

# Synthesis and Application of Assessment Framework for Human Resources for Health Policy Implementation: Gaps in India's National Health Policy

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## Research

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# Abstract

**Background:** Human Resources for Health (HRH) are crucial to improve health services coverage and population health outcomes. The World Health Organization (WHO) promotes four dimensions - availability, accessibility, acceptability, and quality (AAAQ) for HRH strengthening. Integrating AAAQ dimensions in policymaking is essential to reduce the critical shortage of HRH in India.

**Methods:** We created a multilevel framework consisting of implementable strategies and actions that can improve AAAQ dimensions. We assessed and monitored the incorporation of dimensions in HRH-related recommendations of all versions of the National Health Policy of India (NHPI) policies using this framework. Recommendations were coded using this framework and classified according to targeted dimensions and cadres. We formulated dimension-wise normalized indices to calculate HRH deficits for pre-NHPI years and assess situational deficiencies. Finally, we evaluated whether or not the HRH recommendations of NHPIs addressed the deficient cadres and dimensions for the corresponding year.

**Results:** We observed that HRH availability and quality were focused more in NHPI compared to accessibility and acceptability. Doctors were prioritized over auxiliary nurses-midwives and health assistants. AAAQ indices showed deficits in all dimensions in almost all cadres over the years. The cadres focused by NHPI recommendations did not completely correspond to the deficient cadres.

**Conclusion:** The framework and indices based method can help identify the gaps between targeted and needed dimensions and cadres for effective HRH strengthening in countries. At the global level, the application of framework and indices will allow a comparison of the strengths and weaknesses of HRH-related policies and indicate implementation strategies and actions.

## Contributions To The Literature

- We conceptualized a framework to evaluate the incorporation of availability, accessibility, acceptability, and quality dimensions in human resources for health (HRH) policies. We formulated four dimension-wise deficit indices. The concurrent application of framework and indices evaluates whether HRH policies target deficient dimensions and deficient HRH cadres.
- Applying the framework to the National Health Policies of India (NHPIs) indicated that the main focus was on the availability and quality of doctors. The acceptability of all cadres was neglected. NHPIs did not always focus on deficient cadres.
- Integrated indices-framework approach globally will allow cross-national comparison of gaps in HRH policies and point to implementation strategies and actions.

## Background

Human resources for health (HRH) are “all people primarily engaged in actions with the primary intent of enhancing health”.(1) HRH is a crucial component of health systems to improve health services coverage

and population health outcomes.(2) HRH strengthening is, therefore, quintessential to achieve Universal Health Coverage (UHC)(3) within the broader Sustainable Development Goals (SDGs) framework.(4) However, there is a shortage of 6.9 million and 4.2 million skilled HRH in South-East Asia and Africa, respectively.(5) To address this shortage, under SDG-3.c, the World Health Organization (WHO) encourages nations with an HRH crisis to create and implement national and local policies focused on four HRH dimensions - availability, accessibility, acceptability, and quality (AAAQ).(5)

India is facing a critical shortage of HRH with only 160 skilled health workers per 100,000 people.(6) In 2016, 36% of total HRH served in rural areas which had 71% population with doctors and nurses constituting the largest portion of HRH.(7) In response to global calls and the existing crisis, India adopted the target of achieving 550 physicians, nurses, and midwives per 100,000 population by 2030 under SDG indicator 3.c.(8) The National Health Policy of India (NHPI), arguably, the most comprehensive policy securing the health of a billion Indians, encompasses recommendations and plans to attain UHC. (9) The first NHPI (1983) was framed as a response to the 1978 Alma Ata Declaration. Subsequently, NHPI was revised in 2002 and 2017 to match the country's needs and progress. Integrating HRH recommendations aimed at AAAQ dimensions in NHPI can bridge national priority-setting and global calls for action.

Analysis of NHPIs in the context of HRH is crucial for the following reasons. First, it helps to study policy changes and their effects on HRH strengthening over an extensive period of three decades. Second, it helps to evaluate the nation's policy commitment towards addressing HRH needs and achieving development targets. Third, it could guide the development of future policies geared towards areas of need in an evidence-based fashion. Thus, our analysis has three main aims:

1. Identify the degree of incorporation of WHO's AAAQ dimensions in NHPI's HRH-related recommendations.
2. Identify dimensional deficiencies in HRH cadres prior to three NHPI adoptions to gauge situational needs and also assess longitudinal trends in deficiencies.
3. Investigate whether NHPI recommendations targeted the deficient HRH dimensions and cadres.

## Methods

### Data Sources and Variables:

We obtained NHPI reports for 1983, 2002, 2017, and the 'Situational Analyses: Backdrop to NHPI 2017' report from the Health Policy section of the National Health Portal of India.(10) We extracted the absolute number of national and rural personnel present for 49 HRH cadres enlisted in Indian Public Health Standards (IPHS),(11) for pre-NHPI years 1982, 2001, and 2016. Data sources and specifications are given in **Additional file 1- Table 1**. The cadre-wise absolute numbers were converted to HRH personnel density per 100,000 people (P) using population estimates taken from the census tables (**Additional file 1- Table 1**). We calculated two cadre-wise requirement thresholds (R) i.e density of HRH personnel required

per 100,000 population using benchmark planning committee reports from Health Survey & Development or the Bhore Committee (R-1)(12) and High-level Expert Group (HLEG) (R-2).(13) Calculations of P and R values are detailed in **Additional File 2**. We chose the Bhore Committee (1946) and HLEG (2012) reports as the former presented the first HRH requirement thresholds for Independent India while the latter presented the latest norms. Together they cover the span of over thirty years encompassing the same period covered by NHPs. The Bhore Committee set an ambitious target for the then India, which would have brought India closer to UHC much earlier. The HLEG presents a recent and realistic target-setting, considering the existing HRH shortage and global development calls.

## Framework for Policy Analysis:

We created a three-tiered framework with HRH dimensions, implementation strategies and actions for assessing HRH strengthening (Fig. 1). The first level is based on four HRH-AAAQ dimensions proposed by the Global Health Workforce Alliance (GHWA)(14) - availability (total number of personnel: stock and production), accessibility (distribution across sectors: public and private, demographics: rural and urban, and levels of care: primary, secondary and tertiary), acceptability (compatibility with the population being served in terms of HRH sex/age composition, skill-mix, cultural awareness, attitudes, and behaviors), and quality (competencies, training and skills, knowledge, and professional work ethics and patients' satisfaction). Based on an iterative scoping review of literature for Indian HRH, we added implementation strategies and actions that could improve each dimension. Strategies are the broad approaches that can be used independently or in combination to improve a dimension. Cutting across dimensions and working in synergy, actions under strategies are directly implementable measures to produce such an improvement. The framework has four dimensions, twenty strategies, and twenty-four actions (Fig. 1).

