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A three years WISN study demonstrates that the peril of underestimating manpower through static IPHS norms threatens the consciousness of national public health goals in India by 2047

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Abstract

Background

The Indian Public Health Standards (IPHS) were introduced to strengthen infrastructure and staffing in public-sector health facilities. However, their staffing norms remain largely population-based and may not adequately capture variation in service demand, geographic accessibility, and the requirements of continuous (24×7) service delivery in india. The persistent shortage of the health workforce in India Severely jeopardizes the nation's capacity to achieve its “Viksit Bharat' targets for 2047”.

Objective

To estimate workload-based staffing requirements using the World Health Organization's Workload Indicators of Staffing Need (WISN) method and to examine longitudinal trends in staffing adequacy across public health facilities in Ajmer district, Rajasthan.

Methods

A longitudinal analysis of secondary administrative data was conducted across 108 public health facilities in Ajmer district between 2021–22. 2022-23 and 2023–24. Service-utilisation data and workforce records were obtained from routine health information systems and district administrative records. Cadre-wise staffing requirements were derived using WISN and expressed as WISN ratios, which were categorised into levels of workload pressure.

Results

Outpatient attendance rose by approximately 10% and inpatient admissions by more than 50% over the study period, whereas antenatal registrations and institutional deliveries declined by 31% and 21%, respectively. Persistent vacancies were evident across cadres, most acutely among nursing and paramedical staff. In 2023–24, WISN ratios indicated critical shortages of Medical Officers (0.42), Staff Nurses (0.45), Pharmacists (0.12) and Laboratory Technicians (0.31). Longitudinal analysis showed progressive deterioration in staffing adequacy, with the majority of facilities experiencing high workload pressure.

Conclusion

Current IPHS staffing norms appear to underestimate the workforce required for continuous service delivery in rural health facilities. Embedding workload-based workforce planning into routine health-

system management could improve staffing distribution and strengthen primary and secondary care performance.

1. Introduction

In India, primary health care is delivered through an extensive network of Primary Health Centres (PHCs) and Community Health Centres (CHCs) that provide preventive, promotive, curative and referral services to a predominantly rural population[1]. To standardise the availability and quality of these services, the Government of India established the Indian Public Health Standards (IPHS), which prescribe minimum benchmarks for infrastructure, human resources, essential drugs and diagnostics at each level of care[2,3].

Although the IPHS were revised in 2022 to support comprehensive primary health care, their staffing provisions remain anchored largely to population-coverage criteria[3]. Such norms may not fully reflect the contextual determinants of workload that shape service delivery in rural facilities, including the intensity of patient demand, the geographic dispersion of settlements, round-the-clock (24×7) service provision, and predictable staff absences arising from leave and training obligations. Compounding these design limitations, the Indian health workforce is markedly maldistributed, with rural facilities persistently understaffed relative to urban centres[4]. Together, these factors may undermine the capacity of PHCs and CHCs to sustain emergency and maternal-health services.

The World Health Organization's Workload Indicators of Staffing Need (WISN) method offers a systematic, workload-based alternative for workforce planning by linking observed service volumes to activity-specific time standards and the time staff genuinely have available for work[5]. WISN-based assessments conducted in India and other low- and middle-income countries have repeatedly revealed substantial staffing deficits and have informed evidence-based establishment decisions[6–9]. Most such analyses, however, are cross-sectional; longitudinal evidence describing how staffing adequacy evolves as service demand changes over time remains scarce[6].

Against this background, the present study applied the WISN method to public health facilities in Ajmer district, Rajasthan, with two aims: to quantify the gap between IPHS-sanctioned staffing and workload-based requirements, and to characterize longitudinal trends in staffing adequacy between 2021–22 and 2023–24. A retrospective national analysis utilizing the WHO’s WISN validates severe systemic shortages in frontline health workforce. Therefore, without trained medical workforces’ deployment and ethical organization investments[10–12]. The persistent shortage of the health workforce in India severely jeopardizes the nation's capacity to achieve its 'Viksit Bharat' targets for 2047 [1–4].

2. Methods

2.1 Study design and setting

A longitudinal analytical study was undertaken using secondary administrative data from public health facilities in Ajmer district, Rajasthan, covering three financial years from April 2021 to March 2024. The district is characterised by semi-arid terrain and dispersed rural settlements, features that plausibly influence both healthcare access and the deployment and retention of health workers.

