefficient for any category of an independent variable is associated with an odds ratio greater than one, which indicates that this category has a greater likelihood of experiencing the event relative to the reference category. Parameter estimates with negative signs indicate the opposite relationship. The result of multivariate analysis of factors affecting the use or non-use of health facilities by women for their most recent child delivery in the three years preceding the survey are shown in Table. The results of the logistic regression model comparing institutional deliveries with those of home deliveries (Home=0; Institute=1). The number of cases included in the analysis was 7603 and the value of -2 log likelihood was 8178.952.

Table 7 Odds ratios from logistic regression examining the effect of selected background variables on the place of delivery

Background variables	β	S.E.	p-value	Exp(B)	95.0% C.I.for EXP(B)	
					Lower	Upper
Age NS 15-19 (ref)			.288	1.000		
20-24	.014	.139	.919	1.014	.772	1.332
25-29	.150	.152	.323	1.162	.863	1.566
30-34	.245	.168	.144	1.278	.920	1.774
35-39	.175	.197	.375	1.192	.809	1.755
40-44	-.071	.283	.801	.931	.535	1.621
45-49	-.076	.533	.887	.927	.326	2.636
Place of Residence ***						
Rural (ref)				1.000		
Urban	.667	.084	.000	1.949	1.653	2.298
Religion NS						
Hindu (ref)			.044	1.000		
Muslims	.061	.106	.564	1.063	.864	1.308
Christian	-.697	.312	.025	.498	.270	.917
Others	-.842	.509	.098	.431	.159	1.169

Caste ***						
ST (ref)			.000	1.000		
SC	.587	.093	.000	1.799	1.499	2.160
OBC	.525	.071	.000	1.691	1.471	1.943
Others	.566	.093	.000	1.762	1.468	2.114
Level of Schooling ***						
No schooling (ref)			.000	1.000		
1-5 years	.062	.076	.417	1.064	.916	1.236
6-10 years	.396	.070	.000	1.486	1.294	1.706
11-12 years	.933	.167	.000	2.542	1.834	3.523
Above 12 years	1.550	.243	.000	4.711	2.926	7.583
Occupation ***						
Not working (ref)			.000	1.000		
Agricultural sector	-.293	.064	.000	.746	.659	.845
Non-Agricultural sector	-.076	.081	.345	.927	.791	1.085
Wealth index quintiles ***						
Poorest (ref)			.000	1.000		
Poorer	.130	.108	.228	1.139	.922	1.407
Middle	.384	.106	.000	1.469	1.193	1.808
Richer	.592	.113	.000	1.808	1.449	2.257
Richest	1.320	.141	.000	3.743	2.841	4.931
Received Full ANC ***						
No (ref)				1.000		
Yes	.902	.079	.000	2.464	2.109	2.878
Age at Marriage NS						
less than 18 (ref)			.110			
18-20	-.107	.062	.083	.899	.796	1.014
21-25	.064	.108	.553	1.066	.862	1.319
Above 25	-.353	.321	.271	.703	.375	1.318
Total Live Births NS						
No birth			.000	1.000		
One live birth	.642	.505	.204	1.900	.706	5.110
Two live births	.012	.506	.982	1.012	.375	2.726
Three live births	-.240	.509	.638	.787	.290	2.134
More than 3 live births	-.370	.512	.469	.691	.253	1.882
Constant	-1.159	.521	.026	.314		
-2 Log likelihood	8178.952					

***, ** and * denotes significant at .1%, 1% and 5% probability level respectively. NS- Not Significant

The results of the logistic regression analysis on institutional deliveries with those of home deliveries show that institutional deliveries is positively and significantly associated with some of the socio-economic, demographic variables. All the variables the odds increase with the categories of a variable when compared to the respective variable's reference category, indicating an increase in institutional deliveries when improving the background conditions of women. This model shows that the residence, caste, educational status, occupation, wealth index and full ANC coverage were more

significantly determining the institutional deliveries among the women in Gujarat state. A significant effect of place of residence on institutional delivery was found in this study. The odds ratio suggests that compared to women who lived in rural areas, women who resided in urban areas were about 1.94 times more likely to have birth at the health facility.

In this model, as in the bivariate analysis, women's education continued to be positively influence the use of heath facility for child delivery. The effect is found to be statistically highly significantly at p=.000. The odds of using heath facility suggests that compared to non-educated women, women with high school educational level were about 1.48 times more likely to given births at health facility. Furthermore, if the non-educated women are compared with women of educational levels higher than primary, the odds are even higher. Women with secondary educational level being 2.54 times more likely to use heath facility for child delivery compared to uneducated women, and women with academy and above education were 4.71 times more likely to use heath facility for child delivery compared to uneducated women. The wealth index shows the well established link between the variables, when compared the poorest, the prevalence of institutional deliveries on richest women 3.7 times higher. Coverage of full ANC also acted in the expected direction and was a statistically significant predictor of institutional deliveries. The present regressions model shows that the age, religion, and age at marriage variables does not show any significance influence in determining the institutional child deliveries.

Conclusion: Despite the progress that has been made in India in recent decades to enhance the institutional deliveries, home deliveries still remain high among Gujarat state. Friends, relatives and other persons (TBAs) still play a major role in assisting the delivery among this society. Accessibility, acceptability and affordability of women are related to their attitudes, social influence and their self efficacy towards delivery care usage. The attitudes, social influence and self efficacy of a woman depend on her social environment, economic condition and demographic characteristics. The bivariate analysis results suggest that use of health facility for child birth show a statistically significant relationship with socio-economic and demographic factors. As in the bivariate analysis, in the multivariate regression analysis, women's education, wealth index, women's place of residence, caste, and coverage of full ANC continued to be strong predictors of the use of maternal health care services. Hence, particular attention should be paid to women living in rural areas, women with low education, women living in low standard of living condition. The underutilization of formal facilities as the place of

delivery and professional skilled birth attendants during delivery is a matter of concern for policy makers and program managers. The question of relatively high proportion of women in Gujarat using home as a place of delivery may be addressed by placing health centers in every village, with volunteers and outreach services to the village will make the modern health care services facilities more accessible.

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