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**Health and Population:  
Perspectives and Issues**



राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान

**The National Institute of Health and Family Welfare**

बाबा गंगनाथ मार्ग, मुनीरका, नई दिल्ली—110067

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# स्वास्थ्य एवं जनसंख्या परिप्रेक्ष्य एवं मुद्दे

## Health and Population: Perspectives and Issues



आरोग्यम् सुखसम्पदम्

राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान

The National Institute of Health and Family Welfare

(स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार के अधीन एक स्वायत्त संस्थान)

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## Delivery of Primary Healthcare Services in Delhi, India: A Cross-sectional Study on Knowledge and Functional Efficacy of ASHAs

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### Abstract

*Accredited Social Health Activists (ASHAs) are Community Health Workers of India, recognized for their pivotal role in providing primary healthcare services at the grassroots level. Trained and supported by the government, they serve as a vital link between the community and the formal health system contributing significantly to improving public health outcomes. The objectives of this study are to assess the knowledge of ASHA workers regarding primary healthcare services being provided by them in Delhi; and determine the functional efficacy of ASHA. A descriptive cross-sectional study was conducted among 200 ASHAs from 4 different districts of Delhi. Data was collected by using a pre-tested, structured, self-administered questionnaire tool which consisted of items on sociodemographic profile of ASHA, knowledge, and their functional efficacy (Role performance). Collected data were analyzed by using Microsoft excel 365, GraphPad software version Prism 8 and IBM SPSS software version 25.0.*

*It was found that out of the 200 ASHAs, 99 (49.5%) belonged to age group 40-49 years. 173 (86.5%) of them were married and majority of them 74 (37%) had minimum education of higher secondary level. They belonged mostly to OBC category i.e., 74 (37%) and 188 (94%) were Hindu. Majority of them 96 (48%) had average monthly family income between 10k-20k. Most ASHA respondents in the study have a very good or excellent overall knowledge (89%). Only 2% had knowledge scores suggestive of inadequate knowledge. Overall, 178 (89%) ASHAs fell under exceptional functional efficacy and 11 per cent (22) were identified with above average efficacy. ASHAs in Delhi demonstrated above-average competency in primary healthcare provision but exhibited gaps in knowledge regarding certain programs such as JSSK, early pregnancy care, and home preparation of ORS. Improvement opportunities include enhancing support for institutional deliveries, conducting home visits for communicable diseases among children, distributing IFA supplements to adolescents, and ensuring treatment compliance of non-communicable diseases.*

**Key words:** ASHA; Community Health Worker; primary healthcare; knowledge; performance

### Introduction

The concept of primary healthcare was introduced worldwide with the Alma-Ata declaration in 1978. Primary healthcare was defined as essential health care based on practical, scientifically sound, and socially acceptable methods and technology, made universally accessible to individuals and families in the community.<sup>1</sup> The declaration stressed the importance of active

community participation in the planning, organization, operation, and control of primary health care, as well as in the attainment of better health. This gave rise to formation Community Health Workers cadre all around the world. In India Accredited Social Health Activists (ASHA) introduced in 2005 under the National Rural Health Mission (NRHM) emerged as one of the largest CHWs cadre. They are the female volunteer health worker preferably of age 25-45 with secondary level education who serve a population of 1000-2500. Their main roles are functioning as link between community and the health facility, health activist and service provider. The ASHA programme was introduced in Delhi in 2006. Earlier their roles were focused on MCH and family planning services but has since grown to cater to everything from communicable to non-communicable diseases and beyond.<sup>2</sup> Recognized as a vital component of the health system, ASHAs play a central role in mobilizing communities, delivering essential health services, and fostering grassroots participation in improving public health outcomes.

The present study was done for a period of three months (September 2023-November 2023) to assess knowledge and functional efficacy (role performance) of ASHA in provision of primary healthcare services in Delhi.

### **Objectives**

The primary objectives of the current study are to:

- assess the knowledge of ASHA workers regarding primary healthcare services being provided by them in Delhi; and
- determine the functional efficacy of ASHAs.

### **Methodology**

This study was a descriptive cross-sectional study. Multistage random sampling technique was applied to select the study area. Out of 11 districts in Delhi, 4 were selected using lottery method. Further, 3-4 primary health centre level health facilities were randomly selected from each district until a sample size of 50 ASHAs were reached from each district, ultimately totaling to 200 ASHAs. The sample size was calculated using the following formula

$n = Z^2 P (1-P) / d^2$  where:

- $n$  = sample size
- $Z = 1.96$  value of the standard normal variant corresponding to 95% confidence level.
- $P$  = Expected proportion in population (50%) having knowledge regarding primary healthcare services.
- $d$  = Absolute error or precision (7%).

Thus, using this formula  $n = 1.962 \times 50\% (1-50\%) / (7\%)^2 = 196$ , which was rounded upto 200. Hence, 200 ASHAs were considered for the study.

#### **Inclusion criteria:**

- ASHA who has completed their essential training.
- ASHA willing to participate in the study.

The data were collected using pre-tested, structured, self-administered questionnaire tool. It contained items on sociodemographic profile of ASHA, 30 multiple choice questions to assess

knowledge framed from their latest modules (modules 6&7) and 4-point Likert scale to determine their functional efficacy. Total score of 15 or less out of 30= Inadequate knowledge.16-20 out of 30= Good knowledge.21-25 out of 30= Very good knowledge.26-30 out of 30= Excellent knowledge. 20 roles and responsibilities expected of ASHAs were listed out according to the Guidelines on Accredited Social Health Activists (ASHA), NHM government of India. They were prompted to mark the frequency of performing these roles in – ‘Always’, ‘Sometimes’, ‘Rarely’ or ‘Never’. Each response was scored as follows:

Always: 3

Sometimes: 2

Rarely: 1

Never: 0

Score of < 30= Needs improvement

31-40= Below average functional efficacy

41-50= Above average functional efficacy

51-60= Exceptional functional efficacy

The tool was translated in Hindi language. Written consent was obtained from the study participants. Data was analyzed using Microsoft excel 365, GraphPad software version Prism 8 and IBM SPSS software version 25.0. The study was approved by Institutional Ethical Committee.

## Findings

In the group of 200 ASHAs interviewed in the present study the mean age was found to be 41 years. Majority of them (86.5%) were married. Most of them had secondary (35.5%) to higher secondary (37%) level of education. 37 per cent of them belonged to OBC caste while 36.5 per cent belonged to General caste. More than 90 per cent of them were Hindu and only 6% were Muslim. Around 50 per cent of the ASHAs declared their monthly family income to be between 10k-20k. Population served per ASHA was mostly 1501-2000 (46.5%) and more than 2000 (46.5%). More than 80 per cent had some kind of training in the last 1 week (41.5%) or in the period between 1 week to 1 month (40.5%).

**Table 1**  
Socio-demographic Background of ASHAs

Socio-demographic Parameter	Group	n (%)
<b>Age group</b>	< 30 years	7 (3.5%)
	30-39 years	75 (37.5%)
	40-49years	99 (49.5%)
	50 and above years	19 (9.5%)
<b>Marital Status</b>	Unmarried	12 (6%)
	Married	173 (86.5%)
	Separated	4 (2%)
	Widowed	11 (5.5%)
<b>Education level</b>	Primary	27 (13.5%)
	Secondary	71 (35.5%)
	Higher secondary	74 (37%)
	Graduate	28 (14%)

<b>Caste</b>	General	73 (36.5%)
	OBC	74 (37%)
	SC	53 (26.5%)
<b>Religion</b>	Hindu	188 (94%)
	Muslim	12 (6%)
<b>Monthly family income</b>	< 10k	47 (23.5%)
	10k-20k	96 (48%)
	21k-30k	50 (25%)
	>30k	7 (3.5%)
<b>Population served</b>	<1000	1 (0.5%)
	1000-1500	13 (6.5%)
	1501-2000	93 (46.5%)
	>2000	93 (46.5%)
<b>Duration since last training</b>	<1 week	83 (41.5%)
	1week-1month	81 (40.5%)
	>1 month	36 (18%)

It was seen that most of the ASHA respondents in the study has a very good (58%) or excellent overall knowledge (31%). Only 2% ASHAs had a knowledge score of less than 15 suggestive of inadequate knowledge. More than 90% displayed correct knowledge on the main roles of ASHA, purpose of home visits, danger signs in pregnancy, sign of vaginal infection, duration of exclusive breastfeeding, signs of pneumonia and TB, vaccine preventable diseases, prevention of night blindness, ways to reduce risk of heart attack and cause of Goitre. Most of them did not possess correct knowledge on skin manifestation in Leprosy with only 23% of them giving the correct answer that there is loss of sensation. Only 26.5% of them knew about the availability of free drugs for new-borns under JSSK programme. Close to 50% did not know the correct way to prepare ORS at home.

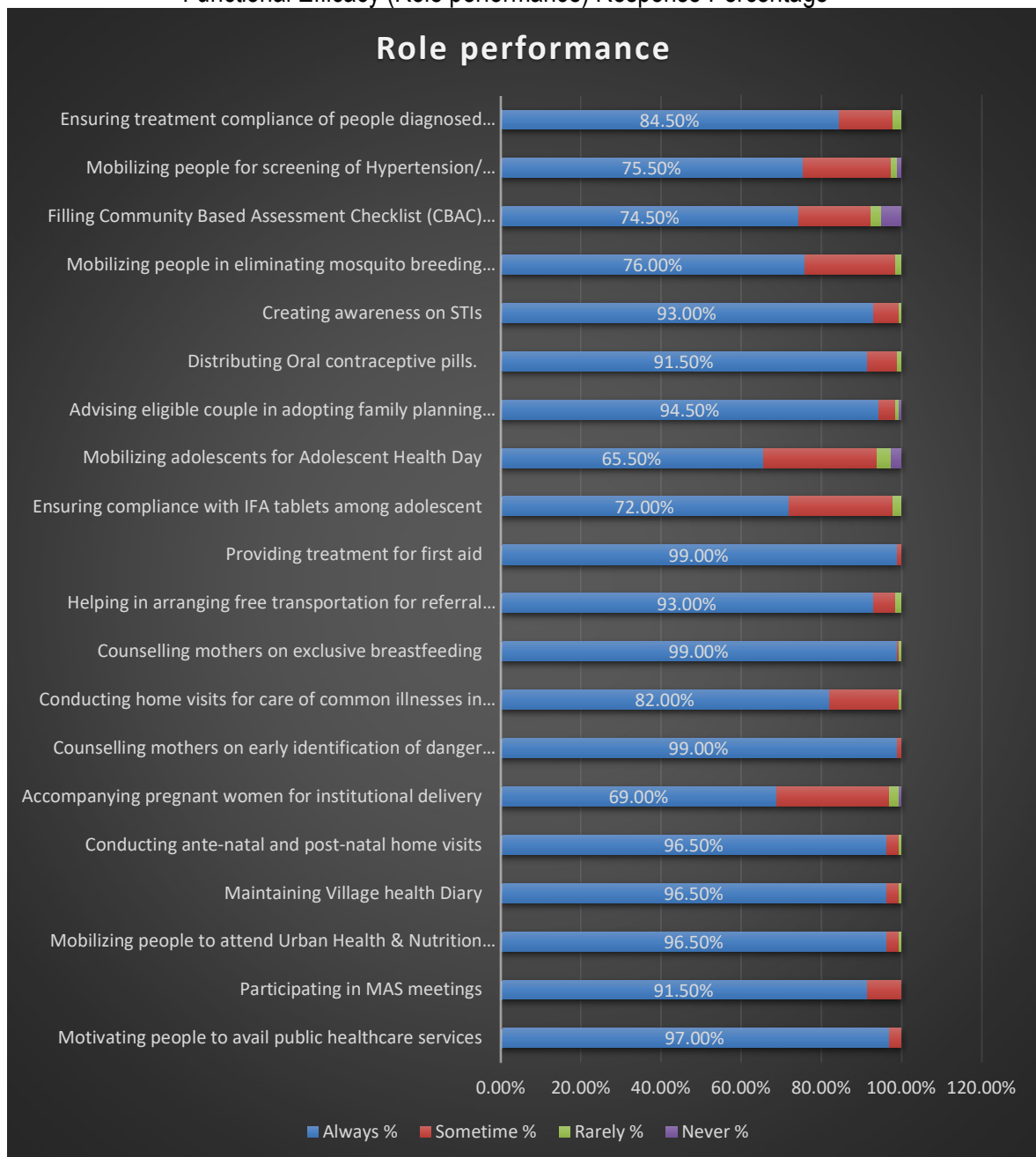
**Table 2**  
Correct Responses to the Knowledge Questionnaire

Knowledge	Correct	Correct %
<b>Part 1</b>		
What are the main roles of ASHA?	191	95.50%
What contributes to a healthy community?	149	74.50%
Which can be a factor for ill health in a community?	155	77.50%
Home visits are for	192	96.00%
<b>Free drugs for newborn babies are available under which scheme?</b>	<b>53</b>	<b>26.50%</b>
<b>Part 2</b>		
First ANC should be scheduled at	185	92.50%
<b>IFA tablet regime for a woman in early pregnancy with Hb 9gm/dl</b>	<b>79</b>	<b>39.50%</b>
In pregnant woman danger sign requiring immediate referral to hospital is	183	91.50%
White coloured discharge from genitals during pregnancy is a sign of?	192	96.00%
How many post-natal visits are essential for a woman who had normal delivery?	175	87.50%
<b>Part 3</b>		

Knowledge	Correct	Correct %
Who are high-risk babies?	159	79.50%
How long a baby should be exclusively breastfed?	194	97.00%
A child with fever, difficulty breathing with chest wall in-drawing is a sign of	190	95.00%
Which disease can be prevented by immunization?	190	95.00%
<b>How to prepare ORS at home?</b>	<b>113</b>	<b>56.50%</b>
<b>Part 4</b>		
Adolescent health meetings are important	175	87.50%
<b>Menarche is</b>	<b>139</b>	<b>69.50%</b>
HIV is not spread via	169	84.50%
Which contraceptive method can prevent both unwanted pregnancy and STI?	178	89.00%
<b>In India abortion can legally done up to</b>	<b>119</b>	<b>59.50%</b>
<b>Part 5</b>		
Which disease is spread by mosquito?	172	86.00%
Fever with severe joint and back pain with rash is suggestive of which disease?	161	80.50%
Evening fever with cough more than 2 weeks and weight loss is suggestive of which disease?	188	94.00%
<b>Which disease is not spread by coughing and sneezing?</b>	<b>127</b>	<b>63.50%</b>
<b>The affected skin patch in Leprosy may also have</b>	<b>46</b>	<b>23.00%</b>
<b>Part 6</b>		
Night blindness can be prevented by	198	99.00%
Which of the following is a risk factor for hypertension	173	86.50%
<b>Smoking is risk factor for which disease?</b>	<b>133</b>	<b>66.50%</b>
Which of the following would help to reduce risk of heart attack?	191	95.50%
Goitre is caused by deficiency of	198	99.00%

In terms of performance assessment for the ASHAs, it was observed that ASHA satisfactorily delivered on roles and responsibilities as expected from them. More 90 per cent of ASHAs admitted to performing the following activities always: Motivating people to avail public healthcare services, participating in MAS meetings, maintaining village health diary, counselling mothers on early identification of danger signs in babies for referral and exclusive breastfeeding, helping to arrange for free transportation for referral cases to hospitals, providing first aid, distributing OCPs, advising eligible couple to adopt family planning methods and creating awareness on STIs. Although only 69 per cent of them admitted to accompanying pregnant mothers to the hospital and 65.5 per cent mobilized youth for adolescent health days. Just over 70 per cent worked on ensuring IFA tablet compliance, mobilizing people to eliminate mosquito breeding areas and screening for hypertension, diabetes and cancer and filling CBAC forms. Overall, 89 per cent (178) ASHAs fell under exceptional functional efficacy and 11 per cent (22) were identified with above average efficacy.

**Figure1**  
Functional Efficacy (Role performance) Response Percentage



## Discussion

The present study assessed 200 ASHAs from four different districts of Delhi for their knowledge and work performance in provision of primary healthcare services.

### Socio-demographic parameters of ASHAs

The average age of ASHA respondents was 41.11 years, with a majority falling in the 40-49 age group, and 9.50% were above 50 years old, indicating a willingness of older individuals to volunteer despite guidelines suggesting an age range of 25-45 years. Most respondents were married women with education above the mandated 10th class level. The majority belonged to OBC or SC groups, reflecting societal inclusiveness. Almost all respondents were Hindus, aligning with the population demographics. The majority came from low-income families. Most ASHAs served populations of 1501-2000 or >2000. About 82 per cent had received training in the past month, with half receiving training within the week prior to the study. However, about 20 per cent had not received training within the past month, highlighting a gap in continuous training, which is recommended for ASHAs.

In a Bhadson based study it was found that almost 65.2% of ASHA workers were above 35 years of age. This was in line with the observation in the present study as well. Most of the respondents were Matriculate pass as per education and belonged to the middle and lower middle socioeconomic status. The population covered was 1000-1199 in their study which was significantly lower compared to the levels seen in the present study. The primary reason for the difference was urban versus semi-urban setup between the two studies.<sup>3</sup>

Manjunath et al. (2022)<sup>4</sup> in a study on 538 ASHAs showed that the average age of ASHAs was 36 years with an age range of 20–60 years. Overall, 90% ASHAs were in the age group of 25–44 years, 7.1 per cent in the age group of 45–60 years and 2.6% in the age group of 18–24 years. A total of 72.2 per cent of the ASHAs belong to a low socio-economic background: OBC category (34.4%), SC category (22%) and ST category (15.8%). Education background is as follows: A total of 42.2 per cent have completed secondary school; 36.4 per cent have completed primary school level; 10 per cent have completed PUC/Diploma-level education; and 3 per cent have completed bachelor's degree and above.

It shows that a total of 8.4 per cent of ASHAs were illiterate, most of whom were in the age group of 45–60 years. In other study from a Karnataka, it showed that out of 617 ASHA workers evaluated, maximum number of them were from the age group 30-39 (52.4%), followed by the age group 20-29 (47%). The mean age of the study subjects in the given study was  $30.67 \pm 4.65$ . Majority of ASHAs were married (68.6%) and nearly 32 per cent were either separated or widowed. About 86.5 per cent of ASHAs were High School Educated. 95.8 per cent ASHAs were Hindus, with monthly income less than 5000 (74.4%). Most of the ASHAs (78.1%) revealed that they come from nuclear family and worked for the same village in which they were residing (80.1%)<sup>5</sup>.

### Knowledge of ASHAs

The study found that ASHAs generally understood their roles in public health delivery and were aware of societal health determinants and the purpose of home visits. However, they lacked knowledge about free drug availability for new-borns, which is crucial for improving infant mortality rate (IMR) and new-born health. While ASHAs were familiar with antenatal care schedules and pregnancy warning signs, many were unaware of the iron-folic acid (IFA) tablet regime for anaemic pregnant women, a critical intervention for high-risk pregnancies. Additionally, ASHAs showed awareness of child risk assessment, immunization, and breastfeeding but lacked knowledge of oral rehydration solution (ORS) preparation, essential for treating childhood dehydration. Their understanding of adolescent sexual health was varied, with gaps in knowledge about menarche and legal abortion period. ASHAs also demonstrated limited awareness of communicable diseases like leprosy and dengue, as well as non-communicable diseases such as vitamin deficiencies and lifestyle disorders. Training and support in these areas could enhance ASHAs' effectiveness in addressing public health challenges, particularly in urban areas with high disease prevalence.