2.2 Study facilities and data sources

A total of 108 public health facilities—comprising PHCs, CHCs and district-level hospitals—were included. Service-utilisation data were extracted from routine health information systems, while sanctioned, working and vacant post data were retrieved from State and district administrative records[10]. To improve reliability, data were triangulated across multiple sources and verified at facility level before analysis.

2.3 WISN analysis

Cadre-wise staffing requirements were estimated following the WHO WISN method[5]. For each cadre, the Available Working Time (AWT) was calculated after deducting public holidays, authorised leave, training and administrative duties from the notional working year. The principal components of each cadre's workload were identified and assigned activity-specific time standards. For every activity, the annual workload was multiplied by its time standard and divided by the AWT to yield the full-time-equivalent (FTE) staff required. The WISN ratio—the number of available staff relative to the number required—was then computed as an objective measure of workload pressure.

WISN ratios were interpreted using the following thresholds: A WISN ratio below 0.6 denoted a critical shortage; A ratio of 0.6–0.79 denoted a moderate shortage; and A ratio of 0.8 or above denoted adequate staffing. The cadres analysed were Medical Officers, Staff Nurses, Pharmacists and Laboratory Technicians.

2.4 Ethical considerations

The study used aggregated, de-identified secondary data and was approved by the Institutional Ethics Committee. The analysis was conducted in accordance with the national ethical guidelines for health research[11].

3. Results

3.1 Facility profile and service utilisation

Following data validation, all 108 public health facilities were retained in the final analysis (Fig. 1). Patterns of service utilisation shifted appreciably over the three-year period (Table 1). Outpatient department (OPD) attendance rose from 5.69 million visits in 2021–22 to 6.26 million in 2023–24—a net increase of approximately 10%—after peaking at 7.99 million in 2022–23. Growth was more pronounced for inpatient admissions, which increased by more than 50%, signalling rising demand for facility-based

care. In contrast, antenatal-care registrations fell by about 31% and institutional deliveries by about 21%, possibly reflecting shifts in service-seeking behaviour or changing referral patterns.

Table 1
Facility characteristics and service-utilisation trends (2021–2024).

Indicator	2021–22	2022–23	2023–24	Trend
Number of facilities	108	108	108	Stable
OPD visits	5,689,930	7,993,790	6,263,257	Increasing
IPD admissions	219,140	242,736	329,681	Increasing
ANC registrations	73,877	83,480	50,951	Decreasing
Institutional deliveries	53,515	58,708	42,387	Decreasing

Annual trends in the number of government health institutions and major service-utilisation indicators (OPD visits, IPD admissions, ANC registrations and institutional deliveries).

3.2 Workforce availability and workload pressure

Health-workforce availability remained constrained across all cadres throughout the study period. Vacancy rates ranged from 9% to 17% for Medical Officers but were considerably higher for Staff Nurses (39–47%) and paramedical staff (approximately 40%). These shortfalls were evident across facility types and improved only marginally over time (Fig. 2).

WISN analysis for 2023–24 revealed wide gaps between the workforce required and that available (Table 2, Fig. 3). For Medical Officers, 865 posts were required against 156 available, corresponding to a WISN ratio of 0.42. A comparable picture was observed for Staff Nurses, with 1,176 required against 163 available (ratio 0.45). Workload pressure was most extreme in pharmacy and diagnostic services, where Pharmacists and Laboratory Technicians recorded the lowest ratios of 0.12 and 0.31, respectively.

Table 2
Cadre-wise staffing requirements and WISN ratios (2023–24).

Cadre	Required staff	Available staff	WISN ratio	Workload pressure
Medical Officers	865	156	0.42	Critical
Staff Nurses	1,176	163	0.45	Critical
Pharmacists	84	29	0.12	Critical
Laboratory Technicians	477	33	0.31	Critical

Comparison of required and available staffing across four critical cadres—Medical Officers, Staff Nurses, Pharmacists and Laboratory Technicians—with WISN ratios indicating the level of workload pressure. All four cadres fell below the 0.6 threshold, denoting critical shortage.

