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Introduction: The role of air pollution on SARS-CoV-2 infection is still unclear. We aimed to verify this association in a cohort of healthcare workers (HCWs), a group identified as at high risk since the beginning of the pandemic.

Material and Methods: We included HCWs who performed a nasopharyngeal swab (NS) for detection of SARS-CoV-2 at the Policlinico Hospital (Milan, Italy) in February–December 2020. Daily average concentrations of particulate matter <2.5 μm (PM2.5) and nitrogen dioxide (NO2) were assigned to each worker’s residential address and treated as time-dependent variables. We generated person-days at risk and applied multivariable Poisson regression models adjusted for age, sex, BMI, smoke, job title and province to evaluate incidence rate ratios (IRR) and 95% confidence interval (CI) of positive NS. The association between air pollution and anti-nucleocapside antibodies was assessed among swab-positive workers through multivariable linear regression models. The study was approved by the hospital Ethics Committee (828_2021bis).

Results: 635 (17%) positive swabs were recorded among 3,712 included HCWs. A 10 μg/m3 increase in PM2.5 and NO2 average concentrations in the five days preceding NS was associated with a higher risk of testing positive [IRR: 1.11 (CI: 1.02; 1.21) and 1.10 (1.03; 1.18), respectively]. Among swab-positive HCWs, we observed a 49% decrease in antibody titer (CI: -60; -36) associated with a 10 μg/m3 increase in PM2.5 mean levels in the month preceding NS.

Conclusions: Our study suggests a potential role of air pollution exposure in influencing the immune response to SARS-CoV-2 infection.

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COVID-19 outbreak investigation in a hospital using computational flow analysis

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Introduction: Over the last two years, the COVID-19 has caused unprecedented disruption worldwide. Healthcare workers (HCW), particular those working in hospitals have been the most affected from increased risk of contracting COVID-19 from hospital environment and patient care. Although various efforts have been taken by the hospital to reduce the risk, however, outbreaks still continue to occur. This case study reports on an outbreak investigation using computational flow analysis to investigate an outbreak in a non-COVID-19 ward.

Material and Methods: This is a case report of an outbreak that occurs in a non-COVID-19 ward in a teaching hospital in Malaysia. The outbreak investigation was conducted, which includes contact tracing, risk assessment, walk-through survey, airflow measurements and computational flow analysis (CFA).

Results: The outbreak occurred in one of the five bedded cubicles in a non-COVID-19 ward. The index case was a patient that was admitted for non-COVID-19 related medical conditions. The index case subsequently transmitted the disease to three patients and one HCW. On initial assessment, the HCW was not considered to have acquired COVID-19 from the index case, as the HCW have no unprotected contact with the index case. However, after the walk-through survey assessment, it was noted that airflow may be a contributing factor. An airflow measurement and CFA was conducted and reviewed the possibility route of transmission.

Conclusion: The use of airflow assessment and CFA should be considered in a respiratory diseases outbreak investigation.

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Corporate response to the COVID-19 pandemic and the usefulness of the study group for multidisciplinary occupational health staffs

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Objective: The spread of the COVID-19 has had a significant impact on OH activities. We report on the corporate response to the pandemic and the usefulness of study groups based on surveys and discussions at the Sanpo-society (the study group for multidisciplinary OH staffs).

Methods: (1) During the first wave (April–May 2020), we conducted a survey on the pandemic response at the Sanpo-society. (2) In the second wave (September), we summarized the discussions at the summer seminar “Impact of the pandemic on corporate OH activities and health promotion.”

Results: (1) We received responses to the survey from 122 companies, and in most of them, OH activities had been affected by the pandemic. Major issues mentioned were refraining from meetings, installing disinfectants, promoting telework, shortening work hours, and health monitoring. The most common issues were shortage of masks and disinfectants, impact on business performance, anxiety about infection, and the physical and mental stress of telework. (2) Discussions at the summer seminar revealed the enormous impact of the pandemic on corporate activities and the limitations of OH activities. However, this resulted in the expansion of OH activities and health education online and a major shift toward telecommuting for OH and safety management.

Discussion: The enormous impact of the pandemic on OH activities was evident from both the survey responses and the seminar discussions. Despite the lack of evidence and experience, the number of participants in Sanpo-society doubled, helping to resolve problems and share multidisciplinary information among companies.

