

## ANNUAL REPORT 2021

# INTERNATIONAL LABORATORY FOR AIR QUALITY and HEALTH (ILAQH)

WORLD HEALTH ORGANISATION
COLLABORATING CENTRE FOR AIR QUALITY AND
HEALTH

#### 1. Introduction

The International Laboratory for Air Quality and Health (ILAQH) is part of the School of Earth and Atmospheric Sciences (EAS), Institute for Health and Biomedical Innovation (IHBI) and the Institute for Future Environments (IFE), at the Queensland University of Technology (QUT). ILAQH undertakes research, postgraduate training and consultancy in the complex, interdisciplinary field of air quality and its impact on human health, with a specific focus on ultrafine and nanoparticles. The three main aspects of ILAQH research activities are:

- Comprehensive characterisation of indoor and outdoor air, including emission sources.
- Integrated health and environmental risk assessments.
- Strategies for controlling and managing air pollutants.

To address the challenge related to the interdisciplinary nature of air pollution and its impact on human health, academics from a number of Faculties within QUT are involved with the programs undertaken by the ILAQH, including discipline areas such as: physics, chemistry, microbiology, mathematics, public health and engineering. The expertise of the ILAQH personnel is strengthened by close collaboration with a number of government and non-government organizations. Through joint research, lecturing and postgraduate student supervision, the ILAQH collaborates closely with a number of North American, European and Asian research and tertiary organizations.

The facility is equipped with state-of-the-art instrumentation for aerosol generation, mass and number size classification; monitoring of atmospheric gases; real time biological studies; vehicle emission testing, filter testing, lung deposition studies, and computer modelling. Access to electron microscopy and analytical chemistry facilities is available through the links existing within the Science and Engineering Faculty.

The ILAQH has built up a scientific program, which is recognised internationally through a high publication rate in reputable international journals, visits by scholars from around the world to the facility, and invitations to the ILAQH key researchers to address international conferences and participate in international initiatives. In Australia both the Queensland State and the Federal government and non-government organizations regularly seek the expertise of this facility.

The ILAQH is a Collaborating Centre of the World Health Organization on Research and Training in the field of Air Quality and Health, since 2004.

## 2. Collaboration with the World Health Organisation (WHO)

In July 2019, the ILAQH was re-designated for the third time as a World Health Organization (WHO) Collaborating Centre for Air Quality and Health.

Distinguished Professor Lidia Morawska has made a sustained longstanding and ongoing contribution in her service as an advisor to the WHO.

As a **collaborator and adviser to the WHO**, D/Prof Morawska has contributed to all WHO air quality-related guidelines over the past two decades. She Co-Chairs the <u>Guideline Development Group</u> responsible for the air quality guidelines, the most important document on which nations base their air quality standards. The new <u>WHO Global Air Quality Guidelines</u> (2021) has set new directions for air pollution management and, includes UFP, based on the cutting-edge research conducted over two decades done by D/Prof Morawska and her team, which has influenced policy makers. She has also contributed to the Best Practiced Statement for UFP in the new WHO Global AQG (2021), based on the White Paper titled, "<u>Ambient ultrafine particles: evidence for policy makers</u>"). In addition, the WHO policy range of initiatives she has been involved with over the years, includes:

- (i) Work on international WHO Guideline documents, serving as the main reference point for the international community, including WHO Guidelines for: Air Quality (2021, she is Co-Chairing this); Global Platform on Air Quality (in preparation); Healthy Housing 2018; Household Combustion, 2014; Indoor Air Quality: Selected Pollutants, 2010; Indoor Air Quality Guidelines on Dampness and Mould, 2009; Air Quality, 2005; Concentration and Exposure-Response Measurements of Fine/Ultrafine Particulate Matter, 2002; and Dust Prevention in Workplaces, 1996.
- (ii) Work towards improvement of the quality of air in developed/developing countries through assisting governments in forming national air quality legislation in major epidemiological studies on air quality impacts.
- (iii) Participating in WHO Emergency Outbreak Response Groups (e.g., 2003 SARS, and 2021 COVID-19).

In 2021, Distinguished Professor Morawska was invited by the WHO as a consultant on air pollution, to participate in the following activities:

- Contributed to a paper on COVID 19 and air pollution titled "Ambient Air Pollution and SARS-CoV-2: an experts' take on what we know and where we go?", led by Dr. Sophie Gumy of the WHO Geneva office. The work is continuing, and a paper will be submitted to a high impact factor journal in 2021.
- Participated in a meeting (virtually) of the WHO 'Global Science Dialogue on Transmission in Children', 26 January 2021. This meeting focussed on the transmission of SARS-COV-2 in children and adolescents 0-19 years old, and the overall impact of the pandemic on children's well-being. With WHO and UNICEF as conveners, the Global Transmission Discussion brought together over 700 individuals and organizations from throughout the world from research, medical, scientific, and regulatory backgrounds.
- Participated in the WHO webinar on healthy housing, 'WHO Global Webinars on the COVID-19
  pandemic's impact on Equity and the Social Determinants of Health: Fuel poverty,
  homelessness and informal settlements: how housing affects health equity', 28 January 2021.
- Participated in a meeting and gave a presentation (virtually) to the 'WHO meeting: Airborne mode of transmission multidisciplinary working group', 18 February 2021, on the topic of the 'Role of Airborne Transmission: Systematic review (WHO report: 21 Jan 2020)', on fomite and orofecal transmissions.

- Invited by Dr. Maria Van Kerkhove, WHO COVID-19 technical lead, to participate in a meeting (virtually) and give a presentation in a 'Multi-disciplinary meeting on airborne transmission of SARS-CoV-2', held on 24 February 2021. A follow up call was organised with Dr. Maria Van Kerkhove on the 10 March 2021. Presentation title: Physics of airborne respiratory infection transmission. A follow up call with Dr. Maria Van Kerkhove was held on 10 March 2021.
- Following a meeting in January last year, the WHO convened an international group of experts to
  discuss the implementation strategy for the <u>WHO Housing and Health Guidelines</u>. At the end
  February 2021, participated in meetings (virtually), as well as provided comments and
  suggestions to the final draft of the implementation strategy of the guidelines.
- Participated and provided comments and suggestions on the WHO 'Roadmap to improve and
  ensure good indoor ventilation in the context of COVID-19' (13 April 2021), which defined the
  major steps needed to reach the expected ventilation requirements, or simply improving indoor
  air quality including recommendations on how to assess and measure the different parameters.
- Work continued following the review of the WHO Global Air Quality Guidelines. Participated in a
  number of meetings and the WHO AQG revisions were submitted to the Guidelines Review
  Committee in late March 2021 and approved for publication in April 2021. The new WHO Global
  Air Quality Guidelines was launched in September 2021.
- Participated (virtually) in the WHO 'WPRO's Partners' Briefing', 5 October 2021.
- Participated in a meeting (virtually) with Dr. Luca Fontana of the WHO and Professor Giorgio Buonanno of the University of Cassino and Southern Lazio in Italy, to discuss the joint project on risk assessment tools for airborne transmission, 30 June 2021.
- Work continued with the 'WHO Environment and Engineering Control Expert Advisory Panel (ECAP) for COVID-19', to further support the 'Preparedness, Readiness and Response to COVID-19' within the WHO Health Emergencies Programme (WHE), led by WHO (Dr. Maria Neira and Dr. Luca Fontana). Participated in meetings held in March 2021, as well as participated in the meeting 'Research priorities and areas of focus related to SARS-CoV-2 modes of transmission', held on 17 May 2021.
- Following the meeting (virtually) with Dr. Luca Fontana of the WHO and Professor Giorgio Buonanno of the University of Cassino and Southern Lazio in Italy, to discuss the joint 'Airborne Risk Assessment Working Group' project with CERN, 30 June 2021. Work continued, a meeting was then held on 20 July, and a concept note titled, 'Airborne risk assessment; method and application' was prepared at the end of July 2021. This work is continued with revisions in August 2021, and the final version submitted to Dr. Maria Van Kerkhove, Dr. Maria Neira and Dr. Benedetta Allegranzi on the 5 August 2021. A number of other activities also took place:
  - A WHO paper in preparation.
  - o work continued on the 'Comparison between AIRC and a CDC study'.
  - Rapid systematic reviews.
  - A new scientific brief on SARS-CoV-2 transmission.
- Participated in meetings (virtually) and became of the WHO Health Emergencies Program (WHE) 'ARIA Airborne Risk Indoor Assessment Technical Working Group', led by Dr. Luca Fontana in August 2021. A systematic rapid review began at the end of August 2021. The 'kick-off' meeting was held on the on the 5 October 2021. She then became a Co-Chair of the Technical Working Group which was formed following this meeting, and further meeting were held in October, November, and December, with more meetings planned in 2022.

