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Family planning in the northeastern states of India: geographic, demographic and programmatic priorities

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Abstract

The northeastern states of India exhibit unique geographic, demographic, and cultural challenges affecting family planning (FP) outcomes. Despite improvements in modern contraceptive prevalence rates (mCPR) over the past 15 years, significant inter- and intra-state disparities persist. The study aims to assess the challenges in family planning for the states northeastern India. Using NFHS and HMIS data, this study analyzes FP indicators, including mCPR, unmet need, method mix, and discontinuation rates, across eight northeastern states. A vulnerability score was developed to assess programmatic challenges. Variability in mCPR and unmet need reflects geographic and socioeconomic differences. While Nagaland and Arunachal Pradesh showed substantial mCPR increases, states like Manipur and Mizoram reported declines. High discontinuation rates due to side effects and access-related issues were prominent. Vulnerability analysis identified districts requiring targeted interventions Localized FP strategies are critical to addressing diverse needs. Strengthened counselling, improved access to long-term methods, and culturally sensitive demand-generation activities could mitigate unwanted fertility and enhance outcomes. Tailored FP programs addressing geographic and demographic disparities are vital for achieving universal health coverage in this region. Future efforts should prioritize strengthening health systems and integrating resilient, community-focused approaches.

Keywords

Family planning, Northeastern states, India, NFHS, mPCR

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Introduction

The northeastern region of India is home to eight states—Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. The population in this region is characterized by diverse ethnic groups with a wide range of cultural practices. These groups live and reside in difficult geographic terrains that have limited accessibility. The region faces geographic barriers to healthcare, especially last-mile delivery of family planning (FP) services.

The northeastern region of India faces significant challenges in delivering healthcare services, particularly in remote mountainous areas. Geographic barriers, combined with diverse ethnic populations and cultural practices, hinder access to reproductive, maternal, and child health services (Bhattacharyya & Sarma, 2015; Byrne et al., 2015). Strategies to improve healthcare delivery in these difficult-to-reach areas include task-shifting to community health workers, mobile teams, and community engagement (Byrne et al., 2014). Healthcare providers in Assam report challenges such as lack of medicine, manpower shortages, and community dynamics as major obstacles in providing maternity management and family planning services (Samal & Dehury, 2015). Cultural factors also influence reproductive intentions, as evidenced by differences between matriarchal and patriarchal societies in Meghalaya and Manipur (Singh et al., 2007). Addressing these challenges requires a multifaceted approach that considers both supply and demand barriers to healthcare utilization in northeastern India's unique geographical and cultural context.

With the aim of providing safe and quality FP services to all married people who need contraceptives, the National Family Planning (NFP) programme delivers services under the existing platform of Reproductive, Maternal, Child and Adolescent Health (RMNCH+A) that functions along with state health departments (Gogoi et al., 2021; Sarma & Bhattacharyya, 2015).

Over the course of the last 15 years, FP outcomes have shown some improvement (Dixit & SG, 2022). For instance, the modern contraceptive prevalence rate (mCPR) in the eight northeastern states increased from 29% in 2005–06 to 43% in 2019–21 (IIPS and Macro International 2007, IIPS and ICF 2022). Having said that, the increase in contraceptive prevalence at the regional level masks the wide variation in FP indicators across the states. For example, the National Family Health Survey (NFHS) (IIPS, 2021) reports that, Nagaland has shown a 23-percentage point (PP) increase in mCPR from 2005–06 to 2019–21, followed by Assam with an increase of 18 PP. Other states have also shown an increase in mCPR like Arunachal Pradesh (9 PP), Sikkim (6 PP), Tripura and Meghalaya (4 PP). On the

other hand, there was a decline in Manipur (5 PP) and Mizoram (29 PP). Apart from the interstate variation, a considerable intrastate variation could also be noticed. In Sikkim, the lowest mCPR was in East district (43%) and the highest in West district (71%); in Arunachal Pradesh East Siang had a 36% mCPR and in Siang it was 61 percent. Similarly, mCPR in Nagaland ranged from 33% (Kiphire) to 56% (Zunheboto), in Mizoram it ranged from 21% (Aizwal) to 50% (Champhai), in Meghalaya it ranged between 11% (East Khasi Hills) to 40% (West Garo Hills) and in Assam it varied between 31% (Majuli) to 61% (South Salmara Mancachar). (International Institute for Population Sciences [IIPS], 2021)

Besides geographic variation, there is a variation in contraceptive use by population groups as well. In Arunachal Pradesh, contraceptive use was observed in 43% of the tribal population and 34% of non-tribal populations. In Mizoram, 69% of the tribal population showed contraceptive use while it was 66% in non-tribal populations. The percentage of non-users in tribal populations in Arunachal Pradesh was high; whereas, in Nagaland (tribal 43% and non-tribal 47%) and Meghalaya (tribal 72% and non-tribal 78%) the percentage of non-users in non-tribal populations was higher. In Sikkim (urban 44%, rural 23%) and Mizoram (urban 71%, rural 67%), the urban population had more non-users than in rural areas. Whereas, in Nagaland (urban 39%, rural 44%) and Tripura (urban 23%, rural 31%), rural areas had a higher proportion of non-users. Similarly, the richest quintile in Sikkim had a higher proportion of non-users (poorest 19%, richest 38%) whereas in Tripura the poorest quintile had a higher proportion of non-users (poorest 29%, richest 26%). This paper presents an overview of the conditions of FP programs in the northeastern states and attempts to answer the following research questions- What are the characteristics of people who prefer specific methods? Why is the use of specific contraceptive methods (for example the use of pills) increasing in certain geographies and not others? Should there be a localized plan depending on the pattern trends and method mix levels? To address these questions an in-depth analysis of multiple data sources was required. Therefore, in this paper, large-scale datasets available in the public domain were analysed. Datasets included multiple rounds of the National Family Health Survey (NFHS) and the Health Management Information System (HMIS).

Data and Methodology

Data source

The study has used multiple rounds of the National Family Health Survey (NFHS) and the Health Management Information System (HMIS).

The NFHS is a large-scale, multi-round survey conducted on a representative sample of households throughout India. NFHS uses the multistage stratified sampling procedure to collect a nationally representative sample of India. Highly trained personnel interview subjects by filling out a systematically designed questionnaire. The census populations serve as the sampling frame for the selection of primary sampling units (PSUs). PSUs in rural areas are villages and Census Enumeration Blocks (CEBs) in urban areas. This study used NFHS-3(IIPS, 2007) (2005–06), NFHS-4 (2015–16) (IIPS & ICF, 2015) and NFHS-5 (2019–21)(IIPS, 2021) data for the analyses.

The HMIS is a government-to-government web-based Monitoring Information System (MIS) that facilitates the flow of physical performance from the facility-level to the sub-district, district-, state- and national-level, using a web-based interface. For this paper, state-level information on FP indicators was used. Using the NFHS data, the authors estimated different FP indicators such as modern contraceptive prevalence, unmet need for contraception, method-mix, method information index, contraceptive discontinuation rates and reasons for non-use and discontinuation. Along with the FP indicators, the analyses further calculated the fertility intentions, total fertility rate (TFR) and wanted fertility to understand the reproductive preference of the populations, which is a major prerequisite for the use of FP methods. Data from HMIS were used to understand system readiness and performance statistics of the FP program in the study districts. Findings from both NFHS and HMIS were triangulated to understand the programmatic contexts. Based on the variables available in NFHS, program vulnerability for districts was calculated.

