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The economics of patient
safety Part IV: Safety
in the workplace:
Occupational safety as the
bedrock of resilient health
systems

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OECD Health Working Paper No. 130 The Economics of Patient Safety Part IV: Safety in the Workplace

Occupational safety as the bedrock of resilient health systems

Katherine de Bienassis,* Luke Slawomirski,* and Niek Klazinga*

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The Economics of Patient Safety

Part IV: Safety in the Workplace

Occupational safety as the bedrock of resilient health systems



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Key Messages

Chapter 1:

- In OECD countries, the health and social care systems now employ **more workers than ever before**. In 2017, over 1 in 10 jobs were in the health or social care sectors.
- Health care settings are inherently hazardous places, with very unpredictable and complex working environments. The stakes are high, and working conditions are often stressful. In some countries, **the likelihood of sustaining occupational injury in health care ranks among other high-risk industries**, such as mining or construction. Health care settings face high job turnover, high job dropout rates, and high levels of absenteeism.
- The main types of workplace injury and harm in health care settings include infection, interpersonal violence, physical injury, and mental ill-health. **These hazards and risks not only result in a range of injuries and ill-health among workers but also jeopardise the safety of patients.**
- Improving worker well-being has intrinsic value, but it also **lowers the costs** of occupational harm (estimated at up to **2% of health spending**) and contributes to minimising patient harm (estimated at up to **12% of health spending**).

Chapter 2:

- The COVID-19 crisis has brought **renewed attention to the occupational hazards of health workers**, as countries have faced staffing shortages, lack of appropriate training, and shortages of personal protective equipment (PPE).
- Health workers have been overrepresented in terms of **COVID-19 infections and mortality**, as well as **physical and mental strain** caused by the demands of the ongoing COVID-19 crisis.
- **A sufficient, and capable, workforce, is the foundation of resilient systems.** Policy makers need to focus now on how to build and support an appropriate workforce to respond to future shocks. This includes health workers beyond the hospital—including those in community, long-term, and primary care.

Chapter 3:

- Investment in promoting health worker safety **simultaneously addresses two sources of avoidable expenditure in health care systems**. This super-additive effect means that much can be gained from placing healthcare worker safety within a patient safety governance and policy framework.
- A focus on **working conditions and culture** should form the backbone of strategies and efforts to improve occupational safety and well-being for those working in health care. This is underpinned by the right policy and regulatory environment.

- While some aspects of health care will always require strict protocols, rules, and standardisation, many will perform better under a model that **empowers workers**, giving them and their colleagues agency and capacity (within limits) to adapt how they carry out their tasks.
- There is potential for improvement in patient safety and quality of care by **aligning clinical risk management with corporate and professional risk**. Foundational and structural domains such as culture, communication and governance influence procedural domains, which in turn affect the health and well-being of workers, as patient outcomes. **Measures of worker safety** are a valuable compliment to current commonly used health care quality metrics.

Chapter 4:

- Countries should adopt policies that enable a flexible workforce with appropriate safeguards, thus putting parameters around local adaptability. The health workforce needs to be supported through **concrete policy actions and appropriate resources**. This includes not only resources highlighted during the COVID-19 pandemic—such as PPE, testing, and vaccination—but also legal protections, access to psychological support, and services to promote employee well-being.
- A system that has built-in elements of **adaptive capacity** is much more likely to withstand, and prove resilient, in the face of a crisis. An adaptive approach needs workers to be furnished with the skills and knowledge to deploy change in their own environments. Teams must also have access to information to successfully plan, implement and assess improvement initiatives.
- Promoting well-being and safety in the workplace—**beyond preventing harm**—provides scope for proactive strategies that create adaptability and resilience. This perspective also aligns with important upstream determinants such as leadership, a positive working environment and a supportive culture, which determine success in other aspects of health system performance.

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Abstract

Patient harm is the 14th leading cause of the global burden of disease; available evidence suggests that 15% of hospital expenditure and activity in OECD countries can be attributed to treating safety failures. Adverse events occur in about one in ten hospital admissions, and it is estimated that every adult in the United States will experience a diagnostic error at least once during their lifetime. In addition to patient harm, **health care settings can be unsafe places for health workers, who experience a number of harms, including exposure to infectious disease, physical harm (accidents, injury, and violence), and psychological harm (burn out, depression).**

The recent COVID-19 crisis has amplified the importance of ensuring that the care that is provided is safe—for patients and health workers alike. The **COVID-19 crisis has brought renewed attention to the occupational hazards of health workers**, as countries have faced staffing shortages, lack of appropriate training, and shortages of personal protective equipment (PPE). Numerous countries have now labelled COVID-19 as an occupational disease. In Italy, which faced one of the most acute outbreaks, as much as 10% of all COVID infections were those of health workers. For many patient safety events, there are second victims, health workers who are involved in adverse events who experience negative personal and professional repercussions. Research in the US have found that health workers who experience a high-impact patient event (i.e. an adverse patient safety event) are more likely to leave their job, creating high turnover costs for hospitals and other health settings.

The COVID-19 situation is emphasizing the need for safety at the work place, whilst at the same time requiring more flexibility in the size and nature of the health care workforce. A flexible workforce, with appropriate worker protections, is required to address the need for upscaling and downscaling of specific health care services such as ICU capacity, safety policies in nursing homes with COVID-19 cases, and capacity for tracking of personal contacts by municipal public health offices.

However, to date, analysis of the economic impact of patient safety has largely excluded the costs of safety issues that affect health workers, which adversely affect staff leave, turnover, and productivity. Salaries for health care staff are one of the top cost inputs of health across reporting OECD countries. **Improving safety not only improves patient outcomes, but it also improves the bottom line for health systems**, both by reducing costs spent on treating adverse events and by decreasing staff costs associated with them. In particular, the current pandemic has highlighted the need for strong and resilient safety governance beyond the hospital, and the importance of ensuring safe working environments for workers in the long-term care and ambulatory care settings with continuous investment in staff competences, safety and numbers.

The safety of both patients and health workers should be protected through appropriate mechanisms to ensure the safety of protective equipment and sufficient supplies, appropriate staffing levels, training and support at the workplace. These governance mechanisms will become even more relevant when policy makers face trade-offs between health, safety and economic concerns.

Résumé

Les préjudices causés aux patients arrivent en 14^e position pour leur contribution à la charge de morbidité totale ; les éléments disponibles donnent à penser que 15 % des dépenses et de l'activité hospitalières dans les pays de l'OCDE résulteraient d'un défaut de maîtrise des risques. Environ une hospitalisation sur dix donne lieu à un événement indésirable, et l'on estime que chaque adulte aux États-Unis fera l'objet d'une erreur de diagnostic au moins une fois dans sa vie. Outre les préjudices causés aux patients, **les établissements de soins peuvent être des lieux dangereux pour ceux qui y travaillent également, en raison de l'exposition à différents risques, qu'ils soient infectieux, physiques (accidents, blessures, actes de violence) ou psychologiques (épuisement professionnel, dépression).**

La crise du COVID-19 est venue rappeler dernièrement combien il est important que les soins soient prodigués dans un environnement sûr – pour les patients comme pour les professionnels de santé. **Cette crise a suscité un regain d'attention pour les risques professionnels auxquels les soignants sont exposés**, quand les pays se sont retrouvés avec un personnel en sous-effectif, dépourvu de formation adéquate et manquant d'équipements de protection individuelle (EPI). Nombre d'entre eux reconnaissent désormais le COVID-19 comme une maladie professionnelle. En Italie, pays qui a dû faire face à des vagues épidémiques particulièrement violentes, pas moins de 10 % des cas de COVID ont été recensés parmi le personnel de santé. Les atteintes à la sécurité des patients font bien souvent des victimes collatérales en la personne des soignants mis en cause, qui en subissent les conséquences sur les plans personnel et professionnel. Il est ressorti de recherches conduites aux États-Unis qu'un professionnel de santé impliqué dans un incident grave (c'est-à-dire un événement portant atteinte à la sécurité du patient) sera plus susceptible qu'un autre de quitter son poste, ce qui génère des coûts de remplacement élevés pour les hôpitaux et autres établissements de soins.

La pandémie de COVID-19 accentue le besoin de prêter attention à la sécurité sur le lieu de travail, tout en exigeant une plus grande souplesse dans les effectifs et la composition du personnel de santé. Cette souplesse, doublée de garanties adaptées, est rendue nécessaire par les pics et creux d'activité dans différents services, par exemple les unités de soins intensifs, l'application des protocoles sanitaires dans les établissements de long séjour où des cas de COVID-19 se sont déclarés et le suivi des cas contacts par les services de santé municipaux.

À ce jour toutefois, les analyses des retombées économiques liées à la prise en compte de la sécurité du patient méconnaissent dans une large mesure les coûts induits par les problèmes de sécurité touchant les soignants, qui affectent les congés, la rotation des effectifs et la productivité de ces professionnels. La rémunération des agents est l'une des principales composantes du coût de la santé dans les pays de l'OCDE ayant communiqué des données sur le sujet. **Améliorer la sécurité est bénéfique non seulement pour les patients, mais aussi pour le bilan des systèmes de santé**, à travers la diminution des coûts induits par le traitement des événements indésirables et celle des dépenses de personnel connexes. La pandémie actuelle a notamment montré qu'il fallait une gouvernance solide et résiliente de la sécurité au-delà des hôpitaux et qu'il était important de garantir un environnement de travail sans risque aux employés des établissements de soins de longue durée et des structures de soins ambulatoires par

des investissements soutenus en faveur du développement de leurs compétences, de leur sécurité et du renforcement de leurs effectifs.

La sécurité des patients et de ceux qui les soignent devrait être protégée par des mécanismes propres à garantir la fiabilité des équipements de protection et leur fourniture en quantité suffisante, de même que la présence d'effectifs appropriés, dûment formés et bénéficiant d'un accompagnement adéquat sur le lieu de travail. Ces mécanismes de gouvernance se révéleront encore plus utiles lorsque les pouvoirs publics devront trouver un compromis entre santé, sécurité et considérations économiques.

Abriss

Patientenschäden stehen unter den Ursachen der weltweiten Krankheitslast an 14. Stelle. Den vorliegenden Daten zufolge sind 15 % der Krankenhausausgaben und -aktivitäten im OECD-Raum auf Sicherheitsdefizite zurückzuführen. Bei etwa jeder zehnten Hospitalisierung kommt es zu unerwünschten Ereignissen. Schätzungen zufolge ist jede*r Erwachsene in den Vereinigten Staaten mindestens einmal im Leben von einem Diagnosefehler betroffen. Doch nicht nur die Patient*innen können Schäden erleiden. **Einrichtungen der Gesundheitsversorgung bergen auch Gefahren für ihr Personal. Die Mitarbeitenden können sich z. B. mit Infektionskrankheiten anstecken, Verletzungen erleiden (etwa durch Unfälle oder Gewalt) oder psychisch erkranken (Burnout, Depression).**

Die COVID-19-Krise macht in besonderem Maße deutlich, wie wichtig es ist, eine sichere Gesundheitsversorgung zu gewährleisten – für die Behandelten ebenso wie die Behandelnden. Der Mangel an Personal, dessen teils unzureichende Ausbildung und die Engpässe im Bereich der persönlichen Schutzausrüstung **lenkten in der COVID-19-Pandemie erneut die Aufmerksamkeit auf die Gefahren am Arbeitsplatz, denen Gesundheitskräfte ausgesetzt sind.** In vielen Ländern wurde COVID-19 inzwischen als Berufskrankheit eingestuft. In Italien, das von der Pandemie besonders hart getroffen wurde, entfielen 10 % aller COVID-19-Infektionen auf Gesundheitskräfte. Bei vielen unerwünschten Ereignissen für die Behandelten gibt es „Second Victims“ unter den Behandelnden: Mitarbeitende des Gesundheitssektors, für die diese Ereignisse persönlich oder beruflich negative Konsequenzen haben. Forschungsarbeiten aus den Vereinigten Staaten zeigen, dass Gesundheitskräfte, die ein für ihre Patient*innen schwerwiegendes unerwünschtes Ereignis erleben, mit größerer Wahrscheinlichkeit aus dem Beruf ausscheiden. Dadurch entstehen Krankenhäusern und anderen Gesundheitseinrichtungen hohe Nachbesetzungskosten.

COVID-19 macht Sicherheit am Arbeitsplatz noch wichtiger und erfordert zugleich mehr Flexibilität, was den Umfang und die Art des eingesetzten Gesundheitspersonals betrifft. Um die Kapazitäten in bestimmten Bereichen, z. B. in den Intensivstationen, bei Bedarf hochzufahren und anschließend wieder herunterzufahren, den Infektionsschutz in Pflegeheimen mit COVID-19-Fällen zu gewährleisten und die Kontaktnachverfolgung durch die Gesundheitsämter zu ermöglichen, bedarf es flexibler, ausreichend geschützter Mitarbeitender.

Dennoch wurden die Kosten von Sicherheitsdefiziten mit Folgen für die Beschäftigten, die sich negativ auf Fehlzeiten, Personalfuktuation und Produktivität auswirken, in Analysen des ökonomischen Effekts der Patientensicherheit bislang weitgehend ausgeblendet. Die Löhne und Gehälter der Mitarbeitenden des Gesundheitswesens sind in den OECD-Ländern, die Daten dazu bereitstellen, einer der wichtigsten Kostenpunkte. **Mehr Sicherheit zahlt sich nicht nur für die Patient*innen aus, sondern auch für die Gesundheitssysteme insgesamt,** denn dadurch verringern sich sowohl die Ausgaben für die Behebung der Folgen unerwünschter Ereignisse als auch die damit verbundenen Personalkosten. Die aktuelle Pandemie zeigt insbesondere, wie dringend notwendig es ist, ein starkes und belastbares Sicherheitsmanagement außerhalb der Krankenhäuser sowie ein sicheres Arbeitsumfeld für Beschäftigte in der Langzeitpflege und in der ambulanten Versorgung zu gewährleisten. Dazu bedarf es kontinuierlicher Investitionen in die Zahl der Mitarbeitenden, ihre Kompetenzen und ihre Sicherheit.

Um die Sicherheit der Behandelten und der Behandelnden zu gewährleisten, braucht es geeigneter Mechanismen für sichere Schutzausrüstung, ausreichendes medizinisches Material und eine angemessene Ausstattung mit gut geschultem und unterstütztem Personal. Diese Mechanismen sind besonders wichtig, wenn politisch Verantwortliche gesundheitliche, sicherheitsbezogene und wirtschaftliche Anforderungen miteinander in Einklang bringen müssen.

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Acronyms

AE	Adverse event
AHCA	American Health Care Association (United States)
AMA	American Medical Association
ARC	Aged Residential Care Facilities
COVID-19	Coronavirus Disease 2019
CMS	Center for Medicare and Medicaid Services (United States)
EASE	Acute Stress of Health Professionals Caring COVID-19 Scale
ED	Emergency department
EU	European Union
HAI	Health care acquired infection
ICU	Intensive care unit
ILO	International Labour Organization
LTC	Long-term care
NSI	Needle stick injury
OECD	Organisation for Economic Cooperation and Development
OHS	Occupational health and safety
QoL	Quality of Life
SVS	Second Victim Syndrome
NCAL	National Center for Assisted Living (United States)
PPE	Personal protective equipment
PS	Patient Safety
PSC	Patient Safety Culture
WHO	World Health Organisation

1 A safe health care workplace is the foundation for a high-quality, sustainable health system

Protecting health workers from harm has both intrinsic and instrumental value. A safe workplace is a basic right, and minimising occupational hazards is a core responsibility of any public or private sector health organisation. However, in the context of patient safety, protecting health workers has an important spillover effect because it is impossible to deliver the safest possible care in an unsafe environment. Put simply, any risks to health worker safety also heighten the risk of patient harm, and a safe workplace is the bedrock of a well-functioning health system.

1. Patient safety and quality of care continue to be a global policy priority, with a series of recent international reports highlighting the extent of patient harm, its health and economic consequences, and the comparatively modest investment needed to improve the situation (Slawomirski, Auraaen and Klazinga, 2017^[1]; Slawomirski, Auraaen and Klazinga, 2018^[2]; de Bienassis, Llana-Nozal and Klazinga, 2020^[3]). However, patients are not the only ones who may experience harm in a health system. The people providing care also face many hazards and risks in their workplace.

2. The world has approximately 60 million health workers who are routinely exposed to a variety of health and safety hazards as part of their job. These hazards range from exposure to infectious agents

and chemicals, radiation, noise, heavy lifting, long-periods of standing, long working hours, bullying and stressful work. Exposure to these hazards can result in number of physical, mental and emotional harms such as infection, physical injury, burnout and depression. The results can range from reduction in productivity, to permanent disability and even suicide (Joseph and Joseph, 2016^[4]).

3. The COVID-19 crisis has amplified the nexus between patient and health worker safety. It has renewed attention on the occupational hazards of workers, as countries have faced staffing shortages, lack of appropriate training, and shortages of personal protective equipment (PPE). Numerous countries have now labelled COVID-19 as an occupational disease. For example, in Italy approximately one in ten people infected was a health worker (Kartal, 2020^[5]).

4. This report explores the causes, consequences, and preventive measures of occupation harm to health workers. It comprises four chapters. After a section describing the growing volume and the changing nature of health work, Chapter 1 describes the risks and hazards faced by health workers, then examines the main types of occupational harm in health care, their prevalence and economic costs. It then goes on to explore in more detail the underlying conditions that contribute to failures in maintaining occupational safety and protecting health workers from harm.

5. Chapter 2 explores health worker safety in the context of the COVID-19 pandemic, which has exerted great pressure on health system, highlighting many of the occupational hazards and harms experienced by health workers. Chapter 3 examines how occupational safety in health care can be improved, focusing on governance and sustainability of health worker safety. Chapter 4 summarises the key themes and messages of the report and attempts to chart a way forward for health worker safety.

Box 1.1. Key terms/ definitions

Health worker: An individual who is engaged in promoting, protecting or improving the health of a population. This includes delivering health care and services to the sick and ailing either directly as a nurse, doctor or allied health professional (e.g. pharmacist, occupational- or physiotherapist) or indirectly as aides, helpers, laboratory technicians, and medical waste handlers (Joseph and Joseph, 2016^[4]; Dal Poz et al., 2007^[6]).

Harm: The “impairment of structure or function of the body and/or any deleterious effect arising therefrom, including disease, injury, suffering, disability and death. Harm may be physical, social or psychological” (WHO, 2011^[7]).

Safety: The ability for a system perform its intended purpose while at the same time preventing harm to individuals, and the result of decisions, policies and actions of all individuals and institutions that interact with the system (Provan et al., 2020^[8]).

Occupational harm: Harm originating in a person’s workplace and/or resulting from working conditions and hazards.

Occupational Safety and Health (OSH): The science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment (Alli, 2008^[9]).

Patient safety: The reduction of risk of unnecessary harm associated with health care to an acceptable minimum. An acceptable minimum refers to the collective notions of current knowledge, resources available and the context in which care was delivered and weighed against the risk of non-treatment or alternative treatment (WHO, 2018^[10]).

Patient safety culture as defined by the European Society for Quality in Healthcare, is a pattern of individual and organisational behaviour, based upon shared beliefs and values that continuously seeks to minimise patient harm, which may result from the process of care delivery **Invalid source specified..**

Adverse event: The term “adverse event” describes harm to a patient as a result of medical care or in a health care setting, including the failure to provide needed care. An adverse event indicates that the care resulted in an undesirable clinical outcome not caused by underlying disease. We separately identify temporary harm events, which are events that harmed patients and required medical intervention but did not cause lasting harm (OIG, 2018^[11]).

Adaptive capacity: This refers to the conditions that enable people to anticipate and respond to change, and recover from and minimise the consequences of change (Adger and Vincent, 2005^[12]).

The cost of failure: Estimating the costs of safety lapses. Costs are quantified in terms of disease burden (morbidity and mortality), and financial and resource impact on the health care system.

Health workers make up a growing proportion of the workforce

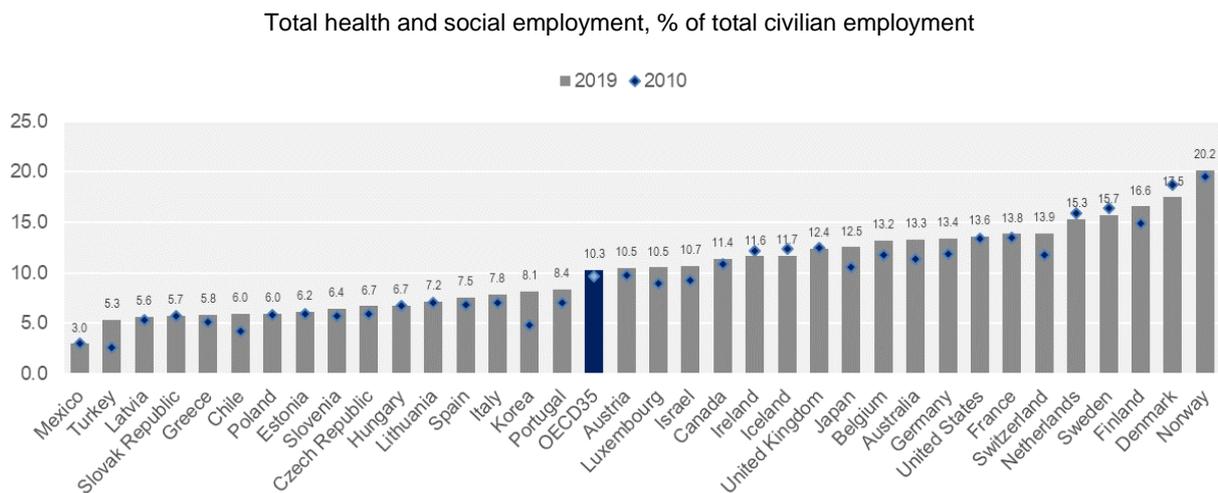
6. Outside the home, the workplace is where a significant proportion of people spend the majority of their time. Workers in all industries face occupational hazards and are occasionally harmed in their workplace. The WHO estimates that in 2015 more than 1.2 million deaths were attributable to occupational risks globally, representing 2.1% of all deaths and 2.7% of the global disease burden (WHO, 2018^[13]).

7. Health care employs a considerable and growing proportion of the world’s workforce. Occupational hazards in the health industry have proliferated. Technological progress, demographic changes and higher community expectations -- in tandem with growing costs and limited budgets -- have broadened the range of physical and psychological factors that jeopardise the health and well-being of health workers. Workloads and work pressures are greater. The resulting workplace injuries and occupational harms impart considerable costs on health systems and societies more broadly.

Health and social care employ a growing proportion of people

8. Projections suggest that by 2030 global demand for health workers (including physicians, nurses, midwives and other health occupations) will rise to 80 million workers — double the total number of available health workers in 2013 (Liu et al., 2016^[14]). In OECD countries, the health and social care systems now employ more workers than ever before. In 2019, over one in ten jobs were in the health or social care sectors (Figure 1.1.). In a number of countries, such as Norway, Demark, Sweden, Finland, and the Netherlands, health and social services account for more than 15% of all jobs.

Figure 1.1. Share of health and Social Employment in total employment (selected OECD countries)



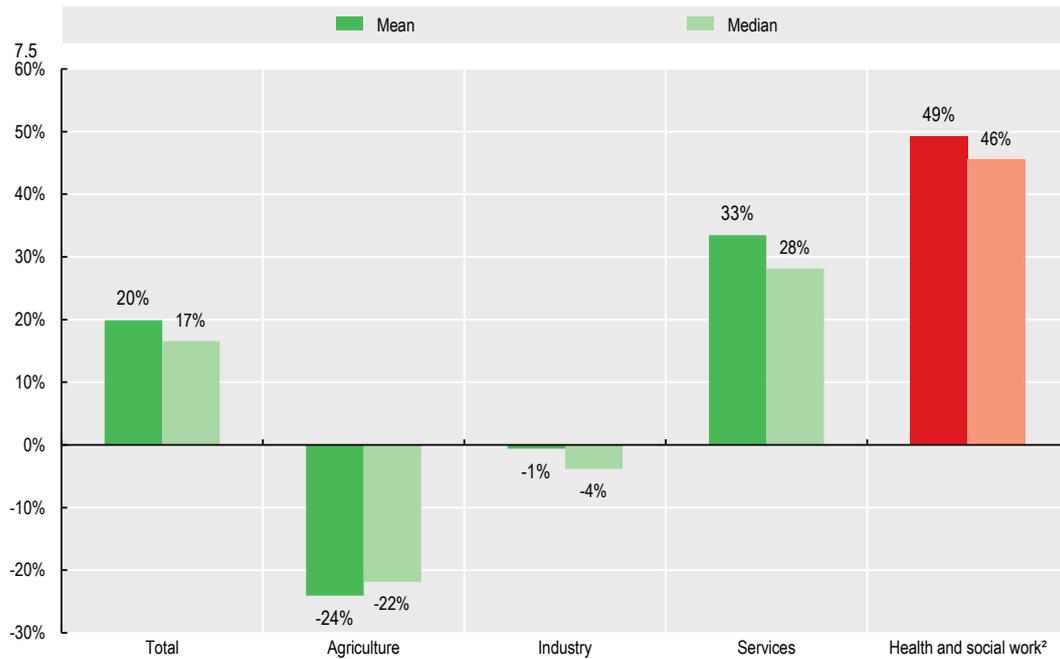
Source: OECD Health Statistics 2021

9. European Union data from 2015 suggest that, on average, more than half of employment in the health and social sectors are in the field of health (57%), with the remaining shares equally distributed between the long-term care (LTC) and social work sub-sectors (21% and 22 %) (ILO, 2017^[15]). Within health, the top three most commonly held positions are nurses, midwives, and other medical associates (19.1%), followed by personal care workers (17.0%), and medical doctors (7.5%). Almost half (45%) of LTC workers in OECD countries work on a part time basis, double the average share in the economy as a whole. Across OECD countries, one in five LTC workers and over one in ten hospital workers have short term contracts. (OECD, 2020^[16]).

