



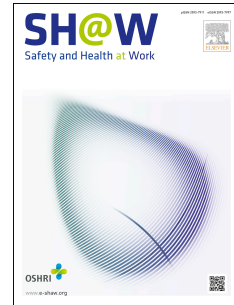
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# Journal Pre-proof

Overview of legal measures for managing workplace COVID-19 infection risk in several Asia-Pacific countries

Miller Derek, Feng-Jen Tsai, Jiwon Kim, Mila Tejamaya, Vilandi Putri, Go Muto, Alex Reginald, Wantanee Phanprasit, Nelia Granadillos, Marina Bt Zainal Farid, Carmela Q. Capule, Yu-Wen Lin, Jihoon Park, Ruey-Yu Chen, Kyong Hui Lee, Jeongim Park, Haruo Hashimoto, Chungsik Yoon, Chantana Padungtod, Dong-Uk Park



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*Original Article*

**Overview of legal measures for managing workplace COVID-19 infection risk in several Asia-Pacific countries**

Miller Derek<sup>1</sup>, Feng-Jen Tsai<sup>2</sup>, Jiwon Kim<sup>3</sup>, Mila Tejamaya<sup>4</sup>, Vilandi Putri<sup>5</sup>, Go Muto<sup>6</sup>, Alex Reginald<sup>7</sup>, Wantanee Phanprasit<sup>8</sup>, Nelia Granadillos<sup>9</sup>, Marina Bt Zainal Farid<sup>10</sup>, Carmela Q. Capule<sup>11</sup>, Yu-Wen Lin<sup>12</sup>, Jihoon Park<sup>13</sup>, Ruey-Yu Chen<sup>14</sup>, Kyong Hui Lee<sup>15</sup>, Jeongim Park<sup>16</sup>, Haruo Hashimoto<sup>17</sup>, Chungsik Yoon<sup>18</sup>, Chantana Padungtod<sup>19</sup>, Dong-Uk Park<sup>3\*</sup>

<sup>1</sup> D Miller Consultancy, New Zealand

<sup>2</sup> Ph.D. program in Global Health and Health Security, Taipei Medical University, Taiwan

<sup>3</sup> Department of Environmental Health, Korea National Open University, Republic of Korea

<sup>4</sup> Faculty of Public Health, University of Indonesia, Indonesia

<sup>5</sup> Indonesia Industrial Hygiene Association, Indonesia

<sup>6</sup> Department of Hygiene, Kitasato University School of Medicine, Japan

<sup>7</sup> Christian Medical College, Vellore, India

<sup>8</sup> Department of Occupational Health and Safety, Faculty of Public Health, Mahidol University, Thailand

<sup>9</sup> Occupational Safety and Health Center, Republic of the Philippines

<sup>10</sup> Industrial Hygiene (Custodian) Health & Safety, PETRONAS Group HSSE, Malaysia

<sup>11</sup> Industrial Hygienists Association of the Philippines, Inc.

<sup>12</sup> Department of Public Health, Fu-Jen Catholic University, Taiwan

<sup>13</sup> National Institute of Chemical Safety, Ministry of Environment, Republic of Korea

<sup>14</sup> School of Public Health, Taipei Medical University, Taiwan

<sup>15</sup> The 65th Medical Brigade, US Army, United States

<sup>16</sup> Department of Environmental Health Sciences, Soonchunhyang University, Republic of Korea

<sup>17</sup> Hashimoto Occupational Safety and Hygiene Consulting, Japan

<sup>18</sup> Department of Environmental Health Sciences, Institute of Health and Environment, Graduate School of Public Health, Seoul National University, Republic of Korea

<sup>19</sup> Division of Vector-borne Diseases, Department of Disease Control, Ministry of Public Health, Thailand

