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RESEARCH ARTICLE

High non-use of contraception among tribal and non-tribal women in North-Eastern India: alarming but neglected

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Abstract
Limited evidence exists about the contraception uptake in indigenous tribal groups of the north-eastern region of India. This study based on the National Family Health Survey (NFHS) IV (2015–2016) reports aimed to describe the pattern and factors associated with contraceptive non-use in the tribal women of the north-eastern part of India. The study was a cross-sectional analytical study based on secondary analysis of NFHS-IV data. All women in the age group of 15–49 years from the north-eastern part of India were included. Data were extracted and analysed using modified STATA-14 software. The association of socio-demographic and economic characteristics with contraceptive non-use was assessed using logistic regression. The inter-group differences of population characteristics for non-use contraceptives were assessed by modified Blinder–Oaxaca decomposition technique using 'Fairlie decomposition'. A total of 65,941 women were included, of whom 34,936 (52.9%) were tribal women. The proportion of contraceptive non-use was higher in tribal women. Tribal women with age at marriage above 30 years, Christian community, and women from Assam and Manipur state had higher odds of contraceptive non-use. The decomposition analysis showed that geographical variations, parity, and Christian religion contributed the most to contraceptive use disparity in the population. A huge gap was observed in contraceptive non-use among tribal and non-tribal women in the north-eastern part of India. The healthcare system must involve community representatives in designing context-specific community-based initiatives to increase the uptake of contraceptive use in these remote vulnerable communities.

Keywords: Fairlie decomposition; family planning; tribal women; contraceptives; North-East India

Introduction

Reproductive health is one of the major contributors of development, as envisaged in the Millennium Development Goals (United Nations, 2015). In India, contraceptives have been an integral component of reproductive healthcare and family planning services for the communities; however, the acceptance and adoption of contraception differ in population due to multiple socio-economic and socio-demographic factors (Dewri Bharali *et al.*, 2016). The use of contraception, similar to other health parameters, is influenced by gender, race or ethnic difference, education, and income (Mcguire *et al.*, 2006).

The indigenous population of India, also known as the tribal population, is one of the poorest and marginalised population groups in the country. These vulnerable population groups account for 8.6% of the population of India (Kamble *et al.*, 2016) but have limited access to developmental and health facilities (Agrawal, 2013; Balgir, 2001). The tribal population has poor health outcomes

and is prone to infectious diseases (Agrawal, 2013); low levels of contraception use are one of them.

According to the National Family Health Survey (NFHS) India-IV (2015–2016), about 99% of women had basic knowledge about family planning methods (International Institute for Population Sciences, 2017), though the utilisation of the contraceptive methods varied between tribal and non-tribal women. A study from tribal groups of eastern part of India described only 32% of tribal women were using modern and traditional family planning methods (Mondal *et al.*, 2012). Similarly, in central India, about 42% of tribal women used contraception compared to 58% of non-tribal women (Sharma and Rani, 2009).

The north-eastern part of India including eight states of the country shares borders with several nations, such as Nepal, Bhutan, China, Myanmar, and Bangladesh, and comprises multiple social and ethnic groups of tribal communities. The geographical terrain and hilly areas add more challenges in access to health care for these hard-to-reach vulnerable groups. These tribal communities also follow herbal-based traditional healthcare systems, which are common in rural communities of the region. These complexities add to the challenges of uptake of healthcare services, including contraception use (Mog *et al.*, 2020; New *et al.*, 2017). Despite widespread knowledge about contraception, only 35% of tribal women use modern contraception (Mog *et al.*, 2020). Cultural influences, non-availability of contraceptives in the healthcare system, and poor access to healthcare services contribute to the poor uptake of contraceptives in these vulnerable groups (Palo *et al.*, 2020; Prusty, 2014) and later access to traditional healers.

The indigenous tribal groups in remote hilly areas of north-eastern India still face major reproductive health morbidities in the form of unintended births, low birth weight, maternal morbidity, and mortality – mostly due to the non-use of contraceptives (International Institute for Population Sciences, 2017). Though studies on contraceptive non-use in individual states have been carried out, limited evidence exists about the contraception uptake in indigenous tribal groups of the north-eastern region of India. Thus, to address the knowledge gap, this study was carried out based on NFHS 2015–2016 reports with the following objectives: (i) to describe the contraceptive non-use in the tribal women of the north-eastern part of India and (ii) to identify the socio-demographic factors associated with the contraception non-use. We believe the results of the study will help policymakers and implementers to develop context-specific, tailored interventions for tribal populations in north-eastern India and neighbouring countries of the region.

