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Understanding Unmet Need for Family Planning through Background Characteristics of Women: Evidence from National Family Health Survey and District Level Health Survey

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ABSTRACT

The extent of unplanned pregnancy helps in understanding the amount of unmet need for family planning and fertility level. Addressing the unmet need for family planning is the priority of both population policy 2000 and SDGs. Odisha is an eastern state of India where socio-economic and demographic indicators are not good on many fronts and also complex in nature to understand but one thing is that TFR is reducing and contraceptive practices are increasing but still a significant portion of women are in the category of unmet need. In this context, it is relevant to know the unmet need groups and the background factors of women responsible for unmet need for contraception using logistic regression with the help of the NFHS and DLHS. The study found that the trend is declining but tribes and Muslims have more unmet need and economic condition and demographic factors like age and living children of women play an important role in deciding contraceptive practices but education level and mass media exposure of women have no significant role in using methods. Besides, variations in results are observed between data sets and also different geographical locations. However, after understanding the variations in results, the focus should be on individuals rather than groups in line with SDG.

Keywords: Fertility, Contraceptive practice, Unmet need for family planning, Unplanned pregnancy, Public health, Culture

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I. INTRODUCTION

Fertility, mortality and migration are three important components of the population growth and responsible for demographic transition (Srinivasan, 1998). The changes in fertility and mortality level i.e. natural growth is the prime reason of population growth keeping aside migration because its role is limited due to its small volume. One of the best options to check population growth is to reducing the fertility level because it is inappropriate to increase the mortality level. Contraceptive use, one of the proximate determinants of fertility, plays an important role in lowering the fertility. The other three proximate determinants are marriage, induced abortion and lactational infecundability. Contraceptive use means use of various contraceptive methods, generally known as family planning methods, are two types like spacing and limiting. Spacing methods, known as temporary methods, help in keeping space between pregnancies and it is reversible, allow women to become pregnant again. According to fourth national family health survey (NFHS-4), these are condom for males and females, contraceptives pills, intra-uterine devices IUD/PPIUD, injectables, lactational amenorrhoea methods, emergency contraception, rhythm and withdrawal methods. Limiting methods are permanent and also irreversible that controls the unplanned pregnancies. These are tubectomy for females and vasectomy for males, generally known as sterilization. The main aim of family planning methods is to check unplanned pregnancy and also provides better reproductive care as well keeps a check on various sexually transmitted diseases (Rout & Mohapatra, 2018). Condoms, the only contraceptive method can prevent both pregnancy and transmission of sexually transmitted infections, including HIV. But here the study will only focus on unplanned pregnancy. Unplanned pregnancy is a public health issue in both low and high income countries. Unplanned pregnancy means pregnancy that is either unwanted or mistimed at the time of conception (Rantunga & Jayaratne, 2020). Unwanted pregnancy means pregnancy occurs when no children or no more children are desired. Mistimed pregnancy means pregnancy occurs earlier than desire. Unplanned pregnancy is also known as unintended pregnancy. The extent of unintended pregnancies is the fundamental issue to understand fertility and most importantly unmet need for family planning.

These pregnancies are due to poor knowledge of contraception, non-use of contraception and, inconsistent or incorrect use of effective contraceptive methods, contraceptive failures and less commonly rape (Rantunga & Jayaratne, 2020, Klima, 1998). Besides, poor educational and economic status, malnutrition, lack of access to health services and health education, lack of sanitation and socio-cultural behaviors are the reasons of unintended pregnancies in developing countries. Unintended pregnancy has substantial negative consequences on women, their families and society like induced abortions sometime unsafe and long term health effects, infertility, malnutrition, mental illness, low birth weight, pre-mature death, infant mortality and maternal mortality. Unplanned pregnancy is the outcome of the unmet need for family planning. According to world health organization, high rates of unintended pregnancies are linked to gaps in family planning services. Now the questions are what do we mean by unmet need and who are these groups and why is it important to discuss. According to world health organization, women who are fecund and sexually active but do not use any method of contraception and report not wanting any more children or wanting to delay the next child for at least

two more years are coming under the group of unmet need for family planning. Unmet need is the gap between women's reproductive intentions and their contraceptive behavior and the specific groups are adolescents, migrants, urban slum dwellers, refugees and women in post-partum period. But here the standard definition of unmet need is used according to national family health survey (NFHS) which follow the demographic and health surveys (DHS). Unmet need for family planning includes women who are fecund, married or living in union, presumed to be sexually active, wanting to delay the next child for at least 2 more years or not wanting any more children but do not use any method of contraception as per national family health survey. The most important aspect about unmet need is that this group is not interested in child birth but is not using any contraceptives methods due to specific reasons. That means there are chances of unintended pregnancy.

After knowing the importance of the unmet need, it is somehow necessary to know the Indian family planning programme because unmet need is one of the indicators to assess the effectiveness of the family planning programme. India launched national level family planning programme in 1952 viewing alarming rate of population growth, first of this kind in the world and adopted many population policies with different strategies and approaches as per requirement of the time. Later, family planning was integrated into reproductive and child health programme to cater the healthcare needs of women and children and it envisages that couples will control their fertility and have sexual relations free from the fear of the pregnancy, according to second round district level of household survey 2002-04. One of the components of the RCH programme is to provide free contraceptive services. The latest national population policy (NPP) 2000 aimed to achieve replacement level of fertility (TFR=2.1) by 2010. The policy gave importance to the consent of citizens and focused on the informed choices and voluntary acceptance of contraceptive methods while maintaining the target free approach. Besides, the policy focused on social determinants of health, women empowerment and education, community participation and convergence of service delivery at community level (Quraishi, 2021). In addition to, individual needs like meeting unmet need for family planning and promotion of accessibility, availability and affordability (3A's) of contraceptive methods ensuring that the couples have children by choice not by chance. The policy accepted both reproductive health and rights-based approach as discussed in international conference on population and development (ICPD) held at Cairo in 1994. The conference focused on quality of life that means every person counts rather population is not just counting all person and marked as a landmark event at international level on population and development. Later, this approach was accepted into the ongoing family planning programme. The long-term objective of the policy is to achieve stable population at a level consistent with the requirements of sustainable economic growth, social development and environment protection. However, the immediate objective of the policy is to address unmet need for family planning. Lastly, India's commitment to London summit in 2012 which is known as 'Vision family planning 2020' of India and subsequently India adopted the compressive reproductive, maternal, newborn, child and adolescent health (RMNCH+A) strategy to address different groups more specifically in 2013. According to family planning and the 2030 agenda for sustainable development: data booklet of United Nations, one of the key goals of sustainable development goals (SDGs) is to ensure the universal access of sexual and reproductive health care services including family planning with proper information and education by 2030 and also monitor the key family planning

indicators. India's population control strategy was never adopted coercive measures except during emergency period.

