



RESEARCH IN A SNAP

OVERVIEW

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RESEARCH DESIGN
CONNECTIONS

Knowledge Repository News

Among the 70 new entries in the Knowledge Repository, 18 focus on the built environment and COVID-19. Research in this area is becoming available at an accelerated rate to support efforts to combat the disease. By clicking on the “doi” links below, you will find many of the COVID-19 papers are open-access (free). Note: because journals are prioritizing quick access to information, many of these papers have not yet gone through the rigors of the peer-review process.

(Papers published ahead of print “in press” will be updated as volume and page information becomes available.)

May – June 2020

COVID-19

1. Bloise, I., Gómez-Arroyo, B., & García-Rodríguez, J. (2020). Detection of SARS-CoV-2 on high-touch surfaces in a clinical microbiology laboratory. *Journal of Hospital Infection*, in press. <https://doi.org/10.1016/j.jhin.2020.05.017>
2. Chia, P. Y., Coleman, K. K., Tan, Y. K., Ong, S. W. X., Gum, M., Lau, S. K., Lim, X. F., Lim, A. S., Sutjipto, S., Lee, P. H., Son, T. T., Young, B. E., Milton, D. K., Gray, G. C., Schuster, S., Barkham, T., De, P. P., Vasoo, S., Chan, M., ... Marimuthu, K. (2020). Detection of air and surface contamination by SARS-CoV-2 in hospital rooms of infected patients. *Nature Communications*, *11*(1), 1–7. <https://doi.org/10.1038/s41467-020-16670-2>
3. Colaneri, M., Seminari, E., Novati, S., Asperges, E., Biscarini, S., Piralla, A., Percivalle, E., Cassaniti, I., Baldanti, F., Bruno, R., Mondelli, M. U., Brunetti, E., Di Matteo, A., Seminari, E., Maiocchi, L., Zuccaro, V., Novanti, S., Maserati, R., Orsolini, P., & Vecchia, M. (2020). SARS-CoV-2 RNA contamination of inanimate surfaces and virus viability in a health care emergency unit. *Clinical Microbiology and Infection*, in press. <https://doi.org/10.1016/j.cmi.2020.05.009>
4. Correia, G., Rodrigues, L., Gameiro da Silva, M., & Gonçalves, T. (2020). Airborne route and bad use of ventilation systems as non-negligible factors in SARS-CoV-2 transmission. *Medical Hypotheses*, *141*, in press. <https://doi.org/10.1016/j.mehy.2020.109781>
5. El Baz, S., & Imzilin, B. (2020). Can aerosols and wastewater be considered as potential transmissional sources of COVID-19 to humans? *European Journal of Environment and Public Health*, *4*(2). <https://doi.org/10.29333/ejeph/8324>
6. Hasan, J., Xu, Y., Yarlagadda, T., Schuetz, M., Spann, K., & Yarlagadda, P. K. D. V. (2020). Antiviral and antibacterial nanostructured surfaces with excellent mechanical properties for hospital applications. *ACS Biomaterials Science & Engineering*, in press. <https://doi.org/10.1021/acsbiomaterials.0c00348>



