

A photograph of three diverse students in a library setting. A woman in a hijab, a Black woman, and a young man with glasses are gathered around a laptop, smiling and looking at the screen. The background shows bookshelves filled with books. The entire image has a light green tint.

**inHALE**  
Indoor Healthy Air  
for Living Environments

**Breathable Air, Brighter Futures.**

# Dr. Simon Sutcliffe

Expert Steering Member, inHALE

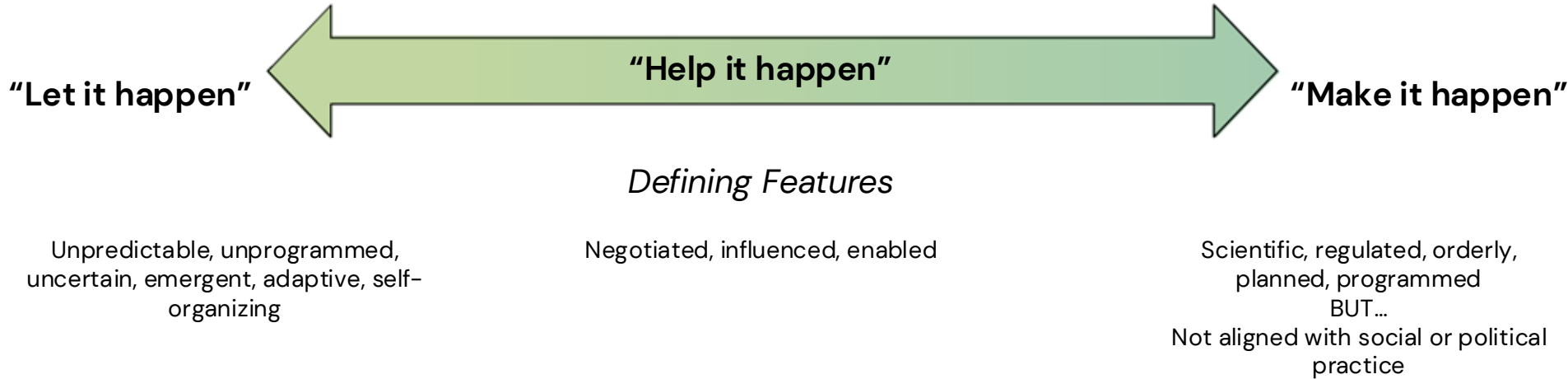
President, Two Worlds Cancer Collaboration  
Former CEO, BC Cancer & Princess Margaret Hospital  
Former Chair, Canadian Partnership Against Cancer



**Breathable Air, Brighter Futures.**



# Acting on Indoor Air Quality



# Jim Pattison Centre for Health Systems Learning + Innovation

First-of-its kind Centre for health systems learning and innovation with a focus on rural, community-based, technology enabled, equitable and sustainable health care.

Located in Kelowna, BC on unceded Syilx territory.

**Mission:** To ignite, support, and scale innovations that drive lasting transformation in healthcare.

Rooted in communities across British Columbia, and with a commitment to equity and inclusion, we bring people and partners together to create solutions that strengthen health systems today—and inspire impact across Canada tomorrow.



**DEE  
TAYLOR**

Founding Executive Director of the  
Jim Pattison Centre for Health  
Systems Learning and Innovation;  
Kelowna, Canada



**ALEX  
KENT**

Director of Innovation &  
Knowledge Mobilization,  
JP Centre  
Kelowna, Canada



**NEGAR  
BALOUCHESTANI-ASLI**

Campaign Coordinator, inHALE  
JP Centre  
Toronto, Canada



**JOCELYN  
BRADY**

Campaign Coordinator, inHALE  
JP Centre  
Vancouver, Canada



**Breathable Air, Brighter Futures.**



# Who is inHALE?

A **public health campaign** dedicated to healthy indoor air for all, with a mission to inform, inspire, and guide healthier indoor air quality in Canada and beyond.

## How We Work:

- Grounded in **evidence-informed education**
- Powered by **collaboration across sectors**
- Focused on **advocacy for systemic change**

**Our Role:** Convening partners across government, health systems, academia, industry, nonprofits, and communities to elevate IAQ as a population health priority.

