Role of Quality of care in the sterilization regret among women from 1992-2016 in India

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Abbreviations:

BPL- Below Poverty Line

SC- Schedule Caste

ST- Schedule Tribe

ASHA- Accredited Social Health Activist

Abstract

The study examines the contribution of quality of care and health provider on the sterilization regret among the women using data from three rounds of NFHS. The pooled data from 1992-2016 was used to explore the regret by creating interaction terms between time and predictors. Predicted probabilities were calculated to show the regret trend amounting to quality of care, type of health provider at the three time periods. The sterilization regret has increased to 7% in NFHS-4 from 5% in NFHS-1. The likelihood of regret increases with the bad quality of care provided in the sterilization. Also, operation conducted in public health facility has 1.3 times increases the likelihood of regret according to the latest NFHS-4. The study emphasizes the need of standardized infrastructure and quality of care in every government hospital. The government should also employ strict evaluation of hospitals, to decrease the regret to this routine process.

Keywords: Family Planning, sterilization, regret, quality of care, health facility

Introduction

India was the first one to launch its first family planning programme in 1952 to control the population (Ledbetter, 1984). Post the launch of the programme, India took many initiatives to control the growth rate but struggled to reduce the growth rate of the country. According to Census 2011, India's total population is around 1.2 billion , which is the third highest in the world and projected to be highest in the year 2027 (UN, Department of Economic and Social Affairs, Population Division, 2019).

During the family planning programme the government introduced various contraceptive methods. During the 1960s, sterilization method was introduced which gained popularity soon after implementation (Srinivasan, 1998). The maximum sterilization operations were conducted during the emergency period in India, around 8 million sterilizations were conducted (Percher, 2016), and majority of them were forced and performed on men. Due to the mass "forced" sterilization, the ruling party was ruled out and a new party was formed, which shifted family planning programme approach to family welfare approach, and male sterilization almost disappeared from the family

planning programme (Matthews et al., 2009; Ramanathan, 1995) and female sterilization emerged as the only permanent method of contraception in the country.

According to the United Nations, 19 percent of married or in-union women in the world relied on female sterilization (United Nation 2015). In India, during 2014-2015, more than 4 million sterilizations were done (MoSPI, 2016); out of which only 1 lakh were performed on men (Biswas, 2014. The latest estimates provided by National Family Health Survey (NFHS) –IV (2015-2016), also showed the similar picture where 37% of currently married women in India relied on the female sterilization (IIPS and ICF, 2017). Due to the high incidence of sterilization conducted in India, post sterilization regret and its associated co-factors influencing the regret is important to be studied.

Sterilization is a permanent method which cannot be reversed, so it should be performed only after been informed about the side effects and consequences of the same (Petta et al., 1995; Ramanathan and Mishra 2000). About 10% women worldwide experienced regret because of the sterilization (Gary, 1996; Ghosh, 2016; Henshaw and Singh, 1986; Ramanathan and Mishra, 2000; Singh et al., 2012; Vieira and Ford, 1996), and in India according to NFHS-3 (2005-2006), around 4.7% women regretted their decision of sterilization (IIPS & MACRO, 2006). According to different literatures on the sterilization regret many reasons attributed to the regret post sterilization. A study conducted in India, showed that sterilization conducted at the young age is the major reason for the regret (Singh et al., 2012). Another important factor which contributes to the sterilization regret is the loss of child post sterilization (Hapugalle et al., 1989; Kim et al., 1997;Machado, Ludermir and da Costa, 2005; Ramanathan and Mishra, 2000; Singh et al., 2012). Also many women regretted about the routine process due to the various socio-economic variables (Chi and Jones, 1994; Hillis et al., 1999; McGonigle and Huggins, 1990; Singh et al., 2012). A study conducted by Ramanthan and Mishra (2000) found that the quality of services provided during the sterilization operations also contributes to the regret.

