PROTECTING HEALTH CARE WORKERS A Need for Urgent Action

PROTECTING **HEALTH CARE** WORKERS

A Need for Urgent Action



器 Community Health Impact Coalition

best investment for a







PRAEKELT ORG



VILLAGE

REACH.

EUPHA







sforming lives

Stection Contro

Netwo



Contents

Foreword	4
Executive summary	5
Summary of key recommendations	7
Introduction	8
A persistent problem: high rates of infection and death among health care workers WASH and IPC standards protect HCWs and make health facilities safer Unmet WASH and IPC standards fuel health care-associated infections Lack of support intensifies psychological impacts of outbreaks Measuring progress	10 12 15 17 18
The cost of failure to protect health care workers World Bank report: Failing to protect frontline health care workers during the COVID-19 pandemic has caused a preventable financial burden	20 22
Recommendations	24
Conclusion	30
Endnotes	31

Abbreviations

COVID-19 coronavirus disease 2019					
EVD	Ebola virus disease				
H1N1	Influenza A				
H5N1	Bird Flu Virus				
HCAI	health care-associated infection				
HCW	health care worker				
IHR	International Health Regulations				
IPC	Infection Prevention and Control				
IPCAT2	Infection Prevention and Control Assessment Tool 2				
IPCAF	Infection Prevention and Control AssessmentFramework				

JEE MERS	Joint External Evaluation Middle East respiratory syndrome
MVD	Marburg virus disease
PPE	personal protective equipment
PTSD	post-traumatic stress disorder
SARS	severe acute respiratory syndrome
SPAR	State Party Self-Assessment Annual Reporting
WASH	water, sanitation and hygiene
WHO	World Health Organization

Foreword

For decades, global health agencies warned of the impending threat of a pandemic, but despite the warnings and many epidemics throughout two decades, countries were ill prepared for COVID-19. Under-resourced and overwhelmed health systems were unable to cope, putting extreme pressure on health care workers, with many making the ultimate sacrifice and paying with their lives.

Governments, international institutions and donors must learn from this pandemic; it is not the first and will certainly not be the last. Every country has a duty to its people to strengthen health systems by investing in the heath work force and having appropriate preparedness strategies.

Governments, health agencies and the public were loud in their praise for frontline workers, but actions are what is required. Health agencies have a duty of care to their workforce to have sufficient, well-trained and competent staff who are protected and supported.

Disease threats are not new, and they have consistently impacted health care workers at a higher rate than the general population. From MERS to Ebola and Lassa Fever, health care workers have been insufficiently protected and prepared. During COVID-19, the World Health Organization (WHO) found that in Europe and the Americas, health care workers, who represent 3% of the global population, made up 14% of reported COVID-19 cases. This does not have to happen. We know what we must to do keep our health workforce safe.

This report lays out the problems our health workforce currently face and recommends urgent actions that governments, health systems, and funders must take to address them. These recommendations fall into four main categories: infection prevention and control, health workforce training, socioeconomic and legal support, continuous monitoring and improvement and data collection.

As nurses, we know firsthand what it is like to face an epidemic without sufficient support. When you don't have the appropriate resources, equipment, policies, training, guidelines or other support it puts not only you but also your patients at higher risk. We see the heavy toll this pandemic has on the health care workers mental and physical health. Without the health workforce, there would be no health care system and we would not curb this or future pandemics. It is incumbent on all policy makers to act now to implement strategies to support, protect and retain our most valuable resource—our health care workers.

Amanda McClelland RN, MPHTM Senior Vice President, Prevent Epidemics at Resolve to Save Lives

Annette Kennedy,

President, International Council of Nurses RN, RM, DipMgt, BNS, RNT, DipHRM, MSC, FFNMRCSI

Executive summary



Even as the world lionizes health care workers as heroes, we fail to keep them safe.

The COVID-19 pandemic has made this contradiction more apparent than ever. As the virus swept the globe in early 2020, public displays of support for overburdened health care workers (HCWs) were common. From Spain to Singapore, residents cheered and banged pots nightly to show appreciation.¹ In the United States, signs at medical facilities blared: "Heroes Work Here." And yet, the lack of protections for HCWs—and their consequences—were clear: hundreds of thousands of HCW infections, reports of HCWs wearing trash bags in the absence of proper personal protective equipment, and an uptick in mental health issues and suicides as HCWs shouldered the strain of ill-prepared public health systems. Amnesty International found that as of September 2020, at least 7,000 HCWs had died fighting COVID-19.² In some places, HCWs have even faced attacks in direct response to public health measures put in place to control COVID-19.

Sadly, these phenomena are not new or unique to the COVID-19 pandemic. Many outbreaks have taken an unacceptable toll on the health and well-being of HCWs. More broadly, HCW infections threaten the control of outbreaks by sidelining necessary staff; making HCWs (and by proxy, hospitals and other health care facilities) vectors for spreading disease; depleting the health care workforce, and impeding the regular provision of routine care. In Sierra Leone following the 2014–2016 Ebola outbreak, the loss of HCWs translated to a 23% reduction in health services overall.³ In a world that is already facing a dramatic shortage of HCWs—the World Health Organization (WHO) estimates an additional 18 million HCWs will be needed in the next decade⁴— failing to protect them weakens health care systems, and moves us away from the goal of universal health care and the broader vision outlined in the United Nations' sustainable development goal 3: to ensure healthy lives and promote well-being for all at all ages.

We know what must be done

The world's lack of preparedness for outbreaks of all sizes and refusal to adequately protect HCWs is a failure not only of governments, but also of international institutions and donors. We must move from placing individuals at undue risk to accepting collective responsibility and accountability for the well-being of our HCWs. An extensive review of the severe acute respiratory syndrome (SARS) outbreak published by the U.S. Institute of Medicine begins by quoting Goethe: "Knowing is not enough; we must apply. Willing is not enough; we must do." We must all heed these words and take concrete action to protect HCWs who risk their own lives to care for us all.



Summary of key recommendations

Protecting health care workers must be a collaboration among governments, donors and WHO, and each group has particular roles and responsibilities.

Governments must work toward:

- Full implementation of infection prevention and control (IPC) and water, sanitation and hygiene (WASH) standards in the next five years by implementing WHO protocols at the national and facility levels.
- Investing in training, tools and resources for a safer health care workforce, ensuring that HCWs have sufficient IPC training and safety equipment, and



creating a career path for IPC professionals.

Reviewing laws and regulations to protect HCWs from attack and stigma while providing HCWs with mental health support.

Monitoring progress and implementing improvements using WHO monitoring frameworks at the national and facility levels, along with Joint



External Evaluation (JEE) and State Party Self-Assessment Annual Reporting (SPAR) to develop and implement effective national plans to improve readiness. Improving data collection and accountability by tracking and reporting HCW illnesses, deaths, impacts on employment in



outbreak contexts, and underlying causes of illness and deaths. The health care workforce must be maintained, and more data collected on IPC and WASH in facilities to improve policy linkages among IPC, WASH, patient safety and HCW wellness during outbreaks.

In collaboration with governments, WHO must work toward:

- Reviewing and updating JEE and SPAR indicators to ensure they adequately account for IPC and WASH.
- Issuing an annual report on the burden of health care-associated infections on HCWs.

Donors must work toward:

Increasing support for IPC and WASH, including sufficient personal protective

equipment (PPE) supplies, and ensuring that grants include assessment of IPC readiness. Funding of IPC and WASH must be a part of all investments—both in broad heath programs and in vertical programs focused on particular health issues.

Introduction

In 430 B.C.E., a plague struck Athens, killing as much as a quarter of the Athenian people over the next five years.⁵

Athenian general and historian Thucydides wrote a firsthand account, having fallen ill himself and survived:

[B]ut so great a plague and mortality of men was never remembered to have happened in any place before. For at first neither were the physicians able to cure it through ignorance of what it was but died fastest themselves, as being the men that most approached the sick, nor any other art of man availed whatsoever...⁶

Thucydides' description, which is among the oldest written accounts of a pandemic,⁷ identified a fundamental horror of disease outbreaks that persists today: the people tasked with caring for the ill are at great risk of illness and death themselves. Nearly 25 centuries later, we have the evidence-based technology to protect health care workers (HCWs) including physicians, clinical officers, nurses, midwives, community health workers, cleaning staff and others who come into contact with patients.



