

Strengthening the Health Sector while Promoting Jobs for Youth

November 2022

Executive Summary

The COVID-19 pandemic has highlighted the risk of underinvestment and shortages in the health workforce, globally. Health workforce shortages offer an opportunity to prepare and employ young people for meaningful jobs in the health sector, while also supporting further development of the health ecosystem. Three critical and growing sub-sectors within the health workforce could offer opportunities to increase youth employment: (i) new non-clinical support roles (ii) digital health jobs and (iii) jobs in the care economy. Overall, gaps in the health workforce supply chain must be addressed through investment in education, TVET infrastructure and resources to align workforce demand and supply for emerging healthcare jobs and the migratory health labor force.

This note is a part of Solutions for Youth Employment's (S4YE) Discussion Note series. It aims to stimulate discussion amongst public, private sector and civil society stakeholders to explore win-win opportunities to develop the health workforce whilst also creating jobs for youth.

1. The increasing importance of investment in health

The health sector is a crucial part of the service economy, contributing to the socio-economic resilience of a nation's workforce. Expenditure on health is growing faster than the rest of the global economy, corresponding to more than 10 percent of global gross domestic product¹. A report on global health financing from the World Health Organization highlights the upward trajectory of global health spending, with low- and middle-income countries' health expenditure growing on average 6 percent annually compared with 4 percent in high-income countries, in 2019² (Tables 1 and 2). The aggregate size of the world's health sector is over US\$8.45 trillion. Additionally, a survey conducted by the International Monetary Fund (IMF) on countries' responses to the pandemic in 2020-2021, found that the median increase in real health spending was significant for lower-income countries at 55 percent, given their low starting base. Lower-middle income countries' real median increase in health spending exceeded 16 percent³. The demand for health services, therefore, continues to increase, potentially creating millions of new jobs.⁴

¹ Health spending comprises government expenditure, out-of-pocket payments (people paying for their own care), and sources such as voluntary health insurance, employer-provided health programs, and activities by non-governmental organizations. WHO (2019).

² WHO (2019). Countries are spending more on health, but people are still paying too much out of their own pockets. February 20, 2019. Available at: <https://www.who.int/news/item/20-02-2019-countries-are-spending-more-on-health-but-people-are-still-paying-too-much-out-of-their-own-pockets> (Accessed: May 2022)

³ Gupta, S., Sala, L. (2022). Pandemic-era health spending increases in developing countries are unlikely to be sustained. June 6, 2022. Center for Global Development: Blog Post. Available at: <https://www.cgdev.org/blog/pandemic-era-health-spending-increases-developing-countries-are-unlikely-be-sustained>

⁴ WHO (2016). High-Level Commission on Health Employment & Economic Growth. Working for health and growth: Investing the health workforce. Available at: <https://apps.who.int/iris/bitstream/handle/10665/250047/9789241511308-eng.pdf>

Table 1: Current health expenditure (percent of GDP) indicating government priority allocated to health, by World Bank income groups⁵

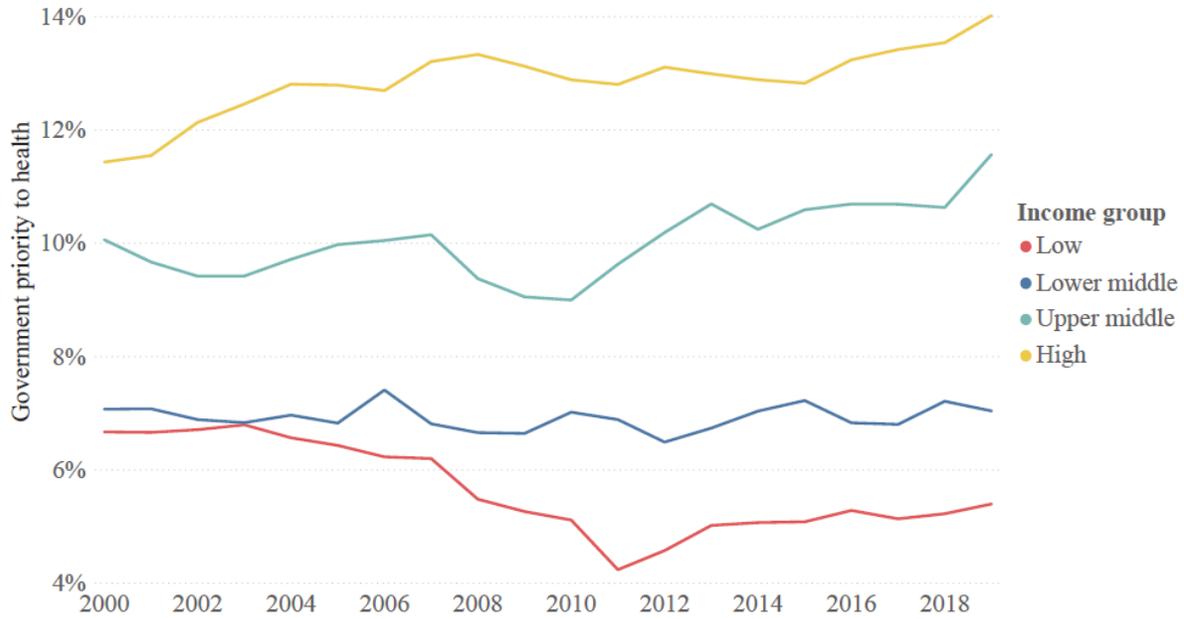
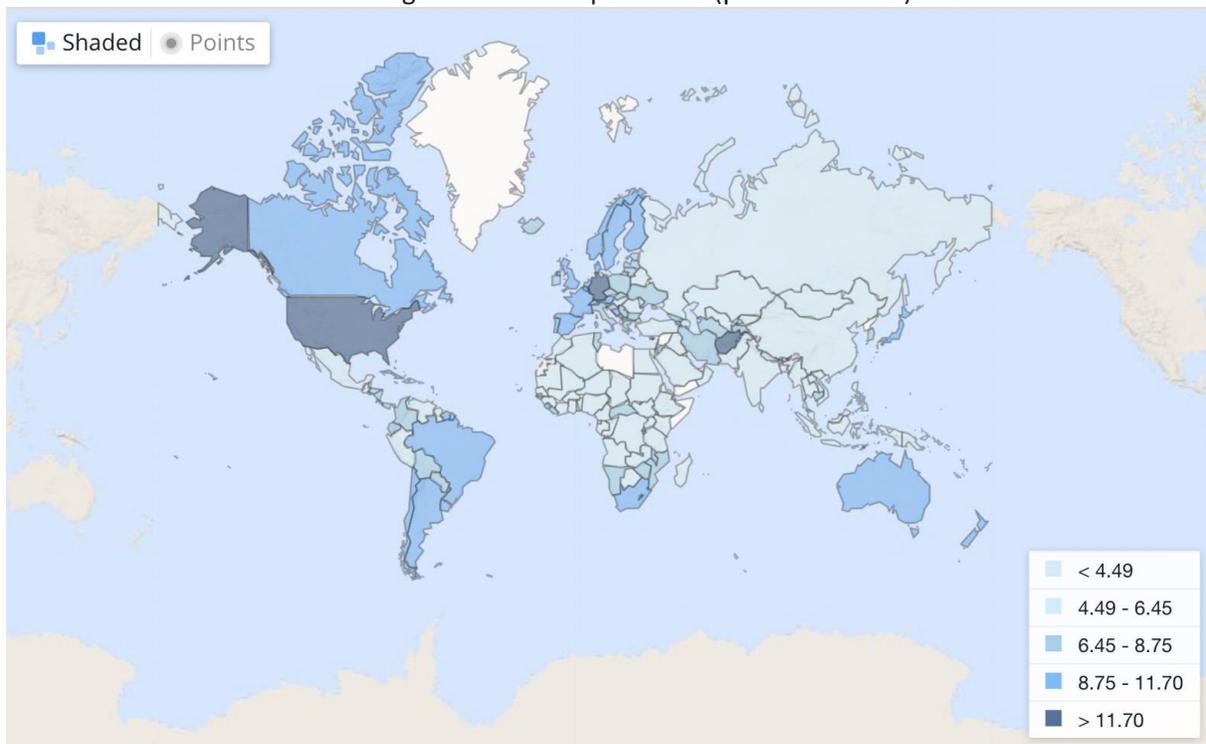


Table 2: Current global health expenditure (percent of GDP) in 2019⁶



⁵ World Health Organization Global Health Expenditure database, Available at: apps.who.int/nha/database

⁶ World Health Organization Global Health Expenditure database, Available at: <https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS?view=map>

An increased demand for quality healthcare has been reinforced by rising living standards, longer lifespans and new technology. As the demand for healthcare increases with population growth and aging, the demand for workers is growing as well. However, the current pipeline of healthcare workers won't likely be enough to meet pending needs. The World Medical Association reports that there are currently 76 countries with less than one physician per every 1,000 people and 3 billion people globally without access to a health professional⁷. Additionally, with the global COVID-19 pandemic, the need for better access to safe, quality health and associated services has further increased. With the pandemic inequitably impacting low and lower-middle income countries, investment in health is crucial as a pathway to socio-economic recovery in these regions.

Investing in human capital is critical for greater equity and economic growth, globally. The World Bank's [Human Capital Project \(HCP\)](#) reflects this agenda, particularly with the COVID-19 pandemic which has eroded human security, productivity and led to socio-economic losses. Investing in jobs for youth and specifically, the health workforce as an imperative of social protection would enable people to cope with crises and shocks, find jobs, improve productivity, build resilience and protect the aging population as well as the demographic dividend. Such systems are transformative as they help the poor and most vulnerable mitigate economic and fiscal shocks and provide opportunity by giving them a chance to move out of poverty and become productive members of society.