The program vulnerability score was calculated for 104 districts, using exposure to FP messages through media, frontline health workers (FLWs) outreach for discussions on FP and method information index (MII), a measurement for informed consent. If the estimated value of these three indicators was below the national average, then it was coded as "1"; otherwise, it was "0". By summing up the vulnerability, the score ranged from 0 to 3, a higher score indicating greater vulnerability from a program perspective.

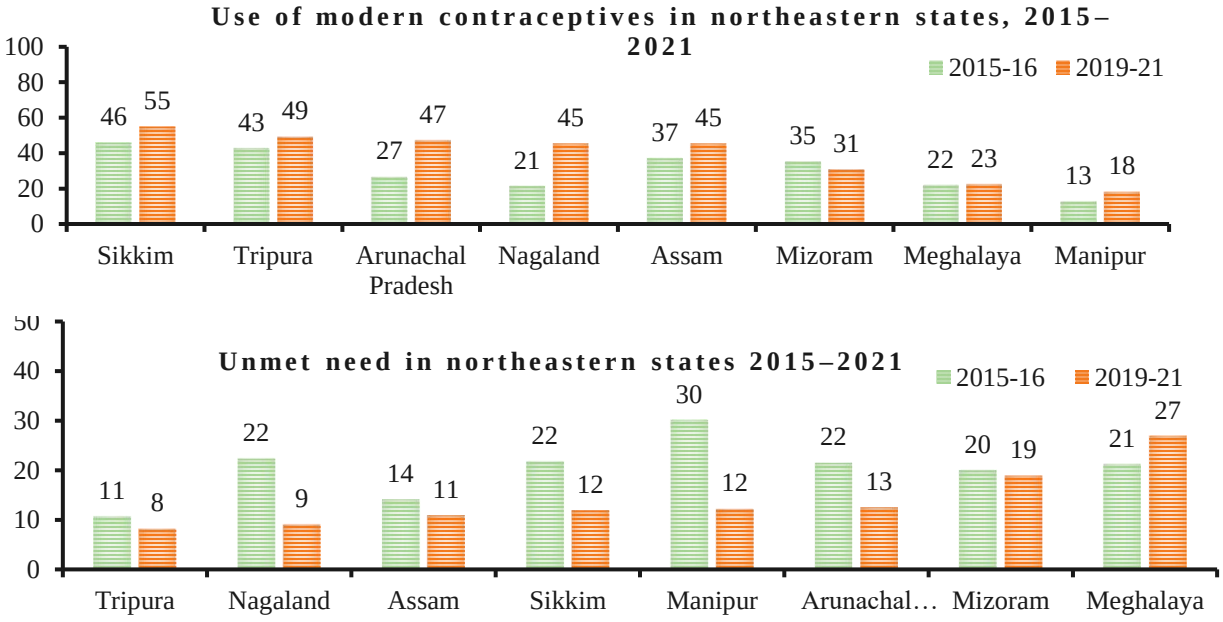
Apart from using the population-level data from NFHS, this paper also used HMIS data from three financial years (FY): 2018–19, 2019–20 and 2020–21. The performance statistics of uptake of FP services were compared between FY 2018–19 and FY 2019–20 and termed a relative change in 2018–20, and between FY 2019–20 and 2020–21 and termed a relative change in 2019–21.

Results

Contraceptive use and unmet need in northeastern states

Analyses of NFHS 2015–16 and 2019–21 data showed that the mCPR for all states was below the national average (Figure 1). Compared to the other states of the region, the increase in mCPR was high in Nagaland (from 21% in 2015–16 to 45% in 2019–21) and Arunachal Pradesh (from 27% in 2015–16 to 47% in 2019–21). The unmet need for contraception, on the other hand, was higher than the national average for all states; the decrease was highest in Nagaland (from 21% in 2015–16 to 8% in 2019–21) and Manipur (from 30% in 2015–16 to 12% in 2019–21).

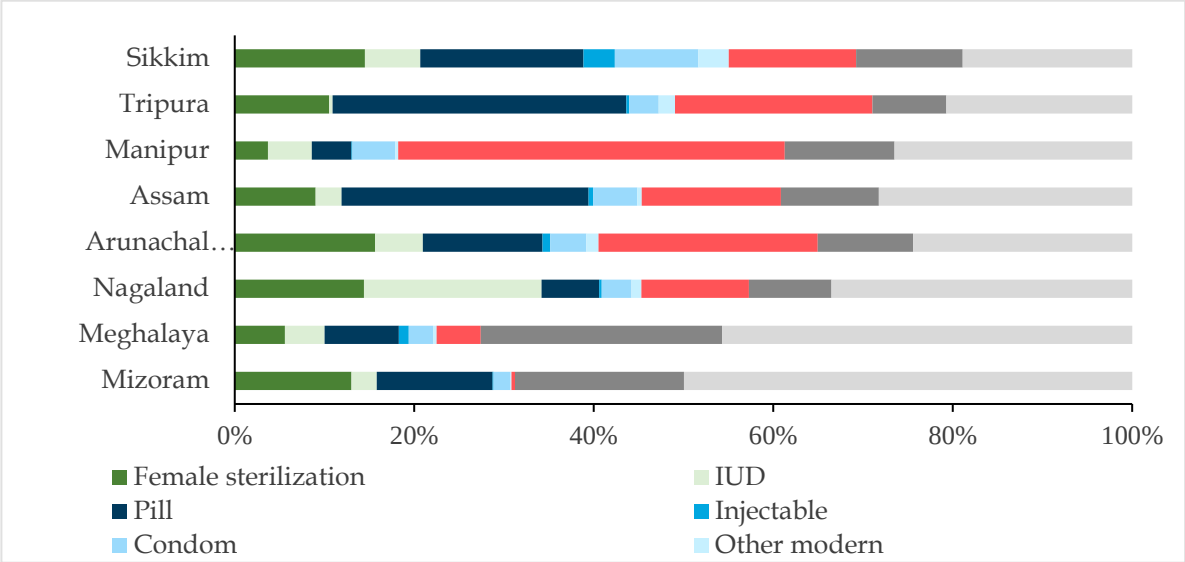
Figure 1: Changes in modern contraceptive prevalence and unmet need for contraceptives in northeastern states of India, 2015–21



Method mix and non-use of contraceptives in northeastern states

There was a huge variation in the use of method mix in all districts across the region (Figure 2). Long-term method use was more than 30% in Nagaland, whereas less than 20% in the remaining states. The predominant reversible method used was pills, but the use varied across states, with the highest being observed in Tripura and lowest in Manipur. Use of injectables and condoms was negligible in the northeast. The use of traditional methods was negligible in Mizoram but high in Manipur and Arunachal Pradesh. The unmet need for contraceptives was highest in Meghalaya and the lowest in Tripura. The number of non-users with no unmet need was highest in Mizoram followed by Meghalaya.