Methods

Study design

This is a cross-sectional analytical study involving secondary analysis of the NFHS-IV (2015–2016).

Setting

National Family Health Survey (NFHS)-IV

The NFHS is a large-scale and multi-round survey in India, carried out by the International Institute of Population Sciences, Mumbai, India (nodal agency for the surveys). The NFHS-IV was conducted in 2015–2016 and covered all the states and union territories of India and obtained household-level data from 640 districts of the country. The parameters included in the survey were fertility, mortality, morbidity, maternal health, child health, and family planning. It covered a nationwide sample of 628,892 households having women in the age group of 15–49 years, eligible to be included in the survey. A total of 65,941 eligible women from the north-east part of the country were included in the survey.

Study population

All women in the age group of 15–49 years from the north-eastern part of India (from states: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura) included in NFHS-IV during 2015–2016 were included.

Data management and analysis

Data were extracted from the NFHS-IV databases and analysed using modified STATA-14 software (StataCorp LP, College Station, Texas). The use of contraceptives (Yes/No)- the outcome variable was computed by including information on the use of contraceptives including modern and traditional methods (International Institute for Population Sciences, 2017). The study participants were categorised as tribal and non-tribal populations. Other socio-demographic and economic characteristics included in the study were age groups, place of residence, religion, education, media exposure for family planning, wealth index, working status, age at first marriage, parity, and geographical location. The outcome variable (non-use of contraceptives) was summarised as proportions with a 95% confidence interval (CI). The association of socio-demographic and economic characteristics with contraceptive non-use was assessed using a chi-square test and unadjusted odds ratio with 95% CI. A *P* value of less than 0.05 was considered as statistically significant.

The inter-group differences of the socio-demographic and economic characteristics for non-use contraceptives in tribal and non-tribal women was assessed by modified Blinder–Oaxaca decomposition technique to decompose the gap between social groups (Fairlie, 2005; Van De Poel and Speybroeck, 2009). The positive percentage contribution suggested that the variable had contributed to widening the gap for non-use of contraceptives among non-tribal and tribal women. In contrast, a negative percentage contribution indicated that the variable had committed to narrowing the gap for non-use of contraceptives among non-tribal and tribal women. The exposure variables were tested for possible multicollinearity before entering them into the analysis. The 'Fairlie' command was used in STATA-14 for decomposition analysis (Fairlie, 2005). As the NFHS-IV used a multistage sampling design, standard errors were adjusted for weighting and clustering in all estimations.

Ethics

The NFHS-IV (2015-2016) received ethics approval from the Ethics Review Board of the International Institute of Population Sciences, Mumbai, India. The current study is based on an analysis of existing secondary records from NFHS-IV.

Results

A total of 65,941 women (aged 14–45 years) from the north-eastern region of India were included in the study, comprising 34,936 (52.9%) tribal and 31,005 (47.1%) non-tribal women. The socio-demographic and economic characteristics of these tribal and non-tribal women are described in Table 1. A higher proportion of tribal women had no education compared with non-tribal women. Further, tribal women had lower knowledge about contraceptives than non-tribal women.

The proportion of contraceptive non-use was higher in tribal women compared with non-tribal women in the north-eastern region of the country (Figure 1). The high contraceptive non-use in tribal women was consistent in most of the socio-demographic and economic characteristics (Table 2).

The factors associated with the non-use of contraceptives among tribal are presented in Table 3. For tribal women, women with age at marriage above 30 years (OR: 1.26, 95% CI [1.05–1.50]), women from Christian community (OR: 1.44, 95% CI [1.3–1.59]), and women from Assam (OR: 2.01, 95% CI [1.78–2.26]) and Manipur state (OR: 1.6, 95% CI [1.45–1.75]) had higher odds of contraceptive non-use.

