

Length of Stay after Childbirth in India: A comparative study of Public and Private Health Institution

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Abstract

This paper presents a less discussed indicator of quality of postpartum care, that is, length of stay following a childbirth in the health institution. The aims of this paper is to examine the factors associated with this by public and private health facility. We use the recently released national representative data from National Family Health survey-4, (2015-16) and apply cox proportional hazard model to determine the factors associated with discharge from health facility. Average length of stay after childbirth is 3.4 days; 2.1 for vaginal and 8.6 for cesarean section deliveries. Strikingly, half of the women take discharge within 48 hours. Women who delivered in private hospitals have prolonged stay than public facility. However, this differential is prevalent only in vaginal deliveries, while women having C-section deliveries in public facility are staying longer than private hospitals. Present findings provide background of women who take early or late discharge after childbirth.

Keywords: Postnatal Care, Discharge from hospital, Public, Private, normal, caesarian delivery

Background:

Global efforts to prevent maternal and perinatal mortality aim to ensure all women have access to skilled attendants for childbirth, which in practice is virtually synonymous with advocating for facility delivery rather than home birth. In the 20th century, the majority of births happening at the facility/hospital (Watt et al., 2005; Brumfield 1998; Mitchinson 2002). The maternal mortality ratio (MMR) in India has declined by 87 points from 254 maternal deaths per 100,000 live births in 2006 to 130 in 2016 (Registrar General of India [RGI], 2018). There is a surge in the level of institutional deliveries leads to a reduction in the maternal mortality ratio (Graham et al., 2001; Randive et al., 2014). The government of India initiatives through implementation of National Rural Health Mission (NRHM) and Janani Suraksha Yojna (JSY) programs from early 2005 has shown a considerable impact on maternal health care utilization in India as a whole. The program encourages institutional deliveries by providing cash incentives to pregnant women and Accredited Social Health Activists (ASHAs) and consequently to reduce the MMR, especially among states with high maternal mortality. Various literature indicated that JSY had made a difference in terms of institutional deliveries (Gupta et al., 2012). Evidence suggests that increase in the level of institutional deliveries due to the implementation of JSY, but it may not decrease the MMR to the same extent (Jain, 2010). There is a gigantic increase in the institutional deliveries from 39 percent in 2005-06 to 79 percent in 2015-16. However; during the same time, percentage of mothers who received a postnatal check in the first two days after birth increased from 37 percent to 65 percent (NFHS, 2016-17).

Half of all post-delivery maternal deaths occur during the first week after childbirth, and the majority of these deaths occurs during the first 24 hours after delivery (Warren et al. 2006). The institutional delivery strategy stems from a recognition that most potentially fatal complications cannot be prevented or predicted for that delivery and the first 24 hours postpartum is the highest risk period for women and newborns (Campbell et al., 2016; Campbell et al., 2006). For both the mother and the infant, immediate postnatal care is important to treat complications that arise from birth and to provide the mother with relevant information on caring for herself and her baby, which is directly related to the duration of postpartum stay of women. Postoperative length of stay after vaginal delivery is identified as an essential quality indicator of women care (Blumenfeld et al., 2015; Raleigh et al., 2008; Gruskay et al., 2016). Length of stay after cesarean delivery may also be an important sign for evaluating the quality of peripartum and postpartum obstetric care.

In 1992, the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists defined early postnatal discharge as a stay of less than 48 hours for women who had vaginal deliveries and less than 96 hours those who had cesarean sections. Short lengths of stay may leave insufficient time to detect, diagnose, or treat complications, which can in turn increase morbidity and mortality (Campbell et al., 2016; Catz et al., 1995; Malkin et al., 2000). Gözüm and Kiliç, (2005) evidenced the four most prevalent health problems viz. fatigue, insomnia, breast problems and constipation among Turkish women after early discharge. Moreover, Women

who are discharging early after childbirth are significantly more likely to be depressed than women who are staying more (Brown et al. 2004; Bravo et al. 2011; Hickey, 1997). Another study shows that women with an early release (one night) from the hospital more frequently reported fatigue, worry about their baby's health and neonatal morbidities (Lane et al. 1999). Hence, it is evidenced from the previous literature that early discharge after childbirth has negative impact on women's health.

