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Conference Draft for Review

POLICY BRIEF 52

Global Health Workforce responses to address the COVID-19 pandemic

What policies and practices to recruit, retain, reskill, and support health workers during the COVID-19 pandemic should inform future workforce development?

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This policy brief is one of a new series to meet the needs of policy-makers and health system managers. The aim is to develop key messages to support evidence-informed policy-making and the editors will continue to strengthen the series by working with authors to improve the consideration given to policy options and implementation.

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Policy briefs provide evidence for policy-makers not policy advice. They do not seek to explain or advocate a policy position but to set out clearly what is known about it. They may outline the evidence on different prospective policy options and on implementation issues, but they do not promote a particular option or act as a manual for implementation.

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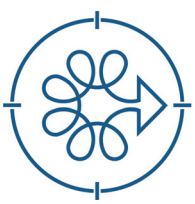

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CONFERENCE DRAFT

The European Observatory is non-normative and offers evidence and options but does not make recommendations. This policy brief, however, has been developed with WHO HQ and Regions in the context of the 5th Global Forum on Human Resources for Health. The key messages therefore go beyond the standard European Observatory approach and assert what should be done. These messages, while they are more directive than 'usual', are supported by rigorous analysis of the evidence.

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List of abbreviations

ANCC	American Nurses' Credentialing Center
BHPU	Border Health Protection Unit
CHW	community health workers
HCWs	health and care workers
HCWF	health and care workforce
HRH	human resources for health
HWF	health workforce
ICU	intensive care unit
IT	information technology
LMIC	low- and middle-income countries
LTC	long-term care
MoH	Ministry of Health
NHS	National Health Service
NHWA	National Health Workforce Accounts
PPE	personal protective equipment
PTSD	post-traumatic stress disorder
RPM	remote patient monitoring
SDG	sustainable development goals
SSL	Support and Safeguards List
UHC	universal health coverage

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Towards an evidence-informed statement of intent: key messages on workforce development

National responses to COVID-19 showed that the health and care workforce is capable of hugely positive change. The lessons generated offer powerful evidence on how best to develop a sustainable workforce to deliver on the ambitions of universal health coverage (UHC), health security and the sustainable development goals (SDGs).

If governments are to take forward the policies and practices that worked, they should know that:

1. Changing scopes of practice and introducing team-based roles is central to an effective, sustainable workforce and can be achieved.

- Health and care workers (HCWs) have proved that they are willing and able to adjust and optimize their roles and meet service needs.
- There is an opportunity to capitalize on this and adapt team-based practice across all health and care services, including the essential public health functions. Options include:
  - optimizing multidisciplinary work and expanding the skill-mix
  - configuring professional and support roles to maximize available personnel by better leveraging their respective educations, competencies and licences
  - involving patients and their caregivers in home-based prevention, care and support.
- The changes that worked during the pandemic can be sustained best when:
  - health professional bodies engage with change
  - incentives are adjusted
  - protection and support for HCW are in place.

2. The use of technology and digital tools has taken huge steps forward – and needs to continue and expand to all countries.

- Information technology (IT) and digital tools – especially for remote consultations – allowed health systems and health professionals to overcome COVID-19 challenges and maintain care continuity.
- Expanding the use of technology in the way care is provided can counteract the challenges associated with shortages, maldistribution and skills mismatch.
- Care must be taken to avoid exacerbating inequalities, particularly for the digitally excluded.
- Health outcomes need to be monitored to ensure quality is not compromised.

3. Flexible regulation is the way forward.

- Exceptional measures made changes in scope of practice and the introduction of digital tools possible during the pandemic.
- Systems need to be able to **adapt as health systems evolve** and this means:
  - reviewing the legislative framework that defines the space in which the health and care workforce (HCWF) operates
  - considering how regulation works and how quickly it can be adjusted
  - tackling licensing issues.
- The lessons of the pandemic suggest the value of flexibility in regulation and the importance of:
  - high-quality training and education that will allow the HCWF to meet new responsibilities
  - monitoring and review of change, transparency and accountability.

4. Protecting the health and care workforce is essential.

- Governments made real efforts to protect the security, safety, and physical and mental health of workers during COVID-19.
- Improved working conditions and support are obligations of employers and help to retain workers. It requires governments to:
  - provide physical security and decent working conditions
  - address diverse needs and psychosocial risk factors, and tackle stigma and discrimination
  - consider wider measures around childcare, transportation and safe accommodation.
- Getting support and protection right enhances retention of the existing workforce and will attract a new generation of HCWs.

5. Providing political leadership starts from the top and sets the agenda throughout government and society.

- Heads of state and government leadership and their focus on health made whole-of-government commitments tangible during the pandemic and delivered both resources and solutions.
- The challenges facing the HCWF are immense and demand the highest-level political commitment and engagement to:
  - secure financing
  - strengthen governance to achieve real collaboration across sectors
  - prioritize the long-term commitments the HCWF needs.
- Implementation means political investment in:
  - building HCWF capacity to deliver health and care services as well as public health measures
  - filling critical gaps in public health, and making the HCWF ready for future emergencies
  - using data monitoring and analysis to plan for the right people and the right services
  - ensuring education and training fosters the ability to adapt to future change.
- **The HCWF is central to UHC and health security**, and repays political commitment through promoting social cohesion, solidarity and security.

Executive summary

Countries can capitalize on the lessons learned and progress achieved during COVID-19 to strengthen the health and care workforce

Health and care services are labour intensive, and the health and care workforce (HCWF) is essential to their effective delivery and to achieving universal health coverage (UHC), health security and the sustainable development goals (SDGs). The COVID-19 pandemic highlighted and exacerbated longstanding HCWF challenges that pose ongoing threats to health systems worldwide, such as shortages, maldistribution in rural and other underserved areas, and insufficient skill-mix. Yet, it also brought the HCWF to the forefront of the policy agenda and sparked rapid innovation and policy adoption, showing that changes to and improvement upon the status quo are possible.

Increased demand for services during the COVID-19 pandemic spurred the implementation or enhanced use of numerous measures to strengthen HCWF capacity. Strategies and supportive policy measures for HCWF pandemic response focused on three areas: surging the supply and availability of health and care workers (HCWs); optimizing their use; and enhancing HCW support and protection. Some initiatives were only short-term strategies, but others have potential to be continued. Learning from these experiences and progress achieved can help countries to strengthen the HCWF, health systems, and the health and well-being of all, now and in the future.

COVID-19 demonstrated that changes to scope of practice and the introduction of team-based roles are possible and central to an effective, sustainable workforce

Many countries redeployed, reskilled or enabled HCWs to take on new roles during COVID-19, to meet new needs and maintain health care services. HCWs proved that they were willing and able to adjust and optimize their roles to meet service needs effectively. The health system must capitalize on these changes and adopt team-based practice across all health and care services and functions. This enhancement will allow for more efficient health service delivery for patients. Implementation options include the optimization of multidisciplinary and team-based work, expanding professional support roles to broaden the skill-mix, and increasing the involvement of patients and their caregivers in home-based prevention, care and support. During the pandemic, the adoption or expanded use of some of these changes were only possible as they had agreement from health sector actors – such as professional bodies – that may have resisted their implementation in the past. Building on these innovations can only be sustained if all stakeholders continue to engage with change. High-quality education and training will also be needed to allow the HCWF to meet new responsibilities.

The use of technology and digital tools expanded during COVID-19 and can be built on to enhance access, as well as efficiency and productivity of care delivery

Information technology (IT) and digital tools, particularly those used to promote remote consultations, allowed health systems and health professional education to overcome COVID-19 challenges and maintain care continuity. They hold enormous potential to improve the efficiency and delivery of health care and patient outcomes, while simultaneously reducing workloads and supporting and protecting the HCWF. To facilitate their continued use, countries need to continue to create an enabling environment for their use, including by ensuring the development of strategies, regulation and investing in infrastructure. Efforts will also be needed to develop digital health competencies among HCWs. However, attention must be given to ensure that quality is not compromised and that inequities in access to care are not enhanced.

The pandemic highlighted how important protection, support and tailored gender-responsive measures are in maintaining HCWF capacity

Governments implemented a range of protective and supportive measures to maintain HCWF capacity, making considerable efforts to protect the security, safety, and physical and mental health of HCWs during COVID-19. Physical safety protections – such as provision of personal protective equipment (PPE) and violence protection measures – were key in reducing infection and death, as well as abuse and harm of the HCWF. Mental health and well-being measures like helplines, counselling and peer support, were rapidly developed with the aim of sustaining HCWF capacity during the pandemic, as were support measures beyond the health sector, including financial support, transportation and safe accommodation.

These measures have long-term applications to protect and support HCWs and reduce attrition. For example, multi-pronged efforts are needed that address the organizational and systems-level drivers of poor mental health and burnout, including identifying barriers to accessing mental health support and awareness raising for all staff; and reducing risk factors, such as by reductions in workload and schedule changes, or improvements to communications and teamwork. Moreover, improved working conditions and support are obligations of employers and, together with fair pay, are good practice in order to retain workers.

COVID-19 highlighted that the successful design of support and protection measures, and their implementation, hinge upon an understanding of the specific needs of the populations for whom they are intended. In particular, support measures should be gender-responsive. While women make up the majority of the HCWF globally, they experience pay inequalities and are under-represented in leadership roles. They were also disproportionately negatively affected by the pandemic – especially in terms of experiencing burnout and mental health conditions – and have experienced large declines in labour force participation globally. Addressing gender-based inequalities will be crucial in helping to retain and attract HCWs going forward.

The flexibility of regulatory, financial, quality and technical measures was critical in enabling the implementation of HCWF strategies and is the way forward

Legislation, regulations and licensing were all adapted and often relaxed to facilitate changes such as increasing workloads to surge capacity among the existing workforce; implementing skill-mix changes by modifying scopes of practice; and utilizing digital technologies. Systems need to be able to make such adaptations and evolve to support HCWF reforms. This implies reviewing the legislative

framework in which the HCWF operates to ensure regulatory flexibility so the HCWF can adapt quickly to their dynamic surroundings. It also means that licensing and credentialing must become more flexible overall.

All these measures show the value of responsiveness. They also highlight how important it is to have an emergency response plan that covers surge capacity strategies for the HCWF, and sufficient staff, resources and governance structures in place to implement the plan. The pressures the HCWF faced also uncovered more structural challenges which need to be addressed urgently. These include governance for HCW safety and wellbeing; an education and training system to enable an agile response to changing needs; and effective data monitoring and analysis capacities to support planning and service delivery. All these need to be strengthened and resourced. The crisis also highlighted the importance of effective governance structures and mechanisms to coordinate. Governance that could link the health and education sectors, for example, was critical, as was the ability to put in place flexible and adequate health financing. There is a need to strengthen capacity and coordination, and the governance mechanisms that ensure both.

Effective political leadership starts from the top and sets the agenda throughout government and society

Strong leadership during the pandemic showed that a whole-of-government approach is possible, fruitful and should be continued. The challenges facing the HCWF are immense and demand the highest level of political commitment and engagement to secure financing, strengthen governance and prioritize long-term commitments for HCWF capacity and needs in the future. This implies that political leadership must direct resources and solutions to building HCWF capacity, filling gaps in public health to prepare for future emergencies, ensuring that education and training is adaptable to future needs, and using data and monitoring effectively to ensure proper HCWF planning.

As countries transition from crisis management to recovery, heads of state and government must make tangible commitments to strengthen and support the HCWF in the long term. This will ensure that health systems are better prepared in the face of future shocks and restart progress towards achieving UHC, health security and SDGs after the setbacks of the pandemic. The HCWF is central to the achievement of health goals and will repay political commitment by strengthening social cohesion, solidarity and security.

POLICY BRIEF

1. Introduction

COVID-19 put unprecedented strain on the health and care workforce but revealed many innovative solutions that can be built upon to overcome workforce challenges and meet SDGs

COVID-19 placed incredible strain on health care systems and the global HCWF. The pandemic rapidly increased demand for health and care services and created an acute need for HCWF in many areas of care (Iserson, 2020; DeSalvo et al., 2021). As demand was rising, health and care workers (HCWs) faced considerable uncertainty and risks presented by a novel pathogen and insufficient PPE, as well as competing domestic duties such as childcare, resulting in their absenteeism and attrition, and further limiting the capacity of health systems to respond (WHO, 2020a; DeSalvo et al., 2021; Kuhlmann et al., 2021). Countries reported disruptions across many areas of care, including primary care, rehabilitative, palliative, long-term care (LTC), dental care, and reproductive and maternal health care (Choi et al., 2021; WHO, 2021c; Strasser et al., 2022). While some of these disruptions were the result of strategic modifications to service delivery, many others have been attributed to HCWF challenges such as shortages, maldistribution, skill-mix imbalance and poor working conditions, especially in the later phases of the pandemic (WHO, 2021c). Many low-income and smaller countries were particularly vulnerable due to pre-existing constraints (WHO Regional Office for Europe, 2022b). The pandemic also exacerbated pre-existing shortages and disparities within high-income countries such as the United States, where HCWs left their jobs in record numbers (Oster et al., 2022), placing further strain on the remaining HCWF and health systems, especially in rural areas.

Yet, while the pandemic revealed multiple health system deficiencies across the globe, so too did it spur huge policy innovation and opportunities to stabilize and strengthen the HCWF. Countries enacted a range of strategies and supportive policy measures (and built upon their existing ones) to increase HCWF capacity for the pandemic response, focusing on three areas: (1) surging the supply and availability of HCWs; (2) optimizing their use; and (3) enhancing their support and protection. While some of these are just suited to emergencies, there were some innovative solutions and positive changes that are worthwhile exploring further as potential options to address longstanding HCWF challenges.

This policy brief reviews emergency workforce strategies implemented during the pandemic and examines their effectiveness, implementation considerations and long-term sustainability

Drawing on a scoping review of literature (Box 1), this policy brief aims to support national policy-makers and other stakeholders by identifying and assessing the effectiveness and sustainability of emergency HCWF strategies implemented during the pandemic (Section 2); identifying factors that contributed to their implementation; and discussing if and how they can be sustained in the longer term (Section 3). The final section of the brief (Section 4) summarizes the overarching lessons learned and offers conclusions.

Box 1: How was the evidence used in this policy brief compiled?

This policy brief draws on an expert-led review of the scholarly and grey literature across key English-language publications. The research question that guided the review is, *'What emergency health workforce strategies were implemented during COVID-19 to increase, optimize, and support and protect the health workforce, and what evidence exists for their effectiveness?'*.

The authors searched databases that index international peer-reviewed publications (including PubMed, PAIS, and Google Scholar), and online repositories (including the WHO Data Collections, Health Workforce Technical Assistance Center, Canadian Health Human Resources Network Library and European Observatory on Health Systems and Policies) were consulted to identify relevant grey literature reports, briefs and case studies. An example of key word search terms used on PubMed are shown in the Annex. Targeted Google searches were employed to identify grey literature reports, briefs, and initiatives being covered by the press. The review was conducted in Autumn 2022 and reflects available literature up to 1 December 2022. Literature in the English-language that contained information on implemented strategies to surge numbers, optimize skill mix, or protect and support workers were included.

Based on the literature, the evidence for the impact of strategies described in this brief was compiled and synthesized for each of the three areas examined: surging HCWF supply; optimizing the HCWF; and protecting and supporting the HCWF. This framework for analysing evidence on surge strategies is based on that included in other literature including Williams et al., 2020a and Williams et al., 2020b). When used in this brief, the term 'impact' is defined as: *'an effect or consequence relevant to the health system caused directly or indirectly by the health workforce strategies assessed',* based on a definition provided by the European Observatory on Health Systems and Policies (Wismar et al., 2011).

Two types of evidence are presented:

1. When possible, this policy brief provides direct evidence for the effectiveness of emergency workforce strategies as they were implemented during COVID-19. However, as the COVID-19 pandemic is still ongoing and very little time has elapsed to examine the outcomes of these strategies, this type of evidence is often unavailable.
2. To address the evidence limitations described in point 1, evidence for the effectiveness of emergency HCWF strategies included in this brief is often based on what is known from their use prior to the pandemic (e.g., during past public health emergencies or periods of HCWF strain).

The authors attempt to clarify which type of evidence is being used throughout this brief.

An additional limitation of the literature is that the majority originates from high- and middle-income countries, with few sources originating from low-income countries. Further, given the wide heterogeneity across countries in population and workforce demographics, governance models, policies and other regional factors, findings may not always be generalizable across – or even within – countries, and should be interpreted with consideration for the regional context.

Evidence from the literature was complemented by case studies compiled from different WHO regions, each providing key examples of strategies to surge and/or protect and support health and care workers. Case studies were selected through a consultation process with WHO experts in each WHO Region, who recommended best-practice case studies to highlight themes covered in the brief.

2. What strategies did countries adopt during the pandemic to surge, optimize, and protect and support their health and care workers, to what effect, and what have we learned from this?