The decomposition analysis representing differentials in the non-use of contraceptives among non-tribal and tribal women (Table 4) showed that the state Nagaland was the main contributor

Table 1. Socio-economic Profile of Tribal and Non-tribal Women in North-Eastern India, 2015–2016

Variables	Tribal women		Non-tribal women	
	N	%	*N*	%
Age (years)				
15–24	5,021	14.4	5,906	19.1
25–34	13,700	39.2	11,725	37.8
35+	16,215	46.4	13,374	43.1
Age at first marriage (year)				
<18	10,654	30.5	11,732	37.8
18–30	23,233	66.5	18,390	59.3
>30	1,049	3.0	883	2.9
Parity				
No children	3,133	9.0	3,019	9.7
One	6,669	19.1	8,192	26.4
Two	8,573	24.5	9,526	30.7
Three and above	16,561	47.4	10,268	33.1
Education				
No education	7,947	22.8	7,180	23.2
Primary	6,474	18.5	4,951	16.0
Secondary	18,510	53.0	16,549	53.4
Higher	2,005	5.7	2,325	7.5
Working status[a]				
No	3,992	68.7	3,932	80.3
Yes	1,816	31.3	965	19.7
Knowledge of contraceptive				
No	15,951	45.7	9,170	29.6
Yes	18,985	54.3	21,835	70.4
Religion				
Hindu	5,609	16.1	20,041	64.6
Muslim	58	0.2	8,166	26.3
Christian	24,521	70.2	1,067	3.4
Others	4,748	13.6	1,731	5.6
Wealth				
Poorest	5,099	14.6	5,025	16.2
Poorer	10,492	30.0	10,291	33.2
Middle	9,442	27.0	7,796	25.1
Richer	6,505	18.6	5,701	18.4
Richest	3,398	9.7	2,192	7.1

(*Continued*)

Table 1. (*Continued*)

Variables	Tribal women		Non-tribal women	
	N	%	*N*	%
Residence				
Urban	7,632	21.9	8,019	25.9
Rural	27,304	78.2	22,986	74.1
State				
Arunachal Pradesh	7,775	22.3	2,451	7.9
Assam	3,721	10.7	16,922	54.6
Manipur	3,040	8.7	5,832	18.8
Meghalaya	5,035	14.4	524	1.7
Mizoram	6,728	19.3	278	0.9
Nagaland	6,053	17.3	593	1.9
Sikkim	1,433	4.1	1,910	6.2
Tripura	1,151	3.3	2,495	8.1
Total	**34,936**	**52.9**	**31,005**	**47.1**

N: sample; %: percentage.
[a]Working status responses were collected for the state module only.

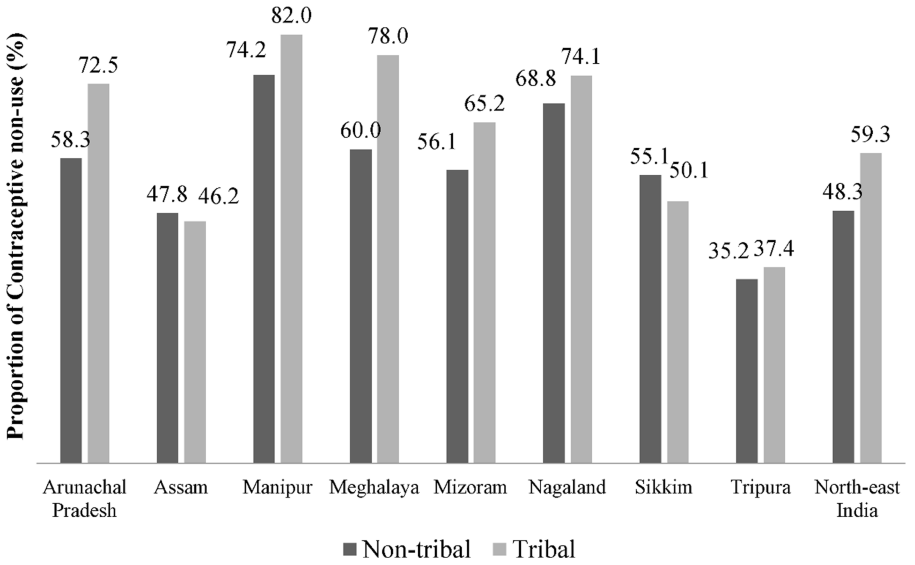

Figure 1. Contraceptive Non-use among Tribal and Non-tribal Women in North-East India, 2015–2016.
Source: National Family and Health Survey, 2015–2016.

explaining almost 35.8% of the difference in the non-use of contraception between non-tribal and tribal women, followed by the state of Mizoram, which contributed about 35.6% of the gap. Apart from geographical variations, women who had the parity of two and the Christian religion contributed about 17.5% and 12.8%, respectively.

