

Public Health Impacts of Billy Bishop Airport Expansion

Prepared for
Board of Health:
Investigating the Increased Risk of Heart
Disease, Lung Cancer, and Tumours from
Bringing Jets to Toronto's Waterfront
Communities

July 13, 2026

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CAPE
Canadian Association
of Physicians
for the Environment
Association canadienne
des médecins
pour l'environnement
ACME

Ontario Regional Committee

on@cape.ca

Disclosures: None

CAPE

We are physicians & health professionals working in the intersectional space of planetary health to protect human health by protecting the planet

We engage with governments, policy and media. We run campaigns, conduct research & educate on key issues.



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Public Health Concerns

- CAPE Ontario has significant concerns regarding adverse public health impacts of proposed Billy Bishop airport expansion from:
 - Toxic jet emissions
 - Noise pollution
 - Traffic related air pollution
 - Loss of access to nature
- Jet pollutant health harms are amplified by:
 - location in a densely populated city centre
 - goals to quintuple passenger volumes to ~10 million yearly



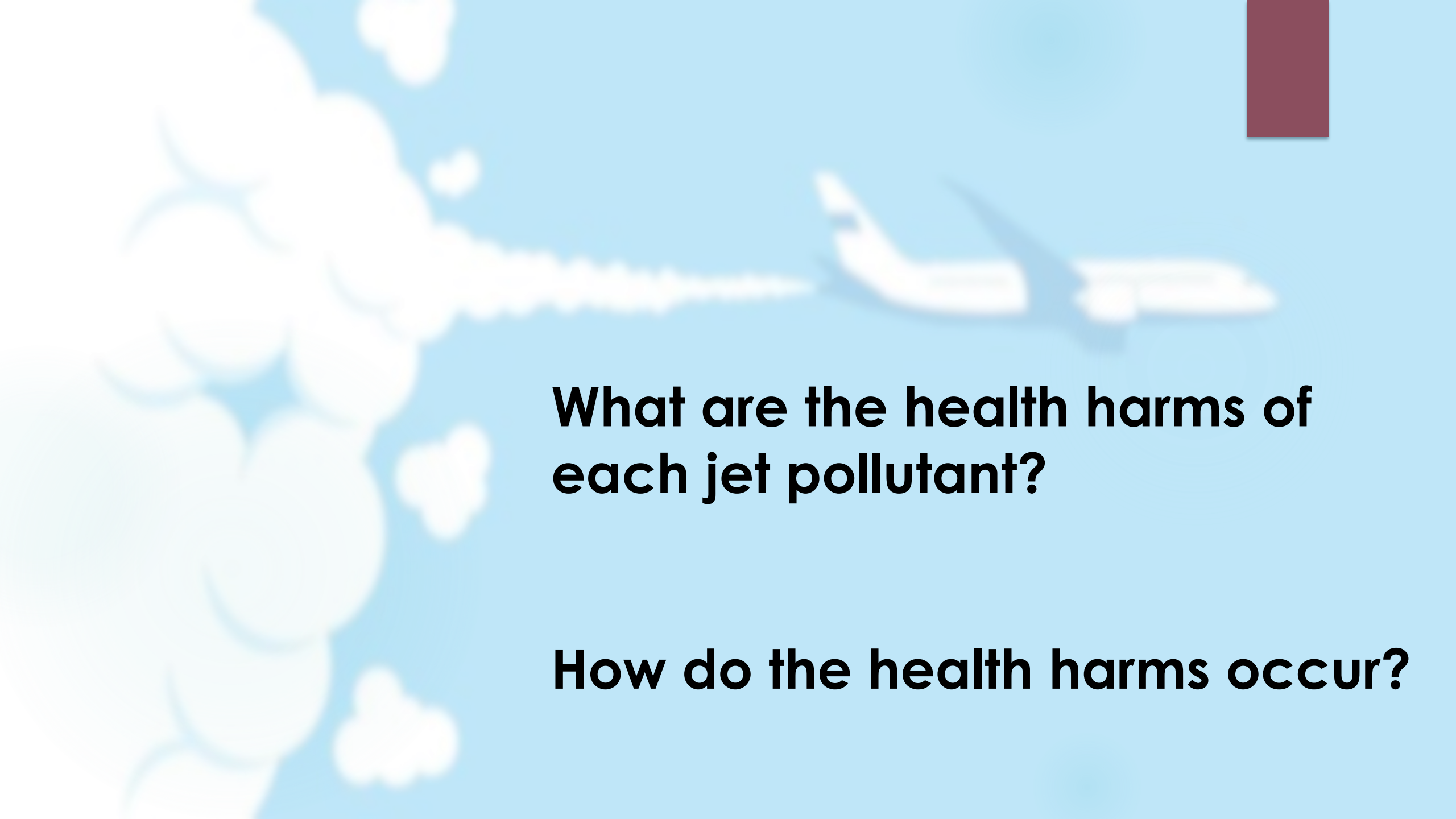
What are the pollutants of concern in jet emissions?

