

**Distribution of Iron Folic Acid and Calcium among  
Pregnant Women in Jammu and Kashmir  
(2015-16 to 2019-20)**

**Submitted to Ministry of Health and Family welfare  
Government of India New Delhi -10001**

**by**

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## PREFACE

Quality Antenatal Care is the cornerstone to improved maternal health and a crucial challenge that is faced by every health care setting especially in a country like ours. We are all aware that one of the leading causes of maternal mortality is hypertensive disorders during pregnancy which can lead to pre-eclampsia and a considerable amount of child and maternal morbidity and mortality is associated with this condition. It is in this context that the Ministry of Health & Family Welfare has taken a decision to adopt a preventive strategy for pregnancy induced hypertensive disorders. Key intervention in this strategy is universal supplementation of Calcium to all pregnant women across India. Long term policies by government, non-government agencies and the community can be directed to formulate effective plans like eradicating anemia in children and adolescent girls. Since Independence various nationally designed Health and Family Welfare Programmes have been implemented in J&K to improve the health care delivery system. National Health Mission is the latest in the series which was initiated during 2005-2006. It has proved to be very useful intervention to support the State in improving health care by addressing the key issues of accessibility, availability, financial viability and accessibility of services. The Annual work Plan of Jammu and Kashmir, 2019-20 has been approved and PRC is completing the given tasks and targets. While approving the AWP, Ministry has also decided to know the implementation of various components of State by Population Research Centre, Srinagar. This Study **Distribution of IFA and Calcium among Pregnant Women in Jammu and Kashmir** is one of the AWP studies which based on NFHS-4 and HMIS data of all districts.

The study was successfully completed due to the efforts, involvement, cooperation, support and guidance of a number of officials and individuals at different levels. We wish to express our thanks to the Ministry of Health and Family Welfare, Government of India for giving us an opportunity to be part of this exercise of National importance.

I thank Mr. Bashir Ahmad Bhat, Associate Professor and Mr. Imtiaz Ahmad Bhat Research Investigator of the PRC for their immense support and guidance during the completion of this study. I also thank to all our colleagues who also provided valuable suggestions in making this study meaningful for future planning. It is hoped that the findings of this study will be helpful to both the Union Ministry of Health and Family Welfare and the State Government in taking necessary changes.

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## **1. Background**

Dietary requirement for different nutrients increases during pregnancy and lactation. The dietary intake of many Indian women, however, is significantly below recommended dietary requirements. Of these, two most important nutrient iron and calcium. (*Maternal Health Division Ministry of Health & Family Welfare Government of India December 2014.*)

Nutritional anemia is the most common type of anemia worldwide. The anemia in pregnant women may causes increased risk of intra-uterine growth retardation or prematurity, prenatal and neonatal mortality, inadequate iron stores for the newborn, increased risk of maternal morbidity and mortality, and lowered physical activity, mental concentration, and productivity. The Government of India recommends a minimum dose of total 100 tablets containing 60 mg of elemental iron and 100mcg folic acid to be prescribed during pregnancy. However, prevalence of anemia is still 53% among women of reproductive age group, despite the availability of this effective, low-cost intervention for prevention and treatment. (*Maternal Health Division Ministry of Health & Family Welfare Government of India December 2014.*)

National Family Health Survey-5 (NFHS-5) data shows that 44.1 percent of Pregnant women age (15-49) in J&K are anemic compared to 47 percent in NFHS-4 (2005-06). This shows the state has improved 3 percentage points but still there is need to look in the alarming situation in few districts which have higher rate of anemia cases than the state. The prevalence of the Anemia in the state ranges between 22 percent to 65 percent. In this background we intend to analyze the factors effecting the distribution IFA and calcium tablets in the J&K. The study attempts to understand the reason why distribution is not uniform. Though the district is having a good socio economic back ground but there may be some other factors such as the availability of ANC services in the health facilities, non-availability of IFA and calcium at these health facilities and the knowledge of the target group about the IFA calcium and dietary practices during the pregnancy.

Maternal mortality is the prime health indicator in any society. When the concentrations of hemoglobin or red blood cells in the blood are reduced to below normal, anemia is developed. WHO defines anemia as a condition in which the Hemoglobin (Hb) content of blood is lower than normal (11.0 g/dl) as a result of deficiency of one or more essential nutrients, regardless of the cause of such deficiencies? The anemia levels for ever-married women age 15–49. Three levels of severity of anemia are distinguished: mild anemia (10.0–10.9 grams/deciliter for pregnant women and 10.0–11.9 g/dl for non-pregnant women), moderate anemia (7.0–9.9 g/dl), and severe anemia (less than 7.0 g/dl).

## **1.2. World Scenario:**

Various international evidences are available on the benefit of daily maternal calcium supplementation during pregnancy. These include the Lancet 2013 series in maternal and child nutrition, several meta-analyses, WHO 2011 and WHO 2013 guidelines and the 2014 Cochrane systematic review. A summary of these evidences is that the daily intake of at least one gm/ day of calcium in pregnancy after the first trimester reduces the risk of pre-eclampsia

by at least 50%, with an additional 24% reduction in the risk of pre-term birth. For prevention of pre-eclampsia. Moreover WHO 2013 guidelines recommend inclusion of routine prenatal calcium supplementation in high doses (>1 gm/day), especially in areas where dietary calcium intake is low.

Anemia affects 1.62 billion people, which corresponds to 24.8% of the population. The highest prevalence is in preschool-age children (47.4%), and the lowest prevalence is in men (12.7%). However, the population group with the greatest number of individuals affected is pregnant women (41.8%). Nine out of ten anemia sufferers live in developing countries, about 2 billion people suffer from anemia and an even larger number of people present iron deficiency. Anemia is estimated to contribute to more than 115,000 maternal deaths and 591,000 prenatal deaths globally per year. South Asia (52% among pregnant and 47% among non-pregnant) region had the second highest anemia prevalence in the world only after Central and West Africa (56% among pregnant and 48% among non-pregnant) region during 2011. An alarming 600 million people in South-East Asia are suffering from iron deficiency anemia, predominantly affecting adolescent girls, women of reproductive age and young children. Moreover, the study show that the anemia prevalence decreased from 33% to 29% among non-pregnant women, and 43% to 33% among pregnant women during 1995-2011. Though, the decrease in the prevalence of anemia is observed both in pregnant and non-pregnant women, but the gap between both pregnant and non-pregnant, which is around 10% point during 1995 as well as 2011, is stagnant.

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For prevention of pre-eclampsia, WHO 2013 guidelines recommend inclusion of routine prenatal calcium supplementation in high doses (>1 gm/day), especially in areas where dietary calcium intake is low. (*National Guidelines for Calcium Supplementation during Pregnancy and Lactation. Maternal Health Division MoHFW (GOI) December 2014.*)

### **1.3 Anemia and Calcium deficiency in India:**

Anemia, defined as a reduction in hemoglobin concentration, red-cell count, or packed-cell volume below established cut- off levels, is a widely discussed public health challenge that India is facing. In particular, a persistently high level of anemia among women in India (53% of all women have anemia as per the National Family Health Survey 2015–2016) is of great concern, and the 2017 National Health Policy tabled by the Ministry of Health and Family Welfare, Government of India, acknowledges this high burden. Iron- deficiency anemia (IDA) is a common problem among women, primarily due to their recurrent menstrual loss. Demand for iron is higher among pregnant women, and women with anemia in combination with early onset of childbearing, a high number of births, short intervals between births and

poor access to antenatal care and supplementation are likely to experience poor pregnancy outcome. In India, under the Government's Reproductive and Child Health Programme, iron and folic acid tablets are provided to pregnant women in order to prevent anemia during pregnancy. Because anemia is such a serious health problem in India,

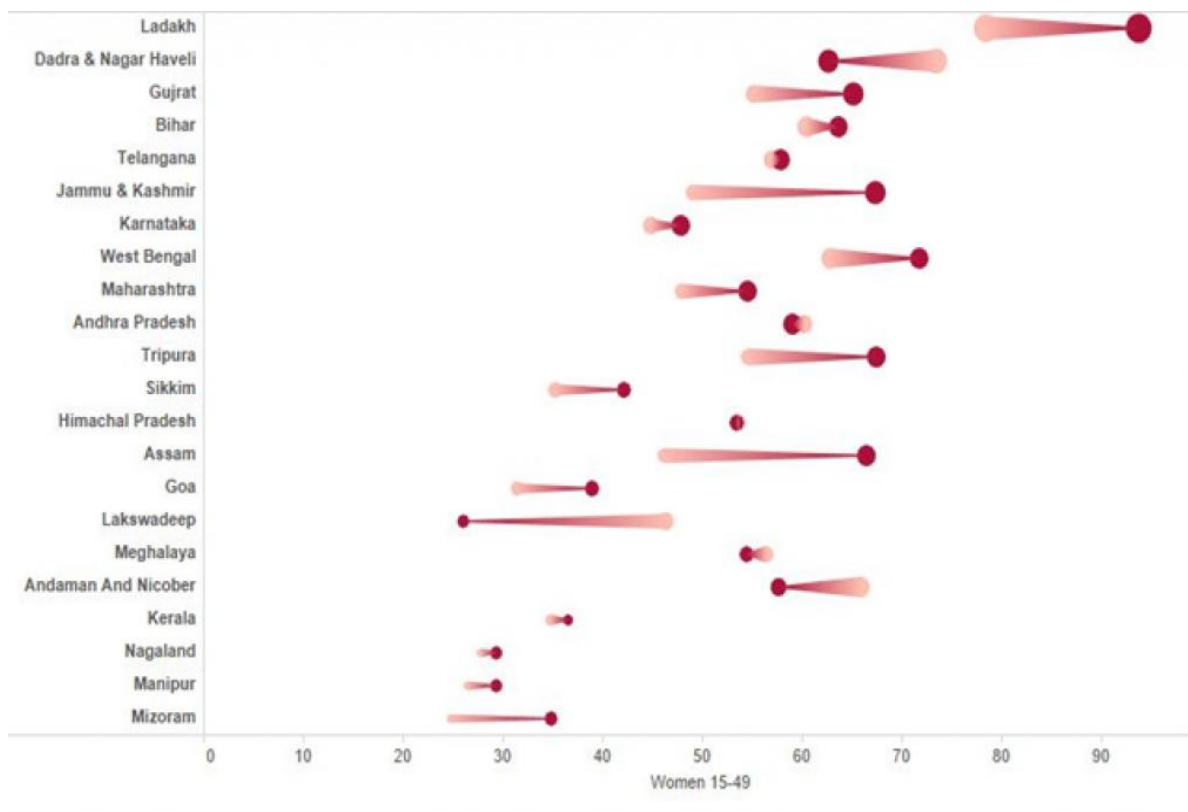
Data from the NFHS in India have been widely used to make national and state-level policy decisions. Estimates from the NFHS indicate that during the period 1998–2016, over 50% of women aged 15–49 years had IDA. Of all the states and union territories, data for 27 were available for comparison between 2005–2006 and 2015–2016. There was an average decrease of only 3.5 percentage points in IDA among all women in India, varying by states. In addition, NFHS-4 (2015–2016) indicates that the National Iron+ Initiative did not yield the desired reduction in IDA nationally.

States and Union territories, according to the latest National Family Health Survey (NFHS-5). As many as 68.4 per cent children and 66.4 per cent women surveyed suffered from anaemia in 2019; 35.7 per cent children and 46.1 per cent women were anaemic in 2016. The prevalence increased in Assam by 32.7 percentage points among children and 20.3 percentage points among women. These were among the findings of the first phase of NFHS-5 (2019-20) carried out by the Union Ministry of Health and Family Welfare. The number of women suffering from anaemia increased by 18 percentage points in Jammu and Kashmir. In Nagaland, 19.3 per cent women surveyed were found anaemic; this rose to 46.4 per cent in 2019. A rise in anaemia was recorded in several other states as well among women aged between 15 and 49 years: Tripura (12.9 percentage points), Mizoram (10.1 percentage points) and West Bengal (8.9 percentage points). Andaman and Nicobar Island, Dadra and Nagar Haveli and Daman and Diu, Meghalaya, Himachal Pradesh and Andhra Pradesh were the states that recorded a reverse trend. Meghalaya recorded a marginal decline in percentage of women suffering from anaemia.