10. The number of jobs in the health and social sector has increased at faster than in other sectors since 2000. On average across OECD countries, employment in the health and social sector increased by 49% between 2000 and 2019, more than double the average growth across all sectors (see Figure 1.2). Most national projections anticipate continued trends in growth in the health care and social work. In the United States, the Bureau of Labour Statistics projected that employment in the health care and social work sector would be the fastest growing work sector between 2019 and 2029, with health occupations

holding 6 out of the 10 fastest growing jobs (BLS, 2020^[17]). In Australia, occupations in health and social work are also expected to increase rapidly by 2025, with a projected increase of 15% of health professionals and an increase of 25 % for personal care workers (LMIP, 2021^[18]). In Canada, projections carried out prior to the COVID-19 pandemic foresaw an increase of 8 % across all health occupations by 2028, including an increase of over 10 % in registered nurses (Government of Canada, 2017^[19]).

Figure 1.2. Employment growth by sector, OECD average, 2000-19 (or nearest year)



1. Average of 32 OECD countries (excluding Chile, Colombia, Iceland, Korea, New Zealand and Turkey).

2. Health and social work is classified as a sub-component of the services sector.

Source: OECD National Accounts, Health at Glance 2021

Worker safety is important in its own right and the benefits flow over into other organisational objectives

11. Workers in any industry have a number of rights, including the expectation that work should take place in a safe and healthy working environment – a core tenet of occupational health and safety (OHS) (Alli, 2008^[9]). Article 23 of The Universal Declaration of Human Rights states that “Everyone has the right to work, to free choice of employment, to just and favourable conditions of work and to protection against unemployment” (UN, 1948^[20]). This was affirmed by the International Covenant on Economic, Social and Cultural Rights, from 1976, which emphasises the right of all workers to “safe and healthy working conditions” (UN, 1976^[21]).

12. While it is universally agreed that no one should be harmed by their work, the health care environment presents a number of unique occupational hazards and risks (Wu et al., 2020^[22]). These hazards and risks not only result in a range of injuries and ill-health among workers but also jeopardise the safety of patients.

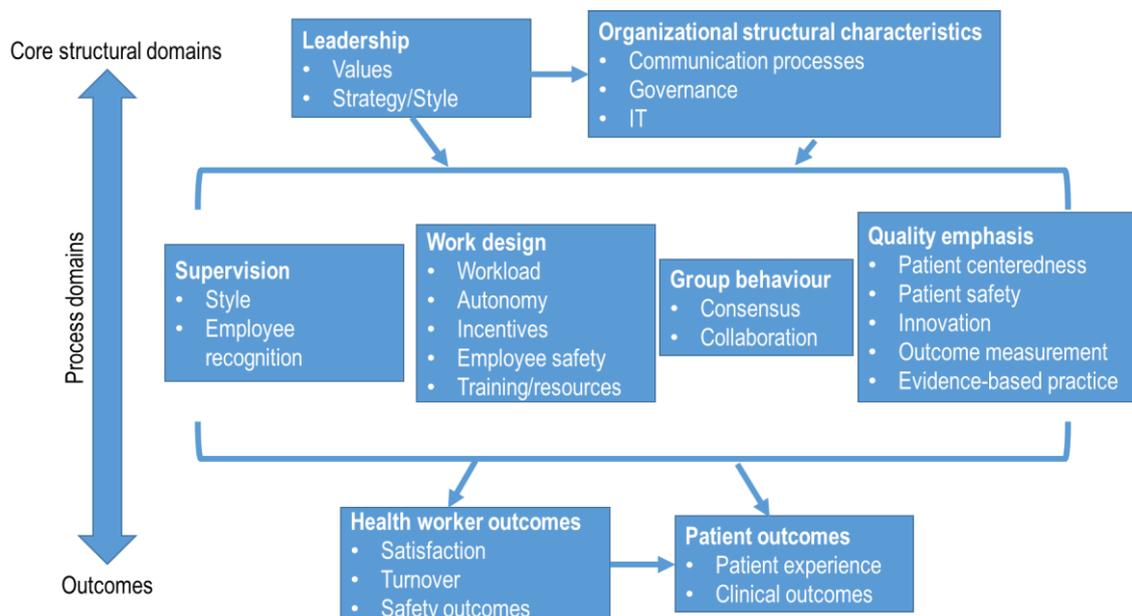
Patient- and worker safety are closely related

13. Patient harm is among the leading causes of the global burden of disease. Evidence suggests that over 10% of all health care expenditure in OECD countries can be attributed to treating safety failures (Slawomirski, Auraaen and Klazinga, 2017^[23]; Slawomirski and Klazinga, 2020^[24]). Adverse events occur in about one in ten hospital visits, and it is estimated that every adult in the United States will experience a diagnostic error at least once during their lifetime (Balogh et al., 2015^[25]).

14. Discussions on health care harm have traditionally separated patient safety and worker safety. But this division may be flawed, as the two are inextricably linked (Wåhlin et al., 2020^[26]). Staff working conditions and occupational safety influences how well health workers can perform their tasks and work as a team. This affects standards of care and patient safety. Burnout among nurses is a predictor of medication errors, for example (Montgomery et al., 2020^[27]). Health systems aiming to reduce patient harm must therefore seek to improve both patient and worker safety simultaneously (The Joint Commission, 2012^[28]).

15. Figure 1.3. presents a conceptual model describing how organisational factors can influence the occupational climate for workers *and* clinical outcomes of patients. For example, leadership, communication and governance affect several process domains including work design, quality and group behaviour, which impact both patients and workers alike.

Figure 1.3. An Integrative Model of Health Care Working Conditions on Organisational Climate and Safety

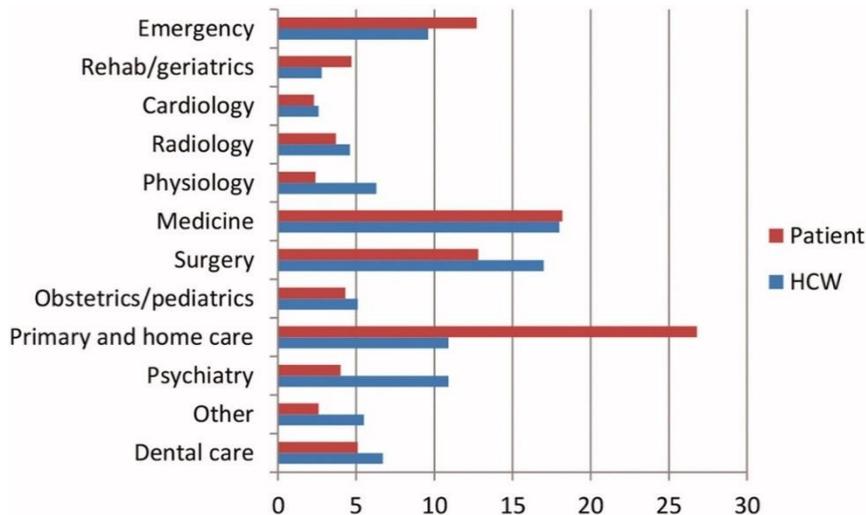


Source: Adapted from (The Joint Commission, 2012^[28])

16. Empirically, worker safety and patient safety appear closely related, with strong associations established in numerous studies, meta-analyses and systematic reviews (Loeppke et al., 2017^[29]). Research in Sweden suggests that settings with high levels of patient safety events often correspond to high levels of health worker injuries (see Figure 1.4.), with patients present in 75% of the incidents and injuries involving health workers (Wåhlin et al., 2020^[26]). This suggests that risk assessments and process

improvements should consider both health worker safety and patient safety together to promote safe and effective health care environments.

Figure 1.4. Percentage of patient and HCW incident reports by setting



Source: (Wählin et al., 2020^[26])

Note: Percentage based on N = 1702 health workers incident reports and N = 11,006 patient incident reports. Missing information on reporting clinic in 45 patient incident reports.

Health workers can be profoundly affected by patient harm

17. Health workers involved in adverse events can often experience serious negative personal and professional repercussions. The term ‘second victim’ (see Box 1.2) was first coined in 2000 to reflect common conceptions in medicine that health worker mistakes were largely based on individual incompetence, rather than organisational structures that require systemic improvements (Wu, 2000^[30]).

Box 1.2. The second victim

‘Second victim’ is used to describe health care providers who are involved in an incident where a patient is harmed during their care, and are affected and sometimes traumatised as a result (Scott et al., 2009^[31]).

While the term implies that first victims are patients and their loved ones, it is not without controversy. A recent editorial in the BMJ called for ending the use of the term, which the authors argue avoids responsibility and “promote[s] the belief that patient harm is random, caused by bad luck, and simply not preventable” (Clarkson et al., 2019^[32]).

This has been supported by focus group research from Ireland suggesting that the term victim, as used in second and third victim, may undermine the harm experienced by patients and their families (Tumelty, 2018^[33]). However, at this time there is no consensus among second victim researchers and supporters regarding a consistent alternative for the term, though “secondary trauma,” “wounded caregiver,” and “wounded healer” have been proposed (Wu et al., 2020^[34]).

18. Estimates suggest that nearly half of all health workers experience Second Victim Syndrome (SVS) (also termed second victim distress in some cases) in their career—and approximately 30% of health

workers experienced an adverse event in the previous year (Marmon and Heiss, 2015^[35]). Common emotional responses experienced as part of SVS include guilt, anxiety, re-living the event, again and again, tiredness, insomnia, persistent doubts about what to do in each case and whether clinical decisions are correct, and difficulties concentrating in work (Mira et al., 2015^[36]).

19. Health workers who were involved in adverse events also reported feeling doubts regarding informing patients, colleagues and managers about what happened, fear of the legal consequences, and concerns about a loss of standing (Mira et al., 2015^[36]). A study of surgeons in the US found that risk factors for SVS included burn-out, less experience, resident status, female physicians, those who feel unrewarded or overwhelmed, or those who feel an imbalance between career, family and personal growth (Marmon and Heiss, 2015^[35]). Research in the US has found that health workers who experience a high-impact patient event are more likely to leave their job, creating high turnover costs for hospitals and other health care settings. Second victim distress was significantly associated with turnover and absenteeism (Burlison et al., 2016^[37]).

20. The first principle of addressing SVS is reducing adverse events, promoting physical and emotional health, and improving the safety culture of the organisation (Marmon and Heiss, 2015^[35]). Mitigation and support may also be provided in the case of adverse events that do occur (see box 1.3).

21. Studies of medical trainees and physicians have found that less than half felt that they were adequately supported at their hospital or practice when involved in an adverse event (Seys et al., 2013^[38]). A study of Belgian hospitals found that over half of surveyed hospitals had procedures in place to provide second victim support; however, further analysis of these plans found poor adherence to existing best practice guidelines (Van Gerven et al., 2014^[39]). Survey results from Spain found that 71 % of participating hospital workers reported a lack of protocol to support second victims, with 45% of workers noting that there was no assigned contact person for professionals involved in adverse events (Mira et al., 2015^[40]).

22. A systematic review of interventions to ameliorate the effects of adverse events on health workers concludes that support needs to be provided not only immediately following an adverse event but also in the middle- and long-term in order to maximize the benefits of support (Seys et al., 2013^[38]).

Box 1.3. Examples of programmes to support the second victim

In **Spain**, a set of recommendations has been developed by Segundas y Terceras Víctimas (a collaboration of health professionals from 8 autonomous communities) to provide an appropriate response to adverse events with support for second and third victims. This includes recommendations and a number of checklists of actions and algorithms for health care managers on topics related to safety culture, open disclosure, and provision of support for second victims (Second and Third Victim Research Group, 2015^[41]). This work has been complimented by the development of the Mitigating Impact in Second Victims (MISE) website, an online program directed at frontline hospital and primary health care professionals that raises awareness and provides information about the second victim phenomenon (Mira et al., 2017^[42]). Efforts in Spain to adapt resources to COVID-19 are discussed in Box 2.4.

In the **United States**, Johns Hopkins Hospital instituted the RISE (Resilience in Stressful Events) peer support programme. After experiencing an adverse event, health workers are matched with a peer responder who provides psychological first aid (PFA) and emotional support. The intervention also provides information on organisational resources, such as the employee assistance programme and community counselling (Edrees et al., 2016^[43]). The RISE program has since been replicated in more than 80 U.S. hospitals (Wu, Connors and Everly, 2020^[44]). Other examples include the creation of a system-wide Second Victim Rapid Response Team at the University of Missouri Health Care (Scott et al., 2010^[45])

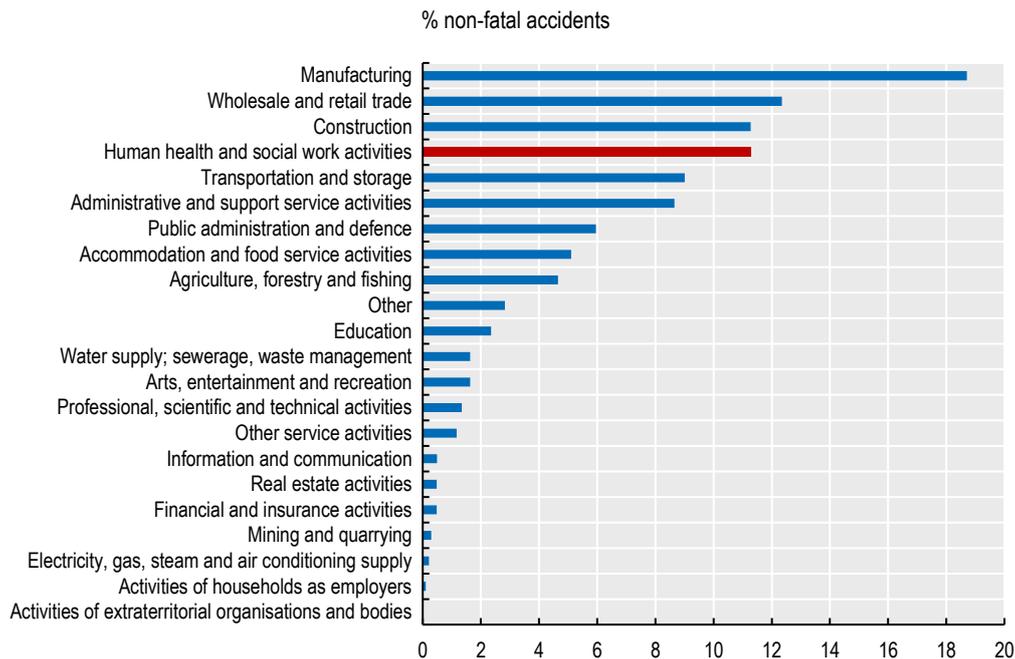
In **Germany**, a support program called [PSUakut](#) has been created for healthcare professionals working in acute care, focusing on prevention, training, crisis intervention and research in the field of psychosocial support in the health sector. Resources include access to a help-line and peer support services.

The health care industry can be a hazardous setting to work in

23. Health care settings are inherently hazardous places, with very unpredictable and complex working environments. The stakes are high, and working conditions are often stressful. Organisational cultures can be complex, tribal and hierarchical. Together, these factors create hazards and heighten the risk of occupational harm. Health professionals operate under principles that aim to promote patient health and well-being, such as the Hippocratic Oath to “do no harm”, the Nightingale Pledge for nurses, or the Galien oath for pharmacists. This can sometimes mean that health workers may put their patients’ interests over their own safety, despite the close link between the two.¹

24. While workplace fatalities are typically less common in health care settings than in other high-risk occupations, such as construction, transportation, and manufacturing, workers in the health and social work sector accounted for 11% of all non-fatal workplace injuries in European Union countries in 2017 (Figure 1.5.) (Eurostat, 2020^[46]). The main types of workplace injury and harm in health care include infection, interpersonal violence, physical injury as well as mental ill-health.

¹ Notably, the Hippocratic Oath is silent on looking after the practitioner’s own health and well-being.

Figure 1.5. Non-fatal accidents at work by NACE section, EU-28, 2017

Note: non-fatal (serious) accidents reported in the framework of ESAW are accidents that imply at least four full calendar days of absence from work. Ranked on the values for fatal accidents.

Source: (Eurostat, 2020^[46])(online data codes: hsw_n2_01 and hsw_n2_02)

25. There is variation across countries and type of workers. In the United States, health care is now the most unsafe work environment in terms of occupational injury—nurses are injured at three times the rate of construction workers (Loeppke et al., 2017^[29]) (Dressner and Kissinger, 2018^[47]). In Germany, the accident rate in 2019 was 60.5 accidents at work per 1,000 full-time workers in the construction industry and 16.5 accidents at work per 1,000 full-time workers for the health and social services (BAuA, 2019^[48]).

26. Workers in LTC may experience particularly poor outcomes. Research has found that workers in the LTC sector exhibited lower self-reported health—corresponding to 13 months of aging—when compared to jobs in other sectors. While workers entering the LTC sector were found to be generally healthier than those in other sectors, their health deteriorated rapidly once they began their roles. The authors conclude “that LTC jobs may be harmful to one’s health” (Rapp, Ronchetti and Sicsic, 2021^[49]).

27. These occupational hazards contribute to higher rates of illness-related absence as opposed to other sectors. In 2019, employees in the health care sector in the Netherlands had the highest absenteeism rates of all sectors—with flu, colds and psychological complaints named as the leading causes of missed work (Hoogte and Brocken, 2020^[50]). Similar findings from the NHS in the UK show that average annual sickness absence rate of workers is almost double the average rate across the public sector (Moberly, 2018^[51]).

Too many health workers are exposed to infections on the job

28. Health care-acquired infections (HAIs) are a major patient safety concern. On average, across OECD countries, almost 5% of hospital patients had an HAI from 2015-17. In some countries, such as Portugal, Greece and Iceland, the rate of HAI surpasses 7% (OECD, 2019^[52]). Due to the nature of their work, health workers are routinely exposed to pathogens and work under an ever-present risk of ‘occupational infection.’ The risk of respiratory infections is especially high, particularly for those who

perform high-risk procedures or those who care for severely ill patients (WHO, 2018^[13]). Research in the Netherlands found that health workers who work in shifts are particularly vulnerable, contracting respiratory infections at a rate 20% above health workers who work non-shift hours (Loef et al., 2018^[53]).

29. Epidemics highlight the seriousness of the infection hazard. During the SARS epidemic of 2003, health workers accounted for 21% of global cases (WHO, 2004^[54]). Liberia saw more than 8% of its health workers killed by Ebola from 2014-16, compared to 0.11% of its general population (Evans, Goldstein and Popova, 2015^[55]). A recent report estimated that around one in twenty COVID-19 hospitalisations were health workers, and almost a third of these cases were severe and needed intensive care (Kambhampati et al., 2020^[56]).

30. In addition, health workers are potential disease vectors and can infect patients. A 2013 review identified 152 hospital-acquired infection outbreaks with a health worker as a source of infection. These were mainly associated with surgery, neonatology, and gynaecology departments. Transmission mainly occurred via direct contact, with physicians and nurses each responsible for about 40% of the outbreaks. The most frequently encountered pathogens were hepatitis B virus, *Staphylococcus aureus*, and *Streptococcus pyogenes* (Danzmann et al., 2013^[57]).

31. Several interventions have been found to be effective in reducing the occupational risk of respiratory infections for health workers. These include immunisation, administrative controls (triage, hygiene policies, special separations), engineering controls (systems for ventilation and sterilization), and the provision of appropriate PPE.

32. Vaccination of health workers has reduced influenza-related mortality in the elderly in long-term care facilities and hospitals (Carman et al., 2000^[58]; Potter et al., 1997^[59]). However, there are reports that health workers are under-immunised. While the recommended proportion of immunised workers is 90%, the vaccination rate in the United States is reportedly 75% (Binder and Favret, 2017^[60]).

Physical injuries are common among nursing staff

33. Health workers are exposed to several potential physical injuries caused by the setting and nature of their work, ranging from falls to back injuries, overexertion, and needle-stick injuries (NSI). Nursing staff experience most of this type of workplace injury. A Swedish study covering hospitals, primary health care, home care, psychiatric care, and dental care found that nurses and nursing assistants accounted for 3 out of 5 workplace injuries across all settings (Wåhlin et al., 2020^[26]).

34. Most health workers are at risk of sharps injuries including NSI and other injuries to skin or mucous membrane. Up to 80% of health workers suffer a sharps injury and are thus exposed to several serious pathogens including HIV, and Hepatitis B and C (Elseviers et al., 2014^[61]). Systematic reviews have identified numerous factors associated with NSIs, including age, education level, workload, and level of training and experience (Motaarefi et al., 2016^[62]).

35. The nature of their job also exposes many health workers to several musculoskeletal injuries, including work requirements such as lifting and manual handling (Reme et al., 2014^[63]). Other workplace factors, such as adverse schedules, limited job control and heavy workloads have also been associated with increased risk of injury (Reme et al., 2014^[63]). Activities that nurses undertake daily, including frequent lifting, are associated with the development of chronic back pain (Holtermann et al., 2013^[64]). A systematic review of musculoskeletal disorders for nurses in hospitals, long-term care facilities, and home health care found that an average of 65% of nurses reported lower back pain over their lifetime, including 55% within the last year and 35% at the time of the study (Davis and Kotowski, 2015^[65]).

36. The prevalence of health issues related to work varies by sector. For example, workers in LTC experience higher rates of physical injuries than in the hospital sector. Across OECD countries, more than half (64%) of LTC workers suffer from physical risk factors (OECD, 2020^[16]).

Violence against health workers is a unique and ever-present concern

37. Violence and abuse are major problems in health care. Health workers will frequently be required to manage agitated or combative patients or visitors, and are 16 times more likely to experience violence in the workplace as compared to other service workers (Lanctôt and Guay, 2014^[66]). Studies of common workplace injury in health care found that threats and workplace violence were the second most commonly experienced injury (Wåhlin et al., 2020^[26]). Over three quarters of health workers in Bulgaria, 67% in Australia, and 60% in Portugal report to have experienced physical violence in the previous year (Lanctôt and Guay, 2014^[66]).

38. Violence against health workers is most common in EDs and psychiatric settings, but is also common in geriatric long-term care facilities (Groenewold et al., 2018^[67]). A study of 106 hospitals in the United States found that nurses and nursing assistants were most affected by violent events compared to other occupations (Groenewold et al., 2018^[67]).

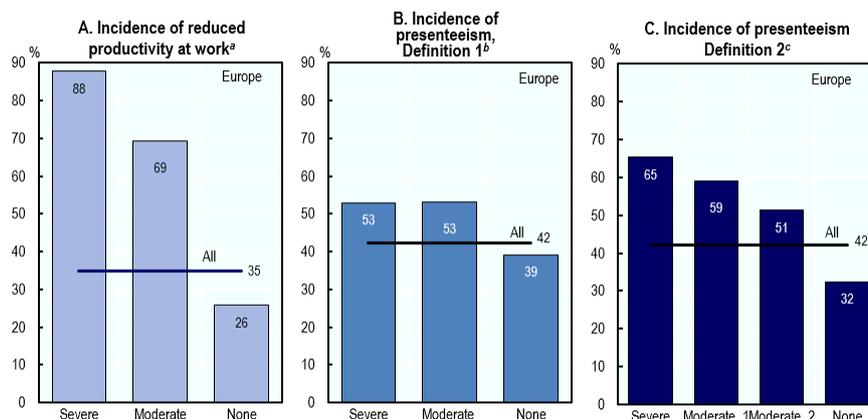
39. A systematic review examining the impacts of workplace violence for health workers found a number of consequences, including physical, psychological, and emotional harms—as well as lower productivity, quality of care, and financial implications (Lanctôt and Guay, 2014^[66]).

Health workers report high rates of mental ill-health

40. Mental ill-health poses one of the greatest social and labour market policy challenges for OECD countries (OECD, 2012^[68]). Depression and anxiety have a significant economic impact on societies; estimates suggest the cost of lost productivity due to these conditions is as much as USD 1 trillion per year globally (WHO, 2019^[69]). Estimates of the impacts of mental ill-health have been estimated at costing 3-4% of gross domestic product in the European Union (OECD, 2012^[68]). In any sector, mental ill-health reduces worker satisfaction, engagement and productivity (see Figure 1.6)

Figure 1.6. Workers suffering from mental ill-health who attend work show less productivity

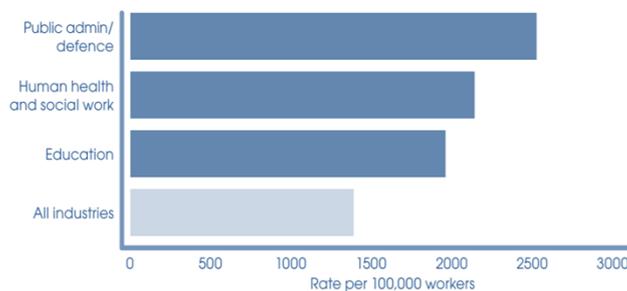
Average incidence over a selection of European countries, 2010



Note: a. Percentage of workers not absent in the previous four weeks but who accomplished less than they would have liked as a result of an emotional or physical health problem. The data are an average of the 21 countries in the 2010 Eurobarometer.
 b. Definition 1: The mental disorder variable is based on a set of five items: feeling cheerful; feeling calm; feeling active; waking up fresh and rested; feeling fulfilled. The data are an average of the 24 countries in the 2010 European Working Conditions Survey.
 c. Definition 2: This mental disorder variable is based on 3 answers to the question, “Over the past 12 months, did you suffer from any of the following problems: depression or anxiety; overall fatigue; insomnia or general sleep difficulties?” The data are an average of the 24 countries in the 2010 European Working Conditions Survey.
 Source: OECD estimates based on the Eurobarometer 2010 for Panels A and D, and the European Working Conditions Survey 2010 for Panels B and C.