## Indices for Dimensional HRH Deficits

We formulated four indices that quantified an important strategy corresponding to each AAAQ dimension. Availability deficit (AvD) measures the deficit in the total stock of HRH, accessibility deficit (AsD) measures the maldistribution of rural HRH against their gross national presence, acceptability deficit (ApD) measures the skew in skill-mix, and quality deficit (QD) measures the deficit of qualified HRH.

AvD measures the deficit of present HRH with respect to the requirement thresholds.

$$AvD = 1 - \left(\frac{P}{R}\right) \quad (\text{Eq. 1})$$

AsD measures the deficit of HRH present in rural areas with respect to the national estimates.

$$AsD = 1 - \left(\frac{P_{rural}/R_{rural}}{P_{national}/R_{national}}\right) = 1 - \left(\frac{P_{rural}}{R_{national}}\right), \text{ as } R_{rural} = R_{national} \quad (\text{Eq. 2})$$

ApD measures the deficit of nursing and supporting cadres with respect to doctors.

$$ApD = 1 - \left( \frac{P_{cadre}/R_{cadre}}{R_{doctor}/R_{doctor}} \right), \text{ cadre} = \text{nursing and supporting cadres} \quad (\text{Eq. 3})$$

QD measures the deficit of qualified HRH with respect to total estimates i.e. qualified and unqualified.

$$QD = 1 - \left( \frac{P_{qualified}/R_{qualified}}{P_{qualified+unqualified}/R_{qualified+unqualified}} \right) = 1 - \left( \frac{P_{qualified}}{P_{qualified+unqualified}} \right) \quad (\text{Eq. 4})$$

These deficit indices (collectively represented as D) normalized as per contextual pre-determined requirement thresholds (R) indicate (a) no deficit if  $D = 0$ , (b) a positive deficit if  $D > 0$ , and (c) a surplus if  $D < 0$ . Here, we classified HRH deficit quartiles as critical (1 to 0.75), high (0.74 to 0.50), moderate (0.49 to 0.25), and low (0.24 to 0). The surplus was categorized as low (-0.01 to -0.24), moderate (-0.25 to -0.49), high (-0.50 to -0.74), and extreme ( $< -0.75$ ).

## Data Analysis:

### Inclusion criteria

We included only the cadres with P values available for at least two out of three years at the national level and R prescribed by at least one committee, resulting in eight cadres - auxiliary nurse midwives (ANMs), health assistant females (HAFs), pharmacists, nurses, dentists, indigenous medical practitioners - AYUSH (Ayurveda, Yoga, Unani, Siddha, Homeopathy), and doctors (graduates and postgraduates in allopathic medicine). We considered ANMs, HAFs, and nurses together as nursing cadres, while pharmacists and nursing cadres together as supporting cadres.

### Analysis 1

To evaluate the incorporation of AAAQ dimensions and focussed cadres, we screened all NHPI sections for HRH-related recommendations. Each recommendation was coded according to - addressed dimensions, targeted cadres, recommended strategies, and employed actions (**Additional file 1- Table 2**). Recommendations not specific to any cadres were coded as 'non-cadre specific'. Cadres apart from the eight mentioned above were grouped as 'others'. For each NHPI, we recorded the total number of dimension-wise and cadre-wise recommendations independently and further cross-tabulated them. Variations in the total number of mentions across NHPIs were used to determine trends in changing focus. The focus was determined by the number of mentions.

### Analysis 2

We calculated AAAQ deficit indices for eight cadres using R-1 and R-2 for pre-NHPI years at national (total) and rural levels. P values were unavailable for 1982 rural HRH. Hence, six sets of national and four

sets of rural AvD and ApD and two sets of AsD were obtained. Similarly, two sets of QD were calculated as the qualification status of HRH was unavailable for 1982. (a) We looked at the longitudinal changes in cadre-wise national and rural deficits from 1982 to 2016 using both R-1 and R-2. (b) For situational analyses, we used cadre-wise national-level deficit indices calculated using 'P' values for each pre-NHPI year (1982, 2001, and 2016) and relevant 'R' values i.e. R-1 for 1983-NHPI and 2002-NHPI, R-2 for 2017-NHPI. Cadres were classified into corresponding deficit or surplus categories.

### Analysis 3

To check whether NHPI recommendations targeted the deficient HRH dimensions and cadres, we compared focused cadres for each dimension in each NHPI with their deficit categories for corresponding years. We used (a) cadre-wise recommendations corresponding to each dimension from Analysis 1 (b) cadre-wise deficit categories under each dimension taken from Analysis 2.b. We arranged the cadres in descending order according to the number of NHPI-recommendations. We then compared whether or not the focused cadres in NHPI corresponded with their deficit categories i.e. whether cadres with high deficit had more focus in the NHPI recommendations and vice versa.

## Results

### 1. Dimension-wise and cadre-wise distribution of NHPI recommendations

The total HRH-related recommendations increased from twelve in 1983, thirty in 2002 to ninety in 2017. **Figure 2A** shows the distribution of recommendations across AAAQ dimensions. Across the years, the dimensional focus shifted from HRH quality to availability and back to quality. Focus on accessibility increased while acceptability was consistently neglected. The commonly proposed strategies for improving availability, accessibility, and quality were: establishing new and expanding existing training institutes, task shifting/sharing, and need-based changes in training, respectively (**Table 1**). The total cadre-specific recommendations increased from five in 1983, twenty-six in 2002 to eighty-two in 2017 (**Figure 2B**) with seven, four, and eight non-cadre specific recommendations, respectively. Doctors were prioritized across all NHPIs while ANMs and HAFs were neglected. The commonly proposed implementation strategies for doctors were mandatory rural service and changes in the curriculum. Improvement in training, integrating AYUSH in underserved areas, and establishing professional councils were common strategies for nurses, AYUSH practitioners, and paramedics, respectively (**Table 1**). Cross-tabulation of cadre-wise and dimension-wise number of recommendations is given in **Table 2**.