8

But even as we lionize health care workers as heroes, we fail to keep them safe.

Reviews in the aftermath of outbreaks and studies of HCW infections and deaths have told us again and again what we need to do: provide health care facilities with access to water, cleaning supplies, consistent electricity and isolation wards; and ensure effective triage of patients, implementation of infection prevention and control (IPC) procedures, sufficient personal protective equipment (PPE) and training of staff on IPC and use of PPE. As health systems around the globe struggle to manage surges of COVID-19 patients, the importance of protecting HCWs has once again come to the forefront. The time to act is now.

This report begins by highlighting the history of the deadly—and disproportionate—impacts of epidemic and pandemic outbreaks on HCWs. It reviews the types of policies and practices that have been shown to protect HCWs (while improving patient safety and health systems' capacity to respond to and stop outbreaks early on) only to fail repeatedly to be implemented. It describes the psychological strains faced by HCWs who respond to outbreaks, and the types of assessment tools that must be used (and improved upon) to ensure HCW protections. Finally, we provide urgent recommendations for governments and donors to improve protections for HCWs today and in epidemic and pandemic outbreaks to come.



A persistent problem: high rates of infection and death among health care workers

In 2013, WHO reported a global shortage of 7.2 million HCWs, with 83 countries characterized as having a staffing crisis.⁸

The rapid increase in outbreaks of infectious disease in recent years there were fewer than 1,000 a year in 1980, and more than 3,000 a year by 2010⁹— represents a growing threat to an already strained health care workforce. And HCWs are not easily replaced. Training takes many years, and is costly. The loss of experienced HCWs also means fewer mentors to train young clinicians — nurses, midwives, physicians and others.

Outbreaks take a tremendous toll on HCWs in the best of circumstances, but when HCWs are asked to perform their lifesaving work without adequate preparation or resources, the results can be disastrous.

During the 2002–2003 SARS epidemic, HCWs accounted for 21% of infections.* HCWs played a significant role in transmitting the virus in hospitals: 55% of likely cases in Taiwan and 72% of cases in Toronto were linked to hospital infection.¹⁰ Middle East respiratory syndrome (MERS), which emerged in 2012, affected HCWs similarly: they made up nearly 20% of cases and 3.2% of deaths.^{11,12}

During the 2014-2016 Ebola outbreak,

HEALTH CARE WORKERS ARE NOT EASILY REPLACED. TRAINING TAKES MANY YEARS, AND IS COSTLY.

HCWs were 21 to 32 times more likely to be infected than the general public.¹³ A total of 8% of the health care workforce in Liberia died. In Sierra Leone, 7% percent of HCWs died, leading to a 23% reduction in health services, and a significant impact on population health.¹⁴ One study estimated that an additional 4,022 women would die during childbirth each year as a result of HCW deaths.¹⁵

These figures from past epidemics make HCW deaths from COVID-19 all the more tragic. Although limited and inconsistent reporting makes estimating the global number of HCW infections and deaths difficult, the International Council of Nurses registered 572,478 reported COVID-19 infections in HCWs across 32 countries as of August 14, 2020. These accounted for an average of 10% of all cases. The 20.7 million confirmed cases of COVID-19 worldwide suggest that the true number of infected HCWs could be in excess of 2 million worldwide.¹⁶ As of September 2020,

*Because of a lack of standardized reporting, the number of deaths remains unknown.

Protecting Health Care Workers: A Need for Urgent Action

at least 7,000 HCWs had lost their lives to COVID-19. WHO found that in Europe and the Americas, 14% of reported COVID-19 cases were HCWs; globally they represent under 3% of the population while in high-income countries they represent under 8%.¹⁷

HCWs across Africa have also been critically affected. Among the 42 countries of WHO's African region reporting HCW infections, there have been a total of 41,936 cases, the vast majority coming from South Africa, which has had 27,360 infections and 240 deaths.^{18,19} Liberia and Sierra Leone, whose HCWs were devastated by the 2014-2016 Ebola outbreak, are among the top five countries with the highest proportion of HCW infections, although deaths for most countries in the region have not been reported.²⁰



600,000





FIGURE 1: Significant recent outbreaks

YEARS	OUTBREAK	HCW INFECTIONS	PROPORTION OF ALL INFECTIONS	HCW DEATHS	INCREASED LIKELIHOOD OF HCW INFECTION
2019-	COVID-19	572,478 in 32 countries ²¹	Unknown	At least 7,000 ²²	3 .1* ²³
2018-2020	Ebola (DRC) ²⁴	171	5%	At least 41 ^{25**}	Unknown
2018-2020 [§]	Lassa fever (Nigeria) ^{26,27,28,29}	109	4%†	Unknown	Unknown
2014-2016	Ebola (Guinea, Liberia, Sierra Leone)	881 ³⁰	3%†	513 ³¹	21-32 ³²
2012-present	MERS ³³	415 ^{34,35}	16%†	25	Unknown
2009-2010	Influenza A (H1N1) pandemic ³⁶	Unknown	Unknown	Unknown	1.93-2.52 [‡]
2002-2003	SARS ³⁷	1,706	21.07%	Unknown	Unknown

* In Wuhan, China.

** As of July 14, 2020.

¹ Data as of September 26, 2020. Total HCW infections for 2017 are not available.

Ebola

881

† As of June 2, 2018.

‡ The study gives slightly different figures based on the comparison group.

WASH and IPC standards protect HCWs and make health facilities safer

While the figures above paint a grim picture of the historical experiences of HCWs during epidemics past and present, these experiences have led to the development of a large arsenal of tools to address outbreaks of health care-associated infections. These tools took a critical scientific step forward in 1847, when Ignaz Semmelweis showed that maternal mortality dropped precipitously when doctors washed their hands.³⁸

Hand-washing protocols and other IPC procedures were developed not in response to an epidemic, but rather to the daily risk of infectious outbreaks in health care settings. This reminds us that HCWs tackle outbreaks



every day: an "outbreak" is simply the increase in incidence of a disease compared to the normal rate of infection in a given population.³⁹ Health care associated infections that cause these outbreaks in facilities can be due to unsafe practices during procedures, lack of hand-washing and lack of isolation for sick patients who can spread an infectious disease, among other things. The outbreaks typically seen in a large hospital are much smaller than epidemics or a pandemic, but the dynamics and responses are comparable in many ways.

The practices used to prevent outbreaks in hospitals fall under two broad categories: WASH—the presence of water, sanitation, hygiene, health care waste management and environmental cleaning in health facilities and infection prevention and control (IPC). Taken together, the rigorous implementation of IPC and WASH (which is needed for effective IPC) prevents transmission of infections in health care settings, keep patients safe and keep health care workers from becoming patients themselves.

Infection prevention and control

IPC consists of a hierarchy of measures to protect HCWs and the patients they serve. At the top of the hierarchy, administrative controls include universal screening and triage of all patients and standardized training of HCWs. Environmental controls reduce the risk of exposure and include the use of outdoor screening and triage areas to improve ventilation, as well as adequate distance between HCWs and patients. The use of personal protective equipment (PPE), including gloves, foot and eye protection, gowns, respirators and full body suits, is the last control measure in the hierarchy. Although PPE use alone can protect against infection, it must be used in conjunction with the other, more effective controls to ensure HCWs are protected. In the context of COVID-19 and other infectious outbreaks, these practices are mutually reinforcing. Universal screening and triage identify patients with suspected infection, who should then be provided care in a separate area of a health facility to minimize spread to patients seeking other types of care. Training HCWs in IPC practices, including hand hygiene and the use of PPE, as well as proper environmental cleaning, can further reduce the risk of infection.

To be clear, these practices must be consistently implemented every day, not just in reaction to epidemics or outbreaks of health care-associated infections (though certain practices may be adjusted depending on the nature of the epidemic pathogen). They are a necessary prerequisite to providing safe medical care, helping hospital patients to avoid new infections unrelated to their reason for visiting the hospital. They also make it possible for HCWs to serve the population without undue fear of becoming ill themselves or becoming vectors of disease transmission, encouraging confidence and empowerment in their work.

