

Determinants of giving birth in a health facility; analysis of three Pakistan demographic health surveys

Sathirakorn Pongponich,¹ Abdul Ghaffar,² Syed Amir Gilani³

Abstract

Objectives: To identify determinants of health facility births in Pakistani pregnant women.

Methods: The retrospective study was conducted at Chulalongkorn University from June to September 2017 and comprised data files of three Pakistan Demographic Health Surveys conducted in 1991, 2007 and 2013. The files were downloaded from the online database. Only data of women who had given at least one birth were included. Logistic regression was applied to see the relation between dependent and independent multivariable models. Confidence intervals were measured around odds ratio at 95% level. All analyses were done on the basis of survey years using SPSS 16

Results: Of the 30192 women interviewed, 17126(56.7%) had given birth during the period: 4,039(61%) out of 6611 in 1991; 5648(56.3%) out of 10023 in 2007; and 7439(54.8%) out of 13558 in 2013. Health facility births increased from 551(13.6%) in 1991 to 1374(37.2%) in 2007 to 3844 (51.7%) in 2013. Women from rural areas (odds ratio = 0.29, 0.689, 0.92; 95% confidence interval [0.23, 0.38], [0.6, 0.8], [0.81, 1.04]) were less likely to deliver in health facilities.

Conclusion: Health facility births increased to almost 50% in 22 years.

Keywords: Parturition, Health facilities, Pregnancy, Pakistan, Determinants. (JPMA 69: 615; 2019)

Introduction

In the last 25 years, the maternal mortality ratio (MMR) decreased by about 44% worldwide to 216 maternal deaths per 100,000 live births in 2015. Approximately 99% of deaths have been from the developing countries, especially South Asia and Africa, accounting for 69,000 maternal deaths every year.¹ Also, globally a decrease of 47% (from 36 to 19 deaths per 1,000 live births) was observed in neonatal mortality rate during 1990 and 2015. In the first 28 days that are very important for neonates, deaths decreased from 5.1 million to 2.7 million from 1991 to 2015.²

Birth process and the first 48 hours need the most care where maximum number (two-thirds) of maternal and perinatal death occur.³ Literature highlights the need for increased importance to interventions relevant to specific settings such as the prevention and treatment of both prenatal and postnatal haemorrhage in the developing countries, suggesting that 13-33% maternal deaths can be reduced in the developing countries through providing proper skilled care during labour.⁴

Skilled birth attendance (SBA) is an approach through which a woman gets enough care at childbirth and

immediately after birth to avoid any life-threatening complications. This course of action calls for skilled health personnel to attend deliveries and a facility with sufficient supplies and equipment as well as well-maintained transport and communication systems.⁵

There is evidence that safe delivery can be provided at homes if the enabling settings are in place and recently in low- and middle-income countries (LMICs), there is a shift to provide SBA through community health workers and maternal, neonatal and child health (MNCH) programmes at the community level. However, in LMICs, where there are constraints in providing proper maternal and child health services, it leads to compromise on the quality of services. To provide quality and safe delivery care in the community, SBAs need legitimacy and regulatory framework, access to important equipment and drugs, and a properly functional referral system. Consequently, birth in health facility is one of the strategies that are effective in reducing maternal and perinatal mortality, also refining maternal and neonatal health and well-being in underdeveloped countries and in some LMICs.⁶ Birth in a health facility takes place in a timely manner under proper hygienic conditions led by a specially-trained health professional.⁷

In LMICs, socio-demographic factors play an important role towards health facility births. Some of these are directly related to women like current age, age at first

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^{1,2}College of Public Health Sciences, Chulalongkorn University Bangkok, Thailand, ³Faculty of Allied Health Sciences, University of Lahore, Pakistan.