- Conducted data analysis and wrote a report on available air quality data and potential sources/sectors and identification of promising air quality measures in Lao PDR, 16 June 2021 to 28 February 2022.
- Participated as a panel member and gave a presentation to in the WHO-WPRO 'Second Annual Meeting of the Technical Advisory Group on Climate Change, the Environment and Health in the Western Pacific Region (TAG-CCE)', specifically as a panel member to the session titled, "Thematic Priority Breakout: Climate change, the environment and health" (1 July), 30 June 2 July 2021. Presentation title: Air pollution is now established as the single greatest environment-related health hazard in the world.
- At the end of June 2021, submitted a proposal for extending the report "Air Quality and Health
  in the Western Pacific Region". The report was first drafted by Dr Yun-Chul Hong's team at the
  Seoul National University in 2018. The report was then extended in 2019 by a team from the
  ILAQH, led by Professor Lidia Morawska.
- Participated in the 'Health Futures Forum: Shaping the Future of Health' Online Forum of the WHO Western Pacific Region (WPRO), 24-26 August 2021. A three-day virtual forum for the WPRO's Member States, partners and stakeholders to systematically assess life under the pandemic and anticipate how a world with COVID-19 in 2022 might look. Health Futures Forum is an organized by the Strategic Dialogue unit in the Data, Strategy and Innovation (DSI) group under the WPRO.
- Observer to the GAPH-TAG and Expert Working Groups (EWG) meetings and contribute to WHO activities related to air quality and health, as part of our ongoing collaboration, to the 'Global Air Pollution and Health Technical Advisory Group (GAPH-TAG)'. The first meeting of the GAPH-TAG was held on the 8 September 2021. A second GAPH TAG meeting for the EWG was held on 30 November 2021.
- Meeting with Dr. Maria Van Kerkhove, WHO COVID-19 technical lead, to discuss how to better communicate about airborne transmission and ventilation. The meeting was organized by Dr. Luca Fontana of the WHO and held on the 20 September 2021.
- Provided advice on the Suva (Fiji) 'Workplace Risk Assessment and Return to Office WHO Input
  to Technical Specs for Workplace Return' led by Dr. Nasir Hassan of the Pacific Climate Change
  and Environment (PCE), Division of Pacific Technical Support (DPS), WHO Regional Office for the
  Western Pacific (WHO WPRO), 23 September 2021.
- Participated in a meeting with Genandrialine Peralta and Ms Myoungsil Han of the WHO WPRO, to discuss potential projects within the area of air pollution and health, to submit to the Korea Ministry of Environment 1Q 2022, 25 October 2021. Also update discussed the update on the Regional Report on Air Quality and Health – the APW.
- Contributed to the 'Chapter X.I Guidelines for Indoor Air Quality', with Professor Wei Huang from Peking University in China on this activity. Revisions were made on the Chapter in October-November and was resubmitted to the published Springer Nature on 11 November 2021.
- Participated in a multiagency and multidisciplinary consultation to define and measure the
  transmission of infectious respiratory pathogens through-the-air', led by Dr. Luca Fontana (WHO).
  Reviewed and contributed to the 'Concept note to undertake a technical consultation
  to develop a global consensus statement for defining how infectious pathogens are transmitted
  through the air', 15 November 2021.

- Participated in the GAPH-TAG 'Meeting of the Global Air Pollution and Health Technical Advisory Group - Expert Working Group on Desert Dust and Health', hosted by the Geneva office on 18 November 2021.
- Invited panellist at the WHOCC Network Forum 'Australian WHO Collaborating Centre Network EOY Forum', 9 December 2021, to discuss capacity building in Australia and the region.

## 3. ILAQH Researchers in 2021

#### Director

Professor Lidia Morawska, PhD (School of Chemistry, Physics & Mechanical Engineering)

#### **Academic Staff**

Professor Godwin Ayoko (School of Chemistry, Physics & Mechanical Engineering) Professor Zoran Ristovski (School of Chemistry, Physics & Mechanical Engineering) Dr Branka Miljevic (School of Chemistry, Physics & Mechanical Engineering) Dr Graham Johnson (School of Chemistry, Physics & Mechanical Engineering)

#### **Research Fellows / Associates**

Dr Congrong He Dr Joel Alroe Dr Rohan Jayaratne

#### **Research Fellowships**

Dr. Marc Mallet

#### **Associated Academic Adjunct Staff**

Adjunct Professor Anne Steinemann (James Cook University, Australia)
Adjunct Professor Giorgio Buonanno (University of Cassino, Italy)
Adjunct Professor Hai Guo (Hong Kong Polytechnic University, Hong Kong)
Adjunct Professor Heidi Salonen (Aalto University, Finland)
Adjunct Professor Paul Jagals (University of South Africa)
Adjunct Professor Tunga Salthammer (Fraunhofer WKI, Germany)

## **Research Support Officer**

Ms. Chantal Labbe

#### **Doctoral Students**

Alexander Mikszewski (Supervisor: Lidia Morawska)

Basant Pradhan (Supervisor: Lidia Morawska with Rohan Jayaratne)

Changda Wu (Joint QUT-JNU student, Supervisor: Zoran Ristovski with Branka Miljevic) Eva Johanna Horchler (Joint QUT-JNU student, Supervisor: Zoran Ristovski with Branka

Miljevic)

Haydn Trounce (Supervisor: Zoran Ristovski with Branka Miljevic) Khanh Long Tran (Supervisor: Lidia Morawska with Rohan Jayaratne)

Lingli Guo (Supervisor: Lidia Morawska)

Meng Xiu (Supervisor: Lidia Morawska with Rohan Jayaratne) Mojibul Sajjad (Supervisor: Richard Brown with Zoran Ristovski)

Priyanka Arora (Supervisor: Zoran Ristovski)

Robert Groth (Supervisor: Graham Johnson with Zoran Ristovski)

Sadegh Niazi (Supervisor: Graham Johnson)

Yik Sze Lau (Supervisor: Branka Miljevic with Zoran Ristovski) Zachary Brown (Supervisor: Branka Miljevic with Zoran Ristovski)

#### Doctoral Students (enrolled in other QUT Schools and other Universities)

G M Hasan Shahariar (Supervisor: Richard Brown with Zoran Ristovski) Jimmy Hilly (Supervisor: Andrew Dansie UNSW with Lidia Morawska) Marc van Beest (Supervisor: Nunzio Motta with Lidia Morawska) Lisa Coulburn (Supervisor: Wendy Miller with Lidia Morawska)

Rebecca Stockwell (QIMR, Supervisor Scott Bell with Lidia Morawska)

Shayan Mokhtarpour Vanaki (Supervisor: Yuan Tong Gu with Zoran Ristovski)

Zhenya Fan (Supervisor: Yuan Tong Gu with Zoran Ristovski)

#### **Masters Students**

Conan Heath Bourke (Supervisor: Lidia Morawska with Rohan Jayaratne)

Raziya Sultana Chowdhury (Supervisor: Godwin Ayoko with Zoran Ristovski and Branka

Miljevic)

Samuel Gordon Putland (Supervisor: Branka Miljevic with Zoran Ristovski)

#### **Honours Students**

Shara Lohrasb (Supervisor: Zoran Ristovski)

#### Postgraduate Completions, PhD

Alireza Taghipour (Supervisor: Richard Brown with Zoran Ristovski)

Alma de Jesus (Supervisor: Lidia Morawska) Joel Alroe (Supervisor: Zoran Ristovski) Nairui Liu (Supervisor: Lidia Morawska)

Xiaoting Liu (Supervisor: Lidia Morawska with Rohan Jayaratne)