3.3 Temporal and geographic patterns

Across all cadres, WISN ratios deteriorated between 2021–22 and 2023–24, indicating worsening staffing adequacy as service demand rose. Geographic disparities were also apparent: facilities in remote blocks recorded lower staffing ratios, consistent with the greater difficulty of deploying and retaining staff in less-accessible areas. Overall, more than two-thirds of facilities were under critical workload pressure, underscoring the systemic constraints on sustaining 24×7 service delivery (Fig. 4).

4. Discussion

This longitudinal analysis provides local evidence of large and persistent shortages in the rural public-health workforce, with workload-based FTE requirements substantially exceeding IPHS-sanctioned staffing levels. Critically, staffing adequacy deteriorated across successive years, signaling a widening gap between the services demanded and the human resources available to deliver them.

These findings are consistent with wider evidence from India and other low- and middle-income countries. A national WISN-based modelling study similarly found rural PHCs across India operating well below workload-derived requirements[6], while analyses of the size and distribution of the Indian health workforce have documented severe rural shortfalls and persistent maldistribution [4]. Internationally, applications of the WISN method in Ghana and Kenya [7] and in Ethiopia[8] have likewise identified pronounced deficits, particularly among front-line service-delivery cadres. Our results extend this evidence base by tracking staffing adequacy across multiple time points rather than at a single moment, demonstrating that static, population-based norms such as the IPHS become progressively less adequate as utilization patterns shift. The concurrent rise in inpatient admissions alongside sustained workforce shortages implies mounting pressure on providers, with potential consequences for service quality and patient outcomes.

The study also surfaces the role of contextual factors such as geographic dispersion and uneven workforce distribution. Lower WISN ratios in rural facilities point to persistent problems of staff availability and retention linked to accessibility. These observations expose the limitations of applying uniform, centrally determined staffing standards that do not account for local variation in service demand or the regional context in which care is delivered. Although national strategies outline standard health force staffing requirements, observed data reflects a severe mismatch in workforce requirement and availability. Global case studies employing the WISN methodology underline that insufficient staffing directly compromises healthcare delivery[7–9]. For India to realize its projected healthcare goals by 2047, local recruitment frameworks must aggressively bridge these current manpower gaps[6, 10].

Embedding workload-based planning methods such as WISN into routine health-system decision-making is likely to improve alignment between workforce supply and service demand[5], an approach consistent with global strategy on human resources for health[12]. Country experiences further indicate that WISN can be operationalised within comprehensive primary-health-care systems when supported by reliable

data and institutional commitment[9]. Periodic re-estimation of staffing needs would enable more responsive workforce planning, especially in high-burden and underserved areas.

4.1 Strengths

A principal strength of this study is its use of WISN, an objective, WHO-recommended method that estimates staffing need from real workload by combining service-utilisation patterns, activity time allocation and staff availability—yielding a more meaningful estimate of requirements than population-based norms. The longitudinal design is a further strength, capturing how staffing adequacy changes with service demand and overcoming a key limitation of cross-sectional assessments. Complete coverage of all public health facilities in the district adds further robustness and district-level representativeness.

4.2 Limitations

Several limitations should be acknowledged. First, the analysis relied on secondary administrative data, which may be subject to under-reporting or inconsistent recording across facilities and could affect the precision of workload and headcount estimates; primary data collection through direct time-motion studies would allow further refinement of activity standards. Second, the findings derive from a single district and may not generalise directly to settings with different population characteristics, infrastructure or workforce policies. Multi-district or state-level analyses are warranted to strengthen external validity and inform broader policy.

5. Conclusion

Current IPHS staffing norms appear to underestimate the workforce required for continuous service delivery in rural health facilities, and the resulting shortfalls worsened over the study period as demand grew. Incorporating workload-based workforce-planning approaches such as WISN into routine health-system management—together with periodic reassessment and attention to geographic equity—could improve staffing distribution and strengthen the performance of primary and secondary health care in rural India.

In spite of conventional IPHS guidelines, a severe shortage in India's trained manpower capital threatens its projected 2047 national health targets. Suggestion from recent WISN evaluations highlights that critical workload disparities and operational workforce shortages will prevent the nation from fulfilling its centenary developmental milestones unless significant, ethically guided investments are made in health sector manpower.

Declarations

1. **Ethical Approval - Not applicable**

The study protocol was reviewed and approved by the **Institutional Review Board (IRB), NIMS University, Jaipur, Rajasthan, India**.

