NSW Regional HEALTH PARTNERS

# Discussion Paper

## Medical Research Future Fund (MRFF)

## Rapid Applied Research Translation (RART) Programme Grants – Discussion Paper 2020

## NSW Regional Health Partners

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NSW GOVERNMENT

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# EXECUTIVE SUMMARY

Through the strategic use of the Medical Research Future Fund (MRFF) Rapid Applied Research Translation (RART) grant scheme, NSW Regional Health Partners (NSWRHP) seeks to provide a new model to commission research that maximises health impact and delivers against local, state and national health system priorities.

After the previous two rounds of MRFF RART grant funding conducted by NSWRHP, the need for process change has become apparent. This proposal builds on the learnings from previous funding rounds, as well as international literature, to propose a new model that takes into account:

- Sustainability, spread and measurable impact on health outcomes;
- Support and engagement from our health service partners;
- The highest quality translational research our Centre can undertake using the skills and expertise of our clinicians, managers and researchers;
- Research that feeds into the clinical research pipeline, enabling clinical researcher career development and further funding; and
- Clinical research that implements solutions for regional and rural Australia.

With this aim, NSWRHP will actively facilitate a six-step co-production process, pulling together multidisciplinary teams and developing implementation proposals that will create impact and outcomes in the health system. Working across multiple partners and scaling solutions for regional and rural Australia will remain priorities.

The six steps and four corresponding 'gates' of the model are detailed below:

- **Step 1:** Early in the proposed process, we will focus on identifying unmet needs.
    - **Gate 1:** A single page EOI will be proposed that articulates the clinical need and/or deficiency of existing services.

- **Step 2:** NSWRHP will work to validate the proposal, ensure that similar proposals do not exist and ensure alignment to the priorities of the health system. Unmet needs will be addressed as outcomes.
    - **Gate 2:** A proposal written by the proponents, based on feedback from NSWRHP, will build on the EOI and pivot from unmet needs to outcomes that may be achieved.

- **Step 3:** Multidisciplinary teams are key to the development of clinical research capability in the health system. Thus at this stage, or earlier, multidisciplinary working groups will be created that include consumers, influential clinicians and demonstrably successful clinical researchers and academics. Where required, additional capability in terms of specific skills (e.g. health economics and policy) will be considered.
    - **Gate 3:** Project group will be formed to work on project proposal.

- **Step 4:** The working group will develop a project to commission a specific health outcome – this will then be subject to competitive review.
    - **Gate 4:** Project proposal submitted for formal and competitive evaluation.

- **Step 5:** Successful projects will be nominated for RART funding or supported to seek other funding sources.
    - Project team will conduct a comprehensive implementation project that is rapidly translatable and consistent with the project and scheme's objectives.

- **Step 6:** If effective, within 24 months of completion, projects will have translated and delivered outcomes into the health system.
    - Projects should be able to be translated into clinical practice within 24 months of completion.

This approach recognises that consumers, carers, clinicians and managers are in a unique position within the system to identify and champion unmet need. However the identification of unmet need is not enough. NSWRHP seeks to shift the focus from description and discovery to the deliberate commissioning of outcomes.

NSWRHP feels this approach will improve the likelihood of commissioning high impact research that results in demonstrated patient outcomes. It will also improve the competitive advantage of NSWRHP for other funding opportunities (including for the RART scheme if it moves to a competitive approach) through strengthening regional and rural research capability across the full geographical footprint of NSWRHP.

# INTRODUCTION

Aligned to the current MRFF RART guidelines, we propose a research and innovation process that enables high quality clinically relevant research aligned with NSWRHP and MRFF priorities to improve health outcomes and service efficiencies locally and nationally. Additionally, we wish to create a culture of research and evidence-based improvement in NSWRHP where research activity becomes integral to the provision of evidence-based care and improvement initiatives.

To achieve this, we will create a research model that will:

1. Connect teams across the partners,
2. Create solutions that can be scaled to other regional and rural areas of Australia and
3. Create a pathway from articulating unmet health need to commissioning a project to develop an innovative solution that becomes standard of care.

Through the creation of a defined pathway from idea to translation, we hope to avoid inefficient cycles of success and failure**. A new process is required to bring together consumers, clinicians, clinician researchers, managers and academics in a pathway that is clear on the mechanisms to access and compete for funding.** As such, the process must contain the best approach to identify priorities and nurture ideas, whilst also containing a contestable process to encourage best return on investment. We will bring mentoring, co-production and rigorous iterative process to ensure that each application is designed for success.

Through implementing this model, NSWRHP will commission research that leads more directly to better health system function and improved health outcomes. Research quality will be assured and enhanced, making it more likely that all proposals make a significant contribution to the evidence base. The way we will compete for RART and MRFF funding is through strengthening rural research capability and work across the full geographical footprint.

## Background

The Australian government has broadened its approach to research, no longer focusing funding on discovering and describing problems but now including the implementation, evaluation and translation of innovative solutions to improve health outcomes. Dedicated RART funding of the NHMRC accredited Advanced Health Research and Translation Centres (AHRTC) and CIRHs is one major vehicle to deliver this broadened approach. The other is via the MRFF calls and Missions. Directing such funding to translation centres over other funding approaches is justified, as they represent long-term committed health service and research partnerships supported at the highest level, where the capacity for spread of success is inherent.  Centres combine translational research projects with research capacity building, both as part of projects, establishment of practice-based research networks and by stand-alone training. The result is that clinicians become more active users of research (as well as creators), leading to more evidence-based care being delivered across the board.

NSWRHP is a centre for research translation in health and became an NHMRC accredited Centre for Innovation in Regional Health (CIRH) in 2017. The purpose of NSWRHP is to accelerate the translation of evidence into practice to improve the health and wellbeing of regional, rural and remote communities. The Centre supports new ways of working by researchers, clinicians, and managers within its eight partner organisations. By bringing the partners together to share information, reduce duplication and share resources, the Centre leverages existing activities to accelerate change within each organisation. It funds new initiatives to translate evidence into practice. The partners are committed to sustainable improvements to ways of working within their organisations in order to deliver better care.

The Centre's objective is to make appreciable improvements in patient outcomes and experience by translating evidence into practice through:

1. Funding research into evidence translation;
2. Building consumer and community capacity to contribute to, and benefit from, research;
3. Educating clinicians and researchers in evaluation and implementation science;
4. Building collaborations between clinicians, consumers, managers, researchers and the community; and
5. Advancing funders' and policy makers' understanding of evidence translation.

One mechanism for delivering improvements in health outcomes is through delivering the MRFF RART Program.

## Purpose of MRFF RART

The proposed NSWRHP pathway is designed to guide the process and delivery of the MRFF RART Programme. The RART initiative invests in research projects that encourage academic researchers and health service providers to collaborate to improve health care delivery, services and systems sustainability. The goal of the RART program is to support research centres (AHRTCs and CIRHs) to conduct transformative translational research,[1] so that patients can benefit from better quality of care. It will provide $218 million over 10 years. The Medical Research Future Fund has been providing support of $2.1M (ex. GST) per annum to the translational centres for the delivery of transformative translation research and national system level initiatives.