1.1 Investing in the health workforce to address demand and supply shortages

The pandemic has highlighted how investment in building a skilled health workforce is vital for a robust health ecosystem. While the shortage of health workers during the pandemic was caused in part by a surge in demand for health workers, WHO estimates a projected shortfall of 15 million health workers and the potential for creation of 40 million new health jobs by 2030⁸. The global needs-based shortage of health workers has been estimated given a projected global demand of 80 million healthcare workers and an estimated supply of only 65 million healthcare professionals by 2030. Current practices of health worker training and employment will not have sufficient impact on reducing the needs-based shortage of health-care workers by 2030, particularly in some regions.

The model predicts the number of physicians from the demand model, and then applies constant ratios of physicians to other cadres to obtain estimates of nurses, midwives, and all other health workers (AOWs). It is important to note however, with the rapidly evolving healthcare jobs and technology landscape, these estimates may not include emerging jobs and associated enabling services in healthcare under the category of all other health workers (AOW) and thus, may provide underestimates of the global health workforce shortage.

⁷ The future of work: four trends that will change healthcare. Kearney, World Economic Forum. Article available at: <https://www.kenarney.com/web/world-economic-forum/the-future-of-work-four-trends-that-will-change-healthcare>

⁸ WHO (2016). [Global Health Workforce statistics database](#). WHO; Note: Needs-based shortages were calculated by subtracting the current/projected supply of health-care workers from the current/projected need (as defined by the SDG index threshold of 4.45 physicians, nurses and midwives i.e., health workers per 1,000 population)

The largest needs-based shortages of health workers lie in the developing countries. In South-Asia, the largest needs-based shortage of health workers is estimated at 6.3 million and Sub-Saharan Africa at 4.3 million. East Asia is predicted to overcome the health labor force shortfall by 2030 (Table 3). In relative terms, the most severe challenges are in the African region, where the needs-based shortage is forecast to worsen between 2013 and 2030⁹. Overall, middle-income countries will face health workforce shortages. On the other hand, in low-income countries, the demand and supply curves for predicted health worker requirements fall below the WHO need threshold (Table 4). It is important to note that “need” as indicated in Tables 4 and 5 – has been calculated based on the WHO SDG index threshold density of 4.45 health workers per 1000 population, which is indicative of a minimum density of health workers required.¹⁰ Increasing the supply of health workers to the WHO threshold level alone may not address the issue if the demand for health services isn’t stimulated at the same time. As a result, low-income countries may experience a paradoxical situation in which they face a shortage of health workers needed to provide basic health services, but also have unemployed health workers due to the limited national and institutional capacity or enough private investment to employ the available supply of workers.¹¹

Thus, despite an increase in supply in the health workforce to keep up with increasing demand (Table 5), health worker shortages remain prevalent in the Global South. Under-investment in technically trained health workers, lack of infrastructure and the mismatch between education and employment strategies in health systems further contribute to worker shortages.

Table 3: Estimates of health worker needs-based shortages and surpluses by region (in millions), 2013 and 2030 (Health Nutrition and Population Global Practice Group, World Bank, 2016¹²)

| Region | 2013 | | | 2030 | | |
|----------------------------|--------|------|------------------|--------|------|------------------|
| | Supply | Need | Difference (S-N) | Supply | Need | Difference (S-N) |
| East Asia and Pacific | 11.1 | 13.7 | -2.6 | 18.2 | 14.7 | 3.5 |
| Europe and Central Asia | 12.6 | 5.6 | 7.0 | 16.6 | 5.7 | 10.9 |
| Latin America | 4.1 | 3.3 | 0.8 | 5.7 | 3.8 | 1.9 |
| Middle East & North Africa | 2.5 | 2.3 | 0.2 | 3.8 | 3.0 | 0.8 |
| North America | 4.2 | 2.1 | 2.1 | 6.9 | 2.4 | 4.5 |
| South Asia | 5.3 | 11.7 | -6.3 | 10.3 | 14.2 | -3.9 |
| Sub-Saharan Africa | 1.6 | 5.9 | -4.3 | 2.8 | 8.9 | -6.1 |

⁹ WHO (2016). Global strategy on human resources for health: Workforce 2030

¹⁰ World Health Organization. Health workforce and services: Draft global strategy on human resources for health: workforce 2030. Rep. Secr. Exec. Board EB13836 [Internet]. 2015 [cited 2015 Dec 20]; Available from: http://apps.who.int/gb/ebwha/pdf_files/EB138/B138_36-en.pdf

¹¹ Liua, Jenny X; Goryakin, Yevgeniy; Maeda, Akiko; Bruckner, Tim; Scheffler, Richard. 2016. Global Health Workforce Labor Market Projections for 2030. Policy Research Working Paper No. 7790. World Bank, Washington, DC. Available at: <https://openknowledge.worldbank.org/handle/10986/25035>

¹² Liua, Jenny X; Goryakin, Yevgeniy; Maeda, Akiko; Bruckner, Tim; Scheffler, Richard. 2016. Global Health Workforce Labor Market Projections for 2030. Policy Research Working Paper No. 7790. World Bank, Washington, DC. Available at: <https://openknowledge.worldbank.org/handle/10986/25035>

Table 4: Trends in demand, supply, and needs-based shortages in the health workforce by World Bank income group, 2013 and 2030 (WHO¹³)

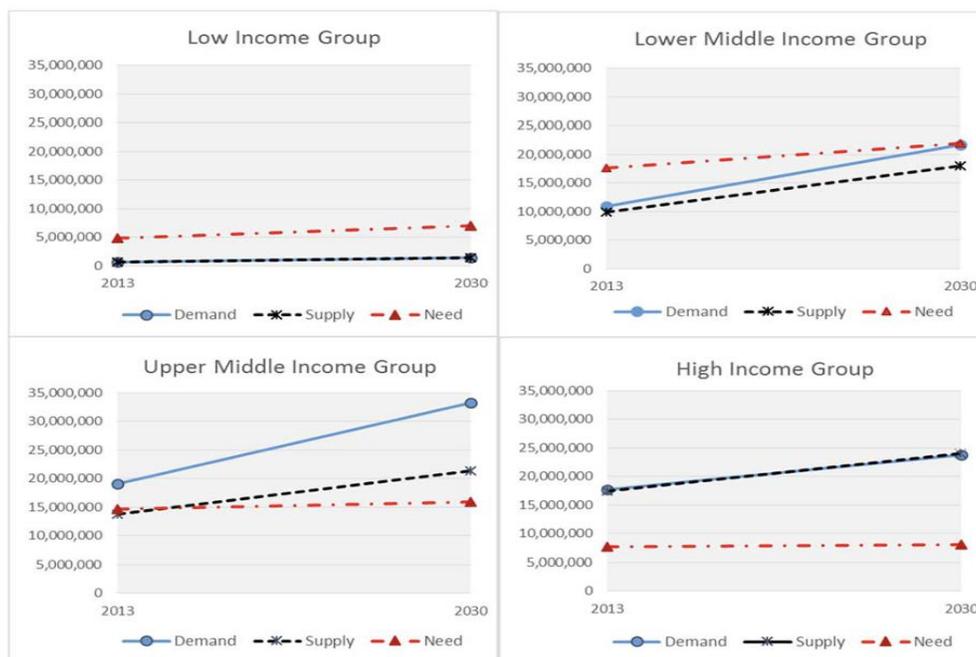


Table 5: Demand, supply and need for health workers (in millions) by region, 2013-2030 (S4YE team, based on WHO¹⁴ estimates)



¹³Liua, Jenny X; Goryakin, Yevgeniy; Maeda, Akiko; Bruckner, Tim; Scheffler, Richard. 2016. Global Health Workforce Labor Market Projections for 2030. Policy Research Working Paper No. 7790. World Bank, Washington, DC. Available at: <https://openknowledge.worldbank.org/handle/10986/25035>

¹⁴Global Health Workforce statistics database, WHO (2016)

1.2 Gender inequity in the health workforce

The pandemic has increased existing inequalities and, in some cases, even regressed the global gender equality agenda. Young women who had to stay at home, have borne the brunt of increased household unpaid work, inequitable digital access to educational and workplace resources, while also suffering from exacerbated risks of domestic violence and online gender violence, if working online¹⁵.

Online violence is not only a security issue but also an economic one. This form of violence might also result in women leaving their jobs, thereby reducing their labor force participation.¹⁶ The Economist Intelligence Unit's 2020 survey on the subject reports that 7 percent of women surveyed lost or had to change their jobs due to online violence. In addition, 35 percent of women reported mental health issues, and 1 in 10 experienced physical harm due to online threats¹⁷.

Given that 70 percent of the health and social workforce are women, particularly those in the care economy, investing in care services and creating inclusive online spaces would generate inclusive employment opportunities for women (Table 6). A report by WHO and Women in Global Health analyzing the health workforce across 104 countries confirms that women health workers are concentrated in lower status, lower paid and often, unpaid roles associated with gender bias and risks of harassment. 84 percent of the 28.5 million nurses and midwives globally are women. Men in the health workforce, on the other hand, are more likely to be physicians, specialists and inhabit leadership positions, leaving women underrepresented in senior, higher-paid roles (Table 6). However, participation of women in highly paid occupations in health is estimated to increase over the next two decades¹⁸.

