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How a COVID-19 ‘blind spot’ put Ontario’s essential workplaces at risk

By [Sara Mojtahedzadeh](#) Work and Wealth Reporter
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Provincial COVID-19 public health guidelines that downplay the risk of aerosol transmission are putting Ontario’s essential workers in jeopardy and sidelining critically important workplace protections.

According to a dozen epidemiologists, scientists, engineers, occupational hygienists, health and safety experts, and Ministry of Labour inspectors interviewed by the Star, the guidelines contain a significant “blind spot” hampering efforts to contain the virus and prevent outbreaks.

On May 7, the U.S. Centers for Disease Control and Prevention recognized aerosol transmission as one of three “principal ways” COVID spreads. While Ontario’s guidance acknowledges aerosol spread can occur in “favourable conditions,” critics say the precautions mandated by the province do not adequately reflect the risks of shared air.

“If you don’t understand the mechanism that’s driving the epidemic, you can’t react to it appropriately,” said Dr. David Fisman, an epidemiologist and professor at the University of Toronto. “It’s created disastrous messaging around how you prevent this in workplaces.”

In a statement to the Star, a Ministry of Health spokesperson said Ontario “acknowledged aerosol transmission” in crowded workplaces “many months ago.”

“The CDC update is not different from what is already in our current guidance,” the statement said. “We have stated before that in

situations with poor ventilation, crowding, poor masking and high risk activities (e.g. singing, exercise), aerosols spread beyond” six feet.

But Ontario’s precautions continue to focus primarily on droplet contact measures: masks rather than respirators, six feet of distancing, and sanitizing.

These measures are not strong enough to protect essential workers from airborne risks, said the Occupational Hygiene Association of Ontario, the professional body representing workplace illness prevention experts, in a recent letter to the labour minister.

The letter urges more focus on measures like N95 respirators and ventilation.

“That’s one of the blind spots in inspections right now,” said Stéphane Bilodeau, a mechanical engineer who has taught ventilation at the University of Sherbrooke for two decades.

The labour ministry has not issued any health and safety orders or tickets for ventilation in workplaces this year, according to data requested by the Star. In one massive January outbreak at a Waterloo-area meat packer — where safety measures were described as the “gold standard” — ventilation is mentioned just once in 300 pages of inspection records.

Without appropriate provincial guidance, health and safety inspectors said they have few tools for stronger enforcement. Speaking anonymously for fear of reprisal, two inspectors expressed frustration at their inability to apply the “precautionary principle” — the idea that when it comes to worker safety, it is better to be safe than sorry.

Almost 23,500 Ontario workers have contracted COVID-19 on the job; 46 have died.

While vaccines are flowing in, it remains crucial to understand why and how the virus ravaged so many workplaces, said Fisman. These efforts can reduce case loads — and help fight future epidemics.

“This is a very old pathogen,” he said. “It’s going to be with us for a while.”

A flawed foundation

Lydia Bourouiba’s interest in infectious disease transmission began in the wake of the SARS epidemic, where she applied her studies in mathematics, fluid dynamics and epidemiology at the Centre for Disease Modelling in Toronto.

In doing so, she arrived at a startling realization: our understanding of how airborne diseases spread hadn’t changed much in about a century.

“It’s something we really need to tackle because it’s a recurring issue,” said Bourouiba, now a professor and director of The Fluid Dynamics of Disease Transmission Laboratory at MIT. “There’s a lot of inertia.”

Based largely on old studies of tuberculosis, respiratory illnesses have long been viewed as spreading through either large droplets, which plummet like cannonballs, or through small aerosols that disperse and evaporate quickly.

This “false debate” initially formed the foundation of global COVID-19 response, said Bourouiba, leading to a narrow focus on droplet contact over other transmission routes.

But Bourouiba’s research showed breathing, coughing and sneezing creates “turbulent” clouds containing droplets on a continuum of sizes. Propelled by air currents created by exhalations, these clouds could travel up to 27 feet as “concentrated and sheltered little packages” that took time to dilute.

The implications are that additional tools are needed: measures like Plexiglas barriers may not help prevent a COVID outbreak; even six feet of distance may not always be sufficient in crowded, enclosed spaces where better ventilation and masking are crucial.

While Ontario's guidance now acknowledges the "historical dichotomy" of small and large droplets is "likely imprecise," the health ministry said in a statement that the evidence still "strongly supports that in hospitals, personal protective equipment for droplet/contact spread is effective."

Currently, N95s are only mandated during aerosol-generating procedures or if a health worker deems it necessary during a point-of-care risk assessment.

A health ministry spokesperson said its guidance "recognizes the need for adequate ventilation" but said the ministry "does not comment specifically on requirements for ventilation" because that is "the responsibility of Infrastructure Ontario."

Infrastructure Ontario said it "does not set provincial ventilation standards" and referred the Star to the labour ministry.

The gold standard

As Ontario's second largest pork producer, Conestoga Meats is considered an essential business — and is one of the largest food processors in the Waterloo area.

Overall, it's a fast-paced, low-wage industry where work is typically done in close quarters, said Jason Foster, an occupational health and safety expert and Athabasca University professor.

Nonetheless, Conestoga Meats had "really good precautions in place" to mitigate COVID outbreaks, according to a December site visit from a public health inspector in response to a "cascading" caseload. In inspection and case management records obtained through a Freedom of Information request, Conestoga president Arnold Drung said a labour ministry inspector described the precautions as the "gold standard" in safety.

By January, 132 workers had tested positive in the plant's second outbreak of the pandemic.

Precautions recommended, adopted and documented by health and labour inspectors included daily temperature checks and screening at the entrance, staggered breaks, and safety messaging in eight languages. They also included extensive droplet precautions: daily deep cleaning, six feet of distance where possible, Plexiglas between work stations, three-ply surgical masks, and goggles.

