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Overview of Legal Measures for Managing Workplace COVID-19 Infection Risk in Several Asia-Pacific Countries

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ABSTRACT

Background: Despite the lack of official COVID-19 statistics, various workplaces and occupations have been at the center of COVID-19 outbreaks. We aimed to compare legal measures and governance established for managing COVID-19 infection risks at workplaces in nine Asia and Pacific countries and to recommend key administrative measures.

Methods: We collected information on legal measures and governance from both general citizens and workers regarding infection risks such as COVID-19 from industrial hygiene professionals in nine countries (Indonesia, India, Japan, Malaysia, New Zealand, Republic of the Philippines, Republic of Korea, Taiwan, and Thailand) using a structured questionnaire.

Results: A governmental body overseeing public health and welfare was in charge of containing the spread and occurrence of infectious diseases under an infectious disease control and prevention act or another special act, although the name of the pertinent organizations and legislation vary among countries. Unlike in the case of other traditional hazards, there have been no specific articles or clauses describing the means of mitigating virus risk in the workplace that are legally required of employers, making it difficult to define the responsibilities of the employer. Each country maintains own legal systems regarding access to the duration, administration, and financing of paid sick leave. Many workers may not have access to paid sick leave even if it is legally guaranteed.

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Conclusion: Specific legal measures to manage infectious disease risks, such as providing proper personal protective equipment, education, engineering control measures, and paid sick leave are recommended to be stipulated in Industrial safety and health-related acts.

1. Introduction

Countries around the globe have implemented national prevention and response systems for COVID-19, including lockdowns, multiple levels of social distancing, different types of legal measures, and so on, focusing on containing the risk of virus in various public facilities. Typically, social activities, workplaces, and hospital facilities involving indoor mass gatherings and frequent contact have accounted for the largest portion of confirmed outbreaks. The primary interventions against COVID-19 in most countries seemed to focus on the prevention of community infection, and the development of policies to control infection in the workplace or by occupation has been relatively neglected. Approximately 18.4% (26.7 million) of all workers in the United States are employed in occupations where exposure to disease or infection occurs at least once per month [1].

Workplaces are one of the major places at the center of COVID-19 outbreaks around the world, including call centers in Republic of the Philippines; meat-processing plants in the United States, Germany, Ireland, and Canada; as well as nursing homes in all affected countries (which are especially vulnerable to infection) [2,3]. These outbreaks underscore the importance of physical proximity (density), ventilation, hygiene, and sanitary installations in workplace as determinants of risk during a pandemic. In the wake of the worldwide spread of COVID-19, characterizing the contribution of workplaces to disease transmission has become a crucial public health measure, especially given the variety of work tasks that could promote the spread of infectious disease and the contribution of workplace settings in the spread of viruses observed in previous epidemics or pandemics [4,5]. Considering the crowded environment common in many workplaces, not only individual workers but also the workplace itself can be a source of potential mass transmission.

In the Republic of Korea, as of February 2021, nearly 61% of new mass cluster infections were reported from workplaces with crowded and closed environments in terms of people, space, and ventilation [6], even though it was not the incidence within a specified period of time. The workplace is a key locus for public health interventions that could protect both workers and the communities they serve. To our knowledge, no study has reported on the legal measures enacted in occupational safety and health acts, even though there are a number of studies reporting on outbreaks in certain occupations or workplaces [7,8]. Protecting the health and safety of workers is a prerequisite to maintain economic activity without requiring confinement and/or lockdown measures. The aims of this study are to provide an overview of legal measures and governance for managing COVID-19 infection risk and protecting workers from it in selected Asia and Pacific countries and to recommend key occupational health and safety elements that all employers should implement to mitigate infection risk as a general obligation of employers.

2. Materials and methods

2.1. Participating countries

We accessed international networks of occupational hygiene professionals for this study. Among the 17 member countries of the Asian Network of Occupational Health(ANOH), representatives of the nine countries, namely Indonesia, India, Japan, Malaysia, New Zealand, Republic of the Philippines, Republic of Korea, Taiwan and Thailand, voluntarily participated in the study. There were no particular scientific criteria for their selection. Some of the ANOH board members who designed this study and developed the structured questionnaire were invited to respond to this standardized form and collaborate in this international study. They are either the current or former president of an industrial hygiene society in the participating countries and are mainly from academic institutions and the governmental and industry sector. The information from each country was systematically collected, reviewed, and discussed to ensure the accuracy of the information and finally integrated into the results of this study.

