ihat

University of Manitoba

Insights On

Prevention of Anaemia Among Pregnant Women


सचिव
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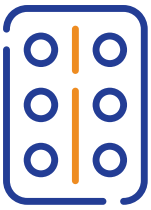
IDENTIFYING OPPORTUNITY GAPS IN THE EFFECTIVE COVERAGE CASCADE FOR PREVENTION OF ANAEMIA AMONG PREGNANT WOMEN IN INDIA



'Effective Coverage' cascades for prevention of anaemia among pregnant women in India have been developed using published results of National Family Health Survey – 5 (NFHS-5). Health Management Information System (HMIS) data from multiple states was also examined for the cascade. The measurement of 'Effective coverage' begins with required coverage; it takes into consideration health service contact coverage, crude coverage, quality adjusted coverage, user adjusted coverage and outcome adjusted coverage. The 'effective coverage' cascade is used to identify coverage gaps, quantify coverage at each step, determine where the largest gaps exist within the cascade and prioritize where actions are most urgent (Figure 1 and Table 1). Innovative and effective interventions can then be designed to specifically address the largest gaps. HMIS provides at least three of these indicators viz., estimates of pregnant women, numbers registered for antenatal care (ANC), and provided with 180 Iron and Folic Acid (IFA) tablets for the prevention of anaemia.

NFHS-5 data indicates that the 'effective coverage' of **IFA supplementation among pregnant women is uniformly LOW across all states**, with less than a third of all pregnant women effectively covered for the prevention of anaemia. States demonstrate variances in the cascade and in the levels of 'effective coverage' that range from less than 2% to about 32%.

The largest gap in the IFA cascade is in 'user adjusted coverage' denoting the proportion of pregnant women reporting having consumed IFA for 180 days. This drop is high in most states. In Jammu and Kashmir, despite high coverage (86.6%) of early registration in antenatal care, user adjusted coverage is less than 16%. The second largest and most consistent gap is between women who received any ANC versus those who received early ANC. Early ANC, or care during the first trimester, offers an opportunity to initiate IFA at the start of the second trimester, thus allowing compliance with guidelines to provide 180 days of IFA during pregnancy for anaemia prevention. We have used early ANC coverage as a proxy indicator for quality adjusted coverage, indicating the potential to receive IFA as per standards during ANC (i.e., for 180 days). This gap between any ANC and early ANC is also high ranging between 5-34% across states.

States may explore innovative methods to support user adherence to daily consumption of IFA for a period of not less than 180 days. Many states will also need to improve coverage rates for early (first trimester) registration of pregnant women. Finally, states could expand facility and community-based distribution systems to ensure uninterrupted availability of sufficient quantities of IFA during antenatal care sessions.

NFHS surveys are conducted once in five years, whereas HMIS is available every year. HMIS can be used to track elements of the cascade annually, but the use of data is limited by its sub-optimal quality and restriction to public sector alone. HMIS quality can be improved by standardisation of indicator definitions and creation of mechanisms that amalgamate and validate data inputs, including private sector, to improve validity and timeliness.

Background

Anaemia is a serious global public health problem that particularly affects young children, adolescents and pregnant women. WHO estimates that 40% of pregnant women worldwide are anaemic[1]. In India, almost 50% of pregnant women are estimated to be anaemic[2]. Anaemia during pregnancy is associated with a number of maternal and fetal complications, including increased risk of intra uterine growth restriction, premature delivery, low birth weight (LBW) and maternal and child mortality. The most common cause of anaemia worldwide is iron deficiency, resulting from prolonged negative iron balance, caused by inadequate dietary iron intake or absorption, increased needs for iron during pregnancy or growth periods, and increased iron losses as a result of menstruation and helminth (intestinal worms) infestation[3]. This note focuses on prevention of anaemia among pregnant women through IFA supplementation.

Rationale

The Anaemia Mukt Bharat (AMB) program has designed a 6x6x6 strategy to reduce the prevalence of anaemia in India. Six interventions, six target groups and six institutional mechanisms are involved in making India anaemia free. Iron and Folic Acid (IFA) prophylaxis is the first and foremost of these interventions, and pregnant women are one among the six beneficiaries of the program[4]. As per the Government of India guidelines, every pregnant women should consume a single dose of IFA daily for the duration of the pregnancy from the start of the second trimester (180 tablets)[5]. To achieve this, there are a number of steps involved including ensuring availability, accessibility, quality and uptake. There is a need to first characterize these steps, measure coverage at each step, understand the challenges and barriers and identify and address the key bottlenecks that emerge in the cascade. Antenatal care service delivery is the period of time in which IFA is delivered. The note measures these gaps by analyzing the pathway to **effective coverage** of IFA supplementation for pregnant women across 30 states as well as at national level, using data from the NFHS-5. Treatment of moderate and severe anaemia has not been considered within this note. The focus is on anaemia prevention, using both NFHS and HMIS data from across the 30 states.

Effective Coverage Cascade

The 'effective coverage' model[6] presented in Annexure 1, Figure 1, was used to assess the effective coverage of IFA for the prevention of anaemia among pregnant women, using NFHS data. The cascade analysis for India as well as for 30 states used the data from NFHS-5 (2019-21)[7]. All women who were pregnant during the five years prior to the NFHS, in the respective state, were considered in the denominator for each step in the cascade. The cascade was created for each state, based on the indicators as stated in column 3 in Table 1. The last outcome based coverage indicator on health gain achieved was applied at 47%, based on the results of a systematic review on IFA supplementation[8].

The cascade analysis can be used by individual states to inform program and policy makers on key decisions and implementation strategies related to the supply, service delivery and consumption of IFA among pregnant women for a specified geography, depending on the availability of data. The cascade can be used by individual states for three purposes:

1. Estimate coverage in each stage of the cascade
2. Identify the areas where the gap is the highest, in order to prioritize critical solutions that can address the largest coverage gaps.
3. Conduct the cascade analysis in specific geographies or sub-populations in order to measure and address inequity in coverage at each step of the coverage cascade.

Table 1: Definitions of Indicators

Criteria	Optimal measure	Indicator used based on available data	Remarks
Target Population	All pregnant women	Estimated number of pregnant women	This is 100% of women who were pregnant in the respective state as per NFHS-5
Health Service Contact	Women who received at least one ANC	Women who received at least one ANC	Sourced from NFHS-5
Crude Coverage	Received IFA	Received or bought IFA tablets/syrup	Sourced from NFHS-5
Quality Adjusted Coverage	Received IFA as per standards	Women who had antenatal check-up in the first trimester	A proxy indicator considering that only those who received ANC in the 1st trimester have sufficient opportunity to receive IFA as per standards.
User Adjusted Coverage	Consumed IFA tablets as per guidelines	Consumed IFA tablets for 100 and 180 or more days	Sourced from NFHS-5. The earlier standard was 100 days. 180 days is the standard of care during 2019-20. Both indicators are represented.
Outcome Adjusted Coverage	Heath Gain Achieved	Heath Gain Achieved	Systematic Review indicates IFA supplementation reduces the risk of maternal anaemia by 47%. 47% was applied for those who consumed IFA for at least 180 days.

Limitations

- **Quality adjusted coverage:** Early ANC in the first trimester has been used as a proxy indicator. This may not indicate whether the woman actually received IFA as per standards. NFHS captures consumption of 180 IFA tablets, whereas HMIS inputs the distribution of 180 IFA tablets among pregnant women. Map 1 depicts the variation between states in a scatter plot of these two data sources.
- **Outcome Adjusted Coverage:** Data is not available in NFHS surveys. However, a recent systematic review indicated that IFA supplementation reduced the risk of maternal anaemia by 47%. We have applied this uniformly for all states.
- **180 days of IFA red consumed is for prevention of anaemia** and is not an indicator of whether the women received treatment as per recommended standards for anaemia.
- **We have not triangulated these results with the prevalence of anaemia among pregnant women**, in each of the states. However, we have indicated the prevalence of anaemia among pregnant women for each of the states in a text box placed within the respective cascade.

Results and Discussion

Overall, the effective coverage of IFA supplementation to prevent anaemia during pregnancy is low. NFHS-5 shows that the effective coverage of IFA supplementation to prevent anaemia among pregnant women in India is 12% (Figure 2). Various states demonstrate differences in the effective coverage of IFA supplementation, ranging from less than 2% to about 32%. (Figures in Annexure 2).

Where is the greatest gap in the cascade?

- The largest gap in the cascade is 'user adjusted coverage' or consumption of IFA tablets. This gap is 44% points at India level and ranges from 5% of pregnant women in Goa to about 71% in Jammu and Kashmir.
- The second most common gap is between women who received any ANC versus those who received early ANC. Any ANC is an indicator of 'contact coverage' while early ANC (first trimester) coverage is used as a proxy indicator for 'quality adjusted coverage', indicating the potential to receive IFA as per standards during ANC (i.e., for 180 days), beginning from the start of the second trimester. This gap is 23% points at India level and ranges between 4.7% in Kerala to 33.5% in Meghalaya, with a gap greater than 20% points in more than half the states included in the current analysis. Computing HMIS data reveals that distribution of IFA was to more pregnant women than the total number of estimated pregnant women. There is also wide variance between NFHS and HMIS data, indicating the need to improve the quality of HMIS inputs (Figures 3 & 4).

How can the most critical gaps be reduced?

- Optimizing coverage of early and complete ANC with availability and delivery of IFA can reduce the missed opportunity for women to receive IFA as per standards, and potentially reduce the gap in effective coverage. In the state of Uttar Pradesh, the Technical Support Unit, implemented by the Institute for Global Public Health, University of Manitoba and the India Health Action Trust, conducted community based tracking surveys on an annual basis to track the improvements in coverage in the high-priority districts for MNCH interventions[9]. Subsequently, auxiliary nurse midwives (ANMs) were trained to assess adequacy of IFA for each Village Health and Nutrition Days (VHND), and were motivated to carry the required number of IFA at each session.
- Methods to improve 'User adherence' must be explored. HIV, TB and Non-communicable disease programs have used a range of behavioural, educational, integrated care and self-management strategies including patient-support groups, individual and family level counselling, widespread information campaigns and packaging and daily reminders with success[10,11,12,13]. Similar initiatives could be explored within states, especially in pockets with high prevalence of anaemia.
- A more detailed geographic or socio-demographic analysis of the cascade indicates sub-populations with greater inequities in access and effective coverage of services. This information can then be used to inform more intensive and innovative interventions for certain sub-populations or geographic areas in order to reduce inequities (Map 1 to Map 6).
- HMIS allows tracking of elements in the cascade on an annual basis. However, the quality of HMIS data is a challenge. Moreover, HMIS does not capture private sector data for these elements. Improving quality and coverage of HMIS data will help to track the cascade on an annual basis. This will allow use of HMIS for better assessment, planning and evaluation. The analyses of individualised level data from NFHS would also allow corrections that account for non-capture of private sector.

Specific findings for further exploration by individual states:

1. In a few states (West Bengal, Tripura, Sikkim, Tamil Nadu, Delhi and Himachal Pradesh), NFHS shows that the numbers receiving IFA are more than those who ever received ANC. Are pregnant women purchasing IFA as over the counter medications? What is the impact of this on effective coverage?
2. The user-adherence to IFA appears to be variable across these states ranging from 9% in Tripura to 63% in Tamil Nadu. Are women who buy IFA tablets more likely to consume them as compared to women who receive them free of charge?
3. J&K shows more women receiving early ANC care than women who received IFA. Is this indicative of a shortage in supply or not receiving IFA in early ANC? States may benefit by examining the procurement and distribution of IFA in relation to the estimated need from their own HMIS data.

Next steps/future areas

More specific questions that could be explored at State Level:

a. In which geographic pockets is the registration and coverage of pregnant women the lowest?

b. Are there sub-groups of women who are less likely to register during pregnancy? Age/Parity/Urban-Rural-Tribal/Socio-economic factors, etc.,

c. How can the equity analysis derived from A and B above, inform pathways to reduce disparity in effective coverage of services?

d. What health system barriers impact on availability and distribution of IFA at the level of service delivery? Does the proper procurement and adequate supply of IFA tablets has been done at health care facility?

e. Are anaemia, nutrition and deworming specific counselling offered to pregnant women?

f. Does ASHA/ANM regularly monitor compliance among pregnant women who received IFA tablets and other nutritional supplements? Is IFA available in adequate quantity at every VHND?

g. What individual, family, community level and health-care provider behavioral barriers can we identify and address in the short-term?

h. How much does the availability of IFA contribute to effective coverage of pregnant women for anaemia prevention?

i. Are there other underlying behavioral, social and structural factors related to nutrition, menstrual and reproductive health that must also be addressed?

The analyses of unitized data from NFHS-5, triangulation with HMIS data and of data from concurrent quantitative and qualitative surveys, using a 'Program Science[14,15,16] approach may help to address these questions. Program Science is defined as the "systematic application of theoretical and empirical scientific knowledge to improve the design, implementation and evaluation of public health programs".[14] It focuses on adaptive responses that enable public health programs to continuously and systematically examine program processes, outputs and outcomes, explore areas that require further understanding, implement and evaluate new interventions and then use the knowledge gained to further improve and expand programs and policy.

