PublicHealth@Cambridge Annual Showcase:

Planetary Health

Friday 15th November 2019
David Attenborough Building
Planetary Health 2019 | Programme

9:00  Registration and Coffee

9:30  Welcome
Professor Carol Brayne, Cambridge Institute of Public Health

9:35  The challenges of climate change to living on our planet
Sir Professor David King, introduced by Professor Patrick Maxwell

Session 1 | Chaired by Professor Carol Brayne

10:30 Using novel sensing technologies, advanced computational methods and detailed health outcomes to investigate the underlying mechanisms of air pollution on health.
Professor Rod Jones, Department of Chemistry

10:50 The link between ecosystem services and health.
Professor David Coomes, Director of University of Cambridge Conservation Research Institute

11:10 Tea and Coffee

11:40 Ageing in Planet: Achieving sustainable development across the life course.
Dr Angelique Mavarodaris, Cambridge Institute of Public Health

12:00 On the efficiency of our industrial system as a stakeholder in our natural and human health systems
Professor Steve Evans, Director of Research in Industrial Sustainability

12:20 Harnessing routinely collected data for human and planetary health in Uganda.
Dr Lydia Drumright, Department of Medicine

12:40 Gender, energy and ‘wellbeing’ in slum rehabilitation housing in Mumbai, India.
Dr Minna Sunikka-Blank and Dr Ronita Bardhan, Department of Architecture

13:00 Lunch and Poster Session

Session 2 | Pecha Kucha | Chaired by Professor Bhaskar Vira

14:00 Interactions between land use change, Pteropodid (flying-fox) ecology and Hendra virus dynamics in Australia.
Tamika Lunn, Department of Veterinary Medicine

Sustainable expansion of bivalve shellfish aquaculture for global food security.
David Willer, Department of Zoology

Rory Braggins and Dr James Smith, Department of Public Health and Primary Care

15:00 Tea and Coffee
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**Session 3 | Chaired by Professor Mike Kelly**

15:20  *Talk Show: The relationship between consumers and major crises such as climate change, water scarcity, land degradation*
   - Professor Howard Griffiths, Cambridge Global Food Security
   - Dr Jake Reynolds, Cambridge Institute for Sustainable Leadership
   - Professor James Wood, Cambridge Infectious Diseases IRC

16:20  *Planetary-scale law and policy engagement challenges and opportunities.*
   - Professor Marie-Claire Cordonier Segger, UNFCCC Climate Law and Governance Initiative

16:30  *Climate Change Engagement: The Role of Corporates*
   - Dr Ron Zimmern, PHG Foundation

16:50  *Close*
   - Professor David Coomes

**Drinks Reception | The Whale Café, Museum of Zoology**
Professor Carol Brayne
Director of Cambridge Institute of Public Health

Professor Carol Brayne CBE is Professor of Public Health Medicine in the Department of Public Health and Primary Care in the University of Cambridge. She is Director of the Cambridge Institute of Public Health. Her research focuses on the public health of ageing.

Professor Sir David King

The UK’s prominent thought leader, policy adviser and campaigner on the causes and consequences of climate change. Founder and guiding force of academic and pragmatic research initiatives that have resulted in meaningful improvements in climate change science and action. A highly effective diplomat, driving change in environmental and societal practices at a corporate, national and international level.

The challenges of climate change to living on our planet

Professor Sir David King will present a brief summary of the current understanding of climate change and how it will impact on our ecosystems and human well-being. Although time is not on our side, David will also present a comprehensive plan of action, which includes deep and rapid emission reduction, greenhouse gas removal at scale, and refreezing the poles.
Dr Ronita Bardhan  
*Lecturer, Department of Architecture*

Dr Ronita Bardhan is University Lecturer of Sustainable Built Environment at the Department of Architecture, University of Cambridge, UK and leads the Sustainable Design Group. She holds visiting position at Stanford University and Indian Institute of Technology Bombay. She works on the niche sector of habitat design, energy decisions and gender equality for low-income housing in Global South, especially in the slum rehabilitation housing of Mumbai.