2.2. Legal acts and governance for controlling COVID-19 infection risk

The legal acts and governmental structures that have been implemented in each country to control COVID-19 infection risk were collected and compared. Governmental bodies and acts to protect citizens and workers from infectious disease were also examined and compared according to the level of law. In particular, specific clauses stipulated in acts requiring employers to protect workers, including infected and potentially infected workers, from infectious diseases are listed. Using a structured questionnaire, we collected legal measures and governance frameworks intended for preventing and controlling infectious disease risks such as COVID-19. Standardized forms were developed to collect qualitative information related to the management of infectious diseases such as COVID-19, focusing on the presence of legal measures and type of government authorities dealing with legislation. Key information collected and discussed is as follows:

- The presence of infectious disease controls related to acts
- Governmental bodies and structures for the control of infectious disease, and cooperation among them
- The presence of an article stipulating the control of infectious disease in industrial safety and health-related acts
- The presence of legal articles to protect the job security of workers from COVID-19 risks

Standardized tables with respondent instructions were sent to all co-authors, collected, confirmed again through either e-mail or online meetings, and finally organized as the results tables for this study.

3. Results

Regulations and administrative organizations in each country intended to control the risk of infectious diseases such as COVID-19 are summarized. A governmental body overseeing public health and welfare (PHW) is found to be in charge of controlling the spread and occurrence of infectious diseases hazardous to citizens' health, including workers (Table 1), under the local infectious disease control—related act or special act, although the name of the organization and legal act differ among countries. According to all

Table 1
Administrative surveillance system to monitor COVID-19 cases among the general population and employees

Country	For general population		For employees in workplaces	
	Governmental ministry	Frontline organization	Governmental ministry	Frontline organization
India	Ministry of Health and Family Welfare	National Center for Disease Control	Ministry of Health and Family Welfare	National Center for Disease Control
Indonesia	Ministry of Health	- Committee for Handling COVID-19 and National Economic Recovery (KCPPEN) - COVID-19 Response Acceleration Task Force	Ministry of Health, Ministry of Manpower	- Committee for Handling COVID-19 and National Economic Recovery - COVID-19 Response Acceleration Task Force
Japan	Ministry of Health, Labor and Welfare	Office for Novel Coronavirus Disease Control, Cabinet Secretariat	Ministry of Health, Labor and Welfare	Office for Novel Coronavirus Disease Control, Cabinet Secretariat
Malaysia	Ministry of Health	Ministry of Health	Ministry of Human Resources	Department of Occupational Safety & Health (DOSH)
New Zealand	Ministry of Health	Ministry of Health	Ministry of Health, WorkSafeNZ	Ministry of Health, WorkSafeNZ
Republic of the Philippines	Department of Health	Disease Prevention and Control Bureau	Department of Labor and Employment	Occupational Safety and Health Center
Republic of Korea	Ministry of Health and Welfare	Korea Disease Control and Prevention Agency	Ministry of Employment and Labor	Korea Occupational Safety and Health Agency
Taiwan	Ministry of Health and Welfare	Taiwan Centers for Disease Control	Ministry of Health and Welfare	Taiwan Centers for Disease Control
Thailand	Ministry of Public Health	Public Health Emergency Operation Center	Ministry of Public Health, Ministry of Labor	Public Health Emergency Operation Center

the acts, not only individual citizens but also all government ministries and local/provincial governments must cooperate with the PHW's policies, including administrative orders against infectious diseases (Table 2). Most countries have implemented a special act and/or a governmental task force for managing COVID response. Compensation for absences due to compliance with public health guidance is available for workers in every country by means of paid leave and sickness benefits. Each country maintains its own legal system and customs regarding access to and the duration, administration, and financing of paid sick leave (Table 3). No country has specific articles or clauses describing the means of mitigation of virus risk in the workplace that are legally required of employers, making it difficult to define the responsibilities of the employer.