Early funding priority areas have included:

1. Improving clinical pathways;
2. Reducing unwarranted variation in clinical care and outcomes;
3. Improving the health of vulnerable groups;
4. Increasing primary care research; and
5. Testing new ways to reduce risk factors for chronic and complex diseases.

[1] Note: For most, translational research is research into the methods of translation, however, for others, translational research is the movement of knowledge from bench to bedside, such as that of a clinical trial. There is no agreed precise definition. All this work is important, but NSWRHP is oriented towards the methods focus where there are major knowledge and practice gaps, while there are many other funding sources for research such as clinical trials.

# MAJOR ISSUES CONSIDERED IN DEVELOPMENT OF THE PROPOSAL

## 1. Learning from the international literature

A summary of literature with commentary on its relevance to NSWRHP is provided in Appendix 1.

## 2. Learning from the previous RART funding rounds

After the previous two rounds of MRFF RART grant funding, the need for process change has become apparent. The processes undertaken in previous rounds did not provide clear evidence that the funded translational research projects represented top health service priorities, or that projects with positive results would be implemented. While the current process of health service management 'sign off' of applications excludes projects that are of no interest at all, it does generally support well-organised applicants regardless of their proposed research. Furthermore, while health economic evaluations have been included in all projects, real savings that make sustained implementation and spread affordable are only possible within a select few. A further concern is that projects funded to date are not clearly sited on a research development pipeline. While change implemented for the benefit of patients and community has been the ultimate research aim of RART funding to date, it is also advantageous if NSWRHP funding can assist researchers to obtain future funding for their research programs from other sources.

**Ideally NSWRHP would learn from detailed study of the results of the previous two rounds – both outputs and outcomes – however results are not yet available.** The six projects funded from RART 2.1 are scheduled to conclude in December 2020 with five on track to do this. The sixth project has been delayed by COVID-19 and will be completed in early 2021. The seven projects funded through RART 2.2 are not scheduled to conclude until December 2021 and will likely require a further six months to overcome the impact of COVID-19. An extension to 30 June 2022 will be requested for the RART 2.2 projects.

As we have to make decisions in the absence of output and outcome data, we can only consider the subjective RART selection experience to date. In doing so, the following points are important:

1. In the first RART round (which was made more difficult by strict government delivery timeframes, later relaxed), an open competitive process benefited the expert translational public health researchers. However, there is no pathway for spread or sustainability for many projects and the impact of many (e.g. of interventions addressing childhood obesity) will be long-term and difficult to measure. However some of the research is likely to assist the researchers, obtain competitive funding from other sources, and thus the development of the knowledge base, which is desirable.
2. In the second RART round, a major investment was planned for an end of life theme, an area of great concern for clinicians in primary and tertiary care, the public and healthcare funders. In line with best practice, a white paper describing issues and need was prepared to support a competitive funding call. Responses though reflected insufficient NSWRHP research expertise in this particular area. This resulted in fewer suitable proposals than expected, little competition for funding and some requirement to support novice researchers. Probably few of these projects will lead to future competitive research funding for the teams involved, but their required economic evaluations will generate health service business cases and may to lead to sustainable system change.
3. A successful part of the second RART round was development of the Embedded Economist project, with skills in evaluation being placed in health services to solve problems and build capacity (including via a formal education program targeted at senior managers). The micro-

projects worked on at each site are completely focused on the priorities selected by NSWRHP executive teams and thus directly and immediately contribute to more evidenced based commissioning and implementation of evidence-based service delivery. There has been significant health service engagement to date and this project offers the opportunity to influence large numbers of healthcare staff and improve key decision-making practices. This work has been picked up by other AHRTCs, with Health Translation SA partnering in the current research and others investigating participation.

## 3. The need to prepare for a potentially competitive future funding environment for the translational centres

As one of only three national Centres for Innovation in Regional Health, NSWRHP has a clear mandate to support projects that can be scaled to meet the needs of rural and regional Australia. Thus to differentiate the work of NSWRHP, it is proposed that grants must be: (1) scalable to solve regional and rural health care issues, (2) involve multiple providers of health care, and (3) be focused on delivering improved health outcomes without additional cost to the system. Additionally, projects that meaningfully address the needs of Aboriginal people will be prioritised. An intended consequence of this planned differentiation is to place NSWRHP at a competitive advantage in future funding scenarios. Therefore, focus on inherent regional strengths and delivering outcomes of scale for regional and rural communities is crucial to sustained success.

## 4. Relationship of RART grants to other research priorities and the existing research pipeline

There is an established research pipeline in the health system including improvement grants, clinical fellowships, Translational Research Grants Scheme (TRGS) grants and also those that are available from other sources such as the Hunter Medical Research Institute (HMRI) and/or NHMRC. The RART grants administered by NSWRHP should form a complementary part of the research and translation pipeline. While there are specific criteria for RART grants every year, some are broad and within these criteria we should also solicit proposals that have alignment to the broader priorities of the MRFF, the NHMRC and NSW Health, so that any funding required for further development may be able to be obtained from these sources. NSWRHP will actively work with and mentor project teams to facilitate applications for funding from other sources.

However, due to our size we sometimes have a gap between health and health service priorities and available researcher expertise in our footprint (we have world class research teams in some areas, but in others, few academics at all). If academic track record or the existing research pipeline became highly prioritised in NSWRHP decision-making it could lead to disengagement of health service partners.

## 5. Limited clinician and health service capacity and capability

Review of the NSWRHP Researching Important Clinical Questions to Improve Health Outcomes (RICH) program revealed that clinicians need specialist academic guidance and support to design and undertake research. Workload proved a common challenge, therefore administration and coordination must be built into any project. The time of health service managers cannot be assumed. Given the capacity and capability we have, we need to ensure that translational research project goals are feasible and realistic.

## 6. Minimal current development of a NSWRHP consumer engagement process

To date, NSWRHP has not comprehensively involved consumers in a priority setting. Consumers were involved in the selection of the Round 2 end of life projects and added significant value. Recruitment difficulties have prevented substantive development in this area, which remains a NSWRHP priority.

# PROPOSED FUTURE GRANTS PROCESS

In light of these findings, NSWRHP proposes conducting a gated, competitive process for future rounds of MRFF funding. This process involves a model or pathway with six steps and four 'gates' to support the assessment of projects. The process, its underpinnings and its principles are outlined in the following sections.

## Proposed Collaboration Model

A central purpose of this new model is to ignite interest in research and the process. For long-term capability development, this is key and will lead to improved health service outcomes. Through igniting interest, we will create an innovation funnel of potential projects leading both translation of outcomes into the health system and an increase in both the capability and collaboration of our partners via their managers, clinicians, clinical researchers and academics.

