

Occupation groups and Covid-19

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Sever acute respiratory syndrome coronavirus 2 (SARS-COV-2) cases of new type of contagious pneumonia were first in Wuhan, China, at the end of 2019. The COVID-19 outbreak was reported a pandemic state by World Health Organization (WHO) on 12 March 2020 [1]. COVID-19 continues to spread across the worldwide. According to WHO report as of 17th Apr 2020 COVID-19 causes about 2,000,000 confirm human cases and more than 135,000 confirmed deaths [2]. Although the COVID-19 mortality rate is not fully understand, it appears have higher mortality than other recent pandemic and seasonal influenza [3, 4]. Existing evidence show the human-to-human transmission of COVID-19 via droplets and contact [1]. Different group of people, including older people and those with some medical conditions are especially vulnerable to the COVID-19, but a main section of cases are linked to occupational exposure such as front-line workers including clinical, paramedics and other staff [4, 5]. Work-related transmission is a critical to infection diseases outbreaks. The specification of coronavirus and its transmission routes could causes high transmission rates among workers [6]. There are many conditions and risk factors in all workplaces which could affect safety and health of workers. Biological agents, as hazardous factors, are known to cause health problems especially in health care workers. Occupational exposure to biological agents may be associated with several health problems, including infectious diseases, cancer and allergies. Health care workers at risk because of probable exposure to biological

agents including numerous bacteria, viruses, fungi and parasites. The source of exposure to many biological factors can be identified and therefore its harmful effects on workers' health can be prevented. Risk management of occupational infectious diseases is of great importance in occupational health and medicine. Occupational exposure among health care workers, specifically among nurses, can be attributed to direct or indirect factors, such as direct care to patients, administering medication and dressing wounds, and applying special instruments for patients [7]. As was mentioned earlier, a considerable percent of cases infected with coronavirus is related to occupational exposures. COVID-19 is the first new occupational disease to be outlined in this decade by International Labour Organization (ILO) [8]. It is believed that the first occupational groups at risk were persons working in seafood and wet animal markets in Wuhan. These wet-markets acts as a hotspot to the emerging of new zoonotic pathogens and transmission to humans therefore the first occupational groups at risk exposure were persons working in the wet-market and wild animals' salesman and women in Wuhan, Chain [9]. However, with initial outbreak at least 41 workers patient were reported in this wet-market. The local health authority declared an epidemic alert on 29 December 2019 and the wet-market was closed on 1 January, 2020. Overall 59 suspected human cases with fever and dry cough symptoms were referred to hospital. Of the 59 suspected human cases, 41 cases were confirmed. Approximately 66% (27/44) of cases had history of exposure to this wet-market [10]. Health care workers

(HCWs) are the next high-risk group to acquire this infection. In addition to the pathogen exposure other hazard are include long work hours, psychological distress, fatigue, occupational burnout, stigma, and physical and psychological violence [11]. Among 315,531 U.S COVID-19 cases reported to Centers for Disease Control and Prevention (CDC) during February 12 -April 9, 9282 (19%) cases were identified as HCWs [12]. The COVID-19 cases reported among HCWs in China and Italy up to 10% and 9%, respectively [13]. Understanding how HCWs exposure to coronavirus and level of exposure is crucial for informing infection prevention and control recommendation. Centers for Disease Control and Prevention emphasizes that, the risk to people is depended on level of exposure to coronavirus. According to Occupational Safety and Health Administration (OSHA), high risk workers include those involved in healthcare, laboratories, airline operations, border protection, solid waste and wastewater management, and travel to areas where the virus is spreading [14]. However, there is limited discussion on drivers, tour guides, cleaners and janitors, and civil servants, who have many contacts with other peoples in daily pathways or have occupational settings with higher risks of COVID-19. In a study, identified several high-risk occupations for Covid-19 infection in six countries including Hong Kong, Japan, Singapore, Taiwan, Thailand, and Vietnam. The result show that five occupation groups with the most cases were healthcare workers (HCWs) (22%), drivers and transport workers(18%), services and sales workers (18%), cleaning and domestic workers (9%) and public safety workers (7%). So, implementing preventive/ surveillance strategies for high-risk working populations is warranted [6]. Protection of workers against animals, plants or several aspects of the environment with exposure to biological hazards must be used in the workplace. Measures should be taken to prevent risks of exposure to biological agents and hazards or, where this is not reasonably practicable, to reduce the risk of exposure to an acceptable level. Control measures are systems and actions used to reduce the risks of exposure to biological agents and