These practices extend beyond the walls of hospitals to smaller health care centers and HCWs working at the community level. Appropriate IPC measures should also be implemented routinely at the primary health facility level; these include well-ventilated areas for patients with potentially infectious illnesses, separate from those seeking care for other services, and efficient patient flow to prevent overcrowding. Access to adequate WASH infrastructure should be made available, including hand-washing stations or alcohol-based hand rub and sufficient cleaning supplies. Adequate PPE should be provided for all HCWs, including community health care workers and cleaning staff.

Both IPC and WASH are essential for day-to-day care, for preventing transmission of antibiotic-resistant bacteria, and for preventing outbreaks small and large.⁴⁰ The provision of safer medical care ultimately builds community trust and strengthens the overall health care system.

BOTH IPC AND WASH ARE ESSENTIAL FOR DAY-TO-DAY CARE, FOR PREVENTING TRANSMISSION OF ANTIBIOTIC-RESISTANT BACTERIA, AND FOR PREVENTING OUTBREAKS SMALL AND LARGE.

Evidence from past outbreaks

Data from past outbreaks illustrates the critical role of WASH and IPC standards and the dangers faced by HCWs caring for patients in facilities that do not meet them.

In response to outbreaks of Lassa fever in 1974, WHO issued the first IPC guidelines, including isolation rooms for patients, regular hand-washing and protective clothing for caregivers, and appropriate waste disposal for protective clothing and patient secretions. But more than 40 years later, despite evidence of significant human-to-human transmission and the important number of HCW deaths caused by Lassa, shortcomings persisted.⁴¹ A survey of Nigerian HCWs and facilities during a 2016 outbreak found that none of the facilities met all IPC requirements: just over a third of HCWs had full PPE available to them, 23% had training in IPC and 80% had washed their hands before their last patient contact. Three-quarters of the facilities lacked an isolation room and 12% lacked water.⁴²

A systematic review of Marburg virus disease and Ebola outbreaks found that IPC and WASH deficiencies repeatedly put HCWs at risk. Insufficient and inappropriately used PPE were the most frequently cited risk factors in HCW infections followed by exposure to patients whose illness was not recognized. Other contributing factors included insufficient or nonexistent isolation facilities, incorrect screening of Ebola/Marburg patients, "deficiencies in essential infrastructure" (e.g., lack of soap, water, sharps disposal boxes, electricity, etc.) and staffing shortages.⁴³

During the 2002–2003 SARS epidemic, reports and subsequent studies showed that the outbreak was made worse by delayed recognition of patients presenting with SARS and continued IPC lapses once the disease was recognized.⁴⁴ Local doctors operating in private clinics were not warned of the outbreak and as a consequence were not adequately protected, leading to additional deaths.⁴⁵ In Toronto, even when nurses suspected a second wave of SARS patients, administrators ignored these suspicions at a time when procedures for PPE use had been relaxed, leading to additional cases.⁴⁶ Nursing resources were so strained that nurses in quarantine due to occupational exposure were still required to work.⁴⁷

According to a review of hospital-acquired SARS infections in Toronto and Taiwan, once widespread IPC measures were implemented, the number of new cases declined. The investigators reported: "Restricting SARS care to one unit or ward allowed the separation of contagious and noncontagious patients and limited the number of staff with potential exposures to SARS. Exposure opportunities were further minimized by maintaining a high staff-to-patient ratio and a high level of infection-control training on SARS wards."⁴⁸

In the case of MERS, HCW infections peaked at 26.5% of total infections in 2014. By June 2018, they had decreased to just 4.5%. Survival of MERS for HCWs also increased

Total MERS infections

26.5% MERS infections in Health Care Workers

FIGURE 2: More than 1 in 4 of all MERS infections in 2014 were among HCWs dramatically; the case-fatality ratio was over 60% in 2012 and 2013, but by 2018 it had dropped to 29.8%.⁴⁹ A review of the MERS response attributed this improvement to enhanced IPC efforts, including regular training of health care workers in IPC, auditing of IPC in health care facilities, improved case notification and isolation within emergency departments, and comprehensive contact tracing and testing of all contacts, including HCWs, regardless of the development of symptoms.⁵⁰

In repeated Ebola outbreaks, high infection rates among HCWs were attributed to persistent deficiencies in IPC, "including a lack of PPE and environmental/engineering controls, lack of or inefficient triage and failure to recognize patients with Ebola/Marburg, and a shortage of human resources." After improved IPC and other measures were put in place, HCW infections dropped precipitously. For example, in the 1995 Ebola outbreak in the Democratic Republic of the Congo, HCW infections dropped from 79 cases to one case after IPC measures were introduced. In the 2014-2016 West Africa Ebola outbreak, HCWs represented 12% of all cases in July 2014, which dropped to 1% in February 2015, after efforts by international and nongovernmental organizations to improve IPC practices.⁵¹

IN THE 1995 EBOLA OUTBREAK IN THE **DEMOCRATIC REPUBLIC OF THE CONGO,** HEALTH CARE WORKER INFECTIONS **DROPPED FROM 79 CASES TO ONE CASE** AFTER IPC MEASURES WERE PUT IN PLACE.

Unmet WASH and IPC standards fuel health careassociated infections



had not received a COVID-19 test

27% of US nurses exposed to COVID-19 without PPE

FIGURE 3: A recent survey of 23,000 U.S. nurses working during the COVID-19 pandemic

The experiences of HCWs during the COVID-19 pandemic have demonstrated the persistence of inadequate WASH and IPC. A recent survey of 23,000 U.S. nurses found that "27% of nurses providing care to confirmed COVID-19 patients reported having been exposed without the appropriate PPE and having worked within 14 days of exposure; and 84% of nurses said they had not yet been tested".⁵² Despite the urgent need for proper IPC implementation, an International Council of Nurses survey found that only slightly more than half of national nursing associations (18 out of 32) reported that formal IPC training or refresher courses on PPE use for airborne transmitted infections had been provided to nurses

in the last six months.53

Globally, health care-associated infections are the single largest risk to patient safety.⁵⁴ According to the European Centre for Disease Prevention and Control, there are 2.6 million health care-associated infections each year in European hospitals and the burden is greater than all reported communicable diseases.⁵⁵ In Canada, the rate of such infections has decreased significantly in recent years, but 1 in 8 intensive care patients still acquire one.⁵⁶

Health care-associated infections are of even greater concern in low- and middle-income countries, where they occur in 15.5% of patients (compared to 7.1% of patients in Europe and 4.5 in the United States). Health care-associated infection rates among newborns have been found to be anywhere from three to 20 times higher than in high-income countries.

The drivers of health care-associated infections are similar across settings: inadequate IPC practices (including hand hygiene and environmental disinfection) and training, understaffing, and inadequate facilities.^{57,58}

18 OUT OF 32

national nursing associations provided formal IPC training or refresher courses on PPE use for airborne transmitted infections.

A number of studies have shown that adherence to hand-washing protocols across several low-resource settings is below 20%.⁵⁹ But training is critical. In a study of caregivers involved in outbreaks of Lassa fever, researchers found that health care workers trained in IPC were "more likely to have used gloves at the last patient contact and they were also more likely to have washed their hands at the last patient contact."⁶⁰

A World Bank study in Kenya found baseline performance on patient safety measures was poor, with 97% of facilities not complying with minimum standards, scoring below 60% of the Joint Health Inspection Checklist maximum score. With appropriate steps by management to implement oversight mechanisms, standards improved significantly.⁶¹

A study carried out in a Wuhan hospital found that HCWs who received IPC training had significantly lower COVID-19 infection rates than those who had not received the training.⁶² And WHO data has shown that as IPC measures have been strengthened and PPE has become more readily available, the proportion of COVID-19 infections in HCWs in Europe has gone down fivefold.⁶³

Every day, the lack of adequate IPC practices and WASH, and lack of adequate HCW training and resources, makes patients sick, and causes preventable deaths and enormous economic costs. When epidemics strike, these same dynamics make health care workers sick, take their lives and make them spreaders of infection. Insufficient IPC practices and WASH also handicap the fight against antimicrobial resistance, emerging threats and global health security.