41. Work in the health and social care sectors has been associated with high prevalence of stress, depression and anxiety. The rates are almost a third higher than the average across all industries based on research in the United Kingdom (see Figure 1.7.). Across, OECD countries, on average almost half (46%) of all LTC workers are exposed to mental health risks (OECD, 2020^[16]). Risk of psychiatric illness among physicians is high, with suicide rates reported to be 5-7 times that of the general population (Ventriglio, Watson and Bhugra, 2020^[70]). As discussed on page 23, health workers can also experience serious negative psychological effects of adverse events on the patients they care for ('second victim syndrome').

Figure 1.7. Industries with higher-than-average rates of stress, depression or anxiety, averaged 2016/17–2018/19



Source: (HSE, 2019^[71])

42. While most data on the mental health of health workers relies on self-reporting, Korean research using claims data found that use of health services was higher among health workers, who displayed higher prevalence of mental health conditions than employees in other industries. The conditions included mood disorders, anxiety disorders, sleep disorders and other psychiatric disorders (Kim et al., 2018^[72]).

Workplace and labour conditions are important drivers of occupational safety

43. The conditions faced by health workers can influence the hazards and risks they face. This section examines three important drivers of occupational safety: workload and working hours; skills and skill mix; and the labour market and contractual conditions.

Workload and long working hours pose fundamental safety risks... to both patients and workers

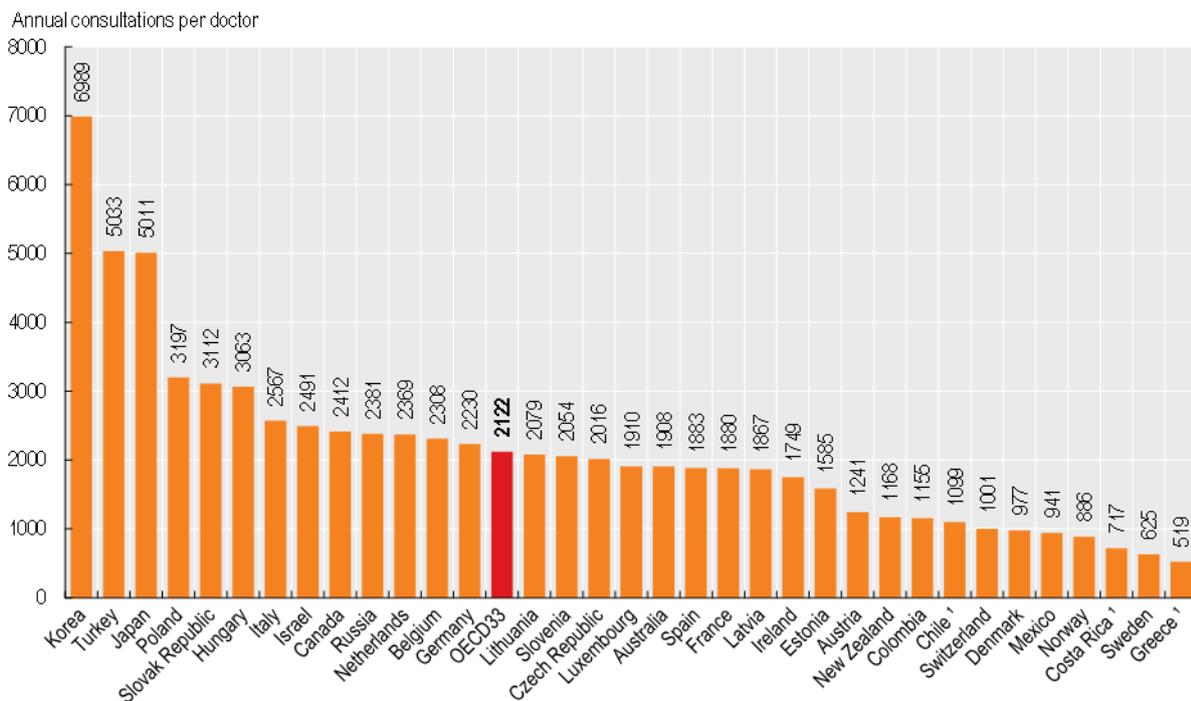
44. Providing high-quality health services is a complex endeavour. Many health services need to provide continuous care, 24 hours a day and seven days a week. This poses a significant challenge for the organisation of working time arrangements. Reconciling these demands with worker health, safety and productivity as well as organisational performance and patient outcomes is difficult. The result is, most often, that health workers are asked to manage heavy workloads, odd hours, and multiple competing priorities—leading to safety risks for both patients and workers.

45. Heavy workloads are common in health care, despite their association with occupational harm *and* with lower care quality. Shift work, night work, and extended hours are common practices within the health services sector across countries (ILO, 2017^[15]).

46. Shift work has safety implications for both health workers and the patients they care for. Twelve-hour shifts, for example, are increasingly common in the hospital sector, but have been associated with higher levels of job-dissatisfaction, burnout, and employee turnover (Dall’Ora et al., 2015^[73]). Half of all LTC workers work in shifts across OECD countries (OECD, 2020^[16]). Among nurses, shift-work was shown to be a potential risk factor for increased psychiatric morbidity and low quality of life (Selvi et al., 2010^[74]). Shift-work also has an impact on sleep disruption demonstrated by the higher risk of sleeping while driving to or from work (twice the odds) and on accidents or errors related to sleepiness (twice the odds) (Gold et al., 1992^[75]). Shift work also has implications for patient safety, as important care information may not be communicated appropriately during staffing changes. Recent findings from assessments of the safety of handoffs and transitions in OECD countries found that only 51% (Portugal) to 32% (Belgium, UK (Scotland)) of hospital staff across OECD countries thought that transitions were adequate to ensure patient safety (OECD, forthcoming^[76]). Risks of shift work can be potentially reduced, and employee well-being improved, through design interventions that have been shown to be effective in other sectors, for example, switching from slow to fast rotation, from backward to forward rotation, or self-scheduling (Saint-Martin, Inanc and Prinz, 2018^[77]).

47. Personnel shortages in health care can be compensated by increasing staff overtime, extending shift lengths and reducing the rest time between shifts (ILO, 2017^[15]). Health workers in OECD countries often face overly heavy workloads. Doctors in OECD countries perform, on average, over 2,000 consultations per year (Figure 1.8) Doctors in some OECD countries (Korea, Turkey, and Japan) conduct over 5,000 consultations annually. The heavy workloads placed on health workers can cause stress, burnout, and lower health care quality.

Figure 1.8. Estimated number of consultations per doctor, 2019 (or nearest year)



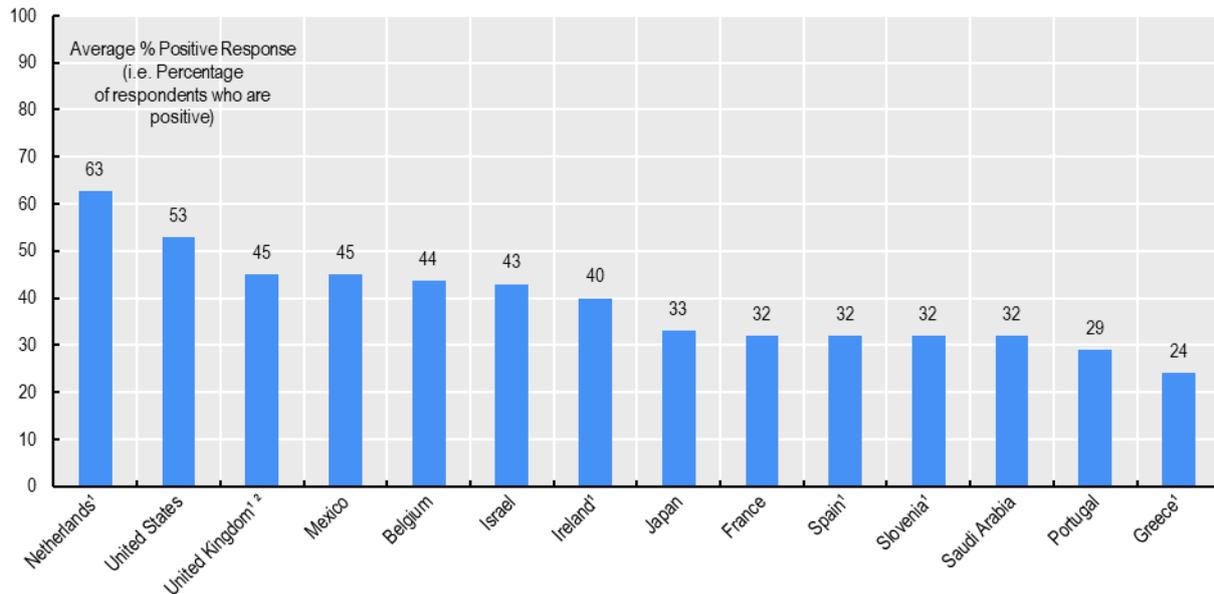
1. In Chile, Costa Rica and Greece, data for the denominator include all doctors licensed to practice.

Source: OECD Health Statistics 2021

48. International comparisons of health worker perceptions of patient safety, using the Hospital Survey for Patient Safety Culture, have found that in many countries, the majority of staff do not think that there

are enough staff to handle the workload and that work hours are appropriate to provide the best care for patients. Countries where the fewest health workers had a positive perception of staffing levels include Japan (33%), France (32%), Portugal (29%), and Greece (24%) (OECD, forthcoming^[76]) (Figure 1.9).

Figure 1.9. Health workers perceptions on the adequacy of staffing for ensuring the best care for patients.



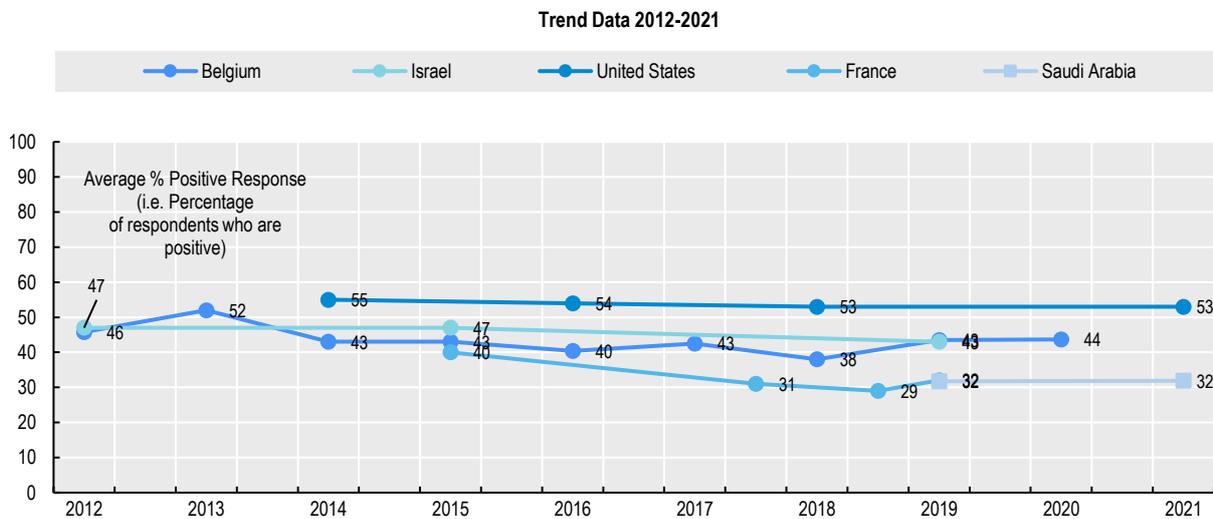
1. Data older than 2015, 2. Scotland.

Source: OECD Patient Safety Culture Pilot Data Collection 2021 (OECD, forthcoming^[76])

Note: Definition of Staffing: There are enough staff to handle the workload and work hours are appropriate to provide the best care for patients.

49. Tracking this same indicator over time, shows that perceptions of inadequate staffing have remained relatively stable from 2012-2021, for countries for which there have been multiple rounds of data collection. (OECD, forthcoming^[76]). The most recent data, from the United States, shows that only 53% of surveyed health workers felt that there was enough staffing to ensure safe care for patients, with findings at 43% for Israel and Belgium, and 32% in France.

Figure 1.10. Health workers perceptions on the adequacy of staffing for ensuring the best care for patients, trends over time.



Source: OECD Patient Safety Culture Pilot Data Collection 2021, (OECD, forthcoming^[76]).

Note: Definition of Staffing: There are enough staff to handle the workload and work hours are appropriate to provide the best care for patients.

50. A study across nine European countries found that increasing a nurse's workload by one patient increased by 7% the likelihood of an inpatient dying within 30 days of admission (Aiken et al., 2014^[78]). A Korean study found similar results, where each additional patient per nurse was associated with a 5% increase in the risk of patient death within 30 days of admission (Cho et al., 2015^[79]). In some specific sectors, such as burns care, adding an additional patient per nurse was found to increase mortality by as much as 30% (Bettencourt et al., 2020^[80]).²

51. Working overtime increases the likelihood of making errors regardless of the duration of the shift. Nurses working on a shift over 12.5 hours have a risk three times higher to make mistakes (Rogers et al., 2020^[81]). Research has found that these adverse events are primarily associated with factors such as workload, sleep disruption and a lack of detachment from work (Tucker and Folkard, 2012^[82]). A study in an acute care setting in the United States found that burnout among nurses was a statistically significant predictor of medication error (Montgomery et al., 2021^[83]).

52. Reducing working hours reduces harm to patients and health workers. A study reported that a reorganised clinical work schedule comprising shifts no longer than 16 hours and weekly hours up to a limit of 65 hours was associated with a 30% decrease in medical error (Tucker and Folkard, 2012^[82]). Moreover, the association of long work hours and poor health outcomes for workers is well studied. 2021 research from the WHO and ILO estimates that approximately 745,000 deaths from stroke and ischemic heart disease were linked to long working hours (i.e. more than 55 hours a week) in 2016 (Pega et al., 2021^[84]).

53. Finally, in addition to staffing levels, the right mix of personnel is also important in achieving optimal workload and care quality. Some evidence suggests that excess ward staff increases the risk of inpatient mortality (see pg. 29) and that non-clinical roles, such as ward managers, play a pivotal part in improving working conditions and safety (Slawomirski and Klazinga, 2020^[24]). In the end, the optimal nurse-to-patient

² The right staffing mix is also important in achieving optimal workload and care quality. Some evidence suggests that excess number of ward staff increases the risk of inpatient mortality (Slawomirski and Klazinga, 2020^[24]). In the end, the optimal nurse-to-patient ratio depends on the context of the given facility or organisation.

ratio is difficult to prescribe and depends on the context of the given facility or organisation. In an institution where registered nurses spent less time with patients, the nurse-to-patient ratio did not have a strong bearing on patient safety outcomes (Johnson-Pawlson and Infeld, 1996^[85]).

Imbalance in skills and competencies can constitute risks for occupational health ... and patient safety

54. Education, vocational training and skill development are central to productive employment in the health sector. Health workers often require specialized education in order to perform necessary tasks and to delivery high quality, safe care. For example, less experience as a registered nurse correlates with increased risk for needle stick and sharp injuries (Cho et al., 2013^[86]).

55. Moreover, an appropriate skill-mix, involving multiple competencies and abilities, is needed to respond to care needs in an efficient and effective manner. Rapid technological development and an increasingly older population, with more complex care needs, has amplified the need for a skilled, responsive health care workforce. The 2010 Lancet Commission for Education for Health Professionals in the 21st century noted a growing mismatch of professional competencies to patient and population priorities due, in part, to fragmented, outdated education systems that produce poorly equipped graduates. These systemic challenges in workforce education have contributed to staffing shortages and skill-mix imbalances (Frenk et al., 2010^[87]).

56. Optimising skill-mix across a clinical team has been shown to result in better quality care as well as worker quality of life and job satisfaction when associated with favourable environmental conditions (Koopmans, Damen and Wagner, 2018^[88]). A review found that a mix of all levels of nurses has a positive impact on patient outcomes, as well as on nurse outcomes, as evidenced by the significantly lower turnover when in the presence of a richer registered nurse skill mix (Griffiths et al., 2014^[89]).

57. Task shifting has been increasingly used as a policy response to lower health care costs. But responsibility for clinical activities must only be delegated to other health professionals if this does not extend beyond their qualifications and competence and does not result in inferior outcomes. Re-assignment of tasks must occur within a suitable risk management framework with adequate supervision and support, and monitoring of outcomes (WHO, 2008^[90]) (Malterud, Aamland and Fosse, 2020^[91]). Otherwise the savings can be outweighed by the costs of harm.

Labour market policy can influence worker- and patient safety

58. Micro-economic policies underpin much of occupational safety, and patient safety, in health care. Labour policy, such as promoting casualization of the workforce, increases hazards and risks including disease infection and transmission. Non-full time staff (including casual staff, zero-hours contracts, and temporary agency workers) may work across several health care facilities, potentially acting as 'super-spreaders' of a pathogen among other staff and patients. They are also not incentivised to stay at home if unwell, further increasing the risk of spread. Casual workers may also be insufficiently trained in occupational safety and health protocols due to several economic and contractual restrictions. Credentialing requirements may be lower for casual staff, for example, and investing in their training costs money in the short term. On the side of the worker, a lack of remuneration for participating in safety training is a potential barrier, as is a lack of time spent at any one place of work.

59. Paid sick leave can serve as a mechanism to reduce disease transmission among staff and patients, and has been shown to reduce the risk of outbreaks in long-term care (DeRigne, Stoddard-Dare and Quinn, 2016^[92]). Almost half the OECD countries have temporarily expanded or initiated paid sick leave policies to provide improved support to eligible employees in case of contracting COVID-19 (OECD, 2020^[93]).

60. Behavioural solutions to regulatory policy issues are another important element beyond more training, leave, or time off (OECD, 2017^[94]). As health care workers are often under time pressures and overworked, this can create a breeding ground for issues with cognitive overload, bounded rationality and will power. There is potential for the use of policies inspired by behavioural insights to address behavioural barriers and biases and how they may affect performance and safety culture. Behavioural approaches recognize that more training doesn't always solve the problem, particularly for workers who are cognitively overloaded and time poor. These approaches have explored in the financial and energy sectors, in addition to the health sector, and aim to provide workers with the right information (not too much), at the right time (point of decision making), and in the right format (easily digestible) (OECD, 2020^[95]).

61. To maximise worker safety, individual health care organisations and facilities need a policy and regulatory environment that incentivises the right behaviours. Policy makers and regulators need to consider the corporate and contractual conditions of the health care labour market as important drivers of safety for workers and patients. The COVID-19 pandemic has illustrated the importance of labour market conditions in managing the spread of the virus, especially in long-term care (see Chapter 2 for more discussion on COVID-19).

Organisational culture influences the well-being and productivity of workers

62. The link between workplace culture and the well-being, efficiency and productivity of workers is felt across all industries. Organisational culture, for example, is at the heart of industrial relations that has been credited with the decline of the United States car-manufacturing giant General Motors in the 1980s and 1990s, and the corresponding rise of Japanese firm Toyota and its contrasting approach to employer-employee relationships (Helper and Henderson, 2014^[96]).

63. In health care, a culture of safety is a key part of the healthy work environments that enable staff to consistently deliver high-quality and safe health care services (de Bienassis et al., 2020^[97]). In fact, creating a healthy work environment for health worker and improving the quality and safety of care are mutually reinforcing.

64. Health care systems and organisations with strong safety cultures have been shown to provide better provider-patient communication throughout the care process and may reduce health care errors (Vincent and Coulter, 2002^[98]). Key domains of safety culture have been found to be critical for improving aspects of safety in health care settings, such as the improvement of adherence to reporting standards (Itoh et al., 2002^[99]). Previous reports from the OECD have noted the importance of a 'just culture' for safety reporting that focuses on organisational learning and improvement instead of on blaming and shaming individuals (OECD, 2018^[100]).

Staff injuries, work environment, and safety culture

65. A growing evidence base suggests links between safety culture and occupational harm. A number of studies have found that poor safety climate is associated with increased work-related injuries, including studies in Scotland, the United States, and Costa Rica (Gimeno et al., 2005^[101]; Agnew, Flin and Mearns, 2013^[102]; McCaughey et al., 2013^[103]).

66. A strong safety culture has been found to be significantly correlated with specific kinds of injuries, including reduced occurrences of back injuries (Mark et al., 2007^[104]) as well as needle-stick and sharp injuries of health workers (Smith et al., 2010^[105]). A study of German hospital physicians found that social stress and time pressures at work were related to lower quality care (Krämer et al., 2016^[106]). Research on hospital workers in the United States found that injuries were significantly associated with a number of organisational factors, including a less people-oriented culture, as well as psychosocial factors such as lack of supervisor support (Reme et al., 2014^[63]).

67. While most of the studied relationships between staff injuries and safety culture are observational, an example from a United States rural hospital found lower incidences of staff injuries following the implementation of a new employee safety program, with a specific focus on improving safety culture (Hooper and Charney, 2005^[107]).

Culture influences the mental health of workers

68. In addition to preventing physical injuries, workplace culture has been linked to the psychological well-being of staff, (de Bienassis et al., 2020^[97]; Gershon et al., 2007^[108]; Halbesleben et al., 2008^[109]). A 2016 systematic review found that 70% of included studies established a significant association between higher risks of burnout among health care staff and the perception of low levels of patient safety (Hall et al., 2016^[110]).

69. Research from the United States has found that positive characteristics of work environments, such as good work-life balance, are associated with better teamwork and safety (Sexton et al., 2017^[111]). A study conducted on public hospital employees showed that when they perceive safety communication, safety systems and training as positive they tend to be more involved in the safety process and to abide more willingly by safety rules (Amponsah-Tawaih and Adu, 2016^[112]).

70. One manifestation of poor culture is unprofessional interaction between health workers. Unfortunately, behaviours such as discrimination, bullying and even sexual harassment are common in health care in a range of countries (Box 1.4. Unprofessional interactions involving health workers are common in health care settings). Studies have found that uncivil behaviour in the workplace can significantly impact staff performance and the quality of delivered health services. Poor working relationships can lead to increased cognitive load, distraction, and decreased attention (Porath and Erez, 2007^[113]; Riskin et al., 2017^[114]; Katz et al., 2019^[115]).

71. Unsurprisingly this negatively affects patient safety. A 2019 study found that patients of surgeons with high levels of reports from co-workers about unprofessional behaviour were at almost 15% higher risk for post-operative complications (Cooper et al., 2019^[116]). A study from the United States found that nurse-reported bullying was associated with the incidence of central-line-associated bloodstream infections, even when controlling for nurse staffing and qualifications (Arnetz et al., 2020^[117]).

Box 1.4. Unprofessional interactions involving health workers are common in health care settings

In **Australia** and **New Zealand**, a study of surgeons led by the Royal Australasian College of Surgeons found that almost half of respondents reported that they had experienced unprofessional behaviours, and more than 70% of hospitals reported internal instances of discrimination, bullying or sexual harassment by a surgeon within the last 5 years (Crebbin et al., 2015^[118]).

In **Germany**, a study across 74 hospitals found that workplace bullying was reported by 35% of survey respondents (Schermyly et al., 2015^[119]).

In **England**, research found that one fifth of NHS doctors were bullied or abused in the last year (Campbell, 2018^[120]).

In **Japan**, a study of workplace bullying in hospitals found that almost 20% of nurse respondents were bullied, with the most common bullying behaviours being the withholding of information, which affects staff performance, an unmanageable workload, and being shouted at or being the target of spontaneous anger (Yokoyama et al., 2016^[121]).

In **Poland**, a study of over 400 nurses found that 65.84% of participants reported that they had experienced workplace bullying (Serafin and Czarkowska-Pączek, 2019^[122]).

Occupational harm in health care imparts considerable costs

72. Occupational injuries and harms incur considerable costs that are borne by individuals, the health system and society. These comprise three types (Table 1.1).

- *Direct* costs include the immediate expenses created by of treating and rehabilitating the injured worker, replacing them for the duration, the administrative costs of processing the claim and any ensuing compensation pay-outs.
- *Indirect* costs cover losses in productivity of the injured worker and the expense of training and integrating replacements.
- *Intangible* costs comprise the loss of quality of life, diminished morale as well as the opportunity costs of having the worker side-lined for a period of time, or permanently if the injury causes them to leave their profession altogether.

Table 1.1. Types of costs

Direct costs	Indirect costs	Intangible costs
<ul style="list-style-type: none"> • Treatment and rehabilitation costs • Time off due to injury • Insurance administrative costs • Worker replacement costs • Other administrative costs • Workers' compensation payments 	<ul style="list-style-type: none"> • Victim productivity loss (wage losses and household production losses) • Employer productivity losses (recruiting and training replacements for injured workers) • Turnover costs (recruiting and training replacements for workers that leave the profession) 	<ul style="list-style-type: none"> • Quality of Life/ • Loss of morale • Opportunity cost of health worker leaving profession

Source: (Waehrer, Leigh and Miller, 2005^[123]) (Luyten, Naci and Knapp, n.d.^[124])

The aggregate cost of occupational harm may be as high as 2% of health spending

73. The aggregate costs of occupational harm in the health sector are substantial. In the United Kingdom, for example, the cost of occupational harm in health care was estimated at GBP 2.6 billion per annum in 2017 (HSE, 2020_[125]), which amounts to 1.83% of health expenditure that year (Harker, 2020_[126]). Findings from British Columbia in Canada showed that workplace injuries in the health care system cost CAD 107 million in 2018 (WorkSafeBC, 2018_[127]), which amounts to 0.54% of health spending in that province (Fayerman, 2019_[128]).

74. The United States Occupational Safety and Health Administration (OSHA) reported more than 2 million lost workdays due to work injuries in 2011 at a cost of USD 13.1 billion (Harris, 2013_[129]). This represents just under 0.5% of health spending (Hartman et al., 2013_[130]). Another study estimated that work injuries cost USD 4.9 billion in 2005 (Waehrer, Leigh and Miller, 2005_[123]).

Musculoskeletal injury, infections and mental ill-health are among the most costly occupational harms

75. Health workers, especially nurses, are among the most at-risk occupations for work-related lower-back pain (Shaw, 2018_[131]). National injury costs for nurses and nursing aides in the United States alone have been estimated at USD 1.6 billion, USD344 million, USD 192 million, USD 65 million, and USD 134 million for low back, shoulder, knee, neck, and hand/wrist, respectively in 2013 (Davis and Kotowski, 2015_[65]).

