Inequality in the Utilisation of Maternal Healthcare Services
Evidence from Indian States

SOHINI PAUL

How the pattern of inequality in maternal healthcare service utilisation has evolved after the adoption of the National Rural Health Mission in 2005 is analysed here and the absolute as well as relative measures of inequality at the state level are estimated. National Family Health Survey data from the third round (2006) and the fourth round (2016) shows that inequality has declined but poor women in poor states still have a long way to go to catch up with even the poor in rich states. By 2016, 10 years after the implementation of the NRHM, the utilisation of maternal healthcare services by poor women in well-performing states was higher than the utilisation of similar services by rich women in poorly performing states.

A high maternal mortality rate, along with persistent inequality in maternal healthcare service utilisation and maternal health outcomes, is a serious concern in India. Although there has been a significant decline in the maternal death rate in recent years, India still accounts for one-fifth of global maternal deaths annually (WHO 2015). In this paper, the objective is to study how maternal healthcare services coverage has improved while inequality in maternal healthcare utilisation has declined across 29 states in India after the implementation of the National Rural Health Mission (NRHM) in 2005.

The Indian government launched the NRHM in 2005 to eradicate persistent inequalities by providing good quality and affordable healthcare services to all, especially to the socio-economically weaker sections of society (M.o.H.F.W. 2005). One of the important components of the NRHM is a conditional cash transfer programme—the Janani Suraksha Yojana (JSY)—to provide financial support to poor women to enable them to give birth in healthcare facilities (Lim et al. 2010). The programme provided financial support to all women undergoing institutional deliveries in 18 states with poor maternal and child health indicators and to poor women alone in the remaining 10 states. The high-focus states were Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Jammu and Kashmir, Manipur, Mizoram, Meghalaya, Madhya Pradesh, Nagaland, Odisha, Rajasthan, Sikkim, Tripura, Uttarakhand, and Uttar Pradesh.

To ensure that NRHM services were accessible to all at the grassroots level, the programme deployed front-line health workers—accredited social health activists (ASHAs)—who served as the link between the community and the public health system. The NRHM was subsequently restructured as the National Health Mission (NHM) in 2013 to serve a wider population (M.o.H.F.W. 2013).

Even a decade after the implementation of the NRHM, maternal, newborn, and child health (MNCH) outcomes in India are yet to reach the targets set by different international conventions—for example, the maternal mortality rate (MMR) was 130 per 1,00,000 live births in 2014–16, as against the United Nations Millennium Development Goal of reducing the MMR to 109 per 1,00,000 live births by 2015 (NITI Aayog nd). The MMR also varies widely across different states, ranging from a low of 46 per 1,00,000 live births in Kerala to a high of...
237 per 1,00,000 live births in Assam. Tamil Nadu (66) and Andhra Pradesh (74) are among the better performing states, while Uttar Pradesh (201), Rajasthan (199), Odisha (180), Madhya Pradesh and Chhattisgarh (173), and Bihar and Jharkhand (165) have high MMRs. How has the utilisation of MNCH services changed across states after the implementation of the NRHM and against the backdrop of wide variations in socio-economic status and uneven access to maternal healthcare services?

Historical evidence suggests that the use of antenatal as well as childbirth care services was higher in the southern states than in the northern states before the implementation of the NRHM (Govindasamy and Ramesh 1997). Some studies note how inequalities in institutional delivery care coverage evolved across different states following the implementation of the NRHM. For example, Randive et al (2013) found that institutional delivery care coverage increased from 20% to 49% in nine high-focus (low-performing) states—Assam, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh, and Uttar Pradesh—during 2005–10. Although coverage improved, the gap between the rich and the poor in accessing institutional delivery care remained significantly high. Another study, using data from 2009–10 from a population surveillance system, found that Odisha and Jharkhand showed similar results (Thongkong et al 2017). Vellakkal et al (2017) found that inequality in antenatal and neonatal care coverage decreased after the adoption of the NRHM in high-focus states, including Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh, Uttarakhand, and seven north-eastern states. The study also showed that there was a greater decline in inequality in institutional delivery care compared to antenatal care (ANC). A case study from Haryana also revealed inequality in the use of ANC services (Ray et al 2018).