- **UFP's – ultrafine particles:** almost all particulate aviation emissions are UFPs – lack regulation, monitoring & data
- **NO₂ – nitrogen dioxide gas**
- **SO₂ – sulfur dioxide gas**
- **Noise pollution**
- **Other – carbon monoxide, black carbon, volatile organic compounds, hydrocarbons**

How do commercial jets compare against turboprop planes?

- Turboprops now at Billy Bishop fly at lower altitudes and lower speeds than jets
- Turboprops are much more fuel efficient than jets – emitting 30-50% less CO₂/passenger mile flown for short haul flights < 500 km → lower health risks

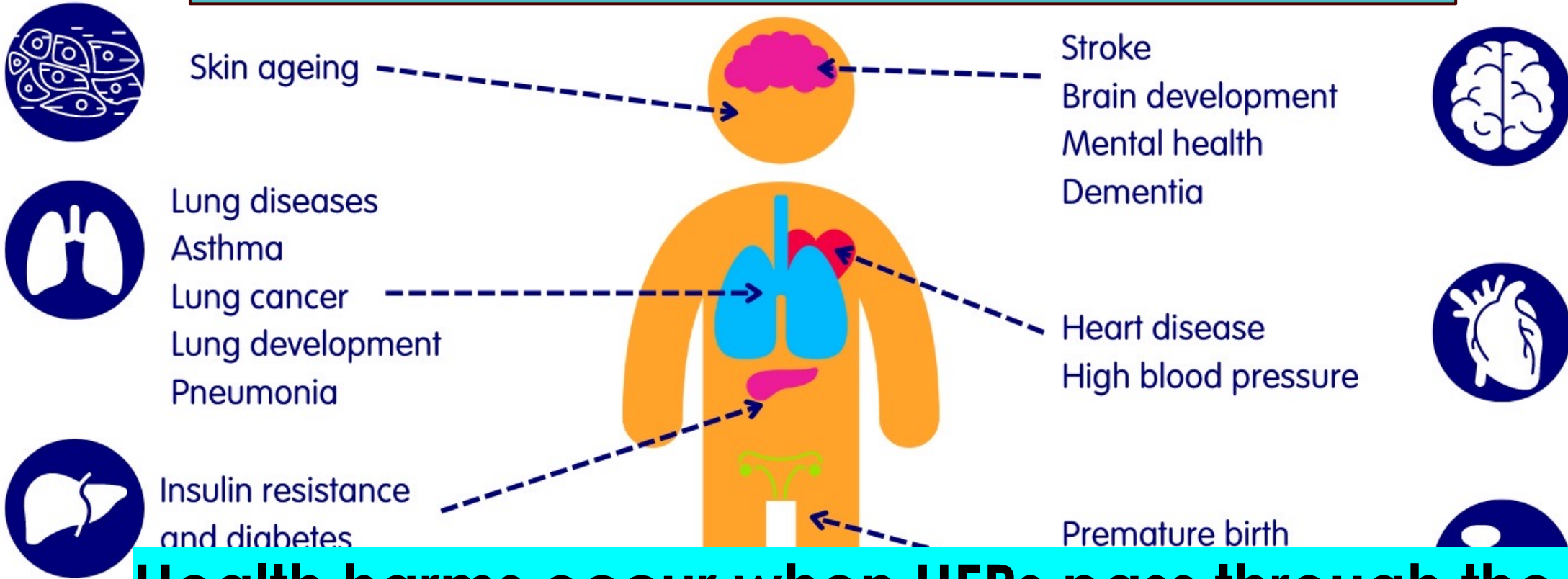




What are the health harms of each jet pollutant?

How do the health harms occur?

UFPs are linked to multi-system diseases



Health harms occur when UFPs pass through the lungs or gut into the bloodstream to cause disease in multiple body systems. The smaller the UFP, the more toxic and harmful to health.

UFPs are linked to multi-system diseases



Skin ageing



LUNGS:

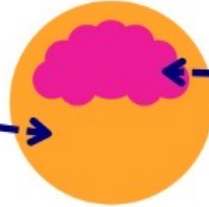
- ASTHMA
- COUGH
- LUNG INFLAMMATION
- BRONCHITIS



and diabetes



Blood clots



Stroke

Brain development
Mental health
Dementia



Heart disease
High blood pressure



Premature birth
Low birthweight
Decreased sperm quality
Illness during pregnancy

UFPs are linked to multi-system diseases



Skin ageing



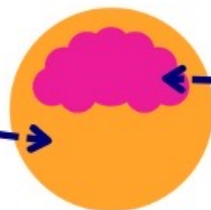
Lung diseases
Asthma
Lung cancer
Lung development
Pneumonia



