

BRIEF TO THE NEW BRUNSWICK TEACHERS'
ASSOCIATION ON THE
“POST-COVID-19 CONDITION IN CANADA”
REPORT AND M. LEPAGE’S MOTION 36

June 13, 2023

Abstract

An examination of recommendations 9 and 17 as they relate to schools and Membership, a discussion of Motion 36 and information currently available to and/or from the Employer, and suggestions of actions Executive and Membership could take to advance both causes.

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Glossary of Terms

Carbon dioxide (CO₂): By-product of respiration used as a proxy to measure air quality and the rate at which air is being renewed. Increasing indoor CO₂ levels indicate an increase in exhaled air in a space - or, the air is being rebreathed. This is different than safe exposure levels, which indicate at what concentration acute health effects are seen. Research has also shown academic performance and attention declines with increased levels of carbon dioxide.

Indoor Air Quality (IAQ): The air quality within and around buildings and structures. IAQ is known to affect the health, comfort, and well-being of building occupants. Poor indoor air quality has been linked to sick building syndrome, reduced productivity, and impaired learning in schools. IAQ is evaluated through collection of air samples, monitoring human exposure to pollutants, analysis of building surfaces, and computer modelling of air flow inside buildings.

Particulate Matter (PM): Particulates are microscopic particles of solid or liquid matter suspended in the air. The term aerosol commonly refers to the particulate/air mixture, as opposed to the particulate matter alone.[1] Sources of particulate matter can be natural or anthropogenic.[2] They have impacts on climate and precipitation that adversely affect human health, in ways additional to direct inhalation. Also: **atmospheric aerosol particles, atmospheric particulate matter, or suspended particulate matter (SPM).**

PM_{2.5}: Fine particles with a diameter of 2.5 µm or less. Examples include combustion particles, organic compounds, metals.

PM₁₀: Coarse particles with a diameter of 10 µm or less. Examples include dust, pollen, mold.

Post-COVID-19 Condition (PCC): About 15 percent of adults who have contracted COVID-19 say they experience symptoms three months or more after their initial SARS-CoV-2 virus infection. These include respiratory, cardiovascular, neurological and cognitive impairments and they can be debilitating. Also: **Long Covid.**

SARS-CoV-2: Severe acute respiratory syndrome coronavirus 2 is a strain of coronavirus that causes COVID-19 (Coronavirus Disease 2019), the respiratory illness responsible for the COVID-19 pandemic. Also: **SARS-2.**

Post-COVID-19 Condition in Canada:

What We Know, What We Don't Know and a Framework for Action

9. Acknowledge that PCC is real by raising awareness through outreach to citizens, schools and workplaces.

The Post-Covid-19 Condition report calls on schools and workplaces to raise awareness of PCC. It reminds us that “studies so far suggest that **between 10-20 percent of people infected with SARS-CoV-2 develop PCC.**”¹

We have seen in the regular briefings from the Office of the Chief Science Officer of Canada to all provincial Ministries of Health (including the Employer's Department of Health and Office of the Chief Medical Officer of Health) that **working age women** and **school staff** are both factors that **increase the risk of PCC**. Unfortunately, that information has not been shared by the Employer, and was only uncovered through **Right to Information** requests filed by citizens. The results of some of those RTI inquiries are [available here](#).

The information void has so far been filled by scientists and citizen groups alike, but their collective reach is limited. Schools, generally, and the Federation, specifically, have a unique opportunity to provide accurate, trusted information to the public through Members.

This is supported by the Principles of the NBTA Professional Conduct and Standards, specifically the requirements that:

- Teachers shall regard as their first obligation the student's physical, social, moral and educational growth.
- Teachers have regard for the safety of their students.
- Teachers recognize the special position of trust and responsibility which they assume in their guidance of young people.²

The Employer's *Occupational Health and Safety Policy* (Finance and Treasury Board, applicable to all individuals employed in all parts of the Public Service), states in relevant part that:

“It is the policy of the provincial government, as employer, to provide and maintain healthful working conditions and procedures which are:

- conducive to the health and safety of employees...”.