Odisha is one of the eastern states of India having rich natural resources and sharing border with states like West Bengal in the northeast, Chhattisgarh in the west, Jharkhand in the north and Andhra Pradesh on the south and its eastern part is connected to Bay of Bengal. According to census 2011, the state has a huge amount of population from Scheduled Castes (17.1%) and Scheduled Tribes (22.8%), which is more than the national average. Besides, Literacy rate, urbanization rate and life expectancy at birth are also lower than the national average. However, the total fertility rate, sex ratio, female work participation rate and overall nutritional status of children under five of Odisha are better than India. While under-five mortality is slightly good comparing to national average, the Infant mortality and maternal mortality ratio are higher in Odisha than India as per the latest round of NFHS-5 and SRS, 2022. According to SDG the maternal mortality ratio should less than 70 per 100000 live births but it is 136 with confidence interval 85-188 while few states have already achieved this. As per NFHS-4, the teenage pregnancy among young women age 15-19 is still 8 percent in Odisha. Unplanned pregnancies are relatively common in Odisha. If all women would have only wanted children, the total fertility rate would have been 1.7 instead 2.1, according to NFHS-4. The multi-dimensional poverty index-2021 baseline report based on NFHS-4 data, Odisha ranks 8th from the bottom and having nearly 30 percent of population are poor. It is clear from above information that Odisha's socio-economic and demographic indicators are not good in many front and also complex in nature to understand. Another important issue is that Odisha adopted two-child norms for candidates of both panchayati raj institutions (PRIs) and urban local bodies (ULBs). In this context, it is necessary to know contraceptive practice and unmet need for contraception of Odisha because the concept of pregnancy is not only limited to demographic indicator rather it is a broader concept and linked to development.

According to world health organization, 1.1 billion women have need for family planning among the 1.9 billion women of reproductive age group (15-49 years) worldwide in 2019. Among these 1.1 billion women, 842 million have met need and 270 million have unmet need for contraception. Due to Covid-19, 7 million unintended pregnancies, as estimated by UNICEF, have occurred globally due to supply chain disruption of contraceptives. An analysis on low and middle income countries (LMICs) has estimated that a 10% decline in the use of contraception could result roughly 49 million women with an unmet need for contraception and extra 15 million unintended pregnancies in the year following the covid-19 pandemic (Dimond-Smith, et al. 2022). According to 5th round of NFHS conducted in 2019-21, the unmet need for family planning in India is 9.4 percent and for spacing and limiting the figure is 5.4 percent and 4 percent respectively. The contraceptive prevalence (met need) of India is 66.7 percent whereas the total demand for family planning is 76.1 percent. In Odisha, total unmet need is 7.2 percent whereas spacing is 2.5 percent and limiting is 4.7 percent. Contraceptive prevalence (met need) is 74.1 percent and total demand for family planning is 81.3 percent. The trend of contraceptive prevalence rate (for any method) is increasing for both India and Odisha but in NFHS-4, the rate slightly declines for India. Initially, the rate is high for India but gradually the trend becomes high for Odisha

after NFHS-3. Now, question is, after increase in contraceptive practices across the women groups, why still a significant portion of women are in the unmet need groups? That means, contraceptive behavior may be affected due to women's background characteristics. Unmet need has a great importance in family planning programme as it identifies the group of women who want to use contraception but are not using it. It is an important indicator for assessing the potential demand for family planning services. The implied fertility rate of India is 2.1 from the NFHS level of 2.68, a reduction of 22% after satisfying unmet need whereas the implied fertility rate for Odisha is 1.82 from 2.37 with a reduction of 23% after satisfying unmet need (Mohapatra, 2015). The fertility rates of women are also reducing after satisfying unmet need on women's various socio-economic variables (place of residence, educational level, religion, social groups and wealth index). Meting unmet need is important even in conditions of low fertility and giving importance to individual needs (Mohapatra, 2018). After knowing the importance of unmet need in determination of fertility, it is imperative to know the group of women having unmet need and also their background characteristics in determining unmet need. Now questions arise whether different background factors like caste, religion, region, economic status, age and last but not the least the number of living children of women have different practice in accepting contraceptive methods or something else. Specifically, this paper tries to understand the past, present and future contraceptive behavior of women of Odisha. To know this, it needs to understand the trends, patterns of unmet need and the most importantly, the relationship between women having unmet need and their background characteristics.

II. DATA AND METHODS

Data and Analytical Tools

To know the above questions, the NFHS level data set from first round to fifth round are used for analysis. The first NFHS was conducted in 1992-93 whereas the second and third round was conducted in 1998-99 and 2005-06 respectively. The fourth and the fifth round, the latest one, were conducted in 2015-16 and 2019-21 respectively. It is the largest dataset in the world related to health and its different measures. It is highly comparable in nature and it is developed according to demographic and health survey (DHS). All the surveys were conducted under the stewardship of ministry of health and family welfare, Government of India. The ministry assigned the International institute of population sciences (IIPS) as the nodal agency for surveys. Women age between 15 and 49 was interviewed for unmet need. Understanding the relevance of micro level data, the first district level household survey (DLHS) in 1998-99 was collected by same department and agency. Consequently, another three DLHS were conducted 2002-04 (DLHS-2), 2007-08 (DLHS-3) and 2012-13 (DLHS-4) on various aspects of health and most importantly family planning. Unlike the second round of DLHS where currently married women age 15-44 were interviewed, ever-married women of age15-49 were interviewed in DLHS-3. Note that there was not much time gap between the two surveys, NFHS-3 was carried out during 2005-06 and DLHS-3 during 2007-08. But, the survey instruments are different somewhat. Therefore, it is useful to see if the results differ. In DLHS-3, two definitions of unmet need were used, one corresponding to DLHS-2 and the other corresponding to NFHS-3. Here the analysis uses the NFHS-3 definition of unmet need for DLHS-3 which is comparable, unlike DLHS-2. Both the data set of NFHS and DLHS of different level are used to find trend and pattern of unmet need and also the paper discusses different background

characteristics of woman and their influence on the total unmet need for family planning and spacing as well as limiting in context of Odisha and also in rural coastal Odisha. The region of coastal Odisha has eight districts namely are Baleswar, Bhadrak, Kendrapara, Jagatsinghpur, Cuttack, Khurda, Puri and Ganjam. The basic difference between coastal part and other part of Odisha is the difference between the concentrations of tribal population that means the population of scheduled tribes is high in other part of Odisha. Besides, the unmet need for family planning is high in rural part of Odisha.