Previous researchers have attempted to analyze average duration of stay after childbirth in health facility by type of delivery and complications. A study based on 92 countries and associated factors of 30 low and middle-income countries reported that the average length of stay after childbirth ranges between 1.3 and 6.6 days for vaginal deliveries and 2.5 and 9.3 days for C-section deliveries (Campbell et. al., 2016). Other studies found the mean duration of postpartum stay for vaginal deliveries is 1.5 days (Wen et al., 1998), 1.18 days (Leung et al., 1998), and four days (Mamun et al., 2011; Acharya 2016). On the other hand, for cesarean deliveries, 1.4 days (Wen et al., 1998), 2.71 days (Leung et al., 1998), 6.21 days (Mamun et al., 2011) and seven days (Acharya, 2016). Majority of women who delivered with cesarean delivery are staying for six and more days (Rice et al. 1999; Ford et al. 2012). Length of stay after childbirth is steadily declining in the UK and other countries also due to cost saving. Liu et al. 2002 reported that 13 percent women are staying at the facility for less than full days after a vaginal delivery. Women having complication before, during or after childbirth are staying longer after birth (Hebert et al. 1999; Lee et al. 2001; Liu et al. 2002). However, healthy mothers have shortest postpartum hospital stays. Women with perioperative complications are the higher risk for an extended postpartum length of stay. A study based on the impact of postpartum hemorrhage on hospital length of stay reported that women with postpartum hemorrhage experienced the significantly longer length of stay and higher inpatient mortality rates than women without postpartum hemorrhage (Marshall et al. 2017).

Postpartum length of stay may depend on several factors like type of facility, mode of delivery, obstetric morbidity and socioeconomic and demographic characteristics of the women. The earlier research found that women from older age group, of higher socioeconomic status and education and having private pay source have the most extended length of stay. Whereas earlier discharge is associated with young age, multi-parity, low socioeconomic status and lack of readiness for discharge (Weiss et al. 2004). Early discharge women are more likely to be multiparous, low wealth and without private health insurance (Brown & Lumley 1997). The growing cost of hospital stays is one of the factors for early discharge (Martell, 2000). Further, Blumenfeld et al., (2015) found that young and old women (less than 20 years or more than 34 years), having insurance and obesity are more likely to stay for longer after birth.

It is clear from the above literature review that the importance of post-delivery stay in the hospital are not well understood and evident particularly in India. A very few research which emphasize on the duration of stay and type of care given to women and children after delivery in health facility is available. Therefore, the present study in an attempt to fill this research gap by providing estimate of the average length of stay after childbirth in both vaginal and c section deliveries and

also public and private health facility. We further determine the factors associated with duration of stay in health institution.

Data and Methodology:

This study uses the data from the fourth round of the National Family Health Survey (NFHS), which is the national representative survey conducted in 2015-16. NFHS provides the information on population, health, nutrition, abortion, sexual behavior, HIV/AIDS knowledge, attitudes, behavior, and domestic violence for India as well as each state and union territory and district for India. NFHS uses stratified multi-stage cluster random sampling procedure for the selection of the sample and covered 29 states with six union territories and 640 districts. More detail of the survey design and sample size can be find in the national report (IIPS and ICF, 2017). The study uses the women data that contains information from 148,185 women aged 15-49 about their last institutional delivery conducted in five years preceding the survey. Certain specific set of questions were asked using standard questionnaires with the consent of the respondents. These women were asked “how long after delivered did you stay in the health facility?” Responses were recorded in hours for those who stayed less than 24 hours, in days who stayed for less than 7 days and then in weeks for remaining women. We transformed these responses into number of days for calculating average duration of stay. Further, women who reported more than 7 days were categorized in last category for bivariate analysis. We perform univariate analysis to calculate the mean length of stay after childbirth for separate cesarean and vaginal deliveries and also for public and private hospitals. There were four per cent women who reported more than 7 days of stay and 0.31 per cent reported don’t know. Therefore, these smaller proportion of women may not affect estimates of mean duration of stay.