A pro-rich bias has been observed in the use of healthcare services across different states due to the high out-of-pocket expenditure required and other supply-side barriers, including the low quality of services, inadequate infrastructure, and long distance to hospitals (Modugu et al 2012). Although various studies using different data sets and focusing on different states indicate that the coverage of specific maternal healthcare services increased immediately after the implementation of the NRHM, inequality is still a matter of concern. None of the studies, to the best of my knowledge, captured whether the level of inequality has decreased across states and the continuum of maternal healthcare—that is, ANC, care during child delivery, and postnatal care (PNC)—due to the limited availability of data at the national level. Recently published data from the National Family Health Survey-4 (NFHS) and Demographic and Health Survey (DHS) data from India provide an opportunity to fill this gap in the literature. The objective of this paper is to study the extent to which the use of maternal healthcare services has improved among the poor versus the rich, and the extent to which inequality in maternal healthcare utilisation has reduced in 29 Indian states. Which states have become more equitable or more inequitable across health indicators and which components of MNCH care remain the least and most equitably accessed across states during the period 2006–16 are also examined.

**Methods**

The data analysed for the 29 states were taken from NFHS-3 and 4 (IIPS and Macro International 2007; IIPS and ICF 2017), conducted in 2005–06 and 2015–16, respectively. The NFHS employs the same sampling methodology and survey instruments as the international DHS. These nationally representative surveys followed a multistage, stratified sampling technique; at the final stage, households are selected using a systematic sampling method. Like the DHS, the NFHS is based on interviews with women aged 15 to 49 years and collects information on the availability and accessibility of maternal healthcare services along with information on their demographic and economic characteristics. Detailed information on maternal healthcare services is available on the three stages of the care continuum—ANC, child delivery, and PNC. The NFHS-3 and the NFHS-4 covered 1,24,385 and 6,99,686 women, respectively. The analysis focuses on MNCH care sought for the last birth among ever-married women aged 15–49 years who had given birth in the five years before the survey. Thus, the final analytical sample sizes become 36,850 and 1,86,721 for 2005–06 and 2015–16, respectively. National-level sampling weights were used to adjust for sample selection. The data analysis was performed with Stata 13.1 (StataCorp 2013).

**Key Outcome Variables**

A comprehensive list of maternal healthcare services spanning the three stages of the care continuum was selected. The ANC outcome variables consisted of the following: whether women had their first antenatal check-up in the first trimester of pregnancy; whether a pregnant woman received four or more antenatal check-ups; whether she received at least two doses of tetanus toxoid (Tt2+) injections; whether she consumed iron and folic acid (IFA) supplements for at least 100 days; whether a woman received comprehensive health check-ups during pregnancy, comprising five check-ups, including measurement of weight and blood pressure and a blood test, urine test, and abdominal examination. If a woman had undergone all five tests and check-ups at least once, they were assigned a score of 5 and created a binary variable where women with the score 5 are assigned the value 1 and the rest were assigned a value of 0. The outcome variables relating to child delivery included whether the woman had an institutional delivery and whether she had skilled birth attendance during delivery; the postnatal outcome variable tracked whether she received a health check-up within 48 hours of child delivery. Like the ANC comprehensive health check-up binary, binary variables were created for each of the other outcome variables, where a woman who received the respective service was assigned the value 1 and the rest were assigned a value of 0.

