Understanding inequalities in health outcomes:
patterns and distributions of inequalities in antenatal and delivery care coverage in Uttar Pradesh, India

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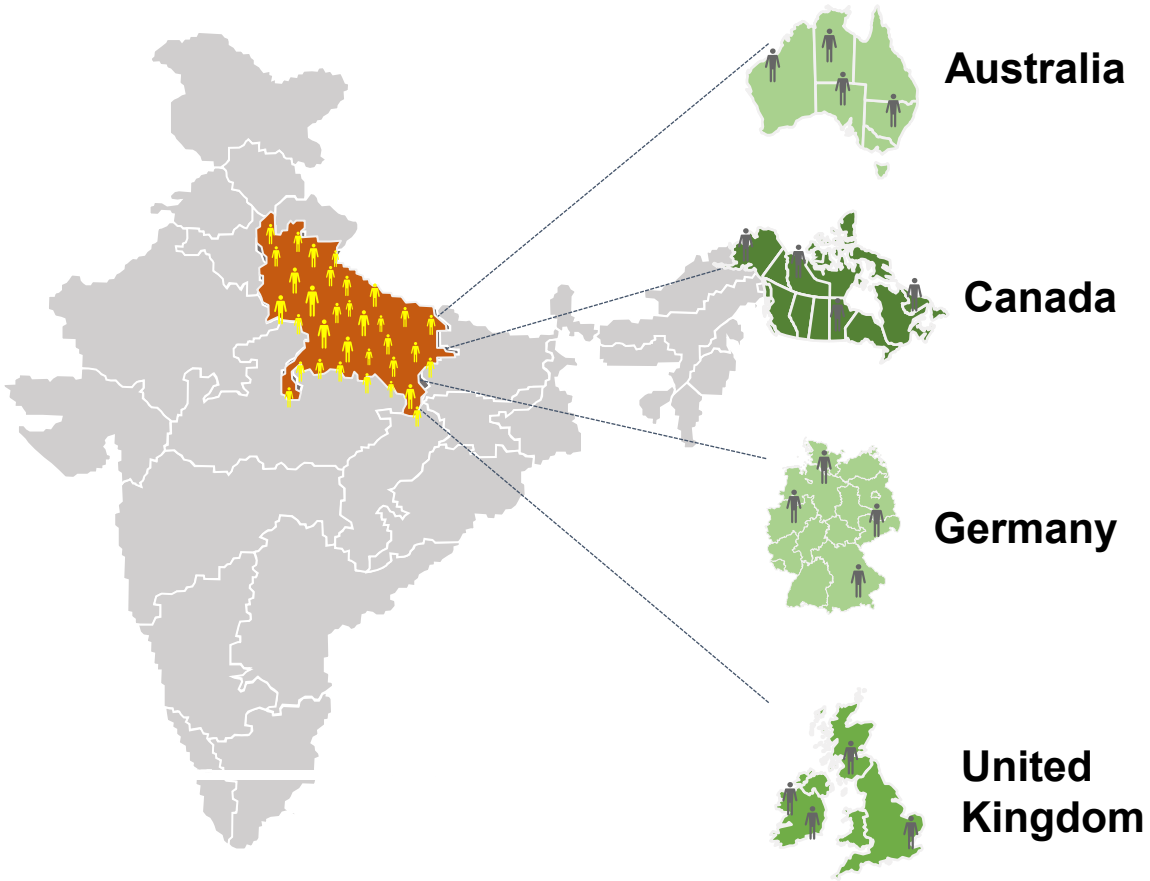
Uttar Pradesh and its relevance to India and the World

6x the population of California
Over 70% of the population of the entire U.S.



Uttar Pradesh (UP)

235 million population

78% Rural; **106,000** villages, **75** districts

6 Million Pregnancies/year

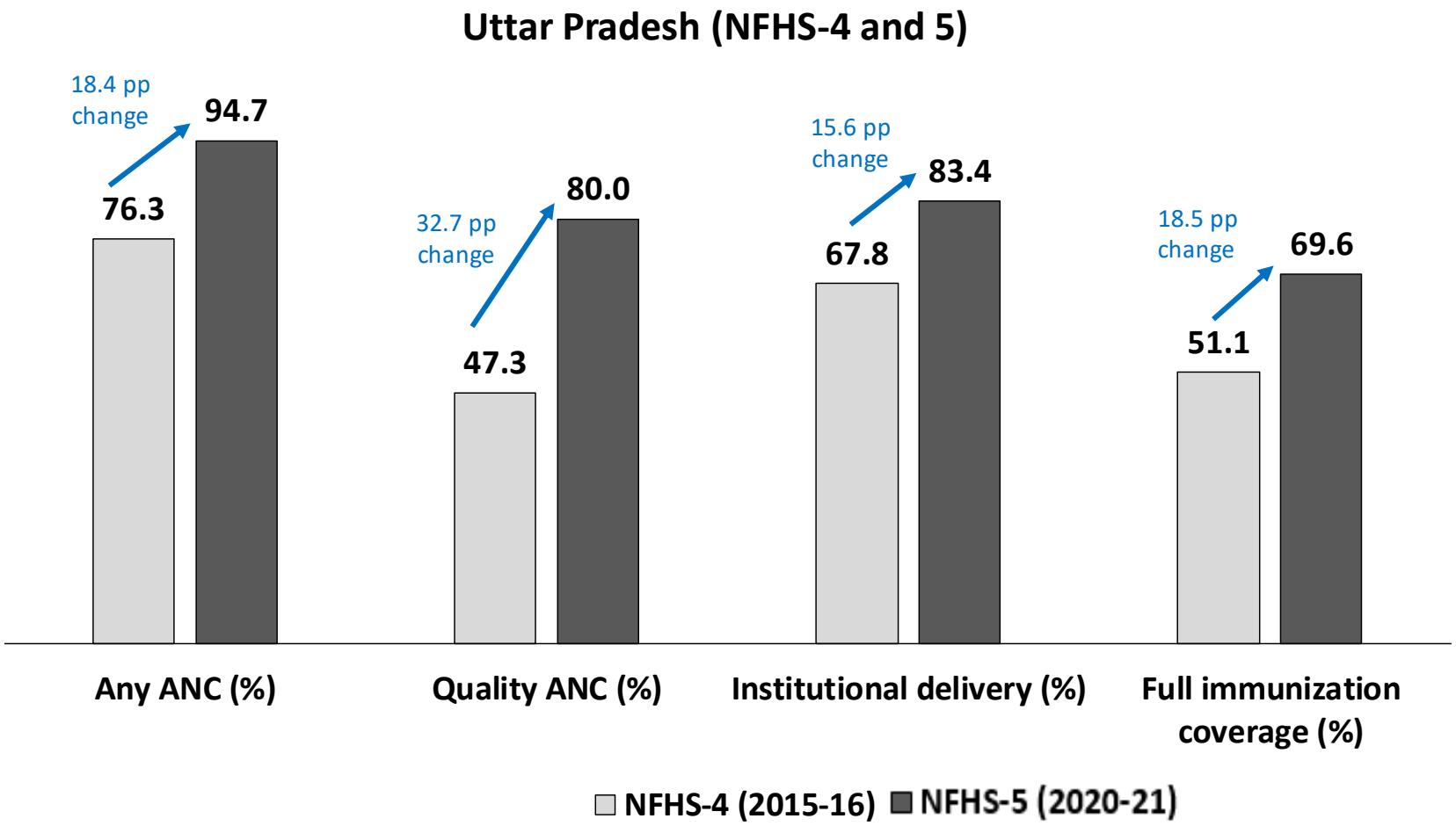
9K+ maternal deaths/year
- 4% of global maternal deaths
- 33% of India's maternal deaths

170K+ neonatal deaths/year
- 7% of global neonatal deaths
- 26% of India's neonatal deaths

210K+ infant deaths/year
- 9% of global neonatal deaths
- 26% of India's neonatal deaths

Source(s):https://www.who.int/healthinfo/global_burden_disease/GlobalHealthRisks_report_part2.pdf?ua=1
NFHS 2016, SRS 2016, Census 2011
India state level disease burden initiative

While there has been considerable improvements in many MNCH indicators over time, yet many are "left behind"



Health inequity framework that targets ‘left behinds’

Literature around **‘inverse equity hypothesis’** where individuals with higher socio-economic position expected to have better reach to the interventions first followed by others; causing inequities

Even after improvement in access, a small proportion still remain unreached.