It continues:

¹ Office of the Chief Science Officer of Canada, Post-COVID-19 Condition in Canada: What We Know, What We Don't Know and a Framework for Action (2023).

https://science.gc.ca/site/science/sites/default/files/attachments/2023/Post-Covid-Condition_Report-2022.pdf

² New Brunswick Teachers' Association, Professional Conduct and Standards (2011).

<https://www.nbta.ca/professional-conduct-and-standards/>

“The Employees are responsible for conducting themselves to ensure their own health and safety and that of other persons at, in or near their place of employment.”³

17. Scale-up and monitor effective prevention interventions, such as improving ventilation in schools, workplaces and public places as part of a first line of prevention of SARS-CoV2 infection and other respiratory/airborne pathogens.

The New Brunswick Research and Productivity Council was commissioned by the Employer to produce a report (“Recommendations on the Use of Portable Air Filtration Systems in New Brunswick Classrooms: A COVID-19 Focus”, hereafter “the Report”) on school ventilation. That report is [available here](#).

Many of the findings of the report are being ignored by the Employer, and some Members and parents have received communications from the Employer that there is no need for filtration devices in mechanically ventilated schools, citing the Report.

In fact, the report repeatedly recommends the addition of portable filtration in all classrooms. It does stipulate that they should first be considered in spaces without mechanical ventilation - but the Employer has already successfully completed the installation of portable filtration in all unventilated spaces.

Of note, the Report was completed in January 2022, and there has been significant advancement of research and of our collective understanding of the importance of clean air in the interim. Still, the report’s introduction states:

*There is no single measure that acts as a blanket mitigation to the risk of COVID-19 transmission in indoor settings. Guidance from the Public Health Agency of Canada (PHAC) recommends the following public health measures for reducing the risk of COVID-19:*⁴

- *Minimizing the number of persons in one place at the same time*
- *Maintaining a physical distance of at least 2 metres*
- *Using well-constructed, well-fitting face masks*
- *Practising good hand and respiratory hygiene*

In addition to the above measures, proper ventilation can contribute to the reduction of COVID19 transmission indoors. However, it has been emphasized that

³ Finance and Treasury Board, Occupational Health and Safety Policy (n.d.). https://www2.gnb.ca/content/gnb/en/departments/finance/human_resources/content/policies_and_guidelines/health_safety_policy.html

⁴ Public Health Agency of Canada, COVID-19: Guidance on indoor ventilation during the pandemic, (n.d.). <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/guidance-documents/guide-indoor-ventilation-covid-19-pandemic.html> (accessed January 5, 2022).

good ventilation alone is not a substitute for the above-listed measures.
(Rackov & Botelho, 2022)

Other relevant sections of the report include (**emphasis** added for clarity):

- Is there evidence that HEPA filtration units reduce aerosol concentrations in classroom? **Yes**.
- For spaces with adequate mechanical ventilation systems, the use of portable air filters is not recommended. In our opinion, use of HEPA air filtration units **should first be considered** for spaces that do not have any form of integrated mechanical ventilation system.
- Evidence in the literature indicates that mechanical ventilation, natural ventilation, and air filtration are all means to reduce aerosols in indoor spaces **and can be combined as necessary to improve indoor air quality**.^{5 6}
- Similarly, the Government of Ontario has moved to implement portable air filtration units in classrooms with no mechanical ventilation **and in spaces where masks are not worn**, such as full-day kindergarten classrooms (even if these classrooms have mechanical ventilation).⁷
- A study conducted by the United States Centers for Disease Control and Prevention on indoor aerosol concentrations and the effects of masking and portable air purifiers noted:

“The addition of two HEPA air cleaners that met the Environmental Protection Agency (EPA)-recommended clean air delivery rate (CADR) **reduced overall exposure to simulated exhaled aerosol particles by up to 65% without universal masking**. Without the HEPA air cleaners, universal masking reduced the combined mean aerosol concentration by 72%. The combination of the two HEPA air cleaners and universal masking reduced overall exposure by up to 90%. The HEPA air cleaners were most effective when they were close to the aerosol source. These findings suggest that **portable HEPA air cleaners can reduce exposure to SARS-CoV-2 aerosols in indoor environments**, with greater reductions in exposure occurring when used in combination with universal masking.”