**Methodology**

The sample households were divided into quintiles according to their wealth score in their respective states: poorest (Q1), poor (Q2), middle class (Q3), rich (Q4) and richest (Q5). The proportion...
of average coverage for the three groups of women was estimated for each of the MNCH service indicators: (i) all ever-married women, (ii) ever-married women in the poorest quintile (Q1), and (iii) ever-married women in the wealthiest quintile (Q5). Those estimates were then compared across two time points, 2006 and 2016, capturing the pre- and post-NRHM eras, respectively, to understand how maternal healthcare services utilisation had changed over the decade across each of the 29 states.

The extent to which inequality in the utilisation of MNCH services had narrowed between 2005–06 and 2015–16 across states was also assessed by using both absolute and relative measures of inequality. Two measures of absolute inequality are estimated: the absolute gap in coverage between the poorest (Q1) and richest (Q5) women, and the slope index of inequality (SI), which refers to the absolute difference between Q1 and Q5 in the predicted values of an indicator, estimated using logistic regression (Pamuk 1985; Regidor 2004). The measures of relative inequality were also calculated: the ratio between Q5 and Q1 and the concentration index (CI), which quantifies the extent to which a health service coverage indicator is concentrated among the poorest or the richest (Wagstaff et al 1991). CI is expressed on a scale of 0 to 1, where a value of 0 indicates perfect equality, a higher positive value indicates that the health service is availed of more by rich women, and 1 indicates perfect inequality. All the estimation has been done using appropriate sample weights at the state level.

**Result**

The overall utilisation of maternal healthcare services improved in most of the 29 states during the decade, although the magnitude of improvement varied across states as well as across different service components. The highest improvement for each component of maternal healthcare services across states is presented in Table 1.

Table 1: Highest Increase in Utilisation of Maternal Healthcare Services across States during 2006–16

<table>
<thead>
<tr>
<th>Indicator</th>
<th>State</th>
<th>Extent of Improvement during 2006–16 (% Points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC comprehensive health check-ups</td>
<td>Chhattisgarh</td>
<td>18–77</td>
</tr>
<tr>
<td>Institutional delivery</td>
<td>Chhattisgarh</td>
<td>15–72</td>
</tr>
<tr>
<td>Postpartum check-ups within two days of delivery</td>
<td>Uttar Pradesh</td>
<td>13–59</td>
</tr>
<tr>
<td>Skilled assistance at birth</td>
<td>Rajasthan</td>
<td>44–88</td>
</tr>
<tr>
<td>At least four antenatal check-ups</td>
<td>West Bengal</td>
<td>39–76</td>
</tr>
<tr>
<td>IFA consumption at least for 100 days</td>
<td>Tamil Nadu</td>
<td>28–64</td>
</tr>
<tr>
<td>At least one antenatal check-up during the first trimester</td>
<td>Rajasthan</td>
<td>34–63</td>
</tr>
<tr>
<td>At least two doses of tetanus injections</td>
<td>Mizoram</td>
<td>51–72</td>
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</tbody>
</table>

IFA = Iron and folic acid. Source: Author’s calculation.

Goa, Kerala, and Tamil Nadu remained the best-performing states during 2006–16, with the overall utilisation of maternal healthcare services hovering between 80% and 100% for almost all indicators. Punjab and Himachal Pradesh performed moderately well over that time. Incidence of institutional deliveries and receiving TT2+ was high in most states in 2015–16. For example, more than 80% of women in 16 out of 29 states gave birth in health facilities in 2015–16, in the presence of skilled birth assistants, while more than 80% of pregnant women in 23 states took TT2+. Like all other states, usage of care services during child delivery and PNC improved more than ANC in high-focus states, including some of the north-eastern states. Utilisation of different components of ANC—including antenatal comprehensive health check-ups, at least four ANC visits, at least one ANC visit in the first trimester, and IFA consumption for at least 100 days—remained very low in Bihar, Nagaland, and Uttar Pradesh, and moderately low in Jharkhand, Madhya Pradesh, Rajasthan, and Uttarakhand. Consumption of at least 100 IFA tablets during pregnancy increased very slowly during 2006–16. It reached 67% in Goa and Kerala, the better performing states, by 2015–16, whereas only 4% of women consumed the required IFA supplements during pregnancy in Nagaland, one of the states most lagging in maternal healthcare services utilisation.

