Outline

Reducing the impact of disasters globally presents a colossal challenge that requires coordinated and collaborative action. The UCL Institute for Risk and Disaster Reduction (IRDR) was launched in 2010 with a remit to concentrate the internationally established, highly successful, but dispersed expertise at UCL. The Institute now brings together the wealth of knowledge and expertise across the university, and through research, teaching, public engagement and knowledge exchange aims to improve the understanding of risk and overcome the barriers to increasing resilience to disasters. IRDR is located within its own space, because co-location of researchers demonstrably works, and is supported in its unique role by IRDR administrative staff and experts in knowledge exchange, public engagement and research support.

Research areas include, but are not limited to: disaster response, disaster recovery, disaster impacts, disaster preparedness, integrating science into disaster risk reduction, earthquake mechanics, communicating risk, disaster diplomacy, risk education, island sustainability, integrating climate change into disaster and health research, seismic hazards and risks, risk statistics, cyber security, flood risk assessment, probabilistic and statistical tools for modeling and managing risk, space weather, space environment risks, arctic risks, cascading crises, water management and risk assessment, contaminant hydrogeology, risks of water and food insecurity, volcanic hazards, tsunami risk analysis, use of social media in disaster recovery, fracking risks, landslide risks, resilience of critical infrastructure, catastrophe risk engineering, and vulnerability assessment. Within these research topics, we consider wide and diverse locations across the globe, and have many international research partners.
Research Achievements and Challenges

- Established the UCL Chair for Risk and Disaster Reduction and appointed the world leading authority on resilience, David Alexander, to the position, so raising UCL to be a major international player in the field.

- Established the Readership in Risk, Resilience and Global Health, jointly with the Institute for Global Health, in a unique initiative with the School of Life and Medical Sciences, to which Ilan Kelman has been appointed.

- Established three other joint lectureships to connect to the statistical sciences, space and climate physics, and civil engineering departments at UCL.

- Established a Lectureship in Earthquake Hazard, appointing Joanna Faure Walker, who encompasses both disciplinary excellence and City experience in risk management.

- Brought in over £3 million of funding from research councils, industry, charities, and Europe.


- UCL IRDR co-leads a 4.75M Euro multi-partner European project on Cascading Crises.

- Established research projects with funding from (re)insurance and banking industries.

- Over two dozen new PhD studentships set up in the discipline, co-supervised across UCL.

- Launched a new MRes programme in Risk and Disaster Reduction.

- Launched a new MSc programme in Risk, Disaster and Resilience.

- Achieved wide-ranging impact and extensive, international media coverage.

- Set up a partnership with Tohoku University International Research Institute of Disaster Science, as an integral part of a University wide MoU. Since the establishment of this partnership, we have conducted joint field missions to investigate post-disaster housing in the aftermath of Typhoon Haiyan in the Philippines and after the Great East Japan earthquake and tsunami in the Tohoku region, a joint field survey of the Bristol Channel, joint research into tsunami fragility functions, and have begun joint research into earthquake mechanics.

- Established schools knowledge exchange programmes in India and Indonesia, in association with local schools, Geology for Global Development (an NGO), Jammu University (India), the Geological Society of London, and the Indonesian Government.

- Established and published some of the controls on sea ice friction and their implications for Arctic Risks, and established partnerships with TOTAL, France and NTNU, Trondheim, to continue working to improve our understanding of how ice mechanics and friction influence arctic risks.

- Established a research partnership with CAFOD (an NGO), and through our joint-funded research we have created guidelines for water management and risk assessment in the Bolivian Altiplano, where water resources are contaminated by mining activity.

- Established and published key controls on groundwater arsenic pollution in Bangladesh. This research was the basis for our outreach project to install hand-operated tubewells for vulnerable communities in coastal Bangladesh. We are still working on the challenge of further improving our understanding the health impacts of arsenic pollution and how to mitigate them in Bangladesh and further afield.

- IRDR academics and researchers have joined the Earthquake Engineering Field Investigation Team (EEFIT) in their missions to Tohoku and L’Aquila after earthquakes and tsunamis in these regions. They remain on the teams that could be called to join future post-disaster field investigations.

- Published timely Special Reports on the Eyjafjallajokull eruption (eruption April 2010, Iceland;
report published May 2010), on a UK-Japan disaster science workshop and lessons disaster risk reduction (workshop Oct 2012; published Feb 2013), on transitional recovery and reconstruction after Typhoon Yolanda (typhoon in Nov 2013, field mission in March 2014, published in May 2015), and on Arctic Risks (published as evidence to the House of Lords Arctic Subcommittee in October 2014, following a call for evidence in August 2014 and scenario meeting in September 2014).