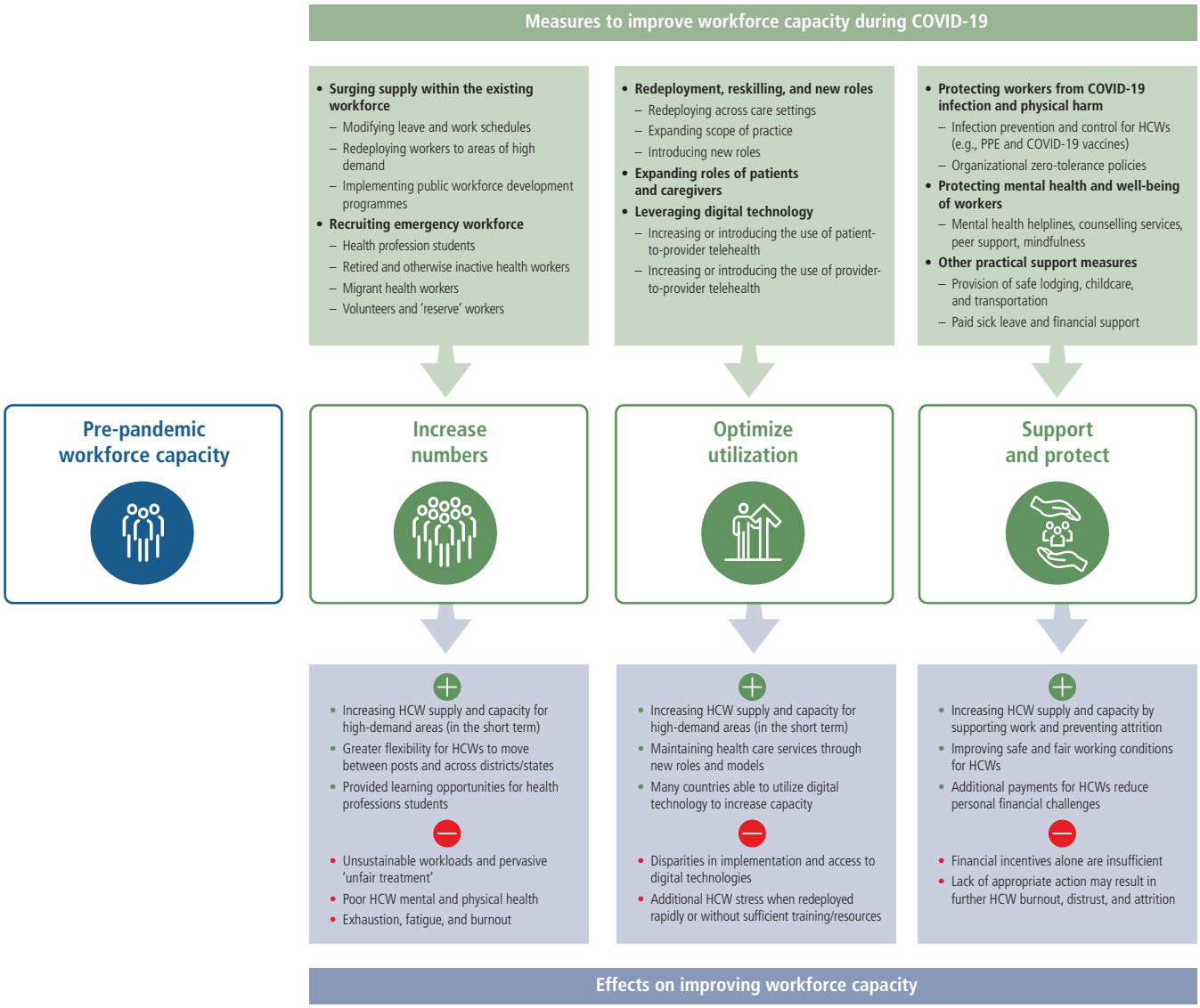
COVID-19 placed significant demands on health and care systems, which necessitated large increases in HCWF capacity. In response, countries around the globe employed strategies to quickly bolster the capacity of the HCWF. These strategies predominantly fell into three broad categories: (1) surging supply of HCWs; (2) optimizing the use of the workforce in terms of setting, skills and roles; and (3) providing worker support and protection. Many countries took a multifaceted approach to address HCWF needs by employing strategies across each of these three categories, such as in the case of Oman (Box 2). Figure 1 summarizes these broad strategies and how various countries implemented them during the pandemic.

2.1. Surging supply of HCWs

Prior to COVID-19, countries were already facing difficulties related to HCWF supply and distribution; the pandemic exacerbated these

Low numbers and unequal distribution of HCWs were challenging countries long before the pandemic (Box 3). Worker shortages, driven by both supply and demand factors, have contributed to workforce insufficiencies in professions central to the promotion of population health, including primary care, nursing and LTC. Relatedly, HCWs are often maldistributed both within and across countries, creating inequities where rural areas and low-income countries historically experience lower supplies of HCWs, and thus limited access to health care. These challenges have been exacerbated by the COVID-19 pandemic and are likely to intensify.

Figure 1: Many strategies implemented during COVID-19 have the potential to alleviate workforce challenges in the long term too, but some are unsustainable



Box 2: Oman implemented a multifaceted approach to strengthen its HCWF during the COVID-19 pandemic

Oman's holistic strategy to boost its HCWF during the pandemic included expedited recruitment of foreign-trained HCWs, mobilization of domestic HCWs, and addressing their skill-mix and competencies

For Oman, a country with a population of around 4.6 million, the COVID-19 pandemic profoundly impacted health care delivery and demonstrated the need for a sufficiently sized, mixed and competent health workforce (HWF), as well as resilient policies and strategies. In its response to COVID-19, Oman's Ministry of Health (MoH) demonstrated how investment in human resources for health (HRH) can help to address systemic challenges, tackle disease burden, and sustain UHC through providing quality health care services.

Aiming to expand its workforce capacity and develop new pathways for patients to access services, Oman's MoH implemented several new policies, strategies and regulatory changes. It was able to expedite recruitment processes and accelerate HCW deployment, including 427 non-Omani doctors from 22 countries between January 2020 and May 2021.

To cope with HRH unavailability, the MoH mobilized HCWs from all levels of care and called upon retired staff to rejoin the service. In addition to establishing a 100-bed field hospital in the Muscat governorate, the MoH also implemented a robust monitoring system to anticipate HRH absenteeism and rearrange working hours and duties.

The MoH took a more holistic approach to address the skill-mix and competencies of its HWF, putting in place robust monitoring mechanisms to ensure more inclusive, high-quality care. It also developed a set of competencies for educating and retraining HCWs and made training on COVID-19 management mandatory for all its staff, even providing accelerated training for overloaded workers.

Attention was paid to ensuring physical, mental and occupational safety and well-being of all deployed HRH, particularly frontline workers

Another key priority was to ensure the physical, mental and occupational safety and well-being of all deployed HRH, particularly frontline workers. By providing adequate hygiene and PPE, and offering priority vaccination, counselling services and innovative incentive mechanisms, Oman was able to retain its HWF and safeguard them against fatigue, burnout, psychosocial stress and physical illness. Moreover, by investing in innovative applications and supporting the use of e-health in service delivery, Oman decreased direct contact with caretakers while simultaneously improving patient access and outcomes.

Ultimately, Oman effectively mobilized its HWF during COVID-19 and provided necessary care to its citizens through: rapidly recruiting and deploying HRH; providing additional resources and support to build HCW capacity; prioritizing HRH safety and well-being; and implementing new technologies. While the true impacts of the pandemic on its HCWF remain unknown, the policy, strategy and regulatory changes implemented by Oman's MoH are likely to have longer-lasting effects on its health system, making it more resilient to future shocks.

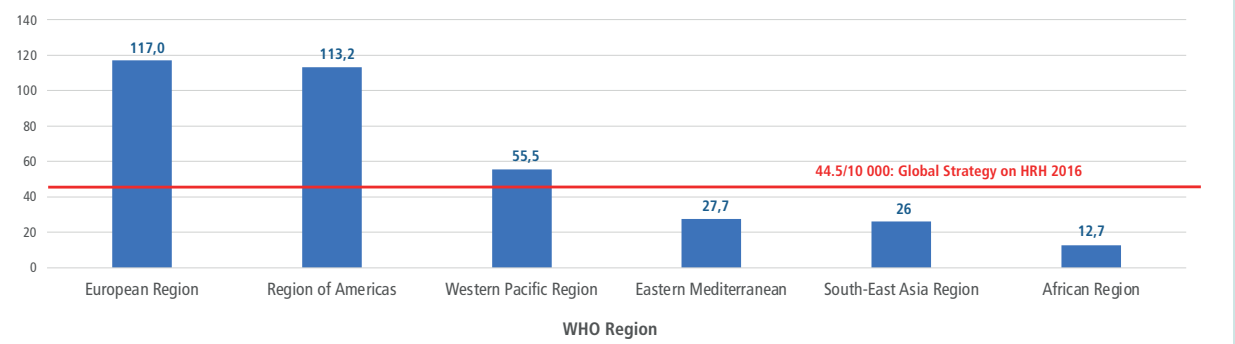
Box 3: Shortages, maldistribution and skill-mix imbalances are among the key workforce challenges we face today

The WHO estimates a projected shortfall of 10 million health workers by 2030 based on pre-COVID-19 data, with middle to low-income countries in Africa, the Eastern Mediterranean and Middle East most severely affected (WHO, 2020a). However, even in higher-income countries, HCW supply was a critical concern prior to COVID-19. In addition, many countries lacked sufficient skill-mix in areas especially needed for the pandemic, such as intensive care unit (ICU) physicians and nurses, and public health workers.

HCWs are also maldistributed across and within countries, and increases in overall numbers of HCWs in some regions do not equate with equitable distribution (WHO, 2021b; WHO Regional Office for Europe, 2022a). Across WHO regions, significant disparities in HCW availability favour high-income countries (Figure 2) (WHO Regional Office for South-East Asia, 2019; WHO, 2021d) and these are exacerbated by the outmigration of workers when higher-income countries turn to international recruitment to address their own HCWF shortages (OECD, 2020a; Buchan, Catton & Shaffer, 2022).

Geographic maldistribution also exists within countries where the infrastructure of HCWs and health systems is mostly concentrated in urban areas (WHO, 2021e; Strasser, Dewhurst & Westergaard, 2022). Increased demand for HCWs in these areas further increases the pull effect on the rural HCWF (Luo, Chong & Chen, 2020).

Figure 2: Workforce supply is a particularly critical concern in the African, South-East Asian and Eastern Mediterranean WHO regions



Density of doctors, nurses and midwives across six WHO regions (doctors, nurses and midwives per 10 000 population)

Source: Figure 6 in WHO Regional Office for South-East Asia (2019).

Notes: The authors of this figure took data from the National Health Workforce Accounts (NHWA) 2020 – latest available data based on 190 data points for medical doctors and 192 for nursing and midwifery; the reference line reflects the WHO's threshold for the density of doctors, nurses and midwives needed to meet the health services SDG (WHO, 2016b).

2.1.1. Surging supply within the existing HCWF

Countries implemented a range of strategies to maximize existing HCWF capacities during the pandemic. This included modifying HCWs' schedules, facilitating their mobility to high-need areas, and public investments in HCWF development programmes. The latter could potentially promote more equitable long-term distribution of the HCWF in rural and underserved communities. The ability to surge supply within countries' existing HCWFs was largely dependent on their HCW availability at the start of the pandemic; many faced limited scope for maneuver.

1) Modifying leave and work schedules

Existing workers were encouraged or mandated to increase their workload

Many countries modified leave and work schedules to increase the short-term workforce capacity of health care systems (Williams et al., 2020b; Buchan, Williams & Zapata, 2021; Köppen, Hartl & Maier, 2021; WHO, 2021b). Specific strategies included cancelling leave or suspending rest time, asking workers to take on additional hours or move from part- to full-time work, or mandating overtime. In **Greece**, for example, leave of absence was revoked for all public-sector staff (Williams et al., 2020b); **Canada** enacted legislation cancelling HCW vacations and modifying their work schedules (Williams et al., 2020b); and the **United States** shortened guidelines for quarantine/isolation periods in 2021, in part to mitigate HCWF shortages by allowing workers to return sooner (CDC, 2016).

2. Redeployment across geographical areas

Workers were moved to areas of high demand and public investments in HCWF development programmes helped to increase supply in rural and underserved areas

Changing epidemiological situations and differences in starting capacities meant that demand for HCWFs differed both within and across countries. In response to these challenges, countries took steps to facilitate movement of HCWs from low- to high-demand regions. The **United Kingdom**, for example, implemented digital National Health Service (NHS) staff passports to enable staff to change posts more quickly and avoid repeated training (NHS Providers, 2020); **Peru** created mobile brigades of health professionals to deploy to critical areas of need across the country; and in the **United States**, emergency federal and state policies allowed reimbursement for HCWs practising outside their home licensure state, waived licensing regulations for interstate practice, expedited emergency licences for out-of-state providers, and recognized out-of-state licences through reciprocity (CMS, 2020; FSMB, 2022; NCSBN, 2022).

Some countries introduced public investments in HCWF development programmes to increase the supply and distribution of the HCWF in rural and underserved communities (ASPE, 2022). For example, the **United States** increased public funding for the National Health Service Corps, which provides scholarship or loan repayment as a financial incentive for practice in an underserved setting, and for the Teaching Health Center Graduate Medical Education programme, which funds primary care physician residency and nurse training programmes in underserved areas. (ASPE, 2022).

What is the evidence on the impact of these measures and what have we learned from this?

Increasing the workload of the existing workforce can increase a health system's capacity in the short term, but endangers the health and well-being of workers and can put patients at risk

Encouraging or mandating additional work hours can increase a health system's capacity during times of heightened demand (Rubinson et al., 2005; Mascha et al., 2020) and HCWs have acknowledged the necessity of their extra efforts during prior disease outbreaks (Corley, Hammond & Fraser, 2010). However, these strategies are rife with challenges and are unsustainable over extended periods. A review of national nursing surveys assessing the effects of pandemic-related demands reported significant workload increases (**Australia, Egypt**), pervasive 'unfair treatment' such as forced shift changes (**Republic of Korea**), and work hours that frequently extended beyond those contracted (**United Kingdom**). These contributed to poor mental and physical health, exhaustion and fatigue, turnover intention, and potential post-traumatic stress disorder (PTSD) among HCWs (New Zealand Rural General Practice Network, 2020; Grimm, 2021; Buchan, Catton &, 2022; Poon et al., 2022). Ample evidence also demonstrates that long shifts (12+ hours), overtime work, and long work weeks (40+ hours per week) significantly increase the risks of medical errors and patient safety accidents (Rogers et al., 2004; Son, Lee & Ko, 2019; Assaye et al., 2021).

Redeploying HCWs to areas of high need may be valuable for the receiving communities, but consideration for the effects on workers and their home regions is warranted

International cooperation strategies and the easing of requirements to facilitate practice across regions increases HCW mobility to meet population health needs, including during times of heightened demand like public health emergencies. In South America, agreements with the United Nations Refugee Agency, US Agency for International Development, and Cuban Ministry of Health resulted in the recruitment of 150 and 85 health professionals in **Columbia** and **Peru**, respectively (WHO, 2021b). A survey of 10,000 HCWs in the **United States** who received temporary licences to practise in New Jersey found they originated from every state in the country, provided COVID-19 and non-COVID-19 care, conversed with patients in 36 languages, and expanded the state's respiratory therapist and nurse workforce (Nguyen et al., 2022). The mobility of nurses in the **United States** also increased when licensing laws were relaxed to facilitate worker movement across regions (Shakya, Ghosh & Norris, 2022). Scope-of-practice laws, determined at the state level in the United States, have been associated with HCWF distribution and access. For example, full scope-of-practice policies are associated with nurse practitioner movement from more to less restrictive states (Shakya, Ghosh & Norris, 2020; Markowitz & Adams, 2022), and with increased supply of nurse practitioners in rural and underserved settings (Xue et al., 2018).

Strategies to facilitate HCW mobility may be especially valuable for localized emergencies and are commonly used in response to weather-related disasters (Coates et al., 2021). However, the utility of these strategies may be diminished when there is widespread need, as was the case during the height of COVID-19 pandemic surges. Further, redeployments to areas of critical need may impact HCWs negatively. A qualitative study examining the experiences of frontline HCWs redeployed to Wuhan, **China**, during the initial COVID-19 outbreak found that they experienced emotions of shock, fear and loneliness, rooted in a lack of knowledge about the virus, unfamiliarity with the new environment, and concern for their safety. Language barriers were also cited as a barrier to care delivery (Li H, 2022). Cultural and contextual barriers and challenges around integrating with local services have also been identified as issues associated with HCW redeployments in reviews of the evidence for emergency HCWF strategies (Coates et al., 2021).