76. In the United Kingdom, occupational infection of health workers causes over 79,700 days of absenteeism each year, directly costing the health system over GBP 3.4 million (Guest et al., 2020_[132]). In Canada, the average cost of falls by health workers was around CAD 840 000 per year (Alamgir et al., 2011_[133]).

77. A systematic review estimating average international costs of needlestick injuries (NSIs) impacting health workers, per event, found that the total costs per event ranged from Int\$ 650 to Int\$ 750 (Mannocci et al., 2020_[134]). Other estimates have put the cost per reported injury was EUR 272 on average (Elseviers et al., 2014_[61]). While these sums may seem small, given that about 10% health workers report one or more NSIs per year, the aggregate costs can be considerable.

78. These costs have been studied in the United States, United Kingdom, Germany, France, Italy, and Spain and the estimates were USD 118-591 million, GBP 300 million, EUR 4.6 million, EUR 6.1 million, EUR 7.0 million, EUR 6-7 million per year respectively (Saia et al., 2010_[135]). In Sweden, the cost of work sharp injuries was estimated at EUR 1.8 million per year (Glenngård and Persson, 2009_[136]).

79. According to the American Medical Association (AMA), the cost of in-facility violence to United States hospitals and health systems was considerable. In the United States, a total of USD 1.1 billion is spent annually on proactive violence prevention costs—comprising USD 846.7 million in security costs, USD 175.1 million in staff training, and USD97.6 million in procedure development (AMA, 2017_[137]). In-facility violence also increases staff turnover, estimated to cost USD 234.2 million, in addition to medical costs of USD 42.3 million and indemnity costs of USD7.6 million (AMA, 2017_[137]). Finally, disability costs related to workplace violence in hospitals amounts to USD90.7 million annually (AMA, 2017_[137]).

80. The costs of mental ill-health among health workers mirror those of any other workplace injury, and include time off, lost productivity, and costs with recruitment caused by staff turnover. In France, work-related stress in health workers costs the country between EUR 1,627 and EUR 1,975 million in 2000 (Béjean and Sultan-Taïeb, 2005_[138]). Findings from United States suggests that replacing a physician who leaves their position due to burnout can cost between USD 500,000 and USD 1 million considering costs of recruitment, training, and lost revenue (Noseworthy et al., 2017_[139]). Another study from the United States estimated that physician turnover and reduced clinical hours due to burnout incurs approximately

USD 4.6 billion in costs annually (Han et al., 2019^[140]). In Canada, the cost of burnout for physicians was estimated to be CAD 213.1 million in (more than 85% being due to early retirement) and nearly 60% of the burnout costs account for family doctors (Dewa et al., 2014^[141]). Estimates by a hospital in the United States evaluating a peer support program to mitigate the impacts of second victim events found the program could save the hospital as much as USD 1.81 million annually (Moran et al., 2017^[142]).

81. More research is needed into the direct and indirect financial benefits of interventions to improve health worker safety. But evidence on the costs of occupational harm is solid, with several studies summarised in Table 1.2.

Table 1.2. Poor health worker safety incurs significant costs

	Evaluated health worker Safety Issue	Estimated Annual National Cost	Source
Japan	In hospital NSIs	USD 302 million	(Kunishima et al., 2019 ^[143])
United Kingdom	NSI with insulin administration	GBP 600,000	(Trueman et al., 2008 ^[144])
United Kingdom	Total costs to the NHS for HAIs for frontline health workers	GBP 3,534,158	(Guest et al., 2020 ^[132])
United Kingdom (Great Britain)	Workplace injuries and new cases of work-related ill health	GBP 2,623 million	(HSE, 2020 ^[125])
United States	Proactive violence prevention costs on hospitals	USD 1.1 billion	(AMA, 2017 ^[137])
United States	NSI and subsequent hepatitis and HIV infection	USD 188.5 million	(Leigh et al., 2007 ^[145])
United States	Physician burnout-associated costs	USD 4.6 billion (2.6 to 6.3 billion)	(Han et al., 2019 ^[140])
Canada	Physician burnout-associated costs	USD 213.1 million (185.2 million due to early retirement and USD27.9 million due to reduced clinical hours)	(Dewa et al., 2014 ^[141])
Sweden	Occupational sharps injuries	EUR 1.8 million	(Glenngård and Persson, 2009 ^[146])
Korea	Occupational sharps injuries in health workers	USD 884,385	(Oh et al., 2013 ^[147])

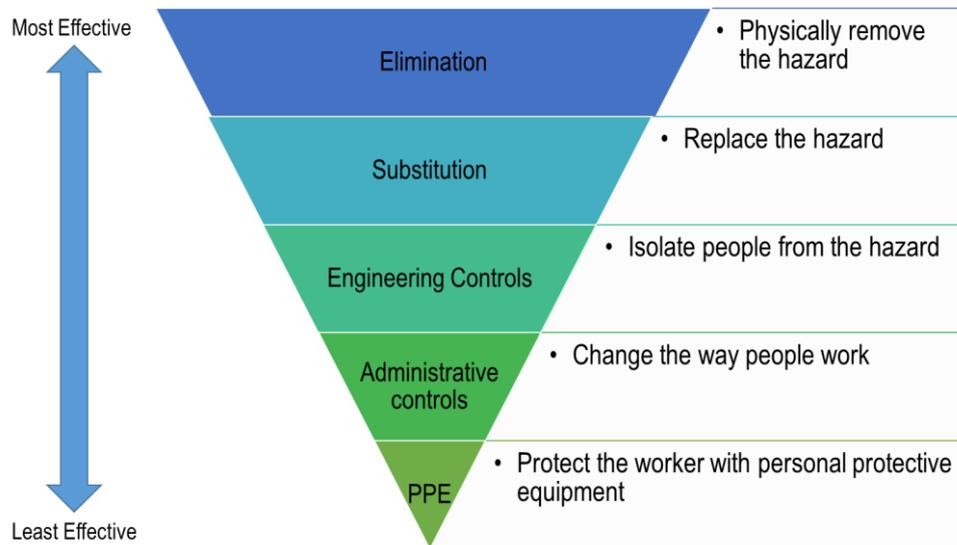
Source: Authors

The costs can be reduced through investment in prevention and appropriate resourcing

82. As with patient safety, investing in the prevention of occupational harm can deliver considerable cost savings and returns. Needle-stick injuries (NSIs), for example, are common and can result in serious illness with commensurate time off work and other costs. South African research has found that interventions to reduce NSIs, ranging from safety-engineered injecting devices to more comprehensive training, may be cost-effective from a public payer's perspective (de Jager, Zungu and Dyers, 2018^[148]). Several countries, including the United States, Canada, United Kingdom and European Union countries, have enacted legislation to reduce the incidence of NSIs among health workers (Cooke and Stephens, 2017^[149]).

83. Because health care settings are hazardous environments, risks cannot be completely eliminated without completely shutting down health systems. Like other industries where workers face risks, the aim is hazard reduction and mitigation through a range of measures or controls that can be arranged in a hierarchy from most- to least effective.

84. This is illustrated in Figure 1.11, where the preferred order begins with complete elimination of the hazard. However, as this is often not possible in health care, the next tier of methods aims to contain the hazard at its source. This is followed by efforts to create a barrier between the source of the hazard and the worker, either systemically or at the individual level through PPE, for example (WHO, 2018^[150]).

Figure 1.11. OHS Hierarchy of Controls

Source: Adapted from (WHO, 2018_[150])

85. System-level strategies and measures to prevent occupational harm in health care are discussed in more detail in Chapter 3.

Conclusions

86. The number of health workers worldwide is growing, as are the occupational risks and hazards they face. The results are injuries and harms such as infection, physical injury, burn out and mental ill-health. Some of these harms are more prevalent among health workers than in other occupations. For example, rates of depression and anxiety are almost a third higher among health professionals compared to workers in other industries. Occupational injury incurs considerable economic costs. While data are often incomplete, the aggregate financial cost of injury and harm ranges from 0.5% to 2% of health spending. Policies and programmes aimed at reducing risk in these and other areas have been shown to be cost-effective.

87. Working conditions such as workload, long hours and underlying working environment - in particular workplace culture - are powerful determinants of occupational safety and worker health. They influence not only the risk of occupational injury and worker health and well-being but also the incidence of patient harm.

88. As such, a focus on working conditions and culture should form the backbone of strategies and efforts to improve occupational safety in health care. This is underpinned by the right policy and regulatory environment. These factors are explored in more detail in Chapter 3. The focus of the following chapter is health worker safety and the COVID-19 crisis.

2 COVID-19 as a safety risk for health care workers

The COVID-19 crisis has triggered significant public awareness of the hazards faced by front-line health workers. Nightly rounds of applause during periods of confinement and media stories of health workers' efforts in the face of PPE shortages and onslaughts of patients helped increase public appreciation for the risks of working in health care. This has strengthened calls for increasing safety for health workers. This chapter examines the safety issues health workers face, focusing on those which have been highlighted by the COVID-19 pandemic.

Health workers have suffered due to COVID-19

89. As described in Chapter 1, infection is a key risk of working in health care; it is thus unsurprising that a considerable proportion of health workers have acquired COVID-19 at work. No setting has been spared: infections have been common among staff working in acute and non-acute care, outpatient services, long-term care, home and community care, mental health, and allied health (e.g. dentistry), as well as among para-medics. This is problematic on several fronts. Ill workers are not only at risk for known complications from the virus but are also temporarily unavailable during a time of great need. Moreover, ill workers may infect patients, colleagues and household members.

90. In addition, the risks and hazards of working in health care during the COVID-19 pandemic have evolved. The collective sense of purpose that sustained health workers during the pandemic's first wave has given way to fatigue and exhaustion, as subsequent outbreaks have battered many countries throughout 2020 and into 2021. COVID-19 has therefore caused much secondary occupational harm, such

as burnout, fatigue and mental ill-health, brought about by extremely high workload and commensurate stress for health workers around the world.

COVID-19 has impacted frontline health workers in terms of acute infections, long COVID, and deaths

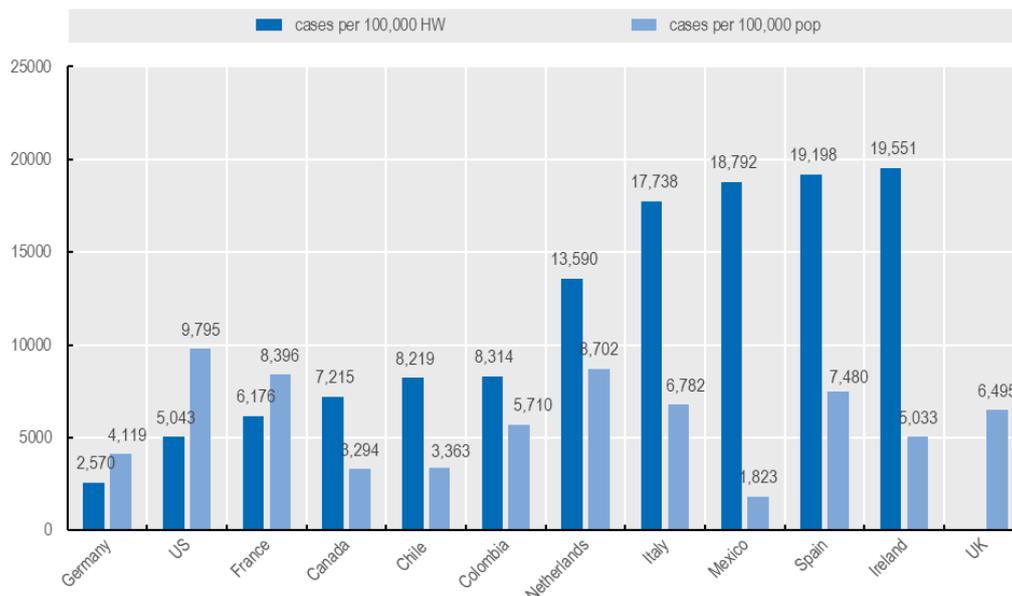
91. Health workers have found themselves on the front line of the fight against COVID-19, and the outbreak has brought international attention to the importance of ensuring the safety of health workers. The high risk of transmission from patients to health workers depends on a number of factors, including prolonged exposure, inadequate hand hygiene and PPE, insufficient spacing, and lack of negative pressure or insufficient ventilation (Ferioli et al., 2020^[151]).

92. Findings from the early stages of the outbreak in 2020 show that 44% of infections were transmitted in the hospital setting, of which 33% were in hospital staff. These rates are similar to those during the SARS and MERS outbreaks, where 36% and 56%, respectively, of infections were acquired in the hospital setting, of which 37% and 19% were in health workers. (Zhou et al., 2020^[152]).

93. The pandemic has resulted in a large number of health workers infected with COVID-19. International comparisons are limited by variation in how countries collect, capture and classify COVID-19 infection among the health workforce. Nevertheless, as of May 2020, over 30,000 health workers were infected with COVID-19 in Spain, over 23,000 in Italy, over 10,000 in the Netherlands and over 9,000 in Germany. Thirteen OECD countries, for which their data were available, had over 1,000 occupational COVID-19 cases in health workers as of May 2020 (Bandyopadhyay et al., 2020^[153]). As of September 2020, estimates from the Americas suggested that over 570,000 health workers had been infected in the region (PAHO, 2020^[154]).

94. Unsurprisingly, health workers have had a higher risk of COVID-19 infection than the general population, as much as four times as likely in Ireland and ten times as likely in Mexico (see Figure 2.1).

Figure 2.1. COVID-19 cases among health workers vs. general population per 100,000 [as of May 2021]



Note: Definition of healthcare workers can differ across countries which can affect the comparability of the figures. For Canada, Chile, Italy, Mexico, the Netherlands, Spain and the United States, healthcare workers considered in COVID-19 infections are defined based on their occupational status. For Colombia, France, Germany and Ireland, healthcare workers considered includes place of work as well as occupational

status. Thus non-clinical staff (e.g. administrative or cleaning staff) are included in COVID-19 infection data. Denominator values for number of health workers are derived from official reports and statistics, adjusted –as far as possible- to the healthcare workers definition in each country used for the denominator. Data for Canada and Chile through end December/mid-January 2021. Data for the other countries through mid-May 2021. Data for general population were collected up to the 17th week of 2021. Screening policies can differ between healthcare workers and general population and can affect the comparability of the figures. Differences in testing and diagnosis processes and definitions may also impact comparability. **For these reasons, careful interpretation of the data is required.**

Sources: Canadian Institute for Health Information (CIHI), 2021; Chilean Ministry of Health, 2021; Colombian National Health Institute, 2021; Santé Publique France, 2021; Robert Koch Institute, 2021 (RKI); Health Protection Surveillance Centre (HPSC), 2021; Epicentro, Instituto Superiore di Sanita (ISS), 2021; Mexican Ministry of Health, 2021; Rijksinstituut voor Volksgezondheid en Milieu (RIVM), 2021; Spanish Ministry of Health, 2021; Centers for Disease Control and Prevention (CDC), 2021; European Centre for Disease Prevention and Control (ECDC), 2021.

95. COVID-19 exposure and outcomes may differ depending on staffing level and role. Information from the International council of nurses has found that, as of June 2020, over 230,000 health workers have contracted COVID-19, (ICN, 2020_[155]). By 31 December 2020, this number had risen to 1.6 million (ICN, 2021_[156])

96. A Scottish study found that 17.2% of all hospital admissions for COVID-19 in the working age population were health workers or members of their households. Patient-facing health workers were over three times more likely to be admitted to hospital with the disease compared to non-patient facing workers (Shah et al., 2020_[157]). In the United States, health workers were found to be three times more likely to report a positive COVID-19 test than the general population (Nguyen et al., 2020_[158]). Six per cent of all infections in the United States are among health workers, with 28% of these requiring intensive care (Kambhampati et al., 2020_[56]).

97. These figures may underestimate the true extent of COVID-19 among the health workforce. Insufficient testing and gaps in the data are not uncommon. A serology study conducted in a New York hospital found considerable asymptomatic infection among health workers (Stock et al., 2020_[159]).

98. In addition to suffering from acute COVID-19 infections, health workers have also been impacted by long COVID, which is chronic or post-acute COVID syndrome, with persisting symptoms beyond the initial infection not attributable to alternative diagnoses. Health workers who experience mild COVID-19 infections may still experience long term symptoms from the illness, including fatigue, dyspnoea, joint pain, and chest pain (BMJ, 2020_[160]).

99. Research from Sweden found that over 1 in 10 healthcare workers with mild COVID-19 infections were still experiencing at least one moderate to severe symptom eight months after their initial infection. Moreover, 8% reported that their long-term symptoms had disrupted their work life (Havervall et al., 2021_[161]). In the United Kingdom, as of April 2021, more than 120,000 NHS workers had long COVID, more than any other occupational group—and representing nearly 4% of all of those with the condition (Campbell, 2021_[162]).

100. High rates of long COVID in health workers have raised concerns regarding health system capacity, given prolonged leaves of absence health workers with severe long COVID symptoms may need to take. Interviews with physicians with long COVID have highlighted concerns about future fitness for work and stigma with suffering from symptoms such as fatigue (Burns and Warren, 2021_[163]). Living with long COVID may also have psychological manifestations for health workers, including anxiety, depression, and post-traumatic stress disorder (Burns and Warren, 2021_[163]).

101. Long COVID may also have financial and social impacts for health workers who are unable to return to work for long periods of time. In the Netherlands, for example, over a quarter of health workers that have experienced COVID-19 infection report that their finances have been impacted by the condition (van Essen, 2021_[164]).

102. Policies to address long COVID are lacking due to the novelty of the disease. In the United States, for example, as of March 2021, return-to-work guidelines from the CDC and OSHA focused on infection status—and did not provide guidance for those with long COVID (Praschan et al., 2021_[165]).

Box 2.1. OECD-WHO joint project to estimate the cost-effectiveness of infection prevention and control measures to limit the risk of hospital acquired COVID-19 infections

The COVID-19 pandemic exacted a staggering toll on health workers. Globally, health workers face a greater risk of COVID-19 infections and attributable mortality, relative to the general population (Gómez-Ochoa et al., 2020^[166]; Galanis et al., 2021^[167]). Among OECD members, COVID-19 infections among health workers stymied health system response to the pandemic; undermined the provision of care for chronic care patients (Kiss et al., 2020^[168]; Riera et al., 2021^[169]) and caused delays in the delivery of emergency care (Scquizzato et al., 2020^[170]).

Insufficient infection prevention and control (IPC) measures at health care facilities may elevate the risk of COVID-19 infections (Chou et al., 2020^[171]). In recognition, the OECD embarked on a new project with the WHO's Geneva-based IPC Technical and Clinical Hub to estimate the effectiveness and cost-effectiveness of selected IPC interventions that can help reduce the risk of health-care acquired COVID-19 infections across selected WHO regions, with an emphasis on low- and middle-income countries. These IPC interventions include:

- Enhancing hand-hygiene practices in health facilities;
- IPC training and education of health workers; and
- Increasing access to and use of personal protective equipment.

The selected IPC interventions have been linked to reductions in the risk of health-care acquired infections broadly, and COVID-19 infections in particular (Chou et al., 2020^[171]). Each IPC intervention is grounded in the WHO guidelines on the core components of IPC programs at health care facilities (WHO Guidelines Development Group, 2017^[172]), as well as the WHO guidelines on prevention, identification and management of COVID-19 infections among health worker (WHO, 2020^[173]). Importantly, these IPC interventions can interrupt COVID-19 infections among patients and health workers, though the ongoing OECD-WHO project focuses on health workers due to data limitations.

The OECD-WHO project will quantify health and economic impacts. Health impacts encompass morbidity and mortality attributable COVID-19 infections. Economic impacts capture the cost of hospital care and loss of productivity caused by absence from work due to COVID-19 infections. The OECD Strategic Public Health Economic Planning (SPHeP) framework, which underlies all of the public health modelling work of the OECD, informs the design of the OECD's COVID-19 modelling approach.

To simulate the biology and epidemiology of SARS-CoV-2, the OECD SPHeP-COVID-19 model was designed as a compartmental model that extends the traditional Susceptible, Infected and Recovered (SIR) models. The OECD SPHeP-COVID-19 model estimates health and economic impacts using a country-aggregated, time-series database that combines information from WHO and OECD datasets and publicly available sources. The modelled outcomes are generated based on a synthetic cohort of individuals that replicate health worker characteristics in terms of their demographic profiles, the likelihood of SARS-CoV-2 transmission, and the risk of hospitalisation (i.e., inpatient/intensive care).

The OECD-WHO analysis will generate effectiveness and cost-effectiveness estimates of selected IPC interventions, which will be comparable across WHO regions and over time. Results produced by the OECD SPHeP-COVID-19 model will help make an economic case for scaling up investments in the selected IPC interventions. In doing so, the OECD-WHO analysis will bolster efforts to plan and prepare for future health emergencies.

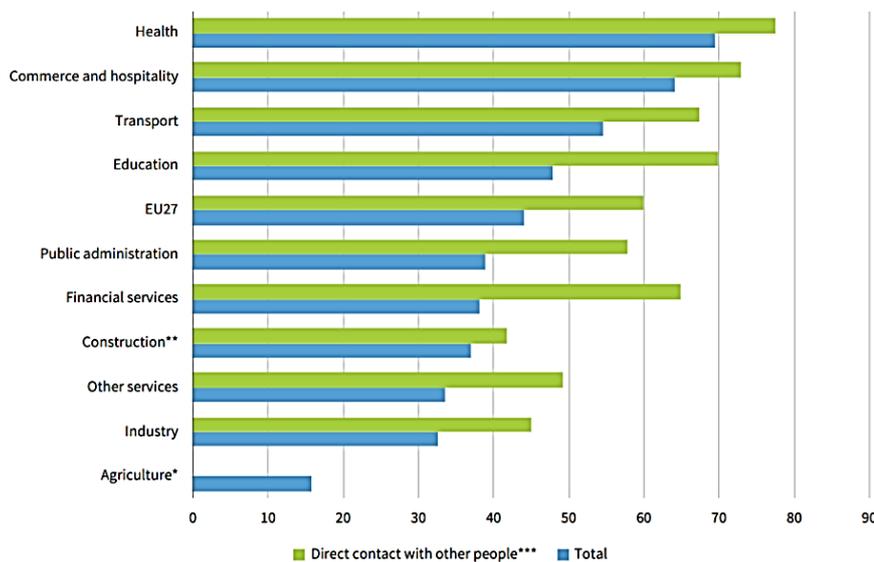
103. Unfortunately, the high number of COVID-19 infections in health workers has also resulted in deaths. Bearing in mind that mortality data have limitations due to differences in the way countries count the number of COVID 19 deaths, where the death took place, whether the presence of the virus was confirmed through testing, and variations in coding and registration practices (OECD, 2020^[174]). In August 2020, Mexico, the United States, Italy and the United Kingdom had reported 162, 574, 214 and 106 health worker deaths due to COVID-19 (Erdem and Lucey, 2021^[175]). Over the course of the COVID-19 pandemic, these rates rose rapidly. By November 2020, the United States CDC COVID Data Tracker reported 786 health worker deaths attributed to COVID-19 (Kavanagh, Pare and Pontus, 2020^[176]). The International Council of Nurses estimated that over 600 nurses had died from COVID-19 worldwide by June 2020 (ICN, 2020^[155]). By 31 December 2020, this had risen to 2,262 (ICN, 2021^[177]).

The pandemic has adversely affected the mental health of workers

104. Throughout the COVID-19 crisis, health workers have had to navigate high stress environments, often with limited resources. In responding to the previous SARS outbreak, up to 50% of health workers experienced acute psychological distress, burnout, and post-traumatic stress while caring for patients—where fear of contagion and of infecting family members, social isolation, and additional stressors were found to be contributing factors (Wu, Connors and Everly, 2020^[44]).

105. The current situation is similar. Just under 70% of European health workers surveyed declared they believe that their job put them at risk of contracting COVID-19. The proportion was closer to 80% for health workers who report direct contact with people as part of their job (Eurofound, 2020^[178]). These figures are higher than all other sectors surveyed including hospitality, transport and education (Figure 2.2).

Figure 2.2. Employees feeling their job puts them at risk of contracting COVID-19, by sector, EU27 (%)



Note: Survey collected between April and July 2020.

Source: (Eurofound, 2020^[178])

106. A study of mental health outcomes of health workers exposed to COVID-19 in China found that high proportions of front-line workers reported symptoms of depression, anxiety, insomnia, and distress

(Lai et al., 2020^[179]). An Italian study found that almost half of front- and second-line health workers experienced symptoms of post-traumatic stress, with 25% and 20% experiencing depression and anxiety respectively (Lai et al., 2020^[179]). Findings from surveys results of NHS workers in London found that 70% of respondents said they felt unable to cope with work-related stress, and over half had considered quitting work in health care due to the pressures experienced in the past year (UNISON, 2021^[180]).

107. Studies in both China and Italy found that women, who also represent a larger proportion of the health care workforce, are more likely to experience negative mental health outcomes. Other initial findings researching frontline health workers found that over half experienced poor sleep quality and moderate-to-severe stress (Jahrami et al., 2020^[181]). A cross-sectional study of health workers in Spain, using the Acute Stress of Health Professionals Caring COVID-19 Scale (EASE) found that 23.9% of respondents reported medium–high emotional load and 4.5% extreme acute stress (Mira et al., 2020^[182]).

