

Future Urban Ventilation Network

@BreathingCity

771





Dr. Christina Vanderwel



Prof. Paul Linden

Dr. Maarten

van Reeuwijk

Dr. Abigail Hathway



Prof. Cath Noakes



Prof. Tim Sharpe



Dr. Matteo Carpentieri

Prof. Alison Tomlin



Prof. Janet Barlow



Dr. Megan **Davies Wykes**



Future Urban Ventilation Network



Dr. Zheng-Tong Xie





Dr. Andrew Timmins





Dr. Helen Freeman

Drivers

- Understanding airflow is key to understanding and mitigating poor air quality
 - Link between pollution sources and exposure
 - Need to be able to interpret measurements
- Physics of indoor- outdoor flows is technically challenging
 - Urban and indoor flows both matter
 - Complex and at different time and length scales
- Multiple factors including energy, comfort, noise, climate alongside air quality
- Ventilation doesn't consider health or behaviour effectively
- Building ventilation is not connected with city design huge legacy infrastructure that is not fit for purpose



Theme 1 Coupled indoor-outdoor environments Theme Leads Malcolm Cook and Maarten van Reeuwijk

Theme 1 focuses on mechanisms for ingress and egress of pollutants in buildings and the tools and techniques for quantifying this exchange. We will bring together researchers, practitioners, policy makers and regulators to establish:

- 1. the technical requirements for models from a health, ventilation, design and regulatory perspective;
- 2. models and data sets that are currently available and their strength/weaknesses;
- 3. approaches to characterise human behaviour within flow models;
- 4. systematic differences in characterising indoor-outdoor exchange for building types for specific vulnerable groups (e.g. hospitals, schools, homes, community centres); and
- 5. opportunities arising from technology advances (wearable sensors, machine learning techniques).







Theme 2 Health-centred ventilation design Theme Leads Abigail Hathway and Henry Burridge

Theme 2 will explore innovations required to deliver good ventilation for occupant health. Workshop activities will be designed to explore:

- 1. the evidence base for key health and exposure parameters that could form the performance specification for future ventilation;
- 2. how the challenges of understanding indoor and outdoor airflow relate to the resulting uncertainty in occupant exposure, and the implications for ventilation design;
- 3. identification of future ventilation requirements in terms of research and immediate technological development.



Dr. Henry Burridge



Theme 3 Breathing City into practice Theme Lead Tim Sharpe

Theme 3 will identify and engage with potential users at different scales.

- Current approaches to policy and regulation tend to be piecemeal and driven by different departments and agencies. Through workshops and focus groups the theme would identify common and overlapping areas of influence and expertise to identify gaps in knowledge needed to inform cohesive strategies for informed policy.
- This may include aspects such as planning policies and building regulations but would also link to wider regional and local health strategies, and also development of standards (e.g. BSi or CEN) for urban air flow.



Prof. Tim Sharpe

Objectives

Bring people together across disciplines to:

- Scope the Breathing City framework how do we integrate health evidenced flow design?
- Define and initiate new research to model flows, pollutant transport and exposure risks
- Build partnerships, drive technology solutions, enable user engagement
- Identify the policy requirements to enable health-based ventilation design

Activities

- Core workshop and engagement programme
 - Sharing issues, knowledge and expertise
 - Defining key concepts and technical challenges
 - Building collaborative teams and proposals
 - Research through to practice and policy
- Pilot research activities
 - Test modelling and measurement and approaches
 - Systematic reviews
 - Community science activities
 - Seedcorn funding through calls
 - Open repository for data sets

Morning Schedule

- 10.20-10.40 The Clean Air programme and the health challenges associated with poor air quality Professor Stephen Holgate, University of Southampton, Clean air champion
- 10.40-11.00 Indoor air quality and its health impacts Dr Sani Dimitroulopoulou, Principal Environmental Public Health Scientist, Public Health England
- 11.00-11.10 Break
- 11.10-11.30 COVID-19 and Net Zero: challenges and opportunities for the built and urban environment Professor Paul Monks, Chief Scientific Adviser, Department for Business, Energy and Industrial Strategy
- 11.30-12.00 Policy challenges associated with air quality and buildings in urban environments Professor Alan Penn, Chief Scientific Adviser, Ministry of Housing, Communities and Local Government

LUNCH BREAK 12.00-13.00

 $\sum_{n=1}^{n} \sum_{n=1}^{n} \sum_{n$

Afternoon Schedule

- 13.00-13.10 Introduction to Theme 1: Coupled indoor-outdoor environments
- 13.10-13.20 Introduction to Theme 2: Health-centred ventilation design
- 13.20-13.30 Introduction to Theme 3: Breathing City into practice
- 13.30-13.35 Setting up air quality repositories building our knowledge base
- 13.35-14.15 Break out discussions to capture key theme ideas via X-Leap

BREAK 14.15-14.45

- 14.45-15.00 Summary of breakout discussions from Theme Leads
- 15.00-15.45 Panel discussion Hywel Davies (Technical Director of CIBSE, the Chartered Institution of Building Services Engineers) Irene Gallou (joint Head of Specialist Modelling Group and a partner at Foster + Partners) Professor Elizabeth Shove (Distinguished Professor of Sociology, Lancaster University) Dr Lena Ciric (Senior Lecturer of molecular biology, UCL) Professor Helen ApSimon (Professor of Air Pollution Studies, Imperial College London
- 15.45-16.00 Wrap-up, future events and getting involved



Keep in touch



@BreathingCity



breathingcity.org



contact@breathingcity.org