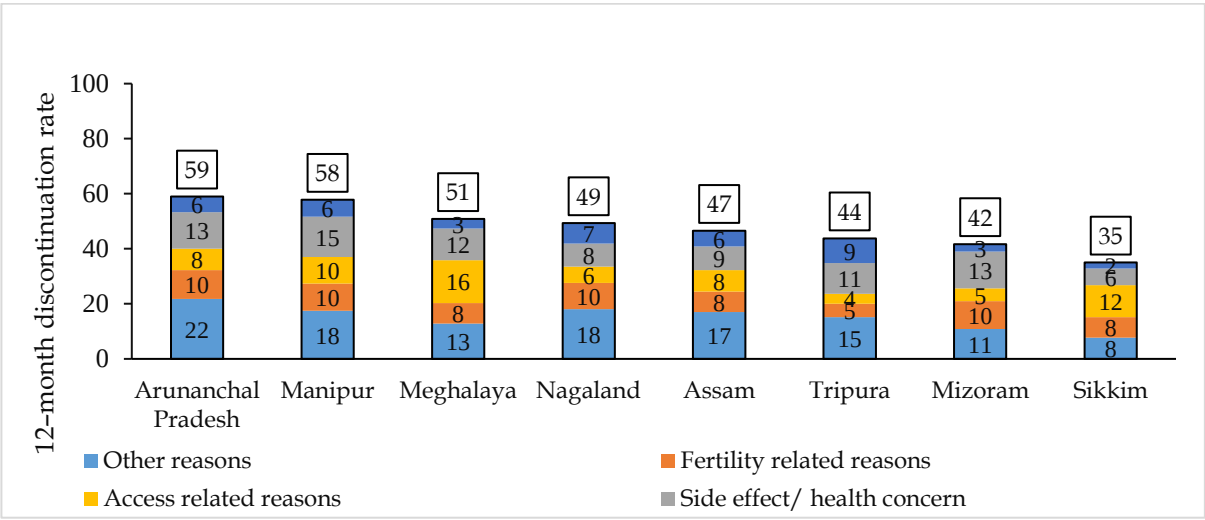
Figure 2. Contraceptive method mix in northeastern states of India, 2019–21



12-month discontinuation rate in northeastern states

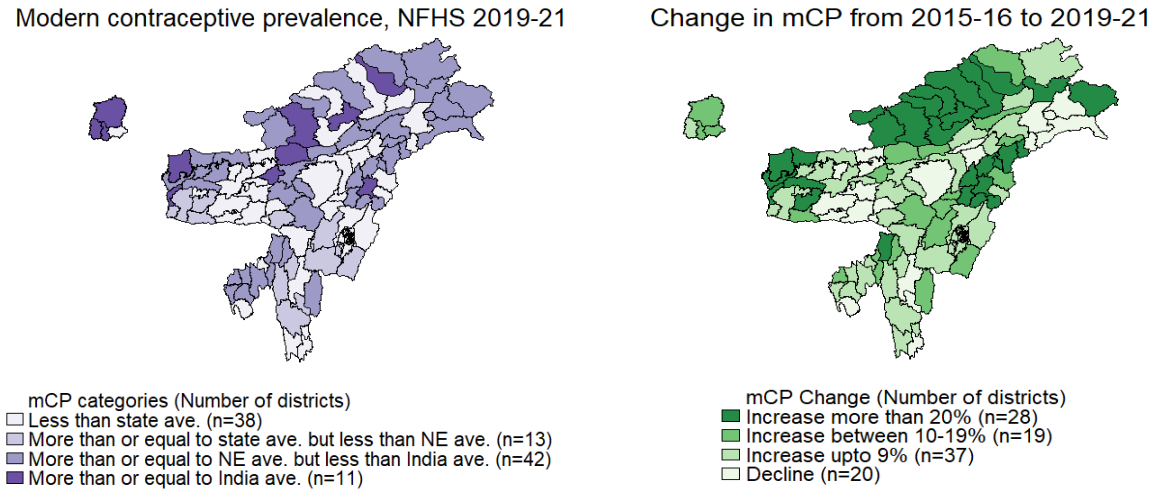
Most of the users of modern methods used reversible methods but the discontinuation rates were high. The 12-month discontinuation rate was lowest in Sikkim at 35% and highest in Arunachal Pradesh at 59 percent. All the other states had more than 40% discontinuation rate.

Figure 3. 12-month discontinuation rate and reasons for discontinuation of reversible methods, 2019–21



About 10% episodes of use were discontinued due to fertility related reasons across all the states. The states with high discontinuation rates, such as Arunachal Pradesh, Manipur and Meghalaya also experienced higher discontinuation due to experience of side-effects and health concerns. In Meghalaya, access-related reasons for discontinuation were the most prevalent at 16 percent.

Figure 4. Modern contraceptive prevalence (mCP) in 2019–21 and the change in mCP from 2015–16 to 2019–21 in districts of northeastern states of India

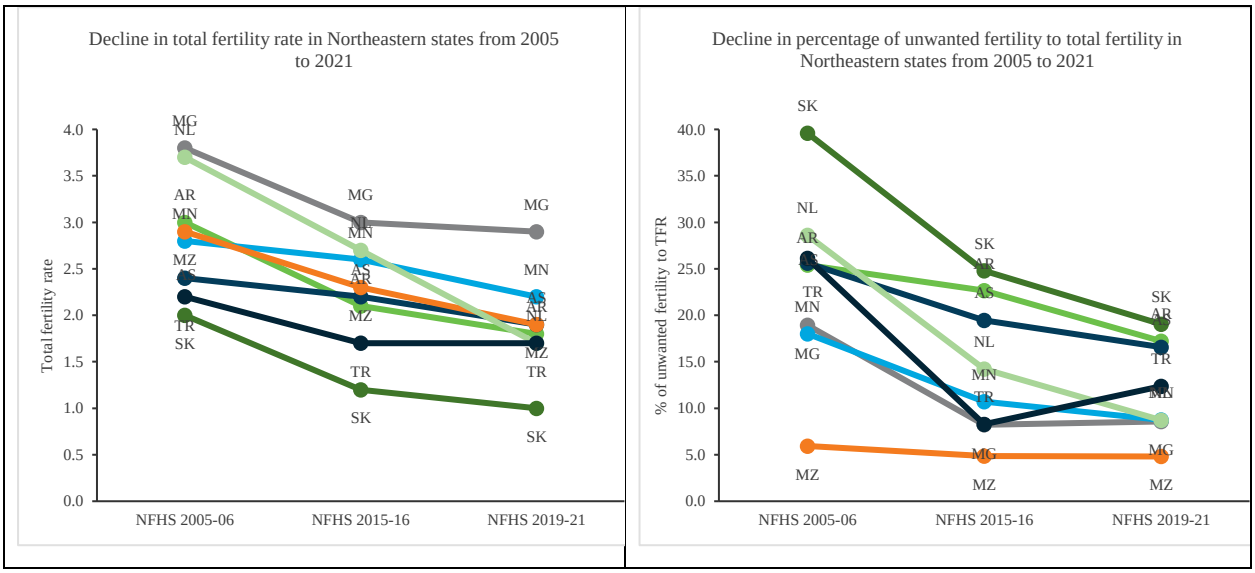


Total fertility and unwanted fertility in northeastern states

The total fertility rate (TFR) in all states declined over the last 15 years (Figure 5). In some states, like Nagaland (3.7 in 2005–06 to 1.7 in 2019–21) and Arunachal Pradesh (3.0 in 2005–06 to 1.8 in 2019–21), the decline in TFR was considerably greater. While, in some states like Meghalaya (3.8 in 2005–06 to 2.9 in 2019–21) the TFR consistently remained high and in Manipur where the change in TFR was not so prominent (2.8 in 2005–06 to 2.2 in 2019–21).

