



Expanding the UCL Grand Challenges

UCL Grand Challenges at London's Global University

Since 2009, UCL Grand Challenges has tapped into our research community's appetite to engage with the world's problems; provoked new and intense collaborations across our university's disciplines; widened academics' understanding of the relevance of their research; and stimulated productive interaction with policymakers, practitioners, businesses and community groups.

Since UCL was founded almost two centuries ago, it has prized innovation, accessibility and relevance.

We recognise that humanity faces problems which are complex, systemic, interconnected and urgent to an unprecedented degree. We must bring together our different expert perspectives to address these issues in their full complexity. Our vision is that a university must be more than the sum of its excellent parts, and that we can achieve more collectively than we can as expert individuals.

This cross-disciplinary approach lies at the heart of UCL Grand Challenges, which aims to bring together academic expertise from across our university to develop holistic solutions to global problems.

During this decade the programme has become an intrinsic part of the way we understand and implement our approach to research. It has provided a new way for this generation of researchers to fulfil their responsibilities.

Through a wide range of activities we have promoted, stimulated and supported impactful and exciting research, increasingly through engagement and partnerships with external organisations interested in using our university's new knowledge output. Here we highlight just a few examples of achievement from the each of the continuing UCL Grand Challenges – Global Health, Sustainable Cities, Cultural Understanding and Human Wellbeing – and introduce two new UCL Grand Challenges: Transformative Technology and Justice & Equality.

New UCL Grand Challenges

The scope of our endeavour has expanded significantly in order to play a critical role in the implementation of our university's 20-year strategy, *UCL 2034*. We have introduced two new UCL Grand Challenges:

The UCL Grand Challenge of **Transformative Technology** encourages cross-disciplinary approaches leading to the translation of insights from advances in science and engineering into prototypes and products with the potential to transform society, and the development of novel technological solutions to societal challenges.

The UCL Grand Challenge of **Justice & Equality** examines the barriers that people face in securing adequate healthcare, safe living and working conditions, education and employment. It seeks to understand and overcome societal structures that limit access to just solutions or sustain persistent inequalities, whether by design or unintentionally.



The continuing UCL Grand Challenges are described on page 4.

Continuing UCL Grand Challenges

The UCL Grand Challenges established in 2009/10 will continue to draw together cross-disciplinary expertise, in partnership with policymakers, practitioners, businesses and community groups.

UCL Grand
Challenge of

**Global
Health**

The UCL Grand Challenge of **Global Health** brings together our university's diverse skills and expertise to find new ways to reduce health inequality in the world, with a focus on people and populations in the global south. The programme facilitates novel collaborations between healthcare specialists and researchers from non-medical disciplines, including engineering, the social sciences and the humanities, often in partnership with practitioners and policymakers.

UCL Grand
Challenge of

**Sustainable
Cities**

By the middle of the 21st century, about two-thirds of the world's population will live in cities. As pressure on the urban environment increases, it is crucial that we consider how we can manage the earth's resources and build cities which are fit for the future. The UCL Grand Challenge of **Sustainable Cities** adopts a holistic approach to issues including housing, sanitation, transport, food security, energy, supply chains and quality of life.

UCL
Grand
Challenge of

**Cultural
Understanding**

The relationships between people, communities and culture are complex and continually evolving. Religion, politics, ethnicity and cultural heritage are closely interwoven and often volatile subjects. The UCL Grand Challenge of **Cultural Understanding** (formerly Intercultural Interaction) draws on our diverse strengths – including in the arts and humanities, social and political sciences, law, economics, history and heritage – to develop our understanding of societies, culture and civilisation.

UCL Grand
Challenge of

**Human
Wellbeing**

The UCL Grand Challenge of **Human Wellbeing** considers the diverse factors that influence our sense of physical and emotional wellbeing, such as ageing, behaviour and social interaction, affected by our biology, the environment (built and natural) in which we live, and how we relate to and look after one another.

Priority Themes and Flagship Activities

From 2016/17, each UCL Grand Challenge will pursue a set of Priority Themes, as well as lead the development and delivery of one Flagship Activity that will engage with the other five UCL Grand Challenges.