Much of the extensive literature on the quality of care in the family planning programme around the world has exposed the quality issues in the programme (Koeing et al., 2000; Ramanathan and Mishra 2000; Sango et al., 2003). Quality has many dimensions and includes, freedom of choice of method, proper information received on the contraceptive method being adopted, infrastructure, building of delivery system, contraceptive supplies, technical competence of providers, intra-

personnel relationship between client and providers (Alizadeh et al., 2009; Koenig, 2003; Loha, 2003; RamaRao and Mohanam, 2003; RamaRao et al., 2003;Sango et al., 2003). The family planning methods operated under the knife is a routine process, but if conducted in an unsafe environment can result in severe repercussions to the health. If done in an unhygienic and hazardous environment, a regular process can be life-threatening or can result in infections, internal bleeding, haemorrhaging, pelvic inflammatory disease (Jacobson, 1988). Koeing et al. (2003), in his systematic review on quality of care in the family planning programme, concluded that in India, the women are not counselled adequately about the other methods of contraceptives nor they were educated about the possible warning signs and side effects after the operation. A study conducted in Bihar and West Bengal also cited that the midwives are rarely discussed about the side-effects related to a contraceptive method (Roy & Verma, 1999), even women experience the harsh and derogatory treatment while seeking family planning services in the public sector (Ganatra et al., 1998; Gupta, 1993; Nataraj, 1994).

There has been extensive literature in and around the world addressing the issue of the female sterilization and its associated regret. In India, only one study tried to see the impact of socio-economic factors on the sterilization regret (Singh et al., 2012) but none focused on the contribution of quality of care and type of choice provider on the sterilization regret. India in 2005 has launched the National Rural Health mission to to provide accessible, affordable and quality health care to the rural population, especially the vulnerable groups and the approach expanded to urban areas in 2011 but still the quality issues pertaining in the health facility is a matter of concern especially in the public facility (Andrew, 2013). The study is the first to explore the trends of sterilization regret in India from 1992 to 2015 and exploring the role of quality of care provided post sterilization and choice of health provider in it. In the DHS survey, a question is asked to the women who have gone for the sterilization about the quality issues in the same, and we have used the quality of care variable for the further analysis.

Data and Methods

Data

The present study uses the data from three rounds of National Family Health Survey (NFHS), first was conducted in 1992-1993, the third was conducted in 2005-2006 and the fourth in 2015-2016.

NFHS is a nationally representative cross-sectional survey which includes representatives' samples of household throughout India. The survey provides state, national and district level estimates of demographic and health parameters as well as data on various socioeconomic and program dimensions, which are critical for implementing the desired changes in demographic and health parameters. Stratified, multistage cluster sampling method is used in NFHS to obtain a representative sample of households. Probability proportional to size (PPS) is used to select the households from all states and Union Territories. Two-Stage PPS has been used to select households in urban areas and three stage PPS is used for the selection in rural areas (for detailed sampling see IIPS & ICF, 2017). The survey for the first time in 2015-2016 provided district level estimates on the various key indicators associated with the demographic and health parameter for the country. The NFHS-1 interviewed 88,562 households and 89,777 ever married women in the age group 13-49 from 24 states and Delhi.The NFHS-3 interviewed 109,041 households, 124,385 women age 15-49, and 74,369 men age 15-54. In comparison, NFHS-4 interviewed 601,509 households, 699,686 women age 15- 49, and 112,122 men age 15-54. Since the objective of the paper is to examine the post sterilization regret, we have filtered only those currently married women who have reported of being sterilized at the time of survey. In NFHS-1 23,136 women, in NFHS-3 32,519 women and in NFHS-4 165,276 women were reported to be sterilized.

Variables

The dependent variable in the analysis is post sterilization regret and it is coded as "0" if women does not report regret and "1" if reported regret. Growing literature indicates that many socio-economic demographic, life-cycle factors and many more factors influence the sterilization regret among women. The independent variables are geographic regions (With TFR More than 2.1 and With TFR less than 2.1), place of residence (urban and rural), caste (Schedule Caste/Tribe and Others), Religion (Hindu, Muslim and Others), Educational Status (No Education, Primary, Secondary and Higher), Wealth Index (Poorest, Poorer, Middle, Richer, and Richest), Sex Composition of living children (No Male,1 Male, 2+ Male, and both Male and Female), Age At Sterilization(<29, 30-39, and 40+), Parity At Sterilization(Less Than 2, 2-3, and 4+), Year Since Sterilization(Less Than 2, 2-3, and 4+), Child Loss Post Sterilization(No Loss, Male, and Female), Quality Of Care (very good, alright, not so bad, bad) and Type service provider (Public

and Private), Compensation received for sterilization (Received and Not Received). Child Loss (No loss, one loss, 2+ loss).