Occupational segregation also drives a gender pay gap which is larger than in many other economic sectors. Women in the health sector earn on average, 28 percent less than men. Occupational segregation alone drives 10 percent of the pay gap¹⁹. Additionally, while women in health contribute 5 percent to global GDP annually i.e., USD\$ 3 trillion, 50 percent of this is unrecognized, unpaid and outside the formal labor market. If women were to participate in the economy equally, it would result in an estimated \$160 trillion increase in global GDP i.e., a 21.7 percent increase in human capital wealth²⁰.

¹⁵ WHO and Women in Global Health (2019). Delivered by women, led by men: A gender and equity analysis of the global health and social workforce. Available at: <https://apps.who.int/iris/handle/10665/311322>

¹⁶ S4YE (2022). Online violence against young female workers: Risks, threats and mitigation strategies. March 2022. Available at: https://www.s4ye.org/sites/default/files/2022-03/Online%20Violence%20Against%20Young%20Female%20Workers_S4YE%20and%20Gender_March%203%202022_final.pdf

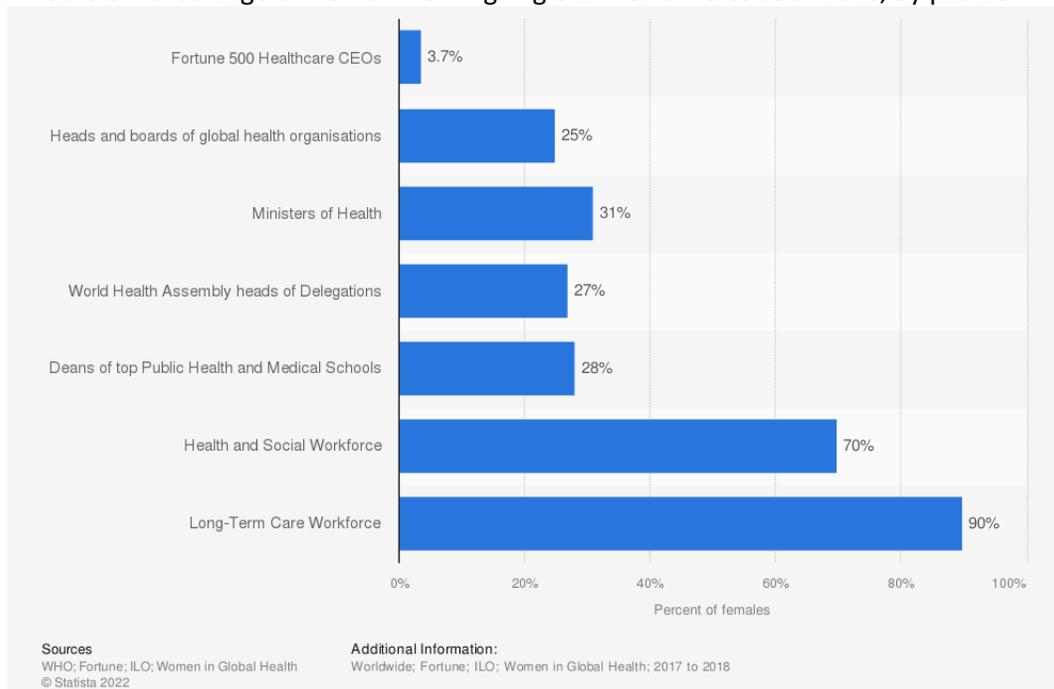
¹⁷ Economist Intelligence Unit. (2020). Measuring the prevalence of online violence against women. Available at: <https://onlineviolencewomen.eiu.com/>

¹⁸ WHO and Women in Global Health (2019). Delivered by women, led by men: A gender and equity analysis of the global health and social workforce. Available at: <https://apps.who.int/iris/handle/10665/311322>

¹⁹ WHO (2019). Female health workers drive global health. 20 March 2019. Available at: <https://www.who.int/news-room/commentaries/detail/female-health-workers-drive-global-health>

²⁰ WHO (2019). Female health workers drive global health. 20 March 2019. Available at: <https://www.who.int/news-room/commentaries/detail/female-health-workers-drive-global-health>

Table 6: Percentage of women working in global health roles as of 2018, by position²¹



In summary, financing the health workforce may result in an estimated 9:1 return on investment and lead to the creation of a more robust and well-designed health system which is inclusive of women’s perspectives²². Investments in the health workforce, related technological innovation and safe digital access from a gender lens, therefore, can spur inclusive economic growth which is essential for post-pandemic recovery.

1.3 Changing nature of the health workforce

Rapid developments in technology such as artificial intelligence, the [Internet of Things](#) and virtual reality are transforming how we work. This has led to the merging of the physical, digital, and biological spheres²³. The rapid digitization of health services such as telemedicine, digital care assistance and jobs arising out of the pandemic (such as contact tracers, support for diagnostic testing²⁴, or COVID-19 information call centre technicians), also requires a simultaneous investment in skills and training programs for health workers to keep up with changing occupations and digitization. Occupations such as digital health care specialists need to be part of technical and skill training programs, to keep up with changing demands of the health sector. Additionally, the COVID-19 pandemic underscores the need to continuously understand how current events affect the health labor market, from the level of the community to country-

²¹ Statista Research Department (2022). Representation of women in the global health workforce as of 2018, by position. Available at: <https://www.statista.com/statistics/1102621/females-global-health-workforce-by-role/>

²² WHO and Women in Global Health (2019). Delivered by women, led by men: A gender and equity analysis of the global health and social workforce. Available at: <https://apps.who.int/iris/handle/10665/311322>

²³ WEF. Fourth Industrial Revolution. Available at: <https://www.weforum.org/focus/fourth-industrial-revolution> (Accessed: May 2022)

²⁴ Support for diagnostic testing (to gauge if one is infected with SARS-CoV-2) includes: lab workers, data entry workers to input diagnostic test results

wide needs for specialized skills. It stresses the importance of developing flexible, agile, online learning and TVET initiatives to ensure the workforce is skill-ready when a health crisis leads to a surge in demand requirements.

2. The Opportunity for Youth Employment in the Health Sector

There are 64 million unemployed youth and 145 million youth living in poverty²⁵. In developing countries, the youth unemployment rate is about 9.5 percent²⁶. Youth have been especially impacted by COVID-19 mitigation measures such as the closure of education institutions and work premises worldwide. In developing countries where working poverty and low productivity jobs constitute key challenges, most youth have limited employment opportunities or do not have the option to continue flexible work assignments from home. Therefore, young workers have had to make the trade-off between health or livelihood i.e., choosing between increasing risk of infection or losing their source of income. The number of young people who need jobs combined with a global need for health workers, considering the 1 million health worker shortage, presents an opportunity. Health workforce shortages offer an opening to prepare and employ young people for decent and meaningful work in the health sector, while also supporting further development of the health sector.

3. Win-Win Opportunities for the Health Agenda and Jobs for Youth

The increasing demand for health and hence, the health workforce, could thus, create win-win opportunities that could be leveraged by TVET and youth employment programs:

3.1 Non-clinical health roles provide crucial support to the health system

Non-health workers who work in assisting roles comprise an estimated 60 percent of all formal health jobs globally. The ILO estimates that each health worker is supported by 2.3 non-clinical health workers²⁷. Moreover, it is estimated that there is need for 57 million more decent jobs for non-health workers (such as orderlies, phlebotomists, pharmacy aides, home health aides, housekeeping, maintenance, dietary, nursing assistants, patient care techs, and health administration workers) to deliver universal health coverage by 2030²⁸. Technical training for jobs carried out by non-health workers is crucial to the smooth functioning of health systems.

²⁵ Technical and Vocational Education and Training (TVET) Institutions: Best Practices and Opportunities to Increase Youth Employment in Health. USAID: Technical Brief: HRH 2030, March 2021. Available at: https://hrh2030program.org/wp-content/uploads/2021/03/TVET_Global-Brief_Final_3.17.pdf

²⁶ Building the Future Health Workforce 2030: Opportunities for Youth Employment in Health. USAID: HRH 2030. September 2018. Available at: https://www.hrh2030program.org/wp-content/uploads/2018/10/HRH-2030-Tech-Poster_Youth_final_Sept2018.pdf

²⁷ Horton R (Chair), Araujo E, Bhorat H, Bruysten S, Jacinto CG, McPake B, et al. Final report of the expert group to the High-level Commission on Health Employment and Economic Growth. Geneva: World Health Organization; 2016. Available at: <http://apps.who.int/iris/bitstream/10665/250040/1/9789241511285-eng.pdf>

²⁸ Horton R (Chair), Araujo E, Bhorat H, Bruysten S, Jacinto CG, McPake B, et al. Final report of the expert group to the High-level Commission on Health Employment and Economic Growth. Geneva: World Health Organization; 2016. Available at: <http://apps.who.int/iris/bitstream/10665/250040/1/9789241511285-eng.pdf>

3.2 Extending health access and associated social services to remote areas

In addition to providing jobs for women and young people, investment in the health sector has at least two other significant employment-related benefits.

First, health and social services are important sources of jobs in rural and remote locations, given the fundamental demand for the service. Further, half the world's population currently lives in rural and remote areas²⁹. Investment in establishing healthcare ecosystems in rural areas would thus, generate local job opportunities and address the regional health workforce demand-supply imbalance.

Second, investment in strengthening health systems creates jobs along the health value chain in many other sectors and public services, apart from just the final delivery of health services. For example, the health sector is one of many that is water dependent. Improving water and sanitation infrastructure in hospitals, health facilities and educational institutions and fulfilling the human right to water and sanitation are prerequisites for the creation of good quality jobs and ensuring the occupational health, safety, and well-being of health workers. Additionally, investments in infrastructure and operations of water-related services can provide high returns for economic growth through direct and indirect job creation³⁰. In addition to this, the health sector requires infrastructure in the form of education institutions, local clinics, hospitals, specialized healthcare units, which require construction workers, architects, and urban planners thus, generating indirect white and blue-collar workforce opportunities in the broader health value chain in rural areas, with limited alternative job opportunities for youth.