7. Jiang, F.-C., Jiang, X.-L., Wang, Z.-G., Meng, Z.-H., Shao, S.-F., Anderson, B. D., & Ma, M.-J. (2020). Detection of Severe Acute Respiratory Syndrome Coronavirus 2 RNA on surfaces in quarantine rooms. *Emerging Infectious Diseases*, 26(9), in press. <https://doi.org/10.3201/eid2609.201435>
8. Lee, S.-E., Lee, D.-Y., Lee, W.-G., Kang, B. H., Jang, Y. S., Ryu, B., Lee, S. J., Bahk, H., & Lee, E. (2020). Detection of Novel Coronavirus on the surface of environmental materials contaminated by COVID-19 patients in the Republic of Korea. *Osong Public Health and Research Perspectives*, in press.
9. Naranje, K. M., Gupta, G., Singh, A., Bajpai, S., Verma, A., Jaiswal, R., Pandey, A., Roy, A., Kaur, H., Gupta, A., Gautam, A., Dwivedi, M., & Birthare, A. (2020). Neonatal COVID-19 infection management. *Journal of Neonatology*. <https://doi.org/10.1177/0973217920928638>
10. Nardell, E. A., & Nathavitharana, R. R. (2020). Airborne spread of SARS-CoV-2 and a potential role for air disinfection. *JAMA*, in press. <https://doi.org/10.1001/jama.2020.7603>
11. Paganini, M., Conti, A., Weinstein, E., Della Corte, F., & Ragazzoni, L. (2020). Translating COVID-19 pandemic surge theory to practice in the Emergency Department: How to expand structure. *Disaster Medicine and Public Health Preparedness*, in press. <https://doi.org/10.1017/dmp.2020.57>
12. Rawlinson, S. (2020). COVID-19 Pandemic – Let’s not forget surfaces. *Journal of Hospital Infection*, in press. <https://doi.org/10.1016/j.jhin.2020.05.022>
13. Rocca-Ihenacho, L., & Alonso, C. (2020). Where do women birth during a pandemic? Changing perspectives on safe motherhood during the COVID-19 pandemic. *Journal of Global Health Science*, 2. <https://doi.org/10.35500/jghs.2020.2.e4>
14. Saran, S., Gurjar, M., Baronia, A., Sivapurapu, V., Ghosh, P. S., Raju, G. M., & Maurya, I. (2020). Heating, ventilation and air conditioning (HVAC) in intensive care unit. *Critical Care*, 24(194), 1–11. <https://doi.org/10.1186/s13054-020-02907-5>
15. Vilendrer, S., Patel, B., Chadwick, W., Hwa, M., Asch, S., Pageler, N., Ramdeo, R., Saliba-Gustafsson, E. A., Strong, P., & Sharp, C. (2020). Rapid deployment of inpatient telemedicine in response to COVID-19 across three health systems. *Journal of the American Medical Informatics Association*, in press. <https://doi.org/10.1093/jamia/ocaa077>
16. Wei, T., Yu, M. a. O., Yan, L. Q., Die, M., Ling, C., Hong, W., Ren, Z. H. U., & Xian, Z. W. (2020). Prevalence of opportunistic pathogens and diversity of microbial communities in the water system of a pulmonary hospital. *Biomedical and Environmental Sciences*, 33(4), 248–259. <https://doi.org/10.3967/bes2020.034>
17. Wu, S., Wang, Y., Jin, X., Tian, J., Liu, J., & Mao, Y. (2020). Environmental contamination by SARS-CoV-2 in a designated hospital for coronavirus disease 2019. *American Journal of Infection Control*, in press. <https://doi.org/10.1016/j.ajic.2020.05.003>
18. Zhang, D. X. (2020). SARS-CoV-2: Air/aerosols and surfaces in laboratory and clinical settings. *Journal of Hospital Infection*, in press. <https://doi.org/10.1016/j.jhin.2020.05.001>



Experience

Perceived Quality of Care (Noise, Communication, Waiting, etc.)

19. Hulland, T., Su, A., & Kingan, M. (2020). Noise in an inpatient hospital ward in New Zealand. *Building Acoustics*, in press. <https://doi.org/10.1177/1351010X20916120>
20. Jafarifiroozabadi, R., Joseph, A., Joshi, R., & Wingler, D. (2020). Evaluating care partner preferences for seating in an outpatient surgery waiting area using virtual reality. *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720922194>
21. Mendes, C. A., Silva, C. R. L., Souza, L. V., Cabral, J. A., Dutra, L. B., Raphael, B. N., Garcia, A., Bridi, A. C., Salu, M. S., & Barroso. (2020). Evaluation of sound pressure levels in a pediatric intensive care unit. *Open Science Journal*, *5*(2), 1–17. <https://doi.org/10.23954/osj.v5i2.2415>
22. Presutti, R. J., Willis, F. B., Scott, R., Greig, H. E., & Abu Dabrh, A. M. (2019). “No Waiting” in the “Waiting Room”: The self-rooming patient pilot study. *Cureus*, *11*(11). <https://doi.org/10.7759/cureus.6238>

Supportive Design (Social Support, Distractions, Nature, etc.)