Meghalaya, Andhra Pradesh and Himachal Pradesh, however, showed a marginal improvement in child and women health, according to survey findings.

The highest percentage of school children suffering from anaemia, according to NFHS-4, was observed in Haryana (71 per cent), followed by Jharkhand (69.9 per cent); Madhya Pradesh (68.9 per cent), Bihar (63.5 per cent) and Uttar Pradesh (63.2 per cent). Among Union territories, 84.6 per cent children were anaemic in Dadra and Nagar Haveli; 73.8 per cent in Daman and Diu and 73.1 per cent in Chandigarh.

In 2016, among the states that had a higher percentage of women with anaemia were: Jharkhand (65.2 per cent), Haryana (62.7 per cent), West Bengal (62.5 per cent), Bihar (60.3 per cent) and Andhra Pradesh (60.0 per cent) and UTs Dadra & Nagar Haveli (79.5 per cent), Chandigarh (75.9 per cent) and Andaman and Nicobar Islands (65.7 per cent).



Red circles signify the prevalence of anemia among women (15-49 years) in 2019-20. Chart includes states and UTs surveyed in the first phase of NFHS-5. Source: NFHS-5 and NFHS-4

Northeastern states such as Mizoram, Manipur, Nagaland, Sikkim had the lowest rate of anaemia among both children and women in 2016.

The first phase of NFHS-5 was conducted before the novel coronavirus disease (COVID-19) lockdown. If current trends continue, India may miss the sustainable development goal 2 (achieving Zero Hunger by 2030). India ranks 170 out of 180 countries for anaemia among women, according to global nutrition survey, 2016. According to the World Health Organization (WHO), women in the reproductive age group and having hemoglobin levels lower than 12 grams per deciliter (g / dL), as well as children under five with hemoglobin levels lower than 11.0 g / dL are considered anemic.

The National Nutritional Anemia Prophylaxis Programme initiated in 1970, was revised and expanded to include beneficiaries from all age groups namely children aged 6-59 months, 5-10 yr, adolescents aged 10-19 yr, pregnant and lactating women and women in reproductive age group under the National Iron plus Initiative (NIPI) programme in 2011. The dose of iron, frequency and duration of iron supplementation and roles and responsibilities of the functionaries were described. At present, the coverage of beneficiaries with iron and folic acid has been poor at the national level. The prevalence of anaemia has continued to remain high during the last 60 years, and there has been no significant change in the scenario due to various reasons.



## **1.4 Maternal consequences of anemia**

### **Mild anemia**

Women with mild anemia in pregnancy have decreased work capacity. They may be unable to earn their livelihood if the work involves manual labour. Women with chronic mild anemia may go through pregnancy and labour without any adverse consequences, because they are well compensated.

### **Moderate anemia**

Women with moderate anemia have substantial reduction in work capacity and may find it difficult to cope with household chores and child care. Available data from India and elsewhere indicate that maternal morbidity rates are higher in women with Hb below 8gm/dl [Prema K, Neela Kumari S, Ramalakshmi BA. *Anaemia and adverse obstetric outcome. Nutr Rep Int. 1981; 23:637-43.*].

They are more susceptible to infections and recovery from infections may be prolonged. Premature births are more common in women with moderate anemia. They deliver infants with lower birth weight and prenatal mortality is higher in these babies. They may not be able to bear blood loss prior to or during labour and may succumb to infections more readily. Substantial proportion of maternal deaths due to antepartum and post-partum hemorrhage, pregnancy induced hypertension and sepsis occur in women with moderate anemia.

### **Severe anemia**

Three distinct stages of severe anemia have been recognized - compensated, decompensated, and that associated with circulatory failure. Cardiac decompensation usually occurs when Hb falls below 5.0 g/dl. The cardiac output is raised even at rest, the stroke volume is larger and the heart rate is increased. Palpitation and breathlessness even at rest are symptoms of these changes. These compensatory mechanisms are inadequate to deal with the decrease in Hb levels. Oxygen lack results in anaerobic metabolism and lactic acid accumulation occurs. Eventually circulatory failure occurs restricting work output. Untreated, it leads to pulmonary oedema and death. When Hb is <5 g/dl and packed cell volume (PCV) below 14 [Lawson JB. *Anaemia in . In: Lawson JB, Stewart DB, editors. Obstetrics and gynecology in the tropics. London: Edwards Arnold; 1967.*].

A blood loss of even 200 ml in the third stage produces shock and death in these women. Even today women in the remote rural areas in India reach to the hospital only at this late decompensate stage. Available data from India indicate that maternal morbidity rates are higher in women with Hb below 8.0 g/dl. Maternal mortality rates show a steep increase when maternal Hb levels fall below 5.0 g/dl. Anemia directly causes 20 percent of maternal deaths in India and indirectly accounts for another 20 per cent of maternal deaths [Indian Council of Medical Research. *Evaluation of the National Nutritional Anaemia Prophylaxis Programme. Task Force Study. New Delhi: ICMR, 1989.*].

### **1.5 Causes of Anemia:**

Commonly, anemia is the final outcome of nutritional deficiency of iron, foliate, vitamin B<sub>12</sub>, and some other nutrients (Lee and Herbert, 1999). Many other causes of anemia have also been identified. They include malaria, hemorrhage, infection, parasite infestation (hookworm), chronic disease, and others. A vegetarian diet is also linked with iron-deficiency anemia. Even though a vegetarian diet contains as much dietary iron as a non-vegetarian diet, research has shown that animal-based iron is better absorbed (15-40%) than plant-based iron (1-15%). To make up for the low absorption, large quantities of green leafy vegetables, pulses and nuts need to be consumed. But these are unaffordable for the poor.

### **Un balanced Diet:**

NFHS-5 asked ever-married women how often they consume various types of food (daily, weekly, occasionally, or never). Women consume vegetables (other than green, leafy vegetables) most often. Fruits are eaten daily by a lesser percent of women and only one-third of women eat fruits at least once a week.

It was asked to the respondents what are the causes of anemia most of them replied that the un balanced diet is responsible for the cause of anemia. A large proportion (98%) of women in the age group of less than 25years age(97.6%) in the age group of 25-30 years while (92.7 %) were saying that un balanced diet is responsible for anemia whose age was more than 30 years. While we analyze the data according to the education level of the respondents only 69 percent those who were illiterate were considering unbalanced diet as main cause of the anemia about we have heard while 98 percent were in all education level were of the same opinion.

### **Hook Worms:**

In many areas of Kashmir however, a number of other factors besides iron deficiency contribute to the burden of anemia. Of particular importance in many areas are intestinal parasites, especially hookworm infestation. The level of contribution of these factors to the overall prevalence of anemia depends on the magnitude of malaria epidemics, the existence of iron supplementation and fortification programs, and other conditions in each particular area. Only 21 respondents were aware that hook worms also add to the cause of the anemia in pregnancy.

### **Excessive Menstrual loss:**

Anemia may be caused by excessive bleeding. Bleeding may be sudden, as may occur as a result of an injury or during surgery. Often, bleeding is gradual and repetitive (chronic bleeding), typically due to abnormalities in the digestive or urinary tract or heavy menstrual periods. Chronic bleeding typically leads to low levels of iron, which leads to worsening anemia. With the onset of menstruation and associated blood loss, there is a further rise in prevalence and severity of anemia in pregnant women. A large number of (86 %) respondents were have heard that excessive menstrual loss is a one of the measures cause responsible for anemia in pregnancy.

### **Ulcers and TB:**

Only about one percent pregnant women have heard that ulcer and TB as cause of anemia in pregnancy.

### **Lack of iron in Food:**

In light of the minimum daily requirement, it is not surprising that a deficiency will occur within months if dietary intake or intestinal absorption is curtailed. There are certain critical periods when iron requirements are significantly increased and the iron balance can be easily disturbed. Such situations include pregnancy. Only 10 percent of the respondents have heard about the lack of iron in food as a cause of anemia in all age groups while in salaried class 24 percent have heard this as cause of anemia.

### **Inability to absorb iron from food:**

The amount of Iron absorbed by the body depends not only on the amount consumed through the diet, but also how much of that can be absorbed and assimilated within the body. Iron present in plant-based foods (non-haem iron) has lower absorbability than that present in animal foods such as red and organ meats (haem iron). Patients with folic acid deficiency are often malnourished and are likely to appear wasted. Diarrhea is often present, as well as visible defects of the tongue and mucosal surfaces of the mouth. A very little percentage only 2 percent have heard that poor absorption is also a cause of the anemia in pregnancy.

## **1.6 Calcium supplementation in pregnant women**

The word calcium is derived from a Latin word “calx or calcis” which means “lime.” Calcium was known as early as the 1st century when ancient Romans prepared lime as calcium oxide; however, it was isolated in 1808 by Englishman Sir Humphrey Davy. In 1883, Sydney Ringer demonstrated the biological significance of calcium, when he showed that frog hearts needed the presence of calcium in the bathing solution in order to continue beating. Calcium as a nutrient is most commonly associated with the formation and metabolism of bone. Over 99% of the total body calcium is found as calcium hydroxyapatite ( $\text{Ca}_{10}[\text{PO}_4]_6[\text{OH}]_2$ ) in bones and teeth. The rest 1% is intracellular and about 0.1% is in extracellular fluid. Calcium is an important intracellular and extracellular cation, which is required physiologically for muscle contraction, nerve conduction, vascular reactivity, and hormonal secretion. Calcium in plasma or serum exists in the following three forms or fractions: ionized or free calcium (50%), protein-bound calcium (40%), and complexed or chelated calcium which is bound to phosphate, bicarbonate, sulfate, citrate, and lactate (10%). [1] According to the Institute of Medicine, [1] daily allowance for calcium ranges from 600 to 1300 mg in relation to age and gender. The Indian Council of Medical Research [2] recommends 600 mg for both genders. In the USA and Northern Europe, the average daily intake of calcium is about 900–1000 mg, and in South Asia and India, it is 400–500 mg. [3,4] This means that at both geographical areas, intake of calcium is suboptimal in >50% of population. This also gives impression that these all people require calcium supplementation. If this holds true, then it has huge financial and commercial implications. If more than half of the world’s population is calcium deficient, then why we do not observe its consequences often? To address this question, we first discuss the physiological aspects of calcium

homeostasis, then discuss about when, which, and how calcium supplementation should be given.

### **1.7 Why – Calcium supplementation?**

“Something that is added to something else in order to improve it or complete it.” – Cambridge Dictionary.