We provide average duration of stay by background variables of women and delivery. Further, the study applies the Cox proportional hazard model to determine the factors affecting the risk of discharge after delivery. Here, time is defined as duration of stay and the failure event is discharge from the facility. Therefore, time to event vary across individuals and censoring of events exists. The form of Cox proportional hazard model is given below-

$$h(t, X) = h_0(t) \exp \left(\sum_{i=1}^p [\beta_i X_i] \right)$$

where

$X=(X_1, X_2, \dots, X_p)$ are the explanatory/predictor variables and $h_0(t)$ is called the baseline hazard.

Here, hazard ratio represents the coefficient value, that is, a ratio of discharge at a given time. Predictor variables include- age of women (15-24, 25-29, 30-39 and 40+ years), place of residence (Rural and Urban), education of the women (Illiterate, Primary, Secondary and Higher), caste (Schedule caste, Schedule Tribe, Other Backward Class and Others), religion (Hindu, Muslim and Others), wealth index (Poorest, Poorer, Middle, Richer and Richest), parity (1st, 2nd, 3rd and 4th+), number of antenatal checkup visits (ANCs) (No visits, 1-3, 4 and more visits), JSY assistance (Not received and received), mode of the delivery (Vaginal and Cesarean), type of delivery (Public and Private), breech presentation (No and Yes) and any complication during delivery (breech presentation, prolonged labor and excessive bleeding).

Public facilities includes government/municipality Hospital, government dispensary, Urban health clinics/urban health post (UHP)/urban family welfare centers (UFWC), Community Health Centre (CHC)/Rural Hospital/Block Primary Health Care (BPHC), PHC/Additional PHC, Sub-Centre and other public sector health facility whereas Private includes Hospital/Maternity home/Clinic, other private sector health facility and NGO or trust hospital/clinic.

Results:

Duration of stay for vaginal and C-section deliveries by public and private health institution are shown in table-1. Overall, average length of stay at any health facility is 3.4 days; 2.9 days in public and 4.7 days in private health facility. As expected, women who have vaginal deliveries are staying for a shorter duration (2.1 days) after childbirth; however, it does not vary much by public and private health facility. On the other hand, a significant number of women are staying for longer time (8.6 days) after having C-section deliveries. Interestingly, in caesarian deliveries, women are staying for longer in public than in private health facility.

Study finds a significant percentage of women are taking early discharge. As overall, around 36.8 per cent (41.5 per cent in public and 28.3 per cent in private) of the women take discharge before two days and 18 percent (21.2 per cent in public and 12.8 per cent in private) within a day. Early discharge is more common in the deliveries conducted in public sector than in private for both modes of deliveries. In public sector, nearly 23 percent of women with normal delivery and 6.7 per cent of women with caesarian are discharged in the same day of childbirth. However, late discharge (after a week) who have cesarean deliveries is also common in public facility (18.5 per cent) as compared to private (13.3 per cent).

(table-1 about here)

The cumulative percentage of women by days of discharge after birth is shown in figure-1. It is clearly visible that in case of normal delivery, women are taking early discharge and there is a minor difference by public- private sector. Whereas, in caesarian deliveries, early discharge is more common in public hospital and continue till 4 days, afterwards, higher proportion of women have taken discharge from private hospitals.

(figure-1 about here)

We further link the duration of stay with the cost of delivery. Average cost by day of discharge after birth is given in Figure-2. This reveals that cost of delivery is higher in private than public health facility. With increase in the number of days of stay, cost of delivery increases but this is true only in private health facility. Cost of delivery in private facility increases sharply after 2 days of stay and more so in vaginal delivery. Obviously cost of cesarean is higher than normal delivery. After 7th day of stay vaginal delivery cost meets with caesarian delivery cost.

