SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

This ethnographic and archival research examined historical perspectives on the role of 'air' in hospital architecture in the context of CF clinics and emphasized the role of the built environment in battling an AMR crisis.

Air Care: an 'aerography' of breath, buildings and bugs in the cystic fibrosis clinic

Brown, N., Buse, C., Lewis, A., Martin, D., Nettleton, S., 2020 | Sociology of Health and Illness, Volume 42, Issue 5, Page(s) 972-986

Key Concepts/Context

Research in medical humanities works on hospital architecture demonstrates the historical significance of spatial design for airflow and air exchange from the pre-antibiotic period until the present. The spatial and atmospheric design of hospitals are conceived while paying attention to the prevention of the spread of airborne infections, e.g., cystic fibrosis (CF). The results of this ethnographic and archival research in outpatient CF clinics suggest that attention to the design of airflow in hospitals is critical to the fight against antimicrobial resistance (AMR).

Methods

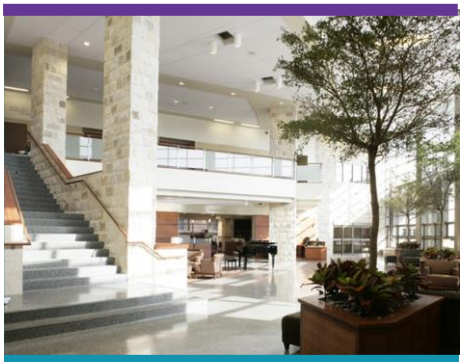
The study was conducted at three outpatient CF (cystic fibrosis) clinics in the UK, each with a unique architectural history and scale of delivery:

Site 1: The facility is used for outpatient treatment and is part of a 1970s-built hospital. The facility is located in a small provincial city with the capacity to treat 35 adult CF patients.

Site 2: This site (built in the 1990s as an addition to a 1904 infectious disease hospital) has 400 listed CF patients and is located on the semi-rural margins of a large metropolitan area.

Site 3: With over 300 CF patients, this site houses outpatient services built in the 1990s.

The authors used ethnography, archival research, and face-to-face and walking interviews with 54 participants, including 34 hospital staff, 15 patients, two family members, and three architects.



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During face-to-face graphic interviews with participants, the architectural layout plans of the clinics were incorporated for interactive discussion and annotation. The plans were annotated using colorful markers to highlight routes, design features, and 'hot spots' in which cross-infection could potentially occur.

The authors conducted 70 interviews, 45 graphic, and 25 walking interviews, with participants guiding them through buildings, and taking photos of interior spaces and signage, using the built environment cues to stimulate discussion. Ethnographic observations were conducted in outpatient clinics and inpatient wards that included facilities for emergency appointments. Incidental observations were conducted during site visits over a 9-10-month period. Qualitative data analysis was undertaken via the NVivo software while inputting the graphic as well as the textual data and connecting various data types for seamless analysis. Ethical approval was secured through the UK NHS.

Findings

Based on the analysis, three main themes were highlighted:

"Imagining atmospheres – The spherology of 'cloud bodies'". In this theme the authors describe the uncertainties and anxieties of medical staff and patients in respiratory clinics regarding the transmission of bacteria through the air. The lack of knowledge about the movement of air and bacteria in a given space leads to speculation about the risks of infection as well as risk of antibiotic resistance. The fluidity and 'leakiness' of the air make it difficult to contain and classify, and its potential for contagion threatens the orderliness of spatial boundaries. This theme highlights the importance of environmental conditions, such as air flow, ventilation, and air filtering in reducing the risks of infection and AMR and the challenges of achieving optimal conditions in clinical settings.

This theme explores the material politics of air, windows, and air conditioning – "Air technics and window politics". This second theme discusses the significance of windows in modern buildings and the tensions arising from their presence or absence. Windows are not only related to the design of buildings but also connected to complex systems of governance and policy. They have evolved through regulated design mandates linked to thermal efficiency, conceptions of thermal comfort, and cooling/heating systems, privacy, visibility, and security. The authors illustrate these tensions by referring to outpatient CF treatment at Site 1, where the sliding aluminum windows that could be fully opened for ventilation had to be restricted to 10 centimeters due to safety legislation. This resulted in an uncomfortably warm atmosphere, increasing the need for mechanical ventilation.

This final theme discusses economic considerations and the challenges regarding designing the air flow within modern high-rise healthcare architecture – "Costing

the air". This theme discusses the aero-economic issues surrounding healthcare building design, particularly related to air quality and ventilation systems. In some cases, windows are seen as an alternative to expensive infection-control air pressure management systems. The availability of clean air is increasingly becoming a matter of affordability, and the design of healthcare buildings must consider the trade-offs between patient safety, comfort, and affordability.

Limitations

This archival and ethnographic research provided invaluable insights and directions for the design of air flow and air systems in healthcare environments. The authors also highlight that the design of other public spaces could benefit from this conscious attention to air flow while accounting for people's "microbial companions."

In light of the COVID-19 respiratory pandemic, design of air flow and policies regarding air exchange was hotly debated in the context of school buildings and workplaces. Such building typologies could also benefit from mixed-methods research and analysis for illustration of future directions for healthier designs in light of historical forces.

Design Implications

AMR crisis and infection control in the post-antibiotic era requires healthcare designers to question the rigid environmental boundaries of hospitals and think more critically about clean air and air flow through understanding the role of humidity and different ventilation systems on reducing indoor pathogens. Architects, doctors, and building managers should work together to ensure living and working environments also take into account bodies and their "microbial companions."