

How can countries respond to the health and care workforce crisis? Insights from international evidence

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Abstract

Future global health security requires a health and care workforce (HCWF) that can respond effectively to health crises as well as to changing health needs with ageing populations, a rise in chronic conditions and growing inequality. COVID-19 has drawn attention to an impending HCWF crisis with a large projected shortfall in numbers against need. Addressing this requires countries to move beyond a focus on numbers of doctors, nurses and midwives to consider what kinds of healthcare workers can deliver the services needed; are more likely to stay in country, in rural and remote areas, and in health sector jobs; and what support they need to deliver high-quality services. In this paper, which draws on a Policy Brief prepared for the World Health Organization (WHO) Fifth Global Forum on Human Resources for Health, we review the global evidence on best practices in organising, training, deploying, and managing the HCWF to highlight areas for strategic investments. These include (1). Increasing HCWF diversity to improve the skill-mix and provide culturally competent care; (2). Introducing multidisciplinary teams in primary care; (3). Transforming health professional

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education with greater interprofessional education; (4). Re-thinking employment and deployment systems to address HCWF shortages; (5). Improving HCWF retention by supporting healthcare workers and addressing migration through destination country policies that limit draining resources from countries with greatest need. These approaches are departures from current norms and hold substantial potential for building a sustainable and responsive HCWF.

KEYWORDS

health care policy, health professional education, health security, health systems policy, healthcare workforce, human resources for health

Highlights

- There has been chronic underfunding of the health and care workforce globally
- More resources are needed to strengthen the quality of education
- Skill mix reforms are needed to deliver effective team-based primary care
- Investing in retention is critical to overcome HCWF challenges

1 | INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic has highlighted the chronic underfunding of the health and care workforce (HCWF) and demonstrated how unprepared health systems were to respond to a global health crisis.¹ Future global health security requires a HCWF that is sufficient and adequately trained to respond effectively to future health crises and meet growing and changing health needs with ageing populations, a rise in chronic conditions and growing inequality.²

Chronic underinvestment in health and other social sectors is universal across high-middle- and low-income countries.³ Even before the COVID-19 pandemic hit, the World Health Organisation (WHO) had called attention to an impending HCWF crisis with a projected global shortage of 18 million healthcare workers by 2030.⁴ This number has subsequently been revised to 10 million, but countries with the greatest need have shown the least growth.⁵ Projections show that in Africa an estimated 6.1 million more physicians, nurses and midwives will be needed to meet population health demands by 2030; however, only 3.1 million will be trained and ready for service if current educational trajectories are maintained.⁶ While low- and middle-income countries (LMICs) are most affected by shortages, high-income countries have not yet built a self-sufficient HCWF with some recruiting foreign-trained workers to fill gaps.

However, sufficient quantities of doctors, nurses and midwives will not ensure access to appropriate care for all. With slowing economic growth in the aftermath of the COVID-19 crisis, countries and the global health community need to work together to prioritise investments in HCWF education, employment, and retention to help build a HCWF

that is fit for purpose. This will require the global health community to consider what kinds of healthcare workers can deliver the services needed; are more likely to stay in country, in rural and remote areas, and in health sector jobs; and what support they need to deliver high-quality services. In this paper, which draws on a Policy Brief prepared for the WHO Fifth Global Forum on Human Resources for Health,⁷ we review the global evidence on best practices in organising, training, deploying, and managing the HCWF to highlight key areas of strategic investments.

2 | KEY AREAS FOR STRATEGIC INVESTMENT

2.1 | Increasing health care worker diversity

Meeting future population health needs requires investment to better target who to educate and train. The changing burden of disease in all regions requires health systems to transform from a mode that is responsive to episodes of illness to one that maintains health and prevents the onset and progression of chronic illness, addresses risk factors across the life-cycle and takes a population perspective. This inevitably requires a rethinking of the skill mix and the set of disciplines needed, extending from nursing and medicine into physiotherapy, dietetics, optometry, exercise science and many others. The old skill mix and physician-centric service delivery model is no longer fit for purpose. However, workforce imbalance is a common challenge in many contexts with many more doctors and nurses than other allied health staff; and distribution skewed towards secondary and tertiary care.

