McKinsey
Health Institute

Heartbeat of health: Reimagining the healthcare workforce of the future

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Contents

Closing the healthcare worker shortage gap could eliminate 7 percent of the global disease burden and add $1.1 trillion to the global economy.

At a glance

— A global healthcare worker shortage of at least ten million is expected by 2030.

— Closing that shortage could avert 189 million years of life lost to early death and disability and boost the global economy by $1.1 trillion.

— While known supply-side interventions that enable the workforce to grow, thrive, and stay can add about 5.6 million healthcare workers, this is not enough to close the gap. Closing it will require transforming healthcare service delivery—reimagining who provides healthcare, how services are delivered, and where care is accessed.

Over the last century, people have lived longer, yet the portion of life spent in poor health remains unchanged, resulting in more years battling chronic and infectious diseases.[1] Individuals face a growing reality: Access to healthcare professionals when one is sick, elderly, or in pain can no longer be taken for granted.

That is because a global shortage of at least ten million healthcare workers is expected in 2030, according to the World Health Organization, with upper estimates over 78 million (see sidebar "Definition of healthcare workers").[2] Without enough healthcare workers to deliver care, fewer people have access to services that save lives and improve quality of life.

Currently, nearly 60 percent of the global population— approximately 4.5 billion individuals—lack access to essential health services. These services include immunization, safe pregnancy and childbirth practices, prevention and treatment of infectious diseases, and management of chronic or noncommunicable conditions.[3] In practical terms, the consequences include delays that affect patient experience, such as waiting longer for a hip or knee surgery, and tragic outcomes, such as mothers and newborns dying in childbirth due to a lack of qualified health workers.[4] Developing and retaining sufficient healthcare workers to assist those who are ill and promote healthy living is a challenge that affects almost every country. It is also a challenge that cannot be addressed solely by the healthcare industry. Rather, it will take a global

[1] "Adding years to life and life to years," McKinsey Health Institute, March 29, 2022.
[2] Mathieu Boniol et al., "The global health workforce stock and distribution in 2020 and 2030: A threat to equity and 'universal' health coverage?," *BMJ Global Health*, 2022, Volume 7, Number 6; The 18 million 2030 shortage projection was based on gap to median index that averaged aggregate coverage indicator and United Nations Sustainable Development Goal (SDG) attainment score. *Global strategy on human resources for health: Workforce 2030*, World Health Organization, 2016. The 12.5 million and 78.1 million shortage projections in 2030 were estimated based on gap to 70 percent and 80 percent of Universal Health Coverage Service Coverage Index, respectively. Mathieu Boniol et al., "The global health workforce stock and distribution in 2020 and 2030: A threat to equity and 'universal' health coverage?," *BMJ Global Health*, 2022, 7, Number 6.
[3] *Tracking universal health coverage: 2023 global monitoring report*, World Bank, 2023.
[4] "New report sounds the alarm on global shortage of 900,000 midwives," World Health Organization, May 2, 2021.

movement in which public and private stakeholders inside and outside healthcare invest and innovate.

Addressing the healthcare worker shortage is an opportunity to profoundly advance health worldwide, adding years to life and life to years. McKinsey Health Institute's analysis finds that closing this shortage could avert 189 million years of life lost to early death and lived with disability, accounting for 7 percent of all disease burden (see appendix, "Disease burden and GDP impact sizing methodology"). To put this into context, closing the shortage would have as much positive benefit as eliminating the disease burden stemming from maternal and neonatal morbidity and mortality conditions.[5]

Closing the healthcare worker gap can also have an immense impact on the global economy to the tune of $1.1 trillion, roughly equal to the GDP of Switzerland.[6] The McKinsey Health Institute (MHI) estimates that around $300 billion of that could be a direct result of the greater number of healthcare worker

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[5] Based on 2030 projected disability-adjusted life years (DALYs). Maternal and neonatal disorders: 171 million DALYs, University of Washington Institute for Health Metrics and Evaluation (IHME), Global burden of disease.

[6] In 2023, Switzerland's GDP was almost $885 billion, according to the World Bank, 2023.

jobs (Exhibit 1). However, the much larger economic stimulus comes from the ripple effects healthcare workers have on making all workforces healthier and indirectly creating non-healthcare jobs (for details, see appendix, "Disease burden and GDP impact sizing methodology").

The shortage of healthcare workers and the potential for improvement are not evenly distributed globally. Africa, with 17 percent of the world's population, accounts for 52 percent of the shortage and over 70 percent of the opportunity to reduce disease burden (Exhibit 2). However, less than 20 percent of

Exhibit 1

Closing the healthcare worker shortage adds up to 189 million years to life and $1.1 trillion to the global GDP in 2030.

Impact of closing the 10 million global healthcare worker shortage, by 2030[1]

Global disease burden reduction effect,[2] disability-adjusted life years (DALYs)

Years lost to death
169 million

Years lived with disability
20 million
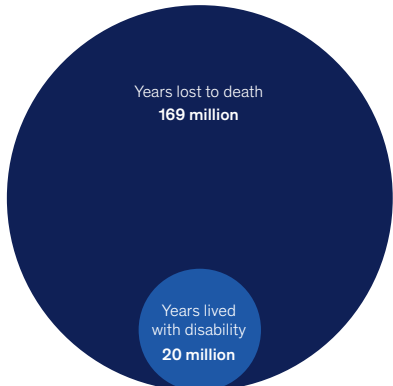
Total reduction by 2030 **189 million** DALYs

Global disease burden reduction effect on GDP, by cause,[3] $ billion added

Indirect and induced jobs from healthcare workforce expansion
700

Direct healthcare worker jobs
300

Healthier population
100

Total GDP by 2030 **$1.1 trillion**

[1]10.2 million shortage is based on the gap to global median healthcare worker (HCW) density sourced from WHO. Shortage is estimated as the difference between supply and need. Supply is estimated using a stock-and-flow model, where current stock is adjusted for expected retirees and graduates. Need is estimated using varying methodologies; estimates are based on reduction of communicable diseases.
[2]Disability adjusted life years (DALYs) = years of life lost (YLLs) + years lost due to disability (YLDs).
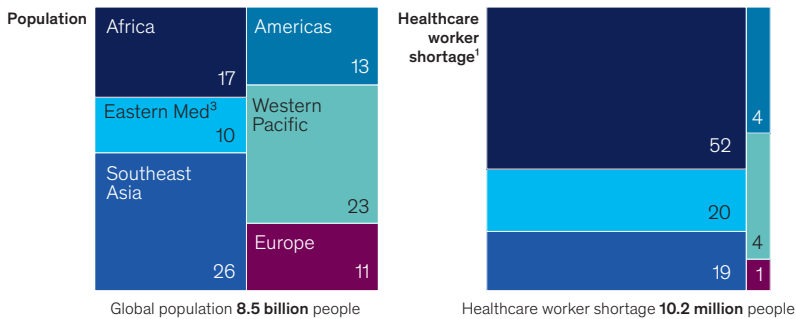[3]GDP impact is calculated based on both impact from more years working (ie, increasing HCW density to reduce years lived with disability and death during working age that removes workers from the workforce) and from added jobs (ie, more direct jobs in healthcare, indirect jobs from employer spend, and induced jobs from employee spend).
Source: Annie Haakenstad et al., "Measuring the availability of human resources for health and its relationship to universal health coverage for 204 countries and territories from 1990 to 2019: A systematic analysis for the Global Burden of Disease Study 2019," *Lancet*, 2022, Volume 399, Issue 10341; Carla Castillo-Laborde, "Human resources for health and burden of disease: An econometric approach," *Human Resources for Health*, 2011, Volume 9, Issue 4; Global Industry Service, Oxford Economics, 2025; Input-Output tables, OECD, 2023; Mathieu Boniol et al., "The global health workforce stock and distribution in 2020 and 2030: A threat to equity and 'universal' health coverage?," *BMJ Global Health*, 2022, Volume 7, Number 6; World Bank Data, accessed May 1, 2025
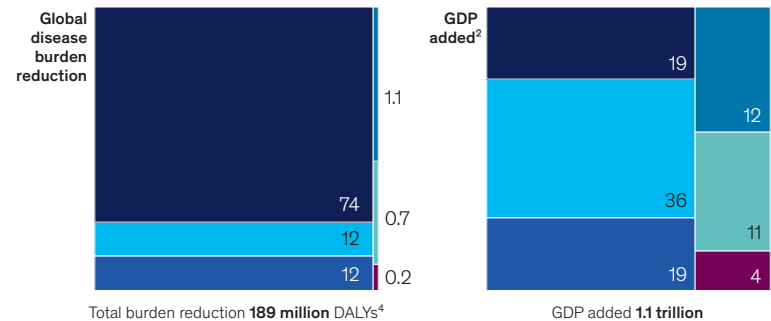
Exhibit 2

Closing the healthcare worker shortage adds up to 189 million years to life and $1.1 trillion to the global GDP in 2030.

2030 population and healthcare workforce shortage projections, % share

Population			Healthcare worker shortage[1]	
Africa **17**	Americas **13**		**52**	**4**
Eastern Med[3] **10**	Western Pacific **23**		**20**	
Southeast Asia **26**	Europe **11**		**19**	**4** **1**

Global population **8.5 billion** people   Healthcare worker shortage **10.2 million** people

Health and economic impact of closing the shortage, % share

Global disease burden reduction		GDP added[2]	
74	1.1	**19**	**12**
12	0.7	**36**	**11**
12	0.2	**19**	**4**

Total burden reduction **189 million DALYs**[4]   GDP added **1.1 trillion**

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the GDP opportunity is concentrated in Africa, highlighting the variation in disease burden averted and GDP gained by closing the shortage. Further, while global life expectancy at birth could be extended a year and a half by eliminating the worker shortage, this improvement pales in comparison to the potential for Africa, where individuals could live seven years longer.[7]

The healthcare workforce needs attention, investment, and innovation. In this report, MHI considers how to address the healthcare worker shortage by not only increasing the supply of healthcare workers but also fundamentally reimagining the "who," "how," and "where" of healthcare service delivery.

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[7] The reduction in deaths was estimated by assuming the same proportions for reduction in deaths and reduction in years of life lost (YLL) through closing the shortage. The impact on life expectancy at birth was estimated by comparing the infant mortality rate (World Bank, 2022) with infant mortality after assumed reduction in deaths. The calculation was based on life tables from M. Greenwood, "Discussion on the value of life-tables in statistical research," *Journal of the Royal Statistical Society*, June 1922, Volume 85, Number 4; Chin Long Chiang, *The Life Table and Its Applications*, Krieger Publishing, 1984. Analysis was conducted for each World Health Organization region.