Coverage of these services was, in general, low among poor women during 2006. It was even lower in the high-focus states. Although utilisation increased in those states in 2006–16, it is still significantly lower than in the better performing states. On the contrary, there is little difference in coverage among poor and rich women in Kerala and Goa. Poor women in these two states use most of the maternal healthcare services, more than even the rich women of Bihar, Uttar Pradesh, and the north-eastern states. A large proportion of rich women in Goa, Kerala, Maharashtra, and Tamil Nadu gave birth in health facilities, while the consumption of IFA supplements is still low even among the rich in these states (55% in Maharashtra compared to 72% in Kerala).

The share of women receiving institutional delivery care and PNC increased more than that of ANC services at the national level as well as in many states (Paul forthcoming). One of the major focus areas of the NRHM was promoting institutional delivery among the poorest section of society through cash incentives, especially in the poorly performing states. After 10 years of NRHM implementation, poor women in some of these states—such as Chhattisgarh (from 3% to 54%), Madhya Pradesh (from 9% to 61%), Odisha (from 10% to 69%), and Rajasthan (from 11% to 74%)—experienced a more than 50% increase in institutional delivery care.

**Maternal Healthcare Utilisation: Inequality across States**

Inequality in the utilisation of MNCH services by household economic status declined between 2005–06 and 2015–16 at the national level (Paul forthcoming). Although inequality declined in most states as well, differences in economic status, uneven
access, and varied coverage of maternal healthcare services led to considerable inequality across states in the use of maternal healthcare services across different stages of continuum of care. The states were categorised in terms of the magnitude of the decline in inequality over the past decade, by using both absolute and relative measures (Tables 2 and 3, p 41). Inequality measures are reported in detail in Appendix Tables A1 and A2 (p 44).

Inequality in the use of almost all the MNCH services was low in Goa and Kerala during 2006–16. The pace at which inequality reduced was promising in Maharashtra, followed by Punjab and West Bengal. Goa and Sikkim, along with the four major southern states of Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu, showed consistently high levels of equality across all the eight components of maternal healthcare services in 2015–16. Inequality across wealth quintiles among women receiving their first ANC check-up in the first trimester became zero in Sikkim, followed by Karnataka, Goa, Kerala (0.01 point in the CI; 3%, 4%, and 7%, respectively, in the sII), and Tamil Nadu (CI 0.02 point; sII 10%). For at least four ANC visits, zero inequality was observed in Sikkim (in terms of the CI), Karnataka and Kerala (CI as well as sII), followed by Goa, and Tamil Nadu (CI-o.01 point), and Andhra Pradesh (CI-o.03 point). Relative inequality has been almost wiped out in terms of taking TT2+ in Andhra Pradesh, Chhattisgarh, Goa, Karnataka, Kerala, Maharashtra, Odisha, Sikkim, and Tamil Nadu, while absolute inequality in the consumption of IFA tablets in terms of the sII varied from 0% to 10% in Goa, Kerala, and Sikkim. Institutional delivery and skilled assistance remained highly equitable in all four major southern states and in Goa, Maharashtra, and Sikkim. Rates of postpartum check-up within two days of childbirth were also more equitable in Andhra Pradesh, Goa, Karnataka, Kerala, Punjab, Sikkim, and Tamil Nadu.