High TFR could result either from couples' desire for more children, i.e. wanted fertility or their inability to stop unintended pregnancies and subsequently the childbirth, i.e. unwanted fertility. The percentage of unwanted fertility to TFR is a good indicator that measures the contribution of reasons other than the desire for children to have total fertility. The fertility data showed that the contribution of unwanted fertility declined in all states over the last 15 years (Figure 5). Some states showed a rapid decline (e.g., Sikkim, Nagaland) but for some states (e.g., Assam, Arunachal Pradesh) the decline was not that rapid.

Figure 5. Total fertility rate (TFR) and contribution of unwanted fertility to TFR in northeastern states in India, 2005–06 to 2019–21



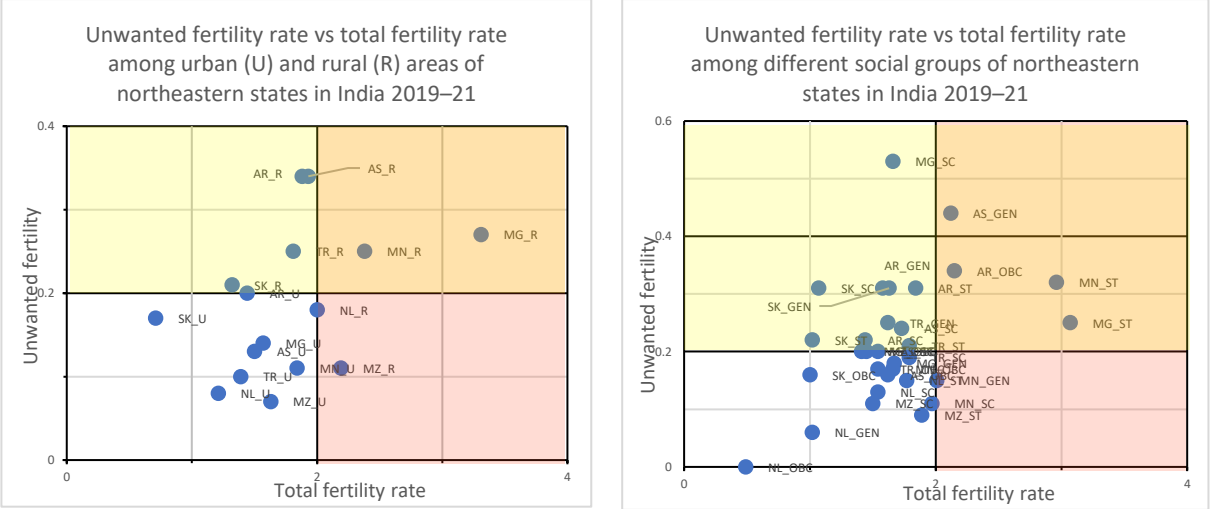
The distribution of TFR and unwanted fertility across urban and rural communities and among different social groups is shown in **Figure 6**. The figure shows certain geographies and social groups have high TFR as well as high unwanted fertility. These geographies include rural areas of Meghalaya and Manipur, and the social group includes the general population, and Other Backward Classes (OBCs) of Assam and Arunachal Pradesh and Scheduled Tribe (ST) populations of Manipur and Meghalaya. Certain geographies and social groups had high unwanted fertility but the TFR was below the replacement level. These geographies were rural areas of Arunachal Pradesh, Assam, Tripura and Sikkim; and social groups were the Scheduled Castes (SC) population of Meghalaya, the general population of Assam and all groups in Arunachal Pradesh and SC and general population in Sikkim. In rural areas of Mizoram and Nagaland, the TFR was higher than the replacement level, but the unwanted fertility was low.

Vulnerability in family planning programming in northeastern districts

The vulnerability score for FP programming was calculated for all 104 districts. The districts with a vulnerability score of 3 were considered to have a 'high' level of vulnerability, a score of 2 to have 'middle' level of vulnerability, a score of "1" to have 'low' level of vulnerability. Districts with a score of "0" were considered to have 'no' vulnerability. The distribution of districts by their vulnerability to FP programming is presented in Figure 7. The program vulnerability was found to be 'high' in 32 districts, 'medium' in 31 districts, 'low' in

29 districts and 'no' vulnerability was found in 12 districts. The districts with high vulnerability were concentrated in Manipur, Tripura, Nagaland and Arunachal Pradesh. Districts in upper Assam had 'low' or 'no' vulnerability.

Figure 6. Total fertility rate (TFR) and unwanted fertility in urban/rural areas and among different social groups in northeastern states in India, 2019–21



Performance statistics of family planning programming using HMIS data

The HMIS data over the period of 2018–20 and 2019–21 showed an overall decrease in service uptake in all states. However, certain states showed an increase in some methods (Table 1). For example, the uptake of pills both daily and weekly increased in Mizoram, Tripura, Meghalaya and Assam and the uptake of injectables increased in Sikkim, Mizoram and Meghalaya. Tripura showed an increase in the uptake of condoms. Sikkim showed an increase in uptake of female sterilisation and intrauterine contraceptive device (IUCD) apart from injectables.

Figure 7. District-wise program vulnerability in northeastern states

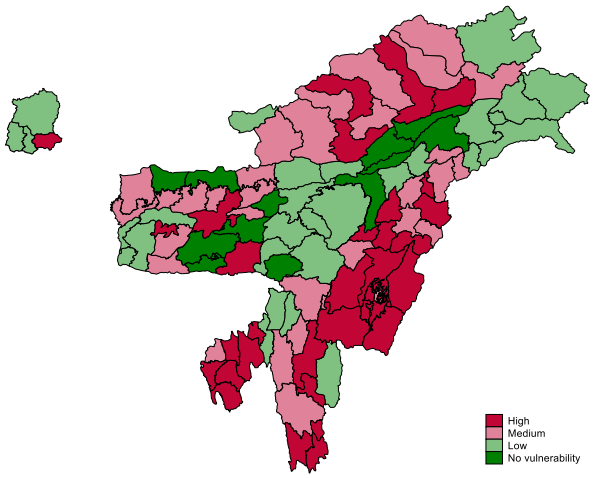


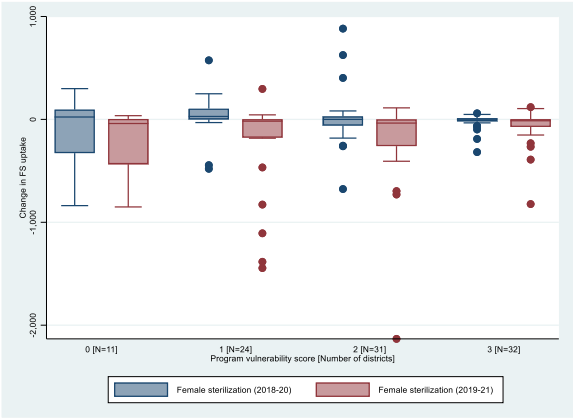
Table 1. Relative change (in %) in the uptake of different contraceptive methods from the year 2018–19 & 2019–20

