UK Research and Innovation

UKRI Planetary Health workshop report

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Executive summary

The concept of planetary health is gaining prominence within the research landscape, which is unsurprising given evidence of the extensive damage to natural systems over the last two centuries and the close links between the health of the natural environment and the life it supports. To help understand emerging research priorities in planetary health, the Natural Environment Research Council (NERC) on behalf of the UK Research and Innovation (UKRI) planetary health network held a workshop on 24th March 2022 to discuss what planetary health research themes should be tackled, the UK strengths and where can UKRI add value. Fourteen academics, alongside a chair and UKRI representatives were invited to attend this workshop.

The key recommendations for UKRI were as follows:

1. Develop a planetary health specific funding opportunity to advance approaches, innovation and methodologies to explicitly consider interacting environmental and socio-economic stressors and health impacts across different scales, and how to measure and evaluate the impact of interventions to adapt to or mitigate environmental change.

2. Provide funding to pilot exemplar applications of planetary health approaches to decision-making and transformational actions on complex challenges. Producing these examples using system-based science approaches would allow scope for future research, training, and other activities.

3. Raise awareness and increase dialogue of planetary health across UKRI and embed planetary health research within appropriate sector-specific initiatives, adopting a similar approach used with frameworks such as One Health, Global Health, Ecological Public Health and Ecosystem Services.

4. Work across UKRI to identify best practice in inter- and trans- disciplinary research funding processes and address barriers that hinder this type of research.

5. Review the way researchers are trained by incorporating a more systems and international perspective from the outset.

The proposed next step is to create an advisory committee to act as a sounding board for future UKRI interdisciplinary planetary health related research. The advisory committee will be composed of experts from a range of disciplines will help to shape UKRI plans for planetary health research by identifying possible topics/themes, suggesting future initiatives (programmes, networks etc) and facilitating input from key partners.

Introduction

The UKRI Planetary Health workshop was borne out of the UKRI Planetary Health network; an informal network of representatives across the UKRI councils with an interest in planetary health (NERC, AHRC, BBSRC, MRC, ESRC, EPSRC). As planetary health encompasses many of the largest global challenges, and is a transdisciplinary subject, any UKRI research and innovation programme will require cross-council representation. And so, this network enables UKRI to bring all relevant UKRI Councils together to share information and exchange ideas for future investment.

Rationale and background for the workshop

UKRI is aware that planetary health is gaining prominence within the research landscape, as seen by the growing interest from the research community and demand through funds such as Global Challenges Research Fund (GCRF). Moreover, new academic centres of planetary health excellence are appearing at many universities across the UK. As detailed in the UKRI strategy, UKRI is committed to catalysing interdisciplinary approaches to tackling national and global challenges with themes around improving the health of the environment, better human health, tackling infections, building security, tackling place based disparities, which are all important aspects of planetary health. However, despite the growing significance of planetary health as a concept, UKRI sees few research grant applications on this topic through responsive mode schemes.

The purpose of this workshop was to bring together academics from different disciplines to discuss planetary health research progress to date and identify research priorities where the UK can contribute. The main goals of this workshop were to try and ascertain what planetary health research themes should be tackled, identify UK strengths and where UKRI can add value.

Workshop attendees were nominated by the UKRI Council members of the UKRI planetary health network, based on their experience and expertise in the planetary health field (see Annex 1).

Definition of planetary health

The UKRI Planetary Health network agreed a working definition of planetary health, based on the Rockefeller Foundation–Lancet Commission on Planetary Health, which is:

The concept of Planetary health focuses on the health impacts (in humans, animals, and plants) of human-caused disruptions of Earth's natural systems and the development and evaluation of potential actions to create positive feedback loops between a healthy environment and a healthy society. At the crux, planetary health describes how the health of humans and other living organisms are inextricably linked and how these in turn depend on Earth systems that sustain life. Our health therefore ultimately depends on flourishing natural systems as well as underpinned by economic and social equity, and the wise stewardship of natural resources.

To help guide the discussions and provide a focus for the workshop, the planetary boundaries concept was used as an organisational framework.

Scope

This workshop was focussed on environmental change and health. UKRI sought information about research that would provide new knowledge on interlinkages between environmental change and human health and research that proposes and evaluates strategies to reduce environmental damage or restore environmental integrity with co-benefits for human and environmental health. The workshop scope also included methodologies to measure and track progress in links between human welfare and ecosystem integrity. Global issues were in scope for discussion, including but not limited to research in Low- and Middle-Income Countries (LMIC), as well as issues that are relevant to the UK and developed nations. The workshop agenda is available at Annex 2.