In 300 pages of documentation, ventilation is mentioned once.

“Maintenance has changed ventilation cycles to increase air exchange,” says a January field visit report from a labour inspector.

In a statement, Conestoga Meats said it invested \$11 million in COVID response measures, and has done “everything possible to comply” with evolving requirements. The company said its “own extensive contract tracing has shown that the vast majority of cases can be directly linked to community spread and personal circumstances.”

“One would expect that with workplace spread, there would be clusters of infection on certain production lines or in certain cohorts. This has not occurred. Linkages are stronger to family or living arrangements and external activities.”

Conestoga Meats also said it already had significant air filtration systems in place, which it enhanced late last year. It said it maintained a ventilation standard of Minimum Efficiency Reporting Value (MERV) 8 and “up to MERV 13 where required.”

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Global standards-setting body ASHRAE recommends MERV 13 filters to address COVID. At this grade, a ventilation system would efficiently filter the majority of microscopic air particles. MERV 8 removes only a fraction.

Assessing the efficacy of these systems should be a critical part of Ontario’s infection control in workplaces, said Bilodeau.

“They’re forgetting a big, big chunk of the measures,” he said.
“Because they’ve dropped one of the major transmission vectors.”

Sidelined

From the pandemic’s outset, occupational health and safety experts urged the province to consider the possibility of aerosol transmission and apply the precautionary principle.

But in interviews, two health and safety inspectors who didn’t want their names published for fear of reprisal said they feel unable to apply this tenet.

Instead, inspectors said they felt the labour ministry had been sidelined in the pandemic, as it had during SARS — a crucial failing, according to a provincial investigation of the 2003 epidemic.

One inspector felt responsibility for worker protections had been “abdicated.” To another inspector, the response had been too reactive and focused on keeping businesses open, rather than penalizing repeated non-compliance.

While some inspectors sounded the alarm about ventilation and possible airborne transmission, the guidance remained centred on droplet contact.

These tensions are evident in four school inspection reports reviewed by the Star where workers complained of ventilation issues. Even where inspectors brought in occupational hygienists to assess air quality, the reports contain almost identical communication about health authorities’ COVID advice: transmission occurs primarily through droplet contact. No orders were issued during the inspections.

“Ventilation systems can be very complex,” says internal guidance on school ventilation issued to ministry inspectors and obtained by the Star. “Therefore, the issuance of orders on the performance of these systems must be carefully considered.”

In a statement, ministry spokesperson Kalem McSween said the precautionary principle is not “referenced or defined” in workplace safety laws. The province has developed sector-specific safety guidance for COVID-19, he added. The Occupational Health and Safety Act (OSHA) does contain ventilation regulations for a number of sectors, and employers are required to maintain ventilation systems in good condition.

From January to the end of April, there were no COVID-related orders or tickets issued for ventilation, according to data provided to the Star.

Asked why, the ministry said inspectors “may address concerns related to ventilation by issuing orders under the general duty clauses” in OSHA.

The Star asked for a breakdown of enforcement efforts in warehousing, manufacturing and food processing, where ventilation is often poor and many COVID cases have occurred.

Of the 450 fines between January and April, 45 were issued in those sectors — primarily for inadequate masking, physical distancing, screening, and disinfecting. The bulk of the ministry’s fines to date have been issued in retail.

The pandemic’s third wave has battered essential workplaces, “in spite of the increased enforcements and inspections,” notes the April letter sent to the labour minister by the Occupational Hygiene Association of Ontario. That suggests new variants are “overwhelming” current precautions.

Based on the latest scientific evidence, the letter says two metres’ distance with masking “may not be sufficient if ventilation is poor or unknown indoors.” Crucially, the ministry should be “requiring employers to at least investigate improved ventilation controls and implement such measures.” Where ventilation can’t be improved, N95 masks should be distributed, the letter says.

While the early stages of the pandemic suffered from genuine N95 shortages, Fisman said the province’s response has seen “the tail

wagging the dog, where the science has to be shoehorned into what the resources are.”

“But if you want to protect people, you have to start off by acknowledging the realities of how this is transmitted.”

Opening the toolbox

Barely any buildings in Ontario have ventilation systems operating at the level recommended to combat COVID-19, said occupational hygienist and engineer Paul Bozek, who is also a U of T professor and past president of OHAO.

Ventilation systems in most facilities, including factories and warehouses, operate with MERV 8 filters, which don't aggressively remove microscopic particles. Typically, buildings operate with as little as 15 per cent outdoor air intake, which in normal times would achieve decent air quality.

But some workplaces are particularly challenging. Food processing plants must limit outdoor air flow to maintain refrigeration temperatures; schools are “typically older buildings that ... don't have much ventilation at all,” said Bilodeau.

In March, labour ministry inspectors responded to a complaint at St. Anne Catholic Elementary School in London about air quality in two portables. The school had experienced a February outbreak.

According to the field visit report obtained by the Star, the portables both had air handling units, but their specifications were “not known at the time of inspection,” the report says.

Tests revealed CO₂ levels of up to 1,270 parts per million or higher, almost double the recommended amount, indicating insufficient outdoor air supply. No orders were issued.

The problem was caused by “human error,” said London Catholic District School Board communications officer Mark Adkinson. The portables and ventilation units were brought in that year, he said, and

the custodian had not realized a dirty filter needed replacing. It got fixed the day after the ministry visit.

Focusing on preventing these kinds of errors should be “no-brainer when we're having a third wave,” said Bozek.

“By acknowledging this is aerosol, you open the toolbox,” added Fisman. “It has some stuff you can actually do.”

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