Insulin resistance
and diabetes



Blood clots



Stroke
Brain development
Mental health

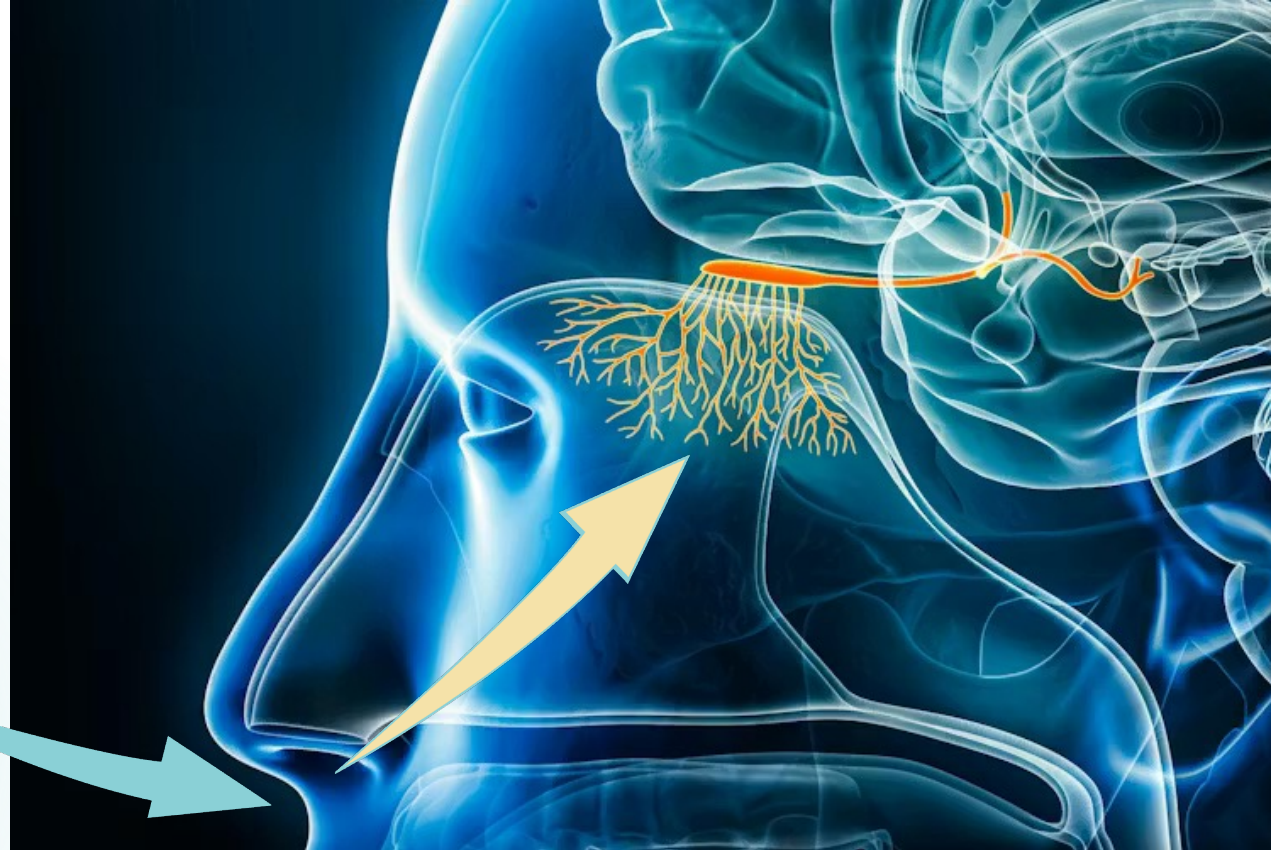


CARDIOVASCULAR:

- HEART RELATED DEATHS
- HEART ATTACKS
- HEART FAILURE
- HYPERTENSION
- BLOOD CLOTS

UFPs are linked to multi-system diseases

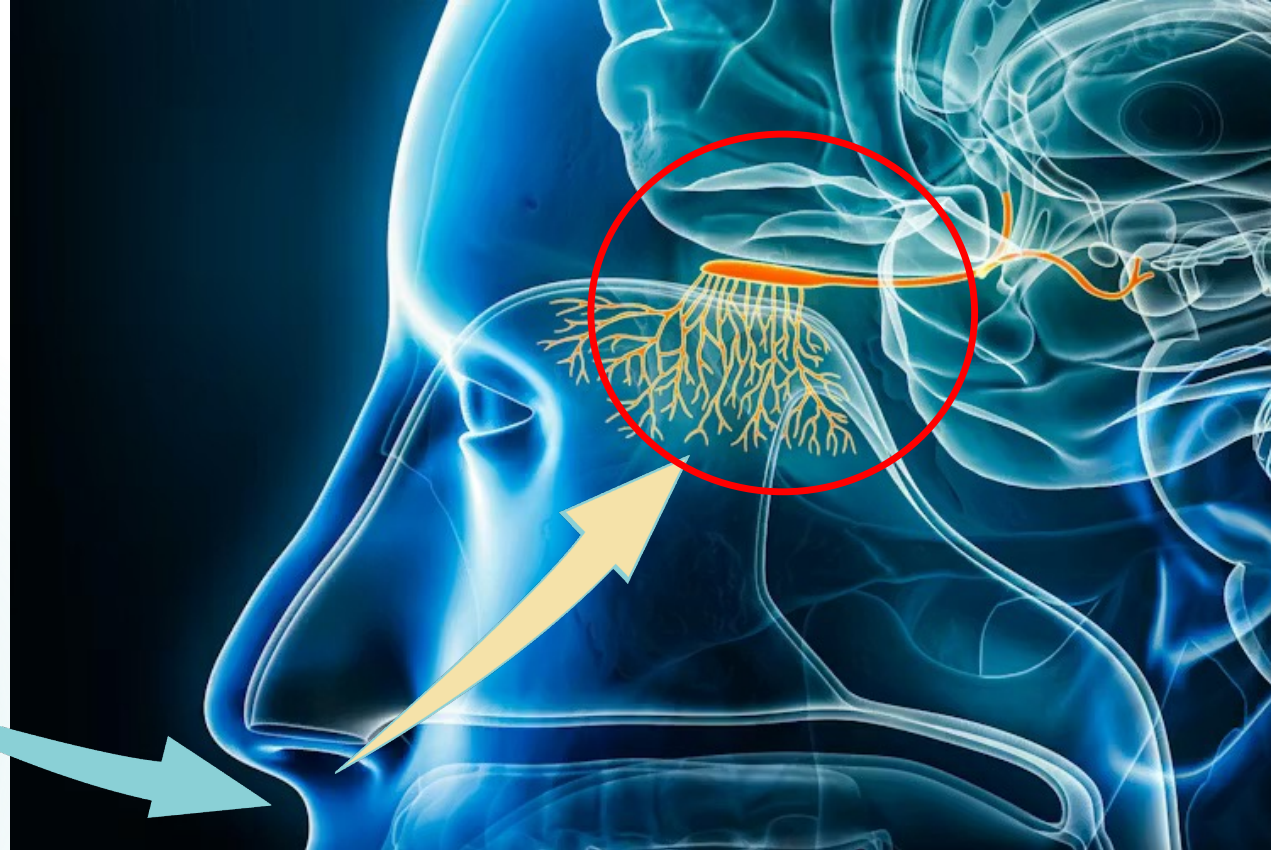
**UFP's
breathed in
through the
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directly up the
olfactory
nerve to enter
the brain**



**UFPs can
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UFP exposure is linked to:
Dementia Stroke Alzheimer's

Other Health Impacts of UFPs

- Diabetes
- Lung Cancer
- Pregnancy risks:
 - UFPs are found in placentas
 - Low birth weight babies
 - Possible links to birth defects



Health Impacts of NO₂

- **Premature death** – proven by meta-analysis
- **Respiratory** – asthma, COPD, inflammation
- **Cardiovascular** – heart attack, heart failure, atherosclerosis, stroke
- **Lung cancer**
- **Diabetes**
- **Pregnancy risks** – low birth weight, prematurity
- **Neurodevelopmental delays** – intellectual disabilities, developmental delays, mental & behavioural disorders



NO₂: Take Home Message

**WHO 2021 Air Quality Guidelines:
annual mean NO₂ limit of <10 µg/m³**

***But...there is NO safe
threshold of exposure***

Health Impacts of SO₂

- **Premature death** – analysis of 43.7 million deaths in 23 countries and meta-analysis
- **Respiratory** – asthma, COPD, inflammation, reduced lung function
- **Cardiovascular** – heart attacks, angina
- **Pregnancy risks** – low birth weight, prematurity, birth defects
- **Neurodevelopmental disorders** - neurodevelopmental delays, ADHD



SO₂: Take Home Message

**WHO 2021 Air Quality Guidelines:
24 hr mean SO₂ limit of 40 µg/m³**

***But...there is NO safe
threshold of exposure***

Health Impacts of Noise Pollution

- Aviation noise is identified as the most bothersome of all environmental noise sources
- World Health Organization (WHO) defines aviation noise as a significant health hazard



Health Impacts of Noise Pollution

Cardiovascular -2025 meta-analysis showed link between aircraft noise and cardiovascular disease

Mental Health – depression, anxiety, substance abuse, cognitive impairment 40% increased risks (meta-analysis)

Children's Health – hyperactivity/inattention disorder; reading comprehension & recognition memory deficits – in Munich, improved near closure of one airport and re-emerged around new airport



Health Risks of Airports in Dense City Centres

Increased Ground Risks – mass casualties, property destruction and chemical spill risks higher

Airspace Intrusion – by tall buildings, cranes nearby

Bird Strikes – higher risks with increased bird life in parks, city areas nearby

Congested Airspace – city centres may have increased risks of private aircraft nearby

Runway Excursion Risks – aircraft veering off or overshooting runways more likely to harm public areas, busy roads or properties



Press Release

Ultrafine particles from planes put 52 million Europeans at risk of serious health conditions

- **First ever study of health impacts specifically due to aviation-derived UFPs**
- **52 million (>10% of Europe's total population) live within 20km of the 32 busiest airports in Europe and are particularly exposed to UFPs from aviation**
- **Exposure to UFPs may be linked to 280,000 cases of high blood pressure, 330,000 cases of diabetes, and 18,000 cases of dementia in Europe**