Lack of support intensifies psychological impacts of outbreaks

Under normal circumstances, HCWs are at higher risk for mental health issues and are more likely to miss more days of work than those employed in other sectors.⁶⁴ During outbreaks, the everyday stresses of being a HCW are amplified, further threatening their mental health.

A systematic review of the psychological impacts of epidemics (including SARS, MERS, Ebola, COVID-19, H1N1, and influenza A) from across the world showed a significant proportion of HCWs had post-traumatic stress disorder-like (PTSD) symptoms, with many meeting the standard for a PTSD diagnosis. In some studies, more than 70% of HCWs responding to COVID-19 exhibited PTSD-like symptoms. For many, these symptoms can last for years. Nurses reported higher levels of stress and PTSD symptoms compared to other HCWs.⁶⁵

Similarly, HCWs fighting outbreaks show significant symptoms of depression, including 50% of those involved in COVID-19 response. Studies also show significant impacts on insomnia, sleep quality and other forms of stress.⁶⁶



Perceived organizational support and adequate training are protective factors for general mental health, while confidence in IPC measures reduces stress and burnout.⁶⁷ The same measures that keep HCWs (and patients) safe also protect the workers' mental health.

Many past outbreaks have seen physical attacks against HCWs, including the 2014-2016 Ebola outbreak and the ongoing Ebola outbreak in the Democratic Republic of the Congo. In the case of COVID-19, the verbal and physical attacks against health care workers have increased. According to one report, 69 HCWs were killed and 34 kidnapped as the pandemic spread from January to June 2020.⁶⁸ In India alone, 145 HCWs have reported injuries or attacks.⁶⁹ HCWs in India have been stoned and evicted from homes, while in the Philippines a nurse was attacked and had bleach poured on his face.⁷⁰ In Mexico, 24 such incidents have been reported, including bleach and hot liquid being poured on HCWs' bodies.⁷¹

The normal strain of providing health care has been amplified by the ongoing pandemic and further amplified by HCWs' physical insecurity in that context. In addition to providing mental health support, governments must work to protect HCWs from violence and threats of violence.

Measuring progress

Inadequate IPC, WASH, HCW training and understaffing endanger HCWs and patients. During epidemic outbreaks, they are costly to our health care systems and cause severe mental health consequences for HCWs. Improving practices across all of these areas will keep our HCWs safe, protect their lives and mental health and deliver a stronger, more resilient health care system. There is a clear pathway ahead for what must change, but the question is: how?

WHO has published clear guidance on IPC and WASH standards (see box below). WHO and the International Labour Organization have also published a manual about the occupational safety and health of health workers and responders in public health emergencies.

World Health Organization Guidance on IPC and WASH Standards

- <u>Minimum requirements for infection prevention and</u> <u>control programmes</u>
- <u>Guidelines on core components of infection prevention and control</u> programmes at the national and acute health care facility level
- WASH in health care facilities: practical steps to achieve universal access to quality care
- <u>Water and sanitation for health facility improvement tool</u>
 <u>(WASH FIT)</u>



Implementation of the guidance outlined in these publications is challenging and resource-intensive. However, given the incredible costs—personal and economic—associated with HCW infections, death, mental health strain and burnout, these measures must be put in place in order to have the strong health care workforce that is needed globally.

In order to measure progress in implementing these standards, WHO's Infection Prevention and Control Assessment Tool 2 (<u>IPCAT2</u>) is available for implementing monitoring frameworks at the national level. WHO's Safe Hospitals Index and Infection Prevention and Control Assessment Framework (<u>IPCAF</u>) can be used for facility-level implementation.

Stakeholders should also use the Joint External Evaluation (JEE) and State Party Self-Assessment Annual Reporting tool (SPAR) to assess capacities. However, the indicators in these tools regarding IPC and WASH standards must be updated. At present, they play too limited a role and do not prioritize IPC and WASH as critical components of epidemic preparedness and response. Further, stakeholders must create a new technical area for safe delivery of health care services in relevant vehicle(s) of the International Health Regulations (IHR) Monitoring and Evaluation Framework which would measure clinical capacity, IPC and WASH procedures in health facilities to elevate the importance of HCW safety in epidemic preparedness efforts.

At a more basic level, the lack of data on HCW deaths during the COVID-19 pandemic is emblematic of a variety of missing data about HCWs. As one example, the occupational death rate for HCWs is unknown, while it is known for firefighters and police.⁷² When we do not have accurate accounting of what is sickening and killing our HCWs and the circumstances in which they fell ill, we cannot properly protect them.

We must do better.

WHEN WE DO NOT HAVE ACCURATE ACCOUNTING OF WHAT IS KILLING OUR HEALTH CARE WORKERS, WE CANNOT PROPERLY PROTECT THEM.

The cost of failure to protect health care workers

Implementing IPC and WASH standards, HCW training and psychological support—and measuring progress—is a costly endeavor. But outbreaks are costlier still.

The 2014-2016 West African Ebola outbreak was estimated to have cost USD \$53 billion. The largest single portion of that sum was nearly \$19 billion for the deaths from non-Ebola causes, which included over 10,000 excess deaths due to HIV/AIDS, TB and malaria.⁷³ The SARS outbreak was estimated to have cost the global economy \$40 billion.⁷⁴ Estimates put economic losses from COVID-19 between \$8 trillion and \$16 trillion, including more than a million deaths globally.⁷⁵

SARS: \$40 billion (2003) •

- H5N1: \$40 billion (2006) •
- H1N1: \$45 billion (2009) •
- Ebola: \$50 billion (2013) •

COVID-19: \$18 trillion

The International Monetary Fund has announced that \$11 trillion has been spent as of June 2020 to respond to COVID-19, including new spending, lost revenue and loans to prop up economies.⁷⁶ McKinsey & Company has estimated that preparations to prevent and fight future pandemics would cost \$70 to \$120 billion to set up over two years and \$20 to \$40 billion to maintain thereafter—a reasonable sum given the trillions currently being spent and lost. While these estimates contain some elements of what is needed, they do not include all needed investments in IPC and WASH.⁷⁷

Making these investments up front saves lives and prevents dramatic economic losses. As a World Bank report noted that although Nigeria spent approximately \$13 million responding to the 2014-2016 EVD outbreak, it suffered minimal economic losses. Had Nigeria's gross domestic product fallen by several points, as did those of Guinea, Sierra Leone and Liberia, the loss would have translated to nearly \$12billion."⁷⁸

While many organizations—UNICEF and the U.S. Agency for International Development, among others—have worked on the ground to implement IPC and WASH standards, the repeated shortcomings in these areas demonstrate a need for greater focus and greater financial support.

The United States, for instance, dramatically increased funding for global health security in response to the 2014-2016 West African Ebola outbreak. After a peak in 2015 at \$1.3 billion and additional extra funds to respond to the Zika virus in 2016, annual funding has dropped to \$482 million requested in the 2020 budget.⁷⁹

Funders must better align their investments in IPC, WASH and the broader set of WHO's International Health Regulations when new health programs are launched. Much greater attention must be paid to implementing these basic needs, training HCWs, and ensuring that in times of crisis additional resources are available for PPE so that HCWs can be safe. Funding for IPC and WASH must be included in cross-cutting programs and vertical disease-specific programs.

Finally, WHO must lead in advocating for these changes, monitoring progress and updating measurement tools to ensure they measure the right things (such as IPC) and include targets. However, WHO cannot take on these tasks without strong financial support, which in recent decades has continually eroded while its mandate has grown.⁸⁰ Governments and private donors must ensure that WHO is well-equipped to support HCWs and push implementation of policies to keep them safe.