	Relative change in	Sikkim	Arunachal Pradesh	Nagaland	Manipur	Mizoram	Tripura	Meghalaya	Assam
Female sterilisation	2018–20	22.2	30.0	11.7	–44.6	2.2	18.7	10.4	–2.5
	2019–21	63.6	–44.1	–52.7	–21.8	–29.2	–19.1	–16.8	–37.0
IUCD	2018–20	–13.5	7.4	5.1	–5.1	18.7	–12.1	2.1	27.2
	2019–21	1.2	–10.3	–29.5	–56.8	–21.0	–11.5	–10.5	–17.1
Injectable	2018–20	0.5	–4.5	38.0	593.3	23.0	103.9	301.4	266.2
	2019–21	135.6	–3.9	–40.4	–61.9	371.0	–35.9	70.1	–31.0
OCP	2018–20	–5.6	47.4	8.3	–16.6	13.9	–5.2	4.7	19.4
	2019–21	–5.4	27.7	–27.4	–25.2	11.1	5.4	39.3	19.6
Weekly pills	2018–20	–6.5	211.1	92.8	407.3	–84.0	–9.6	73.4	121.8
	2019–21	–60.5	–56.0	–25.8	–25.6	277.0	185.2	93.9	0.4
Condom	2018–20	–9.9	88.9	–1.7	1.6	–18.4	–28.5	1.5	13.6
	2019–21	–10.6	–40.6	–20.3	–31.4	–11.1	13.6	–8.0	–8.4
ECP	2018–20	–4.2	79.9	15.6	16.5	–8.8	–21.7	23.6	72.0
	2019–21	434.1	–5.8	–15.1	–53.8	39.8	25.4	1.5	40.5

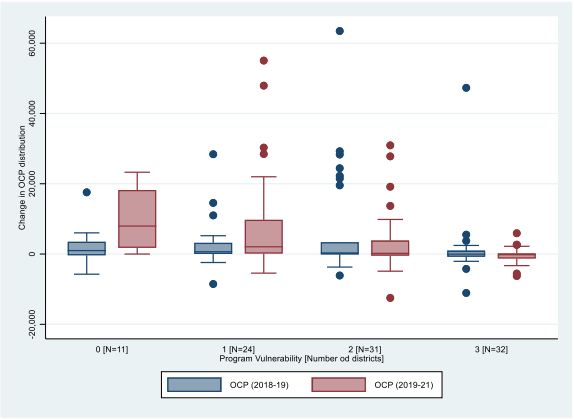
- **Female sterilisation:** relative uptake was consistently high in Sikkim and consistently low in Manipur and Assam.
- **IUCD:** uptake consistently declined in Tripura but in other states it increased in 2018–20 but reduced in 2019–21. This trend was reversed in Sikkim.
- **Injectables:** uptake of injectables increased in Tripura, Manipur, Meghalaya and Assam in 2018–20 but 2019–21 the uptake declined. Sikkim and Mizoram showed increased uptake in injectables in 2019–21.
- **Oral Contraceptive Pills (OCP), weekly pills, condoms and Emergency Contraceptive Pills (ECP):** uptake of OCP, weekly pills and condoms consistently declined in Sikkim and uptake of ECP increased in 2019–21. The uptake of OCP consistently declined in Sikkim but increased in Meghalaya. Weekly pill uptake increased in Arunachal Pradesh, Nagaland and Manipur in the year 2018–20 but declined in 2019–21. Mizoram and Tripura showed increased uptake in 2019–21. The uptake of condoms consistently declined in Sikkim, Nagaland and Tripura. The uptake of ECP considerably increased in Sikkim in 2019–21.

Figure 8. Change in the uptake of different contraceptives between 2018–20 and 2019–21 in northeastern states of India, HMIS 2018–19, 2019–20 and 2020–21

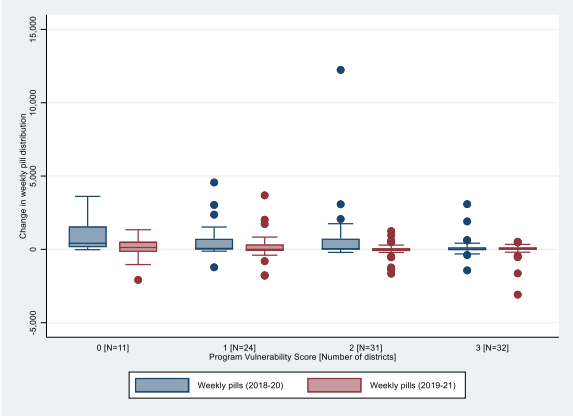
Change in the uptake of female sterilisation



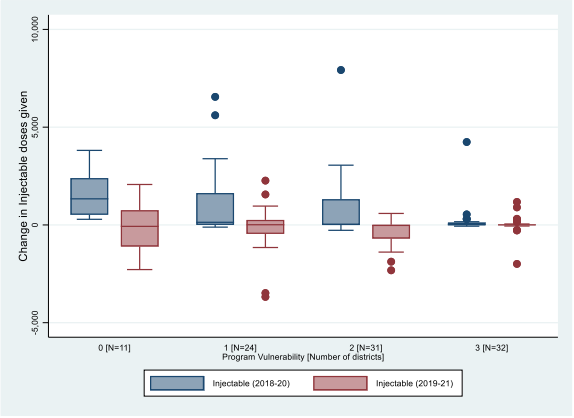
Change in the uptake of daily pills



Change in the uptake of weekly pills



Change in the uptake of injectables



The box plots in Figure 8 show the change in the uptake of different contraceptives over the recent years and the programmatic vulnerability across districts to examine the possible association between vulnerability in FP programming and its performance. The average change in the uptake of female sterilisation did not show much difference by programme vulnerability. The districts with high programme vulnerability did not show much change in the distribution of daily oral pills. Similarly, districts with high programme vulnerability also did not show much increase in the average change in the distribution of weekly pills and injectables.

Overall, the uptake of female sterilization and injectables declined from 2018–20 to 2019–21, while the uptake of daily pills

and weekly pills increased from 2018–20 to 2019–21. The change in the uptake of contraceptives did not change much in districts with high programme vulnerability, while the districts with no programme vulnerability showed a wider variation in change in contraceptive uptake over the recent years.

