



ADB WORKSHOP DISEASE RESILIENCE AND IAQ IN BUILDINGS TITLE: IEQ IN BUILDINGS

DONALD M. WEEKES, CIH, CSP, FAIHA

IEQ-GA PRESIDENT

SEPTEMBER 1ST, 2021

This is not an ADB material. The views expressed in this document are the views of the author/s and/or their organizations and do not necessarily reflect the views or policies of the Asian Development Bank, or its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy and/or completeness of the material's contents, and accepts no responsibility for any direct or indirect consequence of their use or reliance, whether wholly or partially. Please feel free to contact the authors directly should you have queries.

BACKGROUND – INDUSTRIAL HYGIENE

- **Industrial Hygiene**

Industrial hygiene has been defined as “that science and art devoted to the anticipation, recognition, evaluation, and control of those environmental factors or stresses arising in or from the workplace, which may cause sickness, impaired health and well-being, or significant discomfort among workers or among the citizens of the community.”

BACKGROUND - IAQ

- Indoor Air Quality (IAQ)

Indoor air quality is the air quality within and around buildings and structures. IAQ is known to affect the health, comfort and well-being of building occupants.

- Mainly Comfort Issues

- Temperature, relative humidity, air flow

BACKGROUND - IEQ

- **Indoor Environmental Quality (IEQ)**

The quality of a building's environment in relation to the health and wellbeing of those who occupy space within it. IEQ is determined by many factors, including lighting, radiation, electromagnetic, ergonomics, noise, air quality, and damp conditions.

CASE STUDY #1 – INDOOR AIR QUALITY

- Large governmental building complex
- Periodic IAQ complaints – ‘bad air’, adverse health symptoms including choking, coughing, etc.
- Previous IAQ surveys – no adverse findings



CASE STUDY #1 – INDOOR AIR QUALITY

- Focus – Carbon dioxide & VOC's
- 5 locations – elevated CO₂ in afternoon
- Recommend – Increased air flow and monitoring of CO₂



CASE STUDY #1 – INDOOR AIR QUALITY

- 4 Locations – elevated VOC's
- Personal hygiene products, indoor plants (chemicals), and cleaning products
- No health concerns, but may be noticeable and irritating



CASE STUDY #2 – INDOOR ENVIRONMENTAL QUALITY

- Sun roof in office building
- Occupant complaints – elevated temperatures
- PVC shades placed near sunroof to block sun during summer
- New complaints – chemical odour



CASE STUDY #2 – INDOOR ENVIRONMENTAL QUALITY

- IAQ Sampling – no adverse results
- Investigate PVC blinds – elevated temps (above 140 degree F) result in off-gassing & odour
- Replace PVC blinds



DISEASE RESILIENCE AND IEQ

- Resilience refers to the ability (of people) to cope with difficult, stressful and traumatic situations while maintaining or restoring normal functioning. The higher the resilience, the lower the vulnerability and risk of illness.
- Psychologists define resilience as the process of people adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress—such as family and relationship problems, serious health problems, or workplace and financial stressors. ... That's the role of resilience.

HOW DOES IEQ HELP DISEASE RESILIENCE?

- The Lancet COVID-19 Commission – Designing Infectious Disease Resilience in School Buildings Through Improvements in Ventilation and Air Cleaning (April 2021)
- “In addition to decreased airborne infectious disease transmission, research shows that ventilation and air cleaning improvements are likely to lead to improved academic performance (in particular reading and math performance), fewer missed school days for students, higher scores on cognitive function tests, and many benefits for teachers including decreased respiratory symptoms, increased teacher retention, and improved morale.”

PEOPLE ARE THE MOST IMPORTANT ASSET IN A BUILDING

- The purpose of any building:
 - To provide shelter and comfort to the occupants
 - To provide an environment where the occupants can work, live and play successfully
 - To withstand extreme weather and atmospheric conditions while protecting the occupants
 - To provide for the mental and physical wellbeing of the occupants

CONCLUSIONS

- IAQ/IEQ is a complex multidisciplinary subject involving both health and comfort issues
- Key to improvements in IAQ/IEQ in Buildings
 - Knowledge of building HVAC systems
 - Work closely with mechanical engineers, building scientists, building operators, etc.
 - Knowledge of air contaminants
 - **GOOD COMMUNICATION SKILLS!**

CONTACT INFORMATION

Mr. Donald Weekes CIH, CSP, FAIHA

Phone: (613) 853-0244

E-mail address:

don.weekes1953@gmail.com

@donweek (Twitter)