

Title: Assessing the distributional disparities in human resources for health in rural India: A longitudinal analysis of Rural Health Statistics (2005-2017)

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Background: Absolute shortage of Human Resources for Health (HRH) is a highly cited factor impeding universal health coverage in developing nations like India. However, discussion on the disparities in HRH distribution is limited. We analyzed the inequalities in HRH distribution particular in rural India for progressing a nuanced understanding of the issue.

Methods: State-level data were acquired from Rural Health Statistics (RHS), which is in the public domain. Three HRH cadres deployed in the rural public health sector were considered - doctors at primary health centers (PHCs), specialist doctors at Community Health Centers (CHCs) and nurses at PHCs and CHCs. Cadre specific densities were computed using the relevant decadal rural population census estimates. Theil's T index (T) was used for computing the cadre-specific HRH inequalities across states. Non-zero T index values represent inequality in distribution with larger values signifying greater inequality. States were grouped by their Empowered Action Group (EAG) status to evaluate the between-group (T_b) and within-group (T_w) inequalities. Trends in inequalities were assessed from 2005 to 2017. Analyses were conducted using Python (3.0), RStudio (1.1.383) and Microsoft Excel (16.29).

Results: In 2017, inequality was largest for specialist doctors ($T = 2.32$), followed by nurses (1.02) and regular doctors (0.41). Within-group inequalities for EAG-states were

larger than between-group inequalities for all cadres ($T_w - T_b = 0.22$ for Doctors, 0.72 for nurses, and 2.06 for specialists). In 2005, inequality was largest for specialist doctors (0.68), followed by nurses (0.60) and regular doctors (0.29). Within-group inequalities for EAG-states were larger than between-group inequalities for all cadres ($T_w - T_b = 0.25$ for Doctors, 0.44 for nurses, and 0.63 for specialists). Between 2005 and 2017, there was a 23.9% rise in the inequality of specialists, followed by 6.9% for nurses and 4.4% for doctors.

Significance: These results point to an alarming rise in distributional disparities of specialist doctors and other cadres in rural India that necessitate immediate policy actions. Greater inequalities among EAG states indicate that some states within the group might require greater support than others.

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