To see the differentials in unmet need by background factors and assess net effects of these on unmet need, the bi-variate (correlation) and binary logistic regression analysis are carried out. Binary logistic regression is an appropriate technique to analyze the relationship between a set of predictor variables and a dependent variable which is dichotomous. According to Luiz Paulo Favero, Patricia Belfiore and Rafael de Freitas Souza in a paper in 2023, the model is an expression of the probability of an event occurrence defined between two possibilities as a function of determined independent variables. Logistic regression is based on probabilities, odds and odds ratios. In this case, unmet need, whether a woman has unmet need for family planning or not, as ascertained by the DHS definition, is the dependent variable. The predictor variables may be either categorical or in ratio scale.

The formula for logistic regression is as follows:

$$\text{Log } \{P/ (1-P)\} = \beta 0 + \beta 1X1 + \ldots\ldots + \beta kXk$$

Where P is the probability that Y = 1, for k independent variables. The left hand side equation is referred as the logit or simply the log-odds. The logit model assumes a non-linear relationship between the dependent variable and independent variable and the coefficient indicates log odds, according to Suzanne Davies Withers in a paper in 2009. To make log odds interpretable, the exponentiated value of the coefficient ($e\beta$) provides the odds ratio for the independent variable, controlling other variables in the model. The coefficients are estimated using maximum likelihood method instead of least square method. Categories are known as odds ratio and one category is labeled as 'reference' and it is interpreted like the influence of particular category relative to the reference category. The categories get treated as dummy variables and the exponential of the logistic regression coefficient, Exp (βkj) is the odds ratio of category j of the kth variable to the reference category of it. The analysis is based on the unit level data for currently married women in the NFHS-3 and ever-married women of DLHS-3 for Odisha and for the eight districts of Odisha pooled from DLHS-3.

Variables

There are three dependent variables (or the response variable), unmet need for family planning, unmet need for spacing and unmet need for limiting. Unmet need for family planning is the combination of both the unmet need for spacing and the unmet need for limiting. The coding schemes for the dependent variables are as follows: Unmet need is coded in two categories, has unmet need and otherwise. Unmet need for spacing and limiting are also categorized in a like manner. The acceptance of family planning methods is affected by the demand factors. These

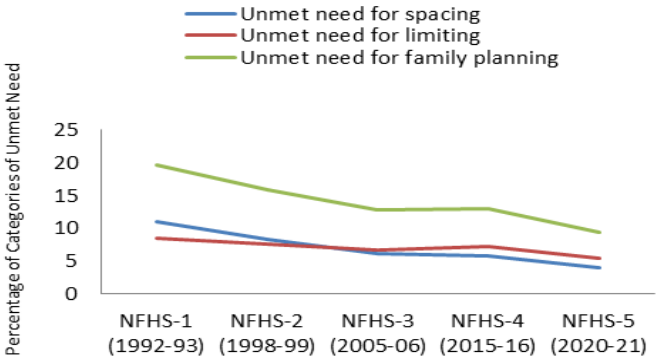
demand factors, commonly known as independent variables, are social, economic and demographic in nature. The social variables include caste/tribe, religion, educational level, exposure to mass media and place of residence of the woman. The economic variables included are standard of living and the work status of woman. The demographic variables in this framework include age and the number of living children of the woman. The independent variables are coded according to suitability and availability of data. In NFHS-3, social groups are classified into four categories like scheduled castes, scheduled tribes, other backward castes, and others but in DLHS-3, OBCs and others jointly represent as one category. That means there are four categories in NFHS whereas it is three in DLHS. Like social group, the variable religion has also different coding system in both NFHS and DLHS. Three categories are framed as Hindu, Muslim and others for NFHS-3 whereas in DLHS-3, only two categories Hindu and non-Hindu are made for the analysis. The category scheduled caste and Hindu are the reference category in both the data set. On the basis of the highest educational level, women are categorized as no education, primary level of education, secondary level of education, higher level of education. But in the analysis of DLHS-3 data, only two categories, illiterate and literate are used. Women having no education and illiterate women are taken as the reference category in both the data set respectively. The exposure to mass media is categorized as no and yes in the analysis of NFHS-3, whereas in DLHS-3, the data is not available. The place of residence of women is coded into rural and urban and it is same in both data sets. Women with no exposure to mass media and women living in rural areas are the reference category. According to National Family Health Survey women are classified into 5 categories of wealth index namely lowest, second, middle, fourth and highest. Wealth index is made by combining 33 household characteristics into a single index. The household population is divided into five equal groups of 20 percent each (quintals) at the national level from lowest to highest. In a similar manner a composite index based on household assets and housing characteristics into three categories and coded as: low level standard of living, medium level standard of living and high level of standard of living. The National Family Health Survey considers work as any kind of job for which a woman is paid in cash or in kind as well as unpaid work on a family farm or business and classifies women as non-working and working where the first group is known as reference category. Women's age is coded into three categories i.e. less than twenty five years, 25-35 years, and more than 35 years. Women less than 25 years are the reference category. Based on the number of living children, women are classified as less than and equal to 2 living children and More than 2 living children where the first one is the reference category.

III. ANALYSIS AND RESULTS

The result part is basically divided into four parts. Understanding trends of unmet need for family planning give glimpse of past and also show the current situation while pattern and differentials also show the current status of unmet need. Lastly, binary logistic regression analysis will help in knowing the relationship of various background factors of women with their contraceptive practices and also predict the future behavior.