3.3 New jobs due to digitization of health care work

Technology, particularly access to the internet and acquisition of mobile phones, has presented opportunities to expand access to care across the world, including in remote areas of developing countries. The overall mobile health (mHealth) market was worth an estimated \$23 billion by 2017, according to SNS Research - and it is expected to grow significantly. In sub-Saharan Africa, which bears the highest relative disease burden in the world, and where mobile phone penetration rates have increased significantly (GSMA estimates that about 475 million people in the region will be mobile internet users by 2025, and nearly a third of connections will be on 4G), mobile operators have begun to facilitate health payments made via mobile devices³¹. Further, COVID-19 has catalyzed health care related digital innovation and facilitated the uptake of telemedicine. Virtual health and care delivered at home became the model of not only necessity but, also preference (Box 1).

²⁹ WHO (2010). Increasing access to health workers in remote and rural areas through improved retention. Report. February 2, 2010. Available at: <https://www.who.int/publications/i/item/increasing-access-to-health-workers-in-remote-and-rural-areas-through-improved-retention>

³⁰ United Nations World Water Assessment Programme (WWAP). The United Nations world water development report 2016: water and jobs. Paris: United Nations Educational, Scientific and Cultural Organization; 2016. Available at: <http://unesdoc.unesco.org/images/0024/002439/243938e.pdf>

³¹ WEF. Global Issue: Health and Healthcare: Technology. Available at: https://intelligence.weforum.org/topics/a1Gb00000038u3nEAA/key-issues/a1G68000004DYnEAM?utm_source=Weforum&utm_medium=Topic+page+DidYouKnow&utm_campaign=Weforum_Topicpage_UTMs

Thus, skilled digital technicians, telemedicine specialists and emerging health device technicians are integral to the continued functioning of health systems. Further, the aggregating and sharing of data, for which health care workers are required, can improve diagnoses, lead to new discoveries, and strengthen scientific results³².

Box 1: Survey on telehealth practices³³

According to a McKinsey survey, more than 76 percent of consumers of healthcare systems are moderately likely to use telehealth in the future, and 74 percent reported “high satisfaction” from past use. Psychiatry has the highest telehealth penetration, followed by neurology, gastroenterology (the digestive system), internal medicine, pulmonology (the respiratory tract), and family medicine.

Skill gaps across the digital health care value chain

Over the past two decades, health systems adopted digital technologies, which included installing electronic health record (EHR) systems, building applications and utilizing technologies such as artificial intelligence to advance service delivery and innovation in the field³⁴. Despite rapid technological advancement in systems, health care leaders stated that talent and skill was a major barrier to digital transformation of healthcare work, as shown in a Deloitte study³⁵.

Additionally, emerging areas within digitized healthcare where skill training, curriculum development and employment linkage programs are required include on-demand healthcare, patient data predictive analytics, medical wearable device measurement, personalized treatment using artificial intelligence, augmented and extended reality used by faraway specialists to virtually treat patients³⁶ (Table 7).

On-demand healthcare and personalized predictive analytics include making sense of medical data using machine learning and AI technology. The high-level use case of such technologies is to disentangle the large amounts of unstructured healthcare data collected from X-rays, CT and MRI scans as well as other information on the spread of communicable diseases like COVID, vaccine distribution, genomic data and even doctor’s prescriptions. Data on previous diagnoses are used in the field of preventative medicine by AI-based tools, to spot patterns across datasets. Thus, rather than reacting to illness by providing treatment post diagnosis, preventive medicine predicts where and when illness may occur and provides preventive care before it occurs. On a macro level, this could include predicting where outbreaks of contagious diseases may occur; and

³² WEF. Global Issue: Health and Healthcare: Technology. Available at: https://intelligence.weforum.org/topics/a1Gb00000038u3nEAA/key-issues/a1G68000004DYnEAM?utm_source=Weforum&utm_medium=Topic+page+DidYouKnow&utm_campaign=Weforum_Topicpage_UTMs

³³ WEF. Global Issue: Health and Healthcare: Technology. Available at: https://intelligence.weforum.org/topics/a1Gb00000038u3nEAA/key-issues/a1G68000004DYnEAM?utm_source=Weforum&utm_medium=Topic+page+DidYouKnow&utm_campaign=Weforum_Topicpage_UTMs

³⁴ Stephanie Newkirchen, Leslie Korenda, and Jessica Overman, [Opportunities for consumer-facing technologies in health systems: Building a better health care experience](#), Deloitte.

³⁵ Appleby, C., Hendricks, J., Wurz, J., Shudes, C., Chang, C., Shukla, M. Digital Transformation: From a buzzword to an imperative for health systems. October 26, 2021. Deloitte. Available at: <https://www2.deloitte.com/us/en/insights/industry/health-care/digital-transformation-in-healthcare.html>

³⁶ Ericsson (2018). Nordic Prime Ministers unite to prioritize 5G and digitalization. May 23, 2018. Available at: <https://www.ericsson.com/en/news/2018/5/nordic-prime-ministers-prioritize-5g>

on a micro level, where lifestyle factors are likely to lead to health issues in different populations. Applications of such technology thus, lead to accurate, personalized health care predictions and better patient outcomes at lower cost³⁷.

Table 7: Emerging jobs due to digital transformation of healthcare (Digital Authority Partners, 2022)³⁸

| | |
|---|---|
|  | <p>mHealth: Patients want on-demand healthcare 2.7 billion people worldwide own smartphones 77% of customers book medical appointments online</p> |
|  | <p>Medical wearable devices: Improve preventive care 80% of consumers are willing to wear smartwatches which measure health data 44% people feel more in control of their health due to wearable devices</p> |
|  | <p>Big data analytics: Improve health insights 47% of healthcare organizations use patient data predictive analytics 57% healthcare companies think predictive analytics will save them 25% per year The big data market share is expected to reach \$14.9 billion by 2022</p> |
|  | <p>Technical training: Virtual reality \$5.1 billion large medical virtual reality market by 2025 24% reduction in post-surgical pain due to VR 29% faster surgeries with 7 times fewer errors by surgeons who trained in computer simulators</p> |
|  | <p>Artificial Intelligence: Personalized treatment \$34 billion healthcare AI-powered tools market by 2025 84% industry leaders think AI will transform healthcare</p> |

Medical wearable devices for predictive care are an emerging healthcare application with high customer adoption. It includes the use of smartwatches and smart patches to enable patients to monitor health and fitness markets intermittently. Deloitte Global predicts that 440 million consumer health and wellness wearable devices will ship worldwide in 2024 (Table 8). Their most common uses have historically been to help people get fit and lose weight. However, increasingly, people are using smartwatches to monitor their health, as new hardware, software, and apps have turned them into personalized health clinics. Heart rate monitors are now standard on most smartwatches, and some such as [Google’s Fitbit](#) have been approved by America’s Food and Drug Administration for detecting heart abnormalities that can lead to strokes or heart failure³⁹.

³⁷ Bernard, M. The Five Biggest Healthcare Tech Trends in 2022. Forbes. January 10, 2022. Available at:

<https://www.forbes.com/sites/bernardmarr/2022/01/10/the-five-biggest-healthcare-tech-trends-in-2022/?sh=6d6bb7ca54d0>

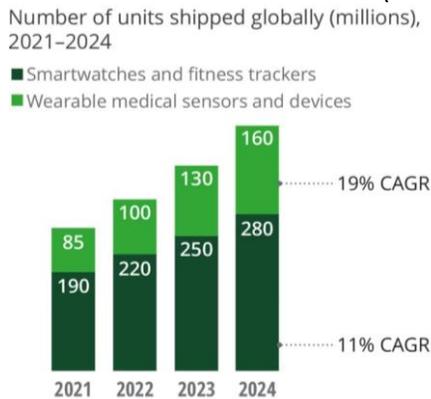
³⁸ Reddy, M., Digital Transformation in Healthcare in 2022: 7 Key Trends. January 4, 2022. Digital Authority Partners. Available at:

<https://www.digitalauthority.me/resources/state-of-digital-transformation-healthcare/>

³⁹ Loucks, J., Stewart D., Bucaille, A., Crossan, G. Wearable technology in health care: Getting better all the time. Deloitte. December 1, 2021.

Available at: <https://www2.deloitte.com/us/en/insights/industry/technology/technology-media-and-telecom-predictions/2022/wearable-technology-healthcare.html>

Table 8: The global market for health wearable (Deloitte Insights, 2021)



Smartwatch innovation is progressing at a fast pace owing to advances in sensors, semiconductors, and artificial intelligence. Algorithms produced and improved via machine learning use data from these sensors to provide insights into activity levels, stress, and more.⁴⁰ Digitally skilled physicians, wearable specialists who can read data trends as well as technicians who can repair or maintain wearable smart devices are thus, required to keep up with the rapid innovation. These provide new emerging opportunities for youth jobs.

Additionally, extended reality (ER) is being utilized to virtually treat patients and train surgeons. Extended reality includes virtual, augmented and mixed reality (i.e., VR, AR and MR) – which use lenses or headsets that alter one’s perception of the world by placing the individual in entirely virtual or an overlay of a virtual-real world. Robots, IoT and other smart technology are integral to this application and can be used to virtually train doctors and surgeons by allowing them to get acquainted with the workings of the human body and hone their skills without putting patients at risk. [Microsoft’s HoloLens system](#) is used in surgical theatres, where it lets the surgeon receive real-time information about what they are seeing, as well as share their view with other professionals or students who may be observing the operation⁴¹. The technology has reduced training time by 30% at an average savings of \$63 per hour, and improved efficiency by 30% to complete ward rounds at an average savings of \$41 per hour⁴². Although these technologies are being developed in the Global North, they enable low-cost treatment in the developing world, through remote healthcare clinics and telemedicine centers.