Analyses of Data

In this study we have pooled the three rounds of NFHS; NFHS-I (1992-1993), NFHS-III (2005-2006) and NFHS-IV (2015-2016) and 8 dummy variables were created. Four variables for quality of care i.e. very good, alright, not so bad, bad care during and post sterilization. Two variables for type of health facility i.e. public health facility and private health facility. All the dummy variables were interacted with the time period of the survey. NFHS-II (1998-1999) was not used as it does not have the question on sterilization regret. The estimates of the different rounds of NFHS are comparable because of its sampling design (Mishra, Roy, & Retherford, 2004; Ram & Roy, 2004). Many studies in the past have pooled different DHS/NFHS rounds to observe the trend over time (Kandala, Fahrmeir, Klasen, & Priebe, 2009; Pathak & Singh, 2011).

To measure the sterilization regret among the sterilized women, we have fitted a pooled binary logistic regression analysis while adjusting for socio-demographic, region of residence, age at sterilization, the year since sterilization parity at sterilization, child loss, life cycle and economic factors. The result of the analysis was presented as the set of predicted probability of sterilization regret among women who were currently married by the quality care provided during and post-sterilization and type of health facility at the two time periods. The predicted probabilities were based on terms in the logistic regression model relating to interaction between year and quality of care, and year and type of health facility.

All analyses were completed using Stata version 13 and all the results were reported at 5% level of significance.

Results

Trends in Sterilization Regret

The female sterilization users increased to 13% points from NFHS-1 to NFHS-4. The result indicates that the sterilization regret has increased from NFHS I (1992-1993) to NFHS- IV (2015-2016), so as the number of sterilized women. The sterilization regret increased to seven percent in

NFHS-IV compared to five percent in NFHS-3 (2005-2006), which was six percent in NFHS-1 (1992-1993).

Results from the bi-variate analysis

The maximum numbers of sterilized women were concentrated in the southern region of India, where maximum tubectomy was observed. In southern region, most Women in Andhra Pradesh adopt sterilization as the only method of family planning, but the highest regret percentage was found among North-East women, where maximum were in Manipur in both NFHS-III and NFHS-IV. The least regret was seen in Himachal Pradesh in both rounds of NFHS. Table 1 represents the relative change in sterilization regret from NFHS-III to NFHS-IV. There has been an increase of 58% in overall sterilization regret from 2005-06 to 2015-16 (Appendix table 1 and table 2). Table 1 shows that the percentage of users of sterilization has been increased to five times in public health facility, so as the regret in the public health facility. The regret in the public facility has risen to 61% in the last decade. The maximum regret was seen where the child is lost post-sterilization operation. The maximum increase in the regret was observed among the women when a male child was lost after the sterilization. Place of the region also demonstrate a significant increase in the sterilization regret, where the regret was more in the rural area than urban area. Educational Status and Wealth Index also illustrate the same pattern, as a more impoverished and uneducated women experience more regret than educated and wealthy women.

Results obtained from logistic regression

Table 2 provides an estimate of the odds of women who regretted their decision of sterilization in NFHS-IV by different covariates. Here we have adjusted for variables, geographic regions, place of residence, caste, religion, educational status, wealth index, sex composition, age at sterilization, parity at sterilization, year since sterilization, and child loss post sterilization. After adjusting for the latter variables, it was found that the sterilization regret is less likely among women who have received their compensation for sterilization (OR-0.879; CI (0.841-0.917)). Also, in a private health facility, the regret was found to be less (OR-0.937; CI- (0.882-0.996)) than sterilization performed at public health facility. Quality of care holds a significant importance in the regret; women were more likely to report sterilization regret when the quality of care was bad compared to the very good quality of care during and post-sterilization (OR-2.419; CI- (2.009-2.913)).