Investments made in HCWF development programmes during the pandemic are unlikely to see short-term returns. This is especially so considering that many segments of the HCWF – e.g., primary care and public health – are not possible to scale up in the short term since they require training, experience and good knowledge of local communities. They nevertheless support some of the most promising evidence-based strategies for increasing the future supply of HCWs – especially primary care clinicians – for rural and underserved communities, which will likely lead to long-term returns (Ziemann et al., 2022b).

2.1.2. Surging supply by recruiting emergency HCWs

Increasing the workload of the existing HCWF was often not enough, and additional HCWs had to be brought in

Increasing the workloads of existing HCWs or moving them around was usually not enough to cope with increased demand for services during the pandemic. Most countries also had to recruit emergency workers to ensure adequate HCWF capacity. Specific strategies included: recruiting students; bringing back retired or otherwise inactive workers; hiring foreign-trained workers that were in the country but not yet working in the health sector; using workers from other government sectors (e.g. military) and those from the private sector. While many of these strategies were successful at increasing HCWF supply in the short term, each had drawbacks which may impact their long-term usefulness.

1) Health professions students

Many countries put in place procedures to allow medical and nursing students to enter clinical practice early, serve as health care support extenders, or provide other assistance

Health professions students have often been recruited to augment the existing HCWF during emergencies, and this is a recommended strategy in emergency preparedness plans (Stachteas, Vlachopoulos & Smyrnakis, 2021). During COVID-19, health professions students were generally used to increase HCWF supply in two ways: 1) by entering clinical practice early; and 2) by serving as health care support extenders by addressing the social and other non-clinical needs of HCWs, patients and community members (Iserson, 2020; Williams et al., 2020b; Stachteas, Vlachopoulos & Smyrnakis, 2021).

In the **United States**, **Canada** and many countries in **Europe**, medical and nursing students nearing graduation were allowed to graduate early to join the workforce and relieve pressure on existing frontline clinicians (Iserson, 2020; Williams et al., 2020b). In the **United Kingdom**, 24,000 final-year student nurses and doctors were recruited to work in the NHS (BBC News, 2020). Several countries in South America, including **Bolivia**, **Colombia**, **Ecuador** and **Peru**, also took steps to expedite the entry of qualified health professions students or recent graduates into the HCWF (WHO, 2021b). In **Peru**, for example, degree procedures for medical students were temporarily removed to facilitate their entry into the workplace, while residency requirements in some specialties were ended early (WHO, 2021b).

Strategies to leverage students as health care extenders to increase health system capacity outside of providing clinical care were also employed in many countries, for example, by assisting with contact tracing and COVID-19 hotlines, supplying food and PPE, educating the community, and by enhancing existing workforce capacity through provision of services for frontline clinicians (Iserson, 2020; Stachteas, Vlachopoulos & Smyrnakis, 2021; Umar et al., 2022).

2) Retired and otherwise inactive health workers

Retired and otherwise inactive workers were sometimes brought back into the workforce

Campaigns calling for inactive or retired health professionals to rejoin the workforce were launched throughout all WHO regions (Iserson, 2020; Williams et al., 2020b; WHO, 2021b; WHO Regional Office for Africa, 2021). Early in the pandemic, the Governor of hard-hit Lombardy, **Italy**, appealed to all HCWs who had retired in the past two years to rejoin the HCWF (Balma & Pollina, 2020). In **Chile**, allowing retired and inactive health professionals to return to duty resulted in 1,500 HCWs re-entering the medical field (WHO, 2021b).

3) Foreign-trained health workers

Countries facilitated employment of foreign-trained professionals

Prior to COVID, many countries relied heavily on foreign-trained HCWs with the share of foreign-trained doctors around 40% in Norway, Ireland and New Zealand, and the share of foreign-trained nurses up to 20–25% in Australia, Switzerland and New Zealand (OECD, 2020a). When COVID-19 emerged, some countries modified immigration policies to fast-track the licensing and recruitment of foreign-trained health professionals already in the country but not working (Williams et al., 2020b; Buchan, Williams & Zapata, 2021; WHO, 2021b). **Ireland** allowed for the hiring

of refugees and asylum-seekers with medical qualifications to serve in support roles (Williams et al., 2020b). **Columbia** waived registration fees, provided temporary licences, and expedited the recognition of foreign licences (WHO, 2021b). Some countries have also seen or are taking steps to increase international recruitment. In the **United Kingdom**, international nurse registrants reached a two-decade high in 2021/22. In **Australia**, the cost of flights, relocation fees, and quarantine costs for foreign nurses were covered (Buchan, Catton & Shaffer, 2022). In **Canada**, the Manitoba province announced in November 2022 that it will offer up to $23,000 to international nurses to practise in Manitoba (Province of Manitoba, 2021). As of the end of its 2022 legislative session, the **United States** Congress was considering legislation to expand the country's J-1 visa waiver programme, which facilitates immigration of foreign-trained physicians in exchange for practice in underserved settings (Library of Congress, 2021–2022).

4) Volunteers and 'reserve' workers

Volunteers and 'reserve' workers have been used in clinical and non-clinical – including public health – roles

As they have in previous disasters and public health emergencies (Coates et al., 2021), countries also used potential and existing pools of volunteer and 'reserve' workers with and without formal health care experience to increase HCWF capacity during COVID-19 (Iserson, 2020; Williams et al., 2020b). For example, **France**'s health reserve swelled from 3,800 to 22,800 registrants by March 2020 (OECD & European Observatory on Health Systems and Policies, 2021b). **Sweden** reported registering more than 5,000 volunteers in a matter of weeks after appealing to the public for assistance (OECD & European Observatory on Health Systems and Policies, 2021f).

Other 'reserves' called upon by countries for pandemic response included using pools of health workers employed in the national military (e.g., **Spain**, **Germany**) in support and logistic roles, and the Red Cross (e.g., **Belgium**) (Iserson, 2020; Williams et al., 2020b; Köppen, Hartl & Maier, 2021; OECD & European Observatory on Health Systems and Policies, 2021e). In **Hungary**, the recruitment of hundreds of volunteers and deployment of soldiers to hospitals contributed to the country increasing the total number of intensive care beds by 44% over one year (OECD & European Observatory on Health Systems and Policies, 2021c).

Volunteers and 'reserve' workers were used for a range of roles. In the **Maldives**, for example, volunteers were mobilized for case investigation, contact tracing and psychosocial support teams (Usman, Moosa & Abdullah, 2021). In **Cyprus**, volunteers assisted with appointment scheduling for PCR testing at public health centres (OECD & European Observatory on Health Systems and Policies, 2021a). Reservists, such as those in the **United States**' Medical Reserve Corps, were also used in a variety of clinical and non-clinical support roles (Doran, Hess & Andersen, 2022).

The pandemic has provided a window to expand intersectoral collaboration and create new health workforce roles. One example is the establishment of a Border Health Protection Unit (BHPU) in Fiji, which is now in the process of being embedded in policy and practice (Box 4).

Box 4: New health workforce roles were established through intersectoral collaboration, such as the Border Health Protection Unit in Fiji

Fiji's existing Quarantine Act was leveraged to redeploy doctors and nurses to marine and air Border Health Protection Units (BHPUs)

Before the pandemic, Fiji's Quarantine Act was enforced by the Border Protection Force, including some health-related tasks (e.g. vector surveillance), but without formal health sector involvement. Threatened by COVID-19, the health sector was called upon to collaborate in establishing health teams at the crucial points of entry – marine and air.

These initially required heavy staffing. Doctors and nurses were redeployed from clinical roles; defence personnel fulfilled enforcement and data roles; and health professionals provided health data management training. Shared financing agreements were developed, whereby Defence continued to pay their employees' salaries while the health sector paid Defence staff for overtime, meals and transport. The National Employment Centre provided a further pool of recruits, seeking candidates who listed IT or health care in their skillsets.

These new teams worked effectively as the pandemic peaked, refining processes over time. Clinical roles were more central when arrivals were required to quarantine, but with the pandemic subsiding, teams have reduced in size, maintaining a risk mitigation role.

There is high-level agreement that BHPUs are beneficial beyond the COVID-19 pandemic

The Border Management Committee and Permanent Health Secretary agree that the BHPU is beneficial to border protection and the health system in Fiji, extending beyond COVID-19. The BHPU, once established and functional, can monitor and respond to other health threats at the borders. To this end, intersectoral submissions have been put to the Cabinet asking for BHPU's establishment and these are awaiting approval.

The BHPU will need to be maintained by redeployed staff this coming year, with intersectoral discussions underway for the retention of upskilled data personnel and funding mechanisms through the current fiscal year. A budget request will be prepared for 2023/24. In parallel, work is underway to develop operational frameworks and protocols for escalating and de-escalating the BHPU according to emerging needs.

5) Use of private-sector workers

Some countries also relied on the private sector to address HCWF needs. In the United States, hospitals' employment of private contract nurses surged (Box 5). In England (United Kingdom), an agreement was brokered for the government to take over private hospitals and their staff during two waves of infection, resulting in tens of thousands of clinical staff moving to the public sector.

Box 5: The use of private contract nurses was widespread in the United States during COVID-19 – but it was very costly

Private nurses were used in hospitals for short term-assignments in different locations

In the United States, the use of contract nurses to augment staff nurses was ubiquitous across hospitals in response to COVID-19 (ASPE, 2022). Often referred to as 'travel nurses' for their ability to take short-term staff assignments in different locations, these nurses are typically employed by independent staffing agencies. Travel nurses can provide a valuable addition to health care teams during times of increased demand or staffing shortages, and they can bring specialized skills to rural and medically underserved areas. Although their use to mitigate temporary nurse staffing shortages preceded the COVID-19 pandemic, the proliferation of contracted nurse staffing in response to the pandemic was dramatic, with reports of up to 95% of health care facilities in the US hiring nurses from contract agencies (ASPE, 2022). Across American hospitals, the use of travel nurses increased 35% in 2020 compared to 2019 (ASPE, 2022).

The use of private nurses had a neutral effect on patient outcomes – but it was very costly and put much financial strains on the hospitals

Studies find neutral effects of the use of contracted travel nurses on patient outcomes, with neither positive nor negative impact (Xue et al., 2012; Faller, Dent & Gogek, 2017), although there are anecdotal reports attributing rises in hospital-acquired infections to hiring ill-trained contract staff during the pandemic (Grimm, 2021). However, COVID-19 demonstrated the importance of considering the consequences of travel nurse staffing beyond patient care delivery. Travel nurses made significantly more money than staff nurses during the pandemic – wages rose 25% in the early months of the pandemic and were reported as being as high as US$ 5–20,000 per week (ASPE, 2022), causing some staff nurses to leave their jobs for travel nurse positions (Bernstein, 2021). Contract staffing agencies' margins increased from 15 to 62% (AHA, 2022), prompting allegations of price gouging and contract agencies' exploitation of the health care crisis (Yang & Mason, 2022). The costs associated with employing travel nurses resulted in a tremendous financial strain on hospitals in the United States, accounting for 50% of nurse labour expenses and preventing hospitals from investing these costs into their existing workforces (AHA, 2022). The situation was exacerbated for small and rural hospitals, which were unable to compete against better resourced hospitals for nursing staff (ASPE, 2022). The use of travel nurses also contributed to the erosion of morale amongst existing staff, leading to increased turnover and staffing shortages – the exact challenges hospitals were attempting to address (AHA, 2022; ASPE, 2022).

What is the evidence on the impact of measures to surge supply of HCWs and what have we learned from this?

There is little evidence of the wider effects of the targeted recruitment efforts implemented during COVID-19

The limited evidence available suggests that the strategies countries employed to quickly increase the supply of clinical and non-clinical HCWs through the targeted recruitment efforts described were effective, based on short-term process measures of outcomes such as the number of volunteers registered (WHO, 2022b). However, there is a dearth of evaluative data on the strategies, and their effects on broader health system outcomes, a deficiency that has been noted elsewhere (Coates et al., 2021; Gupta et al., 2021). Scarcer still is any evidence for the effects of these strategies on specific demographic sub-groups, such as women, who make up the vast majority of the HCWF in many countries across the world. Understanding around the effect of recruiting any single group (e.g., students, retired health workers or volunteers) is also difficult as most countries recruited multiple groups as part of a larger national surge capacity strategy.

Using students provided valuable opportunities for training but the associated supervisory requirements may have put strain on the already overburdened staff

Much of the literature examining the effects of recruiting health professions students in response to emergencies focuses on students' perceptions of their experiences. Students reported multiple advantages to volunteering in public health emergencies, including real-world learning and practice opportunities, collaboration with other types of HCWs, strengthened communication skills and empathy, and increased comfort managing COVID-19 patients, donning and doffing PPE, and completing transitions of care functions (Pravder et al., 2021; Umar et al., 2022). Those who graduated medical school early to work in hospitals during the first wave of the pandemic believed their experience would be helpful in their future residency training and practice (Pravder et al., 2021). Evidence also suggests lower prevalence of anxiety and depression among student volunteers compared to non-volunteers (Umar et al., 2022), and that students were safely enlisted in pandemic response efforts without contracting COVID-19 (Pravder et al., 2021).

However, the evidence suggests that some health professions students were also deterred from joining the pandemic response due to perceived threats of infection or harm, scarcity of PPE, uncertainty about academic demands, uncertainty about possessing sufficient qualifications, and perceptions that they were not needed in the response effort (Umar et al., 2022). While concerns have been raised that COVID-19 may diminish interest in the health professions, early application and enrolment data from nursing and medical schools in the United States suggest the opposite (AACN, 2021; Mitchell & Gooch, 2021). Experts have posited that the application surge is partly due to increased motivation to join the pandemic response and alleviate social injustices (National Academy of Medicine, 2022).

Despite the valuable contributions of health professions students, their supervision also requires consideration when determining their involvement and roles, especially in already overburdened regions where frontline staff are limited (Stachteas, Vlachopoulos & Smyrnakis, 2021).

Recruitment of retired health professionals has raised concerns about the associated risks to their health

There are some concerns around the recruitment of inactive health professionals – particularly retirees – as they are likely to be older and have risk factors that make them more susceptible to severe illnesses like COVID-19 (Iserson, 2020). HCWs over the age of 50 experienced significantly more COVID-19 deaths, compared to matched controls (Lin et al.,

2022). In one study examining COVID-19 deaths among physicians, the average age was 63.7 years (Ing, et al., 2020). Additionally, recruiting retired clinicians may endanger their spouses, who are also likely to be older. To alleviate the risk of infection, retirees may be considered for low-risk settings, especially where they can make use of remote consultations (Sabath & Colt, 2020).

Some private-sector attempts to surge HCWF supply have had negative outcomes

While the private sector strengthened the capacity of health systems during the COVID-19 response, cautionary tales also emerged. The **United States**' experience with private contract nurses is detailed in Box 5. Private-sector partnerships in **Nigeria**, **Senegal**, the **Democratic Republic of Congo** and **Uganda** supported testing, procurement and distribution of PPE for HCWs, plus COVID-19 treatment and management, among other activities. However, concerns arose around regulatory compliance, high service fees, poor surveillance and reporting, and a general lack of guidance on private-sector engagement in times of emergency (Kabwama, 2022). In the **United Kingdom**, the operation of a private call centre to support contract tracing was criticized for inadequate training of call handlers, accidental sharing of private contact information, and inappropriate follow-up with positive COVID-19 cases (BMA, 2020).

Recruitment of foreign-trained workers raises many concerns, and this may increase due to workforce pressures

Policies to fast-track the recruitment of foreign-trained HCWs during the pandemic have facilitated marked increases in entrants over short periods of time in some high-income countries, especially among nurses. Using foreign-trained workers can bring positive effects for increasing diversity (as discussed in the companion policy brief of this series '*What steps can improve and promote investment in the health and care workforce?*' by McPake et al., 2023), but there are also ethical considerations around the effects on these HCWs and their origin countries. Many of these foreign-trained workers originate from low- and middle-income countries (LMIC) such as India, Nigeria and the Philippines (Shaffer et al., 2022). Expert bodies caution that while the international recruitment of HCWs may seem to be a 'quick fix' to HCWF shortages, it is neither an equitable nor efficient solution (OECD, 2020a; Shaffer et al., 2022). It does not address structural factors that affect the supply and demand for HCWs, and it threatens HCWF sustainability in origination countries with existing health system weaknesses.

In 2010, the WHO Member States adopted the WHO Global Code of Practice on the International Recruitment of Health Personnel (WHO, 2010) and in 2020 the Health Workforce Support and Safeguards List (SSL) was published by the WHO, comprising 47 countries that faced the most pressing health workforce challenges related to UHC (WHO, 2020b). In January 2023, eight more countries were added to the SSL, increasing the number of countries that need additional protection against active international recruitment to 55.

Yet, there are early signs that international recruitment is growing and efforts are needed to tackle both the push (such as poor working conditions and low pay) and pull (better pay and career development) factors of migration in countries of origin and destination (see the companion policy brief *'What steps can improve and promote investment in the health and care workforce?'* in this series by McPake et al., 2023).

