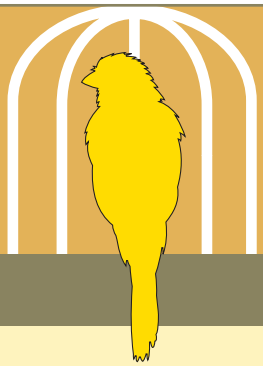
Indoor Air Quality and Ventilation



HEALTH AND SAFETY FACT SHEET

CUPE Canadian Union of Public Employees

What is Indoor Air Quality?

Indoor air quality (IAQ) is a general term for the physical, chemical and biological state of the air inside the building you work. Poor indoor air quality and poor workplace ventilation are hazards that affect the health of CUPE members.

What causes poor indoor air quality?

In modern buildings, fresh outside air is pulled into the system and mixed with the existing indoor air. This air mixture is heated or cooled and then filtered before it is circulated throughout a workplace. These systems are commonly known as heating, ventilation and air conditioning (HVAC) systems. There are many factors that create polluted indoor air, including cutbacks, poor maintenance and poor engineering of HVAC systems.

- **Cutbacks:** Cutbacks, cost-cutting measures and employer inaction (including ignorance about air quality issues) can undermine proper ventilation and degrade indoor air quality in workplaces. In order to save money on heating or cooling the air, employers will often reduce the amount of fresh air brought into the system. Less fresh outdoor air contributes to the accumulation of contaminants.

- **Poor maintenance:** Additionally, cutbacks to maintenance staff or regular maintenance work often means the systems are not kept in appropriate conditions. When filters are not changed or fans aren't cleaned, the quality and quantity of ventilated air can be affected.

- **Poor engineering:** Many public buildings have been retrofitted without due consideration to the HVAC systems. These systems can be affected by changes to internal structures (such as walls or partitions), or by adding more staff than originally intended. More workers in the same space may lead to them not getting adequate amounts of fresh air.

What are the hazards of poor air quality?

Poor ventilation and IAQ allows for the accumulation and mixture of hazardous contaminants. The resulting physical effects on workers are harmful.

Major outcomes and hazards of poor ventilation:

- Chemical and biological contaminants may build up, leading to multiple conditions.
- Extremes in temperature can cause fatigue, discomfort and distraction.
- Elevated levels of carbon dioxide and low levels of oxygen due to low ventilation rates can make people feel drowsy. Some can suffer headaches, which also decreases productivity.
- Psychological effects like stress arise when members know they are constantly exposed to ventilation hazards, or when they are frequently distracted by the other conditions listed above.
- Low humidity often causes dry throat, dry skin and static electricity build-up, while high humidity contributes to bacterial and mould growth.
- Legionnaire's disease, Pontiac fever and Humidifier fever can be caused by contaminated standing water in poorly maintained HVAC systems.
- Excessive and irritating workplace odours can cause worker discomfort.

- Sick Building Syndrome (SBS) can also result from low IAQ. SBS effects include irritation of eyes, nose and throat, headaches, fatigue, and a susceptibility to colds and flu. This is often noticed when away from the workplace for a period of time (like the weekend), when symptoms are less severe or absent.
- Multiple Chemical Sensitivity (MCS) is a debilitating illness triggered by exposure to one chemical or a combination of chemicals. MCS sufferers experience skin rashes, irregular breathing, central nervous system problems, and eye, nose and throat irritations.

How poor air quality is created

CUPE members work in different settings, which means members may have ventilation systems that are both general and local. General ventilation supplies and removes air across large workplaces, such as hospitals, schools and office buildings, while local ventilation controls and removes contaminants at the source. Both of these systems can lead to health issues.

