ORAL PRESENTATIONS
Equity in maternal health care

OP-01 RELATIONSHIP BETWEEN MATERNAL HEALTH SERVICES AND MATERNAL DEATHS DUE TO DIRECT OBSTETRIC CAUSES OVER FIVE-YEAR PERIOD IN KARNATAKA: AN EQUITY FOCUSED EVALUATION

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10.1136/bmjgh-2016-EPHPabstracts.1

Background Karnataka recorded a maternal mortality ratio of 144/100,000 live births in the year 2012–2013. State estimates mask regional variations in maternal mortality, which are attributed to regional inequity in health-system coverage and access. Provision of universal access to antenatal care services, skill birth attendants and emergency obstetric care (EmOC) are strategies of the union government through the National Rural Health Mission to reduce maternal mortality. Periodic monitoring of progress and evaluation of outcomes is essential due to enormity. An equity focused approach to assess health-system performance could yield evidence for decision-making in healthcare reforms.

Methods Cross-sectional analysis was done on six maternal health indicators retrieved from the District Level Household Survey fact sheets of 2007–2008 and 2012–2013. Coverage indicators such as antenatal care (ANC), comprehensive antenatal care (CANC), skilled birth assistance (SBA), density of Basic EmOC (BEmOC) and Comprehensive EmOC (CEmOC) facilities, per cent of First Referral Units offering CEmOC services and per cent of caesarean section (C-section) deliveries were retrieved district-wise. Outcome indicators such as maternal mortality rate due to direct obstetric causes (MMR-DOC) were calculated from the 2014 Health Management Information System fact sheets. Theil's equity metric estimated relative inequity between districts for maternal health indicators in 2007–2008 and 2012–2013. Higher T-value indicated increase in inequity. Correlation graphs between district Theil component of indicators and that of direct obstetric fatality rate were plotted. A decomposition analysis was performed using step-wise linear regression.

Findings Between 2007–2008 and 2012–2013, state coverage increased across maternal health indicators except for per cent for CANC with decrease in interquartile range. Density of BEmOC and CEmOC facilities also increased in the state with decrease in interquartile range. In 2012–2013, 23.1% first referral units were converted to CEmOC centres with 0.6% increase from 2007–2008. In 2012–2013, 15 districts had no first referral unit functioning as CEmOC centre. Between two time periods, state Theil T decreased for antenatal care (−27.12%), for comprehensive antenatal care (−30.22%) and for skilled birth assistance (−83.18%), with the highest decrease seen in the per cent of skilled birth assistance. Similarly, Theil T decreased over 50% in density of BEmOC and facilities while it increased marginally in density of BEmOC+ first referral units (7.52), and first referral units designated as CEmOC centres (17.98). Theil's T for C-sections in private sector decreased 57% while that for public sector decreased 25.9%. In 2014, Theil's T for MMR-DOC in the state was 129.91 with 20% of districts contributing largely to the state MMR-DOC (Theil component >1 SD). One-third of state's MMR-DOC occurred in 6 districts where only 13% of population resided. Five of the districts were on the side of disadvantage of relative inequity in coverage of antenatal care, comprehensive antenatal care and skilled birth assistance in 2007–2008 and 2012–2013. Four of these districts also had relatively higher share in state direct obstetric fatality rate than other districts in 2014. Regional distribution of ANC, CANC and SBA negatively correlated with MMR-DOC ($r=-0.43$, $p=0.05$; $r=-0.45$, $p=0.011$, $r=-0.40$, $p=0.03$ respectively) while that of BEmOC positively correlated with MMR-DOC ($r=0.38$, $p=0.038$). Distribution of C-section in public and private settings negatively correlated with MMR-DOC-TC ($r=-0.4$, $p=0.031$; $r=-0.4$, $p=0.025$ respectively). In a step-wise regression analysis, distribution of CANC and C-section in public settings was associated in distribution of MMR-DOC ($R2=0.292$, $p=0.004$).

Discussion Between 2007–2008 and 2012–2013, there was an increase in coverage of ANC, SBA, and density of BEmOC and CEmOC facilities in Karnataka with concomitant decrease in inequity. Meanwhile, CANC coverage decreased uniformly across districts in the same time periods. Provision of CEmOC services at community level was not achieved as envisaged under the National Rural Health Mission as only one-quarter of the first referral units were converted to CEmOC facilities and distribution was inequitable. 50% of districts had no first referral units functioning as CEmOC facilities. This perhaps reflected in marginal increase in uptake of C-section services in public sector with marginal decrease in inequity as against private sector, which recorded greater decrease in inequity. Regression analysis showed that districts with higher state share of CANC and C-Section in public settings contributed relatively less to the state's MMR-DOC. Thus equitable distribution of CANC and CEmOC facilities driven by systems approach may have a role in prevention of deaths due to direct obstetric complications.

Five districts that suffered from perpetual inequity in ANC, SBA and CANC coverage require focus in increasing coverage for these services as these districts contributed the most to state MMR-DOC. In conclusion, this equity focused evaluation study provides evidence for decrease in inequity of maternal health system indicators and EmOC services in Karnataka between

2007–2008 and 2012–2013. However, CEmOC facility at community level is inequitable and provision of the same has not progressed. Evidence indicates that provision of CANC and C-Section in public settings may prevent maternal deaths due to direct obstetric complications, which are responsible for majority of maternal mortality. In addition, this study records disadvantaged districts that require attention in terms of health system intervention to prevent further maternal deaths.

No competing interests.