Further, barriers to high-quality, affordable healthcare for women in low-income countries, have been difficult to address, however, technology offers new hope⁴³. Research by Frost and Sullivan shows that the women’s health tech market has the potential to reach \$9.4 billion by 2024. Women’s health tech services provide women from remote, underserved communities with reliable health information and low-cost, accessible, and high-quality health services. For

⁴⁰ Tania Pereira et al., “[Photoplethysmography based atrial fibrillation detection: a review](#),” NPJ Digital Medicine 3 (2020).

⁴¹ Bernard, M. The Five Biggest Healthcare Tech Trends in 2022. Forbes. January 10, 2022. Available at: <https://www.forbes.com/sites/bernardmarr/2022/01/10/the-five-biggest-healthcare-tech-trends-in-2022/?sh=6d6bb7ca54d0>

⁴² Microsoft, HoloLens: About, Available at: <https://www.microsoft.com/en-us/hololens/industry-healthcare>

⁴³ Shukla, R. It’s time to shine a light on HealthTech for women, World Bank Blogs: Digital Development. September 16, 2021. Available at: <https://blogs.worldbank.org/digital-development/its-time-shine-light-healthtech-women>

instance, [Oky](#)⁴⁴ is a free period-tracking app used by UNICEF to help adolescent girls in Mongolia and Indonesia learn about menstruation. [MobileODT](#)⁴⁵, an Israeli health-tech company, has created a non-invasive diagnostic device to detect cervical cancer that is being used for mass screenings in the Dominican Republic. [Remote monitors](#)⁴⁶ are helping patients in Mexico manage diabetes, which afflicts an estimated 223 million women globally. There are also wellness platforms with information on menopause, nutrition, and mental health⁴⁷. Jobs and skill training pertaining to monitoring, maintenance and end-to-end delivery of health services associated with such overlooked technology applications are critical to their sustainability and use.

Finally, another emerging digital healthcare application involves the use of agile digital tools to support provision of mental health services at scale. Digital healthcare tools in this context are being viewed as critical to building youth’s emotional resilience and ability to overcome adversity. The cumulative impact of (i) COVID-19 on work, (ii) a changing employment landscape due to rapid advancements in technology even before the pandemic, and (iii) a rise in conflicts around the world have all taken a toll on young people’s mental health⁴⁸. Digital self-help interventions are appealing as they can be efficiently implemented at scale. First, these interventions do not require in-person support. Second, these interventions can be disseminated at low cost to wide audiences. Third, they can be quickly adapted and modified as per contextual specifications. Finally, digital interventions have been shown to be effective in just a single session. However, little is known about the uptake, acceptability, and perceived utility of these interventions outside of clinical trials in which participants are compensated⁴⁹.

In this context, the following investments in education, TVET infrastructure and skill development would be important to develop the health workforce for digitized healthcare. First, create curriculum, standards and TVET programs for the new emerging digital health roles. Second, equip health workers with the requisite skills to utilize digital technologies that provide more efficient, quality-integrated service delivery, including telehealth services that can extend the reach of health services from facilities into communities, including the most marginalized populations (Box 2).

Box 2: Upskilling health workers by tapping into private health networks⁵⁰

Identifying and bolstering in-demand competencies required for health jobs in Africa, Southeast Asia and India: [GE Healthcare's collaboration](#) with Tata Trusts and the America College of Obstetricians and

⁴⁴ UN Innovation Network (2019). “Oky” by the United Nations Children Fund. YouTube. Available at: <https://www.youtube.com/watch?app=desktop&v=bbV84ruVbxw>

⁴⁵ MobileODT, About the Company, Available at: <https://www.mobileodt.com/>

⁴⁶ IFC (2020). Innovative Health Care in Mexico Treats a Diabetes Epidemic. IFC: Stories of Impact. January 2020. Available at: https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/impact-stories/innovative+health+care+in+mexico+treats+a+diabetes+epidemic

⁴⁷ Shukla, R., It’s time to shine a light on HealthTech for women, World Bank Blogs: Digital Development, September 16, 2021, Available at: <https://blogs.worldbank.org/digital-development/its-time-shine-light-healthtech-women>

⁴⁸ S4YE (2021). Resilience: Cultivating Emotional Resilience among Youth to Boost their Employment Prospects. Discussion Note Series: Issue 3. October 2021.

⁴⁹ Wasil et al., 2020, Promoting Graduate Student Mental Health during COVID-19: Acceptability and Perceived Utility of an Online Single-Session Intervention

⁵⁰ GE Healthcare Institute. About us. Available at: <https://hci.gehealthcare.com/aboutus>

Gynecologists provides a collaborative model focused on specific occupational skills. They aim to reach the 5.8 billion people in the emerging world with limited access to healthcare through the development of disruptive, low-cost technologies and healthcare delivery systems. They draw on private hospital networks to identify necessary and appropriate hard and soft skills required for entry level jobs in their institutions, incorporate them into training programs and utilize technology to increase reach and up-grade the skilled workforce in the healthcare industry in remote areas such as Tier 2 and Tier 3 cities across Africa, India and Southeast Asia. TVET programs cover multiple care areas including radiology, cardiology, critical care, fetal medicine and leadership training.

Third, equip health care workers and upskill them to understand digital systems and enable data collection. Digital systems provide real time data to health workers, which may improve evidence-based decision making by strengthening data collection, management, analysis, and utilization at all levels of the health care delivery system. This will enable better connectivity to other health workers thus, bringing care to unserved populations (Box 3).

Box 3: Public-private partnerships for digital healthcare in Somalia, Sierra Leone and DRC⁵¹

Digital solutions for frontline health workers in Africa: The [Rockefeller-GAVI partnership](#) launched initiatives in Somalia, Sierra Leone, and the Democratic Republic of the Congo (DRC) focused on using mobile phone technologies to teach frontline workers digitally during the pandemic, to expand the pool of vaccinators available. In Somalia, the project partnered with Dimagi and Medic Mobile, the two largest developers of apps designed specifically for community health workers. Over 700,000 health workers around the world currently use these apps. The project supported the Ministry of Health to introduce and roll-out Covid-19 vaccine, including vaccination registration, eligibility-checking, status tracking, and follow-up.

3.4 The Care Economy

Almost 40 percent of projected job opportunities in emerging professions will be in the care sector between 2020 and 2023, as per a report from the World Economic Forum⁵². “Care” professions include childcare, eldercare, nursing, therapy and personal training. Selection of emerging professions is based on historic trend data from online job postings, hiring rates and LinkedIn’s Economic Graph research⁵³, tracking in near-real time the transformations underway in the global labor market. In the report, emerging professions are defined as those that have experienced the most growth over the previous five years.

The caretakers of 40 percent of all children, or nearly 350 million below primary school age, do not have adequate access to childcare services. Where childcare does exist, it remains too costly

⁵¹ Kuzmak, G., How new training approaches are transforming health workers’ ability to deliver vaccines. February 22, 2022. The Rockefeller Foundation Blog. Available at: www.rockefellerfoundation.org/blog/how-new-training-approaches-are-transforming-health-workers-ability-to-deliver-vaccines/

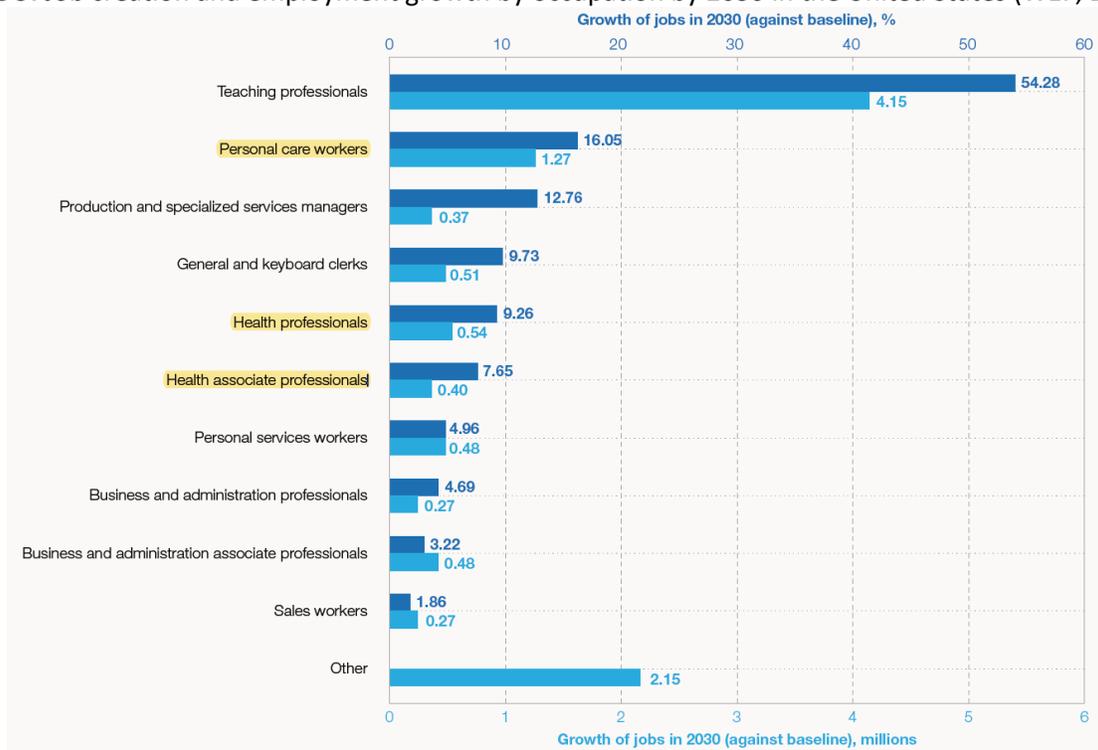
⁵² WEF (2020). Jobs of Tomorrow: Mapping Opportunity in the New Economy. January 2020. Available at: http://www3.weforum.org/docs/WEF_Jobs_of_Tomorrow_2020.pdf

⁵³ LinkedIn Economic Graph, <https://economicgraph.linkedin.com>

for the average household⁵⁴. This lack of adequate and affordable childcare prevents women from participating fully in the labor market since the burden of care work lies primarily on women, owing to socio-cultural norms. Furthermore, while some economies have an ageing population, such as the US, and require care workers for the elderly now (Table 9); others have a relatively young and burgeoning demographic dividend, such as India and Africa, and require care workers for the young. Ensuring there is adequate supply to meet demand for care, therefore, has the potential to create millions of new jobs around the world, in the short and long-term.

