Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Overview of Legal Measures for Managing Workplace COVID-19 Infection Risk in Several Asia-Pacific Countries

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

1 D Miller Consultancy, New Zealand
2 Ph.D. Program in Global Health and Health Security, Taipei Medical University, Taiwan
3 Department of Environmental Health, Korea National Open University, Republic of Korea
4 Faculty of Public Health, University of Indonesia, Indonesia
5 Indonesian Industrial Hygiene Association, Indonesia
6 Department of Hygiene, Kitasato University School of Medicine, Japan
7 Christian Medical College, Vellore, India
8 Department of Occupational Health and Safety, Faculty of Public Health, Mahidol University, Thailand
9 Occupational Safety and Health Center, Philippines
10 Industrial Hygiene (Custodian) Health & Safety, PETRONAS Group HSSE, Malaysia
11 Industrial Hygienists Association of the Philippines, Inc., Philippines
12 Department of Public Health, Fu-Jen Catholic University, Taiwan
13 National Institute of Chemical Safety, Ministry of Environment, Republic of Korea
14 School of Public Health, Taipei Medical University, Taiwan
15 Force Health Protection & Preventive Medicine, MEDIAC-Korea, Unit #15281, US Army, United States
16 Department of Environmental Health Sciences, Soonchunhyang University, Republic of Korea
17 Hashimoto Occupational Safety and Hygiene Consulting, Japan
18 Department of Environmental Health Sciences, Institute of Health and Environment, Graduate School of Public Health, Seoul National University, Republic of Korea
19 Division of Vector-borne Diseases, Department of Disease Control, Ministry of Public Health, Thailand

ARTICLE INFO
Article history:
Received 26 May 2021
Received in revised form
17 August 2021
Accepted 22 August 2021
Available online xxx

Keywords:
COVID-19
Infectious disease risk
Personal protective equipment
ANOH(Asian Network of Occupational Hygiene)

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 Korea, Republic of the Philippines, 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.

Please cite this article as: Derek M et al., Overview of Legal Measures for Managing Workplace COVID-19 Infection Risk in Several Asia-Pacific Countries, Safety and Health at Work, https://doi.org/10.1016/j.shaw.2021.08.003
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 the 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 format 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, and 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–related act or special act, although the name of the organization and legal act differ among countries. According to all
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 considered 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)
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 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

| 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 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                                                      | 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.

Table 2

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

Please cite this article as: Derek M et al., Overview of Legal Measures for Managing Workplace COVID-19 Infection Risk in Several Asia-Pacific Countries, Safety and Health at Work, https://doi.org/10.1016/j.shaw.2021.08.003
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]. 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

| 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                                                             | Yes                                                             | 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.

| 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                                                                                             | No                                                                                                                | Yes                                                                                                               | Yes                                                                               |
| Taiwan               | Yes                                                                                             | Yes                                                                                                               | No                                                                                                                | Yes                                                                               |
| Thailand             | Yes                                                                                             | No                                                                                                                | No                                                                                                                | Yes                                                                               |