Correspondence: Abdul Ghaffar. Email: abdulghaffarlashari@gmail.com

birth, education and income of women, number of children born, and medical condition of the women. Other factors like education and occupation of husband, family size, living place, family income, religious and cultural beliefs also influence health facility births.^{8,9}

Pakistan, an LMIC with MMR of 178 deaths/100000 live births in 2015 reduced it from 400 in 1991 and, parallel to that, increased health facility births from 13.7% to more than 50% from 1991 to 2013 indicates a lot of effort from the government, but it has not achieved any indicators for the millennium development goals (MDGs) 4 and 5,¹⁰ meaning that lot is to be done to improve maternal and child health indicators. Studies have been conducted to see the relationship of socio-demographic factors with SBAs in many developing countries using demographic health survey (DHS) data. The acceleration in improving maternal and child health will only be possible with both effective medical and non-medical interventions. Not many studies have been conducted using Pakistan Demographic Health Survey (PDHS) to assess factors associated with health facility births in Pakistan. The current study was planned to assess factors (mostly socio-demographic) related with giving birth in a health facility.

Materials and Methods

The retrospective study was conducted at Chulalongkorn University from June to September 2017 and comprised data files of three PDHSs conducted in 1991, 2007 and 2013. Data files were downloaded from the free online DHS database that has information about demographic and mother and child health (MCH) situation in Pakistan, on the basis of interviews, among others, with females aged 15 -49 years conducted at household (HH) level.¹¹

The contents of measurement tools of HH, the questionnaires were based on the MEASURE demographic health survey programme model.¹² Also, parts of tools were modified according to local Pakistani customs, in consultation with research institutes, government departments, and local and international organisations.

A multistage sampling design was used among all surveys. The Pakistan Bureau of Statistics (PBS) delivered the sample design and HH lists for selected sampled areas across the country. In all surveys, total study universe consisted of all urban and rural areas of four provinces of Pakistan. Different sampling frame were used for urban and rural areas. Enumeration blocks and village/mouzas/deh were used for urban

and rural areas respectively.

Variables assessed in this study are from the questionnaires of HH schedule and individual women interviewed during PDHS 2012-13, 2007 and 1991. Only women giving birth were included from all the three surveys.¹¹

There are two major sources of problems in DHS and other survey programmes. These are partial or incomplete reporting of information, and inconsistent responses to different questions in the survey. We followed editing and correction rules described in DHS-I data processing manual to deal with the missing values.¹¹ Assigning special code for the question indicated that there was no response in the questionnaire; cases with missing data were handled specially at early stages during the selection of variables.

Dependent variable was constructed from original variable 'Place of giving birth' which had responses like homes, government health facilities and private health facilities. A new variable 'giving birth in a health facility' with No (0) and Yes (1) responses was computed.

Factors potentially influencing giving birth at health facility were selected through literature review and were available in all three surveys.¹¹ These included living place (urban/rural), respondent's and husband's age in 5 year groups, respondent's level of education (four categories), husband education (four categories), wealth index (five categories), respondent owns land (dichotomous), respondent's occupation (four categories), and husband's occupation (four categories). The number of children five and under in HH was computed in four categories (from 0, 1-2, 3-4 and 5 or more), and number of children ever born to the respondent (continuous variable) was computed to three categories (1-2, 3-4 and 5 or more).

Data analysis was done using SPSS 16 for inferential statistics. Variables of interest were selected through analysing frequencies (univariate analysis) and cross-tabulating variables with each other.¹³ Chi-square test was used to see the associations and select variables through bivariate analysis. Data was weighted and analysis was carried out by survey year. A two-stage multivariable logistic regression model¹⁴ was created to analyse the risk factor of giving birth in a health facility in each survey year. Results were presented as calculated odds ratio (OR) and 95% confidence interval (CI). A cut-off point of <0.25 was used to select variables for the 2nd stage which was the final stage.

Hosmer-lemshow goodness of fit test was applied to check the fitness of model. $P < 0.05$ was considered significant.

Approval was obtained from the research ethics committee of Chulalongkorn University, Bangkok, Thailand.

Results

Of the 30192 women interviewed, 17126 (56.7%) had given birth during the period: 4,039 (61%) out of 6611 in 1991; 5648 (56.3%) out of 10023 in 2007; and 7439 (54.8%) out of 13558 in 2013. Frequency distribution of the respondents in terms of living area, age, education level and other socio-demographic features of the target population were noted (Figure-1).

The trend of health facility births increased from 551 (13.6%) in 1991 to 1373 (37.2%) in 2007 to 3844 (51.7%) in 2013 (Figure-2). Significant increase in giving birth at a health facility was seen among highly educated women ($p < 0.05$).