The local ministry of labor or manpower, which is responsible for workers in terms of occupational safety and accidents, should cooperate with the activities of the PHW. The duty of employers to protect employees from hazardous agents, including infection risk, can be regarded as among the general duties described in occupational safety health laws. Unlike other traditional hazardous agents, however, no country has stipulated specific articles or clauses for controlling infectious diseases in the workplace under an Industrial Safety and Health Act (ISHA) with which employers must comply (Table 4). Thus, all countries have regulations regarding the prevention of health effects caused by biohazard, but none of them include specific clauses related to infectious diseases such as COVID-19.

4. Discussion

This study found that no country has specifically stipulated legal articles in its ISHA act detailing an employer's duty to contain risks of infectious diseases such as COVID-19 in the workplace (Tables 2 and 4), regardless of the difference in the incidence and death rate of COVID-19 infection among countries. The United States has no federal Occupational Safety and Health Administration standard or regulation that specifically outlines precautions that employers are required to implement to control COVID-19 exposure in the workplace. Workplaces are not considered a typical place of origin of infectious diseases such as COVID-19. However, workers who contracted a virus elsewhere can spread infectious disease to co-workers, resulting in a mass infection in a workplace. Clusters of cases among various types of occupations and workplaces have been observed since the emergence of COVID-19 in December 2019 [2,9,10]. For example, medical staff and other workers in nursing homes could trigger mass COVID-19 infections as they commute, while hospitalized patients pose relatively lower risks of virus transmission because they are tested before admission. During an infectious disease outbreak, workplaces can play an important role in both spreading the disease [11,12] and helping to halt the spread of disease through proper workplace practices and policies [4,13]. All countries have a General Duty Clause in their regulations, stipulating that employers have an obligation to provide an environment free from recognized hazards that can cause or are likely to cause death or serious harm to their employees (Table 4). Specific virus response measures should be implemented in workplaces to both swiftly identify infected workers and to allow them to self-quarantine, resulting in containing and/or delaying the spread of COVID-19. Without proper enforcement, there is an increasing reliance on employers' voluntary adherence to guidelines, leaving workers' protections at risk. To ultimately contain and reduce the spread and transmission of COVID-19, proper legal response measures from the occupational health field should be enforced to combat infection risk. Legal measures against infectious disease risk may differ not only by type of infectious risk but also by type of industry and occupation in terms of the use of appropriate personal protective equipment (PPE), education, the practice of individual hygiene, and engineering control measures.

First of all, employers should provide proper PPE to workers. Respirators are confirmed to be the most effective tool to protect workers from the risk of respiratory tract infection. Any scarcity of PPE can lead to allowing extended wear and reuse of masks, raising concern about their effectiveness [14]. In particular, policies aimed at providing resources to obtain additional direct care staff and PPE for vulnerable hospitals and nursing homes, particularly in areas with rising community COVID-19 case rates, are needed to reduce the national COVID-19 infection risk. McGarry et al (2020) reported that more than one in five staff members from 98% of nursing homes in the United States experienced a severe shortage of PPE [15]. The level of access to essential PPE during the COVID-19 pandemic varied substantially among countries. In a cross-sectional study conducted in May 2020 in Ethiopia, 31%, 27.4%, 15.9%, 14.5%, and 14.2% of helath care workers (HCW) (n = 422)

Table 2
Governmental organization and relevant legislation to control infectious diseases, including COVID-19