Improving the diversity of the HCWF by developing more mid-level cadres instead of just high-level cadres is likely to be a more efficient way to meet population health needs, and address inequities in rural and other underserved areas. For example, a 2013 systematic review suggested 'no difference between the effectiveness of care provided by mid-level healthcare workers in the areas of maternal and child health and communicable and non-communicable diseases, and that provided by higher level healthcare workers'.⁸ More recent studies have confirmed that different health professionals such as nurses can be highly effective in delivering a wide range of services that have traditionally been delivered by physicians and many countries have already taken steps to invest in developing the skills of the non-physician workforce to support role delegation.

Diversity not just in skill-mix but inclusive of race/ethnicity, gender, socioeconomic status, rural background and other minoritised communities, can also help repair trust in health systems and meet population health needs. A developing body of work suggests racial concordance improves communication and patient satisfaction,⁹ and has the potential to improve patient outcomes. Ensuring cultural diversity of the health workforce remains an ongoing challenge. In the United States for example, Black, Hispanic and Native American individuals are severely under-represented in higher income health professions and conversely, overrepresented in lower wage health care occupations.¹⁰

The first step to increase the diversity of the available HCWF is to invest in expanding the pool of people qualified for careers in the health sector to create a diverse candidate pool for health professional training programs.¹ Evidence-based strategies to improve the diversity of the health workforce include investment in pipeline/pathway programs to encourage and support future health careers, mentorship and internship opportunities in health departments and health facilities, recruitment and admission practices that encourage students from ethnically diverse backgrounds, rural areas and girls, student support services, financial support, and accreditation standards for diversity.^{1,10}

2.2 | Introducing multidisciplinary teams in primary care

Since the 1978 Alma-Ata Declaration, investing in primary health care has widely been agreed upon as a cost-effective way to improve health outcomes, health system efficiency and health equity. Global consensus

recognises the gold standard of the primary care team (PCT) approach, where accessible and high-quality primary care is best provided by a team of clinicians and other health professionals, especially in the context of epidemiological transition, growing multimorbidity and an ageing population. While there is no standardized, or one-size-fits-all, approach, a typical configuration of a PCT includes a core team (e.g. clinician, nurse, medical assistant), an extended health care team (e.g. dentist, social worker, pharmacist) and an extended community care team (e.g. home health aide, community health worker).¹¹ One extended team may support several core teams.

The PCT approach has been successfully adapted and implemented in communities worldwide, both in urban and rural settings. Brazil for example, launched its integrated and comprehensive primary health care approach in 1994, where care is provided by Family Health Teams.¹² These teams are composed of a family physician, a nurse, a nursing assistant and 4–12 community health agents who are based at Health Units covering a population of approximately 4000 people. Some countries have implemented PCTs with a more limited range of healthcare workers to mitigate the workforce shortage.

While PCTs are an efficient and effective way to deliver primary care, more physicians, mid-level cadres and allied health professionals are needed to meet population health needs. Other challenges identified in implementing a PCT approach include traditional hierarchies where physicians are trained to manage patients individually rather than collectively.¹³ Strategies to improve the diversity of the HCWF (strategy #1) and to transform health professional education and training to promote collaboration (strategy #3) are therefore inextricably linked to strengthening primary and preventative care.

2.3 | Transforming health professional education

Underinvestment in education and training has resulted in an under supply of healthcare workers to meet population health demands. While countries will need to invest in increasing the number of graduates, health professional education needs to be transformed to produce high quality healthcare workers capable of meeting changing health needs.

In 2010, the Lancet Commission on health professional education called for the re-design of health professional education.¹⁴ It recommended several strategies to transform health professional education including a shift towards competency-based curricula adapted to local contexts, interprofessional education to promote collaboration, use of IT, strengthening of education resources including faculty, syllabuses, instructional materials and infrastructure, and promotion of culturally competent care.