108. According to the International Council of Nurses:

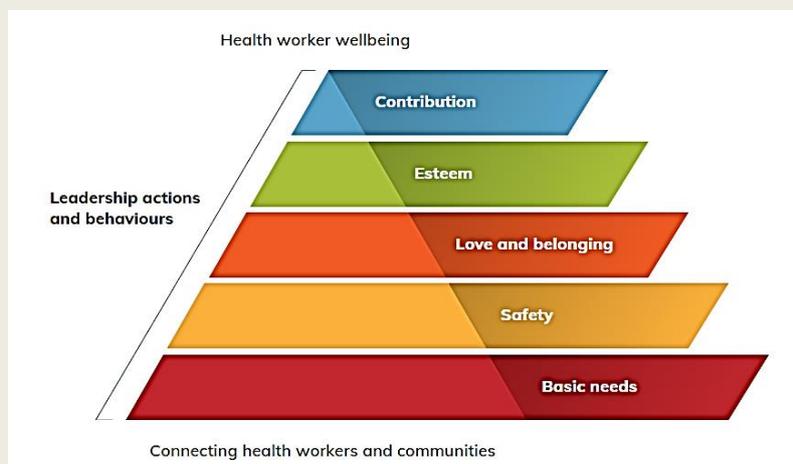
- 20% of nurses in Japan report experiencing discrimination or prejudice amid the spread of the first wave of the pandemic.
- In the United States, 93% of health workers were experiencing stress, with 76% reporting exhaustion and burnout as nurse-to-patient ratios increased three-fold during the pandemic. In Brazil 49% of nurses report anxiety and 25% report depression.
- In China, 60% of nurses report exhaustion and 90% report anxiety.
- 20% of health workers in 13 African countries surveyed reported daily depression symptoms, compared to 2% prior to the pandemic.
- In Spain, 80% of nurses report symptoms of anxiety and increasing burnout.
- 61% of Australian health workers report burnout and 28% report depression.

109. These adverse effects on mental well-being have spurred initiatives in some countries and regions. An example of one such programme is provided in Box 2.2.

Box 2.2. Pandemic Kindness: Improving health worker well-being in South Australia

The Pandemic Kindness Movement was created by clinicians across Australia to support and enhance the health and well-being of all health workers during the pandemic. Supported by several Australian States and Territory governments, the Pandemic Kindness Movement aims to give health workers with access to respected, evidence-based resources that are curated by teams of clinicians and well-being experts. Resources are grouped under the domains of Maslow's hierarchy of needs to reflect potential challenges on the health workforce: basic needs, safety, love and belonging, esteem, contribution and leadership actions (see Figure). In the initial stages of the COVID-19 pandemic, resources in 'basic needs' (e.g. addressing fatigue, sleep, nutrition and hydration) were the most accessed across Australia.

Figure 2.3. The Pandemic Kindness Movement framework



Source: (ACI, n.d.^[183])

In response to COVID-19, South Australia has developed further health worker well-being initiatives to complement the Pandemic Kindness Movement. In June 2020, that state's Commission on Excellence and Innovation in Health (CEIH) delivered Compassion Labs to about 80 health workers from all professions. These Labs teach participants about the physiological and psychological benefits of compassion, and how to exercise compassion in their personal and professional lives. Participants learn how to be compassionate towards themselves to sustain compassion towards others. CEIH is coordinating a compassion collaborative to provide ongoing support to participants.

In August, the CEIH brought together clinical, operational, and workforce leaders across the health system in South Australia for a workshop to promote health worker well-being program, aiming to:

- create the motivation and a network for change
- demonstrate leadership commitment to improve worker well-being
- alert leaders to available tools
- identify practical steps to improve worker well-being

Key to the CEIH programme's success is measuring health worker well-being by combining worker compensation payments and absentee rates with real-time, validated well-being metrics. This enables providers to identify areas of concern and take appropriate action.

The overarching aim is to support providers to improve care quality and outcomes, reduce avoidable harm to patients and workers.

Source: (MedicSA, 2020^[184])

There are risks for medical students performing above their capacity... and staying home

110. During the acute phases of COVID-19, many countries faced an insufficient number of physicians. As a result, some countries implemented policies calling on other health care personnel including medical students, to join health teams. For example, in the UK, 5,500 final-year medical students were given the option to join the NHS workforce early to address staffing challenges caused by COVID-19 (Park, 2020^[185]). Similar actions were taken by Spain, in allowing medical students in their final year to be hired by the health system (Urta, 2020^[186]). Twenty-five medical schools in the US allowed medical students in their last year to graduate early in order to begin work in hospitals (Balingit, n.d.^[187]).

111. There is a notable lack of consensus regarding the appropriate use of medical students in health systems in times of crisis. In the US, for example, the Association of American Medical Colleges (AAMC) recommended the removal of students from clinical rotations during the acute phase of the epidemic (Patrinely et al., 2020^[188]). This decision has been controversial, with critics citing health care workforce needs and lost clinical learning opportunities for students (Nadell Farber, 2020^[189]).

112. The literature has cited several risks of having medical students providing care for patients with COVID-19, including lack of appropriate supervision, inadequate training in hygiene measures, and risk of COVID-19 infection or mental ill-health (Bank and Wijnen-Meijer, 2020^[190]). A study of medical students across 40 US medical schools found that students were 61% more likely to experience anxiety and 70% more likely to experience depression during the COVID-19 era, as compared to medical students in previous cohorts (Halperin et al., 2021^[191]). Other research has found that disruptions in traditional medical education and training due to COVID-19 have increased risk of poor mental health among medical students worldwide—which included research from the US, Spain, Italy, Turkey, and the UK (Sharma and Bhaskar, 2020^[192]).

113. Survey data has found that many medical students were motivated to participate in the care of patients with suspected COVID-19 infection due to a sense of duty, altruism, or values of professionalism (Tempski et al., 2021^[193]). Even so, is important to recognize that medical students may have limited agency to decline to participate in activities above their skill level when asked, and it's the responsibility of the health system to ensure that appropriate safeguards are put in place to protect patients and medical students, alike.

Absenteeism can reflect worker safety and working conditions

114. Countries have reported different trends in worker absenteeism during the pandemic. Several European countries reported higher rates reflecting genuine illness as well as a concern for personal safety and/or unfavourable working conditions. Across sectors, preliminary data suggests that utilization of paid sick leave has gone up significantly in most countries in the outbreak of the pandemic, by up to 50-100%, but declined quickly in many countries after the peak of the outbreak (OECD, 2020^[93]). The decline across sectors may be attributed to increased telework, which is often not possible for health workers. Obviously staff should stay home if ill, but unnecessary absenteeism is undesirable as it puts colleagues, facilities and the entire system under greater stress.

115. An evaluation of LTC workers in New Zealand found reduced turnover and absenteeism during four weeks of COVID-19 related lock down (NZ Ministry of Health, 2020^[194]). This has been attributed in part to increased comradery and commitment during the acute phases of the outbreak, although it is likely to have been complemented by increased financial compensation (NZ Ministry of Health, 2020^[194]). Nevertheless, this perhaps serves as a testament to the commitment and sense of duty of LTC staff, many of whom are poorly remunerated, and illustrates that health workers care about the welfare of their patients and the community.

116. Remuneration can play an important role. Casual workers who are paid per diem or per hour have an incentive to work even when unwell, and a disincentive to stay home under such circumstances. The opposite applies to salaried workers who typically are contractually permitted to take a certain number of sick days without losing income.

Ensuring sufficient workforce in future crises should be considered now

117. The COVID-19 crisis has led to an increase in the demand for health-related occupations to address staffing short falls. OECD studies of job vacancy data, for example, have found that technical medical skills, such as Emergency and Intensive care, Medical support, Basic Patient Care, Radiology, Paediatrics, Obstetrics and Gynaecology, Infectious disease or Mental and Behavioural health specialties saw a strong positive demand between March and November 2020, and a general increasing trend for recruitment of those with technical medical skills (OECD, 2021^[195]).

Roles, responsibilities and service models have evolved rapidly

118. The COVID-19 crisis has provided an opportunity to assess—and appreciate—the roles and responsibilities of health workers, especially those embedded within the community: primary and community care providers, long-term care workers, and community pharmacists. The pandemic has meant that the demands and scope of work for staff in these sectors have required adaptation, reinforcement and, in many cases, additional resourcing. If nothing else, the crisis has illustrated the importance of these workers in a well-functioning health system and a healthy population. It has also presented an opportunity to ‘mainstream’ newer service models like telemedicine.

Primary care is pivotal in managing a disease outbreak

119. Primary health care is often considered to be the frontline of health systems and plays a crucial role during a pandemic. A strong primary health care system has been critical in the age of COVID-19, as health systems seek to cope with the surge in demand for patients acutely ill with a new, highly infectious disease, while needing to maintain care for chronic patients under difficult circumstances and deal with indirect effects as described above (OECD, 2020^[196]).

120. Ongoing, sustained investments in primary health care systems are the first line of defence against health emergencies. Strong primary health care systems have been shown to pay off in times of crisis and help mitigate pressure on health systems. As the first point of contact, primary health care (Box 3.2) that ensures accessible, comprehensive, continuous, and co-ordinated health care is key to boosting preventive care and screening, treating those who need it, and helping people become more active in managing their own health. A strong, well-resourced primary care sector can make health systems more effective, efficient and equitable (OECD, 2020^[196]). For example, managing patients in the community can reduce demand on hospitals and emergency departments, prevent unnecessary procedures and lower the need for the use of costly and scarce facilities (Van den Berg, Van Loenen and Westert, 2016^[197]).

121. Primary care providers are the centre of numerous actions during a crisis such as COVID-19. They can reinforce public health messages on how to contain the transmission of the virus by adapting the messages to the population and by educating health workers on risk minimization. Their proximity to their patients allows them to reach out to those who are most at risk of developing a severe case. At the same time, they can meet the needs of the population in their communities. This also leaves them well-placed to participate to the epidemiological surveillance of COVID-19 (WHO, 2020^[198]).

Community health workers play an important role

122. Community health workers who are integrated in the primary health care sector can also be beneficial during health emergencies. Well-trained community health workers can relay information related to protection, raise awareness, counter social stigma, and manage chronic conditions. Community health workers could thus play a pivotal role in reducing the impact of the COVID-19 pandemic (Ballard et al., 2020_[199]).

123. Community health workers can undertake regular review of vulnerable people at home or virtually depending on need; when patients become ill, community health workers could undertake simple assessment of the need for more advanced care, reporting to other members of the primary health care team (Haines et al., 2020_[200]). With appropriate training and personal protective equipment, community health workers can monitor physical and mental health during the COVID-19 pandemic, review availability and use of medicines, and assess whether individuals have adequate supplies of food and medicines for chronic conditions (Haines et al., 2020_[200]).

124. Workers providing home care services and those caring for individuals with special needs in their homes should not be forgotten. During a lockdown, for example, these staff may be the only humans a cared-for individual would have any physical contact with. These essential workers are not only exposed to risk but are also in contact with individuals who are vulnerable to COVID-19. They therefore require adequate protection and access to resources, information, testing and immunisation in line with colleagues in other health settings.

Long-term care workers have been pivotal during COVID-19

125. The impact of COVID-19 on LTC workers is significant, as they are already helping the most vulnerable population in society (OECD 2020). Significant adaptation has occurred in response to the pandemic. Some LTC facilities in several countries have been involved in the coronavirus spread slowing strategy by being converted into “recovery centres.” This way, patients who left the hospital but might still be contagious are managed in specific settings with medical supervision, freeing up hospital beds and relieving pressure on acute care facilities (Associated Press, 2020_[201]) (Song et al., 2020_[202]).

126. As discussed previously, the important role of LTC workers during this pandemic has been undermined by labour market conditions such as insecure contracts, casualised work across several facilities and being among the lowest-paid workers in the health sector (VADEAN et al., 2020_[203]). Due to the lack of PPE, LTC workers are particularly vulnerable to the pandemic.

127. Some countries took initiatives to address these problems ahead of the peak of the epidemic. The Australian government, for instance, allocated an additional AUD 440 million to the long term care sector on the 11th of March 2020. This included staff retention, surge staffing and improvement of infection control. Direct support for LTC workers includes paid pandemic leave of up to 2 weeks for those eligible, a pandemic leave disaster payment, and a lump sum payment of AUD 1,500 to help workers during the 14 days they may need to self-isolate, quarantine or care for someone (International Long-Term Care Policy Network, 2021_[204])

128. However, an independent investigation (the ‘Royal Commission into Aged Care Quality & Safety’ initiated before the pandemic) found deficiencies in government planning around COVID-19 in LTC, including poor infection control, inadequate access to PPE and testing, and insufficient surge staffing arrangements resulting in poor care during COVID-19 outbreaks, especially in the state of Victoria. Moreover, the Australian government did not have a COVID-19 plan devoted solely to LTC. The Commission recommended that the Australian government publish a national LTC plan, establish a national aged care advisory body, and deploy accredited infection prevention and control experts across the sector (International Long-Term Care Policy Network, 2021_[204]).

129. An independent review of the response to COVID-19 in New Zealand LTC facilities highlighted the need to further develop policies, protocols, and strategies for handling similar outbreaks. The report included several recommendations that potentially spill over into better protection of health workers' safety and well-being in the sector and beyond (NZ Ministry of Health, 2020^[194]). For example:

- Providing psychosocial support for staff during a stand down and in the period after, taking into account the unique circumstances of the individual, including accommodation, family, and community
- Identify and provide psychosocial support for resident, including alternatives to visitation during lockdown, taking into account the unique circumstances and identity of the resident.
- A national outbreak management policy with leadership roles, reporting processes and communication channels, including policies on IPC strategies, case recognition, staff and resident management and support, supply and use of PPE, testing, screening, isolation, lockdown, and resident transfers and admissions.
- Consideration of the reputational consequences for facilities and stigmatisation of staff, for example reconsidering how outbreaks are named.
- Simplifying and streamlining reporting requirements, including appropriate software

130. The German government has provided financial support and decreased monitoring for health care providers to maintain ambulatory care. At the same time, LTC insurance will reimburse health institutions for additional costs or loss of revenue related to the COVID-19 crisis. The government has also increased LTC workers' wages and disbursed a one-off bonus (International Long-Term Care Policy Network, 2021^[204]).

Telemedicine has become a standard service model

131. One area where regulatory bodies demonstrated extreme adaptability and flexibility relates to the expansion of telemedicine services in response to COVID-19, as patient visits to health care providers could cause increased risk to both patients and health care providers.

132. While full-scale use of digital technologies was not the norm across OECD countries before the pandemic, the acceleration of the digital transformation is astonishing. In Norway, the share of digital consultations in primary health care rose from 5% before the pandemic to 60% by March 2020. Some providers in the United States have gone from 6% of consultations being done remotely to 50%-70% by March 2020. In France, similarly, there were close to 500 000 teleconsultations in March 2020 compared to around 40 000 before March.

133. Overall, telemedicine services were made available in 23 countries during the COVID-19 pandemic. Several strategies have been employed to scale-up telemedicine, ranging from providing new legislation (Costa Rica, Peru, Estonia, and Poland); expanding provider payments (Canada, Estonia, Slovak Republic, Poland, Japan, Belgium, Australia); and designing new telemedicine services (Slovak Republic, Greece, Israel, Turkey, Luxembourg, Brazil, Chile and Spain) to developing new guidelines and regulations (Belgium, Canada, France, the United States and Japan) (OECD, 2020^[205]).

134. Patient privacy has been at the centre of discussions regarding the large-scale adoption of telemedicine. The Health Insurance Portability and Accountability Act of 1996 (HIPAA), which ensures patient privacy in the United States, has been perceived as a potential obstacle for clinicians willing to use telemedicine. In response to the COVID pandemic, the government stated that no penalties would be imposed on clinicians in case of HIPAA violations. This adaptation allowed them to use platforms such as FaceTime or other commonly used ones for the time of the pandemic. The next step will be to ensure security in the long-term using new regulations or systems (Shachar, Engel and Elwyn, 2020^[206]).

Countries can do more to enable safe working environments in LTC

135. Hospitals have played a key part in treating and managing the effects of COVID-19, with the associated risks and hazards outlined above. But workers in long-term care (LTC) facilities have not only been pivotal in protecting a very vulnerable population from the disease but have also been exposed to greater primary and secondary occupational hazards during the pandemic (OECD, 2020_[207]).

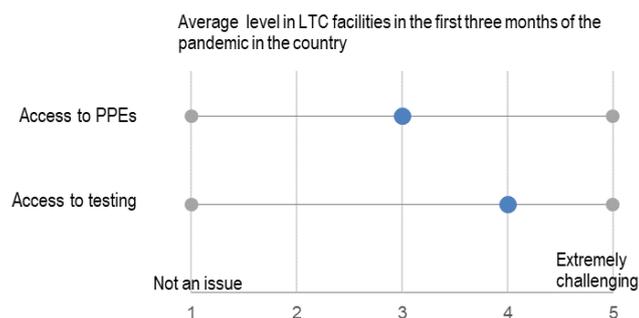
Countries have taken steps to limit the spread of COVID-19 in LTC

136. Many OECD countries are taking steps to mitigate the impact of COVID-19, both on LTC workers and the people they care for. Measures to limit the spread of infections in LTC facilities have included banning external visitors, isolating affected residents and increasing cleaning and disinfection. Many nursing homes in Spain and France, for example, have placed limits on group activities. Korea and the United States have included care homes as a priority group for diagnostic testing (OECD, 2020_[207]; OECD, 2021 Forthcoming_[208]).³

137. Both home care workers and carers in institutions are at high risk of infection and of infecting patients, particularly as this workforce is often informal - with individuals working across several locations. For example, a New Zealand study evaluating how LTC facilities are responding to COVID-19 found that in three out of five affected facilities the outbreak originated with a member of staff (NZ Ministry of Health, 2020_[194]). To address this challenge, a number of countries took steps to restrict mobility of staff, such as creating COVID-19 wards and reducing multisite work (OECD, 2021 Forthcoming_[208]).

138. Correct identification of symptoms among residents and staff, and appropriate follow-up, can be limited due to lack of access to sufficient, qualified medical staff and structural problems with insufficient co-ordination. Due to lack of co-ordination with the acute care sector, for example, enhancing the availability of respiratory therapy services in LTC settings can also present a problem. Numerous countries have also reported shortages in PPE and testing for workers in LTC facilities (CMS, 2020_[209]; Togoh, 2020_[210]) Country responses to a 2021 OECD survey found that most countries found access to PPE in LTC facilities to be at least some-what challenging and access to testing to be very challenging during the initial phases of the pandemic (see Figure 2.4).

Figure 2.4. Reported levels of Access to PPE and COVID-19 testing in LTC facilities in the first three months of the pandemic in your country



N=20 for the question on access to PPE and N=19 for the question on access to testing.

Source: OECD questionnaire on COVID-19 and LTC 2021/ (OECD, 2021 Forthcoming_[208])

³<https://www.hhs.gov/about/news/2020/07/14/trump-administration-announces-initiative-more-faster-covid-19-testing-nursing-homes.html>

But in many countries the pandemic has exposed long-standing problems in the sector

139. The pandemic has highlighted deficiencies in the LTC sectors of many countries, such as underinvestment, staffing and safety. Work conditions are often difficult and demanding, and staff turnover is high—more than 90% of LTC workers are women, and remuneration for work in the LTC is among the lowest in the health sector (OECD, 2020_[207]). In addition, LTC workers do not always have appropriate training or the ability to implement infection protocols or other prevention activities (OECD, 2021 Forthcoming_[208]). Infection outbreaks often cause staff absenteeism, as workers take sick leave or are afraid to go to work (OECD, 2020_[207]). In the home care sector, absenteeism of LTC workers also increases the burden on informal or family carers.

140. Several OECD countries have increased funding for LTC to face the increased costs caused by the pandemic response (OECD, 2020_[207]). Australia issued plans to increase staffing, and Spain developed rapid response teams to intervene in certain institutions. Germany has issued financial support for LTC workers, especially to increase minimum wages in the sector, promote bonuses for LTC workers and facilitate the distribution of personal protective equipment. France has also announced support in the form of bonuses for workers and sharing additional costs for institutions (OECD, 2020_[207]). Data from CMS on LTC facilities in the United States updated 23 July 2020 suggest that over 20,000 nursing homes reported shortages in nursing aids, and over 17,000 reported shortages in nursing staff—impacting 17% and 14% of all nursing homes respectively (CMS, 2020_[209]).

Health workers in all settings must be protected and supported in a range of ways

141. The pandemic has illustrated health systems' dependence on human capital and therefore the importance of ensuring worker safety and well-being. This includes protecting against infection through equipment, testing and immunisation, as well as providing safe working environments, support, information, and resourcing. It also means, where necessary, upholding or adapting existing mechanisms to protect workers and patients.

Legal protections should be updated to reflect the risks to health workers caused by the COVID-19 situation

142. Legal protections should be updated to reflect the hazard that health workers face in regards to exposure to COVID-19 as frontline workers. A key example of where this applies relates to legal classifications of occupational diseases. This is of significant importance due to recognition and preventability as it relates to the work environment. Moreover, there is a legal aspect that entitles workers to compensation. As of March 2021, COVID-19 has not been recognized as an occupational disease by international organisations, including the ILO, WHO, and EU (Sandal and Yildiz, 2021_[211]). Even so, many countries have moved forward in developing new regulations classifying COVID-19 as an occupational disease, work accident, or otherwise providing compensation to those impacted. Examples of country policies relating to COVID-19 are illustrated in Table 2.1.

143. While several countries have made progress in providing support to health workers impacted by acute COVID-19 infections, there is growing support for addressing the challenges to frontline workers caused by long COVID as well. Policy makers in the UK, for example, have begun efforts to add long COVID as an occupational disease (Limb, 2021_[212]). Similar calls have been made by the European Public Service Union (EPSU, 2021_[213]).

Table 2.1. Practices on workers' compensation for work-related COVID-19 in selected countries as of December 15, 2020

Country	Status	Brief explanation
Australia	No specific regulation, but can be compensated	The Safe Work Australia statutory agency declared that COVID-19 might be compensated, but workers' compensation authorities would determine whether the employee was covered and if the contraction of COVID-19 was adequately connected to the employment after case-based evaluation
Belgium	Occupational disease	The Federal Agency for Occupational Risks declared that COVID-19 would be accepted as an occupational disease for healthcare workers who are at significantly increased risk of infection by the virus (occupational disease code 1.404.03) and workers in critical sectors and essential services.
France	Occupational disease	The decree published on September 14, 2020, defined specific criteria for the recognition of COVID-19 as an occupational disease. The criteria include COVID-19 cases requiring oxygen therapy, ventilatory assistance or cases resulting in death.
Germany	Occupational disease/Work accident	The German Social Accident Insurance (In German: Deutsche Gesetzliche Unfallversicherung, abbreviated as DGUV) declared that COVID-19 might be accepted as an occupational disease according to BK 3101 Annex I for healthcare, laboratory, or other workers with similar occupational exposure risk, which is higher than the risk of the general population. The DGUV has revised its initial approach and declared possible recognition as an occupational accident after a case-based assessment.
Italy	Work accident	A regulation published on March 17, 2020, accepts confirmed COVID-19 cases in the workplace as a work accident.
Japan	Recognition according to certain criteria	Workers developing COVID-19 are eligible for the benefits of the Workers' Accident Compensation Insurance after the recognition. The Ministry of Health, Labour and Welfare has announced criteria and case samples for recognition of COVID-19 in healthcare and nonhealthcare workers.
Republic of Korea	Work accident/Occupational disease	The Ministry of Employment and Labor has addressed the Korea Workers' Compensation & Welfare Service (KCOMWEL) for possible recognition and compensation under the Industrial Accident Compensation Insurance Act.
Norway	Occupational disease	COVID-19, with severe complications, has been added to the compensated occupational disease list since March 2020.
Turkey	Ongoing discussion for specific regulations, but can be compensated according to current legislation	No legislative change specific to COVID-19 has yet been made. However, the current legislation allows for the compensation of unlisted occupational infectious diseases, with conclusive evidence of work-relatedness and laboratory tests. A corresponding practice is also in effect for employees of public institutions.
United States of America	Various regulations for different employees and regions	The Department of Labor has declared that all federal employees who develop COVID-19 due to their federal duties are entitled to workers' compensation coverage defined in "the Federal Employees' Compensation Act." Federal employees should fill the form for traumatic injury or occupational disease. The regulations vary among different states and employees.

Source: Adapted from (Sandal and Yildiz, 2021^[211])

Provision, adequacy and safety of PPE and medical equipment is critical

144. The COVID-19 outbreak highlighted systematic challenges in ensuring workforce safety through the provision of adequate and effective PPE and other medical supplies. PPE is important in reducing primary and secondary occupational harm during a pandemic. It not only reduces the actual and perceived risk of infection, but it also reduces health worker stress and anxiety.

145. Policy makers and health leaders can support staff by ensuring the procurement of required PPE, informing staff about the adequacy of supplies, and providing appropriate guidance on how to use it. Routine testing for both patients and health workers, particularly among those previously not suspected to be infected, can also reduce stress and anxiety (Wu et al., 2020^[222]).

146. Many countries experienced challenges in securing adequate supplies of PPE in response to the needs brought on by COVID-19. In the United States, CMS reported that 13% of nursing homes did not have a one-week supply of N95 masks or a one-week supply of gowns, using data from July 2020 (CMS,

2020_[209]). Over 3,000 nursing homes reported having no supply of N95 masks, and 1,000 nursing homes reported having no supply of surgical masks (CMS, 2020_[209]). Shortages of PPE were reported in many other OECD countries, including France, Italy, Spain, and the UK (Togoh, 2020_[210]). A study of working conditions found that only 64% of European health workers surveyed indicated that they are required to wear personal protective equipment to prevent the spread of COVID-19 for their job ‘all of the time’ (Eurofound, 2020_[178]). While coverage was higher than in other sectors, this is a surprisingly low response rate given higher exposure and transmission risk in the health setting.

147. Even for countries who were able to manage the outbreak relatively well, many still experienced challenges in accessing and distributing appropriate PPE. In New Zealand, from March 2020 to early April 2020, the provision of PPE stocks in many LTC facilities relied on the regular supply of PPE, most notably masks and facial shields/goggles. Improvements in access were made after the development of a national supply chain and enhanced central purchasing arrangement (NZ Ministry of Health, 2020_[194]). Safety and trust can be undermined if equipment is sub-standard or faulty.⁴ See Box 2.2 for examples of efforts to ensure adequate supplies of effective PPE.

