Healthcare-Associated Infection & Antimicrobial Resistance Knowledge Mobilisation Strategy, University of Oxford and Public Health England

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1. Background

The National Institute for Health Research Health Protection Research Unit (NIHR HPRU) in Healthcare Associated Infections (HCAI) and Antimicrobial Resistance (AMR) at University of Oxford is one of thirteen HPRUs established in partnership between universities and Public Health England (PHE) that act as centres of excellence in multidisciplinary health protection research in England. The HCAI & AMR HPRU programme of research brings together world-leading expertise to deliver a step-change in how we exploit increasingly rich data sources, technologies and theory with the aim of improving our response to HCAI & AMR and deliver cost-effective, evidence-based, high-quality public health impact.

Within the Oxford AMR & HCAI HPRU are four main Research Themes:

1. 'Populations': will exploit large-scale linked EHR data from multiple sources to optimally automate routine surveillance and identify "at-risk" populations.
2. 'Interventions': will combine multi-disciplinary approaches to complex interventions, including behaviour change techniques, mathematical modelling and whole genome sequencing, to develop, improve, pilot and test approaches to, and tools for, antimicrobial stewardship and management of key HCAI & AMR threats, and target interventions to those most at-risk.
3. 'Contexts': will increase our understanding of the contexts within which HCAI & AMR proliferate, identifying the those that are the most important drivers for HCAI & AMR, and how we can manage and/or reduce their influence.
4. 'Sequencing': will deliver public health whole genome sequencing services to industry standards incorporating the newest components to enable PHE to expand and renew its services.

Diverse organisations are involved in the work of the HPRU across research themes, including Oxford University (including the Biomedical Research Centre (BRC)), PHE's National Infection Service (particularly the HCAI & AMR Division, Laboratories, Data and Analytical Sciences and Field Service), Leeds University and the Animal and Plant Health Agency (APHA). Likewise, the work of the HPRU calls upon a range of disciplines, including infectious diseases, microbiology, public health, biostatistics, mathematical modelling, health economics, health psychology, behaviour change, bioinformatics, genomics and machine learning.

Increasing KM capacity and practice within the HCAI & AMR HPRU programme is designed to mobilise research outputs through engagement across organisations and disciplines, to increase their impact and reach in terms of policies and practices.
The HPRU HCAI & AMR Knowledge Mobilisation (KM) team consists of 10-20% FTE PHE Senior Executive Officer (SEO) and 50% FTE Higher Executive Officer (HEO) working with the KM Lead.

2. Definitions and underpinning theory

Applying a knowledge mobilisation strategy within research projects allows these to become meaningful and impactful. One of the most consistent findings in research of health services is the gap between evidence and practice (Grol and Grimshaw, 2003) and the acknowledgement that considerable avoidable waste is produced in the development and reporting of research evidence (Chalmers and Glasziou, 2009).

Knowledge mobilisation is about bringing 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.

The Oxford HCAI & AMR HPRU KM strategy has been developed to align with the wider NIHR HPRUs KM collaborative network and closely links with the overarching NIHR HPRUs KM strategy. It is based on a defined methodology and an iterative process, that includes a theory of change and an evaluation framework to map outcomes and impact across the lifetime of the programme. It is informed by the discussion document *Using Evidence: What Works* and its six underlying mechanisms of enabling research-informed decision-making:

1. Awareness: building awareness and positive attitudes towards research
2. Agree: building mutual understanding and agreement on relevant questions and the kinds of research and other evidence needed to answer them
3. Access and communication: providing communication of and access to research evidence
4. Interact: facilitating interactions between decision-makers and researchers
5. Skills: supporting decision-makers to develop skills necessary for drawing on research evidence
6. Structures and processes: influencing decision-making structures and their processes.

3. Aims

The HCAI & AMR KM strategy's overarching aim is to maximise the impact of current and future research projects carried out within the four HPRU themes and to capture and communicate those impacts as widely as possible. With relation to this, and in line with KM principles, the HPRU will aim to develop and test, in co-production with our key stakeholders, a KM model/framework to support the HPRU and embed KM as a crucial element for research planning, producing impactful outputs and monitoring and evaluating the impact of these on an ongoing basis. This will ultimately support the implementation of more effective, evidence based and collaborative policies and practices and promote a long-lasting culture change around tackling antimicrobial resistance.

