

## ORIGINAL ARTICLE

# Place and type of delivery along with assistance during delivery among women residing in a village in South Delhi: Low performance pocket within a high performing state

Geeta Pardeshi<sup>1</sup>, Neelam Roy<sup>1</sup>, Anita Verma<sup>1</sup>, Sneha Ranjan<sup>1</sup>, Jugal Kishore<sup>1</sup>

<sup>1</sup>Department of Community Medicine, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi

[Abstract](#) | [Introduction](#) | [Methodology](#) | [Results](#) | [Conclusion](#) | [References](#) | [Citation](#) | [Tables / Figures](#)

## Corresponding Author

Address for Correspondence: Dr. Geeta Pardeshi, Department of Community Medicine, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi  
E Mail ID: [kanugeet@gmail.com](mailto:kanugeet@gmail.com)



## Citation

Pardeshi G, Roy N, Verma A, Ranjan S, Kishore J. Place and type of delivery along with assistance during delivery among women residing in a village in South Delhi: Low performance pocket within a high performing state. Indian J Comm Health. 2017; 29, 3: 245-250.

**Source of Funding:** Nil **Conflict of Interest:** None declared

## Article Cycle

**Received:** 17/08/2017; **Revision:** 25/08/2017; **Accepted:** 25/09/2017; **Published:** 30/09/2017

This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

## Abstract

**Background:** Various initiatives have been taken under the National Health Mission to improve coverage of institutional deliveries. Yet there are disparities in the proportion of institutional deliveries between states. A high proportion of non-institutional deliveries was noted in a village under PHC Fatehpur Beri in South Delhi. **Aims and Objectives:** To study the place, assistance and type of deliveries in this village during the years 2007 to 2016 which is the period when several initiatives were taken up to promote institutional deliveries. **Material & Methods:** A community based cross-sectional study was conducted in Kharak village under PHC, Fatehpur Beri in which data on place and year of delivery, assistance during delivery, type and outcome of deliveries in the period 2007 to 2016 were collected. In analysis, the data for two five year periods were compared using Fishers exact test and odds ratio was calculated with 95% confidence intervals. Trends were assessed by using Mantel-Haenszel test. Changes in the delivery characteristics of two consecutive deliveries were assessed. **Results:** Of the 312 deliveries, 106 (34%) were institutional deliveries out of which 98 (92%) were in public hospitals. A total of 113 (36%) were assisted by doctors and nurses 44 (14%) were caesarean section deliveries. The proportion of institutional deliveries had increased significantly from 23% in the years 2007-2012 to 42 % in the period 2012 to 2016. [ $\chi^2=11.76$ ,  $df=1$ ,  $p=0.001$ ,  $OR=2.37(1.44-3.91)$ ]. The proportion of women assisted by trained health professionals during the deliveries also showed a significant rise from 26% to 44% between these time periods. [ $\chi^2=11.39$ ,  $df=1$ ,  $p=0.001$ ,  $OR=2.3(1.41-3.75)$ ] There was no significant difference in the proportion of caesarean section deliveries between the two study periods. [ $\chi^2=0.167$ ,  $df=1$ ,  $p=0.683$ ,  $OR=0.87(0.46-1.66)$ ]. There was a significant increase in the proportion of institutional deliveries over the ten year period from 23% to 56% [ $\chi^2=17.84$ ,  $df=1$ ,  $p=0.00$ ]. **Conclusion:** There are pockets of poor performance on institutional deliveries within high performing states. There is increasing trend in institutional deliveries and assistance by trained health professional in the village but there is huge scope to improve the coverage to match the state and national figures. There is a need to identify the challenges and customize interventions to address them in such pockets

## Keywords

Institutional deliveries; Assistance during delivery; Caesarean section, low performing pocket, high performing states