Understanding healthcare workforce dynamics

Four country archetypes represent how challenges and priorities differ based on healthcare workforce dynamics.

Each country faces unique supply and demand dynamics in the healthcare labor market,[8] so customizing solutions is essential for addressing the global shortage. Solutions cannot be limited to recruiting more healthcare workers based on population needs; countries also must ensure there are enough available healthcare jobs in a region or country.

Countries can be categorized based on whether they have enough healthcare workers relative to population needs and enough employment opportunities for new and existing healthcare professionals. Either of these may reflect deeper challenges such as economic, educational, or policy constraints. To help stakeholders frame potential opportunities for improvement, MHI's analysis categorized countries by these two dimensions to define four archetypes (Exhibit 3):

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[8] In this report, "labor supply" refers to the current availability of trained healthcare professionals, including the number of individuals actively working or prepared (seeking) to enter the healthcare workforce. This definition excludes trained health professionals who choose not to work in healthcare. The term "need" represents the healthcare workers required to achieve basic health outcomes and meet population health needs effectively. The term "demand" reflects the number of healthcare workers that the healthcare market is willing and able to employ, based on economic conditions, budget allocations, and policy priorities.

Exhibit 3

Closing the healthcare worker shortage adds up to 189 million years to life and $1.1 trillion to the global GDP in 2030.

2030 population and healthcare workforce shortage projections, % share
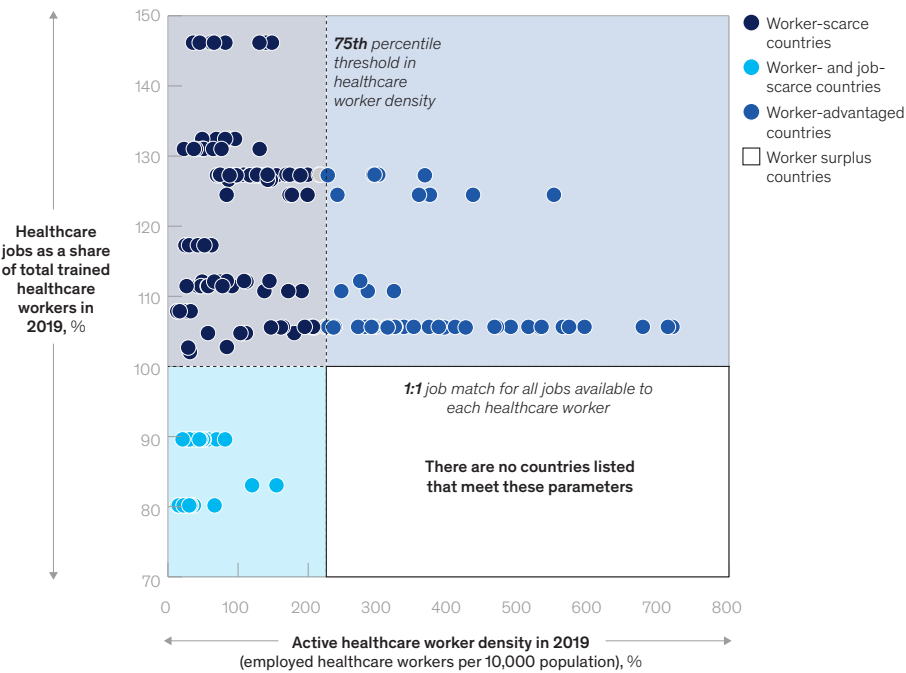
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1. *Worker-scarce countries.* A worker-scarce country has too few healthcare workers to serve its population, and many of its healthcare jobs are unfilled. Examples include Brazil and Peru.

2. *Worker- and job-scarce countries.* In a worker- and job-scarce country, there are too few healthcare workers to serve its population, as well as too few available healthcare jobs. Examples include Malawi and Nigeria.

3. *Worker-advantaged countries.* A worker-advantaged country has a high number of healthcare workers to serve its population, compared with other countries, but still has unfilled healthcare jobs. Examples include the United States and United Kingdom.

4. *Worker surplus countries.* A worker surplus country is defined as one with a high number of healthcare workers to serve its population, compared with other countries, and too many qualified workers for the available jobs. No such countries exist.

Examination of these archetypes shows that each comes with its own challenges. More than half of all countries, representing 71 percent of the global population, are *worker-scarce countries,* with a low number of healthcare workers relative to the population but many open healthcare jobs. These countries have a median of 98 healthcare workers per 10,000 population. These are mostly middle-income countries across Latin America, Asia, and the Middle East. For example, Peru has fewer than 400,000 healthcare workers supporting a population of about 30 million,[9] and there are 1.3 jobs for every healthcare worker.[10] Because worker-scarce companies have capacity to absorb new healthcare workers, investments in training capacity are especially critical.

Worker- and job-scarce countries—those with the dual challenge of not enough healthcare workers and not enough available healthcare jobs to meet population health needs— include 42 countries, mostly low- and middle-income countries on the African continent. They have a median of 32 healthcare workers per 10,000 population, less than one-third the global

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9   Based on 2019 healthcare worker volume data following partnership between *The Lancet* and the Gates Foundation to improve healthcare worker volume data quality for 2019. Annie Haakenstad et al., "Measuring the availability of human resources for health and its relationship to universal health coverage for 204 countries and territories from 1990 to 2019: A systematic analysis for the Global Burden of Disease Study 2019," *Lancet*, 2022, Volume 399, Number 10341. Original data used by *The Lancet* from National Healthcare Workforce Accounts Data Portal, World Health Organization.
10   Jenny X. Liu et al., "Global health workforce labor market projections for 2030," *Human Resources for Health*, 2017, Volume 15, Number 11.

More than half of all countries have a low number of healthcare workers relative to the population but many open healthcare jobs.

median. These countries experience poorer health outcomes than the rest of the world: an individual's median health-adjusted life expectancy is 55 years, compared with a global median health-adjusted life expectancy of 63 years,[11] and their disease burden is nearly a third higher than the global median. These countries' primary challenge is economic conditions that limit the ability to finance health systems, build

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[11] Based on 2019 healthy life expectancy (HALE) at birth, Global Health Observatory Healthy life expectancy (HALE) at birth (years), World Health Organization.

critical infrastructure, train staff, and provide living wages for healthcare workers.[12]

Worker-advantaged countries, where relatively more healthcare workers serve their populations than the global median but some healthcare jobs are unfilled, include 47 countries, primarily in North America and Europe. These countries have more than three times the global median of healthcare workers per capita and more than ten times the median of worker- and job-scarce countries. They typically have better health outcomes, with an average health-adjusted life expectancy at birth of 70 years, compared with the global median of 63 years, with a roughly 8 percent lower disease burden. The largest opportunity in these countries is to support healthcare worker effectiveness, which can lead to increased healthcare worker capacity. But even in these countries, substantial disparities in the distribution of healthcare workers may persist.[13]

Worker surplus countries have more trained healthcare workers than available jobs. While this phenomenon may occur on a subnational level, no countries currently fit this archetype. Everyone bears the burden of the shortage.

A country cannot change from a scarcity archetype solely by adding more healthcare workers. Rather, countries need a broader lens that accounts for investment, regional and national priorities, and infrastructure.

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[12] Based on 2019 healthcare worker volume data following partnership between *The Lancet* and the Gates Foundation to improve healthcare worker volume data quality for 2019. Annie Haakenstad et al., "Measuring the availability of human resources for health and its relationship to universal health coverage for 204 countries and territories from 1990 to 2019: A systematic analysis for the Global Burden of Disease Study 2019," *Lancet*, 2022, Volume 399, Number 10341.

[13] Based on 2019 healthcare worker volume data following partnership between *The Lancet* and the Gates Foundation to improve healthcare worker volume data quality for 2019. Annie Haakenstad et al., "Measuring the availability of human resources for health and its relationship to universal health coverage for 204 countries and territories from 1990 to 2019: A systematic analysis for the Global Burden of Disease Study 2019," *Lancet*, 2022, Volume 399, Number 10341.

Strengthening the Healthcare Workforce Triangle

Scaling known interventions from the Healthcare Workforce Triangle can enable the workforce to Grow, Thrive, and Stay.

How could public- and private-sector entities come together to strengthen the healthcare workforce in ways that reflect their country's needs? In this report, MHI focuses on three types of strategies, which form what we call the Healthcare Workforce Triangle (Exhibit 4):

— *Grow.* Expand the talent pipeline by reimagining training program structure, timing, and scale.

— *Thrive.* Free up healthcare workers' time to focus on delivering quality care to more patients.

— *Stay.* Improve retention of healthcare workers by addressing the root causes of burnout and attrition.

Together, these interventions can improve the supply of healthcare workers, adding more than 5.6 million workers to the global healthcare workforce.

Grow: Expand the talent pipeline by reimagining the structure, timing, and scale of training

A shortage of clinical training positions and skilled educators is a major barrier to expanding the healthcare workforce. Existing training programs have limited capacity—in terms

Exhibit 4

Scaling known interventions could reinforce the Healthcare Workforce Triangle to Grow, Thrive, and Stay.

Total impact on healthcare workers from reinforcing the healthcare triangle

Expand the talent pipeline by reimagining training program structure, timing, and scale
1.86 million workers

Grow

Thrive

5.66 million workers

Free up healthcare workers' time to focus on delivering quality care to more patients
2.04 million workers

Stay

Improve retention of healthcare workers by addressing the root causes of burnout and attrition
1.76 million workers

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of both school enrollment and clinical experience positions— that restrict the number of graduates entering the field.[14] In the United States, for example, there were more than twice as many applicants as available spots for medical school in 2024.[15] Compounding this issue, many experienced clinical faculty are nearing retirement.[16] Expanding the talent pipeline could add 1.9 million healthcare workers globally (for details, see appendix, "Disease burden and GDP impact sizing methodology"). This is especially important in worker-scarce countries, which have high rates of job vacancy.

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[14] Julio Frent et al., "Challenges and opportunities for educating health professionals after the COVID-19 pandemic," *Lancet*, 2022, Volume 400, Number 10362.

[15] *2024 FACTS: Applicants and matriculants data*, AAMC, 2024.

[16] Sheila A. Boamah, Miranda Callen, and Edward Cruz, "Nursing faculty shortage in Canada: A scoping review of contributing factors," *Nursing Outlook*, 2021, Volume 69, Number 4.

Expand enrollment capacity with additional training sites and educators

Expanding the pipeline will likely necessitate increasing school capacity and attracting additional educators. This involves assessing the specific needs of a country based on its archetype and introducing a range of educational opportunities for prospective healthcare workers, such as pharmacists, imaging technicians, nurses, and more.