World Bank report: Failing to protect frontline health care workers during the COVID-19 pandemic has imposed unnecessary cost to the world^{*}

A modeling study has suggested high cost-effectiveness of providing PPEs to health care workers. The World Bank forthcoming study is seeking to provide empirical estimates and analysis of the cost to selected countries that resulted from failure to protect health care workers. Granular knowledge on the stakeholders and distributional patterns of such cost can support decision makers to take informed and targeted actions to protect health care workers.⁸¹

Conceptual framework for estimating the cost of failing to protect health care workers



individual income loss, facility revenue loss, human capital loss and economy loss)

When health care workers are not adequately protected from COVID-19:

- Health care worker's families take on additional responsibility, such as caring for them when sick, bearing additional risk of being infected, and suffering loss of future income if infection leads to death. In a hospital of Eswatini, for example, 39 family members were infected as a result of the infection of 14 health care workers.
- Financiers for health sectors (including the government, insurance agencies) need to allocate resources for their treatment, which would have not have been necessary with adequate protective measures. This corresponds to the proportion of health care worker cases out of total cases.
- Essential services (both COVID-19 and non-COVID-19 related) have been disrupted by health care worker absenteeism, which results in loss of human capital and reversal of country development progress. In Kenya, in secondary hospitals have been more than 20 percent of doctors and nurses absent due to infection.
- When health care workers are not properly protected, patients' trust in health facilities may suffer, leadings to decreased utilization of essential care.
- Transmission of COVID-19 (to patients and other health care workers) increases when health workers continue to provide care despite having suspected or confirmed COVID-19 infections, and leads to worse outcomes for patients as a result of compromised care (presentism). Data from the Brazil National Household Survey on COVID-19 shows that 86% of high-skilled health workers with COVID-19 symptoms continued to work. The National Nurses Observatory reports that only 31% of nurses with a confirmed COVID-19 diagnosis are in quarantine.
- COVID-19 infections and deaths exacerbate the existing shortage of health workers. The reduced supply has consequences on wages and general compensation, adding pressure on already tight health budgets during times of economic and fiscal crisis in most low- and middleincome countries.

Recommendations

While each outbreak brings challenges specific to the pathogen at hand, we know what must be done to protect health care workers and communities. The number of outbreaks is increasing each year, particularly zoonotic pathogens.

Our recommendations fall into five categories:

Each of these five areas must be addressed to comprehensively protect HCWs which will, in turn, better prepare us to address outbreaks and deliver health care day to day.

Full implementation of IPC and WASH standards



Investing in training, tools and resources for a safer health care workforce



Full implementation of IPC and WASH standards

Repeated reviews of outbreaks cite the same risks of exposure time and again: lack of systematic IPC protocols and training on how to follow them, and lack of appropriate WASH standards and resources.

In order to protect HCWs from these repeated failures, all governments must commit in the next five years to:

- Implement WHO's 2019 "Minimum requirements for infection prevention and control programmes"⁸² to ensure the health and safety of HCWs and everyone who enters a health care facility;
- Implement key IPC protocols, described in *Guidelines on core* components of infection prevention and control programmes at the national and acute health care facility level⁸³ and Occupational safety and health in public health emergencies: A manual for protecting health workers and responders, published by WHO and the International Labour Organization;⁸⁴
- Implement WASH standards defined in WHO publications: WASH in health care facilities: Practical steps to achieve universal access to quality care;⁸⁵ Water and sanitation for health facility improvement tool (WASH FIT);⁸⁶ and Core questions and indicators for monitoring WASH in health care facilities in the Sustainable Development Goals;⁸⁷ and
- Closely track and ensure that implementation of policies moves from the national level to the level of local facilities.



Implementation of these standards will not only prepare health facilities for outbreaks so that HCWs are protected, but also improve day-to-day care and staff morale, reduce the spread of health care-associated infections, and protect patient health.

Investing in training, tools and resources for a safer health care workforce

Governments must invest to have a health care workforce that is ready to respond to outbreaks. Health care workers are at the front lines of detecting and stopping the spread of outbreak pathogens and face considerable personal risk, which can be lethal.



To ensure that the health care workforce is safe and ready to support all of us in times of outbreak, governments must:

- Ensure HCWs have the training and tools needed to recognize an outbreak and protect themselves;
- Train all HCWs, including cleaning staff, in IPC standards and protocols;
- Plan ahead and have sufficient PPE stock as well as, hygiene, cleaning and other supplies needed in outbreaks; work with manufacturers so they can increase production as needed; set aside funding to ensure adequate supplies in epidemics;
- Review policies, regulations and laws that protect HCWs from stigma and violence, particularly in the context of outbreaks, and strengthen these policies where gaps are found;
- Create a career path for infection prevention and control, as well as a certification program (similar to U.S. CDC's Field Epidemiology Training Program) for continuing medical education, in order to have a qualified IPC workforce; and
- Provide mental health support to HCWs and increase resources during outbreaks.

Taken together, these measures will prepare a health care workforce to stanch outbreaks and keep themselves safe and healthy. Using and improving tools to monitor implementation and enact further improvements

Successful implementation of IPC and WASH standards, outbreak preparations and HCW training must be monitored using transparent, internationally agreedupon tools.



While strong tools exist, they must be improved to better evaluate progress in meeting IPC standards.

Governments must:

 Implement monitoring frameworks at the national level (using WHO's Infection Prevention and Control Assessment Tool) and facility level (using WHO's Safe Hospitals Index Infection Prevention and Control Assessment Framework) and establish regular monitoring and supervision for continuous quality improvement.

WHO, working with governments, should:

- Review existing indicators related to IPC and WASH in the Joint External Evaluation (JEE) and the State Party Self-Assessment Annual Reporting tool (SPAR) to ensure they adequately account for IPC and WASH. These tools should also set national targets. Stakeholders must create a new technical area for safe delivery of health care services in relevant vehicle(s) of the IHR Monitoring and Evaluation Framework which would measure clinical capacity, IPC, and WASH procedures in health facilities to elevate the importance of HCW safety in epidemic preparedness efforts; and
- Use evaluation outcomes to put in place effective national action plans for health security and other preparations as necessary.

Transparent evaluation systems enable for benchmarking and monitoring progress in implementing lifesaving practices that make health systems stronger while protecting HCWs.

Improving data collection and accountability

Understanding of the risks faced by HCWs is severely hampered by a lack of data on HCW infections and deaths during outbreaks.



At a very basic level, we frequently do not know the death toll of HCWs in outbreaks because adequate data is not collected. Even when we do know the scale of morbidity and mortality, we often do not have adequate data to precisely understand and address exposure risks.

Governments must:

- Collect information about health care worker infections and deaths in epidemic and pandemic contexts as part of their core set of indicators on human resources for health, with annual reporting to the Global Health Observatory, as well as the Strategic Partnership Portal for IHR and Health Security. This should include pathogen exposure and protective measures, in addition to information about HCW turnover, absenteeism, burnout and suicide;
- Investigate and publicly report the underlying conditions, mistakes, negligence, or other systematic failures at health facilities that lead directly or indirectly to any cause of death or serious illness in HCWs, including those related to mental suffering, and propose actionable recommendations on how to prevent such morbidity or mortality in the future;
- Improve data collection and research on patient safety, IPC and WASH standards, and protecting HCWs in outbreaks to demonstrate linkages and inform policy ; and
- Invest in reporting about the health care workforce and HCW training to ensure adequate HCW-to-patient ratios.

WHO should:

- Work with governments to support collection and reporting of this information; and
- Issue an annual report tracking the impacts of health care-associated infections on HCWs to inform improvements and create a forum for accountability.

By collecting systematic data on how outbreaks affect the health and safety of HCWs, we can determine what needs to change, address gaps and hold decision-makers accountable for failures.

Increasing donor support for and focus on HCW protections

Epidemic and pandemic outbreaks are not simply a matter of national responsibility, but rather, global solidarity—particularly as many outbreak pathogens can quickly cross national borders.



Private, governmental and multilateral donors must:

- Increase and coordinate their investments in IPC training, supplies and monitoring, including adequate WASH facilities, to support domestic efforts to improve HCW safety. Donors should fund IPC and WASH measures in both vertical programs (including HIV, tuberculosis, maternal and child health, immunization and noncommunicable diseases) and broader health initiatives;
- Build up resources for sufficient PPE and facilitate access to PPE for funded programs; and
- Ensure that all grants include an assessment of IPC needs, testing of IPC measures through simulation exercises, and after-action reviews to identify and apply lessons learned.