Program would need to know:

Who are the unreached?

- Profile, location

Are they unreachable?

- Missed opportunities

How to reach them?

- Context-specific intervention strategies to ensure ‘LNOB’

Need to better understand the heterogeneity in progress of specific intervention

and systematically analyze the patterns and distributions of coverage inequalities to tailor the health interventions

We did this using antenatal care and facility-level delivery as indicators and developed a framework for measuring and analyzing inequalities *(using education as a stratifier)* to guide health programmes to accelerate progress and to better reach those left behind

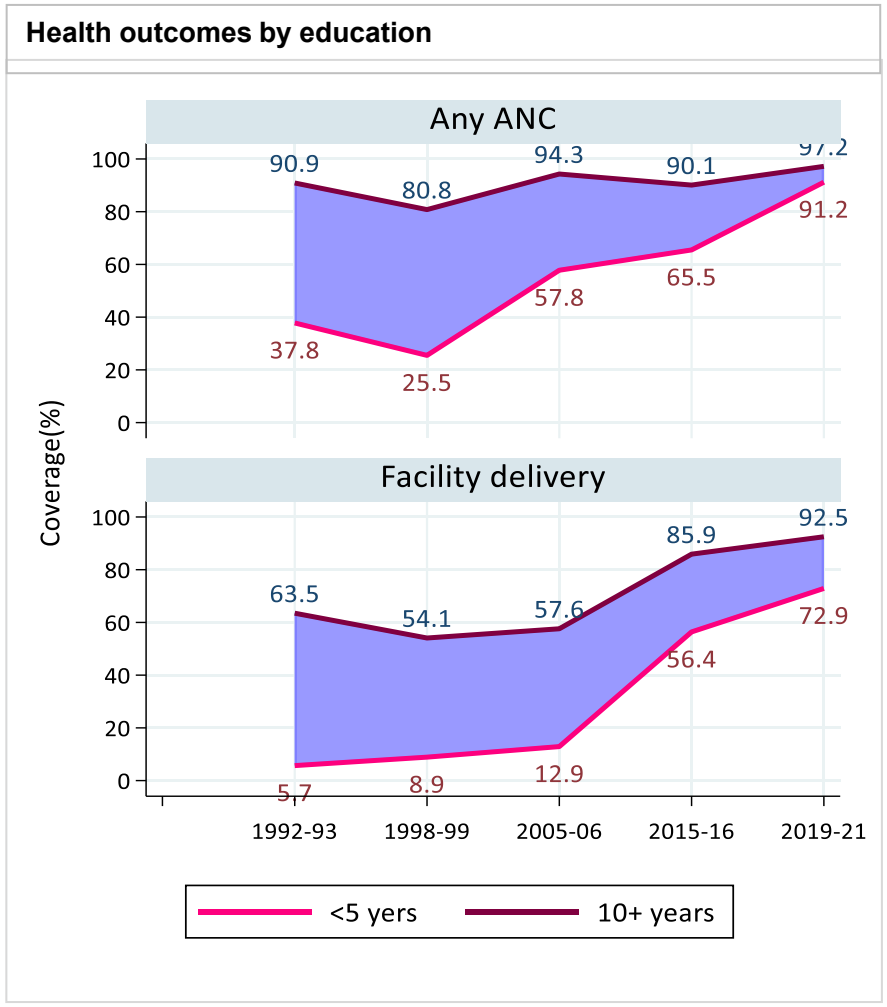
Data:

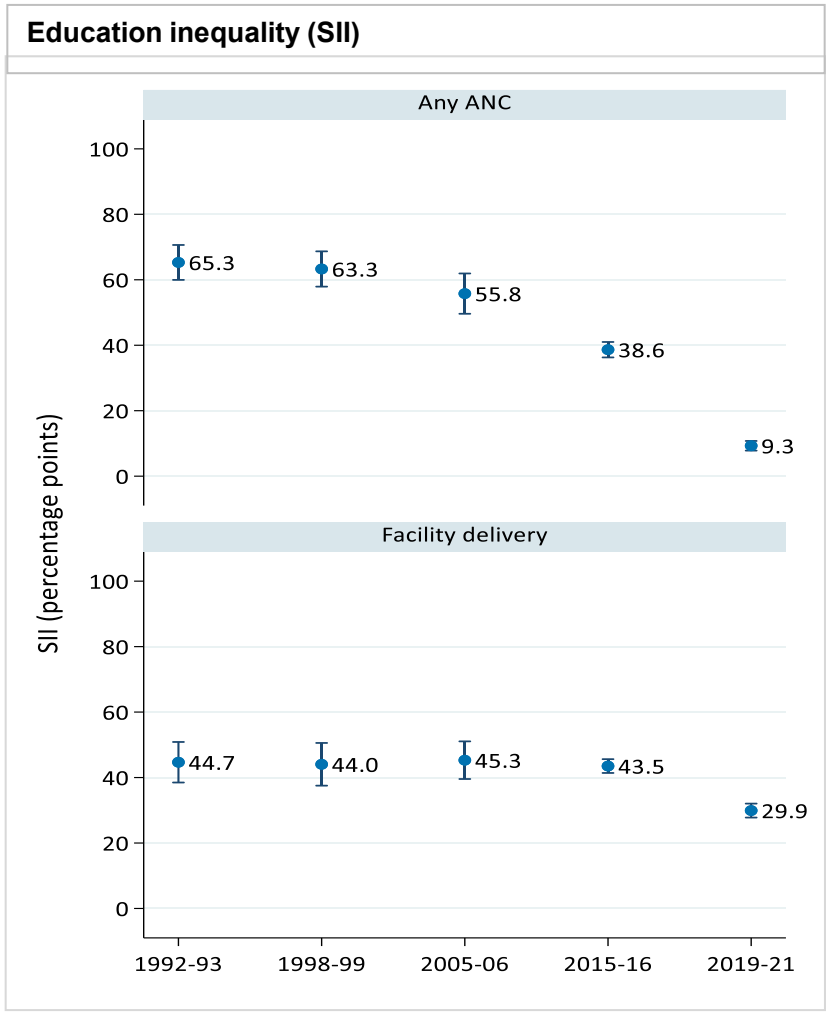
Data and methods

- **Secondary Data**
- **National Family Health Survey (NFHS)**
  - **India & Uttar Pradesh:**
    - Round 1 (1992-93) to Round 5 (2019-21)
- **Community Behaviour Tracking Survey (CBTS)**
  - **Uttar Pradesh**
    - Round-1 (2014-15) and Round-6 (2018)
- **Sample size:**
  - **NFHS:** 7,909 births in 1992-93 to 35,766 births in 2019-21 (UP)
  - **CBTS:** 11,008 and 4,647 eligible women in the two rounds, respectively.