The four primary aims of the HCAI & AMR KM strategy are:

1. Embed knowledge mobilisation within organisational cultures
2. Develop collaborations and facilitate engagement
3. Support active and varied dissemination and communication
4. Measure impact and evaluate success and within this improve the evidence base for knowledge mobilisation

3.1 Aim 1: Embed knowledge mobilisation within organisational cultures

We aim to move from a state in which staff may lack awareness of, or interest in, Knowledge Mobilisation, to a state where Knowledge Mobilisation is 'in the DNA' of the HPRU.

A wealth of resources to facilitate and enhance KM activities are already in existence within PHE. These existing tools and resources will be collated and assimilated, and relationships built with those with experience and expertise in KM principles and practice, such that knowledge can be shared and methods adopted within the Oxford HCAI & AMR HPRU. Curation and development of a single repository for online-training resources in knowledge mobilisation for access across HPRUs will be explored.

A toolkit of available resources (the 'KM Toolkit') will be developed and shared with project leads for cascade amongst staff, including information on KM principles and how to develop/share KM practices (see Methodologies section). An engagement planning tool will be provided, which is designed to engage staff across the HPRU with KM and build KM into the culture and business planning of the HPRU.

Within the HCAI & AMR Division, PHE, KM will be raised and championed to strengthen understanding and embed KM in PHE practice. The KM Toolkit will be signposted at the Divisional level and more widely through participation in PHE's network of 'Knowledge Advocates'. The importance of embedding KM early, at research inception, as well as via an evolving process throughout the research cycle will be addressed through exploring the inclusion of an Introduction to Knowledge Mobilisation session within the PHE HCAI & AMR Induction Programme, as well as its consideration in the annual Personal Development Reviews of staff.

Raising researchers' awareness of *how* policy-makers access and use information is a key element of embedding consideration of KM within research, alongside enhancing their own communication skills. Skills training, seminars presenting successful translation examples as well as opportunities to work in PHE to see how evidence informs local/national decision-making and placements/secondments, for example in a practice/prescribing environment, may be offered, and likewise for PHE staff to undertake placements within the University.

Sharing of successes, techniques and ideas will be a key part of the HCAI & AMR KM network and HPRU meetings, and sharing developments on open-source platforms, especially those that feedback engagement metrics for evaluation, will be encouraged.

The KM Network is exploring the instigation of 'Action Learning Sets' to support staff and develop KM skills across HPRUs.

3.2. Aim 2: Develop collaborations and facilitate engagement

Effective KM emphasises interactions and relationship building, enabling the targeting of the 'right people' to build networks and teams to make changes happen.
Key to this is determining the audience, including all types of stakeholder, partners and users. Examples of relationships to be built and strengthened throughout the HPRU are given below, however these are not definitive, and are likely to vary across programmes and evolve over time. Developing such relationships should help maintain robust KM activities throughout the HPRU, irrespective of dynamic changes to the system and organisational structures.

Effectiveness in this area of strategy will be evidenced by overall collaborative structures and processes as well as the role of these in case study examples.

Collaboration with Public Health England (PHE)
As the principal user of research evidence generated by HPRUs, collaboration between PHE staff and structures and the units is critical. This will include development of relationships to support joint working in the area and specifically ensure: i) engagement of PHE and its stakeholders in framing the research questions so that research outputs effectively address policy and practice needs, ii) policy and practice innovation and planning is informed by research findings and expertise.

PHE leaders may often be best-placed to ensure HPRU studies directly inform policy needs and results are disseminated beyond academia, including into PHE guidance/outputs. PHE involvement in major committees setting healthcare policy (DHSC expert advisory committees, NHS England and NHSX (NHS digital/data/technology organisation) AMR programme boards, NICE guidelines groups) demonstrates strong stakeholder connectivity. These existing networks and connections should be utilised to direct HPRU research for greatest policy/practice relevance.

The HPRU will foster working relationships between HCAI & AMR HPRU leads and the HCAI & AMR Divisional Senior leadership and Management team to create an HCAI & AMR KM network, in order to share ideas and celebrate progress across the HPRU and for PHE to share further.

PHE Knowledge and Evidence teams (e.g. Library Services, Evidence & Evaluation team, among others) have committed to collaboration with HPRUs to mobilise HPRU generated knowledge across PHE. This wealth of expertise and resources already in place/development will be exploited to best effect.

Collaboration across NIHR HPRUs

A network of 13 KM Leads from across the HPRUs has been developed and aims to meet bi-monthly. This network will be utilised to nurture collaboration across the HPRUs and to ensure that learning, resources and successes are shared, and that KM activity is aligned across the HPRUs.