*Using novel sensing technologies, advanced computational methods and detailed health outcomes to investigate the underlying mechanisms of air pollution on health.*

This research adopted a gendered perspective in exploring slum rehabilitation housing (SRH) in Mumbai, India. Based on a household survey and focus group discussions (FGDs), women’s household practices, energy use and wellbeing were explored in interview narratives and systems analysis. The findings show that the relocation to slum rehabilitation housing (SRH) has radically transformed women’s household routines and that women are more affected by the relocation than men. Cooking and cleaning practices have changed due to LPG and water access. Due to poor design and discomfort in three out of four housing typologies, comfort practices have become reliant on electric appliances such as fans and even AC units. Most importantly, cleaning, entertainment and childrearing practices have transformed from outdoors to indoors means higher energy intensity, respiratory health problems but also reduced social interaction and loss of social capital. Women try to absorb high living and energy costs by compromising their own comfort standards and by looking for extra employment, often in informal economy, on the top of their caring responsibilities. This creates a vicious trap where women’s time poverty further reduces their social capital and opportunities for self-development. A comparison of SRH typologies shows that building design has great influence on gendered use of space and electricity use, advocating a courtyard building typology. Further, interviews with policy-makers reveal a dis-juncture between the occupant realities and the policy objectives. The research suggests that gender equality and wellbeing can and should be influenced through energy and housing policies and offers a conceptual framework for inclusive SRH to address this dis-juncture.

Dr Minna Sunikka-Blank  
*Senior Lecturer, Department of Architecture*

Dr Minna Sunikka-Blank is a Senior Lecturer at the Department of Architecture in Cambridge. She is interested in policies: the adoption of new technologies, how they change household practices and energy cultures. Dr Sunikka-Blank is part of Behaviour and Building Performance (BBP) research group and Global Energy Nexus in Urban Settlements (GENUS) network. Her recent research looks at energy demand from the perspectives of users, gender and policy, in the context of slum rehabilitation housing in India. Dr Sunikka-Blank is a Director of Studies and Fellow in Architecture at Churchill College.
Conserving the world’s dwindling biological diversity is one of the most pressing issues facing humans. Professor David Coomes’s lab uses high-resolution remote sensing to understand how forests are responding to global change and contribute to international efforts to protect these ecosystems.

Using novel sensing technologies, advanced computational methods and detailed health outcomes to investigate the underlying mechanisms of air pollution on health.

Humanity faces two environmental crises - climate change and biodiversity loss - which have serious knock-on consequences for health and wellbeing. Unless we understand the connections between greenhouse emissions and land-use change, we face the very real prospect of destroying nature in our attempts to mitigate climate change. Professor David Coomes will discuss the unintended consequences of climate change mitigation.
Professor Marie-Claire Cordonier Segger
UNFCCC Climate Law and Governance Initiative

Professor Dr Marie-Claire Cordonier Segger, DPhil (Oxon), MEM (Yale), BCL& LLB (McGill) is a distinguished scholar, executive and expert jurist in law and governance on sustainable development. With over 22 books and 80 papers published, editor of a CUP Series on Treaty Implementation for Sustainable Development, and founder/editorial board member of several law journals, she is also Executive Secretary of the United Nations Framework Convention on Climate Change (UNFCCC) Climate Law & Governance Initiative; Senior Director of the Centre for International Sustainable Development Law (CISDL); a Full Professor of International Law at the School of Environment, Enterprise and Development (SEED), University of Waterloo in Canada; and Fellow of the Centre for Energy, Environment and Natural Resources Governance (C-EENRG), Law Fellow and Director of Studies of Lucy Cavendish College, and Affiliated Fellow of the Lauterpacht Centre for International Law (LCIL) in the University of Cambridge. A former General Counsel to the Ramsar Convention and Senior Legal Expert with the International Development Law Organization, she serves as Chair of the UN Biodiversity Convention’s Biodiversity Law & Governance Initiative, as Chair of the World Bank’s LID Climate Law CoP, and on the boards of the International Law Association, the Trust for Sustainable Living and other charities. She received the international Justitia Regnorum Fundamentum Award for her leadership on climate change, among other international honours.

Planetary-scale law and policy engagement challenges and opportunities.

Professor Marie-Claire Cordonier Segger will speak about planetary climate change and cooperative efforts to implement the United Nations Framework Convention on Climate Change Paris Agreement’s mitigation, adaptation, finance, transparency and other key commitments for more sustainable development. She will highlight the need to increase the ambition of our responses to climate change across all sectors and professions, including the law, drawing on inspiring innovations from around the world, and share how the UNFCCC CoP25 Climate Law and Governance Initiative helps to challenge and mobilise legal and institutional reform, globally, to scale up education, capacity and action to address climate change.