Table 2. Percentage Change in Non-use of Contraception in Tribal and Non-tribal Women in Northeast India, 2015–2016

Variables	Tribal %	Non-tribal %	Difference (tribal–non-tribal) %	Proportion test $P < 0.05$
Age (years)				
15–24	68.8	55.6	13.2	*
25–34	54.9	39.5	15.4	*
35+	59.6	52.3	7.3	*
Age at first marriage (year)				
<18	54.9	45.8	9.2	*
18–30	60.9	49.6	11.3	*
>30	73.6	62.0	11.6	*
Parity				
No children	90.4	84.8	5.7	*
One	59.9	45.6	14.3	*
Two	48.9	40.5	8.4	*
Three and above	59.3	46.3	13.0	*
Education				
No education	62.4	52.1	10.3	*
Primary	59.1	47.5	11.5	*
Secondary	57.6	46.5	11.1	*
Higher	63.2	50.0	13.2	*
Working status[a]				
No	51.6	45.3	6.3	*
Yes	56.1	40.8	15.3	*
Knowledge of contraceptive				
No	66.0	54.3	11.7	*
Yes	55.6	45.7	9.9	*
Religion				
Hindu	45.5	46.8	−1.3	*
Muslim	55.8	50.2	5.5	*
Christian	71.3	49.2	22.1	*
Others	64.6	63.9	0.7	
Wealth				
Poorest	57.0	50.8	6.2	*
Poorer	57.9	47.7	10.3	*
Middle	61.1	47.2	13.9	*
Richer	61.5	48.1	13.5	*
Richest	61.3	47.6	13.7	*

(*Continued*)

Table 2. (*Continued*)

Variables	Tribal %	Non-tribal %	Difference (tribal–non-tribal) %	Proportion test $P < 0.05$
Residence				
Urban	62.1	47.6	14.4	*
Rural	58.7	48.4	10.3	*
State				
Arunachal Pradesh	72.5	58.3	14.3	*
Assam	46.2	47.8	–1.6	
Manipur	82.0	74.2	7.8	*
Meghalaya	78.0	60.0	18.0	
Mizoram	65.2	56.1	9.1	*
Nagaland	74.1	68.8	5.3	*
Sikkim	50.1	55.1	–5.0	*
Tripura	37.4	35.2	2.2	

%: percentage.
[a]Working status responses were collected for the state module only.
*If $P < 0.05$.

Figure 2 shows district-level spatial prevalence of non-use contraception among tribal women. The proportion of contraceptive non-use was higher in tribal women from Arunachal Pradesh, Nagaland, and Meghalaya states.

Discussion

This study highlights the neglected public health issue of contraceptive non-use among the indigenous tribal populations of the north-eastern part of India. Significant differences in non-use contraceptives among socially vulnerable tribal women were found with geographical variations in the region. Women of rural residents, low wealth status, inappropriate contraceptive knowledge, and lack of higher education were associated with non-use contraceptives between tribal and non-tribal women. Fairlie's decomposition method was used to identify the contributors for contraceptive non-use disparities in the region.

Previous studies have described reasons for variations in contraceptive non-use in tribal and non-tribal women as gender disparity in education, the remoteness of the health service provider, lack of follow-up services, and lack of media exposure (Anderson *et al.*, 2016; Narzary and Ao, 2019; Sharma and Rani, 2009). Our study used Fairlie's decomposition method and identified significant gaps in the first and second parity, Christian religion status, and geographical location, in line with other studies mentioning parity as a contributor (Anderson *et al.*, 2016; Osmani *et al.*, 2015).

The influence of religion on the non-use of family planning methods has been well documented (Anderson *et al.*, 2016). The north-eastern part of the country has a significant proportion of Christians, and a considerable proportion lives with lower average income and high unemployment rates (Chowdhury, 2011; Kumar and Singh, 2015). Previous studies also documented that Christian religion women follow religious techniques to prevent unwanted childbirth rather than using any contraceptive methods (Srikanthan and Reid, 2008). Thus, more adapted awareness campaigns including the religious leaders must be planned for family planning services to increase the uptake of the services.

