

## Preference of place of delivery and its determinants: a cross-sectional study in Chukha district, Bhutan

Kencho Wangdi<sup>1</sup>, Mongal S. Gurung<sup>2</sup>, Dorji Pelzom<sup>3</sup>, Tashi Dema<sup>4</sup>, Sonam Wangdi<sup>5</sup>

<sup>1</sup>Dzongkhag Health Sector, Chukha Dzongkhag, Royal Government of Bhutan

<sup>2-4</sup>Health Research and Epidemiology Unit, Ministry of Health, Royal Government of Bhutan

<sup>5</sup>Reproductive Health Programme, Department of Public Health, Ministry of Health, Royal Government of Bhutan

### ABSTRACT

**Introduction:** The estimated global maternal deaths in 2013 was 289000. In Bhutan, Maternal Mortality Ratio has remarkably declined from 770 deaths per 100,000 live births in 1984 to 86 in 2012. However, the maternal mortality ratio still remains high and a high proportion of delivery still take place at homes (26%) despite of adopting 100% institutional delivery policy ever since 2005. This study was carried out to determine the important factors that prevent women from coming to the health facilities for safe delivery. **Methods:** A cross-sectional study among the women who delivered in Chukha District in 2013 was carried out after seeking ethical approval from Research Ethics Board of Health and World Health Organization. Chukha is a district with the second highest number of population in Bhutan where 55.7% of the people live in rural villages. **Results:** Out of 899 eligible listed women, 78.1% participated in the study and among the participants 11.5% had delivered at home. The number of home deliveries was higher in rural areas, 17.3%, as compared to urban places, 6.4%. Women who were delivering for third or more times are 2.42 times more likely to give birth at home compared to women who were delivering for the first time. Women residing at places more than three hours away from the health facility were 2.58 times more likely to give birth at home compared to women residing less than three hours away. During their last pregnancy, 99.4% of the participants have sought at least one ANC. **Conclusions:** This study suggests that the two most important factors associated with home delivery are the distance to health facility from their residences and the parity.

**Keywords:** Bhutan; Facility delivery; Home delivery; Place of delivery.

### INTRODUCTION

The estimated global maternal deaths in 2013 was 289000<sup>1</sup>. In Bhutan, Maternal Mortality Ratio (MMR) has remarkably declined from 770 deaths per 100,000 live births in 1984 to 255 in 2000 and to 86 in 2012<sup>2-5</sup>. However, the MMR is still high compared to many developed and developing countries. The maternal deaths in Bhutan can largely be prevented if all pregnant women come to health facilities for delivery because the main cause of maternal death in the country is postpartum haemorrhage<sup>6</sup>.

The strategies to facilitate 100 percent institutional delivery by 2015 was adopted in 2005<sup>7</sup>. However, the health seeking behaviour of the pregnant women has not changed as expected, especially in the rural areas, and bringing the pregnant women to the health facility for safe delivery remains a major challenge. The institutional delivery coverage was 74% in 2012<sup>5</sup>. In this light, this study was carried out to determine the important factors that prevent pregnant women from coming to the health facilities for safe delivery.

#### Corresponding author:

Mongal S. Gurung

mongal56@gmail.com

### METHODS

#### Study design

A cross-sectional study among the women who delivered in Chukha District in 2013.

#### Place and duration of study

In Bhutan health care services are provided free by the state through three-tiered system comprising of one National Referral Hospital, two Regional Referral Hospitals, 31 Hospitals, 205 Basic Health Units (BHU), 23 Sub-posts and 519 out-reach clinics<sup>14</sup>. Chukha District has the second largest population among the districts in Bhutan and it's the main entry points for import of goods. The district has total population of 74,387, out of which 55.7% live in the rural areas<sup>15</sup>. The health care services in Chukha district are rendered through three hospitals, 10 BHUs and 45 Outreach Clinics. Antenatal and postnatal services are provided through regular MCH clinics. Village health workers are involved in motivating and bringing women and children to clinics for MCH/FP services. They also educate and support pregnant women and mothers during pregnancy, childbirth and the postpartum period. All the health facilities are well equipped and have facilities for retaining patients. The staffs are trained and are capable of providing some form of obstetric services.