Box 2.3. Examples of efforts to increase PPE supply and adequacy

- In **Austria**, the Federal Ministry of Social Affairs, Health, Care and Consumer Protection has provided recommendations for preventive and protective measures for care workers in different settings and guidance on the use of face masks for health and social care professionals.
- In **Italy**, the guidelines for nursing homes published by the Ministry of Health require providers to ensure the training of care workers.
- In the **Netherlands**, the government became the centralized purchaser for protective equipment.
- In **Germany**, the Federal Ministry of Health as well as a number of federal states have become involved in the procurement of PPE.
- In **Ireland**, the performance of a risk assessment to ensure that facilities have adequate supplies, including PPE, has been recommended.
- In the **United Kingdom**, PPE recommendations were aligned with the WHO’s to ensure adequate health worker safety. A hotline has also been opened for health workers.

Source: (WHO/EURO, 2020_[214])

148. While ensuring the proper use of PPE in times of scarcity is necessary, excessive use is a form of waste. On the other hand, when scarcity rises as the supply chain is weakened, health workers are often forced to re-use PPE resulting in safety risk (Cook, 2020_[215]). Misuse can also occur when staff members have not had effective training on donning PPE, leading to an increased risk of transmission (Herron et al., 2020_[216]). The WHO recommended to extend the use of PPE, to reprocess or to use alternatives as a response to shortages or lack of equipment in the context of COVID-19 (WHO, 2020_[217]).

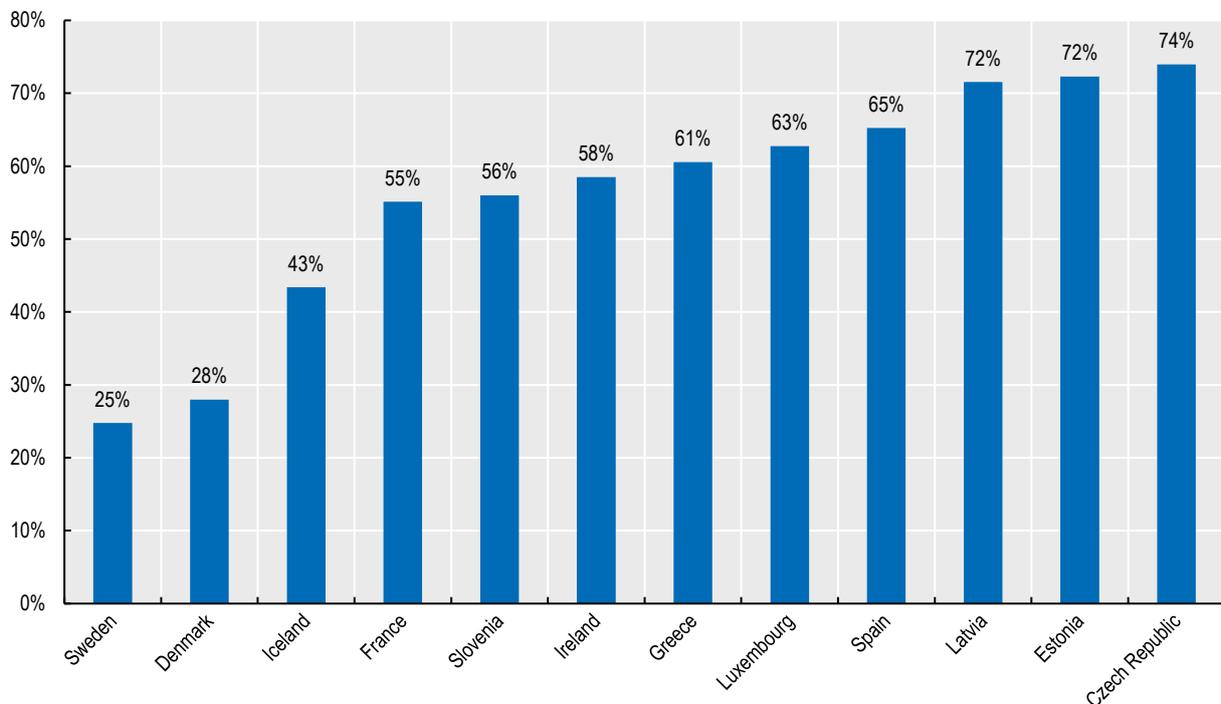
⁴ Approval and delivery of dubious quality equipment have been reported (Lupkin, 2020_[267])

Health workers should be prioritized in accessing new safety technologies, such as testing and vaccinations

149. As outlined in the previous chapter, immunisation is a central plank of protecting health workers (and their patients) against acquiring, and spreading, a range of diseases. Countries are adopting different immunisation prioritisation strategies in early 2021 due to the tension between equity and addressing potential workforce shortages.

150. The first COVID-19 vaccines began to be rolled out in December 2020 (BBC, 2020^[218]). As of 05 May 2021, countries had achieved various levels of vaccination of health workers—ranging from 25% in Sweden to 74% in the Czech Republic of health workers who had received two-doses of COVID-19 vaccination (see Figure 2.5).

Figure 2.5. Percentage of health workers who had received two COVID-19 vaccination doses, selected countries [as of 05 May 2021]



Note: The definition of healthcare workers for COVID-19 vaccination is based on the place of work as well as occupational status. Thus, non-clinical staff who may come into contact with patients are included (e.g. administrative staff, home care staff). Denominator values for number of healthcare workers were provided by EU/EEA Member States with COVID-19 vaccination data. Numerator values from ECDC tracking of vaccination of priority populations.

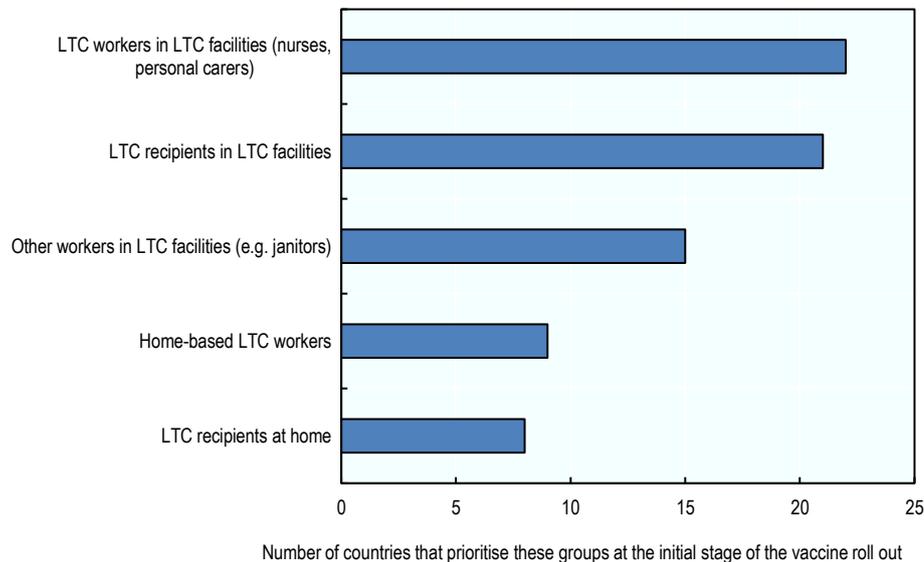
Source: Vaccine Tracker, European Centre for Disease Prevention and Control (ECDC), 2021.

151. The explicit trade-off between immunising the most vulnerable be first (e.g. elderly) and allocating the first vaccines to health workers is approached differently across countries. In a survey assessing vaccination in the LTC setting, 92% (22 countries out of 25 survey respondents) noted that LTC health workers in LTC facilities were prioritized for vaccination during the initial stages of the COVID-19 vaccine roll out. An additional 17 countries prioritized non-health workers in LTC facilities.

152. Home-based health workers often work in many different homes and are therefore also faced high risk of contracting and spreading COVID-19 among vulnerable populations. Only nine countries (Canada,

Denmark, Finland, Germany, Hungary, Japan, Luxembourg, Portugal and Slovenia) indicated that home-based LTC workers were among those prioritized for vaccination (see Figure 2.6).

Figure 2.6. Number of countries that indicated that they prioritized LTC workers in the initial stage of the COVID-19 vaccine roll-out



Note: N=25

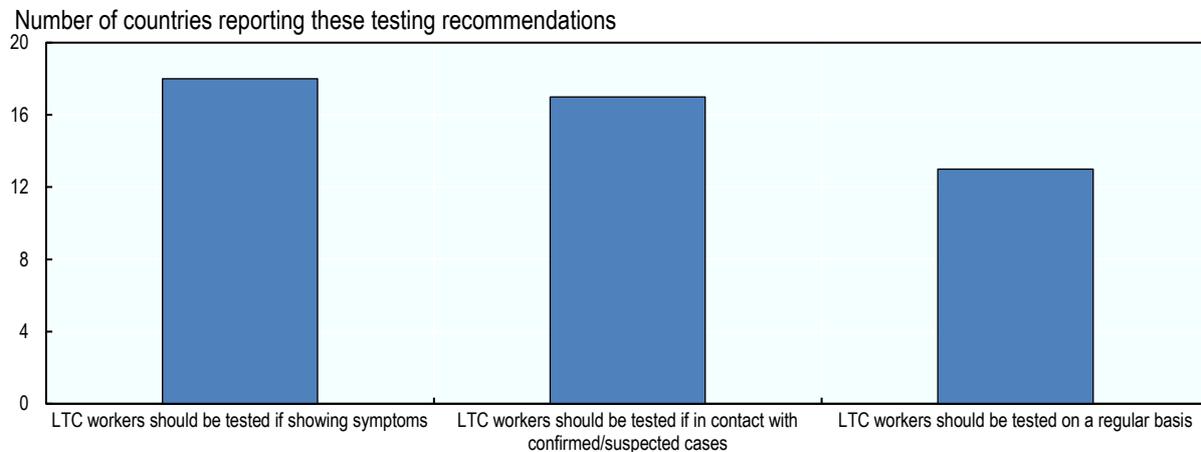
Source: OECD questionnaire on COVID-19 and LTC 2021/ (OECD, 2021 Forthcoming^[208])

153. In the case of COVID-19, because the vaccines were developed and trialled very rapidly, their effectiveness and safety in non-trial subjects was unknown at the time of the first roll-out. It is therefore important that those immunised, including health workers, be monitored closely for any signs of side-effects and adverse reactions.

154. Protecting health workers—and their patients—during a pandemic can also benefit from regular testing. Obligatory tests, regardless of symptoms, for health staff were implemented in several countries. Switzerland and the Netherlands, for example, recommended rapid access to SARS-CoV-2 PCR testing and results for all health-care workers (Bielicki et al., 2020^[219]). Elsewhere testing has also been encouraged during the acute phases of the pandemic. In the Hovedstaden region of Denmark, employees with mild symptoms and employees working with particularly vulnerable groups in the social field can be tested for coronavirus by agreement with their human resources manager (Region Hovedstaden, n.d.^[220]).

155. Findings from a sample of 24 OECD countries, as of March 2021, found that 19 countries have policies that LTC workers be tested for COVID-19 when they experience COVID-like symptoms, 18 countries recommend testing when a worker has been in contact with a confirmed or suspected COVID-19 case, and 14 countries have policies of routine testing (see Figure 2.7). In the majority of cases, regular testing was performed with antigen tests (as opposed to PCR tests).

Figure 2.7. Testing recommendations in OECD countries aim mostly to trace symptomatic workers and contact cases



Note: N=24.

Source: OECD questionnaire on COVID-19 and LTC 2021/ (OECD, 2021 Forthcoming_[208])

Effective communication, support initiatives, and appropriate resourcing can alleviate stress and anxiety felt by staff

156. As discussed previously in this report, health workers are vulnerable to stress and anxiety due to long shifts and working hours, stress and other pressures. The resulting mental ill-health and burnout imparts a high cost. Given the unprecedented nature of the COVID-19 outbreak, many health systems were not prepared with human and other resources. A review of peer reviewed literature found a prevalence of trauma-related stress ranging from 7.4% to 35%, particularly among women, nurses, frontline workers, and workers who experienced physical COVID-19 symptoms (Benfante et al., 2020_[221]). A systematic review found a 45% prevalence of stress, 24.3% prevalence of depression and 25.8% prevalence of anxiety among health workers caring for COVID-19 patients (Salari et al., 2020_[222]). Health workers in the New Zealand LTC sector reported high levels of stress during the pandemic, due to factors including higher levels of required vigilance at work and longer hours. Stress was also reported to stem from external pressures due to community misinformation, isolation from families, and fears of losing accommodation due to concerns from landlords or housemates (NZ Ministry of Health, 2020_[194]).

157. A number of countries are dually offering support to front-line health workers. A survey of OECD countries in early 2021 found that 15 countries offered LTC workers access to a free phone line as part of psychological support for LTC workers during acute phases of the epidemic (Belgium, Colombia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Latvia, Lithuania, Luxembourg, Netherlands, Portugal and Slovenia). Another 12 countries offered LTC workers access to consultation with a specialist as part of psychological support systems (Belgium, Colombia, Czech Republic, Estonia, Finland, Germany, Japan, Lithuania, Netherlands and Portugal) (OECD, 2021 Forthcoming_[208]). In addition to national-level efforts, advocacy groups and stakeholders released resources to providers and workers. The American Medical Association in the United States, for example, has provided archives of resources for emotional and mental well-being and social support, including the physician support line, a national support line service staffed by over 700 volunteer psychiatrists, to provide peer support in the context of the COVID-19 epidemic (AMA, 2021_[223]; PSL, n.d._[224]).

158. Complementing access to psychological support, peer support initiatives—where by health workers support each other, share use experiences, and normalise and validate each other’s feelings—

can be useful mechanisms to build worker resilience and support well-being. Peer support activities have been found to be useful to help clinicians cope during the COVID-19 crisis, with documented examples in ICU units and among groups of junior doctors (Behrman, Baruch and Stegen, 2020^[225]; Chanchlani et al., 2018^[226]).

159. Finally, appropriate access to resources for health workers is necessary to promote safe practices and reduce health worker stress and anxiety. For example, the provision of adequate barrier precautions (such as masks, gloves, gowns, and eye wear) for health workers caring patients with respiratory symptoms should be a significant priority for health care managers and policy makers (Adams and Walls, 2020^[227]). Equally important is the need to provide accurate, reliable and consistent public information about the spread of the pandemic, the status of patients in health facilities and the role of health workers in trying to manage the spread of, as well as care for patients with and without, COVID-19.

Established safety and quality mechanisms should be maintained in a crisis

160. Emergency situations, often exacerbated by shortages of staff and supplies, can lead to challenges in maintaining safe and quality care. For example, during the COVID-19 crisis many patient safety and quality improvement experts were deemed “unessential,” asked to work from home, and often ended up carrying out tasks unrelated to the current crisis (Staines et al., 2020^[228]). However, a crisis can also present an opportunity to institute overdue changes to outdated processes. Research suggests that reducing non-critical work activities can be beneficial to health worker well-being during times of crisis without adversely affecting health outcomes for patients, for example by postponing elective procedures and visits and reducing non-essential administrative tasks (Dewey et al., 2020^[229]).

161. In many places, several areas of improvement have been observed, including the adoption and implementation of: key attributes of safety culture such as transparency, communication and collaboration; improved safety practices to protect health workers; and state-of-the-art health information technology (IT) to improve the safety of patients and clinicians within the health delivery system. (Singh, Sittig and Gandhi, 2020^[230]).

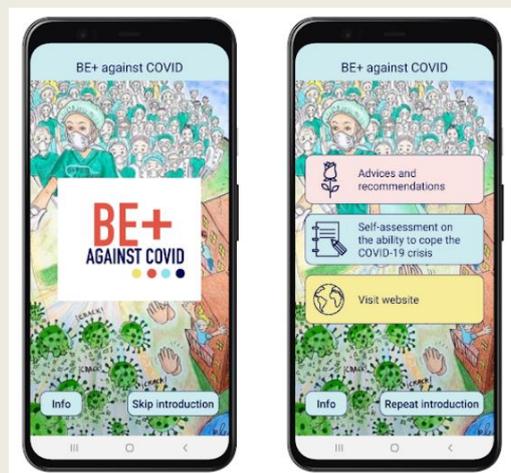
162. For example, hospitals in the United States have developed protocols for promoting staff well-being during COVID-19 (Adibe, Perticone and Hebert, 2020^[231]). Peer support systems and crisis communication strategies have also been deployed to help mitigate the stress caused by COVID-19 exposure and response (Wu, Connors and Everly, 2020^[44]) (See also Box 2.2 and Box 2.4). Sustainable versions of such protocols and interventions can be implemented on a more permanent basis.

Box 2.4. Be + against COVID Platform in Spain

Health workers in Spain have been particularly impacted by COVID, where at one point health workers comprised 1 in 5 of all infections in the country (ECDC, 2020^[232]). To address common [COVID-19 related problem situations](#), researchers developed a digital platform to provide support resources that might prevent acute stress. The *Be + against COVID* platform ([website](#) and mobile app) was developed and launched during the first wave in that country to offer a pool of recommendations and support resources, which were specifically designed to protect the psychological well-being and the work morale of health care workers. For each need, many recommendations were offered, and 19 support resources were created as intervention proposals. Infographics were designed to complement some of these resources. The tool includes a 10-question validated scale named “Self-assessment on the ability to cope the COVID-19 crisis,” and based on respondent answers, the app proposes a series of guidelines or recommendations, including in-app advice and web resources.

The mobile app and website are available in Spanish, English, and Portuguese.

Figure 2.8. Interface of the Be + against COVID Mobile App Platform



Source: (Mira et al., 2020^[233])

But existing protocols can be temporarily adapted

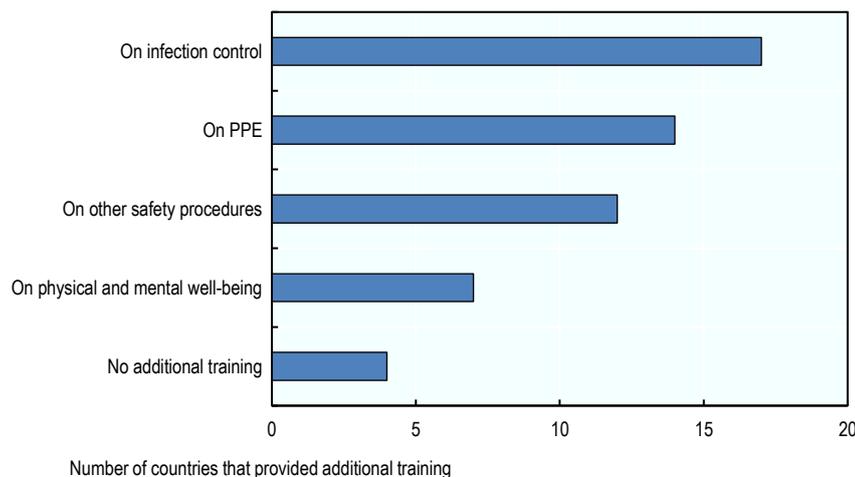
163. Not all policies and protocols must, or should, be maintained during a crisis like COVID-19. In some cases, temporary suspension or adaptation can avoid more difficulties and costs in the longer-term. To meet local health needs and address the surge in demand for health care services, it is critical to ensure that the health care workforce has sufficient professionals with the right mix of skills. During the pandemic, several countries have made efforts to issue short-term, fast-track licenses and provide exceptional training to mobilise health care providers and address the surge in demand related to the COVID-19 pandemic (OECD, 2020^[205]).

164. In Canada, medical residents' exams were deferred from early 2020 until Q3 2020 at the earliest (Taekema, 2020^[234]). While residents were granted a provisional licence until they can be certified, restrictions on temporary licences restrict them from practicing in certain settings. The American Board of

Internal Medicine cancelled exams for the maintenance of certification scheduled for spring 2020. At the same time, the capacity of test centres for initial certification examination decreased due to safety measures and led to cancellation of some appointments (American Board of Internal Medicine, 2020^[235]). While some residents faced cancellation of examinations due to safety measures, others have concerns regarding the requirements necessary to meet the certification because of the time spent dealing with the COVID crisis at the expense of their training (American Medical Association, 2020^[236]). The impact of these changes in licensing on health worker well-being and patient safety are unknown. However, they do present a real risk in the medium- and longer-term and should be appropriately managed by regulatory authorities and other agencies.

165. Another mechanism to adapt workforce capacity related to ad hoc trainings to build the skills needed in a crisis. The COVID-19 crisis showed that countries were able to adapt by providing additional training to health workers, responding to the specific challenges of the situation. Findings from OECD research on LTC facilities, for example, found that 68% of responding countries provided additional training on infection control (17 out of 25), 56% provided additional training on PPE (14 out of 25), and 48% provided training on other safety procedures (12 out of 25). Seven countries (Belgium, Czech Republic, Estonia, Finland, Ireland, and the United States) indicated that they also provided additional staff training on physical and mental well-being in response to demands brought on by the COVID-19 crisis (OECD, 2021 Forthcoming^[208])

Figure 2.9. Most countries introduced exceptional training for LTC workers



Note: N=22.

Source: OECD questionnaire on COVID-19 and LTC 2021/ (OECD, 2021 Forthcoming^[208])

166. In addition to providing training to existing human resources, some countries deployed rapid solutions to address staffing needs during COVID-19. For example, in Canada, the Manitoba government partnered with a local college to create a condensed one-week training program, enabling health sciences students to work as uncertified health care aides in LTC facilities to address staffing shortfalls (CBC, 2020^[237]). Similarly, the Ontario government is investing \$115 million to train up to 8,200 new LTC workers, a policy that includes offering tuition free training, and shortening existing training from eight to six months (Government of Ontario, 2021^[238]).

Conclusions: using the crisis to improve structures, processes and policy

167. COVID-19 has taken a significant human toll on OECD countries. Preventing and minimising future pandemics—and adequately preparing for them when they do come—must be elevated to one of the top priorities for global public health.

168. However, this challenging time has led to a number of innovations. One of these is the speed with which efficacious vaccines have been developed, which can be attributed to unprecedented global cooperation and information sharing across the public and private sectors. The true public value of science and innovation has been demonstrated.⁵ Information and knowledge has been shared rapidly and efficiently. The importance of timely data to manage public health responses and maximise the effectiveness of treatment has been appreciated and should be built upon.

169. More germane to the topic in this report, the crisis has spurred hitherto unseen coordination, communication and collaboration between and across professions. The landscape of health work and the working conditions of many health workers has been exposed, and changes to improve the safety of the health workforce is underway in a number of countries.

170. A sufficient, and capable, workforce, is the foundation of resilient systems. Policy makers need to focus now on how to build and support an appropriate workforce to respond to future shocks. This includes health workers beyond the hospital—including those in community, long-term, and primary care. Next, this workforce needs to be supported through concrete policy actions and appropriate resourcing. This includes not only things highlighted by COVID-19—such as PPE, testing, and vaccination—but also access to physiological support and services to promote employee well-being.

⁵ The same cannot be said for how initial vaccine doses have been allocated. At the time of writing, the vast majority of immunised people are in developed countries.

3

Creating the right conditions for a safe working environment across a health system

A focus on working conditions and culture should form the backbone of strategies and efforts to improve occupational safety and well-being for those that work in health care. This is underpinned by the right policy and regulatory environment. Investment in promoting health worker safety simultaneously addresses two sources of avoidable expenditure—costs incurred due to workers safety incidents and costs occurred due to patient safety events. This super-additive effect means that much can be gained from placing healthcare worker safety within a patient safety governance and policy framework. Promoting well-being and safety in the workplace—beyond preventing harm—provides scope for proactive strategies that create adaptability and resilience. This perspective also aligns with important upstream determinants such as leadership, a positive working environment and a supportive culture, which determine success in other aspects of health system performance.

171. Health care can be an unsafe industry for its workers, who face a range of hazards and threats to their physical, psychological, and emotional well-being if risks are not appropriately managed. The probability of sustaining occupational injury is on par with high-risk industries like mining or construction (see Chapter 1). The available evidence suggests that risks of occupational harm in healthcare worker are

not managed well, and there is currently ample room for improvement. For example, mental ill-health among healthcare workers, especially health professionals, is almost a third higher compared to other industries (see Chapter 1).

172. This must improve because healthcare workers comprise a growing proportion of the global workforce, meaning that the health and economic burden of unsafe working conditions are considerable. It must also improve because healthcare worker well-being directly influences the safety and quality of care that they are able to provide.

173. The COVID-19 crisis, which has taken a terrible toll on the health workforce worldwide, has highlighted the fundamental importance of wellness among healthcare workers. While the spirit and commitment of workers has come to the fore, the crisis has also revealed several weaknesses and pressure-points of health systems. It has provided valuable lessons on the critical part played by the health workforce in a health system's resilience, sustainability and performance.

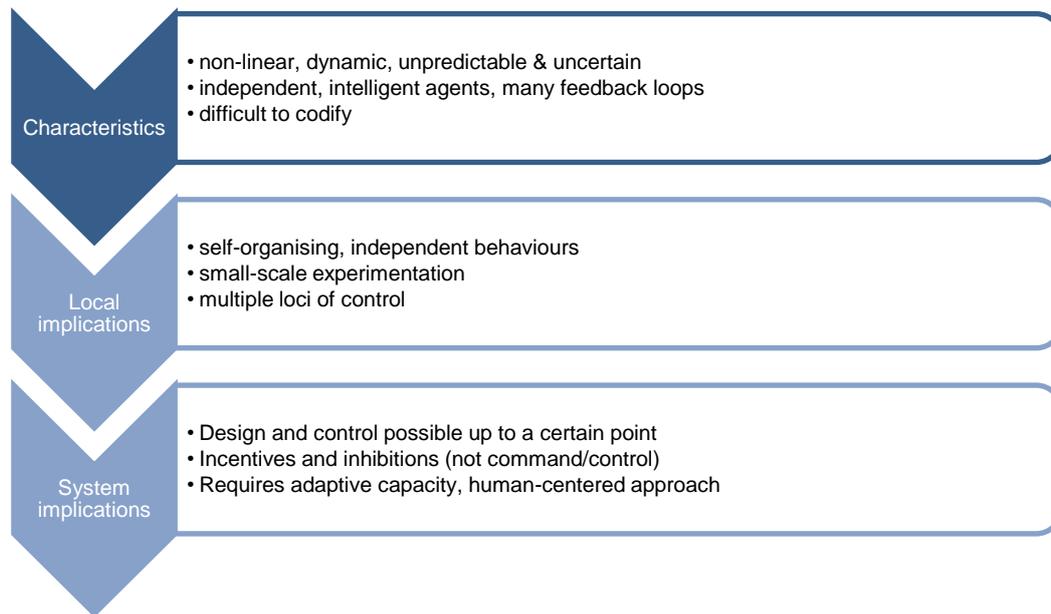
174. The economics of healthcare worker harm is closely related to the economics of patient safety. Improving worker well-being has intrinsic value, but it also lessens the costs of occupational harm (estimated at up to 2% of health spending) *and* contributes to minimising patient harm (estimated at up to 12% of health spending). Safe, healthy and happy workers are also more productive and contribute to better care quality more broadly.

