INDOOR AIR QUALITY
PHYSIOLOGICAL HEALTH
Talking Points

Keywords: Indoor air quality, physiological health, absenteeism, SBS, ventilation, pollutants

Indoor Pollutants

- Indoor air pollutants can be classified as volatile organic compounds (VOCs), particulate matter, infectious agents, allergens and gases (Gerardi 2010). High level of these indoor pollutants are associated with health effects, especially for people with existent asthma or other respiratory problems (MacNaughton 2015).

Sick Building Syndrome (SBS)

- The primary factors triggering SBS symptoms are outdoor ventilation rates, temperature, humidity, dust, and microbial content of the air (Burge 2004). Evidence suggests that low outdoor ventilation rates can cause respiratory health effects such as mucosal and allergy symptoms, and other SBS related symptoms (Fisk 2017).

Asthma

- A major factor in the development and exacerbation of asthma is exposure to indoor allergens and irritants such as dust, particulates, mold and moisture, with as much at 40% of the excess asthma in minority children attributed to exposure to indoor allergens (Lanphear 2001).

Ventilation + IAQ

- Natural ventilation can significantly reduce adverse effects of indoor air pollutants by reducing their concentration in indoor air (Gerardi 2010). In addition, increasing outdoor ventilation rates beyond ASHRAE standard has been found to have benefits in health and performance and reduce building related health symptoms (Mendell 2013, Allen 2016, Fisk 2017, Tarantini 2017).

Ventilation + Spread of Airborne Infectious Disease

- Increasing ventilation rates and outdoor air exchange rates, enhancing filtration and disinfection, and avoiding air-recirculation can reduce the spread of airborne infectious disease by diluting bacterial and viral load in indoor air (Seppanen 1999, Li 2007, Bahnfleth et al. 2020).

Ventilation + Absenteeism

- Many offices and schools experience ventilation rates well below ASHRAE standards (Mendell 2013). Increased ventilation rates greatly benefit occupant health and can significantly reduce sickness related absences in work and school settings (Mendell 2005, Wyon 2004, Wargocki 2000, Fisk 2017, Allen 2016).

Talking Points

Ventilation + Energy + Diminishing Returns for IAQ

- There is a rate of diminishing returns for increasing ventilation rates in a building (Myatt 2002). Higher ventilation rates can impose energy costs and increase size of HVAC systems (Fisk 2017). In buildings that have adequate ventilation of outdoor air, increasing the ventilation rate will not necessarily yield higher indoor air quality (Barolin 2020).

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