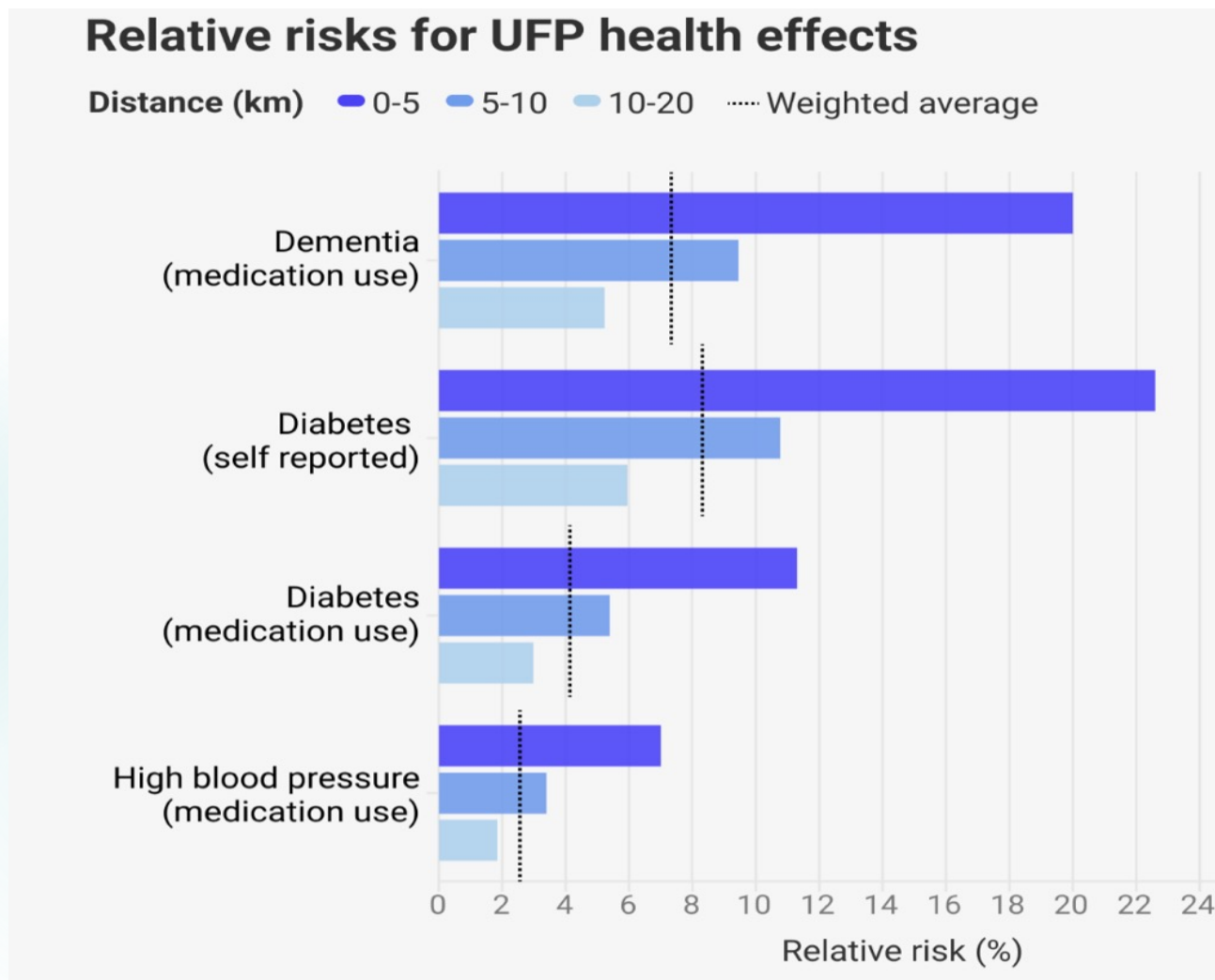
Ref: CE Delft Study, Health Impacts of Aviation UFP Emissions in Europe, 2024