Inequality, however, was still high in some of the high-focus states in 2015–16. For example, absolute inequality in receiving at least one ANC visit during the first trimester in terms of the sII was the highest in Rajasthan (48%); for at least four ANC visits was highest in Mizoram (66%); for at least two tetanus injections was highest in Nagaland (50%); for the consumption of IFA tablets for at least 100 days during pregnancy was highest in Manipur (56%); for comprehensive health check-ups during pregnancy was highest in Jharkhand (63%); for institutional delivery and use of skilled assistants were highest in Arunachal Pradesh (76% and 77%, respectively); and for a postpartum check-up within two days of delivery, sII was highest in Mizoram (54%). Although absolute inequality increased over time in states like Mizoram, Nagaland, and Uttar Pradesh, relative inequality declined for all states across each of the components. Relative inequality, measured in terms of the CI for ANC indicators—like receiving an ANC check-up during the first trimester, at least four ANC visits, and consumption of IFA tablets at least for 100 days—ranged from 0.18 points to 0.32 points in Bihar, Jharkhand, Madhya Pradesh, Rajasthan, Uttarakhand, and Uttar Pradesh in 2015–16.
Out of eight maternal healthcare indicators considered in the study, inequality continued to be high in six indicators in Nagaland—the most lagging state—for skilled birth assistance ($SII_{70\%}$), antenatal comprehensive health check-ups and at least two doses of tetanus injections ($SII_{50\%}$), at least four ANC visits ($SII_{51\%}$), and first ANC check-up in the first trimester ($SII_{48\%}$ points). Sikkim was the only north-eastern state that made significant progress in the utilisation of almost all related services during the decade. For example, inequality declined by $71\%$ in comprehensive coverage of ANC check-ups in Sikkim, by $70\%$ in institutional delivery care, by $66\%$ in four or more ANC check-ups, by $60\%$ in the first ANC check-up happening in the first trimester and a postpartum check-up within two days of child delivery in terms of the $SII$.

### Table 2: Trend of Absolute Inequality across States in Terms of Slope Index of Inequality during 2006–16

<table>
<thead>
<tr>
<th>Increased</th>
<th>Decreased By</th>
</tr>
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<tbody>
<tr>
<td>0%–9%</td>
<td>10%–19%</td>
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</table>

#### Antenatal check-up in the first trimester
- UP, BR, CG, HR, HK, JP, MZ, NL
- DL, KL, ML, MN, MZ, RJ, UK
- AR, AS, GA, HK, JK, OR, WB
- GJ, MH, PB, TN, TR
- KA, SK

#### At least four antenatal check-ups
- BR, JP, HK, KL, MN, MZ, NL
- AR, CG, DL, GA, HR, ML, UP
- AP, AS, JK, RJ, TN, UK
- GJ, OR, TR
- PB, WB
- KA, MH, SK

#### At least two doses of tetanus injections
- AP, KL, MZ, TN
- DL, GA, GJ, HR, HK, JK, MH, MN, OR, SK, WB
- AR, AS, BR, HK, JA, RJ, TR, UK

#### Iron and folic acid consumption at least for 100 days during pregnancy
- AS, CG, JH, HK, ML, MN, MP, NL, UP
- BR, GJ, HK, JP, KL, HK, MZ, PB, RJ
- AP, AR, HK, TR, UK, WB
- DL, GA, SK, TN
- KA

#### Antenatal comprehensive health check-ups
- BR, JP, HK, KL, MZ, TN
- GA, MP, MZ
- AR, AS, CG, HK, JK, KL, MN, RJ, UK
- AR, JP, HK, HR, ML, MN, RJ, UK
- AP, DL, MH
- KA, PB, SK

#### Institutional births
- MZ, NL
- AR, KL
- AS, BR, CG, GA, HK, JP, MN, MZ
- AP, CG, MZ, MP, TN, UP
- ML, MP, TN, UK
- AP, PB
- DL, GJ, HK, JP, RJ, TR, WB
- KA, SK

#### Skilled assistance at birth
- AR, KL, NL
- AS, BR, GA, UP
- HP, HK, JL, KL, ML, MN, MZ
- AP, CG, ML, MP, TN, UP
- ML, MP, TN, UK
- GJ, HR, HK, JP, RJ, TN, UK, WB
- AP, PB
- DL, GJ, HK, JP, RJ, TR, WB
- KA, SK