Increasing investments in providing universal access to quality and affordable childcare can act as a powerful equalizer of both, opportunities for children from disadvantaged backgrounds and for women who take on a disproportionate share of unpaid care work. Facilitating access to childcare for all children can address inequality at a young age, setting individuals up for a more equitable lifetime of opportunity and development, and can generate significant returns on investment (Heckman, 2013). Non-parental childcare has also been positively correlated to children’s cognitive development, social readiness, cognitive and language development for disadvantaged children, and can narrow the gap between privileged and under-privileged children⁵⁵.

Table 9: Job creation and employment growth by occupation by 2030 in the United States (WEF, 2020)⁵⁶



⁵⁴ OECD Tax and Benefits Models, <https://www.oecd.org/els/soc/OECD-Taxbenefit-model-Overview.pdf>

⁵⁵ WEF (2020). Jobs of Tomorrow: Mapping Opportunity in the New Economy. January 2020. Available at: http://www3.weforum.org/docs/WEF_Jobs_of_Tomorrow_2020.pdf

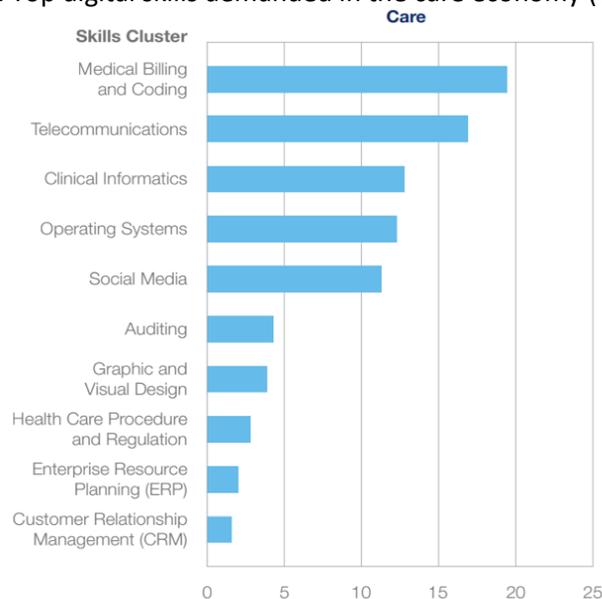
⁵⁶ WEF (2020). Jobs of Tomorrow: Mapping Opportunity in the New Economy. January 2020. Available at: http://www3.weforum.org/docs/WEF_Jobs_of_Tomorrow_2020.pdf

In keeping with emerging opportunities in the care economy, the World Economic Forum has identified emerging care jobs and the top ten skills required for them (Table 10). Government and private sector may invest in establishing the appropriate TVET infrastructure and implementing skill building programs to align supply with emerging job opportunities in both developed and developing economies. Furthermore, digital skills within the care economy should be prioritized as part of TVET initiatives, given the increasingly digitized nature of health and care work (Table 11).

Table 10: Emerging jobs and top 10 skills required in the care economy (WEF, 2020)⁵⁷

| Emerging Jobs | Top 10 Skills |
|--|--|
| 1 Medical Transcriptionists | 1 Respiratory Therapy |
| 2 Physical Therapist Aides | 2 Caregiving |
| 3 Radiation Therapists | 3 Sterile Procedures / Techniques |
| 4 Athletic Trainers | 4 Transcription |
| 5 Medical Equipment Preparers | 5 Radiation Treatment |
| 6 Veterinary Assistants and Laboratory Animal Caretakers | 6 Medical Dosimetry |
| 6 Exercise Physiologists | 7 Vital Signs Measurement |
| 8 Recreation Workers | 8 Simulation |
| 8 Personal Care Aides | 9 Advanced Cardiac Life Support (ACLS) |
| 8 Respiratory Therapists | 10 Radiologic Technology |
| 11 Medical Assistants | |
| 12 Fitness Trainers and Aerobics Instructors | |
| 13 Occupational Health and Safety Technicians | |
| 13 Orderlies | |
| 13 Healthcare Support Workers, All Other | |

Table 11: Top digital skills demanded in the care economy (WEF, 2020)⁵⁸



⁵⁷ WEF (2020). Jobs of Tomorrow: Mapping Opportunity in the New Economy. January 2020. Available at: http://www3.weforum.org/docs/WEF_Jobs_of_Tomorrow_2020.pdf

⁵⁸ WEF (2020). Jobs of Tomorrow: Mapping Opportunity in the New Economy. January 2020. Available at: http://www3.weforum.org/docs/WEF_Jobs_of_Tomorrow_2020.pdf

Additionally, focus on training young people in the care sector through TVET interventions and employment linkage program could have knock-on benefits and close gender gaps in labor force participation. Studies show women shoulder more unpaid care work than men⁵⁹. Since women are the primary caregivers for both children and aging relatives, a robust care economy will enable their increased workforce participation, allowing businesses and economies to benefit from an expanded talent pool, while creating a better gender balance in unpaid care (Box 4).

Box 4: Employer-subsidized childcare services in rural Mexico (IFC, 2022)⁶⁰

[Grupo Altex](#), a Mexican agro-industrial business with more than 7,000 employees, supports the childcare needs of its employees by offering affordable, quality childcare in partnership with a private care provider, Hipocampus. The group offers subsidized childcare services for employees' children aged 1-6 years old as well as for community members. Parents pay a subsidized amount for high-quality service near their workplace, most of them in rural areas where this type of childcare offering is rare. All employees, regardless of contract type, receive paid maternity and paternity leave in accordance with Mexican law. According to a 2021 survey with 46 Altex employees:

- 100 percent believe that access to the service has allowed them to increase their productivity
- 60 percent of parents said that Hippocampus was a factor in their decision to join the company
- 97 percent mentioned that the service increases the probability of continuing to work
- 98 percent say the service has helped them better balance work and family responsibilities.

Given emerging demand and cascading benefits, there is an urgent need to address gaps in funding and implementation of care-focused training programs (Box 5). Recognizing and valuing care as a vital sector of the economy, making roles in care more professional, rebalancing paid and unpaid work responsibilities, expanding care infrastructure and services and using innovative ways to fund and facilitate care – require equal importance⁶¹.

Box 5: Bringing care work home in India and Bangladesh⁶²

[Noora Health](#)⁶³, a non-profit organization funded by TED 2022 Audacious and Skoll Foundation, collaborates with local health systems and government to train home care workers using online care modules. They seek to address health conditions that are drivers of mortality, morbidity and preventable through home care programs, by empowering family caregivers with essential care skills. Master Trainers teach community healthcare staff how to lead caregiving training sessions, by deploying training and information to caregivers remotely as well as in-person.

This model has proven to be effective: a randomized control trial (RCT) in Jamaica showed that a simple, cheap intervention such as having a community health worker teach parenting skills to communities can

⁵⁹ WEF (2020). Jobs of Tomorrow: Mapping Opportunity in the New Economy. January 2020. Available at: http://www3.weforum.org/docs/WEF_Jobs_of_Tomorrow_2020.pdf

⁶⁰ IFC (2022). Spotlight on Grupo Altex, Mexico: Supporting Employees through Childcare. International Finance Corporation. Available at: https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/gender+at+ifc/resources/202206-grupo-altex-mexico-childcare

⁶¹ WEF (2020). Jobs of Tomorrow: Mapping Opportunity in the New Economy. January 2020. Available at: http://www3.weforum.org/docs/WEF_Jobs_of_Tomorrow_2020.pdf