(Figure-2 about here)

Average length of stay of women after childbirth by their socioeconomic and demographic characteristics for both modes of deliveries and health facility is presented in Table-2. The duration decreases with the increase in the age of women irrespective of modes of delivery and place of delivery. For vaginal deliveries, women with having 3 and more parity are early discharged in 1.9 and 1.67 days respectively as compare to first parity women (2.3 days). This pattern is true for both place of delivery. For vaginal deliveries, length of stay of women after childbirth increases with their level of education which is not true for caesarian deliveries. Higher educated women stay on an average for 2.6 days as compare to illiterate women (1.6 days) for vaginal births. The average stay among urban women is longer (4.07 vs 3.17) compared to their rural counterparts for vaginal deliveries while it is another direction (7.98 vs 9.10) for caesarian deliveries. Overall, Schedule tribe women taking early discharge (2.94) than all others caste groups. Caste doesn't play a significant role determining length of stay for vaginal deliveries. However, for cesarean deliveries, the duration of stay is lower in general caste then lower socio-economic groups (SCs, STs) and OBCs. For vaginal deliveries, women from poorest households are taking discharge in about 1.7 days in contrast to nearly 2.3 days of stay among women from the affluent households irrespective the place of delivery. However, in caesarian deliveries, women from richest households take discharge in 7.24 days as compare to 9.6 days of stay of women from poorest families.

When women carry a pregnancy in breech presentation and deliver it normally, her stay at facility is longer (2.9 days) than others who had normal delivery without such complication (2 days). Further, women having any delivery complication are staying longer at facility irrespective of the mode of delivery and place of delivery. Number of ANC visits has a significant role in women's days of stay in health institution and particularly in public health facility. Women who deliver in public health facility and make four and more ANC visits stay for 2.5 days for normal and 10.1 days for cesarean as compare to 1.7 days for normal and 8.7 days for cesarean delivery among who do not go for any ANC. Moreover, women who receive JSY assistance for delivery in public health facility are staying for shorter duration than who do not get this assistance.

The findings from cox regression that shows the effect of factors on duration of stay after controlling other factors are shown in table 4. In contrast to the bivariate result, the risk of getting discharge at a given time does not vary much by women's age as hazard ratio (HR) for age 25-29 30-39 is 0.983 and 0.97 in compare to 15-24. There is a positive relationship between women's

education, household's wealth and their discharge rate at a given time. In other words, with increase in the level of education and wealth of the women, they are more likely stay longer than their counterpart. However, the richest women staying for shorter duration than poorest women. The risk of getting early discharge is high among rural women (HR-1.053) than urban. Women belonging to lower caste group (SC, ST, OBC) are more likely to stay for longer duration (HR-0.925, 0.929, 0.931 respectively) than higher caste.

Women having higher parity are staying for shorter period. The hazard ratio of getting discharge of women from second, third, fourth and more parity is HR-1.032, HR-1.087, and HR-1.113 respectively. Further results show that early discharge rate is significantly lower among women having obstetric morbidity (HR-0.939) and having cesarean delivery (HR-0.334). Antenatal care is among the most important indicator for improvement of maternal health. Women those are going for four and more times for antenatal visits are significantly having less risk of early discharge (HR-0.916). Women receiving JSY assistance having significantly higher discharge rate (HR-1.088) compared to reference categories. Surprisingly findings suggest that after receiving the JSY assistance, women are staying for shorter time at facility after childbirth. Further, women who deliver at private health facility are staying for longer time as discharge rate is high (HR-1.032) in comparison to women who deliver birth in the public facility.