The prevalence of sterilization regret varied from different rounds of NFHS. Through the z- score, we have tried to see if there was a significant difference in covariates of NFHS-III to NFHS-IV but no significant change was found in all the covariates from NFHS-III (2005-2006) to NFHS-IV (2015-2016).

Results from the predicted probabilities

The predicted probabilities presented in table3, suggests that the likelihood of sterilization regret among women attributed to bad quality of care during and post-sterilization increased from 1992-1993 to 2015-2016. Also, the probability of regret has increased more in the public health facility from NFHS-I to NFHS-IV. The regression analysis indicates that the disparity in the care provided in the public health facility compared to the private facility contributes to the sterilization regret among sterilized women. The table provide enough evidence to suggest that the bad quality of care in sterilization operation has increased with each subsequent NFHS. This attributes that the care provided in the health facility deteriorates in a 23-year period gap.

Discussion

In the recent past, public health activists have focused their interest in the quality of care provided in the family planning programmes in the developing world. The quality issues in the family planning programme is always a matter of concern in meeting the overall reproductive health needs at the individual level (Koenig, Foo & Joshi, 2000). In a country setting of India where most of the population belonged to the rural areas, the quality of care has become increasingly prominent. Despite the efforts, programmes have failed to achieve the modest achievement. The general picture that emerges from the analysis can be summed as, over time the regret associated with the sterilization has increased to approximately one percent points from NFHS-I (1992-1993) to NFHS-IV (2015-2016) but three percent points from NFHS-3 (2015-2016). Various covariates have significantly contributed to the sterilization regret but among all, quality of care and sterilization done in the type of facility has contributed most to the sterilization regret.

The public facilities have seriously strayed from improving the health and well-being of women in providing the family planning methods. The predicted probability confirms that women who experience a lousy quality of care at the time of sterilization and operated in the public facility are found to more regretting on their decision of sterilization. Every year more number of women are

adding to the female sterilization number in the country, but the quality provided for the same is not up to the standards. Around 1,434 deaths occur due to sterilization in the country during the years 2003 to 2012, with maximum number in 2009, which crosses the mark of 247 deaths (Sourjya, 2014). Due to the high rates of deaths in the sterilization camps, in 2005, the Supreme Court issued guidelines for mass vasectomy in the country; different states were asked to form a panel of qualified doctors to conduct operations in the camps and also directed doctors to counsel women and ensure the women if something went wrong during the operation. They were also asked to take the informed consent from the women about the operation (Supreme Court of India. Laws (SC)-2005-3-159, 2015). The Supreme Court of India also passed a rule that ensure the standard quality of care during these operations and compensation for families who died due to the botched operations (Pulla, 2014), but still, a substantial number of reports publishing and addressing the same issue. The situation has become worse in a decade, which led to the ban on the sterilization camp in the country by Supreme court in 2016 (Kundan, 2016; Sandhya, 2016) and the supreme court asked different states that within three years the sterilization camps should be discontinued.

Still, a long path has to be made by India to improve the quality of standard in their public health facilities to provide good quality health care to the individuals. The condition of public health facilities has also been in a serious situation now, where a study conducted in Bihar indicates an inferior quality of services provided to the women, correlates with the disappointment among them because of the sterilization operation (Achyut et al., 2014). A report by ICRW in Bihar, India accessed the quality maintained in the public facilities, where they reported that the hospitals are overcrowded with patients and also the patients were not informed about the side effects associated with the procedure of female sterilization (Achyut, Nanda, Khan, & Verma, 2014). It was found that the women were neither checked before getting discharged, nor they were given necessary information on rest, bath, and follow-up visits. The females were neither informed about the side effects associated with the process, nor were told about the other methods of family planning methods (Andrew, 2013). One high-profile event that took place in Chhattisgarh, 2014 has revealed the darkest situation of India of quality of care in sterilization operation in "**public hospitals**", in which almost 83 women were gone for sterilization and the procedure was done in less than 6 hours, which led to the death of 13 women in the sterilization camp in Bilaspur (Krishnan and Pradhan, 2014). Also, the study hints that the compensation given out of sterilization