Trends of Unmet Need for Family Planning in Odisha

Figure 1: Trends of Unmet Need for Family Planning, Spacing and Limiting from NFHS-1 to NFHS-5, India



Source: Computed from the Data Files of NFHS-1 to NFHS-5

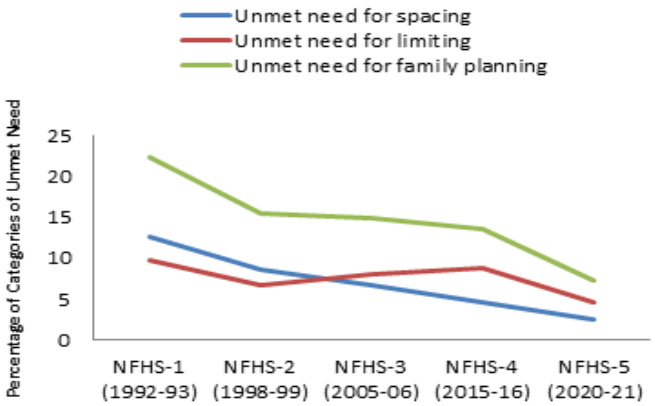
Unmet need is decreasing gradually from NFHS-1 to NFHS-5 in both India and Odisha but it is more satisfactory in case of Odisha compare to India. It is same for both spacing and limiting. But, there is slight difference (say upward movement) in trend; in case of total unmet need, and unmet need for limiting of India and unmet need for limiting of Odisha in NFHS-4. The most important aspect is that the percentage of unmet need remain very close from NFHS-1 to NFHS-3. It is less than 3 percentages in case of India whereas it is less than 2 percentages in case of Odisha.

Table-1: Trends in Unmet Need for Family Planning in India and Odisha, NFHS-1, 2, 3, 4 and 5

Survey	India			Odisha		
	Spacing	Limiting	Total	Spacing	Limiting	Total
NFHS-1 (1992-93)	11	8.5	19.5	12.7	9.7	22.4
NFHS-2 (1998-99)	8.3	7.5	15.8	8.7	6.8	15.5
NFHS-3 (2005-06)	6.2	6.6	12.8	6.8	8.1	14.9
NFHS-4 (2015-16)	5.7	7.2	12.9	4.7	8.9	13.6
NFHS-5 (2020-21)	4	5.4	9.4	2.5	4.7	7.2

Source: Computed from the Data Files of NFHS-1 to NFHS-5

Figure 2: Trends of Unmet Need for Family Planning, Spacing and Limiting from NFHS-1 to NFHS-5, Odisha



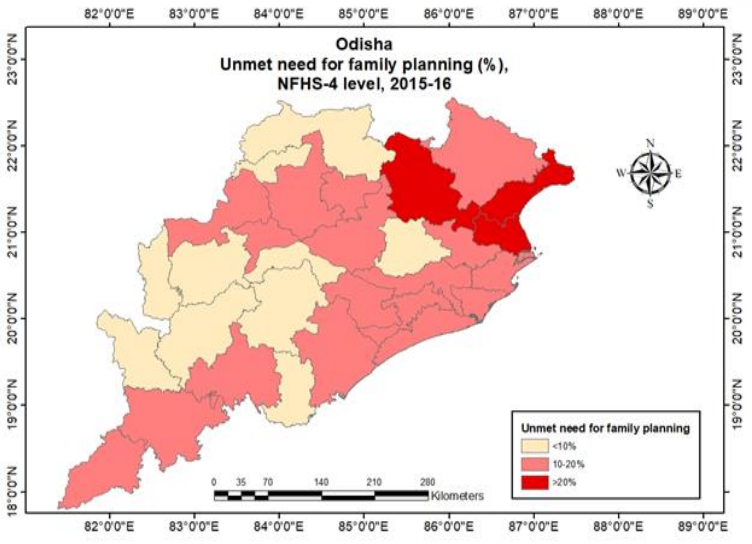
Source: Computed from the Data Files of NFHS-1 to NFHS-5

Regional Patterns in Concentration of Unmet Need for Family Planning in Odisha

Both total unmet need and limiting are high in Kendujhar district while spacing is high in Bhadrak district. Jharsuguda occupies the lowest percentage in all categories of unmet need, limiting and spacing. To make it simple, three different scales (low,

middle and high) are prepared for all the categories of total unmet need, limiting and spacing respectively and the scale varies according to the range of the percentage. The percentage of unmet need for family planning is categorized as less than 10 (low), 10 to 20 (moderate) and more than 20 (high). The districts 'less than 10 percentages' are Sundargarha, Nuapada, Nabarangapur, Kandhamal, Kalahandi, Jharsuguda, Gajapati, Dhenkanal, Baudh and Bolangir. The districts of '10 to 20 percentage' group are Anugul, Bargarh, Cuttack, Debagarh, Ganjam, Jagatsingpur, Jajpur, Kendrapara, Khordha, Koraput, Malkangiri, Mayurbhanj, Nayagarh, Puri, Rayagada, Sambalpur and Subarnapur. The districts belong to last group 'more than 20' are Balesore, Bhadrak and Kendujhar.

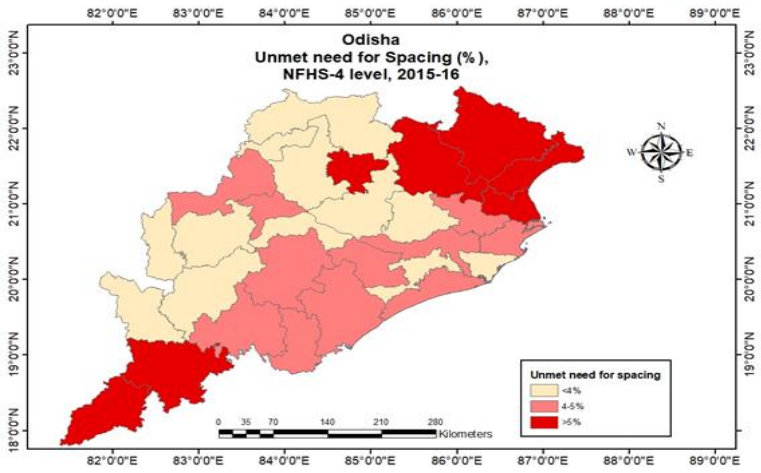
Figure 3: Concentration of Unmet Need for Family Planning in NFHS-4, Odisha



Source: Computed from the Data Files of NFHS-4, 2015-16

The percentage of unmet need for spacing is categorized as less than 4 (low), 4 to 5 (moderate) and 5 and above (high). The districts belong to 'less than 4' are Anugul, Bolangir, Baudh, Dhenkanal, Jagatsingpur, Jharsuguda, Kalahandi, Khordha, Nabarangapur, Nuapada, Sambalpur and Sundargarh. The districts coming under '4 to 5 percentage' group are Bargarh, Cuttack, Gajapati, Ganjam, Jajpur, Kandhamal, Kendrapara, Nayagarh, Puri, Ryagada and Subarnpur. The districts of '5 and above percentage' group are Balesore, Bhadrak, Debagarh, Kendujhar, Koraput, Malkangiri and Mayurbhanj.

