

COVID-19 negative patients. Increasing the in-hospital stockpile of PPE as well as the regional and national stockpile and creating local production capacities. The importance of the daily multidisciplinary managerial meeting was to improve situational awareness and allow improved decision making. Staff briefing occurred on a daily basis and during times of high uncertainty at the beginning of every shift.

Conclusion: Performing structured and frequent debriefing and analysis to achieve clinical and operational insights is crucial for improved short-term performance as well as improving preparedness for future challenges.

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COVID, Co-Ventilation, and Cross-contamination

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Introduction: During the COVID-19 pandemic, consideration was given to co-ventilating multiple patients on a single ventilator. Prior work had shown that this procedure was possible by ventilating four adult-size sheep for twenty-four hours, and other groups had performed this maneuver during dire circumstances. However, no investigation had examined the safety regarding cross-contamination. The purpose of our studies was to investigate if an infection could spread between individuals who were being co-ventilated.

Method: Four sterile two-liter anesthesia bags were connected to a sterilized ventilator circuit to simulate the co-ventilated patients' "lungs." The circuit utilized Heat and Moisture Exchange filters and bacterial/viral filters, which were strategically inserted to prevent the transmission of infectious droplets. *Serratia marcescens* was inoculated into "lung" number one. The circuit was then run for 24 hours, after which each "lung" and three additional points in the circuit were cultured to see if *S. marcescens* had spread. These cultures were examined at 24 and 48 hours to assess for cross-contamination. This entire procedure was performed a total of four times.

Results: *S. marcescens* was not identified in lungs two, three, or four or the three additional sampling sites on the expiratory limb of the tubing at 24 and 48 hours in all four trials.

Conclusion: Cross-contamination between co-ventilated patients did not occur within 24 hours utilizing the described ventilator circuit configuration.

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The Vaccinodrome: How to Set up the Largest Mass Vaccination Center in Europe.

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Introduction: Covid-19 pandemic had a massive impact on the capabilities of the healthcare system. The development of the vaccines and the setup of the vaccination program of the general population required an important coordination and organizational work, from an already worn-out system.

The implementation of mass vaccination centers is known as the most efficient way of vaccinating rapidly and efficiently a large part of the population, but requires a non-negligible amount of resources. For Covid-19 vaccination, time sustainability was an important challenge to consider due to the time-span needed between boosters; unfortunately, most of the models presented up to 2020 are short duration systems.

A mass vaccination center (MVC) organizational model was proposed and staffed with only two health care workers on a daily basis, with a more than 10,000 shots a day capacity over a seven-month duration.

Method: The MVC was under the supervision of one medical coordinator, one nurse coordinator and one operational coordinator. Students (both in health and non-health studies) were the most important part of the human resources. Data concerning the population vaccinated, the number and the type of vaccines used were routinely recorded.

Results: From March 28 to October 20, 2021, 501,714 vaccines were administered at the MVC. A mean rate of 2951 ± 1804 doses was injected per day with a staff of 180 ± 95 persons working every day. The peak was reached with 10,095 injections in one day. The average time spent by a patient in the MVC was 43.2 ± 15 minutes. The average time to be vaccinated was 26 ± 13 minutes.

Conclusion: Provided with adequate supervision, an optimized organization and adequate training, the use of a student workforce allows for the implementation of a functional, efficient, and sustainable mass vaccination center.

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The Application of Information Technology in Preventing and Controlling COVID-19 Pandemic: A Bibliometric Study

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Introduction: Information Technology has been applied to respond to the coronavirus disease 2019 (COVID-19), which has attracted increasing attention. However, there is still no comprehensive bibliometrics study in the global publications on the application of Information Technology in COVID-19. This study aimed to investigate the current research status of Information Technology in preventing and controlling the COVID-19 pandemic.