Women from rural areas were less likely to give birth in a health facility in all three surveys but urban/rural differences were not significant in 2013 survey (Table-1). Women with increasing education and wealth were more likely to give birth at a health facility in all three surveys and increasing respondent's husband education also increased likelihood of giving birth in health facility. However, occupation of both husband and wife did not show any significant association in all three surveys in the final model (Table-2).

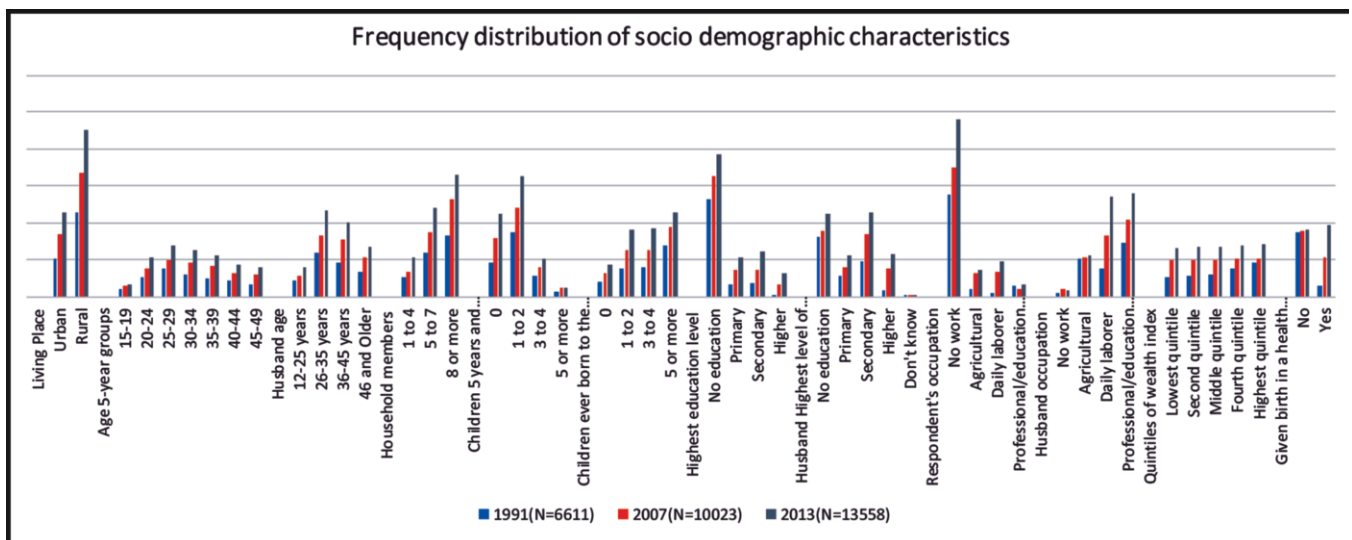


Figure-1: Frequency distribution of socio demographic characteristics of women aged 15-49 years who had given birth in the preceding 2 years, Pakistan, 1991, 2007 and 2013.