Figure 4: Concentration of Unmet Need for Spacing in NFHS-4, Odisha

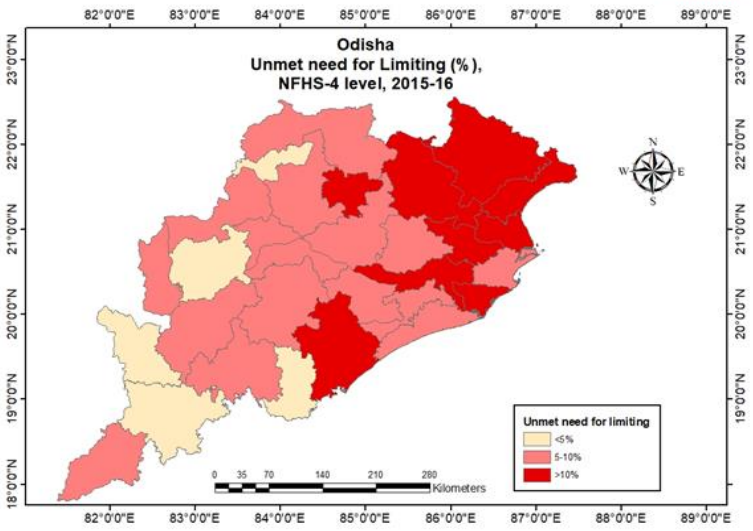


Source: Computed from the Data Files of NFHS-4, 2015-16

The percentage of unmet need for limiting is categorized as less than 5 (low), 5 to 10 (moderate) and 10 and above (high). The districts belong to 'less than 5 percentage' group are Bolangir, Gajapati, Jharsuguda, Koraput and Nabarangpur. The districts coming under '5 to 10 percentage' group are Sundargarh, Subarnpur,

Sambalpur, Rayagada, Puri, Nuapada, Nayagarh, Malkangiri, Khordha, Kendrapara, Kandhamal, Kalahandi, Dhenkanal, Baudh, Bargarh and Anugul. The last group '10 and above percentage' includes Balsore, Bhadrak, Cuttack, Debagarh, Ganjam, Jagatsinghpur, Jajpur, Kendujhar and Mayurbhanj. The three northern districts of Odisha i.e. Balesore, Bhadrak and Kendujhar have severe unmet need in all categories where first two districts belong coastal part of Odisha.

Figure 5: Concentration of Unmet Need for Limiting in NFHS-4, Odisha



Source: Computed from the Data Files of NFHS-4, 2015-16

Differentials in Unmet Need for Family planning, Spacing and Limiting in Odisha

The NFHS-3 dataset of Odisha (Table 2) reveals the differentials by various background characteristics of women and different categories of unmet need. The total unmet need and unmet need for limiting is more for scheduled tribes' women whereas unmet need for spacing is more among other backward castes women. Women belong to other category have less unmet need and also spacing but limiting is the lowest among the OBC. Muslim women have more amount of unmet need in all categories and Hindu women have less unmet need and limiting whereas women having other than Hindu and Muslim have less spacing. Interestingly, women's having secondary level of education have more total unmet need and unmet need for spacing than women with no education whereas women having primary level education have less unmet need in all categories than higher level of education. However, the percentage of unmet need for limiting is more among the women having no education. Women having no exposure to mass media have more total unmet need and also limiting whereas women having exposure to mass media have more spacing. Women living in rural areas have more unmet need for family planning. Unmet need for family planning is more among the women having low level of standard of living. The non-working women have more unmet need for family planning. Total unmet need and unmet need for spacing is more for the women having the age less than 25 years but unmet need for limiting is more in the age group of 25 to 35 years of women. Women in the age group of more than 35 years have less unmet need. Total unmet need and unmet need for spacing is more for the women having less than and equal to 2 children whereas unmet need for limiting is more for the women having more than 2 children. However, the overall differentials are narrow.

Table-2: Unmet Need for Family Planning, by Various Background Characteristics, Odisha, NFHS-3, 2005-06

Background Characteristics	Total Unmet Need (%)	Unmet Need for Spacing (%)	Unmet Need for Limiting (%)
Social Groups			
Scheduled caste	14.5	6.7	7.8
Scheduled Tribe	17.8	7.7	10.1
Other backward caste	14.4	7.9	6.5
Others	13.9	5.5	8.4
Religion			
Hindu	14.8	6.8	8
Muslim	20.4	8.6	11.8
Others	17.7	5.9	11.8
Educational Level			
No Education	15.4	5.9	9.5
Primary level Education	9.9	4	5.8
Secondary level of Education	17.8	10.2	7.5
Higher level of Education	13.8	5.7	8.1
Exposure to Mass Media			
No	15.7	6.2	9.4
Yes	14.6	7	7.6
Place of Residence			
Urban	12.5	5.6	6.9
Rural	15.4	7	8.3
Standard of Living			
Low level of standard of living	16.1	6.5	9.6
Medium level of standard of living	14.6	6.6	8
High level of standard of living	10.6	4.6	6
Work Status			
Not working	15.7	7.6	8.1
Working	13	4.9	8.1
Age			
<25 years age	25.6	19.2	6.5
25- 35 years age	17.4	5.6	11.8
More than 35 years	5.5	0.2	5.3
Number of living children			
Less than and equal to 2	17.1	10.5	6.6
More than and equal to 3	11.8	1.6	10.1
All	**14.9**	**6.8**	**8.1**