Ethics Approval Number: NIMS-PH-2023-07

The study utilized anonymized secondary administrative health data and was conducted in accordance with the ethical principles outlined in the **Declaration of Helsinki** and the **Indian Council of Medical Research (ICMR) National Ethical Guidelines for Biomedical and Health Research Involving Human Participants (2017)**.

2. **Consent to Participate- Not applicable**

This investigation was based exclusively on anonymized secondary administrative health data collected routinely by the Government of Rajasthan. No direct interaction or intervention involving human participants was undertaken. **Therefore, *individual informed consent to participate was not applicable.***

3. **Patients' Consent Statement- Not applicable**

Patient consent for publication was **not required**, as no identifiable patient information, images, or personal health records are reported in this manuscript.

4. **Data Availability Statement**

The data used in this study are based on secondary sources, including government reports and institutional records. The data are available from the corresponding author upon reasonable request, subject to necessary permissions from the concerned authorities.

5. **Consent to Publish: Not Applicable**

Personal data or images are Not present, so ‘Not Applicable’ for the consent to publish.

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Figures

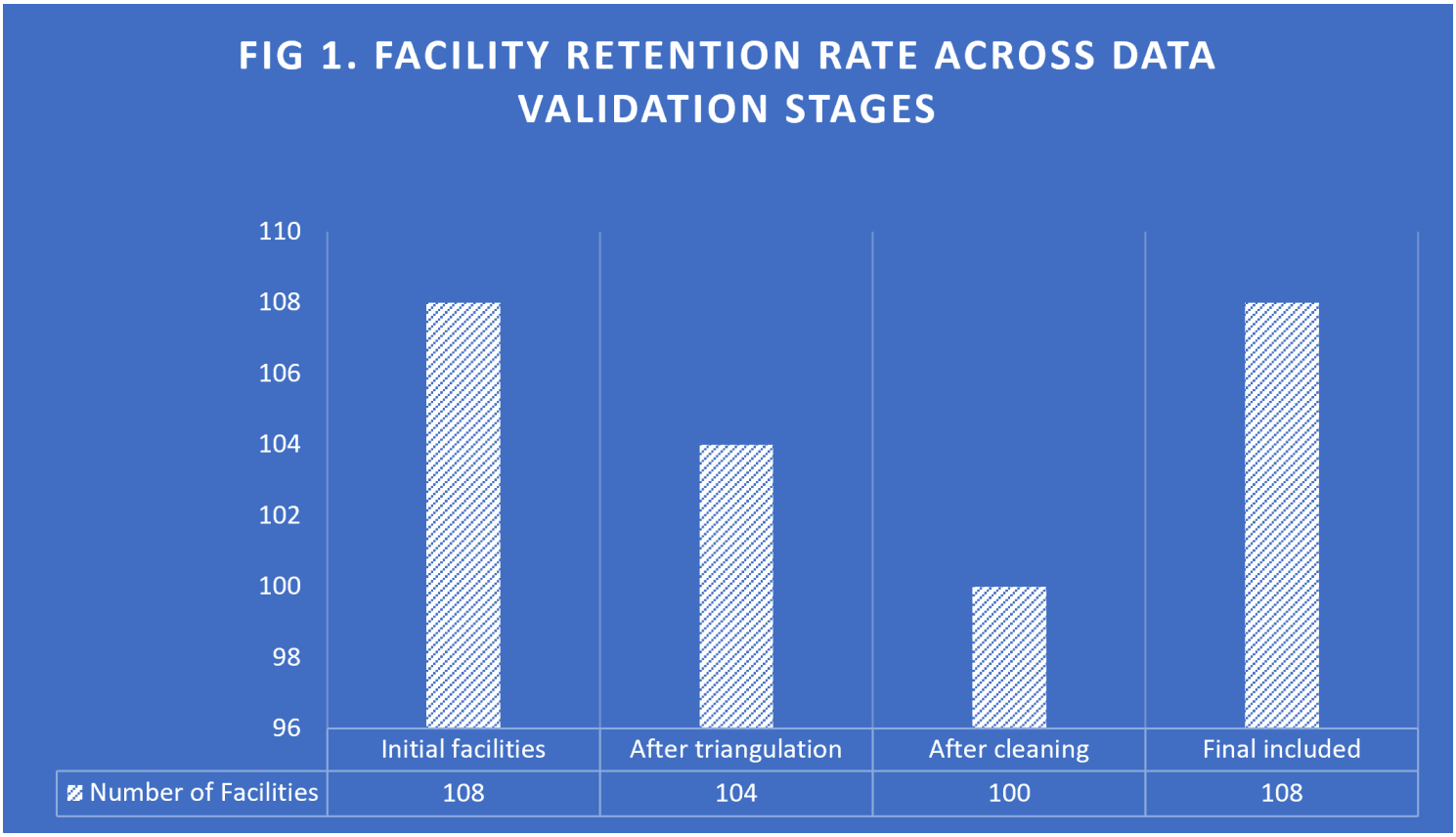


Figure 1

Flow of facilities retained through successive stages of data triangulation, cleaning, validation and final inclusion (n = 108).

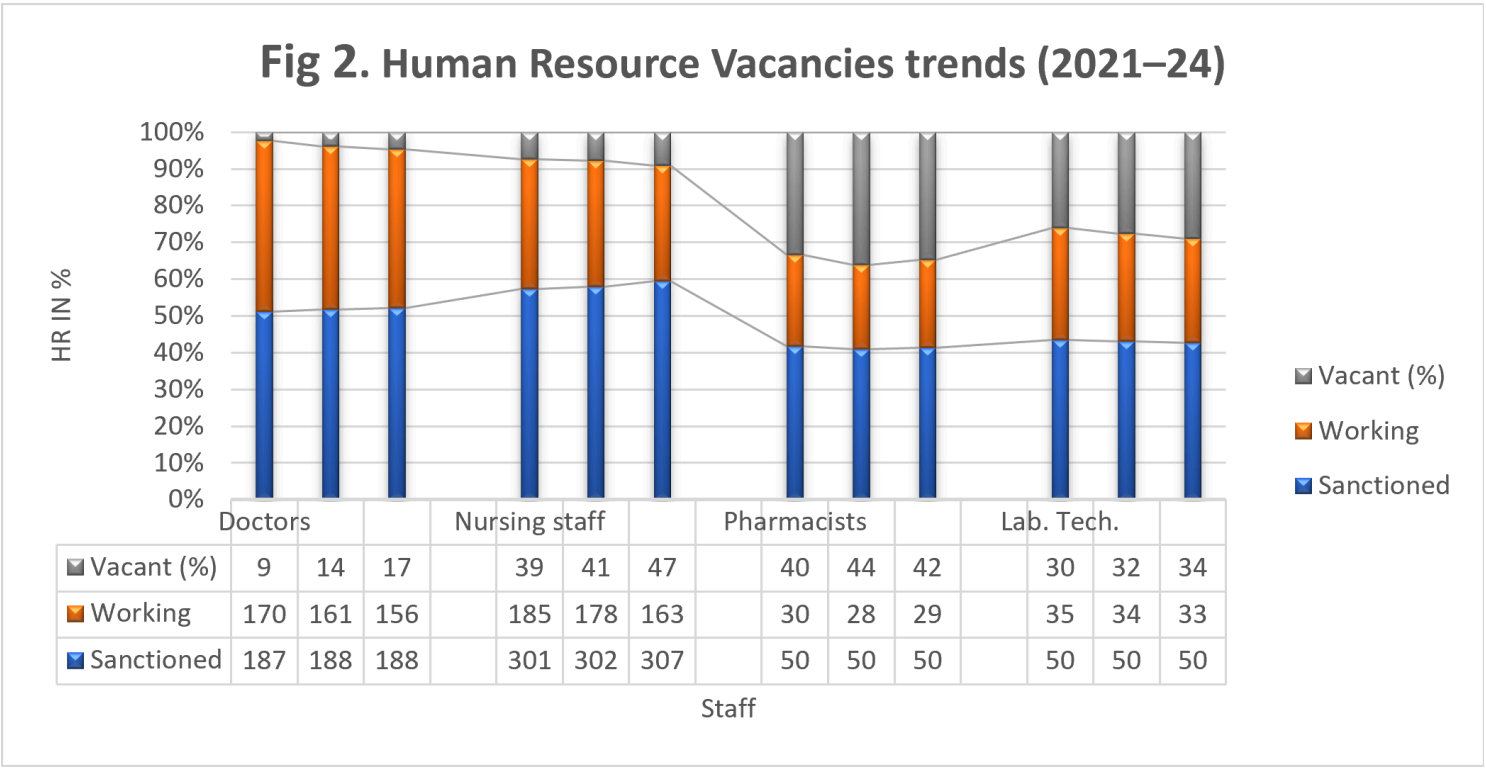


Figure 2

Trends in sanctioned, working and vacant positions for the main health-staffing cadres during the study period.