While the proposed framework leans on successful overseas programs such as CIMIT (USA) and MIMIT (UK), the purpose is not to develop new technology, create intellectual property or spin out companies. Although this might be an end result, it is not the purpose. The purpose is to improve delivery of services and products within the health system. These activities must be translatable and achievable within the short time horizon of 24 months.

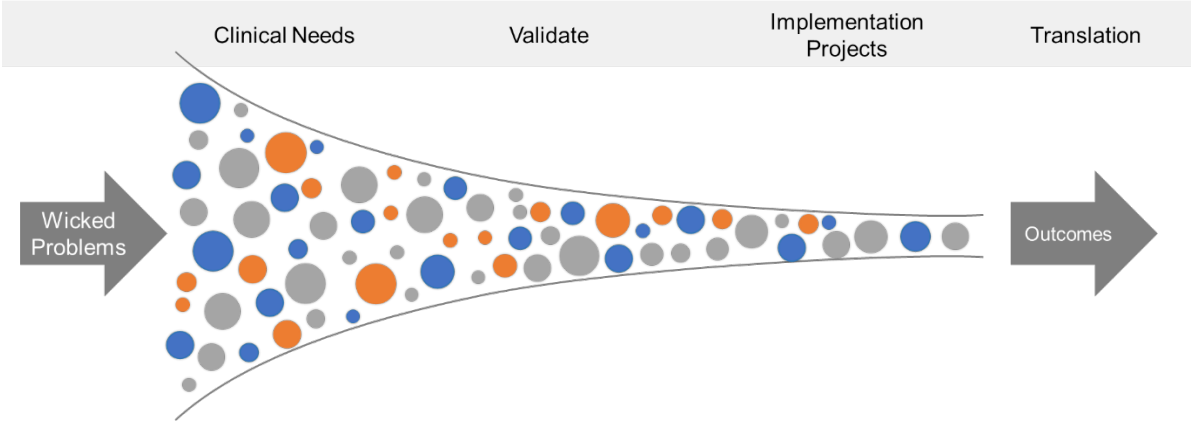


*Figure 1: The innovation funnel: developing identified clinical need into improved outcomes*

We wish to ensure success, through gaining information about specific healthcare needs in an organised fashion, as well as finding clinicians who have identified key challenges and joining them with academic partners at an early stage. This builds on our advantage, as NSWRHP is powered by a community of healthcare practitioners, academics, and clinician researchers working in our eight partners. Through our eight partners, we connect with diverse expertise to generate innovative ideas, novel methods and new solutions. The way we compete for RART and MRFF funding is through strengthening rural research capability and working across the full footprint. Our footprint in regional and rural Australia is our long-term competitive advantage.

To this aim, we will create a steering group of experts in clinical research, implementation science, and health policy to act as a community of ambassadors to underpin the success. Working together with NSWRHP, they are responsible for priming the pipeline, forging connections, collaborations and partnerships within and across the network.

## Participants in a Co-Production Process

Collaboration is at the heart of the CIRH network and vision. Building on the strengths of different professional groups and the principles of co-production, we will support projects that bring together key stakeholders.

**Clinicians** are at the front line of the challenges in the health system, and as such are acutely aware of the ways in which the system can be improved. They will drive the needs analysis and be rigorous in ensuring that outcomes can be translated. Through collaboration with researchers they will develop and understand methods to seek out new ways to solve healthcare problems and improve patient outcomes.

**Clinician researchers** will work with clinicians to develop a deeper systems-based understanding of the problem and posit methods to improve outcomes. They will mentor and assist the clinicians through the research process and assist the alignment of clinical and academic priorities. Clinician researchers are a bridge between academics and clinicians. They accelerate the identification, development and adoption of new ideas.

**Academics** provide expertise and enable contacts into other fields and industries who may have developed solutions or have unique insights. They are often challenged by how to connect with clinicians and clinical researchers in terms of finding out the real problems and developing solutions that can be translated into routine practice.

Additionally, the **health managers, funders and other key decision makers** play a large part in the shaping and validation of any proposed projects. All projects must be feasible within the service and have a ready pathway towards translation that has senior level buy-in and commitment.

The sharing of perspective, methodologies and experience is key to the proposed process and necessary to ensure the success of any project. Applications that link clinicians across the three local health districts (LHD) or across the primary health network (PHN) and LHDs will be prioritised and all solutions must be applicable to regional and rural Australia.

## Funding Model

The MRFF RART grants are highly prestigious and competitive, and as such all applications will be subject to a rigorous, transparent selection process. The proposed funding model or pathway has six steps, with four ‘gates’ to support the assessment of projects. These are:

1. Expression of Interest (EOI);
2. Proposal;
3. Project team formation;
4. Implementation Project Plan and Proposal.

Importantly, the project team will be assisted and mentored by NSWRHP through the first three gates to ensure the highest quality application. The process will be iterative, where project teams may revise proposals with additional feedback. The development of proposals that are peer reviewed at an early stage will challenge teams to ensure that they meet health system priorities, are broad in membership and developed proposals that are scalable for regional and rural NSW.