The following are the anticipated Priority Themes within each UCL Grand Challenge for 2016/17:

Global Health:

Migration & Health; Antimicrobial Resistance

Sustainable Cities:

Future Cities; Affordable Housing; Supply Chains

Cultural Understanding:

Extreme Religion; Culture & Health

Human Wellbeing:

Adolescent Wellbeing; Demographic Change; Disability

Transformative Technology:

Living Software; Social Impact of New Technology

Justice & Equality:

Age Equality; Equity in Politics & Governance.

Over the coming years, the following prospective Flagship Activities – each led by one UCL Grand Challenge, but drawing on all of them – will respond to the Campaign for UCL's emphasis on 'disruptive thinking' and to the Campaign's public launch event question, 'How will society survive into the 22nd century?':

Global Health:

Human Displacement

Sustainable Cities:

Our Common Future

Cultural Understanding:

Brexit (in partnership with UCL Public Policy)

Human Wellbeing:

Adolescent Lives.

Flagship Activities for **Transformative Technology** and **Justice & Equality** are to be determined.



UCL Grand Challenges

'Grassroots' engagement

The UCL Grand Challenges Small Grants scheme stimulates new cross-disciplinary collaborations between researchers from different academic units, in order to address societally significant problems. These collaborations can also include external partners as additional academic or non-academic collaborators.

Through annual competitive rounds since 2009/10, 145 UCL Grand Challenges Small Grants have been awarded to a value of £587,000:

Global Health: 41 awards worth £177k (since 2009/10)

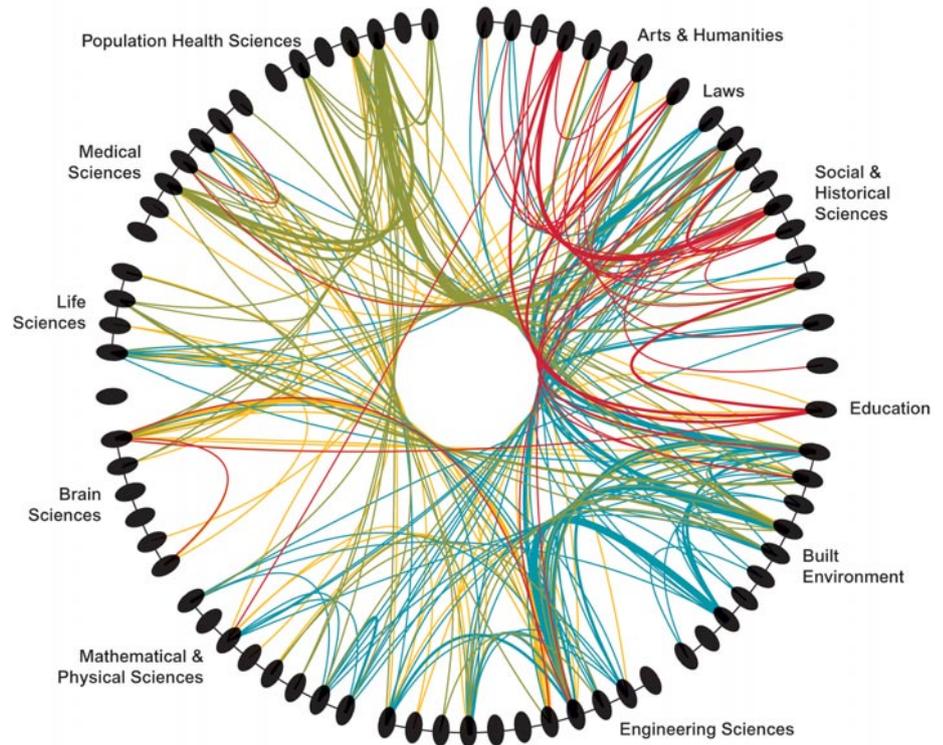
Sustainable Cities: 38 awards worth £168k (since 2010/11)

Cultural Understanding: 28 awards worth £106k (since 2011/12)

Human Wellbeing: 31 awards worth £112k (since 2011/12)

With two new Grand Challenges, this important grassroots scheme now needs extra finance in order to sustain its capacity to award the most excellent 25% of proposals.