Discussion:

Childbirth considered to be a relatively safe event when it takes place at an institution or delivery conducted by a trained health professional. There is a substantial amount of maternal morbidity which can cause severe health complications and results in a prolonged length of stay after childbirth. We find overall a higher proportion of women who deliver in public health facility are discharged within two days of delivery in compare to who deliver in private health facility. Further our finding shows a higher mean length of stay at the hospital/care centers after delivery is 3.4 days for women whose delivery happen in private health facilities than public health facility. This finding concurs with earlier studies including one multi-country study (Campbell et al., 2016) Some plausible reasons for this pattern could be that population often prefer better quality services which are mostly found in private health providers. A recent NSSO study reported that Indian population more rely on private health provider for their treatment which reflects that people have more satisfaction in undergoing treatment at the private hospital even though private health providers are often profit oriented. Interestingly, in cesarean deliveries, women are staying for longer in public than in private health facility. There are two possible reasons for this. One- that women have to bear high cost of delivery in private hospitals, second that women who go for cesarean deliveries in public facility may have more complications that may extend their post-delivery stay. Furthermore, obviously women with vaginal deliveries are staying shorter duration after childbirth than women with a cesarean section delivery which validates with the previous studies done by Wen et al., in 1998 and Campbell et al., in 2016.

Older women are spending lesser time particularly in public health facility after child birth. However, in multivariate results, age has not much effect on duration of stay. Further, women with higher parity are staying for shorter period irrespective of mode and place of delivery. Higher parity women might be less educated and come from poor families and therefore utilizing lower quality of healthcare services. Similarly, findings suggest Muslim women also are more likely to take early discharge. In India, Muslims fertility is higher than other religions (Morgan et. al., 2002; Mari Bhat and Francis Zavier, 2005) and therefore women belong to higher parity from this religion. Further, we find that a positive relationship between women's education, households' wealth, urban residents and length of stay. Interestingly, this relationship is only true for normal not for caesarian deliveries. This could be credited to the fact that educated and economically sound and urban residents women are well informed and aware about the health risks involving in childbirth and have the high purchasing power to avail the better quality services and consequently they stay for longer after childbirth. Contrary to normal delivery, we found that for caesarian deliveries, women with less education, from poor households, rural residents and from lower cast groups are staying for longer period. One of the possible reason for this could be that these women might have gone for caesarian delivery with complication, while their counterparts might have gone even without complication. Further, the long distance to the hospital from rural area might force them to stay for longer in hospital after having caesarian delivery.

Further study finds a positive relationship between duration of stay and pregnancy complication. We also consider programmatic variables such as ANC visits and JSY beneficiary. Antenatal care is the important indicator for improvement of maternal health. We found the women going for antenatal visits four more than three times have significantly less risk of getting early discharge. Policy intervention by the government too plays a vital role in encouraging and promoting safe delivery approach as there is a significant increase in the institutional deliveries after implementation of JSY. However, this study finds that women who have received assistance from JSY are getting early discharge particularly in public health facility.

Conclusion: Knowing the importance of postpartum care, this paper analyses a rarely discussed indicator that is duration of stay in health facility after childbirth. Duration of stay after birth largely depends on pregnancy and delivery complications and morbidity. However, this paper examines the effect of socio-economic, demographic and programmatic variables on staying period in facility. On an average women are staying for longer duration in private than public facilities, early discharge is also more common in public health facility than private. However, women with cesarean delivery in public facility are staying more in compare to private hospitals and this is reverse for normal delivery. We also link this relationship of duration of stay in public and private facility with the average cost of delivery. Delivery cost is highly related with duration of stay in private facility for both type of deliveries. We further find that women with higher education, belonging to affluent households, urban residents, are staying longer. However, this is not true in caesarian deliveries. On the other hand, women living in rural areas, belonging to Muslim and other religion and having higher parity are less likely to stay in health facility after

delivery. We discuss the plausible reasons behind this. Another key finding of the paper is the positive effect of ANC visits on duration of stay; however, a negative relationship between the duration of stay of women with the utilization of JSY scheme is observed. This means that JSY scheme has been successful to encourage women to come to the health institution for delivery but not to increase their stay in the facility after childbirth. Therefore, we recommend that government programme should focus in increasing four and more ANCs and implementing JSY scheme not only to uplift levels of the institutional birth but also to provide the effective postnatal care that is possible to keep women in the facility up to a necessary time period. Finally, we recommend that the health facilities should not only have the skilled birth attendants and effective elements of care, but also the women should stay long enough to benefit from these.