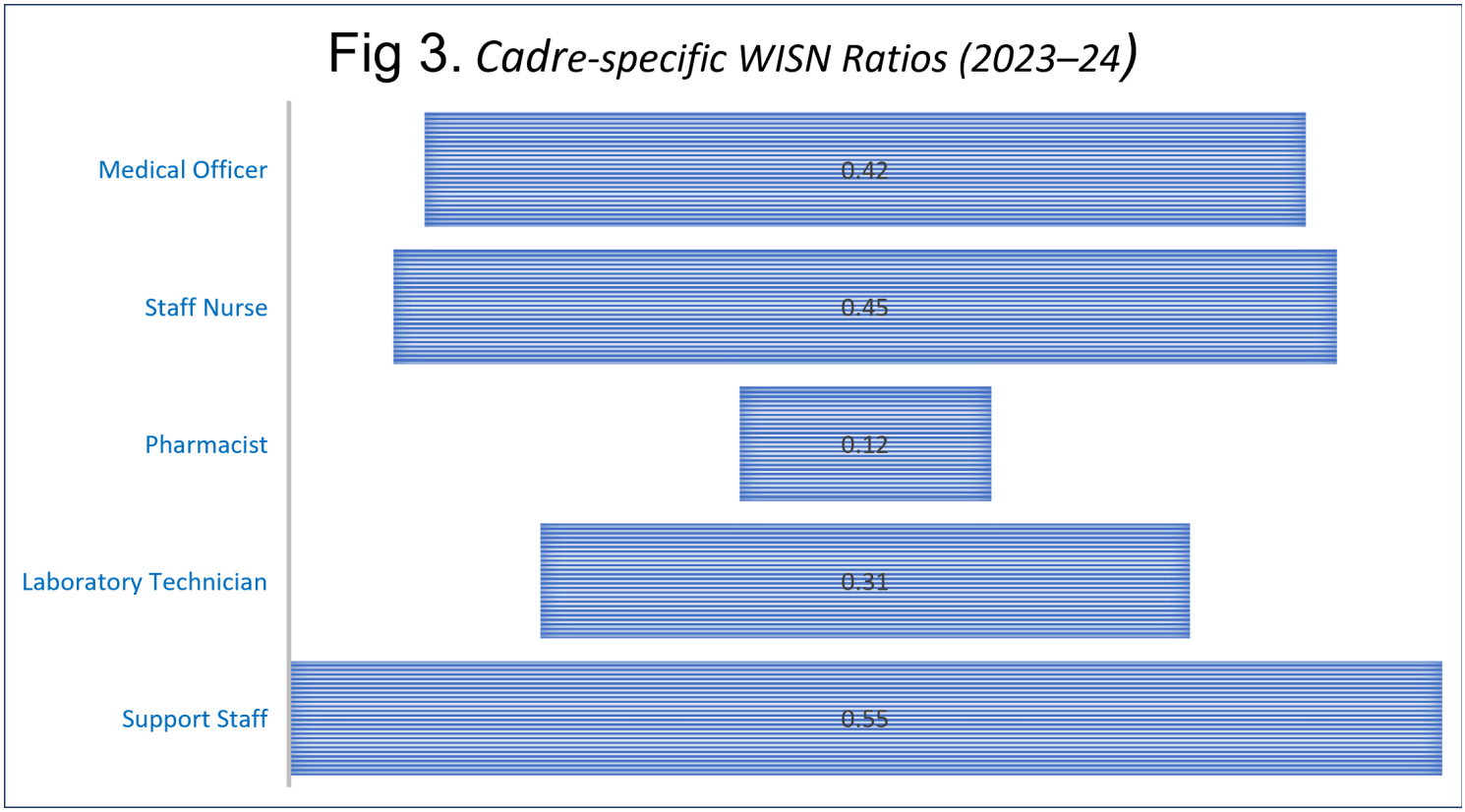


Figure 3

WISN ratios Medical Officers, Staff Nurses, Pharmacists, Laboratory Technicians and Support Staff, showing cadre-specific workload compression.