ANNEXURE 1

Figure 1: Model for Effective Coverage: IFA

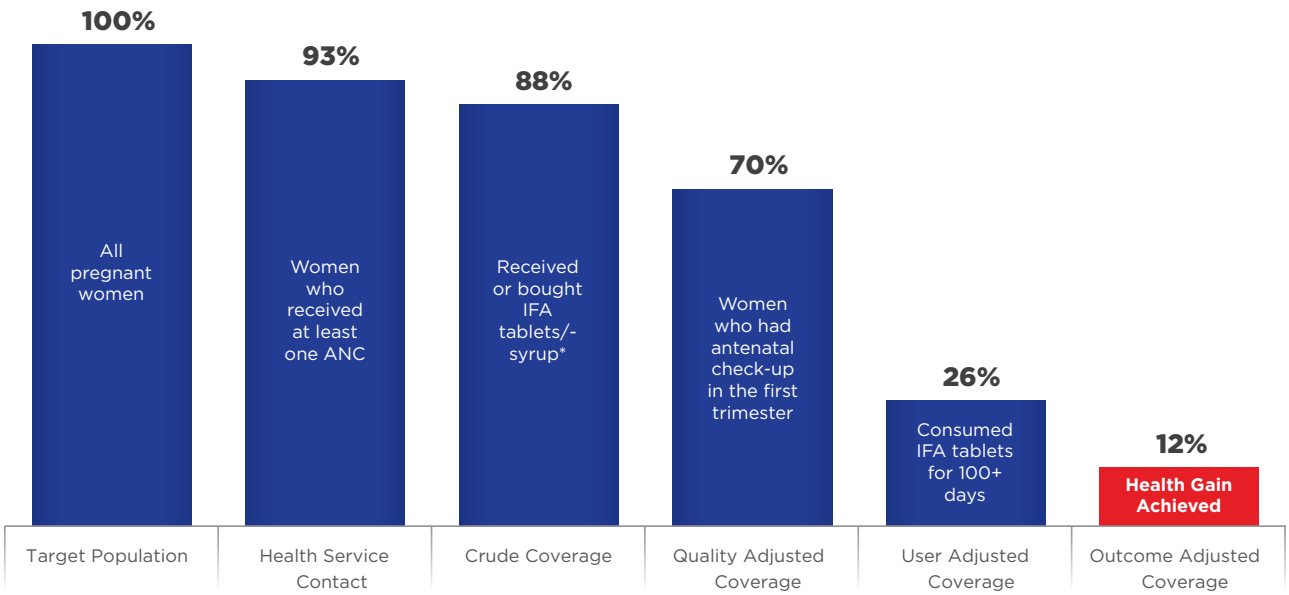
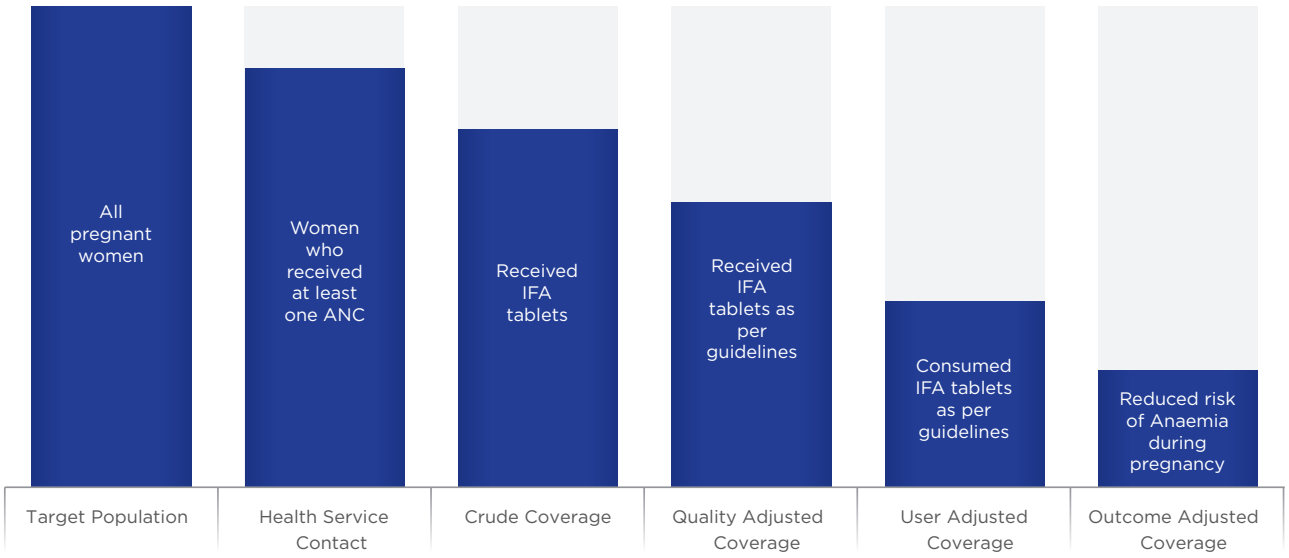
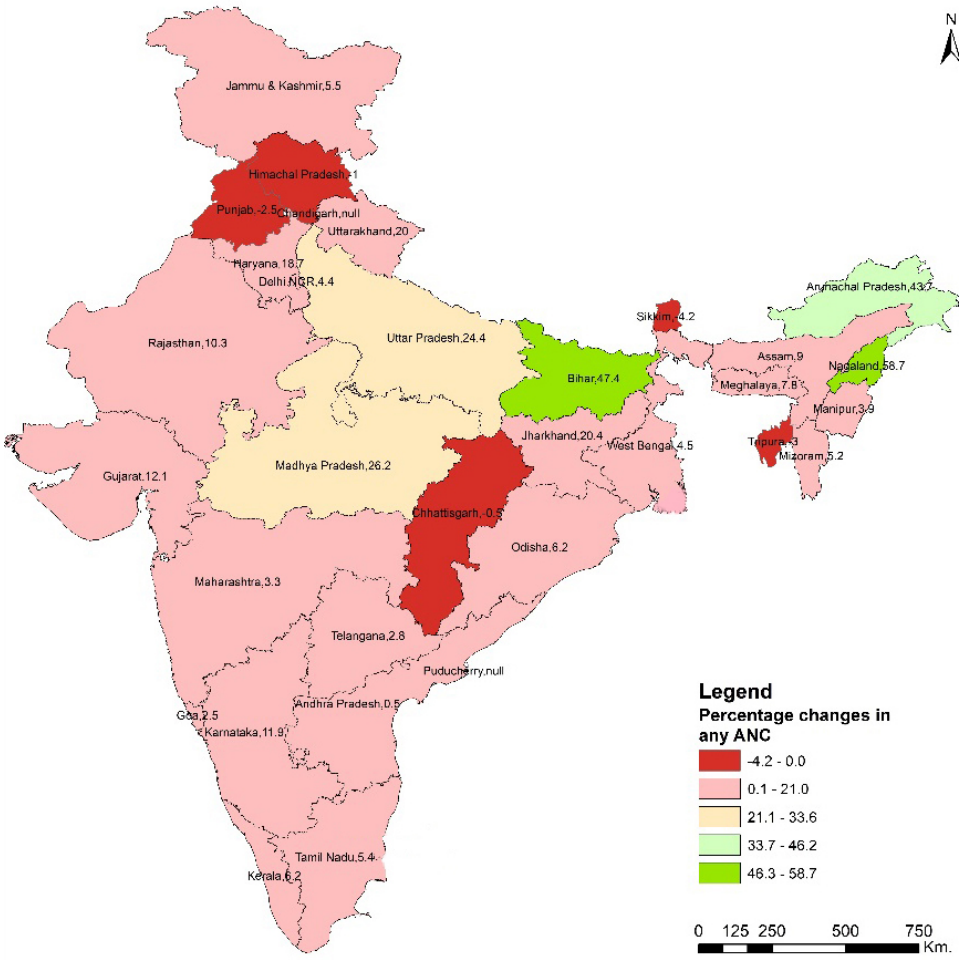


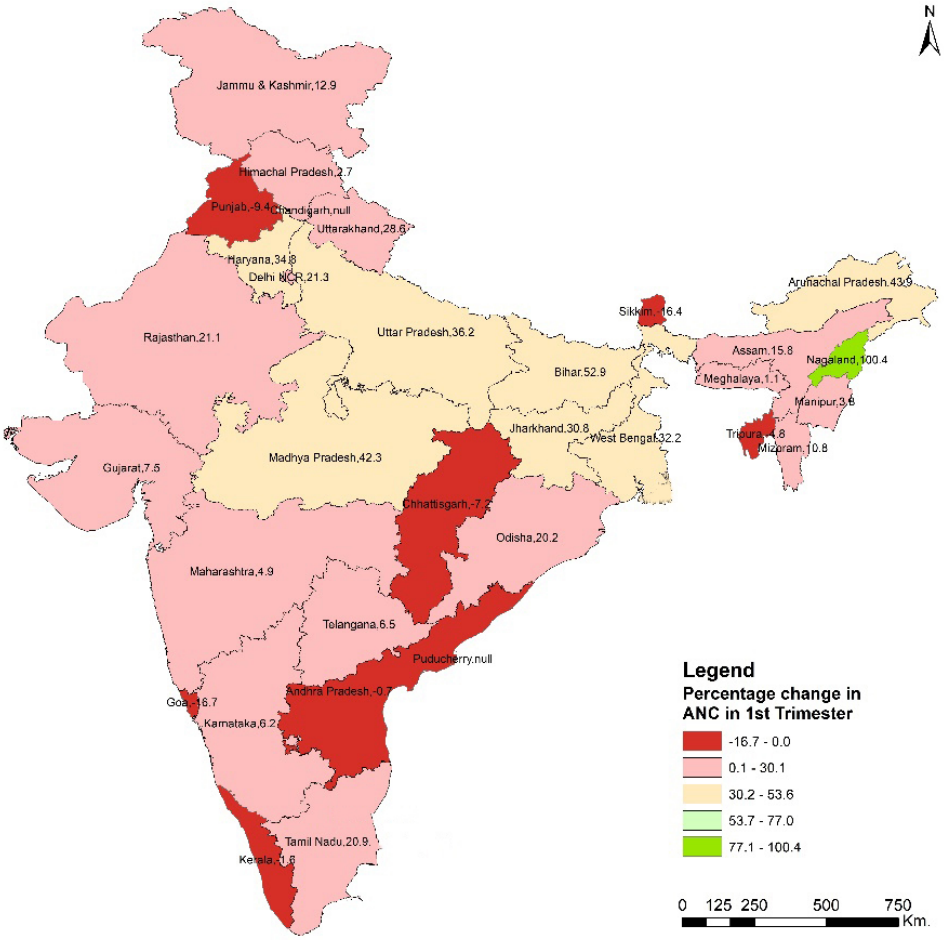
Figure 2: Health service coverage cascade for IFA: INDIA, NFHS-5, 2019-21



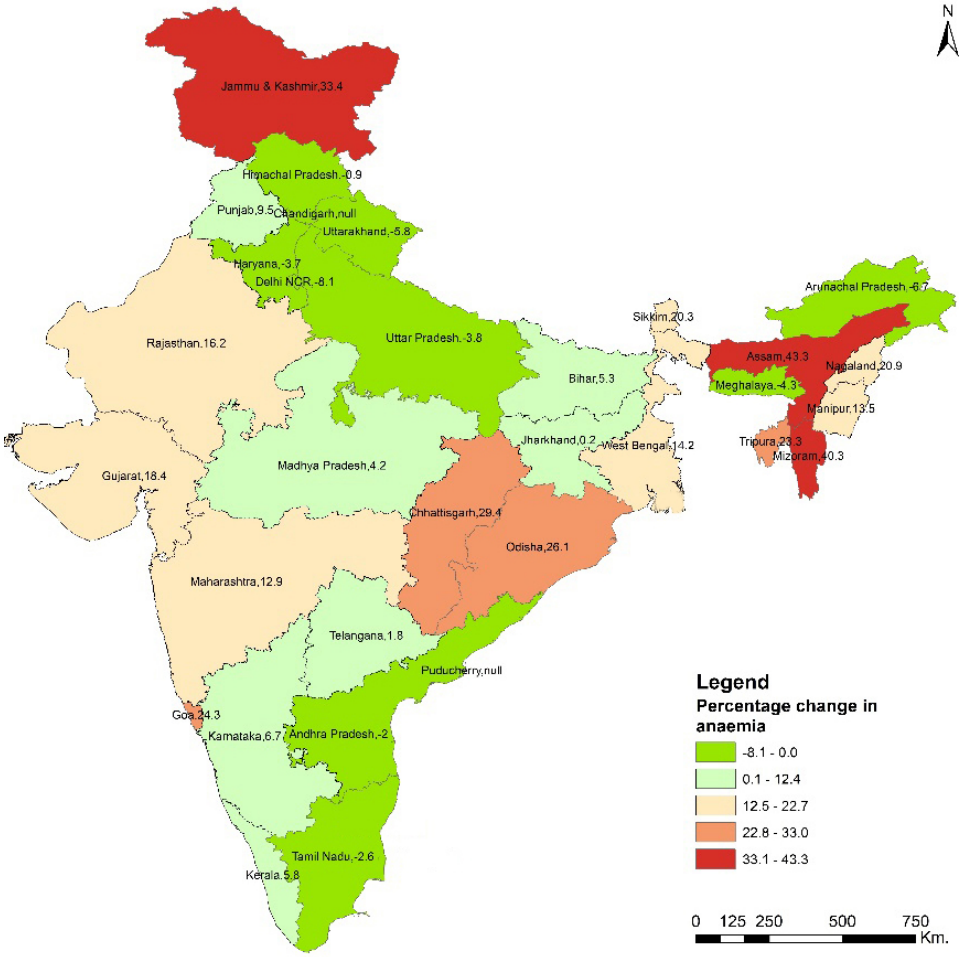
Map 1:
Percentage Changes in any ANC from NFHS-4 to NFHS-5