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Table 1: Duration of stay for cesarean and vaginal deliveries by public and private health facilities, India-2015-16

Duration of Stay (in days)	Total			Public			Private		
	C-section	Vaginal	All	C-section	Vaginal	All	C-section	Vaginal	All
0	5.1	22.3	18.2	6.7	23.4	21.2	4.3	19.2	12.8
1	4.3	23.1	18.6	5.6	22.6	20.3	3.5	24.6	15.5
2	3.4	19.2	15.4	4.3	18.8	16.9	3.0	20.3	12.8
3	7.7	24.0	20.1	6.3	25.1	22.6	8.6	20.8	15.6
4	7.0	3.4	4.2	4.6	3.0	3.2	8.4	4.5	6.2
5	15.3	3.2	6.1	10.0	2.6	3.6	18.3	4.8	10.7
6	8.6	0.9	2.7	7.8	0.8	1.7	9.1	1.2	4.6
7	33.3	2.2	9.6	36.3	2.0	6.5	31.6	2.8	15.2
7 +	15.2	1.8	5.0	18.5	1.8	4.0	13.3	1.8	6.8
Average	8.63	2.12	3.4	8.9	2.1	2.9	8.5	2.2	4.7
N	29,738	118,447	148,185	12,646	92,969	105,615	17,092	25,478	42,570

Figure-1: Cumulative percentage of women by their length of stay at the institution after delivery