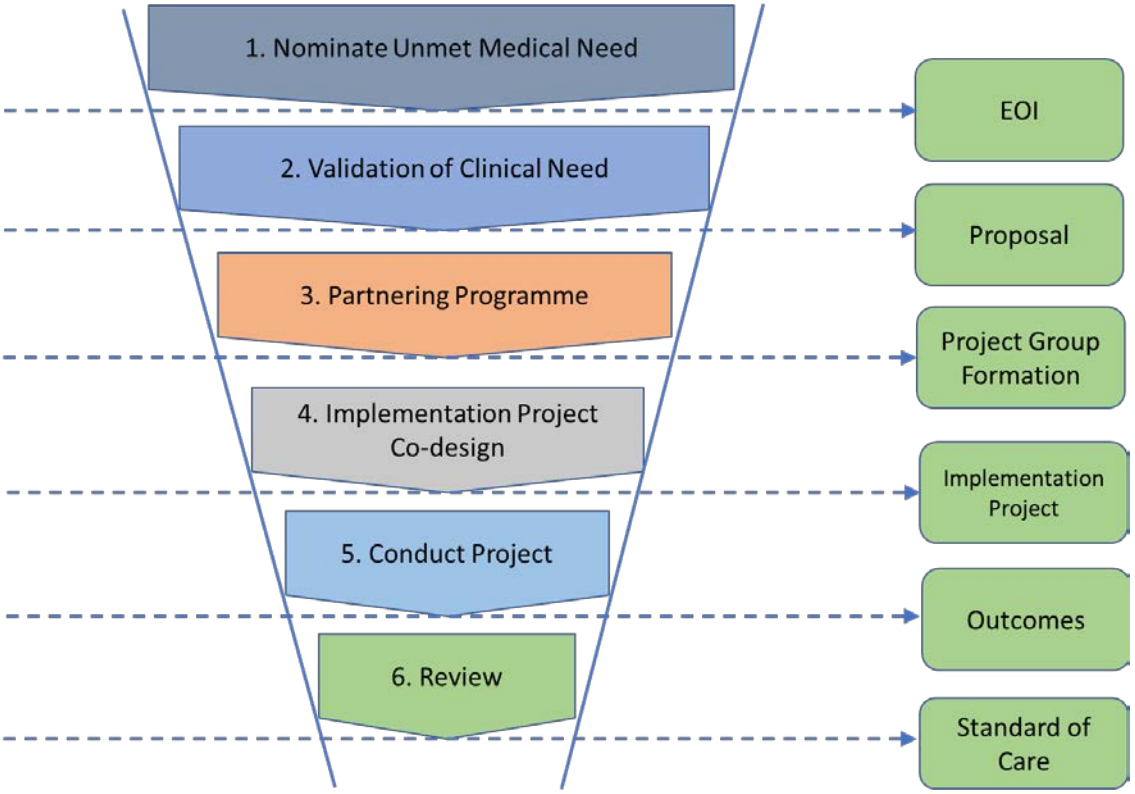


*Figure 2: Proposed funding and development pathway*

Under this new model, NSWRHP will provide implementation project grants of $400 – 600K over two years. The funding is designed to be significant so that project teams are motivated to complete the pathway.

Energy will be spent at the beginning of the process to identify, triage and facilitate projects that have a high degree of success. **Ultimately, the process is designed to ensure alignment to health service priorities, validation of the proposal, creation of the best team and submission of a highly competitive application.**

Unlike previous attempts at identifying 'wicked problems' at a health system level, this proposal will *develop* projects that the health services would wish to commission. There is a clear pathway through the life of the project rather than a single grant round. Additionally, each step of the pathway is curated with deliberate gates which enable the approval or recycling of projects and ensure selection and assessment occur through a transparent and competitive process.

The pathway creates a single portal into the huge pool of clinical and technical domain experts available in NSWRHP. All steps in the process are conducted together with NSWRHP staff who will facilitate the process. There is the opportunity for rework at each gate for proposals that are not ready for progression. Thus we will create a pool of proposals that can be worked through and are available for subsequent rounds and other funding opportunities to reduce the burden on the system.

The six steps of the pathway include:

1. **Nominate Unmet Need.** Clinicians or services will document an unmet need or service improvement. The goal at this stage is to create a low barrier to entry to the program and to facilitate the collection and triage of ideas. It is anticipated that the needs and challenges should be readily identifiable and very little discovery activity is required. Unmet needs can come from a single clinician or from an existing clinical partnership.
   **Activity:** NSWRHP will hold seminars and awareness activities to support the program and development of an EOI. Their purpose is to stimulate novel ideas, create partnerships and build awareness across different domains. Clinicians and consumers will drive the nomination of significant unmet medical needs. We will collect the EOIs for dissemination.
   **Gate #1.** A single page EOI will be proposed that articulates the clinical need and/or deficiency of existing services. EOIs will be approved for dissemination. Feedback will be provided for those EOIs that require revision.

2. **Validation of Clinical Need**. The EOI will be disseminated amongst an advisory group consisting of the members of the Translation Committee, the NSWRHP Director and consumer representatives. The Translation Committee are all senior staff who are research relevant and at a high executive level within the partners. They will evaluate and provide feedback in terms of the project and how it aligns to service priorities. At this stage, projects may be merged, or potential project team members added to increase capability. The goal at this stage is to validate that the unmet need is a 'wicked problem' that addressing could significantly improve patient outcomes and/or provide significant process improvements. Additionally, it must be determined that there are not existing solutions which could be implemented. Often a quality improvement project may be indicated rather than research. However if we don't know the best way to address the need, or if there is a choice of approaches that need testing for efficacy, efficiency, affordability, scalability and sustainability (e.g. study of comparative effectiveness), proposal for a fundable research project is justifiable. It may also be that seed funding from other sources may need to be sought or this point serves as an entrance point from other seed funding schemes.
   **Activity:** NSWRHP will provide constructive feedback on the EOI and link together with other participants who may be able to provide valuable input. Advice at this point will be curated and designed to improve the quality of the application and attraction for potential partnership. Similarly, a rapid literature review may need to be conducted if appropriate.
   **The unmet meet at this point will be re-expressed as an outcome that the health system would wish to commission.**
   **Gate #2.** A proposal written by the proponents, based on feedback from NSWRHP, will build on the EOI and pivot from unmet needs to outcomes that may be achieved. Clinical workflow will be described along with explanation of why other solutions are not feasible.

3. **Partnering Program.** NSWRHP project working groups will be formed. Each working group must have a clinician, clinical researcher and an academic. Additional team members will be proposed (e.g. health economics) to meet a specific gap. The teams will be created from: (a) interest generated by project proposals, (b) input from the advisory group and/or (c) partnering workshops.
   **Activity:** NSWRHP will curate and/or sponsor events and activities to bring together the different stakeholders together.
   **Gate #3**. Project group will be formed to work on project proposal. Project proposal should have positive feedback and buy-in from other stakeholders at this time.

4. **Implementation Project Co-production.** The project team will work on the clinical utility, engage with clinical and academic leadership, and gain health system sponsorship. Project

teams will describe the potential solution with a focus on proof of value. NSWRHP and its partners will play an important role in mentoring the teams to develop a strong proposal.
**Activity:** NSWRHP will work together with project teams to assist the development of a comprehensive proposal. We will bring in external expertise and connect groups to expertise as required, including potentially providing some modest funding for specialist external technical input if required for a stop/go decision.
**Gate #4**. Project proposal submitted for formal and competitive evaluation. Proposals must include proof of feasibility and proof of value. Discussion of any risk factors will be considered (e.g. regulatory, clinical, service, technical). A panel of experienced translational researchers external to NSWRHP will be convened to make the final prioritisation to be presented to the Board for approval. Assessments will be competitive and scaled according predetermined scoring rubric.

Proposed Rubric Items:

| Assessment Item | Measures: |
|---|---|
| 1. Likelihood of translation within NSWRHP footprint (demonstrated by alignment with our health services' priorities, health service research team members and any promised co-funding from the health services or industry) | Translational potential |
| 2. Scalability for implementation into regional and rural Australia generally | |
| 3. Potential to provide improved outcomes without an increase in cost to the system (or at minimal added cost) | |
| 4. Scientific quality | Research pipeline potential |
| 5. Additional alignment to NSW Health, NHMRC and non-RART MRFF priorities – this increases opportunities for translation and for funding for further developments | |
| 6. Team's track record in research and in implementation of innovation | |
| 7. Novelty (not overly weighted, as while trial of innovative approaches to translation will be valued, sometimes what will be tested is scale or sustainability) | |
| 8. Contribution to Aboriginal health (and to development of Indigenous researcher capacity) | Other |
| 9. Value for money | |

5. **Conduct Project.** Successful applications will be funded and undertake the work as described. Project reviews will be required every six months. NSWRHP will conduct project facilitation and mentoring as required and bring in groups to increase the impact and continue management of key stakeholders.
   **Activity:** NSWRHP will review the project to ensure milestones are being met and project remains aligned to program goals and objectives.
   **Step #5.** Project team will conduct a comprehensive implementation project that is rapidly translatable and consistent with the project and schemes objectives.