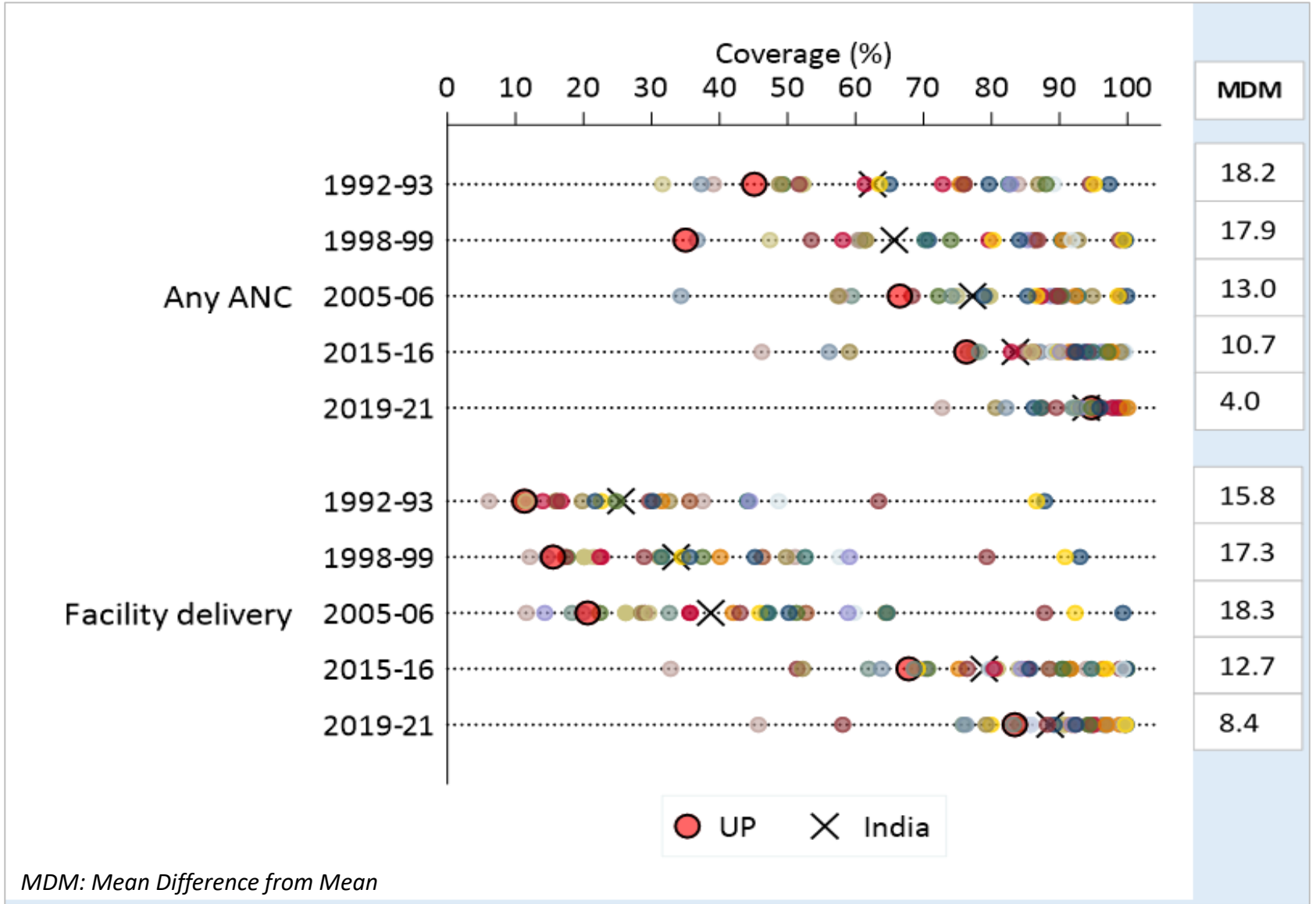
- **Outcomes:**
  - Antenatal Care
  - Facility delivery
- **Analysis:**
  - Slope Index of Inequality (SII)
    - a regression-based, weighted measure of inequality that calculates the absolute difference between the predicted values of the highest category and the lowest category
  - Inequality pattern index
  - Equiplots
  - Bi-variate distributions
  - Stratifier: Education (< 5 years, ‘5–9 years and 10 + years)

In UP, ANC and facility delivery coverage followed a general pattern of socioeconomic inequalities consistent with the inverse equity hypothesis





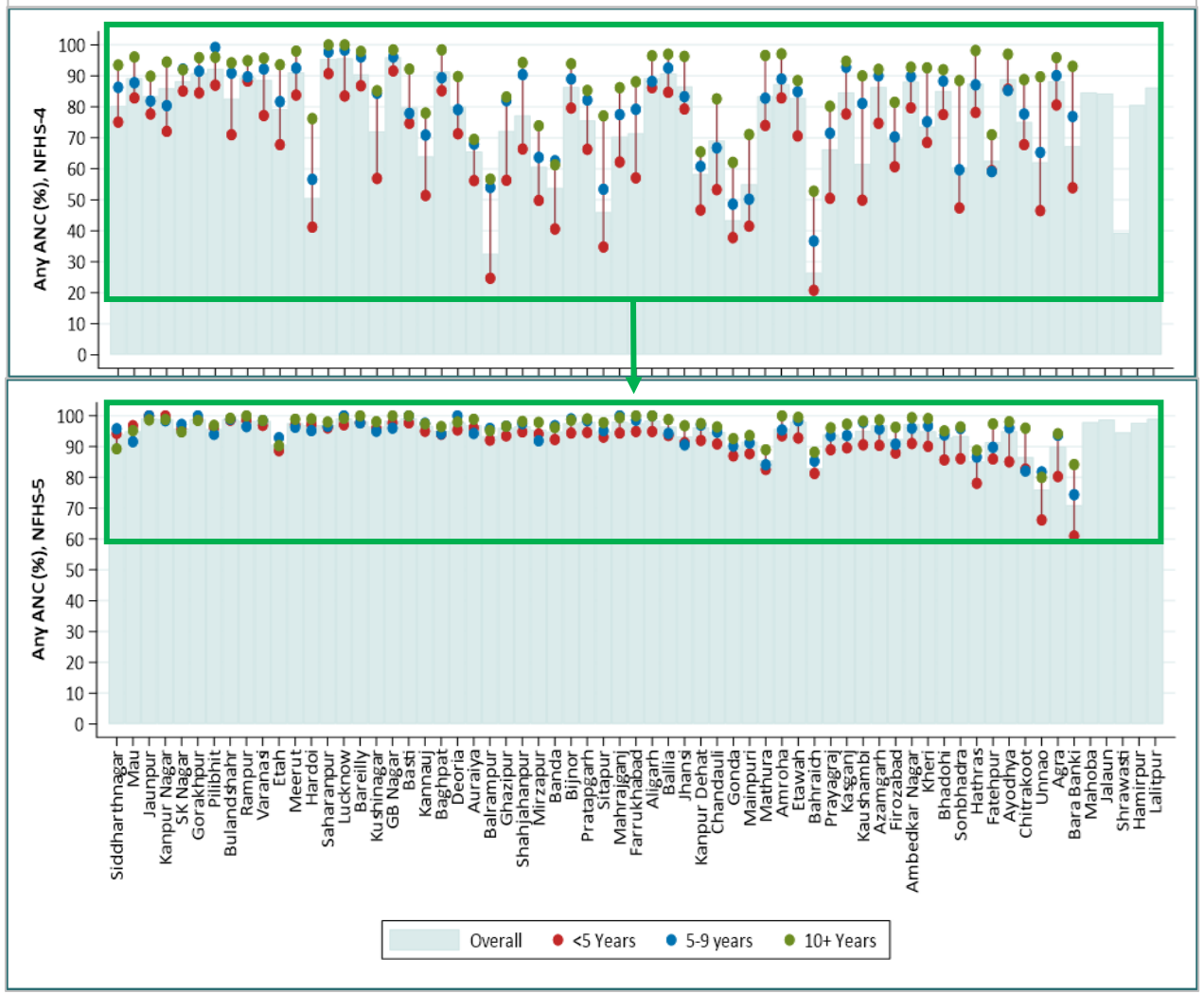
Reduced inequality leading to improved coverage at the state-level