### 2.a. Longitudinal trends of the dimension-wise deficits over three decades

Over three decades, national AvD showed a decreasing trend for all cadres under both norms. The steepest decrease indicated as percentage drop was seen for pharmacists (150%) and doctors (766%) using Bhore (**Figure 3A**) and HLEG norms (**Figure 3B**), respectively. Least fall was in HAFs under both norms (30% - Bhore and 26% - HLEG). Majority cadres showed little change in rural AvD. ANMs (16%) and AYUSH (248%) showed the greatest fall in rural AvD using Bhore and HLEG norms (**Figures 3C and 3D**), respectively. AsD for nurses, pharmacists, and doctors was almost constant (~ 1% change) between 2001

and 2016 while AsD increased for remaining cadres (**Figure 4**). ApD showed a decreasing trend under both requirement thresholds at national (**Figures 5A and 5B**) and rural levels (**Figures 5C and 5D**). QD for all cadres declined with the fall being steepest for dentists (621%) and least for pharmacists (47%) (**Figure 6**).

## 2.b. Retrospective situational analyses of HRH for pre-NHPI years

In 1982, all cadres had critical-to-high AvD with the greatest deficit for nurses using R-1 as norm (**Figure 3A**). High and moderate ApDs were noted for nursing and supporting cadres, respectively (**Figure 5A**). AsD and QD were not measured due to a lack of data. In 2001, all cadres except pharmacists had positive AvDs with nurses being the most deficient (**Figure 3A**). All cadres showed poor accessibility with AsD being greatest for nurses and least for HAFs (**Figure 4**). For all cadres, unqualified HRH was more than the qualified indicating deficit in quality with QD being highest for pharmacists and lowest for AYUSH (**Figure 6**). Moderate and low ApDs were noted for HRH, considering nursing and supporting cadres, respectively (**Figure 5A**). In 2016, using R-2, all cadres except ANMs and HAFs had surplus availability (**Figure 3B**). All cadres showed accessibility deficits with AsD categories almost identical to that in 2001 (**Figure 4**). QD was highest for pharmacists and lowest for dentists (**Figure 6**). Nursing and supporting cadres showed high and moderate ApDs, respectively (**Figure 5B**).

## 3. Comparison of cadre-wise deficit categories with cadre focused in NHPIs

**Table 3** shows that no cadre-specific recommendations were made under AAAQ-dimensions in NHPI-1983 while majority cadres had moderate-to-critical deficits. In 2002, no availability-related recommendations were made for HAFs and ANMs which had high and moderate AvDs. Pharmacists and nurses with critical AsD had only one accessibility-related recommendation each, and AYUSH, dentists, and ANMs with moderate-to-high deficits had none. Pharmacists and nurses with critical QDs had only two and one quality-related recommendations respectively, and AYUSH and dentists with high to moderate deficits had none. In 2017, there were twelve availability-related recommendations for doctors who had extreme surplus while HAFs and ANMs with high to low availability deficits had no recommendations. Nurses and pharmacists with critical AsD had two and one recommendations, respectively while dentists, ANMs, and HAFs with critical to high deficits had none. Doctors had fourteen quality-related recommendations despite showing a low deficit. In all NHPIs, negligible acceptability-related recommendations were made despite consistent deficits.

## **Discussion**

Our results showcase that NHPIs' HRH-related recommendations were not structured to incorporate AAAQ dimensions, clearly depicting policy gaps. Over three decades, the main focus has been on HRH availability and quality, with reduced attention to accessibility and acceptability. Recommendations consistently seem to prioritize doctors over other cadres like ANMs and HAFs. The situational analysis revealed dimension-wise deficits in most cadres for all three NHPIs. Longitudinally, the magnitude of

deficits declined for all dimensions except accessibility. NHPs did not always focus on the deficient cadres thus failing to fully address the situational HRH deficiencies.

The 2014 GHWA report indicated that there was 'insufficient data' for reliance on India's HRH policy on the AAAQ dimensions.(14) We evaluated the HRH-related recommendations of NHPs for the incorporation of AAAQ dimensions to fill this gap. Deficiencies in HRH dimensions have been previously identified for India as shortages in HRH availability,(15) skewed urban-rural distribution depicting disparities in accessibility,(15) poor quality indicated by a substantial proportion of unregistered/unqualified HRH,(15) and low nurse-to-physician ratios compromising workforce acceptability.(14) While policies focusing on increasing HRH production have had success in enhancing availability, they have failed to improve the accessibility and quality of the workforce.(16) Moreover, acceptability and regulation of outsized unqualified HRH remain completely unaddressed.(14, 17)

Previously, HRH availability and accessibility in India (7) and other countries have been measured cross-sectionally(18) and longitudinally,(19, 20) using density as a metric. Here, we formulated normalized cadre-wise AAAQ deficit indices for HRH that can bridge research and policymaking. The advantage of indices over density is that they are indicative of surplus or deficit with respect to contextual requirement norms (thresholds) determined by factors such as health financing, workforce efficiency, etc. In other studies, HRH-related policies have been assessed through interview methods,(20) process tracing,(18) or qualitative summarization.(21) Our framework-based policy analysis is systematic and allows evaluation against quantitative indices. It can be used to study the progress of the National Health Mission (India) and translated to evaluate the HRH policies of other countries. The framework focuses on standardized policy analysis removing stakeholder bias seen in interviews and the investigator's bias in qualitative summaries. The conjoint application of framework and indices generates information useful for rigorous process-tracing.

Focusing on all four dimensions is crucial because population health outcomes can improve only when the high-quality HRH is available where needed in the form acceptable to the people.(22) Integrating AAAQ dimensions in HRH parts of the health policies have shown to increase HRH density and improve population health outcomes.(18) Adopting and locally implementing policies that address these dimensions is crucial and demands several prerequisites - a) identification of deficiencies in cadres through dimension-wise indices,(19, 20) b) identification of dimension-wise and cadre-wise focus of HRH policies using a predetermined framework,(21, 23) c) assessing the mismatches between dimensional deficiencies of HRH and focus of policy, d) experimentation with and evaluation of strategies and actions for their relevance, effectiveness, and cost-effectiveness.(16, 24) Application of integrated indices-framework approach will allow cross-national comparison of gaps in HRH policies with respect to contextual needs and generate evidence for implementation of strategies and actions instrumental for dimension-wise HRH improvements.