According to the above-stated recommendations, more than half of the world’s population will require calcium supplementation. Calcium supplementation is decided by recommended daily allowances. Logically, to maintain calcium homeostasis, first, the body will try to absorb maximum available calcium, rather than affecting bone remodeling. Hence, calcium absorption is the first most important adaptive mechanism. It is well known that fractional calcium absorption (FCA) is inversely proportional to the calcium intake. High FCA (54%–63%) has been reported from the region of China with low calcium intake (<500 mg)[5] compared to 25%–34% among US children with high intake of calcium (>900 mg).[6] There are no such studies reported from India, because this requires double calcium isotopes, which are not available in India. Calcium absorption is mainly facilitated by Vitamin D. The conventional explanation of homeostasis is by systemic adaptation in which decreased calcium intake results in decreased calcium absorption, which leads to increase in PTH levels. The PTH up regulates the 1- $\alpha$  hydroxylase enzyme, leading to increase in the generation of 1,25-dihydroxyvitamin D (1,25(OH) 2D) levels and increased calcium absorption. However, calcium absorption can be kept static over a wide range of calcium intake and serum 25OHD levels.[7] Calcium absorption varies between 20% and 70% at the serum 25OHD levels >10 ng/ml[8] and does not increase with higher levels of 25OHD.[9] This suggests that it is the calcium absorptive mechanism, rather than dietary calcium intake, will decide the adequacy of calcium homeostasis. An alternative hypothesis has been proposed, wherein the adaptation of calcium absorption occurs at the level of intestine called “intestinal calcistat.”[10,11] This “calcistat” senses the calcium intake or available calcium in the gastrointestinal (GI) tract and regulates the generation of active Vitamin D in intestinal cells to adjust FCA. With daily calcium intake of <500 mg, the FCA is about 60%–80%, which can easily supply the daily needs of calcium, i.e., 200 mg. In contrast, with daily calcium intake of >900 mg, FCA is about 25%–35% to maintain calcium homeostasis.

### **1.8 How – Calcium Supplementation?**

Calcium carbonate is the least expensive and requires the fewest tablets. However, it may cause constipation and bloating and must be taken with meals for adequate absorption. Calcium citrate is often more expensive than calcium carbonate and requires more tablets to get the desired dose. Its absorption is not dependent on gastric acid, and it is less likely to cause GI side effects. For optimal absorption, the dose of calcium should not exceed 500 mg per dose, irrespective of calcium preparation. For patients requiring >500 mg/day, the dose should be divided. All nutrients have side effects when taken in excess quantity like obesity with excess calories. There are contradictory evidences about increased calcium intake and cardiovascular deaths both from observational studies and meta-analyses.[14-16] Previous studies and meta-analyses found no correlation between calcium intake and cardiovascular

mortality. A recently published large prospective observational study among Swedish females found a positive relation between calcium intake and cardiovascular death.[16] Increased.

### 1.9 Prevalence of Anemia in Jammu and Kashmir:

Anemia is a major health problem in Jammu & Kashmir, especially among women and children. About 66 percent of women in Jammu & Kashmir have anemia, including 67 percent non pregnant and 44 percent pregnant women as per the report revealed by NFHS-5 while there is increase in all women age 15 -49 group about 26 percent, non-pregnant women age 15-49 by 27 percent and in pregnant women age 15-49 years 6 percent compared to NFHS-4. Anemia has exceeded for every group of women age 15-49 in J&K. The highest overall rates of anemia are reported in Kishtwar with 65.3 percent followed by Kulgam 63.2 and district Ganderbal has 63 percent while Poonch has the lowest Anemic cases of 27 percent followed by Kathua district with 28.4 percent from Jammu division and district Shopian from Kashmir division with 33.5 percent of pregnant women in the age group of 15-49 percent. In district Leh district has the highest 79 percent pregnant women between 15-49 years age group followed by the Kargil district in the Ladakh division. While the capital districts of Jammu and Srinagar have 42 percent pregnant anemic women in the age group of 15-49 years followed by 38.8 percent by the Srinagar in J&K.

District	All women Age 15-49		Non-Pregnant women Age 15-49		Pregnant women Age 15-49	
	2015-16	2019-20	2015-16	2019-20	2015-16	2019-20
J&K	48.9	65.9	49	67.3	46.9	44.1
Leh	84.1	93.5	84.1	94.6	81	79
Kargil	73.1	92	72.8	92.8	77.9	76.7
Kishtwar	57.7	84.8	58.2	86.2	48.6	65.3
Kulgam	54.3	77	54.4	77.5	50.8	63.2
Ganderbal	52.8	77.2	52.8	77.9	52.8	63
Badgam	36.6	73.9	36.7	75	35.5	57
Baramulla	55.6	73.1	55.6	73.1	54.1	56
Bandipora	55	73.7	55.3	74.3	44.7	55.3
Anantnag	36.6	74.3	36.7	75.7	35.5	54.1
Doda	35.3	66.5	35.3	67.9	34.9	47.7
Kupwara	70.5	73.5	69.4	75.6	84.1	45.7
Udhampur	58.4	56.5	56.1	57.3	58.2	44.5
Rajouri	37.8	60.6	37.4	62	45	41.8
Jammu	35.6	66.6	35.5	68.2	37.2	41.7
Samba	37.1	62.4	37.1	63.6	37.9	41.1
Reasi	45.8	92.9	46.8	65.1	32.5	40.3
Srinagar	60.1	51.7	60.7	52.5	44.5	38.8
Pulwama	58.7	73.2	59	74.7	49.4	37.7
Ramban	46.5	59.7	46.3	61.7	49.2	36
Shopian	55.7	63.9	55.9	65.5	49.1	33.5
Kathua	39.9	53.6	40	55.2	38.1	28.4
Poonch	34.6	34.2	34.9	34.6	28.4	27

Source: National Family Health survey (NFHS-4 & 5), 2017-2020: India: Volume 1, Mumbai: IIPS.



### 1.10 Demographic and socio-economic features of Jammu and Kashmir

The total population of the country is 1210 million in which Jammu and Kashmir comprises 12 million accounting roughly one percent of the total population of the country. The decadal growth rate of population is 31 percent substantially higher than the national decadal growth rate of 21 percent. It is evident that the population grew by 70 percent during 1991-2011, with much higher rate than in 1981-91. The crude birth rate and crude death rate of the State is lower than the national average (Table 1). Infant and child mortality rates are good indicators of socio-economic development and the status of health and population Programmes. The infant mortality rate has come down from 50 in 2001 to 26 in 2017 which is lower than the national average of 34. The total fertility rate of the State is 1.9 which is lower than the national average of 2.4. The sex ratio, which has alarmingly come down from 933 in census 2001 to 883 in census 2011 is lower than the national sex ratio (940 females per thousand males). The scheduled caste population of the State is only 8 percent as against 16 percent in the country. However the schedule tribes of the State are higher (11 percent) than the national average (8.6 percent). The literacy rate in the State has improved by more than 14 percent points from 54 percent in 2001 to 68.7 percent in 2011. The literacy rate for the population of seven years and above is 78 percent for males and 58 percent for females and 69 percent for the total population, although it is lower than the national average. The detailed figures of major health and demographic indicators are mentioned in Table 2.

Indicator	J&K	India

Total Population (Crores)	12.54	1210.19
Decadal Growth (percent)	31.42	21.54
Crude Birth Rate (SRS 2017)	15.7	20.4
Crude Death Rate (SRS 2017)	5.2	6.9
Natural Growth Rate (SRS 2017)	10.8	14.0
Infant Mortality Rate (SRS 2017)	24	34
Maternal mortality Rate (SRS 2011)	NA	254
Total Fertility Rate (SRS 2014)	1.9	2.4
Sex Ratio (Census 2011)	883	940
Child Sex Ratio (Census 2011)	859	914
Schedule Caste Population (percent) (Census 2011)	8.0	16.6
Schedule Tribe Population (percent) (Census 2011)	11.0	8.6
Total Literacy rate (percent) (Census 2011)	68.74	74.04
Male Literacy Rate (percent) (Census 2011)	78.26	82.14
Female Literacy Rate (percent) (Census 2011)	58.01	65.46

Source: Census 2011 and (SRS 2017) Government of India.

## 2. Objectives

To assess the availability and utilization of IFA and calcium services by beneficiaries and its determinants in the various, health facilities.

1. To examine inter-district variations of IFA and Calcium distribution.
2. To identify the gaps in the delivery of IFA and Calcium Services.
3. To suggest the measures for improving the quality of IFA and Calcium services to pregnant women.

### 2.1 Methodology

The study intends to collect secondary data of all the districts in Jammu and Kashmir for IFA and Calcium distribution after going through the HMIS facility wise data. The fully Integrated National Health Reporting has been generated automatically. There are District Health Management Information Systems (D-HMIS) in each and every district. The implementation of a District Health Management Information System (D-HMIS) aims to improve the ability to collect, store and analyze accurate health data \and also aims to increase data accuracy and effectiveness of intervention, increase accountability, and improve tracking of health trends in the district. Information on patient registrations, diagnoses, treatments, lab tests, billing and pharmacy records are also being captured. Data sources on distribution on IFA and calcium used for this study include secondary data from HMIS Web Portal of the Ministry of Health and Family Welfare, Government of India.

We have selected five years because the HMIS data was improved after 2015 and we have rapidly given feedback during three round PIP monitoring to all the districts which were visited by the PRC Srinagar teams regarding the improvement of HMIS data. The study will examine HMIS data for five consecutive years 2015-16, 2016-17, 2017-18, 2018-19 and 2019-20. In order to examine authenticity, uniformity and consistency of HMIS data all the indicators of IFA and Calcium will be ranked on the basis of their performance (district wise) of the state for 2015-16 and 2019-20. Difference in the ranking of these indicators for each of the district will be calculated to find out change in their placement by other districts. Large variations in the performance within a particular year as well as significant changes during last year's will be considered as outliers indicating inaccuracy and inconsistency in the HMIS data.

The methodology has been formulated with the purpose of finding the outliers as far as possible. Data sources on IFA and calcium distribution used for this study include secondary data from HMIS Web Portal of the Ministry of Health and Family Welfare, Government of India. The study examines HMIS data for four consecutive years. In order to examine authenticity, uniformity and consistency of HMIS data all the indicators of infant immunization were ranked on the basis of their performance (division wise) of the state for 2010-11 and 2013-14. Difference in the ranking of these indicators for each of the district was calculated to find out change in their placement by other districts.

### **3.1 ANTENATAL CARE**

#### **Antenatal Care**

A health care system aiming to reduce pregnancy-related morbidity and mortality must focus on maternal and newborn health. Reproductive health care, the care a woman receives before and during pregnancy, at the time of delivery, and soon after delivery, is important for the survival and well-being of the mother and her child. It encompasses the health care dimensions of family planning and prenatal, natal, and postnatal care with the aim of reducing maternal morbidity and mortality (Franny, 2013).

The imperatives of reproductive health recognize the importance of a safe pregnancy and childbirth to the health of the mother and the newborn child, as well as recognizing that a healthy start in life is an essential step towards a sound childhood and a productive life. Maternal morbidity and mortality represent the largest and the most persistent gaps in health indicators between the developed and developing world, reflecting the dilapidated state of reproductive health care in some developing countries. Maternal mortality is also recognized as a key human rights issue (Rose field etal, 2006). According to the International Conference on Population and Development Action Program (ICPD), every woman has the right to enjoy good reproductive health, and every birth should be safe (United Nations, 1994). The Universal Declaration of Human Rights states that “motherhood and childhood are entitled to special care and assistance.”



Antenatal care (ANC) from a skilled provider is important to monitor pregnancy and reduce the risk of morbidity for the mother and baby during pregnancy and delivery. The quality of antenatal care can be monitored through the content of services received and the kind of information mothers are given during their visits. Antenatal care is more beneficial in preventing adverse pregnancy outcomes when it is sought early in the pregnancy and is continued through delivery. The World Health Organization recommends that a woman without pregnancy complications have at least four visits to provide sufficient antenatal care (WHO, 2006c). It is possible during these visits to detect health problems associated with a pregnancy. In the event of complications, more frequent visits are advised and admission to a health facility may be necessary.

### **3.2 ANC Registration**

Good care during pregnancy is important for the health of the mother and the development of the unborn baby. Pregnancy is a crucial time to promote healthy behaviors and parenting skills. Good ANC links the woman and her family with the formal health system, increases the chance of using a skilled attendant at birth and contributes to good health through the life cycle. Inadequate care during this time breaks a critical link in the continuum of care, and affects both women and babies.