6. **End of project review.** Project validation. Validation of solutions. Change management of processes. Process to change practice guidelines.
   **Activity:** Outcomes must be disseminated. Launch of service improvement across the network. Clinical use (day-to-day practice change). Solution is recognised as the standard of care. Project impact will be calculated and reported.
   **Step #6.** Projects should be able to be translated into clinical practice within 24 months of completion.

## Measurement of Program Success

The MRFF RART programme has three key measures of success. First, that the community accepts and adopts new technologies and treatments. Second, clinicians adopt best practices quickly. Third, the research community has greater capacity and capability to undertake translational research.

To align to the scheme's measures of success, the following are proposed as measurements (KPIs) of program success:

- Number of needs provided to the network;
- Number of forums held;
- Number of unmet needs (Proposals / EOIs) reviewed;
- Number of partnerships created (and measurement of strength and reach of the partnerships using social network analysis or similar);
- Number of projects proposed;
- Number of projects funded;
- Number of projects completed;
- Amount of funding from external agencies;
- Number of conference presentations and peer reviewed publications;
- Published case studies of rapid adoption of new technologies and treatments;
- Economic improvement in healthcare provided;
- Number of changes to practice and policy; and
- Measured impact on health outcomes.

## Sustainability and scalability

A model where partners are required to support with cash and in-kind support is preferred. Given that the scheme is desired to commission efficiencies in the delivery or outcomes of the health service, there are several partners and stakeholders (such as the NSW Ministry of Health) who have a clear interest and could be part of a co-funding model.

Similarly, industry funding, where appropriate, could be used to leverage funds. Industry funding may come from private health insurance, private hospital systems, pharmaceutical and medical device companies. To that end, NSWRHP will actively engage with the MTP sector to propose avenues of support through initiatives such as Innovation Connections, R&D Tax Incentive, and other types of support.

To shift from 100% support to a degree of leverage, it is recommended that projects that have a degree of matched funding should be prioritised. It is also recognised that for the long-term sustainability of NSWRHP, diversified funding is essential.

The proposed model or pathway is scalable in terms of the resources required. The degree of mentoring and co-production sessions can be adjusted to meet the needs of the partners.

# Appendix 1: What does the literature tell us?

## Knowledge Mobilisation is central to reducing the evidence-practice gap

Knowledge is no longer seen as being 'generated in isolation and then passed on to those who will use it,'[1] but instead as constructed from social interaction and negotiation and therefore, dynamic and contested, relational and thus always contextually sensitive.[2] Knowledge mobilisation (KM) refers to moving available knowledge (e.g. from research) into active use and includes the products, processes and relationships among knowledge creators, users, and mediators (individuals or organisations that support knowledge brokering). The process can be viewed as two-way, in that clinical knowledge of work practices, obstacles, priorities and decision-making must also pass to researchers so that research is relevant for implementation into the health service. Knowledge mobilisation seeks to strengthen connections between research, policy and practice, creating a more social, relational and interactive approach to encouraging research use for improvement'.[3 4 2]

The four key principles proposed for effective KM are to:[2 5]

1. Foster and sustain relationships between researchers and research users over time (interactions and collaboration co-produce knowledge).
2. Pay attention to research users' context, so knowledge is adapted and integrated into local settings.
3. Integrate different kinds of knowledge, including patient experience or tacit knowledge of health professionals.
4. Test and evaluate knowledge mobilisation interventions in use.[2 7]

## Commissioning impactful research requires setting priorities

The primary aim of research priority setting is 'to gain consensus about areas where increased research effort including collaboration, coordination and investment will have wide benefits.'[6] Waste in health research occurs when there is unnecessary repetition of research and when potential users' needs are ignored.[7]

Recommendations for best practice in research priority setting include: [8 6]

1. **Transparency** - clear and specific criteria for eliciting and ranking potential priorities should be determined. Cost, feasibility and benefit are a common core trifecta.
2. **Prior information gathering** – including literature reviews and technical data.
3. **Being inclusive** – involve a multidisciplinary group with broad stakeholder representation. Noting that '[traditional academic] peer review systems … tend to be innately conservative, subject to fashion, and often inimical to ideas that do not conform to mainstream thinking.' [7]
4. Define when and how **evaluation** of priorities and priority setting process will take place.

While two people with a whiteboard can 'set priorities,' doing this well for health and medical research forms part of KM and will influence use of the evidence/implementation:

> *'If we want to improve innovation, diffusion and adoption, we should be seeking to integrate research into clinical practice and organizational routines, promote the coproduction of knowledge and build organisational absorptive capacity.'* [9]

There are multiple international efforts to allow health and medical research *users* to identify and prioritise research topics. Leaders include the National Institute for Health Research Collaborations for Leadership in Applied Health Research and Care (NIHR CLAHRCs) in England. Network organisations such as the Consortia for Improving Medicine with Innovation and Technology (CIMIT)[10] centred around Boston (USA), and its sister organisation in Manchester (UK), Manchester: Improving Medicine with Innovation and Technology (MIMIT) provide useful models of

collaboration. Both CIMIT and MIMIT are excellent evidence-based examples of how to build a collaborative network amongst clinicians, technologists and entrepreneurs to accelerate innovation and implement new technologies into the healthcare system.

Typically, even when patients and carers are involved in research, they are not involved early in priority setting and early decisions about what constitutes a researchable question, which can reduce the potential impact of their involvement.[11] The Patient-Centered Outcomes Research Institute (PCORI) in the United States and initiatives linked to the Canadian Institute for Health Research's Strategy for Patient Oriented Research seek to change this situation.[12] The PCORI institute funds patient-centred comparative effectiveness research with a requirement for engaging patients and other stakeholders in the research process, including during priority setting, design, conduct and analysis etc., a requirement that is unique among the US funders of clinical research.[13] The UK James Lind Alliance developed a careful approach (see box below) perhaps better suited to national priority setting exercises:

**The UK James Lind Alliance 'Priority Setting Partnerships'** typically involve three stages: a survey, an interim priority exercise (online) and a final face-to-face prioritisation exercise. The core principles are: transparency of the process, balanced inclusion of patients and clinicians, exclusion of non-clinician researchers for voting purposes, exclusion of groups with significant competing interests (e.g. pharmaceutical companies), audit trail of the research topics through to final prioritised list, and recognition that priority setting is a form of shared decision-making, not research.[14] For fuller details see the 2013 James Lind Alliance Guidebook (http://www.jla.nihr.ac.uk/jla-guidebook/)

***For translational success, academics need to allow users, patients, community members, clinicians and managers to play a major role setting priorities***