Source: Computed from the Data Files of NFHS-3

Table-3: Unmet Need for Family Planning, by Various Background Characteristics, Odisha, DLHS-3, 2007-08 (using NFHS-3 Definition)

Background Characteristics	Total Unmet Need (%)	Unmet Need for Spacing (%)	Unmet Need for Limiting (%)
Social Groups			
Scheduled Castes	14.1	4.9	9.2
Scheduled Tribes	14.6	4.8	9.8
Other Backward Castes and Others	14	4.2	9.8
Religion			
Hindu	14.1	4.5	9.7
Non-Hindu	14.7	5.4	9.3
Educational Level			
Illiterate	13.6	3.8	9.8
Literate	14.7	5.1	9.5
Place of Residence			
Rural	14.5	4.7	9.8
Urban	11.9	3.2	8.7
Wealth Index			
Poorest	15.3	4.7	10.6
Second	13.6	4.7	8.8
Middle	14.1	4.7	9.4
Second	13.2	4.3	8.9
Richest	12	3.4	8.5
Work status			
Not working	14.7	5.1	9.6
Working	14	3.7	10.4
Age			
<25 years	18.8	12.3	6.5
25- 35 years	17.5	4.3	13.2
>35 years	8.2	0.5	7.7
Number of Living Children			
Less than and equal to 2	14.4	7.4	7
More than and equal to 3	13.9	1.4	12.6
All	**14.2**	**4.5**	**9.6**

Source: Computed from the Data Files of DLHS-3

The DLHS-3 data set for Odisha (Table 3) reveals the differentials in total unmet need, unmet need for spacing and limiting by different background characteristics of women. Scheduled tribes women have more overall unmet need and limiting whereas scheduled castes women have more in spacing but less in limiting. The other category including OBC women has less both total unmet need and spacing. The non-Hindus women have higher unmet need and spacing but Hindu women have more limiting. Literate women also have high unmet need. The unmet need and spacing as well limiting have the highest percentage in rural areas. The poorest have the highest percentage of unmet need whereas the richest have the lowest. The non-working women have more unmet need and spacing whereas working women have more unmet need for limiting. The younger women show more unmet need and spacing whereas the older women have higher unmet need for limiting. The women having less than and equal to two children have more unmet need and spacing whereas women having more than and equal to three children have more limiting.

Table 4: Unmet Need for Family Planning, by Various Background Characteristics, Rural Coastal (Eight Districts) Odisha, DLHS-3, 2007-08 (using NFHS-3 Definition)

Background Characteristics	Total Unmet Need (%)	Unmet Need for Spacing (%)	Unmet Need for Limiting (%)
Social Groups			
Scheduled Castes	13.6	5.1	8.5
Scheduled Tribes	22.5	6.9	15.6
Other Backward Castes/Others	14.8	4.2	10.5
Religion			
Hindu	14.6	4.5	10.2
Non-Hindu	23.9	7.7	16.2
Educational Level			
Illiterate	13.7	3.8	9.9
Literate	15.2	4.8	10.4
Wealth Index			
Poorest	17.3	5.2	12.2
Second	14.4	3.7	10.6
Middle	14.6	4.9	9.6
Second	13.5	4.2	9.3
Richest	13.5	4.7	8.8
Work Status			
Not working	14.9	4.7	10.2
Working	12.7	2.9	9.8
Age			
Less than 25 years	25.3	15.8	9.5
25- 35 years	17.6	4.5	13.1
More than 35	8.3	0.4	7.9
Number of Living children			
Less than and equal to 2	17.4	8.1	9.3
More than and equal to 3	12	0.8	11.3
All	**14.8**	**4.6**	**10.2**

Source: Computed from the Data Files of DLHS-3

The DLHS-3 dataset for rural coastal Odisha (Table-4) reveals the differentials of total unmet need and spacing as well as limiting with different background characteristics of women. The coastal Odisha consists of eight districts, i.e., Baleswar, Bhadrak, Kendrapara, Cuttack, Jagatsighpur, Khurda, Puri and Ganjam. Scheduled Tribes have more unmet need for spacing and limiting. Scheduled castes have low total unmet need and for limiting whereas Other Backward Castes and others have low unmet need for spacing. The Non-Hindus and literates have more unmet need. The poorest have more unmet need and the richest have low unmet need except for spacing. The unmet need is high among non-working women. The unmet need is higher among younger women than older. The percentage of spacing is very low after 35 years of age. Women having 2 children have more total unmet need and for spacing but low in limiting. The differentials as seen from the above DLHS-3 results are not large; this is also the case with the NFHS-3 results for Odisha.

Analysis of Binary Logistic Regression for Unmet Need for Family planning of Odisha

After knowing the differentials i.e. gross variations, of different unmet need among women's background characteristics of Odisha and rural coastal Odisha based on both NFHS-3 and DLHS-3, it is necessary to find the strong associations, to know the net influences, among women's background factors and various unmet need through binary logistic regression analysis. Table-5 gives the result of women's background characteristics and their influence on different categories of unmet need of Odisha. It is found that women having primary education are less likely of overall unmet need and unmet need for limiting with reference to no education. Women having higher standard of living and those are working are less likely of unmet need reference to women with low level of standard of living and non-working respectively. Age of women shows a negative relationship with total unmet need and unmet need for spacing. As age of women increases, both unmet need and spacing decreases. But it is not same in case of unmet need for limiting; women in the age group of 25 to 35 years have more likelihood of unmet need for limiting and women in the age group of more than 35 years have less likelihood of limiting with the reference to women in the age group of less than 25 years. Women having more than two children are more likely of unmet need and unmet need for limiting and less likely of unmet need for spacing with reference to women in the age group of less than and equal to two children.

The results (Table 6) show that women of others including OBCs category are more likely of unmet need and unmet need for limiting with reference to SCs. Non-Hindu women are more likely of unmet need for spacing than Hindu. Women who were literate are more likely of unmet need and unmet need for limiting than illiterate. The urban women are less likely of overall unmet need and unmet need for spacing than rural. With increasing wealth index, the level of total unmet need and unmet need for spacing and limiting decline but it is not systematic decline in case of unmet need for limiting. Working women are less likely of overall unmet need and unmet need for spacing with reference to non-working women. With increasing the age of women both total unmet need and unmet need for spacing tends to decline. Women over 25 years of age are less likely of unmet need with reference to women aged less than 25 years. Women having more than 2 children are more likely of

both total unmet need and unmet need for limiting but women having more than 2 children are less likely of unmet need for spacing than women less than and equal to 2 children.