Discussion sessions

Discussion 1: What are the pressing/emerging issues that need a planetary health approach; what are the cutting-edge research needs?

The aim of the first discussion was to understand which individual or combination of planetary boundaries are the most important to stay within for the health of the planet and the life it supports. The anticipated output was collated suggestions of cutting-edge views in planetary health and opportunities for research progress.

The group agreed that research should be prioritised in areas that had the biggest impacts on human health, such as climate change, pollution (air, light, chemical and noise) and land-use change, as well as understudied areas or where there is a low evidence base, such as the health benefits of climate change mitigation. Whilst modelling studies indicate that there are potential co-benefits of climate change mitigation and human health, there is little evidence that these interventions are having the desired effects on human health and greenhouse gas (GHG) emission reductions, despite the major potential benefits for both. Another evidence gap relates to the health and environmental interrelated benefits of nature-based solutions for climate change and biodiversity loss.

The group also discussed that it would be helpful to produce pilot exemplar applications of planetary health approaches to decision-making on complex challenges. Producing these examples using process and system-based science approaches would allow scope for future research, training, and other activities. These exemplars would involve using planetary health approaches to design and test potential policies and approaches for living sustainably, exploring the trade-offs between planetary boundaries, and quantifying the co-benefits, for example:

- Navigating the trade-offs around delivering net zero and climate risk management with land-use changes in urban design, transport, and food production.
- Designing planetary health sensitive cities for benefits across the life course; recognising differential impacts particularly on the very young and elderly. As well as delivering a net zero transition, whilst still maintaining socially just (economic, political, and social rights and opportunities) spaces for humans.
- The implications and management considerations to reduce the medium- and long-term risks to the supply chain affected by severe climatic changes that pose risks to human health, for example through increasing food prices.

The group suggested that there are specific sector challenges that would benefit from a planetary health approach, as there are many research topics that need addressing and these include:

- Agriculture/food systems that provide healthy sustainable, sustainable dietary choices
- Health effects of aerosol loading from ongoing climate change events - forest fires, desert dust storms, elevated ground level ozone in urban areas, and how to reduce risks
- Wider effects of transport, beyond carbon pollution, including land use change and strategies to reduce unnecessary travel
- Marine environments, alongside terrestrial ecosystems. Understanding how marine, terrestrial, and freshwater systems interact and their implications for health.
- Catchment and river science approaches for assessing impacts of present day and historical metal mining, employing newly developed process-based models and global databases.
- Socioeconomic consequences and impacts to regional and global supply chains due to health risks as well as physical and management interventions to alleviate the risks

A strong consensus was to be open to the different interpretations of planetary health and the various conceptual models of planetary boundaries and sustainable development. There is potential to further test the relevance and interconnections of planetary boundaries when considering the interaction and interrelationships between human health and environmental stressors.

The group recommended a focus on the interactions between different types of environmental and social stressors, including between different planetary boundaries, and human health. Tipping points, beyond which sudden state shifts occur may be rare, and a combination of gradual environmental and socioeconomic changes are also critical in determining health and other impacts.

Discussion 2: What are UK's strengths and weaknesses in this field? What are the external opportunities and threats to UKRI investment adding value?

The aim of the second discussion was to collect views on where and how the UK research community is best placed to contribute to the planetary health agenda and where the funding system is supporting and/or hindering efforts.

The UK is considered a planetary health leader and has a strong base of planetary health 'bodies' throughout UK universities and other organisations. The UK has substantial depth in many planetary health research topics, including climate change, antimicrobial resistance and air pollution and health, from understanding coal-based smog, which is still a concern in many countries, to diesel emission impacts on health. The UK is strong at developing conceptual frameworks with high level thinking, as well as excelling at running large complex projects that involve capacity building. The UK is also a world leader in system-based science, process-based modelling and developing global datasets, but an opportunity would be to integrate health and environmental data to explore the environment- health nexus in the future. There is also an opportunity to build on UK expertise and methodological development in the evaluation of complex interventions, particularly in health.

The group felt that the UK has scope to improve on ensuring that research and policy in natural systems, ecological and socio-political processes are considered as important as human health implications. Another area of research that requires more funding and focus is mental health and social wellbeing issues, especially how these link to environmental and socio-economic stressors. The group recommended that UK funders should offer more opportunities for inter and trans-disciplinary working, and UKRI should find ways to incentivise and increase the dialogue between ecological, social scientists and medical infection/disease/public health researchers. Also, when in discussion of other (potentially competing) frameworks e.g. One Health, Global Health, Ecological

Public Health, Ecosystem Services etc, there is a need to acknowledge them/their communities and encourage collaboration rather than rejection from these other communities/frameworks. It is also important to make the distinction between the terms, multi-, inter-, and trans-disciplinary, as they are often used interchangeably but have different meanings and should not be used synonymously.