Method: Relevant literature published between 2020 and 2022 was downloaded from Web of Science Core Collection (WoSCC) databases. Key search terms included COVID-19, big data, artificial intelligence, internet of things, cloud computing, etc. The data elements were as follows: year, countries/

territories, institutions, authors, journals, research areas and citations of publications. Statistical methods and knowledge domain maps were applied to conduct contribution and collaboration, co-occurrence and co-citation analysis using VOSviewer. COOC software was used to construct the two-mode matrix, conduct hierarchical cluster analysis of high-frequency keywords and journals, and identify keywords of bursts.

Results: A total of 10,962 articles were retrieved. The most frequent country and institution were USA (2,423, 22.10%) and the University of California System (212, 1.934%), respectively. The research areas were included but not limited to computer science (2,198, 20.051%), engineering (1,421, 12.963%) and public environmental occupational health (1,032, 9.414%). Three research hotspots were identified: (i) Internet-based social and psychological surveys; (ii) Distance education, telecommuting and telemedicine; (iii) Artificial intelligence-assisted diagnosis of COVID-19 patients. The clustering results of a two-mode matrix showed that research had the most frequent interaction with health, social media and information technology. According to co-citation analysis, a total of four clusters of journals had been obtained (clinical medicine, medicine, computer science and engineering, and public health). The keywords of burst were computer-based learning, general public, student-centered learning, etc.

Conclusion: Information technology has played an important role in the response to COVID-19, which belongs to the interdisciplinary field.

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Impact of Early Phase DMAT Support Using Natural Disaster Support Techniques for Hospitals Experiencing COVID-19 Outbreak in Japan.

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Introduction: Hospitals experiencing a COVID-19 outbreak are in a similar situation to those affected by natural disasters, with a breakdown in command and coordination, shortage of personnel and supplies, and increased stress among staff. In Japan, when a COVID-19 outbreak occurs, the first step is for the hospital or health center to respond. However, if the local authorities are unable to respond, the Ministry of Health, Labour and Welfare dispatch Disaster Medicine Assistance Team (DMAT) by request of the local government to facilitate early recovery. This study will examine the effectiveness of early phase support by DMAT.

Method: Patients and healthcare workers in 31 hospitals supported by DMAT after an outbreak occurred between April 2020 and January 2021 were included in the study. Attack rate and case fatality rate for patients and the attack rate for healthcare workers were analyzed for each of the two groups: those

that started support less than ten days after the first positive case and those that started support more than ten days after the first positive case.

Results: For hospitals that started support in less than ten days, the attack rate was 27.9%, the case fatality rate was 17.4% for patients, and the attack rate for healthcare workers was 9.7%. For hospitals that took more than ten days to start support, the attack rate was 44.8%, the case fatality rate was 23.1% for patients, and the attack rate for healthcare workers was 14.3%. The attack rate ($p < 0.001$) and case fatality rate ($p = 0.011$) for patients and attack rate for healthcare workers ($p < 0.001$) were significantly lower in hospitals that started support in less than ten days.

Conclusion: Early intervention of DMAT support using natural disaster support techniques for hospitals experiencing an outbreak reduced the attack rate and case fatality rate for patients and healthcare workers.

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An Organizational Perspective of a COVID-19 Outbreak at a Tertiary Hospital

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Introduction: The COVID-19 pandemic challenged health-care systems globally disrupting access to high quality essential health services. The pandemic may be viewed as a disaster impacting on patients and staff alike. There is a paucity of research describing how large health services have maintained, scaled and innovated care during the pandemic. The study was conducted to provide insights to inform hospital disaster management responses, specifically to identify organizational learnings from the COVID-19 response, capture instances of innovation, understand the impact of COVID-19 on models of care and to identify organizational priorities to prepare for a potential future disaster or terror event.

Method: Survey research was conducted using a qualitative research strategy. The study was conducted at a 550-bed university-affiliated tertiary hospital located in the southeast corner of Australia in the State of Victoria. The survey was purpose designed, included open-ended questions requiring text responses, and was completed in an online survey form. A thematic analysis of the data was completed.

Results: A total of 258 staff completed the survey, with staff representing doctors, nurses, allied health, and support personnel. There were four overarching domains of learning identified; People and Care, Staff Support, Implementation of Care, and Organizational Factors. These domains were supported by 14 topic areas which highlighted specific areas of learning and