

Editorial

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Indoor air quality in health care facilities: a call for a concerted multidisciplinary effort

Ambient air quality is known to affect health and hospital admission [1]. The World Health Organization will be convening the first WHO global conference on air pollution and health. The conference will call for nations to work together, because the cost of air pollution is too high and claims 7 million lives a year [2].

Hospital-acquired infection (HAI), in which disease can be transmitted by direct or indirect contact, or by air, even over large distances, or by a combination of both transmission modalities, is an important public health issue with unacceptable levels of morbidity and mortality. Although contact transmission of disease causes the majority of HAI cases, control of transmission via air is more difficult, but one where engineering can play an important role in limiting the spread of disease [3, 4].


Tuberculosis (TB) is an important global concern for public health particularly with the emergence of multidrug-resistant (MDR) TB and extensively drug-resistant (XDR) TB. Hospitals and health care facilities can be substantial sources for the spread of TB. Many environmental interventions to control TB are also considered to apply to viral and bacterial infections with airborne potential. The current state of available environmental interventions has been summarized [5]. Overcrowded health-care environments and poorly ventilated inpatient and outpatient settings in hospitals and clinics can facilitate the spread of airborne infections. Other measures of transmission control include the identification and isolation of patients with suspected cases of TB, a prompt effective treatment of positive infections, and ensuring patients adhere to medication (compliance). However, measures to identify and contain cases of TB infection do not guarantee

that all patients with MDR/XDR TB will be secured for treatment. Other measures in health care facilities must be in place as a second line of defense, including adequate ventilation, temperature control, pest control, adequate air disinfection, and germicidal irradiation including upper room germicidal irradiation [5]. Hospitals also need a dedicated airborne infection isolation (AII) unit, because these units have been shown to improve efficiency in excluding patients suspected of having pulmonary TB [6].

The contribution by Sornboot et al. in the present issue of *Asian Biomedicine* describes the situation of bioaerosol concentrations in 7 large health care facilities [7]. The authors have documented that it is imperative to improve indoor air quality. Similar studies should be expanded to other areas. Once documented, evidence-based interventions to improve air quality should be implemented. A systematic monitoring and evaluation of bioaerosol concentrations should also be a part of a health care facility's quality assurance mechanism.

National legislation needs to be in place to deal with the main indoor pollutant concentrations and monitoring parameters that affect air quality, humidity, and thermal comfort. Specific regulatory performance tools for health care facilities are wanting and will require practical considerations on the adequate choices of hospital construction site, building materials, finishing and furniture, cleaning products, and maintenance activities and management strategies. Legislation should be guided by scientific evidence. Contributions from microbiologists, mechanical and civil engineers, and mathematicians to hospital indoor air quality will be required to reduce the airborne transmission of infection in hospitals. This will require asking appropriate scientific questions, assigning

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priorities, and multidisciplinary approaches to determine cost-effective solutions to reduce the spread of disease and provide clear information for all stakeholders [3].

It cannot be overemphasized that prevention through a proactive air quality monitoring program is far more desirable

than dealing with outmoded health care buildings. Regardless, there are effective, rational approaches for determining outmoded health care buildings. The notions of proactive air quality may be expanded to commercial and public buildings in the future [8].

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