While volunteers can play a key role to support HCWF capacity under emergency settings, it is difficult to predict and plan for their willingness to respond under different circumstances

Evidence from the broader literature suggests that volunteer response during emergencies is influenced by many factors, and pre-registration may not be very predictive. Prior examinations find that the type of emergency, perceived severity of emergency, and perceived threat to the volunteer or volunteer's loved ones are factors that influence volunteer willingness to respond (Devnani, 2012; Errett et al., 2013; Santinha, Forte & Gomes, 2022). Self-efficacy (the perceived ability to perform one's duties), has also been identified as a leading predictor of willingness to respond to emergencies, and efforts to increase it may enhance volunteer response capacity (Errett et al., 2013). However, there is limited evidence on the use of volunteers on patient outcomes.

2.2. What strategies have been adopted to optimize the health and care workforce?

COVID-19 opened a window of opportunity for embracing changes in skills and roles in many countries

The COVID-19 pandemic acutely increased health care demands in areas such as intensive care and public health, while simultaneously limiting health care delivery in other areas to reduce public health risks and reserve capacity to meet acute demands. As a result, HCWs and systems had to flex to reflect evolving knowledge on COVID-19 and optimize the existing HCWF and resources to meet changing demands.

2.2.1. Redeployment, reskilling and new roles

HCWs were redeployed from settings where non-essential services were limited, performing new tasks or roles

Sharp increases in intensive care and hospital demands during the multiple waves of COVID-19 required health systems to flex their workforces. One strategy was to redeploy HCWs from hospital units or health care settings where 'non-essential' services were limited. In these cases, role delegation occurred to maximize the use of redeployed staff, while existing HCWs (e.g., respiratory technicians and others) often took on new roles. Similar redeployment, reskilling and new roles were seen in outpatient and public health settings to meet new needs and maintain health care services.

For example, dental teams were redeployed for COVID-19 testing in **Singapore** (Seneviratne, Lau & Goh, 2020), and pharmacists and other health professionals were authorized

to extend prescriptions, prescribe chronic disease medications, and provide vaccines (OECD, 2021b). Meanwhile, community pharmacists were allowed to extend existing prescriptions and prescribe chronic disease medications in **France**, **Ireland**, **Portugal** and the **United States** (OECD, 2021b). Nurses played a particularly important role in redeployment, reskilling and new roles (Box 6).

Box 6: Nurses played a critical role in the health workforce during COVID-19

Nurses played a critical role in COVID-19 through redeployment, reskilling and new roles

The global nursing workforce is the largest occupational group in the health sector, with 27.9 million nurses worldwide – although these nurses are concentrated in high-income countries (WHO, 2020a). During COVID-19, nurses were indispensable at the bedside, and recruitment and redeployment efforts often focused on this workforce, with emergency staffing configurations increasing or changing the responsibilities of nurses (Halpern & Tan, 2020; Hoogendorn et al., 2021). Many countries also aimed to optimize nurses in different roles; for example, expanding authority for nurses to administer vaccines and provide primary care nurse consultations, and reducing regulatory barriers for full scope of practice for advanced practice nurses. Nurses were also central in community and public health responses. For example, in **Indonesia**, community health nurses were important in providing services and in collaborating to develop communication and surveillance programmes (Akbar, Juniarti & Yamin, 2022).

While scope-of-practice issues are not limited to one profession, nursing has often been the battleground for scope-of-practice challenges. However, in primary health care, there is a growing body of evidence that advanced practice nurses produce at least equivalent or positive impacts on patient outcomes compared to physicians. Evidence on health system outcomes (e.g., cost savings and health care utilization) is more limited and mixed, with some studies showing benefit while others show no difference or occasionally increased utilization (Winkelmann et al., 2022).

Nurses often bore the brunt of frontline challenges resulting in burnout, moral injury and attrition

Due to their essential role in care delivery, nurses faced some of the highest risks for COVID-19 exposure, additional workload, stress and trauma, and workplace violence; and as a majority female workforce, they also often faced additional child and family care challenges. Thus, high rates of burnout, intent to leave and attrition are being seen in the global nursing workforce, as well as increasing efforts to organize and, in some cases, strike for better working conditions. See Section 2.3 for further discussion on HCW safety and well-being.

Community health workers (CHWs) were trained to perform new tasks, such as contact tracing, and deployed to explicitly address the needs of underserved communities through provision of community outreach and wellness checks, providing home delivery of medicines, and connecting patients to critical health and social services (Méllo, Santos & Albuquerque, 2022). In **New Zealand**, where the Māori people face ongoing health disparities, the District Health Boards partnered with Māori health providers to deploy CHWs to deliver health care services such as immunizations, well-being assessments and social support (Cram, 2021); in **South Africa**, Metropolitan Health Services, a public-sector primary care provider, established home delivery of medications by CHWs in Cape Town (Brey et al., 2020); and in **New York City**, CHWs conducted telephone wellness checks with over 9,600 individuals living in underserved communities and addressed social determinants of health by connecting patients to food pantries, benefits, vocational training, rental assistance and immigration resources during the initial COVID-19 wave (Peretz, Islam & Matiz, 2020). Later, the City deployed more than 4,000 contact tracers who were largely hired from the communities hardest hit by COVID-19 (Blaney et al., 2022). The **United States** government subsequently increased funding for CHW training (White House, 2022).

2.2.2. Empowering patients and caregivers in their own care

Patients and caregivers embraced greater responsibilities, thereby reducing the burden on overstretched health and care workforces

The strain on HCWs in combination with mitigation efforts to reduce disease spread further pushed health systems to empower patients and caregivers to take on greater roles in their own care. For example, the **United Kingdom** introduced payment for remote patient monitoring (RPM) using pulse oximetry for COVID-19 (Pronovost, Cole & Hughes, 2022), as well as self-administration of treatments traditionally administered by HCWs; caregivers in **Austria** were allowed to provide basic health care usually restricted to HCWs; and in the **United States**, pharmacies could dispense injectable contraception for self-administration (DHCS, 2020). These strategies during COVID-19 are part of a larger movement to empower patients and support self-management, in recognition that individuals must be at the centre of health care and health systems.

What is the evidence on the impact of these measures and what have we learned from this?

The impacts of skill-mix interventions within hospital, primary care and community care settings requires further investigation

Countries implemented diverse strategies to optimize the HCWF during COVID-19, but evidence on their impacts on patient outcomes is limited. Expanded scope-of-practice policies to enable a wider range of health professions to vaccinate, helped expand the scale and pace of COVID-19 immunization deployment in many places. One study suggests that clinical outcomes for tiered staffing models were comparable to traditional staffing models during the pandemic (Stempek et al., 2021). The literature on CHWs during COVID has largely described different programme initiatives (Méllo, Santos & Albuquerque, 2022), with early studies reporting on the delivery of services, such as the number of completed contact tracing cases (Blaney et al., 2022). The larger CHW literature beyond COVID-19 reveals diverse interventions with CHWs working across disease areas and in different roles, ranging from clinical service delivery to care coordination, health education provision, data collection, community engagement and psychosocial support provision (Scott et al., 2018). While some studies

show no significant effects on outcomes, there is a growing body of evidence suggesting that CHWs have positive impacts on patient behaviours, health care utilization and health outcomes (Viswanathan et al., 2010; Kennedy et al., 2021; Mbuthia, Magutah & Pellowski, 2022).

In non-crisis periods, greater intensivist physician and nurse staffing are associated with lower patient mortality (Wilcox et al., 2013; Rae et al., 2021). However, models employing hospitalists, telemedicine, resident physicians and advanced practice clinicians have shown positive outcomes, although baseline differences in ICUs (e.g., large academic vs community ICUs) should be considered in the implementation of different staffing models (Garland & Gershengorn, 2013). A 2019 Cochrane review of hospital nurse staffing models found the addition of advanced practice nurses did not have negative impacts on patient mortality; however, other patient and health system outcomes were uncertain. Evidence on models to add nursing assistant personnel is limited (Butler et al., 2019).

In primary health care of patients with chronic conditions, there is growing evidence that skill-mix interventions have at least equivalent or positive impacts on patient outcomes. Evidence on health system outcomes (e.g., cost savings and health care utilization) is more limited and mixed, with some studies showing benefit while others show no difference or occasionally increased utilization. Interventions used advanced practice roles, nurse-led clinics, CHWs, patient navigators, care coordinating roles and team-based care (Winkelmann et al., 2022). However, more research is needed to clarify the scope of practice of different health care roles, optimized team configurations for different settings (Meyers et al., 2018) and the implications for access, quality and cost of care.

Home monitoring and self-administration of medicines may also be beneficial and should be studied further

Home and remote patient monitoring for COVID-19 was effective in guiding care escalation and reducing unnecessary contact with the health care system in some cases. While evidence is limited on patient outcomes (Alboksmaty et al., 2022), one study in the **United States** found that high-risk COVID-19 patients enrolled in a RPM care model experienced lower rates of hospital utilization, cost of care and mortality (Haddad et al., 2022). Use of RPM has increased in recent years, mainly for chronic conditions, and is conducted through diverse platforms including smartphone apps, wearables and biosensors. Overall, RPM has been shown to reduce the acute care needs, suggesting potential benefits to patients and health care systems (Vegesna et al., 2017; Taylor et al., 2021). Self-administration of medicines has also been conducted successfully for a variety of diseases (Herth et al., 2021) and, specifically, has been shown to be safe and effective for the injectable contraception depot medroxyprogesterone acetate (Curtis et al., 2021). However, RPM and self-administration of medications will require resources and new staffing and delivery models. Challenges in the implementation of these services will include ensuring equitable access and patient privacy around device-collected data and the electronic transfer of patient data across settings (Malanchini et al., 2021).

While studies suggest self-management has positively impacted outcomes, the evidence for reduced service utilization remains weak. In addition, patient self-management will require HCWs serving in new roles, and education and training for current HCWs to effectively integrate self-management into overall care (Nolte, Merkur & Anell, 2020).

2.2.3. Leveraging digital technology

The use of telehealth was surged in many countries to maintain delivery of health services

Prior to the pandemic, health systems were making slow progress in integrating new technologies into health care. Regulatory barriers and limited payment often hindered these efforts. However, the pandemic drove a number of emergency policies to expand digital health in order to meet changing COVID-19 needs and maintain continuity of health care services in the face of public health constraints. Digital health tools were used in four principal areas in response to COVID-19: communication and information; monitoring and surveillance; supporting provision of health care services; and vaccination, immunity and pharmacovigilance (Fahy, Williams & COVID-19 Health System Response Monitor Network, 2021).

A notable example of digital health tools being used during the pandemic was the rapid expansion in telehealth consultations to increase the reach of HCWs and maintain service delivery during highly infectious waves of COVID-19. In **Norway**, the share of teleconsultations in primary health care rose from 5% before the pandemic to nearly 60%; in **France**, the number of teleconsultations neared 1 million per week in April 2020 compared to about 10,000 per week before March (OECD & European Observatory on Health Systems and Policies, 2021b); and in the **United States**, telehealth visits increased 63-fold for the Medicare programme in 2020 (Samson et al., 2021). Notably, one scoping review of telemedicine in LMIC during COVID-19 highlights that most evidence was from middle-income countries and, even in these studies, lack of infrastructure and weak/slow internet connections were frequently reported as barriers to successful implementation (Mahmoud, Jaramillo & Barteit, 2022). Appendix 2 provides several examples of different telehealth modalities advanced during COVID.

Targeted use of telehealth helped to mitigate inequitable access to the health workforce within and across countries

The targeted use of telehealth was also employed to mitigate inequitable access to the HCWF during COVID. Examples of targeted telehealth include: a tele-ICU programme in **India**, connecting district hospital doctors with off-site multi-specialty ICU teams (Rangappa et al., 2021); a cross-border tele-ICU programme connecting the University of California San Diego Health System with two border community hospitals in **Mexico** (Ramnath et al., 2021); and emergency funding for enhancing telehealth services in federally qualified health centres in the **United States** (ASPE, 2022).

What is the evidence on the impact of measures to optimize use of the HCWF and what have we learned from this?

Evidence on tele-ICU models is promising

While tele-ICU existed before the pandemic, these programmes increased in many countries such as the **United States**, **Israel**, the **United Kingdom**, **Egypt**, **India**, **China**, **Brazil**, **Mexico**, and **Malaysia** in response to COVID-19. Models were diverse, but early evidence suggests tele-ICU was well received by HCWs, expanded ICU capacity, and supported more evidence-based care with decreased ICU mortality (Kemp Van Ee et al., 2022). A scoping review of tele-ICU studies through the first year of the pandemic suggests tele-ICU has been implemented in three areas: extending coverage (often to community-based settings); improving compliance for patient safety and best practices; and facilitating transfer from one ICU to another. Length of stay, mortality, compliance and economic benefits are well documented for the first two areas (Guinemer et al., 2021).

Uptake of telehealth may improve access – however, not everyone may be able to benefit from this equally

Very early evidence suggests that telehealth uptake due to COVID may translate to increased access. One study found that high telehealth availability in federally qualified health centres in the **United States** was associated with increased visits for patients with mental health diagnoses and greater likelihood of timely follow-up after an emergency department visit (Cole et al., 2022).

Disparities in implementation and access to telehealth during COVID are also apparent. For example, reports of telehealth programmes in Africa are limited; in **Japan**, the use of telehealth is higher for individuals with university degrees compared to those with a high school diploma or less, and for residents in urban areas compared to those living in rural areas (Omboni et al., 2022); and in the **United States**, Black and rural Medicare beneficiaries also had lower telehealth use compared to their White, urban counterparts (Samson et al., 2021).

Effects of telehealth needs to be further investigated

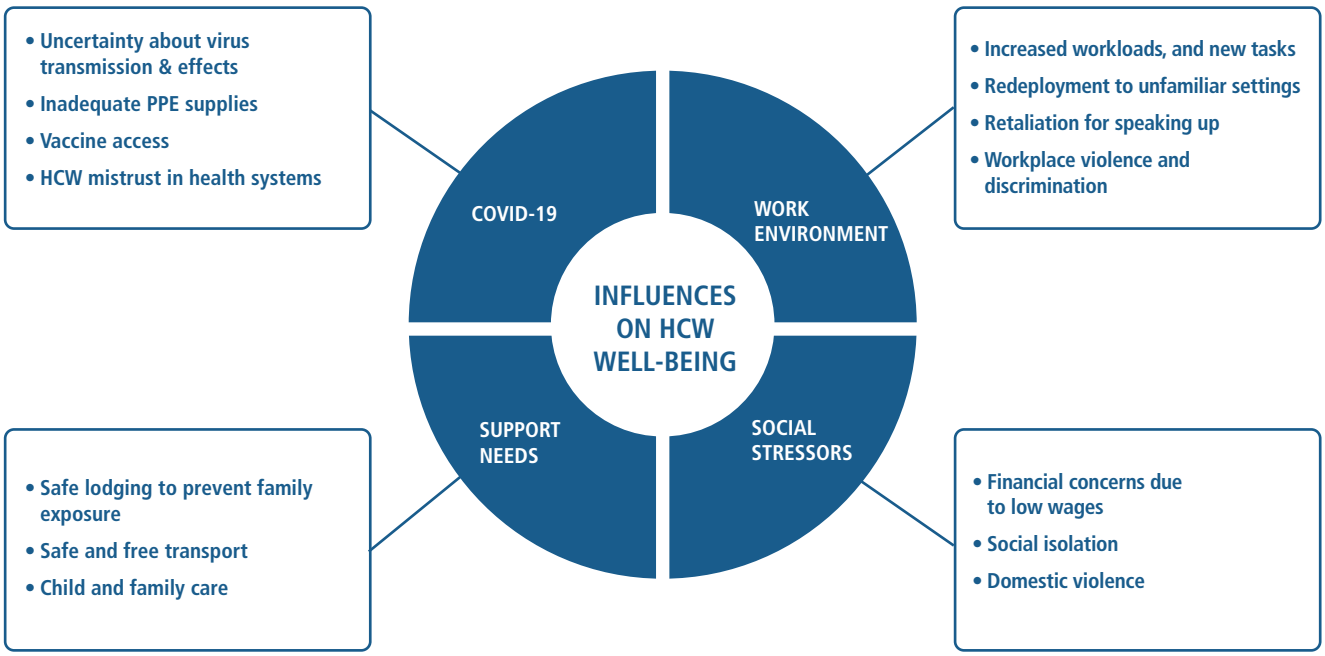
Further evidence is needed to fully understand the impact of telehealth and what factors and policies are associated with better outcomes. The United States government is conducting a mixed-methods review to examine: the characteristics of patients, providers and health systems using telehealth during COVID-19; benefits and harms; successful interventions and strategies; costs and return on investment; and policy and reimbursement considerations (AHRQ, 2021b).

2.3. What strategies did countries adopt to protect and support HCWs?

After initially facing challenges, many countries implemented measures to protect and support their workforce to maximize their capacity to respond to COVID-19

Even before the pandemic, HCWs faced risks to their physical and mental health, linked to a range of stressors

Figure 3: Health and care workers were exposed to a range of stressors during COVID-19



Source: Adapted from Abdul Rahim et al., 2022.