#### **Postgraduate Completions, Masters**

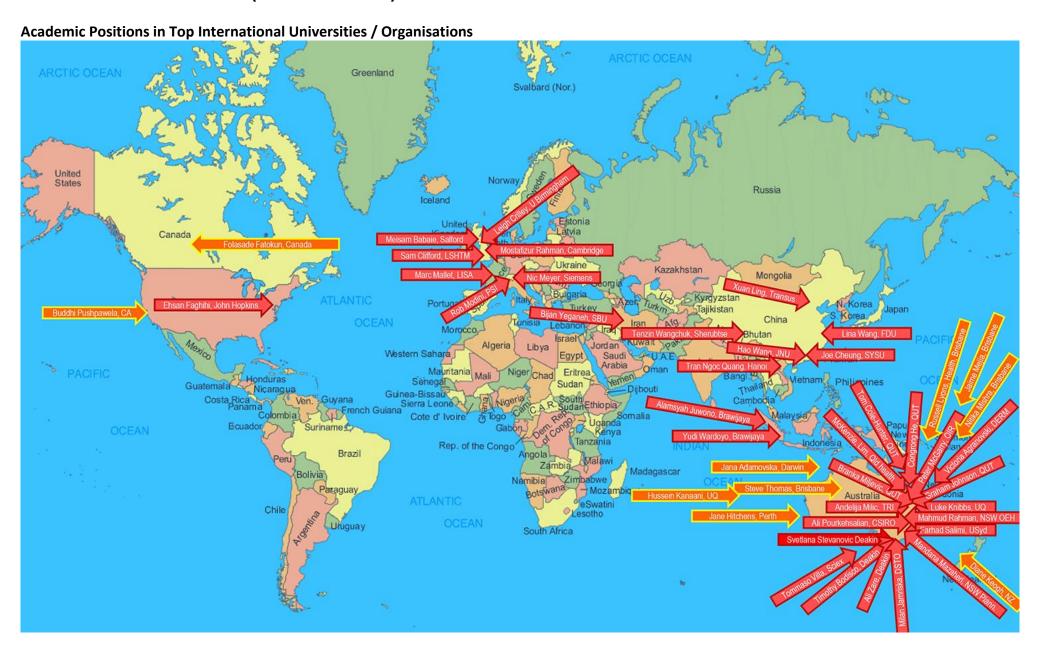
Bryce Christensen (Supervisor: Lidia Morawska with Rohan Jayaratne)

Tara Kuhn (Supervisor: Lidia Morawska with Rohan Jayaratne)

## **Research Support Officer**

Ms. Chantal Labbe

## **Destination of our Graduates (Current Positions)**



## 4. Major Developments

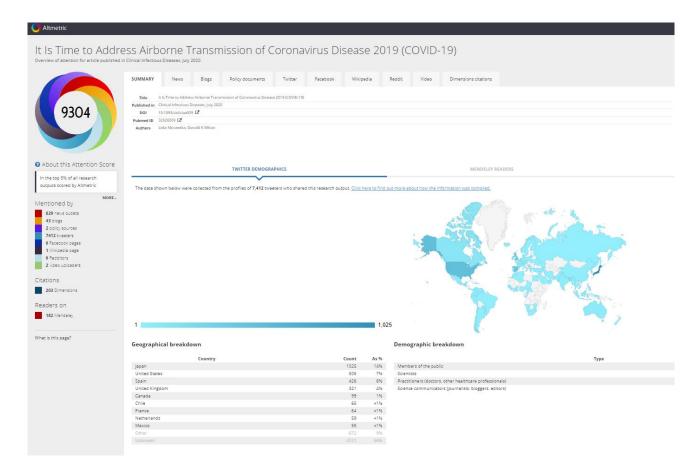
- ➤ Distinguished Professor Lidia Morawska was named as one of the top 40 researchers for <a href="The Australian Lifetime Achiever & Superstar of Research in the Life & Earth Sciences field">Earth Sciences field</a>, in November 2021.
- Distinguished Professor Lidia Morawska was named in <u>The 2021 TIME100 annual list of the</u> <u>hundred most influential people in the world</u>, in September 2021.
- Distinguished Professor Lidia Morawska was selected for The Australian Lifetime Achiever category on the annual list of Australia's outstanding researchers, in September 2021.
- ➤ The Open Letter published in the Clinical Infectious Diseases titled, "It is Time to Address Airborne Transmission of COVID-19", was ranked in the top 5% of all research outputs scored by Altmetric as at January 2021!







She was a leader in understanding Covid-198 aerosol transmission and the importance of ventilating buildings. Her childhood interest in nuclear physics led to a career taking in atmospheric, building and human exposure science. The need for a purpose of my work, beyond satisfying curiosity, is what motivates



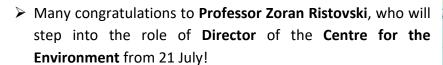
- ➤ Distinguished Professor Lidia Morawska was named in the list of Top 40 Australian Researchers in The Australian Research Magazine please see page 9, and scroll to the Life Sciences & Earth Sciences section (<a href="https://specialreports.theaustralian.com.au/1540291/9/">https://specialreports.theaustralian.com.au/1540291/9/</a>)!
- ➤ Distinguished Professor Lidia Morawska was ranked 16428 in the Stanford University ranking of 100,000 Top Scientists!

#### 5. Awards and Achievements

Congratulations to Distinguished Professor Lidia Morawska for being awarded the special Honorary Fellow status of the CASANZ (Clean Air Society of Australia and New Zealand). This is the first Honorary Fellowship in the Society's 55-year history. There was a prevision for this in the constitution of the Society, but no one before has received it.



- ➤ Many congratulations to **Professor Lidia Morawska**, who was the recipient of the **Vice-Chancellor's Award for Excellence, QUT Recognition Program 2020!**
- ▶ Distinguished Professor Lidia Morawska was awarded by the International Society of Indoor Air Quality and Climate (ISIAQ), 2020 Special Award for an Extraordinary Academic Leadership, in relation to my initiative in "...acting swiftly at the onset of the COVID-19 pandemic (March 2020) to address these new (old) challenges...". The link to read more: <a href="https://www.isiaq.org/v newsletters/article 199238225.ht">https://www.isiaq.org/v newsletters/article 199238225.ht</a>



- Many congratulations to Dr. Branka Miljevic who has been promoted to Associate Professor!
- ➤ Congratulations to Dr. Yi (Gina) Guo, who received the prestigious 2020 Outstanding Doctoral Thesis Award!
- ➤ Congratulations to Dr. Mawuto Nyarku, selected as a recipient of a Faculty of Science Executive Dean's Commendation for Higher Degree Research!







## 6. Peer Reviewed Publications

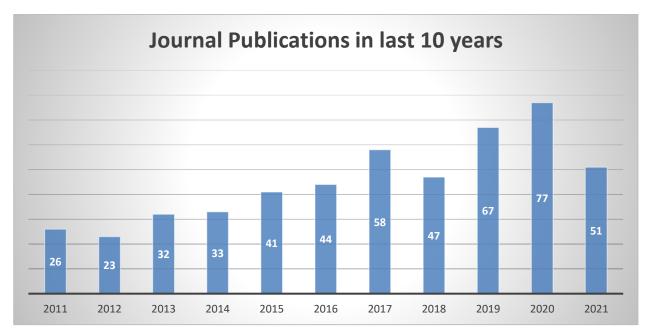


Figure 1. ILAQH Refereed Publications per Year (2011-2021)

## 7. Competitive Grants (Granted)

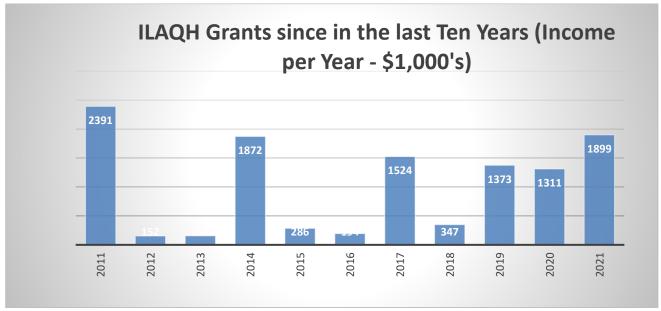


Figure 2. ILAQH Grant Income Distribution per Year (2011-2021)

## **Australian Competitive Grants (Awarded)**

## Administered by QUT (QUT Lead-CI)

**Project Scheme: Linkage Projects (2023-2026)** 

Chief Investigators: Lidia Morawska, Duzgun Agdas, Laurie Buys, Keith Grimwood, Graham Johnson, Guy Marks, Alexander Paz, Thomas Rainey, Zoran Ristovski, Kirsten Spann, Bo Xia, Greg Bell, Scott Bell, Patrick Chambers, Shaun Clough, Stephen Corbett, Charlie dePuthod, Neal Durant, Louisa O'Toole, Travis Kline, Peter McGarry, Ross Mensforth, Clive Paige, John Penny, Brad Prezant, Uma Rajappa, David Ward, Claire Wainwright, Giorgio Buonanno, Mark Jermy, Jose Jimenez,