Interprofessional education, which is increasingly being recognized as 'best practice' as it fosters team-based care, has been defined as occurring 'when two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes'.¹⁵ Despite the endorsement of its desirability, interprofessional education models have proved challenging to implement, with the 'consistent narrative of medical privilege and centrism' and 'profession-centrism' being fundamental and obstinate barriers to implementation.¹⁶ These barriers will need to be considered as the global community works together to support a move towards interprofessional education.

At the same time, more resources are needed to strengthen the quality of education. In many LMICs, lack of proper infrastructure and poor quantity and quality of teaching faculty are major impediments to improving the quality of health professional education. Accreditation is a common mechanism for improving standards in education. However, many countries especially LMIC currently lack the capacity to rely on accreditation (and regulation) as a means of quality improvement. For example, while many countries in sub-Saharan Africa have nursing councils as regulatory bodies, they have lacked the capacity and resources required to be effective.¹⁷ At the same time, where the role of private health training institutions is large and/or growing, it is imperative that regulatory mechanisms focused on the private sector are strengthened. There is a role for regional cooperation to enhance

access to quality education. For example, countries in Africa with capacity to train specialists, such as Kenya, Uganda, Tanzania and South Africa, could help develop programmes and capacity in other countries of the region.⁶

Online learning tools represent a cost-effective way to improve access to education as demonstrated during the COVID-19 pandemic with medical and nursing colleges across the world adapting to online curricula in the face of lockdowns. Online learning provides an opportunity to address faculty shortages, increase the reach of both pre-service and in-service training, attract a more diverse student base, standardise and update content and encourage cross-institutional collaboration.¹⁸ There is a growing body of literature citing the lessons learnt in maximising the value of online tools which will be important for countries to consider when exploring e-learning tools to meet their future HCWF needs.

Evidence also supports greater investment in the creation of rural schools which recruit people with rural backgrounds and educate them in a rural context. A Cochrane systematic review concludes that a rural background is the factor most strongly associated with rural practice.¹⁹ There is also evidence, from both high-income countries and LMIC that HCWs end up practicing close to their training sites, which offers support for investments in community-based and rural training sites.²⁰

2.4 | Re-thinking employment and deployment systems to address shortages

Shortfalls in HCWF and mismatches between available human resources and the need for their services are substantial in many countries, especially in rural areas. Scheil-Adlung (2015) estimated that 77% of the rural population in Africa, 56% in the Middle East and 75% in Asia and the Pacific (excluding India and China) had no access to health care due to healthcare worker shortages. This number was half or less than half in most regions for their urban counterparts.²¹

Many countries use the practice of 'posting' new graduates, which involves allocating new graduates to jobs without a recruitment or application process. This practice is often the means to impose a period of compulsory rural service. Where no explicit national policy exists, some posting systems are non-transparent and not systematic with few incentives, conducted solely at the discretion of local managers or have considerable variation between state and local governments.²²

Random allocation systems miss the opportunity to post those who are happiest to serve in rural or remote positions and who in turn are likely to have higher morale, better performance, less absenteeism and a lower rate of attrition once posted to them. The global community needs to rethink these employment and deployment systems which rely on compulsory posting and instead promote the use of financial and non-financial incentives. While there are few accounts of the effectiveness of these policies, the evidence available indicates that relatively large increases in salary are required to attract staff to remote areas. Indonesia's incentive system that provided for up to four-fold basic salary increases for 'very remote' service resulted in 536 doctors applying for the 55 posts available in West Java Province and doctor vacancies in very remote health centres roughly halved during a four-year period.²³ In contrast, smaller scale incentives in South Africa (18%–22% of salary for doctors and 8%–12% for nurses) and Orissa, India were deemed insufficient to attract workers to rural areas.^{20,24} A common finding is that financial incentives need to be combined with non-financial incentives such as preferential access to education, training and professional development opportunities, housing and career advancement for positive impact.