Finally, WHO member states and donors must demand leadership from WHO to address HCW safety and ensure that WHO has sufficient financial resources to do it. Far too often mandates are placed on WHO without a linked and sufficient expansion of resources for the organization to act effectively.

Conclusion

When COVID-19 emerged, the world should have been more prepared than ever to tackle a global pandemic.

The 2014-2016 Ebola outbreak, which took a tremendous toll on health care workers and health systems in three West African countries, led to countless reviews, the establishment of new organizations, and the revamping of WHO's emergency response capabilities. Funding poured into what was dubbed the "global health security agenda."

And yet, around the world, HCWs were left vulnerable to COVID-19, resulting in thousands of deaths and hundreds of thousands of infections.

Outbreak preparedness is inextricably linked with IPC and WASH practices, HCW training, patient safety, and fighting antimicrobial resistance. Preparing our HCWs for epidemic outbreaks protects them and their patients and makes us all safer every day.

The increasing rate of epidemic outbreaks will translate into increasing stress on HCWs, who are not easily replaced. Training is costly and necessarily slow. To alleviate the current shortage and meet global goals for universal health care in the United Nations' sustainable development goals, we must invest now.

The cost of inaction is unacceptable. We know what must be done. Now, governments, international agencies and donors must act.

Endnotes

- Business Insider. Watch people around the world cheer from their windows and rooftops at the same time to thank healthcare workers and first responders. Published May 6, 2020. Accessed October 1, 2020. <u>https://www.businessinsider.com/videos-people-cities-cheering-healthcareworkers-windows-rooftops-same-time-2020-4</u>
- Amnesty International. Global: Amnesty analysis reveals over 7,000 health workers have died from COVID-19. Published September 3, 2020. Accessed September 16, 2020. <u>https://www.amnesty.org/en/latest/news/2020/09/amnesty-analysis-7000-health-workers-have-died-from-covid19/</u>
- Centers for Disease Control and Prevention. Cost of the Ebola Epidemic. Accessed September 16, 2020. <u>https://www.cdc.gov/vhf/ebola/pdf/impact-ebola-healthcare.pdf</u>
- 13 Global Health Workforce Alliance. A universal truth: no health without a workforce. Published November 2013. Accessed September 16, 2020. <u>https://www.who.int/workforcealliance/knowledge/resources/hrhreport2013/en/</u>
- Littman R. The plague of Athens: epidemiology and paleopathology. Mt Sinai J Med. 2009 Oct;76(5):456-67. DOI: <u>10.1002/msj.20137</u>
- Thucydides, *The Peloponnesian War, The Complete Hobbes Translation* (Chicago: University of Chicago Press, 1989), pages 115-116.
- Martin P, Martin-Granel E. 2,500 year evolution of the term epidemic. *Emerg Infect Dis.* 2006 Jun; 12(6): 976–980. DOI: <u>10.3201/eid1206.051263</u>.
- World Health Organization (WHO). Global health work- force shortage to reach 12.9 million in coming decades. WHO website. Published 11 November 2013. Accessed 18 May 2020. <u>https://</u> www.who.int/mediacentre/news/ releases/2013/health-workforce-shortage/en
- Smith KF, Goldberg M, Rosenthal S, et al. *Global rise in human infectious disease outbreaks*. J R Soc Interface. 2014;11(101):20140950. DOI: <u>10.1098/rsif.2014.0950</u>
- McDonald LC, Simor AE, Su IJ, et al. SARS in healthcare facilities, Toronto and Taiwan. Emerg Infect Dis. 2004 May; 10(5): 777-781. DOI: <u>10.3201/eid1005.030791</u>
- Elkholy A.A., Grant, R., Assiri, A., et al. MERS-CoV infection among healthcare workers and risk factors for death: retrospective analysis of all laboratory-confirmed cases reported to WHO from 2012 to 2 June 2018. J. Infect. Public Health, 0-4 DOI: <u>10.1016/j.jiph.2019.04.011</u>
- World Health Organization Regional Office for the Eastern Mediterranean. MERS situation update: January 2020. Published January 2020. <u>https://applications.emro.who.int/docs/EMCSR254E.</u> pdf?ua=1
- Outbreak Observatory. Ebola vaccine and the healthcare workers. Published August 9, 2018. Accessed September 16, 2020. <u>https://www.outbreakobservatory.org/</u> outbreakthursday-1/8/9/2018/ebola-vaccine-and-the-crucial-role-of-healthcare-workers
- 14. Centers for Disease Control and Prevention. *Cost of the Ebola Epidemic*. Accessed 16 September 2020. <u>https://www.cdc.gov/vhf/ebola/pdf/impact-ebola-healthcare.pdff</u>
- 15. Evans DK, Goldstein M, Popova A: Health-care worker mortality and the legacy of the Ebola epidemic. *Lancet Glob Health 2015*, 3(8):e439-e440. DOI: <u>10.1016/S2214-109X(15)00065-0</u>
- International Council of Nurses. Protecting nurses from COVID-19 a top priority: a survey of ICN's national nursing associations. Published 14 September 2020.
- World Health Organization. Coronavirus Disease (COVID-19): Data as received by WHO from national authorities, as of 11 October 2020, 10am CEST. Published October 2020. Accessed 8 November 2020. <u>https://www.who.int/docs/default-source/coronaviruse/situationreports/20201012-weekly-epi-update-9.pdf</u>
- Amnesty International. Global: Amnesty analysis reveals over 7,000 health workers have died from COVID-19. Published September 3, 2020. Accessed September 16, 2020. <u>https://www.amnesty.org/en/latest/news/2020/09/amnesty-analysis-7000-health-workers-have-died-from-covid19/</u>
- 19. World Health Organization Regional Office for Africa. COVID-19: situation update for the WHO African Region. Published 9 September 2020. Accessed 14 September 2020. <u>https://apps.who.int/</u> <u>iris/bitstream/handle/10665/334234/SITREP_COVID-19_WHOAFRO_20200909-eng.pdf</u>