HMIS shows that on an average 3.79 lac women are registered for ANC services each year in Jammu and Kashmir (Table 3). This huge number of women registered for ANC services under HMIS seems to be highly inflated, as it is not consistent in the year 2019-20 a total of 358,678 pregnant ladies have been registered in the state which is less by more than 21 thousand than average registration per year and less more than 36 thousand than ANC registration in the year 2018-19 reason behind this low registration were the political circumstances of the state.

This problem of inflation of ANC registration is very high in Srinagar and Jammu. Jammu is reporting only 15,743 ANC registrations than it expected ANC registration. The same case is for Srinagar district its ANC registration has reduced in 2019-20 is less than 25 percent which is only 90,489 compared to previous year 2018-19 in which 119,752 pregnant women were registered for ANC. The district where HMIS ANC registration is lowest is district Anantnag with 19,497 in 2019-20 compared to 28,918 in year 2018-19. In fact, all other districts also have reported lesser number of ANC registrations than expected ANC registration. Thus, it can be concluded that 1<sup>st</sup> trimester ANC registration is highly inflated in J&K particularly the capital districts of Srinagar and Jammu and one should use information related to ANC registration of 2019-20 with a note of caution.

ANC indirectly saves the lives of mothers and babies by promoting and establishing good health before childbirth and the early postnatal period – the time periods of highest risk. ANC often presents the first contact opportunity for a woman to connect with health services, thus offering an entry point for integrated care, promoting healthy home practices, influencing

care seeking behaviors, and linking women with pregnancy complications to a referral system. Women are more likely to give birth with a skilled attendant if they have had at least one ANC visit.

**Table 3: Total ANC Registrations in Jammu and Kashmir 2015- 2019-20.**

Districts		Total number of pregnant women Registered for ANC				
		2015-16	2016-17	2017-18	2018-19	2019-20
	J&K	355,477	387,785	399,307	395,092	358,678
1	Anantnag	28,227	27,190	27,773	28,918	19,497
2	Badgam	14,129	13,114	12,592	12,379	12,303
3	Bandipora	7,300	7,443	7,641	7,140	7,170
4	Baramulla	24,615	25,459	25,103	22,241	23,071
5	Doda	8,242	9,219	8,281	8,059	8,453
6	Ganderbal	5,455	5,689	5,548	5,040	5,277
7	Jammu	70,582	68,363	70,043	69,497	66,863
8	Kargil	2,703	2,547	2,356	2,364	2,278
9	Kathua	11,429	12,011	11,605	11,684	12,098
10	Kishtwar	5,067	4,838	4,497	4,223	4,914
11	Kulgam	10,019	9,841	9,893	10,042	10,033
12	Kupwara	16,630	16,162	16,585	15,680	15,374
13	Leh	2,887	2,483	2,504	2,328	2,255
14	Poonch	11,819	12,187	12,727	12,271	12,701
15	Pulwama	9,698	9,094	9,113	9,190	9,484
16	Rajouri	14,087	15,450	14,545	13,858	15,368
17	Ramban	7,584	8,052	6,607	7,423	6,992
18	Reasi	7,053	12,233	7,917	7,071	7,796
19	Samba	5,365	5,210	5,015	4,949	5,043
20	Shopian	4,557	4,578	4,581	4,612	5,003
21	Srinagar	72,892	99,800	117,105	119,752	90,489
22	Udhampur	15,137	16,822	17,276	16,371	16,216

Source: HMIS Web Portal, Ministry of Health and Family Welfare, Government of India, New Delhi

### 3.3 First Trimester Registration

Your first prenatal visit is the most thorough. A complete medical history is taken, a physical exam is done, and certain tests and procedures are performed to assess the health of both you and your unborn baby. A healthy first trimester is crucial to the normal development of the fetus. You may not be showing much on the outside yet, but on the inside, all of the major body organs and systems of the fetus are forming. During pregnancy, many changes will happen to your body to help nourish and protect your baby. Women experience these changes differently. Some symptoms of pregnancy continue for several weeks or months. Others are only experienced for a short time. Some women experience many symptoms, and other women experience only a few or none at all.

The number of antenatal care visits and the timing of the first visit are important for the health of the mother and the outcome of the pregnancy. The World Health Organization recommends that all pregnant women should have at least four antenatal care (ANC) assessments by or under the supervision of a skilled attendant (World Health Organization, 2006). Ministry of Health and Family Welfare, Government of India had adopted this recommendation of WHO of at least four ANC checkups during pregnancy. These assessments should be spaced at regular intervals throughout pregnancy, commencing as early as possible in the first trimester. Studies on the timing of the initial antenatal check-up, however, show that even when antenatal care is initiated as late as the third trimester, there is a substantial reduction in perinatal mortality (Ramachandran, 1992).

The first antenatal check-up should take place at the latest during the first trimester of pregnancy. The most dramatic changes and development happen during the first trimester. During the first eight weeks, a fetus is called an embryo. The embryo develops rapidly and by the end of the first trimester, it becomes a fetus that is fully formed, weighing approximately 0.5 to 1 ounce and measuring, on average, 3 to 4 inches in length. HMIS data shows that only 53 percent of women in the State during 2015-16 were registered for ANC services in the 1<sup>st</sup> trimester but during 2019-20, about 67 percent of women registered for ANC services have been registered in the first trimester (Table 2). HMIS figures of early ANC registration are lower than NFHS-5, and CES figures. For example NFHS-5 shows 86.6 percent of women were registered for ANC in the 1<sup>st</sup> trimester while in NFHS-4 Ist trimester registration was only 76.7 percent main reason for such a difference between sample surveys and HMIS data is over reporting or under reporting of ANC registration under HMIS. Budgam district is ranking highest in ist trimester registration of 99.6 percent to total registration followed by district Kulgam with 94.5 percent and Ganderbal district has achieved this target by 94.4to total ANC registration. The capital districts Jammu and Srinagar have very low Ist trimester registration of 54.7 percent in Srinagar followed by Kishtwar district which is 50.9 percent followed 41.6 percent lowest in J&K by Jammu to total ANC registration.

		% 1st Trimester registration to Total ANC Registrations						
		2015-16	2016-17	2017-18	2018-19	2019-20	Rank	%age change 2015-19
<b>District</b>								
	J &K	52.9	58.7	64.8	67.5	67.1	<b>23</b>	14.2
1	Anantnag	90.1	94.1	91.3	85.4	88.7	<b>7</b>	-5.3
2	Badgam	94	94.5	96.1	99.3	99.6	<b>1</b>	5.6
3	Bandipora	74.2	77.7	82.2	83.4	82.7	<b>9</b>	8.5
4	Baramulla	62.2	76.7	83.4	84.3	90.1	<b>6</b>	27.9

5	Doda	60.9	67.3	68.9	66.1	70.1	<b>15</b>	9.2
6	Ganderbal	96.2	94	92.5	93	94.4	<b>3</b>	-1.8
7	Jammu	28.1	34.6	45.2	41.6	41.6	<b>22</b>	13.5
8	Kargil	44.7	50	49.1	52.4	55.7	<b>19</b>	11
9	Kathua	56.5	70.2	80.1	78.7	77.7	<b>11</b>	21.2
10	Kishtwar	36.6	44.1	47.1	49.8	50.9	<b>21</b>	14.3
11	Kulgam	83	85.9	91.3	93.2	94.5	<b>2</b>	11.5
12	Kupwara	75.7	78.2	83.3	86.8	92.1	<b>5</b>	16.4
13	Leh	56.2	62.1	66.9	69	76.8	<b>13</b>	20.6
14	Poonch	48.3	55.5	63.3	65.5	65.4	<b>17</b>	17.1
15	Pulwama	87.5	88.8	91.8	91.8	92.2	<b>4</b>	4.7
16	Rajouri	63.1	70.1	71.6	79.7	76.7	<b>14</b>	13.6
17	Ramban	61.7	62	71.1	69.2	77.6	<b>12</b>	15.9
18	Reasi	48.5	43.7	70.5	80.1	80	<b>10</b>	31.5
19	Samba	42.7	50.7	56.1	62.4	68.5	<b>16</b>	25.8
20	Shopian	59.6	72	81.4	86.1	87.6	<b>8</b>	28
21	Srinagar	32.1	44.6	52.7	61.5	54.7	<b>20</b>	22.6
22	Udhampur	46.4	49.2	53.1	61.1	58.1	<b>18</b>	11.7

Source: HMIS Web Portal, Ministry of Health and Family Welfare, Government of India, New Delhi.

Of the 12 districts located in Kashmir region, 9 districts have recorded highest percentage of 1<sup>st</sup> trimester ANC registration ranging from 82.7 percent in Bandipora to 99.6 percent in Budgam. While in Jammu region all the districts have recorded a low level of 1<sup>st</sup> trimester ANC registration than Kashmir division ranging from 41.6 percent in Jammu to 80 percent in Reasi. Jammu district has always registered less than 42 percent pregnant women in Ist trimester registration in the State. Surprisingly, Reasi district which is economically one of the most backward districts in the region has the highest ANC registration in the first trimester and Jammu district the most developed district in the region is the lowest in 1<sup>st</sup> trimester ANC registration while Srinagar district has also reported low Ist trimester registration of 54.7 percent only to total ANC registration in Kashmir division.

ANC registration in the first trimester has increased by 14.2 percent between 2015-16 and 2019-20. Reasi has recorded the highest increase in 1<sup>st</sup> trimester registration (31.5 percentage points) and Anantnag has recorded the lowest decline (-5.3 percentage points) between 2015-16 and 2019-20. Ganderbal district also has recorded a decline in 1<sup>st</sup> trimester ANC OF -1.8 Percentage points. Both the districts located in Ladakh division namely Leh and Kargil also have registered 11-20.6 percentage points increase in 1<sup>st</sup> trimester ANC registration. All districts in Kashmir division have shown a persistent increase in 1<sup>st</sup> trimester registration except Ganderbal and Anantnag.

### 3.4 ANC Visits

The first assessment in ANC is to distinguish pregnant women who require standard care, such as the four-visit model, from those requiring special attention and more visits. Depending on the setting, approximately 25-30 percent of women will have specific risk factors which require more attention. Having regular antenatal check-ups is an important part of staying healthy and making sure your baby is healthy. Regular checks during your pregnancy can assist in identifying and reducing risks to either you or your baby. Although you may be feeling well, it is still important to go to all your antenatal check-ups.

Antenatal visits also give you a chance to ask any questions and to talk about any issues that you are unsure about, such as aches and pains, the birth, feeding your baby or any other concerns. Before each visit, it is a good idea to think about the things you want to talk about and then write them down so that you don't forget them.

Antenatal care is more beneficial in preventing adverse pregnancy outcomes when it is sought early in the pregnancy (first trimester) and is continued through delivery. It is possible during these visits to detect health problems associated with a pregnancy. In the event of complications, more frequent visits are advised and admission to a health facility may be necessary. Table 5 shows the district wise percentage of women who had received 4 ANC check up to total ANC registration in J&K.

Around 91 percent of women had received ANC checkups during 2015-16. This proportion has decreased to 84.9 percent during 2016-17 but has again declined to -11.6 percent points during 2019-20. NFHS-5 estimate of 4 ANC checkups is higher than HMIS by about 1.5 percent. This difference is again due to over reporting of ANC registration in HMIS than any real decline in 4 ANC checkups. During 2019-20, percentages of women who have received 4 ANC checkups vary from a high of 119.8 percent in Udhampur district it seems that it is an out-lier because it can never almost double to total ANC registration to a low of 31.3 percent in Kathua district. This finding seems to be surprising given the fact that Reasi, Kulgam or any other district are far behind than Srinagar and Jammu in terms of level of socio-economic development and the only reason for a very low level of 4 ANC checkups (-69.2 percentage points) in Srinagar can be explained by under reporting of ANC registration in Srinagar and (-36.7 percent points) in Jammu.