In India, policies should be restructured to incorporate strategies addressing AAAQ dimensions for HRH strengthening. This will allow for an evidence-based, coordinated, and sustained response towards the



HRH crisis with fewer implementation hurdles. Indicators for HRH acceptability should be defined in the Indian context and actively integrated into policies. Cadre-specific recommendations should focus on primary-care level cadres like ANMs, HAFs, community health workers, and rural physicians. Implementation of strategies like reducing attrition in HRH, removing administrative barriers for deployment, developing socio-cultural competence, and regular assessment of in-service staff is crucial. Robust efforts to continually develop and check HRH requirement thresholds are necessary to address the relevance of AAAQ indices. There is an urgent need for a dedicated national HRH policy that measures needs, and develops, executes, and monitors plans to enhance AAAQ of HRH in India.

Our study has several limitations. First, the P values for 1982 are calculated using data from different sources (**Additional file 1**- Table 1) demanding caution for interpretation of the results. Second, 1982 rural AvD, rural ApD, AsD, and QD were not calculated due to a lack of cadre-wise rural HRH data for the preceding year. However, following the longitudinal declining trend of the deficit, we can infer that the above-mentioned deficits must be higher than those in 2001 and 2016 for all dimensions. Third, focused dimensions and cadres in NHPIs were determined using the number of mentions. There are other ways to determine focus such as measuring relevance, effectiveness, and cost-effectiveness of the recommended strategy.(24) However, such data is not for LMICs, and measuring the strength of strategies/actions was out of the scope of study.(24)

## Conclusions

Our results point to the gaps in the HRH policy recommendations for India over an extended period of three decades and advocate that the policy should match the needs of the country. Application of the framework for a comprehensive and systematic assessment of HRH can help identify challenges specific to individual LMICs facing HRH crisis. Our approach integrates a detailed and evolving ensemble of implementation strategies and actions that can be useful to overcome the challenges into policy evaluation.

## Abbreviations

HRH

Human Resources for Health

AAAQ

Availability, Accessibility, Acceptability, and Quality

NHPI

National Health Policy of India

UHC

Universal Health Care

HLEG

High-level Expert Group

P

HRH personnel density per 100,000 people

R

density of HRH personnel required per 100,000 population

R-1

density of HRH personnel required per 100,000 population according to Bhore Committee thresholds

R-2

density of HRH personnel required per 100,000 population according to HLEG thresholds

GHWA

Global Health Workforce Alliance

AvD

Availability Deficit

AsD

Accessibility Deficit

ApD

Acceptability Deficit

QD

Quality Deficit

ANMs

Auxiliary Nurse Midwives

HAFs

Health Assistants Female

AYUSH

Ayurveda, Yoga, Unani, Siddha, Homeopathy

LMICs

Lower-Middle income countries

CHW

Community Health Worker

LMP

Licentiate Medical Practitioner

ASHA

Accredited Social Health Activist

IPHS

Indian Public Health Standards

## Declarations

**Ethics approval and consent to participate:** Not applicable

**Consent for publication:** Not applicable

**Availability of data and materials:** The datasets supporting the conclusions of this article are included with the article and its additional files.

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**Authors' contributions:** SD and SZ had access to all the data and take responsibility for its integrity and accuracy of the analysis.

Study concept and design: SD and SZ

Acquisition, analysis, or interpretation of data: All authors

Drafting of the manuscript: All authors

Literature review: SD and JV

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: SD and JV

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## Tables

Due to technical limitations, table 1, 2 & 3 is only available as a download in the Supplemental Files section.