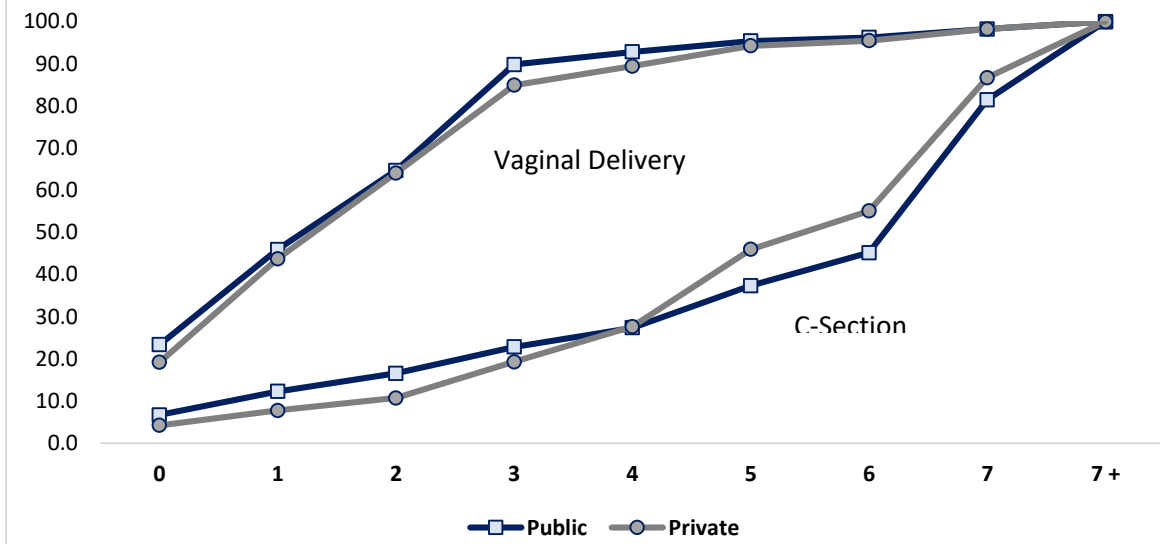


Figure-2: Average cost of delivery by length of stay

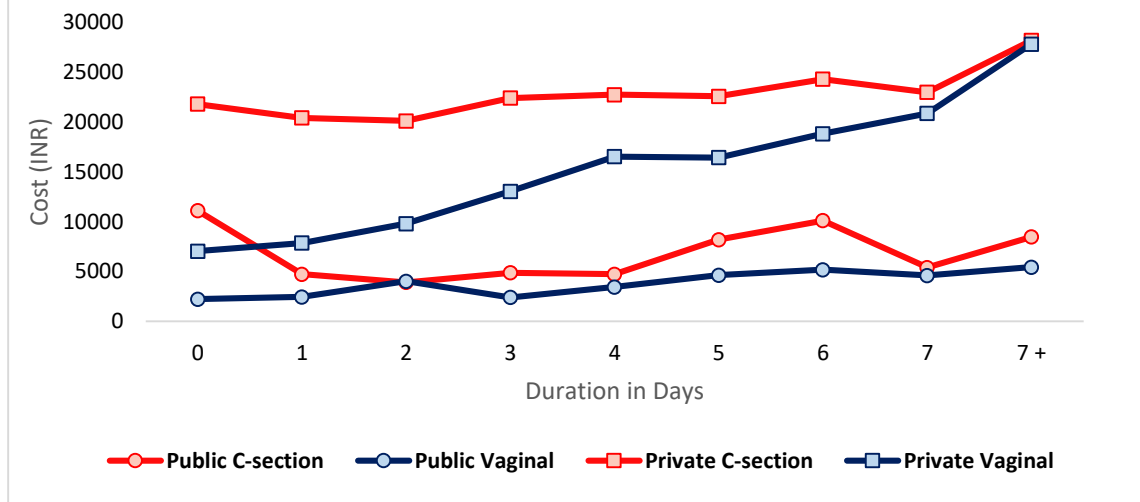


Table-2: Average length of stay of women after childbirth in public-private health facility, by their characteristics and by type of delivery, India 2015-16

Duration of Stay (in days)	Total			Public			Private		
	C-section	Vaginal	All	C-section	Vaginal	All	C-section	Vaginal	All
Age									
15-24 Years	9.18	2.14	3.36	9.26	2.15	2.90	9.12	2.08	4.69
25-29 Years	8.60	2.16	3.47	9.11	2.12	2.95	8.25	2.31	4.71
30-39 Years	8.20	2.08	3.49	8.34	1.99	2.88	8.10	2.35	4.81
>40 Years	7.70	1.78	2.96	6.87	1.72	2.29	8.27	2.02	4.82
Education									
Illiterate	8.92	1.72	2.42	8.19	1.75	2.13	9.68	1.56	3.86
Primary	9.25	2.04	3.00	9.20	2.07	2.68	9.31	1.86	4.35
Secondary	8.76	2.29	3.72	9.03	2.26	3.25	8.53	2.39	4.87
Higher	7.97	2.41	4.47	8.66	2.27	3.70	7.73	2.56	5.03
Residence									
Urban	7.98	2.46	4.07	8.57	2.48	3.62	7.64	2.42	4.68
Rural	9.10	2.01	3.17	9.05	1.98	2.69	9.14	2.13	4.78
Religion									
Hindu	9.09	2.14	3.49	9.64	2.12	2.93	8.73	2.21	4.88
Muslim	7.44	1.95	3.24	7.14	1.90	2.81	7.76	2.10	4.19
Others	7.32	2.20	3.24	7.51	2.06	2.80	7.13	2.77	4.50
Caste									
SC	9.26	2.15	3.36	9.81	2.15	3.00	8.68	2.12	4.73
ST	8.02	2.20	2.94	8.02	2.16	2.67	8.03	2.59	4.55
OBC	9.31	2.07	3.50	9.84	2.02	2.84	9.02	2.20	4.82
Others	7.89	2.11	3.67	8.18	2.08	3.06	7.73	2.20	4.58
Wealth									
Poorest	9.64	1.71	2.28	9.02	1.72	2.04	10.41	1.65	4.19
Poorer	9.62	2.03	2.95	8.90	2.06	2.63	10.61	1.87	4.68
Middle	9.68	2.27	3.75	9.85	2.28	3.34	9.48	2.23	5.02
Richer	8.72	2.39	4.11	8.83	2.37	3.56	8.64	2.42	5.04
Richest	7.24	2.32	4.02	7.60	2.22	3.39	7.11	2.42	4.50
Parity									
1 st Parity	8.53	2.34	3.96	8.91	2.30	3.37	8.27	2.47	5.11
2 nd Parity	8.90	2.21	3.67	9.29	2.19	3.14	8.60	2.30	4.91
3 rd Parity	8.18	1.91	2.73	7.76	1.90	2.34	8.50	1.95	3.99
More Parity	8.52	1.66	2.14	7.81	1.66	1.89	9.07	1.68	3.22
Breech pr									
No	8.59	2.02	3.30	8.92	1.98	2.76	8.36	2.14	4.61
Yes	8.87	2.93	4.38	8.70	2.89	3.87	9.04	3.09	5.70
Any comp_D									
No	8.60	2.10	3.32	8.96	2.07	2.83	8.34	2.20	4.56
Yes	8.66	2.15	3.57	8.79	2.11	3.00	8.57	2.30	4.96
Number of ANC									
No visits	9.89	1.79	2.69	10.05	1.72	2.24	9.75	2.13	4.41
1-3 visits	9.03	1.78	2.75	8.93	1.77	2.31	9.10	1.81	4.24
4 & More Visits	8.38	2.46	4.02	8.74	2.46	3.51	8.13	2.48	4.98
JSY Assistance									
No	8.60	2.32	4.05	9.12	2.38	3.44	8.37	2.23	4.71
Yes	8.75	1.91	2.61	8.58	1.90	2.51	9.85	2.50	5.09