Districts		% Pregnant Woman received 4 ANC checkups to Total ANC Registrations						
		2015-16	2016-17	2017-18	2018-19	2019-20	Rank	%age change 2015-2019
	J & K	91	84.9	62.1	73.1	79.4	23	-11.6
1	Udhampur	62.1	64.6	36.2	53.2	119.8	1	57.7
2	Kulgam	79.8	87.9	75.2	102.6	107.4	2	27.6

3	Kishtwar	45.6	48.6	34	60.1	98.4	3	52.8
4	Baramulla	82.3	92.5	89.7	94.1	93.9	4	11.6
5	Samba	73.2	80.7	92.6	132.4	92.2	5	19
6	Ganderbal	148	84.6	75.1	99.2	85.8	6	-62.2
7	Rajouri	84.8	87.5	62.8	127.7	85.2	7	0.4
8	Pulwama	92.3	89.3	81.6	118.6	81.3	8	-11
9	Badgam	83.4	99.8	77.1	77.8	81.2	9	-2.2
10	Anantnag	81	98.5	70.3	55.4	75.5	10	-5.5
11	Reasi	65.7	57.5	65.7	72.3	75.1	11	9.4
12	Shopian	82.9	86.3	71.5	75.1	74.3	12	-8.6
13	Bandipora	73.5	80	67.6	72.2	71.5	13	-2
14	Kargil	77.8	77	41.9	61.2	69.7	14	-8.1
15	Srinagar	135.1	79.1	68.1	76.5	65.9	15	-69.2
16	Kupwara	66.1	70.2	49.7	65.3	64.4	16	-1.7
17	Doda	52.1	60.3	48.3	54.4	62.5	17	10.4
18	Ramban	50.4	61.6	57.9	47.4	54.9	18	4.5
19	Poonch	69.2	71.6	56.4	59.8	53.5	19	-15.7
20	Jammu	89.2	108	41.8	54.8	52.5	20	-36.7
21	Leh	44.4	50.7	39.8	45.4	51.8	21	7.4
22	Kathua	88.9	81.8	65.7	23.5	31.3	22	-57.6

Source: HMIS Web Portal, Ministry of Health and Family Welfare, Government of India, New Delhi.

The percentage of women with 4 ANC checkups to ANC registration has decreased from 91 percent in 2016-17 to 79.4 percent in 2019-20, thus recording a decrease of -11.6 percentage points during this period. There is large inter district variations on this account ranging from a high of 119.8 percentage points in Udhampur to a low of -69.2 percentage points in Srinagar. Eleven districts namely Kupwara Bandipora, Budgam Anantnag, Shopian, Pulwama, Poonch, Jammu, Kathua, Ganderbal, and Srinagar have witnessed a decline in the proportion of 4 ANC checkups. Srinagar district unexpectedly shows a decline of -69.2 percentage points but this decline can clearly be attributed to unexpected 4 ANC coverage of 135 percent during 2015-2016.

Even though PRC has highlighted this inconsistent figure a number of times, but DPMU has not corrected this figure. Most of the districts have reported a continuous increase in the proportion of women with 4 ANC checkups during 2019-2020 but there a few districts e.g., Udhampur, Kulgam, Kishtwar, Baramulla, Samba, Ganderbal and Rajouri, which have generally followed an increasing trend in 4ANC checkups. Many of these opportunities are missed, if pregnant women do not receive at least four antenatal checkups.

#### 4. Anemia:

Commonly, anemia is the final outcome of nutritional deficiency of iron, foliate, vitamin B<sub>12</sub>, and some other nutrients (Lee and Herbert, 1999). Many other causes of anemia have also been identified. They include malaria, hemorrhage, infection, parasite infestation (hookworm), chronic disease, and others. A vegetarian diet is also linked with iron-deficiency

anemia. Even though a vegetarian diet contains as much dietary iron as a non-vegetarian diet, research has shown that animal-based iron is better absorbed (15-40%) than plant-based iron (1-15%). To make up for the low absorption, large quantities of green leafy vegetables, pulses and nuts need to be consumed. But these are unaffordable for the poor.

NFHS-5 asked ever-married women how often they consume various types of food (daily, weekly, occasionally, or never). Women consume vegetables (other than green, leafy vegetables) most often. Fruits are eaten daily by a lesser percent of women and only one-third of women eat fruits at least once a week. It was asked to the respondents what are the causes of anemia most of them replied that the unbalanced diet is responsible for the cause of anemia.

In many areas of Kashmir however, a number of other factors besides iron deficiency contribute to the burden of anemia. Of particular importance in many areas are intestinal parasites, especially hookworm infestation. Anemia may be caused by excessive bleeding. Bleeding may be sudden, as may occur as a result of an injury or during surgery. Often, bleeding is gradual and repetitive (chronic bleeding), typically due to abnormalities in the digestive or urinary tract or heavy menstrual periods. Chronic bleeding typically leads to low levels of iron, which leads to worsening anemia. With the onset of menstruation and associated blood loss, there is a further rise in prevalence and severity of anemia in pregnant women. In light of the minimum daily requirement, it is not surprising that a deficiency will occur within months if dietary intake or intestinal absorption is curtailed. There are certain critical periods when iron requirements are significantly increased and the iron balance can be easily disturbed. Such situations include pregnancy. The amount of Iron absorbed by the body depends not only on the amount consumed through the diet, but also how much of that can be absorbed and assimilated within the body. Iron present in plant-based foods (non-haem iron) has lower absorbability than that present in animal foods such as red and organ meats (haem iron). Patients with folic acid deficiency are often malnourished and are likely to appear wasted. Diarrhea is often present, as well as visible defects of the tongue and mucosal surfaces of the mouth.

#### **4.1 Level of anemia among pregnant women:**

Anaemia has major consequences on human health as well as social and economic development. Anaemia is the world's second leading cause of disability and is responsible for about 1 million deaths a year, of which three-quarters occur in Africa and South-east Asia<sup>8</sup>. In terms of lost years of healthy life, Iron Deficiency Anaemia causes 25 million cases of Disability Adjusted Life Years (DALYs); this accounts for 2.4 per cent of the total DALYs worldwide<sup>9</sup>. Anaemia is a major health problem for adults as well, affecting 55 per cent of women, 58 per cent of pregnant women and 24 per cent of men. Anaemia in children and women worsened in the past half-a-decade across most states and Union territories, according to the latest National Family Health Survey (NFHS-5). As many as 68.4 per cent children and 66.4 per cent women surveyed suffered from anaemia in 2019; 35.7 per cent children and 46.1 per cent women were anaemic in 2016. These were among the findings of the first phase of NFHS-5 (2019-20) carried out by the Union Ministry of Health and Family Welfare. The

number of women suffering from anaemia increased by 18 percentage points in Jammu and Kashmir.

<b>Table: Hemoglobin levels to diagnose anaemia (g/dl).</b>				
<b>Age groups</b>	<b>No Anaemia</b>	<b>Mild</b>	<b>Moderate</b>	<b>Severe</b>
<b>Children 5–11 years of age</b>	≥11.5	10–10.9	7–9.9	<7
<b>Children 12–14 years of age</b>	≥12	11–11.9	8–10.9	<8
<b>Non-Pregnant Women 15 years and above</b>	≥12	11–11.9	8–10.9	<8
<b>Pregnant Women</b>	≥11	10–10.9	7–9.9	<7
<b>Men</b>	≥13	11–12.9	8–10.9	<8

## 4.2 Mild Anemia

Women with mild anemia in pregnancy have decreased work capacity. They may be unable to earn their livelihood if the work involves manual labour. Women with chronic mild anemia may go through pregnancy and labour without any adverse consequences, because they are well compensated. Mild anemia is in the range of 10–10.9 (g/dl).

In Jammu and Kashmir two capital districts Jammu district is having 59,032 tested cases of pregnant women having Hb <11 followed by Srinagar which has 53,561 and third high mild cases are reported in Poonch (29,023) of Jammu division. While Kishtwar having (73), Doda with (1598) in Jammu division and Shopian (2,705) tested cases in Kashmir division have the lowest number of pregnant women having Hb<11 in the state. In Ladakh division both Leh with (703) and Kargil having (1850) cases of pregnant women having Hb level <11.

<b>Table 6: Pregnant Women having Hb level&lt;11 (tested cases) to Total ANC Registration in J &amp; K, 2015-2019-20.</b>							
<b>District</b>		<b>Number of Pregnant Women having Hb level&lt;11 (tested cases)</b>					
		<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>	<b>Rank</b>
	J&K	181,827	185,619	238,068	290,697	284,193	
1	Jammu	31,296	24,530	29,034	50,728	59,032	1
2	Srinagar	12,939	10,038	47,017	59,093	53,561	2
3	Poonch	18,570	21,080	21,108	18,873	29,023	3
4	Baramulla	31,766	24,984	20,493	31,540	18,377	4
5	Udhampur	8,028	5,813	11,851	16,253	17,981	5
6	Kathua	7,262	11,245	14,900	12,797	14,739	6
7	Anantnag	18,502	24,124	20,178	16,997	14,073	7
8	Kulgam	8,707	7,306	10,398	13,824	12,828	8



9	Rajouri	1,566	5,456	8,692	15,220	10,971	9
10	Kupwara	5,105	5,153	8,416	9,064	9,068	10
11	Pulwama	6,315	6,617	5,469	8,679	8,730	11
12	Reasi	3,485	9,881	7,612	3,523	5,515	12
13	Bandipora	5,137	5,280	4,961	5,200	5,425	13
14	Badgam	6,343	6,896	6,402	6,609	5,003	14
15	Ramban	5,074	5,769	6,466	5,164	4,468	15
16	Samba	2,604	3,386	5,305	5,874	4,294	16
17	Ganderbal	2,307	1,426	2,562	4,207	4,176	17
18	Shopian	2,149	2,160	3,362	3,693	2,705	18
19	Kargil	1,450	1,903	1,704	1,840	1,850	19
20	Doda	747	1,017	1,356	743	1,598	20
21	Leh	1,892	1,068	575	661	703	21
22	Kishtwar	583	487	207	115	73	22

Source: HMIS Web Portal, Ministry of Health and Family Welfare, Government of India, New Delhi.

### 4.3 Moderate Anemia

During pregnancy, women need extra folate. But sometimes they don't get enough from their diet. When that happens, the body can't make enough normal red blood cells to transport oxygen to tissues throughout the body. Manmade supplements of folate is called folic acid.

Folate deficiency can directly contribute to certain types of birth defects, such as neural tube abnormalities (spina bifida) and low birth weight. Women with moderate anemia have substantial reduction in work capacity and may find it difficult to cope with household chores and child care. Available data from India and elsewhere indicate that maternal morbidity rates are higher in women with Hb below 7–9.9 (g/dl).

### 4.4 Severe Anemia

Three distinct stages of severe anemia have been recognized - compensated, decompensate, and that associated with circulatory failure. Cardiac decompensation usually occurs when Hb falls below 5.0 g/dl. The cardiac output is raised even at rest, the stroke volume is larger and the heart rate is increased. Palpitation and breathlessness even at rest are symptoms of these changes. The details of Hb<7 is discussed in Table 7.