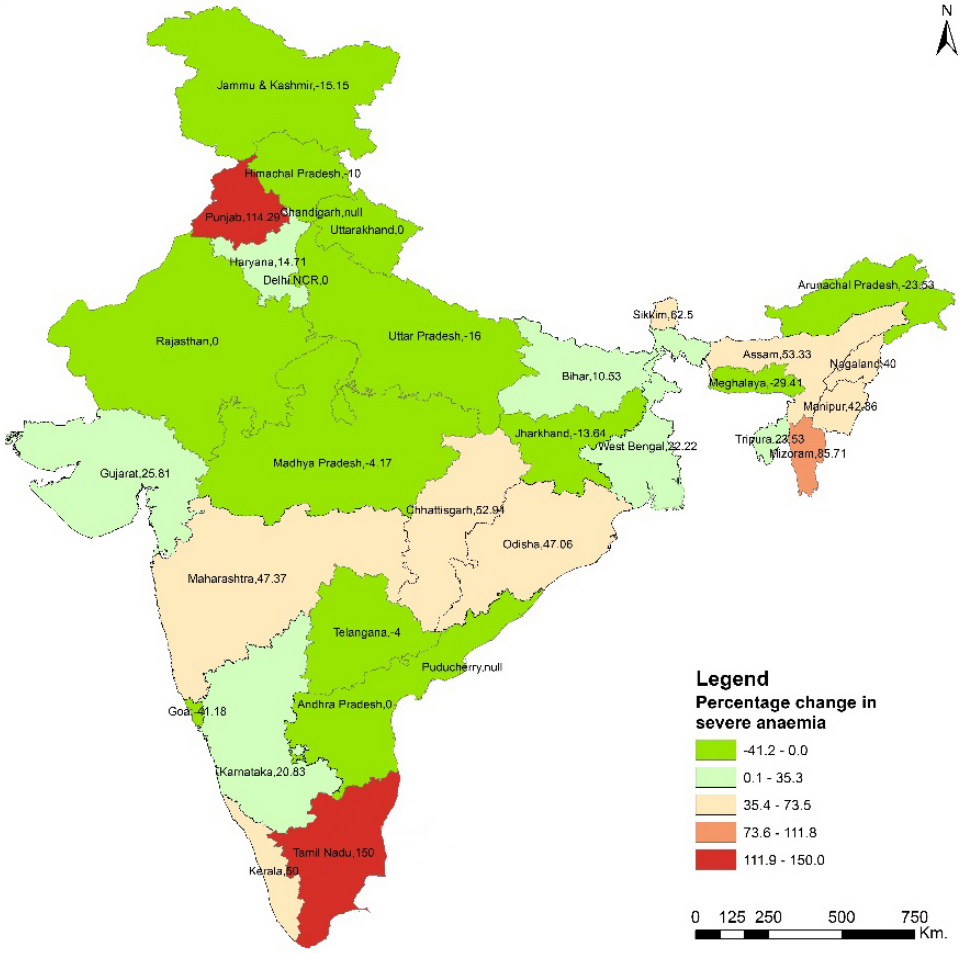
Map 2:
Percentage Changes in any ANC in 1st trimester from NFHS-4 to NFHS-5



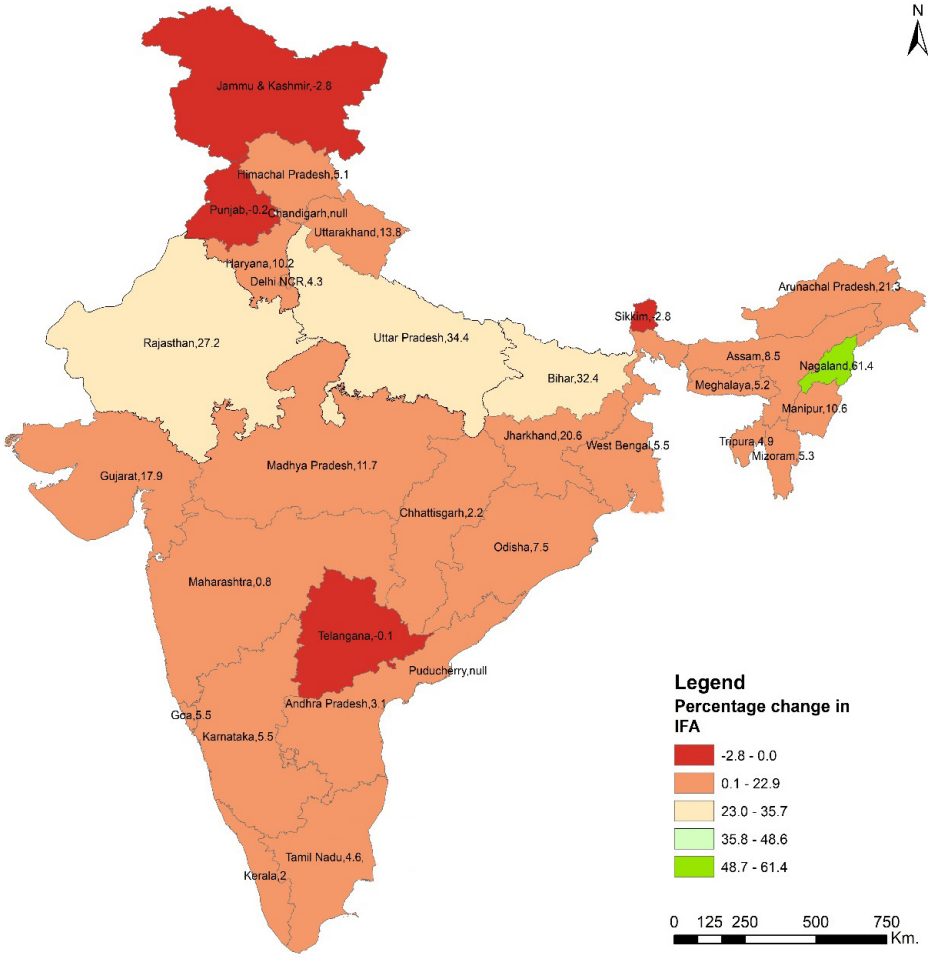
Map 3:
Percentage Changes in anaemia from NFHS-4 to NFHS-5



Map 4:
Percentage Changes in severe anaemia from NFHS-4 to NFHS-5



Map 5:
Percentage changes in received IFA from NFHS-4 to NFHS-5



Map 6:
Percentage of health gain achieved

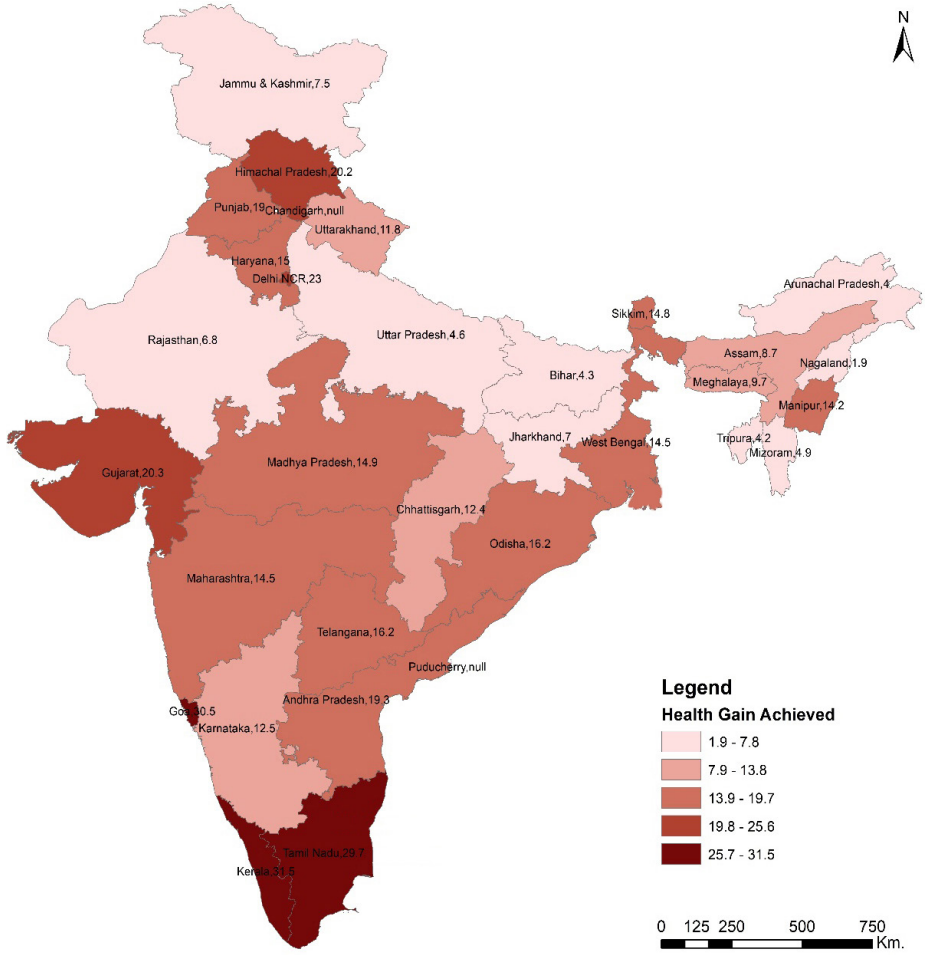


Figure: 3 Comparison of Coverage Indicators in HMIS vs NFHS-5

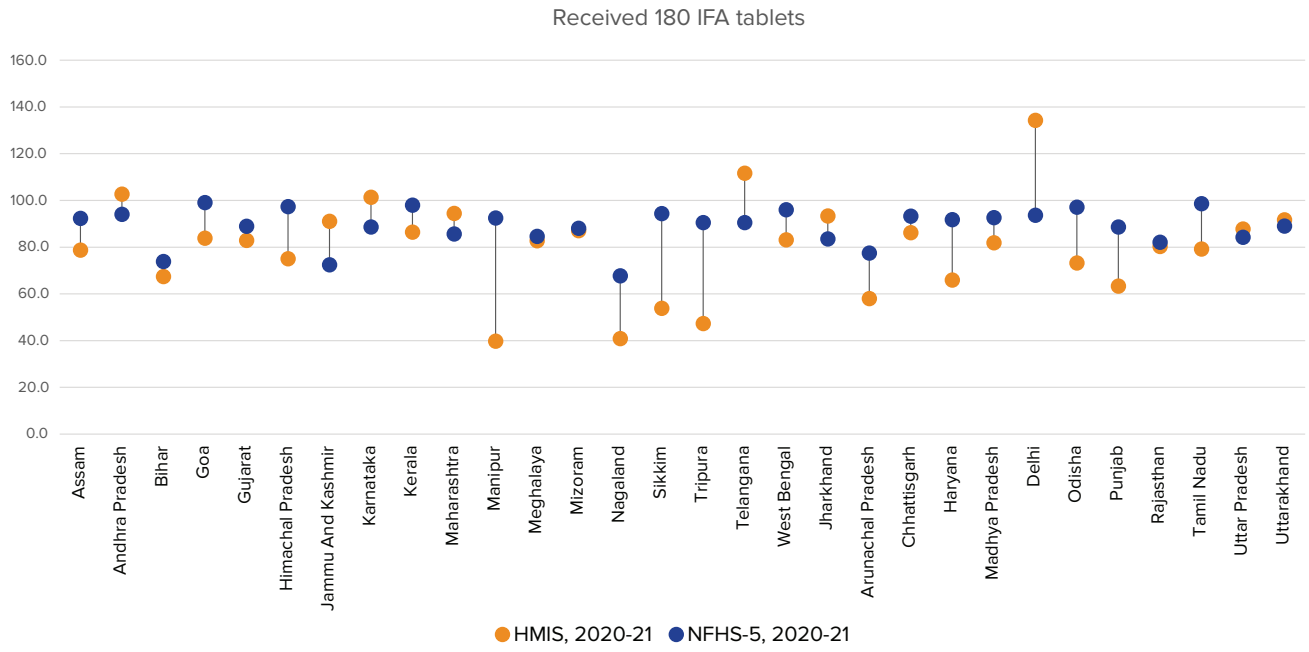
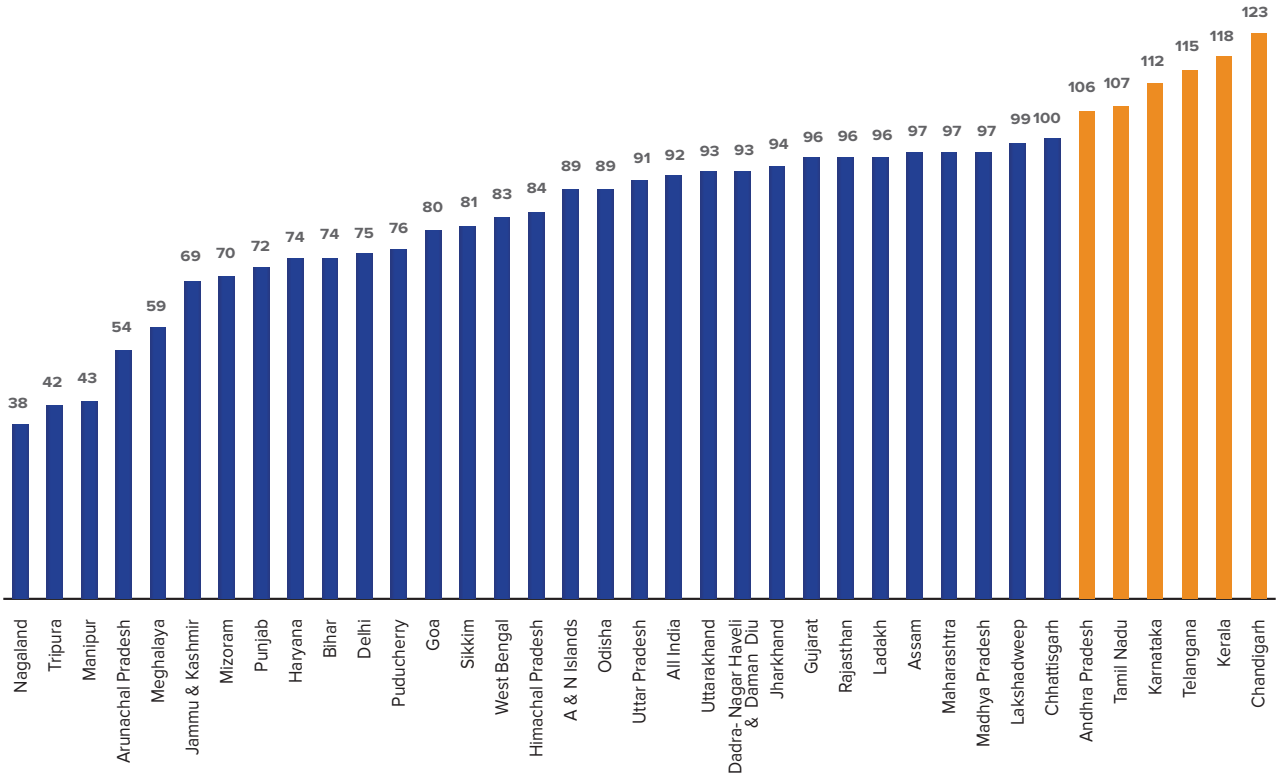