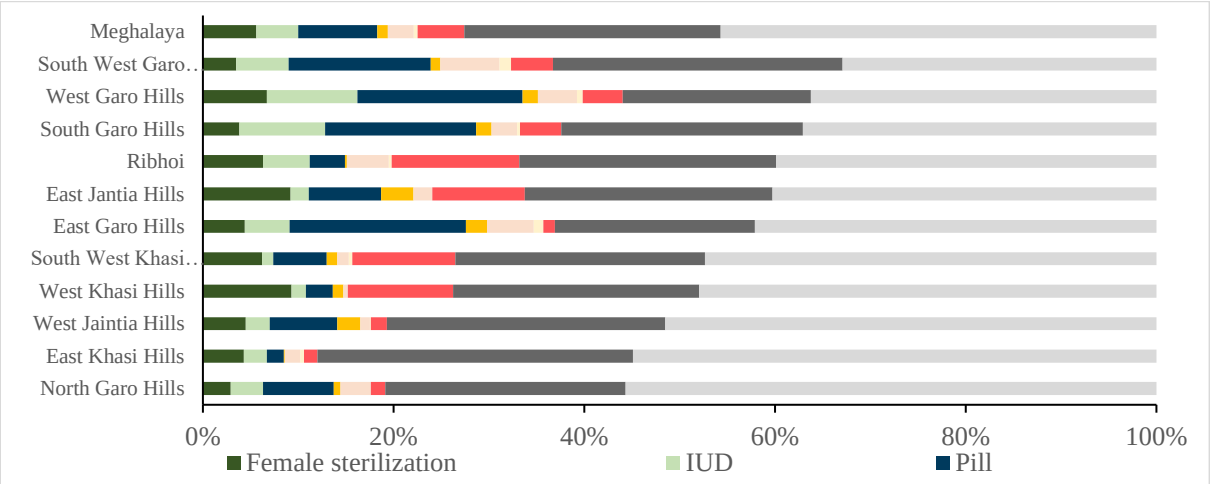
Situation of family planning programming

Studies on FP programming and its outcomes in two states—Meghalaya and Manipur—were conducted to answer the research question. Both these states had low mCPR and high unmet needs. In Meghalaya, the TFR consistently remained high and so did the unwanted fertility. Whereas, in Manipur, the vulnerability of FP programming was high for all the districts. Based on the observations, the study team believe that FP programming in these two states needed programmatic attention to serve the contraceptive needs of couples.

Meghalaya

Meghalaya had the second lowest mCPR (23%) among all states and experienced only a 1 PP increase from 2015–16 to 2019–21. During the same time, the unmet need increased by 6 PP. The use of modern contraceptives did not increase in six districts, namely Ribhoi, East Khasi Hills, East Jantia Hills, Southwest Khasi Hills, West Jantia Hills and West Khasi Hills. Meghalaya showed a balanced method mix between the use of the permanent method and reversible modern method use (Figure 9).

Figure 9. Method mix and unmet need in Meghalaya and its districts, 2019–21

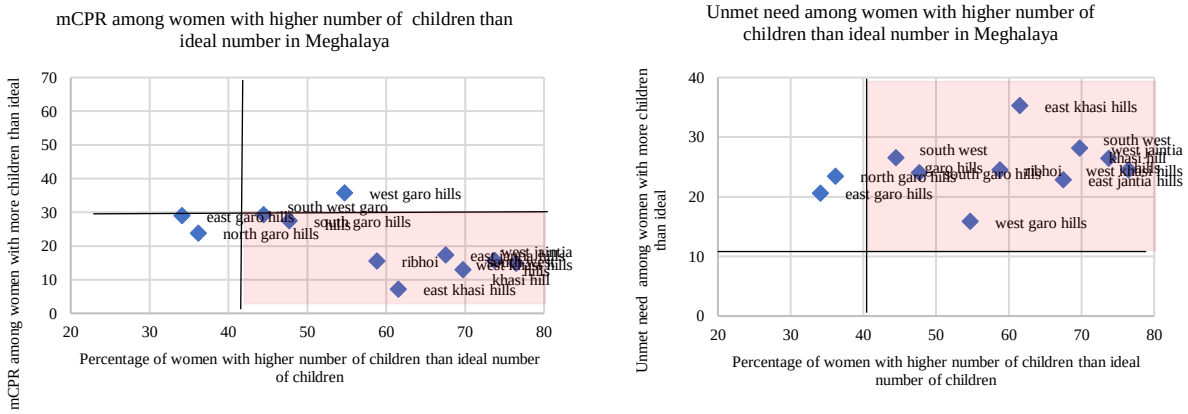


The discontinuation rate for reversible methods was very high at 51 percent. The major reasons reported for discontinuation were access related

reasons (for 16% of episodes of method use) like lack of access/source too far, costs too much and inconvenient to use. For 12% of episodes, the experience of side effect and health concern was reported as the reason for discontinuation. The use of traditional methods for spacing was high in three districts—Ribhoi, West Khasi Hills and South-West Khasi Hills.

The non-use of modern methods could result from a desire for a higher number of children or the lack of acceptance of method use despite reaching the desired family size. To examine the reason for non-use, the study team examined the percentage of women who had a higher number of children than what they reported as an ideal number of children and the mCPR among those women. The district-wise distribution of the percentage of these women is presented in Figure 10. Except for the West Garo Hill district, all other districts had an mCPR lower than the national average even among those women who had more children than their ideal number of children. When the unmet need among women of the same criteria were plotted, with the exception of North Garo district and East Garo district, all other districts had unmet needs higher than the national average.

Figure 10. Unmet need and use of modern contraceptive prevalence among women in Meghalaya who had a higher number of children than the ideal number of children they perceived, 2019–21



The pattern of contraceptive use in different population segments of Meghalaya is presented in Table 2. It was found that the use of contraceptives was low or high in certain population segments depending on the method. For example, the use of pills and condoms was low, while the use of traditional methods was high among the Christian population, the dominant religious group in the state. The use of condoms was low among the ST population who are the ethnic majority

in the state. Whereas, among non-tribal populations, the use of traditional methods was high, and the use of pills and condoms was low. In urban areas, the use of pills and IUCD was low. The use of reversible modern methods was high among women with higher education.

Table 2. Background Characteristics by the method used in the state of Meghalaya

	Nonusers	Pills	IUD	Injectable	Condom	Female Sterilization	Other Modern	Traditional method
	%	%	%	%	%	%	%	%
All married women	72.6	8.3	4.4	1.1	2.7	5.6	0.4	4.9
Religion								
Hindu	70.9	9.8	5.7	1.1	5.1	4.8	0.3	2.2
Muslim	70.1	16.3	0.6	0.8	7.1	1.7	1.9	1.4
Christian	72.3	8	4.4	1.1	2.3	6	0.4	5.6
Others	83.7	4.3	4.6	2.5	0.7	3.3	0	0.9
Tribal								
ST	78.1	4.8	2	0.3	5.4	6.1	0.4	2.9
Non-ST	72	8.4	4.8	1.2	2.3	5.7	0.4	5.3
State wealth index								
Poorest	76.7	8	3.3	1.6	1.3	3.2	0.2	5.7
Poorer	72.9	9	4.6	1.7	1.8	4.5	0.3	5
Middle	71.8	7.4	5.4	0.8	3	5.9	0.5	5.3
Richer	69.6	9.6	4.5	1.1	3.4	6.4	0.5	4.9
Richest	71.9	7.3	4.1	0.5	4.2	8	0.5	3.5
Residence								
Urban	74.1	6	2.9	0.7	3.9	7.1	0.3	4.9
Rural	72.2	8.9	4.7	1.2	2.4	5.2	0.4	4.9
Education								
No education	76.9	8.5	2.4	1.5	1.4	5.7	0	3.6
Primary	72	7.4	3.5	1.2	2.8	7	0.6	5.5
Secondary	70.8	9.5	5.4	1.1	2.8	4.9	0.5	5
Higher	77.9	2.2	4.4	0.5	4.8	5.2	0.1	5