175. Investing in worker wellness makes sense because the costs of harm dwarf the costs of prevention. Good returns for a relatively modest outlay are possible and can in fact exceed those offered by many biomedical interventions. From an economic perspective, investment is made more attractive because it simultaneously addresses two sources of avoidable expenditure. This super-additive effect means that much can be gained from placing healthcare worker safety within a patient safety governance and policy framework.

176. This chapter explores how creating working environments in health care where occupational risks are managed in a way that minimises harm to healthcare workers optimises their well-being, while ensuring that high-quality services continue to be delivered in the face of growing demand and budgetary limits.

177. Health systems are extraordinarily complex (Figure 3.1). They comprise many moving parts and are impossible to entirely codify, let alone be managed by 'command and control' governance systems, without elements of freedom and adaptive capacity to anticipate and solve problems at the local level (Provan et al., 2020^[8]). Managing hazards while continuing to deliver good care in a complex, unpredictable environment with limited resources requires resilience and adaptability, often necessitating trade-offs and optimisation decisions. A core theme of this chapter is therefore adaptation in the face of complexity.

Figure 3.1. Characteristics and implications of a complex adaptive system



Source: adapted from (Auraaen, Saar and Klazinga, 2020^[239])

178. While some aspects of health care will always require strict protocols, rules, and standards, many will perform better under a model that empowers workers, giving them and their colleagues agency and capacity (within limits) to adapt how they carry out their tasks. The advantages of this approach on performance, productivity and well-being have been applied to ‘linear’ processes like automotive production for decades. Health care is only beginning to discover the importance of building ‘adaptive capacity’ into its systems and organisations.

Service level innovation, within boundaries, is the foundation of worker well-being

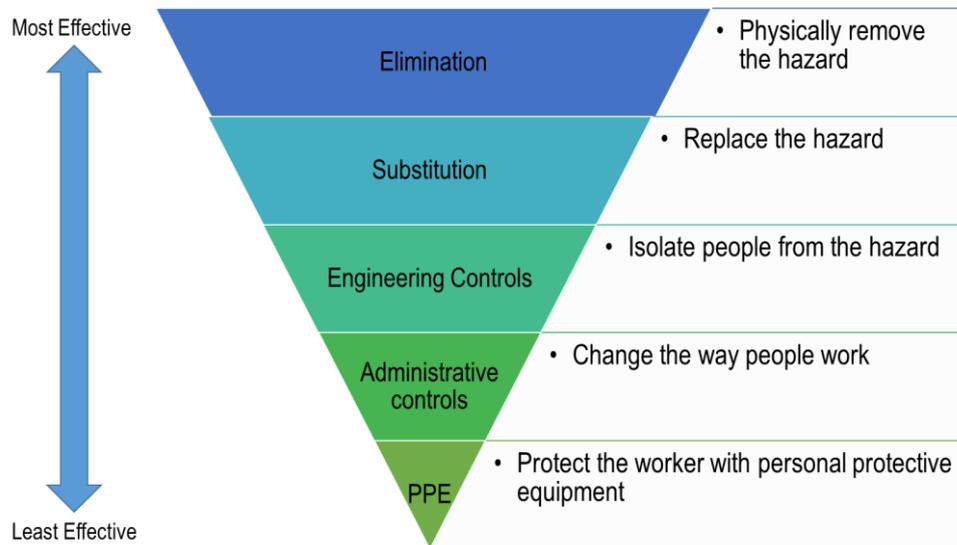
179. Healthcare workers operate in a complex, dynamic and uncertain environment that contains numerous threats and hazards, and often under considerable pressure. The origins of pressure can be inherent (e.g. ‘high stakes’), imposed (e.g. inadequate resourcing), or both.

180. This section argues that because elimination of *all* threats and hazards is impossible in a complex, dynamic environment like health care, risks need to be managed in a nuanced way. Recognising hazards and designing and implementing effective controls relies on two things: 1) professional judgement, expertise, and experience, and 2) intimate knowledge of the local context and environment. Initiatives to reduce work hazards are in most cases ideally led and coordinated by teams at the unit-level. However, this requires not only leadership and an enabling organisational culture, but also the right skills and knowledge as well as reliable data and information.

Local knowledge and innovation to manage risk

181. Complete elimination of all hazards would only be possible by shutting down services. Because this not an option, risks need to be managed and reduced to an acceptable minimum. A hierarchy of methods to do this was introduced in Chapter 1 and is illustrated again in Figure 3.2.

Figure 3.2. OHS Hierarchy of Controls



Source: (WHO, 2018_[150])

182. If elimination is not feasible because it would impede other team- or organisational objectives too greatly, the preferred order of managing the hazard is through:

- **Substitution** such as using oral instead of intravenous rehydration therapy, or a prick test instead of phlebotomy for blood samples.
- **Engineering** controls such as safety-engineered sharps devices; laminar flow boxes; negative pressure rooms and containment (bubble) beds; mechanical patient transfer equipment.
- **Administrative** controls such as training workers in safe working methods; checklists and protocols; triage and restricting access to high-risk spaces.
- **Protective equipment** such as an impermeable gown, coverall, or apron; double gloves; face masks.

183. The schema in Figure 3.1 is notably generic. This is because it is impossible to prescribe exact activities to the myriad of conditions and contexts that are found across a health system – from operating theatres to intensive care units, pathology labs, community health clinics, radiology, to general practice and so on.

184. Translating the schema to meaningful actions in local environments is a challenge, firstly because healthcare environments are complex, dynamic and uncertain, and therefore recognising a hazard in the first place is often difficult, particularly when working under sustained pressure. A patient or visitor may have a highly contagious illness that is undiagnosed or asymptomatic; or an otherwise benign situation may become hazardous due to extrinsic factors such as sudden increase in demand or faulty equipment; or several things occurring in unison align via the ‘Swiss cheese’ model to create a hazard (Reason, 2000_[240]). Staff who are already preoccupied may not be aware of a threat until it is too late.

185. Second, devising and implementing ways to deploy effective methods to manage continuous or incidental risks requires planning, communication and collaboration, and an investment of time and other resources. The method will invariably be shaped by a range of local considerations including:

- physical layout of the working environment (building and plant)
- available resources (equipment, personnel)

- knowledge, expertise and experience
- motivation and incentives (remuneration, paid sick leave)
- organisational culture (climate, values, leadership).

186. These considerations will differ not only by setting and location but also by time of day (e.g. night shift/day shift). As many of them are unique to the working environment in question, implementing local interventions is difficult to do from afar. Occupational health expertise needs to be combined with knowledge of the local environment, particularly regarding the factors listed above. In most cases occupational health initiatives will therefore be more successful if led and implemented by workers doing the work compared to standardised, pro-forma interventions imposed by a central agency.

The freedom to adapt one's working environment at unit level can also improve occupational health

187. There is a range of unit-level interventions that can be used to improve occupational health. Rather than list and describe these, it is more important to emphasise the importance of giving workers a degree of control to adapt their working environment to devise the best ways to manage risks and reduce hazards in their local environment.

188. It has been known for decades that decision-making control – or adaptive capacity – over aspects of a person's work is associated with better health and productivity in industries ranging from automotive production to civil service (Helper and Henderson, 2014^[96]; Marmot et al., 1978^[241]; Marmot et al., 1991^[242]). In health care, teams empowered to exercise their professional judgement, knowledge, and skills to devise, test and implement improved work processes are healthier, happier and more productive. Greater 'control' can increase satisfaction and well-being, while reducing occupational injury, stress and burnout (Lundstrom et al., 2002^[243]).

189. Evidence for a physiological link between health and job control exists in the healthcare setting. A study of nurses found that low control was associated with increased risk of cardiovascular disease. The risk increased if lack of control was coupled with poor teamwork and lack of social support at work. Conversely, job control and social support corresponded with lower mortality risk (Johnson-Pawlson and Infeld, 1996^[85]).

190. The positive impact of furnishing teams with the capacity and the freedom to assess, adapt and improve their own, local working environment can be self-reinforcing through direct and indirect effects on occupational health and other outcomes (Figure 3.3).

Figure 3.3. The reinforcing effect of local agency and adaptive capacity



Source: Authors

Improvement can spill over into other organisational objectives

191. Adaptive capacity can also spill over – directly or indirectly – to improving care delivery and patient outcomes. Direct spillover may occur where the same hazard is faced both by workers and patients. Moving or ambulating patients, for example, place both patients and workers at risk of injury. Reducing healthcare-associated infection will not only benefit the health of patients and providers but is also likely to be more successful if designed and implemented with both groups in mind. Some examples are provided in Table 3.1.

192. Indirect spillover takes place when a quality improvement culture takes hold and spreads to other areas of patient care, improving quality, value and performance. In both cases, benefits will be felt at the unit level as well as the organisation and health system.

Table 3.1. Examples of Interventions and their Potential Benefits to Patients, Staff, and Organisations

Intervention Focus	Examples of interventions	Potential Benefits to Patients	Potential Benefits to Employees	Potential Benefits to the organisation and the health system
Active surveillance, analysis and feedback of incidents, hazards and risks	Reporting “near misses”; safety walk-arounds; periodic health and safety inspections, promotion of a just/no-blame culture	Fewer hazards and adverse events in patients	Fewer injuries and illness; increased satisfaction	Increased opportunities to intervene before harm occurs; better quality data; improved compliance with regulatory and oversight bodies; improved safety culture
Safe patient handling	Patient lifting equipment; no-lift policies; specialized lift teams	Better patient experience; fewer falls; improved outcomes	Increased worker satisfaction; fewer injuries	Decreased worker compensation; staff retention; patient experience and outcomes; length of stay
Fall prevention	Patient assessment; safe-transfer technique; flooring materials; skills;	lower morbidity and mortality, length of stay	Fewer injuries and days off	Decreased worker compensation costs; decreased staff replacement; patient experience and outcomes; reduced length of stay.
Infection prevention	Health care worker immunization; protocols/precautions; hand hygiene; PPE	Reduced nosocomial infections	Reduced occupation infections;	Patient experience; fewer sick days; reduced length of stay.
Assault and violence prevention and management	Frontline staff and security staff training; track patients with history of disruptive behavior	Fewer injuries and adverse events; less use of restraints	Fewer injuries; less anxiety; improved teamwork; improved satisfaction	Lower staff turnover, litigation; improved safety culture
Ergonomics and human factors engineering, work flow redesign	Adaptive clothing and scheduled toileting for residents; mechanical lift equipment; supply kits; toilet seat risers	Quicker recovery; increased satisfaction; decreased errors; quicker staff response	Fewer errors; increased efficiency; fewer injuries; increased satisfaction	Higher reliability; improved adherence to guidelines; improved efficiency; decreased turnover and absenteeism, work-related illnesses
Appropriate staffing levels, mix and workload assignments	Work-hour restrictions, evidence-based shift length, rotation, rest periods	Lower mortality (failure to rescue); fewer fatigue-related adverse events; increased patient satisfaction	Decreased stress and burnout; enhanced morale, quality of work life	Decreased turnover; decreased absenteeism, work-related illnesses; improved publicly-reported patient satisfaction; increased market share; improved safety culture
Improving safety culture/climate and teamwork	Engaging workers and engaging patients in safety activities; leadership rounds; daily huddles	Fewer adverse events; increased satisfaction	Enhanced morale, employee satisfaction; decreased fatigue and burnout	Improved patient and worker outcomes; decreased litigation; improved reputation; decreased turnover
Safer design of practices and built environment	Improved ventilation, surfaces, water systems, private rooms, room design, and equipment proximity; healing environments	Fewer health care-associated infections; quieter; increased satisfaction; faster healing	Decreased stress; increased efficiency; fewer errors; improved security	Increased satisfaction; increased staff retention; increased patient loyalty; improved safety culture

Source: Adapted from (The Joint Commission, 2012^[26])

There are limits to what can be achieved locally

193. Teams at unit-level, of course, face constraints on how much they can do. Improvements within their control are limited to processes and workflows. Even then, some initiatives may be constrained by broader policies and available resources. A simple example would be LTC workers remaining on the job when feeling unwell, thus presenting an infection hazard to co-workers and residents, because their casual employment means that they are not remunerated for taking sick leave. There is no unit-level fix for this common dilemma. Another is staffing numbers, their experience and skill levels, which affect both worker and patient well-being, but are often outside a facility's control (if it is part of a larger system), let alone individual units within it. An overarching policy and governance framework is needed to support organisations; provide the necessary upstream requirements for organisations to keep their staff safe and healthy; and foster adaptive capability at the unit level.

Adaptive capacity needs the right policy settings

194. Healthcare delivery is inherently complex. Practitioners, managers and administrators operate in a constantly changing environment. The inherent complexity and resulting uncertainty cannot be controlled or eliminated. A resilient health system or healthcare organisation embraces complexity and manages it proactively. Local adaptive capacity can not only reduce hazards and improve worker safety; giving workers more control and agency over their working environment and its processes is also beneficial to workers' job satisfaction and health.

195. However, units and organisations do not operate in a vacuum. Their ability to proactively control hazards and manage risks based on local context will be determined to a large extent by policy and governance at the system level. This section discusses the necessary policy and regulatory environment at the system level to foster local adaptive capacity. This starts with a new conception of occupational health, and safety more generally, from one of central control to one that embraces uncertainty to proactively manage risk (Provan et al., 2020^[8]). This does not mean a hands-off, *laissez faire* approach. Overarching policy, regulation and governance are just as important, with central accountability, monitoring and investment needed, but must be designed to guide adaptability, striking the right equilibrium between control and standardisation, and freedom and flexibility.

Variation: from threat to opportunity

196. Fundamental to a resilient, adaptable and learning health system is a conception of risk based on uncertainty and complexity as a normal feature of everyday practice. Key to this is seeing variation as an opportunity as opposed to something that must be eliminated.

197. Embracing variation plays out in two ways. The first is what could be termed *exogeneous*. It centres on accepting that changes in external circumstances are inevitable. Like professions exposed to the natural elements, it is much better to adapt to, than aim to control something that cannot, by its very nature, be controlled. Pilots, sea captains and oil platform chiefs operate under numerous protocols and standards that should be followed in a range of circumstances. But not everything can be codified, and the ability to anticipate, recognise and adapt to changing circumstances is the hallmark of ensuring safety in these pursuits.

198. Second, *proactive* variation is the endogenous type where, dictated by uncertainty, variation is an opportunity to test and learn how to perform certain tasks better, more safely, more effectively or more efficiently. Work patterns and processes are adapted to manage emerging and existing threats, evaluated and then either sustained, scaled or abandoned depending on the results.

199. To work effectively, the governance of such a system needs to permit a certain degree of local experimentation and flexibility to adapt practices. Moreover, as described in the previous section, workers must be equipped the skills and the tools to (a) anticipate and detect hazards, and (b) design and implement change in a considered way. Key to this is having reliable and timely information at their disposal and organisational permission to innovate.

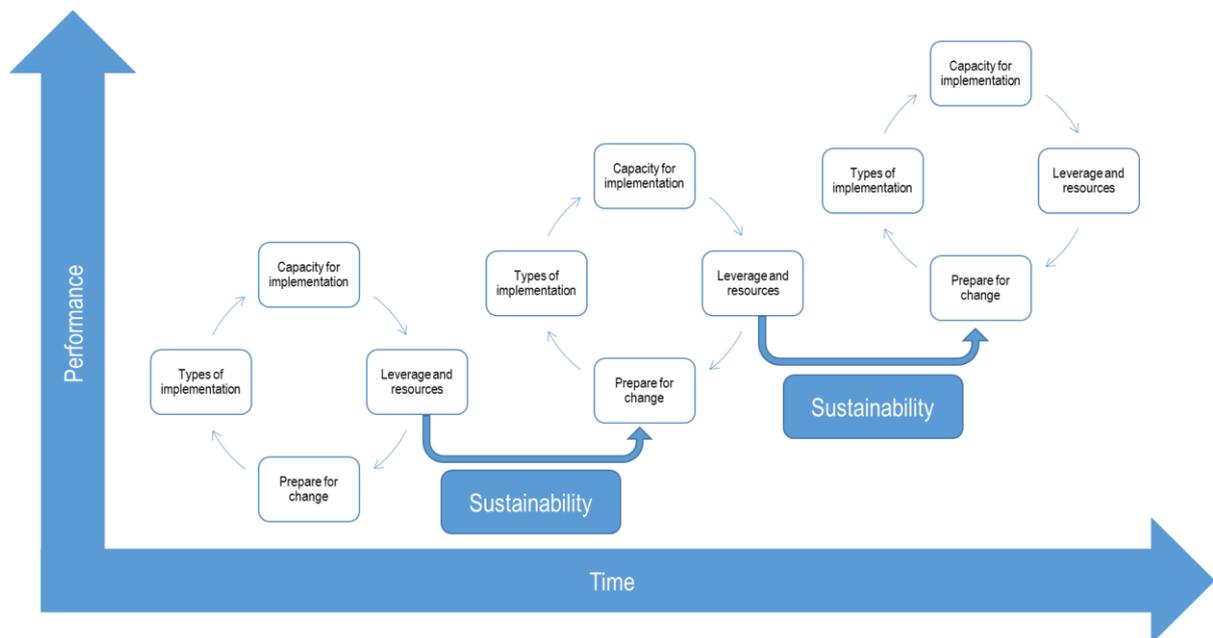
Processes to monitor performance and provide support when needed

200. Evidence of impact is an indispensable part of quality improvement in any field. Data to generate agreed metrics should either be made available, or their collection facilitated. It is helpful to base metrics around outcomes (e.g. absentee rates, turnover, sick days, length of stay, adverse event rates, staff satisfaction, patient-reported outcomes), as well as processes (e.g. length of stay, vaccination rates, antibiotics prescribed).

201. Measurement over time is a key part of any improvement methods, such as the Plan-Do-Study-Act (PDSA) approach promoted by the Institute for Healthcare Improvement (IHI) (IHI, 2021^[244]). Metrics, if relevant, trusted and timely, play as an important role in building and sustaining motivation (a team remains motivated if improvement is reflected in the data). It is also indispensable for evaluation, enable adjustment, cessation or, in the case of success, a business case to continue or scale the initiative up.

202. The adaptive capacity model described here is an indispensable element of a ‘learning healthcare system’ where local requirements, resources, and priorities form the basis of continuous improvement cycles informed by feedback (data) provided in close to real time – a process illustrated in Figure 3.4 (Braithwaite, Glasziou and Westbrook, 2020^[245]). In this model, the Y-axis can include occupational health, patient outcomes or any aspect of organisational performance that can be measured over time.

Figure 3.4. A learning healthcare system model based on continuous improvement



Source: Adapted from (Braithwaite, Glasziou and Westbrook, 2020^[245])

203. A learning (adaptive) health system can be imagined as comprising a multitude of sub-organisational units striving to continuously improve their practice based on evidence derived from local

data. Measurement is integral to the success or failure of this approach, that it should be a mandatory requirement of any local improvement initiative. It must also align with wider requirements of system-level tracking and reporting discussed in subsequent sections.

Human capital must be cultivated

204. As previously described, it is of significant importance to furnish local teams with the knowledge, skills and experience of practicing adaptive capacity to manage risk in their local environment. This, too, needs to be supported and complemented by policies at the macro level.

205. An understanding of quality improvement, change management as well as knowledge of human factors (i.e. the inclusion of consideration of human behaviour, abilities, and limitations in system and environmental design) and resilience engineering (i.e. the design of systems with capacity to sustain operations under both expected and unexpected conditions) can be acquired on the job as part of continuing professional development (CPD) programme. System-level policy and regulation can help. For example, requiring that all workers earn a certain number of CPD credits about these topics will incentivise workers to participate especially if the courses were provided free of charge and were made easily accessible. On-line learning can be deployed. However, quality improvement in the healthcare setting invariably relies on teamwork. Instilling adaptive capacity is therefore likely to require face-to-face group work.

206. Quality improvement, human factors and resilience can be incorporated into undergraduate health professional education, graduate education, on-the-job training, and continuing education. Having providers enter the workforce with a basic understanding of activities that will improve their safety and well-being as well as that of their patients will have positive impact on organisational performance and the performance of the whole system.

207. Healthcare workers must have the requisite qualifications, experience and educational attainment at all grades of service, and there is an optimum ratio of clinical staff below which safety and quality are compromised (and above which the marginal benefit diminishes). However, the right *mix* of skills and qualifications within a team or organisational unit can be as important as the number, and educational attainment, of its individuals. The safety of workers and of patients is enhanced if the clinical microsystem is staffed by the combination professionals, technicians and support staff that is right for that setting and location. Complementing training and skill mix, health workplaces can consider policies that incorporate behavioural insights, acknowledging that even when staffing levels are appropriate, engaging in the right behaviours or safety protocols can be challenging if there are not the right systems in place to encourage and facilitate best practices (OECD, 2020^[95]).

208. Ultimately it is up to organisations and, ideally, the teams in question to determine and recruit the right number and type of personnel. However, the processes of doing this can be facilitated (or hindered) by system-level policies, regulations and guidelines. Put simply, organisations should not face excessive bureaucratic barriers when assembling teams of sufficient size, and comprising the right mix of skills and expertise.

Improvement specialists can play an important role

209. Adaptive capacity can be supported and enhanced by embedding dedicated improvement specialists across the health system. Their role would be two-fold: 1. guide adaptive capacity at organisational level, and 2. provide a formal communication channels across the system more broadly. As such, safety specialists would form a key part of overall safety governance and infrastructure, their scope of work will encompass occupational health as well as other complementary areas of practice, most notably patient safety and care quality.

210. Importantly, these specialists would act more as ‘guides’ than ‘controllers’ helping to manage and harness variation in a safe and controlled manner. Their primary focus would be anticipation and mitigation: creating foresight about the changing nature of risk and facilitating proactive changes to manage it – as opposed to *ex post* reaction to failures. They would also be trainers, tasked with building capacity to among workers to recognise risk, and design, implement and evaluate local interventions to manage it (Provan et al., 2020^[8]). A more comprehensive list of responsibilities is provided in Table 3.2.

211. How and where improvement specialists are deployed would depend on the system’s nature, size, structure, and budget. A typical health system may aim to embed a safety specialist in all major organisations, or across regions or networks of smaller service providers.

Table 3.2. The general activities of improvement specialists

Activity	Description / examples
Explore everyday work to understand the way the organisation is currently functioning, where resilience exists and where risks are emerging.	<ul style="list-style-type: none"> Engage with and observe the challenges and problems faced by front-line work as done. Facilitate the identification and implementation of safe adaptations. Understand the issues and uncertainties being grappled with by technical specialists and the organisational discounting of emerging information. Monitor and enhance the rigor applied to safety-critical decision-making.
Support local practices and guide adaptations	<ul style="list-style-type: none"> Understand how disturbances, problems and surprises are being detected and responded to. Identify the capacities that are supporting safe adaptation and develop actions to extend proactive learning across organisation. Guide adaptability by deciding which local practices and adaptations to re-enforce and which to undermine.
Reduce goal conflict and negotiate re-distribution of resources	<ul style="list-style-type: none"> Monitor organisational pressures; change, cost, production, schedule, resources, etc. Understand where discounting of safety risk and safety trade-offs might be occurring due to production, cost and other goal pressures. Identify actions to intervene. Create system wide action to reduce goal conflict through facilitating adjustments to cost, schedule and production goals. Maintain an inventory of internal and external deployable resources (technical specialists, key roles, critical equipment). Monitor the needs and gaps in resourcing (people and equipment) across the organisation. Identify and facilitate the redistribution of organisational resources to support changes in operational demands.
Facilitate information flows and coordinate action	<ul style="list-style-type: none"> Create formal and informal mechanisms to receive information about the current functioning of teams across the organisation. Facilitate the transfer of this information across organisational boundaries where it can enhance decision-making. Coordinate action and operational support to keep pace with emerging demands across organisational boundaries.
Generate future operational scenarios	<ul style="list-style-type: none"> Facilitate the development of possible future operating scenarios and the associated safety risks based on a multi-disciplinary understanding of the organisation. Facilitate the implementation of contingency plans to detect and respond to these scenarios. Probe front-line workers and technical specialists to identify the uncertainty associated with current operations and safety risks.
Support the understanding of trade-offs and resolve tension between objectives.	<ul style="list-style-type: none"> Facilitate the development of contingency plans, including flexible deployable resources for high-risk activities to enable justified sacrifice decisions to be made Identify sources of operational uncertainty and use this as a definitive signal that work needs to be supported and implement mechanisms to gather more information to understand and respond to the changing shape of risk.
Facilitate Learning	<ul style="list-style-type: none"> Continually monitor the culture of the organisation detecting any sources of blame and sanctions in relation to safety and operational performance and implement actions to restore trust and openness. Develop and conduct training in dealing with anomalies and surprises, to enhance the organisational capabilities for: anticipation, revision, initiative, and reciprocity.