**Australian Universities**: Queensland University of Technology, Australian Catholic University, Griffith University, The University of New South Wales, The University of Queensland

**Government Partners**: Arts Queensland, Queensland Department of Education, Queensland Health, Queensland Department of Transport and Main Roads

**Hospital Partners**: Children's Health Queensland Hospital and Health Service, Western Sydney Local Health District

Partners: INF Associates (USA), Geosyntec Consultants (USA), Gondwana Choirs (Australia), Prezant Environmental (Australia), Southern Cross Care Queensland (Australia), Stantec (Australia), Vista Controls (Australia)

**International Universities**: University of Colorado at Boulder (USA), University of Cassino and Southern Lazio (Italy), University of Canterbury (New Zealand)

Awarded from the ARC: \$898,014 (\$248,260 from Partner contributions)

**Project Title:** Making Australia resilient to airborne infection transmission (LP200301123)

Project Scheme: Advance Queensland, Queensland Citizen Science Grant (2020-2021)

**Awarded**: \$29,900

**Chief Investigators**: Lidia Morawska, Paul Jagals, Rohan Jayaratne, Tom Cole-Hunter, Paul Wells **Project Title**: "The Air is Fair, Here and There": Queensland communities assessing and comparing air quality"

Project Scheme: QUT Edge Grant Scheme (2020-2021)

Awarded: \$116,962

Chief Investigators: Zoran Ristovski

**Project Title**: QUT Edge Grant – Zoran Ristovski

## Administered by external organisations (QUT Co-CI)

Project Scheme: NHMRC MRFF Rare Cancers Rare Diseases and Unmet Need – COVID-19 (2020-

2024)

Administering Organisation: Led by Geraint Rogers, South Australian Health and Medical Research

Institute Limited (APP2005904)

Awarded: \$1,366,094.00

**Chief Investigators**: Geraint Rogers, Maria Crotty, Lidia Morawska, Scott Bell, Ming Qiao, Woodman, Craig Whitehead, Lito Papanicolas, Maria Inacio, Caroline Miller, Erin Flynn, Lucy Carpenter, Anushia

Ashokan, Megan Corlis, Steven Wesselingh, Kerry Ivey, Nicolas Darby

Project Title: Prevention of SARS-CoV-2 transmission in aged care (PreSTAC): Effective evidence-

based measures for rapid translation

**Project Scheme: ARC Discovery (2021-2024)** 

Administering Organisation: Led by Yuming Guo, Monash University

Awarded: \$466,964.00

**Chief Investigators**: Yuming Guo, Michael Abramson, Guy Marks, Lidia Morawska, Fay Johnston, Jane Heyworth, Geoffrey Morgan, Luke Knibbs, Jonathan Samet, Michelle Bell, Alistair Woodward,

Bin Jalaludin, Paulo Saldiva, Simon Hales, Sarah Henderson, Eric Lavigne

**Project Title**: Multi-Country Study on Health Effects of Bushfire Air Pollution (DP210102076)

Project Scheme: Reef Restoration And Adaptation Program (2021-2024) Chief Investigators: Daniel Harrison, Brendan Kelaher, Zoran Ristovski

**Awarded:** \$2,870,000 (\$130,000 to come to QUT)

**Project Title:** Cloud and Sky Brightening Development (RRAP-CS-06-V1)

Project Scheme: Reef Restoration And Adaptation Program (2021-2024)

Chief Investigators: Daniel Harrison, Zoran Ristovski Awarded: \$1,060,000 (\$426,000 to come to QUT) Project Title: Fogging development (RRAP-CS-07-V1)

## **Foreign Competitive Grants (Awarded)**

Project Scheme: Portuguese Scientific Foundation (FCT) (PTDC/CTA-AMB/3040/2021) (2022-2025)

Administering Organisation: Led by Roberto Frias, Fundação para a Ciência e a Tecnologia (FCT)

Awarded: €243,828.17

Chief Investigators: Roberto Frias, Lidia Morawska, and more

**Project Title**: Promoting healthy indoor environments with spotlight on endocrine disruptors: elucidating the links between environmental exposure, neurodevelopment and social behavior in

children [EDC(Mind)2]

## 9. Other Public Sector / New Consultancy Research Projects Commenced

Project Scheme: International Centre for Environmental Management (2021-2022)

**Awarded**: \$23,166

Chief Investigators: Lidia Morawska

**Project Title**: A rapid air pollution assessment for Lao PDR

**Project Scheme: Cox Architecture Commercial Research (2022)** 

**Awarded**: \$70,000

Chief Investigators: Led by Lindy-Lou Burton, Evonne Miller, Jane Carthey, Naima Iftikhar, Lidia

Morawska, Veronica Garcia Hansen, Jacqueline Baker, Tim Morgan, Carol Brubaker

**Project Title**: Designing hospitals for a post pandemic world: An integrated Salutogenic (healthy)

approach grounded in Biophilic (natural) and Eudemonic (happy) architectural design

## 9. Conference Presentations (Keynote/Plenary)

## Lidia Morawska

- Invited Plenary Presentation, 'WHO COVID Research and Resources Group (CRRG) Webinar series', 28 January 2021.
  - Presentation: Physics of respiratory infections: do we understand it?
- Invited Plenary Presentation, 'IAS COVID-19 Conference: Prevention', 2 February 2021.

  Presentation: The importance of airborne transmission
- Invited Plenary Presentation, 'Roomvent 2020 Conference', 15-17 February 2021.
   Presentation: Ventilation systems for future buildings to mitigate the transmission of infection and ensure good indoor air quality. To view the presentation on the conference website
- Invited Plenary Presentation, 'Alha Alberta 2021 Spring PDC Symposium and AGM', 17-18 March 2021.

  Presentation: Airborne transmission of respiratory infections: how will future ventilation systems mitigate it and ensure good indoor air quality?
- Invited Plenary Presentation, 'CASANZ: Measurement SIG', 14 April 2021.

  Presentation: Four years of the KOALA program in Australia and overseas: will it continue?
- Invited Plenary Presentation, 'RAMP Continuity Environmental and Aerosol Transmission of COVID-19 Scientific Meeting', 27 April 2021.
  - Presentation: Airborne transmission of respiratory infections: beyond COVID-19
- Invited Plenary Presentation, 'CAR symposium on "Altering the way we live: multi-level design in a world of complex and dynamic airborne hazards", led by Guy Marks, 4 May 2021.

  Presentation: What to measure and how to measure it?
- Invited Plenary Presentation, 'Pre-ECCMID day on COVID-19 (part one), Annual Congress of the European Society of Clinical Microbiology and Infectious Diseases (ESCMID)', in the session, session "Hospital ventilation and air conditioning (HVAC) in hospitals the great unknown", 5 May 2021.

  Presentation: Particles generated by respiratory activities: role they play in the transmission of infections and how to control them
- Invited Plenary Presentation, 'CASANZ 2021 Conference on "Air Quality in Unprecedented Times"',
   International Clean air and Environment Conference, 17-21 May 2021.
   <u>Presentation</u>: Airborne transmission of respiratory infections: will COVID-19 change the way we control it?
- Invited Plenary Presentation, 'Queensland Health' The McCormack Infection Meeting, 1 June 2021.

  Presentation: Particles generated by respiratory activities: role in transmission of infection and control
- Invited Plenary Presentation, 'Air Quality and Human Health Session 2021, at the 2021 Sustainability Research and Innovation Congress (SRI2021)', 12-15 June 2021.
   Presentation: Baseline air pollution and severe pollution events: are they related?
- Invited Plenary Presentation, '2<sup>nd</sup> International Symposium entitled "Ecosystem Change and Population Health (ECAP)', 14-15 June 2021.
   Presentation: A paradigm shift to combat indoor respiratory infections: beyond COVID-19
- Invited Plenary Presentation, 'Laureate', June 2021.
   Presentation: Advancing interdisciplinary science to combat indoor infection transmission and its health and economic impacts
- Invited Plenary Presentation, 'Queensland Health' (Dr Michael Cleary, Deputy Director General of
  Queensland Health; Dr Alex Markwell, Chair of the Queensland Clinical Senate; Chief Health Officer,
  Deputy Chief Health Officer (from public health) and the Director General, as well as doctors and nurses
  from the key COVID hospitals and the team managing hotel quarantine for Queensland).
  Presentation: Particles generated by respiratory activities: role in transmission of infection and control

- Invited Presentations, 'Healthy Buildings 2021 Europe' Workshops, Norway, 22 June 2021.
   Presentation 1: Use of Infection Risk Calculators to Manage Building Occupancy Post-COVID
   Presentation 2: Ultrafine particles (UFP): could we filtrate them with HVAC filters and purifiers?
- Invited Plenary Presentation 'COPSS-NISS COVID-19 Data Science Webinar Series', 25 June 2021.