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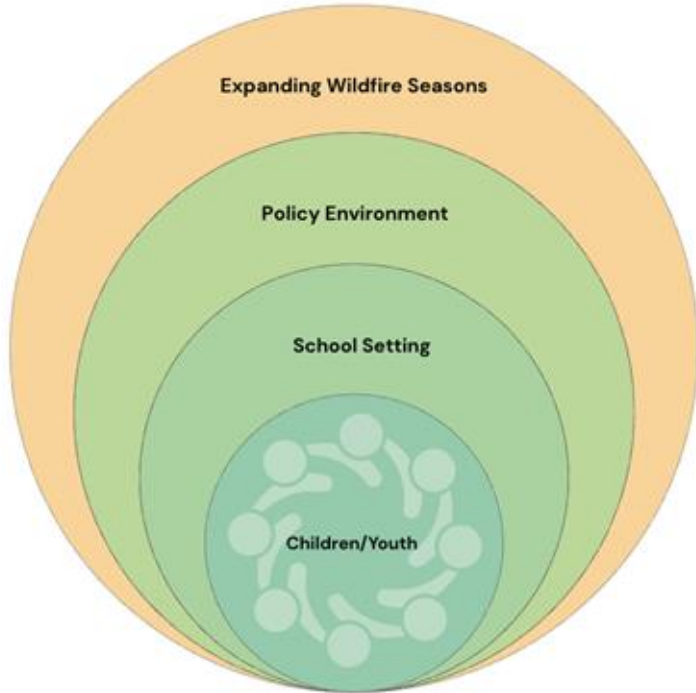
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# Schools & Places of Learning

Indoor air quality (IAQ) is foundational to student health, wellbeing, and academic performance

- Indoor air quality (IAQ) **directly impacts** student health and learning
- Many Canadian schools face aging ventilation and limited funding
- IAQ disparities contribute to inequitable learning environments
- Policy within Canada makes it unclear who is responsible for IAQ in schools
- inHALE is working to advance IAQ in schools as a national public health priority

# Smoke Doesn't Stop at the Door



**The problem:** IAQ in schools remains largely unmonitored and unaddressed at a policy level

**Our Role:** inHALE's purpose of building awareness, coalition, and policy change, responds to this gap.



# Year in Review



## *Youth Leadership & Innovation*

National youth case competition  
11 teams engaged coast-to-coast  
Student-led solutions for healthier schools



## *Expanding Expertise & Leadership*

Expanded national leadership network  
Established collaborative working groups  
Built a foundation for future growth through ongoing engagement



## *Growing Through Collaboration*

Partnered with BGIS to advance inHALE's mission  
Highlighted emerging youth leaders & innovators  
Strengthened fundraising and campaign sustainability

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# Looking Ahead

## Step 1: Social Media Growth

**Goal:** Focus on KT and bringing IAQ to the forefront for the general public

## Step 2: Community Growth

**Goal:** Build organic presence through in person partnerships starting here in BC.

## Step 3: Continue Coalition Building

**Goal:** Continue to work within our network to build strong coalition and shorten the gap for action.

# Join Us!



## **Amplify**

Follow inHALE on Instagram and LinkedIn—and help us grow the movement by sharing with your networks.



## **Collaborate**

Join a growing network of leaders advancing healthier indoor environments.



## **Invest**

Sponsor inHALE initiatives that advance awareness, innovation, and action on indoor air quality.

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# Gord Hicks

Chief Executive Officer, BGIS

Founder, Building Energy Innovators Council  
Sustainability & Youth Mental Health Advocate  
Order of Canada Recipient



**Breathable Air, Brighter Futures.**



# Case Competition Winners



**Kashaf Salaheen**

**Senior Solutions Architect, HashiCorp (IBM)**

Founder, CTRL+She |  
Master of Business,  
Entrepreneurship &  
Technology (MBET)  
Candidate



**Lucy Le**

**Marketing & Recruitment Specialist, University of Waterloo**

Master of Business,  
Entrepreneurship &  
Technology (MBET)  
Candidate

**Breathable Air, Brighter Futures.**



● CANARY CLASSROOM INITIATIVE

# Healthier air. Better learning.

*A real-time indoor air quality strategy for the Hamilton-Wentworth District School Board (HWDSB).*

---

**Lucy Le · Kashaf Salaheen**

University of Waterloo

*Early warning. Better air. Better learning.*



# 01

## Problem & Local Context

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*Why air quality is a learning issue in Hamilton.*

# Air quality drives learning.

*Three signals teachers can act on.*

01



## CO<sub>2</sub> as an early warning

Above ~1,000 ppm, ventilation is lagging — linked to fatigue, headaches, and slower attention.