Add additional schools and sites to train the next generation. A shortage of training opportunities, including limited positions in medical schools, nursing programs, and clinical training sites, limits the number of healthcare professionals entering the workforce.[17] Some countries are addressing this challenge through policy initiatives that expand training infrastructure, particularly in underserved municipalities.[18] For instance, Brazil established over 160 new medical schools from 2013 to 2023, expanding its physician graduate population.[19] This expansion helped increase Brazil's primary-care physician workforce by 12 percent, which has been associated with a 1.4 percent reduction in mortality.[20] Other strategies to expand training sites include establishing centers of excellence for specialized training and forging partnerships between governments

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[17] "The global health care worker shortage: 10 numbers to note," Project HOPE, 2022.

[18] Sneha Kirubakaran et al.,"Establishing new medical schools in diverse contexts: A novel conceptual framework for success," *Medical Education*, 2025, Volume 59, Number 1; Thomas Hone et al., "Impact of the Programa Mais médicos (More Doctors Program) on primary care doctor supply and amenable mortality: Quasi-experimental study of 5565 Brazilian municipalities," *BMC Health Services Research*, 2020, Volume 20, Number 873.

[19] Mário Scheffer et al.,"Brazil's experiment to expand its medical workforce through private and public schools: Impacts and consequences of the balance of regulatory and market forces in resource-scarce settings," *Global Health*, 2025, Volume 21, Number 1.

[20] Thomas Hone et al., "Impact of the Programa Mais médicos (More Doctors Program) on primary care doctor supply and amenable mortality: Quasi-experimental study of 5565 Brazilian municipalities," *BMC Health Services Research*, 2020, Volume 20, Number 873.

and private hospitals to expand residency slots, as India and Tanzania have done.[21]

Encourage flexible clinical faculty positions. Not only are clinical workers aging out of the profession, but so are the teachers of these workers. In Canada, almost half of surveyed nursing faculty were over the age of 50, and 18 percent were above 60, nearing retirement in the next five years.[22] Such a phenomenon runs the risk of leaving training facilities with inadequate faculty to meet student demand. One way to address this challenge is by offering phased retirement, which allows faculty to start working fewer hours at a reduced salary but with full benefits.[23] Keeping faculty in the workforce longer could help retain experienced staff, which would ease staffing shortages and reduce strain on the healthcare system. Early research suggests that older working adults could become more engaged and productive in the workplace through phased retirement.[24] This strategy has the potential to maintain clinical faculty in the healthcare industry beyond traditional retirement age.

Adopt innovative training approaches

To address the healthcare workforce shortage, it may be necessary for countries to reassess the duration of certain educational programs or explore methods for accelerating student training. This could also involve integrating innovative

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[21] Tsegahun Manyazewal et al., "Conceptualizing centers of excellence: A scoping review of global evidence," *BMJ Open*, 2022, Volume 12, Number 2; Nathanael Sirili et al., "Public private partnership in the training of doctors after the 1990s' health sector reforms: The case of Tanzania," *Human Resources for Health*, 2019, Volume 17; Bhaskaran Unnikrishnan et al., "Public−private partnership model in delivering quality health care and medical education," *Indian Journal of Community Medicine*, 2024, Volume 49, Number 6.

[22] Sheila A. Boamah, Miranda Callen, and Edward Cruz, "Nursing faculty shortage in Canada: A scoping review of contributing factors," *Nursing Outlook*, 2021, Volume 69, Number 4.

[23] Kéne Henkens, Hendrik P van Dalen, and Hannah van Solinge, "The rhetoric and reality of phased retirement policies," *Oxford Public Policy & Aging*, 2021, Volume 31, Number 3.

[24] Hanna van Solinge, Anushiya Vanajan, and Kéne Henkens, "Does phased retirement increase vitality in older workers? Findings from a 3-year follow-up panel study," *Journal of Aging & Social Policy*, 2023, Volume 35, Number 2; "Working longer: Implications for a heterogeneous workforce," George Washington School of Business, 2019; Axel Börsch-Supan, "Myths, scientific evidence and economic policy in an aging world," *Journal of Economics of Ageing*, 2013, Volumes 1−2.

technologies, such as virtual reality simulations and AI-driven learning platforms.

Shorten program duration to increase the number of annual graduates. Shorter, innovative training models should still focus on quality while acknowledging that accelerated programs can ease the financial burden on students. In the United States, accelerated nursing program graduates nearly doubled between 2013 and 2023, adding about 8,000 nursing graduates annually.[25] The accelerated bachelor of science in nursing (ABSN) allows students to start working after a 12- to 18-month training period—half the training time of traditional programs.[26] Other countries offering accelerated nursing programs include Australia, Canada, and New Zealand.[27] In the United Kingdom, the National Health Service offers accelerated programs for specialties such as speech and occupational therapy, nursing, and physiotherapy.[28] This has made it easier for nurses to find jobs and has helped attract professionals from a diverse range of fields while maintaining the rigor and quality of training.

Employ digital methods to improve training completion and licensure rates. Scalable tech-enabled training approaches, such as those that utilize mobile learning applications, e-learning platforms, and content production studios, can help bridge critical training gaps, particularly in low- and middle-income countries. In Uganda, for example, integrating interactive displays into medical training not only improved access to quality training in remote areas but also improved training outcomes for healthcare professionals.[29]

[25] "Fact sheet: Accelerated baccalaureate and master's degrees in nursing," American Association of Colleges of Nursing, 2024; "Accelerated nursing programs," American Association of Colleges of Nursing, accessed March 5, 2025.

[26] Doug Wintemute, "How Long Is Nursing School?," *NurseJournal*, updated February 21, 2025. Accessed April 29, 2025.

[27] Sheila Anne Doggrell and Sally Schaffer, "Attrition and success rates of accelerated students in nursing courses: A systematic review," *BMC Nursing*, 2016, Volume 15, Issue 24.

[28] "Accelerated programs," UK National Health Service, accessed February 28, 2025.

[29] Pebalo Francis Pebolo et al., "Medical education technology in resource-limited settings," *Education and Human Development*, IntechOpen, July 31, 2024.

Recent advancements in technology have made virtual reality a new pathway to train healthcare workers for some portion of their training, with its effectiveness comparable to that of traditional settings.[30] In 2020, the Purdue Global School of Nursing started using virtual reality as an experiment. Students could practice procedures such as inserting a catheter and placing an IV in virtual reality. Now VR headsets are an essential tool in their nursing curriculum, and licensure examination pass rates have increased by 10 percent.[31] Other programs have used VR for dementia training, neurogenerative decline, or to understand hearing and vision loss.[32] This approach creates a scalable pathway to expand access to training in areas with limited educational options.

Thrive: Free up healthcare workers' time to focus on delivering quality care to more patients

Healthcare workers face simultaneous pressures from rising patient demand and administrative burdens, limiting the time they can spend on direct patient care.[33] McKinsey's research has shown that up to 30 percent of nurses' tasks could be automated or delegated, freeing up time for more meaningful work.[34] Rapid advancements in AI technology could help streamline workflows by summarizing notes, drafting discharge summaries, automating documentation, and improving task prioritization. While numerous pilots exist, broader implementation remains limited. MHI estimates that freeing up healthcare workers' time could create the equivalent of two million additional workers, a crucial strategy for worker-

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[30] Kai Liu et al., "Effectiveness of virtual reality in nursing education: A systematic review and meta-analysis," *BMC Medical Education*, 2023, Volume 23; Feng-Qin Chen et al., "Effectiveness of virtual reality in nursing education: Meta-analysis," *Journal of Medical Internet Research*, 2020, Volume 22, Number 9.

[31] "The future of virtual reality in nursing education," Purdue Global, June 11, 2021, updated January 22, 2025.

[32] Kerry Hannon, "With virtual reality, caregivers can become patients," *New York Times*, August 19, 2020.

[33] David Sipos, Rahul Goyal, and Tomas Zapata, "Addressing burnout in the healthcare workforce: Current realities and mitigation strategies," *Lancet Regional Health - Europe*, 2024, Volume 42.

[34] "Reimagining the nursing workload: Finding time to close the workforce gap," McKinsey, May 26, 2023.

advantaged countries (see appendix, "Disease burden and GDP impact sizing methodology").

Ensure the right tasks are completed by the right people at the right time and in the right place

Even when recruitment and retention efforts are robust, both health workers and patients benefit from modernizing care delivery. This often includes task-sharing and technology-enabled tools, such as AI.

Maximize task sharing across healthcare workers. Many healthcare workers, such as community health workers (CHWs), care managers, and health assistants, act as the connectors between communities, social services, and healthcare systems yet are often excluded from the formal healthcare system.[35] These workers educate patients, offer health counseling, deliver essential primary healthcare services, provide screenings and assessments, advise on adherence, and assist with routine patient needs, allowing other clinicians to provide more complex care and offering a critical link to improve care. Additionally, other community-based roles in lower-middle-income countries, such as village health workers and patent and proprietary medicine vendors (PPMVs), can support task sharing in preventive care, basic diagnostics, and medication adherence, allowing clinical healthcare workers to focus on more complex care.[36] Training for these roles must be comprehensive and robust for effectiveness; however, training duration is typically shorter

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[35] Alice T. Chen et al, "The community as a full partner: A new model for public health," *Health Affairs*, 2024, Volume 43, Number 6; Yu-hwei Tseng et al., "Integrating community health workers into the formal health system to improve performance: A qualitative study on the role of on-site supervision in the South African program," *BMJ Open*, 2019, Volume 9, Number 2; James O'Donovan et al., "The role and recognition of community health workers in research: A global survey," *Lancet*, 2024, Volume 12, Number 12; Stacy Ignoffo et al., "A review of community health worker integration in health departments," *Journal of Community Health*, 2024, Volume 49, Number 2.

[36] Hongfei Long et al., "Engaging village health workers in non-communicable disease (NCD) prevention and control in Vietnam," *Global Public Health*, 2020, Volume 15, Number 4; Emeka Okafor et al., "Scaling training facilities for patent and proprietary medicine vendors in Nigeria: Insights and lessons learned for policy implication and future partnerships," *Health Research Policy and Systems*, 2024, Volume 22, Number 97.

than for more specialized roles. Introducing roles like these can facilitate top-of-license practice by ensuring workers provide care that aligns with their expertise, rather than performing tasks that could be done by someone with less training.

For example, in India, integrating CHWs into diabetes care improved early detection and timely referrals while reducing unnecessary physician visits.[37] Patients with CHW support were 1.5 times more compliant with medical instruction than those without. The study showed task sharing not only maintained but enhanced diabetes care, easing the burden on the health system.