Professor Howard Griffiths
Director, Cambridge Global Food Security

Professor Griffiths’s lab investigates plant molecular, physiological and environmental processes which regulate productivity and CO2 sequestration, and aim to improve the operating efficiency of the primary carboxylase, Rubisco, and match water availability to use. Stable isotope methods are used to evaluate the origins and regulation of diverse photosynthetic carbon concentrating mechanisms (CCM). The research carried out at the lab translates via fieldwork into food security and biomass crop productivity, as well as natural community diversity.
Dr Lydia Drumright
Lecturer, Department of Medicine

Dr Lydia Drumright is University Lecturer of Clinical Informatics in the Department of Medicine at the University of Cambridge. Within Cambridge Clinical Informatics, she directs the science and research activities, and facilitates expansion of the Centre through collaborations and securing external funding.

Harnessing routinely collected data for human and planetary health in Uganda.

Dr Drumright will speak about her on-going project in collaboration with the Ministry of Health, Makerere and WHO on gathering both electronic records and geospatial data to support malaria (and other health conditions) management.

Professor Steve Evans
Director, Research in Industrial Sustainability

Professor Steve Evans spent 12 years in industry, rising to become Engineering Systems Manager at Martin-Baker Engineering, the world leading manufacturer of ejection seats. Steve has over 20 years of academic experience which includes working collaboratively with leading industrial and academic institutions from around the globe and supervising over 120 PhD. and MSc. students at Cranfield.

On the efficiency of our industrial system as a stakeholder in our natural & human health systems.

Professor Steve Evan’s research seeks a deep understanding of how industry develop solutions that move us towards a sustainable future. He has lead, or co-lead, the first UK EPSRC research projects in the fields of Concurrent Engineering, Co-development and Eco-design and is the Director of the new EPSRC Centre for Innovative Manufacturing in Industrial Sustainability. He is also the director of the Centre for Industrial Sustainability at the IfM. Steve will talk about the relationship between our industrial systems and the natural system and human health and how those have evolved to a condition where they are in competition with one another. Steve will show how we can begin the journey to align our industrial and natural systems and urgently reverse the currently negative relationship.
Using novel sensing technologies, advanced computational methods and detailed health outcomes to investigate the underlying mechanisms of air pollution on health.

Exposure to air pollution is the leading environmental health risk factor globally resulting in 7 million premature deaths annually. To protect global populations from the detrimental effects of air pollution, policies and regulations have been developed on a national and international level based on evidence derived from epidemiological research studying large populations. However, those large-scale epidemiological cohorts employ outdoor air quality measurements with low spatial and temporal resolution that cannot separate the individual health effects of highly correlated outdoor species. As a result, the causal links between individual pollutants and health effects contain significant uncertainties. To address these concerns, the Department of Chemistry has developed a highly portable air pollution monitor (PAM) which collects exposure data at high spatial and temporal resolution. The PAM collects geo-located measurements of multiple gaseous pollutants, particulate matter, temperature and relative humidity. The PAM also contains accelerometry, which is used to classify time-activity-location patterns automatically and so derive estimates of inhalation rates and potential dose (or intake) of air pollution. The PAM has been deployed in the AIRLESS study which represents a unique effort to create an integrated database of detailed air pollution intake and health outcomes with a focus in cardiopulmonary biomarkers in urban and peri-urban residents in Beijing. In this paper we will present some of the findings of the AIRLESS project including personal exposure and dose levels associated with differing environments and activities, and a preliminary assessment of health associations.
Tamika Lunn
Department of Veterinary Medicine

Tamika Lunn’s main research interests are in quantitative ecology, anthropogenic disturbance, and wildlife disease, though her previous field and research experience has encompassed a much broader range of areas. Her PhD research focuses on the mechanistic modelling of flying-fox viral infectious diseases. A central theme of her research will be identifying mechanisms of viral maintenance, and drivers of viral excretion within Australian Pteropus bats, which she will investigate through a combination of modelling, field and laboratory research.

Interactions between land use change, Pteropodid (Flying-Fox) ecology and Hendra virus dynamics in Australia.