Table-5: Unmet Need for Family Planning, unmet need for spacing and limiting by Various Background Factors: Results from Binary Logistic Regression, Odisha, NFHS-3, 2005-06

Women's Background Characteristics	(Exp β) (Odds ratio) Unmet need for Family Planning	(Exp β) (Odds ratio) Unmet Need for Spacing	(Exp β) (Odds ratio) Unmet Need for Limiting
Social Groups			
Scheduled caste®			
Scheduled tribe	1.111	0.877	1.285
Other backward caste	1.974	1.159	0.976
Others	1.143	0.867	1.356
Religion			
Hindu®			
Muslim	2.107	2.357	1.678
Others	0.958	0.513	1.318
Educational Level			
No Education®			
Primary level Education	0.607***	0.594	0.636**
Secondary level of Education	1.147	1.313	0.971
Higher level of Education	1.921	1058	0.952
Exposure to Mass Media			
No®			
Yes	0.948	1.015	0.893
Place of Residence			
Urban®			
Rural	1.079	0.932	1.17
Standard of Living			
Low level of standard of living®			
Medium level of standard of living	0.913	0.902	0.911
High level of standard of living	0.593***	0.504	0.718
Work Status			
Not working®			
Working	0.718***	0.739	0.831
Mother's Age at birth			
<25 years age®			
25- 35 years age	0.613***	0.291***	1.845***
More than 35 years	0.161***	0.011***	0.628**
Number of living children			
Less than and equal to 2®			
More than 2	1.246*	0.450***	1.866***
Constant	**-1.789**	**-2.729**	**-2.417**
Nagelkerke R2	**0.11**	**1105.294**	**0.065**
N	**3260**	**2847**	**3260**

Source: Computed from NFHS data
Note: ***P<0.001; ** P<0.05; *P<0.1
(R): Reference category

Table 6: Unmet Need for family planning, Spacing and Limiting by Various Background Factors: Results from Binary Logistic Regression, Odisha, DLHS-3, 2007-08 (using NFHS-3 Definition)

Women's Background Characteristics	(Exp β) (Odds ratio) Unmet Need for Family Planning	(Exp β) (Odds ratio) Unmet Need for Spacing	(Exp β) (Odds ratio) Unmet Need for Limiting
Social Groups			
Scheduled caste®			
Scheduled tribe	1.031	0.927	1.09
Others & OBCs	1.106*	0.983	1.173*
Religion			
Hindu®			
Non-Hindu	1.073	1.396*	0.928
Educational Level			
Illiterate®			
Literate	1.092*	0.98	1.122*
Place of Residence			
Rural®			
Urban	0.835*	0.709**	0.921
Wealth Index			
Poorest®			
Second	0.840**	0.924	0.809**
Middle	0.855*	0.883	0.852*
Second	0.793**	0.769*	0.825*
Richest	0.795**	0.765*	0.832*
Work Status			
Not working®			
Working	0.882*	0.779*	0.946
Mother's Age at birth			
<25 years age®			
25- 35 years age	0.793***	0.416***	1.618***
More than 35 years	0.295***	0.060***	0.702***
Number of living children			
Less than and equal to 2®			
More than 2	1.419***	0.398***	2.127***
Constant	**-1.41**	**-1.67**	**-2.758**
Nagelkerke R2	**0.046**	**0.158**	**0.043**
N	**26336**	**26366**	**26336**

Source: Computed from DLHS data
Note: ***P<0.001; ** P<0.05; *P<0.1
(R): Reference category

The results (Table 7) show that women belong to scheduled tribes and others including OBCs are more likely to have unmet need for family planning and unmet need for limiting than reference group scheduled castes but it is the highest among scheduled tribes. The likelihood of unmet need for family planning is more in non-Hindus than Hindus. Wealth index has a negative impact on both unmet need for family planning and limiting but the chance of unmet need for spacing is less in second richest category of wealth index. Women belonging to the age group of more

than 25 years of age significantly have a lower likelihood of all categories of unmet need for family planning than women in the age group of less than 25 years of age but in case of limiting, it is significant only in case of women in the age group of more than 35 years. Women having more than 2 children are less likely have unmet need for spacing than the women having less than equal to two children whereas women with more than two children are more likely unmet need for limiting than reference category.

Table-7: Unmet Need for Family Planning, Spacing and Limiting by Various Background Factors: Results from Binary Logistic Regression, Rural Coastal Odisha, DLHS-3, 2007-08 (using NFHS-3 Definition)

Women's Background Characteristics	(Exp β) (Odds ratio) Unmet Need for Family Planning	(Exp β) (Odds ratio) Unmet Need for Spacing	(Exp β) (Odds ratio) Unmet Need for Limiting
Social Groups			
Scheduled caste®			
Scheduled tribe	1.677*	1.11	1.955**
Other backward caste & Others	1.197*	0.959	1.340*
Religion			
Hindu®			
Non-Hindu	1.584*	1.838	1.408
Educational Level			
Illiterate®			
Literate	1.097	0.861	1.168
Wealth Index			
Poorest®			
Second	0.763*	0.709	0.806
Middle	0.798*	0.885	0.775*
Second	0.697**	0.665*	0.740*
Richest	0.642**	0.66	0.665*
Work Status			
Not working®			
Working	0.878	0.784	0.962
Mother's Age at birth			
<25 years age®			
25- 35 years age	0.605***	0.341***	1.202
More than 35 years	0.255***	0.037***	0.598**
Number of living children			
Less than and equal to 2®			
More than 2	1.057	0.220***	1.559***
Constant	**-1.075**	**-1.25**	**-2.436**
Nagelkerke R2	**0.062**	**0.215**	**0.025**
N	**6311**	**6311**	**6311**

Source: Computed from DLHS data
Note: ***P<0.001; ** P<0.05; *P<0.1
(R): Reference category