- Public Health Agency of Canada on portable air filters:

“When properly used, portable air filtration devices with **high-efficiency particulate air (HEPA) filters have been shown to reduce the concentration of some viruses from the air**. The use of these devices could be considered as an

⁵ J.G. Allen, A.M. Ibrahim, Indoor Air Changes and Potential Implications for SARS-CoV-2 Transmission, JAMA. 325 (2021) 2112. doi:10.1001/jama.2021.5053.

⁶ D. Müller, K. Rewitz, D. Derwein, T.M. Burgholz, M. Schweiker, J. Bardey, et al., Abschätzung des Infektionsrisikos durch aerosolgebundene Viren in belüfteten Räumen Einleitung Bekannte Ausbreitungswege von Viren, (2020). doi:10.18154/RWTH-2020-11340.

⁷ Ontario Ministry of Education, School Ventilation, (2021).

https://efis.fma.csc.gov.on.ca/faab/Memos/B2021/B14_EN.pdf (accessed January 6, 2022).

additional protection in situations where enhancing natural or mechanical ventilation is not possible and when physical distancing can [sic] be achieved.”⁸

- World Health Organization statement on portable air filters from December 23, 2021:

“Air filters do not provide ventilation and do not replace other ventilation methods. However, **they can help to reduce the concentration of the COVID-19 virus in the air, thus reducing the possibility of transmission.** A MERV14/ISO ePM1 70-80% air filter can improve air quality when used in indoor settings.”⁹

- United States Environmental Protection Agency on portable air filters in schools:

“Consider using **portable air cleaners to supplement increased HVAC system ventilation and filtration**, especially in areas where adequate ventilation is difficult to achieve. Directing the airflow so that it does not blow directly from one person to another reduces the potential spread of droplets that may contain infectious viruses.”¹⁰

- United States Centers for Disease Control and Prevention on portable air filters in schools and childcare programs:

“Opening windows, **using portable air cleaners, and improving building-wide filtration** are ways you can increase ventilation in your school or childcare program.”¹¹

- The role of an air purifier equipped with a HEPA filter is to reduce the concentration of aerosol particles in the air. Before and after installation of portable air filtration units in a classroom, the aerosol concentration at multiple locations in the room could be measured with particle sizer/counter equipment to verify effectiveness of the air filters. **For long-term continuous monitoring, indoor air quality monitoring devices can be deployed to track particulate matter.** Other experiments could be designed that employ aerosol generators. Computational models could also be employed.

As mentioned by Minister Holder of the Department of Post-Secondary Education, Training and Labour during the June 7, 2023 debate on Motion 36 in the Legislative Assembly of New Brunswick, and reiterated by Ms. Susan Holt in her address, professional standards organizations are tasked with the

⁸ Public Health Agency of Canada, COVID-19: Guidance on indoor ventilation during the pandemic, (n.d.). <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/guidance-documents/guide-indoor-ventilation-covid-19-pandemic.html> (accessed January 5, 2022).

⁹ World Health Organization, Coronavirus disease (COVID-19): Ventilation and air conditioning, (2021). <https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-covid-19-ventilation-and-air-conditioning> (accessed January 9, 2022).

¹⁰ United States Environmental Protection Agency, Air Cleaners, HVAC Filters, and Coronavirus (COVID-19), (n.d.). <https://www.epa.gov/coronavirus/air-cleaners-hvacfilters-and-coronavirus-covid-19> (accessed January 5, 2022).