Shet et al. (2017)<sup>6</sup> in their study showed that the knowledge of the ASHA workers on ANC and PNC (82%) was considerably higher than the knowledge on Family planning (71%), Child health (65%) and General health (67%). In a study carried out in West Bengal it showed that more than half of the study population (64.7% and 50.5 %) had overall good knowledge and practice score related to maternal-child health and family planning respectively, though they had poor knowledge in updated dosage schedule of iron folic acid tablets, proper attachment techniques for successful breast feeding, missed doses of OCP, ECP, IUCD and safe period. They also showed that regarding knowledge of ASHA workers on family planning, 56.84% correctly knew about what a woman should do if she missed consecutive two doses of OCP and only 2 (1.05%) of them knew that MALA-N can be used as emergency contraceptive (ECP). But most of ASHA workers (70% and 73.68%) had correct knowledge of the ideal time for IUCD insertion and safe period respectively.<sup>7</sup>

In a different study conducted in Mysuru showed that knowledge about antenatal care was average among half (51.5%) of the participants. All the listed danger signs during pregnancy were identified only by 49.5 per cent of ASHA workers. About 50 per cent of the respondents were not aware of the exclusive breastfeeding till six months after birth.<sup>8</sup> In the previously mentioned Karnataka study, it showed that out of 617 ASHAs interviewed, 580 (94%) ASHAs had proper knowledge about exclusive breast feeding and the duration, 560 (90.7%) told colostrum was necessary to the baby. Only 323 (52.3%) ASHAs had correct knowledge regarding schedule of immunization. 580 (94%) ASHAs could tell when the weaning should be started correctly and 611 (99%) ASHAs knew about ORS packets and the steps that went in preparing it.<sup>5</sup>

### **Role performance of ASHAs**

The performance assessment of ASHAs indicated satisfactory delivery of their roles, particularly in motivating and mobilizing communities for health-related activities, maintaining health registers, and providing counselling for pregnancy and breastfeeding. Positive outcomes were also noted in sexual health awareness and family planning activities. However, areas for improvement included accompanying patients for institutional deliveries, conducting home visits

for communicable diseases in children, ensuring compliance with iron-folic acid (IFA) distribution schedules among adolescents, and mobilizing communities to counter mosquito-borne and non-communicable diseases. These findings suggest opportunities for enhancing ASHA performance through targeted interventions and support.

C.N Bhargavi (2014)<sup>9</sup> in her Delhi based study found 94.8 per cent of the 500 ASHAs interviewed to be highly functional in rendering MCH services. It was corroborated with ANMs indicating over 90 per cent ASHAs performing their role such as ensuring ANC checkup, home visits, counselling and identifying high risk mothers, health education in diet, helping in ante-natal registration, reminding for immunizations, participating in camp and monthly health meetings, counselling on safe abortion. Some lacunae were found in their role performance such as only 79.1 per cent of them distributed ORS, condoms, and oral pills, just over 80 per cent had ever escorted pregnant women to health facility and teaching newborn care. While only 49 per cent had ever distributed IFA tablets.

In a study undertaken in Jaipur and Tonk districts of Rajasthan it was found that 80.78 per cent of children who had undergone various immunization were motivated by ASHAs. But in case of adopting any family planning method, only 31 per cent were motivated by ASHA. Escorting pregnant women for institutional delivery was also lower comparison with 58.39 per cent. ASHAs belonging to upper caste or with higher education level or older in age were found to be less likely to motivate people in seeking MCH and family planning services.

## **Recommendations**

With regards to the lacunae found among the ASHAs in their knowledge and performance in provision of primary healthcare, these are few recommendations:

- **Comprehensive Training Programs:** Develop and implement regular, comprehensive training programs for ASHA workers focusing on primary healthcare, disease prevention, treatment compliance, community mobilization, and non-communicable diseases.
- **Continuous Education:** Offer continuous education opportunities through workshops, seminars, and online courses to keep ASHA workers updated on the latest healthcare practices, treatments, and community engagement strategies.
- **Enhanced Communication Skills Training:** Provide specialized training to improve ASHA workers' communication skills, enabling them to effectively communicate the nature of their roles, build rapport with communities, and encourage treatment compliance.

## **Conclusion**

The current study revealed that ASHAs possessed commendable knowledge of primary healthcare services and demonstrated satisfactory performance in their roles. Nonetheless, deficiencies were identified in both their knowledge and performance, underscoring the importance of ongoing comprehensive training and support to enable them to fulfil their responsibilities effectively. Recognizing the invaluable contributions of ASHAs and addressing these challenges, policymakers and stakeholders can collaborate to fortify primary healthcare systems, thereby advancing health outcomes for the entire population.

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## Budgetary and Administrative Challenges in Establishing New AIIMS in India

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### Abstract

*It became essential to create some new All India Institutes of Medical Sciences (AIIMS) all over the country in the recent past with a view to reducing healthcare disparities, closing the gap between rural - urban divides, developing medical services and promoting medical education. This paper explores the history of AIIMS in India, the rationale for establishing new institutions, and the importance of this historic initiative. It delves into the administrative and budgetary challenges and objectives of setting up new AIIMS, including infrastructure development, recruitment of skilled professionals, etc. Additionally, it examines the budgetary allocation for PMSSY and the establishment of new AIIMS, and the potential impact of new AIIMS on local communities, the broader healthcare landscape, and regional economies. By analyzing the existing literatures and government initiatives, this paper provides insights into the significance and feasibility of establishing new AIIMS in India.*

**Key words:** All India Institute of Medical Sciences (AIIMS), Pradhan Mantri Swasthya Suraksha Yojana (PMSSY), Health Budget, Healthcare Services

### Introduction

The establishment of some new All India Institutes of Medical Sciences (AIIMS) is a significant endeavour that has the capacity to completely transform healthcare in the region<sup>1</sup>. With a strong emphasis on research, education, and healthcare services, the new AIIMS facilities aims to address the increasing demand for high-quality healthcare services across India in a decentralized manner. This initiative not only provides an opportunity to expand access to advanced medical treatments but also offers a platform for innovation and collaboration for excellence in medical sciences.

The creation of a new All India Institute of Medical Sciences is a significant endeavour that seeks to tackle the healthcare requirements and inequalities in various regions of India. Constructing a new AIIMS would improve the nation's overall health outcome by provide access to top-notch medical education, health services and health research. This would help close the gap between rural and urban healthcare facilities<sup>2</sup>.

In 2003, the Government of India initiated *Pradhan Mantri Swasthya Suraksha Yojana* (PMSSY) with the primary objective of establishing some new AIIMS in different states<sup>3</sup>. The scheme aims to increase the availability and accessibility of cost-effective and trustworthy healthcare services throughout the nation<sup>3</sup>. The primary goal of PMSSY is to address the disparities in the existing health care across different regions and increase the standard of medical education<sup>4</sup>.

## Objective

The basic objective of this paper is to explore the various aspects of establishing a new AIIMS, including the challenges of infrastructure development, recruitment of skilled medical professionals, and the time and cost overrun etc. Additionally, examined the potential impact of the new AIIMS on the local community, the broader healthcare landscape, and the economy of the region.

## Establishment of first AIIMS in India, 1956

In 1956, the first AIIMS was established in India with the aim of providing top-notch healthcare services, medical education, and research facilities<sup>5,6</sup>. The establishment of AIIMS in India was under the leadership of Amrit Kaur, India's first health minister, who played a pivotal role in securing funds from international bodies such as the Rockefeller Foundation, Ford Foundation, and the governments of Australia, West Germany, and the Netherlands<sup>7</sup>. The Ford Foundation provided additional funding of \$ 63,563 to the All-India Institute of Medical Science (AIIMS), a renowned public medical college. This grant adds to the previous grants of \$1.7 million and the Rockefeller Foundation grants of \$1.5 million<sup>7</sup>. These funds were crucial in establishing the initial infrastructure of AIIMS.

Prior to the establishment of AIIMS, the importance of AIIMS in India was acknowledged, as evidenced by the Bhore committee's recommendation in 1946 to build a national-level medical institution<sup>8</sup>. The first establishment of AIIMS was facilitated by a significant financial contribution from New Zealand through the Colombo Plan. The Colombo Plan was formed in 1951 by several countries, including Australia, Canada, India, Pakistan, New Zealand, Sri Lanka, and the United Kingdom<sup>9</sup>. It has since grown to include a total of 27 member countries from diverse backgrounds, such as non-Commonwealth nations and those affiliated with regional organizations like ASEAN and SAARC<sup>10</sup>. The plan emphasizes collaboration for economic advancement through self-help and mutual assistance among its members.

The foundation stone was laid in 1952 by Pandit Jawaharlal Nehru, the then Prime Minister of India. The AIIMS Act passed in 1956 granted autonomy to the institution through an Act of Parliament.

The objectives of AIIMS were ambitious and multi-faceted:

- To develop and maintain the highest standards of medical education and research in India.
- To gather educational facilities of the highest order for the training of staff in all significant branches of Medical and Paramedical Sciences.
- To provide top-notch healthcare services to all individuals in a cost-effective and affordable manner.
- To achieve self-sufficiency in postgraduate medical education.

## ***Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) for establishment of new AIIMS***

Before the establishment of new AIIMS institutions, there was only one AIIMS located in New Delhi, the national capital of India. This single AIIMS, although impactful, was insufficient to meet

the healthcare needs of the entire country, particularly in economically backward states and regions<sup>11</sup>. The demand for more AIIMS institutions was raised in 1999 in Dhanbad, Bihar, highlighting the need for additional healthcare infrastructure in underdeveloped areas<sup>4</sup>. This demand stemmed from the recognition that a single institute located in the national capital was unable to adequately fulfill its objectives of providing quality healthcare and medical education to the entire population of India<sup>12</sup>.

The establishment of new AIIMS-like institutions aims to address regional imbalances in healthcare and ensure that people from all over India can access the same standards of care without having to travel long distances<sup>13</sup>. The *Pradhan Mantri Swasthya Suraksha Yojana* (PMSSY) was announced in 2003<sup>14</sup>. It is a Centrally Sponsored Scheme launched in March 2006 by the Ministry of Health and Family Welfare, Government of India. The scheme aims to correct regional imbalances in the availability of affordable tertiary healthcare services and augment facilities for quality medical education in the country.

The scheme has two main components:

(i) Setting up of new AIIMS; and (ii) Upgradation of Government Medical Colleges

One of the key components of the PMSSY is the establishment of new All India Institutes of Medical Sciences (AIIMS). AIIMS are autonomous institutions of national importance that provide high-quality tertiary healthcare services, medical education, and research.

### **Rationale for Establishing a New AIIMS**

Given the significant healthcare disparities and challenges faced by different regions in India, the establishment of a new AIIMS is the need of the hour. It would address the healthcare needs of underserved areas, bridge the gap between rural and urban healthcare facilities, and improve overall health outcomes for the population. In addition to improving patient care, new AIIMS would also contribute to medical education and research by providing opportunities for undergraduate and postgraduate teaching in medical and paramedical education. Moreover, the establishment of a new AIIMS facility would generate job prospects for medical practitioners and foster economic development in the area<sup>15</sup>.

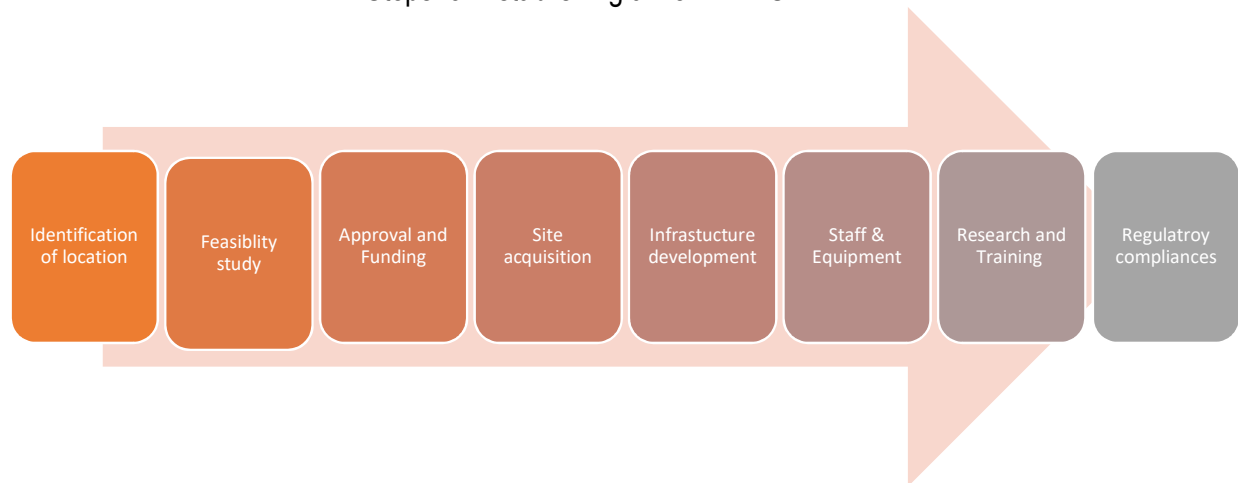
1. **Easing the Burden on Existing AIIMS:** The AIIMS in New Delhi faces an enormous patient load. Establishing new AIIMS institutions in different regions helps distribute this load, offering relief to the existing AIIMS and improving patient care quality<sup>13</sup>.
2. **Improving Healthcare Access:** With new AIIMS establishments spread across different parts of India, particularly in economically backward states, there is increased access to quality healthcare services for people nationwide, ultimately reducing health disparities<sup>11</sup>.
3. **Medical Education:** India currently faces a scarcity of medical faculty and a lack of high-quality medical education. The establishment of new AIIMS institutions can serve as centers for providing medical education and training for more medical professionals<sup>14</sup>.
4. **Promoting Research:** The central funding provided to AIIMS for research fosters a culture of conducting quality medical research, an opportunity that is often limited at the state level due to various constraints.

5. **Developing Clinical Practice Standards:** The presence of more AIIMS institutions can contribute to the development of clinical practice guidelines tailored specifically to the Indian context, reducing the reliance on international standards that may not suit the local healthcare landscape.
6. **Creating Opportunities:** The establishment of new AIIMS in different regions presents opportunities for local students, which is crucial for encouraging doctors to serve in their home states, especially in rural areas.
7. **Competitive Excellence:** The establishment of new AIIMS institutions creates a competitive atmosphere that motivates improvements in patient care, research, and healthcare outcomes.
8. **Strengthening Primary Care:** By mandating the inclusion of departments of family medicine, new AIIMS can reinforce the overall healthcare system's strength by emphasizing the significance of family physicians and community-based medical education, thereby enhancing primary care services.
9. **Support for National Health Policies:** The expansion of AIIMS facilities across the nation aligns with India's National Health Policies, which advocate for improved healthcare accessibility and community-based education.

### Steps for Establishing new AIIMS

Setting up a new AIIMS necessitates meticulous strategizing and implementation to ensure the delivery of cost-effective and dependable healthcare services to the people of the respective state. The following steps are essential for establishment of new AIIMS.

**Figure 1**  
Steps for Establishing a New AIIMS



1. **Location Identification:** The initial stage in establishing a new AIIMS is identifying a suitable location. When choosing a location, several factors should be taken into account, such as accessibility, infrastructure availability, density of population, and availability of land space, which is provided by States (min approx. 200 acres<sup>17</sup>).
2. **Feasibility Study:** Once a location is identified, conducting a comprehensive feasibility assessment is necessary. This study should evaluate the prospective resources, infrastructural and financial needs for establishing a new AIIMS in that particular site.

3. **Approval and Funding:** Necessary approval and funding after feasibility study need to be obtained. The necessary funds for the construction of new AIIMS are provided by the Central government under the *Pradhan Mantri Swasthya Suraksha Yojana* (PMSSY).
4. **Site Acquisition:** Selecting a suitable location for the new AIIMS, next steps after obtaining the necessary approvals and financial approval. The government purchases the land through appropriate legal procedures.
5. **Infrastructure Development:** After acquiring the site, the process of developing the necessary infrastructure can commence. This encompasses the construction of the primary hospital and academic structure, specialised departments, research facilities, administrative buildings, and other essential infrastructure.
6. **Recruitment of Staff:** In addition to developing infrastructure, it is essential to hire skilled and capable staff to ensure the successful operation of new AIIMS. This encompasses the recruitment of medical, paramedical, administrative, and other staff.
7. **Equipment Procurement:** After the completion of the recruitment procedure, the next step is to acquire the essential medical equipment and technology for the new AIIMS. This encompasses diagnostic machinery, surgical devices, laboratory instruments, and IT infrastructure.
8. **Operationalization:** Operationalization refers to the process of starting operations with the commencement of medical education programs and providing care patient services in phases. This process begins with the establishment of outpatient departments and MBBS classes and gradually expands to encompass full-scale operations.
9. **Research and Training:** The new AIIMS has a strong emphasis on postgraduate education and research, with the addition of super-specialty departments and the provision of graduate and undergraduate degree seats<sup>15</sup>. This aims to enhance the medical education system in India.
10. **Regulatory Compliance:** The new AIIMS must adhere to all relevant regulatory and legal requirements for healthcare institutions. This includes getting required licenses, adhering safety standards, adhering to medical ethics guidelines, and complying with healthcare regulations set by the Medical Council of India and other pertinent bodies<sup>16</sup>.

### Financial Process for Establishing new AIIMS

Establishing a new AIIMS requires careful planning of the budget, which includes determining how much money will be needed and how it will be distributed. The fund flow process in PMSSY encompasses various stages, including budget allocation, budget disbursement, management, and monitoring of funds under the scheme. This ensures that funds are effectively used for the establishment of new AIIMS and upgrading existing government medical colleges under the scheme.

1. **Budget Allocation:** The central government, through the Ministry of Health and Family Welfare, Provides funds to the PMSSY scheme by the approved budget. Ministries prepare an annual budget proposal for the schemes, Ministry of Finance allocates funds to schemes during the union budget. PMSSY scheme is the Central Sector (CS) Scheme. Under the Central Scheme, the Central Government provides 100% financial assistance to States.
2. **Disbursement of Funds:** The Central Government releases funds to the nodal agency responsible for the scheme's implementation, for instance, the Ministry of Health and

Family Welfare for PMSSY. Further, these funds are released to the executing agency, who responsible for the establishment of new AIIMS. Disbursement of funds is done in tranches or installments. Each tranche is linked to the achievement of project milestones or the submission of utilization reports.

3. **Management:** Executing agencies are responsible for managing the funds, which includes budgeting for the various project expenses, such as civil construction, procurement of equipment, and hiring necessary personnel.
4. **Fund Monitoring:** The allocation of funds is rigorously monitored to make sure their appropriate utilization. This often involves regular financial reporting, submission of utilization certificates and auditing to track financial progress and financial integrity. The executing agencies must furnish utilisation certificates that accurately document the allocation of previously disbursed money and offer a valid justification for the release of forthcoming installments.
5. **Compliance:** Adherence to all applicable financial norms and guidelines (e.g., General Financial Rules in India) throughout the purchasing and contracting processes.
6. **Coordination:** The timely and accurate execution of the project depends on the seamless flow of finances and the tight coordination of the many departments involved, including construction, procurement, and human resource recruiting.
7. **Reporting:** Regular reporting of both physical and financial progress is done on a monthly, quarterly, and annual basis for transparency and monitoring within the PMSSY division. These reports provide the current status of the project and resource allocation. Furthermore, the present status of the project is monitored through an online dashboard for the PMSSY Division.

These processes are crucial for ensuring the appropriate budget allocation, expenditure, and accountability of funds, which in turn supports the effective achievement of the PMSSY objectives.

### **Present Status of Establishment of New AIIMS**

22 new AIIMS have been approved under the PMSSY of which six are already fully functional. The remaining 16 AIIMS are at various stages of construction and development.