(Figure 3). The physical and psychological demands experienced by HCWs during COVID-19 exacerbated existing occupational stressors, increased physical and psychological harm, and accelerated moral distress and burnout among the HCWF (Box 7) (Abdul Rahim et al., 2022). According to international labour standards, employers have the overall responsibility to ensure that necessary preventive and protective measures are taken to minimize occupational risks (ILO, 1981). During the pandemic, responsibilities to mitigate these risks were shared by organizations and governments in efforts to reduce HCW absenteeism, attenuate shortages, promote HCW safety and well-being, and thus build the resilience of health systems.

Box 7: COVID-19 intensified the physical and mental burden experienced by the HCWF

The HCWF around the world suffered from high levels of physical and psychological harm during COVID-19

Even before the pandemic, HCWs experienced high rates of **injuries and illness** due to occupational hazards, unsafe working conditions, and their prolonged and close proximity to patients (ILO & WHO, 2022). Physical risks to workers increased significantly with COVID-19 due to high exposure to an initially unknown infectious disease, a lack of existing workforce protections like airborne pathogen standards, and insufficient supplies of adequate PPE (LaPuma et al., 2020, Webb et al., 2020). Tragically, these hazards translated into countless COVID-19 infections among HCWs and an estimated 115,000 worker deaths by the spring of 2021 alone (WHO, 2021d).

HCWs already reported high rates of stress, anxiety and depression prior to COVID-19 (Murthy, 2022) and the exceptional demands placed on them during COVID-19 created and intensified workforce stressors (Figure 3), exacerbating **psychological harms** (Abdul Rahim et al., 2022). Prevalence estimates of anxiety and depression among HCWs during the first two years of COVID-19 ranged between 23–46% and 20–37%, respectively (Abdul Rahim et al., 2022). PTSD among HCWs during the pandemic is estimated at 17% (Yunitri et al., 2022). These adverse psychological outcomes are related to HCW **burnout and moral injury** – workplace phenomena driven by organization and systemic factors beyond the worker's control. Estimated rates of burnout during the pandemic ranged from 41–52%, although some studies reported even higher levels (Abdul Rahim et al., 2022).

Violence against HCWs is a growing threat. Although rates of violence against HCWs had been increasing prior to COVID-19, it intensified worldwide during the pandemic (Cheng & Ma, 2022; ICN, 2022). Types of violence experienced by HCWs take many forms, including injury, death and attacks on health care facilities, especially in war and conflict zones (ICN, 2022). Regardless of the nature of the violence experienced by HCWs and systems, it has negative implications for their physical and psychological health, as well as the provision of vital service delivery, as HCW experience of workplace violence is associated with turnover intention (Poon et al., 2022).

The burden of physical and psychological risks and associated harms has not been felt equally among HCWs, highlighting inequities across regions, worker populations and health care settings

HCW mortality varied significantly by country in the first year of the pandemic, with **Mexico**, **Italy** and **Iran** reporting the highest rates, based on 37 countries assessed (Erdem & Lucey, 2021); the **WHO Americas Region** has accounted for the greatest number of deaths overall (WHO, 2021d). Higher levels of mental health conditions have been reported among the rural HCWF, compared to urban (Tham et al., 2022).

HCWs representing racial and ethnic minority subgroups, women and those providing care for some of the most vulnerable patient populations incurred a disproportionate amount of the pandemic's harms. For example, being female or younger (<50) were identified predictors of anxiety, depression, burnout and PTSD among HCWs during COVID-19 (Smallwood et al., 2021; Peñaranda et al., 2022). Additionally, compared to other HCWs, nurses experienced higher rates of COVID-19 infection and mortality, burnout and PTSD (Abdul Rahim et al., 2022), while in the **United States** twice as many HCWs in nursing homes died in the first year of the pandemic, compared to hospital health workers (Spencer & Jewett, 2021). A survey noted disparities in rates of adverse psychological outcomes, burnout and intent to leave their jobs between younger (<55 years) and older physicians (Stephenson, 2022). Younger physicians in nearly all countries surveyed were more likely to report emotional distress and burnout than their older counterparts, and the reverse was true regarding intent to leave the HCWF, with a substantial proportion of older physicians reporting that they intend to leave the HCWF in the next 1–3 years.

2.3.1. Protecting workers from COVID-19 infection and physical harm

After initial challenges, many countries implemented interventions to protect HCWs' physical safety in response to pandemic threats, including protection control and prevention measures, COVID-19 vaccination, and efforts to combat rising rates of violence (see Appendix 3).

Countries implemented strategies to mitigate COVID-19 infection risk among HCWs

Lack of sufficient supply of and access to high-quality PPE, such as N95 masks, for HCWs was of critical concern at the outset of the pandemic. Shortages of PPE were reported globally, necessitating policies and guidelines to optimize limited supplies early in the pandemic. Responding to these insufficiencies, countries (e.g. **Mauritania**, **Niger**, **Togo**) developed and implemented plans to monitor PPE supplies, increase their stockpiles – particularly N95 masks – and distribute them in sufficient quantities to HCWs (Hou et al., 2020; Buchan, Williams & Zapata, 2021; ; WHO, 2021b, 2022b; WHO Regional Office for Africa, 2021). Beyond increasing and distributing HCW safety supplies, countries provided workers with infection prevention and control training. This covered the proper use of PPE and biosafety, and was often facilitated by e-learning tools (WHO, 2022b).

Some countries introduced policies or programmes to universally screen (non-symptom-based) cohorts of HCWs to identify and track COVID-19 infections (WHO, 2021b, 2022b). Most countries established strict isolation and quarantine restrictions in health care facilities to protect patients and HCWs. Long-term care facilities are especially susceptible to virus transmission, and many OECD countries implemented measures to ban personal visits, isolate affected residents and minimize staff movement between facilities to mitigate the risk of COVID-19 infection for vulnerable residents and LTC workers (Curry & Langins, 2020; OECD, 2021c). Many countries also implemented remote health consultations for non-urgent care to protect patients and HCWs from infection (see Section 2.2.3).

The emergence of COVID-19 vaccines represented a turning point in the pandemic, and many countries prioritized their HCWs in vaccination strategies

COVID-19 vaccines became available in late 2020. In line with calls from international bodies to do so (WHO, 2022a), countries swiftly adopted policies and programmes to vaccinate HCWs as priority populations in their national vaccination plans (Dooling et al., 2020; Palmer, Nemer & Menne, 2021; WHO, 2021b). Some countries issued mandates for the vaccination of HCWs.

HCW protections from rising rates of violence during the pandemic usually occurred at the organizational or work-level, but examples of national efforts also exist

Levels of violence against HCWs increased after COVID-19 emerged. Measures implemented to combat violence against HCWs during the pandemic were often focused on organization- or workplace-level interventions to: improve communication skills and de-escalation techniques; enhance security at the workplace; and implement violence reporting and monitoring. Enhanced accountability, stakeholder coordination, and risk assessment and management strategies were also common. Less frequently, legislation was enacted as a countermeasure (ICN, 2022).

What is the evidence on the impact of measures to protect against infection and physical harm and what have we learned from this?

Provision of adequate PPE and other risk mitigation efforts were essential to reduce risk of infection and death

There is strong evidence that **use of adequate PPE**, especially N95 masks, prevents COVID-19 infection among HCWs (Cattelan et al., 2020; Liu et al., 2020; Griswold et al., 2021; Suzuki et al., 2021; Schoberer et al., 2022), and that access to it is associated with willingness to work during a public health emergency (Devnani, 2012). However, sufficient PPE alone is not enough to eliminate the risk of infections in workers, highlighting the need for additional strategies to augment worker safety (Nguyen et al., 2020a). The *lack* of measures to protect workers – particularly access to high-quality PPE – increases HCWs' risks of physical harm, including COVID-19 infection and death (Nguyen et al., 2020b), as well as adverse psychological outcomes, burnout and turnover intention (Brooks et al., 2018; Buchan, Catton & Shaffer, 2022; Poon et al., 2022). Additionally, support initiatives which do not carefully consider the specific needs of their target populations may have unintended consequences. For example, HCWs suffered harmful impacts of PPE, including skin damage, heat stress and other adverse physical events (Galanis et al., 2021), thus demonstrating the importance of policies and practices around HCWF working hours which bear in mind that the PPE HCW will need to wear should not be used for extended periods.

Other **risk mitigation efforts** have also shown promising results in detecting COVID-19 among HCWs and increasing HCW biosecurity competencies (Evans et al., 2021; Hernandez-Perez et al., 2021; Mostafa et al., 2021; Tabari et al., 2021; WHO, 2021b). A subset of HCWs in **China** who received infection prevention training, provision of high-level PPE, and accommodation in designated isolation hotels, did not test positive for COVID-19, despite having frequent contact with patients infected with the virus. A comparative control group had rates of infection between 3.4–5.4% (Hou et al., 2020).

Measures to **isolate and minimize physical interactions,** while identified as effective public health strategies to reduce infection and mortality during disease outbreaks (Leichsenring, Schmidt & Staflinger, 2020; Talic et al., 2021; Thomas, 2021), can also cause emotional and psychological harm, especially to residents in LTC facilities (Gordon et al., 2020; OECD, 2021c). Examination of Dutch guidelines permitting limited visitations in nursing homes for family members meeting specific criteria reported a positive impact on the well-being of patients and no new COVID-19 infections (Verbeek et al., 2020). The effects of expanded adoption of remote digital health technologies are discussed further in Section 2.2.3, but multiple studies identify reduced COVID-19 risk as an advantage of remote consultations for primary care physicians (Verma & Kerrison, 2022).

Vaccinations for HCWs helped reduce infections, but there are inequalities in access and other barriers to uptake

COVID-19 vaccines are effective at preventing infection and severe disease among HCWs (Benenson et al., 2021; Pilishvili et al., 2021; Chano et al., 2022). Across OECD countries, high vaccination rates have also been associated with reductions in hospitalizations and deaths of residents in LTC facilities (OECD, 2021c). However, in addition to vaccine hesitancy (which is higher in women, those of younger age, and those from low-income countries compared to their counterparts), geographic disparities in access to COVID-19 vaccines have served as barriers to the successful vaccination of all HCWs (Sen-Crowe, McKenney & Elkbuli, 2021). Low- and middle-income countries lagged their high-income counterparts in procurement and administration of vaccines, while high-income countries harboured half of the world's vaccine supply (OECD, 2021d). Experts warn that achieving global vaccine equity is critical for reducing the potential emergence of new variants and for pandemic recovery (OECD, 2021d).

Organizational zero-tolerance policies have been advocated to protect against workplace violence, which has seen a rise during the pandemic

There is inferential evidence to support the effectiveness of strategies health care organizations worldwide implemented during COVID-19 to combat HCW violence, as they align with recommended best practices released by the International Committee of the Red Cross and partner organizations in the wake of the pandemic (ICRC, undated). According to the report's authors, the evidence for these practices (such as risk assessment and preparedness, communication with the public, security coordination, and monitoring and documentation of violent incidents) is based on first-hand experiences in humanitarian contexts worldwide. One country that implemented many of these

recommended practices is **Portugal**: it took a comprehensive approach to combatting HCW violence with measures including security protocols, staff support, training, an online incident reporting system, and a national security survey of health institutions. The country reported a decrease in violent episodes against HCWs following the implementation of these measures, despite strong incentives to report such incidents (ICN, 2022).

Organizational zero-tolerance policies for any form of violence, including threats, against HCWs have been advocated for as one of the best protections health care employers can offer their staff (Murthy, 2022; OSHA, undated). There is some limited evidence for the effect of these policies on decreasing workers' tolerance toward aggression (Middleby-Clements & Grenyer, 2007), although researchers point out the lack of clarity in defining aggressive behaviour, especially among patients, as a complicating factor with these policies (Hassankhani & Soheili, 2017).

2.3.2. Protecting the mental health and well-being of workers

The strategies implemented within and across countries to support the mental health and well-being of HCWs during COVID-19 primarily focused on individual-level mental health services

There was an urgent need worldwide to adopt measures aimed at protecting HCW mental health and well-being during the COVID-19 pandemic. In countries across **Europe** and **Asia**, for example, efforts were implemented by national and regional governments, professional associations and academic institutions to establish **helplines** offering psychological support and mental health referrals, and to provide **remote counselling** services, **peer support** services and **mindfulness** sessions (WHO Regional Office for South-East Asia, 2019; Williams et al., 2020a). The **Australian** federal government established a confidential **digital mental health service** where HCWs can access a range of self-guided and person-to-person resources and services. It has been used by at least 50,000 HCWs in the country (Abdul Rahim et al., 2022). Confidential services delivered through digital interventions were especially valuable as they could be accessed with less fear of losing jobs or being stigmatized.

Countries in **South America** also took steps to protect HCWs' mental health by issuing **mental health plans** for the employers and national entities responsible for worker health and safety (WHO, 2021b).

What is the evidence on the impact of measures to protect and support mental health and well-being, and what have we learned from this?

Strategies to support the mental health of HCWs at the individual level may attenuate some of the effects of workplace stressors, but fail to address their organizational and systems-level drivers

The strategies implemented within and across countries to support the mental health and psychological well-being of HCWs during COVID-19 primarily focused on individual-level interventions reliant on help seeking, consistent with broader efforts to address burnout observed prior to the pandemic (National Academies of Sciences, Engineering and Medicine, 2019). There is some evidence to support the effectiveness of individual-level interventions in improving psychological well-being among HCWs before (Waterman et al., 2018) and during the pandemic (Fendel, Bürkle & Göritz, 2021; Llorente-Alonso et al., 2021). However, for long-term impact, consensus bodies assert that systemic, multipronged efforts to address the organizational and systems-level drivers of poor mental health and burnout are required (National Academies of Sciences, Engineering and Medicine, 2019; Murthy, 2022). Organization-level interventions may specifically include those for workplace mental health support, such as identifying barriers to accessing mental health support and awareness raising for all staff; and, more broadly, on prevention of risk factors, for example, reductions in workload, schedule changes, or improvements to communications and teamwork.

Interventions addressing factors like excessive workload, inadequate staffing, administrative burdens and lack of job control, can support HCW mental health and well-being, with benefits for patients

A growing body of evidence identifies promising systems-level strategies that target the drivers of burnout, moral distress and injury, and adverse HCW mental health outcomes. Hospitals with **shared governance models**, which promote participatory decision making in health care and elevate workers' voices in workplace matters, have lower rates of burnout and higher job satisfaction ratings from nurses, plus improved quality of care and patient outcomes (Spence Laschinger & Leiter, 2006; Kutney-Lee et al., 2015). **Adequate nurse staffing levels** – especially when mandated – are recognized as a critical factor to improving accountability and the work environment, and have yielded positive outcomes for patients and HCWs alike, including quality of care and retention (Aiken et al., 2010; McHugh et al., 2021; Buchan, Catton & Shaffer, 2022; American Federation of Teachers, undated). Reducing the burden of administrative and clerical requirements on HCWs can improve job satisfaction and decrease burnout (DeChant et al., 2019). Medical scribes perform real-time documentation of clinical encounters, allowing HCWs to spend less time on paperwork and more time listening to patients. Multiple reviews find that the use of medical scribes is associated with improved clinician satisfaction and patient experience, and decreased levels of burnout (DeChant et al., 2019; Ziemann, Erikson & Krips, 2021).

Structural barriers in seeking psychosocial support should be addressed and solutions tailored to different worker populations

Reliance on individual-level interventions fails to acknowledge structural barriers that some workers face when seeking help. For example, medical licensure boards in most of the United States ask questions about a history of mental illness. Such policies may deter applicants from seeking licences, stigmatize mental illness and prevent help-seeking behaviour (Jones et al., 2018).

Perhaps unsurprisingly then, a recent survey of primary care providers across 10 countries found that, despite very high levels of stress, emotional distress and burnout reported by respondents, a slim minority sought professional help, even when it was available (Stephenson, 2022). Confidential services delivered through digital interventions may therefore be especially valuable, as they can be accessed with less fear of losing jobs or being stigmatized.

Further, despite evidence on the various inequalities in the distribution of mental health burden among the HCWF, and the relationship between HCW age, psychological outcomes and burnout, the strategies described in the literature that aim to mitigate these outcomes are largely 'one-size-fits-all' and fail to account for the variations in worker demographics. For example, evidence of gender inequality during the pandemic shows that women experienced large declines in labour force participation globally, and those who remained in the HCWF experienced deteriorating working conditions, with evidence to suggest they have faced higher rates of burnout and mental health conditions, including depression, anxiety and PTSD (OECD, 2021e; Seedat & Rondon, 2021; Jefferson et al., 2022).

2.3.3. Other practical support measures

A number of practical support measures were put in place to enable HCWs to continue working and incentivize retention. These included childcare, transportation and safe accommodation. The provision of additional pay was also used by countries to support and incentivize HCWs and to compensate them for the- added risks of providing care during the pandemic (i.e., hazard pay).