A further problem in many countries is competition from the private sector which draws scarce human resources towards where there is ability to pay and away from where there is need without ability to pay. The private sector may do this by fully employing scarce cadres or by providing public sector staff with opportunities for dual practice involving employment and work assignments in both sectors. This set of issues appears little recognized in the persistence with deployment systems on the part of the public sector developed in a context in which the public sector held the monopoly purchasing role of health professional skills and graduating health professionals had essentially no choice but to work for government. The private sector tends to offer better financial and non-

financial incentives in addition to better working conditions in contrast to the limited nonmonetary incentives in the public sector. McPake et al (2016) outline different kinds of dual practice and a range of potential regulatory strategies to minimise the negative impacts of it on the public health sector to deliver services effectively.²⁵ This exemplifies the kinds of approaches that are needed to delineate clear roles for public and private sectors and stewardship functions to support and protect public interest across public and private workforce roles.²⁶

Addressing distribution of the HCWF will require strong political commitment to invest resources required to move from compulsory posting systems to those that use incentives and allow for heterogenous preferences.

2.5 | Improving HCWF retention by supporting and protecting healthcare workers and addressing migration

Producing sufficient and diverse HCWF is not enough. Trained professionals also need to stay in health careers and in country. If HCWs are not supported, are overworked and burnt-out, and feel undervalued, they will not perform optimally and may drop-out of the workforce entirely. Competitive salaries and benefits packages, flexible working arrangements, professional development and career advancement opportunities are all important investments to improve retention. It is also vitally important to ensure safe working environments, where healthcare workers can deliver services effectively. This includes ensuring access to proper equipment and supplies, adequate workplace facilities (e.g. for breaks), workplaces free from harassment and discrimination, and support for mental health and well-being. While emergencies can impact the mental health and well-being of the HCWF, organizational support can play a large role in mitigating this and improving worker retention and productivity. For example, during the COVID-19 pandemic, perceived organizational support such as the supply of personal protective equipment, training and organizational communication regarding COVID-19 reduced fear and consequently psychological distress among the HCWF.²⁷ Women make up a disproportionately large proportion of the HCWF globally, estimated to be 67% of the total workforce, and yet there is a substantial gender wage gap with women being paid 20% less on average than men.²⁸ Investing in making health care sector working conditions safer for women, closing the gender pay gap, and providing opportunities to enhance leadership roles will be fundamental to building a sustainable HCWF.

Health professional migration is associated with worldwide shortages of HCWs, and substantial lost returns on investment for source countries. For instance, the migration of doctors from Ethiopia, Kenya, Malawi, Nigeria, South Africa, Tanzania, Uganda, Zambia and Zimbabwe was estimated to accumulate lost returns from investment in education of \$2.17bn.²⁹ Health professional migration has been likened to a 'medical carousel',³⁰ which might be better recognized as a ladder by which health professionals seek to migrate to countries with pay and conditions at least one rung up from where they are. This suggests a distribution of responsibility at all points on the ladder. Addressing push factors of migration in countries of origin, such as by improving working conditions, pay and providing career opportunities, are key areas for strategic investment to tackle migration-related challenges. However, migration of health professionals is likely most responsive to policy in destination countries, such as visa restrictions, diploma recognition, points-based migration systems, tax breaks and the availability of permanent residence status. The global health community needs to collectively advocate for restraint on the part of such countries in draining health workforce from the countries with the greatest shortfalls.

3 | CONCLUSION

The paper has covered several approaches that countries need to consider in the development of the HCWF. These approaches are departures from current norms in many countries and hold substantial potential for building a sustainable and responsive HCWF. But it requires political will to not only increase investments, but to think

differently and prioritise actions that drive efficiency. While much of what we discuss is more relevant to the long-term health system development and HCWF planning than resolving immediate crises that countries might be facing, investments in retention initiatives can address workforce challenges in the short-term. It is critically important to be clear about long-term directions in deciding on short-term measures. With COVID-19 unlikely to be the last pandemic, especially with threats from climate change growing, it is essential that political leaders at the country, regional and international levels step up and work together to ensure the HCWF is adequately funded. Even as economic growth slows, education, employment and retention of HCWF needs to be a priority in public expenditure to increase supply, protect the existing workforce and plan ahead to address future challenges.

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The authors declare no competing interests.

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Data sharing is not applicable to this article as no new data were created or analyzed in this study.

ETHICS STATEMENT

Not applicable.