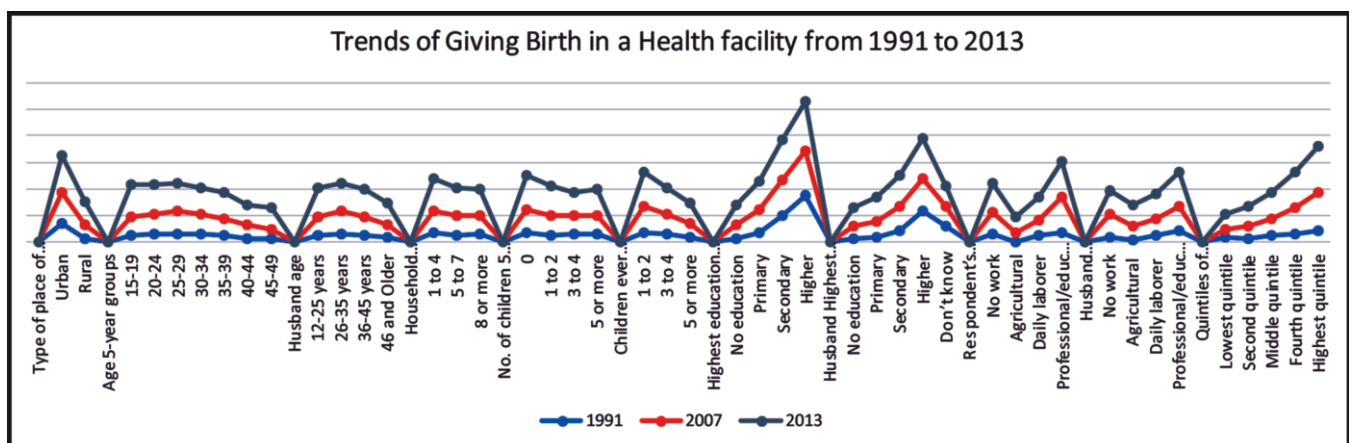


Figure-2: Respondents' socio-demographic factors' association with giving birth in a health facility from 1991 -2013.

Table-1: Logistic Regression model predicting the likelihood of giving birth at health facility.

Characteristics	1991 OR (95% CI)	2007 OR 95% CI)	2013 OR (95% CI)
Living Place			
Urban	Reference		
Rural	0.29(0.23,0.38)*	0.689 (0.6,0.8)*	0.92(0.81,1.04)
Children ever born			
1-2	Reference		
3-4	0.76(0.60,0.97)**	0.68(0.58,0.79)*	0.6(0.53,0.69)*
5 or more	0.74(0.58,0.93)**	0.60(0.52,0.67)*	0.54(0.48,0.62)*
Highest education level			
No education	Reference		
Primary	2.15(1.61,2.86)*	1.39(1.18,1.68)*	1.56(1.34,1.81)*
Secondary	4.83(3.72,6.26)*	1.92(1.67,2.33)*	2.19(1.86,2.57)*
Higher	9.44(4.67,19.07)*	3.75(2.65,5.31)*	4.41(3.37,5.76)*
Husband education			
No education	Reference		
Primary	1.17(0.85,1.61)	1.01(0.90,1.31)	1.17(0.99,1.38)**
Secondary	1.65(1.28,2.12)*	1.21(1.02,1.42)**	1.26(1.10,1.45)***
Higher	3.1(2.1,4.5)*	1.47(1.19,1.82)*	1.21(1.01,1.44)**
Don't know	2.69(0.36,20.16)	1.18(0.31,4.46)	2.41(0.5,11.65)

** P value <0.05, *** P value <0.01, *P value <0.001.

OR: Odds ratio

CI: Confidence interval.

Table-2: Logistic Regression model predicting the likelihood of giving birth at health facility (continued).

Characteristics	1991 OR (95% CI)	2007 OR 95% CI)	2013 OR (95% CI)
Respondent's occupation			
No work	Reference		
Agricultural	0.16(0.02,1.15)	0.97(0.77,1.23)	0.93(0.73,1.17)
Daily labourer	1.3(0.66,2.58)	0.88(0.73,1.05)	1.07(0.9,1.26)
Professional/education related work	0.89(0.65,1.24)	1.41(0.97,2.08)	1.54(1.12,2.1)***
Husband occupation			
No work	Reference		
Agricultural	1.41(0.59,3.38)	0.69(0.49,0.97)	0.88(0.62,1.25)
Daily labourer	1.67(0.73,3.83)	0.69(0.49,0.97)**	0.98(0.71,1.352)
Professional/education related work	1.82(0.81,4.11)	0.66(0.47,0.92)**	1.24(0.89,1.71)
Quintiles of wealth index			
Lowest quintile	Reference		
Second quintile	0.72(0.48,1.07)	1.43(1.17,1.77)***	1.47(1.25,1.72)*
Middle quintile	1.23(0.86,1.74)	1.83(1.47,2.27)*	1.65(1.39,1.96)*
Fourth quintile	1.49(1.04,2.00)**	2.94(2.34,3.69)*	2.57(2.13,3.1)*
Highest quintile	1.75(1.28,2.39)*	5.38(4.12,7.02)*	5.1(4.04,6.44)*

** P value <0.05, *** P value <0.01, *P value <0.001.

OR: Odds ratio

CI: Confidence interval.