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Healthcare workers SARS CoV 2 infection assessment in Terni Hospital, Umbria, central Italy

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Introduction: The risk of SARS CoV 2 infection in healthcare workers (HCWs) has been demonstrated to be very high; we
performed this survey to better understand work-related risk factors and the role of preventive measures. Material and methods: Between March 2020 and March 2021, 453 HCWs filled in a health surveillance form after a close contact with a positive SARS-CoV-2 case. Information on occupational task, SARS-CoV-2 infection source and contact mode, use of personal protective equipment (PPE), disease symptoms and diagnostic tests have been collected and analysed using SPSS software. Results: Of the 453 HCWs who filled in a health surveillance form 134 (67% female, mean age 44 years), had a SARS-CoV-2 positive molecular swab test and 105 were compensated by work insurance. Results showed that working in high risk infection area (OR 1.97 (95% CI 1.27–3.05)), being physician, nurse, nurse assistant or hospital cleaner (OR 1.86 (95% CI 1.27–3.05)), not wearing PPE (OR 3.09 (95% CI 2.03–4.70)), having a close contact exposition (OR 2.93 (95% CI 1.54–5.58)), not knowing infection source (OR 5.27 (95% CI 3.40–8.17)) were risk factors for getting SARS-CoV-2 infection. The multivariate logistic regression showed an increased risk for having a close contact exposition (OR 6.61 (95% CI 3.17–13.81)) and unknown SARS CoV-2 infection source (OR 6.62 (95% CI 3.38–12.94)). Conclusions: Prevalence of SARS-CoV-2 HCWs infection is relevant, active surveillance allowed to early detect the infection and know possible risk factors that can be managed to improve preventive measures with the aim of avoiding work-related SARS-CoV-2 infection.

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Implementation of Risk-Based COVID-19 Safeguards in Upstream Oil & Gas Company

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Upstream oil and gas company operated in Indonesia produce about 160,000-barrel oil per day with nearly 25,000 workers and wide operation areas. The company is committed to protect its people from COVID-19 in the workplace and at the same time maintaining the same level of operation. Company established a risk-based safeguard protocol to achieve it. The protocols were developed using the references from WHO, CDC, IPIECA/OGP and Ministry of Health. They were adjusted with the worker’s health risk and criticality of the facilities. Risk of personnel and impact to operation were evaluated to create risk-based program. Safeguard covers layers of protection and the use of technology. Level of risk for people, asset, and location will determine the layer. General approaches were established to cover all operation areas such as but not limited: screening program, emergency response & case management, WHI & travel limitation, education & vaccination program. Additional layers are added where the risk of exposure and impact to worker and production increasing. For critical facilities, full compartmentalization program with strict quarantine, testing and work segregation are mandatory. Company able to maintain lower number of cases among worker comparing to competitor and general population. Company operates safely with limited workforce cluster although few of them have impacted minorly to oil production lost and down time operation during the peak of the pandemic. Managing COVID-19 in oil & gas industry is quite challenging. Risk-based approach program are proven to be effective.

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Body Mass Index (BMI) and serum levels of SARS-CoV-2 specific antibodies in a group of Healthcare Workers after COVID-19 vaccination

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Introduction: Obesity is considered one of the possible risk factors for hospitalization and intensive care in Covid-19 patients. It is believed that obesity may compromise some steps of the immune response and may affect the development of post-vaccine immunological memory. The aim of our study was to assess the post-vaccination IgG response against the spike protein (S-RBD IgG) in relation to age, gender and body mass index (BMI).

Material and Methods: The study involved 766 Healthcare Workers who received two doses of BioNTech/Pfizer vaccination (December 2020–March 2021) and were tested for S-RBD IgG (CMIA) 20–40 days after the second vaccine dose. These subjects were always negative to SARS CoV-2 nasopharyngeal periodical swabs and were negative to Ab anti SARS-CoV-2 S1/S2 IgG (CLIA) measured before the first dose of vaccine.

Results: The 766 workers (70.8% female and 29.2% male) were all positive for the antibody levels determined after the second dose of vaccine (S-RBD IgG range: 190.8–63093 AU/mL). Multivariable data analysis showed that the increase in the S-RBD IgG was more pronounced in younger subjects (p < 0.001) and in women (p < 0.05). Data analysis also showed an increase in the levels of S-RBD IgG in subjects with greater BMI (p < 0.05). Conclusion: At a first check (20–40 days after the vaccination), the SARS-CoV-2 antibody levels in the studied sample were influenced by age and gender, as expected. Contrary to data reported by others, subjects with greater BMI showed an increased antibody response, but this finding, as well as the temporal trend of antibody levels, need to be further investigated.

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The role of the occupational physician in the management of the pandemic in an Italian company

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Introduction: The pandemic from SARS Cov-2 resulted in a re-engineering of work processes to ensure the health and safety of workers. The occupational physician has assumed a fundamental role for the activities of prevention of the spread of the infection. In Italy, prevention measures to ensure control of the spread of the virus in the workplace and to counteract the Covid-19 epidemic