

tamination [2]. Eckmanns et al reviewed the efficacy of high-efficiency particulate air (HEPA) filtration in the prevention of fungal infection and mortality in patients who received a bone marrow transplant [3]. Their study is not relevant because they assessed HEPA filtration as part of routine care and not during hospital construction, renovation, or demolition (only 1 of the 16 articles they reviewed assessed protection during hospital construction) [3].

The Centers for Disease Control and Prevention recommend use of HEPA filtration systems for high-risk patients [4], and we agree with the authors' comments that outbreaks could be decreased, in part, by the use of HEPA systems. As described in the authors' data and in our review [1, 2], installation of a HEPA filter system in combination with other environmental measures reduces fungal spore counts as measured by air sampling from the environment of healthcare facilities during construction, renovation, or demolition, thereby preventing fungal outbreaks and infections. However, in the majority of articles that described successful control using HEPA filtration, standard preventive measures (eg, relocating high-risk patients, sealing off the construction site, avoiding unnecessary traffic) and/or antifungal prophylaxis were implemented simultaneously, demonstrating that a bundle approach of prevention and control measures based on infection control risk assessment is essential [2]. It remains unclear to what extent HEPA filtration alone contributes to reduction of fungal outbreaks and infections during construction, renovation, or demolition.

It is important to note that there is no scientific evidence to establish a tolerable limit of fungal spores in air samples for the prevention of fungal outbreaks and infections during construction, renovation, or demolition [2]. A major problem in comparing air sampling for fungi is that there is no standardized method of air sampling, which results in difficulty when comparing studies. Our literature review demonstrated that there is not a direct relationship between fungal spore concentra-

tion by air sampling and fungal infections in healthcare settings during construction and renovation [2]. We agree that HEPA filtration systems contribute to the reduction of air contamination. However, given the lack of direct causation between airborne fungal levels and clinical outcomes, further studies are needed to assess the benefits of HEPA filtration during hospital construction, renovation, or demolition.

Note

Potential conflicts of interest. All authors: No reported conflicts. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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Reply to Saliou et al

TO THE EDITOR—We thank Saliou et al [1] for their comments and interest in our review article [2]. Fungal outbreaks and infections can occur in healthcare settings with or without construction, renovation, or demolition. Our review uniquely focused on human fungal outbreaks and infections in healthcare settings during construction, renovation, or demolition, avoiding the combined analysis of infections and con-