  Presentation: Airborne transmission of the virus SARS-COV-2 and other respiratory infections
- Invited Plenary Presentation **'EBMT Summit on COVID-19'**, 29 June 1 July 2021. <u>Presentation</u>: *Update on SARS-COV-2 transmission mechanisms*
- Invited Plenary Presentation 'OECD Webinar: "Supporting effectiveness and efficiency in regulatory delivery through regulatory flexibility. Lessons learnt in times of crisis", 29 June 2021.

  Presentation: Indoor air quality, a "no man's land" how to change this?
- Invited Plenary Presentation '3M Technical Forum seminar' on 6 July 2021.

  Presentation: Airborne transmission of respiratory infections: how will we combat them in the future?
- Invited Plenary Presentation 'The Gap Sustainability Initiative', 14 July 2021. <u>Presentation</u>: There is something in the air...
- Invited Plenary Presentation, 'TUBA WCEST Conference', 12 August 2021.

  Presentation: Air pollution and energy: "this discussion is closed"!
- Invited talk to the 'Royal Society of Biology Kent, Surrey and Sussex Branch', 18 August 2021. Presentation: Something In the Air
- Invited Plenary Presentation, 'IBEC Summit on the Lessons Learned from COVID-19 management, primarily from ignoring airborne transmission of COVID-19 and from reticence to follow scientific advice, 30 August 2 September 2021.
   Presentation: Getting Serious about Airborne Infection Transmission
- Invited Plenary Presentation, 'Innovation Challenge on Disease Resilient and Energy-Efficient Air-Conditioning' on Disease Resilience and IAQ in buildings, Asian Development Bank (ADB), 1 September 2021.
  - Presentation: Indoor air quality, a regulatory "no man's land" how to change this
- Invited Plenary Presentation, 'National Symposium on Advanced Materials and Sustainable Technology 2021 (AM&ST21)', Gold Coast, Australia, 3-5 September 2021.
   Presentation: Future building technologies: on Earth or on Mars?
- Invited Plenary Presentation, 'CARE Webinar: COVID-19 Transmission- Are Aerosol Generating Procedures Still of Relevance? Part Two', 20 September 2021.
   Presentation: A paradigm shift to combat respiratory infection
- Invited Plenary Presentation, 'International Conference on Aerosol Science and Technology (2021 ICAST)', co-organized by Taiwan Association for Aerosol Research (TAAR) and National Pingtung University of Science and Technology (NPUST), Taiwan, 24-25 September 2021.
   Presentation: Ambient ultrafine particles: will they be regulated?
- Invited Plenary Presentation, 'ISIAQ Webinar' 28 September 2021.
   Presentation: A paradigm shift to combat indoor respiratory infection
- Invited Plenary Presentation, 'Global Indoor Air Quality & Respiratory Transmission Webinar Series, Knowledge transfer and practical application of research on indoor air quality (KTP-IAQ)', Surrey, United Kingdom, 13 October 2021.
  - <u>Presentation</u>: *Indoor Air: from science to policy*
- Invited Plenary Presentation, **'iDEA 2021: Planet, Health + Hope'**, 15-17 October 2021. <u>Presentation</u>: *Global Epidemics of Air Pollution and how to stop it*
- Invited Plenary Presentation, 'OECD Webinar', Regulatory Division, 19 October 2021. <u>Presentation</u>: Quality Infrastructure in air quality
- Invited Presentation, 'The Fan Manufacturers Association of Australia and New Zealand (FMA-ANZ)
  Meeting', 19 October 2021.
  - <u>Presentation</u>: Airborne transmission of respiratory infections: how will we combat them in the future?

- Invited Plenary Presentation, **'Electronic Music Conference webinar**', 25 October 2021. <u>Presentation</u>: The risk of airborne infection transmission and its mitigation
- Invited Plenary Presentation, 'Environment A relationship with Pandemic' online workshop, Isabella
  Thoburn College, Lucknow, India, 26-28 October 2021.

   <u>Presentation</u>: The relationship between air pollution and generation of energy: what do we need to know and do?
- Invited Plenary Presentation, 'Impact'21 debata: Jak zbudować lepszą przyszłość odpowiedając na wyzwania teraźniejszości?', 27 October 2021.
- Invited Keynote Presentation, '42<sup>nd</sup> edition Toronto International Festival of Authors (TIFA)', Toronto, Ontario, Canada, 28 October 2021.

<u>Presentation</u>: Fight for Clean Air

• Invited Keynote Presentation, Collaborative Design Event, "Feels like Home; Longevity by Design 2021"", 4-5 November 2021.

<u>Presentation</u>: Air quality matters!

2021.

- Invited Plenary Presentation, 'Next Breath Conference Lausanne' on 4-6 November 2021."

  <u>Presentation</u>: Is clean indoor air a politically impossible goal? <u>Link to Presentation</u>
- Invited Keynote Presentation, 'Annual Aerosol Science Conference', organized by the UK and Ireland Aerosol Society, 4-5 November 2021.
  - <u>Presentation</u>: Airborne transmission of respiratory infections: what have we learned from the pandemic?
- Invited Plenary Presentation, '9th International ACIPC Conference', The Australasian College of Infection Prevention and Control (ACIPC), Adelaide, South Australia, 7-10 November 2021.
   Presentation: Controversies in Mask Use - Science of transmission through the air?
- Invited Plenary Presentation, 'Build for Life Conference 2021', organized by the VELUX Group, Copenhagen, 15-17 November 2021.
   Presentation: What is the impact of air quality in buildings? – a post pandemic perspective
- Invited Keynote Presentation, '17th Annual Australia and New Zealand Aerosol Assembly', Clean Air Society of Australia and New Zealand (CASANZ), The Old Woolstore, Hobart, Tasmania, 25-26 November

Presentation: Airborne transmission of respiratory infections: what have we learned from the pandemic?

- Invited Plenary Presentation, 'The 8<sup>th</sup> International WeBIOPATR Workshop & Conference, Particulate Matter: Research and Management (WeBIOPART2021)', Belgrade, Serbia, 29 November 2021. <u>Presentation</u>: COVID-19, particles in the air and ventilation
- Invited Plenary Presentation, 'AIRAH Future of HVAC conference, Sydney', 29 November 1 December 2021.

Presentation: Buildings and Us: what HAS changed due to COVID-19?

- Plenary Presentation, 'ACC-AQSM Annual Meeting 2021', 2 December 2021.
   Presentation: WHO Air Quality Guidelines 2021: what's new?
- Invited Plenary Presentation, Polish Conference 'Problemy Jakości Powietrza Wewnętrznego w Polsce', 2 December 2021.
- Invited Plenary Presentation, 'The Australian Institute of Physics (AIP) Summer Meeting', Queensland
  University of Technology, 6-9 December 2021.

  Presentation: The Physics of Passington Particle Congration, Edge in the Air, and Inhalation
  - <u>Presentation</u>: The Physics of Respiratory Particle Generation, Fate in the Air, and Inhalation
- Invited Plenary Presentation, 'Beijing Environmental Health Sub-Forum on GeoHealth and sustainability 2021', College of Environmental Sciences and Engineering, Peking University 18-19 December 2021.

## 10. Activities - Other

## **Lidia Morawska**

- Invitation to join the National Health and Medical Research Council (NHMRC) Round Table on COVID-19 and Airflow/Ventilation in Quarantine Arrangements, February 2021.
- Invitation to join the Queensland Health's Expert Advisory Group Quarantine Hotel Environment for the Department of Health in the newly established COVID-19 Quarantine team.