Manipur

Manipur had the lowest mCPR (18%) among all states but experienced a 6 PP increase from 2015–16 to 2019–21. During the same time, the unmet need decreased by 18 PPs. The use of traditional methods was remarkably high in all the districts of Manipur and these methods were being used for both spacing as well as for the purpose of limiting births. In five districts—Bishnupur, Thoubal, Imphal West, Imphal East and Ukhrul—only traditional method increased in the last five years. The discontinuation rate for reversible method was also high at 58%, with side effects as the major concern reported for 15% of the incidents of use. Women with a higher number of children than their ideal number of children had higher unmet need and low mCPR in most of the districts.

Districts-wise percentage of women who had a higher number of children than what they reported as the ideal number and the mCPR among those women is presented in Figure 12. All districts in Manipur had an mCPR lower than the national average, even among those women who had more children than their ideal number of children. Also, the unmet need among these women was higher than the national average in four districts.

The pattern of contraceptive use in different population segments of Manipur is presented in Table 3. Use of pills and condoms was found to be low among the Christian population in the state. The use of pills was low among the ST population, who are the ethnic minority in the state. In urban areas, use of pills was low; whereas, condom use was low in rural areas. Women with higher education had a higher use of condoms and low female sterilization.

Figure 11. Method mix and unmet need in Manipur and its districts, 2019–21

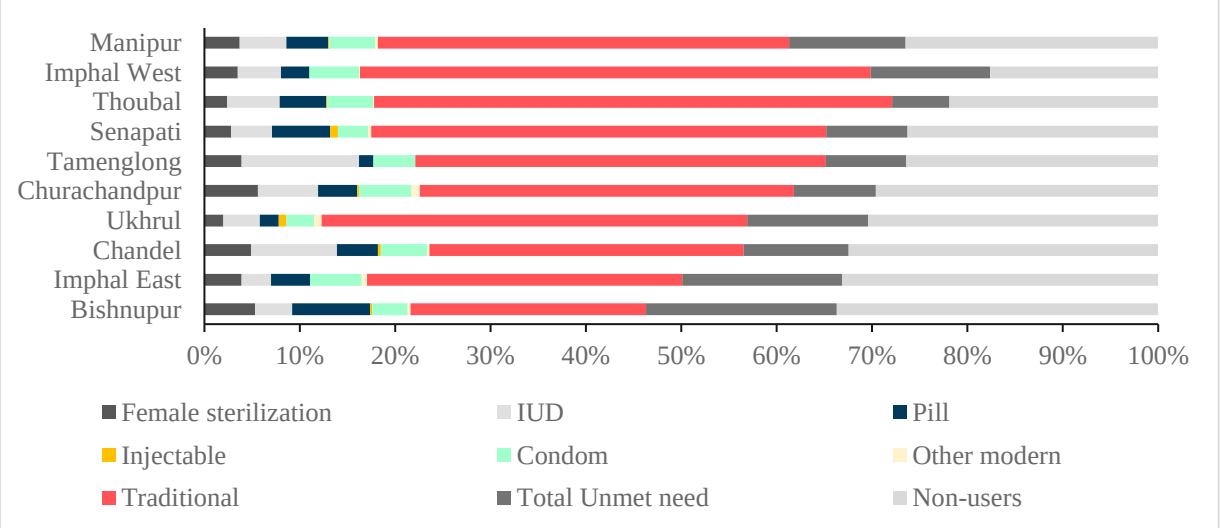


Figure 12. Unmet need and use of modern contraceptive prevalence in Manipur among women who had a higher number of children than the ideal number they perceived, 2019–21

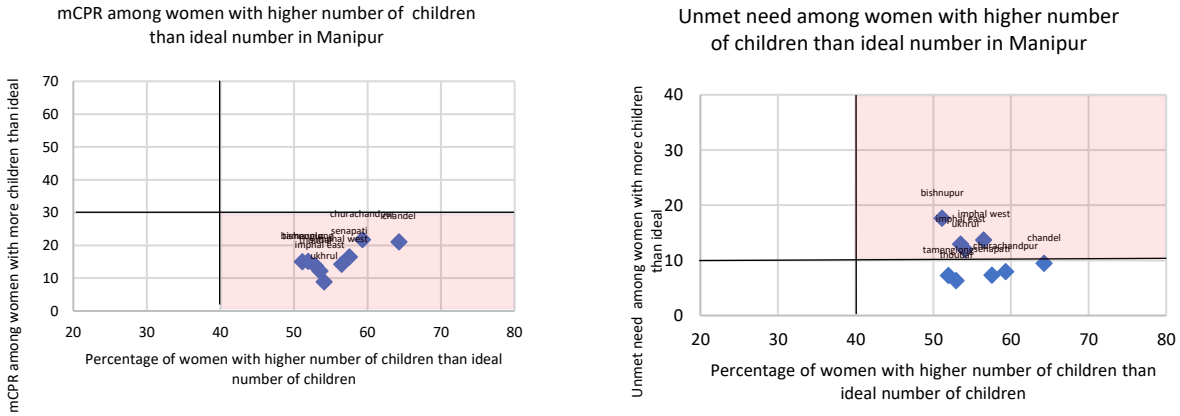


Table 3. Background characteristics by the method used in Manipur

	Nonusers	Pills	IUD	Injectable	Condom	Female Sterilization	Other Modern	Traditional method
	%	%	%	%	%	%	%	%
All married women	38.7	4.4	4.9	0.1	4.8	3.7	0.3	43.1
Religion								
Hindu	38	4.3	4.2	0.1	4.9	3.6	0.3	44.7
Muslim	37.7	4.9	5.4	0	5.1	3.6	0.3	43.1
Christian	39.4	3.5	6.7	0.3	4	4.2	0.5	41.5
Others	40.1	5.5	3.7	0.2	5.4	3.3	0.3	41.7
Tribal								
ST	38.7	3.7	6.7	0.4	4.1	4.2	0.5	41.8
Non-ST	38.8	4.7	4.2	0.1	5.2	3.5	0.3	43.3
State wealth index								
Poorest	38.2	5.2	5.9	0.2	2.9	3.6	0.4	43.8
Poorer	36.1	5.3	5.2	0.1	3.3	3.5	0.5	46
Middle	36.4	5.7	4	0.1	4.4	2.9	0	46.4
Richer	42.8	4.3	4.9	0.3	5.2	3.5	0.3	38.7
Richest	40	1.4	4.4	0	8.1	4.9	0.4	40.8
Residence								
Urban	38.5	3	5.5	0.1	6.1	4.4	0.2	42.3
Rural	38.8	5.2	4.5	0.2	4	3.2	0.4	43.6
Education								
No education	42.1	4.3	4.8	0	1.7	5.2	0	41.9
Primary	36.3	6.9	6.2	0.1	4.4	5.3	0.4	40.4
Secondary	37.2	4.6	5.3	0.2	4.7	3.4	0.4	44.3
Higher	44.2	1.8	2.5	0	7.3	2.6	0.3	41.3