IV. DISCUSSIONS AND CONCLUSION

Unmet need for contraception plays an important role in deciding fertility. Understanding the importance of unmet need, the immediate concern of policy makers is to satisfy the unmet need. However one positive note regarding the unmet need is that it is declining but many districts, especially two coastal Odisha districts, the unmet need is very high. Though scale is made to mark the concentration level of unmet need but the pattern is not region specific. That means the concentration is not limited to a particular geographical area (say uneven distribution). The overall pattern of unmet need for family planning and both for spacing and limiting of Odisha is similar in both the unit level survey data; NFHS-3 and DLHS-3. The differential is clearly visible, the scheduled tribes and Muslim have more unmet need. Both the information on unmet need for family planning of Odisha in DLHS-1 and DLHS-4 are not available perhaps the survey for Odisha was not conducted in this round. Besides, there is no uniform definition for unmet need throughout series of DLHS. So due to lack of availability of data and non-uniformity of definition of unmet need for Odisha in DLHS (1 and 4), finding trend through this dataset will not give a clear picture about unmet need. However, the analysis will be better if the consistent data on unmet need are made available. In social groups, though there is no significant impact on unmet need for Odisha using NFHS-3 data set but interestingly, others including OBCs are more likely of unmet need in case of Odisha whereas tribes have more likelihood of unmet need in rural coastal Odisha in DLHS-3. This insight gives somewhat different perspective that others including OBCs and tribes are more likely of unmet need than scheduled castes which contrary to the result of India and even general perception also (Mohapatra, 2015). This signifies SCs are more likely to use contraceptives method than other and the NFHS-4 data also reveals the same. Besides, the child sex ratio of SCs is better than other population in Odisha but at the same time the other demographic indicators of scheduled castes women are not good though scheduled tribes women have worst health indicators. Obviously this narratives gives hints for further research to find the real reasons whether it is due to effectiveness of family planning programme or any other reasons like cultural or religious practices or economic condition of SCs or male selective migration leaving their family in case of others including OBCs. Muslims have more unmet need than other religion that means they have low contraceptive practices. Here analysis also found that non-Hindu are more likely to have unmet need in rural coastal Odisha which is similar to result of India but that is specifically for the Muslim (Mohapatra, 2015). Another result is that non-Hindus are more likely to have unmet need for spacing in Odisha according to DLHS-3 and many studies at India level also highlights Muslims prefer more spacing methods than sterilization and even NFHS data also reveals same both at national and Odisha level. Even sterilization is forbidden by the Muslim and spacing methods has religious sanctions in Islam (Quraishi, 2021). However, the income has a negative impact on the unmet need for family planning. Unmet need decreases with the increase of standard of living or wealth index. Even working women shows a negative impact on the unmet need except rural coastal Odisha. But interestingly, there is no clear cut relationship exist between education levels with unmet need rather education shows a positive relation with unmet need in DLHS-3 data set. Unmet need is influenced by the demographic factors, consistently for all data set. As age of the woman increases, the unmet need tends to decline. Further, with the increase in the number of living children, the unmet

need increases except spacing but the result is contrary to the result of India (using same NFHS-3) (Mohapatra, 2015).

From the above discussion, though some similarity in the result of Odisha (using NFHS-3 and DLHS-3) and rural coastal Odisha (using DLHS-3) with India (using NFHS-3) but at the same time, difference is also observed among the result of rural coastal Odisha, Odisha and India and even the result vary with different data set (using NFHS-3 and DLHS-3) though have same state. To support these findings, the pioneering historical study on population led by Kingsley Davis through available census data of India has found that tribal fertility is more than Hindu and also other minor religions, except Muslim at India level (Maharatna A, 2000). However, an Indirect estimates on fertility and mortality by A Maharatna and his team give a different result that tribal fertility and mortality are lower than Hindu in the initial years of 20th century. Again using third round NFHS data, both Dr. M Alagaranjan and Prof. P M Kulkarni have explained that differentials fertility, mainly Hindus and Muslims, is not only due to difference in socio-economic characteristics but also differentials in contraceptive practices and also highlights the importance of spatial variation in religious differences, at all India level (Alagaranjan M and Kulkarni P M, 2008). Dr. S Chowdhury and Dr. S Ghosh, using NFHS-4 data also found that fertility rate of Hindus is more than Muslims in four districts of Assam, 11 districts of Bihar, 22 districts in Uttar Pradesh and three of West Bengal. Again another example given by Chandrima Banerjee, using NFHS-5, Christian women bear more children than Muslim women in Meghalaya which has second highest fertility after Bihar. That means it is districts/regional level variations is more important than religion.

It is observed that economic condition and demographic factors like age and living children of women play an important role in deciding contraceptive practices. However caste/tribe and also religion show impact in practicing contraceptive methods but it is not uniform across geographical locations. Even various literatures mentioned that difference not only exists between the caste/tribe or religious groups rather difference exists within a particular caste/tribe or religion. So in nutshell, all the sub-castes/tribes have not equal practices and economic conditions. But education level and mass media exposure have no significant role in using methods however a paper by Dr. Tukur Dahiru has questioned the practice of using p value. Now question may arise, are these factors really affecting the use of family planning methods or other factors like language, traditional practices, parenting, etc. which are not included in this survey questionnaire of NFHS and DLHS? To understand the real reasons of unmet need, various new themes like gender of couples and educational institutions and inmates of jails should be included in the questionnaire and also open ended questionnaire (qualitative) should be promoted. Sexual orientation of partner is also important like sexual health of women. It is often missed or do not get importance in the discussion that while talking about a particular community like tribes, Muslim etc. have more unmet need that means technically it is about entire group but actually many people of that community may have not in that group now due to change in their economic condition or programme effect or any other reasons. Though the analysis gives an overall picture of unmet need from past to present and also predicts the future unmet need group still some women who are in this group may not be in this group later or some women who are not in this may be in this group later (Westoff & Bankole, 1995). Another point is that unmet need can even co-exist with low fertility (Mohapatra, 2018). Understanding the above points, the government and

other stakeholders should come forward and strengthen the supply chain of contraceptive methods to the lowest level and even cater at the individual level (Mohapatra, 2018) and also improve the counseling for contraceptive behavioral change of women through trained health workers and also check unwanted pregnancies because 'leave no one behind' is the central theme of the sustainable development goals. Though the concept of individual level is not new, very similar to the concept of Antyodaya, but in this context the concept is came to discussion by Prof. P.M. Kulkarni. Lastly, both moral education and sex education should be promoted at families and schools for a better tomorrow.

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