23. Albala, L., Bober, T., Hale, G., Warfield, B., Collins, M. L., Merritt, Z., Steimetz, E., Nadler, S., Lev, Y., & Hanifin, J. (2019). Effect on nurse and patient experience: Overnight use of blue-depleted illumination. *BMJ Open Quality*, *8*(3), e000692. <https://doi.org/10.1136/bmjoc-2019-000692>
24. Bae, S., & Asojo, A. O. (2020). Ambient scent as a positive distraction in long-term care units: Theory of supportive design. *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720929021>
25. Dawson, D., & Johansson, L. (2020). The intensive care unit environment: Impact and prevention. In C. Boulanger & D. McWilliams (Eds.), *Passport to Successful ICU Discharge* (pp. 117–133). Springer International Publishing. https://doi.org/10.1007/978-3-030-38916-1_9
26. Fay, L., Santiago, J. E., Real, K., & Isaacs, K. (2020). Designing for efficiency: Examining the impact of centralized and decentralized nurse stations on interdisciplinary care processes. *JONA: The Journal of Nursing Administration*, *50*(6), 335–342. <https://doi.org/10.1097/NNA.0000000000000894>
27. Gharaveis, A., Pati, D., Hamilton, D. K., Shepley, M., Rodiek, S., & Najarian, M. (2020). The correlation between visibility and medical staff collaborative communication in Emergency Departments. *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720921182>
28. Goto, S., Morota, Y., Liu, C., Sun, M., Shi, B. E., & Herrup, K. (2020). The mechanism of relaxation by viewing a Japanese garden: A pilot study. *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720924729>



29. Gumasing, M. J. J., Arreza, C. J. R., Guzman, C. J. P., & Da Costa, A. M. (2020). An ergonomic approach on physical assessment of public hospitals in the Philippines. *Proceedings of the 2020 2nd International Conference on Management Science and Industrial Engineering*, 266–272. <https://doi.org/10.1145/3396743.3396747>
30. Martin, D., Hurlbert, A., & Cousins, D. A. (2018). Sleep disturbance and the change from white to red lighting at night on old age psychiatry wards: A quality improvement project. *Archives of Psychiatric Nursing*, 32(3), 379–383. <https://doi.org/10.1016/j.apnu.2017.12.001>
31. Nash, D., O'Rourke, T., Memmott, P., & Haynes, M. (2020). Indigenous preferences for inpatient rooms in Australian hospitals: A mixed-methods study in cross-cultural design. *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720925552>
32. Nuamah, J., Rodriguez-Paras, C., & Sasangohar, F. (2020). Veteran-centered investigation of architectural and space design considerations for Post-Traumatic Stress Disorder (PTSD). *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720925554>
33. Rea, M. S., & Figueiro, M. G. (2016). The NICU lighted environment. *Newborn and Infant Nursing Reviews*, 16(4), 195–202. <https://doi.org/10.1053/j.nainr.2016.09.009>
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35. Sengke, M. M. C., Atmodiwirjo, P., Yatmo, Y. A., & Johanes, M. (2020). Design consideration for window placement to provide the view within the patient's visual range. *Journal of Design and Built Environment*, 20(1), 13–23.

Safety

36. Muhamad Salleh, N., Agus Salim, N. A., Jaafar, M., Sulieman, M. Z., & Ebekoziem, A. (2020). Fire safety management of public buildings: A systematic review of hospital buildings in Asia. *Property Management*, in press. <https://doi.org/10.1108/PM-12-2019-0069>
37. Sundberg, F., Fridh, I., Lindahl, B., & Kåreholt, I. (2020). Associations between healthcare environment design and adverse events in intensive care unit. *Nursing in Critical Care*, in press. <https://doi.org/10.1111/nicc.12513>