## 11. Media Appearances

News

#### Lidia Morawska

### Many media appearances / interviews, for example:

- Brisbane Times with and Timna Jacks on 26 December, "Omicron: What we know so far"
- WA Today by Sumeyya Ilanbey and Timna Jacks on 23 December, "<u>Toughest mask rules come in but minister rejects some health advice</u>"
- ISSUU Polish Magazine on 21 December.
- Dunya News on 17 December, "COVID-19 face masks do not trap dangerous levels of carbon dioxide"
- Polityka, Top Weekly Magazine, Poland on 15 December.
- Bloomberg with Kanoko Matsuyama on 4 December, "We Have to Live With Covid. Here's How We Get
  Our Lives Back"
- ABC Radio Brisbane with Antonia O'Flaherty on 2 December, "No airborne COVID-19 risk, ventilation problems in classrooms, says Queensland Education Minister Grace Grace"
- Fiji Times with Anna Salleh on 30 November, "Breathing easy COVID-19 is a good reason to fix our bad indoor air quality"
- ABC with Anna Salleh on 27 November, "What are the COVID-related risks of choir singing? Is it safe to go back?"
- Spark Chronicles on 27 November, "One of the most influential people in the world"
- Homestyle Green with Matthew Cutler-Welsh on 26 November.
- ABC Health with Anna Salleh on 25 November, "COVID-19 is a good reason to fix our bad indoor air quality but how do we do that?"
- ABC Sunshine Coast Radio Morning Program with Sheridan Stewart on 22 November.
- Infection Control Matters Podcast with Brett Michell on 11 November.
- Andrzej Skórka, Kierownik Redakcji, Gazeta Krakowska, Oddział w Tarnowie on 11 November.
- ABC with Lori Youmshajekian on 8 Nov, "Ventilation in Schools"
- QWeekend, The Courier Mail with Leisa Scott on 6 November, "The 1.5m myth: alarming distance Covid can travel and stay in the air"
- Work in Mind with Sophie Barton on 4 November, "We are failing to prepare our indoor spaces"
- Weekly podcast for health professionals called The Tea Room with Francine Crimmins on 4 November,
   "Helping Australian health authorities improve air quality as part of their strategy to mitigate covid transmission"
- Leonie Tillman interview for Unity | Stories about Us on 4 November.
- ABC with Emily Clark on 3 November,
- Daily Telegraph with David Barwell on 3 November, "North shore school's parent plea in air purifier donation drive"
- ABC with Catherine Hanrahan on 28 October, "Open windows in New South Wales classrooms key to stopping COVID-19 transmission"
- Anna Woźniakowska, Redaktorka Fotograficzna, Wysokich Obcasów on 27 October.
- ABC Radio Brisbane with Antonia O'Flaherty on 22 October, "Ventilation for Queensland"
- Brisbane Times with Tony Moore on 21 October, "COVID-19 protection for Queensland schools still up in the air"
- <u>Brisbane Times</u> | <u>The Age</u> | <u>WA Today</u> with Melissa Cunningham, Liam Mannix, Farrah Tomazin and Aisha Dow on 21 October, "<u>Opening up: Living with COVID-19 in Victoria</u>"
- RNZ Media New Zealand with Phi Pennington on 20 October, "Classroom air quality an 'incredible blindspot', researcher says"
- The Guardian on 20 October by Cait Kelly, "Row erupts over air purifiers at NSW schools as parents fear Covid spread"

- TVP Rzeszow, Polish Interview with Ilona Małek on 20 October
- Work in Mind with Sophie Barton on 20 October, "Ventilation and air conditioning during the coronavirus (COVID-19) pandemic"
- 103.2FM Sydney Radio with Ben McEachen on 13 October, "NSW return to schools next week and what you recommend for ventilation re: COVID best practices"
- Courier-Mail QWeekend Magazine with Leisa Scott on 11 October, "The 'concerning' silent Covid-19 threat to our schoolkids"
- ABC Weekend Breakfast TV on 10 October, "Ventilation"
- The Saturday Paper on 9 October, "Covid-proofing classrooms"
- TVP Nauka Polish TV on 8 October
- De Radio Ciudad de Buenos Aires with Daniel Bajarlía on 8 October
- La Stampa with Elisa Forte on 8 October
- Chanel 7 Sunrise on 8 October, "Air filters for schools"
- Canberra Times 7 October, "Air filters for schools"
- Honours Research Interview with Helton Davison on 7 October, "Roadmap to improve and ensure good indoor ventilation in the context of COVID-19 by the WHO"
- Kobieta, Poland on 4 October, "Prof. Lidia Morawska zmieniła bieg historii. Z badań Polki korzystają rządy na całym świecie"
- News.com with Wade Zaglas on 1 October, "Air filters for schools"
- QUT UniSuper with Liz Brunetto on 29 September, "Time Mag Top 100"
- Polska Press on 29 September "<u>Lidia Morawska jedyną Polką na prestiżowej liście magazynu "Time".</u> Kim jest wybitna profesor i jak pomogła w walce z koronawirusem?"
- Polish Newspaper on 29 September, "Poradzimy sobie z tym wirusem"
- Chanel 7 Sunrise TV on 29 September, "Air purifiers in schools in Victoria"
- ABC Everyday with Yasmin Jeffery on 27 September, "What air purifiers can do for sleep, allergies, smoke and COVID"
- A Current Affair, Chanel Nine TV on 27 September, "Air filters for schools"
- ABC Radio Darwin on 27 September, "Air filters for schools"
- Cosmos Magazine with Manuela Callari on 27 September, "Let's clear the air on ventilation"
- Chanel 7 News Melbourne with Sharnelle Vella on 27 September, "Air filters for schools"
- Chanel 7 TV Interview on 25 September, "Queensland scientists say schools need better ventilation"
- ABC Blueprint with Jonathan Green on 25 September, "Breathing easy amid COVID-19"
- Gazeta Krakowska with Andrzej Skóra on 24 September, "Prof. Lidia Morawska z listy najbardziej wpływowych ludzi świata urodziła się w Tarnowie. Przekonała WHO, jak przenosi się wirus SARS-Cov-2"
- Workplace Insight by Ben Capper on 24 September, "Winds of change are blowing through the office"
- ARN with Abbey Smith on 24 September, "New WHO Air Quality Guidelines"
- Mirage News on 23 September, "New WHO Air Quality Guidelines: what they mean for Australia"
- QUT Media Release on 23 September, "New WHO Air Quality Guidelines: what they mean for Australia"
- Q+A Science Special on 23 September, "Ventilation"
- The Sydney Morning Herald with Stuart Layt on
   23 September, "'Breathing is not a choice': WHO pumps up air quality guidelines"
- QUT Media Release on 23 September, "New WHO Air Quality Guidelines"
- Brisbane Times with Stuart Layt on 23 September,
   "New WHO Air Quality Guidelines: what they mean for Australia"



- Nine News Melbourne with Selby-Lynn Nicholas on 22 September, "Victoria's Announcement on Ventilation in Schools"
- ABC News Radio with Rachel Hayter on 22 September, "Victoria's Announcement on Ventilation in Schools"
- ABC News with Bridget Rollason on 22 September, "Victoria's Announcement on Ventilation in Schools"
- In Queensland by Janelle Miles on 22 September, "<u>Airflow issues to blame for Princess Alexandra</u> COVID outbreak"
- Australian Doctor Magazine on 21 September, "Featuring in Time magazine's Time100"
- Discovery, Poland with Diana Rysciuk on 21 September, "Time Mag Top 100"
- Q+A Science Special pre-interview with Amanda Collinge on 21 September.
- A Current Affair, Nine Network TV with Tracy Grimshaw on 21 September.
- Weekend Today Television on 20 September, "<u>Time Mag Top 100 & Ventilation</u>"
- ABC Radio Drive Queensland on 20 September, "<u>Time Mag Top 100 accolade & Ventilation</u>"
- FM Magazine with Ben Ice on 20 September, "OzSAGE, CO2 Monitoring & Ventilation"
- The Sydney Morning Herald by Natassia Chrysanthos on 20 September, "<u>'Schools should be made safer'</u>: Scientists say NSW needs better plan for ventilation"
- The First News on 20 September, "Virus-battling scientist named one of Time magazine's 100 most influential people of 2021"
- Dzień Dobry TVN, Poland's Top TV Station, with Diana Rysciuk on 19 September.
- 9 News on 19 September, "<u>Aussie professor recognised in Time's Top 100</u>"
- WA Today by Natassia Chrysanthos on 19 September, "We have to be realistic': Temporary COVID school closures to remain"
- SBS Radio Wywiad on 20 September, "TIME Mag Top 100 Release"
- TVN, a Polish Television Network on 19 September, "TIME Mag Top 100 Release" & other Polish Stations
- The Sunday Times in London on 19 September, "Ventilate! Ventilate! How to design the breathable buildings of the future"
- <u>The Sydney Morning Herald</u> | <u>WA Today</u> by Michael Koziol on 19 September, "<u>Reopening, resistance</u> and the long tail of 'zero COVID'"
- Radio TOK FM Poland on 17 September
- ABC Drive Radio with Richard Glover on 17 September, "There's still a long battle that we have to fight"
- ABC Radio Brisbane by Antonia O'Flaherty on 17 September, "Brisbane scientist Lidia Morawska among Time magazine's 100 most influential people in the world"
- ABC The Drum TV Program o on 17 September, "How public spaces and buildings should change in a post-COVID world & The top 100! (congratulations)"
- ABC TV with Katherine Gregory 17 September,
   "Ventilation in indoor environments"
- ABC Radio Brisbane Breakfast on 17 September with Rebecca Livingstone, "OzSAGE, CO<sub>2</sub> Monitoring & Ventilation"
- ABC Radio Sydney Breakfast on 17 September with Robbie Buck and Wendy Harmer, "OzSAGE, CO2 Monitoring & Ventilation"
- 4BC Brisbane Breakfast Radio with Neil Breen on 17 September, "OzSAGE, CO<sub>2</sub> Monitoring & Ventilation"
- ABC's AM program on 17 September, "Air filters in schools and childcare centres"
- QUT Media Release on 16 September, "QUT Distinguished Professor Lidia Morawska in the TIME100"
   & QUT Tweet
- ABC TV/digital/radio with Emma Pollard on 17 September, "Governments failing to heed 'paradigm change' call on ventilation to slow COVID-19 spread, experts say"