Table 3: Cox Proportional Hazard Ratio (with 95% CI) for the risk of discharge among women by socioeconomic, demographic and program variables, India 2015-16

	Variables	Hazard Ratio (C.I.)
Age	15-24 Years®	
	25-29 Years	0.983**(0.969- 0.998)
	30-39 Years	0.97*** (0.953- 0.987)
	>40 Years	0.977(0.936- 1.021)
Education	Illiterate®	
	Primary	0.951*** (0.931- 0.972)
	Secondary	0.933*** (0.917- 0.95)
	Higher	0.929*** (0.906- 0.952)
Residence	Urban®	
	Rural	1.053*** (1.038- 1.068)
Religion	Hindu®	
	Muslim	1.03*** (1.01- 1.05)
	Others	1.125*** (1.102- 1.148)
Caste	Others®	
	SC	0.925*** (0.908- 0.943)
	ST	0.929*** (0.91- 0.948)
	OBC	0.931*** (0.916- 0.945)
Wealth	Poorest®	
	Poorer	0.958*** (0.939- 0.977)
	Middle	0.939*** (0.92- 0.959)
	Richer	0.962*** (0.94- 0.983)
	Richest	1.048*** (1.021- 1.075)
parity	1 st Parity®	
	2 nd Parity	1.032*** (1.018- 1.047)
	3 rd Parity	1.087*** (1.066- 1.108)
	More Parity	1.113*** (1.086- 1.139)
Breech Presentation	No®	
	Yes	0.851*** (0.835- 0.867)
Any complications during Delivery	No®	
	Yes	0.939*** (0.928- 0.951)
No. of ANC	No visits®	
	1-3 visits	1.018* (0.998- 1.039)
	4 & More Visits	0.916*** (0.898- 0.934)
JSY Assistance	No®	
	Yes	1.088*** (1.073- 1.103)
Mode of Delivery	Vaginal®	
	Cesarean	0.334*** (0.329-0.34)
Type of facility	Public®	
	Private	1.032*** (1.016-1.048)

Note: ® refers Reference Category, p<0.10 *, p<0.05 **, p< 0.01 ***