The setting up of new AIIMS is a major initiative towards improving the availability of quality tertiary healthcare services in underserved regions of the country. The new AIIMS are expected to cater to the needs of a large population by providing specialized healthcare services and to cater to the requirement of huge gaps in quality medical education and research that are not currently available in many parts of the country.

**Table 1**  
Status of AIIMS

Fully Functional AIIMS (6)	AIIMS where MBBS Classes/ OPD Operational (11)	AIIMS where only MBBS Classes running (2)	Other AIIMS (3)
Bhopal Bhubaneswar Jodhpur Patna Raipur Rishikesh	Raebareli # Gorakhpur# Mangalagiri# Nagpur # Bathinda # Bibinagar # Kalyani # Deoghar # Bilaspur # Rajkot ** Guwahati #	Vijaypur (Jammu)** Madurai	Awantipora(Kashmir)** Majra, Rewari(Haryana) Darbhanga(Bihar)*
** Construction started/in progress. * Encumbrance free land yet to be provided. # Limited IPD services also started.			

Source: Annual Report, 2022, Ministry of Health and Family Welfare [(Annual Report 2022-23, n.d.)]

### Budgetary Allocation for Establishment of New AIIMS

The establishment of new AIIMS depends significantly on the allocation of funds for their setup. The Government of India provides funding for this purpose through the Pradhan Mantri Swasthya Suraksha Yojana as part of the Central Sector Scheme. The details of budgetary allocation of the Department of Health and Family Welfare for the financial year 2024-25 [(Notes on Demands for Grants, 2023-2024, n.d.)] is elaborated in Table 2.

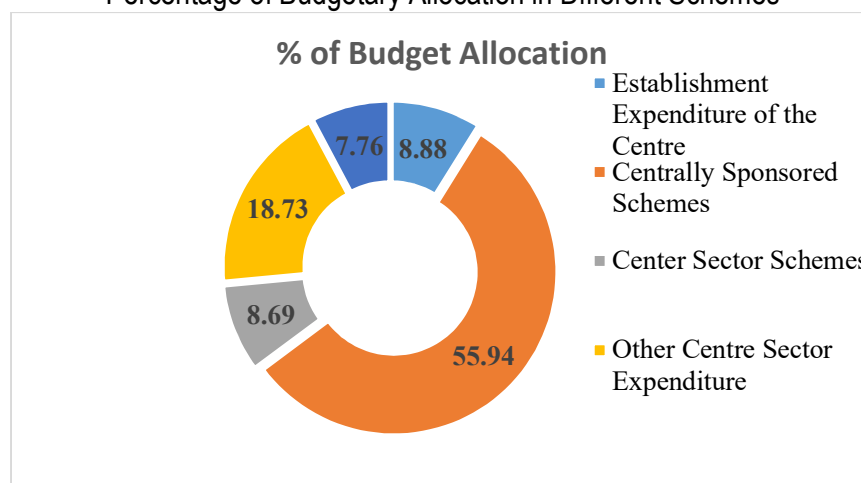
**Table 2**  
Budgetary Allocation of Department of Health and Family Welfare (Rs. In Crores)

	Major Heads	Actual Expenditure (AE) 2022-23	Revised Expenditure (RE) 2023-24	Budget Expenditure (BE) 2024-25	% Change RE 2023-2024 to BE 2024-25
A	Establishment Expenditure of the Centre	6307.92	7136.12	7787.01	9.12
B	Centrally Sponsored Schemes (CSS)				
1	National Health Mission	31278.84	31550.87	31967	1.32
2	Strengthening of State Drug Regulatory System	22.87	52	75	44.23
3	Tertiary Care Programme	304.55	276.39	371.55	34.43
4	Human Resource for Health and Medical Education	1974.87	1519.87	5016	230.03
5	Senior Citizen Health Insurance Scheme	24.7	1.32	0.02	-98.48
6	Pradhan Mantri Ayushman Bharat Health	1228.35	2100	4107.68	95.60

	Infrastructure Mission (PMABHIM)				
7	Rashtriya Swasthya Bima Yojna (RSBY)	0	81.21		-100.00
8	Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PMJAY)	6185.8	6800	7500	10.29
9	Recoveries	-380.03			
	Total Centrally Sponsored Schemes (B)	40639.95	42381.66	49037.25	15.70
C	Central Sector Schemes (CS)				
1	Pardhan Mantri Swasthya Suraksha Yojana (PMSSY)	7517.64	1900	2400	26.32
2	National AIDS & STD Control Programme	2143	2420.56	3049	25.96
3	Family Welfare Schemes	444.99	639.65	694.72	8.61
4	Pradhan Mantri Graib Kalyan Pacakge	314.1	200.21	468	133.75
5	National Digital Health Mission	83.94	200	250	25.00
6	Other Central Sector Schemes	445.47	238.5	753.63	215.99
	Total Central Sector Schemes (C)	10949.14	5598.92	7615.35	36.01
D	Total Other Central Sector Expenditure (D)	15411.29	15773.09	16420.3	4.10
E	Establishment Expenditure of New AIIMS (E)		6735	6800	0.97
	Grand Total (A+B+C+D+E)	73308.3	77624.79	87659.91	12.93

(Sources: Demand Number 47, Demand for Grants, Ministry of Health and Family Welfare, Union Budget, 2023-24 [(Notes on Demands for Grants, 2023-2024, n.d.)])

**Figure 2**  
Percentage of Budgetary Allocation in Different Schemes



Source: Demand for Grant, Annual Indian Budget 2024-25 [21]

- The allocation of funds for the establishment of new AIIMS (All India Institutes of Medical Sciences) comprises 10.49 per cent of the total budget. Out of this amount, 7.76 per cent is

explicit allocated for establishing new AIIMS institutions, while 2.73 per cent is allotted for the *Pradhan Mantri Swasthya Suraksha Yojana* (PMSSY).

- The overall budget of the Department of Health and Family Welfare is Rs. 87,658.91 crore. Out of the total amount, Rs. 9,200 crore is allocated specifically for the establishment of new AIIMS and the *Pradhan Mantri Swasthya Suraksha Yojana*.
- Present condition of the new AIIMS:  
Out of the 22 new AIIMS that were planned, only 6 are currently operating at full capacity. The other AIIMS institutions are currently at different phases of implementation.
- Challenges: Although there is a budgeted allocation, there are worries that the existing funding may not be adequate to fully cover all the requirements for establishing these new AIIMS institutes.

### Importance of Establishing New AIIMS

The establishment of new AIIMS institutions across India is crucial for several reasons<sup>14</sup>. Setting up new AIIMS institutions would help bridge the gap between rural and urban healthcare facilities, as these institutions are expected to provide quality healthcare services in underserved areas<sup>22</sup>. The establishment of new AIIMS institutions is considered an important step for several reasons, which include enhancing accessibility to high-quality healthcare, decentralizing patient load from AIIMS New Delhi, fostering medical education and research, and driving regional and national healthcare improvements<sup>11</sup>:

1. **Quality Tertiary Health Care services:** New AIIMS institutes are a big boost for the overall healthcare system. The main goal behind creating AIIMS is to provide top-notch tertiary medical care to the public. These institutes also play a vital part in driving medical research and education, as well as offering excellent patient care.
2. **Patient Care:** New AIIMS aims to provide accessible healthcare of the same standards as AIIMS New Delhi without patients having to travel long distances, thus reducing the burden on the original AIIMS and allowing for better patient care and research opportunities.
3. **Availability of Medical Faculty:** By establishing local AIIMS, training and availability of medical faculty within the state are facilitated. This addresses the shortage of qualified faculty, which is crucial for the improvement of medical education<sup>15</sup>.
4. **Quality Research:** Central funding for research at local AIIMS stimulates quality medical research that can significantly benefit state medical colleges, especially in regions where state funding may be inadequate.
5. **Clinical Practice Guidelines and Standards:** Additional AIIMS institutions could contribute to the formulation of localized clinical practice guidelines, thus ensuring standards more suitable for the Indian populace as opposed to unsuitable international guidelines being followed currently.
6. **Educational Opportunities for Local Students:** New AIIMS provides more opportunities for local students by ensuring a percentage of them are recruited from the host state and local community, which is also vital for retaining physicians to serve in these local areas.
7. **Competitive Excellence:** The presence of multiple AIIMS institutions can stimulate competition, leading to improved patient care and research outcomes. These centres can also play a pivotal role in developing the under-optimal community understanding and perception towards healthcare<sup>6,23</sup>.

## Key challenges and solutions for establishment of new AIIMS

The Comptroller and Auditor General of India's performance audit report for the 2003-2017 period also acknowledged the scheme's potential. It revealed shortcomings in the execution of the scheme like administrative and budgetary issues such as delays in approval, construction, procurement, and cost overruns, etc (Comptroller and Auditor General of India, 2018). Setting up new AIIMS institutions presents a range of challenges, along with potential solutions to address these issues:

**1. Land Acquisition difficulties:** The acquisition of sufficient land for the construction of the new AIIMS is one of the initial challenges that must be overcome at this stage. The land must be in a suitable location and cleared by several different agencies, making this a potentially time-consuming procedure.

**Solution:** Streamlining land acquisition procedures by the government can expedite this process

**2. Funding and Cost Overruns:** Managing funding and cost overruns can be a significant challenge when establishing these institutions. Nonavailability of funds and not release in a timely lead to cost escalations and delay of the project. These expenses encompass higher construction costs, medical equipment expenses, and the need to hire additional personnel.

**Solution:** Rigorous financial planning is needed and the release of funds is linked with project milestones and conducting regular audit can effectively manage costs.

**3. Procurement and Logistics:** The process of acquiring medical equipment and handling logistics can pose challenges, especially in remote areas with limited accessibility.

**Solution:** By setting up local procurement channels and logistic frameworks, delays can be minimized, maintaining a consistent supply of materials and resources.

**4. Recruitment and Training of Staff:** Deficiencies in the recruitment process can result in a shortage of staff, which can have a negative impact on the operational capacity of new AIIMS. Shortage of adequate faculty and non-faculty staff in new AIIMS.

**Solution:** Improving the recruitment process and imparting specialized training to medical personnel to ensure that there is a sufficient pool of qualified workforce.

**5. Delay in approvals:** Administrative delays, procurement issues, and unforeseen construction complexities have been reported as impediments to efficient fund utilization

**Solution:** Establish streamlined administrative procedures to reduce bureaucratic delays and ensure prompt approval. Procurement process should be simple.

## Conclusion and Future Directions for AIIMS Expansion

The establishment of new AIIMS (All India Institutes of Medical Sciences) in India is a pivotal measure aimed at enhancing healthcare accessibility and narrowing the disparity between urban and rural regions. The expansion is vital to meet the increasing demands of the nation's expanding population for high-quality healthcare and medical education. To ensure the success of the AIIMS expansion, it is crucial to take into account the knowledge gained from the current AIIMS in New Delhi, implement strategies to overcome the difficulties encountered, and consistently adapt to incorporate the most up-to-date advancements in medical technology and educational methods.

1. **Improvement in Healthcare Infrastructure:** The initiation of new AIIMS facilities has commenced to narrow the disparity in healthcare availability and standards among different locations in India.
2. **Improvements of Medical Education:** The establishment of additional AIIMS-like institutions leads to a substantial rise in the accessibility of superior educational prospects for aspiring medical students.
3. **Improvement in Research:** The expansion facilitates the establishment of a sophisticated framework for cutting-edge research in medical science, which is crucial for the advancement of novel treatments and healthcare techniques.
4. **Employment Generation:** The establishment of new AIIMS leads to the creation of a significant number of employment opportunities, both inside the institutions themselves and in the nearby regions, hence promoting economic development.
5. **Public Health Resilience:** The establishment of new AIIMS leads to the creation of a significant number of employment opportunities, both inside the institutions themselves and in the nearby regions, hence promoting economic development.
6. Future directions for AIIMS expansion should focus on:
7. **Ensuring Quality:** Future expansions should uphold or enhance the level of excellence achieved by the existing AIIMS. This entails upholding rigorous standards in education, patient care, and research.
8. **Mitigating Deficiencies:** As new AIIMS facilities commence operations, it is imperative to consistently address deficiencies in resources, such as personnel, medical equipment, and technology.
9. **Equitable Healthcare:** Future AIIMS should prioritise the provision of healthcare services to marginalised groups and use traditional medicine like AYUSH to foster comprehensive well-being.
10. **Sustainable Operations:** AIIMS facilities are required to implement sustainable operations, which involve adopting green hospital activities, in order to reduce their environmental footprint.
11. **Research Focus:** AIIMS should prioritise being leaders in medical research by providing sufficient resources and financing to attract top research expertise.
12. **Telemedicine and Digital Health:** Utilising technology to expand the scope of AIIMS through telemedicine and digital health projects could be a key area of emphasis, hence delivering top-notch healthcare to rural regions.
13. **Public-Private Partnerships:** Investigating public-private partnerships could be a means to exchange knowledge, decrease expenses, and enhance the provision of services in the construction and operation of these institutions.

The establishment of new AIIMS in India aims to improve healthcare accessibility and bridge the gap between urban and rural areas. It is important to learn from the current AIIMS in New Delhi and overcome challenges to ensure the success of the expansion. The expansion will improve healthcare infrastructure, medical education, and research capabilities. It will also generate employment opportunities and contribute to economic development. Future directions for AIIMS expansion should focus on maintaining quality, addressing resource deficiencies, providing equitable healthcare, implementing sustainable operations, prioritizing research, utilizing telemedicine and digital health, and exploring public-private partnerships. The AIIMS expansion

program is expected to have a significant impact on the healthcare sector in India by improving clinical outcomes, promoting research, and providing high-quality education and training.

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## Eating Behaviour amongst the College Students: A Systematic Review

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### Abstract

*Eating behaviour adopted during the years at university may be continued throughout adulthood. Hence, understanding the factors influencing university students' eating habits is essential for prevention of various nutrition-related non-communicable diseases (NR-NCDs). Several factors may lead to eating behaviour which may impact on poor dietary choices and thereby resulting in poor health outcome in university students. The review paper aimed to elucidate the influence of the determinants of eating behaviour amongst college going students.*

*A literature review of published publications was carried out through various search engines platforms namely Elsevier, Science Direct, ESBCO host, Research Gate, Google Scholar and other databases. The review was conducted in three steps, firstly by the identification of research question followed by selection of articles from the literature using specific keywords and lastly summarizing information from collected data. Individual factors particularly nutritional knowledge, gender, physical activity had significant influence on eating behaviour. Societal and environmental determinants on eating behaviour pattern in college students have particularly increased due to digitalization of the modern age as reported in the recent published articles. An opportunity for nutritional education of students exists in the university and college settings can promote healthy eating habits among college students. It is essential to explore the differences in barriers and enablers for maintaining a healthful eating behaviour in students and encourage young people to adopt healthy eating practices.*

**Key words:** Eating behaviour, university students, determinants of eating behaviour, nutrition-related non-communicable diseases (NR-NCDs)

### Introduction

Currently dietary trends appear to be uniformly shifting in favour of a diet that is dominated by greater intakes of caloric sweeteners, ultra-processed foods and fatty meals<sup>1</sup>. Modernization and urbanization have led to a transition in food choices both in quality and quantity in the recent years with an escalating adoption to erratic food behaviour pattern<sup>2</sup>. One of the most sensitive times in the lives of young adults, who encounter numerous difficulties, is the transition from high school to university. During this era of transition, people become more independent and alter their social surroundings which is crucial for the development of healthy behaviours connected to eating patterns and living situations<sup>3</sup>. University students are amongst the population segments

where dietary diversification is minimal with rising consumption of high-calorie, high-fat diets, declining levels of physical activity, and emotional changes (primarily anxiety and depression) that influence food intake and eating behaviour<sup>4,5</sup>.

Eating behaviour is a broad term that encompasses food choice and motives, feeding patterns, dieting and eating related behaviour such as obesity, eating disorders and feeding disorders <sup>6</sup>. There are several underlying drivers associated with eating behaviour which includes genes, hormones, religious beliefs, mood, media and external environmental cues <sup>7</sup>. The evaluation of eating behavior involves observing an individual's traits, such as their relationship with food, food responsiveness and eating habits <sup>8</sup>. In university students, common barriers to healthy eating behaviour can include time constraints, unhealthy snacking, convenience high calorie food, stress, high prices of healthy and organic foods, easy access to junk foods and sedentary lifestyle <sup>9</sup>. On the other hand, improved knowledge about food and its preparation can enable a healthier dietary choice and instilling regular physical activity can be enablers of healthy eating behaviour.

## **Methodology**

A systematic review of dietary behaviour pattern in college going/ adolescent population was undertaken to systematically search for, appraise and synthesize research evidence. Inclusion criteria for the review were studies of university/ college students with a quantitative or qualitative outcome about diet or eating related behaviour and association with nutrition transition. Published articles written in English language was selected. Similarly, exclusion criteria included studies which reported a control group with no nutrition-related non-communicable diseases (NR-NCDs).

Elsevier, ScienceDirect, ESBCO host, ResearchGate, Google Scholar databases were searched as part of an evaluation of the literature of published publications. Selection of articles from the literature using specific keywords like, “eating behaviour”, “foods selection”, “university/college students”, “dietary choices”, “determinants of eating behaviour”, “food preferences” and “eating habits”. The title and abstract and subsequently the whole paper was screened as per the inclusion criteria as stated. Any duplicates of the paper were removed. If multiple publication of the study with different results was given, the papers were selected followed by summarizing data from selected articles.

## **Discussion**

Eating behaviour is defined as “normal behaviour related to eating habits, selecting foods that you eat; culinary preparations and quantities of ingestion”. It is also a complex interplay of physiologic, psychological, social and genetic factors that influence meal timings, quantity of food intake, food preference and food selection <sup>10</sup>. Russell et al.<sup>11</sup> defines eating behaviour to be a multi- component, latent constructs which include state or trait- like context – specific acts, skills or patterns of behaviour that involve food choice, consumption, hedonic, reward, food avoidance/ approach, reactions to food cues, rate of eating, oral processing, food and eating attitudes, beliefs/ cognition and habits.

Several factors may lead to eating behaviour which may impact on poor dietary choices and thereby resulting in poor health outcome in university students.

## Societal Factors

**Peer Influence:** Eating behaviour in university students is highly influenced by peer influence. According to the Social Learning Theory, teenagers do not see or adopt a behaviour, instead they need to believe that their peers approve it<sup>12</sup>. Therein peers can significantly affect how an adolescent looks, behaves, speaks, eats and exhibit other traits. Teenage peer pressure can range from encouraging healthy eating to fostering eating disorders<sup>13</sup>. Socialization is an important aspect in the life of university students. Hence, young adults attach social meanings to food choices and are often judged by their peers on their food choices<sup>14</sup>. A study conducted at Cornwell University, US by Sogari et.al<sup>9</sup> reported that in young adults many habits are influenced by the peers which also includes eating behaviour and there can be an immense peer pressure to eat healthy in a group to fit in and be popular in the university. Gradidge and Cohen<sup>15</sup> also reported that there is a very high impact of peer influence on food purchase. Subsequently the unhealthy food purchases can lead to unhealthy eating behaviour and risk to eating disorders.

**Social Media:** Social media refers to any social networking site that allows for interactive, user-generated material to be shared on internet forums (like Facebook), blogs and microblogs (like Twitter), and photo- or video-hosting platforms (like Instagram, YouTube, or TikTok). Adolescent eating behaviour was found to be influenced by both positive and negative social media contents<sup>16, 17</sup>. Social networking sites (SNS) are places to engage youth with healthy eating and active living messages. Researchers have shown that screen time involved during SNS viewing can contribute further to sedentary living<sup>18, 19</sup>. There are several reports about the decline of television viewing by the adolescence population and increase in the SNS activity. This has led to an upsurge in the food media post or online food marketing surfacing in the social media posts of the young adults<sup>20, 21</sup>. High exposure of the food posts can eventually influence the individual's eating pattern favouring consumption of non-core foods<sup>22</sup>.