General HVAC systems

HVAC systems can face several issues. Only a limited amount of fresh outdoor air gets into the workplace – most HVAC systems only allow for 20 per cent outdoor air mixed with 80 per cent re-circulated indoor air in sealed buildings. Depending on the filtration system used, HVAC systems can be limited in controlling contaminants; not all contaminates may get fully removed. Instead, contaminants can be spread throughout the workplace for extended periods of time. Workers' exposures are therefore difficult to control near the contaminant source with HVAC systems because there is no direct ventilation of the contaminant. Further, the amount of air required to remove a contaminant may be so large that no HVAC system could handle the volume of air exchange.

It is important to note that many HVAC systems have fixed settings that don't allow workers to control ventilation rates.

Local ventilation

Local ventilation controls and removes contaminants at the source. Cross-draft tables and fume hoods are examples of local ventilation.

Local ventilation systems are usually set up with a hood that captures contaminants. A fan or a blower draws the contaminant through the ductwork to an air cleaner and the exhaust air is expelled outside.

Common problems with local ventilation systems can include:

- Local ventilation hoods are too far from contaminant source.
- Local ventilation hoods are too small to capture the contaminant properly.
- Cross drafts and negative indoor air pressure reduce the effectiveness of local ventilation hoods.
- Air supply and return vents placed too close together can result in poor distribution of fresh air.
- Sometimes the system removes the contaminated air but doesn't bring in enough intake air, resulting in a negative airflow. This negative airflow can cause contaminated air to re-enter the workplace through the exhaust ducts.

Workers are generally not allowed to control local ventilation rates.

How to identify a problem

Workplace inspections by CUPE members are an important tool in uncovering and identifying ventilation hazards.

A first step is recognizing that poor ventilation is a *de facto* health and safety hazard in your workplace. If the negative health outcomes mentioned above affect workers, poor ventilation is likely a significant contributor. Surveys and mapping techniques are excellent tools to identify ventilation hazards in your workplace.

A ventilation survey can be done in co-operation with the employer, in which case the union must approve the survey and be involved in collecting and assessing the information that is generated.

The union should conduct its own ventilation survey if the employer resists the idea or denies that poor ventilation is a problem. To identify ventilation hazards, workers can use body mapping, hazard mapping, world mapping techniques as well as surveys.

Note: Inspections should be carried out on a regular basis to identify new ventilation hazards. Members, via their health and safety committees or representatives, can exercise control at work to improve instances of poor ventilation and IAQ.

What you can do

The following actions can help combat poor ventilation:

- Put poor ventilation issues on the health and safety committee agenda.
- Learn about the type of HVAC system at your workplace and its capacity for ventilation.
- Conduct workplace inspections of ventilation systems. Look for blocked vents, excessive dust on air vents, intake air supply vents close to loading docks or busy streets, standing water within the HVAC system, recent renovations without appropriate changes to the HVAC system and intake and exhaust vents that are too close together. Report ventilation hazards.
- Demand employers act on testing and fixing inadequate ventilation systems.
- Refuse to work in unsafe, poorly ventilated working conditions.

Strategies for change

Poor ventilation can be eliminated by the following:

- Keep ventilation on the health and safety committee agenda. Ventilation is not a hazard that is dealt with once. It is a hazard that must be investigated regularly.
- Create a ventilation policy for CUPE workplaces starting with a statement acknowledging that poor ventilation is a health and safety hazard. The health and safety committee in your workplace should be instrumental in tabling and pushing for the adoption of a policy that prevents poor ventilation.
- Put poor ventilation, and other indoor air quality issues, on the bargaining table.
- Monitor and test ventilation systems to ensure proper airflow rates.
- Give workers control of ventilation systems by allowing workers to adjust the flow rate and amount of outdoor air that is distributed into the workplace.
- Sponsor CUPE education around the issue of poor ventilation and its effects.

Employers have the responsibility to provide a healthy and safe workplace. Proper ventilation is a key component of a healthy workplace. Organize your members – their participation is vital to fight for properly ventilated workplaces. Through education and activism, poor ventilation can be eliminated from CUPE workplaces.

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