#### Postpartum check-up within two days of delivery
- NL
- AS, BR, GA, UP
- HP, HK, JL, KL, ML, MN, MZ
- AP, CG, ML, MP, TN, UP
- GJ, HR, HK, JP, RJ, TN, UK, WB
- AP, PB
- DL, GJ, HK, JP, RJ, TR, WB
- KA, SK

### Table 3: Relative Inequality across States in Terms of Concentration Index during 2006–16

<table>
<thead>
<tr>
<th>Concentration Index Decreased By</th>
</tr>
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<tbody>
<tr>
<td>0%–4%</td>
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</table>

#### Antenatal check-up in the first trimester
- CG, DL, HR, KL, NL, MP, AG, TN
- HP, UP, MN, MP, AP, GA, TN
- BR, GJ, HK, JK, KA, MH, MZ, OR, PB, UK
- AS, ML, RJ, SK, TR, WB
- AR

#### At least four antenatal check-ups
- GA, KL, NL, TN
- AP, DL, HP, HR, JK, MZ, TN
- ML, MP, MZ, PB, UK
- AR, BR, GJ, HK, KA, MP, PB, RJ
- GJ, HR, HK, JK, RJ, TN, UK, WB
- AP, PB
- DL, GJ, HK, JP, RJ, TR, WB
- KA, SK

#### At least two doses of tetanus injections
- AP, DL, GA, GJ, HK, JP, HR, JK, KL, MZ, MN, MZ, NL, OR, SK, WB
- AS, BR, CG, HK, JA, KA, MP, PB, RJ
- ML, NL, RJ, TR, UK, TR, UK
- AR

#### Iron and folic acid consumption at least for 100 days during pregnancy
- KL
- GA, GJ, HK, MN, UP
- AP, HP, MN, OR, TR
- AS, CG, JK, MZ, SK, TN, WB
- DL, HR, KA, MP, PB, RJ
- BR, UK
- AR, ML

#### Antenatal comprehensive health check-ups
- GA, KL, TN
- AP, DL, HP, HR, JK, KL, MZ, TN
- ML, MP, MZ, PB, UK
- AR, BR, GJ, HK, KA, MP, PB, RJ
- GJ, HR, HK, JK, RJ, TN, UK, WB
- AP, PB
- DL, GJ, HK, JP, RJ, TR, WB
- KA, SK

#### Institutional births
- GA, KL, TN
- AP, MN, MZ
- AR, DL, GJ, HK, JA, KA, MM, NL, PB
- TR, WB
- BR, HR, ML, OR, RJ, SK
- AS, MP, UK, UP
- JH

#### Skilled assistance at birth
- GA, KL, TN
- AP, MN, MZ
- DL, GJ, HK, JK, MZ, NL, PB
- AR, CG, HR, KA, MM, MZ, PB, TR, UK
- AS, ML, RJ, SK, UK
- KA, SK

#### Postpartum check-up within two days of delivery
- GA, KL, TN
- MZ, TN
- AP, DL, GJ, HK, JK, MZ, NL, PB
- AR, CG, HR, KA, MM, MZ, PB, TR, UK
- AS, ML, RJ, SK, UK
- KA, SK

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AP = Andhra Pradesh; AR = Arunachal Pradesh; AS = Assam; BR = Bihar; CG = Chhattisgarh; DL = Delhi; GA = Goa; GJ = Gujarat; HP = Himachal Pradesh; HR = Haryana; JK = Jammu and Kashmir; KA = Karnataka; KL = Kerala; MH = Maharashtra; ML = Meghalaya; MN = Manipur; MP = Madhya Pradesh; MZ = Mizoram; NL = Nagaland; OR = Odisha; PB = Punjab; RJ = Rajasthan; SK = Sikkim; TN = Tamil Nadu; TR = Tripura; UK = Uttarakhand; UP = Uttar Pradesh; WB = West Bengal.