**Table 7: Percentage of Pregnant women having severe anaemia (Hb<7) treated at institution to women having Hb level<11 in J&K 2015-2019-20.**

Districts		% Pregnant women having severe anaemia (Hb<7) treated at institution to women having Hb level<11					
		2015-16	2016-17	2017-18	2018-19	2019-20	Rank
	J & K	13.5	2.3	62.7	64.8	64	23
1	Badgam	1.3	0.8	82.9	100	100	1
2	Doda	4.1	2.3	10	NA	100	2
3	Kishtwar	15.3	2.5	54.3	50.9	100	3

4	Leh	0.5	2	83.3	83.3	100	4
5	Baramulla	1.3	1.3	94.3	92.3	99.5	5
6	Kupwara	1.1	1.2	76.6	84.9	98.8	6
7	Samba	0.7	0.8	100	95.9	97.5	7
8	Rajouri	3.6	1.9	75.9	54.5	96.8	8
9	Ramban	8.2	5.2	83.9	88	91.5	9
10	Udhampur	0.5	1.1	104.3	94.6	90.1	10
11	Pulwama	1.6	1.5	81.2	95.7	89.2	11
12	Shopian	2.4	6.1	53.4	12.7	88.5	12
13	Bandipora	3.9	2.6	81.8	75.7	85.8	13
14	Jammu	66	2.4	51.6	101.1	85.8	14
15	Kathua	7.4	5.6	14	37.2	81	15
16	Anantnag	2.5	0.8	57	79.7	75.9	16
17	Ganderbal	3.4	6.9	78.1	78.1	75.3	17
18	Poonch	2	1.5	39.5	59.7	67	18
19	Reasi	1.6	1.4	66.8	2.3	35.3	19
20	Kulgam	1.9	1.4	22.8	11.5	32.9	20
21	Kargil	4	5.1	27.6	11.7	21.5	21
22	Srinagar	4.8	7.4	68.1	5.6	2.7	22

Source: HMIS Web Portal, Ministry of Health and Family Welfare, Government of India, New Delhi

These compensatory mechanisms are inadequate to deal with the decrease in Hb levels. Oxygen lack results in anaerobic metabolism and lactic acid accumulation occurs. Eventually circulatory failure occurs further restricting work output. Untreated, it leads to pulmonary edema and death. When Hb is <5 g/dl and packed cell volume (PCV) below 14, cardiac failure is seen in a third of cases 23. Available data from India indicate that maternal morbidity rates are higher in women with Hb below 8.0 g/dl. Maternal mortality rates show a steep increase when maternal Hb levels fall below 5.0 g/dl. Anemia directly causes 20 per cent of maternal deaths in India and indirectly accounts for another 20 per cent of maternal deaths.

The number of a total severe anemic pregnant women who were treated at institutions to the total anemic having Hb <11 was (64%) during the year 2019-20 in the state comparing to the year 2015-16 in which 13.5 percent were treated during the reference period. In the state Badgam in Kashmir division and, Doda and, Kishtwar in Jammu division and Leh in Ladakh Division have treated all pregnant ladies (100 percent) having severe anaemia (Hb<7) treated at institution to women having Hb level<11. while surprisingly district Jammu is lacking far behind with trend of 85.8 percent in treating such pregnant women in the year 2019-20 while the district has treated with (66 percent) in 2015-16 which means the Jammu district has under reported the HB <7 treated to total of <11 in this district. In the state about 10 districts

namely Poonch, Baramulla, Udhampur, Kathua, Anantnag, Kulgam, Rajouri, Kupwara, Pulwama have shown the positive trend in treating the pregnant women <7 to women having Hb level <11 in 2019-20.

#### 4.5 Distribution of Iron Folic Acid to the pregnant women:

India was the first developing country to take up a National Programme to prevent anemia among pregnant women and children. The National Anemia Prophylaxis Programme of iron and folic acid distribution to all pregnant women in India through the primary health care system was evolved and Implemented from 1972, so that the vast majority of pregnant women who never seek health care, could benefit from this outreach programme. It was hoped that this programme will bring about a reduction both in the prevalence and severity of anemia in pregnancy. There were two major components of the anemia prophylaxis programme pre-school children were to receive 20 mg elemental iron and 100 mg folic acid and pregnant women to receive 60 mg elemental iron and 500 µg of folic acid. Of the two components, the coverage under the component for children had always been very poor. Comparatively the component for pregnant women has fared better. At that time antenatal care coverage under rural primary health services was very low and there was no provision for screening pregnant women for anemia. Therefore an attempt was made to identify all pregnant women and give them 100 tablets containing 60 mg of iron and 500 µg of folic acid. However, all the national surveys indicated that coverage under all these Programmes was very low and there has not been any change either in the prevalence of anemia or the adverse consequences associated with anemia. Information on percentage of pregnant women given 100 IFA to total ANC registration during 2015-2019 is presented in Table 8.

**Table 8: Percentage Pregnant women given 100 IFA to Total ANC Registration in Jammu and Kashmir 2015- 2019-20**

District		% Pregnant women given 100 IFA to Total ANC Registration						
		2015-16	2016-17	2017-18	2018-19	2019-20	Rank	%age change 2015-19
	J&K	27.5	43	53.8	35.5	44.4	23	16.9
1	Baramulla	37.7	77.1	93.5	98.4	95.3	1	57.6
2	Rajouri	48.1	91	132.1	105.3	92.2	2	44.1
3	Budgam	18	40.2	82.2	69.4	89.6	3	71.6
4	Leh	38.2	58.3	76.6	74.5	86.4	4	48.2
5	Kulgam	34.6	68.2	91.6	43.6	83.6	5	49
6	Anantnag	23.6	44.3	52.8	27.7	80.1	6	56.5
7	Kargil	91.6	88.1	108.1	84.1	77.7	7	-13.9
8	Kupwara	33.4	55.5	110	78	75.3	8	41.9
9	Bandipora	62.3	73.5	64	78.5	72.7	9	10.4

10	Ramban	55.7	68	88	64	72	10	16.3
11	Ganderbal	40.1	66.9	84	72.7	68.5	11	28.4
12	Reasi	49.1	65.8	95.7	65.7	67.1	12	18
13	Kathua	56.4	70.4	93.4	56	59.6	13	3.2
14	Doda	53.5	82.9	93.3	62.3	58.6	14	5.1
15	Pulwama	53.3	75.2	82.6	24.6	52.3	15	-1
16	Samba	9.7	61.8	74.6	22.2	52.2	16	42.5
17	Shopian	48.4	60.7	73.3	18.7	50.6	17	2.2
18	Poonch	34.6	79.7	99.7	33	41.6	18	7
19	Udhampur	38.1	47.8	59.7	26.1	34.5	19	-3.6
20	Kishtwar	64.3	87.6	79.9	39	33.4	20	-30.9
21	Jammu	8.4	16	25.8	20.4	19.5	21	11.1
22	Srinagar	10.6	11.5	12.5	6.9	6.5	22	-4.1

Source: HMIS Web Portal, Ministry of Health and Family Welfare, Government of India, New Delhi.

The IFA distribution or IFA received by the pregnant women in Jammu and Kashmir has been discussed in table in which only (44 percent) pregnant women registered for ANC have received 100 IFA tablets compared to 27.5 percent in 2015-16 there is a change of 16.9 percent points in the state .Among the districts Baramulla has 57.6 percentage points with highest IFA received by the pregnant women while district Srinagar has lowest -4.1) percentage points in the state over all 4 districts Kargil, Srinagar, Udhampur and Pulwama, have decline in the IFA distribution among pregnant women while other districts have positive trend but not satisfactory. In the state district Baramulla has the highest distribution of IFA of ( 57.6 percent) percentage points only. While as duo capital districts Jammu and Srinagar have distribution of (11.1 percentage points in Jammu and -4.1 percentage points in Srinagar).

The 2 districts located in Ladakh region also have reported IFA coverage of about (48.2 percent) percentage points in Leh district and ( -13.9 percent) decline has been observed in Kargil. One of the main reasons for low IFA coverage in the state during 2015-19 is the shortage of IFA in all health institutions in the State. Actually the J&K Medical Supply Corporation Jammu is responsible in delaying the supplies of IFA and Calcium. Another reason for decline in IFA coverage is that quality of data on this indicator has improved during 2015-18. Though it has declined in 2019-20 but reason for this reduction was political crises in Jammu and Kashmir State.

### **5. Hypertension in pregnancy:**

Hypertensive disorders occur in up to 10% of pregnancy and can seriously affect the mother and fetal health. Pre-eclampsia (PE) and eclampsia are the most severe forms of hypertensive disorders and are associated with short- and long-term sequelae. PE is defined by the presence of blood pressure elevation (>140/90 mmHg) and relevant proteinuria (more than 300 mg/24 h) or, in the absence of proteinuria, the increase of creatinine concentration or a low platelet count or the increase of liver transaminases or presence of pulmonary edema, visual

disturbances, neurological signs or utero-placental dysfunctions that lead to fetal growth retardation. Eclampsia is a convulsive condition associated with PE or hemolysis, elevated liver enzymes, and low platelet count syndrome. This review aimed at focusing on the correct classification and at accurately describing clinical and biochemical features of PE. Early detection of PE/eclampsia and accurate prediction of maternal risk of developing PE is crucial in the management of this threatening condition. There is no debate that blood pressure needs to be controlled to less than 160/110 mmHg. As noted pregnant women are at a higher risk of central nervous system complications from hypertension than non-pregnant women, and has been found that hypertensive disorders of pregnancy increase the risk of stroke 5.2-fold. In addition, a subgroup analysis of the Control of Hypertension in Pregnancy Study (CHIPS) confirmed that severe hypertension was associated with higher rates of maternal death, pregnancy loss or high-level neonatal care for >48 h, small-for-gestational age (SGA), preterm delivery, and a variety of other poor obstetric outcomes compared to those with non-severe hypertension. This was regardless of preeclampsia status.

### 5.1 Classification of Hypertension

Hypertensive disorders complicate 5–10% of pregnancy and, according to “The FIGO Textbook of Pregnancy Hypertension” (1) and the International Society for the Study of Hypertension in Pregnancy (ISSHP) (2), are classifiable in 3 categories 1) Pre-existing hypertension; 2) Gestational hypertension and 3) (GH); Pre-eclampsia (PE) and eclampsia Pre-existing hypertension can be found in approximately 1% of woman and is defined either when systolic blood pressure (SBP) is higher or equal to 140 mmHg and/or diastolic blood pressure (DBP) is higher or equal to 90 mmHg before the 20<sup>th</sup> of gestation or persisting after 12<sup>th</sup> week after delivery. GH that occurs in above 3% of pregnancy is defined as the *de novo* presence of hypertension arising after the 20<sup>th</sup> week of gestation without the characteristics that define PE.

### 5.2 Hypertension Reporting

In Jammu and Kashmir recording and reporting of the Hypertension at institution level was a neglected indicator. The PRC repeatedly raised question on the negligence of this indicator almost in every PIP monitoring report and then this indicator got some attention and it now reported by its recording is still an issue as all the institutions doesn't record the Blood Pressure of the pregnant women though it is recorded on their prescription Chit or the copy / booklet which is provided to her by the visiting institution. Information on percentage of pregnant women detected with hypertension to total ANC registration during 2015-2019 is presented in Table 9:

**Table 9: New cases detected at institution for hypertension to Total ANC Registrations in Jammu and Kashmir 2015- 2019.**

		% New cases detected at institution for hypertension to Total ANC Registrations						
Districts		2015-16	2016-17	2017-18	2018-19	2019-20	Rank	%age change 2015-2019
	J & K	1.6	2	2.8	3.2	2.8	23	1

1	Rajouri	7.7	23	16.1	29.8	17.9	1	4.2
2	Leh	2.3	2.7	5.2	3.7	5.9	2	-1.2
3	Kathua	0.2	0.7	0.2	3.9	4.6	3	-1.1
4	Anantnag	0.3	1.1	2.5	3	4.1	4	0.5
5	Reasi	2.4	0.8	1.6	5.8	3.7	5	0.9
6	Shopian	0.3	0.7	0.6	1.8	3.4	6	-0.9
7	Jammu	1	1.1	4.4	3.7	2.8	7	1.4
8	Pulwama	1.5	2.2	2.7	3.9	2.7	8	-0.5
9	Ganderbal	4.2	2.9	5.2	3.8	2.6	9	6.1
10	Kulgam	1.6	1.2	1.8	1.4	2.4	10	-2.3
11	Ramban	2.2	2.5	1.2	0.6	2	11	1.6
12	Srinagar	1.8	0.9	2	1.6	2	12	1.1
13	Samba	0.3	1	1.8	0.9	1.9	13	3.6
14	Bandipora	3.7	3.3	2.5	2	1.5	14	0.5
15	Kargil	1.8	4.8	1.6	16.2	1.4	15	2.2
16	Poonch	1.3	1.1	1.6	1.3	1.4	16	7.3
17	Budgam	2.2	1.8	2.1	1.8	1.3	17	0.6
18	Doda	0.2	0	1.2	0.2	1	18	2.2
19	Kupwara	0.2	0.2	0.3	0.6	1	19	0.3
20	Baramulla	1.7	1.2	1.8	1.2	0.7	20	1.6
21	Udhampur	0.1	0.1	0.5	0.4	0.2	21	-0.3
22	Kishtwar	2.3	1.6	0	0.2	0	22	0.2

Source: HMIS Web Portal, Ministry of Health and Family Welfare, Government of India, New Delhi.

