

**Title:**

Measuring Availability, Accessibility, Acceptability, and Quality of Human Resources for Health in India from 1981 to 2011

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**Conflicts of Interest:**

None

**Background:**

Human Resources for Health (HRH) are crucial to attaining Universal Health Coverage. WHO recommends improving four HRH dimensions - availability, accessibility, acceptability, and quality (AAAQ) for health system strengthening. India is plagued by critically short and inequitable distribution of HRH with concerns over quality and acceptability. Assessing AAAQ dimensions for Indian HRH is critical yet missing.

**Methods:**

We assessed six HRH cadres - allopathic doctors, Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH) practitioners, nurses, auxiliary nurse-midwives (ANMs), dentists, and pharmacists from 1981-2011. Data for the absolute number of male and female HRH personnel in rural and urban areas for - 1981, 1991, 2001, 2011 was obtained from the Census of India. Data for qualified HRH was obtained from the relevant National Sample Survey rounds. Cadre-specific requirement thresholds were obtained from the seminal Health Survey and Development (Bhore) Committee (1946) and High-Level Expert Group (HLEG) (2012) reports. We formulated a family of dimension-wise deficit indices to assess situational cadre-wise HRH deficiencies and their over-year trends between 1981 and 2011.

**Findings:**

AAAQ indices showed deficits for the majority of HRH cadres in four census years except for AsD of ANMs in 2011, and AvDs of allopathic doctors and AYUSH for 1981-2011. All deficit indices showed a general decreasing trend from 1981 to 2011, except AsD. AvD for all cadres decreased except pharmacists and AYUSH (75% increase for both). AsD for all cadres was almost constant between 1981 to 2011 (<1% change) except ANMs (decreased by 260%). ApDs showed small decreases (<15%) for all cadres except dentists (53% decrease) and nurses (72% decrease). QD showed a decreasing trend for all cadres.

## Interpretation:

Dimensional HRH deficits have existed in India for over three decades. The gradual improvement in these dimensions is evident but not satisfactory. Our findings help point to specific dimensions for certain HRH cadres that need policy attention, e.g., rural accessibility of doctors.

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