The Research Ethics Board of Ministry of Health has approved the conduct of the study in April 2010 and the approval

was renewed on 2<sup>nd</sup> January, 2014. The study was also approved by World Health Organization. Written informed consents were obtained from every participant.

### Inclusion and Exclusion criteria

The women who were not the residents of Chukha District were excluded from the study.

### Data collection and management

The list of women who delivered in 2013 under Chukha district, to be included in the study, was obtained from ANC, Birth and Child Health Registers and the Annual Household Survey records maintained by the health facilities.

All ten enumerators were trained for a period of five days including mock field practices. The whole process of data collection was closely monitored and supervised. The participants were interviewed at their homes using the structured questionnaire. At least two attempts were made to visit the homes to increase the response rate. During the field work, enumerators and the field supervisors checked the questionnaire for completeness, consistencies and errors on daily basis. Data was double entered in EpiInfo7 software.

### Statistical analysis and software used

Data was analyzed using STATA® 13 software. Besides the

descriptive statistics crude and adjusted odds ratios for different socio-demographic indicators were calculated for the outcome variable, place of delivery. For the adjusted odds ratios, a multiple logistic regression was fitted for the outcome variable 'place of delivery' with following statistically significant explanatory variables age, education level, occupation, location, type of nearest facility, distance to health facility and parity.

## RESULTS

### Background Characteristics

All 899 eligible women listed for the study were approached for interview and 78.1% participated in the study. Out of 702 participants, 11.5% had delivered at home. The number of home deliveries was higher in rural areas, 17.3%, as compared to urban places, 6.4%. The mean as well as the median age of the participants was 26 years. While the minimum age of the participants was 17 years the maximum age was 46 years. Among the participants, 98.72% of them were married, 0.43% was separated from their husbands, 0.57% was divorced, and 0.28% was widowed. Among them, 99.4% have sought at least one ANC during their last pregnancy.

### Socio-Demographic Factors

As shown in Table 1 women who had middle secondary or higher

**Table 1. Factors associated with home delivery among the women of Chukha Bhutan in terms of proportions, odds ratio and adjusted odd ratio**

Background Characteristics	Total	Place of Delivery		Unadjusted OR† 95% CI	Adjusted OR 95% CI
		Home	Facility		
Mother's age (Average)	702	27.6	26.3	1.04*(1, 1.09)	1(0.94, 1.06)
Education level					
Never attended school	283	17.3%	82.7%	REF	REF
Non-formal to Lower					
Secondary level	222	11.7%	88.3%	0.63(0.38,1.06)	0.8(0.46, 1.38)
Above Middle Secondary level	197	6 3.0%	97.0%	0.15*(0.06,0.36)	0.48(0.19, 1.26)
Occupation					
Govt./Corp/Private employee	114	0.1%	99.1%	REF	REF
Farmer/House wife/Labourer	588	13.6%	86.4%	17.8*(2.45,129.23)	6.77(0.85, 53.79)
Location					
Urban	362	6.4%	93.7%	REF	REF
Rural	330	17.3%	82.7%	3.07*(1.85,5.1)	1.65(0.78, 3.48)
Type of nearest health facility					
Hospital	358	6.4%	93.6%	REF	REF
BHU‡/Sub-post	344	16.9%	83.1%	2.24*(1.39,3.6)	0.93(0.47, 1.86)
Distance to health facility					
Less than 3 hours	607	91.3%	8.7%	REF	REF
More than 3 hours	95	70.5%	29.5%	4.37*(2.59,7.37)	2.58*(1.41, 4.71)
Pregnancy and delivery history					
primipara or primip (1 <sup>st</sup> delivery)	305	91.5%	8.5%	REF	REF
multip (2 <sup>nd</sup> delivery)	238	92.4%	7.6%	0.88 (0.47,1.64)	0.83 (0.42,1.63)
grand multipara (3 <sup>rd</sup> or more deliveries)	159	76.7%	23.3%	3.25*(1.89,5.61)	2.42*(1.12, 5.22)