Pteropodid bats have come to the forefront of zoonotic disease research as hosts to some of the most significant emerging zoonoses globally. Zoonotic transmission often occurs when bats abandon natural habitats to reside in human settlements, however it is unclear how resulting population structures alter bat disease dynamics. Hendra virus, a bat-borne pathogen in Australia, is a model system to study the interactions among changing landscapes, bat populations, and pathogens. This research explores the influence of roost population structure on Hendra virus dynamics in Pteropodid bats. We collected 12, monthly-repeat roosting measures from 2,522 spatially referenced trees across eight sites, with concurrent viral-surveillance surveys from four of these sites. We then developed mathematical models to combine these complex data, and simulate infection dynamics in a range of realistic population structures. Outputs from these models will aid our ability to predict and prevent disease spill over in Australia and comparable systems worldwide.

Professor Mike Kelly
Department of Public Health and Primary Care

Professor Kelly is a Senior Visiting Fellow in the Department of Public Health and Primary Care at the Institute of Public Health at the University of Cambridge and a member of St John’s College, Cambridge. Between 2005 and 2014 he was the Director of the Centre for Public Health at the National Institute of Health and Care Excellence (NICE) where he led the teams producing public health guidelines. He has advised the House of Commons Health Select Committee and been a witness before parliamentary committees on a number of occasions.
Ageing in Planet: Achieving sustainable development across the life course.

In both scale and impact, global population ageing has far reaching implications for our planet, not least as a major driver of population growth and the ever-increasing human demands on our natural resources and ecosystems. Increases in life expectancy and subsequent population growth will fundamentally impact sustainable development efforts to eradicate poverty, build inclusive and resilient communities and ensure sustainable consumption. In this talk, Dr Angelique Mavarodaris will explore the intersections between planetary health, ageing and sustainability; and how these links can be used to highlight the impact on sustainable development across the life course as well as opportunities for synergistic action.

Dr Angelique Mavarodaris  
*Cambridge Institute of Public Health*

Dr Angelique Mavarodaris’s main research interests are risk factors for cardio metabolic diseases and dementia and differences among various ethnic groups with an aim of developing sustainable preventive interventions in low and middle income countries.

Dr Jake Reynolds  
*Cambridge Institute for Sustainable Leadership*

Dr Jake Reynolds is responsible for CISL’s research, including the pioneering Prince of Wales Global Sustainability Fellowship Programme. He is also responsible for CISL’s Centre for Sustainable Finance which develops practical thought leadership through long-running collaborations with the investment, banking and insurance industries and financial policy makers. As the architect of CISL’s Rewiring the Economy plan, his team seeks to uncover solutions to sustainability problems and put them into practice with leaders in business, government and finance.
Rory Braggins
University of Cambridge School of Clinical Medicine

Rory Braggins is a 6th Year Cambridge Medical Student undertaking a Student Selected Component (SSC) investigating some aspects of the impact of climate change upon respiratory healthcare. Rory is a member of Healthy Planet Cambridge.

Dr James Smith
Department of Public Health and Primary Care

Dr James Smith is Assistant Director of Public Health Studies in the Public Health Education Group of the Department of Public Health and Primary Care. He leads on teaching on global health and environmental sustainability to the clinical medical students. He previously worked for Public Health England where he set up their Sustainability Programme Board and was part of the official UK delegation to the first ever Global Climate and Health Conference at the World Health Organisation. He is on the organising committee of the Cambridge Climate Lecture Series. He also works as a local GP and is a member of the working group preparing the Royal College of GPs response to the climate emergency.


Hydrofluoroalkanes in metered dose inhalers have global warming-potentials thousands of times greater than CO$_2$. We investigated the financial implications of replacing metered dose inhalers with lower global warming-potential dry powder inhalers. The cost per typical day’s use of each inhaler was calculated from NHS Digital 2017 prescription data. Modelled prescription costs decreased by £8.2M annually per 10% of metered dose inhalers changed to the cheapest appropriate dry powder inhaler. Thus replacing metered dose inhalers with dry powder inhalers could reduce drug costs and reduce greenhouse gas emissions. This student selected project demonstrates the potential policy impact of short research projects done within a taught programme. Since this work’s presentation to the British Thoracic Society and to the national policy group on sustainable inhalers at the UK Department of Health, the National Institute for Clinical Excellence have suggested environmental considerations be taken into account during inhaler selection.
Professor Bhaskar Vira
Head of Department of Geography

Professor of Political Economy and Fellow, Founding Director of University of Cambridge Conservation Research Institute. Professor Bhaskar Vira’s research interests centre on the changing political economy of environment and development, especially in South Asia; with a particular interest in the political ecology of forests, water, food, wildlife and landuse change and the social and political context for biodiversity conservation.