02



## PM<sub>2.5</sub> affects breathing

Fine particles build up in crowded rooms, aggravating asthma and contributing to missed class time.

03



## Reactive to evidence-based

Continuous CO<sub>2</sub>, temperature, and humidity data turns comfort assumptions into action.

# The Hamilton context.

*Local conditions that put classroom air at risk.*



## Industrial proximity

Schools near steel and traffic corridors face higher PM2.5 and NOx infiltration on poor dispersion days.



## Aging building stock

Older ventilation, limited filtration, and restricted window use create uneven indoor conditions.



## Inequitable exposure

Schools closest to industry often serve lower-income neighbourhoods — invisible indoor 'hotspots'.



## Decisions without data

Without localized indoor monitoring, responses rely on anecdote rather than evidence.

### HAMILTON SNAPSHOT

~2 km

Distance from steel mills where PM2.5 infiltration risk is highest for nearby schools.

1,000 ppm

Health Canada long-term CO<sub>2</sub> exposure limit for indoor air.

# Our solution: the Canary Classroom system.

*Early warning, not alarm — turning invisible air into visible action.*



## Early warning

Surface small issues before they become chronic health or learning disruptions.



## Make air visible

Continuous CO<sub>2</sub> and PM2.5 signals reveal hour-to-hour changes that would otherwise go unseen.



## Empower practical action

A simple colour status guides responses: ventilate, adjust use, or flag for facilities review.



*Illustrative classroom view — not real data.*

A vertical column of five dots on the left side of the slide. The top dot is blue, the second dot is yellow, and the bottom three dots are blue.

# 02

## Program Design & Core Components

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# IAQ monitoring.

*Low-cost classroom sensors, four signals, secure cloud data.*



## CO<sub>2</sub>

Ventilation effectiveness



## PM<sub>2.5</sub>

Industrial + traffic infiltration



## Temperature

Comfort context



## Humidity

Helps interpret signals



Deploy in high-risk schools first



Automated, secure data flow — no manual entry



Phased rollout with threshold refinement

*Sensor strategy aligned with Health Canada and ASHRAE 2022 guidance on CO<sub>2</sub> as a ventilation indicator.*

# The Canary Dashboard.

*One view for staff, one summary for families.*

## ● Clear, shared status

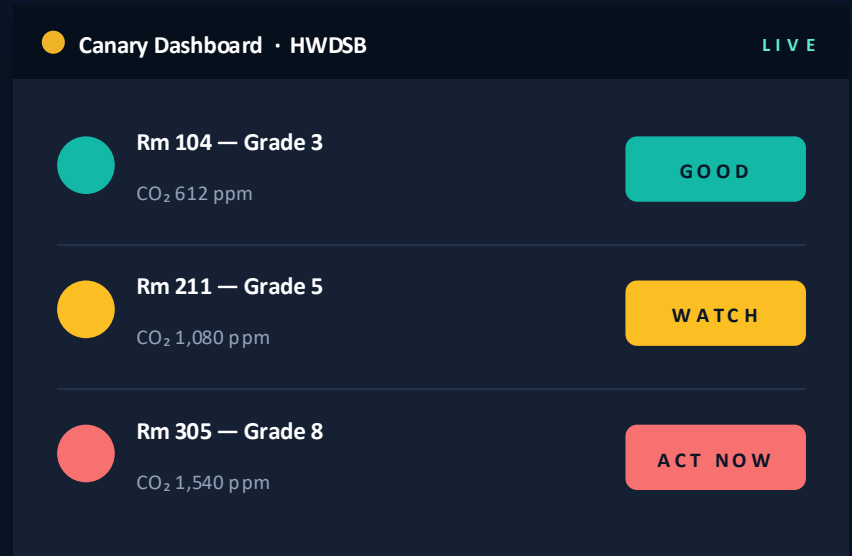
A green-yellow-red view translates sensor data into actionable conditions.