In the mental health space, community-level informal care and nonspecialist workers can play a significant role in freeing up specialist capacity to provide care to the over 90 percent of patients who do not receive care today in low- and lower-middle-income locations.[38] Programs such as Friendship Bench or Thinking Healthy Program show how training nonspecialist health workers in task sharing can help meet mental healthcare needs.[39] However, much work remains to identify implementation barriers and create evidence-based task-sharing mental health interventions at a global scale[40] (for more, see sidebar "Task sharing in mental healthcare"). Some programs have successfully overcome barriers like cost, travel, and scalability by leveraging culturally tailored digital interventions. For example, India's Healthy Activity Program (HAP) used linguistically adapted e-learning to train nonspecialist health workers in delivering psychological care,

[37] Bhavya Balasubramanya et al., "Task shifting to frontline community health workers for improved diabetes care in low-resource settings in India: A phase II non-randomized controlled clinical trial," *Journal of Global Health Reports*, 2020.

[38] Paul Bolton et al., "Expanding mental health services in low-and middle-income countries: A task-shifting framework for delivery of comprehensive, collaborative, and community-based care," Global Mental Health, 2023.

[39] Klaus W. Lange, "Task sharing in psychotherapy as a viable global mental health approach in resource-poor countries and also in high-resource settings," *Global Health Journal*, 2021, Volume 5, Number 3.

[40] Phuong Thao D. Le et al., "Barriers and facilitators to implementation of evidence-based task-sharing mental health interventions in low- and middle-income countries: A systematic review using implementation science frameworks," *Implementation Science*, 2022, Volume 17, Number 4.

Task sharing in mental healthcare

Task sharing has worked particularly well in mental healthcare. Research shows that redistributing tasks and training non-mental-health clinicians in research-based techniques can be an effective way to address common mental health conditions such as anxiety, depression, substance use, and trauma. The collaborative care model is an example of task sharing. It is a team-based approach enabling primary-care providers to manage common mental health conditions in non-specialty settings. MHI has highlighted the effectiveness of programs that train clinical and nonclinical mental health practitioners to deliver basic mental health care. These programs, such as CETA, EMPOWER, and Friendship Bench, have been shown to improve access to care, increase treatment adherence, and reduce symptoms of depression, anxiety, and other mental health conditions.[1] Task sharing can lead to greater workforce efficiency by empowering specialty mental health professionals to practice at the "top of their license" by focusing their time on more complex cases and tasks.

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1   Nadja van Ginneken et al., "Primary-level worker interventions for the care of people living with mental disorders and distress in low- and middle-income countries," *Cochrane Database Systematic Reviews*, 2021, Volume 8, Number 8.

enabling wider reach and sustained mental health support in low-resource settings.[41]

Scale use of tech-enabled tools to free up healthcare workers' time

For well over a decade, the healthcare industry has looked to automation and technology to improve patient care and efficiency.[42] Although pilots abound, many systems

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41   Ravindra Agrawal et al., "Scaling up the task-sharing of an evidence-based psychological treatment for depression in rural India," *BMC Yale*, 2024.

42   Robin Felder, "Medical automation—a technologically enhanced work environment to reduce the burden of care on nursing staff and a solution to the health care cost crisis," *Nursing Outlook*, 2003, Volume 51, Number 3; Philip Betbeze, "Automation and the healthcare cost curve," *HealthLeaders*, April 2012; Randike Gajanayake, Tony Sahama, and Renato Iannella, "The role of perceived usefulness and attitude on electronic health record acceptance," *International Journal of E-Health Medical Communication*, 2014, Volume 5, Number 4.

have become stuck when companies are scaling effective interventions. That should become the focus.

Increase the automation of tasks. AI technology has emerged as a useful tool to shorten time-intensive manual tasks that take away from patient care. One start-up in India has helped primary-care physicians reduce by 72 percent the time they spend reviewing their own notes and determining the appropriate billing code.[43] A study in the United Kingdom found that AI-assisted clinical documentation could reduce consultation length by 26 percent while maintaining patient interaction time and improving documentation accuracy.[44] McKinsey has estimated the opportunity for gen AI in life sciences to have up to $7 billion of value in operations and up to $30 billion of value in commercial life sciences, ranging from real-time inventory optimization to medical review and customer support.[45] For example, some health systems are automating administrative tasks such as reading invoices and faxes for medications—which used to be done manually by pharmacy staff.[46] Collectively, these automation strategies can reduce the administrative burden on clinicians and free up their time for more rewarding and relevant patient care.

Integrate AI-enabled clinical decision-making. The availability of AI can also inform clinical decision-making, saving time while improving the quality of care.[47] For example, in Malawi, computer-aided X-ray interpretation reduced the time to diagnose tuberculosis and HIV by 90 percent, from 11 days to

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[43] "Suki assistant significantly reduces primary care physician documentation burden," American Association of Family Physicians, 2021.

[44] Jasmine Balloch et al., "Use of an ambient artificial intelligence tool to improve quality of clinical documentation," *Future Healthcare Journal*, 2024, Volume 11, Number 3.

[45] "Generative AI in the pharmaceutical industry: Moving from hype to reality," McKinsey, January 9, 2024.

[46] Kate Traynor, "AI helps pharmacists streamline routine tasks," ASHP News Center, April 8, 2025.

[47] Mohsen Khosravi et al., "Artificial Intelligence and decision-making in healthcare: A thematic analysis of a systematic review of reviews," *Health Services Research and Managerial Epidemiology*, 2024, Volume 11.

one day.[48] The automation generated accurate diagnoses in 91 percent of cases while reducing patient visits and freeing up valuable time for physicians to focus on more direct patient care. The goal is for "humans in the loop" to harness the power of AI and other tools to adapt, plan, and guide decisions.[49]

These thoughtfully implemented technologies, protected by robust patient safety and privacy safeguards, can enhance the overall patient experience and improve the healthcare worker experience. Healthcare professionals—such as a midwife who can focus on delivering babies rather than being overwhelmed by postpartum paperwork, or a physician who can initiate HIV and tuberculosis treatment without delay—are more likely to find purpose in their work and stay in their profession.

Stay: Improve retention of healthcare workers

Research shows that inadequate compensation, poor working conditions, and unmanageable workloads are root causes of healthcare worker attrition.[50] Addressing these root causes could result in 1.8 million healthcare workers remaining in their professions (see appendix, "Disease burden and GDP impact sizing methodology"). This is especially important in worker-scarce countries.

Reactivate and reenergize existing healthcare workers
Healthcare leaders embarking on culture transformations have to introduce and embed new rituals and ideas into the workplace, actively exposing individuals to best practices they might not have previously considered. Reducing the violence against healthcare workers, improving workplace culture and prioritizing employee well-being, and creating more societal appreciation for healthcare workers are only three of the topics.

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[48] Peter MacPherson et al., "Computer-aided X-ray screening for tuberculosis and HIV testing among adults with cough in Malawi (the PROSPECT study): A randomised trial and cost-effectiveness analysis," *PLOS Medicine*, 2021, Volume 18, Number 9.
[49] "Superagency in the workplace: Empowering people to unlock AI's full potential," McKinsey, January 28, 2025.
[50] Neeltje de Vries et al., "The race to retain healthcare workers: A systematic review on factors that impact retention of nurses and physicians in hospitals," *Inquiry*, 2023, Volume 60.

Reduce violence against healthcare workers. Healthcare workers cite violence as a top workplace concern, and with good reason: In an analysis of more than 300,000 healthcare workers globally, nearly one in four said they had experienced physical violence, and over half reported verbal abuse.[51] During the COVID-19 pandemic, reports of workplace violence in healthcare settings doubled among nurses worldwide.[52]

Addressing healthcare workplace violence requires comprehensive solutions, not isolated initiatives. Traditionally, efforts to reduce violence in healthcare systems have focused on providing individuals with training in de-escalation and violence mitigation.[53] The next step in advancing safety might be environmental and infrastructure innovations. For example, one French emergency department implemented a multifaceted approach that merged computerized triage with waiting room communication systems, educational messaging, on-site mediation, and security monitoring. The results were immediate and dramatic: violent incidents plummeted by 53 percent within the first month of implementation.[54]

[51] Sandro Vento, Francesca Cainelli, Alfredo Vallone, "Violence against healthcare workers: A worldwide phenomenon with serious consequences," *Frontiers in Public Health*, 2020, Volume 8, Number 57045.

[52] Shuisheng Zhang et al., "Workplace violence against healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis," *Environmental Science and Pollution Research*, 2023, Volume 30, Number 30.

[53] Shannon L Thompson et al., "De-escalation training as part of a workplace violence prevention program," *Journal of Nursing Administration*, 2022, Volume 52, Number 4; Chantelle Recsky et al., "Evidence-based approaches to mitigate workplace violence from patients and visitors in emergency departments: A rapid review," *Journal of Emergency Medicine*, 2023, Volume 4, Number 4.

[54] Sandrine Touzet et al., "Impact of a comprehensive prevention programme aimed at reducing incivility and verbal violence against healthcare workers in a French ophthalmic emergency department: An interrupted time-series study," *BMJ Open*, 2019, Volume 9, Number 9.

Some employers have already realized a positive return on their investments in employee health, including avoiding attrition costs, which could be as high as $1 million per US physician.

Improve workplace culture and well-being. As discussed in previous MHI research, there is considerable economic benefit to investing in employee health and embedding it into organizational culture.[55] For all industries, this may include flexible working schedules, investment in leadership training, job crafting and redesign, and digital programs on workplace health.[56] These interventions can be most effective when employers also invest in the root causes of burnout, such as addressing overwork. In healthcare, an analysis of US hospitals found that most offer physical activity and nutrition programs and chronic disease health screenings, and two-thirds of larger hospitals offered lactation support.[57] Some employers have already realized a positive return on their investments in employee health, including avoiding attrition costs, which could be as high as $1 million per US physician.[58]

Support broader societal appreciation for the healthcare workforce. In addition to verbal abuse, healthcare workers have cited an increasing lack of appreciation and the devaluation of their profession as factors in leaving their jobs.[59] For instance, a study in Denmark, Finland, Norway, and Sweden found that more than 40 percent of healthcare workers said they had seriously considered quitting, with about one-third feeling "not at all valued" by top municipal leaders or media.[60]

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[55] Barbara Jeffery, Brooke Weddle, Jacqueline Brassey, and Shail Thaker, "Thriving workplaces: How employers can improve productivity and change lives," McKinsey Health Institute, January 16, 2025.

[56] Jacqueline Brassey, Brad Herbig, Barbara Jeffery, and Drew Ungerman, "Reframing employee health: Moving beyond burnout to holistic health," McKinsey Health Institute, November 2, 2023.

[57] Laura Mulder et al., "Prevalence of workplace health practices and policies in hospitals: Results from the workplace health in America study," *American Journal of Health Promotion*, 2020, Volume 34, Number 8.