- **ABC Everyday** with Yasmin Jeffery on 17 September, "Air purifiers and whether/how they can help with allergies, smoke, sleep, and with limiting the COVID spread"
- 6PR882 Newstalk Breakfast, Nine Network with Gareth Parker on 17 September
- PUBLICO, Portuguese daily newspaper on 16 September, "Measures put up to control transmission of covid-19 in schools in Portugal"
- ABC Radio Tasmania with Kylie Baster on 16 September, "Aerosol Spread of COVID in Tasmania"
- The Sydney Morning Herald with Stuart Layt on 16 September, "Australian professor named in 'most influential' list for virus work"
- QUT Media Release on 16 September, "Distinguished Professor Lidia Morawska in the TIME100"
- ABC Everyday with Madi Chwasta on 15 September, "Ways to better ventilate your rental to reduce mould and indoor COVID spread"
- ABC Radio with Norman Swan on 14 September, "Even with high vaccination, we might need more ... Coronacast"
- Sky News Newsday with Ashleigh Gillon on 14 September, "Plan to improve air ventilation in indoor spaces 'long overdue'"
- WA Today by Ted Baillieu on 13 September, "<u>Ventilation critical to combat spread of COVID</u>"
- Stringr, by the Associated Press and Reuters with Eve Todd on 13 September, "Airborne transmission of disease and the possible need for better building ventilation in the wake of the coronavirus pandemic"
- ABC with Anna Shalleh on 11 September, "Portable CO<sub>2</sub> meters could be used to help fight coronavirus transmission, experts say"
- ABC PK TV on 9 September, "CO<sub>2</sub> Monitoring & Ventilation"
- ABC Radio Sydney with James Yousif on 9 September, "CO2 Monitoring & Ventilation"
- **ABC Hobart** with Lyndal Byford on 9 September, "Positive and negative ions in the air and what impact they can have on us"
- The Sydney Morning Herald | The Age with Henrietta Cook on 8 September, "Plastic screens at checkouts could cause more harm than good, experts warn"
- ABC Radio Melbourne with Madi Chwasta on 8 September, "CO₂ Monitoring & Ventilation"
- Network Ten on 8 September, "OzSAGE, CO<sub>2</sub> Monitoring & Ventilation"
- The Atlantic with Sarah Zhang on 8 September, "The Plan to Stop Every Respiratory Virus at Once"
- **ABC Radio Melbourne** with Madi Chwasta on 8 September, "Importance of ventilation and what's possible in a space that can't be retrofitted"
- The Sydney Morning Herald with Natassia Chrysanthos on 7 September, "COVID-safe measures being implemented in schools around the world"
- ABC Science with Anna Salleh on 7 September, "OzSAGE, CO₂ Monitoring & Ventilation"
- ABC Radio on 7 September, "CO₂ Monitoring & Ventilation"
- The Sydney Morning Herald with Aisha Dow and Jessica Massola on 5 September, "Calls for national school ventilation plan, more details on booster shots to protect vulnerable"
- SBS News with Biwa Kwan on 4 September, "Why Australia's vaccination goal for re-opening could leave the most vulnerable behind"
- Chanel 7 News on 4 September, "Ventilation Revolution"
- Financial Times with Kyra Ho on 4 September, "COVID Transmission"
- QUT Media Release, Video, 3 September "<u>Ventilation revolution: reduce the spread of disease to save lives</u>"
- UNSW Sydney Newsroom on 3 September "OPINION Introducing OzSAGE, practical expert advice for reopening Australia from COVID safely"
- Brisbane Times on 3 September, "Ventilation Revolution"
- Education HQ on 3 September, "Calls intensify for school recovery plan"
- ABC Radio National with Alan Weedon on 2 September, "Improving Ventilation Revolution"
- The New Daily with James Reid on 30 August, "Why improving ventilation is so important before the return to school"

- Gothamist with Jacklyn Jeffrey-Wilenskiy on 30 August, "<u>Ahead Of NYC School Reopening</u>, <u>1,500</u>
   Classrooms Still Undergoing Ventilation Repairs"
- Education HQ with Sarah Duggan on 26 August, "Act now: Expert calls on govt to reduce risk of airborne transmission in schools"
- ABC with Tim Leslie on 25 August, "Improving Ventilation Revolution in schools and beyond"
- ABC Radio National Breakfast with Fran Kelly and Cathy Can Extel on 26 August, "Poorly ventilated buildings a risk to COVID re-opening plan"
- ABC News with Judd Boaz on 25 August, "Australia's air quality culture criticised as experts point to ventilation as key in COVID-19 fight"
- Independent Australia with Paul Budde on 25 August, "<u>Using satellites in the fight against COVID-19</u>"
- WNYC/Gothamist with Jaclyn Jefferey-Wilensky on 26 August, "School Building Ventilation and COVID-19"
- The Atlantic with Sarah Zhan on 25 August, "Call for "paradigm shift" to fight airborne spread of COVID-19 indoors"
- ACEMS Podcast with Timothy Macuga on 24 August, "Episode 58: Clearing the Air on COVID-19"
- The Sydney Morning Herald with Paul Sakkal and Aisha Dow on 22 August, "Ventilation 'revolution' needed to speed up Australia's path out of lockdown"
- The New Daily with James Ried on 22 August, "Importance of ventilation in buildings to prevent widespread COVID-19 infection"
- ABC with Judd Boaz on 17 August, "COVID-19 and Ventilation"
- Interview with Megan Goldin on 17 August, "Spread of COVID-19 Outdoors"
- Radio Brisbane and Queensland on 12 August.
- **Diffusion Science Radio Podcast** on 11 August, "<u>Ventilation Stops the spread of COVID-19</u>" Watch it on YouTube: https://www.youtube.com/watch?v=eJ-itQJ76f0
- Rynek Instalacyjny (Polish Industrial journal) July-August 2021 Issue "Konieczność zmiany zbioru pojęć i teorii tworzących podstawy wiedzy o wentylacji budynków"
- The Age with Aisha Dow, Melissa Cunningham and Michael Fowler on 11 August, "COVID cases could have been prevented by better ventilation, says leading aerosol scientist"
- Brisbane Times with Stuart Layt on 10 August, "<u>Air quality levels can predict whether lockdowns have</u> worked"
- Business Insider Australia on 10 August, "How a prolific anti-vax doctor, known for endorsing claims
  that COVID-19 shots could make you magnetic, oversees a lucrative empire of junk science"
- Cosmos Magazine with Clare Watson on 6 August, "Ventilating complaints about air standards"
- Diffusion Science Radio interview with Ian Woolf, producer of Diffusion Science Radio on 6 August, a
  weekly science and technology program that's broadcast to 28 stations on the Community Radio
  Network, and podcast around the world, "<u>Australia must get serious about airborne infection
  transmission. Here's what we need to do</u>"
- Insider with Mia Jankowicz on 28 July, "Article about an American anti-vaccine activist named Dr Sherri Tenpenny"
- ABC News Radio with Amelia John on 28 July, "Australia must get serious about airborne infection transmission. Here's what we need to do"
- ABC Radio Sydney on 27 July, "Australia must get serious about airborne infection transmission. Here's what we need to do"
- SER Radio Interview on 26 July, "Indoor airborne transmission"
- The Australian with Natasha Robinson on 22 July, "Covid-19: Aerosol expert in despair at inaction"
- New Scientist by Michael Le Page, Clare Wilson, Graham Lawton and Adam Vaughan on 21 July, "What life will be like now England's covid-19 restrictions have lifted"
- Air Clenz Systems on 20 July, "<u>Air-Clenz Systems Announces Technology Breakthrough That Captures</u>, Isolates, and Cleans Exhaled Air in 10 Seconds and Within Two Feet of Individuals"
- Cosmos Magazine with Clare Watson on 28 June, "Call for "paradigm shift" to fight airborne spread of COVID-19 indoors"