## Figures

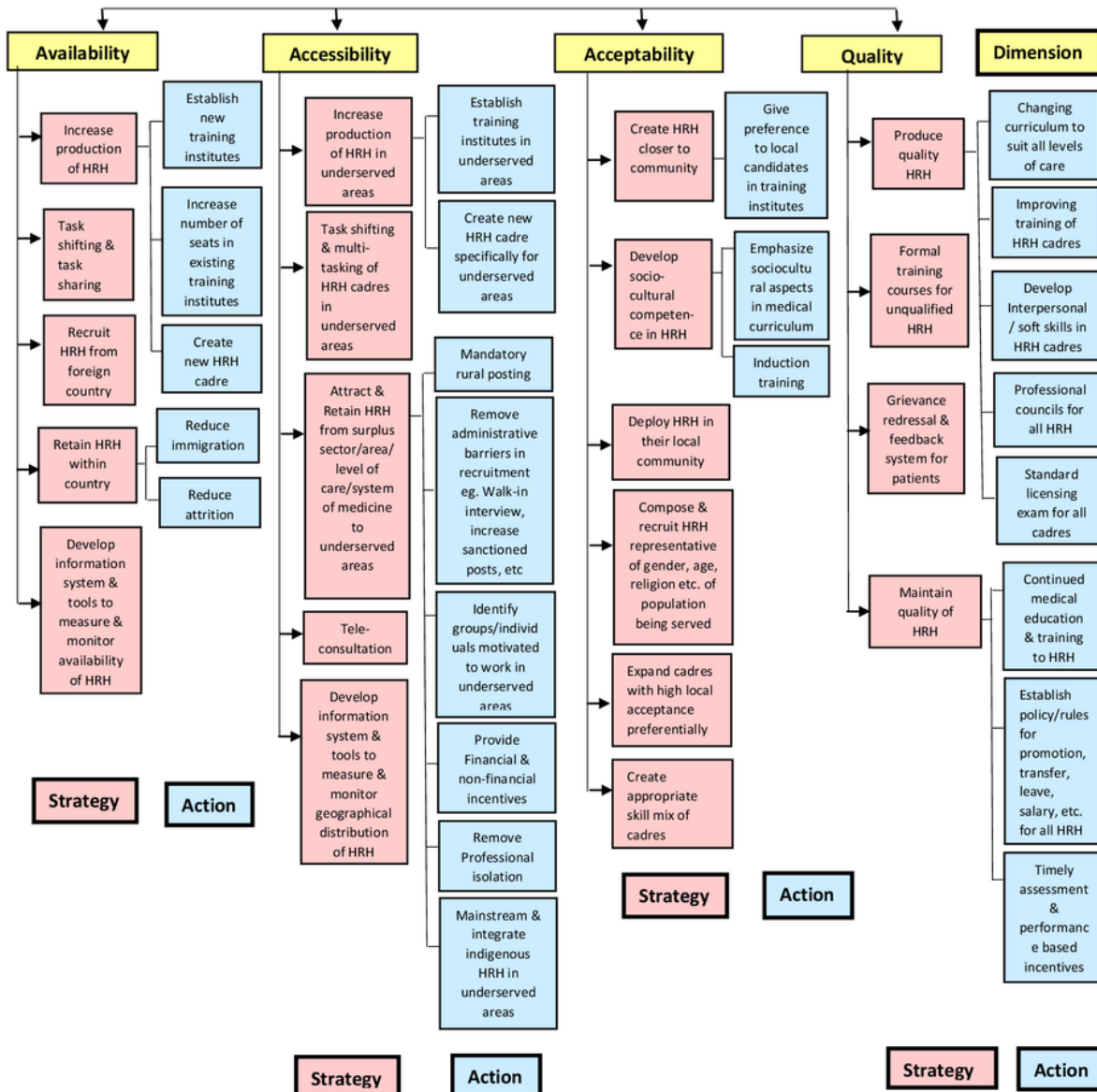


Figure 1

Strategies and actions for HRH strengthening for availability, accessibility, acceptability, and quality dimensions. Legend - HRH: Human Resources for Health.

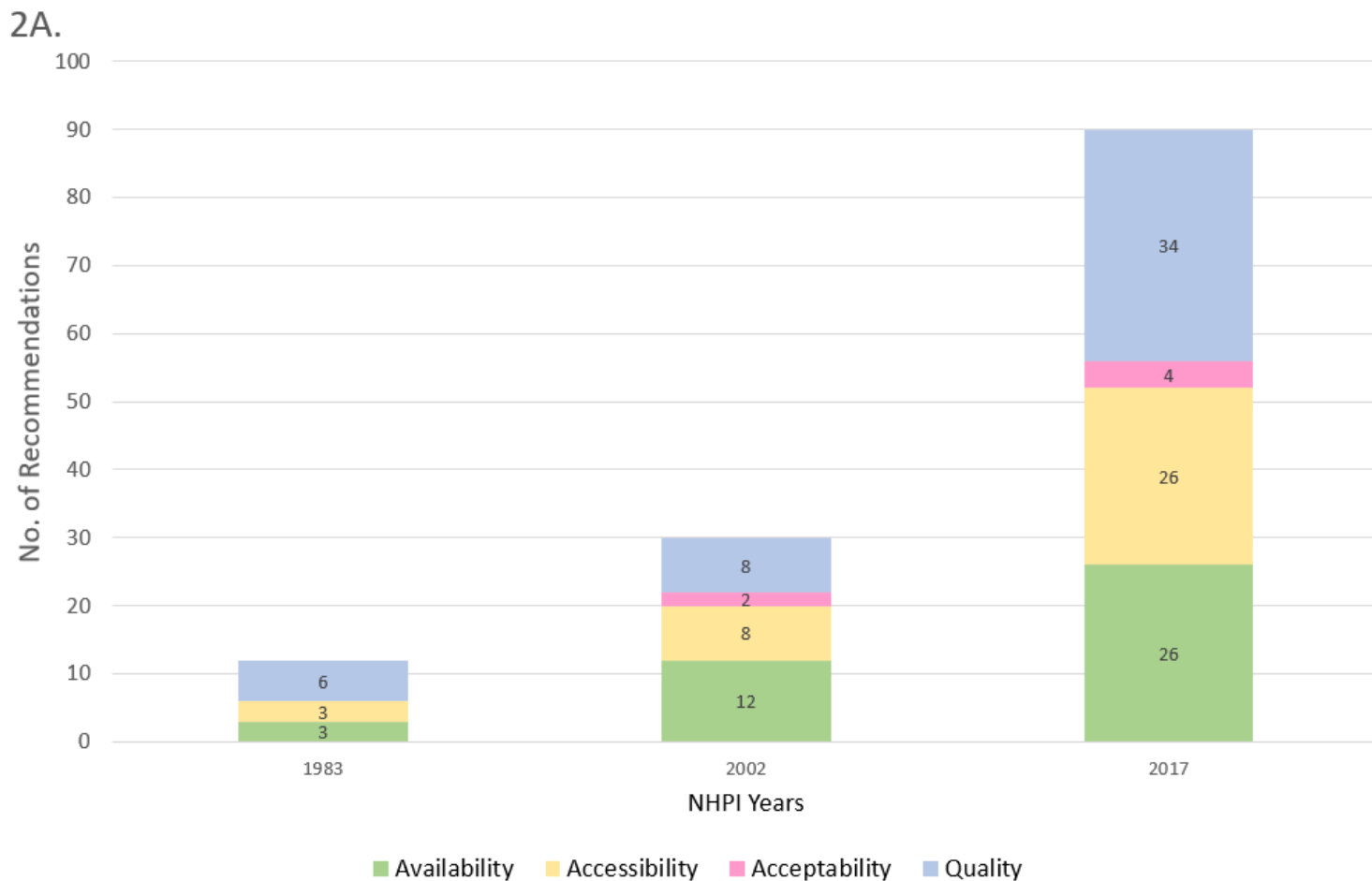


Figure 2

Dimension-wise distribution of HRH-related recommendations of NHPI. Legend - Numbers written inside the bars denote the number of recommendations. NHPI: National Health Policy of India.