\* Statistically significant at  $p < 0.05$

† Odds Ratio

‡ Basic Health Units

education level were 0.15 times (AOR 0.48) less likely to give birth at the home as compared to women with no education. Housewife/farmer/labourer were 17.8 times (AOR 6.77) more likely to give birth at home as compared to government/corporation/private employee and women residing in rural areas were 3.07 times (AOR 1.65) more likely to give birth at home compared to women residing in urban areas. The place of delivery also depended on type of health facility nearest to them, the women with Basic Health Units as the nearest health facility were 2.24 times more likely to give birth at home compared to women with hospitals as the nearest health facility. Also, women residing at places more than three hours away from the health facility were 4.37 times (AOR 2.58) more likely to give birth at home compared to women residing less than 3 hours away.

Lastly, women who were delivering for third or more times were 3.25 times (AOR 2.42) more likely to give birth at home compared to women who were delivering for the first time. While the unadjusted Odds Ratios (UAOR) was statistically significant at  $p < 0.05$  for almost all the predictors, the adjusted Odds Ratios (AOR) was statistically significant only for distance to the nearest health facility and parity.

### Education Level and Occupation of Husband

Gradual increase in facility delivery with the increase in education level of husbands (Figure 1). The trend similar to that of the occupation of women was seen with the occupation of the husbands as shown by Figure 2.

