

Health and Safety Checklist for University Re-opening

If a University Administration wishes to schedule significant in-person activities while COVID-19 remains a public health concern, a number of conditions must be met before staff and students can have confidence that their campus is safe enough for in-person teaching, learning, and other work. The following is a non-exhaustive list of steps that a University Administration must take, *at a minimum*, to reduce the risks associated with university re-openings. These steps, once implemented, will make universities safer for students, staff, and the broader community over the long term.

In terms of return-to-campus *planning*, the University Administration must:

- 1. Strongly encourage and support everyone in the University community to get vaccinated while recognizing that vaccines alone are insufficient to protect the community from COVID-19 and must be used in conjunction with several other mitigation strategies as set out below.**
- 2. Design and prepare re-opening plans for all occupied spaces aimed at addressing the reality of airborne transmission of COVID-19 through respiratory particles (“aerosols”) that can travel significant distances (i.e., farther than two-meters) and remain suspended in the air for long periods of time.**
- 3. Proactively and transparently share information with Joint Health and Safety Committees, and campus unions, faculty associations, and other employee representatives, so that the sufficiency and efficacy of the safety precautions that are in place can be assessed.** This information should include, at a minimum:
 - a. The filtration level being achieved in each building;
 - b. The ASHRAE ventilation standards (e.g., 62.1-2007) that are being met in each occupied space in the building;
 - c. Records regarding the measurement of ventilation rates and equivalent air exchange rates (“ACHeq”) in occupied areas of buildings; and,
 - d. Tests results for Legionella, as well as information on how issues with building water systems are being resolved (i.e., “remediated”).

The following is a non-exhaustive list of steps the University Administration must take with respect to *Ventilation (in keeping with 3 a.-c. above)*.

- 4. For every building that will be occupied, including classrooms, hallways, offices, entry ways, common spaces, stairwells, and washrooms, the University Administration must:**
 - a. **Assess the sufficiency of ventilation and filtration, including:**
 - i. Ensuring that HVAC systems are operating properly; and
 - ii. Measuring ventilation and/or respiratory particle removal rates in each occupied area to a documented particular target level (i.e., equivalent air exchanges per hour (“ACHeq”), Litres per second per square meter per person)

This document was compiled by public health experts at the Dalla Lana School of Public Health who serve on the UTFA side of the U of T Central Health and Safety Committee.

- b. **Significantly improve the filtration and ventilation in each building**, including:
 - i. Upgrading all air filters (e.g., to MERV-13) wherever systems can accommodate them;
 - ii. Modifying all ventilation systems to increase ventilation rates and percentage of outdoor air circulating within the system (e.g., by opening dampers to reduce recirculation of air, disabling demand-controlled ventilation so outdoor air intake is maximized, etc.);
 - iii. After spaces have been occupied or cleaned/disinfected, flushing three room volumes of air based on the measured ACH equivalent for that space¹ before those same spaces are re-occupied; and,
 - iv. Taking additional steps (e.g., adding appropriately sized, located, and maintained portable or wall-mounted air filters) in spaces where target ventilation rates cannot be achieved.

5. Monitor the amount of outdoor air on an ongoing basis in order to verify that targets for ventilation and filtration are being reached in recognition of the fact that HVAC systems often fail to achieve designed performance². Monitoring should include:

- a. Measuring pressure drop at air filter banks to confirm that filters are properly sealed and/or that air flows are consistent with laboratory tests for efficiency;
- b. Documenting and sealing gaps around air filters, as air moves through these gaps and does not get filtered (“bypass”);
- c. Consider using CO₂ monitoring devices to monitor and document the amount of outdoor air that is being supplied to occupied buildings areas;
- d. Periodically measure and document the supply air flow rates to every occupied space; and,
- e. Adjusting and documenting calculations of equivalent air exchange rates to reflect issues with filter efficiency that affect the ‘real-world’ performance including filter bypass and charge media efficiency degradation (e.g., use in-situ efficiency results from ISO 29462:2013 and or field measurements of ACH equivalents).