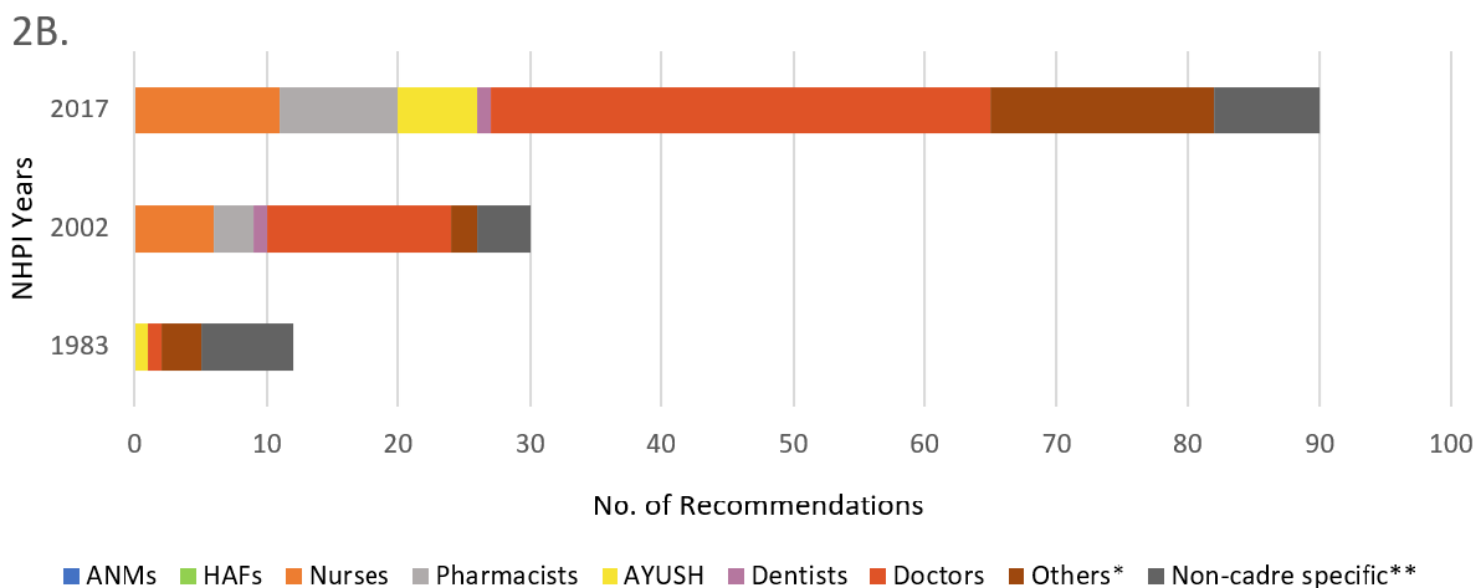
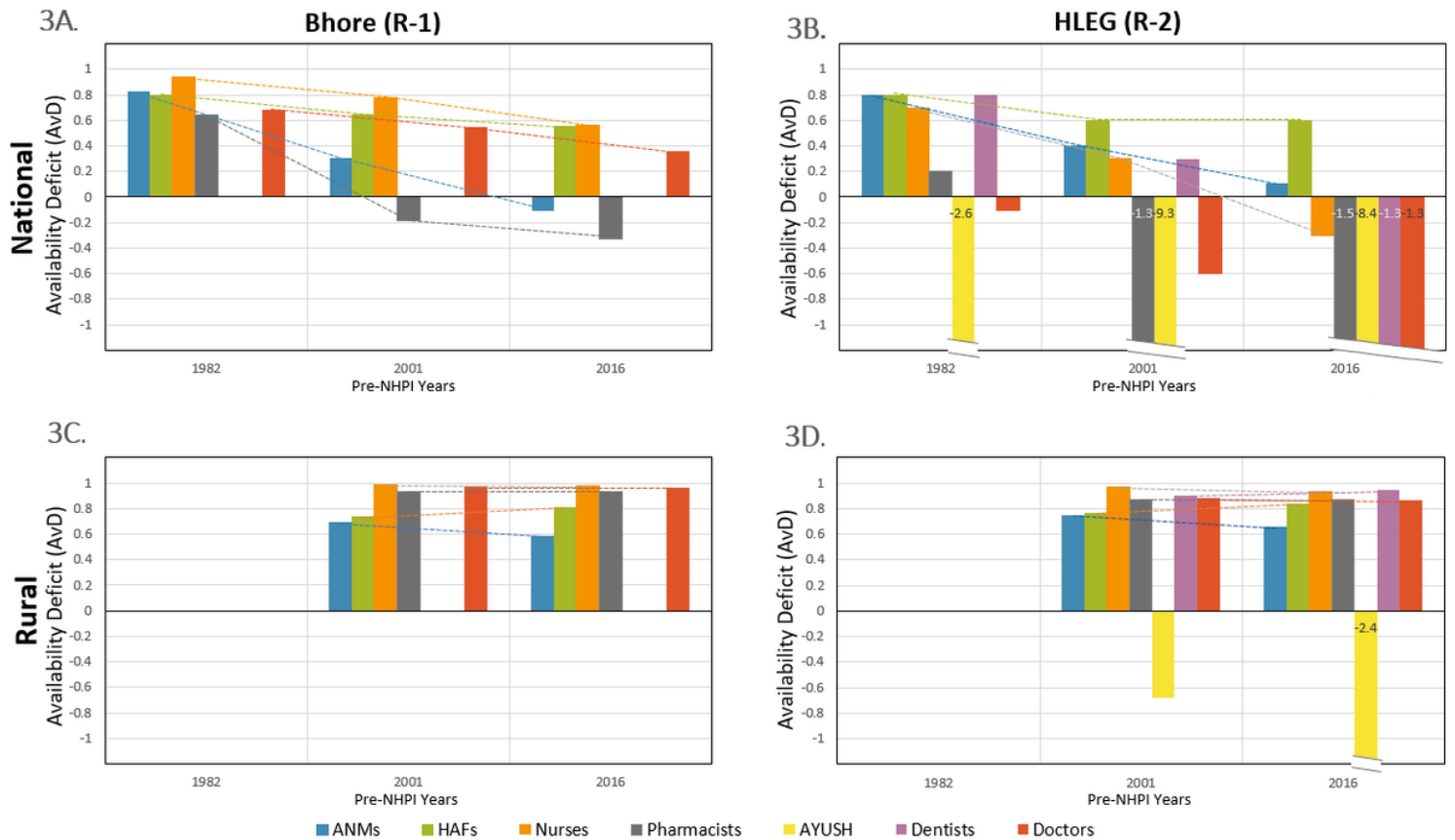