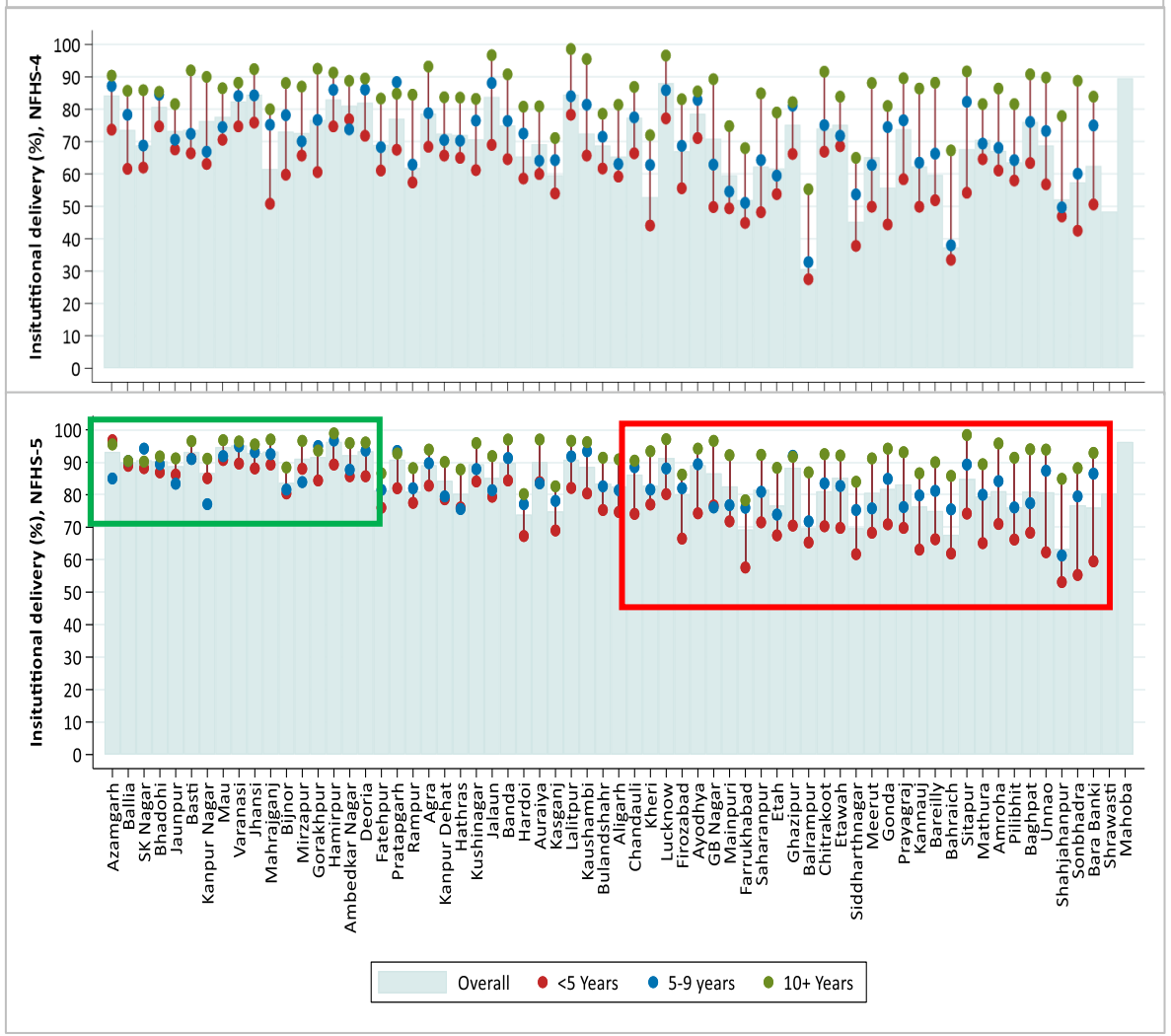
MDM: Mean Difference from Mean

However, progress in inequalities differed by districts and indicators

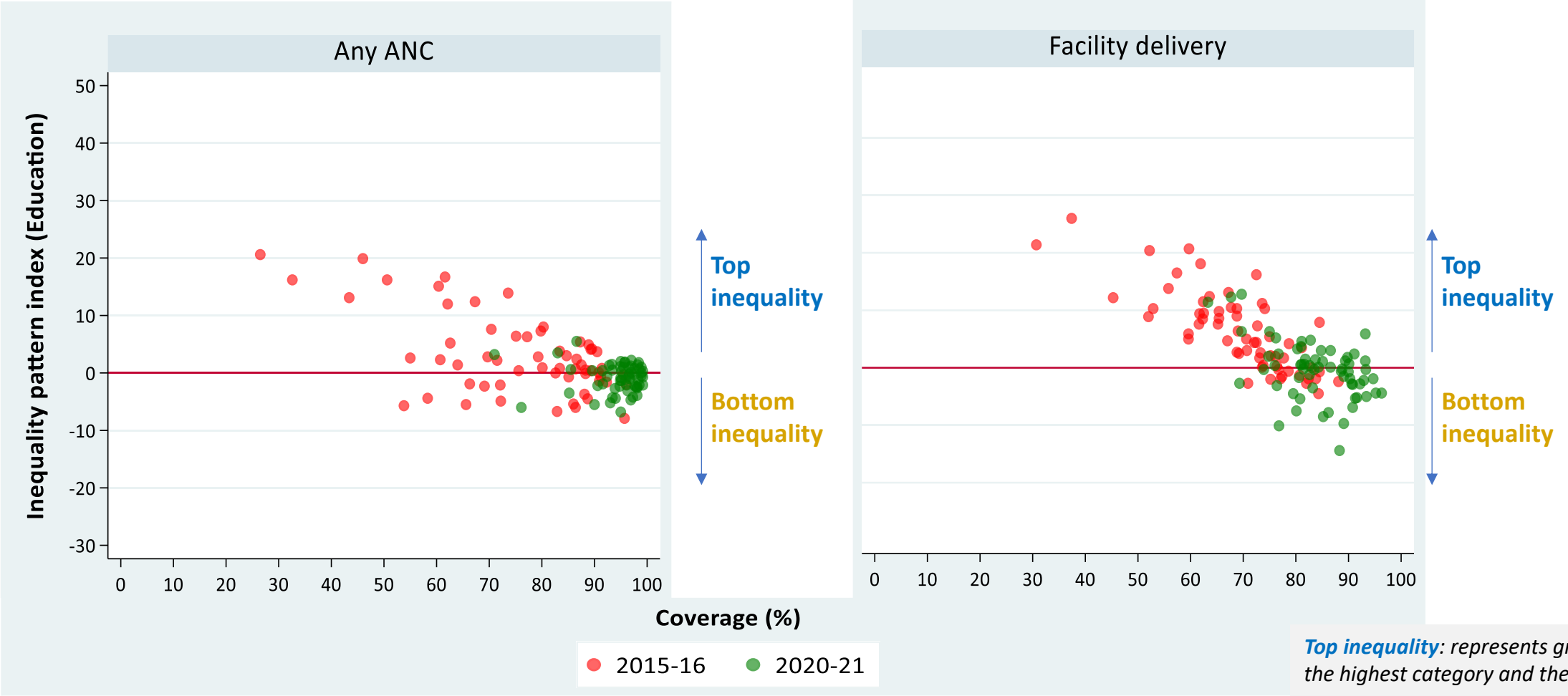
Districts level inequalities in Any ANC between NFHS-4 and NFHS-5