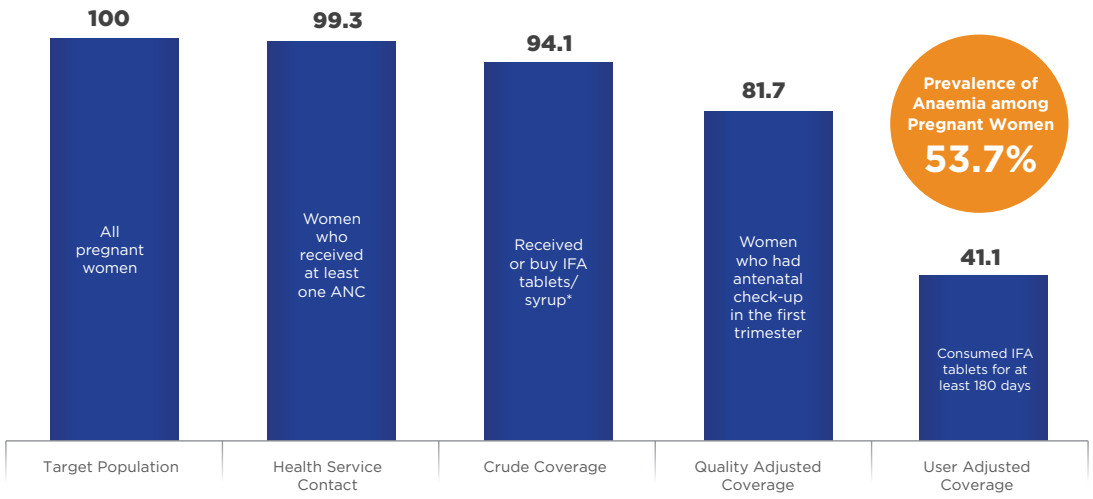
Figure 4: Percent of pregnant women provided 180 IFA tablets against ANC registered



ANNEXURE 2

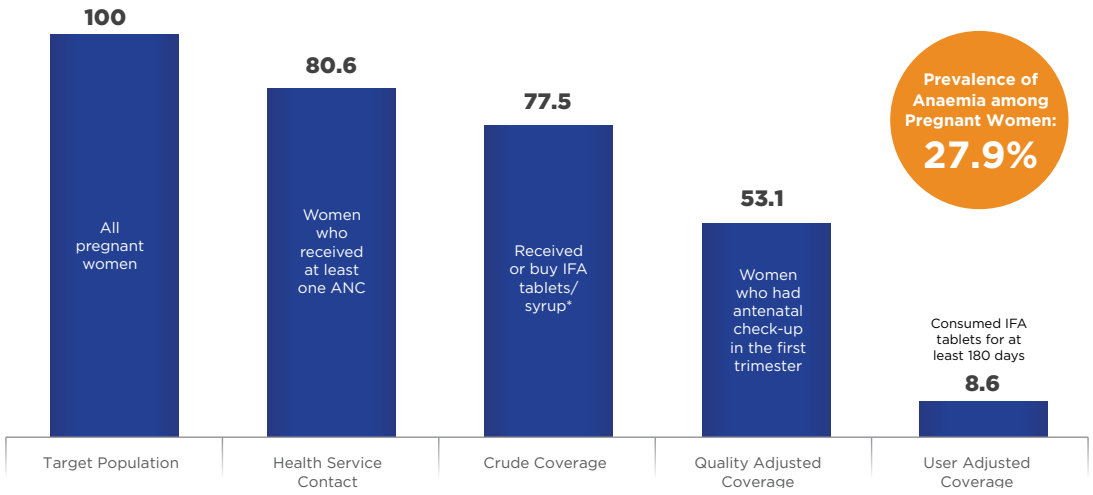
State-wise Health Service Coverage Cascade for IFA NFHS-5, 2019-20

Health service coverage cascade for IFA: **ANDHRA PRADESH**, NFHS-5, 2019-20



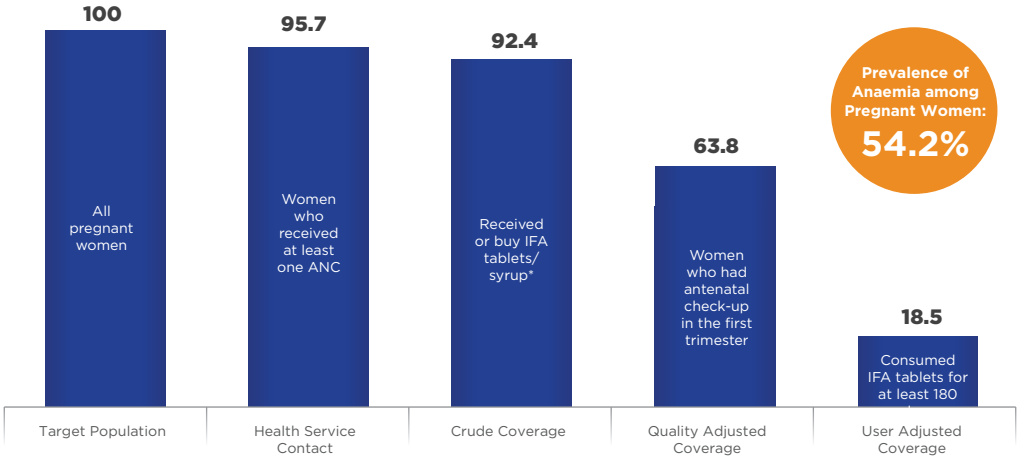
[N=9,19,090]

Health service coverage cascade for IFA: **ARUNACHAL PRADESH**, NFHS-5, 2019-20



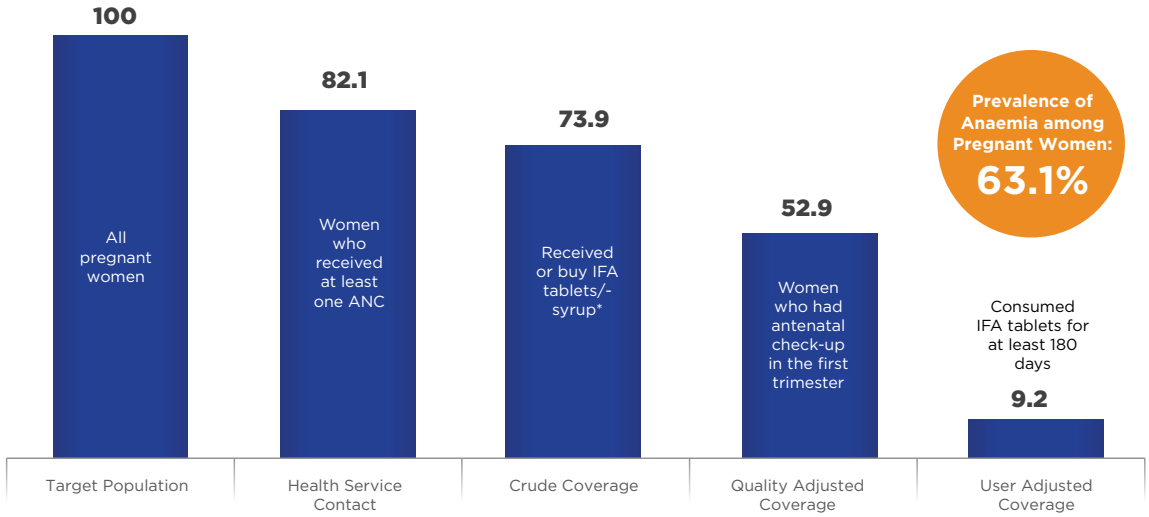
[N=29,614]

Health service coverage cascade for IFA: **ASSAM**, NFHS-5, 2019-20



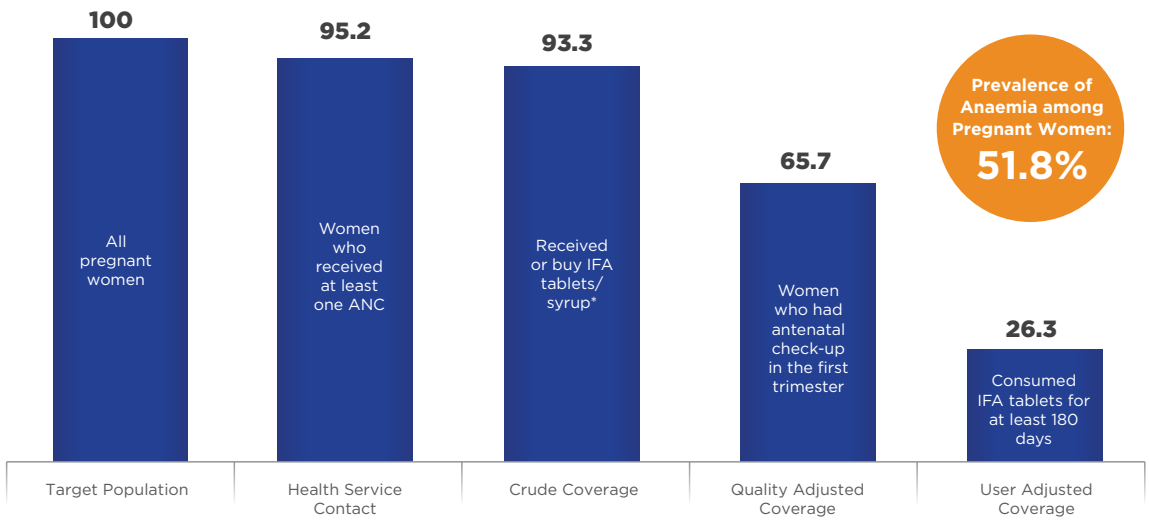
[N=7,95,941]

Health service coverage cascade for IFA: **BIHAR**, NFHS-5, 2019-20



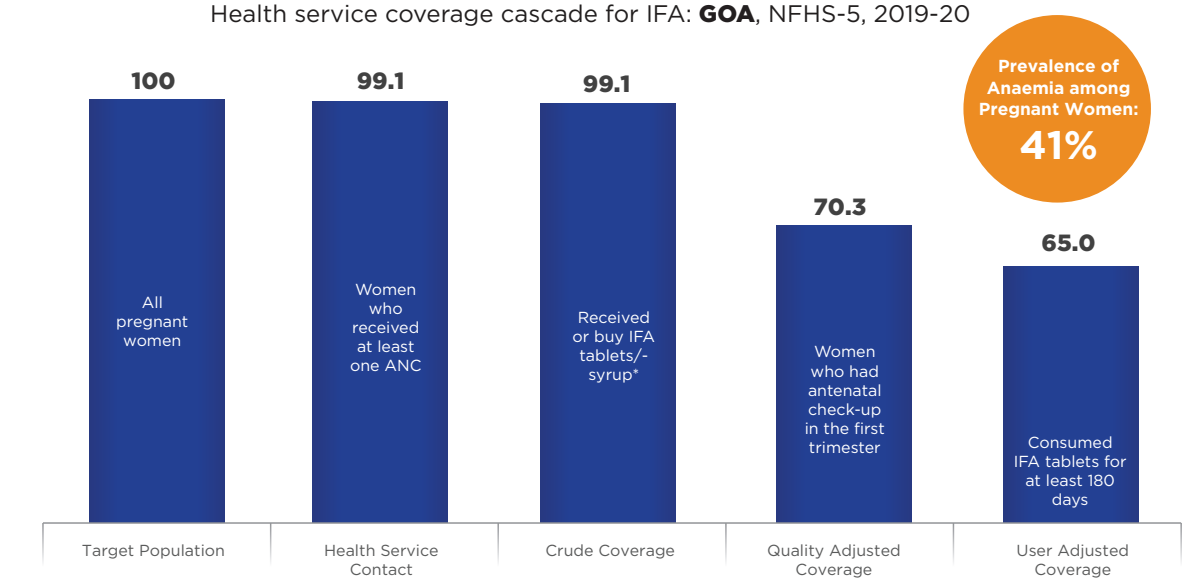
[N=34,44,566]