¹¹ Centers for Disease Control and Prevention, Ventilation in Schools and Childcare Programs, (2021). <https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/ventilation.html> (accessed January 9, 2021).

development and maintenance of guidelines for ventilation and filtration systems for buildings such as schools.¹² The American Society of Heating, Refrigerating and Air-Conditioning Engineer (ASHRAE) has recently updated the standards for schools, in light of the ongoing research into best practices for ventilation and filtration as a mitigation for airborne illness.

Unfortunately, the standards cited by Minister Holder were from a decade ago. “Design Guidance for Education Facilities: Prioritization for Advanced Indoor Air Quality” (“Guidance”) was published earlier this year, and includes both targets and prioritization checklists for improving air quality in educational settings.¹³ Its stated purpose:

“This document should be used to prioritize decisions related to heating, ventilating, and air-conditioning (HVAC) system design and operation for existing facilities (commissioning, maintenance, improvement, and retrofit projects) and new facilities to improve indoor air quality while limiting energy consumption. IAQ upgrades can improve learning outcomes and mitigate the risk of transmission of airborne pathogens within the educational environment.”

In *Prioritization for Advanced IAQ: Checklists*, ASHRAE lists various tasks and suggests a priority ranking. Included in the section **Very High Priority Tasks**, are:

- **HVAC equipment filtration upgrade:** Currently, many EECD facilities use MERV 8-level filters on recirculated air. Unfortunately, MERV 8 filters are wholly ineffective at removing the airborne particles carrying viruses and bacteria - they are instead designed to reduce dust, which is much larger. Guidance recommends a **minimum upgrade to MERV 13 filters**, with a **goal of MERV 13 level in all areas and MERV 14 where possible**.

High Priority Tasks include:

- **IAQ Sensors with Data Aggregation Platform:** “IAQ sensors distributed throughout the building will provide a baseline IAQ profile of the entire building. The driving force for our industry is energy efficiency, which has been the predominant underlying engineering design dogma. **This must now be balanced with a high level of indoor air quality for the health and welfare of the learners.** The best way to balance IAQ and energy efficiency is **to deploy a suite of IAQ sensors to provide a data-driven approach to proper HVAC operations.**

“The designer must, at a minimum, **evaluate PM2.5/PM1.0/PM0.5, CO2, temperature, TVOCs, and humidity**, which all paint a picture of the optimal air quality for the teaching space. **Baseline should be created in**

¹² Legislative Assembly of New Brunswick, Webcasts: 60th Legislature, 2nd Session, Daily Sitting #43. (2023). <https://www.legnb.ca/en/webcasts/905> (accessed June 12, 2023).

¹³ ASHRAE Technical Committee (TC) 9.7 Educational Facilities, Design Guidance for Education Facilities: Prioritization for Advanced Indoor Air Quality (2023). <https://www.ashrae.org/file%20library/technical%20resources/free%20resources/design-guidance-for-education-facilities.pdf> (Last accessed June 12, 2023).

spaces that reflect a minimum of six months of data collection through both occupied and unoccupied times.”

- Classroom-Level Air Cleaning: Based on a misrepresentation of the findings of the RPC report, the Employer has been denying requests for in-class filtration devices. For Advanced IAQ, Guidance recommends schools “Introduce terminal or portable all-electric HEPA/UV machines in each classroom.” Portable unit specifications include HEPA filters, Clean Air Delivery Rates (CADR) adjustable from 200 - 400 CFM, and noise sound levels under NC 35 (about 45 dB_A, or slightly louder than the hum of a refrigerator). As a comparison to one of the models purchased by the Employer does reach CADR rates of 450 CFM - but at a sound level of 63 db, slightly louder than an air conditioner. (Anecdotal measurements in classrooms with that device installed have surpassed 70 db, or approximately the levels of a washing machine or dishwasher.) Corsi-Rosenthal (CR) Boxes are an inexpensive alternative, with higher CADR rates and lower noise levels than Employer-provided devices, at 1/10th to 1/5th the expense. Despite Minister Carr of the Department of Transportation and Infrastructure (DTI) touting them in his address on Motion 36, they have been banned from schools - often citing DTI policy as justification.
- Staff Training and Documentation Organizational Platform: Current training on IAQ in schools is non-existent. Classroom windows and doors are often closed; rooms with portable filtration devices often have them turned down or off; few, if any, staff are aware of the benefits of measuring and improving air quality - both in terms of health, as well as academic performance.