Figure 3

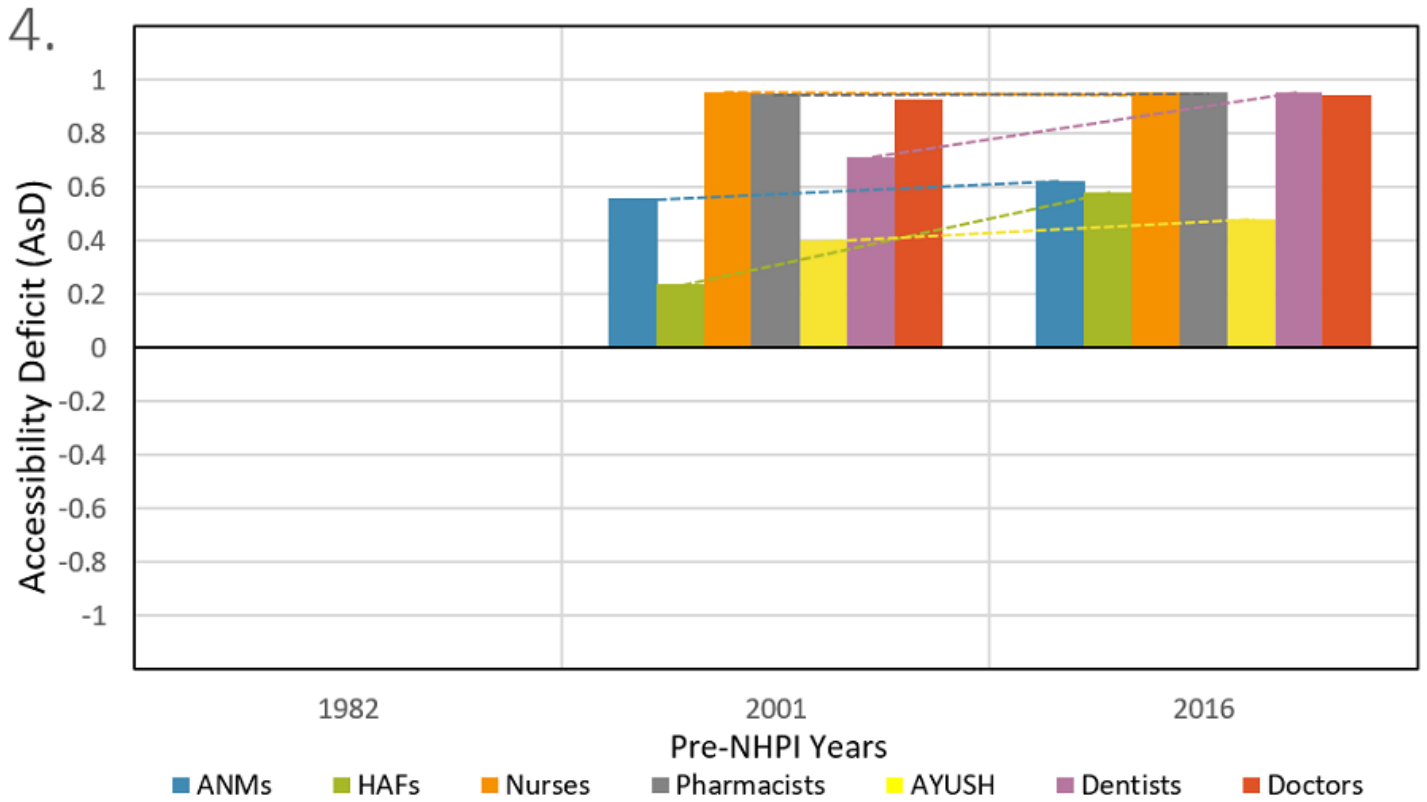
Cadre-wise distribution of HRH-related recommendations of NHPI 1983, 2002, 2017. Legend - \*Others include dentists, mid-level practitioners and multi-purpose workers. \*\*Non-cadre specific recommendations are applicable to all HRH cadres. NHPI: National Health Policy of India, HRH: Human resources for Health, AYUSH: Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy, ANMs: Auxiliary Nurse-Midwives, HAFs: Health Assistants Female.



**Figure 4**

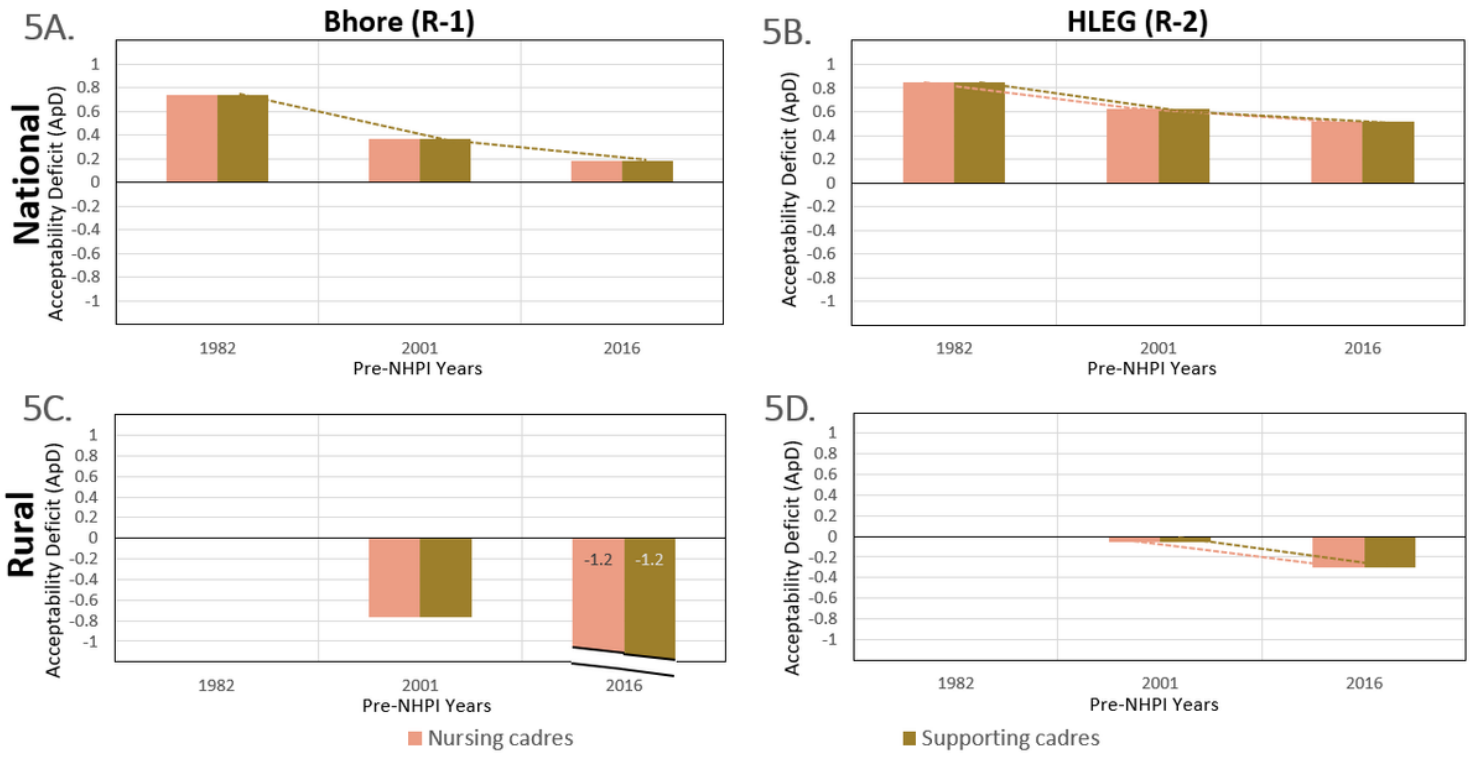
Availability Deficit (AvD) for pre-NHPI years 1982, 2001, 2016 according to Bhore and HLEG norms. Legend - Dashed lines indicate the longitudinal changes in deficit. Truncated bars indicate that the deficit was less than -1 and the corresponding values are written on the bars. Availability Deficit of AYUSH and dentists for 1983 and 2002 were not calculated due to unavailable requirement thresholds. NHPI: National Health Policy of India, AYUSH: Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy, ANMs: Auxiliary Nurse-Midwives, HAFs: Health Assistants Female.