Protecting Health Care Workers: A Need for Urgent Action

- 20. World Health Organization Regional Office for Africa. COVID-19: situation update for the WHO African Region. Published 9 September 2020. Accessed 14 September 2020. <u>https://apps.who.int/</u> <u>iris/bitstream/handle/10665/334234/SITREP_COVID-19_WHOAFRO_20200909-eng.pdf</u>
- International Council of Nurses. Protecting nurses from COVID-19 a top priority: a survey of ICN's national nursing associations. Published 14 September 2020.
- 22. Amnesty International. Global: *Amnesty analysis reveals over 7,000 health workers have died from COVID-19.* Published September 3, 2020. Accessed September 16, 2020. <u>https://www.amnesty.org/en/latest/news/2020/09/amnesty-analysis-7000-health-workers-have-died-from-covid19/</u>
- 23. Pan A, Liu L, Wang C, et al. Association of public health interventions with the epidemiology of the COVID-19 outbreak in Wuhan, China. JAMA. 2020;323(19):1-9. DOI: <u>10.1001/jama.2020.6130</u>
- 24. World Health Organization. Ebola virus disease Democratic Republic of Congo: external situation report 98/ 2020. Published 24 June 2020. <u>https://www.who.int/publications/i/item/10665-332654</u>
- 25. Soucheray S. Three more health workers infected in Ebola outbreak. Center for Infectious Disease Research and Policy. Published 11 July 2019. Accessed 6 October 2020. <u>https://www. cidrap.umn.edu/news-perspective/2019/07/three-more-health-workers-infected-ebolaoutbreak#:~:text=The%20new%20cases%20raise%20the,outbreak%2C%20according%20to%20 DRC%20data</u>
- Dan-Nwafor CC, Furuse Y, Ilori EA, et al. Measures to control protracted large Lassa fever outbreak in Nigeria, 1 January to 28 April 2019. *Euro Surveill*. 2019;24(20):1900272. DOI: <u>10.2807/1560-7917.ES.2019.24.20.1900272</u>
- 27. https://ncdc.gov.ng/themes/common/files/sitreps/8c02d1bf6e3e02aa2adfe144dda40db2.pdf
- Nigeria Centre for Disease Control. 2018 Lassa Fever outbreak situation report. Published 31 December 2018. Accessed 3 October 2020. <u>https://ncdc.gov.ng/themes/common/files/ sitreps/733d856bae4b2afa5d29c0465e6c335e.pdf</u>
- Nigeria Centre for Disease Control. Lassa fever situation report: epi week 39: 21-27 September 2020. Published 27 September 2020. Accessed 3 October 2020.
- Centers for Disease Control and Prevention. Cost of the Ebola Epidemic. Accessed 16 September 2020. https://www.cdc.gov/vhf/ebola/pdf/impact-ebola-healthcare.pdf
- Centers for Disease Control and Prevention. Cost of the Ebola Epidemic. Accessed 16 September 2020. https://www.cdc.gov/vhf/ebola/pdf/impact-ebola-healthcare.pdf
- Elkholy A.A., Grant, R., Assiri, A., et al. MERS-CoV infection among healthcare workers and risk factors for death: retrospective analysis of all laboratory-confirmed cases reported to WHO from 2012 to 2 June 2018. *J. Infect. Public Health*, 0-4 DOI: <u>10.1016/j.jiph.2019.04.011</u>
- Elkholy A.A., Grant, R., Assiri, A., et al. MERS-CoV infection among healthcare workers and risk factors for death: retrospective analysis of all laboratory-confirmed cases reported to WHO from 2012 to 2 June 2018. *J. Infect. Public Health*, 0-4 DOI: <u>10.1016/j.jiph.2019.04.011</u>
- Xiao J, Fang M, Chen Q, et al. SARS, MERS and COVID-19 among healthcare workers: a narrative review. J Infect Public Health. 2020 June;13(6):843-8. DOI: <u>10.1016/j.jiph.2020.05.019</u>
- 36. Lietz J, Westermann C, Nienhaus A, Schablon A. The occupational risk of influenza A (H1N1) infection among healthcare personnel during the 2009 pandemic: a systematic review and meta-analysis of observational studies. PLoS One. 2016;11:e0162061. DOI: <u>10.1371/journal.pone.0162061</u>
- Xiao J, Fang M, Chen Q, et al. SARS, MERS and COVID-19 among healthcare workers: a narrative review. J Infect Public Health. 2020 June;13(6):843-8. DOI: <u>10.1016/j.jiph.2020.05.019</u>
- 38. World Health Organization. WHO Guidelines on Hand Hygiene in Health Care: First Global Patient Safety Challenge Clean Care Is Safer Care. Published 2009. Accessed 14 September 2020. <u>https://www.ncbi.nlm.nih.gov/books/NBK144018/</u>
- 39. Torriani F, Taplitz R. History of infection prevention and control. Infectious Diseases. 2010;76-85.
- Allegranzi B, Kilpatrick C, Storr J, et al. Global infection prevention and control priorities 2018-22: a call for action. *Lancet Glob Health*. 2017 Dec;5(12):e1178-e1180. DOI: <u>10.1016/S2214-109X(17)30427-8</u>

Protecting Health Care Workers: A Need for Urgent Action

- Lo Iacono G, Cunningham AA, Fichet-Calvet E, et al. (2015) Using Modelling to Disentangle the Relative Contributions of Zoonotic and Anthroponotic Transmission: The Case of Lassa Fever. PLoS Negl Trop Dis 9(1): e3398. DOI: <u>10.1371/journal.pntd.0003398</u>
- 42. Xiao J, Fang M, Chen Q, et al. SARS, MERS and COVID-19 among healthcare workers: a narrative review. J Infect Public Health. 2020 June;13(6):843-8. DOI: <u>10.1016/j.jiph.2020.05.019</u>
- Selvaraj SA, Lee KE, Harrell M, et al. Infection rates and risk factors for infection among health workers during Ebola and Marburg virus outbreaks: a systematic review. *J Infect Dis.* 2018;218(suppl 5):S679-S689.
- McDonald LC, Simor AE, Su IJ, et al. SARS in healthcare facilities, Toronto and Taiwan. Emerg Infect Dis. 2004 May; 10(5): 777-781. DOI: <u>10.3201/eid1005.030791</u>
- Brown DL. SARS takes toll on nurses. *The Washington Post*. Published 12 June 2013. Accessed 16 September 2020. <u>https://www.washingtonpost.com/archive/politics/2003/06/12/sars-takes-toll-on-nurses/37c8760a-769a-4a6f-b9d7-fabbef78ed8e/</u>
- McDonald LC, Simor AE, Su IJ, et al. SARS in healthcare facilities, Toronto and Taiwan. Emerg Infect Dis. 2004 May; 10(5): 777-781. DOI: <u>10.3201/eid1005.030791</u>
- Brown DL. SARS takes toll on nurses. *The Washington Post*. Published 12 June 2013. Accessed 16 September 2020. <u>https://www.washingtonpost.com/archive/politics/2003/06/12/sars-takes-toll-on-nurses/37c8760a-769a-4a6f-b9d7-fabbef78ed8e/</u>
- McDonald LC, Simor AE, Su IJ, et al. SARS in healthcare facilities, Toronto and Taiwan. Emerg Infect Dis. 2004 May; 10(5): 777-781. DOI: <u>10.3201/eid1005.030791</u>
- Elkholy A.A., Grant, R., Assiri, A., et al., 2019. MERS-CoV infection among healthcare workers and risk factors for death: retrospective analysis of all laboratory-confirmed cases reported to WHO from 2012 to 2 June 2018. *J. Infect. Public Health*, 0-4 DOI: <u>10.1016/j.jiph.2019.04.011</u>
- Elkholy A.A., Grant, R., Assiri, A., et al., 2019. MERS-CoV infection among healthcare workers and risk factors for death: retrospective analysis of all laboratory-confirmed cases reported to WHO from 2012 to 2 June 2018. *J. Infect. Public Health*, 0–4 DOI: <u>10.1016/j.jiph.2019.04.011</u>
- Selvaraj SA, Lee KE, Harrell M, et al. Infection rates and risk factors for infection among health workers during Ebola and Marburg virus outbreaks: a systematic review. *J Infect Dis.* 2018;218(suppl 5):S679-S689. DOI: <u>10.1093/infdis/jiy435</u>
- 52. National Nurses United. New survey of nurses provides frontline proof of widespread employer, government disregard for nurse and patient safety, mainly through lack of optimal PPE. Published 20 May 2020. Accessed 8 October 2020. <u>https://www.nationalnursesunited.org/press/new-survey-results</u>
- International Council of Nurses. Protecting nurses from COVID-19 a top priority: a survey of ICN's national nursing associations. Published 14 September 2020.
- Allegranzi B, Nejad SB, Combescure C, et al. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. The Lancet. 2010 Dec:377(9761);228-241. DOI: <u>10.1016/S0140-6736(10)61458-4</u>
- Allegranzi B, Kilpatrick C, Storr J, et al. Global infection prevention and control priorities 2018-22: a call for action. *Lancet Glob Health*. 2017 Dec;5(12):e1178-e1180. DOI: <u>10.1016/S2214-109X(17)30427-8</u>
- Johnstone J, Garber G, Muller M. Health care-associated infections in Canadian hospitals: still a major problem. CMAJ. 2019 Sept:191(36);e977-e978; DOI: <u>10.1503/cmaj.190948</u>
- Allegranzi B, Nejad SB, Combescure C, et al. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. The Lancet. 2010 Dec:377(9761);228-241. DOI: <u>10.1016/S0140-6736(10)61458-4</u>
- World Health Organization. Healthcare-associated infections: fact sheet. Accessed 16 September 2020. <u>http://www.who.int/gpsc/country_work/gpsc_ccisc_fact_sheet_en.pdf</u>
- Allegranzi B, Nejad SB, Combescure C, et al. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. The Lancet. 2010 Dec:377(9761);228-241. DOI: <u>10.1016/S0140-6736(10)61458-4</u>
- 60. Xiao J, Fang M, Chen Q, et al. SARS, MERS and COVID-19 among healthcare workers: a narrative review. J Infect Public Health. 2020 June;13(6):843-8. DOI: <u>10.1016/j.jiph.2020.05.019</u>
- 61. Add link to new WB document
- Zhou F, Li J, Lu M, Ma L, Pan Y, Liu X, et al. Tracing asymptomatic SARS-CoV-2 carriers among 3674 hospital staff:a cross-sectional survey. EClinicalMedicine. 2020 DOI: <u>10.1016/j.</u> <u>eclinm.2020.100510</u>