Trained as an economist, Professor Bhaskar Vira’s research is concerned, in particular, with the often-hidden costs of environmental and developmental processes, and the need for scholarship to draw attention to the distributional consequences of public policy choices. His work brings a critical political economy perspective to contemporary debates in relation to ecosystem services and natural capital, and the values of nature for human wellbeing. He has over twenty five years of experience working on conservation, environment and development issues in India. In 2018, he was honoured with the Royal Geographical Society’s Busk Medal, in recognition of his contributions to interdisciplinary research on environment and development.
Sustainable expansion of bivalve shellfish aquaculture for global food security.

There is a global need to provide healthy, sustainable diets to 10 billion people by 2050 in order to tackle the double burden of obesity and malnutrition, and to avoid environmental catastrophe from climate change. Sustainable expansion of aquaculture is a critical component in securing food for 10 billion people by 2050. To meet increasing demand, bivalve shellfish aquaculture has been identified as a strategic and highly attractive solution, offering quality human nutrition at a low economic cost and with environmental benefit. There is great potential to expand bivalve aquaculture in developing nations and feed nearly 1 billion people. Effective and sustainable expansion of bivalve aquaculture requires key actions to be taken across the value chain, from production to policy to consumer marketing.
Dr Ron Zimmern
MA, FRCP, FFPHM—PHG Foundation

Dr Ron Zimmern is a Public Health Physician with an interest in public health genomics, personalised medicine, the law and ethics of medicine, strategic planning, priority setting in the NHS, and the translation of information between the academic community and the world outside. In recent years he has taken an interest in climate change and chairs the Centre for Climate Change Engagement at Hughes Hall where he is a Life Fellow. The Centre focuses on the corporate sector and its Boards and the part they have to play in the mitigation of and adaptation to climate change. Ron is Chairman of the PHG Foundation, successor to the Public Health Genetics Unit which he established in 1997 and for which he served as Director until 2010. He was Director of Public Health for Cambridge and Huntingdon Health Authority from 1991 to 1998, and of the Institute of Public Health at the University of Cambridge from 2002 to 2008. He was for many years an Associate Lecturer at the University and an Honorary Consultant at Addenbrooke's Hospital. He has been a Non-Executive Director of Papworth Hospital. He is a Fellow of Hong Kong University and holds there an Honorary Professorship in Public Health where he also sits on the Management Committee of its Centre for Medical Ethics and Law. He is a member of the External Advisory Committee of the Law Faculty's Centre for Law, Medicine and Life Sciences at the University of Cambridge.

Climate Change Engagement: The Role of Corporates

Public health has as a focus the organised efforts of society of which corporate entities are in the developed world a significant player. Companies (which include the transport sector and energy suppliers) have control of over 80 percent of greenhouse gas emissions in the UK. Hughes Hall established in October 2018 a Centre for Climate Change Engagement that seeks to work with Boards of FTSE 100 companies (in particular their Chairs and Non Executive Directors) to engage their interest in the mitigation of and adaptation to climate change; and to encourage scholarship into law, regulation, financial and other levers that will enable the scaling up of action in this sector. This presentation describes and discusses its work.
Posters

**Jasmin Abbott - University of Cambridge Clinical School**
Health for All? – An Assessment of Transparency and Labour Rights Risk in the Supply Chains of a UK Hospital.

**Lydia Akaje-Macauley – University of Cambridge**
Exploring the Efficacy of the Teaching Kitchen Model within the Urban Slum of Kolkata.

**Sarah Assaad - Cambridge Institute of Public Health**
Changes in Physical, Mental and Social Profiles of a Rare Ageing Cohort.

**Natassia Brenman - Cambridge Institute of Public Health**
Intergenerational Futures and Planetary Health: Contributions from a workshop on public health and the life-course.

**Stefanie Buckner – University of Cambridge**
Ageing well in rural England: How can Neighbourhood Planning contribute?

**Susan Ifeagwu - Cambridge Institute of Public Health**

**Eleni Sofianopoulou – University of Cambridge**
Traffic Exposures, Air Pollution and Outcomes in Pulmonary Arterial Hypertension: A UK Cohort Study Analysis.