DISCLAIMER

The views expressed in this perspective are those of the authors and do not necessarily reflect those of their institutions.

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REFERENCES

1. Deussom R, Lal A, Frymus D, et al. Putting health workers at the Centre of health system investments in COVID-19 and beyond. *Fam Med Community Health*. 2022;10(2):e001449. <https://doi.org/10.1136/fmch-2021-001449>
2. Czabanowska K, Kuhlmann E. Public health competences through the lens of the COVID-19 pandemic: what matters for health workforce preparedness for global health emergencies. *Int J Health Plann Manag*. 2021;36(S1):14-19. <https://doi.org/10.1002/hpm.3131>
3. Cylus JPG, Smith PC Making the economic case for investing in the health system: what is the evidence that health systems advance economic and fiscal objectives? In: Kluge HFJ, ed. *Health Systems for Prosperity and Solidarity Policy brief*. Copenhagen: WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies; 2018.
4. WHO. *Global Strategy on Human Resources for Health: Workforce 2030*. World Health Organization; 2016.
5. Boniol M, Kunjumen T, Nair TS, Siyam A, Campbell J, Diallo K. The global health workforce stock and distribution in 2020 and 2030: a threat to equity and 'universal' health coverage? *BMJ Glob Health*. 2022;7(6):e009316. <https://doi.org/10.1136/bmjgh-2022-009316>
6. Okoroafor SC, Ahmat A, Asamani JA, Jjs M, Nyoni J. An overview of health workforce education and accreditation in Africa: implications for scaling-up capacity and quality. *Hum Resour Health*. 2022;20(1):37. Published 2022 May 7. <https://doi.org/10.1186/s12960-022-00735-y>
7. McPake B, Dayal P, Zimmermann J, Williams GA. *What Steps Can Improve and Promote Investment in the Health and Care Workforce? Enhancing Efficiency of Spending and Rethinking Domestic and International Financing*. European Observatory on Health Systems and Policies; 2023.