**\* Correspondence; Prof. Dong-Uk Park**

Department of Environmental Health, Korea National Open University, 86, Daehak-ro, Jongno-gu, Seoul, Republic of Korea 03087, E-mail: [pdw545@gmail.com](mailto:pdw545@gmail.com) TEL: +82-2-3668-4707

# 1 **Overview of legal measures for managing workplace COVID-19**

## 2 **infection risk in several Asia-Pacific countries**

### 3 **Abstract**

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

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

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

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

- 24 **Key words:** COVID-19; infectious disease risk; personal protective equipment; paid sick  
25 leave

Journal Pre-proof

## 26 **1. Introduction**

27 Countries around the globe have implemented national prevention and response  
28 systems for COVID-19, including lockdowns, multiple levels of social distancing, different  
29 types of legal measures, etc., focusing on containing the risk of virus in various public  
30 facilities. Typically, social activities, workplaces, and hospital facilities involving indoor  
31 mass gatherings and frequent contact have accounted for the largest portion of confirmed  
32 outbreaks. The primary interventions against COVID-19 in most countries seemed to focus  
33 on the prevention of community infection, and the development of policies to control  
34 infection in the workplace or by occupation has been relatively neglected. Approximately  
35 18.4% (26.7 million) of all workers in the U.S. are employed in occupations where exposure  
36 to disease or infection occurs at least once per month [1].

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

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

## 62 **2. Materials and methods**

### 63 **2.1. Participating countries**

64           We accessed international networks of occupational hygiene professionals for this  
65 study. Among the 17 member countries of the Asian Network of Occupational Health  
66 (ANOH), representatives of the nine countries, namely Indonesia, India, Japan, Malaysia,  
67 New Zealand, Republic of the Philippines, Republic of Korea, Taiwan and Thailand,  
68 voluntarily participated in the study. There were no particular scientific criteria for their  
69 selection. Some of the ANOH board members who designed this study and developed the  
70 structured questionnaire were invited to respond to this standardized form and collaborate in  
71 this international study. They are either the current or former president of an industrial

72 hygiene society in the participating countries and are mainly from academic institutions and  
73 the governmental and industry sector. The information from each country was systematically  
74 collected, reviewed, discussed to ensure the accuracy of the information, and finally  
75 integrated into the results of this study.

## 76 **2.2. Legal acts and governance for controlling COVID-19 infection risk**

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

- 88 • The presence of infectious disease controls related to acts
- 89 • Governmental bodies and structures for the control of infectious disease, and cooperation  
90 among them
- 91 • The presence of an article stipulating the control of infectious disease in occupational

92 safety and health related acts

93 • The presence of legal articles to protect the job security of workers from COVID-19 risks

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

### 97 **3. Results**

98 Regulations and administrative organizations in each country intended to control the  
99 risk of infectious diseases such as COVID-19 are summarized. A governmental body  
100 overseeing public health and welfare (PHW) is found to be in charge of controlling the spread  
101 and occurrence of infectious diseases hazardous to citizens' health, including workers (Table  
102 1), under the local infectious disease control related act or special act, although the name of  
103 the organization and legal act differ among countries. According to all the Acts, not only  
104 individual citizens, but also all government ministries and local/provincial governments must  
105 cooperate with the PHW's policies, including administrative orders against infectious disease  
106 (Table 2). Most countries have implemented a special act and/or a governmental task force  
107 for managing COVID response. Compensation for absences due to compliance with public  
108 health guidance is available for workers is available in every country by means of paid leave  
109 and sickness benefits. Each country maintains its own legal system and customs regarding  
110 access to and the duration, administration, and financing of paid sick leave (Table 3). No  
111 country has specific articles or clauses describing the means of mitigation of virus risk in the  
112 workplace that are legally required of employers, making it difficult to define the  
113 responsibilities of the employer.

114 **Table 1.** Administrative surveillance system to monitor COVID-19 cases among the general  
 115 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 (KCPEN) - 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

116

117 **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 non-discriminative, 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, radio-nuclear 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

Country	Responsible governmental body	Applicable law(s), date of enforcement	Purposes of Act	Presence of article/clause on protecting employees/workers
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

118 \* It prohibits acts of violence against healthcare service personnel and damage to property.