## Introduction

Promoting institutional deliveries is one of the key interventions to reduce maternal and neonatal mortality. In India, various initiatives have been taken under the National Health Mission such as cash incentive scheme – Janani Suraksha Yojana, provision of cashless service benefits under Janani Shishu Suraksha Karyakram and appointment of ASHAs for this purpose. (1,2,3) These have resulted in an increasing trend of institutional deliveries in India. (4) The proportion of institutional deliveries at the national level has been reported to increase from 38.7% [NFHS 3] to 78.9% [NFHS 4]. (5) Yet there have been studies which have reported limited uptake of these interventions especially in the empowered action group states leading to disparities in coverage of institutional deliveries between states. (6) Studies have reported barriers for using institutional delivery care such as high opportunity costs, skepticism about health service quality, socio-cultural notions, low level of awareness, non-availability of transportation along with chaotic delivery environment, lack of staff preparedness and poor quality of health infrastructure. (7,8,9,10)

Delhi is a one of the better performing states on the maternal and child health indicators. A high proportion of non-institutional deliveries was noted in a village under PHC Fatehpur Beri in South Delhi.

## Aims & Objectives

To study the place and type of deliveries along with assistance during delivery in this village during the years 2007 to 2016 which is the period when several initiatives were taken up to promote institutional deliveries.

## Material & Methods

A community based cross-sectional study was conducted in Kharak village under PHC, Fatehpur Beri in South Delhi in January 2017. The village has a population of 1500. Women who had delivered in the period 2007 to 2016 were included in the study. A pretested questionnaire was used to collect data on place (Home, Institutional) and year of delivery, assistance during delivery (family members, dais, auxiliary nurse midwives, lady health visitors, nurses, and doctors), type (Normal vaginal, caesarean section) and outcome of delivery (livebirth, stillbirth). Using the definition of NFHS surveys, assistance during delivery by doctors, ANMs, nurses, midwives, lady health visitors and other health

personnel was classified as assistance by trained health professionals.

Cluster sampling method was used for the survey. NFHS 3 report for Delhi mentions 59% of the deliveries are institutional deliveries and 41% are home deliveries. Considering a relative error of 20% and alpha error of 5% the sample size calculated was 144. A design effect of two was considered and the revised sample size calculated to be 288 which was rounded off to 300. The village was divided into six contiguous sectors and 50 deliveries over ten year study period were included from each sector. The first house was selected randomly, and each consecutive house was included in the sample till the desired sample size was met. Women who reported deliveries in the past ten years in the selected household were included in the study. All the deliveries reported by the women in the study period were taken into account.

This study was a part of a survey conducted to assess the reproductive and child health status in Kharak village which was approved by the institutional ethics committee. A written informed consent was taken from the respondents.

Data analysis was done in SPSS (Version 21). The data for two five year periods i.e. 2007-2011 and 2012-2016 were compared using Fishers exact test and odds ratio was calculated with 95% confidence intervals. Trends in the place of delivery, assistance during delivery and type of delivery over a ten year period were assessed by using Mantel-Haenszel test. A p value of less than 0.05 was considered to be statistically significant. Any change in the delivery characteristics in case of two consecutive deliveries reported by women during the study period was assessed.

## Results

A total of 142 women in the study area reported 312 deliveries in the ten year period from 2007 to 2016. The average age of the respondents was 30.63 years (sd =7.14 years), 31 (22%) women reported to have never attended school and only seven were gainfully employed. The place of delivery, type of delivery and assistance during delivery for these deliveries reported by the respondents are described in [Figure 1](#).

Of the 312 deliveries, 206 (66%) were home deliveries and 106 (34%) were institutional deliveries. Of the 106 institutional deliveries, a majority i.e. 98 (92%) were in public hospitals and 8

(8%) were in private hospitals. A total of 199 (64%) deliveries were assisted by dais or family members while 113 (36%) were assisted by doctors and nurses. Overall a total of 268 (86%) deliveries were normal deliveries and 44 (14%) were caesarean section deliveries. Out of the 312 deliveries, 309 (99%) were reported to be live births and three were stillbirths. Of the three stillbirths, one was an institutional vaginal delivery conducted by a doctor and two were home deliveries conducted by dais.