Table 3. Factors Associated with Non-use of Contraceptive among Tribal and Non-tribal Women in North-East India, 2015–2016

Variables	Tribal OR (95% CI)	Non-tribal OR (95% CI)	Total OR (95% CI)
Age (years)			
15–24	Ref.	Ref.	Ref.
25–34	0.76* (0.7, 0.84)	0.87* (0.8, 0.94)	0.84* (0.8, 0.89)
35+	0.8* (0.73, 0.88)	1.55* (1.42, 1.69)	1.14* (1.07, 1.22)
Age at first marriage (year)			
<18	Ref.	Ref.	Ref.
18–30	0.97 (0.92, 1.03)	0.99 (0.93, 1.04)	0.97 (0.94, 1.01)
>30	1.26* (1.05, 1.5)	0.95 (0.8, 1.14)	1.09 (0.96, 1.23)
Parity			
No children	Ref.	Ref.	Ref.
One	0.25* (0.22, 0.29)	0.15* (0.14, 0.17)	0.19* (0.17, 0.2)
Two	0.13* (0.12, 0.16)	0.09* (0.08, 0.11)	0.11* (0.1, 0.12)
Three and above	0.11* (0.1, 0.13)	0.08* (0.07, 0.1)	0.09* (0.09, 0.1)
Education			
No education	Ref.	Ref.	Ref.
Primary	0.66* (0.61, 0.71)	0.88* (0.81, 0.95)	0.76* (0.72, 0.81)
Secondary	0.63* (0.59, 0.68)	0.79* (0.74, 0.85)	0.71* (0.68, 0.75)
Higher	0.64* (0.56, 0.73)	0.79* (0.69, 0.89)	0.74* (0.68, 0.81)
Knowledge of contraceptive			
No	Ref.	Ref.	Ref.
Yes	0.75* (0.71, 0.79)	0.78* (0.74, 0.83)	0.76* (0.73, 0.79)
Religion			
Hindu	Ref.	Ref.	Ref.
Muslim	1.34 (0.72, 2.47)	1.18* (1.11, 1.25)	1.13* (1.06, 1.19)
Christian	1.44* (1.3, 1.59)	1.16* (1.01, 1.33)	1.39* (1.3, 1.48)
Others	1.36* (1.22, 1.53)	0.91 (0.81, 1.02)	1.13* (1.05, 1.22)
Wealth			
Poorest			
Poorer	0.79* (0.72, 0.86)	0.99 (0.92, 1.07)	0.9* (0.85, 0.95)
Middle	0.69* (0.63, 0.75)	0.95 (0.87, 1.03)	0.82* (0.77, 0.87)
Richer	0.75* (0.67, 0.83)	1.02 (0.92, 1.12)	0.88* (0.82, 0.95)
Richest	0.76* (0.67, 0.86)	1.06 (0.93, 1.21)	0.9* (0.83, 0.99)
Caste			
Non-tribal			Ref.
Tribal			1.14* (1.08, 1.21)

(*Continued*)

Table 3. (*Continued*)

Variables	Tribal OR (95% CI)	Non-tribal OR (95% CI)	Total OR (95% CI)
Residence			
Urban	Ref.	Ref.	Ref.
Rural	1.06 (0.99, 1.14)	1.01 (0.95, 1.08)	1.04 (0.99, 1.09)
State			
Tripura	Ref.	Ref.	Ref.
Arunachal Pradesh	0.38* (0.34, 0.43)	4.6* (3.96, 5.33)	4.09* (3.73, 4.48)
Assam	2.01* (1.78, 2.26)	1.77* (1.53, 2.04)	1.74* (1.61, 1.88)
Manipur	1.6* (1.45, 1.75)	9.22* (7.73, 11)	7.19* (6.56, 7.88)
Meghalaya	0.91* (0.84, 0.99)	7.34* (6.25, 8.62)	5.96* (5.36, 6.63)
Mizoram	1.09 (0.99, 1.19)	4.19* (3.57, 4.92)	3.45* (3.11, 3.83)
Nagaland	0.41* (0.36, 0.46)	5.0* (4.26, 5.87)	4.27* (3.84, 4.73)
Sikkim	0.22* (0.19, 0.25)	1.86* (1.56, 2.23)	2.22* (2, 2.47)

Ref: Reference category.
*If $P < 0.05$.