6. Adjust HVAC systems in response to results that are received through ongoing monitoring. This should include:

- a. Installing gaskets around air filters to eliminate gaps around the filters (i.e., “filter bypass”); and
- b. Addressing filter degradation (i.e., deterioration of filters which occurs over time, and which reduces the effectiveness of air filtration).

¹ That is, for at least 30 minutes (at verified 6 ACH equivalents, longer at lower ACH eq).

² This is caused by a variety of issues, including due to damper position issues, humidification, filter loading, occluded outdoor air vents, etc.

7. **Conduct, document, and publish a *building-level assessment of each occupied building*, (including an assessment of stairwells, building entries and exits, corridors, bathrooms, elevator lobbies and cabinets, study areas, labs, libraries, staff and student offices) and areas where large numbers of students may congregate (including classrooms and eating areas), to ensure planned occupancy limits are not exceeded and mitigation approaches (e.g., planned physical distancing and masking) are functioning appropriately as planned.**
8. **Where issues are identified with the above mitigation approaches, ascertain further ways to mitigate transmission of COVID-19, which should include:**
 - a. Additional layers of protection in higher-risk spaces where users will be temporarily unmasked (e.g., eating areas, bathrooms) or where physical distancing is impossible (e.g., classrooms with single stairwells/corridors); and,
 - b. Taking additional ventilation measures (e.g., the addition of appropriately sized, located, and maintained portable or wall-mounted air filters).

The following is a non-exhaustive list of steps the University must take with respect to *Water Systems (consistent with 3d above)*. The University Administration must:

9. **Prevent the growth of Legionella bacteria by implementing (and documenting) a process for regularly flushing domestic water systems.**
10. **Implement a system of testing for Legionella in the potable water distribution systems as well as non-potable water in HVAC systems, fountains, etc. of University buildings, which should include:**
 - a. An appropriate testing methodology, and guidelines to interpret test results, including swabbing distribution points (faucet aerators, shower heads, etc.), HVAC fan coils and sumps, and other high-risk points for biofilm development;
 - b. Collection and analysis of bulk water samples including potable water (both hot and cold) and non-potable water (fountains, sumps, etc.) where appropriate;
 - c. Implementation of a risk-prioritized testing schedule to ensure the effectiveness of control strategies; and,
 - d. Systematic testing of the temperature of cold-water distribution points to ensure cold water systems are not susceptible to Legionella growth.
11. **Implement a system for addressing positive test results, including:**
 - a. Taking appropriate mitigation steps (e.g., super heating or hyperchlorination of potable water systems, biocide use and cleaning of non-potable systems) to remediate areas showing Legionella contamination or for those that are high risk of recurrent problems
 - b. Setting specific guidelines for use in identifying the appropriate remediation measures in different circumstances (e.g., when is super-heating appropriate);

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- c. Implementing a process to identify issues which may not be isolated, and may be evidence of building-wide issues with a building's water systems (e.g., repeated positive test results for Legionella from multiple different locations in a single building); and,
- d. Identifying an achievable schedule for "retesting" after a positive test results are received (e.g., after 36-hours or 48-hours) to confirm that issues have been addressed.

12. Implement clear protocols (e.g., around use of Personal Protective Equipment, where and to the extent warranted) for workers who will be conducting sampling and maintenance, given the high level of risk involved in Legionella sampling.

13. Implement a prompt, thorough, and transparent communication framework for promptly advising building occupants on Legionella testing, and test results, mitigation plans, and risk prioritization.

The following is a non-exhaustive list of steps the University Administration must take with respect to the following additional issues:

Masks

14. Implement a policy requiring the wearing of multi-layer, well-fitting non-medical masks in all University buildings at all times except while eating or drinking in safe designated areas. The policy must include appropriate mechanisms for ensuring compliance that does not generate conflict between faculty, staff, and students.

Compliance

15. Provide transparent information on how physical distancing, occupancy limits, disinfection schedules, and traffic flow will be monitored and upheld. Compliance with these protocols requires the respectful engagement of all members of the University community.

Contact Tracing and Notification of Outbreaks

16. Notify all building occupants (including students and staff who are entering a building to eat or study) of outbreaks and positive cases of COVID-19 within buildings containing work or study spaces.