The image below represents new collaborations stimulated between researchers in academic units across UCL's 11 faculties.



New cross-disciplinary research collaborations stimulated by UCL Grand Challenges Small Grants in **Global Health** (2009/10–2016/17), **Sustainable Cities** (2010/11–2016/17), **Cultural Understanding** (2011/12–2016/17) and **Human Wellbeing** (2011/12–2016/17)

Embedding our cross-disciplinary approach

UCL Grand Challenges has provoked and supported the formation and development of many cross-disciplinary academic groups that are now well-established.

UCL research leaders have recognised that the complex problems facing humanity require them to think beyond traditional disciplinary boundaries. The UCL Grand Challenges approach has been taken up across the university, with many new academic groups adopting a cross-disciplinary and problem-based focus.

Among the new groups taking inspiration from our approach are:

UCL Grand Challenges: the UCL Institute for Global Prosperity; the UCL Institute for Risk & Disaster Reduction

Global Health: the UCL Institute for Global Health; the Population & Lifelong Health Research Domain

Sustainable Cities: the UCL Energy Institute; the UCL Environment Research Domain; UCL Security & Crime Science; the UCL Institute for Sustainable Resources; the UCL Transport Institute

Cultural Understanding: the UCL Centre for Digital Humanities; the UCL European Institute; the UCL Institute for Human Rights; the UCL Centre for Research on the Dynamics of Civilisation

Human Wellbeing: the UCL Centre for Behaviour Change; the UCL Institute of Healthcare Engineering; the UCL Personalised Medicine Research Domain



UCL Grand
Challenges

UCL Grand
Challenge of

Global Health

Maternal and child health A UCL Institute for Global Health study in very poor eastern Indian villages involved women's groups identifying newborn health problems within the community and selecting their own strategies to address the problems, which they then implemented. Where at least a third of pregnant women participated, maternal deaths were cut by almost half, and neonatal deaths by more than a third.

Non-communicable diseases (NCDs) NCDs such as heart disease, lung disease, diabetes, cancer and mental illness kill more people worldwide than any other cause, with 80% of these deaths occurring in the poorest countries. *The UCL Global Health NCD Season* culminated in the first global health-focused event to be held in the UK Parliament, hosted by the All-Party Parliamentary Group on Global Health.

Health and climate change The UCL–*Lancet* Commission on Health and Climate found that tackling climate change could be one of the greatest global health opportunities of the 21st century. With many of the responses identified as low-cost and 'no-regret' interventions, they could bring unprecedented ancillary benefits to global human health.

Thinking beyond sectors A joint project between UCL and the London International Development Centre provoked discussion and engagement with the post-2015 Sustainable Development Goals (SDGs), leading to a multi-author book and student conference with experts on the 17 SDGs.

Global population *Population Footprints*, the UCL–Leverhulme Trust symposium on human population growth and global carrying capacity, was held in London and Kenya. Hundreds of delegates and speakers addressed policy concerns on issues including reproductive health and rights, climate change, sustainable growth, migration and ageing.

UCL Grand
Challenge of

Sustainable Cities

Urban future proofing A major report, *Future Proofing Cities*, was published by Atkins in partnership with the then-Department for International Development and the UCL Development Planning Unit. It assessed the environmental risks facing cities in an integrated way, and identified more than 100 practical policy options that would be of most benefit to people living in different types of cities.

London 2062 A UCL–Future of London symposium examined London’s energy future, housing challenges, economic development and transport planning. The resultant multi-author book, *Imagining the Future City: London 2062*, stimulated debate about the role of policymakers and practitioners in shaping an enduring sustainable capital city.

Urban water poverty A panel discussion and symposium led to a special journal publication estimating that one sixth of the world’s population lives in slums or unsettled communities with limited access to clean water and sanitation. The events and papers explored how to meet the Millennium Development Goals’ aim to reduce this source of ill-health.

The housing crisis The capital’s shortage of affordable housing was addressed in *London Housing Crisis Question Time*, an event run with UCL Public Policy, and in a publication on the political economy of the crisis, criticising the limitations of supply-side arguments.