The other HPRUs will be invited to the annual stakeholder workshops, which will provide opportunity to share learning and engage more deeply with specific projects.

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

This will include identification of stakeholders for and on whom the research of the HPRU has the potential to impact and, utilising and building upon existing PHE networks, developing relationships to allow their expertise in and engagement with the research from planning to dissemination. A stakeholder mapping tool will be provided as part of the KM Toolkit to HPRU project leads, which – in conjunction with other resources - will allow them to identify key stakeholders and consider the most impactful modes of mobilising knowledge for each.

PHE and HPRU to discuss and co-design the best approach to engaging stakeholders in order to steer the direction of research. Records of planning, implementation and reflections on this activity will be kept, providing a record for reporting and material to allow improvement in these approaches.

The SEO at PHE will act as the 'knowledge mediator' and meet stakeholders approximately annually to build relationships, extend networks for propagate HPRU results, and identify new avenues for dissemination and uptake. Progress in this respect will be fed back to the HPRU, as well as any changes is stakeholder evidence needs.

Annual stakeholder workshops can be organised as appropriate, to steer research directions, making use of approaches such as a Theory of Change setting out assumptions, preconditions, interim steps and outcomes needed to reach the impact, or the Policy Laboratory approach developed at King's. These workshops should aim to highlight differences in understanding through the use of mental maps and mindlines (Gabbay & le May, 2004) to guide communication.

3.3. Aim 3: Support active and varied dissemination and communication

The HPRU will work to mobilise knowledge through a range of outputs, (alongside papers including tools, accessible data sets, policy papers, briefing documents etc), and a range of media, depending on the stakeholder. Using the PHE Knowledge to Action Framework (see Methodology section), the HPRU will work to identify the methods of communication that will be the most impactful, and project specific approaches to support implementation of evidence identified from engagement with stakeholders. HPRUs and stakeholders will identify existing networks to support dissemination explicitly and use these to directly target communication.

PHE Knowledge and Evidence teams will collaborate with HPRUs to support dissemination, and alongside this the HPRU "knowledge mediator" can help identify and extend local regional and national networks for propagating HPRU results and identify new avenues for dissemination and uptake. Using this, the KM team will support project teams to develop communications plans. These would outline the key messages that the project aims to convey, the research outputs that will substantiate these messages and the forms of communication that will best convey these messages for specific stakeholders. One important mechanism will be through maintaining an up-to-date website including project descriptions and findings, and signposting data sources/tools/methods (e.g. Github).

The HPRU will be encouraged to use methods of KM that provide metrics for engagement, to allow for evaluation of impact. This could be engagement metrics for social media content, targeted feedback forms to webinar attendees, website hits for blog posts, citations of research outputs in other papers or references in news/other public-facing platforms. The HPRU will be encouraged to and supported in keeping track of these metrics and evidence of engagement in order to provide an annual 'engagement report'.

3.4. Aim 4: Measure impact and evaluate success and within this improve the evidence base for knowledge mobilisation

Establishing evidence and learning about how the KM processes work in practice will be at the heart of the approach, to build on continuous improvement and ensure replicability and potential adoption of the KM models across different areas and research themes. KM is an ongoing process which can last years and may involve many cycles of KM action, evaluation and improvement.

Evaluation of outcomes and impact, as well as a focus on processes and monitoring is an integral element of the overall HPRU KM strategy. Our monitoring and evaluation framework is based on the wider NIHR HPRU KM evaluation framework developed collaboratively by the HPRU KM network. Elements of the PHE-designed KM Maturity Model (see Methodology section) will also inform evaluation against defined KM indicators. The methodologies employed will identify and map impact, outcomes, outputs, activities and will include indicators for monitoring and evaluation, and test it throughout the lifetime of the HPRU programme.

Additional oversight, provided by Eleanor Murray (Saïd Business School, https://www.sbs.ox.ac.uk/about-us/people/eleanor-murray) whose research focuses on how change is constructed and impact/outcomes for stakeholders, will help to identify sources of data on changes in culture and expertise in the area of knowledge mobilisation to allow evaluation.