119 **Table 3.** The presence of legal articles under which employers must protect the job security of  
 120 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 <sup>†</sup>	Yes	Yes	No	Yes

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

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

131 **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

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

## 133 **4. Discussion**

134           This study found that no country has specifically stipulated legal articles in its OSH  
135 law detailing an employer's duty to contain infectious disease risks like COVID-19 in the  
136 workplace (Table 2 and 4), regardless of the difference of the incidence and death rate of  
137 COVID-19 infection among countries. The U.S. has no federal Occupational Safety and  
138 Health Administration standard or regulation that specifically outlines precautions that  
139 employers are required to implement to control COVID-19 exposure in the workplace.  
140 Workplaces are not considered a typical place of origin of infectious disease like COVID-19.  
141 However, workers who contracted a virus elsewhere can spread infectious disease to  
142 coworkers, resulting in a mass infection in a workplace. Clusters of cases among various  
143 types of occupations and workplaces have been observed since the emergence of COVID-19  
144 in December 2019 [2, 9, 10]. For example, medical staff and other workers in nursing homes  
145 could trigger mass COVID-19 infections as they commute, while hospitalized patients pose  
146 relatively lower risks of virus transmission since they are tested prior to admission. During an  
147 infectious disease outbreak, workplaces can play an important role in both spreading the  
148 disease [11, 12] and helping to halt the spread of disease through proper workplace practices  
149 and policies [4, 13]. All countries have a General Duty Clause in their regulations, stipulating  
150 that employers have an obligation to provide an environment free from recognized hazards  
151 that can cause or are likely to cause death or serious harm to their employees (Table 4).  
152 Specific virus response measures should be implemented in workplaces to both swiftly  
153 identify infected workers and to allow them to self-quarantine, resulting in containing and/or  
154 delaying the spread of COVID-19. Without proper enforcement, there is an increasing  
155 reliance on employers' voluntary adherence to guidelines, leaving workers' protections at  
156 risk. To ultimately contain and reduce the spread and transmission of COVID-19, proper

157 legal response measures from the occupational health field should be enforced to combat  
158 infection risk. Legal measures against infectious disease risk may differ not only by type of  
159 infectious risk, but also by type of industry and occupation in terms of the use of appropriate  
160 personal protective equipment (PPE), education, the practice of individual hygiene, and  
161 engineering control measures.

162         First of all, employers should provide proper PPE to workers. Respirators are  
163 confirmed to be the most effective tool to protect workers from the risk of respiratory tract  
164 infection. Any scarcity of PPE can lead to allowing extended wear and re-use of masks,  
165 raising concern about their effectiveness [14]. In particular, policies aimed at providing  
166 resources to obtain additional direct care staff and PPE for vulnerable hospitals and nursing  
167 homes, particularly in areas with rising community COVID-19 case rates, are needed to  
168 reduce the national COVID-19 infection risk. McGarry et al. (2020) reported that more than  
169 one in five staff members from 98% of nursing homes in the U.S. experienced a severe  
170 shortage of PPE [15]. The level of access to essential PPE during the COVID-19 pandemic  
171 varied substantially among countries. In a cross-sectional study conducted in May 2020 in  
172 Ethiopia, 31%, 27.4%, 15.9%, 14.5%, 14.2% of HCW (n=422) responded as having access to  
173 gloves, facemask, goggles, shoes, and aprons, respectively [16]. There was even an outbreak  
174 cluster caused by sharing some of PPE in one large logistics centers and warehouses in  
175 Republic of Korea where products and parcels are sorted, loaded, and delivered nationwide,  
176 allowing workers to share protective clothing, helmets, goggles, gloves, shoes and more,  
177 making it easier to spread COVID-19. The government may subsidize workplaces suffering  
178 from economic difficulties under COVID-19, especially small and medium-sized enterprises  
179 (SMEs), for supplying PPE to their employees.