In hypertension the detected cases in Jammu and Kashmir are 2.8 percent in the year 2019-20 while in 2015-16 only 1.6 percent cases have been detected in the state. Rajouri is the Highest hypertensive case detecting district with 17.9 percent followed by Kathua with 4.6 percent and Reasi district with at a 3.7 percent to total ANC registration in Jammu division while in Kashmir Division district Anantnag is the highest with 4.1 percent followed by Shopian with 3.4 percent cases detected at institution for hypertension to total ANC registrations in Kashmir division during 2019- 20. While in Ladakh division Leh district is highest with 5.9 percent cases detected at institution for hypertension to total ANC registrations while Kargil district is ranking at 15th position with 1.4 percent during the same period. Jammu district is at 7th position with 2.8 percent and Srinagar district at 12 positions among the district raking with 2 percent cases detected at institution for hypertension to total ANC registrations. As already mentioned this indicator is neglected it needs further improvement in recording and reporting of this indicator.

### 5.3 Why is Calcium Important during Pregnancy?

Getting enough calcium helps keep your teeth and bones healthy, and helps your baby develop strong teeth and bones, too. What's more, calcium keeps your circulatory, nervous, and muscular systems running normally. Hypertension is a serious health problem that increases the risk of heart and kidney diseases. Several studies have shown that increasing calcium intake lowers blood pressure even in individuals within a normal blood pressure range. Increasing calcium intake also has benefits for pregnancy outcomes, effects which are

thought to be mediated also by blood pressure reduction. High blood pressure has been identified as a major risk factor for mortality and even small reductions in blood pressure can decrease the occurrence of coronary artery disease, stroke and death. Calcium intake slightly reduces both systolic and diastolic blood pressure in normotensive people, particularly in young people, suggesting a role in the prevention of hypertension. These results should be interpreted with caution, since the proposed biological mechanism explaining the relationship between calcium and blood pressure has not been fully confirmed. The effect across multiple prespecified subgroups and a possible dose response effect reinforce this conclusion. Even small reductions in blood pressure could have important health implications an increase in for reducing vascular disease.

### Strategy for implementation:

One of the leading causes of maternal mortality is hypertensive disorders during pregnancy which can lead to pre-eclampsia and a considerable amount of child and maternal morbidity and mortality is associated with this condition. In order to adopt a preventive strategy for pregnancy induced hypertensive disorders, universal supplementation of Calcium to all pregnant women during ANC & PNC period has been introduced by the MoHFW, GoI and same has been adopted by J&K state. The programme is implemented at all levels of contact of pregnant women (PW) with the health system, such as Village Health & Nutrition Days (VHNDs), Sub-Centers, Primary Health Centers (PHC), Community Health Centers (CHC), District Hospitals (DH), and Medical Colleges (MC).

Women younger than 19 need 1,300 milligrams of calcium per day, and those 19 and older need 1,000 milligrams per day. The provision of calcium tablets to pregnant women is to prevent hypertensive disorders and is an integral part of the Safe Motherhood Services offered as part of the Reproductive and Child Health Programme in the country. The programme recommendation is that women consume 360 tablets of calcium during pregnancy. Information on percentage of pregnant women given 360 Calcium to total ANC registration during 2015-2019 is presented in Table 10.

**Table 10: Pregnant women given 360 Calcium to Total ANC Registration in Jammu & Kashmir 2015-2019**

		% Pregnant women given 360 Calcium to Total ANC Registration						
District		2015-16	2016-17	2017-18	2018-19	2019-20	Rank	%age Change in from 2016-19
	J&K			27.2	37.4	30.1	23	2.9
1	Baramulla			88.5	97	94.3	1	5.8
2	Leh			70.8	74.5	86.3	2	15.5
3	Ramban			79.2	71.2	72.1	3	-7.1
4	Rajouri			77.2	83.6	66.8	4	-10.4

5	Kargil			18.7	55.8	66.2	5	-47.5
6	Reasi			66.8	92.4	60.8	6	-6
7	Badgam			21.1	49.7	60.6	7	39.5
8	Kathua			64.1	62.9	59.9	8	-4.2
9	Bandipora			52.7	77.5	54.6	9	1.9
10	Kulgam			21.6	25.8	53.7	10	32.1
11	Kupwara			45.6	44	52.1	11	6.5
12	Udhampur			35.4	189.8	35.4	12	0
13	Doda			52.1	49.3	33.4	13	-18.7
14	Samba			23.9	17.3	28.5	14	4.6
15	Kishtwar			47	31	26	15	-21
16	Poonch			25.8	22.6	18.1	16	-7.7
17	Jammu			15.5	18.1	17.1	17	1.6
18	Ganderbal			24.1	77.1	16.4	18	-7.7
19	Shopian			15	10.9	12	19	-3
20	Anantnag			12.3	24.6	4.8	20	-7.5
21	Pulwama			3.5	3.6	4.4	21	0.9
22	Srinagar			4.4	5.8	3.2	22	-1.2

Source: HMIS Web Portal, Ministry of Health and Family Welfare, Government of India, New Delhi.

Under the programme, all Pregnant Women after the first trimester till six months after delivery shall be provided with Tab. Calcium. During pregnancy, 360 tablets are required per woman (@ 2 tablets (containing 500 mg calcium each) per day from 14 weeks to 40 weeks = 26 weeks = 182 days) and 360 tablets in the first six months of the postnatal period (@ 2 tablets per day for 6 months).

During 2015-17 programme of calcium distribution was not lunched in J& K state, it was started in 2017-18 only 27.2 percent of pregnant women in the State are reported to have received 360 Calcium tablets. Calcium distribution was considerably better during 2018-2019, when 37.4 percent of pregnant women are reported to have received 360 Calcium tablets. Different large scale health surveys conducted in the State, however, indicate that 28.3 percent of pregnant women do receive 360 Calcium tablets. One of the main reasons for low Calcium coverage in the state during 2019-20 is the shortage of Calcium in all health institutions in the State. However, some of the districts have started procuring Calcium and IFA from open market. Another reason for decline in Calcium coverage is that quality of data on this indicator has improved during 2019-20. Further, due to over reporting of ANC registration, HMIS shows a lower coverage of Calcium. Calcium coverage is highest in 10 districts namely Budgam, Kulgam, Leh, Kupwara, Baramulla, Samba, Bandipora, Jammu and Pulwama had an increase in calcium distribution among the pregnant women during 2019-20. while all other districts have a decline percentage points in calcium distribution in the Jammu and Kashmir. Ramban, Rajouri, Kargil, Reasi, Badgam, Kathua, and these have distributed (27.2 , 88.5, 70.8, 79.2 , 77.2, 18.7, 66.8, 21.1, 64.1, 52.7, 21.6, 45.6 ) in 2017-18., Srinagar, Shopian , Kathua, Reasi, Ramban, Anantnag, Poonch, Ganderbal , Rajouri , Doda



,Kishtwar ,Kargil had reported lowest coverage of calcium distribution with a decline from - 1.2percentage points to-21 percentage points, during 2019-20 thus data quality related to calcium during 2019-20 was not of very good quality. During 2019-20, this data quality issue seems to have been resolved, which also has resulted in low calcium coverage. In Ladakh division Leh district has distributed to 86.3 percent pregnant ladies to total registration with an increase of15.5 percentage points while as Kargil district has a lowest decline of -47.5 percentage points during 2019-20.

## **6. CONCLUSION**

Ministry of Health and Family Welfare launched the National Rural Health Mission (NRHM) to ensure necessary architectural corrections in the basic health care delivery system. The plan of action includes: increasing public expenditure on health, reducing regional imbalance in health infrastructure, pooling resources, integration of organizational structures, optimization of health manpower, decentralization and district management of health Programmes, community participation and ownership of assets, induction of management and financial personnel into district health systems, and operationalizing Community Health Centers into functional hospitals in each block across the country that meet Indian Public Health Standards (IPHS).

These interventions have increased the demand for data on population and health for use in both micro-level planning and programme implementation. At the same time, understanding the synergy between availability of services, cost involved in provision of public health care services, expenditure and pattern of utilization among various sections of population, including vulnerable sections of the society, are important aspects that influence decision making. A continuous flow of good quality information on inputs, outputs and outcome indicators facilitates monitoring of the objectives of NRHM. For reasons such as these, efficient Health Management Information System (HMIS) is required.

Keeping in view the importance of Health Information System (HMIS), Ministry of Health and Family Welfare MoHFW launched HMIS web portal on 21st October, 2008 to enable capturing of public health data from both public and private institutions in rural and urban areas across the country. HMIS is an information system that has been specially designed to assist health programme managers, at all levels, in managing and planning health Programmes. This has facilitated various stakeholders like public health personnel, academicians and public at large to encourage debate and promote informed decision making in fine tuning health related Policy Initiative. The MoHFW is continuously enhancing the portal's functionality and features to encourage all stake holders to dialogue and debate through a common platform in the public domain. It is envisioned to be a Gateway to all public health related information for the country. Currently, various health facilities located in 643 districts in the country are uploading information on more than 250 indicators on a monthly basis on the HMIS Portal.

A look at the data uploaded on the HMIS web portal since 2008 shows that regular data uploading has improved to a large extent. Not only the timely uploading of reports has improved but if we analyze the data contained in these reports, the quality of data being uploaded on the website seems to have improved. This has facilitated to analyze the performance of various RCH indicators at various levels. Further, there is also a need to analyze the quality of HMIS data, so that appropriate measures are taken to improve its quality before it is thrown open to general public for use.

The Population Research Centre University of Kashmir, Srinagar undertook the task of carrying out this study on some Reproductive and Child Health indicators based on HMIS data at the behest of Ministry of Health and Family Welfare (MOHFW), Government of India, New Delhi. While the basic objective of the study is to analyze the trends in antenatal, delivery and postnatal care in Jammu and Kashmir and also examine the performance of various districts in the State during 2010-2014, but at the same time, the study highlights some important data quality issues of HMIS.

## **6.1 Main Findings**

### **ANC Registration**

HMIS shows that on an average 3.79 lac women are registered for ANC services each year in Jammu and Kashmir (Table 3). This huge number of women registered for ANC services under HMIS seems to highly inflated, as it is not consistent in the year 2019-20 a total of 358,678 pregnant ladies have been registered in the state which is less by more than 21 thousand .than average registration per year and less more than 36 thousands than ANC registration in the year 2018-19 reason behind this low registration were the political circumstances of the state.

This problem of inflation of ANC registration is very high in Srinagar and Jammu. Jammu is reporting only 15,743 ANC registrations than it expected ANC registration. The same case is for Srinagar district its ANC registration has reduced in 2019-20 to less than 25 percent which is only 90,489 compared to previous year 2018-19 in which 119,752 pregnant women were registered for ANC. The district where HMIS ANC registration is lowest is district Anantnag with 19,497 in 2019-20 compared to 28,918 in year 2018-19. In fact all other districts also have reported lesser number of ANC registrations than expected ANC registration. Thus, it can be concluded that 1st trimester ANC registration is highly inflated in J&K particularly the capital districts of Srinagar and Jammu and one should use information related to ANC registration of 2019-20 with a note of caution.