8. Lassi ZS, Cometto G, Huicho L, Bhutta ZA. Quality of care provided by mid-level healthcare workers: systematic review and meta-analysis. *Bull World Health Organ.* 2013;91(11):824-833. <https://doi.org/10.2471/blt.13.118786>
9. Shen MJ, Peterson EB, Costas-Muñiz R, et al. The effects of race and racial concordance on patient-physician communication: a systematic review of the literature. *J Racial Ethn Health Disparities.* 2018;5(1):117-140. <https://doi.org/10.1007/s40615-017-0350-4>
10. Farrell JBE, Vichare A, Salsberg E. *Who Enters the Health Workforce? An Examination of Racial and Ethnic Diversity.* Fitzhugh Mullan Institute for Health Workforce Equity, George Washington University; 2022. Accessed February 20, 2023.
11. Medicine, Health, Medicine Division. Board on health care services; committee on implementing high-quality primary care. In: Robinson SK, Meisner M, Phillips Jr. RL, McCauley L, eds. *Implementing High-Quality Primary Care: Rebuilding the Foundation of Health Care.* National Academies Press (US); 2021.
12. Andrade MV, Coelho AQ, Xavier Neto M, de Carvalho LR, Atun R, Castro MC. Transition to universal primary health care coverage in Brazil: analysis of uptake and expansion patterns of Brazil's Family Health Strategy (1998-2012) [published correction appears in *PLoS One.* 2021 May 11;16(5):e0251764. *PLoS One.* 2018;13(8):e0201723. Published 2018 Aug 10. <https://doi.org/10.1371/journal.pone.0201723>
13. O'Reilly P, Lee SH, O'Sullivan M, Cullen W, Kennedy C, MacFarlane A. Assessing the facilitators and barriers of interdisciplinary team working in primary care using normalisation process theory: an integrative review. *PLoS One.* 2017;12(5):e0177026. <https://doi.org/10.1371/journal.pone.0177026>
14. Frenk J, Chen L, Bhutta ZA, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet.* 2010;376(9756):1923-1958. [https://doi.org/10.1016/S0140-6736\(10\)61854-5](https://doi.org/10.1016/S0140-6736(10)61854-5)
15. Gilbert JH, Yan J, Hoffman SJ. A WHO report: framework for action on interprofessional education and collaborative practice. *J Allied Health.* 2010;39(Suppl 1):196-197.
16. Meleis AI. Interprofessional education: a summary of reports and barriers to recommendations. *J Nurs Scholarsh.* 2016;48(1):106-112. <https://doi.org/10.1111/jnu.12184>
17. Bvumbwe T, Mtshali N. Nursing education challenges and solutions in Sub Saharan Africa: an integrative review. *BMC Nurs.* 2018;17(1):3. Published 2018 Jan 31. <https://doi.org/10.1186/s12912-018-0272-4>
18. Frehywot S, Vovides Y, Talib Z, et al. E-learning in medical education in resource constrained low- and middle-income countries. *Hum Resour Health.* 2013;11(1):4. Published 2013 Feb 4. <https://doi.org/10.1186/1478-4491-11-4>
19. Grobler L, Marais BJ, Mabunda S. Interventions for increasing the proportion of health professionals practising in rural and other underserved areas. *Cochrane Database Syst Rev.* 2015;2015(6):CD005314. Published 2015 Jun 30. <https://doi.org/10.1002/14651858.CD005314.pub3>
20. Murphy GT, Goma F, MacKenzie A, et al. A scoping review of training and deployment policies for human resources for health for maternal, newborn, and child health in rural Africa. *Hum Resour Health.* 2014;12(1):72. Published 2014 Dec 16. <https://doi.org/10.1186/1478-4491-12-72>
21. Scheil-Adlung X *Global Evidence on Inequities in Rural Health Protection: New Data on Rural Deficits in Health Coverage for 174 Countries.* International Labour Organization; 2015.
22. Abimbola S, Olanipekun T, Schaaf M, Negin J, Jan S, Martiniuk ALC. Where there is no policy: governing the posting and transfer of primary health care workers in Nigeria. *Int J Health Plann Manag.* 2017;32(4):492-508. <https://doi.org/10.1002/hpm.2356>
23. Efendi F, Chen C.-M, Kurniati A. The situational analysis of nursing education and workforce in Indonesia. *Malays J Nurs (MJN).* 2018;9(4):20-29.
24. Chakravarthi I. Effectiveness of financial incentives for recruitment and retention of skilled health professionals for the public health system in Orissa, India. *BMC Proc.* 2012;6(Suppl 5):O2. <https://doi.org/10.1186/1753-6561-6-S5-O2>
25. McPake B, Russo G, Hipgrave D, Hort K, Campbell J. Implications of dual practice for universal health coverage. *Bull World Health Organ.* 2016;94(2):142-146. <https://doi.org/10.2471/BLT.14.151894>
26. Shaping a Health Workforce for the Future: Factsheet September 2023. https://cdn.who.int/media/docs/default-source/wpro---documents/regional-committee/session-74/fact-sheets/health-workforce-factsheet.pdf?sfvrsn=40e22215_5&download=true. Accessed November 24, 2023, 2023.
27. De Kock JH, Latham HA, Leslie SJ, et al. A rapid review of the impact of COVID-19 on the mental health of healthcare workers: implications for supporting psychological well-being. *BMC Publ Health.* 2021;21(1):104. Published 2021 Jan 9. <https://doi.org/10.1186/s12889-020-10070-3>
28. Who. *The Gender Pay Gap in the Health and Care Sector: A Global Analysis in the Time of COVID-19.* World Health Organization; 2022.
29. Mills EJ, Kanters S, Hagopian A, et al. The financial cost of doctors emigrating from sub-Saharan Africa: human capital analysis. *BMJ.* 2011;343(3):d7031. Published 2011 Nov 23. <https://doi.org/10.1136/bmj.d7031>
30. Bundred PE, Levitt C. Medical migration: who are the real losers? *Lancet.* 2000;356(9225):245-246. [https://doi.org/10.1016/S0140-6736\(00\)02492-2](https://doi.org/10.1016/S0140-6736(00)02492-2)

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