[Table 1](#) compares the intrapartum care between two five year periods i.e. 133 deliveries during the period 2007-2011 and 179 deliveries during the period 2012-2016. The proportion of institutional deliveries had increased significantly from 23% in the years 2007-2012 to 42 % in the period 2012 to 2016. The proportion of women assisted by trained health professionals during the deliveries also showed a significant rise from 26% to 44% between these time periods. There was no significant difference in the proportion of caesarean section deliveries between the two study periods.

A total of 99 women reported two or more deliveries during the study period. [Table 2](#) describes the shifts in the delivery characteristics for the consecutive deliveries among these women. In a majority of cases both the deliveries were home deliveries, both the deliveries were conducted by untrained persons and both consecutive deliveries were normal vaginal deliveries. A shift from home to institutional and untrained to trained persons assisting deliveries was noted in small number of deliveries.

An assessment of the trends shows that there was a significant increase in the proportion of institutional deliveries over the ten year period from 23% to 56%. Similarly, there was a rising trend in the proportion of deliveries assisted by nurses and doctors from 27% to 58%. There was no significant trend in the type of deliveries with the proportion of caesarean section deliveries ranging from 23% in 2007 to 17% in 2016. ([Table 3](#)). In 2015-16, 42 out of 81 deliveries (52%) were institutional deliveries and of these 39 (93%) were conducted in public facilities. Of the total 81 deliveries 44 (54%) were assisted by doctors and nurses and 17% were caesarean section deliveries

## Discussion

Under the NRHM, the Empowered Action Group (EAG) States have been given special focus. For example, under the Janani Suraksha Scheme the financial assistance was graded according to a

classification in which all states and Union Territories (UTs) were classified into Low Performing States and High Performing States on the basis of institutional delivery rate. The states having institutional delivery 25% or less were termed as Low Performing States (LPS) and those which have institutional delivery rate more than 25% were classified as High Performing States (HPS). (1) Studies have reported increased uptake of maternal health care in high focus states under NRHM. (11-13) In this study, we describe the delivery characteristics during the period of NRHM implementation in a village in a better high performing state.

Under NRHM, states with the proportion of institutional deliveries more than 25% were categorized as high performing states. (1) Delhi with the proportion of institutional deliveries of 58% was categorized as high performing state. In NFHS 4 the proportion of institutional deliveries in the National Capital Territory of Delhi as well as South Delhi district has risen to 84%. (14) In contrast, for this village in Delhi, the proportion of institutional deliveries were 23% in 2006 and 56% 2016. This study finding highlights the fact that there are pockets of poor coverage within better performing states which continue to pose challenges to improve proportion of institutional deliveries. If the performance of some low performing states is reviewed, it is observed that compared to NFHS 3, in NFHS 4 reports the proportion of institutional births in Uttar Pradesh has increased from 20.6% to 67.8 (15) and in Bihar the increase has been from 19.9% to 63.8%. (16) Thus, it is observed that the performance of Kharak village is more in line with these states.

In this study, overall 34% of the total deliveries over the ten year period had been conducted in an institution and 36% deliveries were assisted by trained health professionals. The proportion of institutional deliveries had increased from 23% in the first half of study period to 42% in the second half. Though there was an increasing trend over the ten year study period the coverage of institutional deliveries was 56% in the year 2016 which is less as compared to the figures for Delhi and India as per NFHS 4 data. There is a need to identify the reasons for low proportion of institutional deliveries.

At the individual level, among women with more than one delivery during the study period, majority reported all deliveries to be home deliveries. There was a small change in place of delivery either from

home to institution or vice versa. This indicates that the initiatives taken up by the government have not been successful to bring about the intended shift from home to institution deliveries at individual level. In a study in Uttar Pradesh too it was reported that women whose previous delivery was at home have a high probability of delivering at home again. It was recommended that focused attention and encouragement is needed to motivate them to shift from home to the institution for their next delivery. (17)

As per NFHS-4 reports the proportion of institutional deliveries in Delhi was 92.3% of which 55.7% were in public facility. In our study, the proportion of institutional deliveries was 52% in this period and 93% of the institutional deliveries were conducted in public facility. This finding indicates that public health facility are the key service providers for intra-natal care in this village and hence strengthening the delivery services at the Primary Health Centers and sub-centers will contribute in improving coverage of institutional deliveries.