hazards. These include engineering controls such as containment laboratories and use of microbiological safety cabinets; management controls such as safe operating procedures, training, supervision; and the use of personal protective equipment such as laboratory coats, gloves, and spectacles. The minimum and recommended control measures required for work at each containment level are specified in relevant international guidance. Biological containment laboratories, animal facilities, and plant facilities must therefore be classified into one of the three containment levels (CL 1e3). Basically, containment level 1 is for low-risk work, containment level 2 for medium risk work, and containment level 3 for high-risk work. Control measures that are used to prevent or control exposure to biological agents and hazards should be properly maintained, examined, and tested to ensure that they are working efficiently. The control measures that are subjected to detailed examination and testing include engineering controls; local exhaust ventilation, which includes microbiological safety cabinets and extract ventilation for equipment; and respiratory protective equipment. Proper storage, transport, and destruction or inactivation of biological hazards; disinfection; autoclaving; waste management and disposal; health surveillance; monitoring exposure and immunization; emergency procedures including emergency contacts; information; as well as instruction, training, and supervision are also required [15]. According to ILO, persons affected by COVID-19 in their workplace should have access, for as long as required to appropriate and adequate health care and services of preventive including general practitioner care, specialist care (at hospitals and outside), pharmaceutical supplier, hospitalization where necessary, and medical rehabilitation. Workers patient or suspected to COVID-19 should be entitled to paid sick leave or sickness benefits as long as they are incapacitated to work, to compensate for the suspension of earnings they suffer as a consequence. Employers are responsible for protective measures, providing adequate information and appropriate training, protective equipment for minimize occupational risks [8].

☰ REFERENCES

1. Wang X, Pan Z, Cheng Z. Association between 2019-nCoV transmission and N95 respirator use. medRxiv. 2020. <https://doi.org/10.1101/2020.02.18.2002188>.
2. World Health Organization (WHO). Coronavirus disease (COVID-19) outbreak situation [Accessed 25 Mar 2020; cited 10 Apr 2020]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>.
3. Adams JG, Walls RM. Supporting the health care workforce during the COVID-19 global epidemic. JAMA. 2020. <https://doi.org/10.1001/jama.2020.3972>.
4. World Health Organization. Coronavirus (COVID-19) Events as They Happen. [Accessed 22 Mar 2020; cited 17 Apr 2020]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>.
5. Public Health England. COVID-19: Investigation and Initial Clinical Management of POSSIBLE CASES - GOV. UK. Public Health England, [Accessed 22 Mar 2020; cited 17 Apr 2020]. Available from: <https://www.gov.uk/government/publications/wuhan-novel-coronavirus-initial-investigation-of-possible-cases/investigation-and-initial-clinicalmanagement-of-possible-cases-of-wuhan-novel-coronaviruswn-cov-infection>.
6. Lan FY, Wei CF, Hsu YT, Christiani DC, Kales SN. Work-related Covid-19 transmission. medRxiv. 2020 <https://doi.org/10.1101/2020.04.08.20058297>.
7. Jahani A. Modeling of forest canopy density confusion in environmental assessment using artificial neural network. Iranian Journal of Forest and Poplar Research. 2016;24(2).
8. European Agency for Safety and Health at Work (EU-OSHA), Work-related diseases from biological agents, [Accessed 28 Apr 2020; cited 10 Mar 2020]. Available from: <https://osha.europa.eu/en/themes/work-related-diseases/biological-agents>.
9. ILO Standards and COVID-19 (coronavirus), [Accessed 27 Mar 2020; cited 17 Apr 2020]. Available from: https://www.ilo.org/global/standards/WCMS_739937/lang--en/index.htm.
10. Koh D. Occupational risks for COVID-19 infection. Occupational Medicine (Oxford, England). 2020; 70(1):3, <https://doi.org/10.1093/occmed/kqaa036>.
11. Wu YC, Chen CS, Chan YJ. The outbreak of COVID-19: An overview. Journal of the Chinese Medical Association. 2020 Mar 1;83(3):217-20. <https://doi.org/10.1097/JCMA.000000000000270>.
12. Coronavirus disease (COVID-19) outbreak: rights, roles and responsibilities of health workers, including key considerations for occupational safety and health, [Accessed 2 Mar 2020; cited 17 Apr 2020]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/health-workers>
13. Characteristics of Health Care Personnel with COVID-19 — United States, February 12–April 9, 2020, [Accessed 17 Apr 2020; cited 17 Apr 2020]. Available from: https://www.cdc.gov/mmwr/volumes/69/wr/mm6915e6.htm?s_cid=mm6915e6_x
14. Istituto Superiore di Sanita' (ISS). Sorveglianza Integrata COVID-19 in Italia 2020 [updated 26 March 2020; cited 26 March 2020]. Available from: https://www.epicentro.iss.it/coronavirus/bollettino/Infografica_26marzo%20ITA.pdf
15. COVID-19 in the Construction Workplace, [Accessed 17 Mar 2020; cited 17 Apr 2020]. Available from: <https://www.osha.gov/SLTC/covid-19/index.html>.
16. Rahmati O, Panahi M, Ghiasi SS, Deo RC, Tiefenbacher JP, Pradhan B, Jahani A, Goshtasb H, Kornejady A, Shahabi H, Shirzadi A. Hybridized neural fuzzy ensembles for dust source modeling and prediction. Atmospheric Environment. 2020 Mar 1;224:117320.
17. Occupational safety and health council, Biological Hazards– Prevention and Personal Protection, a Practical Guide Specifically for Frontline Workers. (2003), Hong Kong, http://www.oshc.org.hk/oshc_data/files/HotTopic/CB959E.pdf