

Knowledge Mobilisation for the NIHR Health Protection Unit in Environmental Exposures and Health

1. Background

The Health Protection Research Unit (HPRU) in Environmental Exposures and Health (EEH) is led by Imperial College (IC) and is clustered with the Chemical and Radiation Threats and Hazards HPRU .

Since 2014 the HPRU in the Health Impact of Environment Hazards (<http://hieh.hpru.nihr.ac.uk/>), a partnership between IC, Public Health England (now UK Health Security Agency) and King's College London (KCL), has undertaken research to provide high quality scientific evidence that has supported to support PHE in implementing effective public health interventions to reduce the burden of ill health.

Air pollution, noise, illicit drugs and tobacco are major well recognised underlying causes of chronic diseases, but with incomplete understanding. In addition, emerging exposures such as microplastics and e-cigarettes pose possible risks to human health. Combined, these environmental challenges contribute to adverse health causing a considerable burden to the NHS and public purse. Further research into the interactions of genetic and environmental factors and their consequence for health will provide the translatable knowledge to be applied to reduce morbidity and mortality from disease, increase healthy life expectancy, and reduce health inequalities from appropriate interventions and controls.

A difficulty with the understanding the impact of the environment on health is that exposures are often long term and low level. This is challenging in terms of understanding the contribution to or causation of disease. The chronic effects caused are often incremental which complicates the assessment of adverse outcomes, and similarly the benefits of interventions. Furthermore, effects can be compounded and exacerbated by combined environmental stressors e.g., gaseous and particulate pollution and inter-individual variation in predisposing factors amongst those exposed e.g., obesity, pre-existing disease and age. Furthermore, interindividual genetic variation can also give rise to differential susceptibility.

To address these complex issues the EEH HPRU will use all relevant technology to understand exposure, hazard and susceptibilities combined with epidemiology to recognise the most significant hazards and effective interventions. This approach, across our themes will allow us to focus activity around a conceptual framework that examines links from the molecular level to the whole body across the life course, to advance knowledge and better inform environment and health policy. A key function of the Knowledge Mobilisation Team will be to take these new data to application. This strategy outlines our approach to mobilise knowledge generated by the HPRUs, and to developing expertise and establishing a culture in partner organisations to improve their capacity to draw on research evidence.

2. Knowledge Mobilisation Definition

Knowledge mobilisation (KMb) brings together different communities to share knowledge to catalyse change. Knowledge mobilisation is a two-way process which enables advances in health protection research to create benefits for patients and the public; supporting research informed decision-making by policy makers, public health practitioners, the public, and other stakeholders.

Effective knowledge mobilisation involves:

- Facilitation of engagement of researchers with the policy, practice, research and public communities where their research can make a difference.
- Enabling policy, practice, research and communities to have a role in the devising of research questions, to ensure that they address important questions in a useful way.
- Enabling researchers to influence decision-making processes in policy, practice and elsewhere through having a 'seat at the table' alongside other approaches to dissemination
- Increasing understanding of research limitations and uncertainties, among those who can use research findings.
- Transferring useful knowledge from other sources such as conferences to the HPRU.

An introduction to the evidence base for knowledge mobilisation is given in Appendix 1.

3. Knowledge Mobilisation Aims and Objectives

This tailored strategy for the HPRU has evolved from the pan-HPRU KM strategy. It has drawn on:

- research and experiential knowledge of effective knowledge mobilisation strategies
- conversations with HPRU-EEH affiliated academic and UKHSA colleagues
- conversations with KmB leads from other HPRUs
- the HPRU-EEH Forward Business Plans

Accordingly, the three aims agreed with the HPRU directors are:

1. Undertake effective knowledge mobilisation activity appropriate to area of research;
2. Increase knowledge mobilisation skills and capacity;
3. Contribute to the evidence base for effective knowledge mobilisation.

These will be achieved by integrating knowledge mobilisation in the HPRU. Specifically, it will be built into research training for students also engaging their supervisors, management of post-doctoral research activity, in projects led by senior staff, and in HPRU-EEH management and monitoring processes through management meetings.