Attendees felt that the legal system in the UK, like the rest of the world, needs to change and stop treating the environment as a commodity to be exploited, so it can be protected. Natural environments have value beyond the commercial commodities they provide. Currently many planetary health issues cannot be adequately addressed as it falls between environmental law and human health, with very few connections.

To see 'real' changes in terms of addressing major global challenges, such as the human health impacts of climate and other environmental change, knowledge transfer from research into policy and practice needs to be incorporated more efficiently. This will require attention to increasing the demand for research evidence rather than an exclusive focus on supply of research evidence. The principles and ethics of co-design can help to increase the uptake of research evidence by forging closer links with decision makers.

In terms of threats to UKRI investment, a topic that was discussed frequently was overcoming obstacles of international collaboration, learning from the legacy of the GCRF, and developing ways to re-build and instil trust with international collaborators post GCRF. This requires time to build these relationships, as well as the finances/funds to pay and support colleagues.

In addition to a significant improvement on integration and analysis of environmental and health data, the group advised that there is also an opportunity to consider place-based research, as well as more applied research that is appropriate to the geographical scale, rather than just focusing on high level, generalizable and scalable data.

Discussion 3: What steps could UKRI take to further support UK contributions to planetary health research?

The aim of the third discussion was to collect recommendations on where and how UKRI could focus investment and partnerships to facilitate UK contributions to the planetary health agenda.

An area that received extensive attention during the workshop was encouraging the submission of more inter- and trans-disciplinary research by ensuring mechanisms were implemented that allowed for the submission of both discovery and strategic proposals. A suggestion during the workshop was to develop a cross council responsive mode funding route, so that one research council would not need to be a lead on the proposal. In doing so, this would require a radical rethink to the proposal review process, as it is not adequate for interdisciplinary research, where panel members are often from siloed disciplines and so find it challenging to consider the whole project remit.

It could also be beneficial to provide a long-term (5 years or longer) funding mechanism, which would encourage a commitment to a long-term programme that would connect current expertise, as well as build a new generation of researchers. This would allow a 10-year plan for both research and capacity impact, allowing sufficient time to co-design programmes.

Attendees suggested that UKRI could better support so-called research nomads, i.e. individuals that are prepared to move from one disciplinary perspective problem to another. Those that migrate across disciplines often bring different perspectives and so this trajectory needs to stop being considered an impediment to people's career.

There was a feeling that UKRI needs to create a safe space for creative and risk-taking research. UKRI funding structures are currently highly risk averse, and this can limit scientific advance. This is especially important for interdisciplinary research, which often has more uncertainties and academics could be better encouraged to take risks and manage these to push forward transformational research.

Workshop participants proposed that UKRI makes better connections with other funders and organisations, such as:

- International funders: UNEP, WHO, Future Earth, ICSU, Belmont Forum, C40 cities
- Collaboration with charities, like Wellcome Trust and the Gates Foundation
- National Institute for Health Research (NIHR), US National Institutes of Health (NIH), US National Science Foundation (NSF) and European Commission
- NGOs
- Local and national government
- Industry partners (including finance and insurance)

UKRI needs to assist with the current challenges in publishing qualitative research on planetary health. System based science, such as planetary heath requires both qualitative and quantitative data to understand complex processes, and so both data are vital to fully understand the system. UKRI already helps to support data infrastructures, and could do more to integrate qualitative and quantitative data by supporting guidelines, such as those recently developed by MRC and NIHR to evaluate complex interventions. UKRI could help to have a similar framework for planetary health.

Another important theme from this discussion was the importance of engagement with partners (policy, industry, research, users and the public with lived experience) but not just symbolic engagement, rather how to create a productive, equitable and respectful engagement between partners. A suggestion was to develop guidelines for partner engagement, which is not just written by the research community.

The workshop attendees suggested that UKRI could organise more sandpit-exchanges between researchers to shape the development of calls. A good illustration of this is the 2020 AHRC 'where next' initiative, which was a researcher based -setting agenda for future research. The call invited interdisciplinary proposals that explored and developed ideas for interdisciplinary research areas which could form the basis of future research initiatives.

In terms of moving the planetary health research field forward, it would be helpful to review funding mechanisms so UKRI can fund overseas researchers rather than only funding researchers at a UK based institution.