Table 4. Decomposition Analysis Representing Differentials in Non-use of Contraceptive among Tribal and Non-tribal Women in North-East India, 2015–2016

Variables	Coefficient	Z-stat	$P < 0.05$	% contribution
Age (years)				
15–24	Ref.			
25–34	−0.001	−3.71	*	−0.4
35+	0.002	10.28	*	1.3
Age at first marriage (year)				
<18	Ref.			
18–30	0.000	−0.5		−0.2
>30	0.000	0.06		0.0
Parity				
No children	Ref.			
One	0.022	26.23	*	14.1
Two	0.027	40.99	*	17.5
Three and above	−0.065	−42.93	*	−42.4
Education				
No education	Ref.			
Primary	−0.001	−3.28	*	−0.4
Secondary	0.000	−4.22	*	−0.1
Higher	0.001	3.71	*	0.4

(*Continued*)

Table 4. (*Continued*)

Variables	Coefficient	Z-stat	$P < 0.05$	% contribution
Knowledge of contraceptive				
No	Ref.			
Yes	0.008	8.44	*	5.0
Religion				
Hindu	Ref.			
Muslim	−0.009	−5.27	*	−6.0
Christian	0.020	2.05	*	12.8
Others	−0.002	−1.67		−1.2
Wealth				
Poorest	Ref.			
Poorer	0.000	0.29		0.1
Middle	0.000	−1.21		−0.2
Richer	0.000	0.3		0.0
Richest	0.000	0.85		0.2
Residence				
Urban	Ref.			
Rural	0.000	0.26		0.0
State				
Tripura	Ref.			
Arunachal Pradesh	0.033	23.87	*	21.4
Assam	−0.054	−12.57	*	−35.0
Manipur	−0.033	−28.24	*	−21.6
Meghalaya	0.035	12.34	*	22.8
Mizoram	0.055	10	*	35.6
Nagaland	0.055	16.6	*	35.8
Sikkim	−0.002	−6.78	*	−1.4
Mean prediction among non-tribal	0.53			
Mean prediction among tribal	0.69			
Raw differentials	0.15			
Total explained	0.09			
%Explained	58.2			
%Unexplained	41.8			

%: percentage; Ref: Reference category.
[a]Working status responses were collected for the state module only and so were not included in the analysis as they will reduce the sample size.
*If $P < 0.05$.