**Societal Norms and Beliefs:** Eating behaviour is strongly associated with societal norms and values<sup>23</sup>. In the study conducted by Deliens<sup>24</sup>, to determine eating behaviour determinants in college students, it was reported that the participants mentioned that eating behaviour can be region as well as society specific. Social norms may affect the food choice and dietary intake by altering self-perceptions. It has also been proposed that eating norms are followed because they provide information about what/when has to be consumed<sup>25</sup>. Perceiving norms about others' unhealthy eating habits can facilitate one's own unhealthy eating behavior by increasing perceptions of customs, traditions and beliefs<sup>26</sup>. One potential way to improve young people's eating behavior is to intervene in the social norms that govern eating behaviour<sup>27</sup>.

## Environmental Factors

**Factors Associated with University Environment:** A very strong element which shapes an individual's eating behaviour is the external environment<sup>28</sup>. A study report given by Sogari et al.<sup>9</sup> reported that students who are day scholars or from the neighbourhood (close to the university) frequently visit their homes on the weekends, giving them the chance to eat a balanced diet. A university food environment should take into account on-campus dining options, cafés, vending machines, and food sources easily accessible to students who are actually enrolled in classes at the university<sup>29</sup>. It was also concluded from the study undertaken by Pelletier and Laska<sup>30</sup> that

increasing the healthfulness of campus food environment and promotion of healthy food and beverage purchasing may be an important target for nutrition promotion among college students.

**Availability and Food Cost:** University students make dietary choices dependent on the availability and accessibility of fresh, raw foods at reasonable prices as reported by Ganasegeran<sup>31</sup>. The lack of campus availability of food supplies can also contribute to unhealthy food eating behaviour<sup>32</sup>. Fonseca et al.<sup>33</sup> reported that the university students perceived that the easy availability of junk foods at the campus area can prevent them from reaching out healthier food options. Another study conducted at Brazilian university conducted by Pulz et al.<sup>34</sup> concluded that the overall options for healthy food choices were limited by the availability and higher prices of the products. University students are also vulnerable in their eating habits for different reasons and barriers students' dietary preferences are influenced by the cost of food items and personal budgets<sup>35</sup>. Limited budget and time constraint due to busy academic schedules also was identified as barrier to healthy eating by the university students<sup>36, 37</sup>.

### Individual Factors

**Knowledge about Dietary Requirements:** Estimated average requirements (EAR) is the amount of a nutrient that is estimated to meet the requirement for a specific criterion of adequacy of half of the healthy individuals of a specific age, sex and life stage<sup>38</sup>. For a person's body to function effectively and to maintain optimal health, it is essential that they meet their daily dietary needs. Recent researches have shown that the majority of undergraduate students lack adequate nutritional knowledge about individual's dietary requirements, hence leading to poor dietary choices<sup>39-41</sup>. However, many studies have stated a positive but a weak correlation between nutrition knowledge and eating behaviour<sup>42-44</sup>.

**Gender:** Gender specific attitudes towards eating behaviour are often reflected by the food intake pattern<sup>45</sup>. Female students are more likely to choose a healthy diet because they seem to be more conscious of the impact that nutrition has on human health<sup>46-49</sup>. It has also been reported by researches which implies that consumption of red meat and larger portion size was associated with masculinity whereas fruits and vegetables, dairy products and smaller portion size was linked with femininity<sup>50,51</sup>.

**Cooking Skills:** Self efficacy is very essential to promote positive healthy eating behaviour in individuals<sup>52</sup>. As a factor that influence dietary intake on campus, people's culinary abilities have also come into focus<sup>53</sup>. A detailed analysis at cooking knowledge, attitudes, and behaviour along with culinary skills among college students is necessary in light of patterns of weight gain and poor dietary and to improve food consumption. College students who spent more time in food preparations and clean up reported to have a healthier Body Mass Index (BMI)<sup>54</sup>. Young adults' participation in food preparation was linked to an overall improved diet, along with increased fruit and vegetable consumption, decreased fat intake, and higher nutrient intake<sup>55</sup>.

**Stress:** Literature supports that stress is associated with unhealthy food choices, low physical activity and adverse health behaviour in university students<sup>56</sup>. In a cross-sectional study of first-year university students at an Australian university, it was observed that more than half of the students were under some form of stress, with women generally suffering more than men<sup>57</sup>.

Similar observations were reported about stress and eating behaviour pattern amongst the university students from other countries<sup>58, 59</sup>. Students reported that the stress level is high owing to the new academic challenge<sup>60</sup>. Not only academic but social stress can also alter eating behaviour of college students. Stress alters eating habits and leads to overconsumption of hyperpalatable foods result in neurobiological alterations that encourage compulsive behaviour<sup>61</sup>.

**Level of Physical Activity:** According to a study conducted by Rodríguez<sup>62</sup>, female students were more physical inactive primarily due to lack of time and laziness. A similar finding was reported where the students cited that they were not performing physical activity due to lack of time and energy<sup>63</sup>. It is commonly observed that college students devote a considerable amount of time in playing computer games (example for sedentary lifestyle) and it is linked to unhealthy snacking behaviours, such as eating too much calorie and fat dense foods and fewer fruits and vegetables<sup>64</sup>.

**Dietary Intake and Taste Preferences:** Dietary diversification has been globally recognized as an important aspect of assessment of high-quality diet. When a student starts college, they have the freedom and independence to choose the foods they want, which was earlier controlled by their parents and to some extent by the school administration<sup>65</sup>. There has been very limited consumption of pulses, fruits and vegetables, milk and dairy products and high consumption of simple sugars, meat products, carbonated and alcoholic beverages<sup>66</sup>. Hilger<sup>67</sup> in his study reported that taste preferences were cited as one of the major causes of food preferences towards unhealthy food selection. Similar aspects were reported about taste preferences and eating pattern in college students<sup>24</sup>. Furthermore, the latest fad about ordering food online further worsens the food habits of the students.

## Conclusion

There are significant difficulties that college students must overcome that could encourage unhealthful eating patterns and weight increase<sup>68</sup>. Consumption of unhealthy foods like fast food and high-calorie snacks, less intake of fruits and vegetables, and frequently skip meals has been reported in various studies<sup>69</sup>.

Various models to understand and manage the prevailing dietary transition exists, however focus needs to be laid on management on food environment that can target individual behaviour. Several studies have reported that dietary interventions carried out by creating awareness about knowledge regarding Dietary Guidelines is positively related to a healthier eating pattern<sup>70</sup>. Therefore, development of nutrition education programs that promote healthy eating habits should be encouraged. It is also crucial to consider promotion of indigenous foods people's behaviours and interactions with culturally significant foods which are influenced by cultural perceptions and local circumstances<sup>71</sup>. Hence, it is essential to explore the differences in barriers and enablers for maintaining a healthful eating behaviour in students. The behavioural determinant amongst the adolescents and young adults can be considered crucial for public health interventions.

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## Knowledge, Attitude and Practices (KAP) of Millet Consumption among School Children Aged 10-15 Years: A Study in Virudhunagar District, Tamil Nadu, India

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### Abstract

*Millet, small-seeded cereal grasses or coarse grains. India is the leading producer, with eight species including foxtail, finger, small, barnyard, sorghum, kodo, proso, and pearl millet. Millets are a nutritious cereal grain with high dietary fiber, gluten-freeness, and a lower glycemic index. Regular consumption lowers the risk of cancer, diabetes, hyperlipidemia, cardiovascular disease. A study was conducted among school-going children (10-15 years) in Virudhunagar district in Tamil Nadu, assessing millet intake through a dietary survey. The study collected information on demographic details, frequency of millet consumption, and preferred millet recipes. Both government and private schools had children with similar age distributions, with private school children from higher-income families and government school children from middle-income families. Millet-based recipes were consumed only occasionally by both school children. The study aimed to provide baseline data on millet awareness and consumption patterns among school children, which could help plan millet nutrition education programs and interventions to improve millet nutrition among school children.*

**Key-words:** Millets, school children, consumption patterns, KAP study, Virudhunagar district, India.

### Introduction:

Millets, small-seeded cereal grasses or coarse grains, are a significant food crop in India, accounting for 40.2 per cent of the global millet production. India is the leading producer, with eight species including foxtail, finger, small, barnyard, sorghum, kodo, proso, and pearl millet. Millets are rain-fed and require minimal irrigation, making them easy to cultivate in drought-prone areas. Only 35 species, comprising 20 genera, have been domesticated for food and feed<sup>1</sup>. Millets are a nutritious cereal grain with high dietary fiber, gluten-freeness, and a lower glycemic index. Millets also contain vitamins, particularly vitamin B complex and vitamin E, and phenolic compounds that play a role in the immune system. Regular consumption lowers the risk of cancer, diabetes, hyperlipidemia, cardiovascular disease, and neurological illnesses<sup>2</sup>. In India, millets are often consumed with legumes, enhancing protein and digestibility. The International Year of Millets (IYOM 2023) is a global initiative by the Food and Agricultural Organization of the United Nations (FAO) to promote millets as a food crop. India has declared 2023 as the "International Year of Millets" to raise awareness about millets' health benefits, improve food security, and support sustainable agriculture. Millets contribute to India's economy by reducing poverty, boosting agricultural production, and promoting self-sufficiency<sup>3</sup>. Very limited studies conducted

on the knowledge, attitude and practices (KAP) on millets. Hence, the present study was planned to study the KAP on millets among selected subjects. Millets with great nutritional potential has to be promoted for consumption especially among school going children. Hence this study aims to assess the consumption pattern of millets among school going children in Virudhunagar district.

## **Objectives**

The objectives of this study are to

- Study of millet consumption pattern among school going children (10-15 years) both boys and girls in private and government schools.
- Assessment of millets intake through dietary survey.

## **Methodology**

**Sample Selection:** The study was conducted among school-going children of Virudhunagar district in Tamilnadu. The schools selected in Virudhunagar district are from Sivakasi town and Thiruthangal. One private and two government schools from each city of Sivakasi town and Thiruthangal were selected. From these schools a total of 600 school going children in the age group of 10-15 years were selected. Among the 600 children selected, 158 boys and 159 girls were studying in government schools while 140 boys and 143 girls were studying in private schools. The 600 children studying in fifth to ninth standard were selected through purposive sampling method to participate in the study.

**Data Collection:** Questionnaire was framed to collect information from school-going children about demographic details like age, gender, educational level, socio economic status and to collect information about the frequency of type of millet consumption and the dish prepared from millet at home and preferred to eat and also to test knowledge on millets, attitude about millet eating and the practices about millet inclusion in day to day life. Each part consists of five close end questions with the answer yes or no.

## **Knowledge, Attitude and Practices about millets**

Knowledge, attitude, and practice (KAP) questionnaires are commonly used for public health development programmes.

- Knowledge questionnaire included questions about awareness on millets, inclusion of millet in day to day meal, are millets more nutritious than white and brown rice, and are millets nutritious and are they used only in traditional Indian diets.
- Attitude questionnaire included questions like is it essential to eat balanced diet every day to improve immunity, whether parents and grandparents eat millet regularly, healthy foods are expensive and millets help in weight reduction.
- Questionnaires for assessing practices included questions like: Do you wash your hands before eating? Do you consume millets regularly? Do you ascertain that your everyday diet contains basic five food groups? and Would you recommend millets to friends and family?

**Statistical Analysis:** The data was recorded as KAP scores on a two-point continuum, i.e., correct response-1 and incorrect response-0. Descriptive statistics were provided for variables such as age, gender, education, socioeconomic status, millet consumption. Frequencies and percentages were calculated using Microsoft excel. The SPSS package was used for data analysis. A significance level of  $p < 0.05$  was considered.

**Ethical Consideration:** Ethical approval for this study (IHEC/22-23/FSN-9) was provided by the ethical committee of Avinashilingam Institute for Home Science and Higher Education for Women.

## Findings

### Distribution of children based on their age and class studying (Standard)

**Table-1**  
Distribution of Children Based on Their Age and Class

Age in years	Class	Types of school				Total	
		Government school (n=317)		Private School (n=283)		N	%
		N	%	N	%		
10	5 <sup>th</sup>	82	26	65	23	147	24.5
11	6 <sup>th</sup>	73	23	69	24.4	142	23.7
12	7 <sup>th</sup>	69	21.8	71	25.1	140	23.3
13	8 <sup>th</sup>	48	15	37	13	85	14.2
14	9 <sup>th</sup>	45	14.2	41	14.5	86	14.3
Total		317	100.0	283	100.0	600	100.0

The data presented in Table 1 reveal the detailed analysis of the age and the class studying of the selected children in government and private schools. Out of the total 317 children studying in government school, majority Of 26 per cent of the children belonged to 10 years age group and were studying in fifth standard. Twenty-three percent and 22, 15 and 14 per cent of the children belonged to 11, 12, 13 and 14 years age group and were studying in classes sixth, seventh, eighth and ninth respectively. Two eighty-three children were studying in private school, 23 per cent of children belonged to the 10 years age group and were studying in fifth standard. The majority of 24 per cent and 25 per cent of the children belonged to the 11 and 12 years age group and were studying in sixth and seventh standard. Thirteen percent and 15 per cent of children belonged to the 13 and 14 years age group and were studying in classes eighth and ninth respectively.

### Distribution of Children Based on Gender

Gender differences in academic achievement and behavioural patterns in school have an impact on participation in extracurricular activities. Schools should promote gender-inclusive participation in sports, arts and other extracurricular to ensure all children have diverse growth opportunities.

**Figure-1**  
Distribution of Children-based on Gender

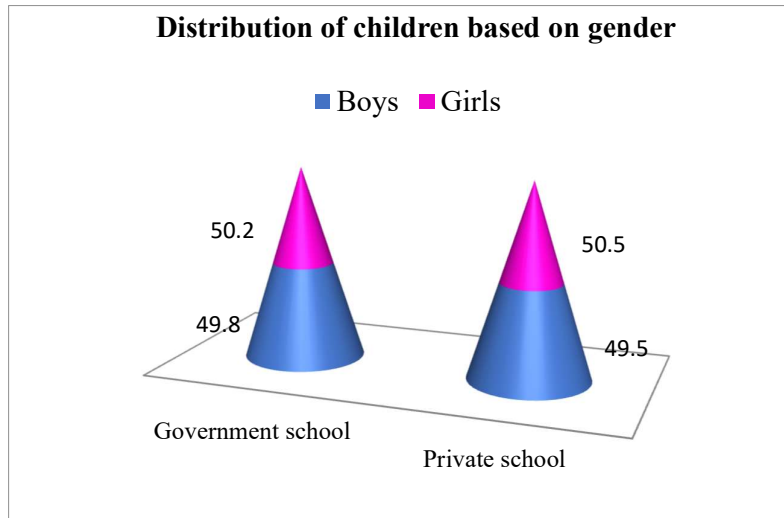


Figure 1 presents a nearly equal gender representation in government and private schools, with boys comprising about half of the total enrolment and girls making up the other half. In government schools, 49.8 per cent of the children are boys and 50.2 per cent are girls, while in private schools, 49.5 per cent are boys and 50.5 per cent are girls. This data suggests that educational opportunities are becoming more accessible across genders, with comparable enrolment rates in both types of schools.

### **Socio-economic Status of the Children**

Socioeconomic status significantly impacts children's educational opportunities, with affluent families having access to private schools, tutoring services, and extracurricular activities. Low-income children may have fewer opportunities for academic enrichment. Additionally, socioeconomic status affects children's social and emotional well-being, impacting their academic performance and school engagement. Stress from poverty, housing instability, family discord, and community violence can negatively affect learning and school participation.

**Figure-2**  
Socio-economic Status of the Children

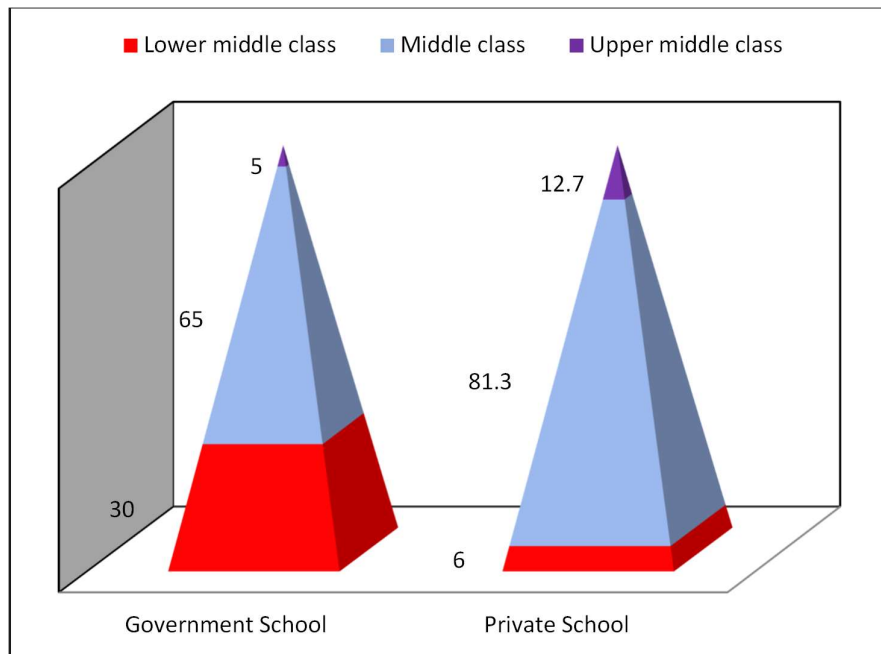
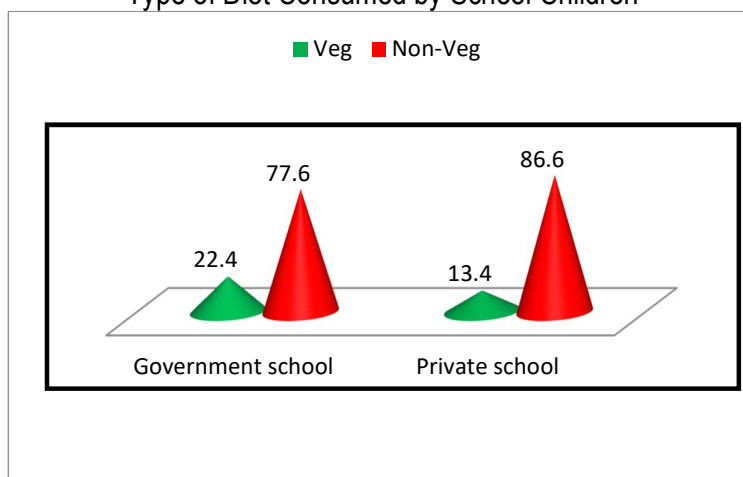


Figure 2 shows that the selected children were classified as lower middle income, middle income, upper middle income, using tiwari & kumar: updation of Socio-Economic scale, 2010. The classification is based upon the factors including land area (square feet), house type, gadgets in the home, computer competence, land/house value, average monthly per capita income, and social profile are used to evaluate socio-economic status (SES). Based on this classification the data reveals that 30 per cent of the children in government schools belong to the lower middle class, while only six percentage belong to lower middle class in private schools. This shows affordability is a criterion to get education in private schools. The majority of the children (i.e.) 65 per cent and 81.3 per cent belong to middle class family from government and private school respectively. However, a smaller fraction represents the upper middle class, with only 5 per cent in government schools and 12.7 per cent in private schools. From the data collected, it can be assessed that in both government and private schools; majority (72.7%) of the children belonged to middle income family, while 18.7 per cent and 8.7 per cent children belonged to lower middle class and upper middle class family respectively.