Objectives

Objective	Aim	Details	Targets	
			Short Term	Medium-Long Term
1. Consider where and how our research questions have been derived	1, 3	This objective includes asking the following questions at the point of generating research ideas, and throughout the research process: <ul style="list-style-type: none"> • What is the relevance of this research to patients/public? • What is the relevance of this research to policy makers? • What is the relevance of this research to healthcare professionals? 	<ul style="list-style-type: none"> • Addressing of these questions in preparation of protocols, reports, workshops, reports, manuscripts etc. 	<ul style="list-style-type: none"> • Consideration of these questions in research meetings and exchanges.

		<ul style="list-style-type: none"> • What is the relevance of this research to private industry and the non-governmental sector? 		
2. Identify and engage with key stakeholders and end-users of HPRU research	1	<p>Key stakeholders include UKHSA, BEIS, and DHSC within government and in the private sector chemical, cosmetic and crop protection companies. Within these organisations we will identify key individuals.</p> <p>In addition, as a cross-cutting HPRU it is critical that we engage with other HPRUs and the public.</p>	<ul style="list-style-type: none"> • Stakeholder mapping exercise in conjunction with UKHSA lead, Director and Theme leads. 	<ul style="list-style-type: none"> • Engagement with PCOG panel. • Continued identification and engagement of new and emerging stakeholders and end users.
3. Training staff and students in Knowledge Mobilisation	2	<p>Many researchers will be unfamiliar with KMb, its aims and methods and how it is distinctive from communication or dissemination of results. We will combine with the other HPRUs to offer training and support to new and existing HPRU staff to help raise awareness of KMb, its methods, aims and the critical role it can play in maximising the value of research.</p> <p>We will develop online-training resources in knowledge mobilisation and ensure that there is a web presence of KMb on the HPRU websites. As part of induction all new staff will have individual or group discussions with the HPRU Knowledge Mobilisation academic lead or the HPRU Knowledge Mobilisation Manager.</p>	<ul style="list-style-type: none"> • KMb section published on the HPRU websites, including KMb strategy. • Regular attendance of KMb Manager at Research Theme Meetings and Management meetings to encourage staff to consider all aspects of KMb throughout the research process. 	<ul style="list-style-type: none"> • Establish and maintain a KMb training programme for doctoral researchers and early career researchers by engaging with HPRU Training lead. • Session on KMb led by KMb Manager at HPRU Annual meeting.
4. Maximise learning across HPRUs	2,3	<p>Knowledge mobilisation needs a developing underpinning evidence base as an expanding area of practise and theory.</p> <p>Knowledge mobilisation in health protection may also have some specific aspects.</p> <p>HPRUs will therefore evaluate the effectiveness of their knowledge mobilisation approaches.</p> <p>Proposals for this includes evaluation of the changes in the culture and expertise in this area across partners, prospective studies of approaches employed and their effects, and observational studies including case studies.</p>	<ul style="list-style-type: none"> • KMb Manager to attend the pan-HPRU KMb Network meetings.. • KMb Manager has role as Training lead on pan-HPRU KMb Network to identify resources for the KMb Network and HPRU staff. 	<ul style="list-style-type: none"> • Share good practice as it arises with other HPRUs. • Contribute to the collective synthesis of case studies across the HPRUs.

	<p>The NIHR Centre for Engagement and Dissemination (CED) Knowledge and Evidence team will support HPRUs to develop and disseminate outputs such as evidence synopses and lay summaries, also tracking the value and impact of outputs. This will be in parallel with submission of manuscripts for peer-reviewed publication</p>		
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Technologies for knowledge mobilisation

The knowledge mobilisation partnerships within and across HPRUs will use the full range of relevant technologies to support knowledge mobilisation. As noted above, collaborative relationships across research, practice and policy process are at the centre of this. However more specific tools including accessible data sets, data visualisation interfaces, easily usable software implementations of methods, policy papers, and briefing documents including lay summaries, and social media communication will be co-produced in support of mobilising knowledge generated by the HPRUs.

4. Capacity building and training for knowledge mobilisation

Internal HPRU knowledge mobilisation

The Knowledge Mobilisation Team will work with the Training team to facilitate training by activities such as arranging placements to work within partner institutions and settings where appropriate to achieve mobilisation of our research findings there and knowledge mobilisation capacity development for the HPRU-EEH researchers and staff in that setting.