Infection Prevention/Control

38. Bae, S., & Asojo, A. O. (2020). Nurses' perception of safety on hospital interior environments and infectious diseases: An exploratory study. *Global Journal on Quality and Safety in Healthcare*, 3(3), 1–9.
39. Cho, J. (2019). Investigation on the contaminant distribution with improved ventilation system in hospital isolation rooms: Effect of supply and exhaust air diffuser configurations. *Applied Thermal Engineering*, 148, 208–218. <https://doi.org/10.1016/j.applthermaleng.2018.11.023>



40. Chopyk, J., Akrami, K., Bavly, T., Shin, J. H., Schwanemann, L. K., Ly, M., Kalia, R., Xu, Y., Kelley, S. T., Malhotra, A., Torriani, F. J., Sweeney, D. A., & Pride, D. T. (2020). Temporal variations in bacterial community diversity and composition throughout intensive care unit renovations. *Microbiome*, *8*(1), 86. <https://doi.org/10.1186/s40168-020-00852-7>
41. Dalton, K. R., Rock, C., Carroll, K. C., & Davis, M. F. (2020). One Health in hospitals: How understanding the dynamics of people, animals, and the hospital built-environment can be used to better inform interventions for antimicrobial-resistant gram-positive infections. *Antimicrobial Resistance & Infection Control*, *9*(1), 1–17. <https://doi.org/10.1186/s13756-020-00737-2>
42. Franco, L. C., Tanner, W., Ganim, C., Davy, T., Edwards, J., & Donlan, R. (2020). A microbiological survey of handwashing sinks in the hospital built environment reveals differences in patient room and healthcare personnel sinks. *Scientific Reports*, *10*(1), 1–11. <https://doi.org/10.1038/s41598-020-65052-7>
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44. Jain, S., & Reed, M. (2018). Laminar air flow handling systems in the operating room. *Surgical Infections*, *20*(2), 151–158. <https://doi.org/10.1089/sur.2018.258>
45. Kotgire, S., Akhtar, R., Damle, A., Siddiqui, S., & Padekar, H. (2020). Bioaerosol assessment of indoor air in hospital wards from a tertiary care hospital. *Indian Journal of Microbiology Research*, *7*(1), 28–34. <https://doi.org/10.18231/j.ijmr.2020.007>
46. Lin, T., Zargar, O. A., Lin, K.-Y., Juiña, O., Sabusap, D. L., Hu, S.-C., & Leggett, G. (2020). An experimental study of the flow characteristics and velocity fields in an operating room with laminar airflow ventilation. *Journal of Building Engineering*, *29*, in press. <https://doi.org/10.1016/j.jobe.2020.101184>
47. Nakamura, I., Miura, Y., Umeda, A., Imura, R., Watanabe, Y., & Watanabe, H. (2020). The Legionella contamination of tap water in a brand-new hospital in Japan before patients move in. *Infection Control & Hospital Epidemiology*, in press. <https://doi.org/10.1017/ice.2020.79>
48. Ogunsola, F. T., & Mehtar, S. (2020). Challenges regarding the control of environmental sources of contamination in healthcare settings in low- and middle-income countries—A narrative review. *Antimicrobial Resistance & Infection Control*, *9*(1), 81. <https://doi.org/10.1186/s13756-020-00747-0>
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51. Sadeghian, P., Wang, C., Duwig, C., & Sadrizadeh, S. (2020). Impact of surgical lamp design on the risk of surgical site infections in operating rooms with mixing and unidirectional airflow ventilation: A numerical study. *Journal of Building Engineering*, 31. <https://doi.org/10.1016/j.jobe.2020.101423>
52. Shirozu, K., Kai, T., Setoguchi, H., Ayagaki, N., & Hoka, S. (2018). Effects of forced air warming on airflow around the operating table. *Anesthesiology: The Journal of the American Society of Anesthesiologists*, 128(1), 79–84. <https://doi.org/10.1097/ALN.0000000000001929>
53. Shirozu, K., Takamori, S., Setoguchi, H., & Yamaura, K. (2020). Effects of forced air warming systems on the airflow and sanitation quality of operating rooms with non-laminar airflow systems. *Perioperative Care and Operating Room Management*, 21, 100119. <https://doi.org/10.1016/j.pcorm.2020.100119>

