Toronto Board of Health
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March 17, 2024

To the Toronto Board of Health;

We are a group of concerned citizens who are members of an online group of people from across Toronto and the Greater Toronto Area. The original and on-going purpose of this online group is to share information about how to keep ourselves and our families safe from COVID-19 infection.

COVID-19, caused by the virus SARS-CoV-2, is a serious infectious disease that impacts the whole body, including the nervous system[1], vascular system[2], and immune system[3]; it carries a significant risk of long-term symptoms (Long COVID) and secondary diseases, particularly with each reinfection.[4,5]

By now, it has been well established that COVID-19 is primarily transmitted through inhalation of infectious aerosols that have been exhaled by an infected person; these aerosols remain suspended in the air and concentrate in poorly ventilated indoor spaces.[6] Other infectious diseases such as measles, influenza, and respiratory syncytial virus (RSV) are also known to be transmitted through airborne infectious aerosols. However, Toronto Public Health guidelines have not evolved to keep up with the reality of airborne transmission of infectious diseases, and Toronto Public Health has not clearly communicated the seriousness of COVID-19 infection to the people of Toronto.

We have watched with dismay as protective public health measures have been gradually eroded over the past two years, to the point that we feel that it is important to gather and advocate for changes at Toronto Public Health.

[Section 1 redacted]

2. Identified issues in Toronto Public Health guidelines

(i) Failure to fulfill mandate as the public health unit of the City of Toronto

The mandate of Toronto Public Health includes the following[7]:

1) *Protect and improve health of the people of Toronto, by using science, evidence and best practices*
2) *Help promote the factors that improve health and prevent causes of illness and injuries*
3) *Monitor data about infections and diseases, and use this information to respond to outbreaks and other public health emergencies*

Over the past four years, we believe that Toronto Public Health (TPH) has failed in its mandate. TPH guidelines have been and continue to be inadequate for reducing the risk of airborne disease transmission. In particular, we note the following:

(1) Failure to protect and improve health of the people of Toronto:

- Making masks optional in high-risk settings such as health care facilities: worn properly, masks protect both the wearer and people surrounding the wearer. By making them optional, the vast majority of people do not wear them.
- Lack of clear, effective communication about the seriousness of COVID-19, the significant risk of chronic symptoms (Long COVID) and secondary diseases following COVID-19 infection, particularly with each reinfection[5,8]; the prevalence of asymptomatic transmission, estimated to be about 40.5% of infections.[9]
- Providing isolation guidelines upon testing positive for COVID-19 that allow people to leave isolation 24 hours after they have no fever and believe their symptoms are "improving"; the provided isolation guidelines are ineffective for controlling and reducing community transmission.[10]

(2) Failure to promote the factors that improve health

- Providing guidelines that are inherently ableist and exclude those from vulnerable sectors and those who wish to avoid infection from accessing services and public indoor spaces: examples include making masks optional in health care settings; weakening isolation guidelines to the point that most people return to work/school while still infectious.
- Lack of communication about the nature of airborne disease transmission and how to reduce the risk of transmission with multiple layers of protection.
- Lack of communication about masks: different types of masks, how to wear them properly, and why they are an effective form of personal protection.

(3) Failure to respond to outbreaks and public health emergencies

- Lack of timely communication of outbreaks and failure to respond: an example is that schools no longer have to report outbreaks in classrooms or positive cases within the school.

(ii) Lack of policies and guidelines that are effective for controlling transmission of airborne infectious diseases

Like clean water, clean air is essential for health. The COVID-19 pandemic has shown us just how poor our indoor air quality is, especially in public shared spaces. The pandemic has highlighted inequities in access to clean air, access to tools to mitigate risk, and access to health care.

The vast majority of public indoor spaces in Toronto were not built with universal design principles in mind. Universal design considers the varied abilities of users, in order to create products and environments that may be accessed and used by people with a range of abilities, making them as accessible as possible.[11]

Indoor air quality is an accessibility issue: vulnerable persons and those people who wish to protect themselves from airborne diseases cannot access an indoor space without knowing the risks associated with that space. A well-fitted respirator mask protects by filtering infectious aerosols from inhaled air, as well as filtering exhaled air of potentially infectious aerosols at its source. Because TPH has not promoted the use of masks as a protective layer, most of the public do not wear masks. In the absence of widespread use of masks, any indoor air quality standards, or information on the state of air quality in a given space, we can no longer safely access public indoor spaces without risking exposure to airborne infectious disease, and other indoor air pollutants. This barrier to access is particularly harmful to people from vulnerable sectors, such as those with chronic health conditions, and those who are immune compromised. If indoor air quality is improved for those who need it the most, it will benefit all citizens of Toronto.