[58] Sara Berg, "How much physician burnout is costing your organization," American Medical Association, October 11, 2018.

[59] Ed Yong, "Why health-care workers are quitting in droves," *Atlantic*, November 16, 2021; Reframing employee health: Moving beyond burnout to holistic health," McKinsey, November 2, 2023; Masha S. Zee et al., "From applause to disappointment – appreciation among healthcare providers that provided end-of-life care during the COVID-19 pandemic and its impact on well-being – a longitudinal mixed methods study (the CO-LIVE study)," *BMC Health Services Research*, 2024, Volume 24, Number 1.

[60] Jon Ivar Elstad and Mia Vabø., "Lack of recognition at the societal level heightens turnover considerations among Nordic eldercare workers," *BMC Health Services Research*, 2021, Volume 21, Number 747.

Public recognition can serve as a powerful tool to boost healthcare worker morale and motivation. During the COVID-19 pandemic, a practice of community members clapping at a scheduled time to honor healthcare workers took hold throughout various countries.[61] While some healthcare workers said the efforts felt intangible, a third of those in the United Kingdom said they considered "Clapping for Carers" to be a helpful response.[62] Similarly, a US study found that 60 percent or more of healthcare workers reported that receiving positive feedback from patients and families enhanced their sense of value and commitment.[63] While these symbolic acts are important, broader societal initiatives such as business discounts, school programs, local celebrations, and media campaigns are essential to shift public perceptions. Ultimately, embedding respect for healthcare workers into public discourse requires conscious time, effort, and attitude shift.

Invest in talent localization

As organizations recruit for qualified healthcare personnel, they may explore strategies to develop their own local talent pipelines. This includes addressing the issues of "brain drain" and rural-urban migration challenges.

Reduce the brain drain. Although many worker-advantaged countries benefit from the immigration of healthcare workers, this migration exacerbates shortages in other parts of the world. While data quantifying the scale of the brain drain is limited, research has found that one-fifth of African-born physicians are working in high-income countries (HICs).[64] This emigration of medical talent from low- and middle-income

[61] William Booth, Kala Adam, and Pamela Rolfe, "In fight against coronavirus, the world gives medical heroes a standing ovation," *Washington Post*, March 26, 2020.

[62] Jill Manthorpe et al., "Clapping for carers in the Covid-19 crisis: Carers' reflections in a UK survey," *Health & Social Care in the Community*, 2022, Volume 30, Number 4.

[63] Doerthe Heimbeck, Laurence R. Gore, and Jennifer L. Bickel-Young, "Burnout and appreciation: A cross-sectional study assessing preferences for appreciation among oncology clinicians," *JCO Oncology Practice*, 2023, Volume 19, Number 10.

[64] Robbert J. Duvivier, Vanessa C. Burch, and John R. Boulet, "A comparison of physician emigration from Africa to the United States of America between 2005 and 2015," *Human Resources for Health*, 2017, Volume 15, Number 41.

countries (LMICs) to HICs has stymied expansion of essential health services by limiting workforce growth and the local cultivation of new talent.[65] Brain drain has also cost LMICs over $15 billion in lost economic growth, with India, Nigeria, Pakistan, and South Africa being the most affected.[66]

As countries create additional or new healthcare educational programs, they also will want to consider whether graduates will migrate. For example, 30 colleges in India offered a bachelor's of science in nursing degree in 2000; by 2021 there were 2,241 options, creating what experts have called "a train for export" model. In the Philippines, traditionally one of the world's largest producer of nurses, officials have said they must find ways to retain the country's own healthcare workforce to fill a gap of 190,000 workers, such as by offering scholarships and strengthening workforce development, and/or by requiring a year of service before moving abroad.[67]

Globally, the World Health Organization has issued guidance on bilateral agreements to provide a structured approach to mitigating the negative effects of brain drain.[68] For example, in Germany's Triple Win program, Germany recruits nurses from countries with a surplus of nurses, such as Bosnia and Herzegovina, Tunisia, Philippines, and others, but also collaborates with those governments to invest in skills development and employment opportunities to ensure that the recruitment does not negatively affect the local workforces.[69]

[65] J. Eaton et al., "The negative impact of global health worker migration, and how it can be addressed," *Public Health*, 2023, Volume 225; Tega Ebeye and HaEun Lee, "Down the brain drain: A rapid review exploring physician emigration from West Africa," *Global Health Research and Policy*, 2023, Volume 8, Number 1.

[66] Saurabh Saluja et al., "The impact of physician migration on mortality in low and middle-income countries: An economic modelling study," *BMJ Global Health*, 2020, Volume 5, Number 1.

[67] Gabriela Baron, "We must find a way to keep our health workers," *Daily Tribune*, November 27, 2024; Jeremaiah M. Opiniano and Alvin P. Ang, "The Philippines' landmark labor export and development policy enters the next generation," Migration Policy Institute, January 3, 2024; Davinci Maru, "One-year mandatory medical service for new doctors, nurses proposed," ABS-CBN News, May 2, 2023.

[68] "Bilateral agreements on health worker migration and mobility," World Health Organization, 2024.

[69] "Sustainable recruitment of nurses (Triple Win)," Deutsche Gasellschaft fur Internationale Zusammenarbeit, 2024.

Reduce rural-urban disparities. The brain drain can also occur within a country. Such a phenomenon, also known as "human capital flight," can hurt rural areas, which are often chronically underserved by healthcare workers. In South Africa, for example, only 19 percent of nurses are based in rural areas, which account for 46 percent of the population.[70]

Countries have successfully mitigated human capital flight by investing in talent localization programs, which employ tailored local training and incentives to develop and retain healthcare professionals in rural areas. These programs have been shown to increase retention by 35 to 50 percent.[71] In Thailand, a rural recruitment program achieved a 2.4-times increase in the likelihood that medical school graduates would continue working in rural facilities.[72]

An additional factor to consider in rural recruitment and retention is offering child care. Globally, around 350 million children below the primary-school entry age—particularly those in rural areas—need child care.[73] In 2020, a rural hospital in Minnesota made a strategic decision to open an on-site child care center for its employees' children. This employee benefit has allowed the hospital to attract and keep workers younger than the national average.[74]

[70] Grace Mburu and Gavin George, "Determining the efficacy of national strategies aimed at addressing the challenges facing health personnel working in rural areas in KwaZulu-Natal, South Africa," *African Journal of Primary Health Care & Family Medicine*, 2017, Volume 9, Number 1.

[71] Rajin Arora et. al., "Retention of doctors in rural health services in Thailand: Impact of a national collaborative approach," *Rural and Remote Health*, 2017, Volume 17, Number 3; Joe McGirr et al., "The Australian Rural Clinical School (RCS) program supports rural medical workforce: Evidence from a cross-sectional study of 12 RCSs," *Rural and Remote Health*, 2019, Volume 19, Number 1; Caleb Van Essen et al., "Increasing and retaining African surgeons working in rural hospitals: An analysis of PAACS surgeons with twenty-year program follow-up," *World Journal of Surgery*, 2019, Volume 43, Number 1.

[72] Rajin Arora et al., "Retention of doctors in rural health services in Thailand: Impact of a national collaborative approach," *Rural and Remote Health*, 2017, Volume 17, Number 3.

[73] "Better jobs and brighter futures: Investing in childcare to build human capital," World Bank, December 2020; Hannah Guevara, "Families in rural communities face acute child care challenges," First Five Years Fund, 2021.

[74] Lola Butcher, "Childcare center at CCM Health helps in recruiting and retaining staff," Health Financial Management Association (HFMA), September 30, 2024.

Reimagining traditional healthcare service delivery

Innovation in *who* delivers healthcare, *how,* and *where* can transform service delivery and help meet the demand for workers.

The healthcare workforce shortage cannot be solved by merely adding more healthcare workers. Chapter 2 illustrates how supply-side strategies could add about 5.6 million more workers to the global healthcare workforce, but that still leaves almost half the shortage unfilled.

A radical shift in the "who," "how," and "where" of healthcare delivery could help patients move from higher-acuity settings that require intensity of healthcare workers—such as intensive care units—to lower-acuity settings, such as community clinics. The goal would be to prioritize primary and preventive care, including by making it a part of individuals' daily lives. In the short term, this may increase demand for care in lower-acuity settings. However, the long-term effects could ultimately decrease patient demand, particularly in high-acuity, resource-intensive environments, while also improving overall patient health management and outcomes. These innovations could include the following:

— *Who: Everyone can be their own healthcare worker.* Empowering patients to receive care at home and in their

community, and to stay physically and mentally active, can assist in preventing and managing disease outside of traditional higher-acuity medical settings.

— *How: People find the right care before disease progression.* Next-generation AI- and technology-enabled tools could encourage clinical touchpoints earlier in disease progression to avoid resource-intensive care.

— *Where: Low-barrier healthcare touchpoints are embedded within daily life.* Introducing more screenings, treatments, and community health resources in everyday locations could boost early intervention and preventive services.

Who: Everyone can be their own healthcare worker

The future of healthcare delivery demands a fundamental shift in how society defines healthcare workers. In the future, individuals may increasingly take on roles such as their own bankers, travel coordinators, or educators, if they have not done so already. They can also act as their own healthcare worker or navigator. In the future, patient–provider boundaries blur, and healthcare careers can start at any time. The healthcare workforce of tomorrow includes every individual, as well as cohorts of individuals emerging from retirement. The future healthcare workforce—which spans traditional clinicians, community health workers, caregivers, and individuals managing their own health—will identify and address potential health concerns at their earliest, most treatable stages, benefiting patients and unburdening the system from preventable acute-care episodes that currently overwhelm limited resources.

These efforts recognize that a patient with a search engine is not the same as a healthcare worker with years of training and experience. The two roles are meant to complement each other, with everyone encouraged to share responsibility for better health outcomes.

Dramatically improve health literacy and ownership of one's health journey

Strengthening comprehensive health education is an opportunity to rewrite how society prepares the next generation to be architects of a healthier future. Tactical education about one's health—how to understand and manage it—could be built into primary and secondary education. For example, every subject from math to language, starting from preschool and extending through post-secondary education, could weave in health concepts. Primary-school students could move beyond basic handwashing into socioemotional learning to build their resilience, which contributes to mental health.[75] Secondary-school students could analyze their community's health resources and barriers in civics class and chronic disease prevention in science.

This isn't just a curriculum; it's the foundation to enable prevention as an effective prescription for care. This foundation is critical, as MHI research has shown that 70 percent of health gains are achievable from behavioral and environmental changes, rather than from disease treatment.[76] Capturing this opportunity will require the democratization of health information to make it more culturally and locally accessible than it is today. Doing so would be beneficial for every patient and also could reduce healthcare workloads, especially in places where health systems are overwhelmed by patients with preventable diseases.