operation also correlates to the regret. Many researches provides significant evidence that most of the sterilization are conducted to get the compensation out of the operation, the compensation amount differs in all the states depending on the fertility rate in the state. In the high focus state, the compensation amount is about Rs.1100 per vasectomy and 600 per tubectomy, whereas in the non-high focus state, the compensation received from tubectomy is Rs250 (for non-BPL, SC and ST) all vasectomy compensation is the same as in the high focus state (GOI,2014). A case study in Rajasthan mentions that because of the massive incentives, husbands are pushing their wives for the routine process (Murali, 2011). In spite of the ban by Supreme court on sterilization camps, camps do held in Rajasthan, and massive compensations are being offered to both men and women (Times of India, 2017), this lucrative inducement makes the women undergo sterilization which eventually results in a situation of grief.

Conclusion

The study concludes that around 7% women are regretting about their decision of sterilization. Though many socio-economic and demographic factors have influenced the regret, but the poor quality of care provided in the sterilization contributes maximum to the regret from 1992 to 2015. This calls for the need to standardize the facilities provided in every government facility so to minimize the dissatisfaction among the users of the routine process. Though the data fails to distinguish whether the sterilization was conducted in camps or in health facility but the previous literature suggest a strict ban on the sterilization camps. Also, government should plan out the policies related to follow up of the women post the family planning operations to avoid any complication post the operation, which can help to minimize the complication or death attributed to sterilization.

The data hints the regret after a loss of a child (though not significant), so government should make efforts to motivate people for adopting more temporary methods of family planning especially among those who have no children or one child. As ASHA workers and Aaganwadi workers are the first to come in contact with the women during the trimester, they can be motivated to encourage women to adopt more of temporary methods as they are reversible. Social media advertisements can also become a great medium to help couple to choose what method they should adopt for limiting or spacing their family size. Adoption of contraceptive should be based on the

purpose. There should also be focus on male sterilization which are gradually disappearing from the society as it is less complicated and can be recovered quickly compared to female sterilization.

Authors' contributions

LKD conceived the idea. AB and LKD designed the experiment and analyzed it, interpreted the results and drafted the manuscript. Both the authors read and approved the final manuscript.

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The authors declared that they have no competing interests.

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Ethical approval

This analysis is based on a secondary dataset with no identifiable information on the survey participants. This dataset is available in the public domain for research use hence no approval was required from any institutional review board as there is no question of human subject protection arise in this case.

Data Availability

The data is available online on the website and can be downloaded. International Institute for Population Sciences was the nodal agency for DLHS-4; therefore IIPS data center has also made it the availability of data for the use of public. As being the faculty and students of this institute, we have accessed the data from institute's datacenter.

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Table 1 :Percentage Distribution of Sterilized women and sterilization regret by different background Variables, NFHS-III (2005-2006) and NFHS-IV (2015-2016)

	NFHS-IV (2015-2016)		NFHS-III(2005-2006)	
Background Variables	**Percent Regret**	**Total No. Of Sterilized Women**	**Percent Regret**	**Total No. Of Sterilized Women**
Regions				
With TFR More Than 2.1	6.42	73,320	4.46	15,831
Less Than 2.1	7.13	91,956	4.31	16,688
Place Of Residence				
Urban	6.94	45,152	4.55	14,260
Rural	6.90	120,124	4.31	18,259
Caste				
Schedule Caste/Tribe	6.81	57,211	4.30	9,344
Others	6.89	104,126	4.34	22,507
Religion				
Hindu	6.83	141,044	4.23	26,608
Muslim	8.59	11,230	6.35	2,784
Others	6.03	13,002	4.12	3,127
Educational				
No Education	6.59	71,249	4.26	14,406