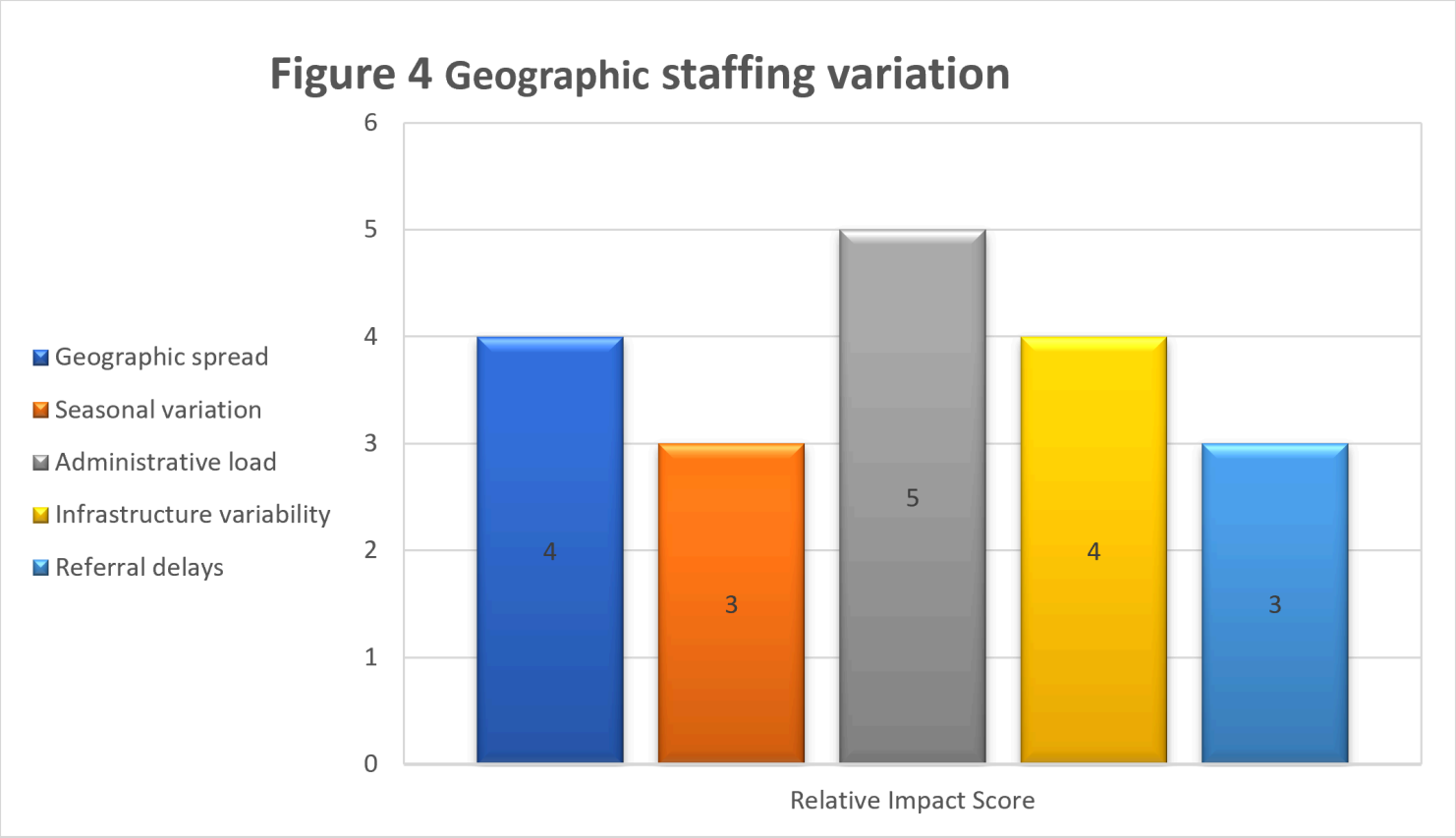


Figure 4

Relative contribution of geographic spread, seasonal variation, administrative workload, infrastructure variability and referral delays to staffing variation.