- Over 3,000 participants in IRDR events over five years. Participants are predominantly London based, but both speakers and attendees are from commercial, humanitarian, and government sectors, as well as academics, students, and the general public.
- Improved understanding of earthquake fault mechanics and earthquake statistics, and published these results in International Journals
- Led research on Disability and Disasters, resulting in editing a book, producing chapters therein, coordinating Council of Europe activities in this field, and hosting a public event on this topic.
Suggestions for the Disaster Research Roadmap

- More integration of disaster research with other fields, such as better connecting health and disaster topics, placing climate change as one hazard driver within disaster risk reduction, and developing overlaps and joint projects with arts and the humanities (in addition to continuing collaborations with physical sciences, social sciences, and professions including medicine, social work, engineering, and law).

- A deeper understanding and respect for history, in terms of research, policy, and practice from before as well as historical case studies and lessons.

- Focusing on determining how to think ahead of disaster, rather than analyzing afterwards and implementing measures in reaction.

- Further investigation into different cultural conceptions of disaster, disaster response, disaster recovery, disaster risk reduction, and each one’s elements.

- More integration of science and evidence into disaster planning and preparedness

- Improved understanding of uncertainties in risk, both in terms of integrating more robust statistics into assessing risk and in terms of addressing how risk and uncertainty is understood, communicated and accepted by different communities both inside and outside of academic research.

- Availability of data for scientific research to all countries and researchers (currently some governments keep back more info, often military related data, than others)

- Quantitative risk analyses to be included in all education programmes on disasters

- Ensure multi-views of research when analysing hazard and risk. I.e., Quantitative risk assessments should include uncertainty of different research studies rather than relying on just one study, one research group, or just the local government agency. For example current seismic hazard maps are often created only using historical records of shaking rather than long-term data. This is also pertinent for tsunami hazard.

- Disasters should be considered in context of everyday living, e.g. Cost benefit analyses of disaster protection should include cost of taking resources from elsewhere.

In addition, recognising the important science and technology role that the

- **Post-2015 framework for disaster risk reduction** Further Streamlined Text (as negotiated up to 28 January 2015), recommend that support of UCL IRDR to support paragraph 23g is agreed by the Member States. This is enclosed below:

  (g) Enhance the scientific and technical work on disaster risk reduction and its mobilization through the coordination of existing networks and scientific research institutions at all levels and all regions with the support of the ISDR Science and Technology Advisory Group in order to: strengthen the evidence-base in support of the implementation and [monitoring / follow-up] of this framework; promote scientific research of disaster risk patterns, causes and effects; disseminate risk information with the best use of geospatial information technology; provide guidance on methodologies and standards for risk assessments, disaster risk modelling and the use of data; identify research and technology gaps and set recommendations for research priority areas in disaster risk reduction; promote and support the availability and application of science and technology to decision-making; contribute to the update of the 2009 Terminology on Disaster Risk Reduction [[and including it] [as part of this framework]] [and requests UNISDR to assist the establishment of an intergovernmental working group on disaster risk reduction to further the process up to its completion]; use post-disaster reviews as opportunities to enhance learning and public policy; and disseminate studies;
By working with the INTERNATIONAL COUNCIL FOR SCIENCE ON BEHALF OF SCIENTIFIC AND TECHNOLOGICAL COMMUNITIES MAJOR GROUP support their voluntary commitment for an International partnership to mobilize science for action on DRR and resilience building to will mobilise and strengthen existing capacities and initiatives to support the implementation of the post-2015 framework for DRR from the local to the global scale, and in particular deliver outputs in the following six areas:

1. Assessment of current state of data availability and scientific knowledge on disaster risks and resilience (what is known, what is needed, what are the uncertainties, etc.);
2. Synthesis of scientific evidence in a timely, accessible and policy-relevant manner;
3. Scientific advice to decision-makers through close collaboration and dialogue to identify knowledge needs including at national and local levels, and review policy options based on scientific evidence; and
4. Monitoring and review to ensure that new and up-to-date scientific information is used in data collection and monitoring progress towards disaster risk reduction and resilience building.

In addition, two cross-cutting capabilities need to be strengthened:

5. Communication and engagement among policy-makers, stakeholders in all sectors and in the S&T domains themselves to ensure useful knowledge is identified, needs are met, and scientists are better equipped to provide evidence and advice.
6. Capacity development to ensure that all countries can produce, have access to and use effectively scientific information.