Primary	6.79	28,584	4.01	6,063
Secondary	7.30	58,584	4.80	10,689
Higher	7.00	6,859	4.83	1,361
Wealth Index				
Poorest	6.57	29,245	4.26	3,417
Poorer	7.09	35,259	4.18	4,964
Middle	7.02	37,205	4.34	6,822
Richer	7.13	34,570	4.49	8,538
Richest	6.62	28,997	4.61	8,778
Sex Composition				
No Male	10.66	9,876	7.97	2,144
1 Male	9.73	8,171	7.36	1,292
2+ Male	7.78	30,047	4.75	5,248
Both Male And Female	5.98	116,910	3.78	23,806
Age At Sterilization				
<29	7.05	123,830	4.55	25,562
30-39	6.35	38,890	3.66	6,746
40+	7.88	2,556	4.67	211

Parity At Sterilization				
Less Than 2	11.37	4,720	8.79	430
2-3	7.08	112,452	4.70	19,910
4+	5.78	48,104	3.74	12,179
Year Since Sterilization				
Less Than 2	6.68	31,075	3.56	6,961
2-3	7.23	36,319	4.82	7,098
4+	6.88	97,882	4.54	18,460
Child Loss Post Sterilization				
No Loss	6.90	165,039	4.38	32,480
Male	12.55	154	10.75	15
Female	20.14	83	3.33	24
Quality Of Care				
Very Good	7.79	78,891	4.72	16,908
All Right	5.58	79,403	3.60	14,229
Poor	9.49	6,201	7.00	1,226
Bad	20.19	781	13.00	156
Type Of Health Facility				

Public	6.93	142,507	4.31	27,097
Private	6.83	22,769	4.79	5,422
Total	**6.92**	**165,276**	**4.38**	**32,519**

Table 2 :Odds of women who feel regret post sterilization by different covariates, NFHS-IV (2015-2016)

	Odds Ratios
Compensation for Sterilization	
Not Received®	1.000
Received	0.879*** (0.841-0.917)
Type of Health Facility	
Public®	1.000
Private	0.937** (0.882-0.996)
Quality of care post sterilization	
Very Good®	1.000
All Right	0.723*** (0.696-0.752)
Poor	1.310*** (1.202-1.427)
Bad	2.419*** (2.009-2.913)
_cons	0.097 (0.093-.101)

Figure 1 : Predicted Probabilities for women who reported sterilization regret, by the Quality of care during and post sterilization, Type of health Facility, NFHS-I (1992-1993), NFHS-III (2005-2006) and NFHS-IV (2015-2016).