Health service coverage cascade for IFA: **CHHATTISGARH**, NFHS-5, 2019-20



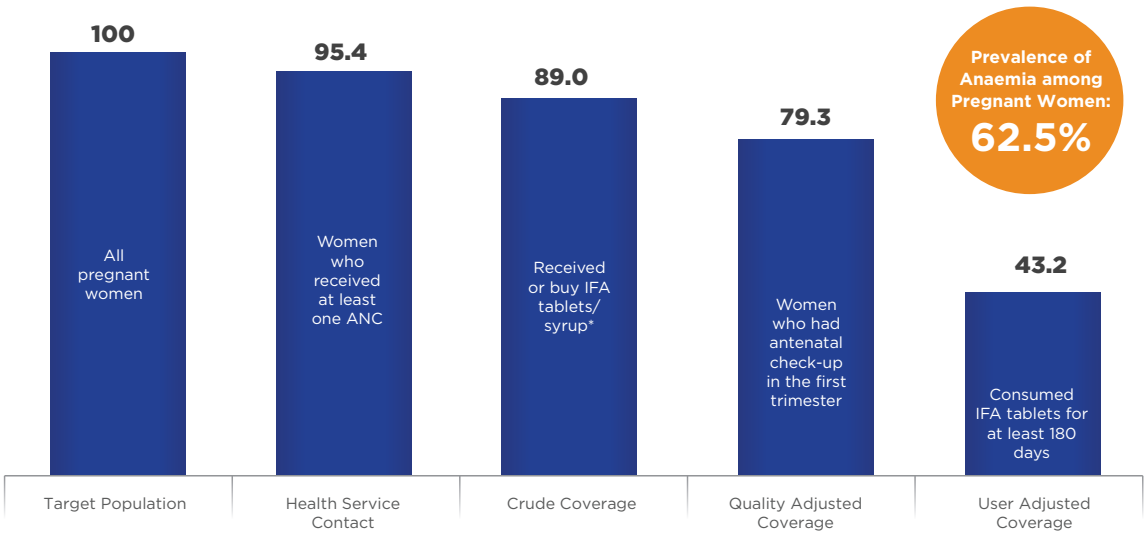
[N=7,10,919]

Health service coverage cascade for IFA: **GOA**, NFHS-5, 2019-20



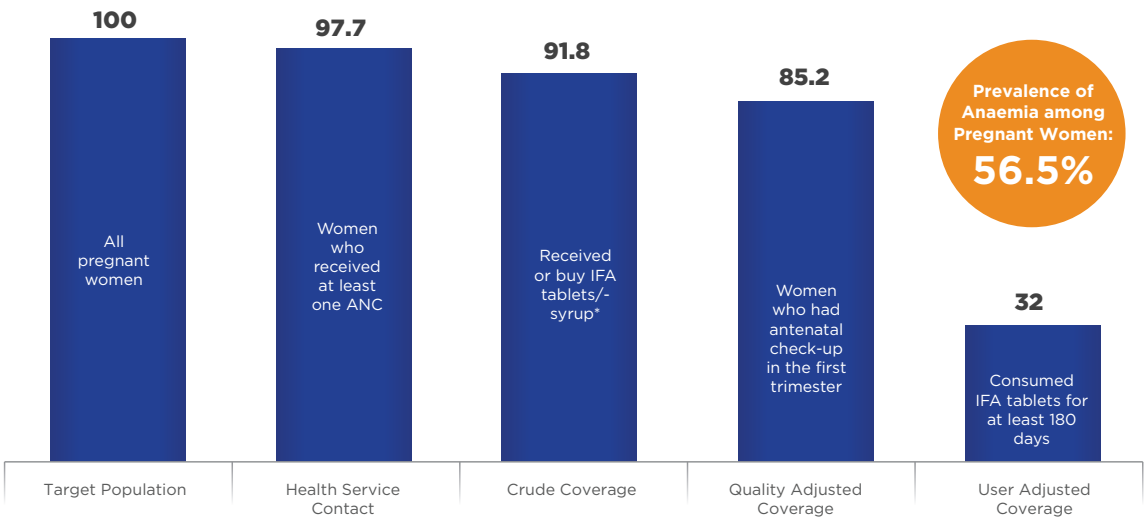
[N=21,006]

Health service coverage cascade for IFA: **GUJARAT**, NFHS-5, 2019-20



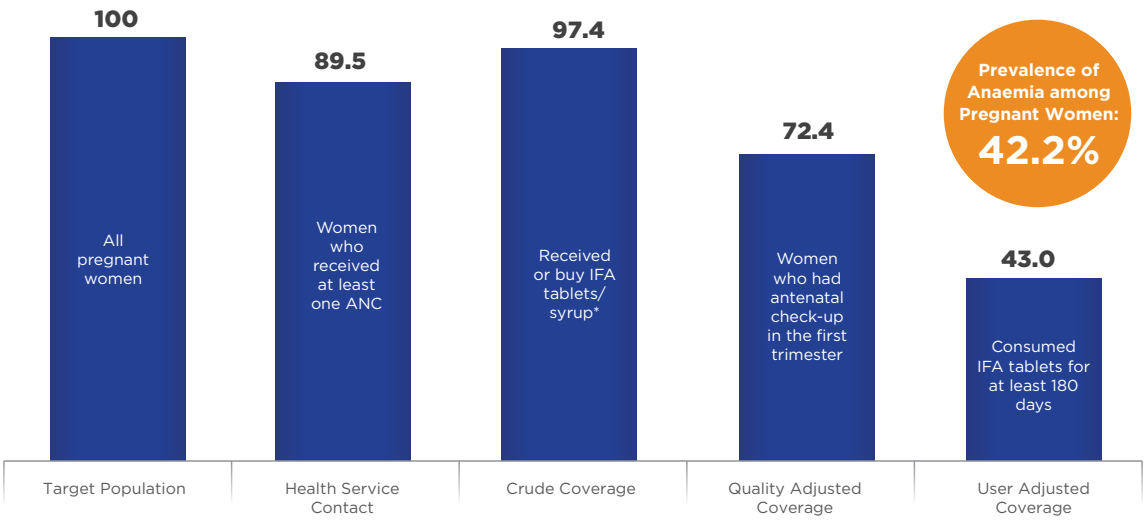
[N=14,72,006]

Health service coverage cascade for IFA: **HARYANA**, NFHS-5, 2019-20



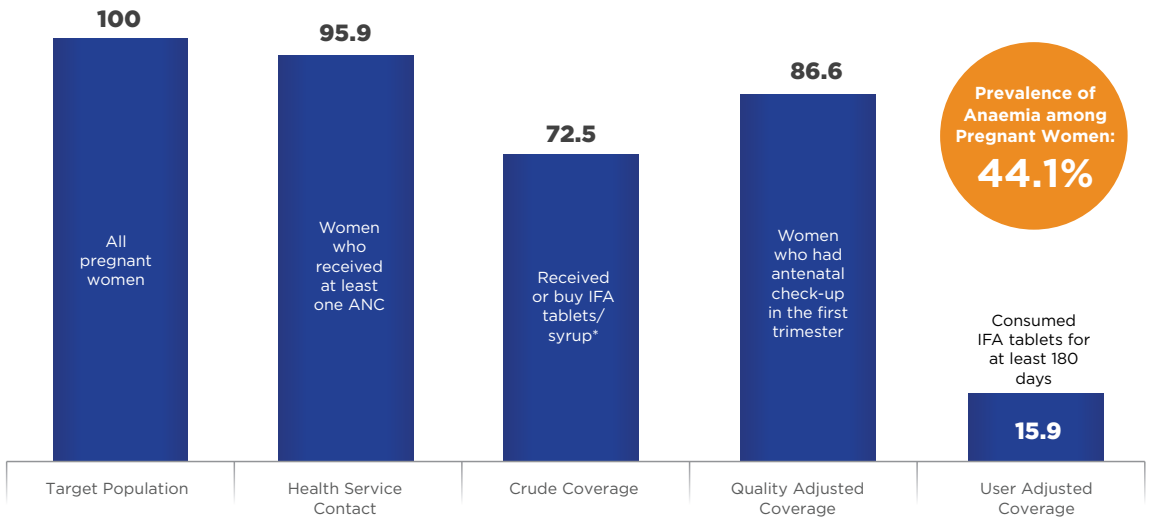
[N=6,40,246]

Health service coverage cascade for IFA: **HIMACHAL PRADESH**, NFHS-5, 2019-20



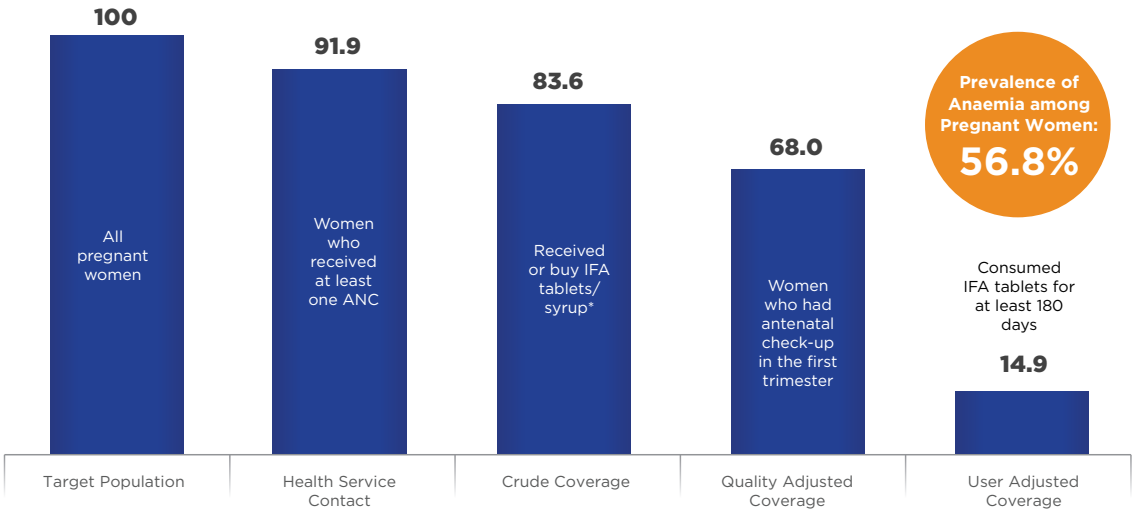
[N=1,26,071]

Health service coverage cascade for IFA: **JAMMU & KASHMIR,** NFHS-5, 2019-20



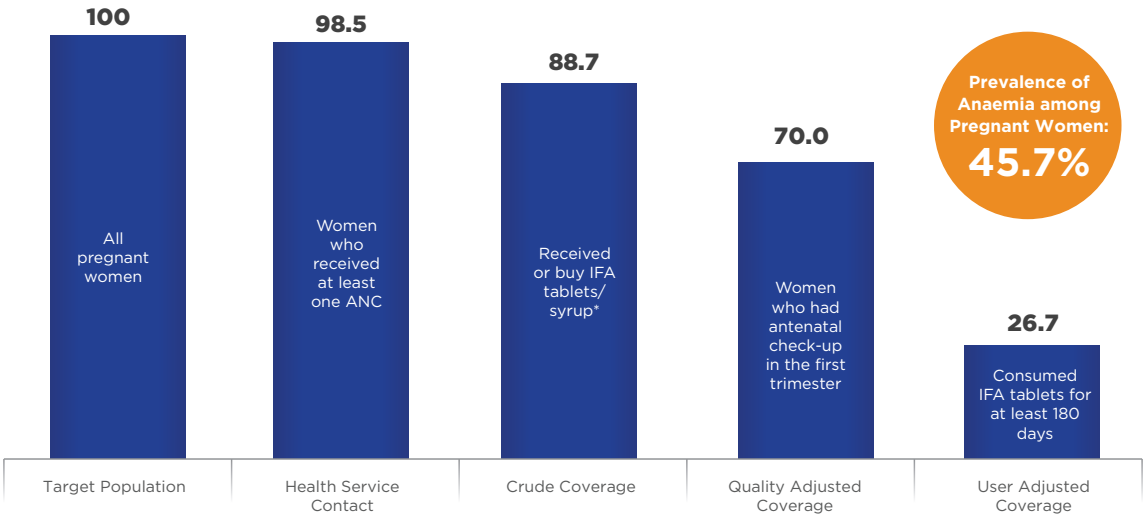
[N=2,23,659]

