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Linking Evidence-Based Architectural Research Methodologies with Medical/Health Sciences: A Qualitative and Mixed-Methods Framework for Infection Prevention in Healthcare Facilities

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Poster

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Abstract

Infection prevention in the built environment is a growing concern, most notably in healthcare facilities where disease transmission risks can be high. Consequently, addressing this challenge through informed architectural design requires a systematic, interdisciplinary and evidence-based research methodology that integrates insights from both architecture and medical/health sciences. Here we explore how qualitative and mixed-methods research methodologies enhance objectivity in architectural decision-making for infection prevention, ensuring that interventions are not only scientifically sound, but also contextually relevant and user-centered.

Qualitative research methodologies provide a deep, contextual understanding of how spatial configurations influence not only infection risk, but also user behavior and adherence to hygiene protocols. Through ethnographic studies, detailed case studies, interviews and spatial observations, architects can assess how users interact with different architectural features such as ventilation systems, sanitation infrastructure and circulation patterns. Moreover, expert input from medical and nursing professionals, as well as public health experts, leads to more structured and more streamlined in architectural decision-making for infection prevention, ensuring that interventions are up-to-date and in accordance with their work needs. These methods also help in identifying social and psychological barriers to effective infection control, ensuring that design solutions are not solely driven by technical considerations, but also by actual human needs and behaviors. Socio-spatial mapping techniques can help identify unseen risks within building (such as high-touch areas or overlooked transmission pathways) that conventional quantitative models may fail to capture.

A mixed-methods approach further strengthens objectivity by integrating qualitative insights with structured assessment tools, such as post-occupancy evaluations and pattern analysis of high-risk infection zones. By triangulating multiple data sources –including epidemiological evidence, behavioral mapping and material performance assessments –this approach ensures that architectural strategies are grounded in empirical evidence. Additionally, mixed-methods research allows for iterative design improvements based on continuous feedback from healthcare professionals, facility managers and end-users, leading to a responsive and adaptive approach to infection prevention.

By emphasizing qualitative rigor and methodological integration, the interdisciplinary potential of architectural research in developing infection-resistant environments becomes very evident. Rather than relying solely on subjective decisions or prescriptive guidelines, this approach enhances objectivity by capturing the complexities of real-world architectural use. In our view, this is a way to reframe architecture as an epidemiological tool, where spatial configurations and material choices are viewed not just as passive design elements, but as active agents in disease transmission dynamics. Informed by qualitative and mixed-methods research, such approach can lead to resilient, adaptive, sustainable and health-centered space, ensuring that infection prevention measures and workforce needs are embedded in both architectural planning and everyday practice.

Keywords

architectural research methodology, infection prevention

Primary authors: JELOVAC, Marko (Faculty of Architecture of the University of Belgrade, Serbia); MEŠTROVIĆ, Tomislav (Health Metrics Centre, University Centre Varaždin, University North, Croatia / Institute for Health Metrics and Evaluation, US / University of Washington School of Medicine, Seattle, US)

Presenters: JELOVAC, Marko (Faculty of Architecture of the University of Belgrade, Serbia); MEŠTROVIĆ, Tomislav (Health Metrics Centre, University Centre Varaždin, University North, Croatia / Institute for Health Metrics and Evaluation, US / University of Washington School of Medicine, Seattle, US)

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