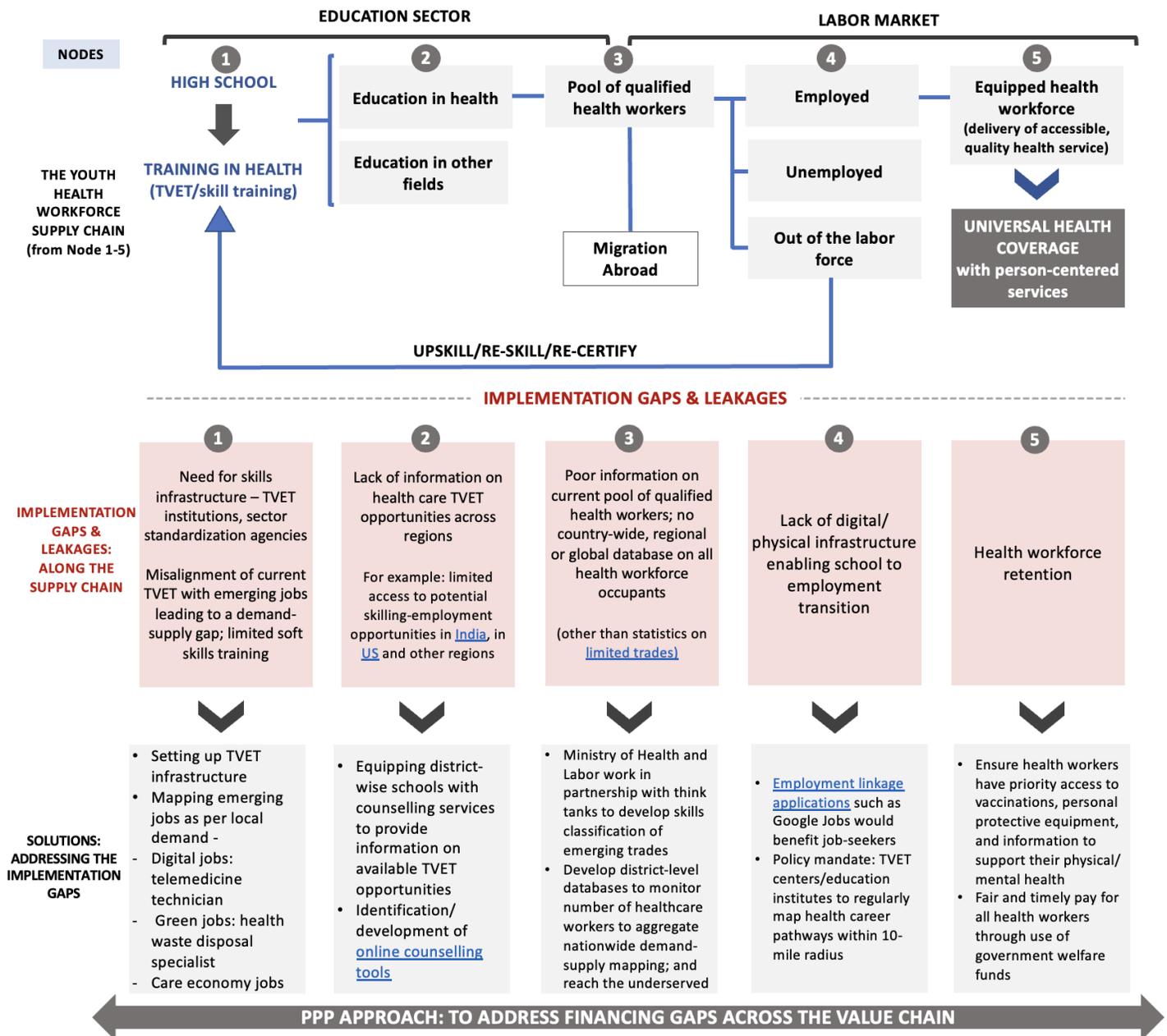
⁶² Business Wire (2022). Noora Health recognized for its impact in transforming the way care is delivered to patients. April 11, 2022. Available at: <https://www.businesswire.com/news/home/20220411005048/en/Noora-Health-Recognized-for-its-Impact-in-Transforming-the-Way-Care-is-Delivered-to-Patients>

⁶³ Noora Health. What We Do. Available at: <https://www.noorahhealth.org/what-we-do/>

boost income by 25 percent two decades later. Noora Health has trained 5,765 health workers and 1.7 million caregivers across India and Bangladesh. The program reduces post-surgical cardiac complications by 71 percent and newborn re-admissions by 56 percent.

4. Recommendations

Table 12: Framework for the health workforce supply chain (S4YE team, based on global strategy on human resources for health, WHO⁶⁴)



⁶⁴ WHO (2016). [Global strategy on human resources for health: Workforce 2030](#)

4.1 Strengthening the TVET system to address health workforce needs

There is considerable public-private opportunity to stimulate funding in the health sector’s human capital. The additional \$1 billion for the new Global Health Worker Initiative by the current U.S. administration; the High-Level Commission on Health Employment and Economic Growth established by United Nations; commitments by the G7 and G20 nation states toward ameliorating health outcomes by investing in the global health workforce and growing private sector investment in the digital health market which reached \$29.1 billion in 2021⁶⁵ highlight this potential for investment. The following areas along the TVET value-chain (Table 12) can be further developed through public-private collaboration and investment to plug existing implementation gaps:

1. **TVET systems could help address some gaps in the health workforce, through shorter-term certification in para-professional health cadres as alternatives to four-year tertiary education.** TVET may yield marketable health workforce skills in less time and at a lower cost. For example, allied health profession jobs (i.e., pharmacy technician, laboratory technician, phlebotomist, and others) require one to two years of post-secondary training. Additionally, because of the shorter duration of certification programs, TVET is more flexible in responding to rapidly evolving labor market changes⁶⁶ (Box 6, 7 and 8).

Box 6: Short term training and certification for healthcare workers in India⁶⁷

Short term training for frontline workers’ emergency response in India: A [customized short-term program](#) has been initiated by the Ministry of Skill Development and Entrepreneurship (MSDE) and the National Skill Development Corporation (NSDC). It aims to create a pool of trained COVID-19 frontline workers and help reduce the workload of healthcare professionals. 114,000 candidates have been trained across six job roles: basic care support, advance care support, home care support, emergency care support, sample collection support, and medical equipment support. The short-term course program includes TVET followed by an on-the-job training (OJT) for three months in healthcare facilities such as primary health centers, hospitals, diagnostic facilities and sample collection centers.

Box 7: Flexible short-term learning programs in Afghanistan, Ethiopia and Ghana⁶⁸

Accelerating, flexible continued learning initiatives in Afghanistan, Ethiopia and Ghana: [Flexible continued learning models](#) are one way of creating supply to meet growing demand for the health workforce. In Afghanistan, an accelerated course in midwifery allows students to receive the same certifications as other 3-year midwifery graduate students, in half the time. Similar actions have been taken in Ethiopia and Ghana and are proving to be effective models in reducing the school-to-work timeline. Additionally, in Ghana, the

⁶⁵ Bestsenny, O., Chmielewski, M., Koffel, A., Shah, A. From facility to home: How healthcare could shift by 2025. February 1, 2022. McKinsey & Company. Available at: <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/from-facility-to-home-how-healthcare-could-shift-by-2025>

⁶⁶ Technical and Vocational Education and Training (TVET) Institutions: Best Practices and Opportunities to Increase Youth Employment in Health, USAID, Technical Brief: HRH 2030, March 2021. Available at: https://hrh2030program.org/wp-content/uploads/2021/03/TVET_Global-Brief_Final_3.17.pdf

⁶⁷ NSDC India. On a war footing with COVID-19 healthcare program. Available at: <https://nsdcindia.org/covid-19-healthcare-program>

⁶⁸ Jozwiak, G., Could unemployed youth solve the health care worker crisis? April 24, 2017. Devex. Available at: <https://www.devex.com/news/could-unemployed-youth-solve-the-health-care-worker-crisis-90091>

country's Youth Employment Agency began a campaign to recruit 20,000 young unemployed people to train as community health workers.

Box 8: Addressing health workforce shortages through short-term training in Africa⁶⁹

To address the health workforce shortage associated with the provision of HIV service delivery in South Africa, specifically antiretroviral treatment (ART), the NGO, Kheth'Impilo developed a pharmacist assistant training program in which community members, many of them young people, earn a pharmacy assistant qualification over a two-year period. Kheth'Impilo works with the Provincial Departments of Health to create posts to increase the likelihood of gainful employment for program graduates and ease the pressure on pharmaceutical services in the country.

2. **Mobilizing community-based health workers:** Building local and regional institutional capacity (Box 9) to support a global health workforce that is adequately prepared to respond to routine and emergency surge capacity needs should be a priority focus. Reaching the underserved i.e., rural, remote and marginalized populations through investment in infrastructure development and increasing access to the healthcare workforce is the first step.

Box 9: Building local capacity through training and employment-linked programs⁷⁰

Training community health agents in Brazil, Africa and India: In partnership with Brazil's Ministry of Health, [Colgate-Palmolive](#) trains community health agents who provide oral care and handwashing education, reaching over 14 million people in across 27 cities. In South Africa, Colgate funds a mobile hospital that provides vital medical and oral health care in under resourced communities. Every year, they treat 50,000 people in 37 communities. In India, Colgate's community health model involves partnering with *Jeevika*, a women's empowerment organization, to provide oral health education to communities, through a short-term TVET program. Women who receive oral care certification act as ambassadors to teach proper oral care, reaching more than 2 million households. Additionally, through *Saksham*, an employability-linked skill development program for underprivileged and marginalized youth in India, Colgate has partnered with an NGO, SEEDs, to deploy National Skill Development Corporation approved short-term skill training curriculum. In each of their several models of community-led health delivery, TVET and employment go hand-in-hand.