### **Type of Diet Consumed by School Children**

Researching the types of diets consumed by school children in India is an important endeavor, as it can provide insights into nutritional patterns, health outcomes, and potential interventions to promote better dietary habits.

**Figure-3**  
Type of Diet Consumed by School Children



From figure-3, it is evident that when food habits of children are compared it indicates that the percentage of government school children following vegetarian diet is 22.4 per cent and it is high when compared to private schools (i.e.) 13.4 per cent consume vegetarian diet in private school. This indicates that while a higher percentage of children in government schools follow a vegetarian diet, the majority (i.e.) 77.6 per cent and 86.6 per cent consume non-vegetarian diet in both types of schools. The data suggests cultural, socioeconomic, and environmental factors influence the dietary preferences among school children.

### Frequency of Millet Consumption by School Children

**Table- 2**  
Frequency of Millet Consumption by School Children

Food items	Government school (n = 317)				Private school (n = 283)				Total (n = 600)			
	D %	A.D %	W.O %	O %	D %	A.D %	W.O %	O %	D %	A.D %	W.O %	O %
Pearl millet	-	11	29	60	-	6	5	89	-	8	18	74
Sorghum	-	-	31	69	-	-	9	9	-	-	20	80
Fingermillet	-	11	29	60	-	6	5	89	-	8	18	74
Kodo millet	-	-	-	100	-	-	-	100	-	-	-	100
Foxtail millet	-	-	-	100	-	-	-	100	-	-	-	100
Proso millet	-	-	-	100	-	-	-	100	-	-	-	100
Little millet	-	-	31	69	-	-	9	91	-	-	20	80
Barnyard millet	-	-	11	89	-	-	6	94	-	-	8	92

D- Daily, A.D- Alternative Days, W.O- Weekly Once, O-Occasionally.

The data about frequency of millet consumption by daily, alternate days, once a week, or occasional intake is presented in Table 2. The study compares the consumption patterns of millet among government school children and private school children. The general observation of the data reveals that either the government or private schools the consumption pattern of one or other millet is very poor or school children consume millets only occasionally. Pearl millet is

mostly consumed occasionally (60%) and on alternative days (29%), followed by sorghum (69%) and finger millet (29%). Kodo millet, foxtail millet, proso millet are primarily consumed occasionally (100%), indicating they are not regular staples in the diet of government school children. Little millet is mostly consumed occasionally (69%) and weekly once (31%), followed by barnyard millet (89%) and on alternative days (11%). Both groups have a trend of consuming millets occasionally, with the highest percentage falling into this category for most millet types. Private school children seem to consume millets more regularly on a weekly basis compared to government school children. Alternative day consumption is relatively low in both groups, indicating that millets are not a consistent part of the daily diet for either group of children. Private school children show a slightly higher frequency of consumption across all categories compared to government school children, suggesting potentially better access or awareness regarding the nutritional benefits of millets. Overall, both groups predominantly consume millets occasionally, highlighting the need for initiatives to promote more regular consumption of these nutritious grains, especially in government schools where consumption rates are generally lower.

### Frequency of Millet-based Recipes Consumption Pattern by School Children

**Table 3**  
Frequency of Millet Recipes Consumption Pattern by School Children

Food items	Government school (n= 317)				Private school (n=283)				Total (n=600)			
	D %	A.D %	W.O %	O %	D %	A.D %	W.O %	O %	D %	A.D %	W.O %	O %
Millet bread	-	-	-	100	-	-	-	100	-	-	-	100
Millet cake	-	-	-	100	-	-	-	100	-	-	-	100
Millet cookies	-	-	31	69	-	-	9	91	-	-	21	79
Millet dosaï	-	11	29	60	-	6	5	89	-	8	18	74
Millet health mix	-	11	9	80	-	6	2	92	-	8	6	86
Millet idiyappam	-	-	11	89	-	-	6	94	-	-	8	92
Millet idly	-	-	40	60	-	-	11	89	-	-	26	74
Millet khichdi	-	-	11	89	-	-	-	100	-	-	11	89
Millet kozukattai	-	-	40	60	-	-	11	89	-	-	26	74
Millet nutri bar	-	-	-	100	-	-	-	100	-	-	-	100
Millet muesli	-	-	-	100	-	-	-	100	-	-	-	100
Millet noodles	-	-	40	60	-	-	11	89	-	-	26	74
Millet pasta	-	-	-	100	-	-	-	100	-	-	-	100
Millet porridge	-	-	9	91	-	-	2	98	-	-	11	89
Millet puttu	-	-	40	60	-	-	11	89	-	-	26	74
Millet roti	-	-	20	80	-	-	5	95	-	-	13	87
Millet kali (mudde)	-	-	40	60	-	-	11	89	-	-	26	74
Millet traditional sweets	-	-	20	80	-	-	5	95	-	-	13	87
Millet traditional savouries	-	-	20	80	-	-	5	95	-	-	13	87
Millet upma	-	-	20	80	-	-	5	95	-	-	13	87
Millet variety rice	-	-	-	100	-	-	-	100	-	-	-	100
Millet pongal	-	-	40	60	-	-	11	89	-	-	26	74

D- Daily, A.D- Alternative Days, W.O- Weekly Once, O-Occasionally.

The data on the frequency of millet based recipes consumption daily, alternative days, once a week or occasionally are presented in Table 3. It indicates that millet-based foods are consumed

by both government and private school children. Only eleven percent and six percent of government and private school children mostly consumed millet dosai and millet health mix on alternative days and remaining childrens occasionally consumed millet based recipes. Government and private school children consumed weekly once or occasionally millet based recipes like millet bread, cake, cookies, idiyappam, idly, khichdi, nutri bar, kozukattai, muesli, noodles, pasta, porridge, puttu, roti, kali (mudde), traditional (sweets and sevories), upma, variety rice and pongal. The children are aware of these recipes and only one or two recipes listed are consumed occasionally. Hence from the data, it is understood that there is a need to create awareness about nutritional benefits of millets among school children to increase the consumption of millet based recipes. The results are consistent with Anitha et al. (2019) study that the popularity of millets has declined over the years and it was either consumed by parents or elders and only a few school children were consuming millets based recipes.

### Knowledge, Attitude and Practice (KAP) on Consumption of Millets among School-going Children (10-15 Years)

**Table 4**  
Knowledge, Attitude and Practice (KAP) on consumption of millets among School-going Children (10-15 Years)

Questions	Answer choice (n=600)			
	Government school (n=317)		Private school (n=283)	
	N	%	N	%
<b>Knowledge about millets among by school children</b>				
Have you heard about Millets?	125	39	112	40
Have you eaten any type of millet	48	15	18	6
Are millets more nutritious than white and brown rice?	63	20	89	31
<b>Are millets nutritious?</b>				
Are millets used only in traditional Indian diet?	298	94	258	91
<b>Attitude towards millets by school children</b>				
Do you think it is essential to eat balanced diet every day to improve immunity	317	100	283	100
Do you feel that healthy foods are expensive?	275	87	227	80
Do millets help in weight loss?	25	8	22	8
Did your parents/grandparents eat millets often?	306	97	250	88
Is consuming fast food everyday not good for health ?	186	59	196	69
<b>Practice of millets among by school children</b>				
Do you take bath regularly?	317	100	283	100
Do you wash your hands before eating?	301	95	277	98
Do you consume millets regularly?	40	13	10	4
Do you ascertain that your everyday diet contains basic five food groups?	6	2	4	1
Do you/would you recommend millets to friends and family?	12	4	9	3

Table-4 presents the scores for different questions asked about knowledge, attitude and practice about millet consumption among school children. In this study the children from government and private schools, 39 per cent and 40 per cent had heard about millets, 15 per cent and 6 per cent had consumed one or other type of millets, 20 per cent and 31 per cent of the children knew that millets are more nutritious than white and brown rice, 98 per cent and 95 per cent opined that millets are nutritious to consume, and 94 per cent and 91 per cent answered that millets are used only in traditional Indian diets. The mean and standard deviation of knowledge in government and private schools are (168.8 ± 126.89) and (104 ± 13.09), respectively. The t-value of 9.05 indicates a significant difference. All the children (i.e.) 100 per cent from government and private schools opined that it is very much essential to eat every day a balanced diet to improve and

maintain immunity. Also 87 per cent and 80 per cent felt that healthy foods are expensive and only 8 per cent of children in both groups believed that millets help in weight loss. Ninety seven percent and 88 per cent answered that their grandparents and parents ate millets very often and 59% and 69 per cent opined the fast food consumption is not good for health. The mean and standard deviation of attitude in government and private schools are  $(1.85 \pm 14.5)$  and  $(1.63 \pm 6.95)$ , respectively. The t-value of 0.182 indicates non-significance. All children from government and private schools (100%) have the practice of taking bath regularly, and 95 per cent and 98 per cent always washed their hands with soap before eating. However, only 13 per cent and four percent of children from government and private schools respectively include millets regularly in their diet. Furthermore, only four percent and three percent of children from government and private schools agreed that they would recommend millets to friends and family, while a negligible percentage of children affirmed that their diet includes all five food groups everyday suggested by the ICMR. The mean and standard deviation of practice in government and private schools are  $(135.2 \pm 169.8)$  and  $(116.6 \pm 171.7)$ , respectively. The t-value of 1.33 indicates non-significance.

## Discussion

In this study, both government and private schools had children with similar age distributions. Private schools' children were from higher-income families, whereas greater number of government schools' children were from middle-income families. Millet based recipes were consumed only occasionally by both school children. The scores of both school children have good knowledge about millets, at the same time, children had less attitude and practice about millet consumption in day to day life.

## Conclusion and Recommendation

The present study aimed to provide baseline data on millet awareness and consumption pattern among school children. The results obtained will be helpful in planning millet nutrition education programs and interventions to improve millet nutrition among the school children. Educational programs focusing on millet benefits and recipes could help promote regular consumption among children, potentially improving their nutritional intake.

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## How Women Perceive the Psycho-Social Challenges during the Perinatal Period

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### Abstract

*Perinatal period is the period which starts when a woman gets pregnant and it continues upto one year after the birth of her child. It has been found that physical conditions, emotional sensitivity, relational aspects, family, no time for self-care contribute to poor perinatal outcomes. Evidence suggests that these factors can have an impact on both the mother and child. This paper seeks to provide information on the incidence and consequences of perinatal period in Kashmir. The study used a qualitative research design and purposive sampling method was used to reach the desired participants. The interview transcripts were analyzed and data was drawn via thematic analytic approach. Health complications, emotional sensitivity, family support, relational aspects, self-neglect emerged as the major themes of the study. The research results provide as a basis for evidence-based interventions and policy activities aiming at enhancing the well-being of perinatal women in the region.*

**Key words-** Kashmir, Perinatal period, Women, Risk factors

### Introduction

Perinatal period encompasses the period during pregnancy (known as prenatal period) and after the baby is born (called postpartum period). Many women develop perinatal depression which can cause extreme sadness, anxiety, and fatigue in mothers, making it difficult for them to carry out daily tasks such as caring for themselves or others<sup>1</sup>. The perinatal period, which spans from pregnancy to the first year after delivery, is a time when women's lives undergo major physiological and psychosocial change and adjustment, including shifts in their social position and capacity for decision-making<sup>2</sup>. For some women, the perinatal period can bring on anxiety and stress, which can have a negative effect on their physical and mental health as well as the health of their children. Mood swings, depression, and irritation are among the mood changes that women may experience during the perinatal period. Women may experience irritability, fatigue, change in social status and relationships. Perinatal period can have an impact on familial relations<sup>3,4</sup>. It can have an impact on the family dynamics like impact on husband-wife relationship, parent infant relationship and child development. Risk factors for a poor perinatal period include stress, mental trauma, lack of family support, economic instability, abuse (physical and mental) and unplanned or unwanted pregnancies. All these factors have an impact on the mother and child.

According to the World Health Organization's (1992) definition, the perinatal period begins at 22 completed weeks of gestation (when the average birth weight is 500 g) and lasts for 7 completed

days after delivery. The psychological condition that affects women the most frequently during pregnancy is depression<sup>5,6</sup>. It is sidelined in the healthcare system especially because patients may be reluctant to disclose their symptoms. As a result, many women with perinatal depression go undiagnosed, and even when it is detected, only a small percentage receive follow-up care<sup>7</sup>.

It is estimated that one in seven perinatal women experience depression<sup>8</sup>. Significant developmental delays, including decreased activity, fewer facial expressions, and physiological alterations, are more likely to occur in children whose mothers have PND<sup>9</sup>. Perinatal period is crucial for the woman and the child. Women are prone to psychiatric disorders during the perinatal period because of the challenges and changes a woman has to go through physically and mentally during this period. During the perinatal period, women are around 22 times more likely to experience a mental health condition<sup>10</sup>. Although there is little information about perinatal period in Kashmir, research indicates that it is a major public health issue in this area. Research on perinatal depression is important for the well-being of both the mother and the child.

### **Psycho-Social Issues during Perinatal Period in Kashmir**

Depression has been related to disease related disability. Major depression is more common among women of reproductive age<sup>11</sup>. The risk of depressive episodes may increase during pregnancy and postpartum period<sup>12</sup>. In the context of Kashmir, there are particular difficulties and circumstances that have an impact on the perinatal period, which is a crucial time for the wellbeing of the mother and child. For decades, the region of Kashmir has been plagued by political unrest and ongoing conflict, which has had a negative influence on the health of the mother and the child. Perinatal depression in Kashmir may be brought on by social, cultural, economic, and political pressures. Since political unrest and violence have been prevalent in Kashmir for many years, the populace has experienced significant stress and trauma. PPH (Postpartum Haemorrhage) and Eclampsia are the most common causes of maternal mortality in Kashmir, with most deaths happening within tertiary care hospitals<sup>13</sup>.

There is a substantial knowledge gap about ideal maternity care in Kashmir. According to a 2017 study in the International Journal of Reproduction, Contraception, Obstetrics and Gynaecology, 26 per cent of pregnant women in a tertiary care hospital in Kashmir had depression. Data from a 2017 study at SKIMS, Soura, which was conducted over 6 months to assess the mental health status of pregnant women attending the antenatal clinic of a tertiary care hospital in Srinagar, revealed that 14.28 per cent of the second trimester women and 32.30 per cent of the third trimester women scored above 10 on the Edinburgh Postnatal Depression Scale (EPDS), indicating possible depression among these women<sup>14</sup>.

Research on perinatal period can aid in the creation of efficient treatment and protective measures for perinatal women in Kashmir. The purpose of the paper has been to synthesize information and collect data from women during their perinatal period and get a comprehensive understanding about their complexities and behaviour during the perinatal period. The early detection of depression among perinatal women can be helpful in reducing the severity of poor perinatal period.

## Methodology

The study was carried out in the Kashmir region of Union territory of Jammu and Kashmir (J&K), which is the northernmost region of India. The study was conducted in Srinagar and Budgam district which lies in the northern and the central part of the Union Territory of Jammu and Kashmir. The purpose of this study was to investigate women during their perinatal period and its associated risk factors. The researchers did a qualitative research and collected primary data. Purposive sampling was used and the participants were interviewed separately according to their convenience and to keep their anonymity. A discussion was initiated by the researcher, followed by the views of the participants (data) which was later incorporated into the study. The investigated parameters included health complications, emotional well-being, relationship aspects to understand how they disrupt the state of a woman during perinatal period. A number of 14 married women were selected for the study. All the participants gave their consent for the study.

## Interview Schedule and Ethical Considerations

Consent was taken from the participants before the data collection process. They were informed about the purpose of the study and their interview was kept confidential. The participants were selected conveniently. Non-probability sampling method was used for the study. The participants were informed in advance about the study. Date and timing was also discussed in advance to for the smooth functioning of the study. The interviews revolved around the perinatal period, psycho-social challenges of women during perinatal period, transition to perinatal period, relationship patterns, stress management mechanisms, etc. Some of the questions asked during the interview were: What are the different challenges faced by women during the perinatal period in all quarters (physical, social, mental)? How has your relationship with your partner and family changed? What are the causes of anxiety and depression during the perinatal period? What has been the most challenging part of perinatal period for you?

The interviews were recorded and transcribed later for research purpose. After that the process of writing was started in English language. The data was cross-checked multiple times for the authenticity of the study. The emerging themes were finalised after comparing them with the transcribed data.

**Participants:** A total of 14 participants were selected for the study. The participants or respondents were interviewed separately at ICDS centre, Kashmir university and other convenient places and their identities have been kept confidential.

**Inclusion criteria:** The study included the women during their perinatal period (pregnant or having delivered, having babies upto 1 year).

**Age group of Women:** Women between 25-35 years of age were taken as it is the phase of significant transition in the life of women including motherhood.

**Exclusion Criteria:** Unmarried women, non- pregnant women were excluded.

**Table 1**  
Demographic Details of the Respondents

Age (Years)	Level of Education	Locality	Type of Family
28 years	M.A	Rural	Joint family
29 years	PhD	Rural	Nuclear family
30 years	B.A	Rural	Joint family
32 years	B.A	Rural	Nuclear family
34 years	B.A	Rural	Joint family
35 years	12 <sup>th</sup>	Rural	Joint family
27 years	B.A	Rural	Nuclear family
25 years	B.A	Urban	Joint family
26 years	B.A	Urban	Joint family
31 years	PhD	Urban	Joint family
33 years	M.A	Urban	Joint family
34 years	B.A	Urban	Joint family
35 years	B.A	Urban	Joint family
30 years	12 <sup>th</sup>	Urban	Joint family

*Source (Field survey, 2023)*

## Data Analysis

Data from the participants was collected via thematic analysis. Permission was taken prior to collecting data. Males were excluded and only married women were taken for the study. Participants were informed in advance about the purpose of the study. Data was recorded and then transcribed into English. Confidentiality was maintained to ensure the trust of the participants. In accordance with the research objectives the themes were analysed. Codes were created based on recurrent themes, or patterns found in the data.

The detected codes were combined and arranged into broader themes. The analysis offers a thorough understanding of the factors influencing prenatal period such as physical, social and cultural factors. The themes emerged from the study were reviewed again and again to make sure that the data is represented accurately.

## Findings

The participants of the study were married women in the age group of (25-35 years) going through their perinatal period. The majority of the participants had the educational qualification of bachelor's degree. The participant's primary occupation ranged from managerial services to PhD scholars to a home-maker. The participants' descriptions of perinatal period and its associated risk factors are highlighted in the section that follows. Five themes emerged from the study. Every theme is presented with a detailed discussion along with participant accounts.

## Themes

### Health complications

Women experience different health issues during perinatal period. The onset of pregnancy brings bodily/physical changes in women. It extends also to women who are doing well physically and eat healthy. Perinatal period brings about a variety of physical changes to a woman's body, including hormonal changes (e.g., release of estrogen and progesterone, weight gain, fluid retention, and breast enlargement); sensory changes (e.g., change in smell and taste); hair, skin, and nail changes (e.g., brittle nails, hair loss, stretch marks); circulatory system changes (e.g., blood pressure, dizziness, fainting); and respiratory and metabolic changes. (e.g., body temperature, metabolic rate, dehydration)<sup>15</sup>.

Participants highlighted that women during the pregnancy time suffer from vomiting, nausea and other stomach issues which can create some discomfort as they are not able to eat properly. Many women also develop health conditions like diabetes and thyroid which can actually have an impact on the foetus and the newborn child. High blood pressure has also been found prevalent among women during the perinatal period. Before becoming pregnant, some women already have high blood pressure. Some women experience it for the first time when pregnant. Preeclampsia, a severe kind of high blood pressure, can also occur during pregnancy or soon after delivery.