## ● Real-time + trends

Staff see live readings and patterns to catch recurring CO<sub>2</sub> or PM2.5 events.

## ● Trust, not raw data

Families get a plain-language school summary — transparency, not noise.



*Illustrative — not real classroom data.*



# 03

## Implementation, Equity & Partnerships

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*How we'd launch, and who we'd launch with.*

# Equity-led rollout: where we start matters.

*Resources go first to schools where health and learning gains are greatest.*

## EQUITY & RISK INDEX

### A composite score per school.

*Five inputs combine into a single ranking that directs the pilot.*

- Industrial proximity
- Building age & ventilation
- Enrollment density
- Neighbourhood SES
- Health vulnerability

## HOW WE USE IT

### 01 Target the highest-burden schools first

Begin with schools within ~2 km of industrial sources, where PM2.5 risk and ventilation gaps cluster.

### 02 Phase the rollout to learn as we go

Refine sensor placement, communications, and response timelines before expanding district-wide.

### 03 Make fairness visible

Prioritizing industrial-adjacent and socially vulnerable communities closes a persistent gap in environmental protection.

# Partnerships & community trust.

*Credible partners, transparent communication, shared accountability.*



## University of Waterloo

**Scientific credibility**

Sensor validation, data interpretation, and rigorous program evaluation.



## Hamilton Public Health

**Health expertise**

Threshold-setting, incident response, and consistent community health messaging.



## Families & staff

**Trust & transparency**

Multilingual updates and a plain-language school summary — shared accountability.

# We're not starting from scratch.

Canadian school boards are already piloting classroom IAQ monitoring — HWDSB can build on what works.

## QUEBEC

~90,000

*sensors installed*

First province-wide program in Canada. Every preschool, elementary, secondary, and adult-education classroom monitors CO<sub>2</sub>, temperature, and humidity.

## WATERLOO REGION

3 schools

*multi-season pilot*

WRDSB pilot at Laurentian, Chicopee Hills, and Abraham Erb, partnered with the University of Waterloo to test ventilation across seasons.

## ONTARIO (PROPOSED)

Bill 140

*private member's bill*

Would require CO<sub>2</sub> monitors in Ontario classrooms with a maximum level and an expert-led air quality action plan.



# 04

## Scalability & Strategic Impact

---

*From a Hamilton pilot to a board-agnostic framework.*

# Long-term value & ROI.

*Four returns — health, operations, accountability, and planning.*



## HEALTH

### Healthier classrooms

Less prolonged CO<sub>2</sub> + PM2.5 exposure → better concentration, fewer respiratory symptoms, lower absenteeism.



## OPERATIONS

### Spend smarter

Continuous data guides ventilation, filtration, and retrofit choices — proactive beats reactive repairs.



## ACCOUNTABILITY

### Trust through data

Clear metrics strengthen communication with families and staff and let us evaluate what's working.



## FUTURE

### A planning input

Over time, air quality becomes a routine input to capital planning — not an afterthought.

*Every dollar of sensing buys evidence — and evidence pays back in fewer reactive fixes and healthier kids.*

● CANARY CLASSROOM INITIATIVE

# Thank *you.*

---

*Healthier air. Better learning.*

GET IN TOUCH

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Support inHALE's work:



# Follow Us!



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[inhale-health.org](http://inhale-health.org)



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# Sneak Peak...

## *Café Scientific – Activity: Wisdom of Crowds*

(June 5, 13:00 – 14:15)

**Ming-Ka Chan**, Professor of Pediatrics and Clinician Educator, University of Manitoba, Winnipeg, Canada

**Diane de Camps Meschino**, Associate Professor, Department of Psychiatry, University of Toronto, Toronto, Canada



*SCAN HERE!*



# Thank You to Our Sponsors



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Centre for Health Systems  
Learning + Innovation



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