Indoor air quality is also an equity issue: poor indoor air quality is associated with higher rates of disease and poor health, and buildings with poor air quality are more likely to be found in communities with lower socioeconomic status.[12] Newer buildings have mechanical ventilation which allows for control of ventilation and filtration of indoor air, while buildings built before the introduction of mechanical ventilation became standard will typically rely on natural/passive ventilation (passive flow of air between indoors and outside). It is not surprising that older buildings which lack mechanical ventilation are more likely to be found in lower income neighbourhoods.

The current building code adheres to ventilation standards provided in ASHRAE* Standard 62.1.[13] ASHRAE has also stated adequacy of ventilation in a room can be monitored with indoor carbon dioxide concentration, and CO_2 monitoring is helpful as part of a strategy to ensure acceptable indoor air quality.[14,15] If a building is in compliance with ASHRAE Standard 62.1, it is possible to achieve an indoor CO_2 concentration of approximately 1000 ppm‡.[14-16]

Adequate ventilation through the supply of outdoor air helps to dilute air pollutants in an indoor space. The City of Toronto has indoor air policies in place for its employees; for those employees who work in an office-type environment, the recommended guideline for indoor CO_2 concentration is "< 1000 ppm or <700 ppm above outdoor carbon dioxide concentration".[7] Given that this indoor air quality policy applies to all City-owned or leased buildings or parts of buildings regularly occupied by City staff in offices or other non-industrial work spaces, why are the relevant portions of this indoor air quality policy, including the limit for CO_2 concentration, not included in Toronto Public Health guidelines?

* ASHRAE = American Society of Heating, Refrigerating and Air-Conditioning Engineers; ppm = parts per million.

Toronto-based organizations and businesses, including Toronto District School Board and the Toronto Transit Commission, follow Toronto Public Health guidelines. These guidelines are inadequate for control of airborne infectious diseases: these guidelines do not include any mention of indoor air quality standards and guidelines on how to improve indoor air quality to reduce the risk of airborne disease transmission. At the same time, TPH guidelines have not promoted the use of multiple layers of protection, particularly in making masks optional, and encouraging individuals to assess their own risk. This has led to unmitigated spread of airborne diseases including COVID-19, RSV, Group A streptococcus, influenza, and potentially measles.

Schools and daycares are known to be major drivers of community transmission of COVID-19; a U.S. study found that 70% of household viral transmission began with a child, who likely brought the infection home from school or daycare.[16] Most TDSB buildings were built decades ago, with a number of them lacking mechanical ventilation. Data published in 2015 showed that many Toronto classrooms have poor ventilation, with 43% of schools tested showing CO^2 levels over 1000 ppm.[17] Currently, there are no enforceable regulations that define acceptable indoor air quality, and TPH guidelines do not include indoor air quality standards; consequently, there is no way to ensure that indoor air quality in schools is acceptable.

Members of our group have recorded CO_2 in classrooms significantly higher than 1000 ppm, indicating inadequate ventilation[7,12-14]; examples are provided in Appendix B. One of our members has a child whose classroom is in a portable unit that does not have mechanical ventilation: CO_2 levels well above 1000 ppm and up to 3000 ppm, are routinely recorded in the classroom. Another member is a parent of a student who spends most of the day in a classroom with mechanical ventilation, but CO_2 is above 1000 ppm for most of the school day, peaking at around 1500 ppm before 3:00 p.m. Besides an increased risk of airborne disease transmission, levels of CO_2 over 1000 ppm are known to have a negative impact on cognition and learning outcomes.[18,19]

3. Key takeaways

(i) What are the top priorities for Toronto Public Health for 2024-2028?

The COVID-19 pandemic has exposed significant health inequities in terms of access to clean indoor air and health care information. Toronto Public Health must fulfill their mandate to promote the health of the whole population and reduce health inequities.

As noted above, current building code adheres to ASHRAE Standard 62.1, which is the bare minimum standard for acceptable air quality, but Standard 62.1 is not adequate for control of airborne infectious diseases. ASHRAE Standard 241 (2023) establishes minimum requirements for reducing the risk of disease transmission from exposure to infectious aerosols in buildings; by adhering to this standard, building owners and operators can effectively reduce exposure to pathogens including SARS-CoV-2 and other disease-causing agents.[20,21] Toronto Public Health can promote and accelerate adoption of ASHRAE Standard 241 by including indoor air quality standards in its guidelines that would require building owners and operators to retrofit or upgrade their air handling equipment to meet these standards.