Source: (Provan et al., 2020^[8])

Direct and indirect return on investment

212. The question is whether investment delivers a reasonable return compared to alternative deployment of the resources in question. The literature on the cost-effectiveness of occupational health interventions in health care is scant. Some interventions aimed at reducing specific types of worker harm such as sharps injuries can result in net savings (Chapter 1).

213. Nevertheless, occupational harm and injury to healthcare workers costs health systems up to 2% of their total expenditure. In most OECD countries this amounts to approximately 0.2% of GDP. This not a trivial amount (EUR 745 million in Germany, for example), and can be drastically reduced with concerted effort (OECD, 2021^[246]).

214. The demonstrated spillover of worker well-being on clinical and organisational objectives means that spending in this area can exert a multiplier effect. Every dollar invested will not only reduce the costs of worker injury and ill health, it will also improve patient outcomes, patient experience and overall productivity. Given that the return on investment of some patient safety initiatives are estimated at 7:1, this super-additive effect can be considerable (Slawomirski and Klazinga, 2020^[24]).

215. In addition, formally aligning worker health with other objectives—safety and quality in particular – may create efficiencies through not only reduced duplication but actual synergies of production. Integrating the two is explored in subsequent sections.

Integrating worker well-being with care quality

216. Other industries have for some time recognised and leveraged the connection between customer service and a happy, healthy, and engaged workforce. In these industries, occupational health is seen as an integral part of organisational strategy, risk management and corporate governance – and not an addition or afterthought.

217. In health care, such integration is not the norm for several reasons including: a lack of resourcing stemming from occupational health not being understood or seen as a strategic priority by leadership; a tribal and hierarchical culture that is not conducive to collaboration across silos; inadequate communication and cross-enterprise management; and fragmented accountability and governance (Sikorski, 2009^[247]).

218. Indeed, a key barrier to better outcomes, performance and value in the health industry is fragmentation – or lack of coordination and integration of core activities. This applies to advancing different but overlapping priorities and objectives. One example is the potential improvement in patient safety and quality of care by aligning clinical risk management with corporate and professional risk (Slawomirski and Klazinga, 2020^[24]). Virtually any reduction in worker harm has a positive effect on patient outcomes and organisational performance. Foundational and structural domains such as culture, communication and governance influence procedural domains, which in turn, affect health and well-being of workers and outcomes.

Resilience relies on several key elements

219. This section argues that integrating occupational health with care quality and safety under one framework can enhance the effectiveness of both, creating resilient health systems and organisations within them. The minimum requirements for success include (The Joint Commission, 2012^[248]; Loeppke et al., 2017^[29]):

1. Leadership and accountability
2. Staff buy-in, agency, participation and training (human capital)
3. Adequate investment and resourcing

- 4. Measurement and monitoring
- 5. Aligned governance
- 6. A strong safety culture

220. This report previously discussed the importance of worker agency, involvement, and human capital, of measurement, and of investment and resourcing. Indeed, the benefits of furnishing teams with the capacity and the freedom to continuously assess, adapt and improve their own, local working environment is worth repeating as it can manifest in three mutually reinforcing ways:

- It is the most effective way to directly improve worker safety throughout a system characterised by uncertainty, complexity, and adaptation.
- When embedded as a mind-set and a part of organisational culture (see below) it spills over into other organisational objectives, most notably patient safety, care quality and general productivity and performance.
- Greater agency and control over their jobs intrinsically make workers more satisfied, engaged and motivated to ‘do better’ for patients, colleagues and the organisations, feeding back into the first two points.

221. The remainder of this section focuses on leadership, culture, and aligned governance.

No progress without good leadership and the right culture

222. Good leadership is an essential component of improving worker and patient safety, productivity and efficiency. Moreover, it is key to building work environments that improve safety culture for both patients and workers.

223. Improving perceptions of safety culture has a positive impact on job satisfaction and staff engagement—and a potential to decrease costs associated with burnout, low-productivity, and workers compensation (de Bienassis et al., 2020^[97]). For example, positive culture and employee engagement, patient-centred care, and employees’ positive assessment of the quality of care provided by their team have all been found to be interrelated (Lowe, 2012^[249]) Safety climate scores have been found to be related to both worker safety compliance behaviours and worker injury rates (Agnew, Flin and Mearns, 2013^[250]). This aligns with findings from previous studies that have found linkages between positive safety cultures and decreased levels of workers’ compensation claims (Thorp et al., 2012^[251]) Finally, culture has been connected to important aspects of staff productivity—including those with significant financial implications for health systems such as higher retention and lower staff turnover, lower burn-out rates, and higher levels of workforce engagement (The Health Foundation, 2011^[252]; Sexton et al., 2018^[253]).

224. As described in Chapter 1, there are significant linkages between cultures that promote worker safety and those that promote patient safety. These are reinforcing, and often address the same domains—such as teamwork, staffing adequacy, and good communication and trust (as described in Table 3.3). Health care leaders should consider mechanisms for the improvement that address both conjointly and implement streamlined monitoring processes to assess the performance of both.

Table 3.3. Common Dimensions across Safety Culture Tools

	Examples of Topic Areas: Worker Safety Culture Tools	Examples of Topic Areas: Patient Safety Culture Tools
Leadership and management	Leadership and management support for staff safety; degree of supervision, leadership hierarchy, policies and procedures	Perceptions of management; leadership and management support for patient safety; nonpunitive response to errors, policies, and procedures; adequacy of training

Group behaviours and relationships	Workgroup relations, conflict vs. cooperation, social relations, coworker trust, supportiveness	Teamwork within and across units; quality of handoffs and transitions
Communications	Openness of communication, formal and informal methods, conflict resolution approaches	Feedback and communication about error; reporting mechanisms
Quality of work life: structural attributes; working conditions	Staffing adequacy, job satisfaction, team satisfaction, security; work pressure, rewards, job security, forced overtime, benefits	Staffing adequacy, job satisfaction, team satisfaction; resource availability; stress recognition

Source: (The Joint Commission, 2012^[248])

225. While it is every health worker’s responsibility to maintain and improve safety, it is the role of leaders and managers to ensure that safety is a core organisational value. In particular, it is the role of managers to “to establish the value system in the organisation; set strategic goals for activities to be undertaken; align efforts within the organisation to achieve those goals; provide resources for the creation, spread, and sustainability of effective systems; remove obstacles to improvements for clinicians and staff; and require adherence to known practices that will promote patient safety” (Botwinick, Bisognano and Haraden, 2006^[254]). In the context of worker safety, leadership is responsible for many of the key factors that underlie worker safety outcomes—such as allocation of resources, good communication channels, staffing decisions, safety protocols/policies, and empowering staff to engage in improvement activities.

Combining worker and patient safety governance

226. The idea of integrating worker health and care quality within the same governance framework is gaining traction (The Joint Commission, 2012^[248]; Binder and Favret, 2017^[60]; Loeppke et al., 2017^[29]; Lundstrom et al., 2002^[243]). Given the low priority typically assigned to worker well-being in health care, one of the benefits of integration is that it formalises, or at least focuses more attention on, this fundamental requirement of high-performing, resilient health systems. Beyond that, it can also generate efficiencies and synergies.

227. Governance in this context can be defined as the steering and rule-making functions designed to achieve specified priorities and objectives. Governance can comprise formal accountability structures, laws, policies and regulations, as well as softer levers such as measurement and benchmarking, human capital development (Auraaen, Saar and Klazinga, 2020^[239]).

228. At the organisational level, achieving alignment requires the elevation of worker health to a core strategic objective. It will in most cases require adjustment to management structures and accountability frameworks. For example, key performance indicators should incorporate occupational health outcomes. Reporting lines need to reflect integrated health and safety efforts. Safety committees should include staff representing both worker-safety and patient-safety interests.

229. Improvement specialists can play a key role in integrating various aspects of safety and quality. They not only act as local guides and trainers for risk management and improvement efforts at organisational and unit levels, but also fortify the governance framework by acting as important conduits of information and accountability across the entire system. An organised, formal cadre of improvement specialists can help identify systemic risks, find innovative solutions to intractable problems, learn from, and train each other, and spread and scale successful interventions to other areas where these may bear fruit.

230. One of the most important parts of integrating healthcare worker health with care quality efforts is measuring results and sharing these measurements across teams. This has already been discussed in the previous section of this chapter, but it is worth repeating here. In the context of governance, a first step is identifying key indicators or metrics in partnership with workers.

231. These metrics will comprise the minimum required for system-level reporting plus additional ones that are relevant to the local environment. These will differ based on setting and location. Community health clinics, intensive care units and long-term care facilities will likely have a different set of additional, relevant metrics.

232. The data should be compiled, analysed, and reported over time. They should be tracked by unit, shared throughout an organisation and reported centrally to enable recognising emerging problems, evaluating local improvement initiatives, and learning from success across a system. Data should be readily accessible to units in periodic intervals. To ensure visibility and action, organisations should report occupational health outcomes alongside metrics for patient safety and care quality such as infection rates, falls and patient-reported outcomes and experiences (Table 3.4).

Table 3.4. Candidate metrics for a minimum set of health worker occupational safety indicators as part of assessing health care quality

<p>Outcomes/Worker Safety Indicators</p> <ul style="list-style-type: none"> • Staff turnover • Sick leave • Injury rate/workers compensation claims • Sharps log injury rate • Workplace violence incidence rate • Health worker mental well-being (e.g. WHO-5)
<p>Structural Indicators</p> <ul style="list-style-type: none"> • Staffing ratios • Organisational culture indicators

Conclusion

233. This chapter has discussed the importance of continuous adaptation and improvement to manage risk at the organisational level, down to single units and teams at the frontlines of service delivery. Moreover, structural policy and regulatory requirements are needed to embed adaptive capacity across a health system. These structures, policies and activities should align with other objectives, especially clinical risk (patient safety) and quality of care, and they should ideally be accommodated within one governance framework. Given the fundamental importance of psychological safety and emotional well-being on worker safety the chapter is framed around *improving* occupational health and worker well-being rather than *avoiding* harm or injury. Promoting well-being and safety provides not only more scope for proactive strategies that create adaptability and resilience, but also because it is natural fit for important upstream determinants such as leadership, a positive working environment and a supportive culture, which determine success in other aspects of health system performance.

4

Conclusions: Investing in health worker well-being to enhance health system resilience

The previous chapters have examined underlying conditions that predispose health workers to occupational harm as well as mechanisms to address these hazards. Chief among these are working conditions driven by workload, skills and competencies, and workplace safety culture—all of which influence not only occupational safety but also care quality and patient safety. This final chapter provides guidance on policy areas for improving health worker well-being. In particular, this chapter focus on policies that enable a flexible workforce with appropriate safeguards—putting parameters around local adaptability.

234. The COVID-19 situation is emphasizing the need for safety at the work place, whilst at the same time requiring more flexibility in the size and nature of the health care workforce. The current pandemic has highlighted the need for strong and resilient safety governance beyond the hospital, and the importance of ensuring safe working environments for workers in the long-term care and ambulatory care settings with continuous investment in staff competences, safety and numbers. A flexible workforce is required to address the need for upscaling and downscaling of specific health care services such as ICU capacity, safety policies in nursing homes with COVID-19 cases, and capacity for tracking of personal contacts by municipal public health offices. The following chapter discussed areas where policy makers can improve health worker safety outcomes through systemic policy changes.

Box 4.1. Inclusion of health worker safety in international calls for action

EU4Health 2021-2027

Launched on March 26, 2021, the European Commission announced the EU4Health Programme to support the resilience and innovation of health systems across Europe EUR 5.1 billion throughout the period 2021-2027. Included in this effort is the target to improve EU's preparedness for major cross border threats, including through a reserve of healthcare staff and experts that can be mobilised to respond to crises (EC, 2021^[255]). A resilient, adaptive workforce is one of the key inputs to creating a reserve that can be called upon to address novel health system needs.

The WHO's Global Patient Safety Action Plan 2021–2030.

The WHO has recognised the inseparably interconnection between patient safety and health workforce safety. This has been reflected in the WHO Health Worker Safety Charter and more recently, the WHO's Global Patient Safety Action Plan 2021–2030 (WHO, 2020^[256]; WHO, 2021^[257]). Related strategic objectives and actions for governments are listed below:

- **Strategic objective 1.1:** Develop a comprehensive patient safety policy, strategy, institutional framework and action plan for the country's health system and all its components as a key priority in working towards universal health coverage
 - Create a national patient safety charter that includes institutional standards and patients' and health workers' rights and responsibilities.
- **Strategic objective 1.2:** Mobilize and allocate adequate resources for patient safety implementation throughout every level of the health care system
 - Ensure sufficient funding to deliver needs-based safe staffing and establish effective human resource planning to ensure an adequate supply of health workers to meet patient and population needs.
- **Strategic objective 5.1:** Incorporate patient safety within health professional undergraduate and postgraduate education curricula and continuing professional development, with an emphasis on interprofessional learning
 - Include health and safety skills pertaining to personal safety in education curricula and training programmes with an interprofessional learning approach.
- **Strategic objective 5.5:** Design care settings, environments and practices to provide safe working conditions for all staff
 - Support and endorse the WHO charter Health worker safety: a priority for patient safety by signing up to it and supporting its implementation.
 - Support and endorse the WHO charter Health worker safety: a priority for patient safety by signing up to it and supporting its implementation.
 - Develop and implement national programmes for the occupational health and safety of health workers in line with national policies and provide adequate resources for sustainability of programmes.
 - Adopt and implement relevant policies and mechanisms to prevent and eliminate violence in the health sector in accordance with national laws.
 - Provide access to mental well-being and social support services for health workers, including advice on work–life balance and risk assessment and mitigation to tackle burnout, enhance well-being and promote resilience.

- Develop linkages of patient safety programmes with health, safety and environment and occupational health and human resource strengthening programmes at national and subnational levels

The Sustainable Development Goals (SDGs)

Patient and health worker safety relate directly to two of the SDGs, SDG 3 and SDG 8.

- SDG 3 relates to targets for health and wellbeing. In particular, Target 3.8, outlines the goal to “Achieve universal health coverage, including financial risk protection, access to quality essential health care services and access to safe, effective, quality and affordable essential medicines and vaccines for all” (UN, 2015_[258]). Improving patient and worker safety relates to UHC by improving health outcomes and reducing costs associated with responding to adverse events after they happen. This improves the efficiency and productivity of the health system, reducing waste, and creating potential for resources to be redirected to areas of need.
- SDG 8 relates to the quality of work and economic growth. Target 8.8 outlines the goal to “Protect labour rights and promote safe and secure working environments for all workers” (UN, 2015_[258]). As health care workers compose a significant part of the labour force in many OECD countries, improving workforce safety is pivotal for achieving this goal.

Enabling a flexible workforce with appropriate safeguards—putting parameters around local adaptability

Some systemic policies are needed...

235. Several foundational requirements for better occupational health are best developed at the system level. The influence of **labour market policies and regulation** on occupational health has been demonstrated several times in this report. In most circumstances, a casualised health workforce will undermine the safety and well-being of healthcare workers as well as patients. For example, people who work across several healthcare facilities pose a much greater risk of spreading pathogens. COVID-19 has demonstrated that perhaps the trade-off between economic efficiency (enhanced by unencumbered movement of human capital) and safety may, in many places, be too skewed towards the former. As outlined in Chapter 2, several countries are revisiting policies and regulations in this regard. At a minimum, the risks of casualisation must be managed through tighter regulation of and requirements for testing for disease and pathogens, shift limits, staffing ratios, and compulsory vaccination, for example. Appropriate legal and financial protections for those risk COVID-19 exposure, including designation of COVID-19 and long-COVID as **occupational diseases** is one way to do this.

236. Any changes to labour policies that restrict worker mobility must be accompanied by a review of **remuneration**. Healthcare workers in some sectors are among the lowest paid. Financially, many have no choice but to work more than one job in several healthcare facilities. Policies that limit movement must therefore be complemented by those ensuring a living wage and other benefits that make it less attractive / necessary to work multiple jobs.

237. There are other system-level policies that, if deployed cross an entire health system, make it easier for organisations to optimise worker health and well-being. **Vaccination** is an obvious example. Put simply, anyone working in health care must be vaccinated for an agreed group of illnesses, including seasonal influenza and exceptional pathogens like SARS-COV-2 and its variants. Exemptions should be rare and granted in exceptional circumstances only. Moreover, given the high benefit/cost ratio of having an immunised workforce, a range of incentives should be deployed. Workers should at a minimum receive

the vaccine for free, and vaccination should be provided at a convenient time and location (ideally at the place of work). Penalties for refusal can also be considered.

238. Related, guaranteeing supply of **essential equipment** such as PPE has needs to be a shared responsibility. Leaving healthcare organisations and facilities to their own devices, and to compete for PPE, has resulted in shortages and misallocation. Better to coordinate production and/or supply at the national level and allocate based on current and projected need according to agreed criteria.

239. This report has identified **abuse and physical violence** as a worsening occupational threat for healthcare workers in all settings. It is another area where systemic policy is needed to complement local efforts. General criminal codes may not be enough to deter violence. National legislation with steep penalties for abusing healthcare workers, supported by a national campaign, sends a clear signal to the public as well as the workforce that they are valued. It is likely to be politically popular. For example, China introduced a national law specifying not only that citizens have a right to basic health services, but also explicitly prohibiting them from attacking medical staff (The Economist, 2021^[259]).

240. Finally, the **mental health** risks to healthcare workers and its foundational impact on occupational harm as well as a range of other outcomes has been well documented (see Chapter 1). While organisations can do a lot to reduce stress and minimise burnout among their workers—not least by equipping workers and teams with a degree of control over their work – efforts to promote mental health, detect problems early and provide support to individuals and teams are more effective if delivered as part of a broader strategy that is centrally coordinated and resourced.

But resilient health systems should also possess a capacity to adapt in the face of uncertainty and change

241. COVID-19 has highlighted the need for resilience and adaptation in a health system, and the importance for coordinated action across and within organisational silos. It is perhaps the most tangible way to illustrate the value of fostering adaptive capacity under a risk management model that marries local adaptation with system-level policy and governance.

242. In cases of crisis, policies and protocols need to be quickly adapted to manage a crisis and minimise failure during the initial waves of the pandemic. A resilient system responds quickly to supply shortages in the face of unprecedented demand. Facilities are temporarily converted, upgraded or created. Workers are redeployed, their roles and responsibilities adapted where possible. Timely adaptation is near impossible under a centralised model of control. A system that has built in elements of adaptive capacity is much more likely to withstand, and prove resilient. An adaptive approach needs workers to be furnished with the skills and knowledge to deploy change in their own environments. Teams must also have access to information in order to successfully plan, implement and assess improvement initiatives.

Health systems should adopt governance mechanism and policies that support good working conditions for health workers

243. The safety of both patients and health workers should be protected through appropriate mechanisms to ensure the safety of protective equipment and sufficient supplies, appropriate staffing levels, training and support at the workplace. These governance mechanisms will become even more relevant when policy makers face trade-offs between health, safety and economic concerns.

Policies to limit psychological and physical risks of staff

244. In many cases, working in health, makes your health... worse. This should not be the case. Comprehensive policies are needed that **protect workers' health by ensuring safe working conditions**.

These include policies that regulate working environments and access to resources, but also the structure of the work—including working hours, shifts, workloads, etc.

245. Beyond policies that address the direct working environment, appropriate resourcing and remuneration (including access to formal work entitlements, such as sick leave), are needed to ensure that health workers are not harmed by their work. This includes legislative and policy safeguards to limit casualization. Such policies are reflective of the strong social appreciation of health workers shown by the general population during the COVID-19 crisis.

Integrating worker and patient safety governance at the system level

246. The alignment between patient safety and worker safety is now increasingly recognized at all levels of the health system. The WHO's 2020 charter on patient safety, for example, calls for countries to “develop linkages between occupational health and safety, patient safety, quality improvement, and infection prevention and control programmes” (WHO, 2020_[256]).

247. In addition to organisational approaches to align patient safety and worker safety (described in Chapter 3), policy makers should align these two domains at a system level as well. Policy makers should work to ensure that regulators and incentives are aligned so that health and safety should be integrated into the core business, risk management and due diligence practices of health systems. Doing so requires increased awareness of the importance of health and safety as a strategic priority by health care leadership and management—which can be improved by system level governance mechanisms that put safety at the forefront (Sikorski, 2009_[247]).

248. While clear roles and responsibilities are essential, regulatory agencies that monitor patient safety should work together with those that oversee worker safety to ensure that their policies are aligned. National quality standards that are used to hold providers accountable for maintaining minimum levels of patient safety can be analysed and reported with corresponding worker safety standards. The same governance mechanism that can be used to drive improvements in patient safety, e.g. provider financial incentives or penalties, routine public reporting of safety indicators and performance, and contracting and commissioning arrangements that include safety requirements—can be expanded to include worker safety related standards.

Using measurement and monitoring to strengthen trust, accountability, and worker well-being

249. For local teams to anticipate, recognise and manage hazards they must have a regular supply of quality data and information on a range of processes and outcomes. A robust system for the tracking, compilation, and analysis of data on occupational accidents and diseases for healthcare workers as well as their health and well-being is a foundation for national policies to improve healthcare workers (Subramanian, Arip and Saraswathy Subramaniam, 2017_[260]).

250. This neatly exemplifies the need for system-level policy and local initiative working in concert. A **global, minimum dataset** should ideally be specified comprising key indicators such as time off due to injury or illness, staff turnover, staff satisfaction and culture survey results. These reporting requirements should be standardised as much as possible. For example, specific survey instruments should be mandated to encourage consistency and comparability.

251. This requirement institutionalises data collection and reporting across organisations in the system. Local teams can then use these data to develop interventions, track progress and – importantly -- benchmark themselves against their peers. They can also supplement the information with additional data that are specific to the local context but not specified in the minimum dataset. Systems reporting can be developed as stand-alone systems—however, it is more efficient and effective to integrate them into an

overarching data and information infrastructure and reporting system. Metrics of health worker safety should be incorporated into the patient safety agenda—and more broadly, the health quality measurement agenda. For example, metrics of health worker safety, as reported by workers, should be further explored. There is potential to harness existing patient safety culture measurement activities, building on them to assess worker perspectives on occupational safety as well.

Adequate resourcing is essential to ensure there are appropriate health professionals that can be deployed to respond to changing circumstances

252. Looking forward, professional and regulatory authorities may be advised to modernise their policies for accreditation, scope of practice as well as continuing education to ensure that an adequate workforce can be called upon during a health or humanitarian crisis. A rigid architecture for professional practice is unsuited for times of crisis. There have been reports of prohibitive requirements and inflexible practice criteria to enable retired medical professionals to contribute to the COVID-19 effort and current professionals to extend their scope of practice. Authorities may also entertain mechanisms such as developing emergency courses to enable former professionals to re-train quickly, and even maintaining a cadre of medical ‘reservists’ that can be called upon at short notice.

253. The adaptive capacity model is based on the idea that local improvement and adaptation will enable organisations to achieve ‘more with less’ (or at least ‘more with the same’). However, it is unrealistic to expect that what, in most cases, amounts to a significant upheaval of existing practice is possible without additional investment and resourcing, especially in the short run.

254. **Adequate resourcing is among the most valuable ways to institutionalise adaptive capacity across health systems** and embed a local continuous improvement across its organisations and facilities. This may take the form of direct funding of programmes and initiatives such as the ones mentioned in preceding paragraphs (vaccination, mental health programmes, continuing education) through recurring budget lines or grant mechanisms. Sponsoring adequately trained safety specialists within or across specific organisations can also pay dividends.

255. Optimally staffed health systems, for example, are better poised to absorb increased demand, and when not facing a crisis, deliver better patient outcomes and lower costs. Findings from Australia assessing minimum nurse-to-patient ratio policies, for example, found that the benefits of decreasing workloads by one patient per nurse decreased 30-day mortality by 7% and reduced seven-day readmissions by the same amount. In addition to significantly improving patient outcomes, researchers found that the costs-savings—due to reduced readmissions and shorter hospital stays--were more than double the costs of hiring additional nurses (McHugh et al., 2021^[261]).

256. Finally, it is important for policy makers and system managers to recognise **the importance of cross-cutting initiatives and invest in them adequately.** A comprehensive information infrastructure, for example, will benefit not only care quality and safety, but also be an important part of improving occupational health within and across organisations. In some cases, more spending to improve the wages and benefits of healthcare workers will be needed to attract suitably qualified and experienced personnel and reduce the need to work multiple jobs.

Workers and organisations must be equipped with the skills to assess, plan and implement change

257. Leadership, culture and a suitable governance model are essential foundations of building local additive capacity. Governance that combines centralised control with devolved decision-making and flexibility at local level is discussed in more detail in the following sections.

258. However, enabling teams to coordinate local quality improvement initiatives also requires them to be able to understand planning and implementing change. This relies on two things: adequate knowledge and training of change management and quality improvement principles; and access to data to measure the impact of their initiatives. The requisite skills can partly be learned ‘on the job’ through mentoring, on-site training and enabling access to external education modules. **Forward-thinking organisations should facilitate ways to ensure their staff have the technical as well as transversal skills to plan, implement and evaluate quality improvement initiatives.**

259. While more training is not always a solution, there are clear organisational advantages for personnel including as administrative and other support staff to acquire these skills and have the freedom to adapt how they do their jobs if this leads to improved outcomes – be it safety, efficiency, productivity, or all three. These initiatives can be used to implement behavioural insights to make systems more effective—and to make it easier for staff to work safely and productively. System-level policy and governance frameworks should align with enabling these skills to be fostered locally. In addition, formal skills to conduct quality improvement should be part of the training pathway of professionals working in the health sector.

Closing words

260. This report has illustrated the fundamental role of a safe, healthy, and happy workforce in a high-performing health system. Moreover, occupational health is fundamental to achieving all clinical, corporate, and policy objectives (Lundstrom et al., 2002^[243]; Loeppke et al., 2017^[29]). While this may be said of any industry, the unique caring element of good health care makes the link especially powerful and should not be understated. **Quality health care is impossible without safe, healthy workers.**

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