Thus, it can be concluded that ANC registration is not consistent with expected number of pregnancies in some districts of J&K particularly the capital districts of Srinagar and Jammu. Since, ANC registration is used as the denominator for the calculation of most ANC indicators, therefore, HMIS ANC estimates are lower than the NFHS-5, DLHS-5 and CES estimates.

## **First Trimester Registration**

HMIS figures of early ANC registration are lower than NFHS-5, and CES figures. For example NFHS-5 shows 86.6 percent of women were registered for ANC in the 1<sup>st</sup> trimester while in NFHS-4 1st trimester registration was only 76.7 percent main reason for such a difference between sample surveys and HMIS data is over reporting or under reporting of ANC registration under HMIS. Budgam district is ranking highest in 1st trimester registration of 99.6 percent to total registration followed by district Kulgam with 94.5 percent and Ganderbal district has achieved this target by 94.4 to total ANC registration. The capital districts Jammu and Srinagar have very low 1st trimester registration of 54.7 percent in Srinagar followed by Kishtwar district which is 50.9 percent followed 41.6 percent lowest in J&K by Jammu to total ANC registration. Of the 12 districts located in Kashmir region, 9 districts have recorded highest percentage of 1st trimester ANC registration ranging from 82.7 percent in Bandipora to 99.6 percent in Budgam. While in Jammu region all the districts have recorded a low level of 1st trimester ANC registration than Kashmir division ranging from 41.6 percent in Jammu to 80 percent in Reasi. Jammu district has always registered less than 42 percent pregnant women in 1st trimester registration in the State. Surprisingly, Reasi district which is economically one of the most backward districts in the region has the highest ANC registration in the first trimester and Jammu district the most developed district in the region is the lowest in 1st trimester ANC registration while Srinagar district has also reported low 1st trimester registration of 54.7 percent only to total ANC registration in Kashmir division.

ANC registration in the first trimester has increased by 14.2 percent between 2015-16 and 2019-20. Reasi has recorded the highest increase in 1st trimester registration (31.5 percentage points) and Anantnag has recorded the lowest decline (-5.3 percentage points) between 2015-16 and 2019-20. Ganderbal district also has recorded a decline in 1st trimester ANC OF -1.8 Percentage points. Both the districts located in Ladakh division namely Leh and Kargil also have registered 11-20.6 percentage points increase in 1st trimester ANC registration. All districts in Kashmir division have shown a persistent increase in 1st trimester registration except Ganderbal and Anantnag.

### **ANC Visits**

Around 91 percent of women had received ANC checkups during 2015-16. This proportion has decreased to 84.9 percent during 2016-17 but has again declined to -11.6 percent points during 2019-20. NFHS-5 estimate of 4 ANC checkups is higher than HMIS by about 1.5 percent. This difference is again due to over reporting of ANC registration in HMIS than any real decline in 4 ANC checkups. During 2019-20, percentages of women who have received 4 ANC checkups vary from a high of 119.8 percent in Udhampur district it seems that it is an out liar because it can never almost double to total ANC registration to a low of 31.3 percent in Kathua district. This finding seems to be surprising given the fact that Reasi, Kulgam or any other district are far behind than Srinagar and Jammu in terms of level of socio-economic development and the only reason for a very low level of 4 ANC checkups (-69.2 percentage points) in Srinagar can be explained by under reporting of ANC registration in Srinagar and

(-36.7 percent points) in Jammu. The percentage of women with 4 ANC checkups to ANC registration has decreased from 91 percent in 2016-17 to 79.4 percent in 2019-20, thus recording a decrease of -11.6 percentage points during this period. There is large inter district variations on this account ranging from a high of 119.8 percentage points in Udhampur to a low of -69.2 percentage points in Srinagar. Eleven districts namely Kupwara Bandipora, Budgam Anantnag, Shopian, Pulwama, Poonch, Jammu, Kathua, Ganderbal, and Srinagar have witnessed a decline in the proportion of 4 ANC checkups. Srinagar district unexpectedly shows a decline of -69.2 percentage points but this decline can clearly be attributed to unexpected 4 ANC coverage of 135 percent during 2015-2016.

### **Distribution of Iron Folic Acid to the pregnant women:**

The IFA distribution or IFA received by the pregnant women in Jammu and Kashmir has been discussed in table in which only (44 percent) pregnant women registered for ANC have received 100 IFA tablets compared to 27.5 percent in 2015-16 there is a change of 16.9 percent points in the state .Among the districts Baramulla has 57.6 percentage points with highest IFA received by the pregnant women while district Srinagar has lowest -4.1) percentage points in the state over all 4 districts Kargil, Srinagar, Udhampur and Pulwama, have decline in the IFA distribution among pregnant women while other districts have positive trend but not satisfactory. In the state district Baramulla has the highest distribution of IFA of ( 57.6 percent) percentage points only. While as duo capital districts Jammu and Srinagar have distribution of (11.1 percentage points in Jammu and -4.1 percentage points in Srinagar).

The 2 districts located in Ladakh region also have reported IFA coverage of about (48.2 percent) percentage points in Leh district and ( -13.9 percent) decline has been observed in Kargil. One of the main reasons for low IFA coverage in the state during 2015-19 is the shortage of IFA in all health institutions in the State. Actually the J&K Medical Supply Corporation Jammu is responsible in delaying the supplies of IFA and Calcium. Another reason for decline in IFA coverage is that quality of data on this indicator has improved during 2015-18. Though it has declined in 2019-20 but reason for this reduction was political crises in Jammu and Kashmir State.

### **Hypertension Reporting**

In hypertension the detected cases in Jammu and Kashmir are 2.8 percent in the year 2019-20 while in 2015-16 only 1.6 percent cases have been detected in the state. Rajouri is the Highest hypertensive case detecting district with 17.9 percent followed by Kathua with 4.6 percent and Reasi district with at a 3.7 percent to total ANC registration in Jammu division while in Kashmir Division district Anantnag is the highest with 4.1 percent followed by Shopian with 3.4 percent cases detected at institution for hypertension to total ANC registrations in Kashmir division during 2019- 20. While in Ladakh division Leh district is highest with 5.9 percent cases detected at institution for hypertension to total ANC registrations while Kargil district is ranking at 15th position with 1.4 percent during the same period. Jammu district is at 7th position with 2.8 percent and Srinagar district at 12 positions among the district ranking with 2 percent cases detected at institution for hypertension to total ANC

registrations. As already mentioned, this indicator is neglected it needs further improvement in recording and reporting of this indicator.

### **Distribution of Calcium to the pregnant women**

During 2015-17 programme of calcium distribution was not lunched in J& K state, it was started in 2017-18 only 27.2 percent of pregnant women in the State are reported to have received 360 Calcium tablets. Calcium distribution was considerably better during 2018-2019, when 37.4 percent of pregnant women are reported to have received 360 Calcium tablets. Different large scale health surveys conducted in the State, however, indicate that 28.3 percent of pregnant women do receive 360 Calcium tablets. One of the main reasons for low Calcium coverage in the state during 2019-20 is the shortage of Calcium in all health institutions in the State. However, some of the districts have started procuring Calcium and IFA from open market. Another reason for decline in Calcium coverage is that quality of data on this indicator has improved during 2019-20. Further, due to over reporting of ANC registration, HMIS shows a lower coverage of Calcium. Calcium coverage is highest in 10 districts namely Budgam, Kulgam, Leh, Kupwara, Baramulla, Samba, Bandipora, Jammu and Pulwama had an increase in calcium distribution among the pregnant women during 2019-20. while all other districts have a decline percentage points in calcium distribution in the Jammu and Kashmir. Ramban, Rajouri, Kargil, Reasi, Badgam, Kathua, and these have distributed (27.2 , 88.5, 70.8, 79.2 , 77.2, 18.7, 66.8, 21.1, 64.1, 52.7, 21.6, 45.6 ) in 2017-18,. Srinagar, Shopian , Kathua, Reasi, Ramban, Anantnag, Poonch, Ganderbal , Rajouri , Doda , Kishtwar , Kargil had reported lowest coverage of calcium distribution with a decline from -1.2 percentage points to -21 percentage points, during 2019-20 thus data quality related to calcium during 2019-20 was not of very good quality. During 2019-20, this data quality issue seems to have been resolved, which also has resulted in low calcium coverage. In Ladakh division Leh district has distributed to 86.3 percent pregnant ladies to total registration with an increase of 15.5 percentage points while as Kargil district has a lowest decline of -47.5 percentage points during 2019-20.

## **7. Recommendations**

Based on the analysis it was observed that HMIS data has a lot of coverage and quality issues. Though, the coverage and quality of HMIS data has improved in some districts but in some districts it has not yet improved. Therefore, HMIS data in its present form can neither be used for any fruitful research to analyses the spatial pattern of the performance of RCH indicators nor for any use in micro-level planning, programme implementation and effective monitoring. Therefore, there is a need to improve the HMIS data quality before it is used for micro-level planning, programme implementation and effective monitoring. Based on the findings of the present study, Populations Research Centre, University of Kashmir, recommends the following measures for improving data quality.

1. Of all HMIS indicators ANC registration is the most problematic one.. Therefore, there is a need to stop this duplication of ANC registration. Reasons for this duplication need to be investigated, so that remedial measures can be initiated to address the problem of over

reporting of ANC Registration.

2. Private health institutions are either not reporting their performance or are under reporting their performance. This is one of the reasons for lesser number of reported deliveries in the State. State needs to take some hard steps to compel the private nursing homes to report their performance as per HMIS guidelines.
3. Feedback mechanism to address the HMIS data quality issues needs to be strengthened
4. Capacity building at the district level and sub district level of all involved in recording, reporting data for HMIS
5. The data quality of Srinagar and Jammu districts is very poor. There is a need to give more attention to these districts as these two districts account for 33 percent of reported deliveries. If we are in a position to improve recording, maintaining, reporting and uploading of HMIS in these two districts, HMIS data quality of J&K will improve to a great extent and it can be used in micro-level planning, programme implementation and effective monitoring.
6. The IFA and calcium distribution programme is not well placed and to the ground reality as this is directly related to maternal and infant mortality so needs to be accorded high priority.
7. A quality vigil on this programme is recommended by engaging ASHA coordinators and ANMs. Also continuous monitoring and supportive supervision to ASHAs may provide impetus to well planted programme to shape in a good public programme.
8. The IFA and Calcium tablets should be made available well in time at all health facilities in the state. Any slowness in releasing the funds under JSSK for IAF and calcium tablets purchasing need to be taken care.
9. Nutritional food items should be made available for ICDS so that the pregnant women from weak socio economic back ground can be benefited.
10. JKMSC delays in purchasing of IFA and Calcium tablets and shortage is faced by the health facilities as have been observed during PIP visits at various districts.
11. Sevier anemia  $Hb < 11$  and  $Hb < 7$  cases are not reported properly to escape from the follow-up of severe anemic pregnant ladies hence special attention is needed for severe anemic  $Hb < 7$ .
12. Due to the heavy workload and lack of manpower at District and State Maternity Hospitals, it is very difficult to record all the services delivered by these hospitals. While many services are not recorded at all and for some services, hospitals record the information on IPD/OPD tickets only, which is not available at the time of compiling of HMIS reports. This results in under reporting of services by District and State maternity Hospitals. Extra man power must be provided to record and report every service provided to all patients at the health facilities.
13. All the officials involved with uploading of the HMIS data at the levels (block and district level) should be sanitized about the preliminary analysis of the data before putting the data on the web portal.
14. The DPM units have to identify the common issues related records and reports and to solve them with the concerned personnel from time to time.

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