3. **Managing international migration of health workers with skill training and employment support:** As per the International Organization for Migration (IOM), labor mobility and migration of health workers will continue to rise in coming years⁷¹. Health systems globally face the issue of managing the in- and out-flow of the health labor force. This is particularly

⁶⁹ Technical and Vocational Education and Training (TVET) Institutions: Best Practices and Opportunities to Increase Youth Employment in Health, USAID, Technical Brief: HRH 2030, March 2021. Available at: https://hrh2030program.org/wp-content/uploads/2021/03/TVET_Global-Brief_Final_3.17.pdf

⁷⁰ Colgate-Palmolive. Employability Linked Skill Building Initiative. Available at: <https://www.colgatepalmolive.co.in/community-impact/employability-linked-skill-building-initiative>

⁷¹ International Organization for Migration (2018). UN Migration. Migration of Health Workers: Information Sheet. September 10, 2018. Available at: https://www.iom.int/sites/default/files/our_work/DMM/Migration-Health/mhd_infosheet_migration_of_health_workers_10.09.2018.pdf

challenging since the temporary or permanent shift of health migrant workers may impact the effectiveness of response to health emergencies as well as the achievement of Universal Health Coverage (UHC) and an overall loss of returns to government investments in medical education⁷². Additionally, migration of high skilled health workers to the developed world creates tensions for low-income countries to improve health care and retain the health care labor force. Since health is a sector where high and low skilled jobs are complements, there is a need to both retain high skilled health workers and train low skilled workers to assist them.

A well-managed migration strategy, however, will enable capacity-building of health systems in both receiving as well as sending countries. While migration of doctors and nurses may lead to brain drain in migrant origin countries, it could also lead to brain gain as migration encourages education investments in the country of origin and thus, increases the supply of skilled workers as not all workers who have newly acquired skills migrate (Gibson and McKenzie, 2011) (Box 10)⁷³.

Box 10: Evidence from the Philippines: Providing healthcare workers with opportunities to migrate can increase education and supply of medical workers in origin countries⁷⁴

A 2021 study of the Philippines, one of the top migrant-origin countries and the largest supplier of foreign nurses globally shows that nursing enrollment and graduation increased substantially in response to greater demand for health workers, in particular nurses, in the United States. It is estimated that enrollment in nursing increased by 129% off a pre-period enrollment rate of 1.35% among the college-aged population, following a policy which enabled U.S. visa expansion for foreign nurses. The policy also led to a 247% increase in nursing graduates, off a pre-period graduation rate of 0.16 percent among the college-aged population. While new nurses passed the license exam at lower rates, many new individuals took the exam – such that for each new nurse that moved abroad, nine additional nurses were licensed in the Philippines. This suggests substantial brain gain of nurses. Additionally, health workers in the Philippines switched to nursing from other fields of study and graduated at higher rates than they would have otherwise, resulting in an overall gain in post-secondary educated labor in the Philippines.

Additionally, supply of nurse education or skilling programs also expanded to accommodate the increased demand for education. This increase in supply, however, was concentrated in existing private institutions which opened up new nursing programs, rather than the opening of new nursing institutions. This ability of the supply of existing schooling institutions to respond to the increased demand for healthcare skills is key to the success of such an intervention. Thus, evidence suggests that healthcare jobs arising out of migration opportunities did not reduce the stock of nurses in the origin country – it actually increased the supply of health care workers and total human capital stock of college-educated labor in the Philippines.

⁷² Health, Nutrition and Population, The World Bank Group. (2021). Europe and Central Asia: Health Workforce Mobility from Croatia, Serbia and North Macedonia to Germany. February 12, 2021. Available at: <https://documents1.worldbank.org/curated/en/489881614056529442/pdf/Main-Report.pdf>

⁷³ Theoharides, C. B., Abarcar, P. (2021). Brain gain: Providing healthcare workers with opportunities to migrate can increase education and supply of medical workers in origin countries. World Bank Blogs. December 16, 2021. Available at: <https://blogs.worldbank.org/peoplemove/brain-gain-providing-healthcare-workers-opportunities-migrate-can-increase-education-and>

⁷⁴ Theoharides, C. B., Abarcar, P. (2021). Brain gain: Providing healthcare workers with opportunities to migrate can increase education and supply of medical workers in origin countries. World Bank Blogs. December 16, 2021. Available at: <https://blogs.worldbank.org/peoplemove/brain-gain-providing-healthcare-workers-opportunities-migrate-can-increase-education-and>

4. Reskilling and upskilling health care workers with new, industry-relevant skills

There is a critical need to focus on creating career pathways and expanding paid employment opportunities for a more diverse and gender equitable workforce in the public and private health sectors. This can be enabled through education and skill development institutions, networks and linkages with industry opportunities. Re-skilling and upskilling certification programs should be added as programmatic components to education/training interventions as per changing, more digitized market demands and to meet local population health needs (Box 11).

Box 11: Public-private partnerships to boost health competencies for new jobs in Saudi Arabia⁷⁵

Government-funded large-scale skill training of health workers in Saudi Arabia: [Saudi Arabia's Ministry of Health \(MoH\)](#) partnered with General Electric to boost healthcare sector competencies for emerging jobs. Through training, technology advancement and knowledge-sharing in line with the country's Strategic Healthcare Plan, they aim to build the country's human capital capability and create new jobs. The government-funded initiative has allocated USD 93 million to the training program: to invest in healthcare infrastructure, deployed new e-health standards and trained 133,000 candidates. GE Performance Solutions has partnered with government to transform the healthcare facilities aimed at enhancing operational efficiencies, quality, patient safety, and clinical improvement.

5. Improving quality of jobs for existing health workforce

Health workforce retention can be increased by ensuring prioritized access to vaccinations, personal protective equipment (PPE); physical, mental health and well-being support including better protection and safeguards from violence and attacks on health facilities, including in conflict and humanitarian settings. Additionally, promoting fair and timely pay for all health workers through use of government welfare funds.

6. Establish employment or industry linkages through partnerships with private sector

Employers can collaborate with TVET institutions to ensure curricula and education programs are designed to meet on-the-job needs. The International Youth Foundation has developed a toolkit which includes a series of guidelines and tools to aid in identifying gaps, which may be related to assets such as interpersonal skills or professionalism⁷⁶. Youth are often unaware of career opportunities in the health sector as specified in sections 3.3 and 3.4, beyond that of doctors and traditional specialists. Establishing linkages with industry through counseling initiatives or providing exposure to industry through apprenticeships, on the job training and employment linkage programs or tools (Box 12) is essential.

⁷⁵ GE (2012). Press Release: Saudi Ministry of Health announces new initiatives focusing on training, technology advancement and knowledge-sharing to expand its healthcare infrastructure. Available at: <https://www.ge.com/news/press-releases/saudi-ministry-health-announces-new-initiatives-focusing-training-technology>

⁷⁶ Technical and Vocational Education and Training (TVET) Institutions: Best Practices and Opportunities to Increase Youth Employment in Health, USAID, Technical Brief: HRH 2030, March 2021. Available at: https://hrh2030program.org/wp-content/uploads/2021/03/TVET_Global-Brief_Final_3.17.pdf

Box 12: Digitally aggregating employment demand and supply in UAE⁷⁷

Online demand-supply aggregation for employment in UAE: [Huntr](#) is a mobile app which matches low- and middle-skilled migrant workers seeking employment as nurses and medical staff in the health sector with potential employers in the UAE. The platform's targeted approach allows data collection for the healthcare sector, supporting the development of one of UAE's priority sectors. To be objective and avoid recruitment bias, job-matching platforms use a computerized matching system. Huntr attempts to deal with recruitment preconceptions when recruiting migrant workers through computerized screening of job applications and skills.

In summary, a trained and well-equipped workforce is foundational to expanding equitable access to public health services and health care across the globe. Investments in health workers not only improve health outcomes, but they also generate jobs and economic development by strengthening human capital⁷⁸.

To address existing health workforce gaps, government, private sector, and civil society need to collaborate to form enabling public-private partnerships. This would facilitate adequate investment in health systems to enhance human health and wellbeing. Stronger partnerships for knowledge and technology transfer have the potential to build countries' resilience and combat the impact that disruptive health shocks may have on labor markets and economies. Systemically investing in building the health workforce is critical not just to develop a robust health system, but can also help create new and good jobs for the youth of developing countries, thus investing in building the future human capital (of youth), while simultaneously building human capital (through better health systems) in the developing world.

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World Health Organization. Health workforce and services: Draft global strategy on human resources for health: workforce 2030. Rep. Secr. Exec. Board EB13836 [Internet]. 2015 [cited 2015 Dec 20]; Available from: http://apps.who.int/gb/ebwha/pdf_files/EB138/B138_36-en.pdf

⁷⁷ Munoz, A., Maaskant, K., Tesema, K. M., Kee, N., How startups in developing countries use data to better connect workers with jobs. April 12, 2022. World Bank Blogs. Available at: <https://blogs.worldbank.org/jobs/how-startups-developing-countries-use-data-better-connect-workers-jobs>

⁷⁸ Fact Sheet: The Biden-Harris Administration Global Health Worker Initiative, April 7, 2022.

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Databases

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LinkedIn Economic Graph, <https://economicgraph.linkedin.com>

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S4YE is a multi-stakeholder coalition that aims to provide leadership and resources for catalytic action to increase the number of young people engaged in productive work. It is a global program housed in the Jobs Group within the Social Protection and Jobs Global Practice at the World Bank Group. It consists of a network of over 35 private partners, 44 high potential youth employment projects representing 38 developing countries and a group of enterprising global youth that provide voice on the design of S4YE's youth employment projects. S4YE's partners include the World Bank Group, Accenture, The Rockefeller Foundation, Mastercard Foundation, Microsoft, Plan International, International Youth Foundation (IYF), Youth Business International (YBI), RAND Corporation, the International Labour Organization (ILO), the Governments of Norway and Germany, and the UN Office of the Secretary-General's Envoy on Youth.

This discussion note does not necessarily reflect the views of the World Bank or each S4YE partner. For additional resources on youth employment, please visit <https://www.s4ye.org/s4ye-publications>