## There is, as yet, no defined best practice in priority setting for a translational research centre

The most useful evidence is from the UK. The **Collaborations for Leadership in Applied Health Research and Care** (CLAHRCs) were developed in response to the 'growing recognition of the need to accelerate the generation and uptake of knowledge in health systems.'[15] CLAHRCs are collaborative partnerships between a university and the surrounding National Health Service (NHS) organisations. The nine CLAHRC pilots were funded for 5 years from 2014-2018. Their funding has been extended and another four centres added. Their three major interlinked functions are: conducting high-quality applied health research, implementing the findings from research in clinical practice and increasing the capacity of NHS organizations to engage with and apply research.[16]

However, there are important differences in relation to NSWRHP and decision-making regarding RART grants. The RART grants are 100% focused on research, whereas the National Institute for Health Research (NIHR) funding to the CLARHCs is allocated 80% to research and 20% toward implementation. Much quality improvement work is therefore supported.[17] Secondly, the CLARHCs have more money, the program receiving approximately 26M pounds per annum from the NIHR, equivalent to 2M pounds each. This is matched by an equal contribution from the health services (a combination of cash and in kind). The Australian translation centres receive equal sums from the RART of $2.1PA. Additionally, the Australian Centres serving more rural and remote populations are underserved in terms of other available research funds, with their academic partners being less wealthy and their health systems partners more stretched (not such an issue in the highly populated and urbanised UK environment).

Despite the CLAHRCs now having been in place for 6 years, a recent systematic review found most evaluations focused on how they have been organised and on development of theory around their emergent properties. Evidence is lacking on the impact of CLAHRCs and there is little generalisable knowledge on the practices adopted to achieve impact, such as priority setting.[15]

However the CLARHCs have put substantial thought and effort into priority setting.[17] As an example, the **NIHR CLARHC North Thames** approach to process and criteria are shown in the diagram below. They have a group of seven applied researchers, who are specialists in statistics, health economics, qualitative research and evaluation: the North Thames Research Partnership Team.

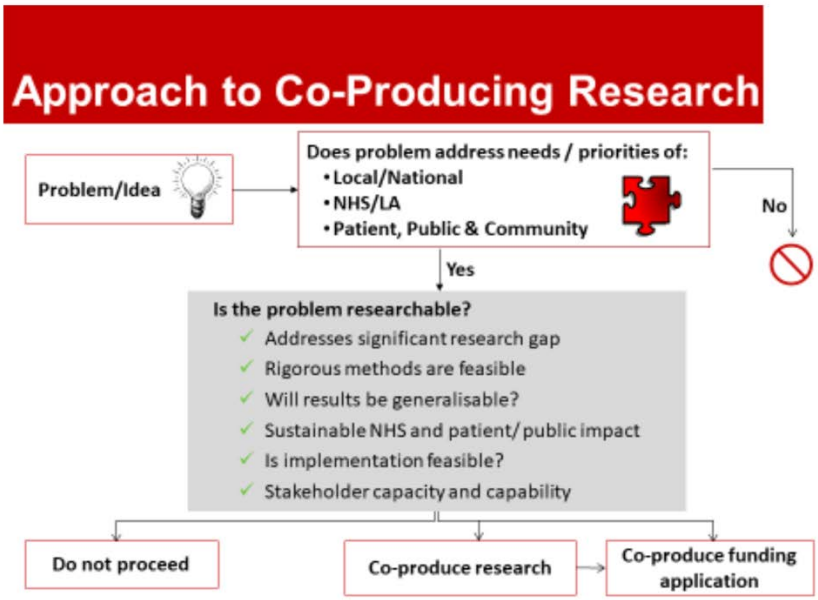


*Figure 1: NIHR CLARHC North Thames's Approach to Co-Producing Research*

The development of the CLAHRCs was influenced by the research metrics required by the NIHR. These include numbers of publications, and funded students awarded higher degrees, additional research funding leveraged and impact on healthcare and patients through 'case studies.'[15] Because of this, many of the CLAHRCs worked from areas of existing research strengths and then mapped these on to the needs of the local health providers ('marrying' them together).[18] Others took a very different approach, establishing what the existing important service innovation projects were in the local region, selecting larger, more organisationally focused projects and then building into the projects performance and ongoing evaluation systems, both formative and summative ('embedded' research and researchers).[18]

In the absence of more generalisable knowledge, some published individual accounts are of interest.

**NIHR CLARHC South-West Peninsula has** published details of an elaborate process. They extensively sought clinical priorities from workshops and meetings with over 290 questions being considered for funding over a two year period. The representatives of the founding health and academic organisations set priorities after the evidence synthesis team spent 2-3 days preparing a briefing for each one, and the panel considered 12 at a time in lengthy meetings. Actions for prioritised topics ranged from literature reviews to development of modelling studies, a cluster randomised controlled trial, development of full research proposal (presumably for funding by others).[19] There is no evidence of the return on investment for this labour intensive approach to priority setting. Indeed, if as is usual, the demand for research far outweighs the funding available, it could even be argued that apart from avoiding egregious examples of waste, selection could just as well be random from among a pool of eligible projects.

**NIHR CLARHC Yorkshire Humber** argued that the priority setting methods they used to achieve impact included: 'flexibility of research and implementation work streams; 'matched' funding arrangements to support alignment of priorities in partner organisations; the size of the collaboration offering a resource to meet project needs; and the length of the programme providing stability and long-term relationships.'[20]

Their work was divided into themes (as in the Sydney, UNSW, Monash and Melbourne translational centres) and theme leads took different approaches. The methods of prioritisation varied, including: historical trusted partnerships with ongoing dialogue; platforms for negotiation and decision-making; and, formal consensus methods.[20] They felt that their processes were a responsive and flexible approach to the resources allocated by the health services and the universities and their receptive leaderships. As a result, 'meaningful' priority setting through iterative and ongoing research-practice relationships occurred. However, processes were considered time consuming and a work burden for some NHS clinical and managerial colleagues.[20]

A **comparison of nine CLAHRCs** proposed five different 'archetypes' to represent the different ways of achieving the balance between research production and research implementation.[18] The two funding rounds undertaken by NSWRHP are most similar to Archetype A (first round) and Archetype D (second round), as detailed below.

| **NSWRHP Round 1 RART process similar to Archetype A** | **NSWRHP Round 2 RART process creates a situation more like Archetype D** |
|---|---|
| Research governance is maintained by academics who are accountable to a wider group of stakeholders. The risk of this approach is a retreat to institutionalised silos of activity if boundaries are not actively managed, rather than sustaining new culture of multi-stakeholder research. In addition, the implementation process may not be formally controlled.[18] | Academics and service providers are involved in research process; existing relationships and high levels of trust form the basis for the collaboration. Research questions are heavily influenced by local provider concerns. The strength is that a legacy is more likely. Weaknesses include difficulties with accountability, and development of cliques and informal networking can make overall coherence and vision difficult to maintain.[18] |

Finally, there are two key observations on co-production that are of interest. Firstly, the busyness of NHS clinical staff (as is also the case in Australia) is the major barrier to their research involvement.[21] [22] Second, co-production and collaborative priority setting has costs in terms of time and effort. [20] [23] A large UK research project on 'Optimising the impact of health services research on the organisation and delivery of health services: a study of embedded models of knowledge co-production in the NHS' (https://fundingawards.nihr.ac.uk/award/16/52/21) will deliver results this year and provide insights on how to mitigate these costs.