Country	Responsible governmental body	Applicable law(s), date of enforcement	Purposes of act	Presence of article/ clause on protecting employees/workers
India	Ministry of Law and Justice	Epidemic Diseases Act, 1897, Epidemic Diseases (Amendment) Ordinance, 2020	To provides for the prevention of the spread of dangerous epidemic diseases. The Ordinance amends the Act to include protections for healthcare personnel combatting epidemic diseases and expands the expands the powers of the central government to prevent the spread of such diseases.	Yes*
Indonesia	Ministry of Health	Law on Health (Law No. Number 36/2009) (Oct 2009)	To maintain and increase the degree of public health as high as possible based on the nondiscriminative, participative, and sustainable principles in the framework of the formation of Indonesian human resources, as well as increasing the resilience and competitiveness of the nation for national development.	Yes
Japan	Ministry of Health, Labor and Welfare, and Cabinet Secretariat	Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response (February 2021)	To protect the lives and health of the people and minimize the impact on their lives and economy by strengthening measures against infectious diseases such as new influenza.	No
Malaysia	Malaysian National Security Council (Prime Ministers Department) & Ministry of Health	Prevention and Control of Infectious Diseases Act 1988 (Act 342)	To govern the prevention and control transmission of infectious diseases.	No
New Zealand	Ministry of Health	COVID-19 Public Health Response Act 2020 (May 2020)	To support a public health response to COVID-19 that prevents and limits the risk of COVID-19 and avoids or mitigates the adverse effects of the COVID-19 outbreak and is coordinated, orderly, and proportionate and allows for social, economic, and other factors to be taken into account and is economically sustainable and allows for recovery of MIQF costs and has enforceable measures.	Yes
Republic of the Philippines	Department of Health	Mandatory Reporting of Notifiable Diseases and Health Events of Public Health Concern Act (July 2018)	To protect the people from public health threats through the disease surveillance of notifiable diseases including emerging and re-emerging infectious diseases, diseases for elimination and eradication, epidemics, and health events including chemical, radionuclear, and environmental agents of public health concern and provide an effective response system.	No
Republic of Korea	Korea Disease Control and Prevention Agency, Ministry of Health and Welfare	Infectious Disease Control and Prevention Act (April 2020)	To contribute to improving and maintaining citizens' health by preventing the occurrence and epidemics of infectious diseases hazardous to citizens' health, and prescribing necessary matters for the prevention and control thereof.	Yes
Taiwan	Ministry of Health and Welfare	Special Act for Prevention, Relief and Revitalization Measures for Severe Pneumonia with Novel Pathogens (April 2020)	To effectively prevent and control severe pneumonia with novel pathogens (COVID-19), protect the health of the people, and mitigate the impact of the disease on the domestic economy and society.	Yes
Thailand	Department of Diseases Control, Ministry of Public health	Communicable Disease Act B.E. 2558 (March 2016)	To prevent and control communicable diseases	No

MIQF, managed isolation and quarantine facility.
*It prohibits acts of violence against health-care service personnel and damage to property.

responded as having access to gloves, facemask, goggles, shoes, and aprons, respectively [16]. There was even an outbreak cluster caused by sharing some PPE in one large logistics centers and warehouses in the Republic of Korea where products and parcels are sorted, loaded, and delivered nationwide, allowing workers to share protective clothing, helmets, goggles, gloves, shoes, and more, making it easier to spread COVID-19. The government may subsidize workplaces suffering from economic difficulties under COVID-19, especially small- and medium-sized enterprises, for supplying PPE to their employees.

Second, proper engineering control measures by type of work environment, including ventilation, partitions, booths, and more, should be stipulated in ISHA. Several types of engineering control measures should be applied to facilities or buildings with a high risk of infection. There have been several clusters occurring in occupations with an often-crowded enclosed work environment and

Table 3
The presence of legal articles under which employers must protect the job security of workers from COVID-19 risk*

Country	Guaranteed paid leave during the period of such hospitalization, quarantine, or isolation	May not dismiss, or otherwise treat unfavorably, employees with infectious risk	Subside the cost of granting a paid leave for infected workers	Ban on discrimination against workers either infected with infectious diseases or suspected of having symptoms	Employment retention subsidies
India	Yes	Yes	Yes	Yes	No
Indonesia	Yes	Yes	Yes	Yes	Yes
Japan	Yes	Yes	Yes	No	Yes
Malaysia	Yes	Yes	Yes	No	No
New Zealand	Yes*	No	No	No	Yes
Republic of the Philippines	Yes	Yes	Yes	No	Yes
Republic of Korea	No	Yes	Yes	No	Yes
Taiwan	No	Yes	Yes	Yes	Yes
Thailand	Yes	Yes	Yes	No	Yes

*Not indicated specifically all legal acts stipulated to protect job security of workers in several nation-level ministries.

those that lack ventilation, such as call centers, fitness/dance/sports centers, detention centers, prisons, and others—all of which can be regarded as facilities susceptible to infection clusters [9,17–19]. Technical guidelines on operating building systems such as heating, ventilation, and air conditioning systems can provide practical guidance for preventing the spread and transmission of airborne infectious aerosols during epidemics. The guidelines usually cover supply systems, higher air change rates, increased filtration, and exhaust systems designed to minimize re-entrainment of contaminated air [20].