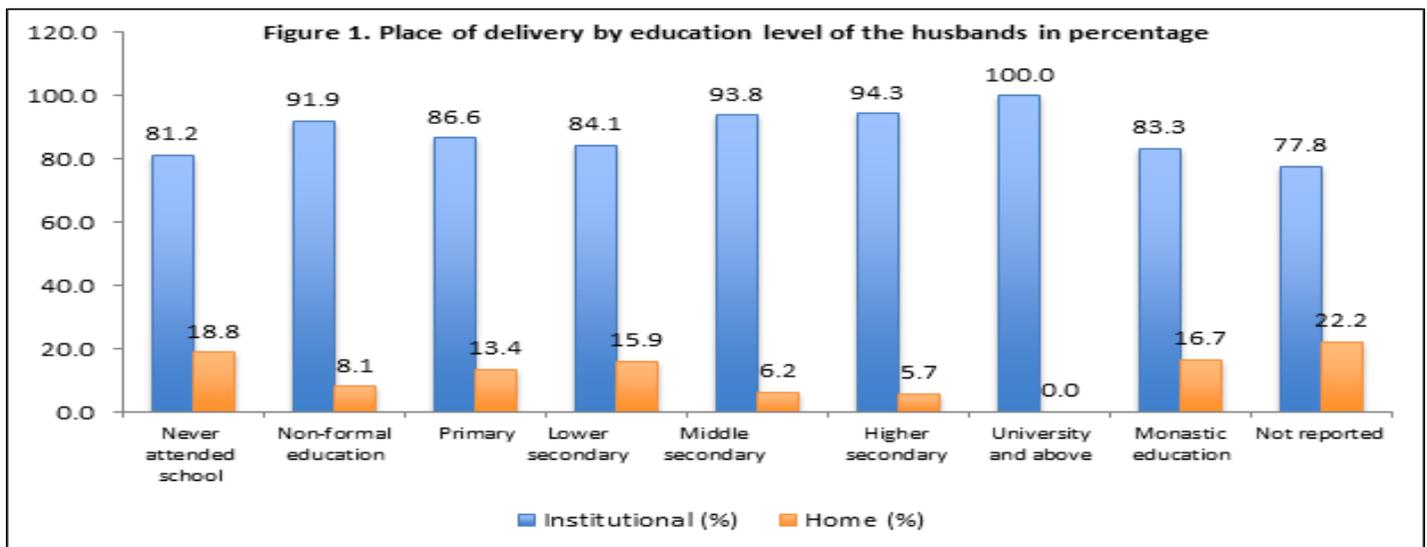


Figure 1. Place of delivery by education level of the husbands in percentage

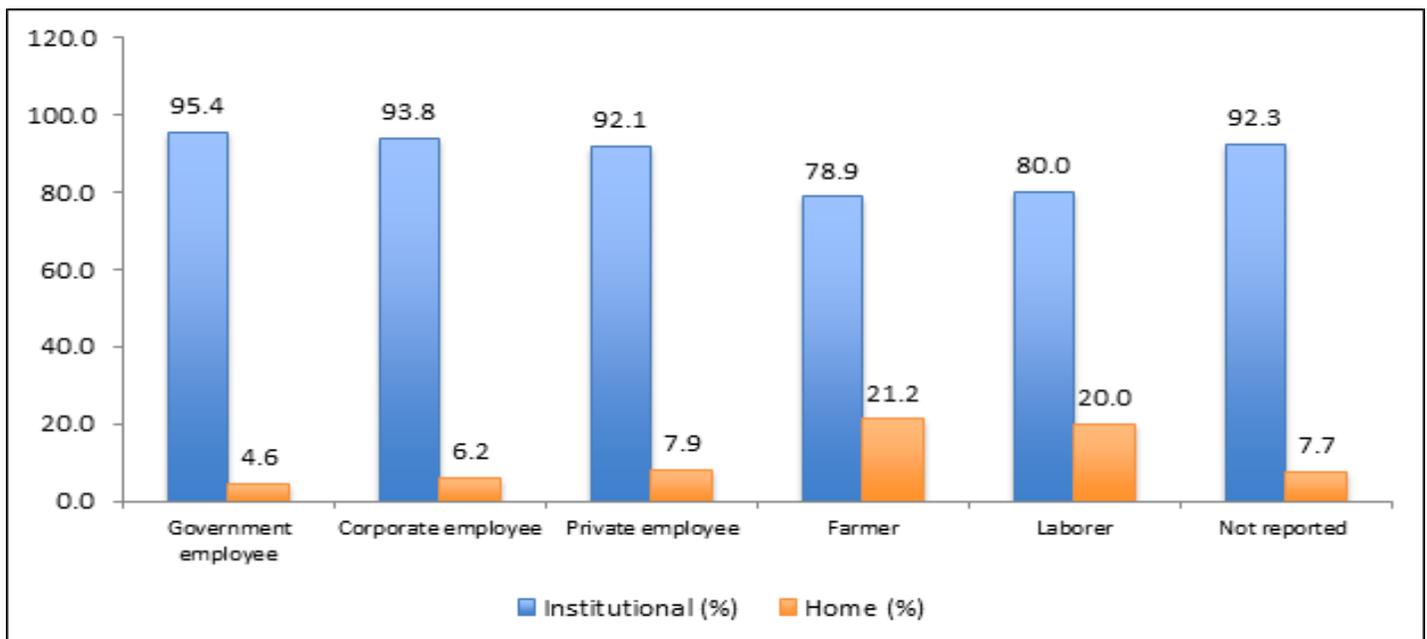


Figure 2. Place of delivery by occupation of the husbands in percentage

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### **Knowledge and awareness**

Out of 702 women, 83.9% knew about the availability of all eight reproductive health services (antenatal care, delivery, post natal care, health education, counselling, family planning, treatment and immunization). While 1.28% women didn't know even a single reproductive health services. Among women who knew all eight, 10.12% delivered at home while 55.56% of women who didn't know even single kind of reproductive health services delivered at home. There was an association between the place of delivery and knowing the danger signs of pregnancy (severe vomiting, bleeding during pregnancy, severe pallor, leakage of water before labour, high blood pressure, fits, swelling of feet and face, high fever). All 10 women who knew at least six danger signs had institutional delivery while 19.63% of 214 women who didn't know even a single danger sign delivered at home. Home delivery was comparatively higher among the respondents who didn't know or who knew less number of complications (difficulty in breast feeding, heavy bleeding per vagina, fits, breast problem, pallor and fever) that a mother can experience during postnatal period. Among 188 women who didn't know even a single complication, 18.09% delivered at home while all four respondents who knew all six complications had institutional delivery. Out of 458 women who didn't know even a single danger signs of miscarriage (bleeding per vagina, pain in lower abdomen/back and tissue coming out), 14.41% of them delivered at home while among 31 women who knew all three danger signs of miscarriage only 6.45% of delivered at home. Among 472 women who didn't know even single immediate complications of miscarriage (bleeding per vagina, pain in lower abdomen/back and tissue coming out, foul smelling vaginal discharge, chills and fever), 13.98% of them delivered at home. The proportion of home delivery decreases with the increase in number of immediate complications of a miscarriage that the respondents know.