Guidance states: “A dedicated school system-level program for IAQ should be established. A maintenance and operational sequence must be adopted and strictly followed to ensure pathogen mitigation efforts and general IAQ objectives are maintained. Safety and health of all staff and students should be the fundamental basis for all maintenance schedules. All maintenance procedures, schedules, adjustments, repairs, upgrades, and replacements should be documented to provide transparency for all stakeholders.”

“Similar to water quality testing, an air quality testing and monitoring system should be established. Each jurisdiction should base their IAQ and risk mitigation program on the goals of “good” air quality in their local region. The program profile should account for outdoor contaminants as well as indoor pollutants. The program should establish HVAC upgrades as part of the capital planning effort to build systems to improve the air

quality in the classroom environment. These systems should consider increased ventilation, better air filtration, better distribution of clean air, air cleaners, and continuous monitoring.”

- UV-C / UVGI in Air Handling Equipment: “UVC/UVGI equipment has been shown to be very effective in deactivating viruses and other infectious agents. These systems produce light that may be harmful to occupants, so they should be installed such that they will not affect the occupants whether being installed inside an air handler, in the upper air zone of the room, or in a recirculating configuration.”

For Advanced IAQ, Guidance recommends the installation of UVC/UVGI in recirculated air systems and upper room UVGI in higher volume spaces.

Immediate Actions

1. The Federation should develop, in collaboration with interested and informed parties as necessary, communications for Members on the existence, prevalence, and consequences of Post-Covid-19 Condition. The Federation should further develop, in collaboration with interested and informed parties as necessary, communications for Members on effective measures to reduce the risk of acute Covid-19 infection and Post-Covid-19 Condition - including, but not limited to, airborne transmission and mitigation, and the role of ventilation and filtration. Understanding the current knowledge gap in the general public, and in Membership, these should be simple and straight-forward, with more detailed information available for those so inclined. All resources should be properly referenced, in keeping with the academic standards expected of Members. An example is [available here](#), and included at the end of this document.
2. The Federation should develop, in collaboration with interested and informed parties as necessary, communications for Members on the intersection of information communicated in Action 1 with the NBTA Professional Conduct and Standards, and how best to incorporate an understanding of that intersection into the discussions and modeling behaviours we expect from Members - particularly as it relates to interactions with students.
3. The Federation should lobby the Employer to act on the recommendations contained in Motion 36, and should inform Membership of both the lobbying and the responses. Normalizing conversations about air quality, employer obligations, and our Employer's work to improve air quality in schools is important.
4. The Federation should cause the Employer to immediately increase the use of available mechanical ventilation systems to include all times when schools are occupied. The Federation should further cause the Employer to immediately increase the fresh-air distribution of available mechanical ventilation systems to the currently recommended levels of ASHRAE guidance, or the maximum values current equipment allows. In many cases, this can be achieved through reprogramming and rescheduling without additional infrastructure purchase.

Long-Term Actions

1. The Federation should collect data from Members on acute Covid-19 infection, Post-Covid-19 Condition, and the effects of each on Members' personal and professional lives.
2. The Federation should develop plans or policy, as appropriate, to assist Members in navigating related areas including, but not limited to, medical, employment, workers' compensation, and group benefits as it pertains to acute Covid-19 infection and Post-Covid-19 Condition.
3. The Federation should cause the Employer to update and upgrade ventilation and filtration systems to meet or exceed current ASHRAE guidance for educational facilities. The Federation should further cause the Employer to upgrade systems as guidance changes.
4. The Federation should cause the Employer to implement real-time monitoring and reporting of IAQ in all classrooms in all schools, as has been completed in jurisdictions like [Boston Public Schools](#). This data should be aggregated, analyzed, and used to improve ventilation and filtration where necessary.
5. The Federation should cause the Employer to install portable filtration devices in all occupied spaces in all schools, as supported by the research review contained in "Recommendations on the Use of Portable Air Filtration Systems in New Brunswick Classrooms: A COVID-19 Focus."