Source: Based on author’s calculation.
Inequality in the use of skilled birth assistants and prevalence of institutional delivery care varied the most across all states. Although at the national level, inequality in the case of institutional delivery saw the greatest decline (Paul forthcoming); many states, especially the north-eastern ones—Arunachal Pradesh, Manipur, Meghalaya, Mizoram, and Nagaland—experienced high inequality for institutional delivery even 10 years after the implementation of the NRHM. However, the two doses of tetanus injection became the most equitable MNCH service component in most states.

Discussion
This study contributes to the limited literature on variations in the coverage and inequality in the utilisation of maternal healthcare services across 29 states in India and whether and how much the gaps have narrowed 10 years after the implementation of the NRHM. How the coverage and patterns of inequality in the utilisation of the relevant components in the continuum of maternal healthcare—including ANC, care during child delivery, and PNC—evolved over the studied decade were examined. Both absolute and relative measures of inequality were used to answer the research question.

The findings indicate that the use of almost all maternal healthcare services increased quite significantly in the majority of the 29 states after 2006. Although causality analysis was not conducted to evaluate the effects of the NRHM, the positive effect of the NRHM on MNCH services use cannot be denied. However, the magnitude of improvement varied widely across states, given their varying socio-economic contexts, differences between the poor and the rich, as well as across different components of maternal healthcare.

Historically, some states have experienced high coverage and high equality all along. They remained good performers in 2016 as well. For example, Kerala had the highest coverage of maternal healthcare services, followed by Tamil Nadu, Andhra Pradesh, and Karnataka in 1992–93 (IIPS 1995). The scenario is still the same for these southern states. The poor were in an advantageous situation in Kerala, even before the implementation of the NRHM, while the poor in the other three southern states made significant progress during 2006–16. Socio-economic progress may play a role as well in the high coverage and low inequality in the utilisation of maternal healthcare services in these southern states. For example, historically, educational attainment has been quite high in Kerala compared to the rest of India. Based on NFHS-4 data, 94% of married women in the age group of 15–49 years have completed secondary education in Kerala, compared to 46% of women in Uttar Pradesh. During 1992–93, 22% and 25% of the populations lived below the poverty line in Andhra Pradesh and Kerala, respectively, which were less than the national average (KPMG 2017). While the poverty ratio was more than 40% in many of the high-focus states, including Bihar, Chhattisgarh, and Uttar Pradesh, it declined steadily in most of the states. However, the magnitude of the decline in the poverty rate was higher in the southern states compared to some of the high-focus states. Moreover, income inequality—in terms of the Gini coefficient—also was quite low in the southern states, ranging from 0.11 in Kerala to 0.17 in Karnataka during 2014–15. In comparison, it was 0.26 and 0.27 in Uttar Pradesh and Bihar, respectively.

Before 2006, access to maternal healthcare services was very low among the poor in the high-focus states, partly due to poor availability of maternal healthcare services (Navaneetham and Dharmalingam 2002). The findings reveal that the utilisation of related services remains low among the poor in the north-eastern states, including Arunachal Pradesh, Manipur, Meghalaya, Mizoram, and Nagaland, and in many of the other high-focus states, even in 2016. Nagaland still lags the most in terms of maternal health outcomes as well as in the use of maternal healthcare services, especially among the poor, resulting in high inequality (IPS and ICF 2017). Difficult terrain, lack of private investment in health, and misappropriation of public-sector healthcare funding are the major causes of its poor performance. Shortfalls in the number of medical staff, along with inadequate health infrastructure, added to its burden (Nienu and Longkumer 2015). However, how much of the change in inequality is explained by such supply-side constraints requires further empirical research using primary data.