- World Health Organization. Coronavirus Disease (COVID-19): Data as received by WHO from national authorities, as of 11 October 2020, 10am CEST. Published October 2020. Accessed 8 November 2020. <u>https://www.who.int/docs/default-source/coronaviruse/situation-reports/20201012-weekly-epi-update-9.pdf</u>
- Moll SE. The web of silence: a qualitative case study of early intervention and support for healthcare workers with mental ill-health. BMC Public Health. 2014 Feb;14(138). DOI:<u>10.1186/1471-2458-14-138</u>
- Preti E, Di Mattei V, Perego G, et al. The Psychological Impact of Epidemic and Pandemic Outbreaks on Healthcare Workers: Rapid Review of the Evidence. *Curr Psychiatry Rep.* 2020 Jul;22(8):43. DOI: <u>10.1007/s11920-020-01166-z</u>
- Preti E, Di Mattei V, Perego G, et al. The Psychological Impact of Epidemic and Pandemic Outbreaks on Healthcare Workers: Rapid Review of the Evidence. *Curr Psychiatry Rep.* 2020 Jul;22(8):43. DOI: <u>10.1007/s11920-020-01166-z</u>
- Preti E, Di Mattei V, Perego G, et al. The Psychological Impact of Epidemic and Pandemic Outbreaks on Healthcare Workers: Rapid Review of the Evidence. *Curr Psychiatry Rep.* 2020 Jul;22(8):43. DOI: <u>10.1007/s11920-020-01166-z</u>
- 68. Insecurity Insight. Aid and health worker safety and security in the context of the COVID-19 pandemic. Published June 2020. Accessed 21 September 2020. <u>http://insecurityinsight.org/</u> wp-content/uploads/2020/09/Aid-and-health-worker-safety-and-security-in-the-context-of-the-COVID-19-pandemic.pdf
- 69. Insecurity Insight. Aid and health worker safety and security in the context of the COVID-19 pandemic. Published June 2020. Accessed September 21, 2020. <u>http://insecurityinsight.org/</u> wp-content/uploads/2020/09/Aid-and-health-worker-safety-and-security-in-the-context-of-the-COVID-19-pandemic.pdf
- McKay D, Heisler M, Mishori R, Catton H, Kloiber O. Attacked against health-care personnel must stop, especially as the world fights COVID-19. The Lancet. 2020;395(10239):1743-1745. DOI: <u>10.1016/S0140-6736(20)31191-0</u>
- 71. Insecurity Insight. Aid and health worker safety and security in the context of the COVID-19 pandemic. Published June 2020. Accessed 21 September 2020. <u>http://insecurityinsight.org/wp-content/uploads/2020/09/Aid-and-health-worker-safety-and-security-in-the-context-of-the-COVID-19-pandemic.pdf</u>
- 72. Huber C, Finelli L, Stevens W. The economic and social burden of the 2014 Ebola outbreak in West Africa. J Infect Dis. 2018 Dec;218(suppl 5):S698-S704. DOI: <u>10.1093/infdis/jiy213</u>
- Reuters. West Africa's Ebola outbreak cost \$53 billion study. Published 24 October 2018. Accessed 16 September 2020. <u>https://www.reuters.com/article/us-health-ebola-cost/west-africas-ebola-outbreak-cost-53-billion-study-idUSKCN1MY2F8</u>
- 74. Gross S. Economist who said SARS \$40 billion sees bigger hit now. Bloomberg. Published January 30, 2020. Accessed 30 September 2020. <u>https://www.bloomberg.com/news/articles/2020-01-30/</u> <u>economist-who-said-sars-cost-40-billion-sees-bigger-hit-now#:~:text=The%20global%20cost%20</u> <u>of%20the,economist%20who%20calculated%20that%20figure</u>.
- 75. Schwab J. Fighting COVID-19 could cost 500 times as much as pandemic prevention measures. *Global Economic Forum*. Published 3 August 2020. Accessed 10 September 2020. <u>https://www.weforum.org/agenda/2020/08/pandemic-fight-costs-500x-more-than-preventing-one-futurity/</u>
- 76. International Monetary Fund. Questions and Answers: *The IMF's Response to COVID-19.* Published 6 October 2020. Accessed 8 October 2020. <u>https://www.imf.org/en/About/ FAQ/imf-response-to-covid-19</u>
- 77. Craven M, Sabow M, Van der Veken L, et al. Not the last pandemic: Investing now to reimagine public-health systems. McKinsey & Company website. Published 13 July 2020. Accessed 6 October 2020. <u>https://www.mckinsey.com/industries/public-and-social-sector/our-insights/not-the-last-pandemic-investing-now-to-reimagine-public-health-systems</u>
- National Academy of Medicine. 2016. The Neglected Dimension of Global Security: A Framework to Counter Infectious Disease Crises. Washington, DC: The National Academies Press. DOI: <u>10.17226/21891</u>

- 79. Michaud J, Moss K, Kates J. The U.S. Government and Global Health Security. Global Health Policy, KFF website. Published 17 December 2019. Accessed 16 September 2020. <u>https://www.kff.org/global-health-policy/issue-brief/the-u-s-government-and-global-health-security/#:~:text=The%20Trump%20Administration%20requested%20%24149.8,%24320%20 million%20in%20FY%202014</u>
- Reddy S, Mazhar S, Lencucha R. The financial sustainability of the World Health Organization and the political economy of global health governance: a review of funding proposals. Global Health 2018 Nov:14(119). DOI: <u>10.1186/s12992-018-0436-8</u>
- Risko N, Werner K, Offorjebe OA, Vecino-Ortiz AI, Wallis LA, Razzak J (2020) Cost-effectiveness and return on investment of protecting health workers in low- and middle-income countries during the COVID-19 pandemic. PLoS ONE 15(10): e0240503. <u>https://doi.org/10.1371/journal.pone.0240503</u>
- 82. _World Health Organization. Minimum Requirements for infection prevention and control programmes. Geneva: World Health Organization; 2019. Accessed 20 September 2020. <u>https://www.who.int/infection-prevention/publications/min-req-IPC-manual/en/</u>
- 83. World Health Organization. *Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level*. Geneva: World Health Organization; 2016. Accessed 20 September 2020. <u>https://www.who.int/infection-prevention/publications/ipc-components-guidelines/en/</u>
- World Health Organization and International Labour Organization. Occupational safety and health in public health emergencies. Geneva: World Health Organization; 2018. Accessed 20 September 2020. <u>https://www.who.int/occupational_health/Web_OSH_manual.pdf</u>
- 85. World Health Organization. *WASH in healthcare facilities: practical steps to achieve universal access to quality care.* Geneva: World Health Organization; 2019. Accessed 20 September 2020. https://www.who.int/water_sanitation_health/publications/wash-in-health-care-facilities/en/
- 86. World Health Organization. Water and sanitation for health facility improvement tool (WASH FIT): a practical guide for improving quality of care through water, sanitation and hygiene in health care facilities. Geneva: World Health Organization; 2018. Accessed 20 September 2020. <u>https:// www.who.int/water_sanitation_health/publications/water-and-sanitation-for-health-facilityimprovement-tool/en/</u>
- World Health Organization. Core questions and indicators for monitoring WASH in health care facilities in the Sustainable Development Goals. Geneva: World Health Organization; 2018. Accessed 20 September 2020. <u>https://www.who.int/water_sanitation_health/publications/corequestions-and-indicators-for-monitoring-wash/en/</u>