Health Impacts of
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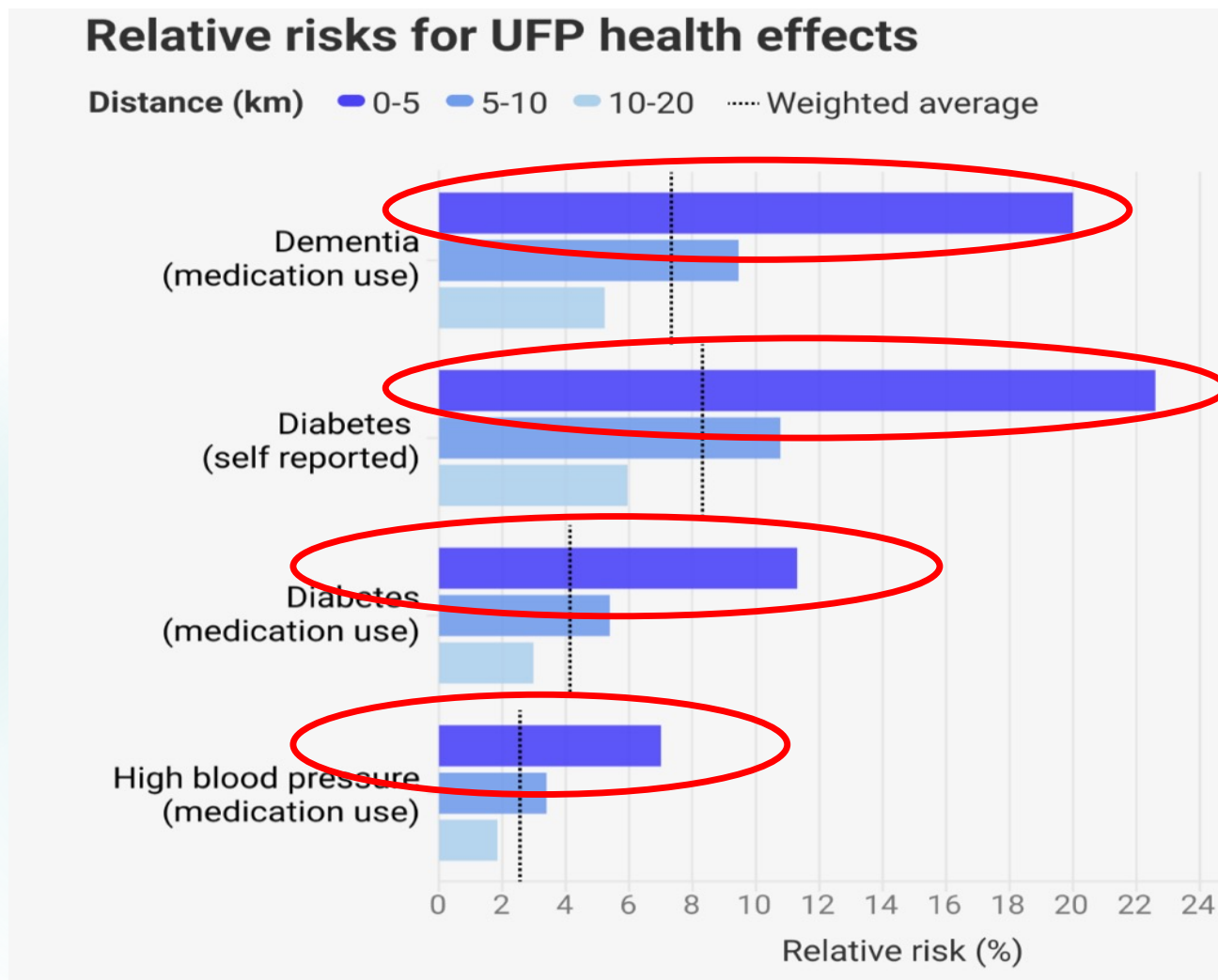
How far do health risks of airports extend?



- **People living within 5 km of airports studied were most affected:** eg diabetes and dementia risks ~ 20% higher and high blood pressure risks ~7% higher
- **Some degree of risk may apply up to 20 km from airports**

