

The Role of Architecture in Fighting COVID-19

Designing Spaces for Infection Control

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Les Centres GHESKIO Tuberculosis Hospital, Port-au-Prince, Haiti

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Amidst the search for Personal Protective Equipment (PPE) and the implementation of large-scale human behavior change, communities of all backgrounds are banding together to fight the COVID-19 pandemic. On a personal level, how can the spaces we occupy be made safer? And on a policy level, **what is the role of architecture in fighting a pandemic?**

Below are some rules of thumb to employ in adapting our domestic, commercial, residential, and public spaces into **spaces that will keep us safe**. We will be assembling and disseminating best practices over the weeks to come, so please **share your questions and your solutions with us**.



Design for social distance, not social isolation.



Rethink material selection and treatment of surfaces.



Make your spaces breathe better.



Temporary shelters are never temporary.



Design for people, not just against pathogens.

Why Design Matters

The design of our spaces has the power to hurt us or to keep us safe. From floor layouts, to the choice of materials, to the circulation of air, every decision we make matters.

At MASS Design Group, we have spent the last ten years building new spaces and retrofitting existing buildings to promote infection control, and to support our partners in providing the best patient care possible. Today, we draw upon lessons learned from the field, bringing infectious disease mitigation principles to inform our current decision making.

Design for social distance, not social isolation.



Communal spaces like hallways, waiting areas, lobbies, and elevators are the most contagious because that is where crowding occurs. Meet, interact, collect, and connect outdoors if you can. When inside, people (and beds) should be separated by 6 ft (2 m) to minimize droplet transmission. **Reduce congestion and reliance on waiting rooms and other communal spaces where infectious and healthy people mix.**



Just as patients must be triaged to prioritize those most in need of care; spaces must be triaged to protect healthy people from getting sick—including healthcare workers and people with non-confirmed cases. **Sequence the flows of people to limit unnecessary overlaps.** Make sure to separate clean and dirty entrances, ensure proper donning and doffing areas for PPE, and consider how people and materials will be moving through the space.

Rethink material selection and treatment of surfaces.



Surfaces contaminated with infected droplets can transmit disease. Hospitals and kitchens use non-porous surfaces (e.g., stainless steel, plastic, composites) for infection control and ease of cleaning; these are proving to be materials where COVID-19 has been shown to live the longest. Take special care to routinely clean non-porous surfaces.



Surprisingly, however, porous materials like wood, cardboard, fibers, cotton, and leather seem to be a less stable material for the COVID-19 virus, which lasts only 24 hours on these surfaces. **We need to rethink guidelines determined by previous diseases, in the face of new realities.**

Make your spaces breathe better.



COVID-19 is mainly spread by droplets—produced by coughing, sneezing or even just talking—that can travel up to 6 ft (2 m). There is early evidence that smaller particles may be able to float even longer distances. In the latter situation, called airborne transmission, proper ventilation and simple airflows strategies can help.



To dilute and remove contaminated indoor air, **open windows for cross ventilation** (if appropriate, and if the space allows), or use exhaust fans or mechanical systems to pull air outside.



Air cleansing strategies are also an effective option, such as Germicidal Ultraviolet (GUV) air disinfection units or air filters.

Temporary shelters are never temporary.



Facilities struggling to meet patient surges will rely on the quick mobilization of “temporary” care spaces. Shelters that are meant as “pop ups” usually end up being used for much longer than intended, some beyond 20 years. Whether erecting a tent clinic or retrofitting a lobby, decisions we make now will have long term effects on institutions and communities. When the spigots of relief dollars begin flowing to temporary structures, **invest in something that will last for a year, not a month.**

Design for people, not just against pathogens.



Well-intentioned spaces will fail if they clash with how people will actually use them. **Designs need to respect user and cultural preferences and anticipate natural human behaviors.** All of us need to bring our best selves, knowing we are all in this together. Just as institutional, sterile spaces may evoke fear, dignified, human-centered spaces can instill trust and hope.



Design can help rebuild trust in the public realm. Use signs and graphics to reveal the systems that are working behind the scenes: publicly display safety standards and protocols for restaurants and places of convening, construction sites, and job sites.