### **Husband Involvement**

Participation of husband during pregnancy and delivery process has lots of bearings on the place of delivery. For instance, home delivery was higher (40.0%) among the women who were not provided financial support by their husband as compare to 10.5% home delivery among the women who were provided financial support by their husband. The home delivery was high with 54.12% among the women who were not arranged transportation by their husband as compared to only 5.36% home delivery among the women who reported that their husband arranged transportation. Home delivery was high with 33.33% among the women who said their husband didn't inform the health workers as compare to only 7.66% among the women whose husband informed the health workers.

It is worth noting that 98.0% of the 702 participants had discussed with their husband about the ANC during last pregnancy and out of 621 women who had facility delivery, 92.8% discussed about transportation arrangement with their husband.

### **Reasons given by the women for delivering either at home or at health facility**

Out of 621 women who had institutional delivery, availability of better care/facilities at health facility was the reason for 570 women, complication in their previous delivery were the reason for 10 women, 31 women were advised by the health workers, it was the parent's or husband's decision for four of them, two women said that it's difficult and risky to deliver at home, two women said that caesarean section services were available only at hospital, one women had high blood pressure and there was no one at home for one woman.

On the other hand, when the 81 women who delivered at home were asked the reasons for home delivery, 47 said the health facility was too far, 20 said that they are more comfortable at home, 11 said it was their parent's decision, 18 said previous easy delivery at home, 8 said personal attention from family, 13 said home birth was safe, 3 were advised by traditional healers, 11 women delivered before the due date, five women delivered immediately after labour pain, three women delivered on the way, three women had financial problem, two women had transportation problem. A woman each said following to be the reason; doctor discharged her saying that her delivery date is not due, health worker not present, more work at home, no one at home, taken leave from BHU to perform religious rituals, and was not aware of delivery time.

### **DISCUSSION**

The percentage of institutional delivery in Chukha district in the year 2013 was 88.5%. The finding is similar to that of the National Health Survey 2012 which found institutional delivery to be 85.8% for Chukha district and 73.7% for Bhutan<sup>5</sup>.

The practice of 98% women discussing with their husband about ANC is encouraging because it opens the door for involvement of husband to take parenting responsibilities from the very beginning. Impressively 99.4% of the women had sought at least one ANC during their last pregnancy. This means that almost all women are visiting health facilities for ANC at least once. So our health workers must capitalize on their first ANC visit to educate them for subsequent ANC visit, institutional delivery, PNC and exclusive breastfeeding.

Majority of the women who had institutional delivery had arranged transportation. So this is one of the important arrangements for the birth preparation. In this light, women and their spouses should be reminded to plan for transportation among other preparations.

### **CONCLUSIONS**

This study underscores the distance to health facility from their residences and the parity as the two most important factors associated with home delivery. In this light, targeting the grand multipara besides continuing with its efforts of making health

services available and accessible is recommended. The findings also indicated that almost all women are visiting health facilities for ANC at least once. So our health workers must capitalize on their first ANC visit to educate them for subsequent ANC visit, institutional delivery, PNC and exclusive breastfeeding.

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### AUTHORS CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

**KW:** Concept, design, literature search, data collection and analysis, manuscript writing and review.

**MSG:** Concept, design, data collection, data analysis, manuscript writing and review.

**DP:** Concept, design, data collection, data and statistical analysis and review.

**TD:** Concept, design, data analysis, and manuscript review.

**SW:** Design, data analysis, manuscript editing and review.

Author agree to be accountable for all respects of the work in ensuring that questions related to the accuracy and integrity of any part of the work are appropriately investigated and resolved.

### CONFLICT OF INTEREST

None

### GRANT SUPPORT AND FINANCIAL DISCLOSURE

None