The factors influencing utilization of maternal health services vary across regions. For example, it has been reported that predictors of maternal health services utilization by poor rural women are different in different states. For example, in Gujarat JSY participation, road access, husband's education predicted institutional delivery in Gujarat while road access, women's education predicted institutional delivery in Tamil Nadu. (18) This indicates the need to identify the barriers for utilization of the maternal health services in poor performing pockets and design specific interventions directed towards those factors.

At the national level the births delivered by caesarean section had increased from 8.5% during NFHS 3 period to 13.7% in NFHS 4 (14) and in Delhi region it had increased from 13.7% (NFHS 3) to 23.7% (NFHS 4). (14) Data based on NFHS I and NFHS III has shown an increasing trend in caesarean section deliveries in India with many states having caesarean section rates of more than 10% with non-medical factors identified as important determinants for performing this procedure. (19) The caesarean section rate during the study period was 14% in the study village. There was no significant difference in the proportion of births delivered by caesarean section over the study period in the study village. The reason for this finding could be that majority of the institutional deliveries in the study village were

conducted in public health facilities. WHO in its statement on caesarean section rates mentions that at population level, caesarean section rates higher than 10% are not associated with reductions in maternal and new-born mortality rates. (20) Hence as we focus on increasing institutional deliveries it is important to monitor the trends of caesarean section deliveries.

## Conclusion

There are pockets of poor performance on institutional deliveries within high performing states. There is increasing trend in institutional deliveries in the village but there is huge scope to improve the coverage to match the state and national figures.

## Recommendation

It is recommended that qualitative studies and operational research be conducted in such pockets of poor performance to understand the challenges and take up correctional steps to improve coverage of institutional deliveries. The policy makers should consider the presence of low performing pockets within better performing states and districts and customize interventions to address the challenges in such pockets

## Limitation of the study

In this study, the number of deliveries in each year may have been inadequate to capture the year wise coverage of institutional deliveries.

## Relevance of the study

The study findings have important policy implications as it indicates the need to have more focused and individualized approach in such low performing pockets within better performing states.

## Authors Contribution

GP contributed to conception and design, analysis and interpretation of data and drafting the manuscript; NR contributed in designing the questionnaire, analysis and revising it critically for important intellectual content; AV and JK contributed to revising it critically and final approval of the version to be published; SR contributed to design the questionnaire and data collection

## Acknowledgement

We acknowledge the field work done by the senior residents, postgraduate students, interns and staff of the department of Community Medicine, Vardhman Mahavir Medical College and Safdarjung Hospital for this study.