Many countries addressed the competing professional and domestic duties of HCWs, especially among women, by implementing supportive childcare measures

Childcare was a pressing need during the pandemic when most schools and childcare facilities closed to the public. This need was especially strong for women, who make up 67% of the global HCWF, and who are also disproportionately responsible for childcare (OECD, 2020e) (Box 8). In many countries (e.g., **Austria**, **France**, **Germany** and the **Netherlands**), emergency measures were enacted to keep facilities open for the provision of childcare for essential workers, including HCWs (Williams, 2020a). In some countries, financial support to help with childcare costs was provided to parents through vouchers or paid subsidies (e.g., **Italy**) (Ricci et al., 2020), by offering paid time off to care for children (e.g., **France**, **Portugal**), or by subsidizing the cost for employers who provide it (e.g., **Japan**) (OECD, 2020e).

Box 8: Women played a prodigious role in the COVID-19 response yet were overlooked in policies

Women are the dominant contributors to the global HCWF and unpaid care work

Women in the HCWF faced disproportionate demands, challenges and effects of the COVID-19 pandemic. Women comprise approximately two-thirds of the global HCWF, and make up the overwhelming majority of the nursing and LTC workforce, yet they are generally underrepresented in some of the highest paying health professions, like medicine and pharmacy (OECD, 2020c; WHO & ILO, 2022). They face a 24 percentage point pay gap (in the case of mean monthly earnings) compared to men across the health and care sector (WHO & ILO, 2022).

Women are also more likely to serve as primary domestic caregivers, both for children and adult relatives, resulting in at least two and a half times more unpaid household and care work than men (UN Women, undated). Gender disparities in unpaid work at home persist even in countries with more progressive attitudes about gender equality. Notably, women are 50% more likely to care for relatives who are ill, disabled or elderly than men (OECD, 2020e).

COVID-19 had a disproportionate impact on women in the HCWF

Due to the nature of their work and their overrepresentation in the HCWF, women faced greater risk of COVID-19 exposure and infection. Women HCWs in the LTC sector were especially vulnerable, given the magnitude of the pandemic's impact on nursing and residential care facilities (OECD, 2021c). Simultaneously, women in the HCWF were faced with additional domestic responsibilities and stressors as schools and childcare facilities closed and care for older relatives was heightened. Workplace hazards and domestic stressors resulted in mental and physical harms for women HCWs. Data collected from United States, Italy and Spain from early in the pandemic showed that 70% of HCW infections were among women, which was partially attributed to less access to PPE, poor PPE fit due to gender-biased design, and insufficient training (UN, 2020; Lotta et al., 2021; Morgan et al., 2022). Compared to their male counterparts, women in the HCWF also reported higher rates of work absenteeism due to caregiving responsibilities at home; career and economic harms; and susceptibility to adverse mental health outcomes and feelings of guilt (Morgan, et al., 2022).

HCWF policy responses to COVID-19 have largely been gender-blind

Women are underrepresented in health care leadership positions and often were not sufficiently included in global COVID-19 response decision making (UN, 2020; OECD, 2021e; Morgan et al., 2022). Despite some measures that may have disproportionately benefited women (e.g., childcare support), most HCWF policy responses to the pandemic were implicitly gender-blind. Experts call for policies that include gender impact assessments, gender disaggregated data, and 'gender budgeting' that applies a gender perspective to fiscal decisions. Most importantly, women must be equitably represented and visible in decision making so that the needs of women and their first-hand expertise within and outside of the HCWF can be considered in emergency preparedness and response, intervention design and evaluation, and overall health system strengthening efforts, and so that gender disparities – often exacerbated during crises – are narrowed (UN, 2020; Lotta et al., 2021; Morgan et al., 2022).

Countries also implemented strategies to facilitate transportation for HCWs and provide them with safe accommodation in which to isolate

Transportation needs of HCWs were also addressed by many countries through providing them with free public transport (e.g., **Hungary**), free access to public cycling schemes (**London, United Kingdom**) and parking (e.g., **Finland**) (Williams et al., 2020a). Countries also provided free lodging to health workers, often in hotels close to the hospitals in which they worked, enabling HCWs to isolate from their families in safe accommodation, so as not to risk spreading COVID-19 to their loved ones (Hou et al., 2020; Williams et al., 2020a). In **Poland**, for example, regional branches of the National Health Fund were responsible for securing and paying for accommodation for HCWs treating COVID-19 patients (Williams et al., 2020a).

Additional pay and bonuses were implemented in many countries to support and incentivize HCWs

Many countries (including 18 across **Europe**, **Canada**, nine French- and Portuguese-speaking West African countries, and more) provided increased financial support to HCWs in the first year of the pandemic, usually in the form of one-time or monthly bonuses (Williams et al., 2020a). In some countries, bonus amounts were a flat rate, while in others, it varied based on profession (e.g., **Kyrgyzstan**), base salary (e.g., **Greece**), and severity of the pandemic (e.g., **France**). In South American countries, such as **Columbia** and **Chile**, salary adjustments were awarded by region to attract HCWs to areas experiencing HCWF shortages (WHO, 2021b). In most cases, bonuses were issued on behalf of the national government, although in countries like **Armenia** and **Estonia**, individual hospitals paid bonuses. In **Germany**, bonuses issued by states were granted on top of that provided by the national government (Williams et al., 2020a). In the **United States**, the federal government passed multiple items of legislation to provide financial support for the health care system and HCWs. Specifically, legislation provided billions of dollars in loans to HCWs to support the sustainability of their practices, compensate for financial losses due to the pandemic, increase and expand provider reimbursements for COVID-19 patient care and telehealth services, and to support rural HCWs and stabilize the direct care workforce (O'Malley Watts, Musumeci & Chidambaram, 2020; Ochieng et al., 2022).

Long-term care workers, long underpaid and undervalued, were at the epicentre of the COVID-19 pandemic, and many countries issued them financial incentives and hazard pay

The pandemic shone a spotlight on the chronic underinvestment and systemic discrimination faced by LTC workers, as well as their critical role in national health care systems (Box 9). In an attempt to stabilize and strengthen this workforce, countries like **Germany**, **France** and the **United States** provided increased financial support for LTC workers in the form of salary increases and bonuses (Scales & McCall, 2022; OECD, 2021c). In countries including **Czechia** and the **Republic of Korea**, wages for LTC workers were permanently increased (OECD, 2021c). In the **United States**, federal legislation provided states with a significant infusion of one-time funds earmarked for 'home and community-based services' for the elderly and disabled, which many used to provide wage increases and bonuses to LTC workers (O'Malley Watts, Musumeci & Chidambaram, 2020).

Box 9: The COVID-19 pandemic highlighted the systemic challenges and hazards LTC workers face, but also elevated their prioritization in policy responses

Job quality and safety in LTC is poor

LTC workers provide care for older people and the disabled, typically in home and community-based settings or congregate care facilities, like nursing homes. This workforce is comprised predominantly of women, immigrants, and racial and ethnic minorities (Campbell et al., 2021; OECD, 2021c). Furthermore, LTC workers are some of the lowest paid in the HCWF, often earning poverty wages (Campbell et al., 2021).

Prior to the pandemic, LTC facilities were typically overlooked in emergency preparedness planning, including in many high-income countries (OECD, 2021b). Unsurprisingly, when the COVID-19 crisis emerged, the LTC sector was ravaged, especially in countries like France, Italy, Spain and the United States, which experienced high death tolls among nursing home residents (OECD, 2021c). The LTC workers who provided vital services for this patient population were thus exposed to high levels of COVID-19 risk while facing acute patient care demands with limited PPE, personnel, and other resources and infection control measures – a combination of factors that led to widespread attrition and shortages in a sector already facing severe challenges prior to the onset of COVID-19 (Campbell et al., 2021; OECD, 2021c).

The LTC sector was ill-equipped to protect workers at the pandemic's outset, but was later prioritized in many countries' policy responses

Recognizing the toll of the pandemic on the LTC sector, many countries adopted virus transmission reduction practices and policies to protect LTC patients and workers. Compared to other OECD countries that did not prioritize PPE for the LTC sector early in the pandemic, the **Republic of Korea** took swift action, establishing a strategy and working group to manage and distribute supplies and avoid shortages among LTC workers. Ultimately, many countries did implement strategies to bolster the supply and availability of sufficient PPE for LTC workers. In **Norway**, for example, digital technology was leveraged to allow municipalities to order PPE for HCWs through a web-based calculator (OECD, 2021c).

Countries also instituted policies restricting the LTC worker movement, as they typically shift between multiple care facilities. Ten OECD countries, for example, restricted multiple site work. While evidence from **France** indicates that mobility restriction policies can be effective in reducing HCW movement and curbing COVID-19 infections and associated mortality (Belmin, et al., 2020), they also place work constraints on LTC workers, who frequently rely on wages from multiple sites of care to earn their livings due to the low wages in the sector (Campbell et al., 2021; OECD, 2021c).

Other protection and support measures instituted in LTC included the provision of infection control and prevention training, palliative care and mental well-being support; regular testing of symptomatic or exposed workers; and prioritization of LTC workers for COVID-19 vaccination.

While increased wages are necessary for building a stronger, more sustainable LTC workforce, they are insufficient on their own

The pandemic uncovered the systemic and pervasive factors that have historically resulted in poor job quality and retention challenges among LTC workers. Even with the significant investments made to improve the LTC work environment during COVID-19, the sector continues to face recruitment and retention challenges, suggesting that efforts to

bolster the workforce must be expanded and intensified. Experts note that multiple factors beyond, but also including, low compensation – poor and unsafe working conditions, limited abilities for career advancement, low support and insufficient training and experience – contribute to workforce challenges in this sector (Campbell et al., 2021).

There are, in fact, some examples of countries taking steps to create meaningful, long-term improvements in LTC. In countries including **Czechia** and the **Republic of Korea**, wages for LTC workers were permanently increased, and in **Columbia** and **Finland**, LTC staff-to-patient ratios are being formally adopted in legislation and regulations (OECD, 2021c).

What is the evidence on the impact of practical support measures and what have we learned from this?

The provision of childcare support may alleviate a significant stressor in the lives of HCWs, especially women

Many HCWs are affected by the social determinants of health (Seeholzer et al., 2022). Among these is access to **childcare**, which has been identified as a significant stressor for health workers – particularly women (OECD, 2020e; Harry et al., 2022). Childcare stress has been associated with increased odds of experiencing anxiety, depression and burnout (Harry et al., 2022), which in turn adversely affect worker retention and patient quality of care (Murthy, 2022). It is reasonable to posit then that programmes to address childcare challenges, such as those implemented as emergency measures during the pandemic, could alleviate HCW childcare stress and its impact on workers, patients and health systems. Furthermore, evidence suggests a positive return on investment for providing childcare for health workers; a simulation study in the **United States** found that in nearly every county in the country, it would be less expensive to provide childcare to all health workers with children than to absorb the costs of HCW absenteeism during school closures (Chin et al., 2020).

Practical support measures like HCW accommodation may improve worker well-being and facilitate care delivery

There is little literature examining the effectiveness of other practical support strategies implemented by countries in response to the pandemic. However, the fear of infecting a loved one during pandemics or other outbreaks has been identified as a risk factor for adverse psychological outcomes in HCWs and a deterrent to participation in emergency response efforts (Abdul Rahim et al., 2022; Buchan, Catton & Shaffer, 2022; Santinha, Forte & Gomes, 2022). Therefore, the **provision of safe accommodation**, where HCWs can isolate away from their families during disease outbreaks, may alleviate one of the psychological stressors they face and remove a barrier to HCW emergency response. There is also some evidence from **China** and **Italy** that, when infection prevention protocols (e.g., temperature screening, meal delivery, separate elevators) are put in place, such accommodation can successfully house HCWs without contributing to the spread of disease (Hou et al., 2020; Vimercati et al., 2020).

Additional payments reduced personal financial challenges among HCWs but this does not mean that the general pay conditions have been addressed

The provision of **additional financial payments** does yield positive outcomes for workers, in terms of their economic well-being, retention and mental health. Analyses of **United States** hazard pay policies during COVID-19 find significant increases in wages and weekly earnings, and improved overall economic well-being for HCWs (Scales & McCall, 2022; SEIU 775 & Center for American Progress, undated). Increased payments also improved the ability of HCWs to keep up with rent and utility payments, and decreased their food insecurity. This link between increased worker pay and well-being is well-supported by the broader evidence base. Studies demonstrate that increasing compensation for low-wage HCWs, like many LTC workers, would lift hundreds of thousands of them and their children out of poverty, significantly reduce reliance on public assistance, and increase retirement savings and home ownership rates among this workforce (Himmelstein & Venkataramani, 2019; Weller et al., 2020). Furthermore, increasing wages has been shown to improve the physical and mental health of low-wage workers (Shook et al., 2020). There is also evidence that higher wages contribute to LTC workers' intent to stay in their job (SEIU 775 & Center for American Progress, undated) as well as contributing positively to the mental health of HCWs by reducing worry, anxiety or depression about finances (SEIU 775 & Center for American Progress, undated).

There is also some evidence that national workforce investments during COVID-19 supported delivery of services. The provision of hazard pay for HCWs was identified as a contributing factor in promoting continuity of health services in **Ethiopia** during the pandemic (Arsenault et al., 2022), while government financial support in the **United States** allowed health care providers to maintain or improve their financial performance and operations (Binkowski, 2021).

Overall, the positive links between adequate financial compensation and HCW mental health, well-being and retention demonstrate the need to address pay and general conditions of the HCWF in many countries to maintain the current workforce (see the companion policy brief *'What steps can improve and promote investment in the health and care workforce?'* in this series). However, increasing pay will not be sufficient for improving retention. A systematic review examining the relationship between the **United Kingdom**'s NHS workforce and satisfaction, retention and wages found that increased wages may improve retention by increasing job satisfaction, but without addressing other organizational and environmental factors, wages alone were limited in their ability to retain workers (Bimpong et al., 2020).

3. What has been done to implement HCWF strategies during COVID-19 and what are the lessons?

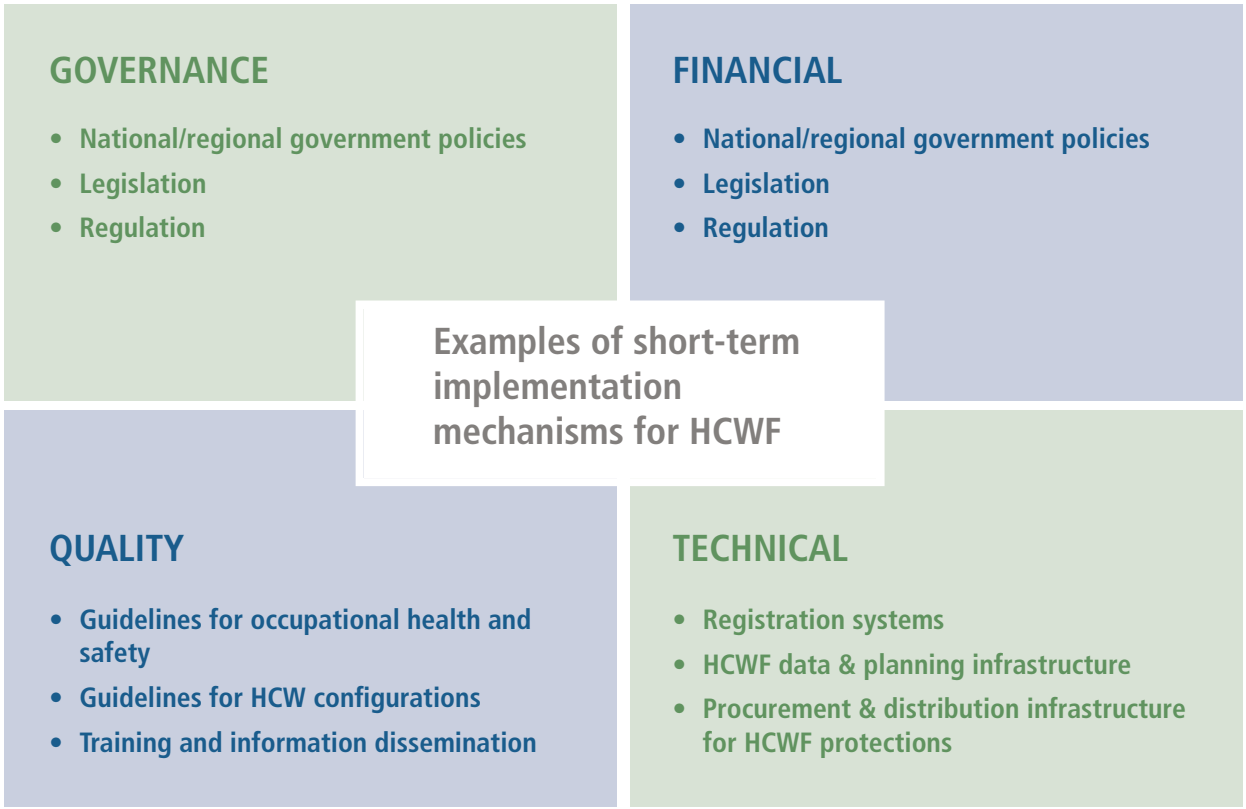
Countries utilized an array of policy mechanisms to surge, flex and protect the HCWF during COVID-19

Prior to COVID-19, health systems were advancing a number of strategies to increase, optimize and protect the HCWF. However, uptake was often slow and hindered by regulatory barriers, limited or inequitable funding and other resources, and insufficient evidence. COVID-19 forced health systems into a period of rapid change, which required countries to leverage an array of policies that can be summarized in governance, financial, quality and technical areas (Figure 4). These policies required speed and flexibility, and their implementation was often unprecedented. The great need and political will during the emergency situation drove their implementation and this likely would not have been possible under normal circumstances.