- Australian University Science Magazine with Wilson da Silva on 25 June, "Airborne transmission of respiratory infections and what needed to be done beyond COVID-19"
- Nature with Dyani Lewis on 23 June, "How public health organisations, specifically the WHO, develop guidance and recommendations in the context of an evolving health emergency"
- Le Fiagro, France with Frémont, Anne-Laure on 17 June, "Covid-19: jusqu'à quand devra-t-on porter le masque en intérieur?"
- CBC Canada on 17 June, "How delays in acknowledging airborne COVID-19 transmission risked lives"
- The Age | SMH on 14 June, "You can't always predict when you'll need a mask"
- Spanish Newspaper with David Higuera on 14 June, "COVID-19: todas las claves de un error científico que ha costado cientos de vidas"
- The New York Times with Emily Anthes on 13 June, "Aerosol Disease Spread"
- **SBS Television** with Gareth Boreham on 12 June, "The effectiveness of outdoor mask wearing in preventing the spread of COVID-19?"
- The Age | <u>SMH</u> with Ashleigh McMillan and Roy Ward on 12 June, "<u>There are more cases out there'</u>: Plea for testing boost as more exposure sites revealed"
- The Age | SMH with Liam Mannix on 11 June, "Little evidence to support outdoor mask-wearing rule, scientists say"
- Plus Maths Magazine with Rachel Thomas on 11 June, "A breath of fresh air"; "Maths in a minute: The Wells-Riley model"; "Maths in a Minute: Computational fluid dynamics"
- ABC Radio with Baz Ruddick on 10 June, "Melbourne case".
- The Economist Radio Podcast on 7 June: "Will vaccinations kick-start travel?"
- The Australian with Natasha Robinson on 4 June, "Debate on droplet spread up in the air"
- The Australian on 2 June, "Fears Indian Covid-19 variant can infect two hours on"
- Ulrika Eriksson, Freelance Journalist for Swedish Industry Magazine on 31 May, "<u>Calling for the development of health standards aimed at reducing he rist of the airborne transmission of respiratory infections such as COVID-19"</u>
- The Economist with Alok Jha on 26 May, "Improving ventilation will help curb SARS-CoV-2"
- 60 Minutes with Sammi Taylor in May, "Call for "paradigm shift" to fight airborne spread of COVID-19 indoors"
- Cosmos Magazine with Graem Sims on 21 May, "Call for "paradigm shift" to fight airborne spread of COVID-19 indoors"
- Der Spiegel, Germany with Blaise Pascal on 21 May, "Call for "paradigm shift" to fight airborne spread of COVID-19 indoors"
- The Bloomberg on 20 May, "The Risks of Covid-19 Airborne Transmissions"
- ABC on 20 May, Follow up story, "Call for "paradigm shift" to fight airborne spread of COVID-19 indoors"
- BuzzFeed News with Stephanie Lee on 19 May, "<u>Call for "paradigm shift" to fight airborne spread of</u>
   COVID-19 indoors"
- Medscape Medical News, Chicago with Marcia Frellick on 19 May, "Clean Indoor Air Is Vital for Infection Control"
- BBC World Service, Science in Action on 18 May, "Covid and clean air"
- Food Processing on 18 May "Call for new indoor ventilation standards to fight COVID-19 spread"
- Thaiger by Ann Carter on 18 May, "New report confirms what many have thought: Covid probably spreads through air"
- Cleaning & Maintenance Management on 18 May, "Researchers Call for Shift in Combating COVID-19"
- The Regulatory Review by Florentine Blanc on 17 May, "The Urgent Need for Indoor Air Quality Regulation"
- Sky News Broadcast (TV) with Tom Connell on 17 May, "Airborne transmission"
- The Australian by Natasha Robinson on 14 May, "Scientists clear the air on Covid failure"
- Fairfax Media | Brisbane Times with Stuart Layt on 14 May "Total overhaul of indoor air quality needed post-pandemic, experts warn"

- The New York Times on 14 May, "Covid Live Updates: C.D.C. Guidance Prompts Caution in Some States"
- ABC Radio National Breakfast with Sally Sara on 14 May, "Researchers say indoor air quality needs
  overhaul to prevent virus spread"
- ABC Radio Brisbane on 14 May, "An Australian-led team of scientists is calling for a complete overhaul of indoor air quality standards"
- ABC North West Queensland on 14 May, "<u>Calls for a change in thinking around air quality in the wake</u>
  of pandemic"
- 4BC Brisbane Drive with Scott Emerson on 14 May, "Airborne transmission"
- 5AA Mornings Radio with Leon Byner on 14 May, "Airborne transmission"
- Mirage News on 14 May, "Call for "paradigm shift" to fight airborne spread of COVID-19 indoors"
- Silvana Salles, freelance journalist based in São Paulo, Brazil on 14 May, "Call for "paradigm shift" to fight airborne spread of COVID-19 indoors"
- Tech Codex with Anirudh Singh on 14 May, "Call for 'paradigm shift' to fight airborne spread of COVID-19 indoors"
- The Sydney Morning Herald | The Age | WA Today by Stuart Layt on 14 May, "Total overhaul of indoor air quality needed post-pandemic, experts warn"
- BBC World Service radio programme and podcast 'Science in Action' with Julian Siddle on 13 May, "Calls for post-Covid 'revolution' in building air quality"
- Science News | Science Mag on 13 May, "Ventilation in buildings: where water sanitation was in the 1800s"
- Daily Star UK with Berny Torre on 13 May, "Disease X could 'kill off Brit pubs' as scientists warn 'now is time to pay attention"
- India Times Post on 13 May, "Covid Pandemic Demands Air Quality Changes in the Workplace, Researchers Say"
- Pledge Times on 13 May, "A team of experts claims to monitor air hygiene as is done with water to avoid future epidemics"
- Interesting Engineering with Brad Bergan on 13 May, "Preventing Another Pandemic Requires a Major 'Paradigm Shift'"
- Medical Express on 13 May, "To prevent next pandemic, scientists say we must regulate air like food and water"
- Earth.com with Chrissy Sexton on 13 May, "Indoor air quality standards needed to prevent pandemics"
- Wired with Megan Molteni on 13 May, "The 60-Year-Old Scientific Screwup That Helped Covid Kill"
- Inverse.com with Katie MacBride on 13 May, "ONCE THE PANDEMIC WAS OVER, EVERYONE WANTED TO FORGET ABOUT IT"
- Vox.com with Brian Resnik on 13 May, "Covid-19 proved bad indoor air quality makes us sick. We can fix that"
- Gamers Grade by Jason Junior on 13 May, "Call for 'paradigm shift' to fight airborne spread of COVID-19 indoors"
- The LA Times with Richard Read on 12 May, "Scientists call for sweeping change in building design to reduce airborne diseases like COVID-19"
- <u>The New York Times</u> | <u>The Seattle Times</u> with Apoorva Mandavilli on 12 May, "<u>Experts Urge Strict</u> Workplace Air Quality Standards, in Wake of Pandemic"
- Público, a Portuguese newspaper with Teresa Serafim on 12 May, "Call for "paradigm shift" to fight airborne spread of COVID-19 indoors"
- Infectious Disease News and Healio.com with Caitlyn Stulpin on 12 May, "Call for "paradigm shift" to fight airborne spread of COVID-19 indoors"
- AIRAH with Mark Vender on 10 May, "<u>Call for "paradigm shift" to fight airborne spread of COVID-19</u> indoors"
- Bloomberg with Jason Gale on 10 May, "<u>Covid Is Airborne, Scientists Say. Now Authorities Think So,</u>
   Too"

- The Atlantic with Rachel Gutman on 4 May, "6 Questions for the Boss Who Wants You Back in Your Cubicle"
- El Pais with Manuel Ansede on 22 April, "Científicos de primera fila cuestionan la mascarilla obligatoria al aire libre y con distancia"
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## 12. Visitors

Dr. Jenny Wang, Visiting Research Fellow, University of Queensland