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

References

[1] Baker MG, Peckham TK, Seixas NS. Estimating the burden of United States workers exposed to infection or disease: a key factor in containing risk of COVID-19 infection. PloS One 2020;15:e023452.
[2] McSweeney E. COVID-19 Outbreaks at Irish meat plants raise fears over worker safety [Internet]. London (United Kingdom): The Guardian. 2020 May 1 [cited 2020 June 2]. Available from: https://www.theguardian.com/environment/2020/may/01/covid-19-outbreaks-at-irish-meat-plants-raise-fears-over-worker-safety.
[3] Coleman J. Meatpacking worker told not to wear face mask on job died of coronavirus; report [Internet]. Washington DC (NW): The Hill. 2020 May 7 [cited 2020 June 2]. Available from: https://thehill.com/policy/finance/4966955-meatpacking-worker-told-not-to-wear-face-mask-on-job-died-of-coronavirus.
[4] Edwards CH, Tomba GS, de Blasio BE. Influenza in workplaces: transmission, workers’ adherence to sick leave advice and European sick leave recommendations. Eur J Public Health 2016;26:478–85.
[5] Webster R, Liu R, Karimullina K, Hall I, Amlôt R, Rubin G. A systematic review of infectious illness presenteeism: prevalence, reasons and risk factors. BMC Public Health 2019;19:1–13.
[6] The Hankyoreh. About 61% of new mass cluster infections occurred in workplaces [Internet]. Seoul: The Hankyoreh. 2021 March 1 [cited 2021 April 2]. Available from: http://www.hani.co.kr/arti/society/health/984971.html (in Korean).
[7] Barranco R, Ventura F. COVID-19 and infection in health-care workers: an emerging problem. Med Leg J 2020;88:65–9.
[8] Eo Y, Hwang S, Kwon R, Cho J, Cho J, Lee J, Yoon J, Yu H. Impact of on-site health intervention on virus spread in an office building. Int J Hyg Environ Health 2019;222:479–85.
[9] Kumar S, Quinn SC, Kim KH, Daniel LH, Freimuth VS. The impact of workplace coronavirus. Cytopathol 2020;128:513.
[10] Meyer JP, Franco-Paredes C, Parmar F, Yasin F, Cartland M. COVID-19 and the coming epidemic in US immigration detention centers. Lancet Infect Dis 2020;20:646–8.
[11] Nelson B, Kaminsky DA. A COVID-19 crisis in US jails and prisons. Cancer Cytopathol 2020;128:913.
[12] Centers for Disease Control and Prevention (CDC). COVID-19 ventilation in buildings [Internet]. Atlanta, GA (USA): CDC. 2021 Mar 23 [cited 2021 Apr 10]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html.
[13] Lupton D. Risk and emotion: towards an alternative theoretical perspective. Health Risk Soc 2013;15:634–47.
[14] Wong C-K, Tsang DN-C, Chan RC-W, Lam ET-K, Jong K-K. Infection risks faced by public health laboratory services teams when handling specimens associated with coronavirus disease 2019 (COVID-19). Saf Health Work 2020;11:372–7.
[15] Ng WT. COVID-19: protection of workers at the workplace in Singapore. Saf Health Work 2021;12:133–5.
[16] Organisation for Economic Cooperation and Development. OECD Policy Responses to Coronavirus (COVID-19) - paid sick leave to protect income, health and jobs through the COVID-19 crisis. Paris (France): OECD. 2020. p. 1–25. Available from: https://www.oecd.org/coronavirus/policy-responses/paid-sick-leave-to-protect-income-health-and-jobs-through-the-covid-19-crisis-a9e1a154/#:
[17] Hearn K, Gertsman S, Sampson M, Webster R, Tsampalieros A, Ng R, Gibson J, Lobos A-T, Acharya N, Agarwal A. Decontaminating N95 and SN95 masks with ultraviolet germicidal irradiation does not impair mask efficacy and safety. J Hosp Infect 2020;105:163–75.
[18] Jones H, Marchant A-C, Phillips N. Possible inactivation of SARS-CoV-2 on medical-grade inorganic surfaces, and the potential for airborne transmission. J Hosp Infect 2020;104:266–74.
[19] Murray AB, Icenogle JP, Reef SE. A large rubella outbreak with spread from the workplace to the community. JAMA 2000;284:2733–5.
[20] McSweeney E. COVID-19 Outbreaks at Irish meat plants raise fears over worker safety. Irish Times [Internet]. Dublin (Ireland): Irish Times. 2020 Mar 2 [cited 2021 Apr 2]. Available from: https://www.irishtimes.com/business/2020/03/02/covid-19-outbreaks-at-irish-meat-plants-raise-fears-over-worker-safety/.
[21] Nelson B, Kaminsky DA. A COVID-19 crisis in US jails and prisons. Cancer Cytopathol 2020;128:913.
[22] Kongtip P, Yoosook W, Chantanakul S. Occupational health and safety management in Thailand. Saf Sci 2008;46. 1356–1368.
[23] Edwards CH, Tomba GS, de Blasio BE. Influenza in workplaces: transmission, workers’ adherence to sick leave advice and European sick leave recommendations. BMC Public Health 2019;19:1–13.
[24] Eo Y, Hwang S, Kwon R, Cho J, Cho J, Lee J, Yoon J, Yu H. Impact of on-site health intervention on virus spread in an office building. Int J Hyg Environ Health 2019;222:479–85.
[25] Leung JW, Sohn M, Chung H. Designing the sickness benefit scheme in South Korea: using the implication from schemes of advanced nations. Health Policy Manag 2019;29:112–29.
[26] Kim E-A. Social distancing and public health guidelines at workplaces in Korea: responses to coronavirus disease-19. Saf Health Work 2020;11:275–83.
[27] Mulu GB, Kebede WM, Worku SA, Mittiku YM, Ayelign B. Preparedness and responses of healthcare providers to combat the spread of COVID-19 among North Shewa zone hospitals, Amhara, Ethiopia. 2020. p. 1–25. Available from: https://www.oecd.org/coronavirus/policy-responses/paid-sick-leave-to-protect-income-health-and-jobs-through-the-covid-19-crisis-a9e1a154/#:
[28] Kongtp P, Yooosook W, Chanantakul S. Occupational health and safety management in small and medium-sized enterprises: an overview of the situation in Thailand. Saf Sci 2009;46:1356–1368.
[29] Kumar S, Quinn SC, Kim KH, Daniel LH, Freimuth VS. The impact of workplace policies and other social factors on self-reported influenza-like illness incidence during the 2009 H1N1 pandemic. Am J Public Health 2013;103:1406–11.
[30] Hearn K, Gertsman S, Sampson M, Webster R, Tsampalieros A, Ng R, Gibson J, Lobos A-T, Acharya N, Agarwal A. Decontaminating N95 and SN95 masks with ultraviolet germicidal irradiation does not impair mask efficacy and safety. J Hosp Infect 2020;105:163–75.
[31] Nelson B, Kaminsky DA. A COVID-19 crisis in US jails and prisons. Cancer Cytopathol 2020;128:913.
[32] Centers for Disease Control and Prevention (CDC). COVID-19 ventilation in buildings [Internet]. Atlanta, GA (USA): CDC. 2021 Mar 23 [cited 2021 Apr 10]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html.

Please cite this article as: Derek M et al., Overview of Legal Measures for Managing Workplace COVID-19 Infection Risk in Several Asia-Pacific Countries, Safety and Health at Work, https://doi.org/10.1016/j.shaw.2021.08.003