Falls

54. Woolrych, R., Zecevic, A., Sixsmith, A., Sims-Gould, J., Feldman, F., Chaudhury, H., Symes, B., & Robinovitch, S. N. (2015). Using video capture to investigate the causes of falls in long-term care. *The Gerontologist*, 55(3), 483–494. <https://doi.org/10.1093/geront/gnu053>

Care across the Lifespan

Elders/Aging

55. Martins, B. A., Barrie, H., Visvanathan, R., Daniel, L., Martins, L. A., Ranasinghe, D., Wilson, A., & Soebarto, V. (2020). A multidisciplinary exploratory approach for investigating the experience of older adults attending hospital services. *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720920858>
56. Wang, Z. (2020). Cross-national comparison of environmental factors important to facility-based senior living. *HERD: Health Environments Research & Design Journal*, 13(2), 186–199. <https://doi.org/10.1177/1937586720901344>

Design & Evaluation (e.g., Process, Methods, Simulation Modeling)

57. Caetano, I., Santos, L., & Leitão, A. (2020). Computational design in architecture: Defining parametric, generative, and algorithmic design. *Frontiers of Architectural Research*, 9(2), 287–300. <https://doi.org/10.1016/j.foar.2019.12.008>
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59. Greenroyd, F. L., Hayward, R., Price, A., Demian, P., & Sharma, S. (2018). A tool for signage placement recommendation in hospitals based on wayfinding metrics. *Indoor and Built Environment*, 27(7), 925–937. <https://doi.org/10.1177/1420326X17695375>



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61. Halpern, N. A., & Anderson, D. C. (2020). Keeping a 2009 design award-winning intensive care unit current: A 13-year case study. *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720918225>
62. Joseph, A., Browning, M. H. E. M., & Jiang, S. (2020). Using Immersive Virtual Environments (IVEs) to conduct environmental design research: A primer and decision framework. *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720924787>
63. Kalantari, S., & Neo, J. R. J. (2020). Virtual environments for design research: Lessons learned from use of fully immersive virtual reality in interior design research. *Journal of Interior Design*, in press. <https://doi.org/10.1111/joid.12171>
64. Lather, J. I., Timothy, L., Renner, K., & Messner, J. I. (2019). Evaluating generated layouts in a healthcare departmental adjacency optimization problem. *Computing in Civil Engineering 2019: Data, Sensing, and Analytics*, 539–546. <https://doi.org/10.1061/9780784482438.068>
65. Lim, L., & Zimring, C. M. (2020). A conceptual visibility framework for linking spatial metrics with experience and organizational outcomes. *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720916825>
66. Machry, H., Joseph, A., & Wingler, D. (2020). The fit between spatial configuration and idealized flows: Mapping flows in surgical facilities as part of case study visits. *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720928350>
67. Ransolin, N., Saurin, T. A., & Formoso, C. T. (2020). Integrated modelling of built environment and functional requirements: Implications for resilience. *Applied Ergonomics*, 88, in press. <https://doi.org/10.1016/j.apergo.2020.103154>
68. Schaumann, D., Putievsky Pilosof, N., Gath-Morad, M., & Kalay, Y. E. (2020). Simulating the impact of facility design on operations: A study in an internal medicine ward. *Facilities*, 38(7/8), 501–522. <https://doi.org/10.1108/F-10-2018-0132>
69. Sun, J. (2020). The appropriateness of adapting the Australian Environmental Assessment Tool–High Care (EAT-HC) for persons with Dementia in Singapore. *HERD: Health Environments Research & Design Journal*, in press. <https://doi.org/10.1177/1937586720929044>

Other

Alapieti, T., Mikkola, R., Pasanen, P., & Salonen, H. (2020). The influence of wooden interior materials on indoor environment: A review. *European Journal of Wood and Wood Products*. <https://doi.org/10.1007/s00107-020-01532-x>