Health service coverage cascade for IFA: **JHARKHAND**, NFHS-5, 2019-20



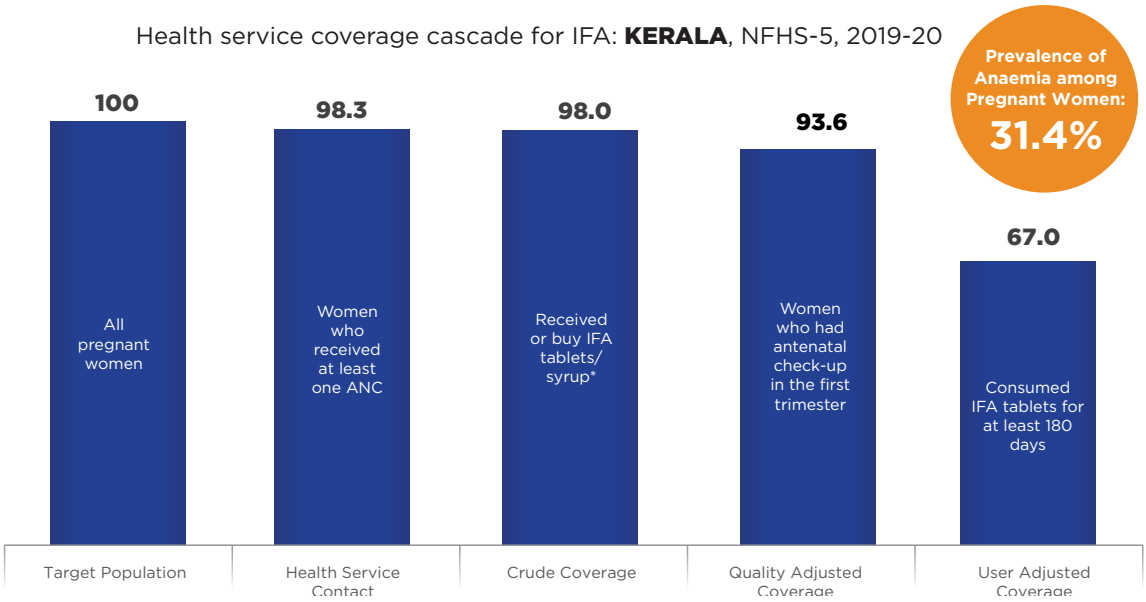
[N=9,29,839]

Health service coverage cascade for IFA: **KARNATAKA**, NFHS-5, 2019-20



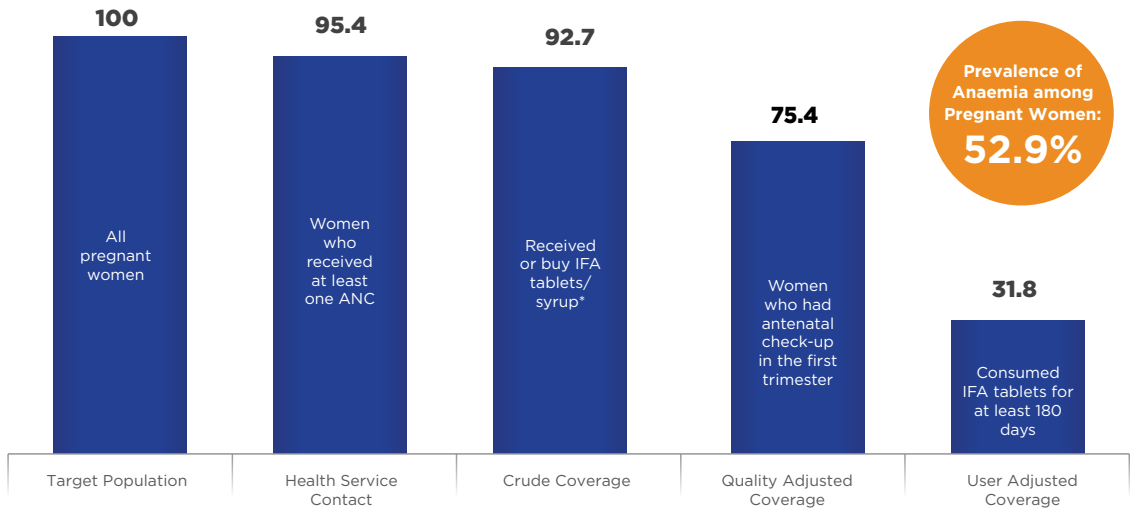
[N=12,44,898]

Health service coverage cascade for IFA: **KERALA**, NFHS-5, 2019-20



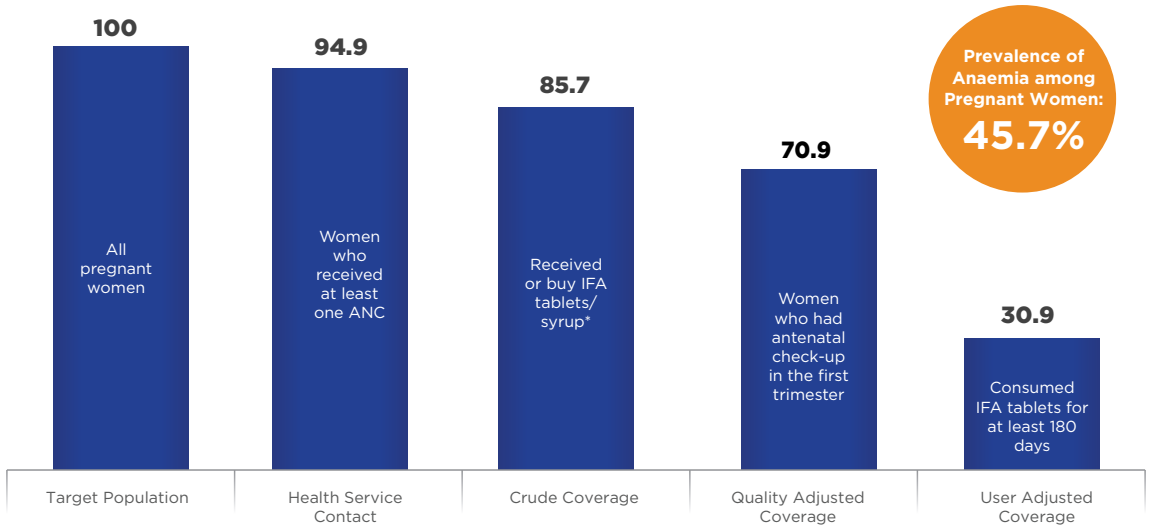
[N=5,37,061]

Health service coverage cascade for IFA: **MADHYA PRADESH**, NFHS-5, 2019-20



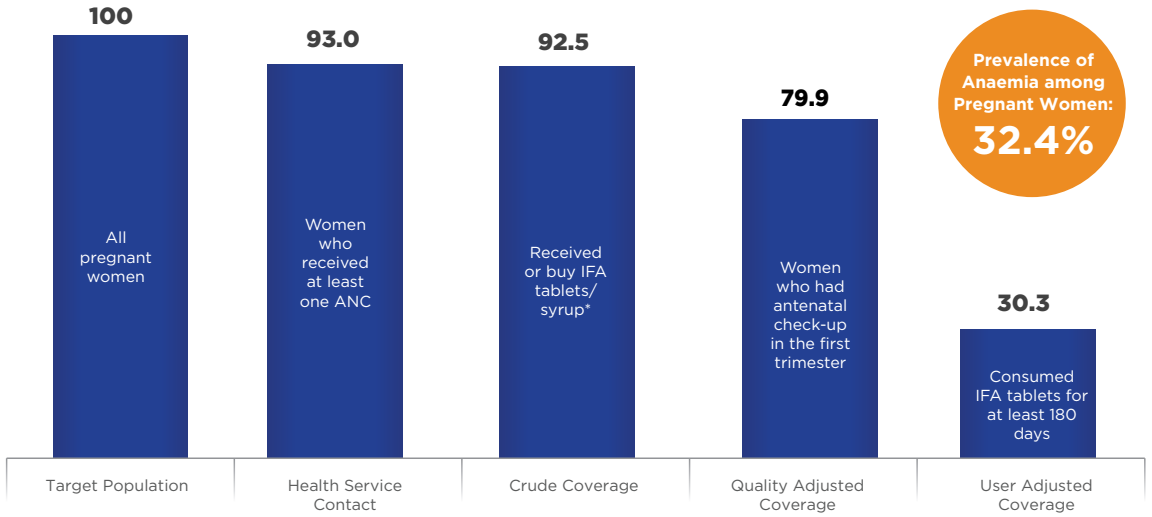
[N=22,25,198]

Health service coverage cascade for IFA: **MAHARASHTRA**, NFHS-5, 2019-20



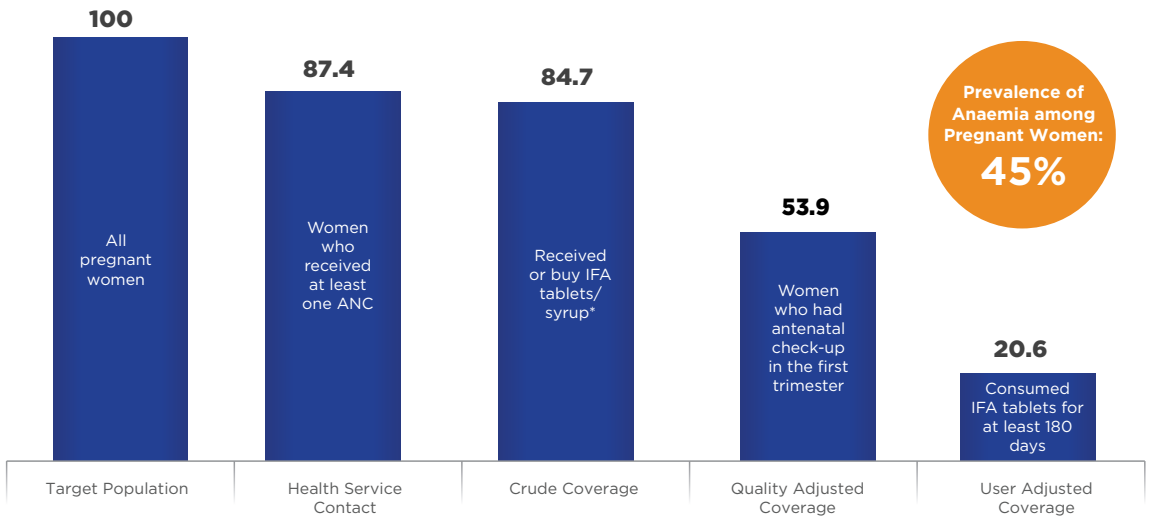
[N=20,96,145]

Health service coverage cascade for IFA: **MANIPUR**, NFHS-5, 2019-20



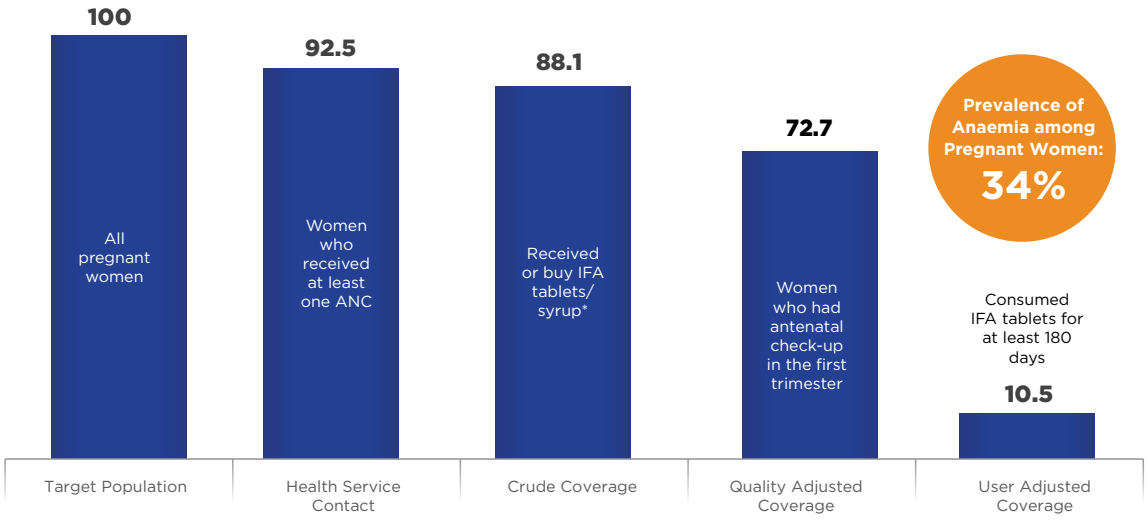
[N= 48,810]

Health service coverage cascade for IFA: **MEGHALAYA**, NFHS-5, 2019-20



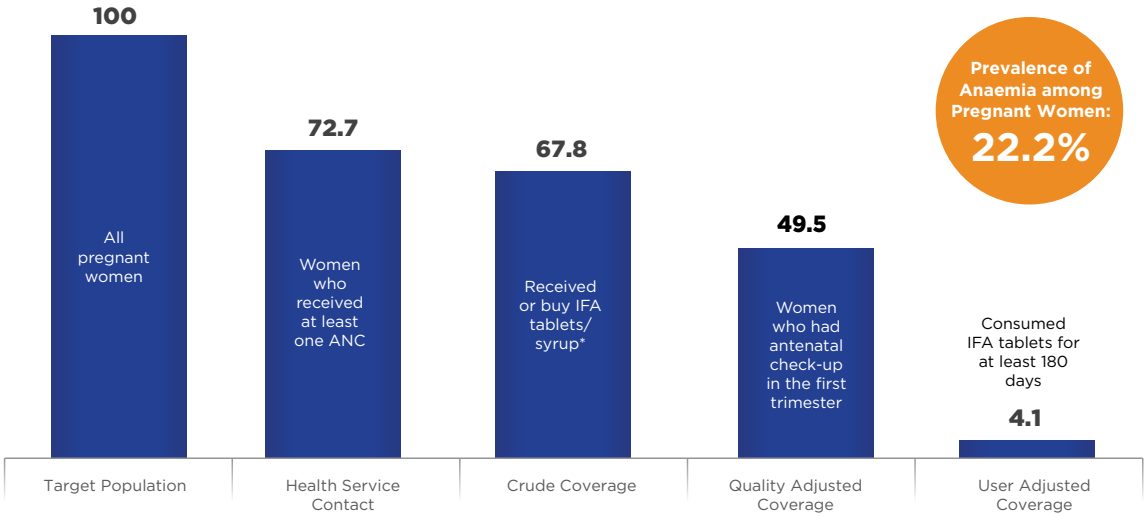
[N= 78,375]

