A Review and Discussion of Indoor Environmental Resilience: An Update since 2015

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ABSTRACT

In 2015, under a NIST effort to develop planning guidance to increase community-based resilience in the face of a broad range of natural disasters and other extreme events, we conducted a review of the potential indoor environmental quality (IEQ) impacts of such events. These impacts included primarily increases in indoor airborne contaminant levels and health risks as well as challenges in maintaining acceptable indoor environmental conditions during the event and afterwards in the recovery phase. At that time, it was noted that the elements of what we then referred to as indoor environmental resilience had not been identified and discussed in a systematic fashion. That 2015 effort, organized by type of event, reviewed existing information, standards, programs and other technical resources related to events that are likely to impact IEQ, focusing on the potential impacts, current activities to address these impacts, important gaps requiring research, and needs for standards and guidance.
The 2015 review included the following types of events: heat waves, storms causing power failures, floods and mold exposure, wildfires, and airborne releases of chemical, biological or radiological agents. The review also addressed pandemics, but only in terms of the role of healthcare facilities, as well as indoor environmental conditions in safe rooms and shelter-in-place facilities. In both cases, these two additional topics were only covered to a limited degree. Since 2015, the need to address pandemic response and impacts increased greatly as a result of the COVID-19 pandemic. The need to address wildfires also increased significantly due to their increased frequency and the widespread impact of wildfire smoke in the past decade.
This presentation will summarize the earlier effort and describe key updates since 2015 in the status of the technical resources, standards, research needs, and needs for new standards and guidance for the events covered previously. There will be expanded information related to airborne infectious disease and wildfires based on the events, trends and lessons learned over the past 10 years.

KEYWORDS

extreme events, hazards, indoor environmental quality, resilience, risk