Districts level inequalities in Facility Delivery between NFHS-4 and NFHS-5



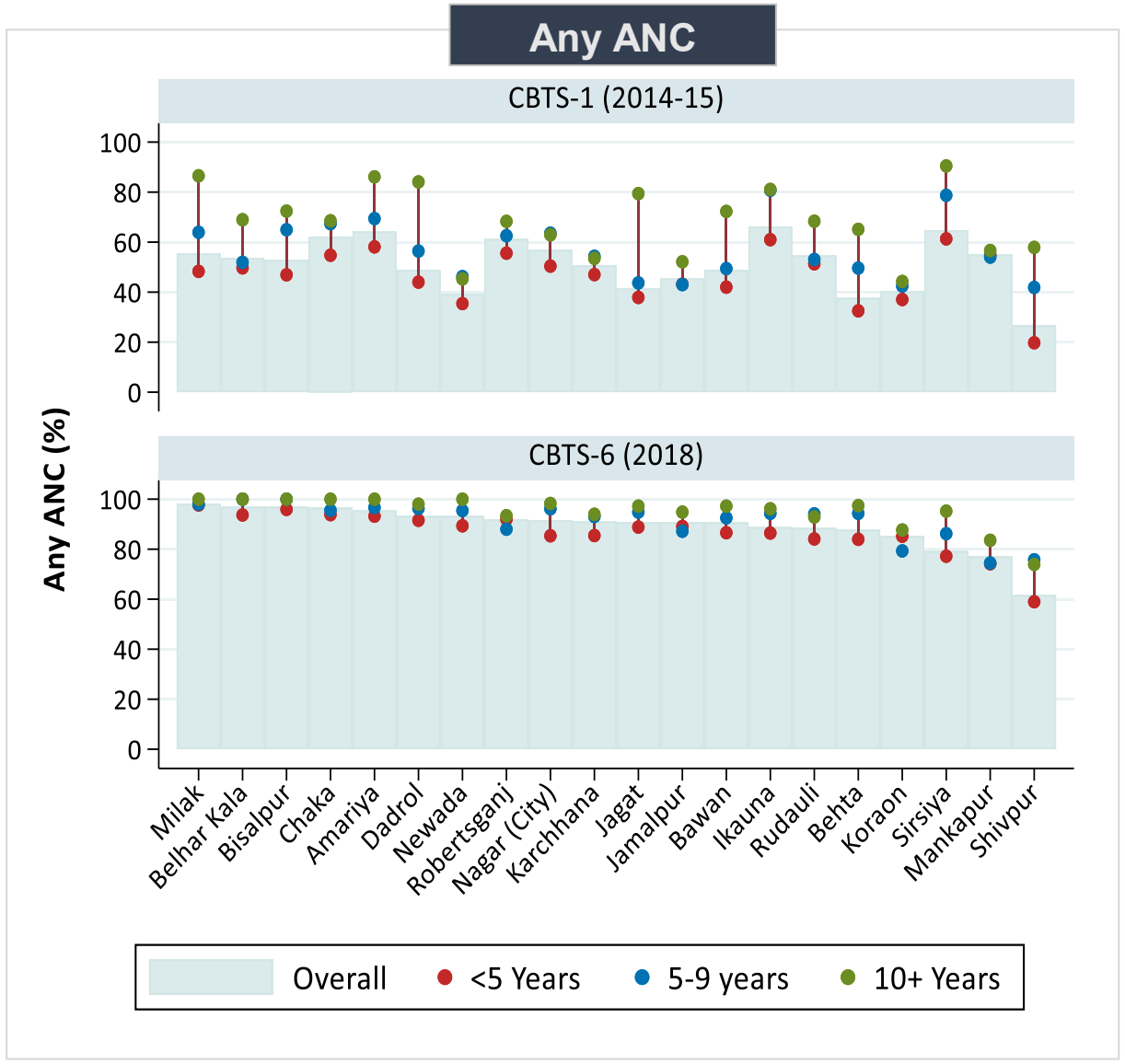
With improved ANC coverage, many districts moved to linear or bottom inequality; same not true with delivery