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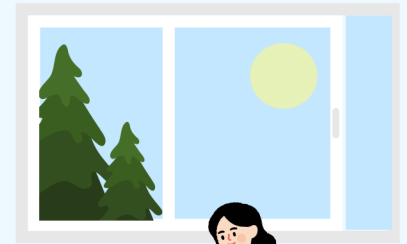
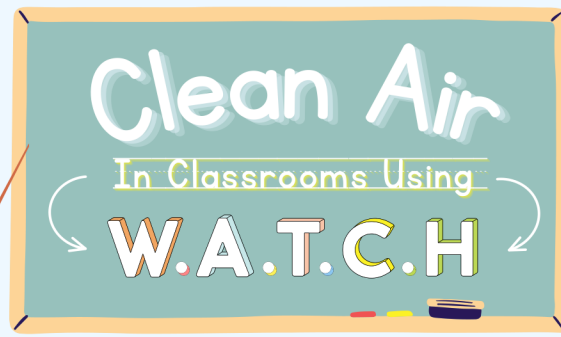
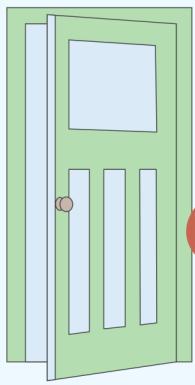
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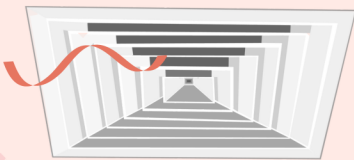
indows

- Open windows as much as possible.
- If it's cold outside, even cracking windows slightly can help.
- Keeping the classroom door open helps circulate the air even more.
- Warm weather? Having 2 windows open while using a fan to blow air out of 1 of the windows is optimal.

A

ir Movement

Check to see if you feel air coming from the diffusers or air vents.



Attach a ribbon to the vent for an easy visual cue that it's working!

T

hermostat

Keep the **FAN** setting **ON** when the room is being **occupied**.



AUTO is **ok** to use when the room is going to be **unoccupied**.

C

O2 Levels



Use a CO2 monitor with a nondispersive infrared (NDIR) sensor

< 600 ppm	Very Good
600 - 800 ppm	Good
800 - 1000 ppm	Acceptable
1000 - 1500 ppm	Poor
> 1500 PPM	Very Poor

* HEPA filters do not change CO2 levels.

H

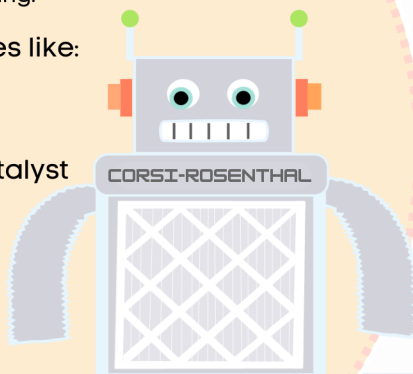
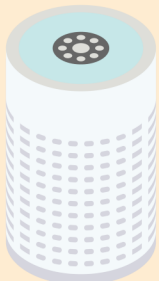
HEPA Filter or Corsi-Rosenthal Box

Use the highest setting.

* Noise permitting.

Disable Features like:

- Ionization
- Plasma
- UV with Catalyst
- Auto



PLACEMENT IS IMPORTANT

- Move away from walls & corners. (0.5 m - 1.5 ft)
- Place as close as you can to the centre of the room.
- Avoid blowing directly at anyone.
- Face away from walls & obstructions, e.g. blowing under a table.
- Raised is better than on the floor.
- Keep away from clean air sources: open windows, air vents & other HEPA filters.
- If you have multiple HEPA filters, space them out evenly.