Secondly, there is a specific issue of *participation* in health service research that has been somewhat neglected in the general talk of co-production. Participation will occur in research which addresses problems experienced by those who have to participate, but a senior management priority will not necessarily result in clinician co-operation and participation. Thus local improvement priorities are engaging.[21] However, senior management support *is* essential for future implementation.[22]

***NSWRHP is still experimenting, which is appropriate in the absence of well-supported guidance. We need to develop a model appropriate to our context, including the size, capability and budget of our Centre.***

## Building a network to accelerate innovation

In many ways NSWRHP can be viewed as a centre without walls, incorporating a network of local health districts, hospitals, medical research institutes, universities and a primary health network. Crucial to success, is to develop a model for how to engage with 'wicked' clinical problems across a range of centres with a singular vision. Both CIMIT (USA) and MIMIT (UK) provide positive examples of success as well as insights into what success may look like. It is important to note that both CIMIT and MIMIT are purposed with delivery of devices, drugs, diagnostics, eHealth and procedures for improvement in healthcare. The purpose of NSWRHP is to improve delivery of services and products within the health system. Despite this, they provide a similar co-production model to collaboration.

CIMIT was founded in Boston over 20 years ago, and is a network of Boston's leading hospitals, universities and research centres. Importantly, they are growing and facilitating development of centres overseas such as MIMIT in Manchester (UK) and A*STAR in Singapore. CIMIT and MIMIT are built on the framework of co-production, where research is conducted together by a community, organisation or group and may involve contributions of many partners.[24]

The CIMIT model is based on identifying the unmet medical need and undertaking a co-production process leading teams through a 'designed for success' roadmap to de-risk the journey from innovation to standard of care (Figure 2 below).[10 25] The roadmap is based on CIMIT's HealthTech Innovation Cycle which consists of a series of well-designed milestones or steps, each with a minimum set of deliverables required to pass the gate to the next stage. The process is designed to be cyclical and importantly always starts with the clinical problem, rather than technology, with the end goal being to improve patient care. Multi-disciplinary teams are created in recognition that researchers working alone cannot generate the trans-domain knowledge requirements for successful implementation in a complex healthcare system. Importantly, the CIMIT Clinical Impact Study[26] reported that there was no difference in success between junior and senior investigators, highlighting that a co-production model with good facilitation may be suitable for NSWRHP where we also have differences in experience levels within and between clinical groups.

Over 20 years CIMIT has been successful across a range of areas. Case examples include: redesigned patient care environments so that personnel and equipment can be tracked in real time; new methods of imaging to improve diagnosis; and setting standards for open platforms in medical devices. Key metrics of success include over $1,113M USD in investment, 2,283 publications and 458 issued US patents.[26] After 20 years, CIMIT provides a significant leveraging effect for partners, in that, for every dollar partners invest in CIMIT, they receive $3.50 directly back from CIMIT for projects, and an additional $10 of funding from outside sources to fund projects.[25] The Clinical Impact Study [26] further reports that they have supported the development of over 250 solutions to unmet medical needs, including over 600 peer-reviewed and facilitated collaborative projects.[26] Of the supported projects, 78 have made a commercial exit and have moved to the point that a commercial partner is now responsible for the success in the wider healthcare system. Similarly, MIMIT in a shorter time frame, has completed 38 projects and leveraged $3M in initial funding to over $10M in follow-on with an additional $40M in industry investment through twenty joint projects.[10] CIMIT and MIMIT have shown that success in medical innovation can create a virtuous cycle stimulating further external investment and attracting more partners to the network.

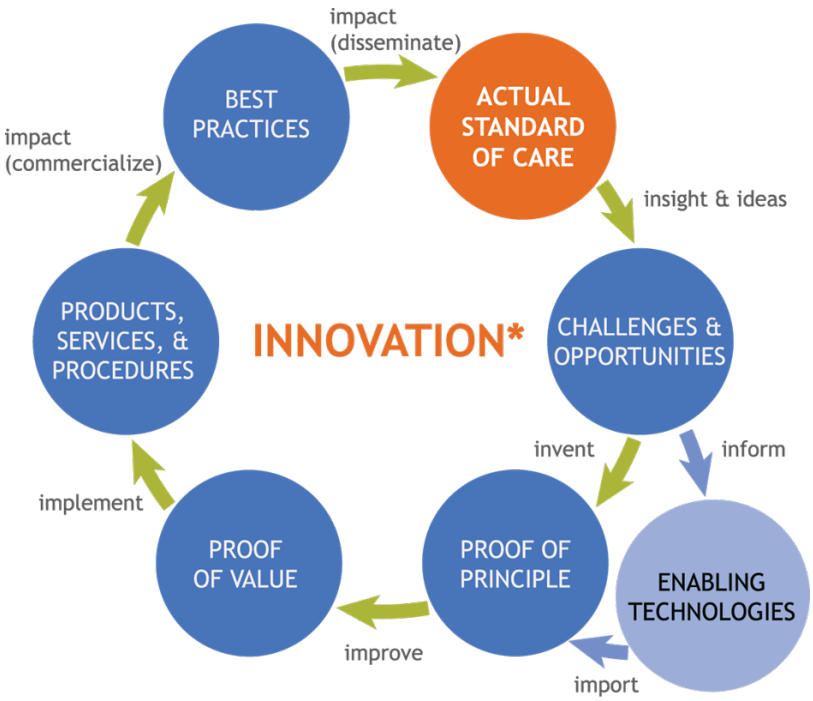


*Figure 2: CIMIT model for accelerating translational medical research, devices, procedures, and clinical systems*[11]

***NSWRHP can take advantage of successful co-production frameworks to increase the likelihood of projects leading to improved healthcare outcomes.***

## Measuring impact

A number of authors have highlighted that traditional methods of measurement of impact and outcomes may under represent the benefits achieved by taking a co-production and knowledge mobilisation approach to measurement of the impact of innovation processes. [3 4 24]

Certainly, the traditional measurements in terms of funding received, peer reviewed publications, increased health benefits obtained, number of project proposals, number of projects completed and similar can still be measured, quantified and reported. However, while valuable, these traditional measures of impact and outcome have been criticised for the inability to measure influence on new healthcare processes, policy and procedures.[4]

Additional benefits need to be calculated that include the understanding that co-production is a process that involves a gradual porous and diffuse series of changes that are undertaken collaboratively.[24] The activity of co-production processes, through a specified framework increases the probability of significant health service change. Alternative methods of measurement would include ongoing holistic evaluations, community led evaluations, policy review, social network analysis and the like. Specifically, following the framework proposed by Beckett et al.[4] impact should be measured at the individual, group, organisational and societal levels. Importantly, these approaches are consistent with the alignment of systems and processes towards value-based healthcare.