Provide learning opportunities and tools so individuals and families can manage disease at home

Continuing health literacy in communities can shift suitable treatments from clinical settings to homes and community centers, dramatically improving access to care, reducing costs, and alleviating the healthcare worker shortage. For example, enhanced medical education can reduce the use of emergency departments. Common emergency department

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[75] Jake Bryant, Emma Dorn, Stephen Hall, and Frédéric Panier, "Reimagining a more equitable and resilient K–12 education system," McKinsey, September 8, 2020.

[76] "Prioritizing health: A prescription for prosperity," McKinsey Global Institute, July 8, 2020.

Strengthening comprehensive health education is an opportunity to rewrite how society prepares the next generation to be architects of a healthier future.

visits for conditions such as urinary tract infections, mild allergic reactions, minor wounds, and dehydration can often be managed at home with enhanced first-aid capabilities, diagnostic tests, and proper training.[77] Reducing such visits could start with reimagining the traditional first-aid kit, transforming it into a home or community station that includes smart diagnostic tools and advanced treatment options. In the case of diarrheal illness, for example, oral rehydration therapy could be used at home, reducing the frequency of emergency room and outpatient visits.[78]

Changes from hospital-based care to self-care have already been linked to greater patient control and treatment satisfaction in home dialysis.[79] The examples here are just some of the ways expanding community-based health literacy could empower patients and increase health system capacity.

Reimagine drug delivery and shift to self-administration

Similarly, the rise of self-administered medication shows how revolutionizing drug delivery has the potential to alleviate strain on healthcare workers. The development of simple pen injectors for periodic self-administration of medicine has made prescription drugs more accessible for home use. Reproductive health has undergone this transformation through the introduction of self-injectable contraceptives, expanding both choice and access to essential care.[80] In two studies from Malawi and Uganda, providers reported that prescribing self-injectable contraceptives reduced their workloads by eliminating the need for visits solely dedicated

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[77] Målfrid A. Nummedal et al., "Non-emergency department (ED) interventions to reduce ED utilization: A scoping review," *BMC Emergency Medicine*, July 2024, Volume 24, Number 117.

[78] Ziba Aghsaeifard, Ghobad Heidari, and Reza Alizadeh, "Understanding the use of oral rehydration therapy: A narrative review from clinical practice to main recommendations," *Health Science Reports*, 2022, Volume 5, Number 5.

[79] Jeffery Perl et al., "Home dialysis: Conclusions from a Kidney Disease: Improving Global Outcomes (KDIGO) Controversies Conference," *Kidney International*, 2023, Volume 103, Number 5.

[80] "The power to prevent pregnancy in women's hands: DMPA-SC injectable contraception," PATH, September 12, 2018.

to medication administration.[81] Patients undergoing fertility treatments have regularly followed instructions on mixing formulations and injecting themselves at home, often within specific time frames.[82] Recently, the advent of self-injectable GLP-1 drugs has driven unprecedented adoption for diabetes and weight management.[83]

Self-injectables might initially increase healthcare professionals' workloads for patient safety training and follow-ups. However, the healthcare system could ultimately benefit from reduced strain as costly chronic disease visits are prevented over time. The balance lies in creating safe systems that prevent errors and require minimal healthcare worker oversight.

Healthcare's future transcends hospital walls. It thrives when individuals become their own first-line providers, equipped with clinical guidance, community support, and the knowledge to transform from passive patients into active stewards of their well-being.

Reinvest in retirees, engaging older adults as healthcare workers

Unretirement, the growing trend of people returning to work after initially retiring, presents a powerful opportunity to engage older adults in meaningful second careers in healthcare. In an MHI survey, nearly 20 percent of older adults in high-income countries expressed interest in working during their later years but said they are not currently doing so.[84] For retired adults who want to feel connected to and part of their communities, working as a healthcare provider may be a way

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81 Holly M. Burke et al., "Client and provider experiences with self-administration of subcutaneous depot medroxyprogesterone acetate (DMPA-SC) in Malawi," *Contraception*, 2018, Volume 98, Number 5; Chloe Morozoff et al., "Contraceptive self-injection through routine service delivery: Health worker perspectives from Uganda," *Frontiers in Global Women's Health*, 2022, Volume 3.

82 "What to know about giving IVF shots at home," Cleveland Clinic, January 19, 2023.

83 "Story of discovery: How different medications for diabetes and obesity emerged from basic research on one pancreatic hormone," National Institute of Diabetes and Digestive and Kidney Diseases, 2021.

84 "Age is just a number: How older adults view healthy aging," McKinsey Health Institute, May 22, 2023.

to find meaning. MHI research has found that older adults are happier and healthier through meaningful engagement with society, including reentering the workforce.[85] Research has also shown that older workers can boost productivity and stabilize employee retention in the workforce.[86] In the future, thoughtfully designed pilot programs could test the viability and success factors of employing reskilled retirees as healthcare workers.

The growing population of working older adults could help address healthcare workforce shortages by taking on roles such as community health workers (CHWs), which require shorter training periods. These reskilled retirees can serve as vital bridges between communities and health systems with flexible schedules—a strategic solution, given CHWs' proven ability to improve outcomes, generate positive return on investment,[87] and enhance cultural responsiveness, especially in underserved areas.[88]

How: People find the right care before disease progression

The traditional model of seeking healthcare—waiting until symptoms appear before engaging with the health system—needs to evolve. Chronic diseases are a global problem. In the United States alone, they affect 60 percent of the population and drive a staggering 90 percent of the nation's total healthcare expenditures.[89] Low- and middle-income countries make up 80 percent of noncommunicable-disease-

[85] "Aging with purpose: Why meaningful engagement with society matters," McKinsey Health Institute, May 22, 2023.

[86] *Promoting an age-inclusive workforce: Living, learning, and earning longer*, OECD, December 2020.

[87] Shreya Kangovi et al., "Evidence-based community health worker program addresses unmet social needs and generates positive return on investment," *Health Affairs*, 2020, Volume 39, Number 2.

[88] Marta Schaaf et al., "The community health worker as service extender, cultural broker and social change agent: A critical interpretive synthesis of roles, intent and accountability," *BMJ Global Health*, 2020, Volume 5, Number 6.

[89] Christine Buttorff, Teague Ruder, and Melissa Bauman, *Multiple Chronic Conditions in the United States*, Rand Corporation, 2017.

related deaths,[90] of which 80 percent are avoidable through disease management.[91] A forward-thinking, technology-enabled approach could detect health problems before they become serious, connect patients with the right healthcare professionals, and dramatically reduce preventable emergencies and chronic disease. This would transform reactive medicine into a system that proactively preserves both lives and resources.

These efforts do not imply increasing low-value care—healthcare services or diagnostics with minimal or no clinical benefit. Rather, a technology-enabled approach can help identify when early intervention is appropriate and match patients with the right professionals based on their unique needs.

Invent and scale diagnostic tools that encourage appropriately early clinical touchpoints to avoid high-acuity treatment later

Next-generation technology, such as AI-enabled pre-detection tools, could alert patients and providers to the early onset of disease before health complications become acute. Imagine smart mirrors that can detect subtle changes in the skin, suggesting potential skin concerns. Toilets equipped with sensors might analyze waste for early signs of colorectal cancer, kidney disease, or nutritional deficiencies. Smartphones could use advanced AI algorithms to look at voice patterns during phone calls to find early signs of memory loss or use cameras to detect small changes in facial symmetry that might indicate stroke risk. In India, AI applications are being applied to detect early-onset cataracts using only smartphone-captured images. This screening tool has the potential to expand eye care in areas with limited specialty access by complementing traditional eye examinations.[92]

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[90] Nweke Ebele Ndubuisi, "Noncommunicable diseases prevention in low- and middle-income countries: An overview of health in all policies (HiAP)," *Inquiry*, 2021.

[91] "Financing NCDs," NCD Alliance, 2024.

[92] Chandrakumar Subbiah Vasan et al., "Accuracy of an artificial intelligence-based mobile application for detecting cataracts: Results from a field study," *Indian Journal of Ophthalmology*, 2023, Volume 71, Number 8.

These innovations, combined with traditional wearables that track vital signs and activity patterns, can embed a comprehensive early-warning system into daily life and reduce the need for acute care. All systems must continue to protect patient privacy and safety, and they must avoid making excessive promises about improving health for all users. Instead, they can be viewed as tools to enhance patients' daily health and increase healthcare worker capacity.

While next-generation technologies hold great promise, there are also opportunities to scale more diagnostic methods that are effective and available today. For example, cholera rapid diagnostic tests (RDTs) are low-cost and easy to deploy, yet they remain largely absent from routine surveillance, particularly outside emergency contexts. In 2024, a partnership between Gavi, the Vaccine Alliance, UNICEF, the Global Task Force on Cholera Control, FIND, and WHO launched the first large-scale deployment of cholera RDTs, aiming to distribute 1.2 million tests across 14 countries to support faster outbreak detection and more targeted vaccine use.[93]

Match patients with the right healthcare professional the first time to speed up access to appropriate treatment plans

Advanced matching systems could match patients with the most appropriate healthcare professionals, reducing unnecessary appointments and ensuring patients get the right care at the right time and at the right site. This could also prevent complications that would otherwise require costly interventions and multiple future visits.

In a recent survey, nearly three out of five patients in the United States (57 percent) said they have shown up to an appointment with a doctor who lacked the appropriate expertise for their needs, leading to delayed care.[94] Such unnecessary visits clog

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[93] Timothy Jesudason, "Global action to improve access to tools for cholera," *Lancet Infectious Diseases*, 2024, Volume 24, Number 6.

[94] "Zocdoc introduces guided search, helping patients more confidently connect with the right providers," Zocdoc, February 13, 2024.

the system and crowd out ideal patient–provider matches. Advanced matching systems can enhance efficiency by using a hub-and-spoke model, ensuring patients first see primary-care clinicians or other professionals equipped to manage their conditions or order the appropriate workup, while reserving specialist care for complex cases.

In mental health, care managers facilitate a collaborative care model by assessing patient needs first, then appropriately directing patients to seek primary-care providers, psychiatrists, or other specialists based on case complexity.[95] This approach, when supported by the right staffing and technology, can ensure that lower-complexity patients receive timely treatment in lower-acuity settings, freeing up specialists for cases that truly require their expertise. Implementing this model at scale demands transparent, real-time access to provider schedules and profiles across traditionally siloed networks, but it offers remarkable potential to reduce wait times, optimize treatment outcomes, and alleviate mounting pressure on the overburdened healthcare workforce.