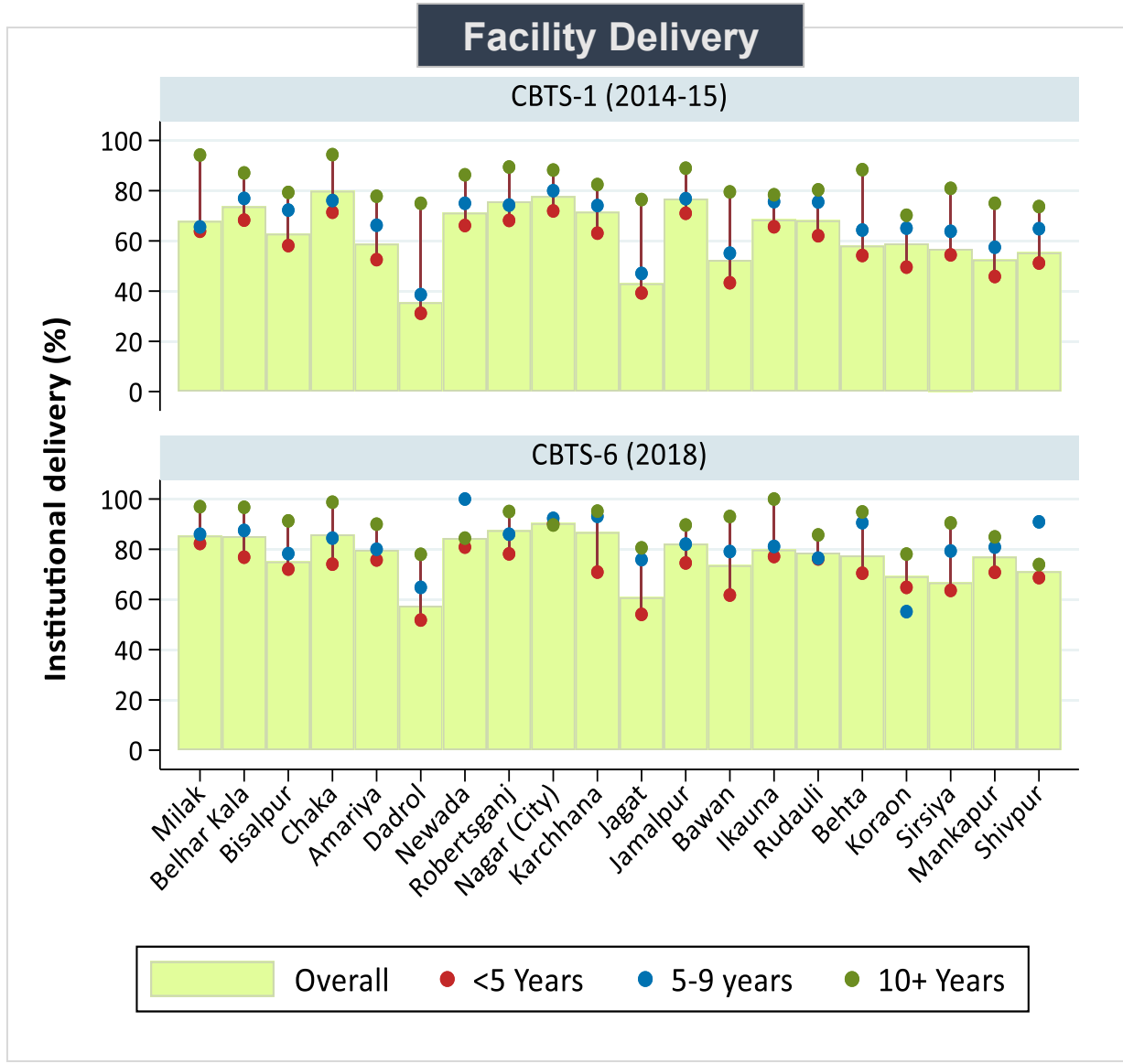


***Top inequality**: represents greater gaps between the highest category and the overall average*

***Bottom inequality**: represents greater gaps between the lowest category and the overall average*

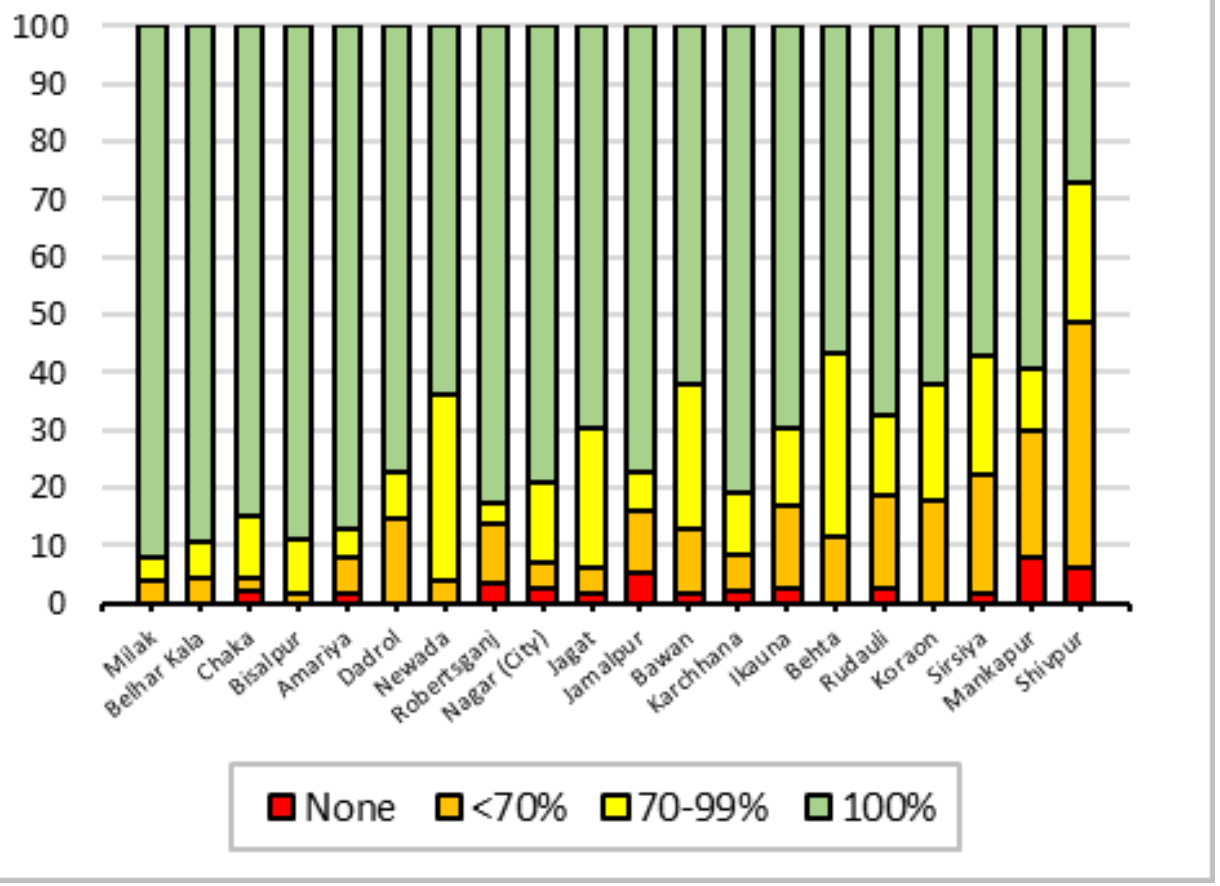
Inequalities persisted at the block level for facility delivery