Health service coverage cascade for IFA: **MIZORAM**, NFHS-5, 2019-20



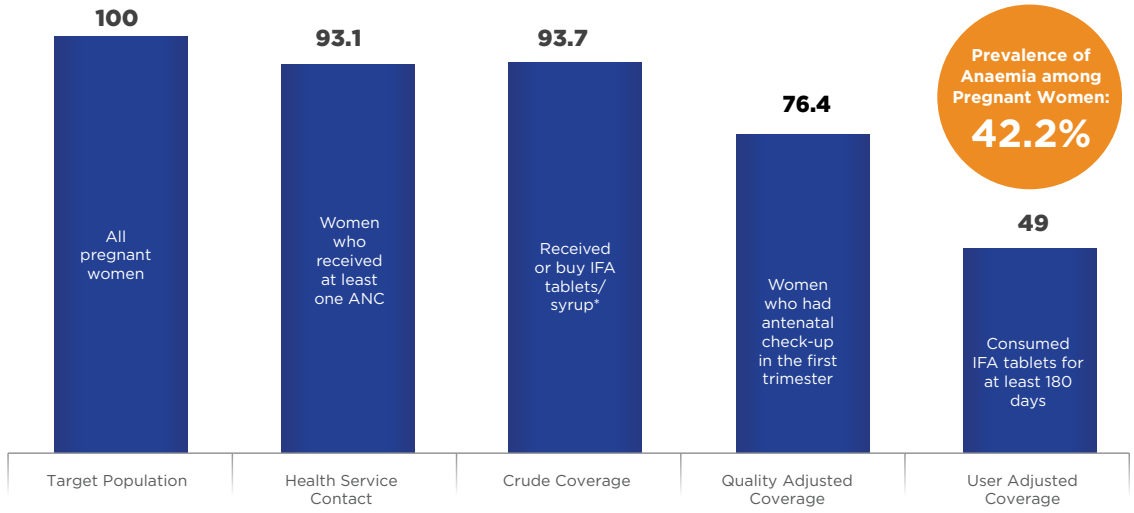
[N= 19,406]

Health service coverage cascade for IFA: **NAGALAND**, NFHS-5, 2019-20



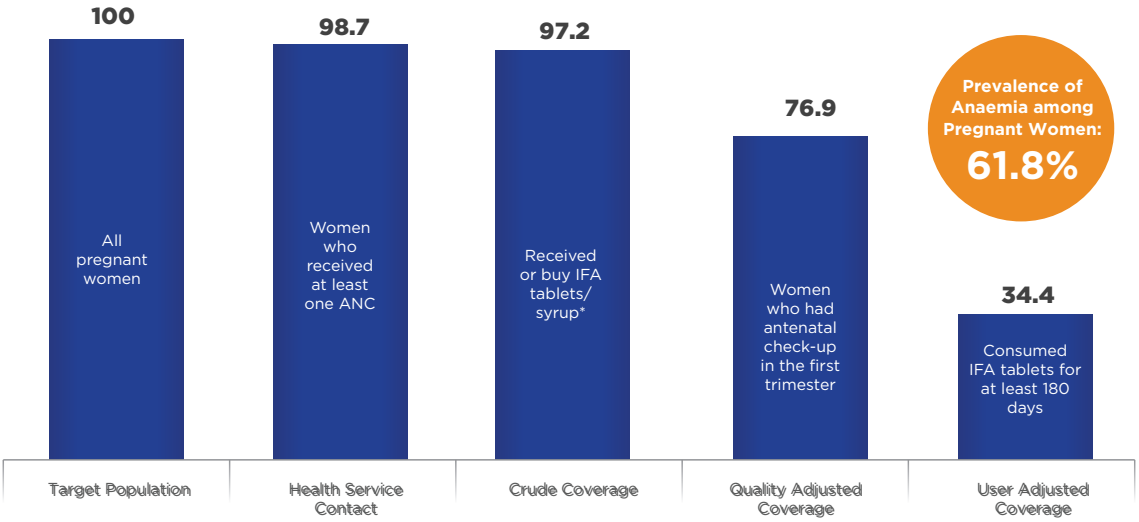
[N= 30,509]

Health service coverage cascade for IFA: **NCT DELHI**, NFHS-5, 2019-20



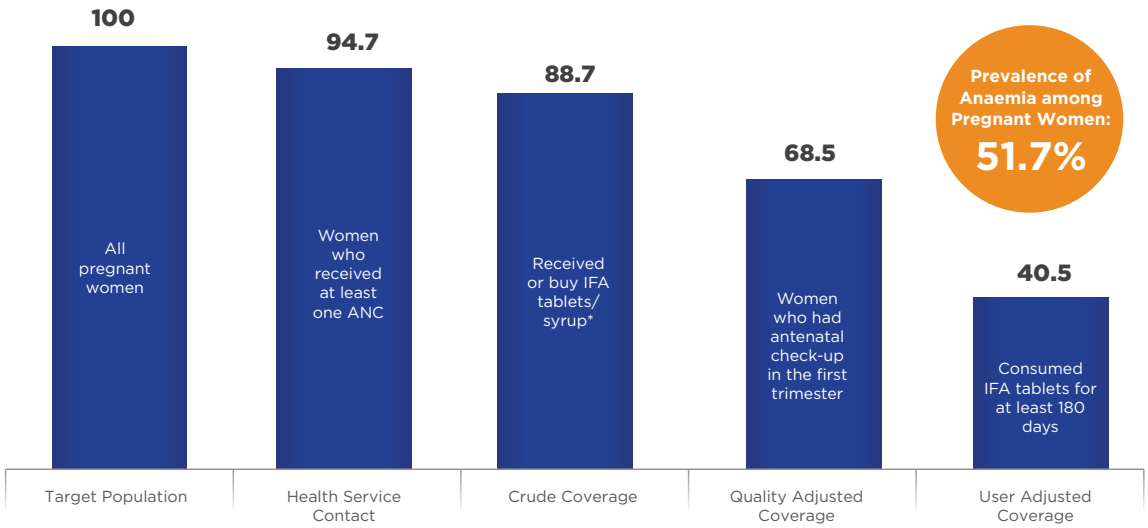
[N=3,20,392]

Health service coverage cascade for IFA: **ODISHA**, NFHS-5, 2019-20



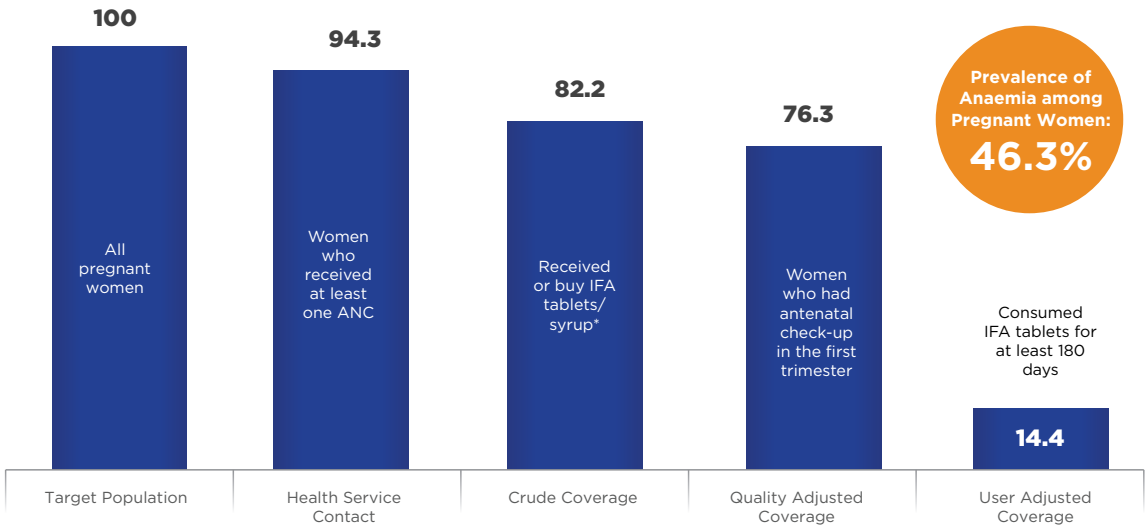
[N=8,74,293]

Health service coverage cascade for IFA: **PUNJAB**, NFHS-5, 2019-20



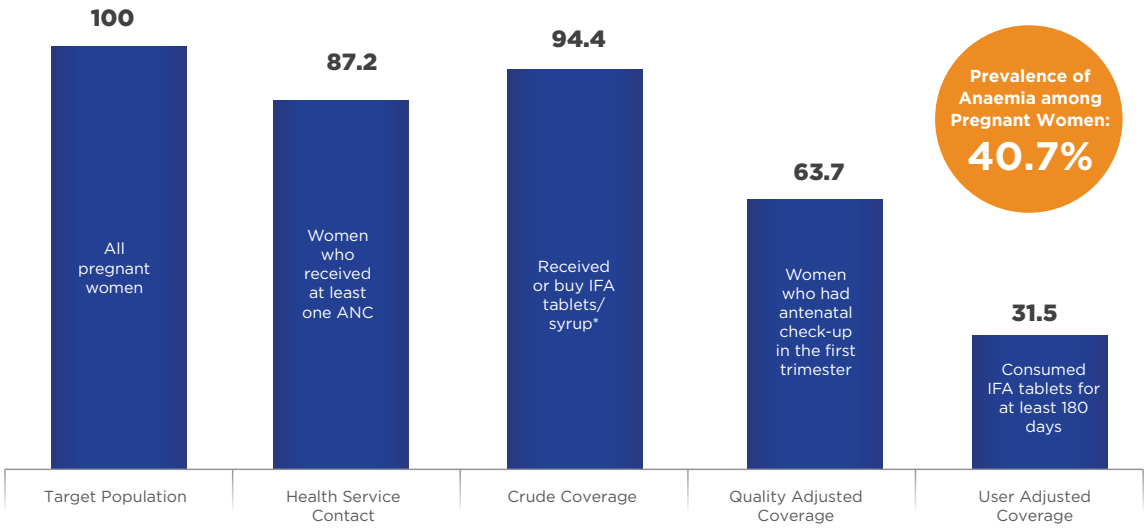
[N=4,86,105]

Health service coverage cascade for IFA: **RAJASTHAN**, NFHS-5, 2019-20



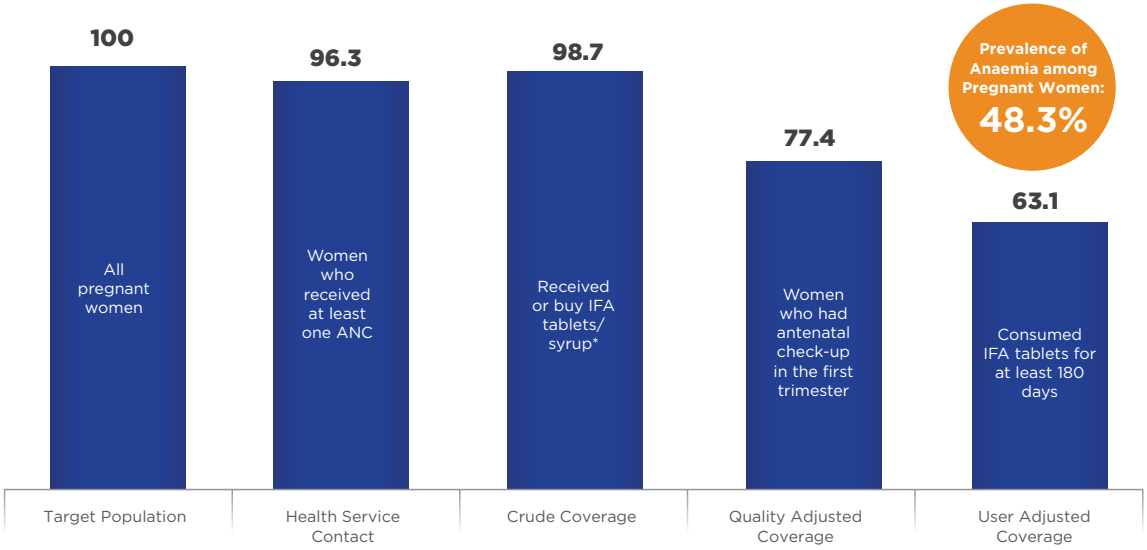
[N=20,39,770]