Shaping cities for health The UCL–*Lancet* Commission on Healthy Cities investigated the role that urban planning can play in making cities healthier and more equitable places. Its report, *Shaping Cities for Health: The complexity of planning urban environments in the 21st century*, recommended how planning the urban fabric of our cities can help to deliver health improvements.

UCL
Grand
Challenge of
**Cultural
Understanding**

Urban migration on film The UCL Urban Migration Film Festival explored the impact migrants have on their physical, social, cultural and economic environment, and the factors affecting their rights, mobility and settlement. A panel of academics and film-makers considered how journeys, transition and the migrant experience have been portrayed in films.

Negotiating religion A series of workshops, *Negotiating Religion: Inquiries into the history and present of religious accommodation*, discussed how religious communities have created and defended their place in society in history and today. A resulting book will contribute to a better understanding of the role of moderation and negotiation in the shaping of contemporary societies.

Mobile technology, communities and environmental change A project, *Rapid Cultural Change in Ethiopia: Testing new technology for mapping community responses*, investigated how mobile technology can collect data on community responses to environmental change, and how it can support agro-pastoral communities in Ethiopia, whose voices are often unheard in political and policy debates.

Digital humanities Workshops, talks and events were held to mark *UCL Digital Humanities Month*, spreading awareness of how the use of computational tools and techniques can transform humanities research, and how humanities' approaches can enhance research in digital sciences.

Culture and health The UCL–*Lancet* Commission on Culture & Health examined ways in which health and health systems are critically entwined with domains of culture, and reviewed the systematic neglect of culture in health. Its report addressed how people construct wellbeing and health in strikingly different and complex ways, and the impact of alternative socio-cultural values on health consequences.

UCL Grand
Challenge of
**Human
Wellbeing**

Heritage in hospitals UCL and UCL Hospitals collaborated on the Heritage in Hospitals project which found that patients handling museum objects – such as archaeological artefacts, artworks and natural history specimens – reported feeling happier and healthier. The findings contributed to a best practice guide for museum and care worker training.

Science of happiness A public event organised with UCL Public Policy, *The Science of Happiness*, addressed governments' increasing emphasis on improving people's life satisfaction. It examined what policymakers can learn from the scientific evidence on human happiness and how they can apply it to policy and practice in order to improve quality of life.

Ageing issues Through a series of events, the *UCL Festival of Ageing* took a cross-disciplinary look at the issues arising from an ageing population. Academics from a broad spectrum of age-related research tackled questions such as: How can we deliver better health services for older people?; What are the implications of people working longer?; and What can we do as a society to support older people?

European healthcare A conference, *The Future of Healthcare in Europe*, brought together expertise from academia, government, public policy institutes, think-tanks and the third sector from across Europe. It defined the major health challenges that Europe faces and explored ways in which different European countries were responding to them.

Behaviour change *UCL Behaviour Change Month* brought together diverse theories, methods and evidence from many academic disciplines in order to facilitate new collaborations, stimulate creative thinking and launch the UCL Centre for Behaviour Change.

Getting involved

UCL researchers are encouraged to explore how their expertise can be creatively linked with that of other disciplines. We provide support to maximise the impact of your work through UCL Grand Challenges.

External bodies such as government departments, non-governmental organisations, community groups and businesses can help us to identify particular problems facing humanity, along with co-developing and implementing solutions to them.

Alumni and friends are encouraged to support UCL Grand Challenges as we draw on our university's collective insights, analysis and discoveries in order to address the significant problems humanity must overcome if it is to survive to the 22nd century. Over the last decade we have been generously supported by visionary philanthropists, among them Dr Carol Bell (UCL Humanities MA 2001; Archaeology PhD 2005), Christopher Nolan and Emma Thomas (UCL English 1993), Dany Farha (UCL Statistics, Computing, Operational Resources and Economics 1992), Ann-Margaret and John Walton (UCL Economics 1968), Martin Rushton-Turner (UCL Laws 1986) and hundreds of donors to UCL's Regular Giving programme.



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