Figure 1.1 Health Facility

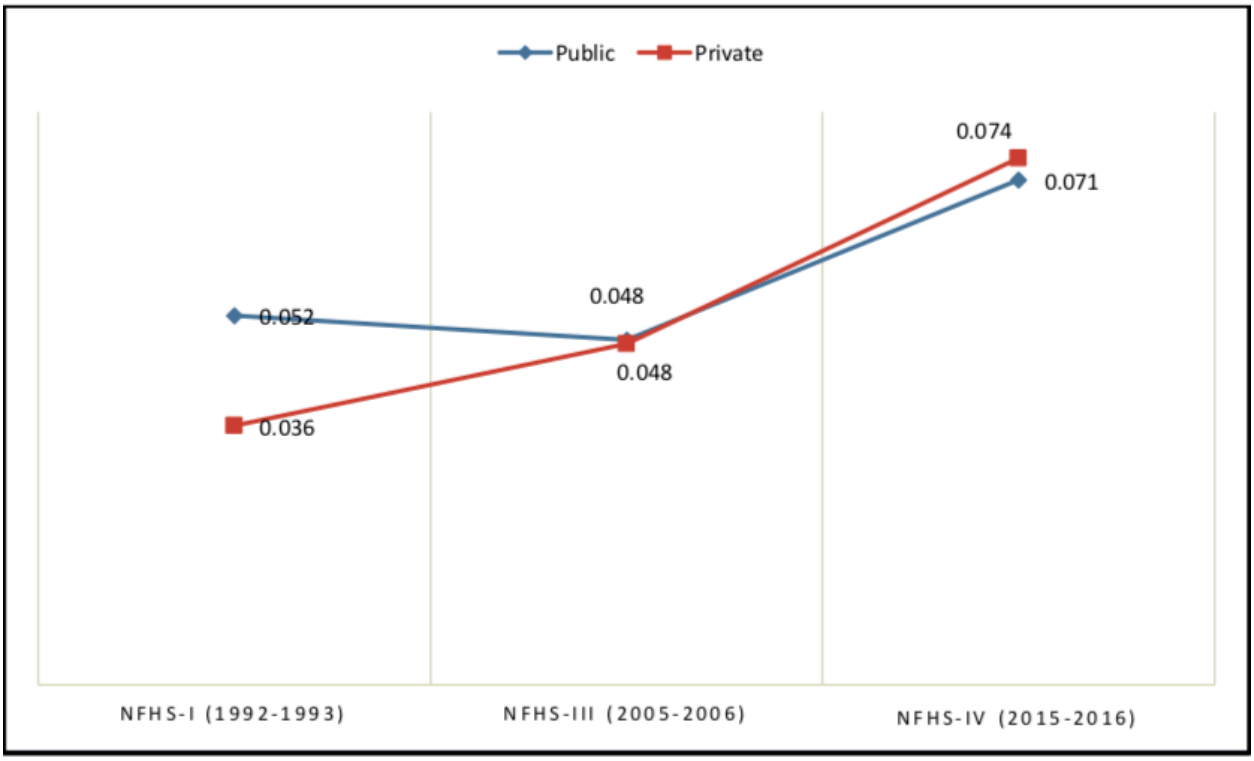

Figure 1.2 Quality of care during and post sterilization

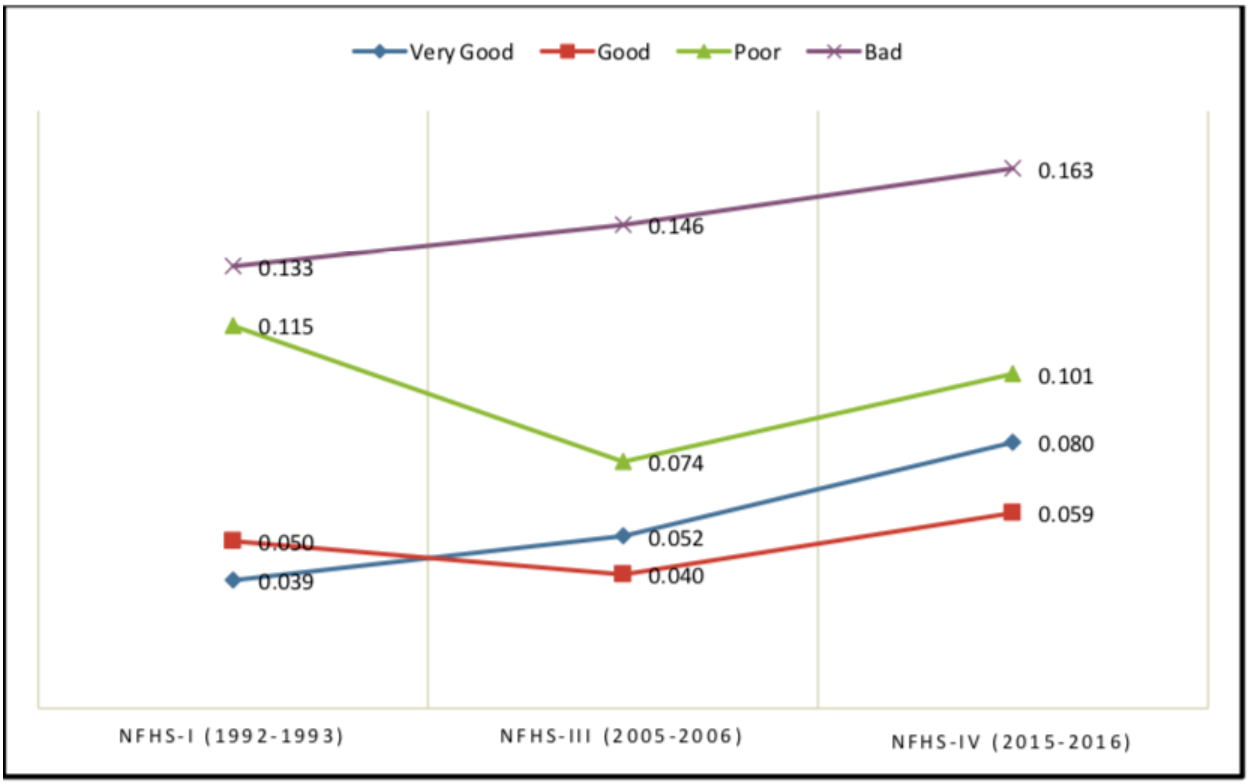