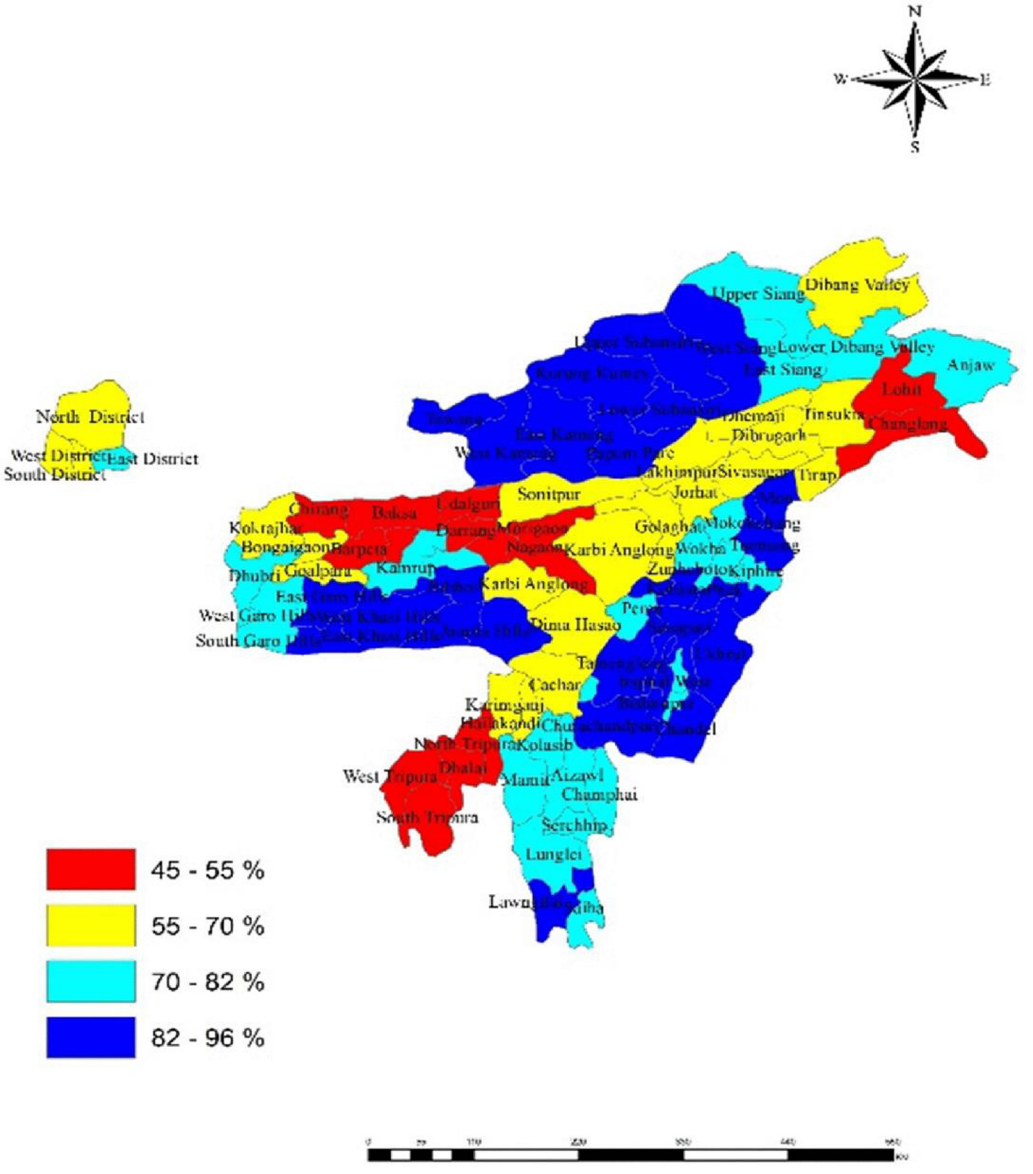

Figure 2. Spatial Prevalence of Contraceptive Non-use in Tribal Women in North-East India, 2015–2016.
Source: National Family and Health Survey, 2015–2016.

Lack of contraceptive knowledge still persists in the communities and contributes to low uptake of contraceptives. Awareness about family planning methods and the ability to use contraception are crucial to promote women's health in developing countries. It is well recognised that younger women are greatly influenced by the mass media (Anderson *et al.*, 2016), so the youth should be involved in designing awareness campaigns around family planning services. Educating women from different social groups and making them economically independent also contributes to postponing or spacing the birth order. Collaboration with education and life skills training departments will help in improving contraceptive uptake in the region.

The tribal women from rural areas had a higher proportion of contraceptive non-use than those from urban areas. Apart from low levels of education and early age at marriage, the tribal women from rural areas face challenges in reaching to nearest healthcare facility for services. The difficult hilly terrain and long distances pose barriers to accessing services and referrals to tertiary care units, in case of emergency. This also leads them to access health care from traditional healers. Primary health centres and local responsible departments should make contraceptive methods available to the community. The healthcare system should also plan community-based initiatives for family planning services, for easier adoption of these services including contraceptive use.

This study was based on recognised, structured NFHS-IV records including nationally representative samples and a wide range of population characteristics. The study has the following limitations: first, in the methodological approaches, the study did not incorporate multiple data sources and factors, which may represent the actual inequality factors similar for other studies. Second, the data on social discrimination on contraceptives in different social groups was unavailable, which may have also influenced on the non-use of contraceptives. Third, the study did not include the issue of accessibility of the contraception and demand-based supply (stakeholders) in the remote areas, as previous studies had outlined (Kumar and Singh, 2015; Mukasa *et al.*, 2017).

Conclusion

A huge gap was observed in view of the non-use of contraceptives among tribal and non-tribal women in the north-eastern part of India. The decomposition method showed that the wealth index, parity, geographical region, and religion have a substantial contribution towards widening the gap of non-use contraception among tribal and non-tribal women. The healthcare system must involve community representatives in designing context-specific community-based initiatives to increase the update of contraceptive use in hard-to-reach vulnerable communities.

Author contribution. MM, DN, and SS conceived and designed the study. MM and SS analysed the study data. MM, DN, and SS interpreted the results and drafted the manuscript. All the authors have contributed to revisions of the manuscript and approved the final manuscript.

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Competing interests. We declare no competing interests.

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