3.1. Governance

The strategies employed across and within countries to increase the capacity of the HCWF during COVID-19 have important governance implications. Strategies necessitated national and regional policies, legislation and changes to regulation to increase, optimize and protect the HCWF (Table 1). Depending on each country's established policies, governance measures to achieve similar aims varied across emergency policies, legislation and regulatory flexibilities.

Figure 4: Policy mechanisms for strengthening the health and care workforce can be summarized in governance, financial, quality and technical areas



Source: Authors' own.

Table 1: A range of governance mechanisms were utilized to increase supply, optimize, support and protect the workforce

GOVERNANCE MECHANISM	INCREASE NUMBERS	OPTIMIZE WORKERS	SUPPORT AND PROTECT
National/ regional government policies	• Authorization for new staff to be hired • National or regional recruitment campaigns to attract new or returning workers • Agreements to temporarily employ private-sector workers in the public sector • Modifying leave and work schedules to increase short-term workforce capacity • Modifying immigration policies to fast-track recruitment of foreign-trained health professionals	• Authorization for certain professions to take on new tasks • Redeployment of health and care workers to new positions across public-sector health systems • Protections against liability for health and care workers in expanded roles • Waivers to allow for patients and caregivers to take on greater roles in their own care	• Providing alternative accommodation for health workers to prevent infections of people living in the same household • Ensuring worker support, including childcare and transportation • Ensuring health and care workers had access to free, high-quality and confidential mental health treatment and care • Establishing helplines and online services for mental health support • Public health provisions to reduce transmission and demand on the health and care workforce • Ensuring health and care workforce protection and support were integrated into emergency preparedness and response plans
Legislation	• Emergency legislation to restrict or cancel leave of absence • Legislation suspended on working hours, changes to shift working and relaxing minimum staffing requirements • Emergency legislation enabling public-sector organizations to take over private-sector hospitals and staff • Emergency legislation to launch exceptional recruitment procedures	• Emergency legislation to allow new/different types of worker to perform additional tasks and practice at full scope • Legislation to clarify or extend medical indemnification to health workers taking on new tasks	• Legislation to reduce violence against health and care workers • Legislation authorizing additional investments to stabilize the long-term care workforce
Regulation	• Registration requirements changed to fast-track new or 'returner' workers • Medical and nursing schools approve early graduation • Language requirements reduced and fees for conversion exams waived for foreign-trained workers • Requirements for re-registration suspended • Relevant professional associations or health authorities develop and offer temporary recruitment contracts	• Regulatory flexibilities to allow health and care workers in expanded roles • Supervision requirements for certain health and care workers suspended • Licensing and other regulatory flexibilities introduced to support telehealth • Agreement from professional associations that certain professions could take on new tasks	• Occupational safety standards for health and care workers strengthened • Testing and vaccination requirements for health and care workers • Paid sick leave policies established to insure health and care workers • Restrictions on access to mental health services suspended, such as the need for referral and requirements for disclosure in the workplace

Source: Adapted from Buchan, Williams & Zapata, 2021.

Policies to maximize the existing HCWF focused on creating regulatory flexibilities by modifying leave and work schedules

Greater legal and regulatory flexibilities likely allowed for changes to occur more easily. For example, some countries modified leave and work schedules to increase the short-term workforce capacity of health care systems (Buchan, Williams & Zapata, 2021; Köppen, Hartl & Maier, 2021; WHO, 2021b; Williams et al., 2020b). This was achieved through measures such as emergency legislation, for example by restricting or cancelling leave of absence, supported by policies and campaigns at the national or regional levels. Countries also created licensing and regulatory flexibilities to facilitate the movement of HCWs from regions of low to high health care demand (FSMB, 2022; NCSBN, 2022). In some cases, public-sector health systems directly redeployed HCWs to areas of higher need. In other instances, barriers such as registration or retraining requirements were relaxed to support easier transitions.

Legal and procedural provisions and licensing flexibilities supported increased entry of new HCWs

Countries often used a combination of strategies to surge capacity and recruit an emergency HCWF from students, retired and inactive workers, and foreign-trained HCWs. These strategies required modified legal and procedural provisions to graduate students early and expedite their entrance into practice (Williams et al., 2020b; Köppen, Hartl & Maier, 2021; WHO, 2021b). In **Slovakia**, the Ministry of Health expanded the legal definition of 'health profession' to include some health professions students and the national government approved the early start of internships for these students (OECD, 2021b). In **Peru**, residency requirements in targeted medical specialties were terminated to expedite trainee entrance into the HCWF (WHO, 2021b).

Licensing and credentialing flexibilities also facilitated retired and inactive workers reentering the HCWF. In **Australia**, former medical professionals whose registration had lapsed in the last three years were eligible to work under a one-year pandemic register (OECD, 2020b). In the **United States**, most states issued waivers that expedited licensure for inactive or retired physicians, nurses and other HCWs, often accompanied by licensing fee waivers (FSMB, 2022; NCSBN, 2022). In some cases, countries modified their immigration policies to facilitate the recruitment and retention of foreign health workers. However, these efforts should consider the ethical recruitment of international HCWs, including consideration for the impacts on LMIC (WHO, 2010).

Scope-of-practice policies and regulatory flexibilities supported HCWs, patients and caregivers in expanded roles

Prior to COVID-19, countries and their health systems were increasingly engaging with skill-mix innovations, including delegating tasks and expanding roles, moving care to new settings, empowering patients and caregivers, and establishing multi-professional teams. However, maximizing these skill-mix innovations was often hampered by regulatory barriers, scope-of-practice limitations, education and training, and insufficient funding and reimbursements to incentivize new models of care (Winkelmann et al., 2022).

During the pandemic, expanded scope-of-practice policies allowed HCWs to provide services previously outside their permitted scope. These policies were often matched with protections against liability in expanded roles. Examples include allowing community pharmacists to extend existing prescriptions and prescribe chronic disease medications in **France**, **Ireland**, **Portugal** and the **United States** (OECD, 2021b; Williams et al., 2020b); and expanding nurses' practice in primary care in **Scotland** by creating nurse consultations and allowing medication prescribing.

Where regulatory barriers for full scope of practice existed, many countries suspended limits such as supervisory requirements for advanced practice clinicians and limitations on task delegation in different settings. An example is the removal of physician supervision requirements for certified nurse anaesthetists and waivers of collaborative practice agreements for physician assistants in the **United States** (Ziemann et al., 2022a). Licensing and credentialing flexibilities also allowed HCWs to provide telehealth across borders and organizations (Fahy, Williams & COVID-19 Health System Response Monitor Network, 2021). Data protection and privacy rules were often relaxed to support rapid uptake of telehealth.

Additional policies allowed patients and caregivers to take on greater roles in their own care. These policies included waivers to allow caregivers to provide health care previously restricted to health professionals, and flexibilities to support self-management, such as allowing pharmacists to dispense injectable contraception for self-administration (DHCS, 2020).

Policies to support and protect HCWs focused on mitigating COVID-19 risks and supporting the ability to work

Countries introduced policies or programmes to universally screen HCWs to identify and track COVID-19 infections (WHO, 2021b, 2022b) and, when COVID-19 vaccines became available in late 2020, adopted policies and programmes to vaccinate HCWs as priority populations in their national vaccination plans (CDC, 2021; Palmer, Nemer & Menne, 2021; WHO, 2021b). Some countries issued mandates for the vaccination of HCWs. However, these COVID-19 vaccine policies also highlighted global inequities in access, as well as local challenges due to disparities and distrust, both broadly and within the HCWF, that require intentional communication and HCW engagement (Woolf et al., 2021).

These measures were facilitated by the enactment and/or enforcement of policies and occupational standards to, for example, provide workers with paid sick leave, procure and distribute adequate PPE, provide alternative accommodation, transportation and childcare, and classify COVID-19 as an occupational hazard for the purposes of providing HCWs with additional compensation or support (Long & Rae, 2020; Webb et al., 2020; Buchan, Williams & Zapata, 2021; WHO, 2021b).

Countries are just starting to address HCW mental health, safety and well-being

Countries have begun to implement additional policies to address HCW mental health, physical safety and well-being. For example, governments established helplines and services for mental health support and suspended regulations that act as barriers to mental health access for HCWs during COVID-19 (Williams et al., 2020a). In 2020, Italy enacted legislation requiring a national campaign around worker safety and respect, increasing incarceration penalties for violence against HCWs (Library of Congress, 2020). Similarly, the United States passed legislation establishing an education and awareness initiative to encourage the use of mental health services by health professionals, and funding programmes to address HCW mental health and well-being (Dr. Lorna Breen Heroes' Foundation, 2022). Managers and employers also had an important role in protecting the HCWF by providing training, monitoring PPE supply and demand, and ensuring a safe working environment.

Efforts to address HCW well-being have increasingly acknowledged the importance of addressing the organizational, system and policy drivers of burnout and moral distress and injury (Abdul Rahim et al., 2022; Murthy, 2022). For example, an important strategy in addressing burnout and moral distress and injury will be through organizational change to shift from hierarchical organizations to flatter organizations that empower HCWs to be part of decision making, such as through shared governance and Magnet organization models (Box 10). However, overall, most efforts still do not target these levels.

Box 10: The Magnet4Europe study is hoped to provide learning on how to improve hospital work environments in Europe

60 hospitals in Europe learn from Magnet-designated hospitals in the United States, which are their twinning partners

Magnet4Europe is a four-year Horizon 2020 EU-funded project that aims to improve mental health and well-being among health professionals in Europe. The project started in January 2020 and is taking place in over 60 hospitals in six European countries: Belgium, England, Germany, Ireland, Norway and Sweden. The aim is to implement and scale up the U.S. Magnet-Model® in Europe and evaluate its impact on nurses' and physicians' well-being and burnout. As the hospitals and health systems vary considerably between countries, the Magnet4Europe study will provide clues as to how best to transfer and implement the Magnet-Model®. A unique feature of Magnet4Europe is the one-to-one twinning; each European hospital has a twinning partner of a U.S.-Magnet designated hospital, which coaches the European hospital individually and supports it on its journey.

Magnet hospitals achieve high levels of job satisfaction and low turnover rates among their nurses

Magnet hospitals are certified by the American Nurses' Credentialing Center (ANCC), with nurses delivering excellent patient outcomes. They have high levels of job satisfaction and a low staff nurse turnover rate. This is achieved through interventions covering comprehensive, organization-wide changes, including: transformational leadership, structural modifications to empower staff, improving professional practice towards excellence, integrating new knowledge and innovation, as well as data and benchmarking to compare outcomes within and across hospitals.

Strategies for strengthening HCWF governance require a balance between regulatory and legislative flexibilities that support short-term innovation and creativity, and careful longer-term planning

COVID-19 clearly demonstrated that there is room to optimize the existing health workforce – and removal or relaxation of regulatory barriers were key to achieving this. Yet, in many cases, strategies implemented to boost HCWF capacity implemented during the pandemic were short-term policies that increased stress and burden on HCWs and may have negative effects on patient care and HCW retention. Resilient health systems must be integrated and adaptable, which will require pre-existing governance structures and cooperation strategies to both support any rapid implementation, as was needed with COVID-19 (Kruk et al., 2015), and also carefully planned and fit-for-purpose mechanisms and implementation design to support sustainability beyond emergency situations. Further investments in regulatory innovation and evaluation of different models can drive meaningful change.

3.2 Financial

The implementation of any strategy to strengthen the HCWF requires funding. As countries sought to recruit and hire additional workers, deploy in new roles, and develop support to protect HCWs, these strategies required both direct funding as well as changes in reimbursements to support new roles and new tasks.

Countries allocated additional funding to increase, optimize and protect the HCWF

Countries directly allocated funds to increase the number of HCWs through establishing registration systems, recruiting and training emergency HCWs, and hiring additional staff. In efforts to stabilize and retain HCWs, countries like **Germany** and **France** also provided increased financial support through salary increases and bonuses (OECD, 2021b; Scales & McCall, 2022). The **United States** provided funding for home and community-based services for the elderly and disabled, which many used to provide wage increases and bonuses to LTC workers in attempts to stabilize the workforce (O'Malley Watts, Musumeci & Chidambaram, 2020).

Funding was also needed to train and deploy HCWs in new roles; support training, equipment and infrastructure for HCWs to quickly increase their telehealth capacity; and to develop and implement programmes to address HCW mental health and well-being. In some cases, additional funding was directed to address HCWF needs in rural and underserved communities. **New Zealand** funded the Tautoko Rural initiative to support short-term locums and staff in rural practices and community-run hospitals (ASPE, 2022); and the **United States** increased funding for programmes that provide scholarships and loan repayment in exchange for service in underserved settings.

Enhanced reimbursements also aimed to support HCWs in new roles and in the use of telehealth

Strategies to optimize the HCWF also required reimbursement policies to support expanded services, in some cases provided by HCWs in new roles or by patients and caregivers. Reimbursement changes included adding eligible services and devices (e.g., RPM and pulse oximeters), provider types, health care settings, and modalities (e.g., audio-only telehealth).

3.3. Quality

The implementation of strategies to surge, optimize and protect the HCWF required rapid development of training, guidelines and the dissemination of evolving information to support the delivery of high-quality health care, particularly in the face of a novel pathogen that rapidly changes the conditions of health care delivery across the globe.

Strategies to surge and optimize require HCWF training and support, but COVID-19 often revealed health system deficiencies

Retired and redeployed HCWs needed to refresh skills. Reskilling (e.g., upskilling health workers to ICU, turning HCWs to public health tasks) and new models (e.g., tiered ICU teams, new roles, telehealth) required flexibility, training and resources. All workers needed access to evolving information on testing and treatment modalities, ranging from ventilation to medications and vaccines, and health care organizations needed information on best practices for staffing reconfigurations and HCW protections. Public and private organizations quickly developed training programmes, often utilizing e-learning platforms. Countries also developed online resource sites to disseminate developing practices and guidelines, and to connect health workers with COVID-19 resources (Williams et al., 2020a). In a rapidly evolving crisis, capturing evolving knowledge and practices, developing guidelines, and effectively disseminating credible information are critical to supporting HCWs and health care organizations.

The pandemic laid bare the deficiencies'of health professions training approaches that have long been fragmented, hyperfocused on medical specialization, and misaligned with practice requirements to meet public health needs (Frenk et al., 2010; WHO Regional Office for Europe, 2022a). Furthermore, health and education systems are often poorly integrated, hampering planning efforts and responsiveness to emergent demand for new skills and competencies (Kuhlmann et al., 2021).

Increased training and support for infection control were recommended even before the COVID-19 pandemic

COVID-19 presented a novel, highly infectious pathogen that rapidly stressed the capacity of existing health systems. As a result, HCWs needed rapid retraining in infection control and PPE. Countries responded with training sessions for HCWs on infection prevention and control, often facilitated by e-learning (WHO, 2022b). Even before the pandemic, the WHO '*Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Health Care Facility Level*' (WHO, 2016a) recommended the inclusion of infection prevention and control training in health facility education strategies, and more broadly recommended investments in education and training support, curriculum development and guidelines.

Additional guidelines and support are needed to address HCW well-being

Early in the pandemic, country efforts focused on scaling up the HCWF to meet acute demands. However, by the second half of 2021, attention turned to HCW mental health, burnout and moral injury. The consequences of burnout, moral distress and poor mental health among health workers are pervasive and alarming. They include reduced quality of care, increased medical errors and risks to patient safety, absenteeism, low productivity, turnover and attrition. Furthermore, there is concerning evidence that suggests burnout could be a contributing factor in increased rates of suicide observed among the HCWF (National Academies of Sciences, Engineering and Medicine, 2019). Major reports on addressing HCW mental health and burnout from the **United Kingdom**, **United States** and the WHO (Abdul Rahim et al., 2022; Department of Health and Social Care, 2022; US Department of Health and Human Services, 2022) were released and discussed the need to better track and

understand HCW well-being, allocate more resource towards HCW well-being initiatives, and develop the evidence base for effective interventions.