Figure 1.3 Health Facility and Type of place of residence

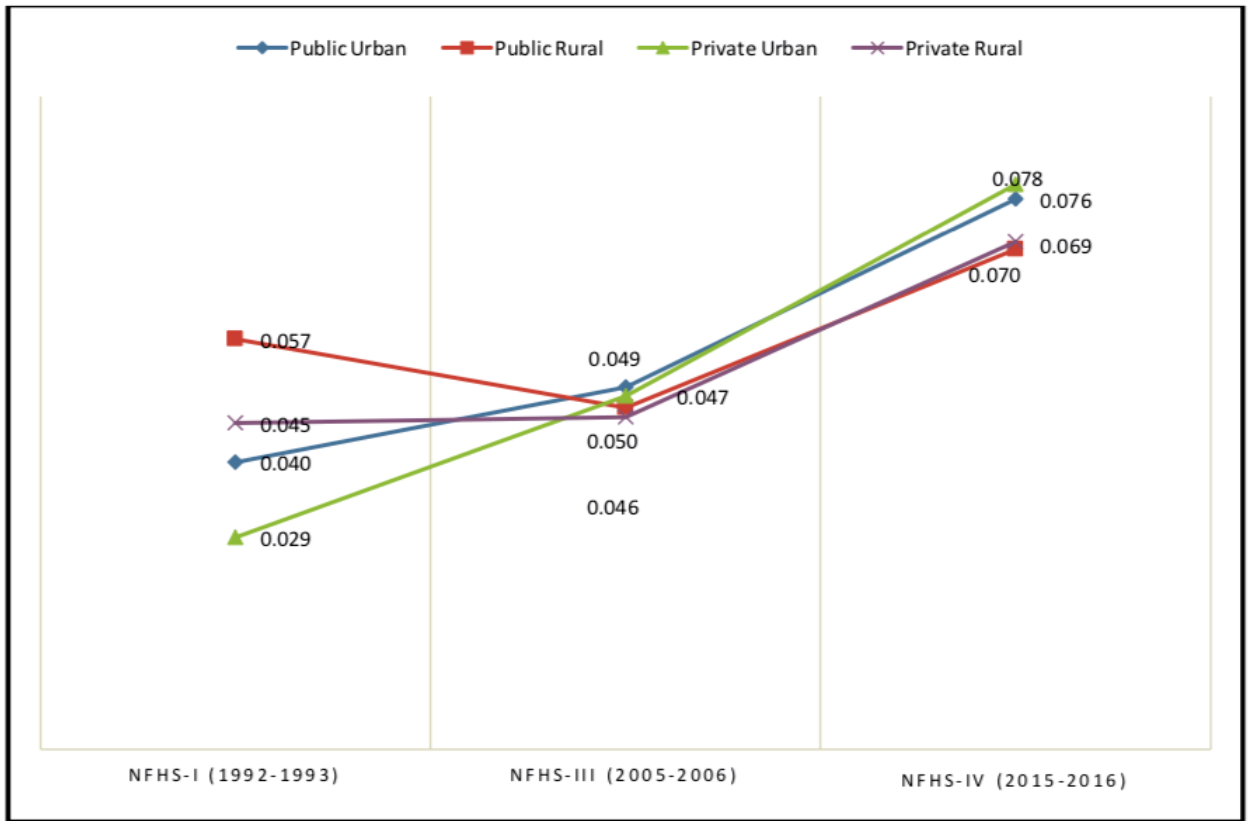

Figure 1.4 : Quality of care and type of health facility