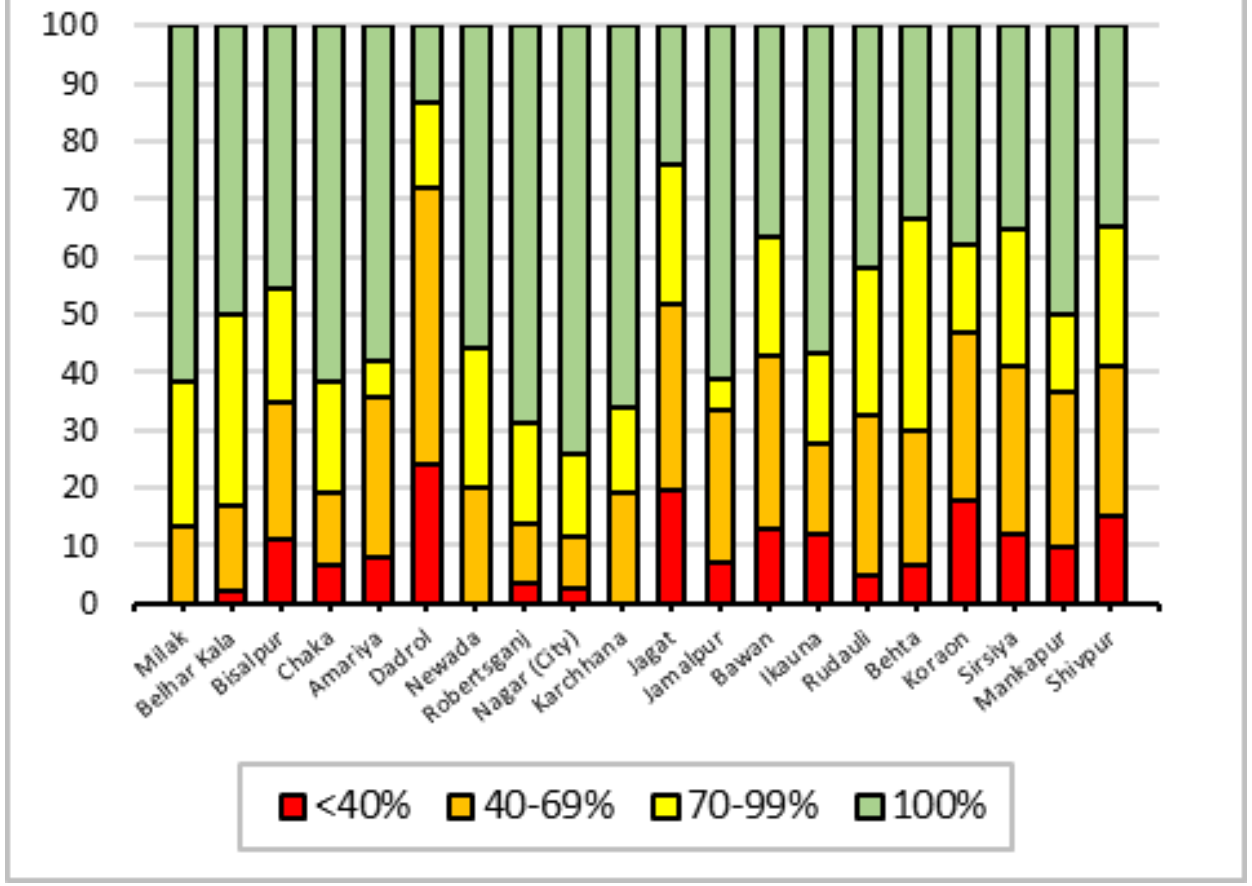


ASHA area level variations within the blocks

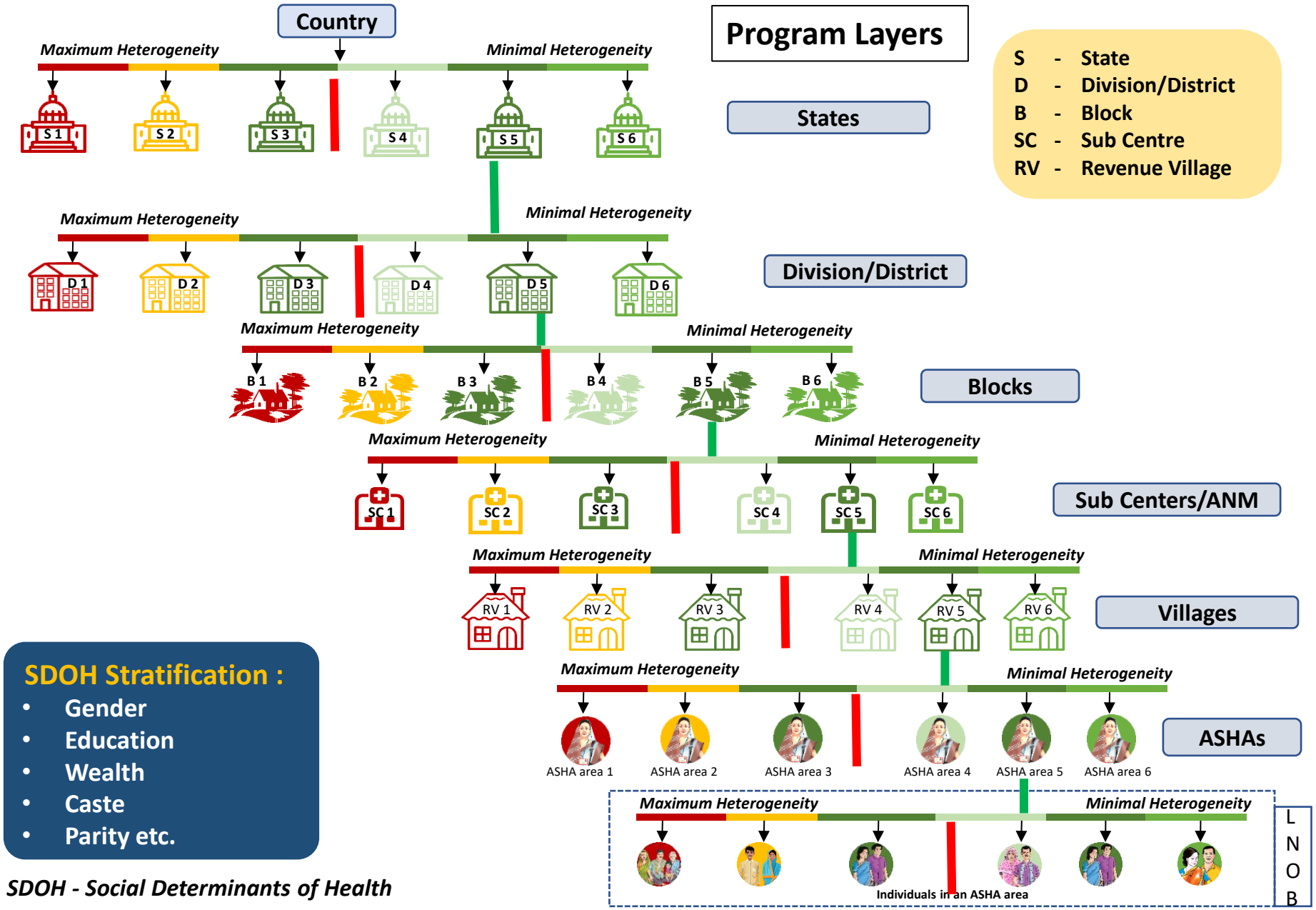
Any ANC



Facility Delivery



Health Equity Framework for Program (HEFP)



SDOH Stratification :

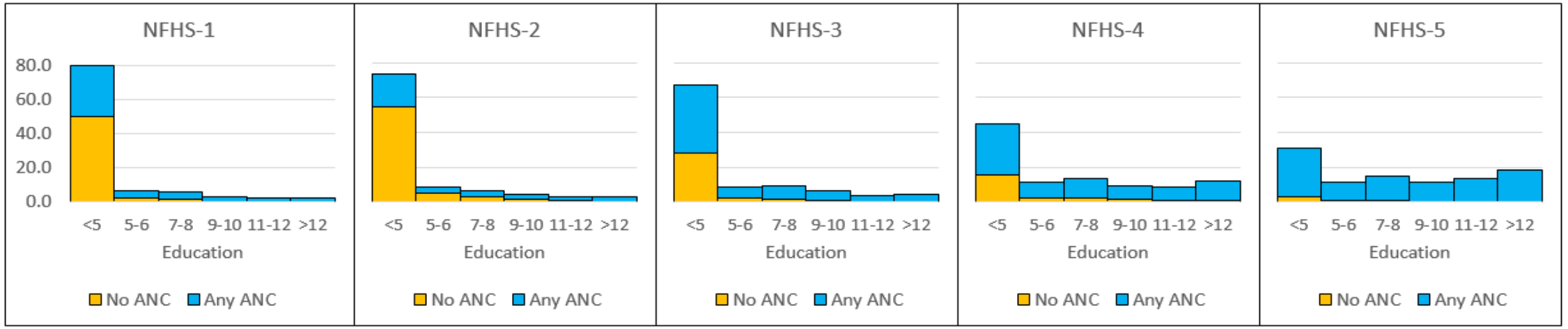
- Gender
- Education
- Wealth
- Caste
- Parity etc.