3.4. Technical

Countries' HCWF strategies to meet COVID-19 demands required technical capacity in a number of areas, from data and information systems to COVID-19 epidemiological monitoring and PPE procurement systems.

A responsive health and care workforce requires various data and information systems

In order to support immediate efforts to recruit and deploy retired, inactive and volunteer workers, countries required registration systems. Having such systems conferred an advantage. For example, some countries like **Belgium**, **France**, the **United Kingdom** and the **United States** leveraged existing medical reserve networks to identify and deploy voluntary workers in response to the pandemic (OECD, 2020b; Williams et al., 2020b; Doran, Hess & Andersen, 2022). The National Health Workforce Accounts were leveraged at the global level to develop planning tools, to estimate the numbers of HCWs that needed to be redeployed to increase COVID vaccination coverage and its cost (WHO, 2023). Coordination between health facilities and regional or national government on HCWF supply and demand data was required to deploy staffing and resources to areas of need. Training, timely information dissemination, new models of care, and deploying HCWs to areas of need also required countries to rapidly develop or enhance data and information systems. These systems involved bidirectional movement of information, e.g., identifying and collecting promising care or staffing models, and disseminating best practices and information back to organizations.

Protecting HCWs from COVID-19 required systems for testing and epidemiological monitoring, and vaccine delivery. Some countries introduced programmes to universally screen (non-symptom-based) cohorts of health workers to identify and track COVID-19 infections, and prioritize and deliver the COVID-19 vaccine to health workers (WHO, 2021b, 2022b). However, as noted previously, these technical responses require matched communication and HCW engagement efforts.

The lack of sufficient supplies of and access to high-quality PPE, such as N95 masks, for HCWs was of critical concern at the pandemic's outset. Shortages of PPE were reported globally, necessitating policies and guidelines to optimize limited supplies early in the pandemic. Responding to these insufficiencies, countries developed and implemented plans to monitor their PPE supplies, increase their stockpile of PPE – particularly N95 masks – and distribute them in sufficient quantities to HCWs (Hou et al., 2020; Buchan, Williams & Zapata, 2021; WHO, 2021b, 2022b; WHO Regional Office for Africa, 2021). Addressing HCW mental health and burnout requires measurement, such as **England**'s NHS staff survey, which was redesigned in 2021 to align with a culture of well-being (Gillam et al., 2020).

Successful strategies for strengthening HCWF technical capabilities require data and infrastructure, and the analysis capacities to utilize these appropriately

COVID-19 shone a spotlight on the limitations of existing HCWF data and support which created barriers to effective planning and response (Gillam et al., 2020; Chen et al., 2021). Furthermore, it also demonstrated the importance of data and technical systems in planning for and executing regular health care service delivery, HCW training and education, and HCW support. Efforts to optimize the HCWF require data and infrastructure**.** HCWF data, tracking and research down to local service areas is needed to inform planning, preparedness and response. Training, timely information dissemination and new models of care require development and maintenance of systems to facilitate information sharing, provide training, disseminate evidence-based practices, develop guidelines and act as a trusted source of information. Going forward, strengthening HCWF data and information systems is needed to inform emergency response as well as ongoing planning and policies.

5. Conclusions and policy considerations for the future

COVID-19 brought to light many persisting workforce challenges and underscored the importance of long-sighted policies to build a robust HCWF capacity

A fundamental lesson of the COVID-19 pandemic is that addressing the health workforce as a comprehensive and ongoing area of policy and planning can no longer be ignored. During the pandemic, much of the focus has been on increasing the number of workers. This is understandable, but the pandemic has also revealed that HCWF issues are broad, and planning needs complex, in order to develop a fit-for-purpose workforce that has the competencies, opportunities and courage to ensure that all people attain their full health potential. Despite the multifaceted and intensive efforts taken by countries and discussed in this policy brief, countries around the world continue to face insufficient HCWF capacities, and the deterioration of HCW well-being persists, demonstrating the prolonged health system shock of the pandemic and existing health system deficiencies. This underscores the importance of preparedness, starting point capacities, and maintaining a stable level of investment in the HCWF, especially in areas that are harder to scale up rapidly or have been undervalued historically, such as public health and LTC.

Moving forward, an adequate, agile and well supported HCWF is necessary not only in times of global crisis, but also to advance pre-existing and ongoing health care goals. These goals include reorienting health systems to primary health care to achieve UHC and meeting health targets for SDGs. COVID-19 represented a setback to these global aims, but also an opportunity to recommit to them with renewed dedication to the HCWF as any health care system's most valuable asset.

Short-term fixes implemented during the pandemic offer important lessons but not all of them are sustainable and they are not sufficient to address the underlying drivers of many HCWF challenges

Strengthening HCWF capacity will require sustained political will to build on what worked during COVID-19 in terms of increasing, optimizing, protecting and supporting the HCWF. Some measures were breakthrough models; others were not necessarily innovative, but the scale and speed of their implementation was unprecedented due to the unique circumstances of the pandemic, or were new to some countries if not others. Many of these solutions could and should be sustained in the future.

Other measures may also have helped to increase the size of the workforce in the early stages of the pandemic but had unintended negative consequences over time. Health care leaders and decision makers must recognize that some short-term fixes relied upon during the COVID-19 crisis are not sufficient for addressing the underlying, systemic drivers of many HCWF challenges, like shortages. Thus, the purpose of this policy brief was to sift through the HCWF strategies used by countries around the world in the hopes that, despite its tragic toll, one of the pandemic's legacies might be a deeper understanding of the problems faced by HCWs and some of the best strategies that can be used to address them. Building and sustaining a robust HCWF in the long term will require long-term investments in the recruitment of a diverse workforce; reskilling and optimizing HCW roles; leveraging digital technologies; a commitment to improving working conditions and job quality; and implementation of other evidence-based strategies to improve HCW retention.

Strengthening the HCWF in the long term hinges on political leadership and intersectoral planning

Many of the measures taken to surge, optimize and protect the HCWF during COVID-19 were only possible because they became a political priority. Presidents and prime ministers got engaged during the pandemic out of necessity, and their focus on health made whole-of-government commitments real, resulting in resources and solutions. To drive continued change and the development of a sustainable workforce, political leadership and commitment at all levels – from the international to the national, regional and local – will be key. The challenges facing the HCWF are immense and demand the highest-level political commitment and engagement to drive innovation forwards, secure financing and ensure engagement across sectors. While building the HCWF is a long-term commitment, it is central to decent health care and repays political commitment through promoting social cohesion, solidarity, and economic and health security.

Siloed approaches to HCWF strengthening are unlikely to result in meaningful change. Sustained efforts will require policies and investments predicated on collaboration between health, labour, education and other systems across the public and private sectors. As was observed during COVID-19, strong intersectoral collaboration is necessary to address the systemic and holistic factors that affect HCWF supply, but when poorly planned or executed, can result in further harms to HCWs and health systems, as was evidenced in some of the private-sector case examples presented in this brief. The companion policy brief *'What can intersectoral governance do to strengthen the health and care workforce?'* by Caffrey et al., 2023 in this series examines the intersectoral governance, planning and decision-making actions that will improve the education, employment and retention of the HCWF, in order to develop sustainable, effective solutions.

Changing scope of practice and ensuring an appropriate skill-mix is possible and necessary to meet population health needs

During the pandemic, HCWs have proven they are willing and able to perform new tasks and roles effectively, while many were granted additional autonomy they did not have previously. The health system needs to capitalize on these changes and adapt health sector practice so that it optimizes service delivery for patients. Revising how roles and tasks are shared by different professionals, strengthening multidisciplinary and team-based working, especially in primary care, and involving patients and their caregivers more in home-based prevention, care and support can all help deliver high-quality and patient-centred care.

These changes were only possible as they had agreement from health sector actors, such as professional bodies that may have resisted them in the past. Building on these innovations can only be sustained if health professional bodies continue to engage with change. In addition, it may be necessary for some countries to review the legislative framework that defines the space in which the HCWF operates and to ensure regulatory flexibility so the HCWF can adapt quickly as health systems evolve. High-quality training and education will also be needed to allow the HCWF to meet new responsibilities.

Increasing the use of digital health tools has been achieved and needs to continue

The unique circumstance of the pandemic saw dramatic increases in the use of digital health tools in countries of all income levels. Digital health tools – especially telehealth – allowed health systems to maintain services and helped with access during the pandemic; they also supported monitoring and surveillance, communication and engagement, and the rollout of vaccination programmes. Digital health tools hold enormous potential to improve the delivery of health care and patient outcomes, while reducing workloads and supporting and protecting the HCWF. To facilitate their continued use, countries need to continue to create an enabling environment for their use, including by ensuring the development of strategies and regulations, and investing in infrastructure. Efforts will also be needed to develop digital health competencies among HCWs.

Adequate compensation and working conditions are needed to achieve workforce stability and sustainability

The long-term health of the health workforce is dependent on creating fair pay and good working conditions, especially for lower-wage workers, in line with the ILO's 'Decent Work' agenda (ILO, 1999). The absence of fair wages and other working conditions meant that attrition was particularly acute among the lower-wage segments of the workforce. Countries are recognizing that to bolster their HCWF there must be more equitable pay; investments in education and training opportunities, as well as career advancement; access to basic health care and social services; and other support and protection measures.

Many of the strategies employed by countries during COVID-19 serve as strong examples of solutions that, if carried forward, could help with long-term HCWF retention. These include: strengthened biosafety protocols and on-demand access to adequate supplies and PPE; free mental health support; allowing HCWs to practice at the top of their licences and education; professional development and training; telework opportunities; and family-supportive services, such as childcare. Fundamentally, the worker perspective must be that which guides efforts to improve HCWF retention.

An equity and gender lens should be applied when developing HCWF policies

The COVID-19 pandemic shone a light on the outsize role women play, both on the frontlines of health care and the home front. Yet, they are underrepresented in health care leadership positions and decision-making bodies across sectors. Women in the HCWF bore the brunt of the pandemic's physical and psychological toll, in part due to their omission from intersectoral activities that directly affected HCW safety and well-being (for example, in manufacturing, the design and fit of PPE is usually based on a man's body). Ensuring that HCW policies adopt a gender-equity lens, promoting women to leadership roles, and closing the gender pay gap in the health sector will all be important in helping to address gender imbalances. In addition, the pandemic also demonstrated how intersectoral partnerships can support women in the HCWF and alleviate the recognized stressors they face, such as when multiple sectors contributed to childcare efforts.

Equity for HCWs must also guide HCWF policies. COVID-19 uncovered the disparities in experiences of HCWs from marginalized groups and the ongoing inequities in access to higher-wage health professions, which negatively impact needed trust and cultural understanding in health systems. Greater investments and accountability are required to advance diversity, equity and inclusion in the HCWF.

Investments in education and training are needed to ensure a robust HCWF

COVID-19 highlighted the immediate and ongoing need for a robust HCWF. Health workforce supply is predicated on the education and training pipeline. However, underinvestment in health professions education and training on the part of some countries, including high-income countries, had already resulted in inadequate numbers of graduates to meet national demands prior to the pandemic (Buchan, Catton & Shaffer, 2022; WHO, 2021a, 2022b). As the new skill-mix models and use of digital technologies are institutionalized, education and training will need to be adjusted, including review of admissions policies, curricula and support, to prepare students for practice.

HCWF investments require sufficient and stable financing

Strategic investments will be required to actualize the strategies to recruit, optimize and retain HCWs and advance equity in the HCWF. This will include investments aimed at: attracting young people in health careers – especially those from rural or disadvantaged backgrounds; improving HCWF efficiencies and bolstering the public health infrastructure and workforce; developing high-quality education programmes and ensuring they are equitably available; providing leadership opportunities for women; innovating in digital technologies; and supporting low-income and developing countries in strengthening their health systems and HCWF development. The companion policy brief *'What steps can improve and promote investment in the health and care workforce?'* by McPake et al., 2023 in this series will explore the funding mechanisms available to promote these investments.

Countries should capitalize on the lessons learned and progress achieved during COVID-19 to build a robust HCWF

The COVID-19 pandemic highlighted and exacerbated longstanding HCWF challenges that pose ongoing threats to health systems worldwide. Yet, it also forced a global reckoning and spurred rapid innovation and policy adoption, showing that change to and improvement upon the status quo is possible. We must capitalize on the resulting progress achieved and lessons learned to strengthen the HCWF, health systems, and the health and well-being of all, now and in the future.

Appendix 1

Example key word search term used in PubMed

Key terms used for PubMed searches fell under the following MESH subheadings:

"Workforce" (which includes "human resources for health")

"Health Workforce"

"Health Personnel"

"Pandemic"

"Coronavirus"

"Covid-19"

"SARS-COV-2"

"Developing countries"

"Civil defense"

"Disaster planning"

"Policy"

"Burnout, psychological"

"Occupational health"

"Health Equity"

These searches were supplemented by topic specific key terms/country terms as needed in both the scholarly and grey literature. Given the degree of specificity that was needed to tailor individual searches, there was wide variation in the terms used beyond those contained in the above list

Appendix 2

Table A1: Telehealth helped connect patients with providers, and the latter with other providers

	EXAMPLES OF TELEHEALTH MODALITIES USED FOR COVID-19	
	Synchronous/Real-time	**Asynchronous**
Patient-to-provider telehealth *Provision of health services at a distance; delivery of health services where clients/patients and health workers are separated by distance (WHO, 2019)*	• Real-time video and audio virtual visits were utilized across countries. In **France**, teleconsultations were billed by a diverse set of specialists, including general practitioners, psychiatrists, paediatricians, gynaecologists, dermatologists and endocrinologists (Richardson et al., 2020)	• Remote patient monitoring collects health data from individuals and electronically transmits the data to health care providers for management. In the **United Kingdom**, virtual wards included remote monitoring apps, wearables and technology platforms to support safe discharge home (NHS, 2022)
Provider-to-provider telehealth *Provision of health services at a distance; delivery of health services where two or more health workers are separated by distance (WHO, 2019)*	• Telehealth connecting providers in real time. In China, the Sichuan University hospital connected bedside physicians in subordinate hospitals with multidisciplinary teams via tele-ICU (Li et al., 2020) • Tele-mentoring models connect community providers with specialists to present cases and discuss treatment. In the United States, more than 9,000 nursing homes participated in the AHRQ ECHO National Nursing Home COVID-19 ACTION Network (AHRQ, 2021a)	• eConsult is an asynchronous consult using digital technology between providers. In Canada, COVID-19 vaccine allergy advice is available through the Ontario eConsult Service (Ontario eConsult, 2022)

Appendix 3

Table A2: Countries introduced various measures to protect the physical safety of health workers

Measure	Examples
Provision of PPE and guidance on its use	• The Republic of Korea established a working group to manage PPE supplies and an IT system to distribute 5.46 million public masks for 770,000 employees via LTC providers in a timely manner (OECD, 2021b). • After experiencing a shortage of PPE early in the pandemic, Bolivia, Chile, Columbia, Ecuador and Peru implemented measures to ensure sufficient procurement and distribution of supplies and guaranteed access for health workers. These countries took action to specify PPE funding sources, designate procurement and distribution agencies, and establish PPE surveillance committees (WHO, 2021b).
Training for health workers on infection prevention and control	• China: the National Health Commission provided infection prevention training for all medical staff responding to the initial COVID-19 outbreak in Wuhan (Liu et al., 2020). • Nigeria: 1051 health workers registered for COVID-19 e-training that enabled them to access up-to-date COVID-19 training modules and near real-time updates via any Android device (Otu et al., 2021).
Testing and epidemiological monitoring	• Colombia and Chile introduced regulations to test health workers every 15 days and to recognize COVID-19 as an occupational disease (WHO, 2021b). • Cyprus: Weekly testing for all working staff at Cyprus' LTC facilities using rapid antigen testing performed by 23 mobile testing units across the country (OECD, 2021a)
Isolation and reduced interactions	• Czechia and Iceland acted swiftly (2 and 6 March, 2020, respectively) to ban nearly all visits to care homes at the pandemic's outset (Curry & Langins, 2020). • In Israel, care home staff were only permitted to work in one facility for regular 12-hour shifts with the same personnel (Curry & Langins, 2020). • Lithuania was one of many countries to implement remote patient consultations. The country expanded the service to include doctor-to-doctor consultations between family physicians and specialists (Liseckiene, 2021).
Vaccination of health workers	• In the **United States**, the federal government required health and care workers to be vaccinated for COVID-19 in efforts to protect workers and patients in high-risk settings, such as nursing homes and hospitals. The mandate applied to employees at any health care facility that received federal reimbursements (CMS, 2021).
Protections from violence	• In September 2020, **Italy** enacted legislation to address violence against 'socio-health' professionals. The legislation directed the creation of a National Observatory on the Safety of the Health and Socio-Health Professions; required the national promotion and dissemination of information pertaining to worker safety and respect, including the establishment of a 'National Day of Education and Prevention against Violence' aimed at health and care workers; and introduced incarceration penalties ranging from 4–16 years for violence against health and care workers (Library of Congress, 2020).

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