Discussion

Findings of this study based on three representative national surveys revealed that giving birth in a health facility increased from 13.6% in 1991 to 37.2% in 2007 and 51.4% in 2013. This increase can be due to increase in health infrastructure and overall development. Pakistan economic survey 2015-16 reported a 14% increase in total health infrastructure from 2000 to 2015.

Urban and rural differences are evident in this analysis for survey 1991 and 2007. In survey 2013 there is no difference between urban and rural respondents, but trends were negative like the two previous surveys. This may be due to increase of 27% in rural health centres, 23% dispensaries, and 6% basic health units (BHUs) and expansion of lady health worker (LHW) programme from 2000 to 2015.¹⁵ In Pakistan, pregnant women living in rural areas like in other developing countries have less likelihood to give birth at a health facility. In a study from early 1990, urban and rural biases were presented in health sector as most of the services were centred in urban areas in spite of the fact that only 30% of Pakistan was considered urban.¹⁶ Studies from Pakistan and elsewhere have reported that urban women have more chance of giving birth in a health facility compared to those living in rural areas.⁶ In developing countries like Pakistan urban-rural difference could be because of gaps in the availability of required equipment, technologies, drugs and supplies in the rural health facilities,¹⁷ and more urban utilisation can be due to concentration of good health infrastructure and trained personnel in urban areas.¹⁸

Giving birth to more than five children in the 1991 survey was about 41% more than any group (1-2 or 3-4) and decreased to 33.4% but was still the biggest group in the 2013 survey. This may reflect relatively high infertility rate in Pakistani pregnant women till now.¹⁷ Increasing number of children ever born to women is constantly hindering Pakistani pregnant women to giving birth at a health facility from 1991 to 2013. In this study mothers having higher number of children ever born were less likely to give birth in a health facility. These findings are consistent with other studies in developing countries in which mothers were found reluctant to go to a health facility, and felt confident, experienced and knowledgeable from their own previous experiences.^{18,19}

Number of respondents in no-education group continuously decreased from 1991 to 2013 and also the frequency of higher grades of education increased. As

expected, more educated women gave birth at a health facility. Education showed significant positive associations with giving birth in a health facility in all surveys. A higher education level leads to higher awareness of health issues and hence more utilisation of good health facilities.¹⁵ Other studies from the developed and the developing countries elaborated the importance of education in general and specifically giving birth in a health facility further, stressing that education increases the autonomy of the women to take decisions by themselves while seeking healthcare.²⁰

Education of husband also showed significant positive associations with women giving birth in a health facility and associations got stronger with each survey. In 1991, number of husbands in no-education category was 49% which decreased to 33% in 2103, leading to stronger positive associations. This association is reported in other studies²¹ as well and this could be due to education increasing awareness.²²

Wealth in this analysis was assessed in five quintiles, and increasing wealth quintiles showed strong positive association with giving birth at a health facility. However, in the 1991 survey, fourth and highest quintiles, and in 2007 and 2013, all four quintiles were significantly associated with the likelihood of giving birth at a health facility compared to the lowest quintile, and these results were consistent with other global studies.⁶ It is consistently predicted that HH income increases the likelihood of giving birth at a health facility both in the developed and the developing countries, and pregnant women from high wealth quintiles choose to deliver in a health facility more than the low-quintile groups.²³ Giving birth at a health facility in 1991 by only the fourth and the highest quintile was perhaps due to conditions of economical and physical infrastructure at that time. Households from higher wealth quintile have a greater ability to access and are more likely to get services at a health facility.²⁴

Women's involvement in an earning profession is one of the important factors positively influencing the use of maternal and child health services and women whose husband had business or professional occupation also had more utilisation of maternal health services.²⁵ In this study occupation of the respondents and husband was assessed in four categories i.e. currently not working, daily labourer, agricultural and professional/educational related work. Unlike another study conducted elsewhere¹⁵ occupation both of the husband and the wife did not show any signification

associations in the final regression model.

Conclusion

There were rural and urban differences in terms of women giving birth at a health facility. There is need to decrease urban and rural differences, control the fertility rate and educating women in Pakistan to increase health facility births to improve maternal and child health in Pakistan and other developing countries.

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Conflict of Interest: None.

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