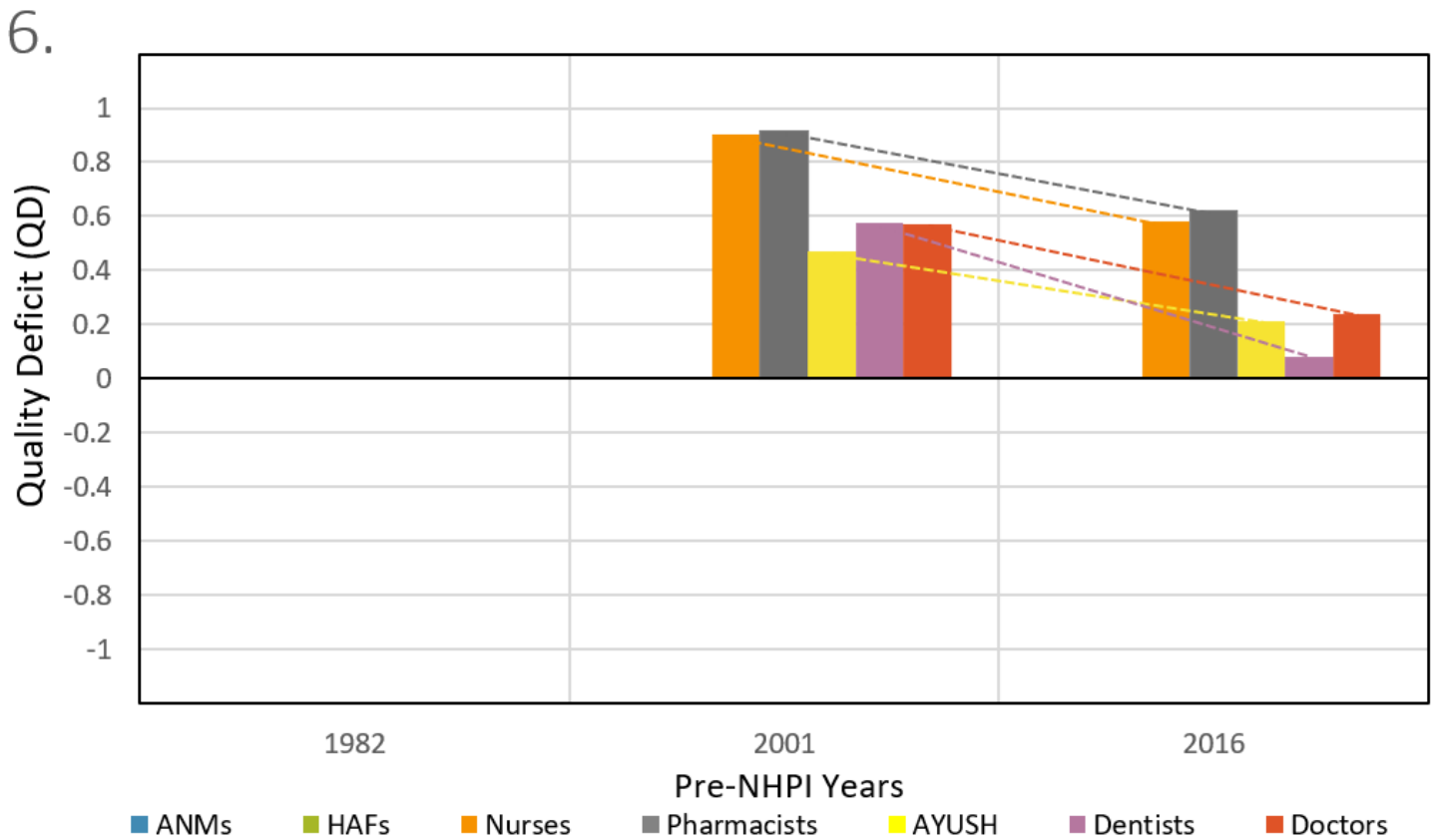
**Figure 5**

Accessibility Deficit (AsD) for pre-NHPI years 2001 and 2016 according to Bhore and HLEG norms. Legend - Dashed lines indicate the longitudinal changes in deficit. Truncated bars indicate that the deficit was less than -1 and corresponding values are written on the bars. Accessibility Deficit for 1983 was not calculated due to unavailable present rural HRH data for the corresponding year. NHPI: National Health Policy of India, HRH: Human resources for Health, AYUSH: Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy, ANMs: Auxiliary Nurse-Midwives, HAFs: Health Assistants Female.



**Figure 6**

Acceptability Deficit (ApD) for pre-NHPI years 1982, 2001, 2016 according to Bhore and HLEG norms. Legend - Dashed lines indicate the longitudinal changes in Acceptability Deficit. Truncated bars indicate that the deficit was less than -1 and the corresponding values are written on the bars. Nursing cadres include ANMs, HAFs, and nurses. Supporting cadres include pharmacists along with nursing cadres. NHPI: National Health Policy of India.



**Figure 7**

Quality Deficit (QD) for pre-NHPI years 2001, and 2016. Legend - Quality Deficit for all cadres of 1983, and ANMs and HAFs for 2002 and 2017 as their qualification details were not available. NHPI: National Health Policy of India, HRH: Human resources for Health, AYUSH: Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy, ANMs: Auxiliary Nurse-Midwives, HAFs: Health Assistants Female.

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