As well as focusing UKRI investment on research, the group agreed that another important area to consider was training. Particularly, funding cross-disciplinary PhD students to generate researchers that work across multiple subject areas. Any academics that lead on interdisciplinary projects, should undertake mandatory training to ensure that they understand how to manage these types of projects. Include addressing career progression and specific barriers that exist for interdisciplinary researchers.

Other suggestions to improve training researchers is to collaborate with other global organisations to create an international centre for doctoral training, to ensure that UKRI are funding world-leading scientists. UKRI could also offer flexibility over how funding is used in international projects, for example, many LMIC research teams do not have PDRAs, and research is carried out by MSc and PhD students. It would also be helpful if UKRI could provide an opportunity for early career researchers to be trained together across UK and LMICs.

It would also be beneficial to have fellowship funding to support early, mid, and late career development. There is emphasis on provisions for early-career researchers and those more established academics, but few opportunities for those scientists in the middle of their career.

Recommendations:

Key recommendations from the workshop for UKRI to consider are:

1. Develop a planetary health specific funding opportunity to advance approaches, innovation and methodologies to explicitly consider interacting environmental and socio-economic stressors and health impacts across different scales, and how to measure and evaluate the impact of interventions to adapt to or mitigate environmental change.

2. Provide funding to pilot exemplar applications of planetary health approaches to decision-making and transformational actions on complex challenges. Producing these examples using system-based science approaches would allow scope for future research, training, and other activities.

3. Raise awareness and increase dialogue of planetary health across UKRI and embed planetary health research within appropriate sector-specific initiatives, adopting a similar approach used with frameworks such as One Health, Global Health, Ecological Public Health and Ecosystem Services.

4. Work across UKRI to identify best practice in inter- and trans- disciplinary research funding processes and address barriers that hinder this type of research.

5. Review the way researchers are trained by incorporating a more systems and international perspective from the outset.

Next steps

The proposed next step is to create an advisory committee to act as a sounding board for future UKRI interdisciplinary planetary health related research. The advisory committee will be composed of experts from a range of disciplines will help to shape UKRI plans for planetary health research by identifying possible topics/themes, suggesting future initiatives (programmes, networks etc) and facilitating input from key partners

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Annex 1

UKRI Planetary Health Workshop – Chair's brief

24th March 2022, 09:45-13:15

Location: Virtual Zoom meeting

Attendees

Chair:

Andy Haines, LSHTM

Speakers:

Matthew Baylis, University of Liverpool (**health perspective**)
Sara MacBride-Stewart, Cardiff University (**social science perspective**)
Pete Smith, University of Aberdeen (**environmental perspective**)

Participants:
Nicola Beaumont, Plymouth Marine Laboratory
Richard Dawson, Newcastle University
Lora Fleming, University of Exeter Medical School
Jérémie Gilbert, University of Roehampton
Dabo Guan, UCL
Ruth Hunter, Queen's University Belfast
Frank Kelly, Imperial College London
Joanne Lello, Cardiff University
Mark Macklin, University of Lincoln
Charles Musselwhite, Aberystwyth University
Tolullah Oni, University of Cambridge

UKRI:
Charlotte Allen, MRC
Graham Campbell, MRC
Caroline Culshaw, NERC
Lucy Hackett, EPSRC
Bryony Pound, ESRC
Liz Rowse, NERC
Eleni Sarakinou, NERC
Lizzie Treadwell, BBSRC
Sarah Turner, NERC

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Annex 2- Agenda

Time	Min	Action	Lead
09:45	5	UKRI Welcome	Liz Rowse, NERC
09:50	3	Chair's Welcome	Andy Haines, LSHTM
09:53	2	UKRI's Vision	Caroline Culshaw, NERC
09:55	10	Chair's Address	Andy Haines, LSHTM
10:05	15	Presentation 1: Planetary Health – an environmental perspective	Pete Smith, University of Aberdeen
10:20	15	Presentation 2: Infectious disease in a changing world	Matthew Baylis, University of Liverpool
10.35	15	Presentation 3: Co-building Planetary Health	Sara MacBride-Stewart, Cardiff University
10.50	45	Discussion 1: What are the pressing/emerging issues that need a planetary health approach; what are the cutting-edge research needs?	Andy Haines, LSHTM
11:35	15	**BREAK**	
11:50	30	Discussion 2: What are UK's strengths and weaknesses in this field? What are the external opportunities and threats to UKRI investment adding value?	Andy Haines, LSHTM
12:20	30	Discussion 3: What steps could UKRI take to further support UK contributions to planetary health research?	Andy Haines, LSHTM
12:50	15	Chair's Reflections	Andy Haines, LSHTM
13:05	10	Wrap up and Next steps	Liz Rowse, NERC
13:15		**END OF WORKSHOP**	