Ref: CE Delft Study, Health Impacts of Aviation UFP Emissions in Europe, 2024

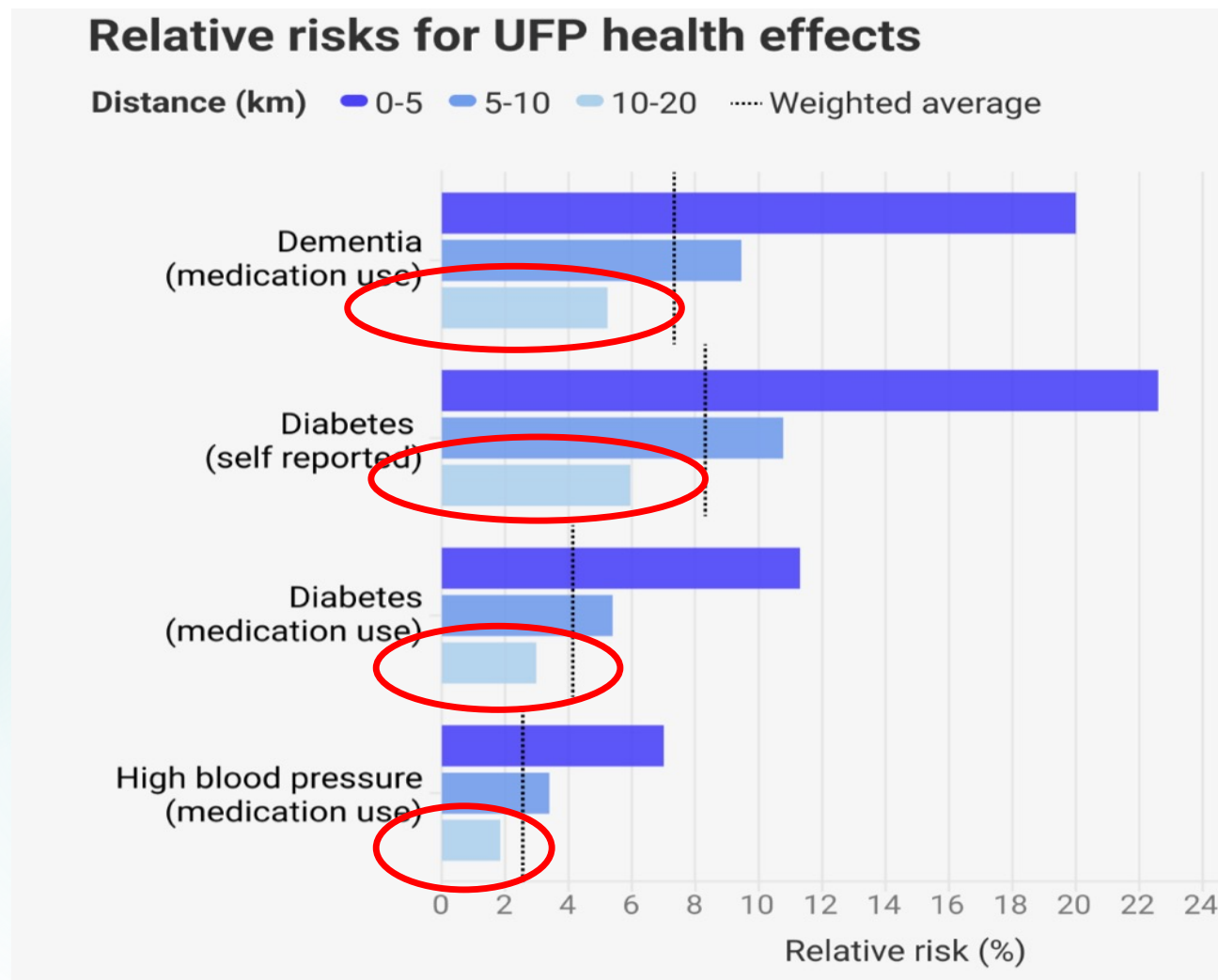
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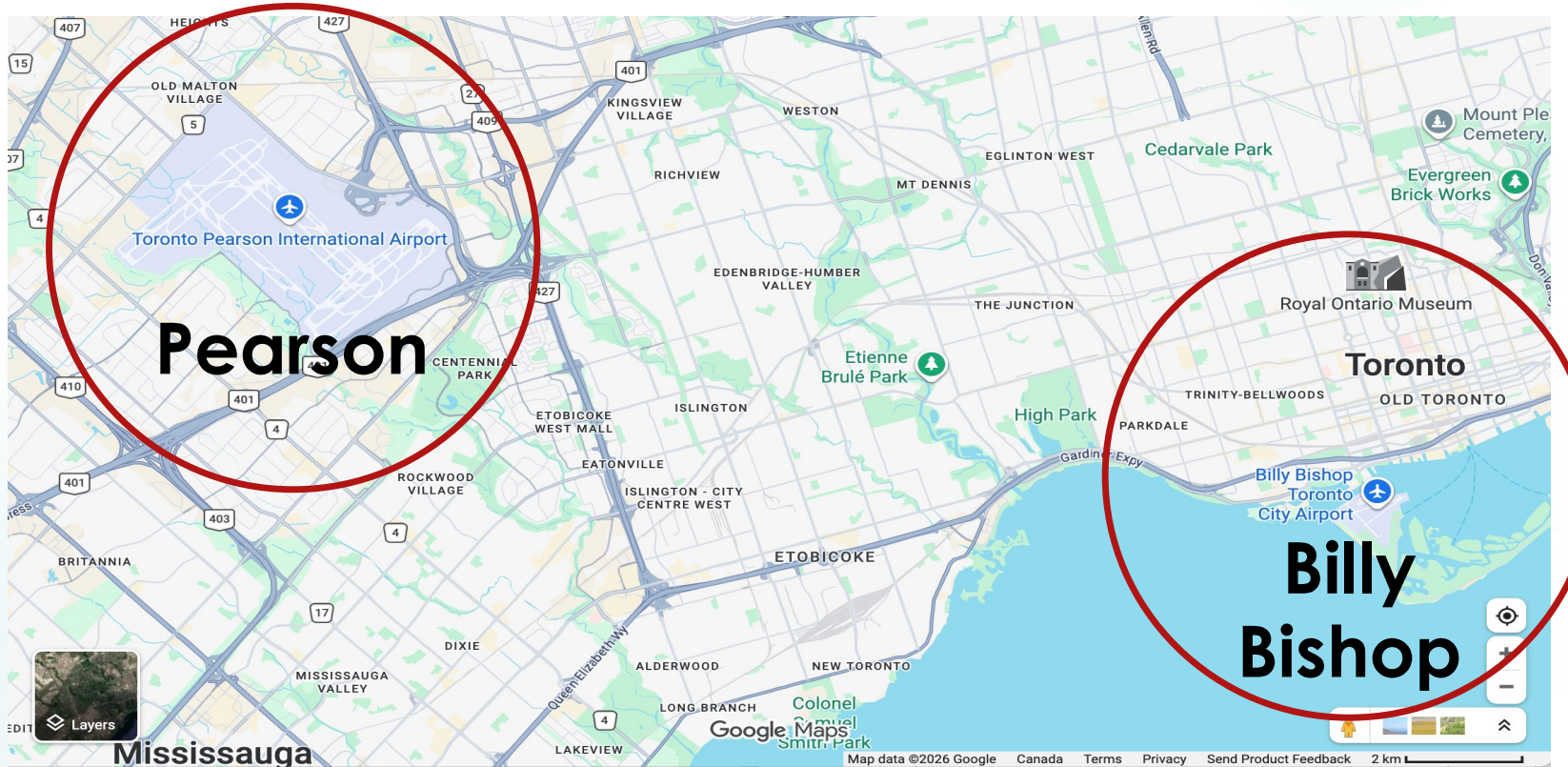