Additionally, specific learning needs related to knowledge mobilisation will be elicited at induction and subsequently and supported on an individual basis and as a group as appropriate. It is expected that many learning needs requiring specific training will be shared across HPRUs and delivered collaboratively through developing resources in the knowledge mobilisation network.

UK Health Security Agency front line staff and other local staff

We will engage with front line staff to disseminate knowledge generated through workshops and iterative development of tools and interfaces to increase their capacity to guide and use our work.

Participation in the pan-HPRU Knowledge Mobilisation network will iteratively develop a knowledge mobilisation framework for health protection incorporating learning across the area. Use of online-training resources in knowledge mobilisation accessible across the HPRU network.

This will include (i) sharing our learning of what works and is difficult, (ii) learning from knowledge mobilisation approaches, experience, and evaluation of other HPRUs, (iii) jointly identifying learning needs and developing training materials and events, and (iv) participating in joint knowledge mobilisation initiatives as appropriate.

This will include active collaboration with subject area HPRUs where our approaches apply, and with groups and individual staff in UKHSA. We will also engage with other researchers and research users nationally and internationally given the general relevance of the intended research. This will include an open approach to HPRU-EEH membership allowing supported use of tools and participation in workshops.

Knowledge mobilisation across HPRUs

The Knowledge Mobilisation Team will facilitate the transfer of knowledge between the HPRUs to further research. This may include activities such as arranging and chairing meetings areas where the Knowledge Mobilisation Team considers there may be benefits from collaboration. The Knowledge Mobilisation Team will continue to monitor calls for research and make members of the HPRU aware.

The Knowledge Mobilisation Team will liaise with other Knowledge Mobilisation Teams to similarly share knowledge and identify opportunities across the HPRUs.

Effectiveness in this area of strategy will be evidenced by new collaborations and projects that otherwise might not have been recognised and the application of knowledge without regard for boundaries.

5. Engagement with external stakeholders

Engagement with wider policy-makers, professionals, industry and the public

This will include identification of end users and stakeholders for, and on whom, the research of each HPRU has the potential to impact. It also involves developing relationships to allow their expertise in and engagement with the research from planning to dissemination. We will also work with our HPRU Patient and Public Involvement and Engagement leads when considering knowledge mobilisation with the public.

Stakeholder mapping can be conducted with the Public and Community Oversight Group (PCOG) to identify end-users and other stakeholders at the project and theme level, the HPRU-EEH can map and reach out to these groups to facilitate knowledge transfer and identify area for new work where there are evidence gaps. This activity may include arranging stakeholder workshops. Stakeholders already identified include the Department of Health and Social Care, the Department for Energy Security and Net Zero (DESNZ) and the Department for Environment, Food and Rural Affairs.

When identifying new stakeholders the following will be taken into account:

- The level of stakeholders' interest in the project
- Aspects of the research they are interested in
- The level of influence to generate impact.

Planning, implementing and reflections on this activity will provide a record for reporting and material to allow improvement in these approaches.

Contributing to the knowledge mobilisation evidence base

As an expanding area of practice, knowledge mobilisation needs a developing underpinning evidence base. Knowledge mobilisation in health protection may also have some specific aspects. HPRUs will therefore evaluate the effectiveness of their knowledge mobilisation approaches.

Recording of activities and capacity development is integrated, including PhD supervision, post-doctoral research activity management, and project development. It will be captured in parallel, ideally within the HPRU intranet to facilitate collation and review.

Proposals for this includes evaluation of the changes in the culture and expertise in mobilising knowledge across researchers and other partners, prospective studies of approaches employed and their effects, and observational studies including case studies.

Measuring impacts and the role of knowledge mobilisation

HPRUs will evaluate their knowledge mobilisation activity annually, using the NIHR HPRU reporting process. Examples of activities captured are included in Appendix 2).

Knowledge mobilisation outcomes in the HPRU-EEH are continuously reported systematically. Researchers are required to report all knowledge engagement and mobilisation activities undertaken. Where available, supporting evidence will be submitted by researchers to strengthen case studies and to enable follow-up actions where required.