**Participant 1:** *"I had sleep problems for the initial months. I couldn't sleep properly for a long time. I had low blood count and I used to feel exhausted all the time."*

**Participant 6:** *I developed diabetes during my perinatal period and till date I am taking medications for that. I had stomach problems. My stomach could not digest anything. I used to feel nausea, vomiting during the initial months."*

**Participant 7:** *"My body went through major changes. I was skinny before marriage and during my perinatal period I put on weight. My feet used to be swollen. I had high blood pressure during my perinatal period"*.

**Participant 8:** *"I developed rashes on my skin. I had itching all over my body which made me feel embarrassed and uncomfortable."*

### **Emotional Sensitivity during Perinatal Period**

The World Health Organization (WHO) stated that "health is a state of complete physical, mental, and social well-being and not merely in the absence of disease or infirmity"<sup>16</sup>.

Perinatal period can serve as a stressful event affecting both the mother and the child<sup>17</sup>. Women experience a range of emotions like mood-swings, fear, anxiety, and excitement. Participants highlighted that in the realm of the perinatal period issues like health problems, family, marital discord could trigger the emotional sensitivity of the mother. Mental wellness is an important factor during perinatal period. Emotional sensitivity may be exacerbated by prior pregnancy or birthing experiences or trauma. Moreover, cultural or societal norms and expectations related to birthing and parenthood might cause pressure or stress. Partners of women may also experience emotional sensitivity during the perinatal period as they transition into parenthood.

**Participant 1:** *"When a woman is pregnant she becomes more emotional as she feels insecure about her body, relationships. I still cry over minute things, as my life has totally changed after*

*having a baby and I feel there is no one I can talk to and rely on. I have bad days too where I feel numb. Expectations get higher, your family expects you to do everything without any complaint.”*  
*Participant 2: “I had some complications during my pregnancy which used to stress me out all the time. I think every pregnant woman during her perinatal period is anxious because of one thing or the other as you have an addition to the family and more responsibilities to shoulder now”.*

**Participant 8:** *“I am a Ph.D. scholar, and I find it difficult to balance my personal and professional life which triggers my anxiety. I feel emotionally exhausted because of the atmosphere I am surrounded with. At home I have different problems and at work there are different. I have two babies and I feel like that I am neither a good wife nor a good mother and this is the worst feeling.”*

### **Relational Aspects**

Relations are bound to change during the onset of perinatal period. There is a new responsibility to carry and at times it can create disruptions in the day to day life of a couple. It has been found that women who have supportive partners experience low postpartum distress in comparison to women who do not have supportive partners<sup>18</sup>.

Participants highlighted that the dynamics of the relationship may change as a result of the variety of emotions and stressors that both partners may feel at this time. New parents may need to make significant changes to schedules, and priorities. As couples navigate to their roles as parents, these adjustments could contribute to stress. However, relationship aspects are not only confined to the partner, but it also includes friends and family. Many women reported that when they are in distress or feeling anxious they often have a word with their siblings (particularly sisters) and friends. In addition to marital discord, a poor quality relationship with family, unsupportive family, isolation also has an impact on the well-being of the mother and the child as it can act as a major stressor during her perinatal period.

**Participant 4:** *“At first, I could not live without my husband, but after having two babies the situation has changed. Our priorities have changed and sometimes you feel sidelined as the priorities change and there are more responsibilities. The well-being of your baby matters. You put them before yourself.”*

**Participant 7:** *“A woman’s life changes completely after getting married and I am no exception. Though my partner was supportive throughout my perinatal period. But, internally I felt a drastic change. I cannot go to my mother’s place often; I don’t meet my friends often. My life revolves around my kids and husband. I barely take care of myself.”*

*Participant 8: “I had a breakout with my in-laws. They did not support me enough during my perinatal period. They only used to hold my baby when I used to do all the house-chores, but once I finished all the chores they used to handover the baby to me again. I used to feel exhausted and I had no one to rely on.”*

### **Family Support**

The presence of family support can provide much needed encouragement, practical assistance and valuable advice during this time. Family support is crucial during this time<sup>19</sup>.

Participants spoke at length about the importance of family support during the perinatal period. They also highlighted that in Kashmir both mother and mother-in-law play an equal role in the well-being of the mother and the child. Family is the first support system and having an immediate connection with the mother and the child it can have an immense impact on the woman during this period. If this support system does not meet her needs and requirements it will automatically have an impact on the mother and the child. Some of the participants, also said that the family can provide practical assistance throughout the perinatal time by cooking, cleaning, and helping with household chores as it can give a sense of relief and comfort to the mother. Family can help in reducing anxiety and stress levels by taking care of the mother and child and assisting them with handling the baby.

**Participant 1:** *“My family was supportive throughout my perinatal period. I was at my husband’s place till the time of my delivery and my mother-in-law used to accompany me to the doctor. There are some difficulties, but overall my family supported me consistently”.*

**Participant 2:** *“Your family supports you, as it is considered a celebration to have grand-kids. They will provide you with nutritious food like milk, ghee as it is good for the well-being of the child”.*

**Participant 6:** *We have different family set-ups. Some families are strict and are reluctant to take care for the woman and her child. I was in my ‘maika’ during the perinatal period as my husband’s family did not take enough care of me and used to make me work”.*

### **Self-neglect**

Most of the participants reported that they do not have time for themselves. Before marriage a girl is free to do anything, but after marriage she is bound to change her life. They reported that during the onset of perinatal period women often tend to side-line themselves. They barely have time to look after themselves, nurture themselves. With the addition of a child there comes responsibility. A woman is supposed to dedicate her time and energy to the child. Finding time for self-care can be difficult for pregnant women because of bodily discomforts like nausea, back-ache, frequent body aches, change in sleeping patterns which can make it harder for them to prioritise self-care.

**Participant4-** *“I barely have time for myself. Having a kid is a big responsibility. You have to wash, cook, clean for them without any complain and if you complain everybody would gang up against you. You feel that you are unheard and not understood”.*

**Participant 8-** *“I live in a nuclear family. I have to look after, my house, kids, husband and manage my studies. At times, I do not even comb or wash my hair if I go out as I am juggling between my personal and professional life”.*

**Participant 10-** *There was a time, when I used to go out and hang out with my friends and family. Now, the situation”.*

### **Discussion**

This study finds a strong link between health complications, relation distress, emotional sensitivity, family support, self-ignorance and distressed perinatal period. Significant physical, emotional, and mental changes occur during perinatal period. Both the mother and the child may

get impacted during the prenatal period. While infants may feel the consequences of parental stress during pregnancy or challenges with bonding and attachment, new mothers may experience depression or anxiety<sup>20</sup>.

The dynamics of a relationship change as a woman enters into motherhood. There is a new addition to the family which automatically needs to be prioritised. There is a new set of responsibilities on both the parents which might sometimes lead to anxiety or frustration. It is a crucial period for the pregnant mother as her body is automatically going through some changes which trigger her emotional sensitivity. Family has an important role to play during this period. If the family is supportive it gives a sense of relief to the mother. A supportive family can aid the mother in her day-to-day work, accompanying to the doctor, taking care of the baby and an unsupportive family can add up to her existing stress<sup>21</sup>.

It has been seen that many mothers do not have time for leisure. The demands of pregnancy are physically and emotionally challenging for women that is why it is difficult for them to make time for themselves. They are expected to be around the child and family and they tend to ignore their needs and desires. This certainly has an impact on them and their relationship with others. Women go through various phases during their perinatal period which can be challenging for them. Pregnancy brings different types of physical changes in women which can create an emotional upheaval in them<sup>22</sup>.

## Recommendations

Based on the findings of the study the researchers suggest the implementation to strengthen mental health services by integrating it into existing healthcare system and provide training for healthcare professionals. Further, they recommend tailored psycho education programmes to foster family support networks which can provide support to women during this period. Adoption of self-care practices among perinatal women by sensitizing them about physical and mental health, and management of stress must be fostered. Community education initiatives to disseminate information about perinatal health of women; and combating the stigma surrounding the mental health of perinatal women must be undertaken.

## Conclusion

Healthcare workers and policymakers must be aware of how perinatal period affects the health and life of the mother and child. Additionally, they should strive to improve access to care and lessen the stigma surrounding mental health in Kashmir. Screening should be provided to assist women with perinatal depression and lower the risk of unfavourable outcomes of poor perinatal period. It is also important to have skilled medical professional who can aid women during their perinatal period and provide needful interventions. During this crucial time, we can work to promote positive experiences, ideal health outcomes among women during perinatal period.

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## Are Support Systems Catalysing AB-PMJAY's Implementation? A Qualitative Study among Beneficiaries in Gujarat, India

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### Abstract

*The Ayushman Bharat - Pradhan Mantri Jan Aarogya Yojana (PM-JAY), a government funded health insurance scheme, launched by Government of India in 2018, aims to achieve universal health coverage to its 10 crore poor as well as vulnerable families by providing Rs. 5 lakhs per family per year towards availing secondary and tertiary level health care. Since support systems play a significant role in creating awareness and influencing the acceptability about health scheme among people which in turn ensure maximum utilization of the same, exploring correlations between support systems available in community and level of awareness and utilization of AB-PMJAY is very important. This qualitative study aims to illustrate the role of support systems in enhancing awareness and augmenting utilization levels of AB-PMJAY scheme in rural and urban areas of Gujarat.*

**Key words:** Ayushman Bharat, Health Insurance, Universal Health Coverage, Support Systems

### Introduction

Although primary health care is considered as a universal human right for people all over the world, accessibility to quality health care has still remain an uphill task to many, especially the deprived and impoverished in India, given the financial as well as social backwardness of their families. The escalating cost of medical treatment is beyond the reach of common man in India.

Myriad of reasons highlighted by several researchers to explain the underutilization of government health care schemes, since long, include lack of awareness among people about the schemes, its improper implementation, difficulty to find out an empanelled hospital nearby, red-tapism in clearing the bills, and non-welcoming attitude by the empanelled hospitals. It is a well-recognized fact that the proportion of patients who avail the health care facilities is less due to lack of awareness, no transportation facilities, long distance to hospitals, absence of bystanders, loss of manual days of caretakers etc. At the same time majority of Indians are too poor to meet the expense of their health care services out-of-pocket<sup>1</sup>.

Health care is an unaffordable task for a substantial proportion of Indians especially when they suffer with chronic diseases like cancer, heart ailments, kidney related diseases, diabetics, which demands continuous medication, radiations, transplantations, surgeries, dialysis, etc. as treatment procedures. Berman, Ahuja & Bhandari estimated that more than 70 million Indians

are impoverished every year due to huge medical expenditure<sup>2</sup>. Even the so called rich and people from above average economical strata of India find it difficult to meet the exorbitant medical expenditure of certain chronic diseases.

It has been found that the existing schemes often failed to protect the health needs of patients of chronic ailments and shield them from debts and helplessness. It is an indisputable fact that maximum utilization of a government scheme cannot be achieved without social support at robust level available at community level.

In this milieu, it is important to study the level of awareness, enrollment, and utilization pattern among eligible beneficiaries of AB-PMJAY scheme and its correlations with level of available support systems in rural and urban communities. Having an understanding about the overall performance of this scheme in the initial years of the programme and its link with existing support systems, will give insights about its interconnectedness to the implementation authorities, so that necessary steps can be taken to improve or rectify the conditions/problems, if any, to achieve optimum output.

### **Literature Review**

AB-PMJAY is regarded as an excellent health care scheme which can cater to the comprehensive health care needs of the poor and most vulnerable sections of India. As only four years are completed since the implementation of this scheme, literature related to various aspects of this scheme, especially links with its utilization and support systems, is meager.

However, Dash et al.<sup>3</sup> highlighted the role of support systems in awareness generation by identifying ASHA workers at the hospitals as the main source of information in Bihar and Haryana regarding benefits covered in AB-PM-JAY. However, in Tamil Nadu, the reported main source of information includes political party cadres/friends/neighbors. Rajasekhar et al.<sup>4</sup> also reported how effectively anganwadi teachers could generate awareness about a government health insurance scheme (RSBY) among rural people while the secretary of gram panchayats miserably failed due to their lack of good connections/network with villagers. So, it is very crucial to ensure maximum support, for a scheme on this scale and ambition of PM-JAY from all possible systems in the community for smooth provision of reliable information without any confusion, corruption or possible political vested interferences, all may hinder the actual roll out of this scheme and keep the actual beneficiaries excluded.

Overall, health insurance schemes in low- and middle-income countries have been found to improve access to health care as measured by increased utilisation of health care facilities. There also appeared to be a favourable effect on financial protection, although several studies indicated otherwise<sup>5</sup>. Disadvantaged patients had higher use of government medical schemes and they paid lower out of pocket fees in Australia<sup>6</sup>. A study from rural Senegal revealed that members of a health insurance scheme are actually better-off than non-members, but analysis also brought out the fact that the poorest of the poor remained excluded<sup>7</sup>. In one of China's western provinces, Wang et al.<sup>8</sup> evaluated the impact of a community-based health insurance scheme and suggested that it had a positive effect on the health status of enrollees.

At the same time, there is evidence that though utilization of inpatient service in general has increased under medical scheme in China, people with high income tend to benefit more than

the low income group<sup>9</sup>. Chemin<sup>10</sup> also reported that social networks and informal groups in communities can play very significant role in making the health insurance scheme more adoptable among people from developing countries, where intake of in-patient health insurance seems very less.

The significance of high level awareness about the health insurance scheme in ensuring its acceptability among beneficiaries, which in turn leads to its augmented coverage, is highlighted by many researchers since long<sup>10-14</sup>. Significant differences in the health outcomes between those aware of the schemes and utilized; and not aware and not utilized are been reported by Gupta; Jathanna; Nandi et al.; Thakur; and Pandve et al.; and thereby emphasized how awareness about a health insurance scheme among potential beneficiaries can influence its purpose<sup>15-19</sup>. Increased support and involvement of local bodies, panchayati raj institutions and youth are also recommended by Dash et al.<sup>3</sup> in generating awareness, and thus enhancing knowledge about its benefits among them to make optimum utilization possible by potential beneficiaries.

## **Methodology**

Scientific studies and rigorous research evidences are lacking in AB-PMJAY scheme as it is comparatively a new scheme. But the literature available on performance of and impact of this scheme from newspaper articles, government reports and write ups depicts a mixed picture of success and failure of this scheme from different parts of the country. Even though studies on previous health care schemes, now merged by many states with AB-PMJAY scheme, illustrated the importance and relevance of proper implementation of such schemes with the help of available social support systems like PRI institutions, local community and youth and highlighted various reasons for its non-acceptance, underutilization and under performance from different parts of the country<sup>3</sup>, there is severe dearth of empirical evidences on the role of community support systems in augmenting the awareness, acceptance and utilization levels among people with respect to these schemes. So, exploring links between available support systems and the awareness and utilization level of potential beneficiaries of AB-PMJAY scheme is essential to ensure its maximum utilization by them.

Guided by a qualitative methodology, authors in this study undertook a phenomenological approach with twelve case studies and three focused group discussions with beneficiaries of AB-PMJAY from three districts namely Anand, Aravalli and Tapi, randomly selected from the best, average and worst performing districts (NHA, 2022) of Gujarat state. The beauty of qualitative research is that it provides a composite understanding of a problem or situation<sup>20</sup> (Gray, 2018, p.1). It explores what people experience as lived experience and locate universal nature of this experience while allows the researchers to articulate the voices of own participants (citation needed). The phenomenological approach used in this study facilitated the researchers to have the richness of understanding<sup>21</sup> as well as direct experience of the phenomena from some other few studies. We heard numerous voices from many participants, gathered various perspectives, and developed many themes. Participants were selected through purposive sampling method as the main purpose of this study was to understand the role of prevailed support systems in the effective implementation of AB-PMJAY in rural and urban India. Participants' availability for interviews, their experiences (having cards, its utilization and non-utilization) with AB-PMJAY scheme, and their readiness/willingness to share about the extent of support they received or not

from the support systems in the community were the main considerations for choosing purposive sampling method.

Thematic analysis is a good approach to research where you're trying to find out something about people's views, opinions, knowledge, experiences or values from a set of qualitative data – for example, interview transcripts or survey responses<sup>22</sup>. So, researchers decided to have an inductive cum semantic approach as we thought of allowing the data to determine the themes and were interested to know the opinions of people about the prevailing support systems in the rural urban areas of Gujarat to enhance the utilization of PMJAY. Also, thematic analysis allows researchers to have lot of flexibility and enables them to approach large data sets thematically. Interviews with a semi-structured tool allowed us to collect the data from respondents. The six-step process suggested for thematic analysis by Braun & Clarke<sup>23</sup> includes familiarization, coding, generating themes, reviewing themes, defining and naming themes, and writing up. The verbatim transcribed text helped researchers to get familiar with the data, and highlight every interesting words or sentences corresponding to each codes (idea or feeling implicit in the text), and collated the data into groups under each code. Identifying common codes and putting it together made themes, after proper reviewing these themes were defined and named. In the following section these identified themes are discussed.

## **Discussion**

### **Support Availed in Awareness Generation**

Success of a government scheme, launched to achieve universal health care of its people, depends upon the complete support of the social systems present in the community. So, this study tries to explore how far support systems get themselves involved in awareness generation about PMJAY in urban rural communities. Analogously, each respondent reflecting on their experience of having support mentioned about an array of individuals and institutions from which they came to know about PMJAY scheme and its benefits.

Ashok, a marginal farmer said:

“I took my daughter to a nearby hospital for checkup as she had a fall while playing at home and had a fracture on her leg. Doctor told me she would need to undergo a surgery and the huge cost (twenty thousand) scared me a lot. At the reception, one madam asked me about this card (showing the card). Do you have this card? I said no. He (Ayushman Mitra) told me that this card will help my daughter to get free surgery in that private hospital. He helped me to complete the formalities and get this card and I could get my daughter treated well”.

The situation explained by Neela, working as a domestic servant from an urban slum gave an interesting note on role of support systems in awareness generation.

Recalling how she got to know about Ayushman Bharat card, Neela said

“I always used to fall sick and had to go for doctor consultation which made me do several medical tests like blood tests, scanning, x-ray etc repeatedly and ultimately hospitalized several times. I took off from job and borrowed money repeatedly from my employer as I

did not have any other option. It was my irritated employer then asked me “Why don’t you have an Ayushman Bharat Card? It is for people like you”. I could get the card without much hassle and the ASHA worker guided, made me aware and helped me to get the documents ready in 05 days. “Then I took treatment from a good hospital for ovarian cyst and now I am feeling much relieved”. Ayushman Bharat card helped me to have a surgery at free of cost. “For me, otherwise this cure wouldn’t have been possible, and otherwise, by now I would have suffered a lot physically and financially.”

### **Support Not Availed in Awareness Generation**

On the other hand, Mohan, 37 years old, a beneficiary when asked for reasons of not having a card expressed his complete lack of awareness about this scheme with the following lines.

“I don’t know. I had not applied, and not having any card too. Who gives this card and what to do with this?” He said he had never heard about this card too.

Similar response was articulated by Ayaz, a 65-year-old vegetable seller by saying

“We aren’t told by anyone about such cards” while asked about the camps/ awareness programmes organized in his ward, PHC, CHC etc.

### **Support Availed in Utilization of PMJAY Card**

Regarding source of support received to avail the card, there was consensus among interviewees and many applauded the help they could receive from Ayushman Mitras, ASHA workers, sarpanchs and ward members.

Kalpesh, a 22-year-old auto driver was full of praise for his sarpanch and Ayushman mitra when he said

“My Sarpanch informed all villagers about the card and arranged camps several times in our village. So, I was having this card. But I did not know how and when it is to be used. It was the Ayushman mitra of the hospital where I was admitted after met with an accident helped me understand how am I eligible to get a surgery at free of cost. Thanks to him, the bill amounting to Rs. 1,50,000 was fully covered and I was so relieved”.