We believe the top priorities for Toronto Public Health (TPH) for 2024-2028 should be:

- Make Toronto's public shared indoor spaces accessible to all with the following:
    - Implementation of a Clean Indoor Air policy that draws from the existing indoor air quality policy for City of Toronto employees[7], the recommendations of ASHRAE[14-16] and the Ontario Society of Professional Engineers[22]; wherein said policy further includes inspection and verification of indoor air quality, and public reporting of collected indoor air quality data; and said policy may be added on to existing TPH inspection programs, including DineSafe, BodySafe, and WaterSafe.
    - Work with relevant government agencies to accelerate adoption of ASHRAE Standard 241, "Control of Infectious Aerosols" into building operation policies; this may include adding relevant portions of ASHRAE Standard 241 to the Clean Indoor Air Policy.
    - Required masks in health care settings and other settings that are considered to be high risk for vulnerable sectors.
- Major public education campaigns that employ innovative communications strategies to ensure the widest reach possible to inform the public on:
    - Indoor air quality;
    - Airborne disease transmission and the use of multiple layers of protection to protect oneself, including masks and appropriate use of rapid tests;
    - COVID-19 and Long COVID.

(ii) How can Toronto Public Health make the most significant contribution to the population health of Toronto in the next four years?

We ask that Toronto Public Health provide:

- Public education on the nature of airborne disease transmission and the use of multiple layers of protection to reduce disease transmission;
- Clear communication of the seriousness of COVID-19 infection;
- Up-to-date and timely information on outbreaks of infectious disease, including COVID-19, that follows the precautionary principle.

In particular, we ask that Toronto Public Health treat COVID-19 as the serious infectious disease that it is, and resume reporting cases of COVID-19 in schools and daycares, as required by the Health Protection and Promotion Act, Ontario Regulations 559/91.[23] Besides helping to reduce community transmission levels of airborne infectious diseases, this measure would help the public understand that COVID-19 is just as serious as other reportable diseases such as measles.

At the same time, we ask that Toronto Public Health create enforceable policies for schools and daycares that are effective for protecting students and staff from diseases that are primarily transmitted through the air, including:

- Develop and implement a Clean Indoor Air policy for education facilities, based on the existing indoor air quality policy for City of Toronto employees[7], the recommendations of ASHRAE including the latest Design Guidance for Educational Facilities[14-16,24], and the Ontario Society of Professional Engineers[25]; wherein said policy includes CO_2 sensors in each ventilation zone, an upper limit of 1000 ppm for indoor CO_2 in each ventilation zone, and rules on proper use of standalone air purifiers.
- Education for staff and parents/caregivers on: airborne disease transmission, indoor air quality and how to improve it, COVID-19, use of masks, appropriate use of rapid tests (e.g., to exit isolation after infection).

Other jurisdictions have already implemented CO_2 monitoring in classrooms, and public reporting of CO_2 data, including the city of Boston (Boston Public Schools[26]), France[27], and New Zealand[28]. Japan has installed CO_2 monitors in a wide variety of public indoor spaces, with real-time data displayed to the public.[29] Examples of publicly available CO_2 data are provided in Appendix C. This is an opportunity for Toronto to join world leaders in improving and monitoring indoor air quality.

(iii) How can Toronto Public Health enhance its engagement with and better serve the diverse needs of our communities over the next four years?

We urge Toronto Public Health to consider new methods to engage with the public and capture their attention. Although there is information on COVID-19 found on the City of Toronto website, it is not easy to find and most people do not bother to look for it. There have never been any major attempts to educate and inform the public about the seriousness of COVID-19 infection, the nature of airborne disease transmission, and the use of multiple layers of protection to reduce risk of transmission. With public health apparently silent on these issues, the vast majority of Torontonians believe that vaccinations could be relied upon to provide full protection against infection, with many now not even regarding vaccinations as useful at all; that hand washing and coughing in one's elbow are helpful measures; and that COVID-19 is a simple respiratory infection that carries minimal risk. If Toronto Public Health is to be successful in protecting the health of the people of this city, then it must seek to address these misconceptions with major public education campaigns.

Possible methods of capturing the public's attention could include multiple communications strategies aimed at various audiences, and using physical platforms outside of social media, such as billboards; signage in public transit stations, community centres and libraries; and mail flyers.

4. Proposed items for Toronto Public Health's 2024-2028 Strategic Plan

(a) Summary of priority items for Toronto Public Health's 2024-2028 Strategic Plan

Upon reviewing TPH's Strategic Plan 2015-2019[30], we have noted a number of goals in the Priority Directions have not been met, particularly with regards to community engagement, inclusion, and health equity. To fulfil these unmet goals, we propose the following additions for the 2024-2028 Strategic Plan:

Priority Direction 1: Serve the public health needs of Toronto's diverse communities

- Protect and promote health by implementing clean indoor air quality standards and policies.
- Ensure public shared indoor spaces are accessible with an enforceable Clean Indoor Air policy.
- Act upon key public health interventions to protect the population from airborne infectious diseases including COVID-19.