SDOH - Social Determinants of Health

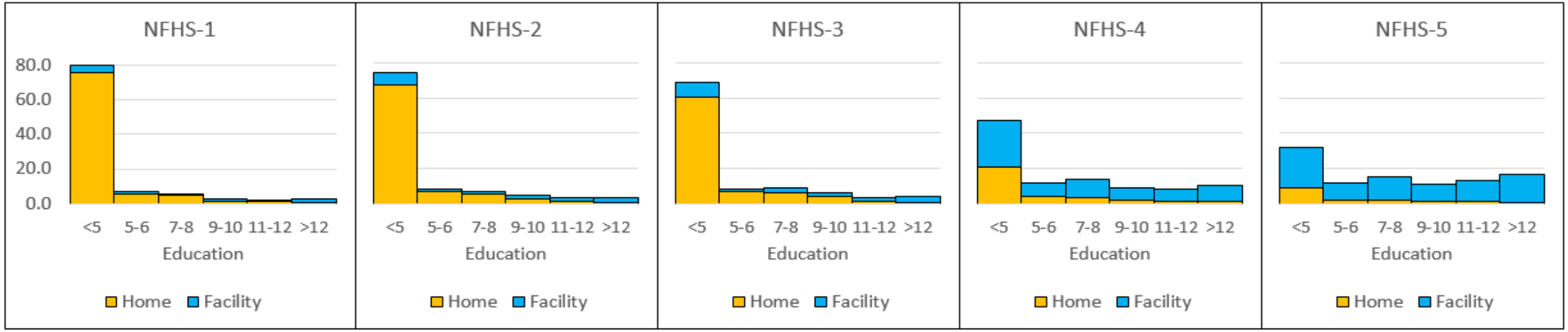
Coverage

Proportion of women by ANC and facility delivery coverage by level of education

Any ANC

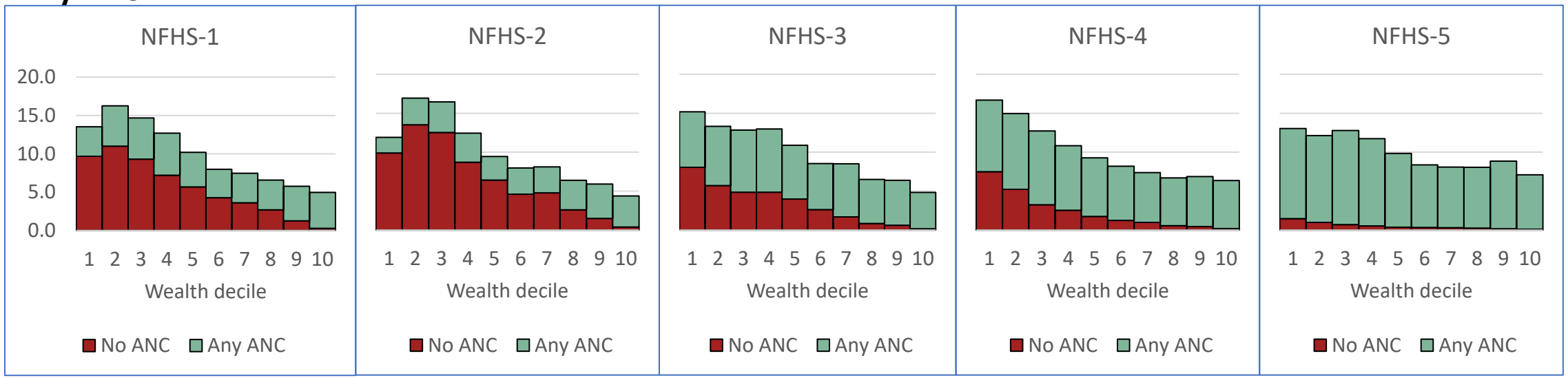


Facility delivery

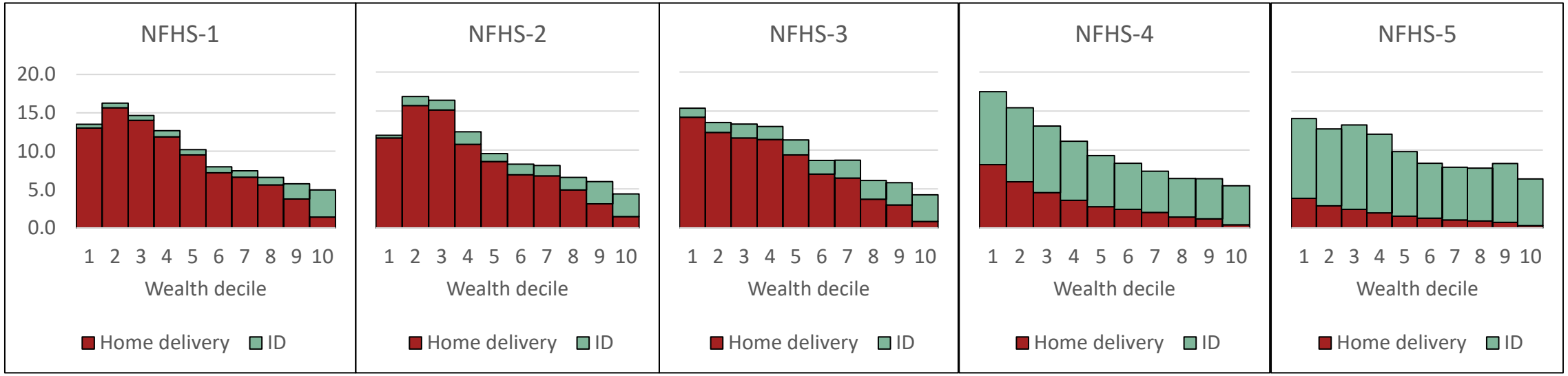


Proportion of women by ANC and facility delivery coverage by wealth deciles

Any ANC



Facility delivery



Learnings

- State-level coverage in various health indicators witnessed considerable increase between 1992-2021; in most situation inequality reduced
- Shift from top inequality to either linear or bottom inequality
- The pattern on inequality varied by different stratifiers for different outcomes and at different levels.
- To achieve LNOB, programmer need to consider the inequality along with the coverage.
  - **If coverage is moderate or low-** program actions are required to improve the same rather than digging inequality at the next layer
  - **If coverage is high and inequality persisted for some stratifiers-** keep on going to the next layer of program delivery to identify the one not able to reach through services

Conclusion

- The proposed framework emphasises the need to analyse inequality measures for different outcomes separately and not combined for focused action.

- Within the same geography, there is a possibility of inequality patterns being different for different outcomes. Hence one can also go beyond geography as a component in this framework

- Need to have granular data- leveraging unitized data platforms for better analysis and programmatic actions.

For more details:

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RESEARCH Open Access

An analytical approach towards attaining leave no one behind using patterns and distributions of inequalities in antenatal and facility delivery coverage in Uttar Pradesh, India

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Abstract

Background Leave No One Behind (LNOB) is a central, transformative promise of the 2030 Agenda for Sustainable Development Goals. To attain LNOB, systematic analysis of patterns and distributions of inequalities in coverage of health outcomes on a continuous basis at different program delivery layers is required to design tailored health interventions. We analysed the patterns of change and geographic distribution of inequalities in coverage of antenatal care and facility-based delivery in Uttar Pradesh (UP), India and developed a framework to guide health programmers to understand inequalities better, to accelerate progress by reaching those left behind.

Methods Data from five-rounds of National Family Health Survey (1992–2021) and two-rounds of Community Behaviour Tracking Survey (2014–2018) is used. Education and wealth have been used as stratifiers. Three measures of inequality- mean difference from mean, slope index of inequality, and inequality pattern index are used to depict the state, district and sub-district level inequalities.

Results UP observed a substantial reduction in the education-related inequality in ANC and facility-delivery during 1992–2021. The slope index of inequality declined from 65.3 [95%CI:60.0-70.6] to 9.3 [95%CI:7.8–10.8] for ANC and from 44.7 [95%CI:38.5–50.9] to 29.9 [95%CI:27.8–32.0] for facility-delivery during 1992–2021. The inequality pattern index showed that, with improved reach of interventions, many districts moved towards bottom inequality from top inequality for any ANC while fewer districts for facility-delivery. Even in districts with high coverage and low inequality, sub-district level(blocks) inequality persisted. Similarly, in blocks with high coverage and low inequality, Accredited Social Health Activist (ASHA) level inequality persisted. Interestingly, for the same ASHA area, the patterns of inequality differed for any ANC and facility delivery; in some districts, inequality direction changed based on the stratifier chosen.

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Thank You

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