Where: Low-barrier healthcare touchpoints are embedded in daily life

Healthcare must shift to more diverse sites of care to meet the complex health challenges of today. One promising approach involves seamlessly integrating healthcare services into the fabric of daily life—transforming routine activities such as going into an office or school attendance into health engagement opportunities. This could make it easier to receive care by creating multiple touchpoints for early intervention and preventive services. Ultimately, this could reduce the number of people that need to see a doctor or land in a hospital for high-acuity care, improving health outcomes.

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95 Courtney Benjamin Wolk et al., "Engaging primary care patients at risk for suicide in mental health treatment: User insights to inform implementation strategy design," *BMC Primary Care*, 2024, Volume 25, Number 1; Christopher Reist et al., "Collaborative mental health care: A narrative review," *Medicine (Baltimore)*, 2022, Volume 101, Number 52.

Strategically locate health screenings and other basic assessments to catch disease before it progresses

By looking at how people live and how they travel, communities can identify the best places for integrated care sites. Care sites integrated into schools in low-income communities in the United States have been shown to improve student health and even academic achievement.[96] School-based health centers (SBHCs) provide essential preventive care services such as comprehensive physical examinations and immunizations, assist in the management of chronic health conditions, and provide reproductive and sexual health services. In Canada, SBHCs that implement these interventions and enhanced physical education report a return on investment (ROI) of over 800 percent.[97] This ROI is driven by the reduction of direct care costs related to chronic disease management for students.

Communities can also consider placing nutritionists or community health workers in supermarkets in neighborhoods with a high prevalence of obesity. These healthcare professionals could provide personalized meal planning, offer guidance on nutrition literacy, and help identify at-risk individuals through basic health assessments and co-morbidity screenings. This novel placement of health services could transform routine grocery shopping into an opportunity not only for health education, but also for early intervention.

Integrate healthcare into workplaces to lower barriers to basic services

In the future, more employers can also play a crucial role in healthcare integration by offering care sites in workplaces. Previous MHI research has found that on-site health clinics at large employers generate positive returns on investment through reduced absenteeism and improved productivity.[98]

[96] Khalida Itriyeva, "Improving health equity and outcomes for children and adolescents: The role of school-based health centers (SBHCs)," *Current Problems in Pediatric and Adolescent Health Care*, 2024, Volume 54, Number 4.

[97] John P Ekwaru et al., "Cost-effectiveness and return on investment of school-based health promotion programmes for chronic disease prevention," *European Journal of Public Health*, 2021, Volume 31, Number 6.

[98] "Thriving workplaces: How employers can improve productivity and change lives," McKinsey Health Institute, January 16, 2025.

These workplace health centers can offer primary-care services, preventive screenings, chronic disease management, and mental health support—all accessible during the workday. For smaller employers, shared health spaces in office complexes or industrial parks can provide similar benefits while distributing costs across multiple businesses.

Embedding health touchpoints into daily life can make healthcare more accessible for patients before they need high-acuity care. This shift could help reduce healthcare workforce shortages by redirecting utilization away from costly acute care settings and toward community-based solutions.

Collectively transforming who delivers care, how care is found, and where care is accessed could simultaneously ease the strain on the healthcare workforce while also improving health outcomes.

Conclusion

Eliminating the healthcare worker shortage is a solvable problem and a shared responsibility to the billions of people globally lacking access to essential healthcare.

No one goes through life without facing illness. And when a major illness occurs, people are fortunate if they can benefit from the care and support of a skilled healthcare worker. For people without access to such care, the consequences of illness can be debilitating, costly, and even deadly. The peril is all too real for many, given that healthcare systems globally have a shortage of ten million workers.

That is why addressing the healthcare worker shortage is about more than filling vacancies. It's also about creating a world where everyone has access to the caregivers—and therefore the care—they need.

According to MHI's research, eliminating the healthcare worker shortage by 2030 would reduce disease burden by 7 percent and add $1.1 trillion to the global economy. Part of the solution is using the Healthcare Workforce Triangle—interventions for the workforce to grow, thrive, and stay—as a framework to increase the healthcare workforce by about 5.6 million.

Closing the rest of the gap will require a more radical shift by broader society—one that addresses the who, how, and where of healthcare service delivery. This could reduce overall demand for healthcare, particularly in high-acuity, resource-intensive settings, and also improve health outcomes. Achieving lasting impact will be possible only through bold, cross-sectoral action involving governments, healthcare providers, educational institutions, nongovernmental organizations, technology companies, researchers, investors, and other stakeholders.

The global healthcare workforce represents a critical social infrastructure that reaches well beyond healthcare institutions and systems. It is the backbone of societal well-being and development, especially in an increasingly aging world. Investing in the workforce is an investment in society's future—one defined by better health outcomes, more resilient communities, and shared economic growth.

Only through radical collaboration can the healthcare workforce shortage evolve from a crisis into an opportunity. Seizing the opportunity not only can eliminate the shortage but also would pave the way for a healthier, more resilient, and sustainable world.

Appendix: Disease burden and GDP impact sizing methodology

Healthcare workers play a critical role in reducing disease prevalence and severity by delivering timely diagnosis, treatment, and preventive services.[99] The ripple effects of increasing the supply of healthcare workers could be healthier workforces that contribute more to the economy and additional indirect non-healthcare jobs. The McKinsey Health Institute (MHI) analysis for this report quantifies the impacts based on eliminating the shortage of ten million healthcare workers, which was estimated by the World Health Organization (WHO) and *BMJ* in 2022.[100]

Disease burden

MHI quantifies disease burden with disability-adjusted life years (DALYs), years of life lost (YLLs) due to premature death, and years lived with disability (YLDs) for communicable diseases, noncommunicable diseases, and injuries. DALYs are the sum of YLLs and YLDs. DALYs, YLLs, and YLDs are widely used metrics for measuring disease burden.[101]

The analysis estimates the reduction in communicable disease DALYs from eliminating the healthcare worker shortage, using the observed semi-log relationship between healthcare worker density and communicable disease

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99 Jinlin Liu and Karen Eggleston, "The association between health workforce and health outcomes: A cross-country econometric study," *Social Indicators Research*, 2022, Volume 163, Number 2.

100 Mathieu Boniol et al., "The global health workforce stock and distribution in 2020 and 2030: A threat to equity and 'universal' health coverage?," *BMJ Global Health*, 2022, Volume 7, Number 6.

101 Suzanne Polinder et al., "Systematic review of general burden of disease studies using disability-adjusted life years," *Population Health Metrics*, 2012, Volume 10, Number 21.

DALYs per 1,000 population.[102] YLL and YLD projections for 2030 were sourced from the University of Washington Institute for Health Metrics and Evaluation (IHME)[103] and normalized by population using population estimates from the United Nations.[104] The modeled DALYs reductions were divided by 2030 DALYs projections to derive the percent reduction in DALYs regionally and globally.

GDP impact

Building on methodology developed by the McKinsey Global Institute,[105] the impact of the DALY reduction on GDP was quantified in three ways: a healthier population, direct healthcare worker jobs, and indirect and induced jobs from healthcare workforce expansion.

1. *Healthier population.* Reductions in disability and premature death in all working populations can increase GDP by increasing working years. First, the working population in each country was calculated by multiplying each country's population by labor force participation and unemployment rates. The calculation assumed that among the working population, the share of total deaths averted is the same as the share of modeled YLLs averted. (For example, if 10 percent of total YLLs are averted in X country, 10 percent of total deaths are assumed to be

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[102] For use of semi-log relationships between disease burden and healthcare worker density see, Jinlin Liu and Karen Eggleston, "The association between health workforce and health outcomes: A cross-country econometric study," *Social Indicators Research*, 2022, Volume 163, Number 2; Carla Castillo-Laborde, "Human resources for health and burden of disease: An econometric approach," *Human Resources for Health*, 2011, Volume 9, Number 4.

[103] "Global burden of disease (GBD)," University of Washington Institute for Health Metrics and Evaluation (IHME) (used with permission).

[104] Population Division data, United Nations, 2022.

[105] Technical appendix in *Prioritizing health: A prescription for prosperity*, McKinsey Global Institute, July 2020.

averted.) Then the number of averted YLDs among the working population were computed using age tables by country. Averted deaths and YLDs were converted into economic impact by multiplying averted deaths and disability by labor force participation rate, employment rate, and GDP per employed person by country. This methodology follows a previous methodology published by the McKinsey Global Institute.[106]

2. *Direct healthcare worker jobs.* Additional healthcare worker jobs have a direct impact on GDP. This is estimated by multiplying the number of additional healthcare workers needed to close the gap by the average GDP per employed person by country. This approach assumes that each additional healthcare worker contributes the same to GDP as the average worker overall.

3. *Indirect and induced jobs from healthcare workforce expansion.* New healthcare worker jobs contribute to economic growth through increased healthcare supplier jobs (indirect jobs) and jobs derived from the spending of the healthcare workers (induced jobs). Impacts were estimated by converting the new healthcare jobs (direct jobs) into indirect and induced jobs, using the input-output, job, and GDP multiples from the Organisation for Economic Co-operation and Development (OECD).[107] These multiples translate inputs in one industry to outputs across all industries.

This analysis acknowledges the following:

— *Conservative shortage estimates.* The estimate of ten million for the

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[106] Technical appendix in *Prioritizing health: A prescription for prosperity*, McKinsey Global Institute, July 2020.
[107] Input-output tables, Organisation for Economic Co-operation and Development, 2019.

healthcare worker shortage is conservative relative to shortage estimates measured by a gap to 80 percent universal health coverage[108] or on a need basis, as was recently conducted by WHO for Africa.[109] Furthermore, WHO and *BMJ* data exclude the approximately 20 million people in countries outside WHO regions. The analysis for this report could be replicated and refined with new shortage data.

— *Healthcare worker (HCW) density conversion to communicable disease DALYs.* The conversion of HCW density to communicable DALYs is based on a relationship between current HCW density and communicable disease YLL and YLD data by country from a 2011 BMC regression analysis (HCW density and DALYs across disease types).[110] This regression was re-run with updated data, additional covariates, and disaggregated YLLs and YLDs to isolate the effects. Covariates used in the updated regression include age distribution, urbanization rate, population density, GDP per capita, GINI index, health expenditures per capita, physician-to-nurse-midwife ratio, and share of rural population with access to clean water. Updated regressions did not show a consistent effect of HCW density from noncommunicable disease DALYs, so the analysis focused on communicable disease. This analysis acknowledges inherent endogeneity in this approach and

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[108] A shortage projection of 78.1 million in 2030. Mathieu Boniol et al., "The global health workforce stock and distribution in 2020 and 2030: A threat to equity and 'universal' health coverage?," *BMJ Global Health*, 2022, Volume 7, Number 6.

[109] *A decade review of the healthcare workforce in the WHO African Region, 2013–2022*, World Health Organization, 2024.