# References

1. Ministry of Health and Family Welfare, Government of India. Janani Suraksha Yojana. National Health Mission Accessed on 2nd Feb 2017 at <http://nhm.gov.in/nrhm-components/rmnch-a/maternal-health/janani-suraksha-yojana/background.html>
2. Ministry of Health and Family Welfare, Government of India. Janani Shishu Suraksha Karyakram. National health Mission Accessed on 02/02/2017 at <http://nhm.gov.in/nrhm-components/rmnch-a/maternal-health/janani-shishu-suraksha-karyakram/background.html>
3. Ministry of Health and Family Welfare, Government of India. ASHA National Health Mission Accessed on 02/02/2017 at <http://nhm.gov.in/communitisation/asha/about-asha.html>
4. Salve HR, Charlette L, Kankaria A, Rai SK, Krishnan A, Kant S. Improving access to institutional delivery through Janani Shishu Suraksha Karyakram: Evidence from rural Haryana, North India. *Indian J Community Med* 2017; 42: 73-6.
5. International Institute for Population Sciences (IIPS) India fact sheet National Family Health Survey (NFHS-4), India, 2015-16.
6. Vellakkal S, Gupta A, Khan Z, Stuckler D, Reeves A, Ebrahim S, Bowling A, Doyle P. Has India's national rural health mission reduced inequities in maternal health services? A pre-post repeated cross-sectional study. *Health Policy Plan*. 2017 Feb;32(1):79-90. doi: 10.1093/heapol/czw100. Epub 2016 Aug 10. PubMed PMID: 27515405.[PubMed].
7. Kaushik A, Mishra P, Kesharwani P, Richa, Hussain MA. Awareness about JSY among reproductive age women in a rural area of Varanasi *Indian J. Prev. Soc. Med.*, 2010; 41 (3 & 4): 158-161.
8. Sidney K, Diwan V, El-Khatib Z, de Costa A. India's JSY cash transfer program for maternal health: who participates and who doesn't--a report from Ujjain district. *Reprod Health*. 2012 Jan 24;9:2. doi: 10.1186/1742-4755-9-2. PubMed PMID: 22269638; PubMed Central PMCID: PMC3287253.[PubMed].
9. Chaturvedi S, De Costa A, Raven J. Does the Janani Suraksha Yojana cash transfer programme to promote facility births in India ensure skilled birth attendance? A qualitative study of intrapartum care in Madhya Pradesh. *Glob Health Action*. 2015 Jul 7;8:27427. doi: 10.3402/gha.v8.27427. eCollection 2015. PubMed PMID: 26160769; PubMed Central PMCID: PMC4497976.[PubMed]
10. Bhattacharyya S, Srivastava A, Avan BI, Graham WJ. Quality care at childbirth in the context of health sector reform program in India: contributing factors, challenges and implementation lesson *Health Syst. Policy Res.*, 2012; 1 (1:2):1-8.
11. Dehury RK, Samal J. Maternal Health Situation in Bihar and Madhya Pradesh: A Comparative Analysis of State Fact Sheets of National Family Health Survey (NFHS)-3 and 4. *J Clin Diagn Res*. 2016 Sep;10(9):IE01-IE04. Epub 2016 Sep 1. Review. PubMed PMID: 27790466; PubMed Central PMCID: PMC5071966.[PubMed]
12. Nair H, Panda R. Quality of maternal healthcare in India: Has the National Rural Health Mission made a difference? *J Glob Health*. 2011 Jun;1(1):79-86. PubMed PMID: 23198105; PubMed Central PMCID: PMC3484741.[PubMed].
13. Powell-Jackson T, Mazumdar S, Mills A. Financial incentives in health: New evidence from India's Janani Suraksha Yojana. *J Health Econ*. 2015 Sep;43:154-69. doi: 10.1016/j.jhealeco.2015.07.001. Epub 2015 Jul 22. PubMed PMID: 26302940.[PubMed].
14. International Institute for Population Sciences (IIPS) State fact sheet NCT Delhi National Family Health Survey (NFHS-4), India, 2015-16.
15. International Institute for Population Sciences (IIPS) State fact sheet Uttar Pradesh National Family Health Survey (NFHS-4), India, 2015-16.
16. International Institute for Population Sciences (IIPS) State fact sheet Bihar National Family Health Survey (NFHS-4), India, 2015-16.
17. Varma DS, Khan ME, Hazra A. Increasing institutional delivery and access to emergency obstetric care services in rural Uttar Pradesh *Journal of Family Welfare*. 2010; 56: 23-30.
18. Vora KS, Koblinsky SA, Koblinsky MA. Predictors of maternal health services utilization by poor, rural women: a comparative study in Indian States of Gujarat and Tamil Nadu. *J Health Popul Nutr*. 2015 Jul 31;33:9. doi: 10.1186/s41043-015-0025-x. PubMed PMID: 26825416; PubMed Central PMCID: PMC5026000.[PubMed]
19. Ghosh S. Increasing Trend in Caesarean Section Delivery in India: Role of Medicalisation of Maternal Health Institute of social and economic change. 2010 Accessed on 12/05/2017 at <http://www.isec.ac.in/WP%20236%20-%20Sancheeta%20Ghosh.pdf>.
20. Department of Reproductive Health and Research World Health Organization WHO Statement on Caesarean Section Rates 2015. Accessed on 12/05/2017 at [http://apps.who.int/iris/bitstream/10665/161442/1/WHO\\_RHR\\_15.02\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/161442/1/WHO_RHR_15.02_eng.pdf)