Outcomes
We will consider the key themes and their respective indicators within the wider HPRU KM evaluation framework ("NIHR HPRU Knowledge Mobilisation Reporting Template"):

- Reflections on and monitoring of KM activity
- Collaboration with PHE and other NIHR HPRUs
- Engagement with wider stakeholders
- Dissemination and communication
- Capacity building and training

Impact
To measure impact, we will consider the following indicators:

- Instrumental: changes to plans, decisions, behaviours, practices, actions, policies
- Conceptual: changes to knowledge, awareness, attitudes, emotions
- Capacity building: changes to skills and expertise
- Enduring connectivity: changes to the number and quality of relationships and trust
- Culture/attitudes: towards knowledge exchange, and research impact itself

A brief reporting template will be produced, which will invite the HPRU project teams to consider how their KM activities have increased impact in these five domains, against a range of defined indicators. This reporting template will be included within the KM Toolkit and project teams will be encouraged to complete alongside other annual reporting activity, including the case study. The HPRU and PHE KM representatives will meet biannually to monitor progress, reflect on areas that have gone well and areas that may require improvement. It may be appropriate to repeat the KM Maturity Model exercise periodically, in order to demonstrate progress and identify areas for further development.

Successes in KM practice will be celebrated and disseminated within the HPRU, within the PHE HCAI & AMR Division, and between HPRUs via the HPRU KM Leads Network. Learning from what works in PHE and the HPRU will be shared bidirectionally.

Knowledge mobilisation is an expanding area of practice and strengthening of the underpinning evidence base is required, including in its application to health protection. HPRUs will therefore evaluate the effectiveness of their knowledge mobilisation approaches. Proposals for this include 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.

Case studies
It is proposed that an annual case study is submitted by the HPRU or where appropriate, jointly across more than one HPRU using the "NIHR HPRU Knowledge Mobilisation Evaluation and Outcome Case Study Template" in order to evaluate progress against key

themes related to KM impact, for a piece of work that offers substantial added value or impact. These case studies will be used to build the evidence base for the use of KM in health protection generally, as well as measure impact and evaluate success, as part of key Aim 4.

4. Methodology

We will utilise two main Knowledge Mobilisation frameworks to achieve the listed aims:

a) The *PHE K2A (Knowledge to Action) framework (Figure 1)*- to support development of KM within projects. The K2A model aims to bridge the 'Know-Do Gap' between the data and evidence and good decision making and the development of effective policy and practice. It encourages the use of data and evidence by making it accessible, translatable and actionable. It includes a User Need process to inform ways to mobilise outputs by linking them to what users need in relation to data and evidence.

Figure 1. Schematic of Knowledge to Action Framework components

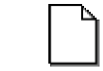
- *The PHE KM maturity model* –a self-assessment tool which helps teams identify/map what they are already doing around knowledge mobilisation, what they would like to be doing, and plan ways to achieve this. Identifying strengths and weaknesses, and target areas for improvement.
  It provides a benchmark, allowing teams to record and review progress and gives measures / indicators to show the types of activities that can be introduced to demonstrate progress against an outcome. The maturity model is adapted from the

cross-government model which was produced by a cross-government working group, reflecting the Knowledge Principles for Government.

The KM Toolkit

We will engage with and provide the HPRU with a toolkit of resources that will allow project teams to:

1) identify their KM aims, messages, audiences and means of communication (using the PHE-designed 'Knowledge to Action' - K2A - framework)
2) self-evaluate their current KM practices, strengths, areas for improvement (e.g. PHE 'KM Maturity Model' framework)
3) facilitate stakeholder mapping (e.g. using the PHE Stakeholder Mapping Tool:



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4) develop an engagement plan, in order to build KM into organisational culture, and project planning
5) design a communications plan, or provide links to communications teams – to facilitate meaningful communications with identified stakeholders
6) measure and evaluate impact (using for example the reporting template as described in section 3.4 Aim 4).

5. Strategy Review

This is a draft strategy and will be refined following feedback from NIHR mid-2021. It is also noted that we have referred to Public Health England (PHE) throughout this document, however the strategy applies to the future UK Health Security Agency, and associated bodies as appropriate, and can be updated accordingly in future iterations.

6. References

Chalmers, I., & Glasziou, P. (2009). Avoidable waste in the production and reporting of research evidence. *Lancet (London, England)*, *374*(9683), 86–89. https://doi.org/10.1016/S0140-6736(09)60329-9

Gabbay, J., & le May, A. (2004). Evidence based guidelines or collectively constructed "mindlines?" Ethnographic study of knowledge management in primary care. *BMJ (Clinical research ed.)*, *329*(7473), 1013. https://doi.org/10.1136/bmj.329.7473.1013

Grol, R., & Grimshaw, J. (2003). From best evidence to best practice: effective implementation of change in patients' care. *Lancet (London, England)*, *362*(9391), 1225–1230. https://doi.org/10.1016/S0140-6736(03)14546-1