Third, administrative measures including education, social distancing rules in workplaces, and individual hygiene should be legally implemented to reduce the transmission of COVID-19. Scientific knowledge and effective methodologies for controlling the risk of infectious disease should be transferred to employers and workers through education and other means, raising individual worker's perceptions of risk of viruses and inspiring them to protect themselves from infection [21]. Instruction and assessment of proper hygiene practices, such as donning and doffing of PPE as well as hand hygiene techniques, are to be encouraged [22]. Social distancing rules for specific locations in workplaces should be developed with the understanding of and respect for ethnic and cultural needs; in Singapore, for instance, spatial rearrangement was made to assist social distancing for Muslim daily prayers [23].

Table 4
Legal articles related to protection of workers from infectious diseases*

Country	The presence of employer's general duty to protect workers from infectious disease risk such as COVID-19	The presence of specific articles or clause related to the prevention of biological hazard in enforcement decree under act	The presence of specific articles or clause related to the prevention of infectious disease in enforcement decree under act	The presence of COVID-19 related circular letter or guidance or scheme or fact sheets
India	Yes	No	No	Yes
Indonesia	Yes	Yes	No	Yes
Japan	Yes	Yes	No	Yes
Malaysia	Yes	No	No	Yes
New Zealand	Yes	No	No	Yes
Republic of the Philippines	Yes	Yes	Yes	Yes
Republic of Korea	Yes	Yes	No	Yes
Taiwan	Yes	Yes	No	Yes
Thailand	Yes	No	No	Yes

*Not indicated specifically, all legal acts stipulated to protect the job security of workers through several nation-level ministries.

Fourth, there should be legal and social protections for workers who contract COVID-19. All countries have implemented legal measures to protect workers who are either infected or suspected of having symptoms such as required self-quarantine, paid sick leave, family sick leave, and more (Table 4). Globally, paid sick leave is now more widely accessible than ever after the COVID-19 crisis—although statutory paid sick leave is either not in place or remains limited in some countries [24]. In many countries, sick leave and other benefits are not always available for workers in certain sectors and types, in spite of the presence of a related law [25]. This lack of access is often exacerbated in small- and medium-sized enterprises by various barriers to occupational health interventions [26,27]. The absence of a statutory paid sick leave system contributes to greater health and economic risks in a public health crisis [28–30]. Heymann et al (2020) analyzed a database of legislative guarantees of paid leave for personal illness in 193 United Nations member states and reported that 27% of countries do not guarantee paid sick leave from the first day of illness and 58% of countries do not have explicit provisions to ensure self-employed and gig economy workers have access to paid sick leave benefits [30]. Reportedly, sick presenteeism contributes to a high attack rate during an infectious disease epidemic [31,32] and puts colleagues, residents, and visitors alike at risk [33]. A cluster outbreak at a call center in the Republic of Korea was reported after asymptomatic employees continued to come to work [9]. As this case indicates, many workers may not have access to paid sick leave even if it is legally guaranteed; however, we were unable to find data that quantify the gap between the law and practice.

In summary, to contain the transmission of infectious diseases, generalized legal measures such as provision of proper PPE, education, engineering control measures, and paid sick leave are recommended to be applied flexibly and diversely to various situations such as type of working environments and practices, job, season, infectious diseases, and level of endemic and pandemic.

This study has several limitations. First, the specific scope, quality, and efficiency of the implementation of legal articles or guidance related to the protection of workers from infectious diseases were not studied. Dichotomous classification (yes or no) on

the presence of legal acts insufficiently reflects all details, necessitating a framework for further elaboration to evaluate the similarities and differences between the countries in terms of legal aspects and authorities. Our results obtained from only nine countries may not be generalizable to other Asia-Pacific countries with different legal measures in the workplace to protect employees from hazardous agents, including infectious diseases.

In conclusion, unlike other hazardous agents originally generated from manufacturing, infectious disease risks were not regarded as an occupational factor, making it difficult to define the responsibility of the employer. No country was found to stipulate a specific article or clause in ISHA on measures to mitigate or prevent the spread of infectious disease risks in the workplace that are legally required of employers. The proposed legal measures include providing proper PPE, education, engineering control measures, and paid sick leave for responding properly to risks of infection diseases such as COVID-19 should be considered in ISHA.

Conflicts of interest

All authors have no conflicts of interest to declare.

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