The magnitude of the decline in inequality also varied widely. Pathak et al (2010), using the first three rounds of NFHS data and focusing on three states, showed that relative inequality in receiving four or more ANC visits remained high in Uttar Pradesh, while Maharashtra performed moderately well, and Kerala observed low inequality during 1992–2006. These findings are reinforced by the present study for a broader set of maternal health service components. Inequality was very low in Kerala during 2006–16, while the decline in inequality over time has been promising in Andhra Pradesh, Goa, Karnataka, Sikkim, and Tamil Nadu. Gujarat, Himachal Pradesh, Maharashtra, and Punjab performed moderately well in reducing inequality. On the other hand, inequality is still high, especially in the use of ANC services, in high-focus states like Bihar, Haryana, Madhya Pradesh, Rajasthan, Uttar Pradesh, and all the north-eastern states, except Sikkim. For child delivery and ANC, inequality declined considerably in Chhattisgarh and Odisha. In 2015–16, institutional delivery and skilled birth assistance were the most inequitable indicators, while two doses of tetanus injection were the most equitable one.

Inequality was high in the case of interventions that are provided in fixed health facilities and that require regular access to secondary or tertiary healthcare services (WHO 2008; Houweling et al 2007). The location of health facilities also played a major role in the unequal distribution of services. Interventions that can be accessed at the community level, like taking tetanus injections as a part of an ANC, are utilised more equitably (Barros et al 2012). It is found that variability between states is higher for the poorest quintile than for the richest quintile. It implies that even if a state is poor, rich women can access the required services, which ensures a high level of coverage for them. Many women from the richest quintile live in urban areas, which could partly explain the high level of access.

The persistence of high inequality in MNCH service utilisation in high-focus states is still observed due to the lack of appropriate
health infrastructure, low quality of health services, and lack of awareness about the importance of ANC. Although most of the services were provided free of cost at the primary health centre or the community level after 2006, poor people may have to bear the cost of travel and forgone earnings (Goli et al 2016). Strategic policy intervention may emphasise a reduction in financial barriers to accessing services, appropriate incentivisation programmes at the grassroots level through the deployment of front-line health workers were most needed, a task-shifting process (Barros et al 2005; Hosseinpoor et al 2011), increasing awareness about the use of ANC services using mass media, and improvement in infrastructure as well as the quality of health services. Linking the incentivisation to ANC with institutional delivery may be considered to promote the use of ANC services among the poor (Vellakkal 2017). Sharing the experience of better performing states like Kerala may help reduce inequality in the high-focus states. Further research may address some of the puzzles for better policy prescription in the provision of MNCH services across states, which was beyond the scope of this paper. Does variation in NRHM programme implementation strategies across high- and low-focus states play any role in the wide differential change in inequality in MNCH services? Does the incentivisation of ANC care increase usage among poor women and reduce inequality in the utilisation of ANC services? Does the differential in quality of care also affect utilisation of MNCH services? Further empirical research may also focus on the causal analysis of changes in inequality across states for the NRHM programme, taking into account the socio-economic progress of the respective states. A disaggregated spatial analysis may answer whether there are any “hotspots” of inequality in MNCH utilisation at the district level, especially in the high-focus states.

In Conclusion

Although the utilisation of MNCH services has increased between 2006 and 2016, it still varies widely across states, with considerable inequality persistent between and within states. Poor women in many of the high-focus states have been left behind. The high inequality in the use of ANC services across high-focus states is of serious concern, although inequality in receiving institutional delivery care showed a considerable decline. Variations in the performances of the states call for further attention to policy, especially at the local level.

NOTE

1 Detailed results are not presented due to space limitations. They will be provided by the author upon request.

REFERENCES


### Appendix

#### Table A1: Measure of Absolute Inequality in Terms of Slope Index of Inequality across States during 2006–16 (%)

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#### Table A2: Measure of Relative Inequality in Terms of Concentration Index across States during 2006–16 (%)

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Concentration index*100 is presented.

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*Table A1 and Table A2 are presented in the document in a tabular format with states listed in the first column and various indicators of health outcomes across states during 2006–16, with columns for percentage values.*