How Ayushman Bharat card helped a 44-year-old marginal farmer, Raman, father of three children to undergo a major abdominal surgery, which was troubling him since long time with the help of ASHA is well depicted in his following words.

“My wife used to tell the ASHA worker about my ailment and she guided us to go to the nearby private hospital. I was quiet reluctant because I knew the medical bill can be huge in that hospital as it is a private hospital, with all modern medical facilities and quality care, not accessible to poor people like us. But she assured us with examples of other patients who already availed the benefits of AB-PMJAY card from the same hospital, and that was the only reason we also went there. Everything went well with the help of ayushman mitra who guided us all through the hospitalization period.”

Chronic illnesses are devastating not only for the poor, but for middle class families too. When it comes to inability to provide best treatment to loved ones due to financial constraints, it becomes an emotionally challenging situation to all, especially the care takers. Nandan, the 45-year-old son of Krishnamurthy narrates the stages of agony, relief and joy he had gone through in different stages of his father's coronary heart disease.

“The diagnosis of severe CHD and an immediate by-pass cardiac surgery suggested by the doctors as the only option to save papa's life was shocking as well as paining and pricking”. I was in trauma as a huge amount was needed, I had nothing and thought, if I am not able to save papas life, I will never able to forgive myself”. Then there is no meaning in my life. It was then the Ayushman Mitra in the same hospital told me that I am eligible to have a PMJAY card and with this card the by-pass surgery was possible, which was otherwise unaffordable to us”.

### **Support Not Availed for utilization of the PMJAY Card**

At the same time a potential drawback of the scheme, non-participation of private hospitals is well articulated by many as follows:

When asked why she could not avail the benefit under this card, even if she needed it, Karuna said....

“When I fell sick, even though we had a card, we could not avail the benefit. The implicit reason was lack of empanelled hospitals nearby. Many private hospitals in our area are not giving treatment with this card. I went and asked, but they refused. Given my family's financial constraints, we couldn't travel to faraway empanelled hospitals and we did not know what to do”. There was no help possible from anywhere, but to do arrangements for the catastrophic bill”.

Explaining the reason for non-utilization of the card Chandaben, a 48-year widow and domestic servant said

“My 29-year-old son (a divorcee) was too sick, there was swelling in his legs, and he was not eating at all. I took him to a nearby hospital, doctor said he had liver problem and TB. But I could not give him proper treatment, even though tried with here and there for temporary relief, as all the nearby hospitals said “this card won't work here”. Because of his illness and treatment, I lost my work in many houses as I took several days off, I sold my only left small earring also, but could not save my son. I feel as a mother, I couldn't do what I wanted to do” as “I did not have enough money and could not get any support from anyone”.

Another themes emerged as a part of this study was the burden of continuing OOP as well as fees paid to “middle men” to get the AB-PMJAY card.

### **Out of Pocket Expenditure and Fees for the Card**

A great part of out of pocket (OOP) expenditure occurs during diagnosis and OPD care<sup>24</sup> which are not covered under the scheme. This is the main reason for out of pocket expenditure as narrated by Kamla,

“Even though I could undergo a breast cancer surgery at free of cost with the help of PMJAY-card, I had to spend around Rs15, 000/- out of pocket, which I had to borrow from money lenders, for scanning, X-ray and other laboratory tests. I don’t know how I will repay the money with interest”.

Pradeep, another respondent also echoed the same feeling.

“I am too poor that I borrowed Rs 20,000/ to do different prescribed tests to get my wife treated with a government hospital for kidney disease. There was no facility there to do the medical tests doctor asked to conduct before admitting her”.

Mahesh, yet another card holder says,

“When my father had to undergo a surgery, I gave Rs.1000/ to an agent to get the card, which he promised me to get ready in a week”. This practice of corruption, still prevalent in our communities, if not stopped, can be detrimental to the beneficiaries for whom this scheme is intended. When asked why you paid when it is available at free of cost, he said, “If you don’t pay, it won’t work here”, then, unnecessarily you will have to visit them many times”. Instead if you pay, then things are easy.”

So, awareness about possible malpractices and how it can be addressed among beneficiaries and other stakeholders must be created and they must also be empowered to use the grievance-redressal system, already put in place by government, efficiently as and when needed.

Mainly the focus of discussion is whether the support systems played an important role in consciousness/awareness-raising about the scheme, assisting beneficiaries to generate cards, utilizing the cards if needed, and facilitating them in the whole process of treatment etc. Even though inadequate level of awareness about government schemes is ubiquitous among beneficiaries in India, out of 12 respondents in the present study, only one said that he had not heard about this scheme. Indeed, this indicates a high level priority given by authorities to awareness generation about this scheme by involving local governing bodies, anganwadi teachers and ayushman mitras in Gujarat. Focused group discussions threw more light on modes of awareness generation used in their respective areas by authorities, which range from distribution and display of leaflets, flyers, notices, phone calls and whatsapp messages about ayushman card camps to household visits by anganawadi workers to explain about the benefits of the scheme and need of having an Ayushman Bharat card. However, few voices of insufficient information, albeit negligible, should not be ignored and a permanent provision for issue of AB-PMJAY card must be made available to the beneficiaries. So, a detailed analysis on reasons of lack of awareness to be done and strategies to strengthen the level of knowledge to be enhanced in areas, especially, where the level of awareness is low.

As noted earlier, while asked about the support availed during utilization, almost 80% who had utilized the card for treatment were all praise of the support they received from the community, especially Ayushman mitras, Asha workers, health workers and Sarpanchs. However, there is still an urgent need to analyze the ground realities and reasons for non-utilization of the card by beneficiaries, despite needed, for availing secondary or tertiary level treatment and either treated elsewhere with OOP expenditure or not treated at all.

Poor understanding about empanelled hospitals, its non-accessibility due to distance, non-coverage of a treatment facility, unwillingness of private hospitals<sup>25</sup> to be part of the scheme, etc. is the main highlighted reasons by respondents for non-utilization, even if needed.

## Conclusion and Recommendation

The findings altogether presented evidence on comparatively better awareness among beneficiaries about PMJAY scheme in Gujarat state. Significant association between community support and awareness generation is explicit in the study areas. Narratives on experiences of utilization by respondents also highlighted the important role played by active support systems in the community, especially Asha workers, Ayushman mitras at empanelled hospitals, ward members and Sarpanchs. At the same time, stories of those who are unaware, not having card and could not utilize the benefit under cards, despite being needed, must get immediate consideration and policy interventions. Policy implications here warrant urgent attention for identifying and engaging more manpower with adequate knowledge of the scheme in awareness generation with appropriate incentives, monetary/non-monetary, as and when needed.

While awareness and enrollment are pre-requisites, a significantly important metric for the successful implementation of any insurance programme is its utilization. Overall, half of the respondents reported utilization of the card for treatment. Nevertheless, an important concern shared by some respondents includes the additional payments they had to make outside of insurance coverage or out of pocket (OOP) mainly for medicines and diagnostic tests either before, during, or after hospitalization. Policy interventions are urgently needed to include/tackle this catastrophic OOP payment associated with hospitalizations, otherwise the envisaged universal health care will continue to remain as a challenge for India.

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## Navigating Challenges and Bridging Gaps: Evaluating the 95-95-95 Targets of UNAIDS in Different Regions of India

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### Abstract

*The UNAIDS 95-95-95 targets are part of a global strategy to end the AIDS epidemic by 2030. These targets aim for 95% of people living with HIV to know their status, 95% of diagnosed individuals to receive antiretroviral therapy (ART), and 95% of those on treatment to have suppressed viral loads. This study examines the success and obstacles faced by different regions in India to meet the UNAIDS 95-95-95 targets between 2018 and 2021, with forecasts for 2025. Examining discrepancies in HIV prevention initiatives, the report highlights both achievements and challenges. Effective methods and treatments are identified to close current gaps in prevalence and control by identifying key factors. Utilizing a combination of secondary data sources and comprehensive literature reviews, this study relies heavily on the National AIDS Control Organization (NACO) Annual Reports. Maharashtra, Tamil Nadu, Delhi, and Tripura do well in the first 95 targets, indicating effective HIV testing programs. The Northeast region has the most ART coverage, as seen by the second 95 target. Better coverage is needed in states like Uttarakhand, Arunachal Pradesh, and Haryana. The focus of the third 95 targets, which prioritizes Manipur, Tripura, and Mizoram, is the suppression of viruses. Madhya Pradesh, Chhattisgarh, and Himachal Pradesh are facing difficulties. The report emphasizes greater accessibility, increased resources, and focused initiatives for HIV control in India. This analysis offers crucial insights for policymakers, healthcare professionals, and stakeholders, paving the way for a more robust national response to HIV/AIDS and a healthier, more resilient India.*

**Key words:** HIV/AIDS, 95-95-95, ART, Regions, India

### Introduction

HIV/AIDS continues to be a significant global health challenge, affecting millions of people worldwide. At the end of 2021, approximately 38.4 million individuals were living with HIV globally, with an estimated 0.7 per cent of adults aged 15-49 years affected.<sup>1</sup> The burden of the epidemic varies considerably across countries and regions, and India stands as the host of the third largest population of people living with HIV (PLHIV), totalling 2.4 million individuals. India's HIV prevalence rate is 0.21, with higher rates observed in certain regions such as Mizoram, Nagaland, and Manipur.<sup>2</sup>

In 2014, the Joint United Nations Programme on HIV/AIDS (UNAIDS) introduced the ambitious 95-95-95 targets, aiming to combat the global HIV epidemic. These targets call for 95% of people

living with HIV to know their status, 95 per cent of those diagnosed to be on antiretroviral therapy (ART), and 95 per cent of those on ART to have viral load suppression.<sup>3</sup> Achieving these targets necessitates a comprehensive national response, including access to testing and treatment, healthcare workforce capacity, anti-stigma campaigns, community engagement, political commitment, and adequate financial resources.

However, the COVID-19 pandemic has further complicated efforts to control the HIV epidemic and ensure access to treatment.<sup>4</sup> In India, one of the major challenges in achieving the UNAIDS targets lies in the significant disparities in infrastructure and services across different states.<sup>5,6</sup> Availability and accessibility of Integrated Counselling and Testing Centres (ICTC), ART Centres, Targeted Interventions, and HIV testing facilities vary widely, contributing to the lagging progress in certain regions.

To address these challenges, the Government of India has implemented the National AIDS Control Program (NACP) Phase-V, a comprehensive scheme running from April 2021 to March 2026. With a budget of Rs. 15471.94 crore, this program aims to reduce annual new HIV infections and AIDS-related deaths by 80 per cent by 2025-26.<sup>2</sup> The specific targets include comprehensive prevention measures for high-risk individuals, increased awareness of HIV status, improved treatment coverage, and viral load suppression.

The present research study aims to analyse the available data from 2018 to 2021, with a prediction for 2025, to analyse the progress made towards the 95-95-95 objectives in different regions of India.<sup>7</sup> This research study also aims to explore the variations in HIV control efforts among different regions in India, with a focus on the successes and challenges faced in meeting the UNAIDS 95-95-95 targets. By analyzing the specific factors influencing HIV prevalence and control efforts, this study intends to identify effective strategies and interventions to address the existing gaps and accelerate progress towards ending AIDS in India.

Through a comprehensive analysis of regional disparities, this research will provide valuable insights and recommendations for policymakers, healthcare professionals, and stakeholders involved in HIV/AIDS control programs. By bridging the gaps in testing, treatment, and support services, we can enhance the effectiveness of the national response and move closer to achieving the UNAIDS 95-95-95 targets, ultimately ensuring a healthier and more resilient India.

## **Methodology**

The methodology adopted for this paper is a combination of secondary data sources and literature reviews. The main source of information is the National AIDS Control Organization (NACO) Annual Reports of various years including NACO Sankalak Report 4<sup>th</sup> edition 2022. These studies provide comprehensive information on HIV/AIDS in India. To analyse the progress made towards the 95-95-95 objectives for HIV testing, ART coverage, and viral load reduction, data from these reports were analysed. The arithmetic method of projection  $P_t = P_0(1 + rt)$  where  $P_t$  is end population,  $P_0$  is beginning population,  $r$  is rate of growth and  $t$  is time, applied to project number of years a State will take to achieve 1<sup>st</sup> target of 95 per cent.

## Findings

Table 1 presents the estimated number of People Living with HIV (PLHIV) in different regions of India, as well as their awareness of HIV status, access to Antiretroviral Therapy (ART), and viral suppression. The data reveals significant variations across the regions. The South region stands out with the highest estimated number of PLHIV (780,975) and a relatively higher proportion who are aware of their HIV status, on ART, and achieving viral suppression. The West region follows with a substantial estimated number of PLHIV (512,206) and relatively high rates of awareness, ART coverage, and viral suppression. The Central and East regions show moderate numbers of PLHIV (272,533 and 288,770 respectively), with a reasonable percentage being aware of their HIV status and on ART. However, the viral suppression rates in these regions are comparatively lower. The Northeast region has the lowest estimated number of PLHIV (67,615), but it faces challenges in terms of awareness, ART coverage, and viral suppression. The North region also shows lower rates of awareness and ART coverage, despite having a significant number of PLHIV (264,381).

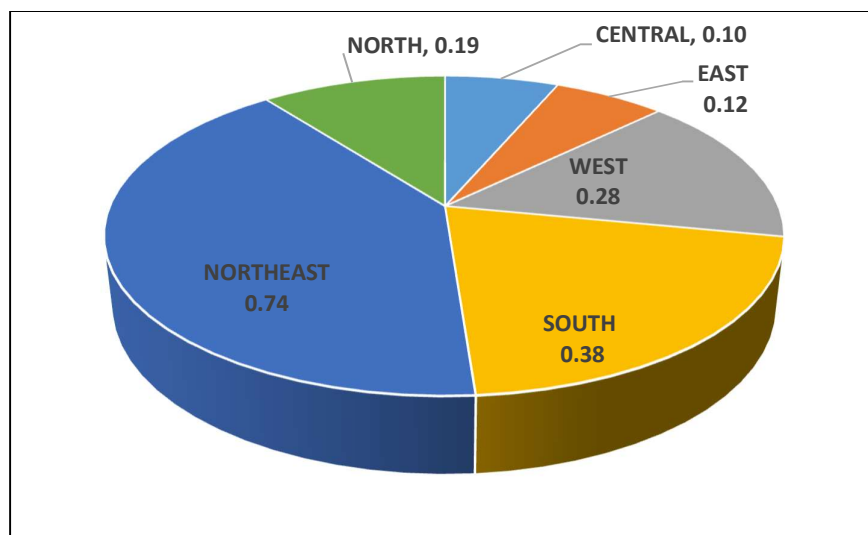
**Table 1**  
PLHIV Indicators for Different Regions and India

Region	Estimated PLHIV Size (2021)	PLHIV Who Know their HIV Status	PLHIV Who Know their HIV Status & on Art	PLHIV Who Are Virally Suppressed
Southern Region	780975	754508	642300	366121
Central Region	272533	181880	163687	74541
Eastern Region	288770	181907	153460	63256
Western Region	512206	444559	340344	239422
North-eastern Region	112048	67453	72953	35164
Northern Region	264381	214053	172873	67841
<b>India</b>	<b>24,01,284</b>	<b>18,56,426</b>	<b>15,56,026</b>	<b>8,52,733</b>

Source: NACO Annual Sankalak Report 2022 and calculated by authors

Figure 1 shows the Adult HIV Prevalence rates in different regions of India reveals varying levels of HIV burden across the country. The Northeast region stands out with the highest prevalence rate of 0.74, indicating a significant challenge in combating HIV/AIDS in that area. The South region follows with a prevalence rate of 0.38, suggesting a comparatively higher burden of HIV. The West and North regions have prevalence rates of 0.28 and 0.19 respectively, indicating moderate levels of HIV prevalence. The Central and East regions have the lowest prevalence rates of 0.12, suggesting a relatively lower burden of HIV.

**Figure 1**  
Prevalence of HIV among Adults by various Regions in India



Source: NACO Annual Sankalak Report 2022 and calculated by authors

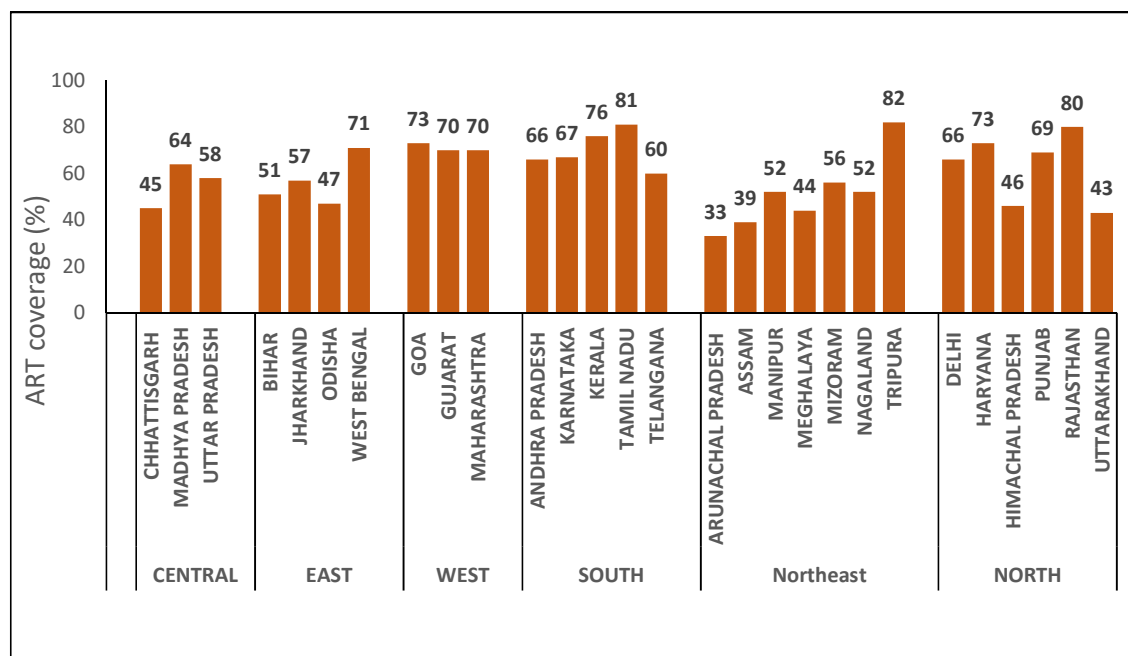
**Table 2**  
Estimated Size of Female Sex Worker (FSW), Men having Sex with Men (MSM) & Injectable Drug Users (IDU) (2021)

Region/HRG	FSW	MSM	IDU
South	417180	112711	12319
Central	74435	27051	24677
East	51543	12189	11932
West	122315	70397	3325
Northeast	39879	6902	59082
North	125020	45840	45136

Source: Calculated by authors from NACO Annual Sankalak Report 2022

Table 2 shows the estimates of the size of key populations at higher risk for HIV transmission in different regions of India. The data highlights the varying numbers of Female Sex Workers (FSW), Men having Sex with Men (MSM), and Injectable Drug Users (IDU) across the regions. The South region has the largest estimated population of FSW (417,180), followed by the North region (125,020) while the Northeast region has the highest number of IDUs (59,082). The Central and East regions have comparatively smaller populations across all three key populations. These estimates play a crucial role in understanding the distribution and size of key populations at higher risk for HIV transmission. They provide valuable information for the development and implementation of targeted prevention and intervention programs in each region.