Discussion

The current study aimed to study the situation of family planning services and uptake in northeastern states of India. Devaraj et al. (2024) examined the trends in unmet need for family planning in India over a 30-year period and aligning with that, this study has found that FP outcomes remain below the national average across all northeastern states. Moreover, a wide variation in mCPR, method-mix and unmet need was noticed, signifying the need for differential programmatic attention for each state in this region. Further, a preference for specific methods has been identified in smaller geographies, this may be due to cultural norms (Schenker & Rabenou, 1993), availability and accessibility of contraceptives and variation in program coverage (Bradley & Shiras, 2022). Except for Manipur and Nagaland, a considerably high use of reversible method is seen in the region. Yet, at the same time, discontinuation rates of reversible modern methods are also very high and the reason for discontinuation varies across states (Kapasia & Ghosh, 2024).

There is a need for FP programs to focus on the management of side-effects and improving accessibility to services. Programs can also be designed to explain the effective use of existing methods to manage method failure. It is estimated that more than 20% of discontinued episodes of method use can be addressed if existing programs incorporate these changes in service delivery.

In half of the states in the region, the TFR was reduced to below the replacement level of fertility and in all states the contribution of unwanted fertility to TFR was reduced over the last 15 years. In states that continue to have a high TFR, like Manipur and Arunachal Pradesh, the contribution of unwanted fertility signals towards the issues of accessibility of FP services for populations most in need of contraceptives. In the rural areas of Meghalaya and Manipur, especially in the ST population of these state, both TFR and unwanted fertility is high, which itself demands more programmatic focus in these geographies and population segments. On the other hand, the rural areas of Arunachal Pradesh and Assam show high unwanted fertility yet not-so-high TFR, indicating the need for improved access to FP services. A considerable proportion of women of all states reported that they are not using any contraceptives yet do not have unmet need for contraception similar to other developing coutries as Sedgh et al. (2016) reports. The unwanted fertility declined in all the states (Dharmalingam et al., 2014) over time but certain geographies and groups of people in specific states need to be focused upon for achieving better FP outcomes.

Demand-side interventions need to be strengthened in rural areas (Belaid et al., 2015)of Meghalaya, Manipur and Mizoram and within state-specific social groups. These social groups include the general population of Assam, OBC of Arunachal Pradesh and STs of Manipur and Meghalaya. Specifically, demand-side interventions are necessary for decreasing the TRF, such as motivating people to use FP methods and clarifying doubts and myths associated with contraceptive use. Rural areas in need for programmatic attention include Arunachal Pradesh, Tripura, Sikkim, Manipur and Meghalaya. While, the social groups include the SC population of Meghalaya, general population of Assam, all groups in Arunachal Pradesh and SC and the general population in Sikkim.

The issues of high unwanted pregnancies can be addressed by improving access (especially in adolcents) of contraception (Raidoo et al., 2022), providing better counselling (Mohamed et al., 2023) and promoting long-term methods use (Lotke, 2015; Mohamed et al., 2023). The use of traditional methods for limiting pregnancies is high in many of the districts and this could potentially be the cause for unwanted pregnancies (Ram et al., 2014). People affected by these indicators can either be motivated to use long acting or permanent methods or accessible short-term methods. The effective use of traditional methods can also be part of the program since these are hard-to-reach geographies.

Although 11% of the districts implemented the existing national-level programs successfully, these programs need to be reevaluated for effectiveness as 60% of districts have shown vulnerabilities for FP programming of some kind. Successful implementation can be used a source of learning to better modify programs based on local needs of particular states. It is suggested that districts that are vulnerable need to improve media exposure of FP, FLW outreach and quality of care which will eventually increase the mCPR and reduce the unmet need of the districts (Ghosh et al., 2021).

The HMIS data shows that the uptake of female sterilisation, IUCD and injectables declined from 2018–20 to 2019–21. However, the uptake of oral contraceptive pills and weekly pills has increased. This could be due to service disruption during the COVID-19 pandemic. At the same time, the uptake of reversible methods was also not high. Health facilities were required to respond to the pandemic and this may have left people with a choice to either use a reversible method or not use any method.

The uptake of new methods such as injectable and weekly pills was significantly high in some states. Specifically, injectable uptake was high in Assam, Manipur, Meghalaya and Tripura

and weekly pills in Assam, Arunachal Pradesh and Manipur. This increase in uptake of new methods in states like Manipur and Meghalaya indicates how the program and the people responded to the contraceptive needs during the COVID-19 pandemic when there was a lack of availability and accessibility to clinical methods.

The district-level analysis for uptake of methods by program vulnerability shows that there is either no change or very little change in districts with high vulnerability. However, the uptake must have a larger interquartile variation as some of the districts with no vulnerability responded well even during the crisis. This suggests the presence of a resilient health system in those districts.

Although the TFR is high in Meghalaya, the contribution of unwanted fertility to TFR has been found to be low. The women in this state also reported that they stopped using any reversible methods due to fertility-related reasons. Therefore, it is intuitive that maybe couples are not using any contraceptives as they want more children, leading to higher fertility. In view of these observations, the FP program needs to focus more on demand generation to address the issue of population stabilisation in Meghalaya.

Based on the observations made during this study in Manipur, the program vulnerability is high for all the districts. The contribution of unwanted fertility in rural areas especially among the ST population and use of traditional methods even for limiting childbearing were observed to be high. The state also shows a considerable proportion of method discontinuation due to the experience of side effects and health concerns (Ram et al., 2014; Zimmerman et al., 2021). The women who have more children than what they perceive as the ideal number are would be expected to use contraceptives more frequently. However, women in Manipur have high unmet needs and low mCPR. This indicates a need for a programmatic focus on improving access to high-quality contraceptive services that reach most-in-need couples.

Conclusion

The northeastern region needs a localised plan depending on the trends and method mix as differences can be found in fertility preferences by states, area of residence and population segments. The method mix and the use of traditional methods for limiting and spacing also varies at the district-level, indicating a significant range in contraceptive choices at the population-level. The region has several vulnerabilities such as geographic inaccessibility, international borders, being prone to disasters and occasionally experiencing instability within the population.

Localised and state- and district-specific program implementation can be a solution to address the challenge of building a resilient health system while responding to multiple vulnerabilities. Understanding the specific needs of different segments of the population is a promising way forward in responding to the FP needs of the region. These tailored efforts can help in reaching FP services to women and couples most in need and achieving universal health coverage by 2030 (World Health Organization, 2019).

Declarations

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Ethical declarations

The present study utilizes a secondary dataset available in the public domain for legitimate research purposes with no identifiable information on the survey participants. Hence, there is no requirement for any additional ethical approval.

Consent for publication

Not applicable. No details, images or videos related to individual participants were obtained. In addition, data are available in the public domain.

Competing interests

The authors declare no competing interests.

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