Health service coverage cascade for IFA: **SIKKIM,** NFHS-5, 2019-20



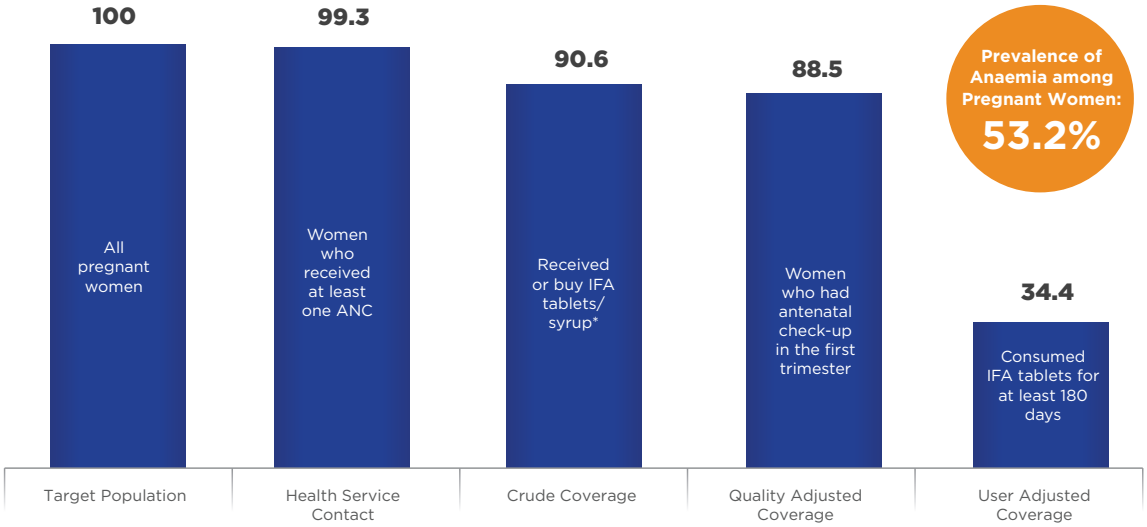
[N= 11,906]

Health service coverage cascade for IFA: **TAMIL NADU,** NFHS-5, 2019-20



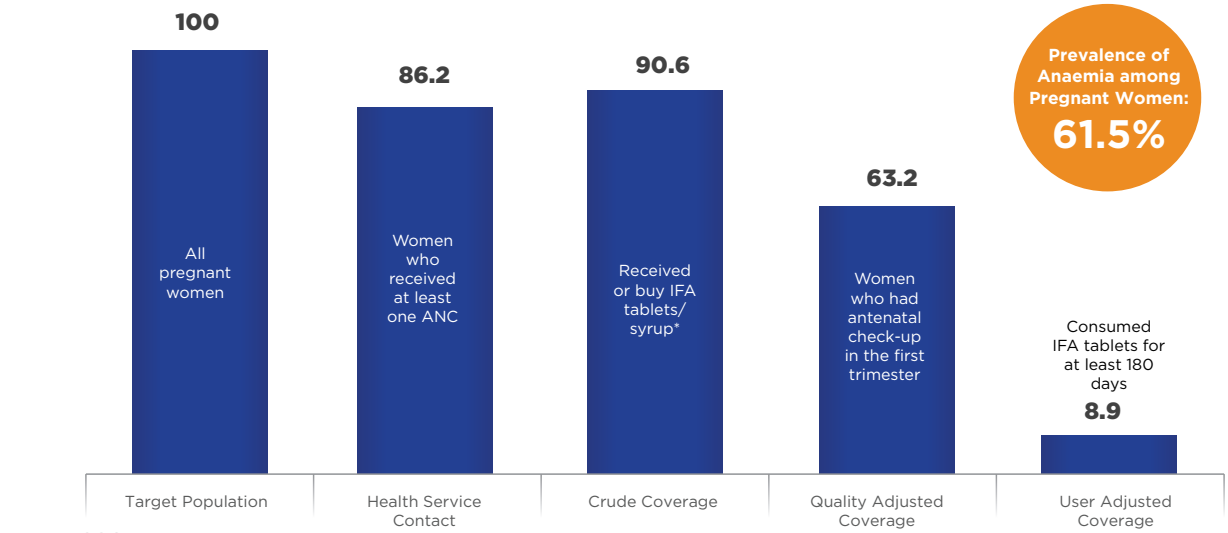
[N=12,23,988]

Health service coverage cascade for IFA: **TELANGANA**, NFHS-5, 2019-20



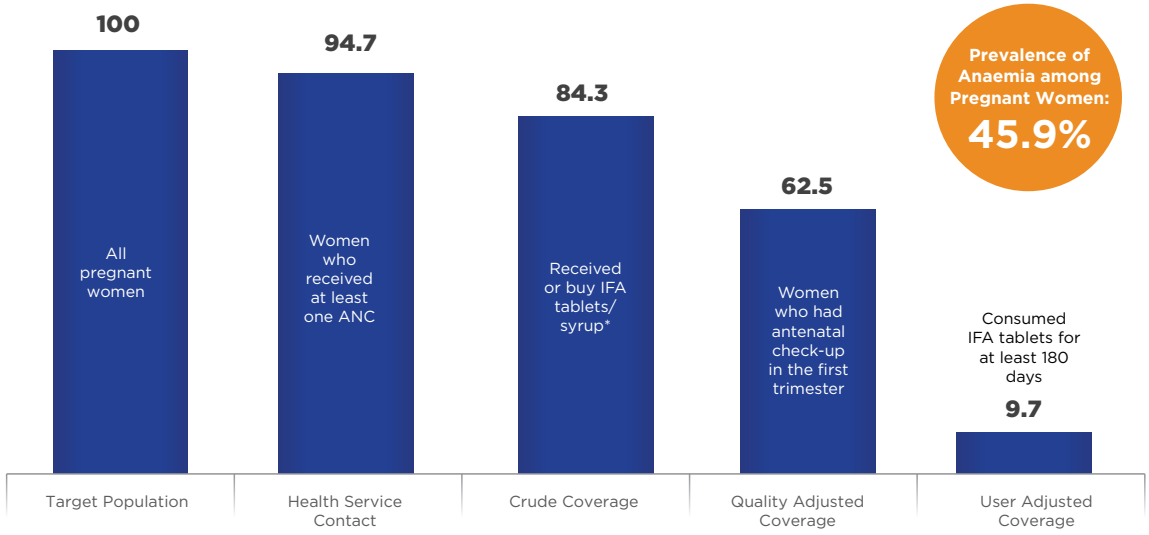
[N= 6,91,920]

Health service coverage cascade for IFA: **TRIPURA,** NFHS-5, 2019-20



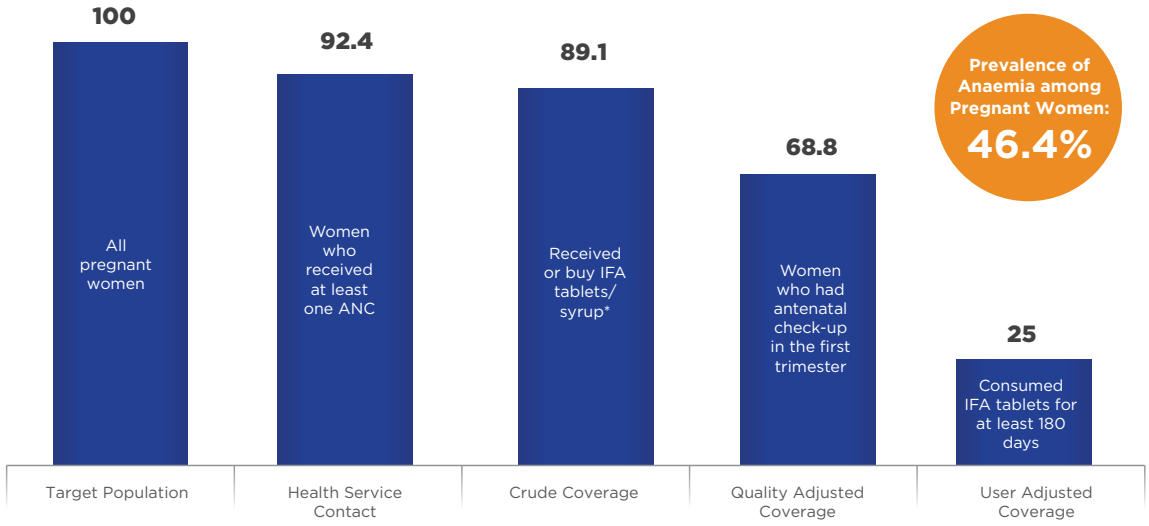
[N= 57,086]

Health service coverage cascade for IFA: **UTTAR PRADESH**, NFHS-5, 2019-20



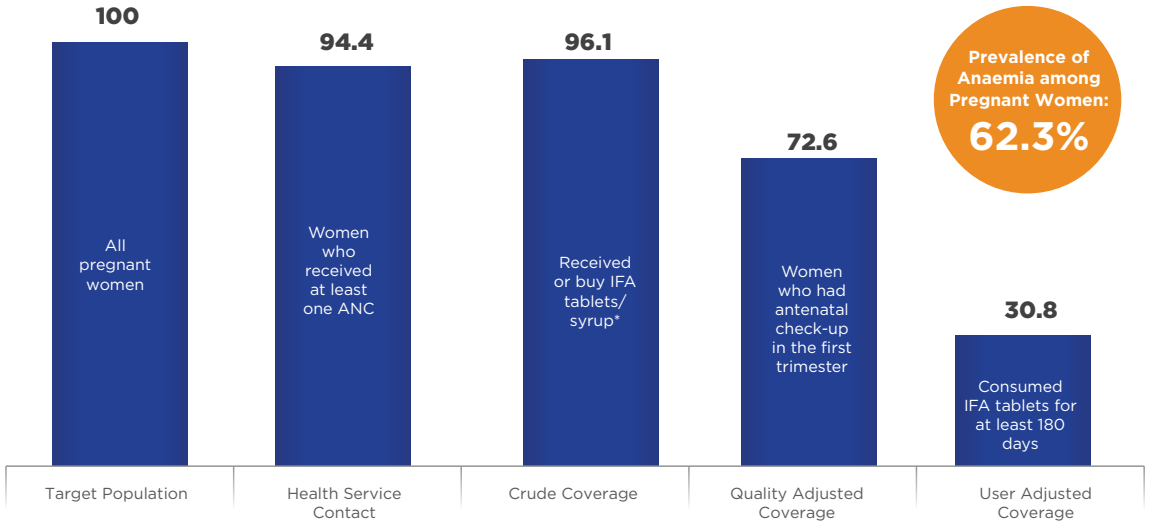
[N=65,35,409]

Health service coverage cascade for IFA: **UTTARAKHAND,** NFHS-5, 2019-20



[N=2,04,460]

Health service coverage cascade for IFA: **WEST BENGAL**, NFHS-5, 2019-20



[N= 15,98,949]

*Estimated numbers are based on projected population in 2019 and CBR (SRS, 2018)

References

1 https://www.who.int/health-topics/anaemia#tab=tab_1

2 NFHS 4, 2016

3 Global Nutrition Targets 2025, Anaemia Policy Brief. apps.who.int/iris/bitstream/handle/10665/

4 https://anemiamuktbharat.info/home/6x6x6-strategy/

5 Intensified National Iron Plus Initiative (I-NIPI) Operational Guidelines, April 2018, Ministry of Health And Family Welfare, Government Of India

6 Amouzou, A. et al. (2019) 'Advances in the measurement of coverage for RMNCH and nutrition: from contact to effective coverage', BMJ Global Health, 4(Suppl 4), p. e001297. doi: 10.1136/bmjgh-2018-001297.

7 http://rchiips.org/nfhs/nfhs5.shtml#

8 Oh C, Keats EC, Bhutta ZA. Vitamin and Mineral Supplementation During Pregnancy on Maternal, Birth, Child Health and Development Outcomes in Low- and Middle-Income Countries: A Systematic Review and Meta-Analysis. Nutrients. 2020 Feb 14;12(2):491. doi: 10.3390/nu12020491

9 Community Behaviour Tracking Survey-3 (2016), The Uttar Pradesh Technical Support Unit. https://www.ihat.in/resources/the-uttar-pradesh-technical-support-unit-community-behaviour-tracking-survey-results-of-the-third-round/

10 Costa E, Giardini A, Savin M, et al. Interventional tools to improve medication adherence: review of literature. Patient Prefer Adherence. 2015;9: 1303-1314. Published 2015 Sep 14. doi:10.2147/PPA.S87551

11 Chaiyachati, Krisda H.a; Ogbuoji, Osondub; Price, Matthewb; Suthar, Amitabh B.c; Negussie, Eyerusalem K.c; Bärnighausen, Tillb,d Interventions to improve adherence to antiretroviral therapy, AIDS: March 2014 - Volume 28 - Issue - p S187-S204 doi: 10.1097/QAD.0000000000000252

12 Meera Viswanathan, Carol E. Golin, et al, Interventions to Improve Adherence to Self-administered Medications for Chronic Diseases in the United States-A Systematic Review, Annals of Internal Medicine, December 2012. https://doi.org/10.7326/0003-4819-157-11-201212040-00538

13 Müller, A. M. et al. (2018) 'Interventions to improve adherence to tuberculosis treatment: Systematic review and meta-analysis', International Journal of Tuberculosis and Lung Disease, 22(7), pp. 731–740. doi: 10.5588/ijtld.17.0596.

14 Blanchard JF, Aral SO. Program Science: an initiative to improve the planning, implementation and evaluation of HIV/sexually transmitted infection prevention programmes. Sexually Transmitted Infections 2011;87(1):2-3.

15 Crockett, M., Avery, L. and Blanchard, J. (2015) 'Program science-A framework for improving global maternal, newborn, and child health', JAMA Pediatrics, 169(4), pp. 305–306. doi: 10.1001/jamapediatrics.2015.9.

16 Becker, M. et al. (2018) 'The contributions and future direction of Program Science in HIV/STI prevention', Emerging Themes in Epidemiology, 15(1), pp. 1–7. doi: 10.1186/s12982-018-0076-8.

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