180         Secondly, proper engineering control measures by type of work environment,

181 including ventilation, partitions, booths, and more should be stipulated in ISHA. Several  
182 types of engineering control measures should be applied to facilities or buildings with a high  
183 risk of infection. There have been several clusters occurring in occupations with an often  
184 crowded enclosed work environment and lacks ventilation, such as call centers,  
185 fitness/dance/sports centers, detention centers, prisons, and others—all of which can be  
186 regarded as facilities susceptible to infection clusters [9, 17-19]. Technical guidelines on  
187 operating building systems such as heating, ventilation, and air conditioning (HVAC)  
188 systems can provide practical guidance for preventing the spread and transmission of airborne  
189 infectious aerosols during epidemics. The guidelines usually cover supply systems, higher air  
190 change rates, increased filtration, and exhaust systems designed to minimize re-entrainment  
191 of contaminated air [20].

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

203 Fourthly, there should be legal and social protections for workers who contract  
204 COVID-19. All countries have implemented legal measures to protect workers who are either

205 infected or suspected of having symptoms such as required self-quarantine, paid sick leave,  
206 family sick leave, and more. (Table 4). Globally, paid sick leave is now more widely  
207 accessible than ever following the COVID-19 crisis—although statutory paid sick leave is  
208 either not in place or remains limited in some countries [24]. In many countries, sick leave  
209 and other benefits are not always available for workers in certain sectors and types, in spite of  
210 the presence of a related law [25]. This lack of access is often exacerbated in SMEs by  
211 various barriers to occupational health interventions [26, 27]. The absence of a statutory paid  
212 sick leave system contributes to greater health and economic risks in a public health crisis  
213 [28-30]. Heymanne et al. (2020) analysed a database of legislative guarantees of paid leave  
214 for personal illness in 193 UN member states, and reported that 27% of countries do not  
215 guarantee paid sick leave from the first day of illness and 58% of countries do not have  
216 explicit provisions to ensure self-employed and gig economy workers have access to paid  
217 sick leave benefits [30]. Reportedly, sick presenteeism contributes to a high attack rate during  
218 an infectious disease epidemic [31, 32] and puts colleagues, residents, and visitors alike at  
219 risk [33]. A cluster outbreak at a call centre in Republic of Korea was reported after  
220 asymptomatic employees continued to come to work [9]. As this case indicates, many  
221 workers may not have access to paid sick leave even if it is legally guaranteed; however, we  
222 were unable to find data that quantifies the gap between the law and practice.

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

228 This study has several limitations. Firstly, the specific scope, quality, and efficiency

229 of the implementation of legal articles or guidance related to the protection of workers from  
230 infectious diseases were not studied. Dichotomous classification (yes or no) on the presence  
231 of legal acts insufficiently reflects all details, necessitating a framework for further  
232 elaboration to evaluate the similarities and differences between the countries in terms of legal  
233 aspects and authorities. Our results obtained from only nine countries may not be  
234 generalizable to other Asia-Pacific countries with different legal measures in the workplace to  
235 protect employees from hazardous agents, including infectious diseases.

## 236 **5. Conclusions**

237 Unlike other hazardous agents originally generated from manufacturing, infectious  
238 disease risks were not regarded as an occupational factor, making it difficult to define the  
239 responsibility of the employer. No country was found to stipulate a specific article or clause  
240 in ISHA on measures to mitigate or prevent the spread of infectious disease risks in the  
241 workplace that are legally required of employers. The proposed legal measures include  
242 providing proper personal protective equipment, education, engineering control measures,  
243 and paid sick leave for responding properly to infection disease risks like COVID-19 should  
244 be considered in ISHA.

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## **Conflict of interest**

All authors have no conflicts of interest to declare.

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