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How many people live 5-20 km from GTA airports?

- 120,000 to 150,000 people live within 5 km
- Closest residential: 2-3 km (Malton, Rexdale)



- 400,000 to 450,000 people live within 5km
- Closest residential: 200m (Windward Co-op, Bathurst Quay)

- An estimated 6.5 -7 million people live within 20 km of Pearson or Billy Bishop
- New housing for 40,000 is planned at Port Lands within 5 km of Billy Bishop

Death Rates in Toronto Due to UFPs



Res Rep Health Eff Inst. 2024 Jul 1;2024:217.

Long-Term Exposure to Outdoor Ultrafine Particles and Black Carbon and Effects on Mortality in Montreal and Toronto, Canada

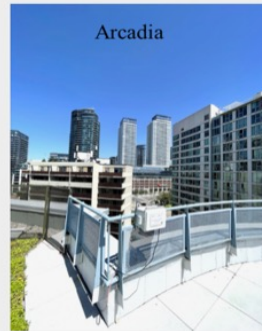
[Scott Weichenthal](#), [Marshall Lloyd](#), [Arman Ganji](#), [Leora Simon](#), [Junshi Xu](#), [Alessya Venuta](#), [Alexandra Schmidt](#), [Joshua Apte](#), [Hong Chen](#), [Eric Lavigne](#), [Paul Villeneuve](#), [Toyib Olaniyan](#), [Michael Tjepkema](#), [Richard T Burnett](#), [Marianne Hatzopoulou](#)

- 1.56 million people studied in Toronto & Montreal
- ~1100 deaths occurred in Toronto & Montreal combined that were attributed to UFPs (heart, lung, stroke, lung cancer)
- Higher UFP levels were linked to mortality
- Lower UFP size was linked to mortality



Campus-Community Partnership for Reducing Air Pollution in the Bathurst Quay Neighborhood

Measurement Sites



Arcadia

7-story

900m from the airport runway



Windward

7-story

800m from the airport runway



FT

2-story

650m from the airport runway

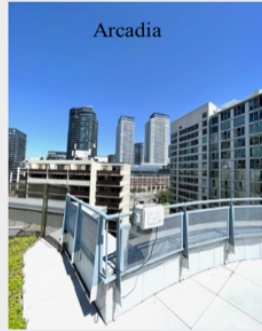
UFP Monitoring sites near Billy Bishop

“This study clearly identified that emissions produced by airport-related activities are increasing air pollution exposure in the Bathurst Quay Neighbourhood (BQN). Concentrations of airborne ultrafine particles (UFP) are higher across BQN than they would be in the absence of the airport.”

“The airport is the largest source of UFP in Toronto.”

Campus-Community Partnership for Reducing Air Pollution in the Bathurst Quay Neighborhood

Measurement Sites



Arcadia

7-story

900m from the airport runway



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800m from the airport runway



FT

2-story

650m from the airport runway

UFP Monitoring sites near Billy Bishop

When the wind blows from the airport during operating hours, UFP levels can double to triple from baseline, sometimes exceeding 100,000 particles/cm³.

Current Scientific Benchmarks for UFP Levels

- Given paucity of data, WHO does not have strict guidelines for UFP levels
- The following may be considered as benchmarks:
 - Low/Acceptable: below 10,000-20,000 particles/cm³
 - High: over 20,000 particles/cm³
- *BQN monitoring recurrently documents >100,000 particles/cm³ related to airport operations & wind direction*



Conclusions

- **CAPE Ontario asks BoH to proactively protect the health of Torontonians by fully and promptly exercising its authority before Billy Bishop expansion plans proceed further without due assessment**
- **CAPE asks BoH to conduct a thorough health impact assessment of the risks of jets at Billy Bishop serving 10 million passengers yearly & report by Q4 of 2026**
- **BoH produced such a report in 2013 within a few months – much new evidence confirming the health risks of jets has been published since**

THANK YOU