[110] Carla Castillo-Laborde, "Human resources for health and burden of disease: An econometric approach," *Human Resources for Health*, 2011, Volume 9, Number 4.

considers the output to be the most reliable available assumption.

— *Ranged impact.* The disease burden and GDP impact represent the values calculated with regression estimates. Applying low- and high-end ranges of the regression estimates based on the 95 percent confidence interval, the reduction of disease burden could range from 65 million to 268 million DALYs, and the GDP impact from $0.9 trillion to $1.2 trillion, respectively.

— *Global impact approach.* Workforce shortage data was available only at a WHO regional level, so income levels and development stages cannot be accounted for at the level of individual countries.

— *Current economic data.* Country-level GDP, labor force participation rate, and unemployment rate were based on the latest economic data. This analysis does not estimate future GDP, participation rates, or unemployment rates.

— *Healthcare worker quality, roles, and distribution.* The analysis does not consider the quality, roles, or distribution of the additional healthcare workers.

Additional healthcare worker sizing methodology

MHI focuses on three areas of healthcare worker capacity based on data from *The Lancet* and WHO and estimated impact.[111] Each strategy is modeled as a percent increase to healthcare workers per 10,000 population (healthcare worker density) for each country archetype discussed in chapter 1. To calculate

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[111] Annie Haakenstad et al., "Measuring the availability of human resources for health and its relationship to universal health coverage for 204 countries and territories from 1990 to 2019: A systematic analysis for the Global Burden of Disease Study 2019," *Lancet*, 2022, Volume 399, Number 10341.

additional healthcare workers, the percent increase in healthcare worker density was multiplied by the country's population.[112] Additional healthcare workers were sized using 2019 healthcare worker volume data.[113]

The following methodologies were developed based on more than 25 academic journal publications and validated with experts in healthcare and epidemiology fields:

— *Grow.* The opportunity from "grow" interventions was modeled as an increase in graduates per 10,000 population (graduate density) as a proxy for increased production of new healthcare workers. Graduate density for each country was modeled to reach the top of the next quartile within its archetype.

Country-level incremental new graduates were converted into a percent increase to healthcare worker density, which was applied to all countries in the archetype to account for missing graduate volume data.

— *Thrive.* The opportunity from "thrive" interventions was modeled as the number of hours saved on administrative tasks. Hours saved (based on assumptions that varied by archetype) were converted to full-time-equivalent healthcare workers to represent improved efficiency of existing healthcare workers.

— *Stay.* The opportunity from "stay" interventions was modeled as an average of two levers for attrition reduction: burnout reduction and

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[112] Population division data, United Nations, 2022.
[113] Based on 2019 healthcare worker volume data following partnership between *The Lancet* and the Gates Foundation to improve healthcare worker volume data quality for 2019. Annie Haakenstad et al., "Measuring the availability of human resources for health and its relationship to universal health coverage for 204 countries and territories from 1990 to 2019: A systematic analysis for the Global Burden of Disease Study 2019," *Lancet*, 2022, Volume 399, Number 10341.

talent localization. Effectiveness and relevance of burnout and talent localization interventions were adapted by archetype.

The analysis acknowledges the following:

— *Healthcare worker evolution.* The analysis did not estimate or forecast healthcare worker data and acknowledges that unexpected events such as COVID-19 can change projections.

— *Timeline to realization of the additional healthcare workers.* The analysis did not estimate the specific timelines or annual run rates for countries to achieve modeled additional workers.

These interventions have widely varying time horizons that interact with the intervention's feasibility, efficacy, and local nuances. Instead, the research suggests relative prioritization of the three workforce supply-side interventions (Grow, Thrive, Stay) against this report's established archetypes.

— *Incomplete healthcare worker data.* The percent increase in healthcare worker per 10,000 population was computed for each archetype, using country-level data where available. Countries with missing data were assumed to have the same percent increase in opportunity as the average for their archetype.

Countries by archetype

Country name	Country archetype
Afghanistan	Worker scarce
Albania	Worker scarce
Algeria	Worker and job scarce
Andorra	Worker advantaged
Angola	Worker and job scarce
Antigua and Barbuda	Worker scarce
Argentina	Worker scarce
Armenia	Worker scarce
Australia	Worker advantaged
Austria	Worker advantaged
Azerbaijan	Worker scarce
Bahamas	Worker advantaged
Bahrain	Worker scarce
Bangladesh	Worker scarce
Barbados	Worker advantaged
Belarus	Worker advantaged
Belgium	Worker advantaged
Belize	Worker scarce
Benin	Worker and job scarce
Bhutan	Worker scarce
Bolivia, Plurinational State of	Worker scarce
Bosnia and Herzegovina	Worker scarce
Botswana	Worker scarce
Brazil	Worker scarce
Brunei Darussalam	Worker advantaged

Country name	Country archetype
Bulgaria	Worker advantaged
Burkina Faso	Worker and job scarce
Burundi	Worker and job scarce
Cambodia	Worker scarce
Cameroon	Worker and job scarce
Canada	Worker advantaged
Cape Verde	Worker and job scarce
Central African Republic	Worker and job scarce
Chad	Worker and job scarce
Chile	Worker scarce
China	Worker scarce
Colombia	Worker scarce
Comoros	Worker and job scarce
Congo	Worker and job scarce
Cook Islands	Worker scarce
Costa Rica	Worker scarce
Côte d'Ivoire	Worker and job scarce
Croatia	Worker scarce
Cuba	Worker advantaged
Cyprus	Worker scarce
Czechia	Worker advantaged
Democratic People's Republic of Korea	Worker scarce
Democratic Republic of the Congo	Worker and job scarce
Denmark	Worker advantaged
Djibouti	Worker scarce
Dominica	Worker scarce
Dominican Republic	Worker scarce
Ecuador	Worker scarce
Egypt	Worker scarce
El Salvador	Worker scarce
Equatorial Guinea	Worker scarce
Eritrea	Worker and job scarce
Estonia	Worker advantaged
Eswatini	Worker and job scarce
Ethiopia	Worker and job scarce
Fiji	Worker scarce

Country name	Country archetype
Finland	Worker advantaged
France	Worker advantaged
Gabon	Worker scarce
Gambia	Worker and job scarce
Georgia	Worker scarce
Germany	Worker advantaged
Ghana	Worker and job scarce
Greece	Worker scarce
Grenada	Worker scarce
Guatemala	Worker scarce
Guinea	Worker and job scarce
Guinea-Bissau	Worker and job scarce
Guyana	Worker scarce
Haiti	Worker scarce
Honduras	Worker scarce
Hungary	Worker scarce
Iceland	Worker advantaged
India	Worker scarce
Indonesia	Worker scarce
Iran, Islamic Republic of	Worker scarce
Iraq	Worker scarce
Ireland	Worker advantaged
Israel	Worker advantaged
Italy	Worker advantaged
Jamaica	Worker scarce
Japan	Worker advantaged
Jordan	Worker scarce
Kazakhstan	Worker scarce
Kenya	Worker and job scarce
Kiribati	Worker scarce
Kuwait	Worker advantaged
Kyrgyzstan	Worker scarce
Lao People's Democratic Republic	Worker scarce
Latvia	Worker advantaged
Lebanon	Worker scarce
Lesotho	Worker and job scarce
Liberia	Worker and job scarce

Country name	Country archetype
Libya	Worker scarce
Lithuania	Worker advantaged
Luxembourg	Worker advantaged
Madagascar	Worker and job scarce
Malawi	Worker and job scarce
Malaysia	Worker scarce
Maldives	Worker scarce
Mali	Worker and job scarce
Malta	Worker advantaged
Marshall Islands	Worker scarce
Mauritania	Worker and job scarce
Mauritius	Worker and job scarce
Mexico	Worker scarce
Micronesia, Federated States of	Worker scarce
Monaco	Worker advantaged
Mongolia	Worker scarce
Montenegro	Worker scarce
Morocco	Worker scarce
Mozambique	Worker and job scarce
Myanmar	Worker scarce
Namibia	Worker scarce
Nauru	Worker scarce
Nepal	Worker scarce
Netherlands	Worker advantaged
New Zealand	Worker advantaged
Nicaragua	Worker scarce
Niger	Worker and job scarce
Nigeria	Worker and job scarce
Niue	Worker scarce
North Macedonia	Worker scarce
Norway	Worker advantaged
Oman	Worker scarce
Pakistan	Worker scarce
Palau	Worker scarce
Panama	Worker scarce
Papua New Guinea	Worker scarce
Paraguay	Worker scarce

Country name	Country archetype
Peru	Worker scarce
Philippines	Worker scarce
Poland	Worker scarce
Portugal	Worker advantaged
Qatar	Worker advantaged
Republic of Korea	Worker scarce
Republic of Moldova	Worker scarce
Romania	Worker scarce
Russian Federation	Worker advantaged
Rwanda	Worker and job scarce
Saint Kitts and Nevis	Worker advantaged
Saint Lucia	Worker scarce
Saint Vincent and the Grenadines	Worker scarce
Samoa	Worker scarce
San Marino	Worker advantaged
Sao Tome and Principe	Worker and job scarce
Saudi Arabia	Worker scarce
Senegal	Worker and job scarce
Serbia	Worker scarce
Seychelles	Worker and job scarce
Sierra Leone	Worker and job scarce
Singapore	Worker advantaged
Slovakia	Worker advantaged
Slovenia	Worker advantaged
Solomon Islands	Worker scarce
Somalia	Worker scarce
South Africa	Worker scarce
South Sudan	Worker and job scarce
Spain	Worker advantaged
Sri Lanka	Worker scarce
Sudan	Worker scarce
Suriname	Worker scarce
Sweden	Worker advantaged
Switzerland	Worker advantaged
Syria Arabic Republic	Worker scarce
Tajikistan	Worker scarce
Thailand	Worker scarce

Country name	Country archetype
Timor-Leste	Worker scarce
Togo	Worker and job scarce
Tonga	Worker scarce
Trinidad and Tobago	Worker scarce
Tunisia	Worker scarce
Türkiye	Worker scarce
Turkmenistan	Worker scarce
Tuvalu	Worker scarce
Uganda	Worker and job scarce
Ukraine	Worker advantaged
United Arab Emirates	Worker advantaged
United Kingdom	Worker advantaged
United Republic of Tanzania	Worker and job scarce
United States of America	Worker advantaged
Uruguay	Worker advantaged
Uzbekistan	Worker scarce
Vanuatu	Worker scarce
Venezuela, Bolivarian Republic of	Worker scarce
Vietnam	Worker scarce
Yemen	Worker scarce
Zambia	Worker and job scarce
Zimbabwe	Worker and job scarce