Priority Direction 2: Champion healthy public policy

- Promote universally accessible, safe, and healthy indoor environments with clean indoor air.
- Promote policy changes to make Toronto's schools and daycares safe and healthy environments for children, with policies that reduce transmission of infectious diseases that are primarily transmitted through the air.
- Ensure masks are required in health care settings to protect the needs of vulnerable populations.

Priority Direction 3: Anticipate and respond to emerging public health threats

- When advising the public of emerging infectious diseases, employ the precautionary principle, wherein the disease may be presumed to transmit through the air; provide the public with the appropriate tools and information to protect themselves.
- Enhance population readiness with effective public education that employs innovative communications strategies to increase audience reach.

(b) Detailed suggestions

We urge Toronto Public Health to implement policies that include the following measures:

(1) Ensuring accessibility of public shared indoor spaces

- Require masks to be worn in health care settings.
- Develop and implement a Clean Indoor Air policy that is effective for controlling infectious aerosols, as per the latest recommendations by ASHRAE[14-16] and the Ontario Society of Professional Engineers[23]; wherein said policy includes the following elements:
    - Defined air quality standards, including an upper limit on indoor CO_2 concentration of "< 1000 ppm or <700 ppm above outdoor carbon dioxide concentration"[7], wherein this limit can be updated as needed, according to the latest recommendations from ASHRAE and the Ontario Society of Professional Engineers;
    - An action plan for increasing fresh air supply and air cleaning when CO_2 concentration approaches and exceeds 1000 ppm;
    - Transparency: inspection and verification of indoor air quality; publicly reporting collected indoor air quality data for each public shared indoor space;
    - Include relevant portions of ASHRAE Standard 241[22] to accelerate its adoption into building operation policies;
    - For education facilities, the latest version of ASHRAE Design Guidance for Education Facilities[25] should be referred to.

(2) Public education

- Communications campaigns to educate and inform all citizens of Toronto of the following:
    - The importance of good indoor air quality and methods to improve air quality in shared indoor spaces, including a public education campaign on indoor air quality, how to improve air quality with ventilation and filtration tools, and how carbon dioxide (CO_2) monitoring works;
    - Airborne transmission of infectious diseases (e.g., COVID-19, measles), and ways to mitigate the risk of infection, including how to improve indoor air quality, and the appropriate use of masks for protection;
    - Clear, effective communication regarding COVID-19, including:
        - COVID-19 is a serious infection that impacts the entire body, particularly the brain and nervous system, the immune system, and vascular system.[1,2,3,31,32,33]
        - The increased risk of secondary disorders (including neurocognitive disorders and neurodegenerative diseases, cardiovascular disease, immune dysfunction and deficiency, and diabetes) and associated chronic sequelae following COVID-19 infection, particularly with each re-infection.[5]

- A COVID-19 infection does not provide durable immunity and unless protective measures are taken, including public health interventions, there is a significant risk of re-infection. Multiple layers of protection are necessary as current vaccines do not provide complete protection against infection, re-infection, and Long COVID.[34]
- Up-to-date information on Long COVID, including symptoms to be aware of, and secondary diseases/disorders associated with prior COVID-19 infection.[35,36]

5. Concluding remarks

Like clean water, clean air is essential for good health. Improving indoor air quality provides countless benefits, not just in terms of reducing the burden of illness in our communities, but also boosting of overall health, productivity and academic performance. Clean indoor air helps make Toronto's public facilities accessible environments for everyone, particularly those with chronic health conditions such as cancer, immune disorders, and asthma.

We realize that it will take time to install the necessary equipment to clean indoor air and monitor its quality. In the meantime, we ask you to make masks required in health care settings, and to promote the use of well-fitted masks as protective equipment. We also ask that you promote the use of multiple layers of protection against airborne infectious diseases.

We urge the Toronto Board of Health to invest in the health of the people of Toronto by implementing policies and guidelines that are effective in protecting the population against transmission of airborne infectious diseases, and that make public shared indoor spaces accessible to all. Toronto Public Health is the largest public health unit in Ontario: when other regions of the province see TPH embracing these measures, they will feel compelled and supported to do so, thus leading to a much healthier population in Ontario. This is an opportunity for the City of Toronto to lead the way and show the rest of the province how we can protect our citizens.

Yours sincerely,

[signatures redacted]

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