***The reporting of NSWRHP should ensure that both traditional quantitative measures of impact are combined with measures of benefits in the health and research ecosystem and wider community.***

## Getting a translational centre working effectively takes time

A survey of staff across six CLAHRCs found that both NHS and academic respondents strongly supported the key objectives of 'increasing the capacity to undertake and use applied health research in the NHS and to foster a culture of collaboration between the academic and service delivery sectors, but there was considerable uncertainty about how best to achieve them in practice, and five years was too short a time in which to embed their approach and change the 'norms' of the service.[27] Those involved with the CLAHRCs have complained, e.g.: 'if they were really serious about collaboration and partnership working, working with projects of local importance, they would have allowed time to establish those relationships and to put together work packages that could be longer-term aims of a wider range of organisations.'[18] Delays in employing staff were also a major problem.[18]

Information from CIMIT supports the view, that despite its favourable location and evident success, that it has taken over 20 years to realise the full capability. The co-production processes recognise that the process of translation of medical science to patient care is complex, long and risky.

Similarly interviews with Canadian researchers and research users involved in collaborative research, found that a distinct early phase of partnerships that took from 6 months for pre-existing partnerships or up to 6 years for newly formed partnerships. This was characterized by identifying and securing partners through multiple interactions, and activities to define the partnership, foster momentum, commitment and enthusiasm, and laying the administrative, governance and research ground work for ensuing collaboration. [28]

***For a translational centre, NSWRHP is a very young organisation.***

## References


1. Davies H, Nutley S, Walter I. Why 'knowledge transfer'is misconceived for applied social research. *Journal of Health Services Research & Policy* 2008;13(3):188-90.
2. Powell A, Davies HT, Nutley SM. Facing the challenges of research - informed knowledge mobilization:'Practising what we preach'? *Public Administration* 2018;96(1):36-52.
3. Kislov R, Waterman H, Harvey G, et al. Rethinking capacity building for knowledge mobilisation: developing multilevel capabilities in healthcare organisations. *Implementation science : IS* 2014;9:166. doi: 10.1186/s13012-014-0166-0 [published Online First: 2014/11/16]
4. Beckett K, Farr M, Kothan A, et al. Embracing complexity and uncertainty to create impact: explorig the processes and transformative potential of co-prodcued research through development of a social impact model. *Health research policy and systems* 2018;16(118):1-18.
5. Holmes BJ, Best A, Davies H, et al. Mobilising knowledge in complex health systems: a call to action. *Evidence & Policy: A Journal of Research, Debate and Practice* 2017;13(3):539-60.
6. Bryant J, Sanson-Fisher R, Walsh J, et al. Health research priority setting in selected high income countries: a narrative review of methods used and recommendations for future practice. *Cost Effectiveness and Resource Allocation* 2014;12(1):23.
7. Chalmers I, Bracken MB, Djulbegovic B, et al. How to increase value and reduce waste when research priorities are set. *The Lancet* 2014;383(9912):156-65.
8. Viergever RF, Olifson S, Ghaffar A, et al. A checklist for health research priority setting: nine common themes of good practice. *Health research policy and systems* 2010;8(1):36.
9. Walshe K, Davies HT. Health research, development and innovation in England from 1988 to 2013: from research production to knowledge mobilization: SAGE Publications Sage UK: London, England, 2013.
10. Parrish JA, Schachter SC, Carleton PF, et al. Accelerating the innovation cycle. *IEEE Pulse* 2014;2154:46-54.
11. Snow R, Crocker J, Crowe S. Missed opportunities for impact in patient and carer involvement: a mixed methods case study of research priority setting. *Research Involvement and Engagement* 2015;1(1):7.
12. Barratt H, Shaw J, Simpson L, et al. Health services research: building capacity to meet the needs of the health care system. *Journal of health services research & policy* 2017:1355819617714815. doi: 10.1177/1355819617714815 [published Online First: 2017/08/09]
13. Forsythe L, Heckert A, Margolis MK, et al. Methods and impact of engagement in research, from theory to practice and back again: early findings from the Patient-Centered Outcomes Research Institute. *Quality of Life Research* 2018;27(1):17-31.
14. Ball J, Ballinger C, De Iongh A, et al. Determining priorities for research to improve fundamental care on hospital wards. *Research Involvement and Engagement* 2016;2(1):31.
15. Kislov R, Wilson PM, Knowles S, et al. Learning from the emergence of NIHR Collaborations for Leadership in Applied Health Research and Care (CLAHRCs): a systematic review of evaluations. *Implementation Science* 2018;13(1):111.
16. Currie G, Lockett A, El Enany N. From what we know to what we do: lessons learned from the translational CLAHRC initiative in England. *Journal of health services research & policy* 2013;18(3 Suppl):27-39. doi: 10.1177/1355819613500484 [published Online First: 2013/10/30]
17. Heaton J, Day J, Britten N. Inside the "Black Box" of a Knowledge Translation Program in Applied Health Research. *Qualitative health research* 2015;25(11):1477-91. doi: 10.1177/1049732315580104 [published Online First: 2015/04/10]
18. Lockett A, El Enany N, Currie G, et al. A formative evaluation of Collaboration for Leadership in Applied Health Research and Care (CLAHRC): institutional entrepreneurship for service innovation. 2014
19. Whear R, Thompson - Coon J, Boddy K, et al. Establishing local priorities for a health research agenda. *Health Expectations* 2015;18(1):8-21.

20. Cooke J, Ariss S, Smith C, et al. On-going collaborative priority-setting for research activity: a method of capacity building to reduce the research-practice translational gap. *Health research policy and systems* 2015;13(1):25.
21. Marjanovic S, Ball S, Harshfield A, et al. Involving NHS staff in research: Cambridge: Healthcare Improvement Studies Institute, 2019.
22. Sheard L, Peacock R. Fiddling while Rome burns? Conducting research with healthcare staff when the NHS is in crisis. *Journal of Health Organization and Management* 2019
23. Oliver K, Kothari A, Mays N. The dark side of coproduction: do the costs outweigh the benefits for health research? *Health Research Policy and Systems* 2019;17(1):33.
24. Pain R, Askins K, Banks S, et al. Mapping Alternative Impact. Alternative apporaches to impact from co-produced research. Durham, UK: Durham University, 2015:16.
25. Parrish JA, Schachter SC, Dempsey M, et al. Facilitating translational research. *Journal of Investigative Dermatology* 2015;135:1463-65.
26. CIMIT. CIMIT Clinical Impact Study. Boston, USA: CIMIT, 2014:1-6.
27. Soper B, Hinrichs S, Drabble S, et al. Delivering the aims of the Collaborations for Leadership in Applied Health Research and Care: understanding their strategies and contributions. 2015
28. Zych MM, Berta WB, Gagliardi AR. Initiation is recognized as a fundamental early phase of integrated knowledge translation (IKT): qualitative interviews with researchers and research users in IKT partnerships. *BMC health services research* 2019;19(1):772.

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