Examples include, but are not limited to:

- Use of research to inform national guidelines
- membership of and contribution to Government advisory groups (e.g. SAGE) or local Government advisory groups (e.g. outbreak management group)
- submissions to Parliamentary Select Committees (written or oral), or other parliamentary knowledge exchange activities
- advising organisations or governing bodies on Covid-19 strategies (e.g. national governing bodies and , businesses)

All data will be collated annually to report to NIHR and case studies selected to highlight substantial added value or impact within the Unit. Reporting will include the following areas:

- Reflections on knowledge mobilisation and monitoring of activity
- Collaboration with UKHSA
- Engagement with stakeholders
- Dissemination and communication of research activity
- Capacity building and training on knowledge mobilisation.

Appendix 1: Theory and Evidence informed approaches

NIHR HPRUs aim to apply evidence or theory-based approaches to knowledge mobilisation, building evidence in the process.

One framework within which evidence-based approaches to knowledge mobilisation is presented in [Using Evidence: What Works](#). This is a “discussion document” which summarises a project called The Science of Using Science, funded by the Wellcome Trust and the What Works Centre for Wellbeing (Breckon and Dodson, 2016; Langer et al, 2016). The aim of The Science of Using Science project was to review which interventions are most effective at increasing decision-makers’ use of research evidence in various decision arenas. The project involved two “review of reviews”.

1. A systematic review of systematic reviews of the evidence-informed decision making literature, which included 36 reviews of 91 interventions;
2. A scoping review of other social science interventions that might be relevant to knowledge mobilisation which identified more than 100 interventions.

Identified interventions were grouped within six underlying mechanisms of enabling research-informed decision-making. These are:

1. **Awareness:** building awareness and positive attitudes towards evidence use
2. **Agree:** building mutual understanding and agreement on policy-relevant questions and the kind of evidence needed to answer them
3. **Access and communication:** providing communication of and access to evidence
4. **Interact:** facilitating interactions between decision-makers and researchers
5. **Skills:** supporting decision-makers to develop skills in accessing and making sense of evidence
6. **Structures and processes:** influencing decision-making structures and their processes.

We will identify evidence-based approaches within this and other frameworks to promote knowledge mobilisation of the findings of our HPRUs.

The NIHR website <https://www.nihr.ac.uk/documents/knowledge-mobilisation-research/22598> has an extensive reading list organised by topic area if you want further information on the topic.

APPENDIX 2

HRPU KM – Interim Reporting requirements – Year 20/21

1. Understanding the KM capacity and capability within the HPRU	
1. KM lead	
<ul style="list-style-type: none"> Working Time Equivalent 	
<ul style="list-style-type: none"> Relevant expertise (training or direct experience in KM) 	
<ul style="list-style-type: none"> Role within HPRU governance structure 	
<ul style="list-style-type: none"> Contact details 	
Communications team	
<ul style="list-style-type: none"> WTE 	
<ul style="list-style-type: none"> Budget for dissemination and KM activities 	
Other support for KM	
<ul style="list-style-type: none"> WTE 	
<ul style="list-style-type: none"> Description (e.g. other staff/students) 	
2. Strategy (up to 500 words)	
<p>Please summarise your strategy for developing your dissemination and knowledge mobilisation capacity across the <i>duration of the HPRU contract</i>.</p> <p>Attach your full strategy (if available) as an appendix</p>	
3. Release of findings (up to 200 words)	

<ul style="list-style-type: none"> ○ Overview of 20/21 activity and approach ○ Key achievements ○ Key challenges 	
<p>4. Dissemination (up to 200 words)</p>	
<ul style="list-style-type: none"> ○ Overview of 20/21 activity and approach ○ Key achievements ○ Key challenges 	
<p>5. Knowledge mobilisation (up to 300 words)</p>	
<ul style="list-style-type: none"> ○ Overview of 20/21 activity and approach ○ Key achievements ○ Key challenges 	
<p>6. Collaborations (up to 200 words)</p>	
<p>These include partnerships that are supporting your knowledge mobilisation activity including other HPRUs, PHE, local authorities etc</p> <ul style="list-style-type: none"> ○ Overview of 20/21 activity and approach ○ Key achievements ○ Key challenges 	
<p>7. Researcher development (up to 200 words)</p>	
<ul style="list-style-type: none"> ○ Overview of 20/21 activity and approach ○ Key achievements ○ Key challenges 	
<p>8. What learning from your KM activities would you</p>	

want to share with other HPRUs?	