**Figure 3**  
Percent of ART Coverage in Various States and Different Regions of India



Source: NACO Annual Sankalak Report 2022

Figure 3 represents the Percent of ART Coverage in different regions of India, the ART (Antiretroviral Therapy) coverage for people living with HIV/AIDS varies significantly across different regions in India. The South region generally exhibits higher coverage percentages, with Kerala and Tamil Nadu leading the way at 76 per cent and 81 per cent respectively. The West region, including states like Goa, Gujarat, and Maharashtra, also demonstrates relatively high coverage levels of around 70 per cent. The North region shows a mix of moderate to high coverage, with Rajasthan having the highest coverage percentage at 80 per cent. The East region exhibits large disparities in the coverage level, with West Bengal leading at 71 per cent and Bihar with 51 percent. The Central region and Northeast region generally have lower coverage compared to other regions.

**Table 3**  
Number of ICTCs, Total Centres and Targeted Interventions by Region

Regions	ICTC Facilities	Total Centre*	HIV Cases per Centre	Targeted Interventions
Central Region	5977	209	3650	193
Eastern Region	2890	217	5323	137
Western Region	7633	462	2835	281
Southern Region	10302	1006	3766	374
North-eastern	1692	117	6335	234
Northern Region	5269	213	8709	257

\*Total Centre includes ART centres, Link ART centres and Care Support Centres

Source: NACO Annual Sankalak Report 2022

Table 3 presents the availability of facilities such as ICTCs, total centres, HIV cases per centre, and targeted interventions in different regions of India. It highlights variations among regions in terms of the number of ICTC facilities and centres, the burden of HIV cases per centre, and the implementation of targeted interventions. The South region has the highest number of ICTC facilities (10,302) and total centres (1,006), indicating a relatively higher emphasis on HIV testing and counselling services. The East region has the highest number of HIV cases per centre (5,323), indicating a higher burden of HIV cases in each centre. The North region has the highest number of targeted interventions (257), demonstrating a focused approach to addressing the specific needs and challenges of the population at risk.

**Table 4**  
Status of 95-95-95 Target in Various States

Region	State	1 <sup>st</sup> 95*	2 <sup>nd</sup> 95**	3 <sup>rd</sup> 95***
Central	Chhattisgarh	59	77	76
	Madhya Pradesh	78	78	77
	Uttar Pradesh	65	84	85
Eastern	Bihar	56	84	83
	Jharkhand	63	86	77
	Odisha	52	83	85
	West Bengal	85	84	87
Western	Goa	81	84	89
	Gujarat	82	84	84
	Maharashtra	88	84	88
Southern	Andhra Pradesh	82	78	86
	Karnataka	79	83	81
	Kerala	79	97	92
	Tamil Nadu	91	85	86
	Telangana	70	95	77
Northeastern	Arunachal Pradesh	47	67	78
	Assam	52	72	89
	Manipur	56	90	95
	Meghalaya	57	74	88
	Mizoram	64	85	91
	Nagaland	67	76	86
	Tripura	92	86	78
Sikkim	65	84	91	
Northern	Delhi	92	73	88
	Haryana	58	71	78
	Himachal Pradesh	78	87	73
	Punjab	84	83	79
	Rajasthan	89	86	85
	Uttarakhand	60	67	86

Source: NACO Annual Sankalak Report, 2022

\*1<sup>st</sup> 95 - Percent of people who know their HIV status,

\*\*2<sup>nd</sup> 95- Percent of diagnosed individuals receive antiretroviral therapy (ART)

\*\*\*3<sup>rd</sup> 95- Percent of those on treatment achieve suppressed viral loads.

Table 4 provides information on the status of the 95-95-95 target in different states of India. The 95-95-95 target refers to the goal of ensuring that 95 per cent of people living with HIV know their HIV-positive status (1<sup>st</sup> 95), 95 per cent of those diagnosed with HIV are on antiretroviral therapy (2<sup>nd</sup> 95), and 95 per cent of those on treatment have achieved viral suppression (3<sup>rd</sup> 95).

The 1<sup>st</sup> 95 target represents the percentage of people living with HIV who are aware of their HIV-positive status. The data provided in the table highlights the progress made by different regions and states in achieving the 1<sup>st</sup> 95 target. States like Delhi, Tripura, Tamil Nadu, and Maharashtra demonstrate higher values for the 1<sup>st</sup> 95 target, indicating a higher percentage of people living with HIV who are aware of their status. This suggests that these states have implemented effective strategies for HIV testing and counselling, resulting in increased awareness among individuals. On the other hand, states like Arunachal Pradesh, Assam, and Bihar have lower values for the 1<sup>st</sup> 95 target, indicating a need for intensified efforts in expanding HIV testing services and promoting awareness about HIV. It is crucial to prioritize and scale up HIV testing programs, raise awareness about the importance of knowing one's HIV status, and ensure that testing services are accessible to all populations at risk. Achieving the 1<sup>st</sup> 95 target is a vital step towards effective HIV prevention and control, as it enables individuals to access timely care, support, and treatment, and reduces the risk of HIV transmission.

The 2<sup>nd</sup> 95 target, which represents the percentage of people living with HIV and aware of their status who are on antiretroviral therapy (ART), The Northeast region and states like Tripura, Manipur, and Mizoram demonstrate higher values for the 2<sup>nd</sup> 95 target, indicating better access to and utilization of ART among those aware of their HIV status. This suggests that these regions have made significant strides in providing treatment to people living with HIV. However, states such as Uttarakhand, Arunachal Pradesh and Haryana have lower values for the 2<sup>nd</sup> 95 target, indicating a need for improved ART coverage and ensuring that more individuals who are aware of their HIV-positive status receive the necessary treatment. Overall, it is crucial to continue efforts in expanding ART coverage and ensuring that individuals living with HIV have access to the necessary care and treatment to effectively manage their condition.

The 3<sup>rd</sup> 95 target represents the percentage of people living with HIV who are on ART and have achieved viral suppression. The data presented in the table shows variations in the achievement of the 3<sup>rd</sup> 95 target across different regions and states in India. States like Manipur, Tripura, and Mizoram in the Northeast region exhibit higher values for the 3<sup>rd</sup> 95 target, indicating a greater proportion of people on ART who have successfully suppressed the viral load. These states have made significant progress in providing effective treatment and support services to achieve viral suppression among people living with HIV. However, states like Himachal Pradesh, Chhattisgarh and Madhya Pradesh have lower values for the 3<sup>rd</sup> 95 target, suggesting a need for enhanced efforts to improve viral suppression rates. It is crucial to focus on strengthening treatment adherence, monitoring viral loads, and providing comprehensive support to ensure that individuals on ART achieve and maintain viral suppression, thereby improving their overall health outcomes and reducing the risk of HIV transmission.

**Table 5**  
Status of 1<sup>st</sup> 95 from 2018 to 2021 and Gap to Reach the Target by 2025

Region	States/Year	2018	2019	2020	2021	2025	Gap	Expected Year of achieving Target*
Central	Chhattisgarh	48	54	55	59	95	36	2031
	Madhya Pradesh	61	71	75	78	95	17	2024
	Uttar Pradesh	58	61	63	65	95	30	2034
Eastern	Bihar	54	56	56	56	95	39	2080
	Jharkhand	62	59	62	63	95	32	2117
	Odisha	43	48	50	52	95	43	2035
	West Bengal	71	78	81	91	95	4	2022
Western	Goa	74	77	77	81	95	14	2027
	Gujarat	76	80	81	82	95	13	2028
	Maharashtra	83	88	89	88	95	7	2025
Southern	Andhra Pradesh	74	78	80	82	95	13	2026
	Karnataka	72	74	77	79	95	16	2028
	Kerala	75	76	78	79	95	16	2023
	Tamil Nadu	86	87	89	91	95	4	2023
	Telangana	76	70	68	70	95	25	**
Northeastern	Arunachal Pradesh	40	45	42	47	95	48	2042
	Assam	42	47	48	52	95	43	2034
	Manipur	53	52	53	56	95	39	2060
	Meghalaya	54	53	55	57	95	38	2059
	Mizoram	53	56	60	64	95	31	2029
	Nagaland	63	57	63	67	95	28	2042
	Tripura	70	75	76	92	95	3	2022
	Sikkim	71	74	75	77	95	18	2030
Northern	Delhi	87	93	91	92	95	3	2023
	Haryana	36	46	50	58	95	37	2026
	Himachal Pradesh	69	72	75	78	95	17	2027
	Punjab	61	73	79	84	95	11	2022
	Rajasthan	78	85	87	89	95	6	2023
	Uttarakhand	47	53	55	60	95	35	2029

Source: India HIV Estimates 2021: Fact Sheet \*Estimated by authors

The table 5 presents estimated number of years a state will take to reach the first target of 95% assuming constant rate of increase over the years.

### Regional Variations in Achieving the Target

In the Central region, the expected years of achieving the target for ART coverage vary across states. Chhattisgarh aims to achieve the target by 2031, Madhya Pradesh by 2024, and Uttar Pradesh by 2034. These states are actively working towards improving ART coverage to ensure that a higher percentage of people living with HIV/AIDS have access to essential antiretroviral treatment. The East region presents a diverse picture in terms of the expected years of achieving the target for ART coverage. Bihar has a target year of 2080, reflecting the need for sustained efforts to enhance treatment access. Jharkhand faces a considerable challenge, with the target set to be achieved by 2117. Odisha aims to make significant progress by 2035, while West Bengal has already achieved the target in 2022, demonstrating successful efforts in improving ART coverage.

The West region showcases relatively close target years for achieving ART coverage. Goa aims to reach the target by 2027, Gujarat by 2028, and Maharashtra by 2025. These states have been actively working towards improving healthcare infrastructure and services to ensure better ART coverage for people living with HIV/AIDS. The South region demonstrates ambitious targets for achieving ART coverage. Andhra Pradesh aims to reach the target by 2026, Karnataka by 2028, Kerala and Tamil Nadu have already surpassed their targets in 2023. The Northeast region has varying target years for achieving ART coverage. Arunachal Pradesh and Nagaland aim for 2042, while Assam targets 2034. Manipur and Meghalaya face longer timelines, with targets set for 2060 and 2059, respectively. Mizoram has a relatively earlier target of 2029, while Tripura has already achieved the target in 2022. Sikkim is working towards achieving the target by 2030, reflecting the diverse landscape of ART coverage in the Northeast region. The North region demonstrates a mix of target years for achieving ART coverage. Delhi achieved its target in 2023, Haryana aims for 2026, Himachal Pradesh targets 2027, and Punjab has already achieved the target in 2022. Rajasthan has also achieved the target in 2023, while Uttarakhand aims for 2029. These states have been actively working towards improving treatment accessibility and ensuring that a larger proportion of individuals living with HIV/AIDS can benefit from antiretroviral therapy.

## Discussion

The analysis of regional disparities in HIV control efforts in India reveals significant challenges that need to be addressed to achieve the UNAIDS targets and effectively combat the HIV epidemic. Regarding variations in HIV prevalence, the Northeast region, particularly states like Mizoram, Nagaland, and Manipur, faces a high prevalence of HIV, indicating a significant challenge in controlling the epidemic in these areas. Understanding the variations in prevalence rates is essential for targeted interventions and resource allocation to regions with the highest burden. Disparities in the availability and accessibility of HIV testing and treatment facilities contribute to the challenges faced in different regions. Results indicate that the South region generally exhibits higher percent of ART coverage, while the Central and Northeast regions have lower coverage levels. This highlights the need of strengthening healthcare infrastructure, increase the number of testing and treatment facilities, and improve accessibility to ensure timely diagnosis and treatment for people living with HIV across all regions.

The percentage of people living with HIV who are aware of their HIV-positive status are much higher in the states like Delhi, Tripura, Tamil Nadu, and Maharashtra, suggesting better awareness among individuals in these regions. In contrast, states like Arunachal Pradesh, Assam, and Bihar have lower values, indicating a need for intensified efforts in expanding HIV testing services and promoting awareness about HIV. Addressing HIV-related stigma is crucial in promoting testing, as stigma often acts as a barrier to individuals seeking HIV testing and accessing care and treatment services. Studies on the effects of internalized stigma on access to care and treatment found that it leads to reduced likelihood of testing for HIV<sup>8</sup>, late linkage to care<sup>9,10</sup>, lower levels of adherence to treatment<sup>11</sup> and lower levels of viral suppression among those on treatment.<sup>12</sup> The viral suppression's ability to lower incidence won't be completely possible unless testing and treatment goals are met throughout all populations, including those in the aforementioned subgroups and across various regions.<sup>13</sup> Achieving viral load suppression is also clearly associated personal benefits for people living with HIV, including improved quality of life and reduced morbidity and mortality. It is essential to understand the distribution and size

of these populations, such as Female Sex Workers (FSW), Men having Sex with Men (MSM), and Injectable Drug Users (IDU), to develop targeted prevention and intervention programs. Regions with larger populations of key populations require focused efforts to provide comprehensive prevention, testing, and treatment services tailored to their specific needs. The disparities in healthcare infrastructure and resources, as indicated by variations in the availability of ICTC facilities, centres, and targeted interventions contribute to the challenges faced in different regions.

Our study also found that there is less number of ICTC, ART centres and Targeted Interventions in north-eastern region and east region compared to the rest of the country. The smaller number of testing centres may hinder individuals' ability to access testing services, resulting in lower testing rates and a decreased awareness of HIV status. The study carried out in Eastern Uganda found that long distance and poor accessibility contributed to the poor utilization of HIV testing services.<sup>14</sup> Furthermore, geographical and topographical barriers in the region may also contribute to the low testing rates. According to the analysis of population-based survey done in South Africa, the achievement of the 90-90-90 target varied by geographic area with the first 90 target met in free state province (91.1%) only, while other provinces such as Northern cape was lagging behind, particularly among agricultural communities.<sup>13</sup> Difficulties in travelling to distant testing centres may discourage individuals from seeking testing services, thus impeding their knowledge of HIV status. Moreover, with more testing facilities, the gap between reaching the 1<sup>st</sup> 95 target can be reduced, as more individuals will have the opportunity to learn about their HIV status. To address these issues, it is recommended that the government establishes linked centres at primary health centres and health and wellness centres. This strategic move would enhance accessibility and convenience for individuals seeking testing and treatment services. It underscores the importance of allocating sufficient resources and implementing strategies to expand access to ICTC facilities, ART centres, and targeted interventions in order to improve HIV/AIDS prevention, testing, counselling, and treatment services in the north-eastern states of India.

Northeast region with its proximity to the "golden triangle" of heroin production and porous borders, the region has witnessed significantly higher rates of drug injection compared to other parts of the country.<sup>15</sup> IDUs have been defined as an individual who injects at least once in the last three months.<sup>16</sup> The north-eastern states, particularly Manipur, have been severely affected, with the highest HIV prevalence observed among IDUs in this region. Several research studies have found the similar observation.<sup>17,18, 19</sup> The unique arrangement called the Freedom Movement Regime (FMR) along the India-Myanmar border has facilitated drug smuggling and contributed to the high rates of injecting drug use in these states.<sup>20</sup> Similarly, The Golden Crescent a region in South Asia that includes Afghanistan, Pakistan, and Iran. This region is notorious for its significant involvement in the production and trafficking of illicit drugs, particularly opium and heroin.<sup>21</sup> The countries in this region face numerous challenges related to drug abuse, addiction, and the associated health and social consequences. The issue of drug abuse and addiction is particularly prominent in the states located near the Golden Crescent, such as Punjab and Delhi. Punjab, in particular, has witnessed a rise in drug abuse, with heroin being a commonly abused substance.<sup>22</sup> The porous border with Pakistan and the transit routes through Punjab contribute to the drug trafficking problem in the region leading to more IDU Users and increase risk of HIV infection.

## Conclusion and Recommendations:

The study estimated that India can achieve the target of 95-95-95 by the year 2030, while the north-eastern region and east region will take more time to achieve the target and the south, west and north region are near to the target. Thus, in order to maximise our ability to reach UN targets, additional efforts must be taken towards optimising participation of certain sub-populations as identified in our study. States or regions with higher HIV burdens and limited healthcare infrastructure may require additional support to strengthen their healthcare systems, enhance testing and treatment services, and expand access to prevention and care programs. Closing the gaps and disparities in testing and treatment coverage across states and regions and population groups will ensure the population level decrease in HIV incidence necessary to achieve the target.

Addressing these regional disparities and challenges requires a multi-faceted approach. It involves strengthening healthcare infrastructure, improving access to testing and treatment services, promoting awareness and education about HIV/AIDS, implementing targeted interventions for key populations, and combating HIV-related stigma. Additionally, adequate resource allocation, policy support, and collaboration between governmental and non-governmental organizations are essential to ensure effective HIV control efforts across all regions of India. In order to achieve the goal of sustainable development goal of ending AIDS as a public health threat by 2030, it is imperative that all these challenges to be solved immediately.

## Limitations

The paper acknowledges certain limitations to consider in this analysis. Firstly, the projections for 2025 are based on current trends and may be subject to change. External factors such as natural disasters, ethnic problems, and policy shifts can influence the actual progress.

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Labeling of the figures shall be reentered by the Editor to conform to a uniform style, wherever necessary. Each table should be referred to as e.g. Table 4 using Arabic number. Tables with borders must be appropriately cited in the text. Legends should be typed on the same sheet of table.

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## THE NATIONAL INSTITUTE OF HEALTH AND FAMILY WELFARE

***The National Institute of Health and Family Welfare (NIHFW)*** an autonomous organization, under the Ministry of health and Family Welfare, Government of India, acts as an 'apex technical institute' as well as 'think tank' for the promotion of Health and Family Welfare programmes in the country. The NIHFW is known for its Education, Training, Research, and Specialized advisory services.

**Educational activities:** The educational activities of the Institute contribute to Human resource development for better management of health and family welfare programmes in the country. The on campus courses are: Three-year Post-graduate Degree in Community Health Administration, a two-year Post-Graduate Diploma in health Administration, and a one year Post-Graduate Diploma in learning mode of one year duration each. These are: Health and Family Welfare management, Hospital management, health Promotion, health Communication, Public Health Nutrition and Applied Epidemiology. These courses are need based and multidisciplinary in nature. The Institute has also developed certificate courses through e-learning mode for enhancing the skills and competencies of in-service middle level health professionals in the areas of 'Professional Development in Public health and Health Sector Reforms' for Medical Officers, and "Programme Management for Public Health care for the Programme Managers working in national health Mission or in the health sector.

**Training and Workshops:** The training courses and workshops (intramural and extramural), numbering around 45-50 are organized by the Institute every year with an aim to familiarize the participants with the goals and the objectives of health and family welfare programmes; updating their knowledge and understanding of operational difficulties in implementation and suggesting remedial measures to overcome such constraints.

**Research and Evaluation:** The Institute gives priority attention to research in various aspects of health and family welfare. The Institute has an Academic Committee and a high level Programme Advisory Committee for ensuring the quality in academic endeavours. The Institute also conducts evaluation studies of National Health Programmes and various other related activities initiated by the Government of India.

**Specialized Services:** Specialized services of the Institute include Clinical services, National Cold Chain and Vaccine Resource management Centre (NCCVMRC), Centre for Health Informatics, Skill Lab, National Documentation Centre and publications. The ministry of health and Family Welfare (MoHFW) has entrusted the Institute to act as a "National Nodal Agency" to organize, coordinate and monitor the training programmes of Reproductive and Child health (RCH) in the country. The main objective of the Clinic is to render Mother and Child Health services. The clinical work in relation to infertility, reproductive disorders, especially endocrinology and sexual dysfunctions deserve special mention. NIHFW in partnership with UNICEF through the National Cold Chain Management Information System, is responsible for the overall maintenance, implantation and monitoring of NCCMIS across the country including providing support to the end users. The reference, referral, press clipping and bibliographic services of the National Documentation Centre; and the publication, art and projection services of the Department of Communication compliment the activities of the Institute.

**Advisory and Consultancy Services:** The Director and faculty members of the Institute provide advisory and consultancy services to various national, international and voluntary organizations in various capacities.

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