# Tables

**TABLE 1: PLACE, ASSISTANCE AND TYPE OF DELIVERIES FROM 2007-2016 IN KHARAK VILLAGE, FATEHPUR BERI (N=312)**

Delivery characteristics	Period 2012-2016 N(%)	Period 2007-2011 N(%)	Chi square, p value	OR (95%CI)
Place of delivery				
Institutional (N=106)	75 (42)	31 (23)	11.76;	2.37(1.44-3.91)
Home (N=206)	104 (58)	102 (77)	0.001	
Assistance during deliveries				
Trained health professionals (N=113)	79 (44)	34 (26)	11.39;	2.3 (1.41-3.75)

Dais, Family members (N=199)	100 (56)	99 (74)	0.001	
<b>Type of delivery</b>				
Caesarean Section (N=44)	24 (13)	20 (15)	0.167;	0.87 (0.46-1.66)
Normal (268)	155 (87)	113 (85)	0.683	

**TABLE 2: CHANGE IN THE DELIVERY CHARACTERISTICS OF CONSECUTIVE DELIVERIES DURING STUDY PERIOD IN KHARAK VILLAGE, FATEHPUR BERI, NEW DELHI (N=167)**

Place of delivery	N (%)	Assistance during delivery	N (%)	Type to delivery	N (%)
Home to Home deliveries	105 (63)	Untrained to untrained	102 (61)	Normal vaginal to Normal vaginal	144 (86)
Institutional to Institutional deliveries	33 (20)	Trained to Trained	37 (13)	Caesarean section to Caesarean section	18 (11)
Home to institutional deliveries	18 (11)	Untrained to Trained	17 (10)	Normal vaginal to Caesarean section	3 (2)
Institutional to home deliveries	11 (6)	Trained to untrained	11 (6)	Caesarean section to Normal Vaginal	2 (1)

**TABLE 3: TRENDS IN PLACE OF DELIVERY, ASSISTANCE DURING DELIVERY AND TYPE OF DELIVERY FROM 2007 TO 2016 IN KHARAK VILLAGE, FATEHPUR BERI, DELHI**

Years	Place of delivery		Assistance by health personnel		Type of delivery	
	Institutional delivery N(%)	Home delivery N(%)	Doctors/ Nurses N(%)	Dais/ Family members N(%)	Caesarean section delivery N(%)	Normal delivery N(%)
2007	5 (23)	17 (77)	6 (27)	16 (73)	5 (23)	17 (77)
2008	5 (28)	13 (72)	5 (28)	13 (72)	2 (11)	16 (89)
2009	4 (14)	24 (86)	4 (14)	24 (86)	4 (14)	24 (86)
2010	2 (8)	24 (92)	2 (8)	24 (92)	2 (8)	24 (92)
2011	15 (38)	24 (62)	17 (44)	22 (56)	7 (18)	32 (82)
2012	9 (29)	22 (61)	10 (32)	21 (68)	3 (10)	28 (90)
2013	14 (38)	23 (62)	14 (38)	23 (62)	4 (11)	33 (89)
2014	10 (33)	20 (67)	11 (37)	19 (63)	3 (10)	27 (90)
2015	22 (49)	23 (51)	23 (51)	22 (49)	8 (18)	37 (82)
2016	20 (56)	16 (44)	21 (58)	15 (42)	6 (17)	30 (83)
Chi square	17.84		17.89		0.002	
d.f	1		1		1	
p value	0.00		0.00		0.97	

## Figures

**FIGURE 1 FLOW CHART OF PLACE OF DELIVERY, ASSISTANCE DURING DELIVERY AND TYPE OF DELIVERY AMONG WOMEN RESIDING IN KHARAK VILLAGE, FATEHPUR BERI (PERIOD 2007 TO 2016)**

